luce x2

type: FST3

cafe

I - E

INSTALLATION AND MAINTENANCE MANUAL
Translation of the original instructions

MAN4200075 rel. 01 del 22.04.2016

rheavendors group

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preliminary safety information

before using the machine, carefully read this information that helps you behave properly and guarantee a safe use;
the following pages use the symbols listed here below, whose meaning is of attention:

GENERAL;
if the text is highlit by this symbol, it is recommended to pay special attention to the performance of the procedures described; if not carefully performed on safe conditions, they can be source of general danger;

HIGH VOLTAGE;
if not properly performed, the actions marked by this symbol may expose to accidental contacts with electric voltage;

DANGEROUS TEMPERATURE;
if not properly performed, the actions marked by this symbol may expose to accidental contacts with high-temperature parts;

MOVING MEMBERS;
if not properly carried out, the actions marked by this symbol may expose to accidental contacts with moving members;

the same symbols are placed inside the vending machine to indicate the parts on which to act with the utmost caution;

SERVICE KEY IN USE;
the symbol recommends the utmost attention during the actions described; the use of the service key <u>intended to activate all machine functions when the door is open</u> is only reserved to the technical operators who know the operation of the vending machine, who are aware of potential risks and who make sure they are operating on totally safe conditions;
the use of the service key shall be strictly limited to the time necessary to perform the actions requiring the use thereof; users shall be informed of the prohibition on using and approaching the vending machine;

WEIGHT:
the symbol reminds the user to consider the machine weight carefully for handling and placing it definitively.

WATER SUPPLY;
it marks the parts duly requiring caution in case of leakage, if connected with the hydraulic network;

SUPPORT SURFACE;
it reminds the user to install the machine on a support surface, the max. inclination of which is 2°;

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safety rules for using the vending machine

*** pay special attention to the chapters and notes high lit by the symbols of alert; strictly observe the rules concerning, in particular, the operators' and users' safety;

*** the vending machine may be used by children who are at least 8 years old and by people having reduced physical, sensory or mental capacities or not having all necessary experience and knowledge, provided that they are under supervision or after they have received all necessary instructions for using the machine on safe conditions and for understanding the dangers related thereto; children must be supervised and prevented from playing with the vending machine;
cleaning and servicing shall not be carried out by children;

*** if you should find out a water leak or the presence of smoke, immediately detach the vending machine from the electric and hydraulic network, never try to restore its operation and apply to skilled technicians;

*** the machine shall be installed according to national rules; pay special attention to the rules about the machines directly connected with the hydraulic network;

*** room (during storage and operation):
temperature: 5 °C ÷ 35 °C
relative humidity: max 80 %

*** the inclination of the vending machine support surface shall not exceed 2°;

*** if the hydraulic connection tube is not supplied with the machine or in case of replacement, the connection must be carried out only with:

- new tube;
- of type-approved material for food use;
- compliant with "IEC 61770 Electric appliances connected to the water mains";
- it can support the working pressure;

*** the user is not allowed to access the maintaining and servicing area that shall be properly signalled;

*** never remove protections, never override safety devices and never modify the machine or its components;

*** tools necessary to act with this vending machine:
- a pair of scissors for electricians, a Phillips PH2 cross screwdriver for 4/6 mm self-threading screws, a set of wrenches up to 13 mm, a set of Allen wrenches from 2 to 8 mm;
- it may be of use to procure some expendables, such as disposable paper, single-use gloves, clean cloths, cups and a bucket for the collection of waste water;

*** never wash the machine by using water jets;

*** for cleaning at regular intervals refer to chapter 12;

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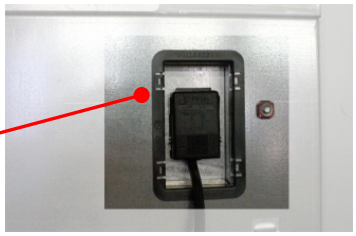
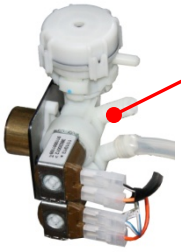
safety rules for using the vending machine





the symbol means that it is forbidden to dispose of the equipment as urban waste and compulsory to provide for separate collection in order to prevent any potential effect on the environment and human health; strictly follow the provisions of the European Parliament's 2012/19/EU Directive;

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residual risks

a residual risk is understood as a potential danger that can not be eliminated and it persists despite all precautions in use since it is related to the intrinsic features of the product and it also includes non-identifiable risks;
the actions and behaviours listed here below are intended to reduce residual risks and you shall always adopt them when interacting with the machine;

wear clothes that can properly avoid any accident (never wear rings, chains, clothes with laces or excessively long sleeves, ...);

carefully evaluate the treatment of residues from installation (wood, plastics, ...) and utilisation (product powder, bags, ...);

never repair or carry out any technical action if you have not been properly trained;

signal that a technical action is in progress on the machine (barriers against approach, signs, ...), carry it out quickly without leaving the station;

install the machine in a sheltered, illuminated, ventilated and noiseless environment; keep it clean and never place tools or any other object on it; never install it outdoors or, anyway, never expose it to atmospheric agents;

make sure it can be neither reached by water sprays or vapours nor hit by objects that might damage it;

carefully consider the machine weight and stability during the installation and in the final working position;

supply the machine within voltage, temperature, pressure and hydraulic limits, ... as it is detailed on the following pages and provide for an effective earthing;

even if detached from supply, the machine may contain hot pressurised water at a high temperature;

never detach hydraulic and electric supplies when they are active;

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general guarantee conditions

these conditions regulate Rheavendors Industries S.p.A.'s obligations with reference to guarantee and repair; any other term or condition, either verbal or written, is not applicable, including those in the purchaser's purchase orders, if not explicitly accepted and signed by Rheavendors Industries S.p.A.; if the guarantee terms here below should be held not to be valid and/or lawful in the Country where the product is sold, they will not be effective whereas all the other clauses will remain valid and applicable;

1st the mechanical and electronic components of the machine are guaranteed for twelve months, starting from the sales date certified by the fiscal receipt;

2nd the guarantee shall be understood as the free replacement or repair of any part of the machine that – at the manufacturer's unquestionable discretion – should prove to be originally defective due to manufacturing defects; the cost of sending the manufacturer machines, defective pieces and spare parts will be totally charged to the user's account; the manufacturer reserves the right to use new or reconditioned components for repair; if replaced, original components will be guaranteed for 12 months; the parts replaced under guarantee will become the property of RhevVendors Services S.p.A. (request for "Form PO 19.01/2b" Materials under guarantee – Authorisation to return);

3rd in case of irreparable failure or if a failure of the same origin is repeated, the manufacturer may – at its unquestionable discretion – replace the machine with another one, the model of which is either the same or an equivalent one; the guarantee of the new machine will be extended up to the original term of guarantee of the replaced machine;

4th all the parts that should prove to be defective due to negligence or carelessness (non-observance of the instructions for the operation of the machine), incorrect installation or maintenance by unauthorised personnel, transport damage or any circumstance – anyway – not due to the manufacturing defects of the machine are not covered by guarantee; the installation and connection with supply plants as well as the maintenance operations mentioned by the installation manual are also excluded from any performance under guarantee; the guarantee will not cover payment systems either; whether installed on the machine or supplied as an accessory, they are subject to their manufacturer's guarantee whereas Rheavendors Industries S.p.A. will just act as a broker;
all changes made to the machine and not agreed with the manufacturer in writing will involve the immediate termination of the guarantee period and anyway fall under the Customer's total responsibility;

5th the guarantee is excluded in all cases of improper use of the machine;

6th Rheavendors Industries S.p.A. will disclaim all responsibility for any damage that may be directly or indirectly caused to people, animals or things as a result of:
improper use of the vending machine; incorrect installation; improper energy or water supply; serious maintenance deficiency; actions or changes not explicitly authorised; use of non original spare parts;

in case of failure, Rheavendors Industries S.p.A. is obliged neither to compensate any economic damage due a forced stop of the machine nor to extend the guarantee period;

7th if the machine should be transferred to a centre designated by the manufacturer for overhaul or repair, the relative transportation risks and costs will be charged to the user's account. The freight charges of machines, defective pieces and spare parts are always understood as charged to the user's account;

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declaration of conformity

Rheavendors Industries S.p.A. declares that this drink vending machine has been designed and manufactured in compliance with the following directives and safety standards:

Directives:
2006/42/EC; 97/23/EC;
2011/65/EC (RoHS); 2012/19/EU (RAEE);
2004/108/EC; (*)
R&TTE 1999/5/EC (**)

(*) if without modem

(**) if complete with a modem

Regulations:
1907/2006/EC (REACH); 1935/2004/EC;

Standards:
SAFETY:
EN 60335-1: 2012 + A11: 2014;
EN 60335-2-75: 2004 + A1: 2005 + A11: 2006 + A2: 2008 + A12: 2010;

EMC:
EN 55014-1: 2006 + A1: 2009 + A2:2011;
EN 55014-2: 1997 + A1: 2001 + A2: 2008;
EN 61000-3-2: 2014;
EN 61000-3-3: 2013;
EN 301 489-1 V1.9.2 and EN 301 489-7 V1.3.1 (**)

EMF:
EN 62233: 2008;
EN 62479: 2010 (**)

RADIO:
EN 301 511 V9.0.2 (**)

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Rhea Vendors Group S.p.A.
Via Valleggio, 2/bis – 22100 Como – (CO) - Italia

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Rheavendors Industries S.p.A.
Via Trieste, 49 - 21042 Caronno Pertusella – (VA) - Italy
Via Milano, 257 - 20021 Baranzate (MI) - Italy

CEO & Legal Representative

(C. D. Majer)

marking

conformity	conformity with modem	quality
CE	CE 0470	N

ISO 9001 certification

DNV BUSINESS ASSURANCE
MANAGEMENT SYSTEM CERTIFICATE

Certificate No. / Certificate No. CERT-00862-2001-AQ-MIL-SINCERT

Si attesta che / This is to certify that

RHEAVENDORS INDUSTRIES S.p.A.

Sede Principale: Via Garavaglia, 58 - 21042 Caronno Pertusella (VA) - Italy
Sede Secondaria: Via Trieste, 49 - 21042 Caronno Pertusella (VA) - Italy
Sede Secondaria: Via Milano, 257 - 20021 Baranzate (MI) - Italy

è conforme ai requisiti della norma per i sistemi di gestione:
has been found to conform to the management system standard:

UNI EN ISO 9001:2008 (ISO 9001:2008)

Questa Certificazione è valida per il seguente campo applicativo:
This Certificate is valid for the following product or service range:

Progettazione e produzione di distributori automatici di bevande calde e fredde
(Settore EA : 18)
Design and manufacture of hot and cold drinks vending machines
(Sector EA : 18)

Data Prima Emissione/Initial Certification Date: 2001-07-18
Il Certificato è valido fino al: / This Certificate is valid until: 2017-08-25
L'audit è stato eseguito sotto la supervisione di: / The audit has been performed under the supervision of:
Franco Domina
Lead Auditor

ACCREDIA

Luogo e Data/Place and Date: Vimercate (MB), 2014-12-23
Per l'Organismo di Certificazione: / For the Certification Body:
Zeno Beltrami
Management Representative

Le validità del presente Certificato è subordinata al rispetto delle condizioni contenute nel Contratto di Certificazione
Lack of fulfilment of conditions as set out in the Certification Agreement may render this Certificate invalid.

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this manual is intended to describe the **luce x2** vending machine in its four versions: basic, TFT, Premium and touchTV; by using the same basic components, the four machines differ from each other in components and in the features specified later on; the descriptions supplied by this document are shared by all four versions, if not otherwise specified by the text.

luce x2

luce x2 con TFT

luce x2 premium

luce x2 touchTV

keyboard	traditional	traditional	traditional	central touch screen
service messages	two-line alphanumeric display	lateral graphical display	lateral graphical display	central touch screen
information messages	no	lateral graphical display	lateral graphical display	central touch screen
person sensor photocell	no	no	no	yes
illuminated panels	yes	yes	no	no

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in the listed chapters, the manual describes a

luce x2

vending machine in its hardware and software components for a complete and fully-aware use of all machine functions; due to the large variety of available options and the constant technical update of our vending machines, some special device or function might be indicated and described not in the manner you expect; in this case, do not hesitate to contact us;

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e mail: rheavendors@rheavendors.com

ATTENTION: this label applied next to the serial number label inside the vending machine points out that the instructions supplied by this manual must be carefully read before the installation and operation of the vending machine;

please, print this manual only if necessary; environmental protection is our common interest;

01	22.04.2016	general update;	
00	09.04.2014	First issue;	A4
rel.	date	description	
this document is made available electronically on site www.rheavendors.com			

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01. legend

some general instructions that may be of use for reference to this manual;

01.01. abbreviations and pictograms

I = dispensing cycle of drinks based on instant products;
E = dispensing cycle of drinks based on instant products and coffee beans;
EE = as above, but with two coffee beans canisters;
BG = ice bench (cooling unit);
FP = dispensing cycle of cold drinks based on instant products (cooling unit);
BB = dispensing cycle of cold drinks based on syrups (bag syrups in box and cooling unit);
FBT = fresh brew tea;
= mixer for mixing the instant product with water;
VSF = worm screw pitch in the product canister (9 mm/18 mm);

see the concerned manuals

§ = product stirrer of instant canisters;

= espresso coffee brewer;

= maximum operating pressure of the boiler;

= water supply pressure range of the vending machine;

02. introduction

02.01. copyright information

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this document contains some confidential information of Rheavendors Industries S.p.A.'s exclusive property; the content of this document can be neither disclosed in favour of third parties, nor copied or reproduced in any form whatsoever, either fully or partially, without Rheavendors Industries S.p.A.'s prior authorisation in writing; the utilisation, reproduction or disclosure of the technical information in this document can be protected by Rheavendors Industries S.p.A. according to the Law;

this manual is intended for the owner of the vending machine; it is an integral part of the machine and it shall be kept with it;

the information supplied by this manual are intended to achieve the best performances of the vending machine within the scope of application established by the Manufacturer; Rheavendors Industries S.p.A. reserves the right to improve future production without serving any prior notice and without assuming any obligation to update the products on the market; the manufacturer will disclaim all responsibility for any inaccuracy due to misprints;

02.02. contacts

Rheavendors Services S.p.A. is at disposal for any kind of support and information on this vending machine;
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fax: 0039 02 96 55 086
e mail: rheavendors@rheavendors.com
for any reference about our partners all over the world please visit site : www.rheavendors.com

02.03. serial number labels

to be able to identify the vending machine rapidly and univocally as well as to get the best support, please specify the data of the serial number label;

code : D12345A67890 (example)
s/n: 1234 56 7890

silvery serial number labels are applied inside and outside the case of the machine;

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03. technical data

03.01. dimensions	height: width: depth: depth with open door:	1.830 mm 640 mm 705 mm 1.270 mm
03.02. mass	instant machine: espresso machine:	145 kg 165 kg
03.03. supply		
water	- connection by means of a solenoid valve with 3/8“ gas male face:	from 0.1 MPa to 0.8 MPa
energy	- 230 V ac, 50/60 Hz; single-phase and ground; - cable of the following type: HO 5VV-F 3 G 1.5 E;	in I: 1,700 W in E: 2,800 W
	values and indications for standard machine **anyway refer to serial number label data**	see 02.03.
03.04. sound pressure	A-weighted sound pressure level;	less than 70 dB(A)
03.05. keyboard	- basic and TFT: electromechanical with backligthed keys:	24 selections;
	- touch TV: touch screen:	up to 64 selections;
03.06. display	- basic: alphanumeric 16 characters; 2 rows:	graphical; 64x128;
	- TFT: 5,7” with touch function:	240 x 320 resolution;
	- touch TV: HD display:	1050x1680 resolution;
03.07. monitor	- Premium: 15” TFT active-matrix color display with LED backlight display	1024 x 768 resolution;
03.08. dispensing cpt.	closed; protected by a liftable transparent bulkhead;	
03.09. safety		
water	in the instant machine, overflow sensor; in the espresso machine, overflow sensor and pressure relief valve; in all machines, water inlet solenoid valve with anti-flood sensor;	
energy	a door switch; two 6.3x32 mm fuses; (power supply 230 V ac); radio interference suppressor;	12 A delayed
heat	manually resettable sensors;	88 °C
software	time limits for water dispensing cycles;	
03.10. grinder motor	in the espresso machine:	230 V dc
03.11. millstones	in the espresso machine: conical	400 r.p.m.
03.12. coffee brewer	variable-volume brewing chamber, two diameters alternatively between them containing, according to the grinding degree: motor:	Ø 36 mm; 5 ÷ 9 gr. Ø 45 mm; 8 ÷ 15 gr. 24 V dc; 30 W
03.13. air break	in the espresso machine, air break with overflow and level switch;	
03.14. pump	instant circuit: maximum five, immersion, rotary: espresso circuit: vibration;	24 V dc 230 V ac
03.15. product motors	max. ten in the instant version, max. eight in the espresso version, according to the machine configuration;	32/85 r.p.m. 24 V dc
03.16. mixing bowls	max. five in the instant version, max. four in the espresso version, according to the machine configuration;	
03.17. mixer motors	max. five in the instant version, max. four in the espresso version, according to the machine configuration;	15,000 r.p.m. 24 V dc

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03.18. boiler	instant machine: open-top boiler:	3.4 litres, 1,600 W
	espresso machine: double boiler - pressurised for espresso: - open-top for instant:	 0.4 litres,1,100 W,max 1,0 MPa 3.4 litres, 1,600 W
03.19. product canisters	max. ten, according to the machine configuration; dispensing worm screws 9 mm or 18 mm in pitch; with mixer gear and stirrer, if arranged by the configuration;	
	- coffee beans canister (or hopper) capacity:	single 5,000 g double 3,000 g
	- instant canister capacity:	sugar 4,500 g milk 1,350 g chocolate 3,500 g instant coffee 1,200 g tea 4,400 g
03.20. cup dispenser	one cup-release turret; five translucid columns:	Ø 70 mm n° 700 Ø 73 mm n° 670
	or two cup-release turrets; four translucid columns, each:	Ø 70 mm n° 450 Ø 73 mm n° 430 Ø 80 mm n° 400
03.21. stirrers dispenser	electromagnetic release; with vertical tank and weight bar;	n° 550 length: 89 mm adjustable to 104, 115 mm
	products, cups and stirrers shall comply with what specified in terms of quantity, dimensions and quality; use only products specifically conceived for automatic vending machines;	
03.22. miscellaneous	- internal service socket:	230 V ac; maximum load: 100 W
	- machine parameters programmable by means of a flash key or selection keyboard; payment system compartment; protocols: serial, parallel, executive, MDB;	
03.23. notes	the water and energy supply tolerances that can ensure a good and proper operation of the **luce x2** machine are:	
	water:	
	- total hardness: - recommended conductivity:	from 10 °F to 25 °F (*) 400 µS @ 20 °C
	(*) if harder, please use anti-limestone filters;	
	energy:	
	- nominal voltage:	+ 10 %/ - 15 %
	room (during storage and operation):	
	- temperature: - relative humidity:	5 °C ÷ 35 °C max 80 %
	electric consumption:	
	- power (vending phase):	I: 470 Wh E: 630 Wh
	the complete data according to the EVA-EMP Energy Measurement Protocol, are made available upon request (see 02.02.);	
	the power supply cable supplied with the vending machine shall not be altered under any circumstance; in case of loss or damage, only the personnel authorised and qualified may replace it with an original component only;	
	make sure that the electric installation can deliver the power suitable for the machine (see 03.03.); a good ground connection is not only a legal obligation for the protection of users and operators, but it can also provide for correct power supply;	

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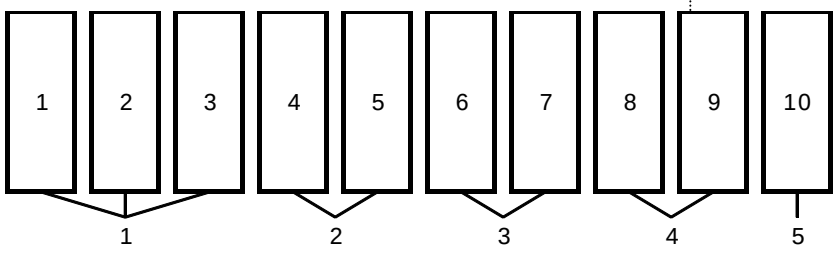
04. configurations

04.01. formalisms

luce x2 configurations are numerous; they are coded by means of some categories exemplified here below in the abbreviation of the machine:

a. instant - instant products only: luce x2 **I**
b. instant and espresso - instant products and coffee beans: luce x2 **E**
c. instant and 2 espresso - instant products and two different coffee beans: luce x2 **EE**
d. product canisters - instant products and coffee beans: luce x2 **E7**
e. cold drinks - hot and cold drinks (option cooling unit): luce x2 E7 **FP**
f. numbering - product canisters, mixing bowls and mixers are numbered in progression, from the left to the right, as it is shown later on; this numbering is used in the chapter on how to programme (see 09.) drinks;

luce x2 I10



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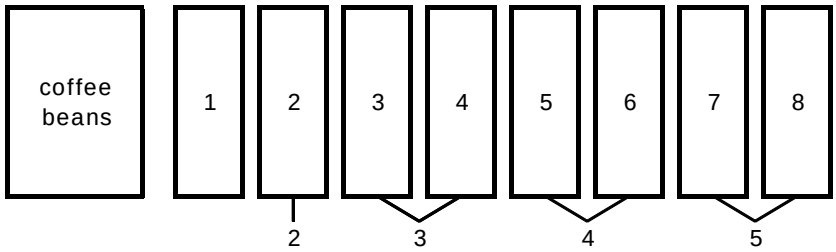

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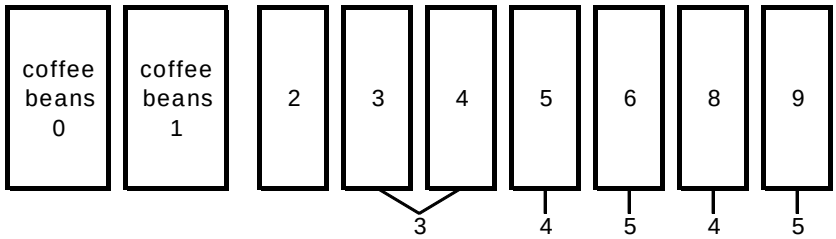
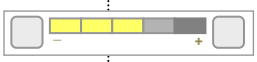
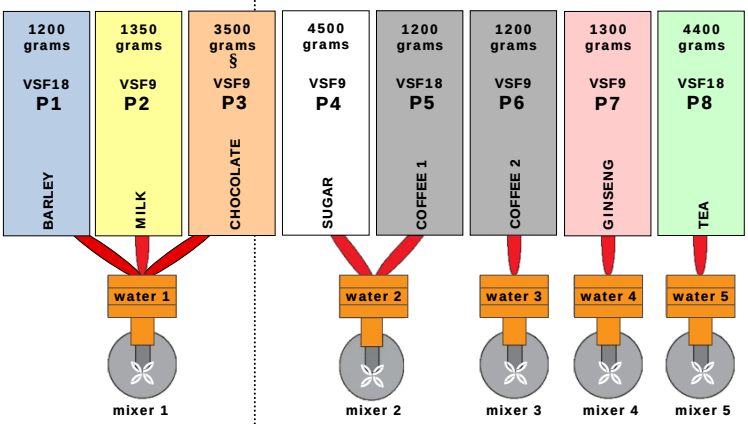


04.02. examples of configurations

luce x2 I8





COFFEE 1		COFFEE 2		INSTANT PRODUCTS	
short coffee without sugar	short coffee with sugar	short coffee without sugar	short coffee with sugar	milk	milk with coffee
long coffee without sugar	long coffee with sugar	long coffee without sugar	long coffee with sugar	capp-ciocc	chocolate
white coffee without sugar	white coffee with sugar	white coffee without sugar	white coffee with sugar	ginseng	barley
cappuccino without sugar	cappuccino with sugar	cappuccino without sugar	cappuccino with sugar	tea	strong tea

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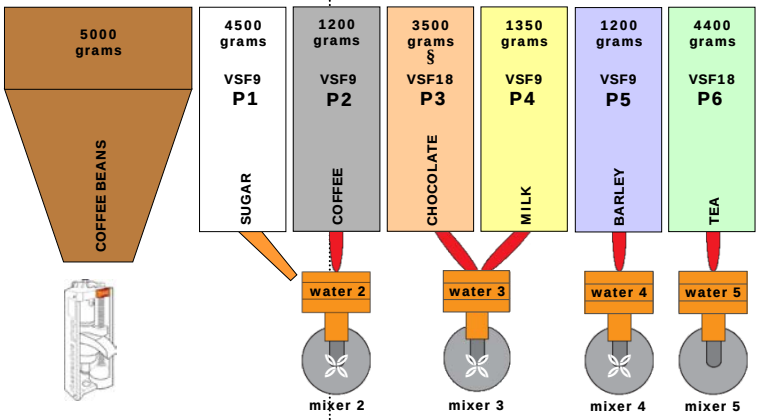
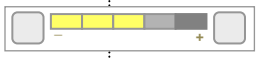
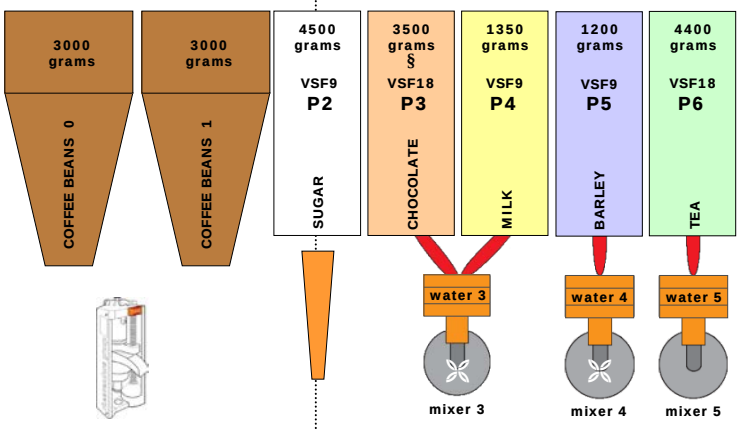
luce x2 E7

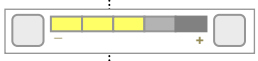




ESPRESSO		INSTANT COFFEE		INSTANT PRODUCTS	
short espresso with sugar	capp-ciocc with sugar	short coffee with sugar	capp-ciocc with sugar	chocolate	strong chocolate
long espresso with sugar	mocaccino with sugar	long coffee with sugar	mocaccino with sugar	capp-ciocc	milk
white coffee with sugar	cappuccino al cacao with sugar	white coffee with sugar	cappuccino al cacao with sugar	tea	strong tea
cappuccino with sugar	latte macchiato with sugar	cappuccino with sugar	latte macchiato with sugar	barley	cup only

luce x2 EE7





COFFEE BEANS 0		COFFEE BEANS 1		INSTANT PRODUCTS	
short espresso with sugar	capp-ciocc with sugar	short espresso with sugar	capp-ciocc with sugar	short barley with sugar	milk with sugar
long espresso with sugar	mocaccino with sugar	long espresso with sugar	mocaccino with sugar	long barley with sugar	chocolate
white coffee with sugar	cappuccino al cacao with sugar	white coffee with sugar	cappuccino al cacao with sugar	white barley with sugar	choco-milk
cappuccino with sugar	latte macchiato with sugar	cappuccino with sugar	latte macchiato with sugar	capuccino with sugar	tea

the configurations above are just some of possible **luce x2** configurations, considering the vending machine releases and programmability; the principles of operation and information are anyway universal and applicable to all machines of the **luce x2** range;

04.03. accessories

to complete and supplement the vending machines of the **luce x2**, range, Rheavendors Industries S.p.A. has got a series of accessories manufactured for these machines, such as autonomous water supply kit, anti-limestone filters, connection with machines for dispensing packed products, module for dispensing covers, cooling unit, peristaltic pump unit for dispensing syrup and water, side ...;

Rheavendors Services S.p.A. is at disposal for any kind of support and information on special configurations (see 02.02.);

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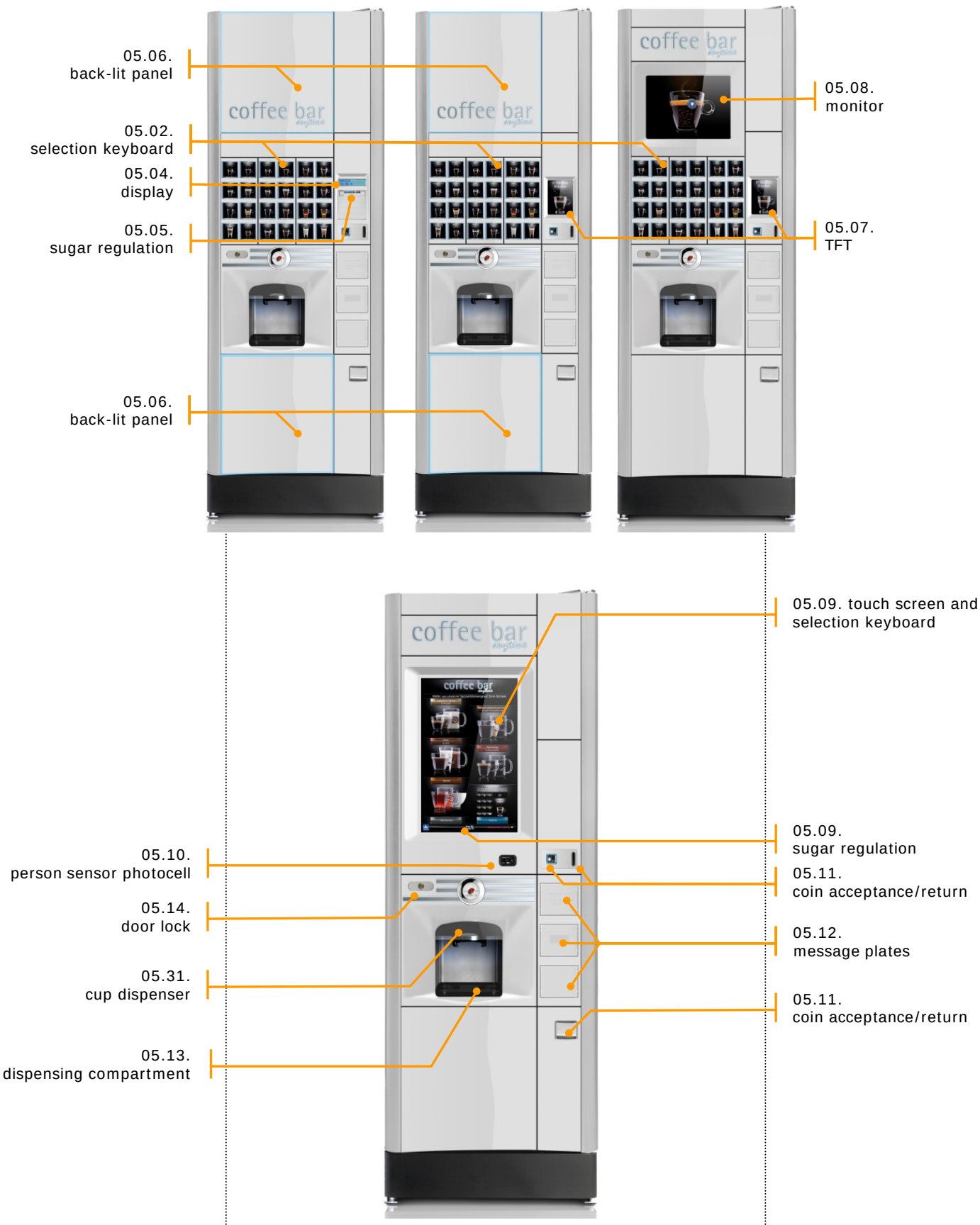
05. presentation



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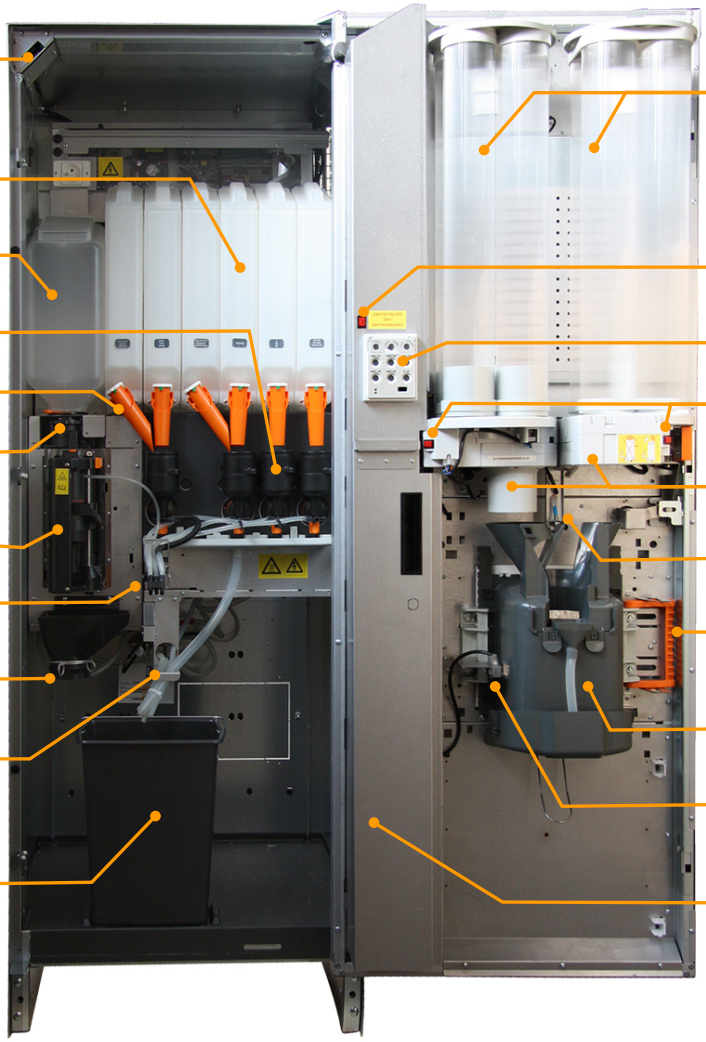


05.18.
door switch

05.19.
instant product canisters

05.19.
coffee beans canisters

05.22.
mixing bowls

05.21.
product slides

05.39.
grinder

05.40. coffee brewer

05.25.
dispenser nozzle arm

05.27.
ring for grounds bag

05.26.
water outlet hose

05.26.
waste water bucket

05.31.
cup columns

05.52.g.
switch on/off GPU

05.38.
service keyboard

05.32.
cup dispensing buttons

05.31.
cup dispenser

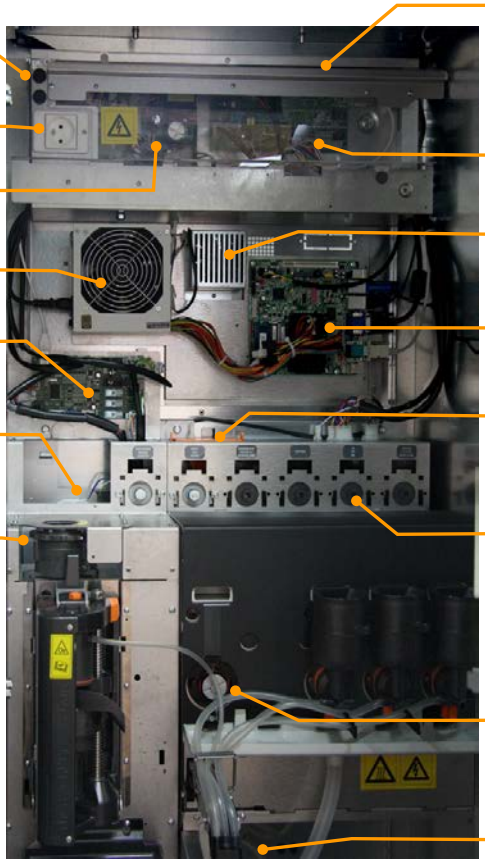
05.34. cups station
lighting led

cups station handle

05.33.
cups station

05.35.
cup sensor

05.37.
carter



05.16.
fuses

05.17.
main socket

05.52.c. switching
power supply

05.52.m. power supply
mother board and touch
screen

05.52.d. coffee brewer
expansion board

05.45.d.
air break

05.39.d.
grinder

05.20.
profile for canisters

05.52.b.
power board

05.47.
environment aspirator

05.52.l.
mother board

05.46.
powder aspirator

05.23.
product motor

05.24.
mixer motor

05.30.
water inlet solenoid valve

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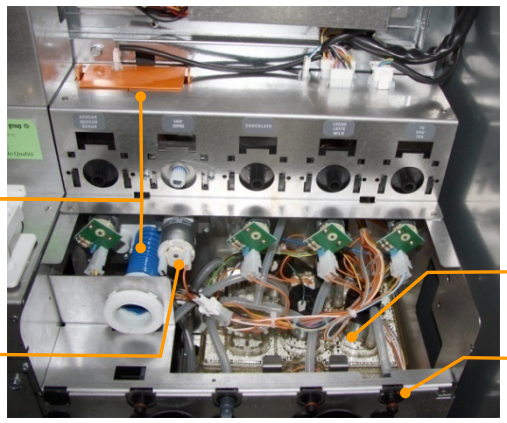

05.46.
powder aspirator

05.23. product motor

05.48.
boiler

05.49.
water outlet

05.52.d.
coffee brewer
expansion board

05.45.d.
air break

05.39.d.
grinder

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05.01. general information	the Rhea **luce x2** vending machine is a machine explicitly designed for being easily used by all users since no specific competence is required in preparing drinks; to dispense, just enter any credit and press a selection key shortly;
	the function consists in dispensing drinks by mixing food products and water at a proper temperature; the correct operation of the vending machine occurs in closed rooms in normal environmental conditions and at a room temperature between 5° and 35°C, the relative humidity below 80%;
	use only specific products and ingredients for vending machines;
05.02. selection keyboard	after having closed the door, press the buttons to dispense; keys will assume various functions in the programming mode (see 09.) and enable the user to modify the machine parameters; keys are numbered progressively from the top and from the left: 1, 2, …;
05.03. selection key labels	a transparent cover keeps the labels intended to identify the features of dispensing cycles in place (each back-lit key is separated from the others); (see 13.14.);
05.04. display	alphanumeric; two lines having sixteen characters each;
05.05. sugar keyboard	two keys, just beneath the display, enable the user to adjust the sugar quantity displayed by a led bar;
05.06. panels door lighting "basic"	two back-lit customisable panels complete the door; upper and lower door parts are lit up by an electroluminiscent panel supplied by low voltage; an electric connector inside the door and on the right can supply the necessary voltage;
05.07. TFT	5,7" TFT; 320x240 pixel resolution; with touch screen; images customisable by means of a USB pen drive; regulate the sugar quantity you wish; programming;
05.08. monitor Premium	15" TFT monitor for general advertising active-matrix color display with LED backlight display, display resolution: 1024 x 768 (width x height);
05.09. touchscreen touchTV	the central touch screen combines all the features which serve to communicate with users; the selections and programming keyboards and all multimedia messages and information are gathered in this component;
05.10. person sensor photocell	it detects the presence of a person near the machine to adapt the messages displayed in the touch screen;
05.11. coin slot - coin reject button – coin return compartment	they enable the machine to accept and/or return the coins inserted for the credit necessary for the dispensing cycle (payment system not supplied);
05.12. message plates	information messages protected by a transparent cover can be inserted for users;
05.13. dispensing compartment	the internal space, protected by a liftable transparent bulkhead, is lit up during the dispensing cycle;
05.14. door lock	the door is closed by means of a lock; the key is mapped and numbered for identification;

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05.15. electric connection

a three-terminal socket is arranged at the back of the cabinet for the connection of the mains cable;

05.16. fuses

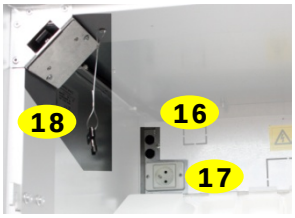
installed on the mains power supply to protect the machine (see 03.09.); fuses must be necessarily replaced by specialised technical personnel only;

05.17. main socket

service 230V ac; 100W max;

05.18. door switch

to power off the machine when the door is open;



attention

some parts remain anyway network-connected

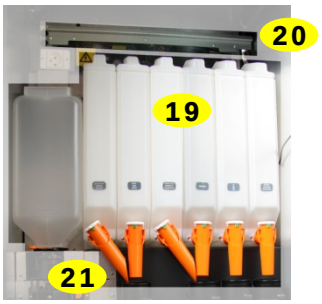
use the service key to supply the vending machine if it is necessary to activate the machine when the door is open; the key is hung up in the proximity of the switch and its use is reserved to the properly trained technical personnel only;

05.19. product canisters

instant product canisters dispense their content in the underlying mixing bowls; an internal worm screw driven by the product motor will push the instant product to the product slide; they can be equipped with a wheel and a stirrer for constant dispensing; the coffee bean canister (hopper) has a closing blade for insertion before lifting it; to protect the products, canisters are closed by a cover;

05.20. profile for canisters

it can be used to hook the product containers during the cleaning of the machine;



05.21. product slides

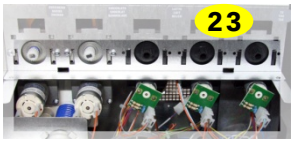
to avoid any product leakage, the end part of product slides can be lifted horizontally and the white ring nut rotated to open (to the left) or to close (to the right) the product canister outlet;

05.22. mixing bowls

the mixing bowls of the mixers will accommodate the instant products you have poured to mix them with water; the fan of mixer motors will act at the bottom and the drink outflow to the dispenser occurs by means of a silicone tube; mixing bowls and outlet tubes can be washed with lukewarm running water;

05.23. product motors

these motors are intended to rotate the worm screws inside instant product canisters to pour the product quantity necessary for selection in the mixing bowls;



05.24. mixer motors

the mixer motors help to mix instant products with water by means of the rotation of the fan mounted on their axis; the rotation speed can be adjusted (see 09.) to the features of the various products;

05.25. dispenser nozzle arm

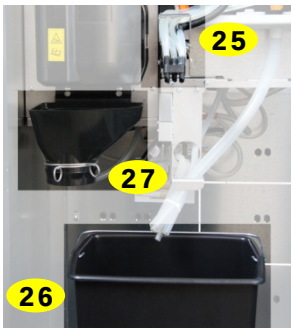
the arm places the nozzles above the cup during the dispensing cycle and draws them back at the end of the cycle;

05.26. waste water bucket

the bucket collects any residual drop from the dispenser and, if necessary, the waste water in excess from the boiler and air break;

05.27. bag grounds

a metal ring keeps the grounds bag in place;



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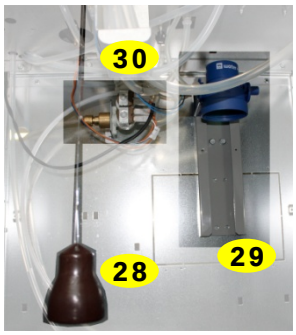
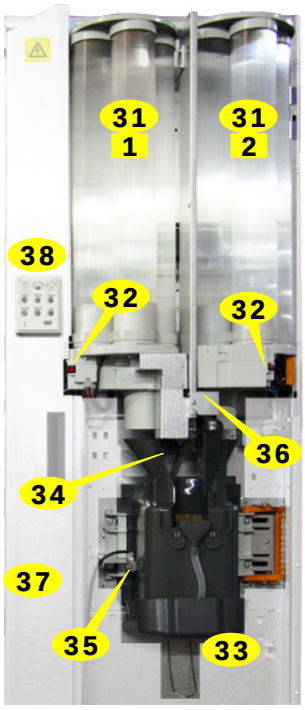


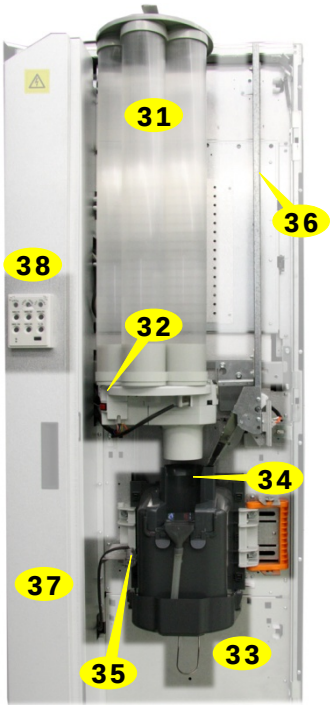
05.28. floater — a floater acts on a microswitch to signal that the waste water bucket filling level is too high;

05.29. filter seat — the filter cartridge intended to demineralise inlet water is placed in the head and secured at the back of the machine; replace the cartridge regularly in compliance with the manufacturer's instructions; the filter is placed on the left of the machine in some versions;

05.30. water inlet solenoid valve — the water inlet solenoid valve has got an anti-flood safety device intended to stop the water inlet in case of failures;

05.31. cup dispenser — a turret consisting of five columns or two turrets consisting of four columns according to the machine configuration contains paper or plastic cups, the diameter ranging from 70 mm to 80 mm; the turret on the left **1** contains the cups classified as "cup. 1" in the programming mode whereas the one on the right **2** contains the cups classified as "cup 2";





05.32. cup dispensing button — press it shortly to dispense a cup;

05.33. cups station — the cups station accommodates the cup during the dispensing cycle of the drink; a funnel and a tray collect the drops in excess, if any, and convey them into the waste water bucket;

05.34. cups station led — a led illuminates the cups station during the dispensing cycle and warns with its flashes the progress of the selection;

05.35. cup sensor — if any, it detects the cup presence by determining the behaviour of the machine (see 09.);

05.36. stirrers dispenser — placed between the cup turrets, it dispenses the stirrers in the tank column by means of an electromagnet; to facilitate the load cycle, rotate the cup turret on the right by pressing the orange block; the tank can be adjusted to the stirrer length by means of three screws;

05.37. carter — the carter protects the CPU, the payment system (not supplied) and the coin box; it is kept in place by a magnet;

05.38. service keyboard — the service keyboard is placed on the carter inside the door; its keys can be used to program the machine;

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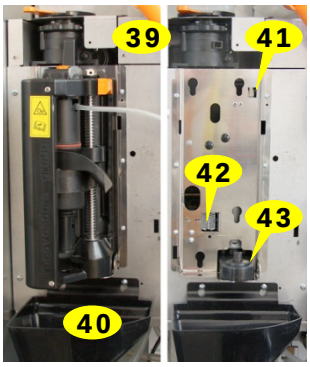
05.39. grinder

it grinds the coffee beans in the canister to pour it in the coffee brewer chamber; the grinding degree can be manually adjusted by means of the wheel you can access after removing the coffee canister whereas the ground quantity is determined by a software parameter (see 09.01.a “grinder time”) that establishes the grinder work time;



05.40. coffee brewer

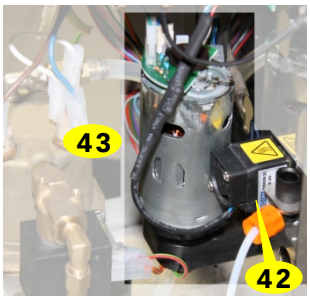
after receiving the coffee dose from the grinder and compressing it, percolation occurs in the coffee brewer with the water from the pump;
the used dose is conveyed to the grounded bag;
the structure of the brewer is kept at the correct temperature by a hot air heating system programmable via software (see 09.01.e. “temperature)”;

05.41. brewer presence switch

the coffee brewer presence is controlled by a micro-switch that can inhibit the selections including coffee beans, if it is not present;

05.42. coffee brewer heater

a safety cover is intended not only to protect the operator against moving parts, but also to keep the coffee brewer at the correct temperature through an air heater preserving the drink quality even after a long vending machine pause;

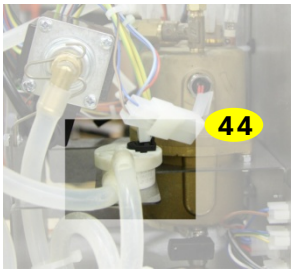


05.43. coffee brewer motor

the variable coffee brewer motor is intended to regulate the chamber closing and compressing phases in order to compress ground coffee for its percolation; its action is controlled by an encoder that informs the CPU on the brewer position;

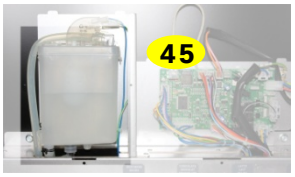
05.44. volumetric counter

for the espresso version only, it supplies the CPU with the water quantity flowing through the coffee brewer to determine its volume;
the water quantity of instant selections is established by the time set in the “water N” parameter only ;



05.45. air break

in E machines, it accumulates water for conveyance to the pressure boiler; the level is controlled by a floater and, if higher than established, it will flow back to the safety device of the inlet solenoid valve, thus preventing further water from flowing in;

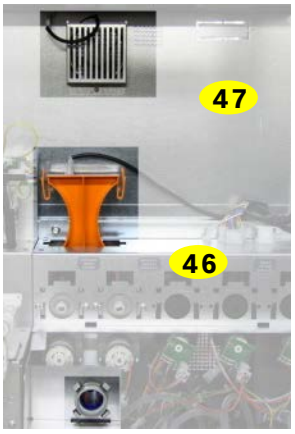


05.46. powder aspirator

an aspirator will eject suspended product residuals from the inside of the vending machine; the aspirator is connected with a drawer beneath the product slides to intercept the residual impalpable powder coming from selections; it can be easily extracted by pressing the side fins of the support; aspirated air is ejected through the slots of the rear panel;

05.47. environment aspirator

to aspirate the air from the internal environment of the machine to avoid any condensate;



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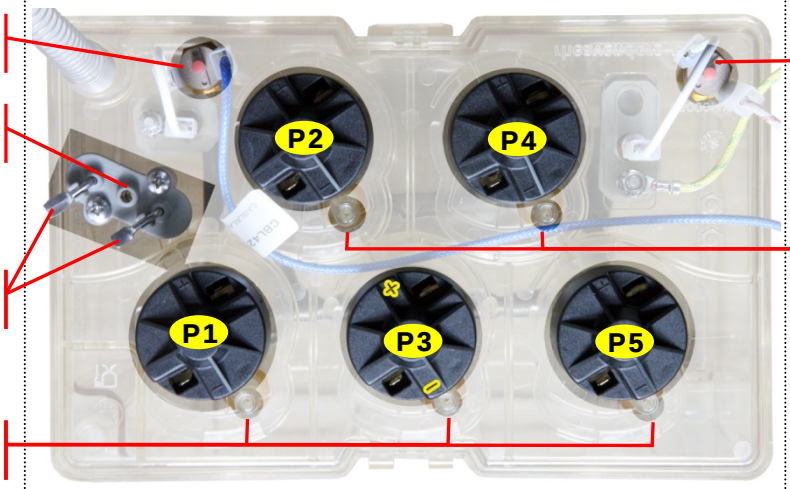
attention
these components may be very hot even if the machine is off;

05.48. boiler

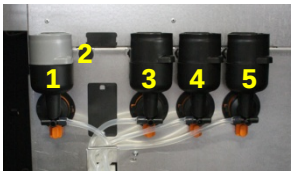
boiler with all active elements (heating element, heat protections, temperature sensor, pumps) secured to the cover;

05.49. boiler pumps

pumps with turbines immersed in the boiler water; water is conveyed in tubes feeding mixing bowls; the number of pumps varies according to the machine configuration; a boiler with five pumps is shown here by way of example (attention to polarisation; see 03.14.);



pump	name sw	outlet
P1	water 1	mixing bowl 1
P2	water 2	direct water
P3	water 3	mixing bowl 3
P4	water 4	mixing bowl 4
P5	water 5	mixing bowl 5

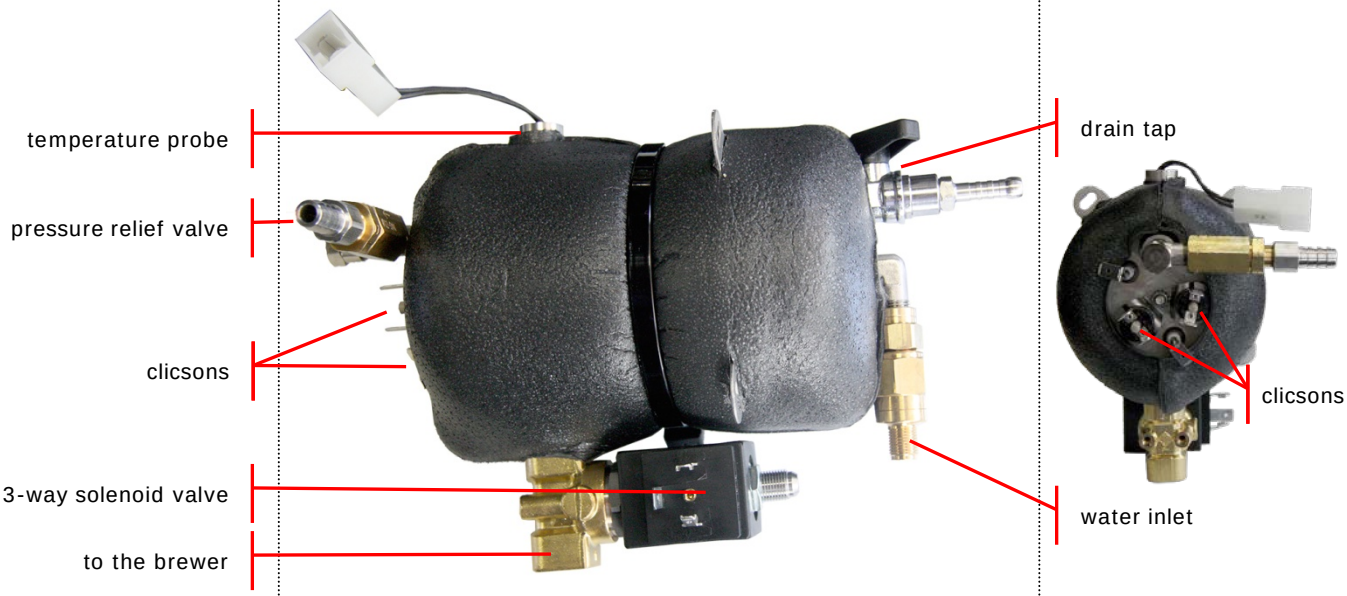


05.50. pressure boiler pump

in E machines, a vibration pump with by-pass intended to direct water to the three-way solenoid valve for espresso is installed in addition to the boiler for instant selections;

05.51. pressure boiler

in the E machine, pressure boiler complete with a temperature probe and protection clicsons; the drain tap may be used to empty



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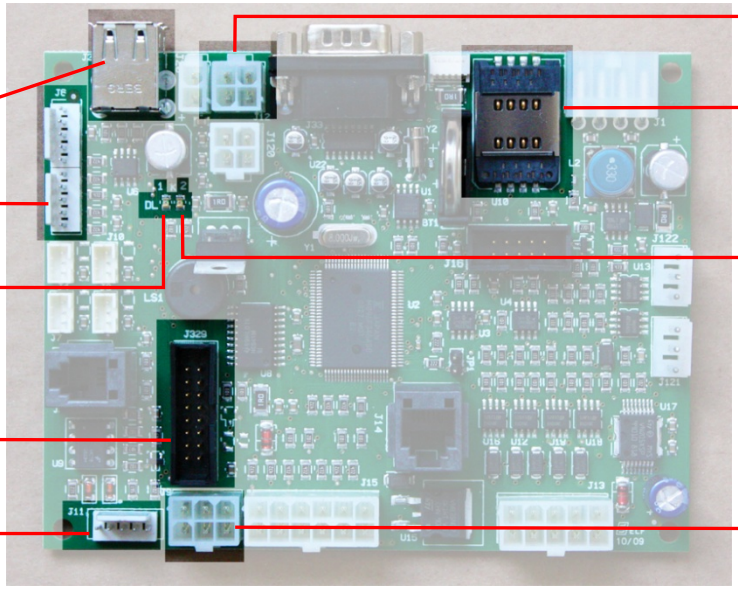
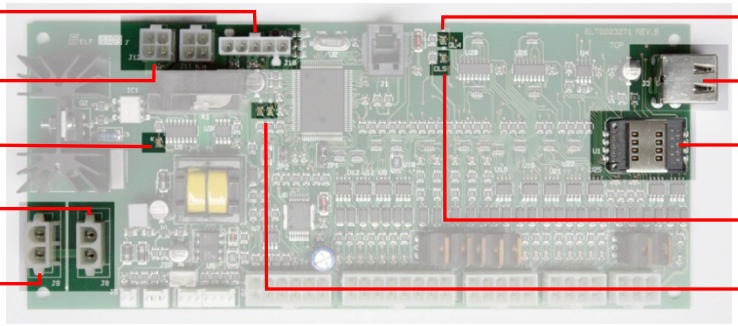
05.52. electronics

05.52.a. CPU



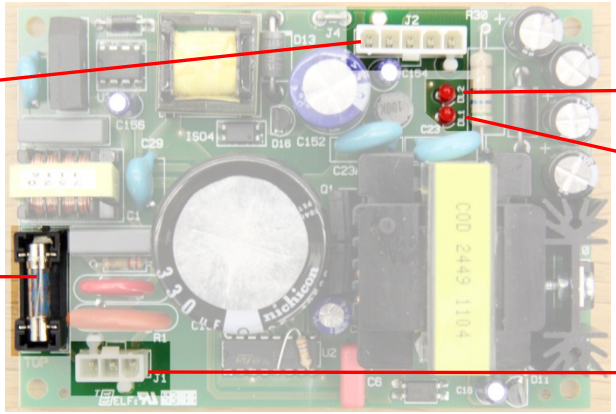
the CPU board placed inside the door and protected by the carter governs the machine operation; the information exchange with the other boards occurs by means of a double USB socket (see 14.), including the connectors for the service keyboard, the payment systems, the display and the programming flash key;

05.52.b. power board



the power board receiving the commands from the CPU is intended to operate the machine devices; it is also intended to control devices, such as motors, pumps, solenoid valves or heating elements; a double USB connector (see 14.) is arranged for the logic connection with the other boards; if the status led's are blinking, it means that it is working normally;

05.52.c. switching power supply unit



the switching power supply unit is intended to generate the voltage necessary to operate the machine boards; it is protected against overvoltage by a fuse;

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05.52.d. coffee brewer expansion board

flash key connector

USB connectors

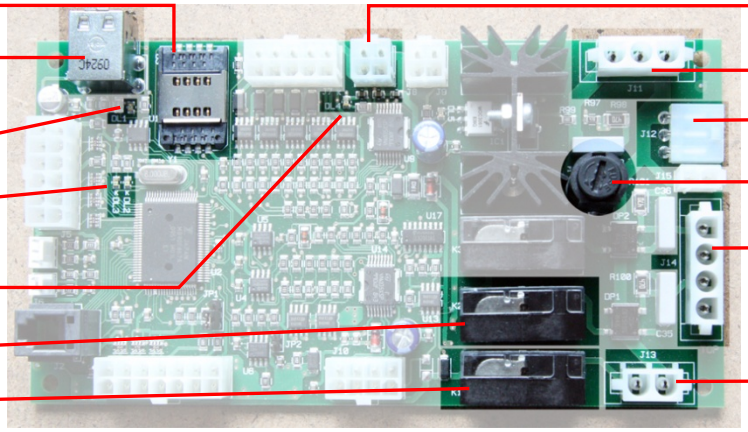
led DL1 +5V dc

status led

led DL4 +24V dc

grinder relay

pump relay



IN low voltage

OUT pressure boiler

IN 230 V ac

6.3-delay grinder fuse

OUT grinder

OUT pump

the coffee brewer expansion board is necessary only in E machines since it is intended to control the devices that are typical of the espresso machine: grinder, vibration pump, ...; input and output signals are exchanged with the other boards by means of a double USB connector (see 14.); if the status led's are blinking, it means that it is working normally;

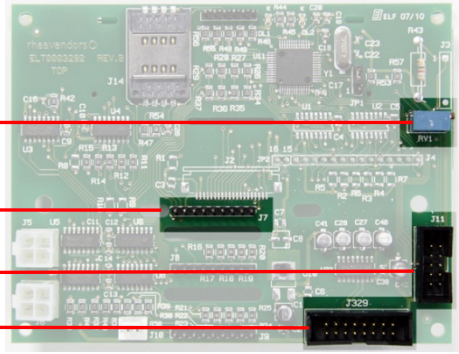
05.52.e. display board

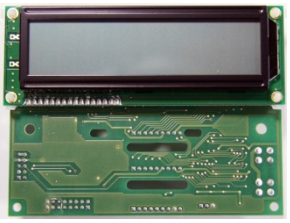
contrast regulation

keyboard connection +/- sugar

keyboard connector

CPU connector





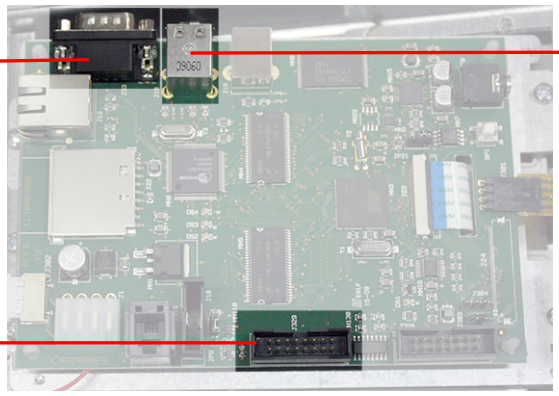
only in Luce x2 basic, the display board secured inside the door is intended to receive the signals from the CPU, the keyboard and the "+/- sugar" regulation and to display the messages to the user or to the operator;

05.52.f. TFT 5,7" display board

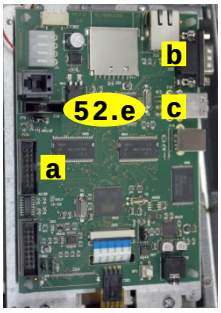
the TFT display board, located in the inner of the door, receives the CPU (connecting "a") and the keyboard (connecting "b"); an USB cable (connecting "c") allows the load of the images and the messages for the users or the technician;

keyboard connecting

CPU connecting



USB connecting



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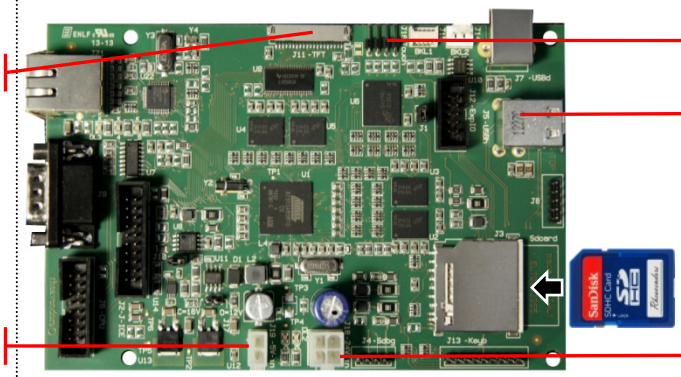
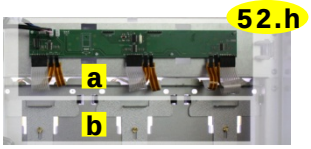
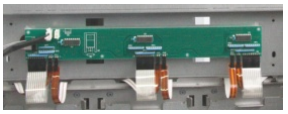
05.52.g. monitor 15” board Premium



05.52.h. keyboard lighting “basic , TFT e premium”

the three modules composing the keyboard are lit up by led’s supplied by flat cables (“a”); every single eight-key module can be easily removed by lifting the flat lever (“b”) and by extracting the assembly from the outside;





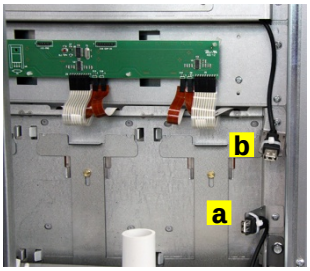
05.52.i. USB connections

a USB cable allows the loading of software and images via a USB pen drive:

in the **luce x2 TFT**, this cable is connected to the TFT 5,7 display board (see 05.52.f.) and it is located inside the door;

in the **luce x2 touch TV**, it is connected to the mother board (see 05.52.l.) and it is located in the inner wall of the cabinet;

in the **luce x2 Premium**, an USB cable “a” connects the TFT 5,7” display (see 05.52.f.) and another on “b” is for the monitor 15” p.c.b. (see 05.52.g.); both are located in the inner wall of the cabinet;



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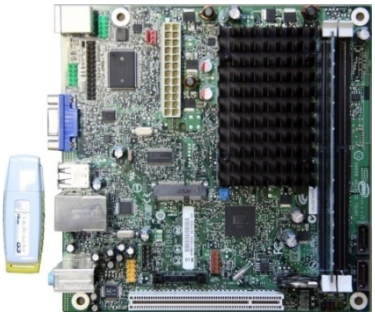
monitor and touch screen hardware

the power of this functional unit is completely independent from the machine and does not switched off when the door is open unless you press the switch installed on the protective carter inside the door;

any modification, change or adaptation on the hardware that supports the programs necessary for the touch screen functions (mother board, touch screen, power supply, cables, ...), unless expressly authorized, determines the immediate forfeiture of any and every form of guarantee (see also page. 06);



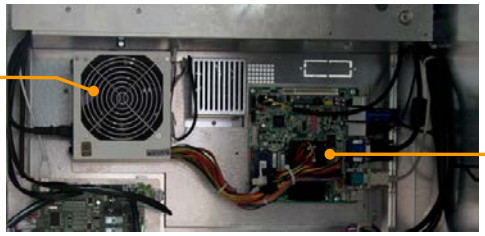
05.52.l. mother board

the mother board is housed on the back wall of the cabinet and it is the seat of the programs that govern all aspects of the touch screen (views of images and keyboard);

05.52.m. mother board and touch screen power supply

it is the item which supplies operating voltages to the mother board and to the touch screen;;

mother board and touch screen power supply

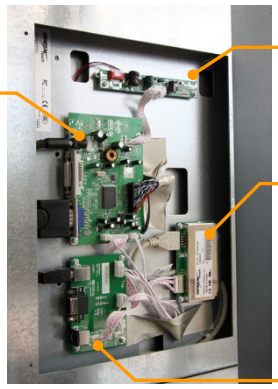


mother board

05.52.n. touch screen support components

these components are subsidiary to the functioning of the touch screen (monitor and touch screen functions);

VGA/LVDS inverter



touch screen backlight inverter

touch screen controller

05.51.n. touch screen interface

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05.53. software
basic

residing software can be transferred and copied by means of a flash key to be inserted into a connector of the machine boards (see 05.52.) and the rheAction programme;
(power off the machine, insert the key into the flash socket of the board in question, power on the machine by means of the service key, power it off at the end of the transfer and remove the key);

these programmes are named:

05.53.a. in the CPU board

- master: it is the software determining the machine cycles, the links between the functions, the order of execution of operations; this software can not be modified by the operator, but it can be replaced in the CPU by means of a flash key written at works or by means of rheAction ;

- configuration: it is the software installed in the CPU, determining the times and the successions of dispensing drinks, the payment system protocol, the display modes, …; variables may be modified by the operator either manually aboard the machine or by means of rheAction to adapt the machine behaviour to the final users' needs (product quantities and mixtures, warning messages …) (see 09.);

05.53.b. in the power board

- power: to establish the functions of the devices of this board;

05.53.c. in the coffee brewer expansion board

- coffee brewer: it is the software installed in this board, determining the coffee brewer behaviour (cycles, timing, …);

please note that the flash key may include:

master only

it can be transferred from the key to the CPU only and updating occurs automatically at the power on of the machine; the display shows "PROGRAMMING OK" at the end:

PROGRAMMING MASTER

configuration only

at the power on, the display shows:
choose "1" to update the machine with the key data; the display shows "PROGRAMMING EAROM";
choose "2" to transfer the data from the machine to the key; the display shows "PROGRAMMING FLASH LEY";
the display shows "PROGRAMMING OK" at the end;

1 from key to VMC
2 from VMC to key

master and configuration

they can be transferred from the key to the CPU only and updating occurs automatically at the power on of the machine; at the end, the display shows:

PROGRAMMING OK

power software

it can be transferred from the key to the board only; wait for the status led's to turn off after having blinked for some seconds;

coffee brewer expansion software

it can be transferred from the key to the board only; wait for the status led's to turn off after having blinked for some seconds;

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05.54. software
TFT, Premium and
touchTV

a): using the USB key

the following software programmes, divided into five logic chapters residing in the machine, can be transferred, copied, modified by means of a USB key, to be inserted into a connector and the rheAction programme;

- **master GPU**: is the software determining the TFT display operation;

- **data file**: is the software installed in the CPU, determining the intervals and sequences, by which drinks are dispensed, the payment system protocol, the display modes, …; variables can be modified by the operator manually, on the machine, and by means of rheAction to adapt the behaviour of the machine (product quantities and mixtures, warning messages, …) to the end users' requirements ;

- **CPU master** : is the software determining the machine cycles, the relations between functions, the order by which the machine will perform operations; this software can not be modified by the operator, but it can be replaced in the CPU by means of a USB key written at works or by means of rheAction;

- **GUI file** : contains the images the display can show during the various work phases of the vending machine; they reside in the display board (GPU) and can be replaced by customised images; the exact procedure to update or replace is described by "rheavendors LuceX2 Touch";

- **message files**: it includes all the messages the machine may show for users and operators;

the following instructions can be observed for transfer data from/to the machine:

- power off the machine;

- insert the USB key in the connector inside the door;

- power on the machine by means of the service key;

to move from one item to the other one on the display, follow the TFT or monitor instructions; in general, act on the touch or on the keyboard where:

key 1	to scroll items down;
key 6	to scroll items up;

key 2	to scroll chapters forward;
key 3	to scroll chapters downward;

- the display shows all GPU masters in the USB key; select the necessary file and update the machine by pressing "4";

- the same operations can be carried out for the following chapters, (data files, CPU masters, GUI files, message files), scroll and select by pressing key "2", any way refer to the instructions supplied by the display;

Rheavendors Services S.p.A. is at disposal for support and information about the RheAction system and the "rheavendors LuceX2 Touch" manual (see 02.02.);

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b): using the flash key

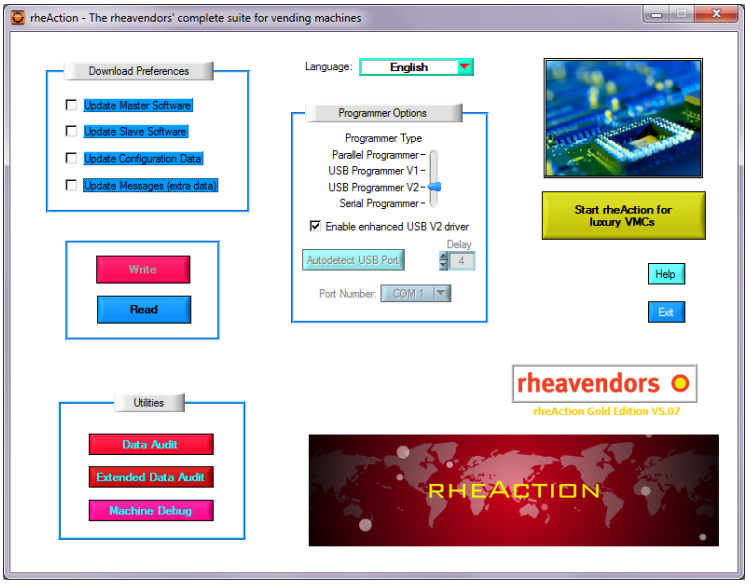
use a flash key to update the firmware intended to govern the "coffee brewer expansion" and "power" boards;

if it is necessary to update one of the software programmes mentioned above in the machine, it is important for the flash key, from which the programme is installed, to be physically inserted into the board; the procedure for the transfer of these software programmes shall observe the following steps:

- power off the machine;
- insert the flash key into the connector of the board in question;
- power on the machine;
- two led's of the machine will flash on and off and turn off at the end of the programming cycle;
- power off the machine and remove the flash key;

05.55. rheAction

a system called rheAction is intended to complete and supplement the programming executable in the machine; it is composed by a software and hardware, installable in a pc, capable of storing, modifying and writing the configuration data of Rhea machines; Rheavendors Services S.p.A. is at disposal for any kind of support and information on the RheAction system (see 02.02.);



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06. preliminary actions

06.01. handling

the vending machine may be transported, handled and positioned by skilled and trained personnel only; while handling, never overturn the machine; observe the orientation arrows on the package;

attention

handle the machine carefully to prevent the authorised personnel from being injured; considering the weight and overall dimensions of the vending machine, it is recommended to use a truck at low speed;

06.02. unpacking

- approach the packed vending machine to its work position;
- cut the protection film used to wind up the vending machine along one of its protection angle bars;
- remove the vending machine from the pallet by unscrewing self-threading screws and by extracting metal squares to the outside;
- lift the vending machine by means of a truck;
- remove the pallet from beneath the vending machine;
- carefully re-arrange the vending machine on the floor;

attention

the materials composing the package shall never be left within the reach of people from outside, in particular of children, because they represent a potential source of danger; only specialised companies may be charged to provide for the disposal of package components;

06.03. positioning

the vending machine shall be arranged for work in a sheltered room; from the walls keep a distance that can provide for good air circulation and easy access; make sure that the floor can properly support the weight of the machine and that the latter is levelled; adjust the feet in such a way that

the inclination of the cabinet shall not exceed 2°

and that the vending machine is perfectly stable; it is recommended to use a water-proof protection that can be easily cleaned beneath the vending machine to collect any accidental product fall;

06.04. preparation

when the machine is in its final working position:

- cut the clamp intended to secure the door key to the supply cable secured at the back of the vending machine;
- insert it into the lock (see 05.14.), rotate it and open the door;
- remove the envelope of documents, labels and accessories from the waste water bucket (see 05.26.);

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07. connections

07.01. water

make sure that the water used to supply the vending machine has all proper features for human consumption;

make sure that there is no sign of impurity and check the degree of hardness; if necessary, contact an analysis lab;

if necessary, use a softening filter and replace the cartridge at regular intervals, in observance of the manufacturer's instructions, to preserve the machine components;

make sure that the network pressure is the one preset for the machine (see 03.03.); use a pump or a reducer in case of non-compliance; it is recommended to install a tap to detach the machine from the network; connection shall occur by means of:

- new tube;
- of type-approved material for food use;
- compliant with "IEC 61770 Electric appliances connected to the water mains";
- it can support the working pressure;

if the tube is not supplied with the machine or in case of replacement use tubes featured as above only;

for the drinkability features of "waters intended for human consumption" refer to the following Internet address:

http://eur-lex.europa.eu/
directive 98/83/EC of 03/11/1998

07.02. energy

observe the rules on connections with the electric network, in particular on grounding; connect the machine permanently without using any reduction, adaptor, multiple socket or extension; use the network connection cable supplied with the vending machine only; it is recommended to install a switch detaching the machine from the network;

it is recommended to install a differential current device operating below 30 mA, detaching the machine from the mains and promptly tripping in case of improper electric input in order to considerably reduce the risks arising out of any short-circuit;

attention

check the power plant capacity to supply the power required by the machine (see 03.03) and the observance of the rules in force; strictly refer to the data of the serial number label (see 02.03.)

for a correct and safe configuration of the electric power supply installation refer to the following Internet address, if necessary:

http://eur-lex.europa.eu/
directive 2006/95/EC of 12/12/2006

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08.
first power on

08.01. introduction

after having unpacked the vending machine, arranged it firmly in the work place and connected it hydraulically and electrically, carry out some actions to operate it;

wash hands thoroughly with water and soap before handling the machine and the products; only use potable water to clean the components;

08.02. activity

open the door, arrange the waste water bucket, insert the floater and all outlet hoses (see 05.26.);

in espresso machines pour a small quantity of coffee beans into the coffee hopper to avoid displaying the no coffee message; never forget to open the hopper/s blade/s;

no coffee beans
OFF 09

remove the stirrers weight from the tank and load the stirrers by inserting them from the above; re-place the weight;
lift the cover/s intended to protect the turret/s, fill in the column, except for the one/s placed on the distributing (dispensing) holes of cup release/s;
insert and rotate the service key into the door switch (see 05.18.);

attention

the vending machine is supplied and running to all effects; the mobile parts of the coffee brewer will be handled; act extremely carefully;

and wait for the rotation of the turret/s to come to an end; load the column/s that have remained empty;

attention

use cups and stirrers only, specifically conceived for vending machines; (see 15.);

the vending machine performs a diagnostic cycle for loading and heating waters; the warning messages about the progress of these phases will appear on the display according to the version;

switching on...
please wait

at the end of assembly and the final inspection, the water used for tests is discharged from the machine; at the first power-on, all circuits shall be filled in before any other action; the machine will therefore load water automatically; after all hydraulic circuits of the machine have been filled in, the water flow stops automatically, thus starting the phase intended to heat water in the boiler, in which temperatures shall reach the set values (see 09.);

refilling water
wait

wait
temperature

08.03. activity

transportation, storage and installation conditions can not provide for immediate utilisation of the vending machine and it is recommended to perform a complete wash cycle before using the vending machine;

attention

the machine dispenses a pre-fixed water quantity for each wash cycle;

you can act in two ways:

- press keys “MIX 01”, “MIX 02”, ... of the service keyboard (see 05.38.) to activate the wash cycle of the corresponding hydraulic circuit (boiler, tubes, mixing bowls, ...);
  during the wash cycle, the monitor displays the message “manual washing” down, on the left corner;
  key “C.G.” activates the wash cycle of the coffee brewer circuit;

- press button “PROG” of the service keyboard and choose “Washing” on the display (see 09.); in this case, the cup is also dispensed in addition to the washing cycle;

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repeat the operation for some times to rinse the whole water circuit of the machine;

power off the vending machine by means of the service key;
detach the power supply cable from the mains;

08.04. coffee brewer washing by means of a tab

a special cycle using a detergent is intended to wash the coffee brewer thoroughly;
to carry it out, press key “C.G.” and hold it down for five seconds until you hear the machine beep repeatedly and the brewing chamber opens; insert the tab and press “C.G.” once; the chamber closes while keeping the tab brewing; a small water quantity is poured three times, each one after about thirty seconds, after the chamber is emptied, it starts a five-rinsing cycle; the machine will dispense a coffee as the last operation;

08.05.

prepare a chlorine-based anti-bacterial sanitising solution by observing the instructions supplied with the product; remove and immerse the following into the solution: the product canisters you have disassembled, the trays of mixers, their fans and the silicone tubes intended to dispense products; the time necessary to sanitise is specified by the anti-bacterial product package; at the end, remove all the parts you have sanitised from the solution, dry them carefully by using clean cloths and reassemble them into the machine;

lift the end of the product slides of instant containers and load them with the corresponding products; refer to the machine configuration (see 04.) and to the labels of containers; fill in the coffee beans canister/s with coffee beans (in machines E); close the containers and the coffee beans canister/s with their upper covers;
lower the product slides to the mixing bowls (see 05.21.) and pull the blade intended to close the coffee beans canister/s (in machine E);

to clean and treat food products properly, refer to the content of the following Internet address:

http://eur-lex.europa.eu//
regulation 2004/852/EC of 29/04/2004

close the door by means of the lock key (see 05.14.) and put it in a safe place;

08.06.

the display (or the monitor) will show the messages that specify the operations carried out by the machine:

initial check; Tsol=nn °C; Tesp=nn °C;

wait
temperature

until the water temperatures of the boiler are adapted to the values set up in the configuration software;

at the end of this phase intended to heat water in the boiler, the vending machine is ready to dispense on a free basis and the display (or the monitor) shows the stand-by screen;

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09. programming basis

the parameters forming the composition of recipes – written in the CPU board memories – enable the user to dispense drinks without requiring the installer to set up special programmes; to modify them to adapt the drinks you have produced to specific requirements, refer to the following; at the end of the chapter (see 09.02.), a summary table may help the user trace back all programming items and variables;
to access the programming mode, open the machine door and use the service key in the safety switch;

attention

the vending machine is supplied and running to all effects in this operation mode; act extremely carefully;

the service keyboard buttons have the following functions:

- "PROG." to access the programming mode;
- "FREE VEND" to dispense selections on a free basis;
- "TOT COUNT" to display the total number of dispensing cycles;
- "MIX NN" to enable the wash cycles of mixing bowls and their circuits;
- "C.G". (unit cycle) to enable the coffee brewer wash cycle and its circuit;

access — press the "PROG" key of the service keyboard (see 05.38.); the display shows:

PROGRAMMING BUTTON N

quit — after having programmed, press "1" and, then, key "PROG" to go back to the usual operation of the vending machine and to store all changes you have made; the display will show:

END PROGRAMMING wait .....

the programming steps listed herein may be not in the correct sequence or provide for some slight differences compared to the machine; however, general principles and preliminary instructions remain applicable;

09.01. "progr"

press the key "PROG", press "1"; the buttons of the selection keyboard will assume the following functions:

Key 1	to scroll the items forward
Key 6	to scroll the items backward

Key 2	to scroll the variables of items forward
Key 3	to scroll the variables of items backward

Key 4	to increase the value of the variable on the screen
Key 5	to decrease the value of the variable on the screen

the items are (scroll by means of key "1"):

09.01.a. key 1 — contains the variable composing selection 1;
...
key 24 — contains the variables composing selection 24;
key 25 — not corresponding to a selection, but to the enable of the cup sensor, as it is specified in the "no-cup pre-selection";

PROGRAMMING BUTTON N

09.01.b. prices — to establish the prices of every single dispensing cycle;

PROGRAMMING PRICES

09.01.c. happy price — to establish the prices of every single dispensing cycle produced in special time bands;

PROGRAMMING HAPPY PRICE

09.01.d. coins — to determine the values of coins;

PROGRAMMING COINS

09.01.e. temperatures — to set up the boiler water temperatures;

PROGRAMMING TEMPERATURE

09.01.f. miscellaneous — to programme different options;

PROGRAMMING MISCELLANEOUS

09.01.g. diagnostics — to display some machine parameters;

DIAGNOSTICS

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09.01.h. sales audit	to display the quantity of dispensing cycles you have performed;	SALES AUDIT
09.01.i. MDB	it contains the programming of the MDB protocol parameters;	PROGRAMMING MDB
09.01.l. clock	to set up the machine clock;	PROGRAMMING CLOCK
09.01.m. out of service	to record any failure that may have occurred;	REGISTRATION OUT OF SERVICE
09.01.n. product qty	to check and enable product dispensing cycles;	PROGRAMMING PRODUCT QTY
09.01.o. maintenance	it contains the maintenance control parameters of the machine;	PROGRAMMING MAINTENANCE
09.01.p. RFID CARD	to determine the RFID card parameters;	PROGRAMMING RFID CARD
09.01.q. tuning motors	to regulate the speed of the boiler pumps and product motors;	PROGRAMMING PRODUCT MOTORS
09.01.r. calibration product flux	programming of the product quantities delivered per unit of time;	CALIBRATION PRODUCT FLUX
09.01.s. product audit flux	products delivery data;	PRODUCT AUDIT FLUX
09.01.t. id. machine	it contains the machine identification parameters;	PROGRAMMING ID MACHINE
09.01.u. variflex	coffee brewer programming;	PROGRAMMING VARIFLEX
09.01.v. cleaning	cleaning programming;	PROGRAMMING CLEANING
	in detail, the chapters just listed include the following items and variables;	
09.01.a. button from 1 to 24	press key “2” when the display shows “key n” to scroll the variables composing the function of that key;	
	scroll keys “4” and “5” to choose among the items:	PROGRAMMING BUTTON N
	- “ENABLED”: the key will perform the function you have programmed (dispensing cycle of a drink); see paragraph “ENABLED”;	FUNCTIONING
	- NOT ENABLED”: the key will be inhibited and it will perform no function;	INHIBITED
	- “PRESELECTION”: if pressed before the actual selection, the key will perform the function of the items specified by paragraph “PRESELECTION”;	PRESELECTION
	- “COLD”: to enable the selection button to dispense cold drinks (machine with FP option); see paragraph “COLD ENABLED”;	COLD
“FUNCTIONING”	use key “2” to scroll the following items:	
	choose the “extended” option to display all variables; choose the “reduced” option to display only the parameters with values other than zero (use keys “4” and “5” to modify the option);	programming: TOTAL programming: PARTIAL

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use key “2” to scroll the following items:

espresso coffee is the first product you can programme for each selection key; there are three variables:

- the water quantity in the cup; change it by means of “4” and “5”; if the variable is zero, no espresso will be dispensed (drink composed by instant products only);

```
COFFEE WATER
0= inhib.     cc: 00
```

- espresso coffee will be dispensed before (value 1) or after (value 0) instant products, if programmed;

```
coffee sequence
1=coffee before  N
```

- to allow the adjustment of the internal coffee group pressure increasing the height of the chamber (from 0 to 10 mm);

```
 Brewer pressure
0=max 10=min.   00
```

- if a version is complete with two coffee canisters, choose between two different coffee bean mixtures;
  0=coffee canister on the left; 1= coffee canister on the right;

```
MIXTURE COFFEE
                N
```

press “2” to scroll and display:

press keys “4” and “5” to change the rotation time of the N product motor, thus changing the product quantity you have dispensed; if time is zero, no product N will be dispensed; you can carry out a “time test” on the set-point; (see 13.21.);

```
PRODUCT N
 0= inhib.      0.0
```

if the time you have programmed is other than zero, the N product motor will be activated at the expiry of the delay time you have programmed; the delay time is increased or decreased by pressing keys “4” and “5”;

```
 start delay
PRODUCT  N    0.0
```

the rotation time of the product motor can be briefly interrupted one or two times during the dispensing cycle (0 = no break);

```
 breaks number
 0-1-2          00
```

to determine the pump power on time (in I machines) or the solenoid valve opening time (in E machines) and then the water quantity it will deliver; you can carry out a “time test” on the set-point; (see 13.21.);

```
WATER N  time
 0= inhib.      0.0
```

water will be dispensed in the mixing bowls at the expiry of the delay time you have programmed;

```
 start delay
WATER N        0.0
```

for instant selections only, the water flow in mixing bowls can be regulated between low, medium, high by pressing keys “4” and “5”;

```
water flow :     N
       medium
```


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	the rotation time of the mixer fan can be changed by pressing keys “4” and “5”; if time is equal to zero, the mixer will not rotate; you can carry out a “time test” on the set-point; (see 13.21.);	MIXER N 0= inhib. 0.0
	if the rotation time is other than zero, the mixer fan will be rotated at the expiry of this delay time;	start delay MIXER N 0.0
	the mixer rotation speed can be regulated between low, medium, high by pressing keys “4” and “5”;	MIXER speed N medium
LM dispensing	to establish the milk quantity of the second dispensing cycle;	PRODUCT LM 0= inhib. 0.0
LM dispensing	to determine the delay of the second milk dispensing cycle;	start delay PRODUCT LM 0.0
LM dispensing	to determine the breaks of the second milk dispensing cycle;	breaks number 0-1-2 00
LM dispensing	to establish the water quantity of the second milk dispensing cycle;	WATER LM time 0= inhib. 0.0
LM dispensing	to determine the water quantity delay of the second milk dispensing cycle;	delay water LM 0= inhib. 0.0
LM dispensing	to establish the mixer rotation time of the second milk dispensing cycle;	MIXER LM 0= disab. 0.0
LM dispensing	if other than zero, the mixer power on will be delayed by the time you have set up;	start delay MIXER LM 0.0
	in E machines, the power-on time of the grinder can be regulated here to establish the coffee quantity that will fall into the brewing chamber of the espresso unit;	grinder time 0.0
	if you enable this option after having compressed the ground dose, the pump will deliver per un secondo a small water quantity to make it wet, stop per i secondi qui impostati (da 01 a 15), and restart the usual dispensing cycle; the stop time can be here programmed from 01 to 15;	T. AFTER PREINF. 0=NO SEC.:00
	press key “4” and “5” to establish how many seconds (from 0 to 20.0) after the end of the activity of the 24V device last involved in the selection (mixer motor, pump boiler, etc.), the dispenser nozzle arm will move back to its standby position;	retards tubes 00.0

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	press key “4” and “5” to choose the cup in which to dispense the drink and whether to release the stirrer or not; in multiple options, cup “2” will be only dispensed if cup “1” fails; if cup “1” fails, the display shows “no cup 1”; if cup “2” fails, the display shows “no cup 2”; if both of them should fail, the vending machine signals the OFF 01 error; (see 11.); - a drink is dispensed, but no cup falls down; - a drink is dispensed, but no cup falls down and a stirrer is released;	OPTION SELECTION cup1 or cup2+stirrer cup 1 or cup 2 cup 2 + stirrer cup 2 cup 1 + stirrer cup 1 no cup no cup + stirrer
	to choose the sugar canister (keys “4” and “5”);	canister SUGAR n:N
	press “4” and “5” to choose the drink name to display during the dispensing cycle; options are listed here below: - “standard”, the display will show “drink N under preparation”; - “list of names” of drinks made available in the machine memory; the display will show “*drink name* under preparation”; - “custom”: the display will show the user’s customised names; it is necessary to create a configuration file with RheAction (see 05.55.) and load it on the machine by means of a flash key (see 05.53.a.);	selection name N ------- n:00
“PRE-SELECTION”	you can choose among an ensemble of names stored in the memory or written by means of rheAction; the commonest pre-selections and their programming options are listed here below:	
“decaffeinated/barley”:	pre-selection is intended to replace espresso coffee with instant decaf (or with barley); variables are listed here below:	
	- message appearing on the display during the dispensing cycle;	preselection DECAFEINATED
	- decaffeinated product canister (keys “4” and “5”);	canister DECAFEINATED n:N
	- mixing bowl and mixing water (keys “4” and “5”);	ev-mixer DECAFEINATED n:N
	- price change with respect to the standard espresso drink; (keys “4” and “5”);	DECAFEINATED price 0=+ 1=- 00
	- keys for which pre-selection has effect (scroll by means of key “2” and select enable or disable by means of key “4” and “5”); this instruction is repeated in any pre-selection to enable the effect in the key or not (*);	enable presel. button N: YES (*)
“extra milk”	- to choose the milk canister;	PRODUCT MILK n:N
	- to determine by how many seconds to change the rotation time of the product motor you have set up in the configuration; to enable, see (*);	extra milk quantity + 0.0
“espresso”	- to decrease the NN water percentage to the water you have set up in the espresso selections; to enable, see (*);	water quantity ESPRESSO -00 %
“cup 2”	- to increase the product quantity by the percentage you have set up; to enable, see (*);	PRODUCT percent +00 %
“no cup” “button 25”	- if available, it is intended to enable the cup sensor to allow the machine to dispense drinks without any cup release, i.e. by using the user’s; to enable, see (*);	cup sensor 1=enable 0

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"FUNCTIONING COLD"	set up the "PRODUCT N". "PRODUCT N start delay" and "pause number" parameters, as it has been specified before for "hot" selections;	PRODUCT N 0= inhib. 0.0 start delay PRODUCT N 0.0 breaks number 0-1-2 00
	press key "4" and "5" to establish the pump power-on time and, therefore, the quantity of still water at room temperature directly dispensed into the cup;	time H2O natur. 0= inhib. 0.0
	still water at room temperature will be dispensed with the delay programmed here (keys "4" and "5");	start delay H2O natur. 0.0
	press key "4" and "5" to establish the pump power-on time and, therefore, the cold water quantity directly dispensed into the cup;	time H2O cold 0= inhib. 0.0
	cold water will be dispensed with the delay programmed here (keys "4" and "5");	start delay H2O cold 0.0
	press key "4" and "5" to establish the pump power-on time and, therefore, the cold water quantity dispensed to mix the instant product;	time H2O cold FP N 0.0
	the cold water necessary to mix the product will be dispensed with the delay programmed here (keys "4" and "5");	start delay H2O cold FP 0.0
	to choose the mixer used to mix water and product;	cold number mixer N
	press key "4" and "5" to modify the rotation time of the N product motor to change the product quantity dispensed; if time is zero, product N is not dispensed;	MIXER N H2O cold 0= inhib. 0.0
	if the rotation time is other than zero, the mixer fan will be rotated with this delay;	start delay MIXER H2O cold 0.0
	press keys "4" and "5" to regulate the mixer rotation speed and choose among slow, medium and quick;	MIXER speed H2O medium
	press key "4" and "5" to establish the pump power-on time and, therefore, the carbonated cold water quantity dispensed;	time H2O cold gas 0= inhib. 0.0
	carbonated cold water will be dispensed with the delay programmed here (keys "4" and "5");	start delay H2O cold gas 0.0
	press key "4" and "5" to establish the pump power-on time and, therefore, the cold water quantity dispensed to mix the syrup;	time H2O scir N 0= inhib. 0.0
	the cold water necessary to mix the syrup will be dispensed with the delay programmed here (keys "4" and "5");	start delay H2O scir N 0.0
	the comments about "hot" selections already made before are also valid for the "tube delay", "cup selection option" and "selection name" variables;	retard tubes 0.0 OPTION SELECTION cups ... selection name N ------- n:00

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09.01.b. prices	press key “2” to display: each selection can be assigned a sales price; use “4" and "5” to modify the amount and “2” to scroll the twenty-four price lines; twenty-four lines are referred to selections, the twenty-fifth to the difference between the price of the drink dispensing cycle with and without a cup, which means that it is the cup price;	PRICE N 0.00
09.01.c. happy price	press key “2” to display: every single selection may be assigned a sales price that will be valid only in well-defined time ranges (see 09.01.l.); use “4” and “5” to change the amount and “2” to scroll the price lines;	PRICE N 0.00
09.01.d. coins	assign each channel its value for the parallel payment system; press “2” to scroll the coins from A to J and use “4” and “5” to change its value;	COIN A 0.00
09.01.e. temperature	press key “2” to display:	
	use keys “4" and "5” to modify the water temperature values of the pressure boiler, boiler and the cooling unit, if any;	TEMPERATURE boiler NN
	to establish the water temperature of the instant boiler;	TEMPERATURE espresso NN
	to establish the basic temperature of the pressure boiler;	DEFINITION first coffee 00
	to establish how many minutes after the latest espresso to activate the following parameter;	heating time sec.: 00
	to establish the power on time of the pressure boiler heating element to increase the water temperature;	temperature heater 00
	to determine the temperature at which to heat the coffee brewer during operation;	TEMPERATURE cold NN
	to establish the water temperature of the cooling unit;	
09.01.f. miscellaneous	the “miscellaneous” item includes some options (press keys “4” and “5” to modify the values of these options):	
	- machine code A and B: you can number the machine to distinguish it from others similar (data collection);	machine code A NN
		machine code B NN
	- message number: press keys “4” and “5” to choose the messages to display on the screen when the machine is in standby mode;	message number N
	- coin mechanism programming options: press keys “4” and “5” to display the options of communication with the payment system; choose among:	
	- parallel single vend	coin-mech type PAR. SING. VEND
	- parallel multiple vend	coin-mech type PAR. MULT. VEND
	- executive	coin-mech type EXECUTIVE
	- executive price holding	coin-mech type PRICE HOLDING
	- MDB	coin-mech type MDB
	- access code: to access the programming mode only after having typed a password you can choose by pressing keys “4” and “5”; carefully note down the combination you have chosen;	access code NN

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- fan delay: to determine for how many minutes after the latest dispensing cycle the powder suction fan will remain active;

```
fan time
min.          NN
```

- beep time: beep time active at the end of each machine function;

```
Beep time
              0.0
```

- number of decimals: to determine how many decimals are considered in the comparison between the selection price and the credit you have inserted;

```
decimal number
              N
```

- first installation: used to make sure that the water circuit will be filled in at the next power on; if the value is zero, the machine will perform the cycle just as for 08.02 at the next power on;

```
first installat.
0=first       N
```

- to enable the summer time function (from the last Sunday in March to last Sunday in October, the set time is automatically increased by one);

```
Summer Time
 1= yes       N
```

- to establish the standard sugar quantity dispensed; press keys "4" and "5" to modify it;

```
DEFAULT SUGAR
LED=0-5     = 3
```

all led's off= no sugar ←

```
+ sugar -
-66% -33% prod.n +33% +66%
```

- to establish whether to release the stirrer before or after the other products;

```
stirrer
0=before 1=after N
```

- to establish whether to release the stirrers or not when a no-sugar dispensing cycle is selected;

```
stirrer no sugar
1= enable    N
```

- in the E machine, to empty water circuits automatically:
  - detach the water supply and press "4";

```
Deinstallation
 4=START
```

  - open the pressure boiler drain tap (see 05.51.) and press "5";

```
Open boiler tap
 P5=START
```

  - when the display shows:

```
Deinstallation
```

  - close the pressure boiler drain tap;

```
END
close boiler tap
```

at the end of the uninstall cycle, the boiler water temperatures will be set to zero and the machine will be set to "FIRST INSTALLATION=0";

- 1 = it enables the changer' keys to allow the emptying of the coins tubes;

```
ABIL. MDB CHANGER
SEL. 1=enable   0
```

- free vend decounter: it establish a numerical limit for the free selections;

```
FREE VEND AMOUNT
 [ 00]        00
```

09.01.g. diagnostics

press key "2" to access diagnostics and to enable the machine to display (keys "4" and "5") the standby message and the boiler water temperature, alternatively;

```
ENABLE DISPLAY
TEMPERA. 1=YES  N
```

press "2" once again to display the voltage value intended to supply devices at 24 V dc;

```
VOLTAGE
 volt:        00.0
```

when this item appears (key "2"), press "4" to dispense a stirrer;

```
TEST STIRRER
sel 4
```

extract the coffee brewer from the machine, arrange a cup beneath the doser and press "4" to get the ground product; now, you can perform the coffee dose test;

```
TEST DOSING COF.
sel 4
```

if a module intended to dispense covers is connected with the machine, press "4" to release a cover and perform a complete module test;

```
test cover
sel 4
```


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09.01.h. sales audit

this menu is intended to gather the quantities of the selections made by the machine: names are assigned according to the EVA-DTS standard:

- VA 102
  quantity of total vends (parameter not resettable);

- VA 104
  quantity of the vends made after the reset;

- VA 101
  total amount of receipts (parameter not resettable);

- VA 103
  total amount of receipts after the reset;

- VA 202
  quantity of total tests (parameter not resettable);

- VA 204
  quantity of tests after the reset;

- VA 302
  quantity of free vends (parameter not resettable);

- VA 304
  quantity of free vends after the reset;

- CA 201
  total amount sold by cash (parameter not resettable);

- CA 203
  total amount sold by cash after the reset;

- CA 202
  total amount of the selections sold by cash;

- CA 204
  quantity of the selections sold by cash after the reset;

- CA 305
  total amount of cash receipts;

- CA 301
  partial amount of cash receipts;

- DA 401
  total amount loaded on RFID cards;

- DA 402
  total amount loaded on RFID cards after the reset;

- DA 201
  total amount sold by means of a RFID card;

- DA 203
  total amount sold by means of a RFID card after the reset;

- DA 202
  quantity of selections sold by means of a RFID card;

- DA 204
  quantity of selections sold by means of a RFID card after the reset;

- LA 1*1
  selections sold at a standard price;

- LA 1*2
  selections sold at a happy price;

- PA 403
  free selections;

TOTAL SELECTIONS
NN

PART. SELECTIONS
NN

TOTAL MONEY
0.00

PARTIAL MONEY
0.00

TOTAL TESTS
00

PARTIAL TESTS
00

TOTAL FREE
00

PARTIAL FREE
00

TOTAL CASH
CASH 0.00

PARTIAL CASH
CASH 0.00

N. TOT. SEL. CASH
00

N. PAR. SEL. CASH
00

TOTAL CASH-BOX
0.00

PARTIAL CASH-BOX
0.00

total loaded on
card 0.00

part loaded on
card 0.00

total unloaded
card 0.00

part unloaded
card 0.00

TOTAL SEL. CARD
00

PARTIAL SEL. CARD
00

TOTAL SEL. N
00

TOTAL SEL. N
HAPPY 00

TOTAL SEL. N
FREE 00

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09.01.i. MDB	press “2” to display the variables necessary for the MDB protocol; press keys “4” and “5” to scroll the values;	
	- tube dispensing: to empty coins tubes;	Ejection tubes button:7-8-...-11-12
	- changegiver enable: to enable the coins change of the changegiver	escrow enable 0=enab. 1=dis. N
	- maximum credit: to establish the maximum acceptable credit amount;	credit max 0.00
	- maximum change: to determine the maximum change amount;	rest max 0.00
	- single/multiple vend: to keep the residual credit amount after a dispensing cycle or not;	Sell type 0=sing. 1=mult. N
	- token value: to quantify the value of the token;	Token value 0.00
	- coins change N: to establish the coins to be used for the change when the machine is able to give it; from A to P;	coin rest a N 0=acc. 1=disab. 0
	- coins no change N: to establish the coins not to be accepted when the machine is unable to give the change; from A to P;	coin no rest a N 0=acc. 1=disab. 0
	- set “0” to enable the changegiver; “1” to enable the changegiver only if the change made available is enough or if there is the RFID card; “2” to enable the changegiver only if there is the RFID card;	Bill validator enab.= 0,1,2 = 0
	- tube value: to specify the value in the ensemble of coins tubes;	MDB tubes value 0.00
09.01.l. clock	this chapter is intended to determine:	
	- current time;	HOUR: 00:00
	- current day;	DAY: 00
	- current month;	MONTH: 00
	- current year;	YEAR: 00
	- day of the week;	day of week: (ex.) Tuesday
	use the three pairs of parameters (Start Happy N and End Happy N) to establish three time bands during which the machine will apply “happy prices” (see 09.01.c.);	START FN: 00:00
		END FN: 00:00
	for each day of the week you can establish a time band during which the machine will accept no selection and reduce the water heating of the boiler;	SWITCHING ON: xxxxx 00:00
		SWITCHING OFF xxxxx 00:00
	to count the energy consumption of the machine;	Kilowatt hours: 0.0
	the machine will perform a wash cycle at the time you have specified provided that it has performed at least five dispensing cycles after the last cycle; erogazioni;	CLEANING: 00:00
09.01.m. out of service	to display the recording of the twenty errors last occurred in the machine; press key “2” to scroll the records and key “4” to reset the recording (see 11.);	n. N off NN hh:mm dd-mm-yyyy

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09.01.n. product qty	each product motor can be assigned a time credit in seconds that will be decreased at each dispensing cycle of that product; after having used up the credit, the machine will answer “selection not available” whenever a request is made for that product; this control is disabled at the beginning and the machine has got no constraint; to programme the credit time of a product motor, just increase the variable by pressing key “4” and “5”; programmable products from 1 to 6;	product qty N [0.0] 0.0
	please note that the first warning threshold can be programmed; if exceeded, the display will show an alarm message without interfering with the operation of the machine;	prod. N warning thresold: 0.0
	after having used up the time credit, the operator may decide whether to inhibit or not the dispensing cycle of the selections, including that product;	enable stop prod. N 1=stop 0
09.01.o. maintenance	in this ensemble of parameters, key “2”, you can set up some counters to trigger an alarm after a programmable number of events (press “4” and “5” to set up and PROG to store):	
	- dispensing cycles before having to replace the cartridge of the external filter, if any; as soon as 500 dispensing cycles are left, the display will show “change water filter” and as soon as the decounter has reached 0, it will display “out of service water filter”, thus inhibiting the operation of the machine;	water filter cnt [00] 00
	- espresso dispensing cycles before having to service the coffee brewer (see 12.); as soon as 5 dispensing cycles are left, the display will show “make brewer cleaning” and as soon as the decounter has reached 0, it will display “out of service cleaning brewer”, thus inhibiting the operation of the machine;	dec. cof. brewer [00] 00
	- espresso dispensing cycles before having to empty the grounds bag (see 05.27.); as soon as the decounter has reached 5, it will display the message “remove coffee grounds” until the decounter has reached 0, thus inhibiting the operation of the machine;	dec. cof. grounds [00] 00
09.01.p. rfid card	- the maximum credit that can be loaded into the RFID card can be established by this variable;	max credit card 0.00
	- 0 for each coin (from A to J) that can be accepted when the RFID card is available;	coin A N with card 0=acc.
	- 0 for each coin (from A to J) that can be accepted when the RFID card is not available;	coin A N no card 0=acc.
	- to specify the percentage used to reduce the prices set in 09.01.b. when the RFID board is in use;	discount RFID card - 00 %
09.01.q. tuning motors	with respect to the setup in 09.01.a:	
	- the rotation time of the boiler pumps can be changed (keys “4” and “5”) by +/- 30 %; the change concerns all the activations of the pumps for all selections (see 13.18.);	tuning pump N percent +00 %
	- the rotation time of every single product motor can be modified (keys “4” and "5”) by +/- 30% compared to the time set in the recipe variables (see 09.01.a.); the modification concerns all the activations of the product motors for all selections;	tuning motor N percent +00 %
	- the activation time of the grinder can be varied (keys “4” and “5”) by +/- 30%;	tuning grinder N percent +00 %

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09.01.r. calibration product flux	this procedure will convert the programming of the doses of grounded coffee or of the instant product expressing in grams rather than, as usual, in seconds of activation of the grinder motor or of the product motor; to perform this procedure, you must have the following: a container (cup) to collect the doses of ground coffee; a balance with 50 grams scale (d = 0.01 gram); before starting the calibration procedure, it is necessary to weigh the container (cup) that will collect the grounded coffee or the instant product;	
execution of the calibration GROUND PRODUCT	press key “2” to enter, the display shows: press PROG; remove the variable coffee brewer (see 13.05.); put in place the coffee grounded conveyor and properly place the cup to collect the dose; press PROG; the machine performs two grinding cycles; the grounded obtained must weigh 20 grams; if this is true, press the key "1“; if not, set the amount weighed by pressing the keys "4" and "5" to change the digits on the display in the lower right corner; at the end, press the key "1" (remember to subtract the weight of the empty cup); the display shows: reinstall the coffee group and all the others components (coffee conveyor, carter, drip tray, ...) and press PROG; the machine will store the data entered; wait for the end of this automatic cycle, which also includes a switch off/switch on cycle without manual intervention; at the end of this procedure, the display will show the usual stand-by messages; after that, in each recipe that includes the coffee beans, the dose will now be expressed in grams of grounded coffee and the machine will compensate the variations of dose while maintaining constant the quantity; the natural wear of the blades which over time tends to decrease the amount of coffee poured into the group, will be well automatically compensated without any outside intervention;	CALIBRATE COFFEE PUSH >PROG< 0.0 REMOVE BREWER AND PRESS >PROG< readed grams 4=+ 5=- 1=ok: 20 REINSTALL BREWER AND PRESS >PROG<
execution of the calibration INSTANT PRODUCT	select the product canister on which to act: place the cup to collect the product, press key “PROG” of the service keyboard; the product motor will be operated for 10 seconds; weigh the product (pay attention to the tare) and set the value of the grams by pressing key “4” and “5”; press 1=ok; the product dose in the recipe will be now expressed in grams; if you wish to go back to the programming and displaying mode in time and not in grams, reset all parameters to zero;	calibr. motor N gr/sec read grams 4=+ 5=- 1=ok NN

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09.01.s. product audit flux	display the partial and the total quantity of delivered product; the partial audit can be erased by pressing the key “4” for some seconds;	product N used Parz. g. 00 product N used Tot. g. 00
09.01.t. id.machine	press key “2” to scroll the identification codes to detect the EVA DTS data: - machine number; - location number; - machine configuration; - address for the connection with the DDCMP protocol; - to transfer the data from the machine to an external device, choose the protocol you wish: - in addition to the TM-ON (“5”) protocol, typical of Rheavendors, the following is made available via RS232 and via IRDA: - DDCMP; choose the transmission speed at 2400 or 9600 bits/sec.; 0 = 2,400 baud; 1 = 9,600 baud; - DEX-UCS; please note that - when the machine is engaged in sending data - the selections of drinks are inhibited and the display shows: after choosing one of these variables, quit the programming mode as usual (key “1” and key “PROG”) and power on/off the machine; the protocol you have chosen will be stored and used in the data exchange with a remote station;	code ID 101 00 code ID 104 00 code ID 106 00 address VIDTS 00 DDCMP 24=0 96=1 DEX=3r TMON=5 N DATA AUDIT PLEASE WAIT
09.01.u. variflex	to set the diameter of the coffee brewer installed in the machine; it decides whether to keep the percolation chamber of the coffee brewer inserted in the upper piston or not in the standby phase (close); to enable the grinder calibration time; if this variable is enabled (1=yes), the machine controls espresso’ cycle to use the measured parameters for the next selection; with a Ø 45 mm brewer group, we consider, as central reference, that: one gram of coffee grounded is high nine-tenths of a millimeter (when compressed) generates three pulses of the motor’ coffee brewer transducer; while a dispensing cycle, the software read and store these parameters as references of the compression’ degree of the coffee grounded pad; the next espresso cycle will use these measurements to set and manage the grinder’ work and the movements of the coffee group;	BREWER SIZE 0=36 1=45 00 BREWER POSITION 0=close 1=open 00 Autom. Adjustment f. Tuning 1=yes 0 encoder impulse/gr. 0.00
09.01.v. cleaning	in this chapter, we find two variables to wash the ice bench output circuit and to start a “sanitary” cycle (with cleaning tab) for the coffee group	ice bench cleaning key=4 coffee group cleaning key=4

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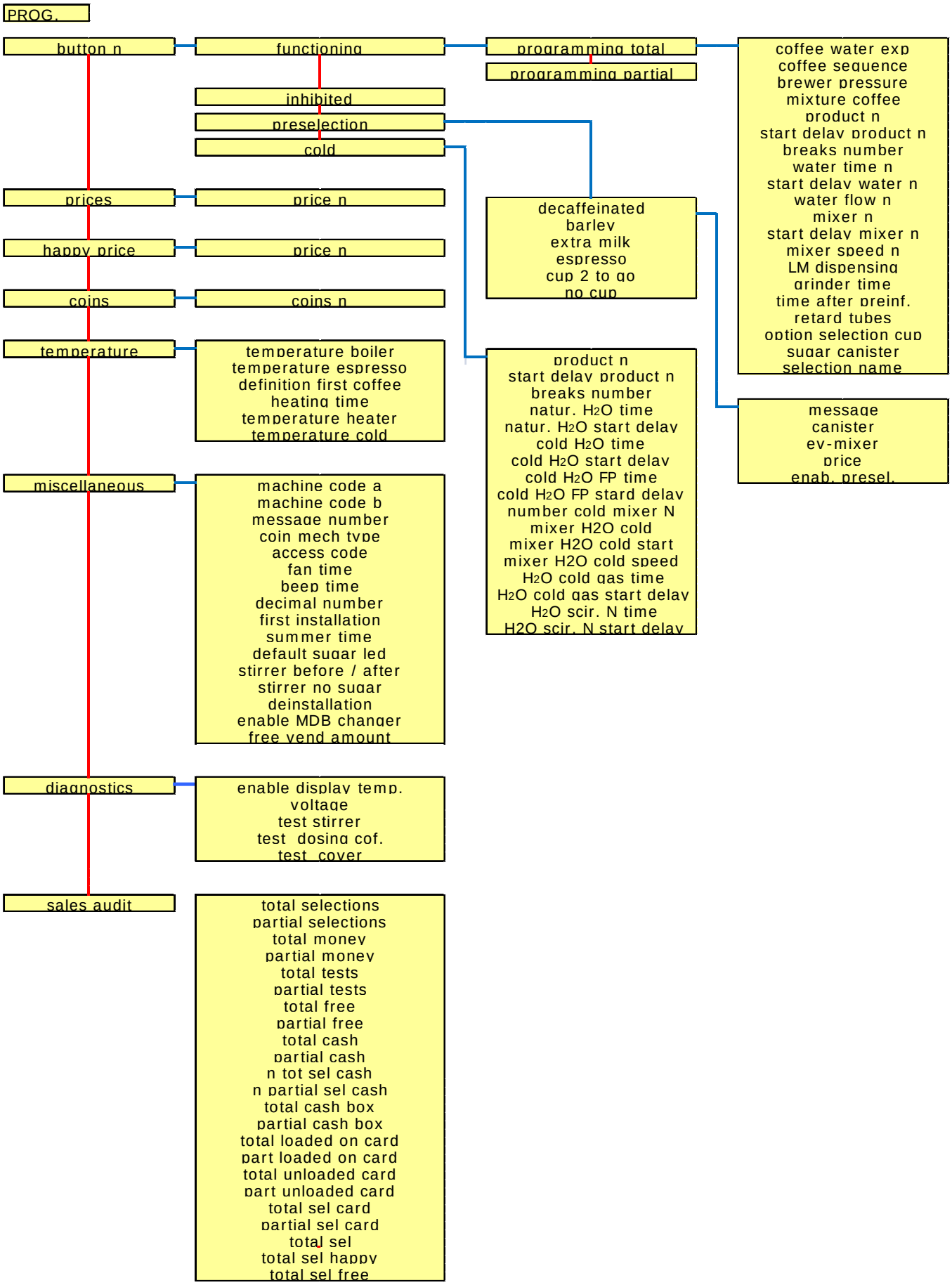
09.02. programming diagram



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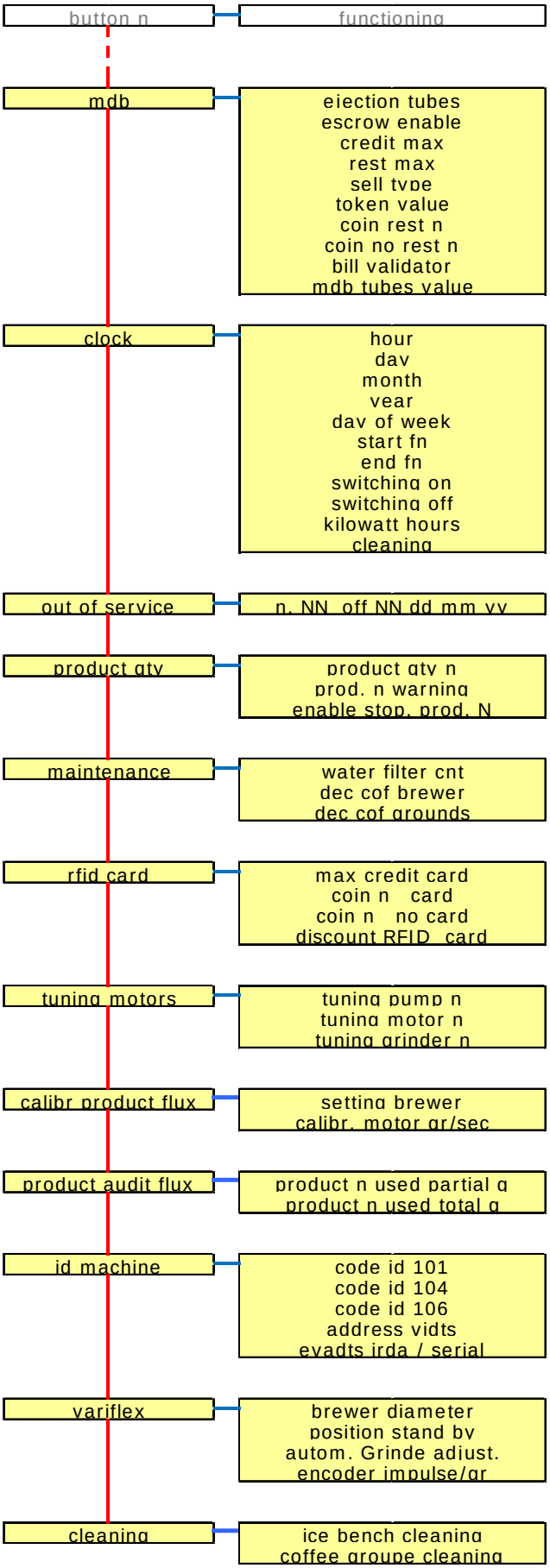
09.02. programming diagram



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09.a. programming TFT , Premium and touchTV

the vending machine is programmed by means of parameters considered standard for the specific configuration required; values forming the composition of recipes enable the user to dispense drinks without requiring the installer to set up special programs; to modify these parameters to adapt the drinks you have produced, refer to the following (programming tree); to access the programming mode, open the door of the machine and use the service key in the safety switch;

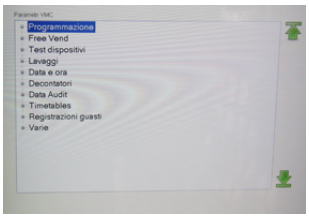
attention

the vending machine is supplied and running to all effects in this mode of operation; act extremely carefully;

access — press the key “PROG” of the service keyboard (see 05.38.);

quit — after having programmed, press key “PROG” to go back to the usual operation of the vending machine and to store all changes you have made;

even if the **luce x2 TFT, Premium** and **touchTV** software has an intuitive and easy structure to approach, it allows maximum freedom of use of the machine’ functions; in particular, there are no names hard linked to the actuators (e.g.: product motor 1, mixer 3, ...), but the programming action, in each selection, is completely free to operate and it may match the name of "device“ to any of the following physical actuators:



device
- coffee brewer or product motor;
- solenoid valve or instant pump motor;
- mixer motor;

please note that these devices can be enabled and used several times during the same selection;

parameters — the following parameters are available for each device:

duration: it is the activation time of the device (pump, mixer, product motor); it will establish the activation time of the pump for coffee beans selections;

delay: it is the delay by which the device is activated after the selection has been started;

product variation: not used;

param1: to establish the work speed of:

- mixer motor 6=slow; 8=medium; 15=quick;

- instant pump motor 6=slow; 11=medium; 15=quick;

or to establish:

- the work time (tenths of a second) of the millstone motor in coffee beans selections (quantity of ground product);

param2: to allow the adjustment of the internal coffee group pressure increasing the height of the chamber (from 0 to 10 mm);

display and guide messages: the graphical display complete with touch screen, by virtue of which the machine parameters can be displayed and modified, can show guide images and message that are of sure reference and orientation during the programmation steps; if the quantity of a variable can be changed, a window shows the current numeric value and two arrows, by means of which to change it;

to supplement the operational information of this manual, refer to “rheavendors LuceX2 Touch”, which includes the instructions necessary to update and modify the programs residing in the machine (see 02.02.)

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- Programming
  - general options
    - number of products — active product canisters;
    - number of selections — active selections;
  - advanced options

instant temperature	boiler water temperature;	max 95 °C
espresso temperature	pressure boiler water temperature;	max 110 °C
brewer chamber temperature	coffee brewer chamber temperature;	max 40 °C
cold temperature	cooling unit dispensing temperature;	from 0 to 15
ID A	first CPU identification number;	
ID B	second CPU identification number;	
ID C	third CPU identification number;	
ID D	fourth CPU identification number;	
fan time	powder suction fan delay	
person sensor	person sensor sensitivity; 0 = sensor excluded;	from 0 to 255
cup sensor	cup sensor sensitivity; 0 = sensor excluded;	from 0 to 255
Cup drop control	0= enables (if the cup sensor is enabled); 1= disabled	
installation/uninstallation	0=first installation, 1=normal power on, 2=uninstallation;	
brewer/type of millstone	0=open/instant, 1=open/not instant, 3=open/timed millstone, 4=closed/instant, 5=closed/not instant, 7=closed/timed millstone	
language	English, Deutsch, Italiano, Français, Espanol, Cestina, Slovensko, ...	14 languages

  - payment system

type of payment	parallel single - parallel multiple - executive - executive price holding - MDB - Rhea parallel single - Rhea parallel multiple - Rhea card + parallel - Rhea card + Rhea parallel;	
number of decimals	number of decimals of the price	from 0 to 3
bill acceptance	0 = always; 1 = with exchange only; 2 = with key only;	
price 2 usage	0=not used, 1=used with cashless, 2=used with "happy hour"; the price of every single selection can be differentiated if the payment is made by means of a key or if the selection is made during special time bands; see "Happy hour";	

    - parallel
      - coin A — coin value A;
      - ...
      - coin J

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+ MDB		
changegiver enable	0=enable 1=inhibited;	
maximum credit	maximum admitted credit;	
maximum coin return	maximum admitted coin return;	
type of sale	0=simple 1 = multiple;	
token value	token value;	
+ coins enabled		
coin A accepted with change	0=accepted 1=not accepted (exchange possible);	
coin A accepted without change	0=accepted 1=not accepted (exchange impossible);	
...		
coin P ...		
coin manually ejected	coin ejected;	
Mass set price 1	to set price 1 of all selections to a well-defined value	
Mass set price 2	to set price 2 of all selections to a well-defined value	
+ EVA-DTS	EVA-DTS protocol parameters;	
ID 101		
ID 104		
ID 106		
EVA-DTS address		
EVA-DTS Port	0=Irda, 1=RS232, 2=DEX, 3=DEX with reset	
+ selections	ensemble of parameters of selection 1;	
+ selection 1		
type of selection	active, not active, preselection, cold, FBT;	
type of cup	cup 1, cup 2, no cup cup 1 or cup 2, cup 2 or cup 1;	
strirrer	release the stirrer 0=disabilitato, 1=abilitato	
stirrer time	release the stirrer 0=after; 1=before the dispensing cycle	
pre-brewing	pre-brewing time	
+ price		
price 1	price 1 of selection (standard price);	
price 2	happy price of the selection; see "payment system" above;	
from price 3 to price 6	price 3... 6;	*options available;*
number of elements	devices that can be activated in this selection (product motors, solenoid valves, mixers, ...);	max 8

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- elements
  - device [1] — first device;
  - duration [1] — activation time of this device;
  - delay [1] — activation delay of this device;
  - parameter 1 [1] — speed or millstone time for espresso brewer;
  - parameter 2 [1] — to allow the adjustment of the internal coffee group pressure increasing the height of the chamber;
  - ...
  - device [8]
  - duration [8]
  - delay [8]
  - parameter 1 [8]
  - parameter 2 [8]
- selection ...
- selection 24

- free vend — they can be made with or without accessories (cup, strirrer, ...)
  - selection 1
  - ...
  - selection 24

- Device under test — to activate the devices listed here below for test purposes;
  - device
    - grinder 1 (P1)
    - grinder 2 (P2)
    - not used (P3)
    - sugar (P4)
    - descafeinated (P5)
    - gingseng (P6)
    - milk (P7)
    - chocolate (P8)
    - barley (P9)
    - tea (P10)
    - hot solenoid valve 1
    - ...
    - hot solenoid valve 5
    - mixer 1
    - ...
    - mixer 5
    - test stirrer
  - parameter 1 (test device) — Param1 (speed or activation time)

press [test]

the screen shows "running test ..."

and then "test ended"

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- Wash cycles
  - mixer 1
  - ...
  - mixer 5
  - brewer wash with pastille

to enable the wash cycles of the specified circuits; ☐

press [start]

- Date and time
  - year
  - month
  - day
  - hour
  - minutes
  - seconds
  - store date and time

to programme these machine parameters; at the end, press "store date and time";

- Decounters
  - limits of decounter 1 — time credit of product motor 1;
  - value of decounter 1* — residual time of product motor 1;
  - reset of decounter 1 — reset of the time credit of product motor 1;
  - ...
  - limits of decounter 20
  - value of decounter 20
  - reset of decounter 20

* it starts from zero up to the setup limit, when it signals the product lack; the counter will increase whenever the product motor rotates in tenths of a second until the setup value is reached;

- Audit data
  - total selections — total number of dispensing cycles;
  - partial selections — number of dispensing cycles of subtotals;
  - total vends — total amount of dispensing cycles;
  - partial vends — total amount cashed since the last reset of subtotals;
  - total free vends — total number of free dispensing cycles;
  - total number per selection
    - total selection 1 — number of dispensing cycles of selection 1;
    - ...
    - ...
    - total selection 24 — number of dispensing cycles of selection 24;
  - partial number per selection — number of selections from 1 to 24 since the last reset;
    - partial selection 1 — number of partial dispensing cycles of selection 1;
    - ...
    - ...
    - partial selection 24 — number of partial dispensing cycles of selection 24
  - partial reset — reset of all partial data;
  - Total reset — reset of all data;

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- Timetables
  - Energy saving bands
    - On hour - Monday ... Sunday
    - On minute - Monday ... Sunday
    - Off hour- Monday ... Sunday
    - Off minute- Monday ... Sunday
    - Espresso standby temperature
    - Instant standby temperature
  - happy hour
    - start hour - N
    - start minute - N
    - end hour - N
    - end minute - N
  - wash hour
  - wash minute
- Failure records
  - message reset
  - 01) DD/MM/YYYY hh.mm - OFF: code
  - ...
  - 50) DD/MM/YYYY hh.mm - OFF: code
- Miscellaneous
  - to show diagnostics information
  - firmware release
  - full machine test
  - Machine UID
  - Conversion factor for products (Time-> Weight)
    - conversion factor product 1
    - ...
    - conversion factor product 8
  - Conversion factor for Hot Valves (Time-> Volume)
    - conversion factor pump 1
    - ...
    - conversion factor pump 5

Energy saving bands		
On hour - Monday ... Sunday	energy saving time band start;	
On minute - Monday ... Sunday		
Off hour- Monday ... Sunday	energy saving time band end;	
Off minute- Monday ... Sunday		
Espresso standby temperature	water temperature in the pressure boiler during the energy saving time band;	
Instant standby temperature	water temperature in the boiler during the energy saving time band;	
happy hour	see "Price 2 usage";	
start hour - N	happy hour time band start hour;	three time bands av.
start minute - N	happy hour time band start minute;	three time bands av.
end hour - N	happy hour time band end hour;	three time bands av.
end minute - N	happy hour time band end minute;	three time bands av.
wash hour	wash cycle start hour;	two time bands av.
wash minute	wash cycle start minute;	two time bands av.
Failure records	error record (see 11.);	max 50
message reset	to delete error records;	
01) DD/MM/YYYY hh.mm - OFF: code		
...		
50) DD/MM/YYYY hh.mm - OFF: code		
Miscellaneous		
to show diagnostics information	to display temperatures, the state of sensors, ...;	
firmware release	software releases of CPU, GPU, Pwr and Espresso	
full machine test	to test the machine devices	
Machine UID	Machine Unique Identifier	
Conversion factor for products (Time-> Weight)		
conversion factor product 1	to set the grams/seconds ratio, that is how many grams of ground product or product are dispensed if the grinder motor or the product motor is operated for 10 seconds;	see also 13.24.
...		see also 13.24.
conversion factor product 8		see also 13.24.
Conversion factor for Hot Valves (Time-> Volume)		
conversion factor pump 1	to set the millilitres/seconds ratio, that is how many millilitres of water are dispensed if the boiler pump motor is operated for 10 seconds;	see also 13.25.
...		see also 13.25.
conversion factor pump 5		see also 13.25.

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+ product calibration product calibration 1 ... product calibration 10	to increase or decrease the activation time of product motors (- 80% ÷ + 80%);
+ hot pump calibration hot pump calibration 1 ... hot pump calibration 5	to increase or decrease the activation time of boiler pumps (- 80% ÷ + 80%);
+ cold solenoid valve calibration cold solenoid valve calibration 1 cold solenoid valve calibration 2	to increase or decrease the activation time of cold unit solenoid valve (- 80% ÷ + 80%);
espresso pump calibration	to increase or decrease the activation time of espresso pump (- 80% ÷ + 80%);
Grinder auto-adjust	it enables the self-adjustment of the grinding wheel;
Grinder 1 calibration	measures the height of the ground dose in coffee beans canister 1
Grinder 2 calibration	measures the height of the ground dose in coffee beans canister 2

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10. parameters

the following tables are intended to supply some information on the programmable parameters of the **luce x2** configuration software; if not otherwise specified, the numeric time values of devices are understood in tenths of a second (e.g. 27 corresponds to 2 seconds and 7 tenths);

10.02. configuration **basic**

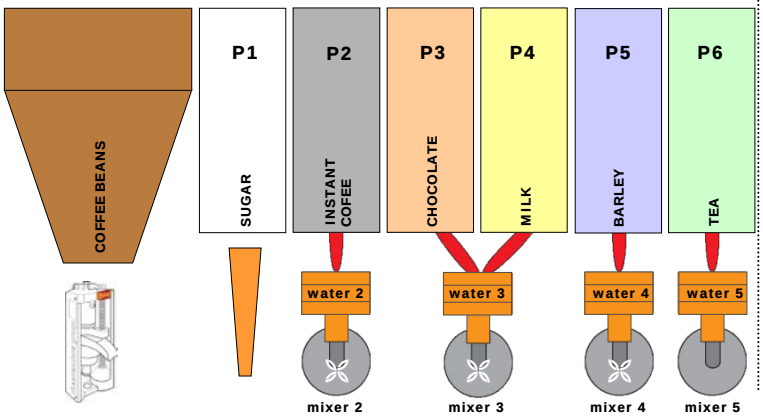
the parameters intended to dispense the drinks with the different possible products are supplied here below, just by way of example; these values enable the operator to program the selections of reference and they can be used to obtain some functional dispensing cycles even if it may be necessary to make some slight changes to appeal to the users;

see 04.02.

product canisters

coffee beans	
sugar	P1
instant coffee	P2
chocolate	P3
milk	P4
barley	P5
tea	P6

espresso	water expr.	35			
	prod. 1	17			
espresso macchiato	water expr.	40			
	prod. 1	15			
	prod. 4	14	delay prod. 4	5	
	water 3	25			speed water 3 1
	mixer 3	40	delay mixer 3	5	speed mixer 3 2
capp ciocc	water expr.	40			
	prod. 1	17			
	prod. 3	10	delay prod. 3	5	
	prod. 4	20	delay prod. 4	5	
	water 3	35			speed water 3 1
	mixer 3	50	delay mixer 3	5	speed mixer 3 3
instant coffee	prod. 1	17			
	prod. 2	18	delay prod. 2	5	
	water 2	30			speed water 2 1
	mixer 2	45	delay mixer 2	5	speed mixer 2 3
instant cappuccino	prod. 1	17			
	prod. 2	18	delay prod. 2	5	
	water 2	35			speed water 2 1
	mixer 2	45	delay mixer 2	5	speed mixer 2 3
	prod. 4	22	delay prod. 2	45	
	water 3	35	delay water 3	40	speed water 3 1
	mixer 3	50	delay mixer 3	45	speed mixer 3 3
instant latte macchiato	prod. 1	17			
	prod. 2	30	delay prod. 2	5	
	water 2	25	delay water 2	55	speed water 2 1
	mixer 2	35	delay mixer 2	60	speed mixer 2 3
	water 4	45			speed water 4 1
	mixer 4	60	delay mixer 4	5	speed mixer 4 3
barley	prod. 1	17			
	prod. 5	18	delay prod. 5	5	
	water 4	35			speed water 4 1
	mixer 4	45	delay mixer 4	5	speed mixer 4 3
chocolate	prod. 3	38	delay prod. 3	5	
	water 3	50			speed water 3 2
	mixer 3	75			speedmixer 3 3
tea	prod. 6	22	delay prod. 6	5	
	water 5	50			speed water 5 2
	mixer 5	65			speed mixer 5 3



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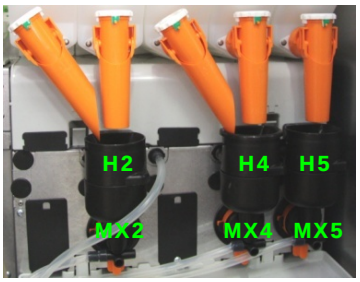
10.01.a. configuration
TFT, Premium and
touchTV

devices names

Coffee beans	P1		
Dek coffee beans	P2		
Sugar	P4	boiler pump H2	mixer 2
Instant coffee	P5		
Chocolate	P6	boiler pump H4	mixer 4
Milk	P7		
Lemon tea	P8	boiler pump H5	mixer 5



selection	device	duration	delay	param1
01. cappuccino classic	P1	80	0	38
	P7	8	5	0
you can change the device P1 with the device P2 to obtain the same selections but using the dek coffee beans ;	P7	8	30	0
	P7	8	55	0
	H4	65	0	11
	MX4	90	5	15
03. espresso	P1	48	0	38
05. milk	P1	48	0	38
	P7	8	5	0
	P7	8	18	0
	P7	8	30	0
	P7	8	50	0
	H4	90	0	11
	MX4	100	0	15
7. americano	P1	95	0	67
	H2	60	0	11
9. mochaccino	P1	82	0	0
	P6	8	2	0
	P6	8	13	0
	P7	13	22	0
	P7	12	29	0
	H4	60	0	0
	MX4	50	0	0
11. hot chocolate	P6	6	2	0
	P6	6	13	0
	P6	5	24	0
	P6	5	35	0
	P7	10	76	0
	H4	104	0	11
	MX4	115	0	15
13. lemon tea	P8	10	12	0
	P8	10	24	0
	P8	9	72	0
	H5	110	0	11

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10.02. limits

the table is intended to list the minimum and maximum values you can assign to programmable variables;

	m.u.	from	to	
exp coffee water	n.	0	250	0 = no espresso;
product	sec.	0	20	0 = no product;
product start delay	sec.	0	20	0 = no delay;
number of product pauses	n.	0	2	0 = no pause;
water time	sec.	0	20	0 = no water;
water start delay	sec.	0	20	0 = no delay;
water flow	→	→	→	low, medium, high
mixer	sec.	0	20	0 = no mixer;
mixer start delay	sec.	0	20	0 = no delay;
mixer speed	→	→	→	low, medium, high
temperature pressure boiler	°C	0	105	
temperature boiler	°C	0	95	
first coffee time	min.	0	20	
heater temperature	°C	0	40	
product decounter	sec.	0	6.000	0 = no limit;
machine code A e B	n.	0	65.535	
message number	n.	0	7	
fan delay	min.	0	180	
beep time	sec.	0	1.5	
number of decimals	n.	0	3	
coin A ÷ J	n.	0	65.000	
prices 1 ÷ 24	n.	0	65.000	
tuning pump	→	→	→	+/-30%
tuning motor	→	→	→	+/-30%
tuning grinder	→	→	→	+/-30%

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11. solution of problems

some malfunctions produce an error message on the display; some general information is supplied here below for these messages;
see also: Technical Information no. 138 → error messages;

error	actions/comments	cause
OFF 1	add cups to the vending machine turrets (see 05.31. and 13.02.); in the machines complete with two cup dispensers, a distinction will be made between OFF **1A** and OFF **1B**;	**no cup**
OFF 2	check the connection between the machine and the payment system; check the supply, programming (see 09.01.f.) and operation of the payment system; it can display OFF **2 E** (executive) or OFF **2 M** (mdb);	**no communication between the machine and the payment system**
OFF 3	empty the waste water bucket (see 05.26.);	**waste water bucket full**
OFF 4	check the movement of the dispenser nozzle arm; motor malfunction (**4A**) or control switch (**4B**) (see 05.25.);	**dispenser nozzle arm**
OFF 5	EAROM of the CPU board failed; replace the CPU board;	**no data storage**
OFF 6 A **OFF 6 C**	water inlet solenoid valve in safety status (waste water from the boiler overflow) or non operating; the internal filter net clogged; water not supplied by the network, water supply flow rate not adequate; supply water circuit throttled or clogged;	**filling time for the boiler or the air break too long**
OFF 6 E **OFF 6 F**	it may physiologically occur at the first power on when the boiler that is completely empty will require more time than usual to fill; (see 05.30.);	
OFF 6 B **OFF 6 D**	there is a control connecting water reloads with the drinks you have dispensed; if some water reloads occur without dispensing any drink, this will produce the 6B error; make sure there is no leakage in the water circuit;	**water reloads without dispensing any drink**
OFF 7	there is a maximum operation time of the brewing pump, at the expiry of which error 7 is produced; check the efficiency of the water circuit: volumetric counter, pump, three-way solenoid valve, …; brewing chamber as well as upper and lower filter of the coffee brewer; the quantity and grinding degree of coffee shall cause the machine to brew for about 10/15 seconds;	**espresso brewing time too long (E machines)**
OFF 7 C	during the brew phase, the chamber has moved down, beyond the safety position, because of pressure;	**brewing chamber (E machines)**
OFF 8A	electrically and mechanically check the switch controlling the coffee brewer rotation, the control cam, the unit rotation motor and its crank;	**false position of the coffee brewer (E machines)**
OFF 8B	make sure that the unit has properly positioned (against the support wall); check the operation of the micro switch operated by the presence of the brewer (see 05.42.); there are also about twenty other "OFF8" errors, specified by a lowercase or uppercase letter, that represents a family of errors that can affect the variable coffee group; these are to be considered as "variable group not correctly working";	**no coffee brewer (E machines)**
OFF 9	there is a control for the maximum grinding time; after this threshold has been exceeded, error 9 is produced; no coffee, hopper orange blade closed; wear, grinders excessively closed; (mechanic and electric); in the machine with two coffee canisters: **9A** in canister 0; **9B** in canister 1; **9C** in canisters 0 and 1 (see 04.01.);	**grinding time too long (macchine E)**

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OFF 10	the values written in the EAROM are not compatible with the operation of the machine or deleted; reload them; replace the CPU board CPU; (see 05.52.a.);	**loss of programming data**
OFF 14	there is a control causing the machine to reload water after a well-defined number of dispensing cycles; otherwise, error 14 is produced; make sure that the water supply from the outside is correct (see 03.03.) and that the water circuit of the machine is orderly (tubes, gaskets, …); even an inlet water pressure value other than the setpoint may cause this error and fill the air-break or the boiler in excess;	**no water reload**
OFF 15	the cup turret rotation is inhibited; check the motor action and make sure that there is no obstacle (see 05.31.);	**cup dispenser**
OFF 16	a key of the service keyboard might have be stuck; (see 05.38.);	**service keyboard**
OFF 17A	a key of the selection keyboard is not operating (short-circuited); it may also occur if an operator should operate it for too long while programming the machine (keys 4 and 5 to increase and decrease the quantities); (see 05.02.);	**selection keyboard out of order**
OFF17B	one of the two keys intended to programme the sugar quantity is short-circuited; replace it; (see 05.05.);	**sugar keys**
OFF 24A	the 24V dc supply is higher than the limit value; replace the power supply unit board (see 05.52.c.);	**24 V dc power supply excessive**
OFF 24B	pay attention to the cause that has brought about the failure; check the alternate supply at the board input; the component regulating the voltage might be faulty; replace the power supply unit board (see 05.52.c.);	**24 V dc power supply inadequate or lacking**
OFF 25	the cup has not been properly released; the motor intended to rotate scrolls might be hindered (see 05.31.); in the machines complete with two cup dispensers, a distinction will be made between OFF **25A** and OFF **25B**;	**cup release**
OFF 25C	the sensor fails to detect the cup drop;	**cup presence sensor**
OFF 31A	the pressure boiler temperature has exceeded the one you have programmed (see 09.01.e.); replace the temperature probe; the device of the CPU board is not working according to control; replace the CPU board;	**water temperature high (E machines)**
OFF 31B	temperature safety devices tripped (clicsons, thermofuses, …); restore or replace them; heating element not supplied or not operating; check the connections and continuity of the heating element; if necessary, replace it;	**water temperature low (E machines)**
OFF 31C	temperature probe interrupted; connector to the board, wiring; make sure that the cable between the probe and the CPU board is not interrupted or replace the probe;	**temperature probe (E machines)**
OFF 33 A, B, C	they have the same meaning of errors 31A, B and C, but referred to the boiler;	**I machines**
OFF 34	temperature not adequate, lack of water in the tank, … ;	**cooling unit**
OFF 50	check the USB connection cable between the two boards;	**communication between the CPU and the power board**
OFF 51	check the USB connection cable between the two boards;	**between the CPU and the control board of the brewer (E machines)**
OFF 53	check the USB connection cable;	**between the machine and the cooling unit**

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10. maintenance

the **luce x2** vending machine requires no special maintenance procedure to do its job; however, if you provide for careful and frequent cleaning, this may help the machine keep its performance constant, prevent failures and ensure the high quality of dispensed drinks; the frequency of cleaning operations largely depends upon the number of dispensing cycles and the hardness of water in use (use a softener system) and it shall be adjusted to the working conditions of the vending machine;

the actions described are intended to prevent the bacterial growth in the machine areas directly in contact with foodstuffs and to keep the parts conveying drink-composing products clean; after having disassembled the parts of the machine listed here below, use plenty of lukewarm water to remove any residue that might build up;

the support of a bacterialstatic or bactericidal solution may strengthen a deep cleaning action, provided it is compatible with human health and the supply of foodstuffs; reassemble all the parts you have cleaned after having dried them by means of a clean piece of cloth;

refer to the content of the Internet address:

http://ec.europa.eu/food/food/biosafety/
hygienelegislation/index_en.htm

this site is intended to supply the European Parliament recommendations for properly and safely processing foodstuffs; consult also:

http://eur-lex.europa.eu//
regulation 2004/852/EC of 29/04/2004

before accessing the machine for each maintenance operation, it is recommended to warn the users by means of boards properly positioned that it is forbidden to approach the vending machine and to use it;

attention

never wash the machine by using water jets;

wash hands thoroughly with water and soap before handling the machine and the products;

only use potable water;

all components shall be washed with running lukewarm water (50 °C maximum);

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12.01. **weekly**

power off the machine; detach the power supply cable and carefully make sure that there is no sign of wear; carefully check the stability and efficiency of the internal connections of the mains supply;

external body and touch screen

use a non-abrasive piece of cloth after having dampened it with lukewarm water; only if necessary, use a neutral, non-foamy, detergent;

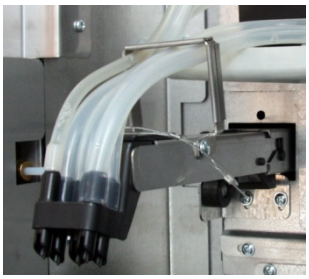
attention

use neutral detergent products only; never use abrasive cloths, steel sponges, aggressive or foamy detergents and other solvents, hot water and acids;

when it is necessary to clean the touch screen, in addition to the notes above mentioned, we recommend to use only a bland detergent, diluted as per instructions of the manufacturer, specific for these components (pc monitors and similar) taking care not to scratch, leaving cleaning liquid drops, ...; do not spray the detergent directly on the monitor; prevent in any case the dripping

cups station

use the orange handle to remove the cups station from the inside the door, separate its components and wash them with plenty of lukewarm water; clean the transparent bulkhead from the inside;



product slides

remove them from the product canisters, wash them in plenty of lukewarm water (product slides are pressure-secured);

dispensing system

rotate the levers intended to secure the mixing bowls clockwise, remove the dispensing nozzles, pull the mixing bowl and the upper ring; also remove the sugar dispensing slide and the tube; wash the ensemble of disassembled parts in plenty of lukewarm water;

walls and bottom of the machine

remove any trace of residue from the internal surfaces of the machine and clean by using a damp piece of cloth;

internal wall of the door

remove any trace of residue from the surfaces inside the door, above all in the proximity of the cups station;

12.02. **monthly**

environmental and powder aspirators

carefully make sure that the motor of the aspirator can freely rotate and has no obstacles or obstructions; make sure that the corrugated tube connecting the powder aspirator and the aspiration drawer is clean and free of any product deposit;

products canister

rotate the baffles, remove the canisters from the machine, clean them externally; clean the support surface carefully to remove any trace of product;

in E machines grinder

to remove the coffee canister, make sure that the coffee slide is free of any encrustation; make sure that grinding wheels are intact, free of any residue;

coffee brewer

the whole coffee brewer can be cleaned and washed with running water since it has no component that may be damaged; to extract the coffee brewer, first remove the coffee dispensing tube from the nozzle holder, release the carter (p) by pressing on each side and by pulling it to the outside, remove the ground grey conveyor just by pulling it, remove the coffee brewer (q) by pressing the orange release button, by lifting it slightly and by pulling it;

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12.03. **yearly**

dispensing system: replace the gaskets at the base of the mixing bowls of the mixers; remove the mixer motor fan by pulling it; replace the gaskets of the mixer motors shaft ;

products canister: disassemble the product canisters from the machine; empty them, disassemble them in their basic components and wash them carefully;

powder aspirator drawer: extract the powder aspirator drawer and the tube and wash them with plenty of lukewarm water; see 13.13.;

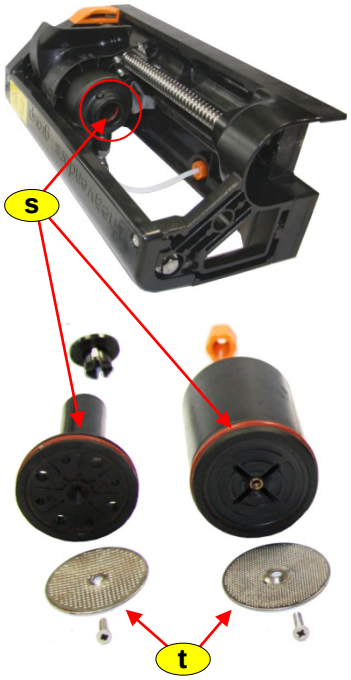
boiler: empty the boiler by means of a drain pipe; extract it from the machine, remove the cover and wash the tank by removing any solid residue that may have built up at the bottom;
remove any calcareous deposit from active elements: temperature probe, heating element, level probes, the shafts of rotary pumps, ...;

silicone tubes: make sure that the water transport tubes are intact and that they have kept their transparency, replace them, if necessary;

in E machines pressure boiler: disassemble the pressure boiler; separate the pressure boiler from the block of the solenoid valves and check the sealing o-ring; clean the instant and espresso water circuits at the outlet; check the drain of the third way of the espresso solenoid valve by removing any trace of residue; empty and clean the air-break tank;

coffee brewer:
- replace the three sealing rings (s) of the compression chamber and lower piston guide;
- replace the upper and lower filters (t);
- check the state of the compression chamber;

the frequency of these operations depends on the number of dispensing cycles and the hardness of water used; their regular and accurate performance is necessary to prevent damage and malfunction, it allows a continued work and extends the life of the machine; the use of a water softener filter, whose cartridge is regularly replaced, prevents the formation of limestone;



12.04. out of order: if the vending machine should be inactive for a long period, please act as follows:

temporary:
- in E machines, perform the uninstall cycle (see 09.01.f.);
- in I machines, set the boiler water temperature to zero (see 09.01.e.);
- detach the water and energy supply;
- in I machines, empty the boiler;
- empty and clean the product canisters;
- empty the waste water bucket;
- remove the bag grounds);
- clean the internal and external surfaces by using a wet piece of cloth;
- cover the machine by means of a cloth;
- store it in a sheltered place, at a temperature not below 5 °C, at a relative humidity not above 80%;

definitive: if you should definitively set the vending machine out of commission and provide for the disposal of some parts thereof, after having carried out the operations above, disassemble the vending machine by separating every single component and subdividing the parts according to the nature of materials; the applied symbol means that the components of the vending machine shall be not processed as home rubbish, but delivered to the collection points capable of recycling electric and electronic equipment; refer to the 2012/19/EU Directive and to the relative rules;
the complete text of the European directive about this specific subject-matter is made available on the Internet site:
http://eur-lex.europa.eu/
directive 2012/19/EU

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13.
how to do to:

13.01. get an espresso selection

the parameters that determine the quality and quantity of an espresso selection in a cup are:

- the temperature and quantity of percolation water;
- the coffee grinding degree;
- the ground coffee quantity;
- the ground compression;
- the features of coffee beans;

considering the great variability of these factors, it is important to establish which are the features of the espresso most in demand by the final user and to programme the vending machine components to achieve the best result for this choice;

many of the variables contributing to dispense an espresso can be regulated via software and autonomously programmed for each selection, except for :

- the water temperature that – once set up – is constant;
- the grinding degree of the coffee beans that is manually established and – once set up – is constant;

the boiler water temperature is generally set to 92 °C ÷ 94 °C in a vending machine installed in a room where the temperature is as prescribed (5 °C ÷ 35 °C);

the grinding degree of the coffee beans – fundamentally established by the distance between the grinding wheels – can be manually adjusted by rotating the regulation ring nut;

it is assumed that a grinder with new blades is basically regulated as follows:

- by turning the regulation ring nut clockwise as far as the stop (minimum distance between the grinding wheels);
- by turning the same ring nut counterclockwise by one complete turn plus 5/8 notches;

the resulting grinding degree can be considered of reference; you can certainly adapt it to the espresso you wish by varying the distance between the grinding wheels;

guide lines

espresso coffee “Italian style” (50 cc. in a cup)

boiler water temperature:	as above;
grinding degree:	as above;
grinding time (for ~ 8.0 gr.)	6 sec.;
percolation water time:	15 sec.;
step down brewer:	no

espresso coffee “American style” (200 cc. in a cup)

boiler water temperature:	as above;
grinding degree:	as above;
grinding time (for ~ 12.0 gr.)	9 sec.;
percolation water time:	35 sec.;
step down brewer:	1;

the cup results can be certainly adapted to the final user’s requests better by changing the parameters above;

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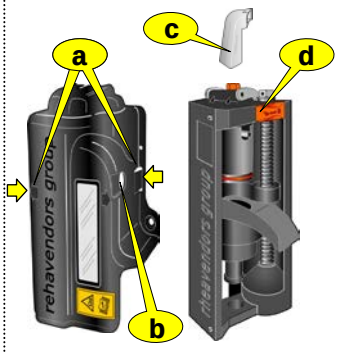
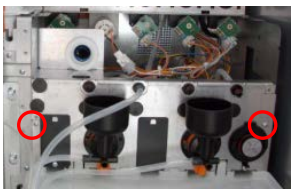
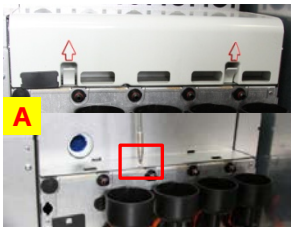
13.02 load the cups	remove the cover, load the cups starting from the turret on the left, compared to the cup conveyor; it is absolutely necessary to press the cup release button (see 05.32.) whenever the cup loader is completely emptied to prevent the machine from dispensing the first drink without any cup;	see 05.31.
13.03. remove the coffee canister	insert the orange closing baffle as far as the bottom and lift the coffee canister;	see 05.19.
13.04. remove the instant canister	pull the canister by lifting it slightly; to reassemble it, insert the rear bush into the motor gear; disassemble the product slides from the canisters by turning them clockwise and pull them;	see 05.19.
13.05 remove the coffee brewer	after opening the machine, press on each side of the protection carter (a) and remove it by letting the espresso nozzle through the groove after removing it from the nozzle holder (b); remove the ground grey conveyor by pulling it (c); pull the brewer release button (d), lift and extract it;	
13.06. regulate the grinding degree	turn the grinder ring nut (clockwise for a finer degree); the effect produced by the regulation is shown by the drink after three or four dispensing cycles;	
13.07. regulate the ground dose	see software options " 09.01.a. grinder time";	
13.08. remove water	follow the uninstall procedure;	
13.09. replace the o-ring of mixing bowls	remove the silicone tubes intended to dispense the product; turn the orange ring nut clockwise; pull the mixing bowl body and extract the mixer fan; you can now access the w-ring of the motor shaft; the water inlet gaskets of the mixing bowl and the mixing bowl gaskets;	
13.10. replace the mixer motor	remove the silicone tubes intended to dispense the product; turn the orange ring nut clockwise and pull the mixing bowl body; unscrew the crosshead screw and extract the motor; the power supply wires can be removed without any tool;	
13.11. replace the product motor	remove the product canister; access the rear part of the machine; extract the two small electric cables from the motor, hold the body, push it to the bottom to release it from the bayonet connection of the structure; the power supply wires can be removed without any tool (observe the polarities);	
13.12. how to access inside the machine	disassemble the mixing bowls (see 05.22.) and remove the nozzle holder from the arm; unscrew the two side screws (◯) from the panel by tilting the upper part to the outside;	
13.13 extract the drawer and the aspiration tube	extract the upper ring of the mixing bowls and, according to the machine versions:	
	A press and lift the two tabs in direction of the arrow to extract the aspirator drawer; unscrew the central screw intended to fasten the protection bulkhead and extract the corrugated tube;	
	B unscrew the central screw intended to fasten the aspiration drawer and extract it; access the inner part as described by point 13.12. to extract the corrugated tube;	

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13.14. insert labels	to insert the labels into the selection keys, just detach them from the sheet supplied with the machine, arrange and secure them by using the transparent covers of the key; the cover is snap-locked by means of tongues;	see 05.03.
13.15. determine water and product times	the times specified by table 10.02. can be referred to as the times functional for the machine and the products to be dispensed; however, they can be adapted to the capacity of the user's cups (by changing "time water N") and its tastes (by changing "product N"); please, never forget to make sure that the dispensing time of the instant product is always lower than the one of corresponding water;	see 09.
13.16. programme delays	dispensing starts as soon as the user presses a selection key; the order in which instant products are poured into the cup depends upon the values of delays (e.g. the one, the delay value of which is zero, will be dispensed before the one, the value of which is 40, dispensed four seconds after the user has pressed the selection key); pay special attention when programming the delays in dispensing a product and the water diluting it in the mixing bowl; except for the instant coffee product, for which just the opposite is applicable, it is recommended to dispense water before the product to enable the latter to drop on the water film already present in the mixing bowl for a better mix; espresso is dispensed before and after any instant product by programming the variable "coffee sequence";	see 09.
13.17. regulate the speed of mixers	the rotation speed of the motors of product mixers can be adjusted between 15,000 r.p.m. and 5,000 r.p.m.; the drink quality of instant products depends a lot upon the action of the fans of mixers: instant chocolate generally requires a long mixing time at the maximum speed for dissolution in water whereas instant tea shall not be mixed to get a drink quality without any bubble on the surface;	see 09.
13.18. tune the water flow for instant products	regulation is admitted for boiler pumps (see 05.49.) within the +/-30% maximum limits only when the programmed water flow is "average"; when it is "low", it can be only increased (max. by 30%) whereas – when it is "high" - the flow can be only reduced (max. 30%);	see 09.
13.19. determine the time for the powder suction fan	to remove the residual powder of instant products from inside the machine, it is recommended to use the value in minutes you have already programmed (three); if you should use particularly volatile products, increase the time to five (and more) minutes;	see 09.
13.20. regulate the format of the stirrers tank	three Phillips screws are intended to arrange a vertical bar inside the stirrers tank to adapt the machine to the format in use;	see 05.36.
13.21. time tests	to check the rotation time of a product motor and a mixer fan or the activation time of a solenoid valve during the programming phase, when the display shows "PRODUCT N" or "WATER N time" or "MIXER N", press the "PROG" key: the device will be activated for the programmed time;	see 09.
13.22. install a payment system	the inner side of the carter (see 05.37.) is pre-arranged for the installation of a payment system; the system functionality is programmed by programmable parameters, such as in 09.; Rheavendors Services S.p.A. is at disposal for any kind of support and information on the installation of payment systems; (see 02.02.);	
13.23. return some material under guarantee	if you should return any material under guarantee that is either defective or not in compliance with your requirements, fill in the form "MOD. PO 19.01/2B Materials under guarantee – Authorisation to return" and send it to the fax number above to apply for authorisation; only after having received the authorisation form signed and numbered, you are permitted to send the goods at your expenses to the address specified by the form;	

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13.24. product conversion factor

+ Miscellaneous
  + Conversion factors for products (Time ->Weight)
    - Conversion Factor Product N →

1= coffee beans 1;
2= coffee beans 2;
3, 4 ... etc. instant products;

select the product canister on which to act:
remove the coffee brewer or the bowls;
place the cup to collect the product, press key “FREE VEND” of the service keyboard; the grinder motor or the product motor will be operated for 10 seconds;
weigh the product (pay attention to the tare) and set the value of the grams multiplied by 100 in "Factor conversion product N";
re-place the coffee brewer or the bowls;

i.e. gr. 19 1900

+ Varie
  - Grinder 1 calibration

only in espresso machines, access “Grinder N calibration” and press “Test”;
place a cup beneath the dispensing nozzles, the machine will dispense an "espresso" drink;
the Variflex unit measures the height of the ground dose in the coffee canister;

now, in “Selection N”→now, in “Selection N” “Ignitions” of the corresponding “device”, the time in tenths of a second (and the quantity in ml) will be displayed, along with the value of grams
of ground product in “Param 1”
of instant product in “duration”

if you vary the time value, the grams will also change;

+ Programming
  + Selections
    + Selections N
      + Ignitions
        - Device
        - Duration
        - Param 1

13.25. conversion factor for “hot valves” instant pumps

+ Miscellaneous
  + Conversion factors for hot valves (Time ->Volume)
    - Conversion Factor hot Valve N

select the pump motor on which to act:
place the graduated cup to collect water, press key “FREE VEND” of the service keyboard; the pump motor will be operated for 10 seconds;
set the value in millilitres multiplied by 10 in “Factor conversion hot valve N”

i.e. ml. 180 1800

now, in “Selection N”→now, in “Selection N” “Ignitions”→” “Device Valve Hn” →” “Duration”, the time in tenths of a second will be displayed along with the value in ml.;

if you vary the time value, the value in millilitres will also change;

+ Selections N
  + Ignitions
    - Device Valve Hn
    - Duration

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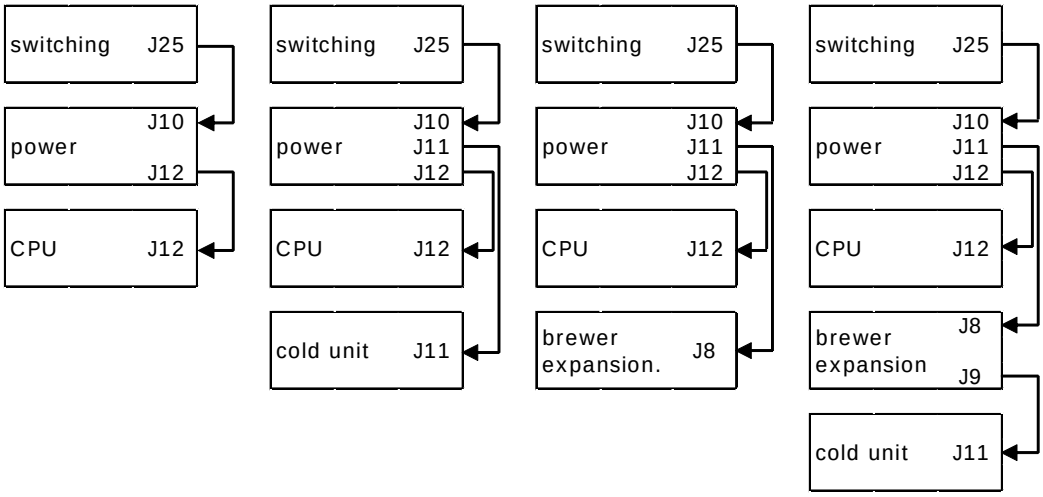
14. electrical connections

the electronic boards composing **luce x2** are connected with each other for voltage supply and data exchange; the electric connections concerning the voltage supply and the USB ports for logic union and data transfer are represented here below;
the abbreviations (J nn) represent the names of the connectors, just as they are specified by the boards;

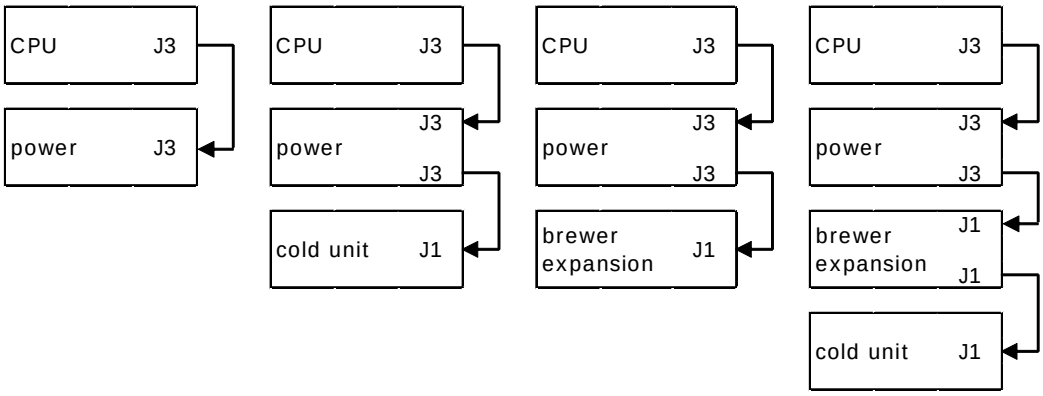
machine version

instant | **instant and cold unit** | **espresso** | **espresso and cold unit**

supplies



USB



Rheavendors Services S.p.A. is at disposal for support and information about wiring diagrams, assembly and wiring (see 02.02.);

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15.
cups specifications

Rheavendors machines have been designed to work with a wide range of cups and have a large variety of hardware configurations to treat the wide ensemble of different cups made available for the vending sector;

the indications and parameters here below provide for a sure and safe functionality of Rheavendors machines, which are designed, manufactured and tested just with cups having these features; cups having a considerably different size or structure can be certainly used, even if their use shall be carefully evaluated, at least for the first time;

general information:

some general conditions are assumed as absolutely necessary for a safe dispensing process; basically, the cups in use shall be:

- specific for the use of vending machines;
- homogeneous in terms of material, dimensions and weight;
- free of electrostatic charges;
- compatible with the temperatures of drinks;
- stacked up in a non-forced way;
- not deformed due to impact or compression;

other features that can be considered are:

the shape of the side wall that - if smooth - favours sliding and separation, conicity, weight and centre of gravity (better if downwards), transparency, reflecting or absorbing colouring (cups photocell), ...;

transportation and loading

however, cups shall be properly treated until they are stored in the machine, ready for dispensing; for instance, transportation shall occur so as to keep them intact, the plastic film winding up stacks shall be removed without charging cups with statical electricity, stacks shall be poured into the cup dispenser in such a way that they are arranged uniformly, tidily and without any deformation, ...;

refer to the technical catalogues of manufacturers supplying not only the dimensions of reference, but also suggestions and recommendations for proper use;

important notes

the cups specifically used for vending have some characteristics typical for use in the machines:

bottom

the geometry of the bottom is shaped so as to prevent cups from getting stuck one in each other and to make sure that their upper curls are placed at the same distance when cups are stacked up, and also,

under-curl diameter

they make sure that the physical size just beneath the upper curl is guaranteed and constant (interacting with the automatic release system and it is of fundamental importance for a safe release of the cups);

upper curl

the shape accomplished, constant and homogeneous ensuring a certain and repeatable interaction with the parts of the cups dispenser;

all these characteristics and indications contribute to a safe and sure automatic dispensing cycle of the cup, while ensuring a correct operation of the vending machine;

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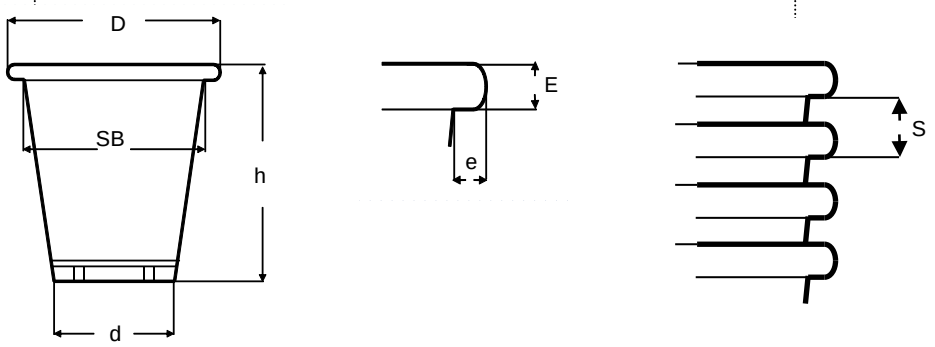
the table sums up the dimensions of the cups used as a reference; the countless number of existing variables is intentionally omitted for the sake of simplicity and clarity (it is impossible to list all the heights made available, the greater diameter being the same, more or less conicity, ...) by listing the sizes of the cups and columns in use, for instance, during the end-of-line testing;

the determining dimensions are certainly the greater diameter of the cup (D) and the under-mouth (SB) because they are the dimensions of the parts directly in contact with the cup release system of the vending machine (through-hole, augers, cups support, ...);

even if important in the structure of the cup compared to the vending machine conformation, the other sizes are not so binding in contributing to the safety and repeatability of the dispensing process and they are supplied by way of example for "a" cup assumed as a reference;



	single cup								column
common name	D mm - 0.0; + 0.6	SB mm - 0.0; + 0.6	d mm	h mm	E mm	e mm	weight gr	volume cc raso bocca	S mm
diameter 57 plastic	57.2	52.9	33.0	61.0	2.0	2.2	2.2	87	≥ 4.0
diameter 70 plastic	70.0	65.0	38.0	74.0	2.0	2.5	3.8	150	≥ 4.0
diameter 73 plastic	73.2	67.5	46.0	100.0	2.0	2.75	4.8	200	≥ 4.5
diameter 70 paper	70.0	64.7	49.0	80.0	2.5	2.5	5.5	200	≥ 6.5
diameter 73 paper	73.2	67.5	50.0	103.0	2.5	2.5	6.4	210	≥ 7.0
diameter 80 paper	79.9	74.7	57.0	116.0	2.6	2.6	8.6	300	≥ 7.5

for above, only the tolerances admitted for size D and SD are specified;

cups with different sizes have already been successfully used in Rheavendors machines, having taken the sole precaution of carefully evaluating - before use - their compatibility with the dispensing systems and the architectures and dimensions of the cups station of vending machines;

Rheavendors Services S.p.A. is at disposal for any kind of support and information (see 02.02.);

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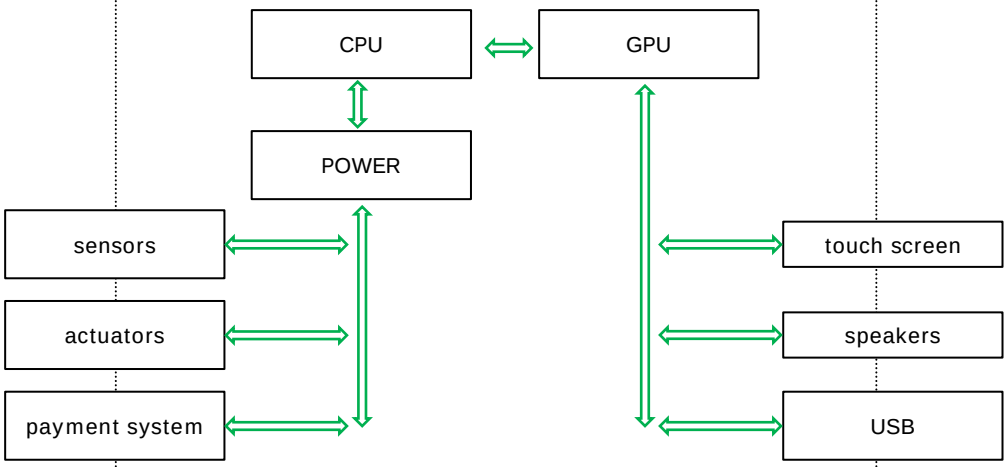
16. electronic features touchTV

important note

the utmost software flexibility and adaptability is not authorising, on no account whatsoever and under no circumstance, any improper use of this device that may be offensive, injurious, harmful, fraudulent or detrimental to human dignity; Rheavendors is only responsible for the multimedia contents (images, videos, sounds) installed at works and whoever may modify these contents, will fully assume civil and criminal liability;

all the machine functions and behaviors are under the CPU/GPU control; the CPU controls, also by means the power board, all the functions that are specific to a traditional dispensing machine while the GPU is mainly devoted to the most innovative devices;



the GPU organizes the GUI (Graphical User Interface) structure which is responsible for the characteristics of the objects displayed on the touch screen as, for example, the video displayed during the stand by or the picture showed during the preparation of a selection; all these objects are fully customizable by user;

the software must be in the following formats:

CPU	GPU
CPU firmware: .mhx recipes: .da2	GPU firmware: .mh2 pictures: .jpg, .png, .bmp videos: .AVI with Xvid codec

and they are transferable to the machine by means of a simple USB key (format it, FAT16, before using);

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16.01. GPU

below an overview of the structure of the GUI file

in a folder named:

x:\rhea\rheaGUI\

the user can load several GUI pack as:

x:\rhea\GUI pack name

the different GUI packs must have different names; e.g.:
x:\rhea\mickeymouse
x:\rhea\donaldduck
x:\rhea\...

structured with the following folders:

images

web

every GUI pack may be composed of:

images	it contains some images like the one used to fill the progress bar during the selection preparation;
web	it may be composed of the following .html files:
Config.html	it is a mandatory file that contains some parameters passed by the GUI firmware; these parameters are passed byurl parameters and are set by a script in some cookies that contain messages("your drink is ready, enjoy your drink, …); this cookies also include selection names and prices;
pageStandby01.html	its content is displayed when the machine is in stand by;
pageCredit01.html	it shown when the end user insert a credit;
pageSel01.html	those pages are shown during the preparation of the corresponding selections number; in this way it is possible to insert a custom image for each selection; the "pageSel01.html" is mandatory whereas all the other are optional and if one page is missing "pageSel01.html" is used instead;
pageSelEnd01.html	it shown when the selection preparation is finished and the cup is still in the cup station; this page is skipped if the cup sensor is disabled and, in this case, only the next message is displayed;
pageSelFinal01.html	when the user take the cup, this message is shown for four seconds; if this page is not present, the display returns to the stand by page;
pageSelNotAvailable.html	it is shown for some seconds when the user chooses a selection not available;
pageOutOfOrder.html	this page is shown when the machine is out of order;
pageMenu.html	during stand by, when a person is detected (sensor person enables), this page is loaded;

the utmost software flexibility and adaptability is not authorising – on no account whatsoever and under no circumstance - any improper use of this device that may be offensive, injurious, harmful, fraudulent or detrimental to human dignity; Rheavendors is only responsible for the multimedia contents (images, videos, sounds) installed at works and whoever may modify these contents, will fully assume civil and criminal liability;

to supplement the operational information of this manual, refer to "rheavendors LuceX2 Touch", which includes the instructions necessary to update and modify the programs residing in the machine (see 02.02.);

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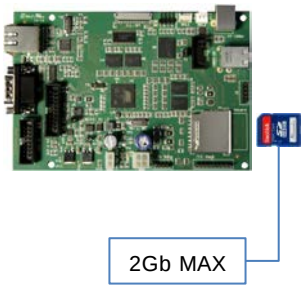
17. monitor 15” technical data

hardware:

monitor:
- 15'' TFT active-matrix color display with LED backlight display, display resolution: 1024 x 768 (width x height);

GPU card:
- onboard Ethernet connector for connecting the machine to a 3G modem or router, in order to have the remote update possibility;
- GPU control board with a microprocessor with hardware video decoder (for a smooth video playback) 180Mb of onboard flash memory for multimedia contents (photos and videos) Storage expandability through onboard SD card slot (up to 2Gb);

power supply:
- the GPU board operations are indipendent from the rest of the vending machine; the GPU uses only the power supply (24V through the 4pin MINIFIT connector, and 5V through the 2-pin MINIFIT connector);



note: the GPU board operations are indipendent from the rest of the vending machine;

software: supported media files:

photo:
- supported images formats: JPG, PNG, BMP;
  resolution (for full screen images): 600x800 / 1024x768; larger images will be automatically scaled in order to fit to the screen resolution, whereas smaller images will be automatically centred

video:
- supported video formats: Avi container (i.e. with .avi extension) with Xvid codec;
  resolution: 600x800 / 1024x768 or lower (the video will be automatically centered on the display); the width of the video should be a multiple of 8 (pixels);

multimedia presentation:
- the presentation layer is fully customizable with your own media content via a flexible configuration of the playlist, a simple configuration file .xml allows the operator to select the sequence of media files;

for more information, please refer to the software options and to the manual "Coffee rheavendors Europe and LuceX2 Premium Multimedia Multimedia update management", available at Rheavendors Group site;

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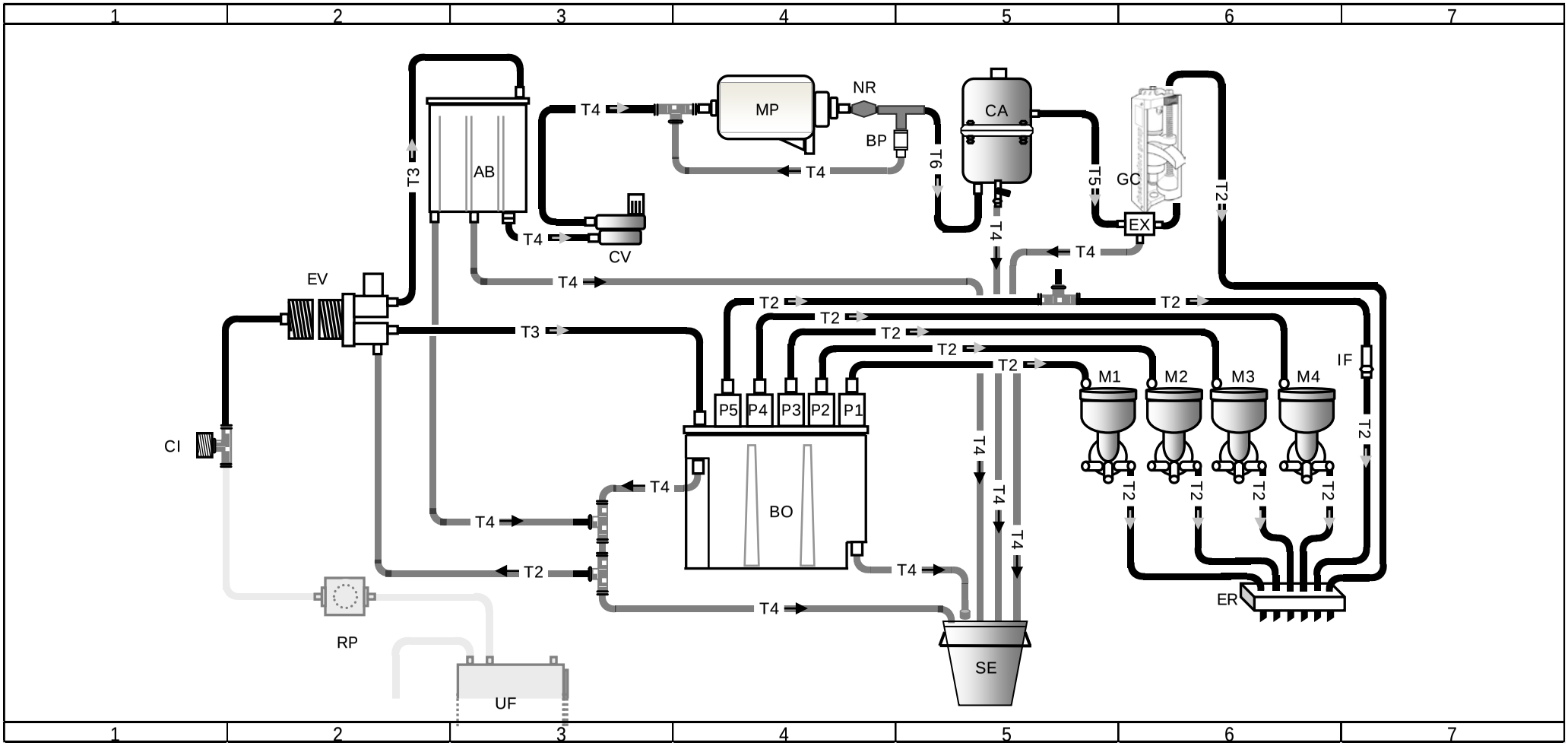
17. hydraulic diagram



LEGEND	column	symbol	name
	1	CI	water connection
	2	EV	water inlet solenoid valve
	3	AB	air break
	3	CV	volumetric counter
	4	MP	pump ex 5
	4	NR	non return valve
	5	BP	safety by pass
	4	BO	boiler

column	symbol	name
4	P1	boiler pump 1
4	P2	boiler pump 2
4	P3	boiler pump 3
4	P4	boiler pump 4
4	P5	boiler pump 5
5	CA	pressure boiler
6	EX	three-way valve
6	GC	coffee brewer

column	symbol	name
5	M1	mixer 1
6	M2	mixer 2
6	M3	mixer 3
6	M4	mixer 4
5	SE	waste water bucket
6	ER	nozzle support
7	IF	short insert
3	UF	cold unit

column	symbol	name
2	RP	pressure regulator
/	T2	silicone hose 06/09T
/	T3	silicone hose 06/11T
/	T4	silicone hose 07/11T
/	T5	ptfe hose 02/04T
/	T6	ptfe hose 04/06T

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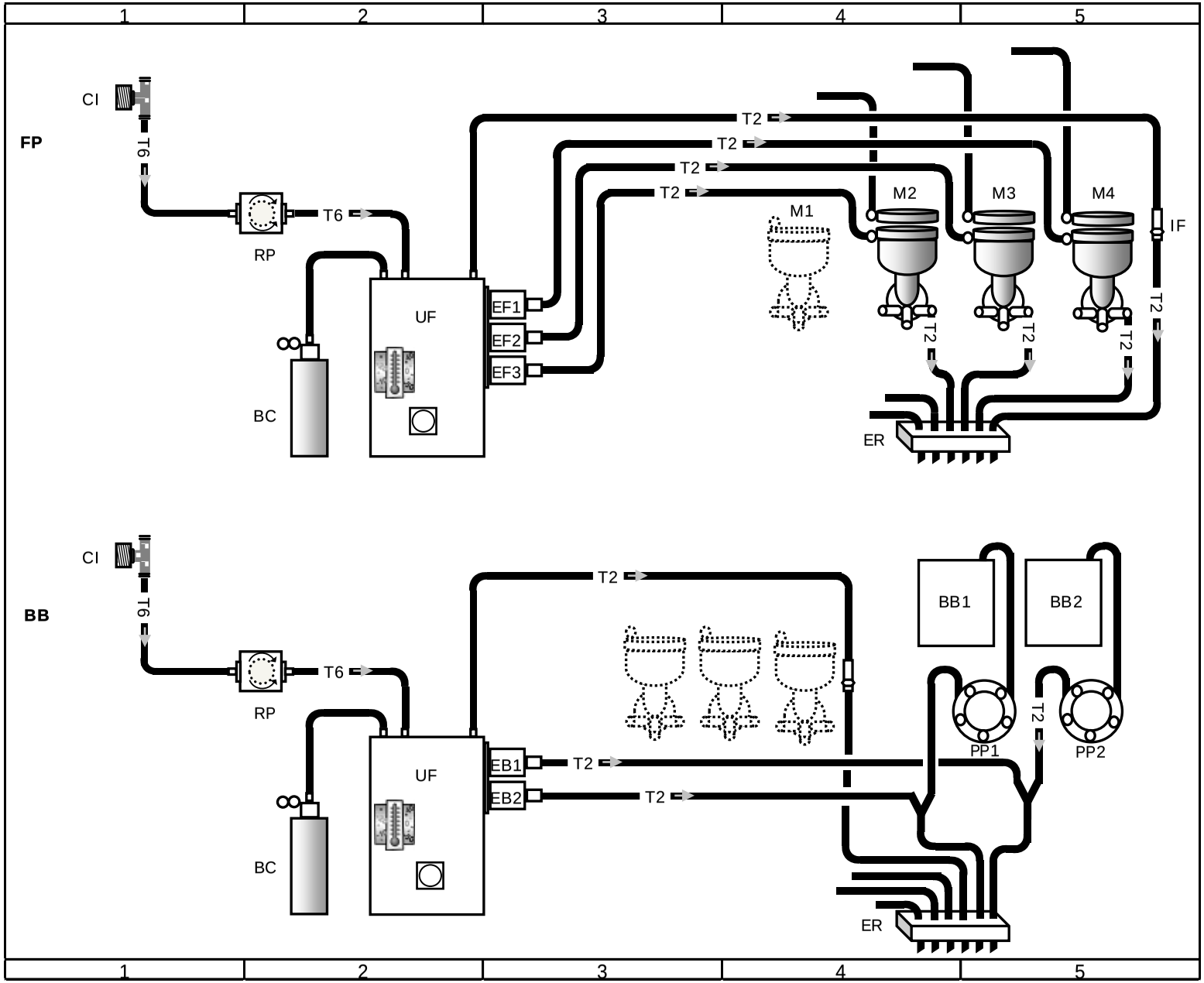
17. hydraulic diagram



LEGEND		
column	sym	name
1	CI	water connection
2	RP	pressure regulator
2	BC	CO2 cylinder
2	UF	cooling unit
3	EF1	powder cold solenoid valve
3	EF2	powder cold solenoid valve
3	EF3	powder cold solenoid valve
4/5	M(n)	mixer n
5	BB(n	bag in box
5	p	peristaltic pump
3	EB1	bag in box 1solenoid
3	EB2	bag in box 2solenoid
4/5	ER	dispenser
/	T2	06/09T silicone tube
/	T6	ptfe 04/06 tube

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