



SERVICE MANUAL

“ SNAKKY ”

BASIC TECHNICAL MANUAL

THE CONTENTS OF THIS DOCUMENT ARE INTENDED FOR NECTA'S AFTER SALES PERSONNEL.

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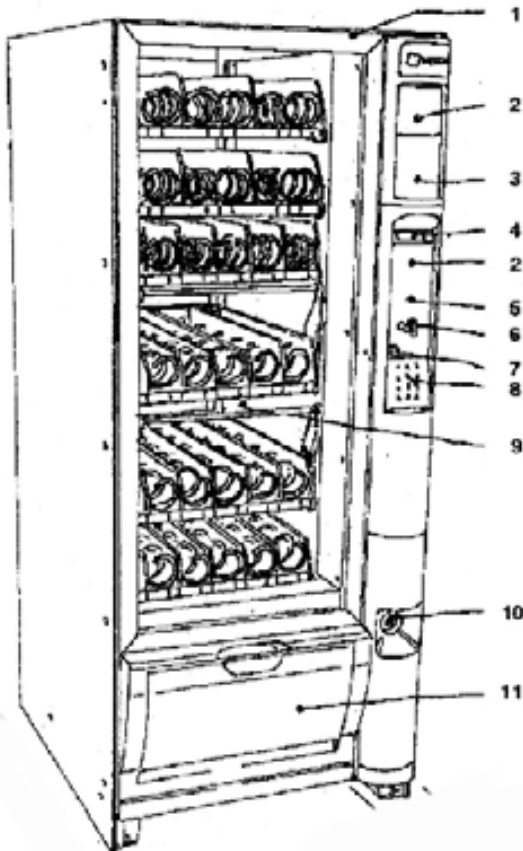
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NOTE

The above systems and functional units are specific to this machine.

All functional units installed but not listed in this document, are also used in other machines in the same range; therefore they will be described in a separate manual for machines belonging to the same range, where all base functional units will be described more in detail.

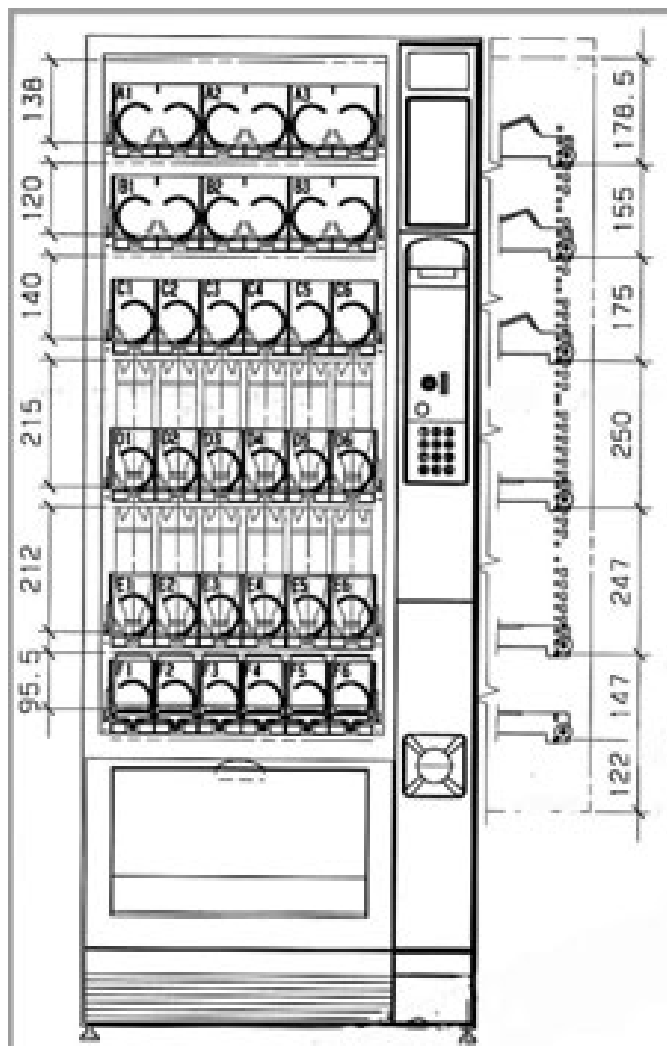
Snakky: View of user interface



Reference	Description
1	Door opening frame
2	Advertising spaces
3	Provision for bill accepters
4	Machine status information display
5	Provision for key-type payment systems
6	Coin slot
7	Key lock
8	Selection keypad
9	Glass door
10	Coin return compartment
11	Product dispensing compartment

1 – LAYOUT - MODELS

DESCRIPTION	VARIABLES
TRAYS	Up to 6 max
HEIGHT OF TRAYS	96 mm min and up to 219 mm max
PARTITIONS PER TRAY	2 triple - 3 double - 6 single
PRICES PER TRAY	One for each selection
TIME BANDS	Available for configuration
PAYMENT SYSTEMS	Serial – EXE- as standard feature MDB – BDV – with additional board
VEND SYSTEMS	With single and double spiral
DIMENSIONS	H 1700 x L 700 x D 800
WEIGHT	-----
OVERALL DIMENSION	H 1700 x L 700 x D 1252
LAMP	1 x 36 W (Neon)
ABSORBED POWER	450 W



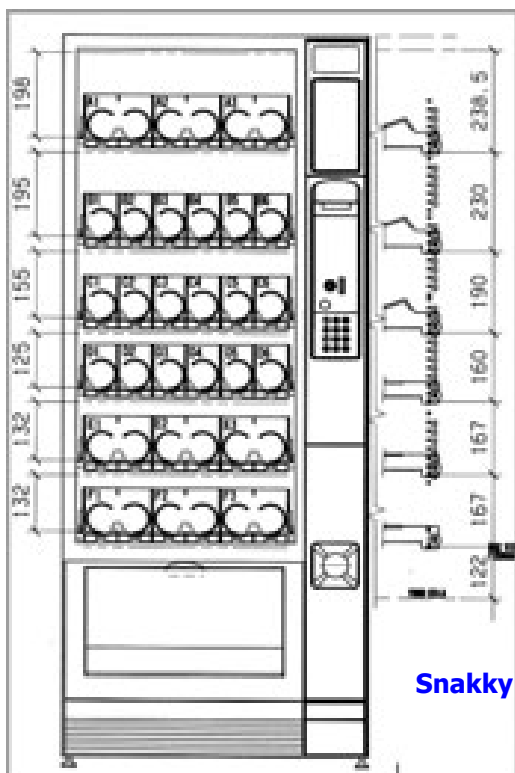
Layout Italy - Version 6-30R / I Q

Meaning: **Snakky** with **6** trays for a total of **30** selections
Refrigerated version **R** (a non refrigerated version is also available)

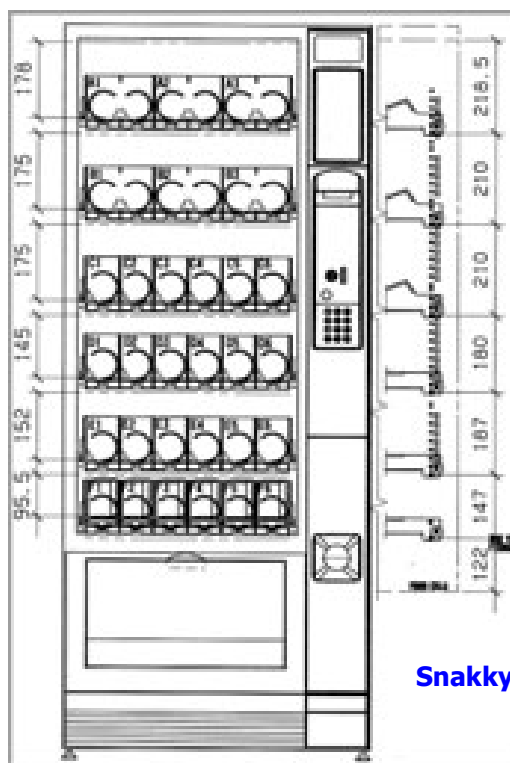
Country: Italy **I**

Approved by **IMQ Q** (if the letter Q is not present it means that such version is not approved by IMQ, or that it is awaiting approval)

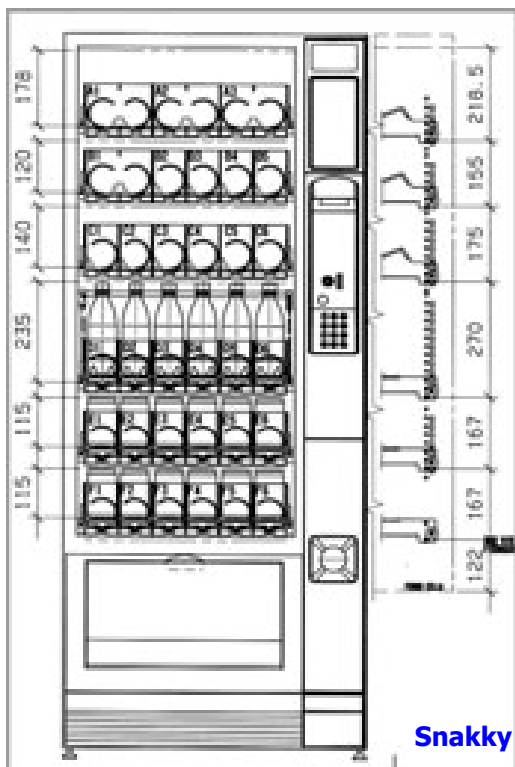
Examples of different tray configurations with indication of their position
 The examples shown below correspond to real layouts (indicated on the side); in any case there are many configurations options with simple and quick change operations (see specific paragraph)



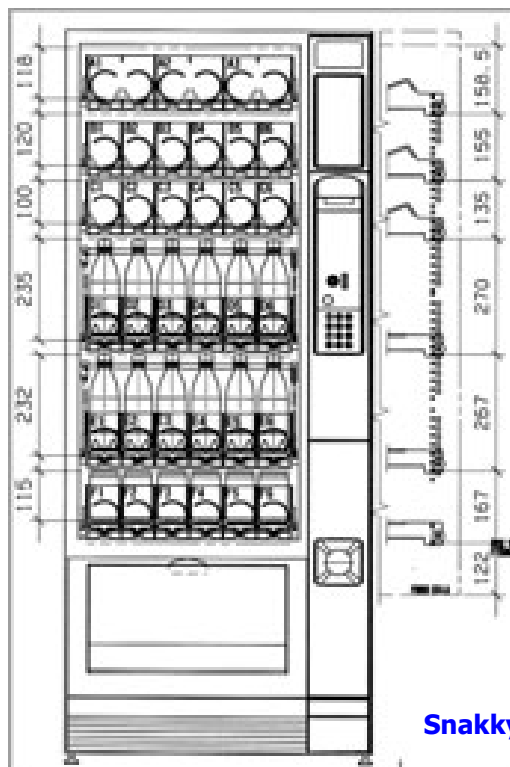
Snakky 6-27R/F



Snakky 6-30R/I



Snakky 6-32R/F



Snakky 6-33R/E

2 - Electrical systems - Connections - Configurations

The machine is designed to operate under a single-phase voltage of 230 V AC (+5-10V)

It is protected with two **T 6,3** fuses on both phases.

A safety transformer supplies power to very-low voltage components (24 V), while the cooling unit and the lamps are powered with the mains voltage.

With regard to the transformer:

The primary winding is protected with a **T 800 mA fuse**

The secondary winding 25 V is protected with the following fuses:

T 1 A – T 1 A

The slide-out compartment is fitted with a safety switch. (10)

The switch is located on the front panel of the power supply unit, and when opening the compartment it disconnects the power from all parts that can be accessed for normal maintenance and cleaning operations.

The only parts that stay energised are those protected by suitable covers carrying a plate with the warning "Disconnect power before removing the cover"; to clear the voltage the power the power supply cable must be disconnected from power outlet.

The power cable can be supplied as standard feature and chosen among the following types:

HO5 RN – F copper with a 3 x 1.5 mm² section

HO5 V V – F " " " "

HO7 RN – F " " " "

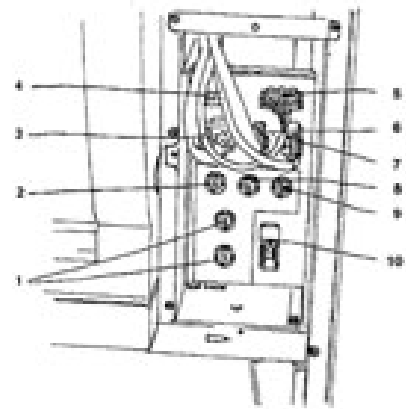
Fitted with a fixed SCHUKO plug.

NOTE: For **UK** there is a specific plug conforming to the standards in force, which is adopted for that specific market.

In the event of replacement cables of exactly the same characteristics must be used.

Since the "Snakky" vending machine is approved by an electrical safety certification institute (IMQ), replacements with non-original components are not permitted.

Otherwise the electrical safety certificate and the warranty will be void.



Detail of Power supply compartment



ACTUATION BOARD AND CONNECTIONS

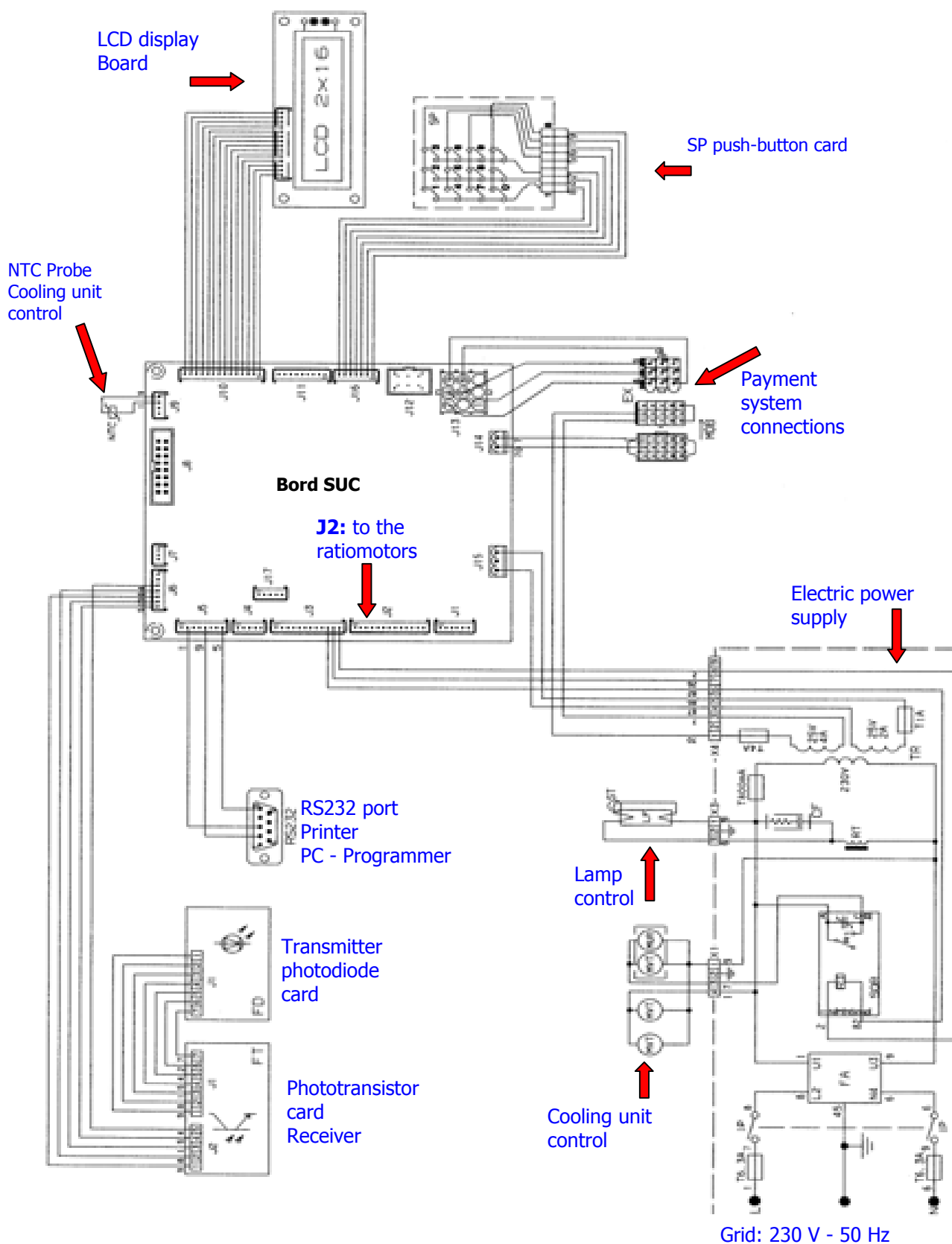
A neon lamp is located vertically on the right-hand side inside the cabinet; the starter is fitted inside the lamp holder. The ballast is located inside the power supply compartment.

The CPU board controls also the 24 V actuations by means of TRIACs and Darlington switches, while the lamp and the cooling unit are controlled by a relay card located inside the power supply compartment.

Some versions are provided with monitoring of the selected product fall into the dispensing compartment by means of a card with receiver/transmitter diodes (infrared). If the barrier is not interrupted it means that a product is finished or jammed and the system will further attempt releasing the product with small rotations; if also this fails the selection is disabled and the customer is entitled to a new selection.

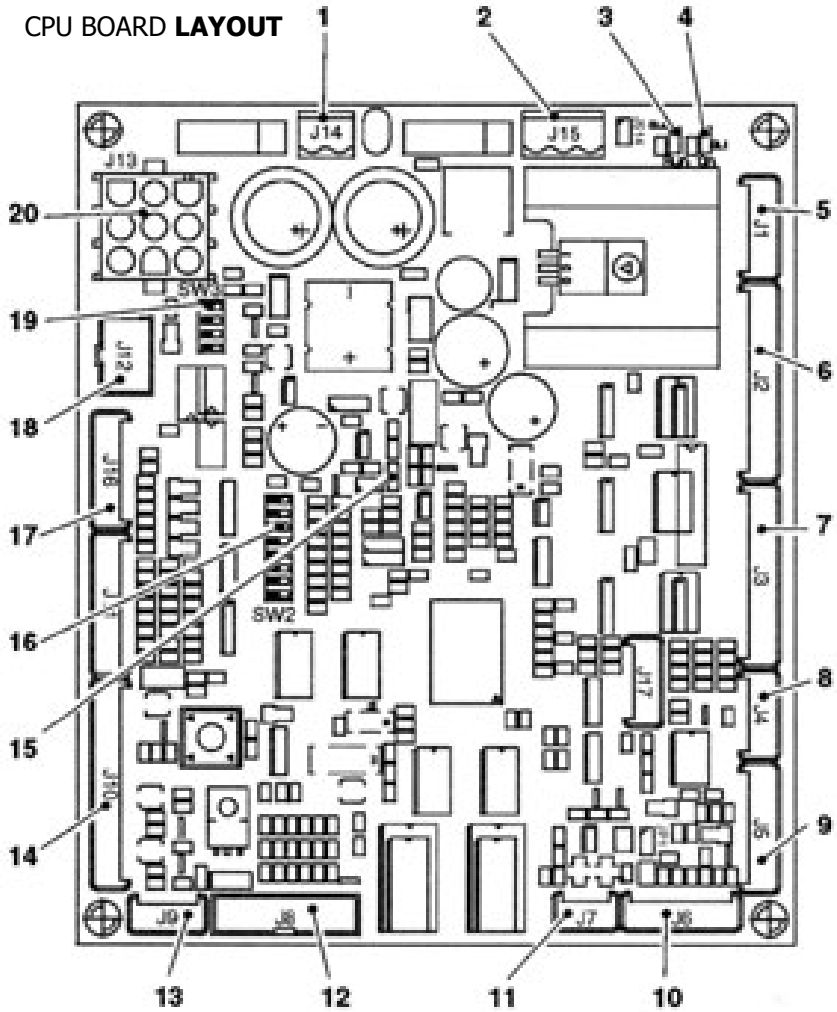
2.1 - ELECTRONIC BOARDS CONNECTIONS

ELECTRICAL AND BOARD CONNECTIONS:



CPU BOARD(SUC)

CPU BOARD LAYOUT



The CPU board is housed inside the payment system compartment, on the sliding door, and includes all low-voltage (24 V DC) actuations, it controls the display, the push-button card, the photodiode barrier, the payment system and the NTC probe that monitors that cooling unit temperature. The software is written in a Flash EPROM that, by means of a special program, can be rewritten and updated without replacing. It is powered from the power supply unit through connection J15 (ref. 2) The photodiode barrier is supplied as standard feature in some versions, or as an after-sales kit.

COLOURED LED FUNCTIONS

GREEN LED

blinking during the normal operation

YELLOW LED

It glows when 5 V DC is present in the board

RED LED

it glows when the software is reset (program malfunction)

Minidip functions 1-4 (19)

Coin mechanism setting 2-3
By default set to OFF

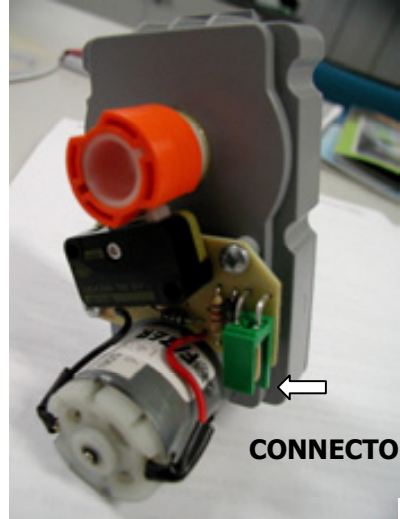
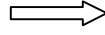
Minidips 1-8 (16)

Default configuration setting fixed to OFF

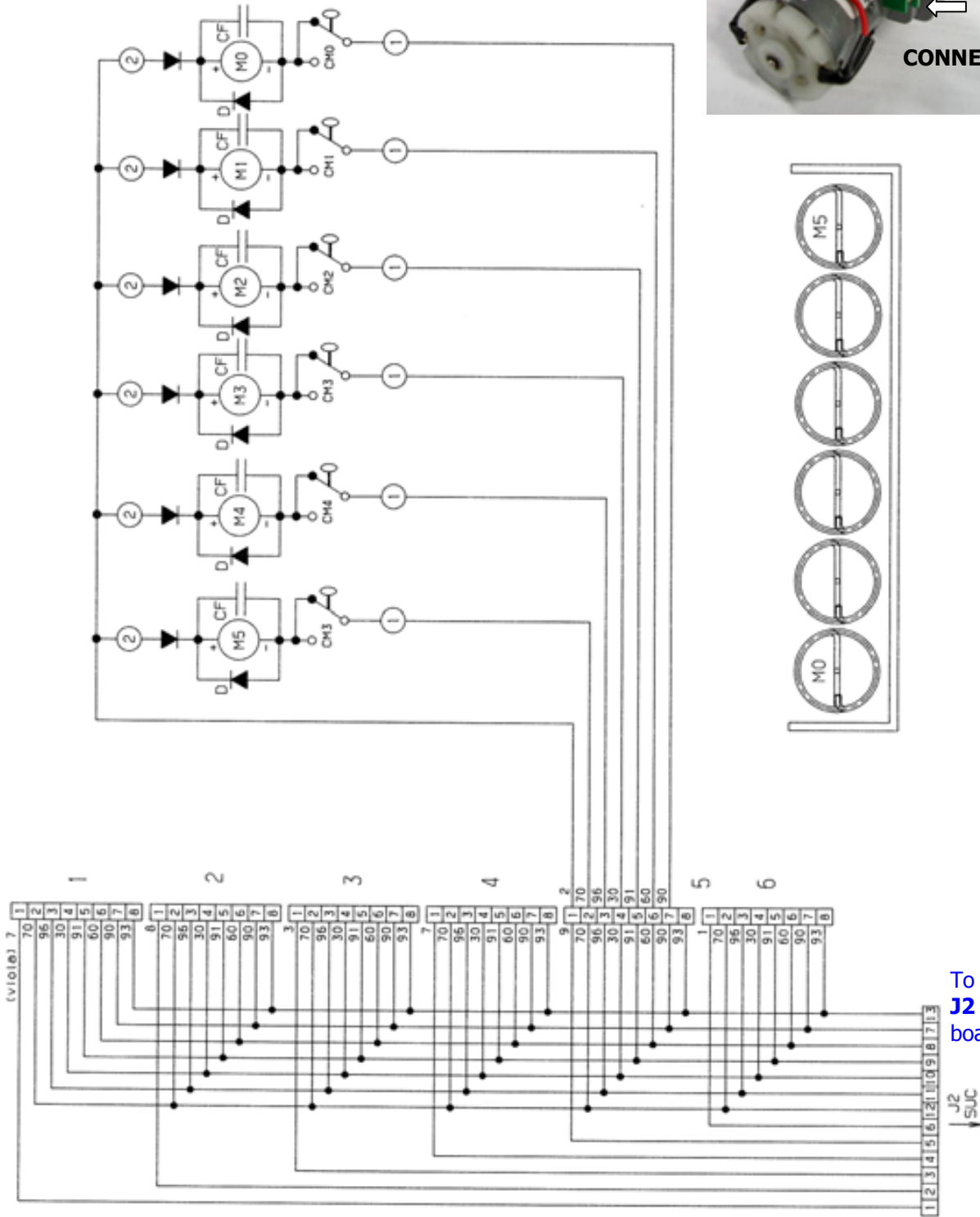
Both will be eliminated in the near future, thus since now the configuration is only via software setting.

Ref. N°	COMPONENT DESCRIPTION	Ref. N°	COMPONENT DESCRIPTION
1	Coin mechanism power supply connector	11	Validator connector
2	Board power supply connector	12	NTC sensor connector
3	GREEN LED	13	LCD display connector
4	YELLOW LED	14	RED LED
5	Connector not used	15	Configuration minidips SW2 (will be
6	Spiral ratiomotor control connector	16	Selection push-button panel connector
7	Input/output connector	17	Expansion board connector for MFB
8	Connector not used	18	Coin mechanism setting minidips
9	Programmer device connector	19	Expansion board connector for BDV / EXE
10	Photodiode barrier connector	20	Validator connector

Detail of spiral control ratiomotor



CONNECTOR



TRAY CONNECTION WIRING DIAGRAM

To connector
J2 - SUC
board

Description of codes used in the wiring diagrams

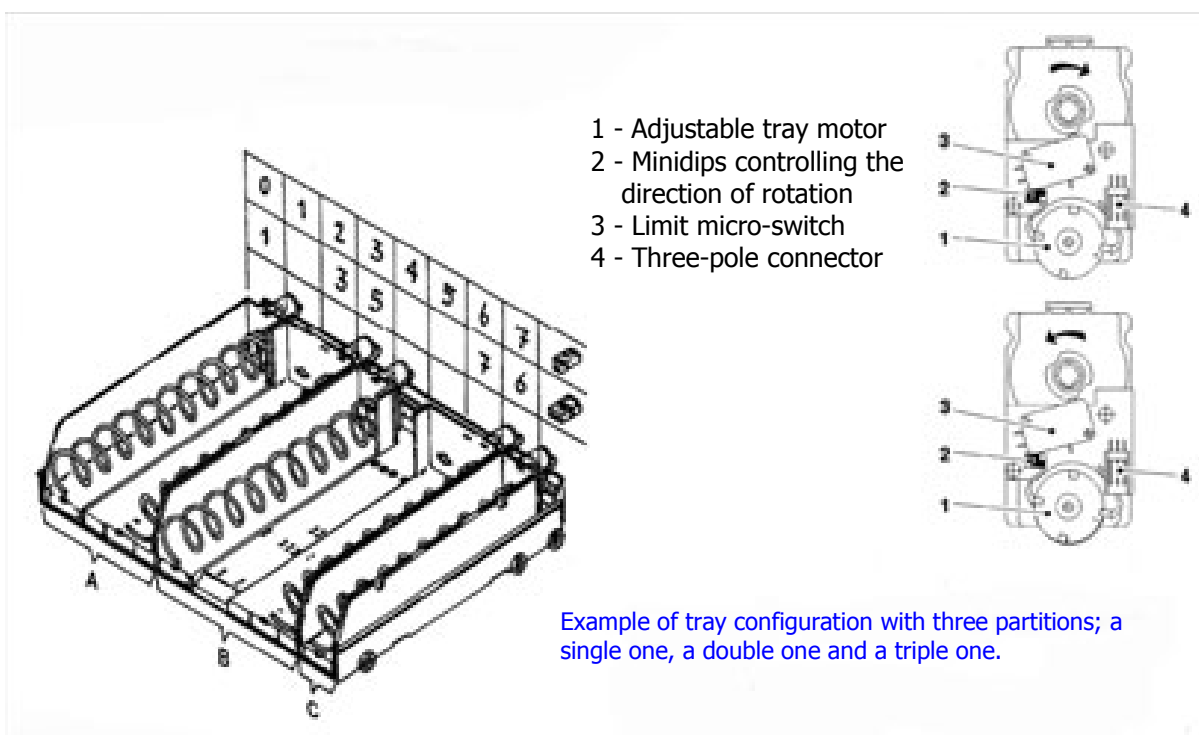
Code	Description
CF	Ratiomotor noise suppressor condenser
CM0-9	Spiral control ratiomotor cam
D	Diode
EX	Connector for coin mechanism with Executive protocol
FA	Grid noise suppressor
FD	Transmitter photodiode card
FT	Receiver photo-transistor card
IP	Sliding panel switch
LCD	LCD display card
M1-6	Spiral control ratiomotors
MDB	Connector for coin mechanism with MDB protocol
MUR	Cooler unit
MVT	Electric fan
NTC	NTC probe for refrigerated box internal temperature monitoring and control
RS 232	Serial port for PC, printer and programmer connection
RT	Neon lamp ballast
SOR	Cooling unit control relay card
SP	Selection push-button card
ST	Neon lamp starter
SUC	Central processing unit board
TR	Power supply transformer
TX	Delayed fuse

3 - VENDING AND LOADING SYSTEMS

"Snakky" is a vending machine belonging to the S & F range, with product dispensing by means of the rotation of spirals.

During their rotation the spirals push the product loaded onto the tray forward.

The tray is modular, and by simply moving the partitions and the motors one, two or three position trays can be used to dispense any products. Different pitch spirals are available to be able to load 20 to 76 mm wide products. In addition the spirals can have right and left pitch, to be used in the case of two spirals in the same partition. The rear position motor is fitted with a minidip, permitting the inversion of the direction of rotation.



- 1 - Adjustable tray motor
- 2 - Minidips controlling the direction of rotation
- 3 - Limit micro-switch
- 4 - Three-pole connector

Example of tray configuration with three partitions; a single one, a double one and a triple one.



Availability of spiral pitches and direction of rotation

Useful pitch:

20, 30, 42, 50, 60, 76 **right rotation**

30, 42, 50, 60 **left rotation**

The tray is held into position by a stop located on the guides; to slide out the tray it need to be lifted slightly and then pulled to the second safety stop. To extract it completely it needs to be lifted further and then removed (after disconnecting the connector located on the right side).

4 - WIRING

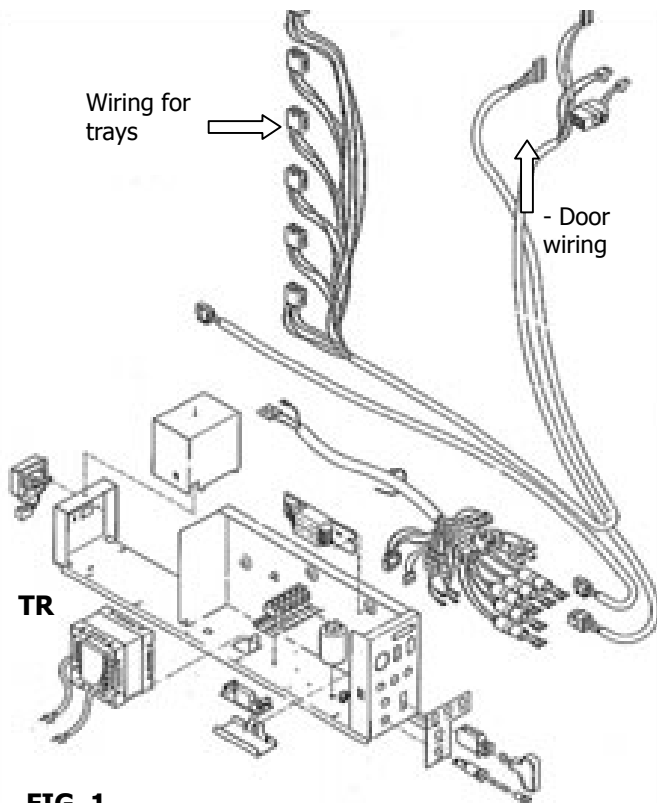


FIG. 1

The Snakky is certified by IMQ, therefore the wiring is complying with the standards and regulations in accordance with current EC directives.

They are completely sheathed and double insulated.

The door can be completely removed, as all cables can be disconnected by means of connectors all starting from the power supply unit (FIG. 1).

All main connections for the different function start from the power supply unit (FIG. 2).

All connections for the vending machine control start from the CPU board: push-buttons, payment systems, ratiomotors, heating elements, display (FIG. 3).

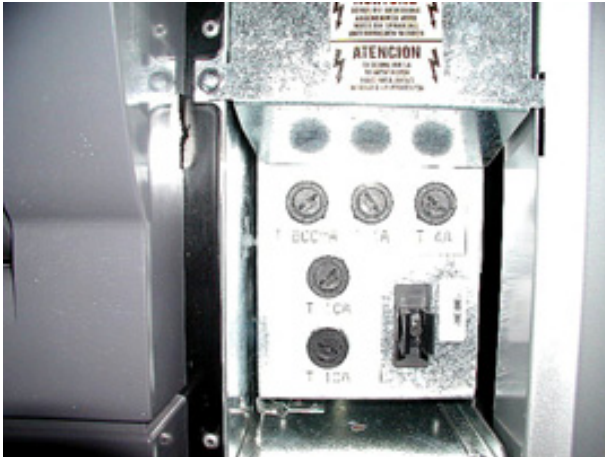
The 230 V 50 Hz grid power supply is transformed by means of 24 V AC transformer TR, then sent to the machine board that rectifies it to DC and sends it to the users through the actuators.

A relay card for the 230 V AC actuators is located in the power supply box, with the function of controlling the cooling unit.



Positioning of machine board and relevant cables on the central sliding partition

5 – POWER SUPPLY



The power supply unit is totally enclosed in a galvanised metal box.

It is composed of a safety transformer, supplying power to all low-voltage functions.

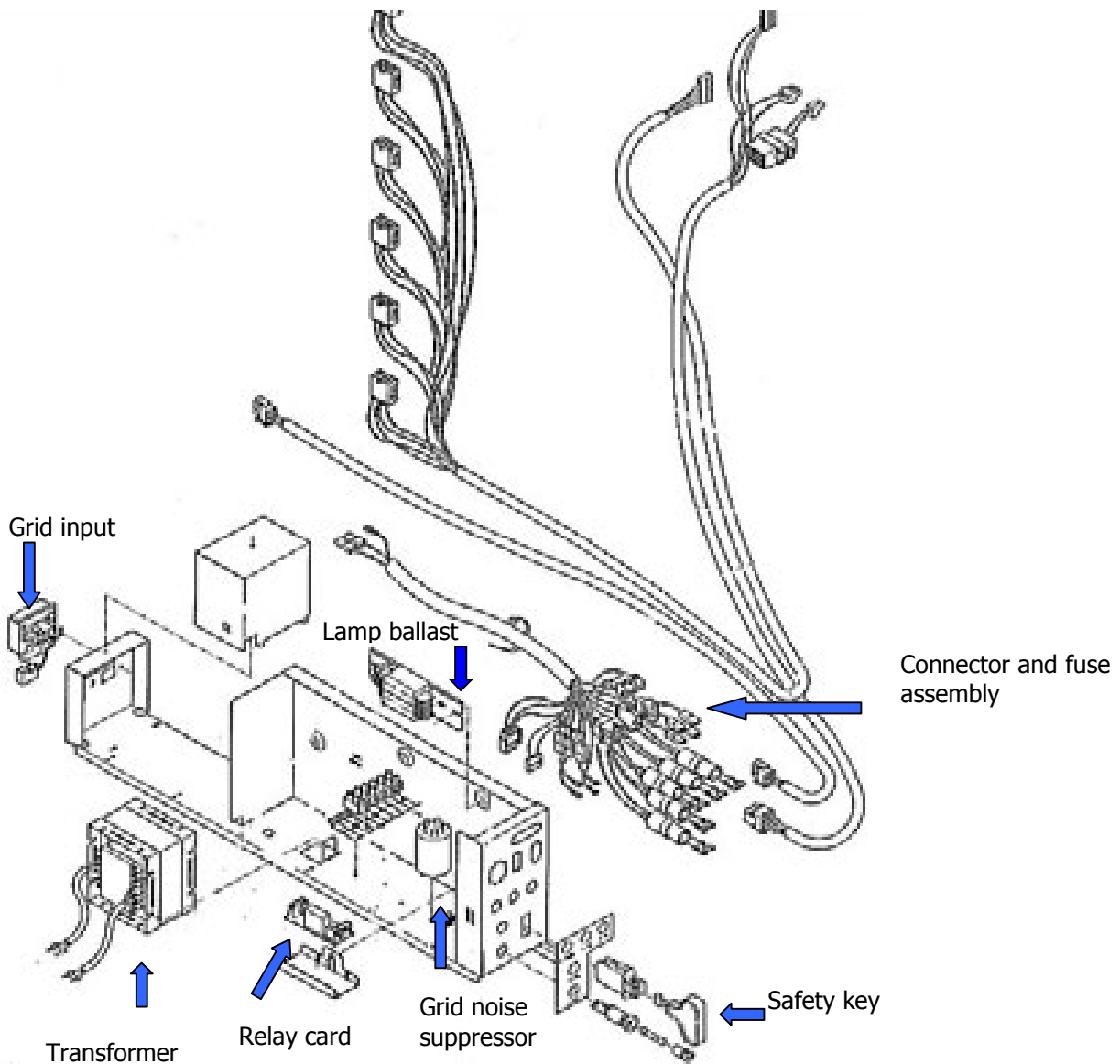
The input from the mains is protected with a main switch and two fuses on both phases.

It is also fitted with a noise suppressor.

The CPU boards controls also a relay card for the 230 V 50 Hz actuations.

Lamps, cooling unit and electric fans.

The same box houses the ballasts for the neon lamps and all main fuses, easily accessible from the outside with the door open.

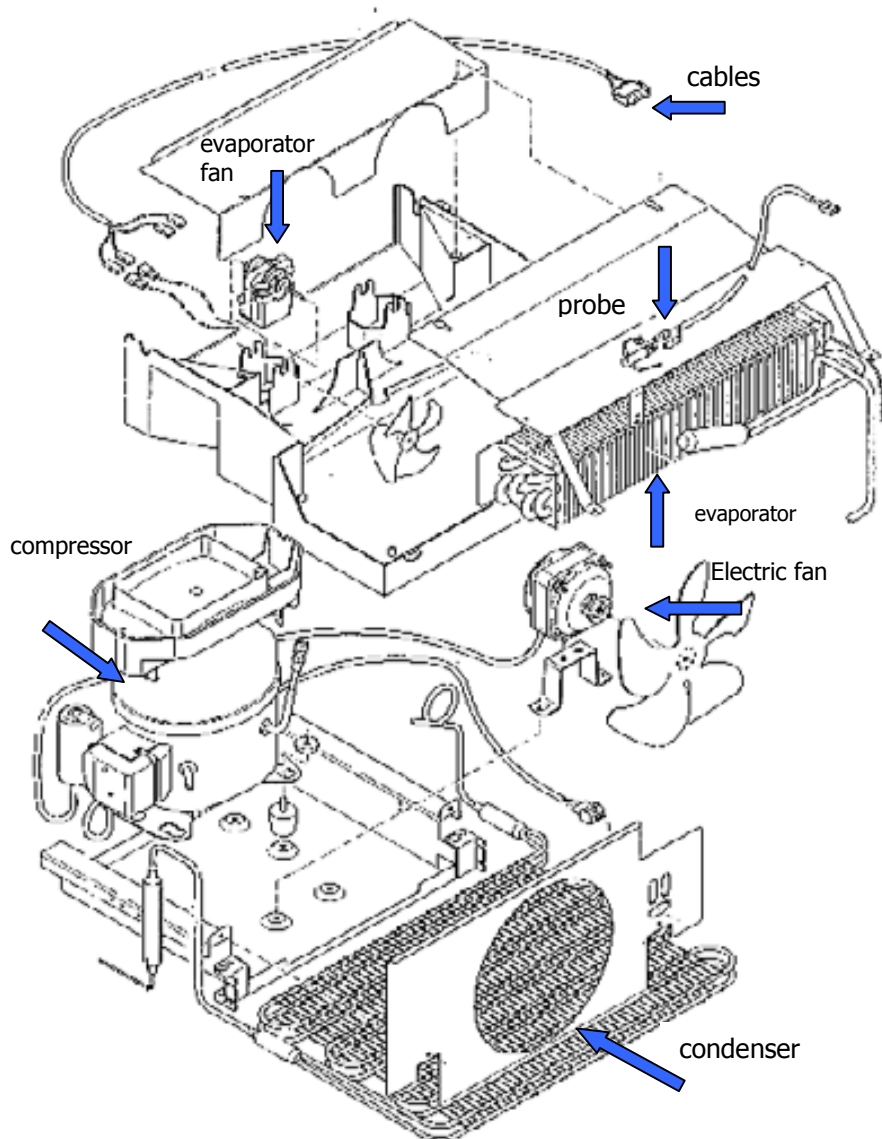


6 – COOLING UNIT AND INTERNAL VENTILATION

The internal temperature control is by means of an NTC type electronic probe fitted with an internal 2267-ohm resistance (± 7 ohm) at a temperature of 3° C.

As the internal temperature decreases the resistance is increased progressively as indicated in the following table. This variation allows the software to control the internal temperature with extreme accuracy.

Ref. box int. temperature	Value in ohm	Allowed tolerance
30°	733	+/-7 ohm
15°	1348	"
3°	2267	"
0°	2612	"



Exploded view of cooling unit

The cooling unit is controlled by the relay card located inside the power supply box and powered at the grid voltage (SOR CARD).

When the machine is started, the software reads the value (in Ohm) from the NTC probe and, according to the temperature setting, sends a signal to the relay card that activates or deactivates the cooling unit operation.

The cooling unit is very compact and of the slide-in type; in any case it is designed to be extracted easily and quickly.

To access the cooling unit, the last tray must be extracted, then the anti-theft grille and the dispensing compartment must be removed.

At this point the complete cooling unit can be extracted.

List of components:

- 1 - COMPRESSOR
- 2 - CONDENSER
- 3 - CONDENSER FAN
- 4 - EVAPORATOR
- 5 - EVAPORATOR FAN
- 6 - PROBE
- 7 - CABLES

The software includes the option of setting time bands for switching on or for safety temperatures: see details in the programming manual.

NB. A cooling unit is a real SLIDE-IN type when it is designed as a complete single piece unit (e.g. the unit installed on the StarFood); for the Snakky it is more of a partial slide-in type, as although it can be removed completely it is not designed as a single piece functional unit.

7 – CABINET

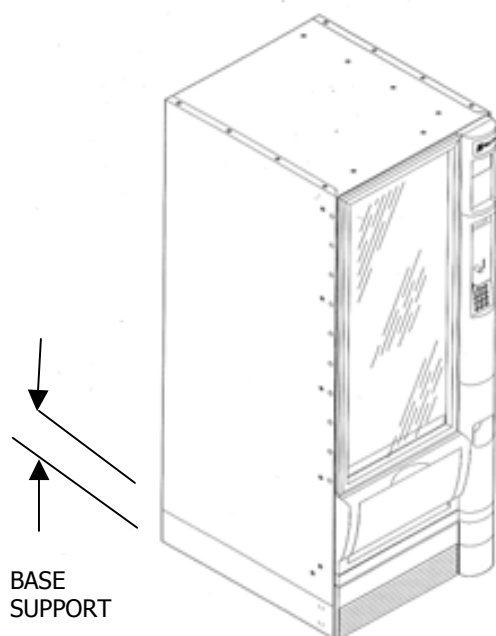
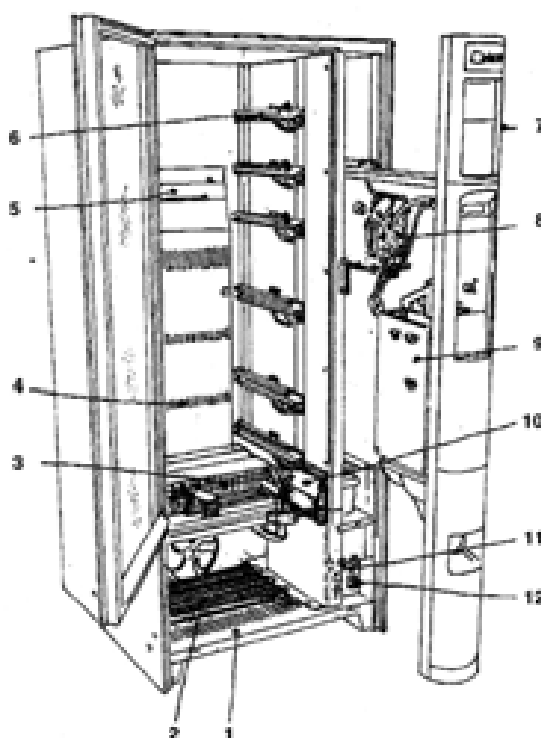
The cabinet is made of pre-varnished sheet-metal, assembled with rivets and various reinforcements; pre-formed polystyrene foam insulation panels are placed between the external pre-varnished sheet-metal part and the internal refrigerated box part.

The advantage of this solution, compared to the injected polyurethane foam insulation, is mainly from an environmental point of view, as in the event of future scrapping of the machine, the cabinet can be disassembled completely without any complications (almost impossible in the case of cabinet injected with foam).

The base is made with varnished and welded sheet-metal, the feet are adjustable for perfect levelling, and after removing the lower grille; a trans-pallet can be used to move the machine.

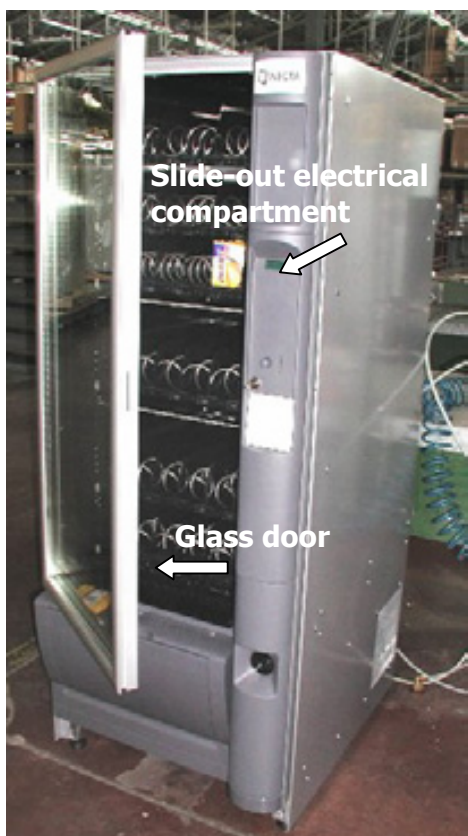
As optional feature, supports are provided to be placed under the base, making it possible to position the machine alongside 1830 mm high vending machines.

As standard feature the Snakky is 1700 mm high.



Perspective view with support and frame, for installation in a bank of 1830 mm high vending machines.

8 – DOOR



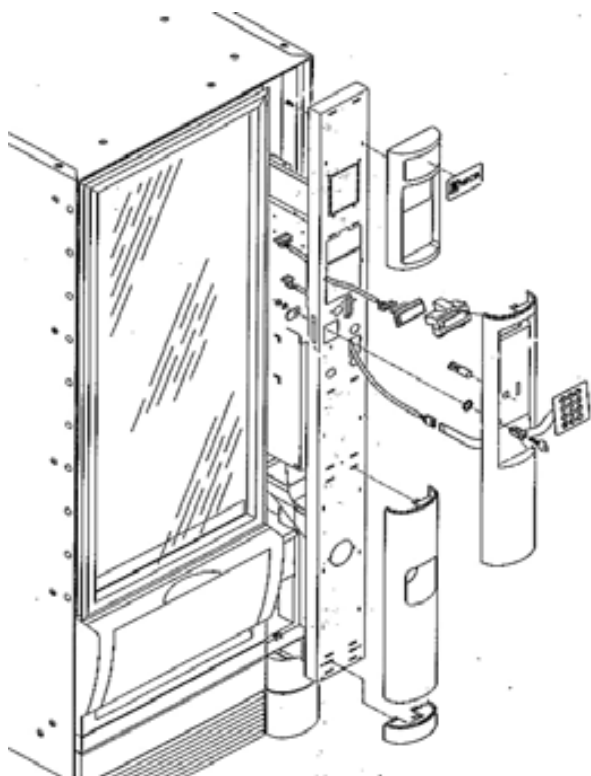
The Snakky is provided with two opening systems: main door and side sliding compartment.

The main door, for loading products, is of the glass front with double glazing.

The handle for opening is part of the perimeter profile of the frame, and locking is by means of a single lock located inside the sliding compartment on the right.

A sliding compartment is located on the side, with the user interface integrated on its front panel; the CPU board and the payment system compartment are fitted inside on the central wall. The following are fitted on the front panel: the main display, the coin slot and the coin return button, the selection keypad and the lock, that as well as ensuring a three-point lock it keeps the glass door closed.

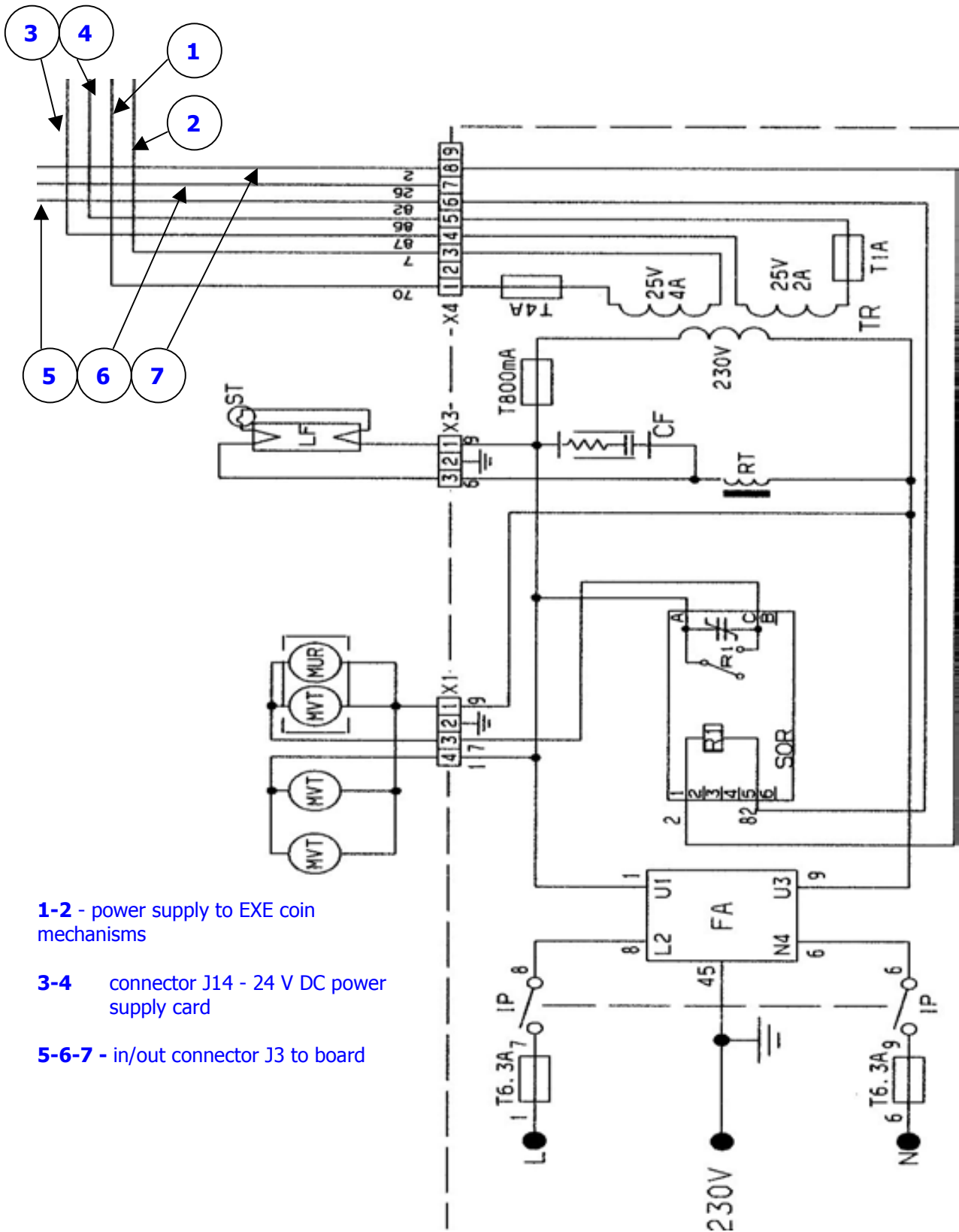
The sliding compartment is protected by a safety switch that disconnects the 230 V AC power, leaving anyway the option of operating in programming mode by inserting the special key in the safety switch slot.



Exploded view of the user interface panel with keypad, display, coin slot and coin return compartment.

9 – WIRING DIAGRAMS

POWER SUPPLY AND LIGHTING DIAGRAM

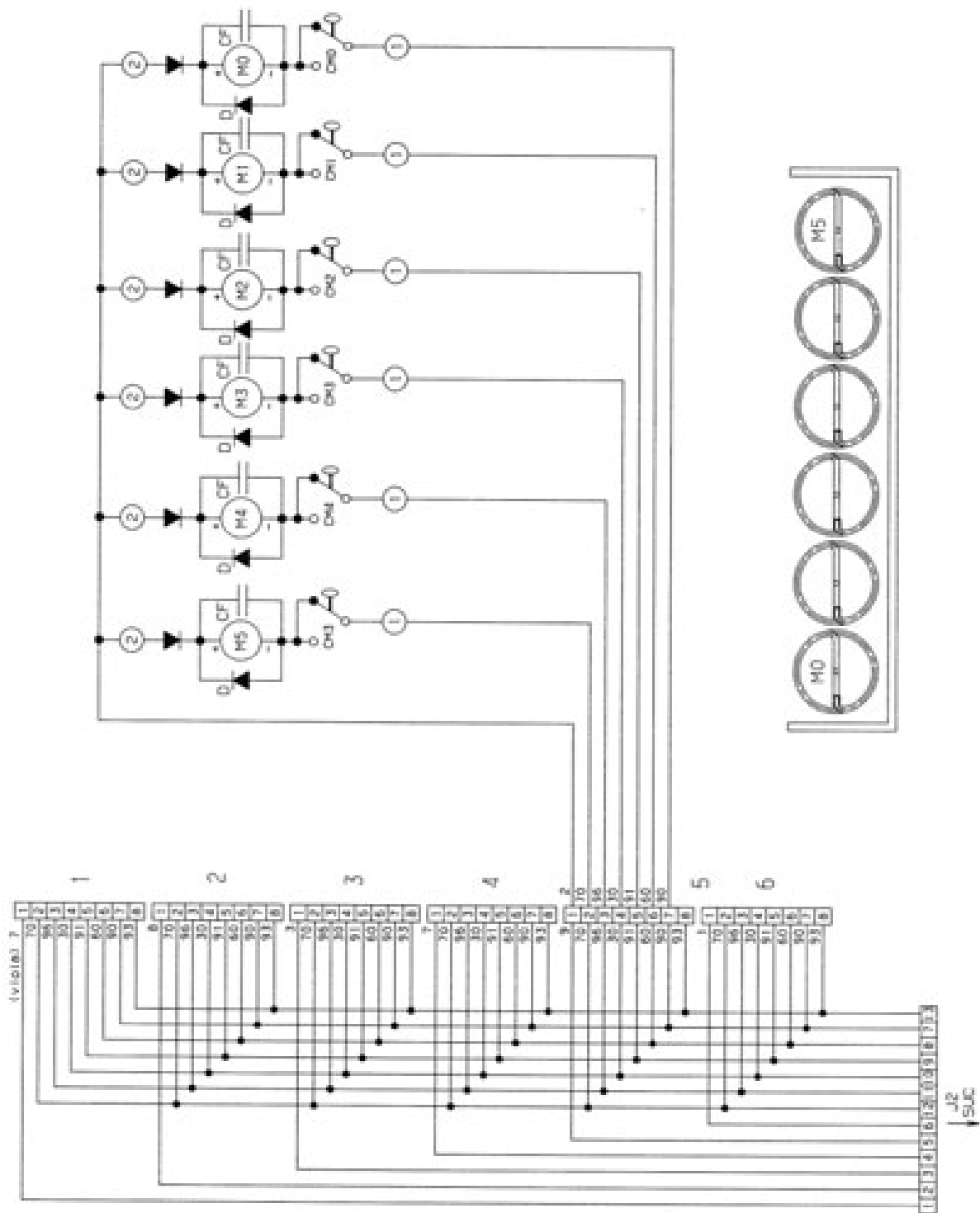


1-2 - power supply to EXE coin mechanisms

3-4 connector J14 - 24 V DC power supply card

5-6-7 - in/out connector J3 to board

Wiring diagram of tray ratiomotor controls



10 – TROUBLESHOOTING

Problem (and/or indication on the display)	Possible cause	Solution
The display indicates the message: "Compressor"	If the compressor runs for 24 hours consecutively without the cabinet reaching the temperature set via the SW, the machine is locked and the selection disabled. The following could be the cause: Lack of gas in the refrigerating circuit. Failure to the evaporator's electric fan. Failure to the condenser's electric fan or PTC triggered. Clogged rear and/or side grille Failed probe (in this case the message "probe failure" will be displayed)	Normally two to four hours are required to reach the operating temperature (according to the load). A longer time means that there is a malfunction: check for any small leaks in the refrigerating gas circuit; if necessary repair the leak and charge with the correct dose of gas. Check that the electric fans work correctly. Check for the correct cooling airflow inside the refrigerated box. In the case of failure to components, replace with original parts.
The display indicates the message "Coin mechanism"	If the CPU for more than 30 seconds does not receive communication impulses from an Executive serial coin mechanism, or 75 seconds from a BDV serial coin mechanism, or if it receives an impulse for longer than 2 seconds, the machine locks and the selections are disabled.	Replace the coin mechanism with one that is certain to work and check the communication. Check connections. Check the CPU board, and if necessary replace with that is certain to work. Check that the 24 V DC power supply fuse is intact.
The display indicates the message "RAM data"	One or more areas of the RAM contain wrong data, which could change the operating default values. The machine will continue working, but some parameters could have been changed, with consequences to the general functioning - the RAM needs to be initialised as soon as possible to recover data from the EPROM.	Initialise the CPU again. After initialising, all data settings will go back to the default settings; restore the customised data using the programmer or a PC. If, in spite of initialising, the malfunction persists, replace the CPU board with an already tested one that is certain to work. If the malfunction persists, replace the cables or check the suitability of connections. The machine was designed to comply with the EMC directive, but if located in an environment subject to high interference immunity problems could arise, therefore in the event of such interference persisting the vending machine should be moved to a different location.
The display indicates the message "Probe"	The temperature control probe in the refrigerated box is of the NTC type, with the internal resistance that changes as the temperature changes. If the probe is interrupted, the machine locks after 5 minutes from the failure and the selections are disabled (THE DISPLAY WILL INDICATE THE TEMPERATURE – 5 ° C) If there is a short-circuit in the probe, the machine locks after 60 minutes and the selections are disabled (THE DISPLAY WILL INDICATE THE TEMPERATURE +32° C) NB: AFTER THE SENSOR FAILURE HAS BEEN DISPLAYED FOR TWO HOURS, A COMPRESSOR FAILURE WILL ALSO BE INDICATED.	Check the internal resistance in the NTC probe using a digital multimeter: A resistance of 730 ohm corresponds to a temperature of 30° C. A resistance of 2612 ohm corresponds to a temperature of 0° C (melting ice). Replace the probe with an original one; before installing the new one check that the internal resistance corresponds to the above parameters. Reset the failures by accessing the special function

Problem (and/or indication on the display)	Possible cause	Solution
The display indicates the message "Motor failure n. XY"	At machine start, an automatic test routine checks the presence of trays and their number, therefore a motor failure is not indicated, as they are not activated. When a selection is made a microswitch is activated, which must close at the end of the cycle; should this function not occur the motor locks or continues running because of an actuation card failure. In this case a time-out is triggered to stop the motor, placing it out of service.	Check that there are no interferences to the motor rotation. Check that the motor is efficiently running. Check that the microswitch is efficiently working. Check that in fact there is not a time-out. If the motor does not pick up at all, check the electrical connection ensuring that a 24 V DC reaches the motors. If all checks are OK replace the card, as the actuation or the software may be malfunctioning.
The display indicates the message "product finished"	This information can be displayed in the version fitted with infrared sensors. And it means that the barrier was not interrupted during a selection due to two possible causes: 1) end of product, 2) jammed product	The software automatically tries to make the product drop with small movements, and if this fails the selection is blocked. In this case the failure must be reset after correcting the problem. The software allows a new selection to be made and the customer does not lose his credit.
The display indicates a number of trays not corresponding to the real situation	At machine start, an automatic test routine checks the presence of trays and their number, therefore if a tray is not indicated it is because it is not electrically detected.	Check that the cables are correctly connected. Check that the cables are efficient.
The machine does not start and the display is off	The vending machine is protected against short-circuits with two line fuses (one on each phase), with fuses on the secondary winding and on CPU board power supply (see wiring diagram).	Check that the fuses are intact and if necessary replace. First identify the cause of the blown fuses. Check the power supply cable. The transformer's functioning.
The refrigerated box does not cool down and the operating temperature is not reached in spite of being correctly set	The cooling unit is not positioned correctly and the condenser cooling air does not have sufficient space for adequate circulation. The machine is installed in a bank of machines without a sufficient distance from the wall. The amount of refrigerant is not sufficient (After some time the display indicates the message "probe failure" or "unit failure", or both)	The back of the vending machine can be positioned right against the wall, but not in a bank of machines, except when the right side is kept free. Check for small leaks using a special instrument and detecting foam. Restore the charge after eliminating the leak.
The internal lamps do not light	Switching on and off of the lamps can be programmed; therefore check that such option was not included in the programming. Probable failure to the starter / ballast	Check the functioning of the neon lamp, starter and ballast Check the functioning of the relay card (SOR) that controls the 230 V AC power supply Check in the special software program that the time band setting is correct.
The display indicates the message: "programming"	The CPU and payment system compartment door closure is monitored by a microswitch that in the event of actuation with the door open indicates "Programming" and does not allow the correct function if the warning is with the door closed. Check the microswitch.	Check that microswitches are activated correctly, check that cables are not damaged or disconnected. Replace the microswitches and/or the cables

11 – HACCP DIRECTIVE

HACCP DIRECTIVE (EEC 93/43 and 96/3)

Outline and instructions for use

Notes: What is indicated by the EC Directive

Directives **EEC 93/43 and 96/3** concern the hygiene of food products and are based on the **HACCP (Hazard Analysis Critical Control Point)**.

The purpose of this directive is to safeguard the consumer health, suggesting a series of actions to be taken by the vending company, aimed at checking, identifying and correcting any critical aspects in the foodstuff chain, from the purchase of products and machines to the dispensing of the product.

The **HACCP** is a system used to analyse any potential risks in the manufacturing and distribution cycle of food product and to identify critical points where such risks can occur; the system also highlights the actions to be undertaken and the decisions to be made with regard to such critical points, as well as the implementation of checking and monitoring procedures.

*Therefore, each vending company must develop a **Company Hygiene Self-control Manual** according to the provisions of the directive - and if necessary use the information and recommendations formulated by some associations in the sector. The manual must contain a programming and checking schedule for the hygiene condition of each vending machine, and when a new machine is added this must be updated immediately.*

Important notes:

For a correct use of the machine, the directives must be fully applied. The operator is responsible for correct operations on a vending machine

HACCP Directives (EEC 93/43 and 96/3)

Guidelines for correct application

- Ensure hygiene control with a special manual for correct hygiene practices.
- After cleaning, do not touch the surface of any elements that may come into contact with food.
- Wash your hands thoroughly, preferably using disinfectant, before starting any hygiene operations
- Use disposable sterile gloves
- Always use a clean cloth to wipe dry.
- Keep the work area tidy.
- Check that the product packages are intact and not damaged.
- Use products within the recommended time period (see expiry date on the package).
- Always use products from the warehouse according to the principle of "first-in first-out".
- Consumables must be kept and transported separate from the cleaning and hygiene products.
- Drums and sectors must be cleaned regularly (see operating instructions).
- Do not fill internal zones of the machine with products to be loaded in a second occasion.
- The products that need to be kept at a refrigerated temperature must be transported to the location of the machine in containers that maintain the products at the ideal temperature or in containers that do not allow excessive temperature difference.

CLEANING THE MACHINE

Carefully observe the following cleaning instructions! Considering that:

The Snakky normally dispenses products with a long shelf life, but it can be enabled to dispense short shelf life products; in this case cleaning must be more frequent and stricter.

In the following instructions, only the cleaning and hygiene operations for the **FIRST** case are described.

Clean the machine, preferably at the end of the day or in the morning before the machine is used, and before loading the products to be sold.

- Fill in the checklist log for cleaning operations.
- When the display indicates an error message immediately check the trouble-shooting sheet.
- Use only recommended cleaning products approved for foodstuff, preferably liquid; do not use powder and abrasive products that could scratch plastic surfaces.

12 – PERIODIC CLEANING AND HYGIENE

DAILY CLEANING AND HYGIENE

(Expected time 3 min)

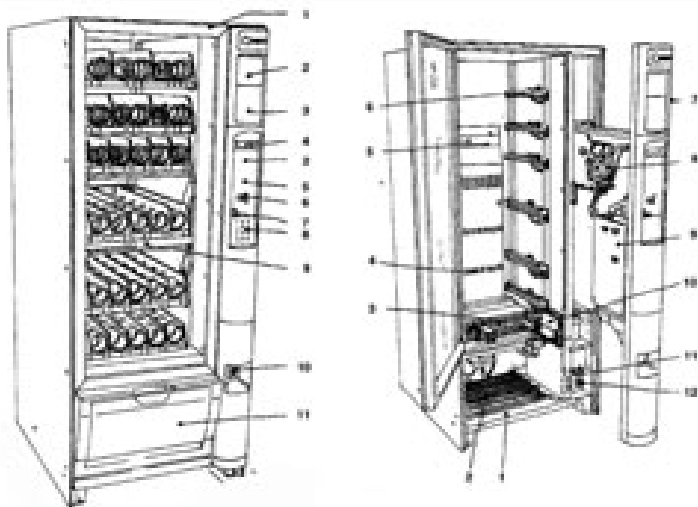


FIG.1

Open the door and disconnect the machine from the power supply (FIG 1).
Clean the outside and inside of the glass front with suitable detergent.
Clean the inside of the trays with a cloth dampened with chlorine-based detergents.
Wipe the dispensing compartment and the flap door with a clean cloth (before loading the products in the morning) (FIG 2)
Dust all of the inside of the refrigerated box, especially the base.
Enter the operation in the HACCP log.

WEEKLY CLEANING AND HYGIENE

(Expected time 6 min.)

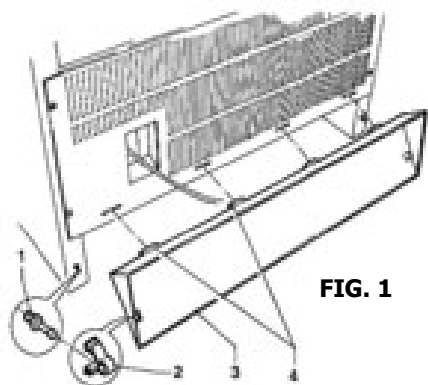


FIG. 1

In addition to the daily cleaning operations:
Brush the rear and side ventilation grilles of the cooling unit, using if necessary a vacuum cleaner to remove the dust.
Remove the trays and clean the inside of the refrigerated box; check for the presence of insects.

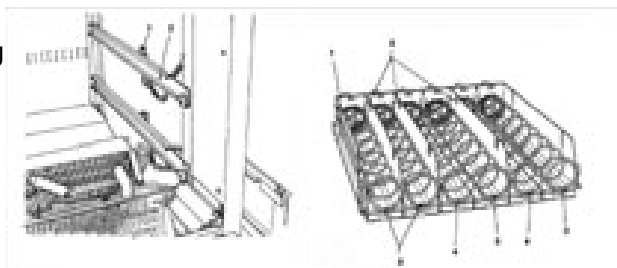


FIG. 2

ANNUAL CLEANING AND HYGIENE

Expected time 20 min. (excluding the pull-down time)

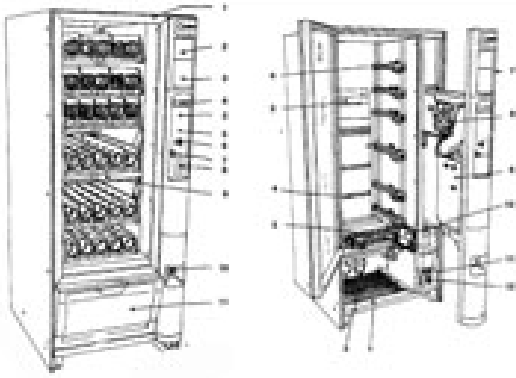


FIG. 1

Open the door and disconnect the machine from the power supply (FIG.1)
Remove all trays, placing them in a clean area proceeding as indicated in FIG. 2

Clean the inside of the refrigerated box with a damp cloth soaked in chlorine-based detergents.

Completely remove the cooling unit (FIG . 3) thoroughly clean the internal base and make hygienic.

Remove all the dust from the fans and cooling unit condenser (FIG. 4).

Clean and make hygienic the condensation tray (FIG. 4)

Reinstall the cooling unit

Reinsert into the operating position.

Clean the external parts, especially the coin-return compartment and the push-buttons.

Reassemble all trays after cleaning the internal product loading parts.

Thoroughly clean the inside of the dispensing compartment.

Start the machine and bring the internal temperature to operating value.

Load all vending products.

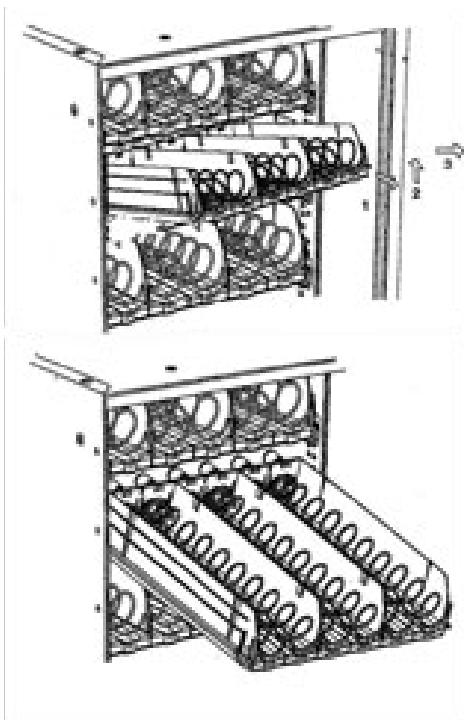


FIG 2

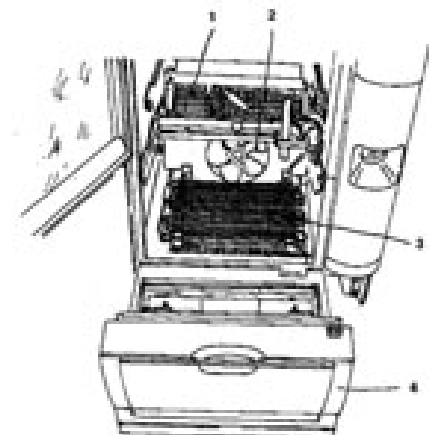


FIG. 3

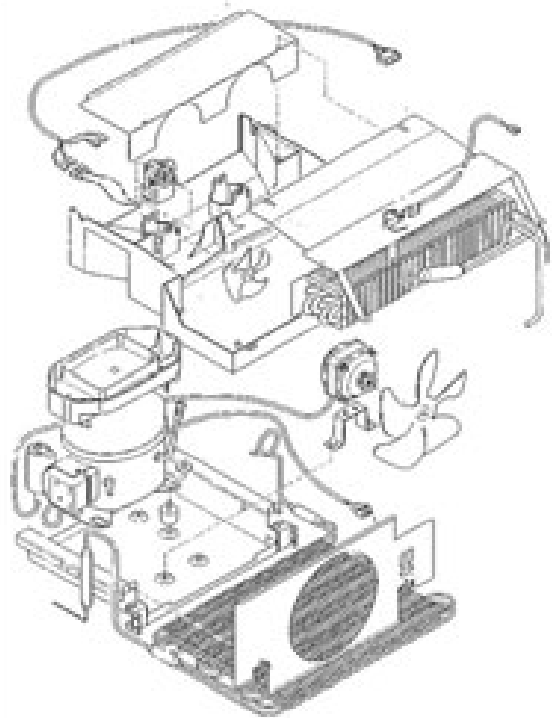


FIG. 4