



SERVICE MANUAL

" StarFood "

BASIC TECHNICAL MANUAL

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

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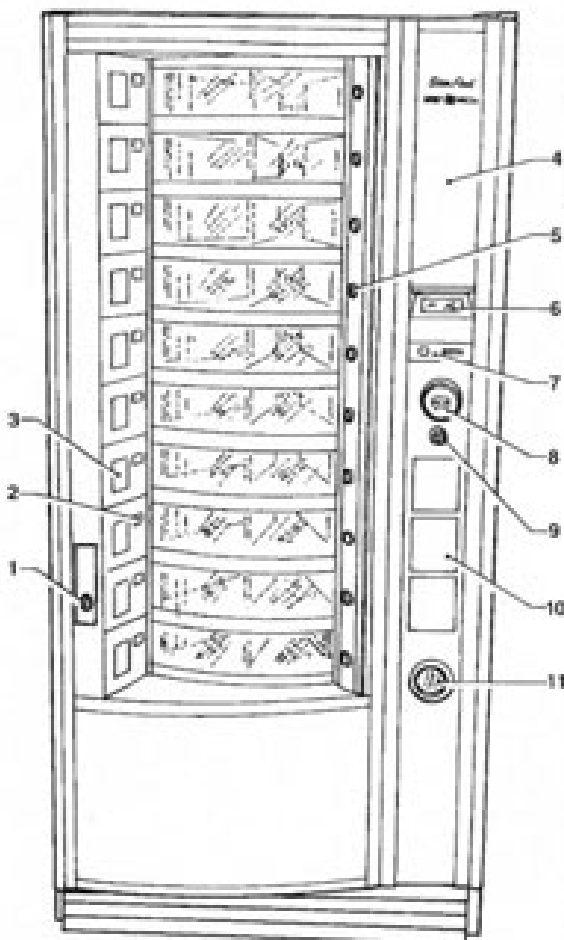
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NOTE

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.

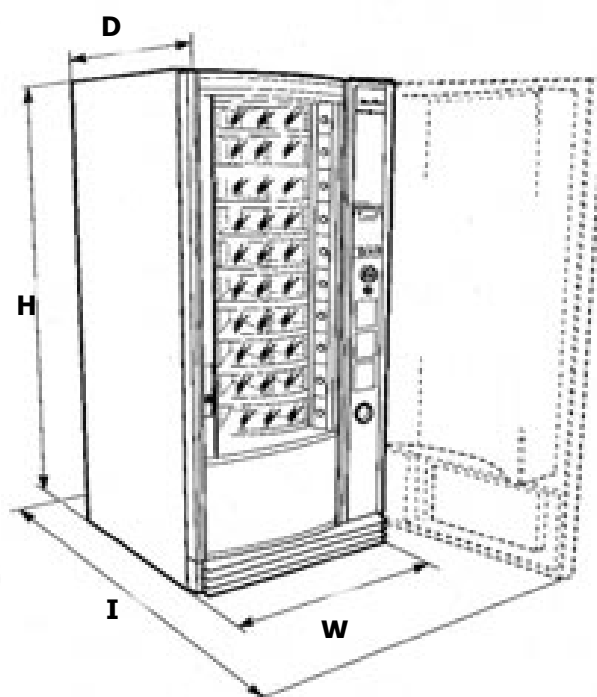
Star Food: View of user interface



Reference	Description
1	Refrigerated compartment lock
2	Selection price indicator display
3	Product label housing
4	Zone provided for payment systems
5	Direct selection buttons
6	Main LCD display
7	Coin-slot and coin-return button
8	Shopper button (drum rotation)
9	Door lock to electronic payment systems, coin box, access to programming, RS 232 port and reset button.
10	Space for miscellaneous information
11	Coin-return pocket

1 – LAYOUT - MODELS

DESCRIPTION	VARIABLES
DRUMS	8 TO 12 MAXIMUM
HEIGHT OF DRUMS	50 mm - 90 mm - 130 mm
DRUM PARTITIONS	VARIABLE: 6-12-18-24-36
PRICES PER DRUM	1 TO THREE
TIME BANDS	SETTABLE
PAYMENT SYSTEMS	Executive - MDB - BDV
VEND SYSTEMS	FIFO – SHOPPER – MIXED (For each drum)
DIMENSIONS	H x W x D = 1830 x 850 x 895 mm
WEIGHT	290 Kg
OVERALL DIMENSION	I = 1650 mm
LAMPS	2 x 36 W
ABSORBED POWER	1300 W



IDENTIFICATION CODE ROOT

1	2	3	4	5	6	7
---	---	---	---	---	---	---

The identification code can be determined by 7 groups of initials having the following meaning:

- 1 - indicating the presence of the rear door with a P
- 2 - indicating the number of drums used
- 3 - indicating the number of 50 mm high drums
- 4 - indicating the number of 90 mm high drums
- 5 - indicating the number of 130 mm high drums
- 6 - Indicating the country: I – F – E – D- UK – CH – B – DK – N – A – NL – CZ – S – FIN –
- 7 - indicating the IMQ certification with a Q

For example:

P-10/0-10-0/IQ means StarFood model with rear door P fitted with 10 x 90 mm drums for the Italian market I and certified by IMQ

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 **T15 A** fuses on both phases.

A safety transformer supplies power to extra-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 3.15 A** fuse

The secondary winding (**24 V**) is protected with the following fuses:

T 15 A - T 6.3 A - T 3.15 A - T 2 A

The power supply board is protected with a **T 3.15 A** fuse (located in the relevant panel)

The machine is equipped with a safety switch fitted on the main door and with a second safety switch on the electronic components and payment systems compartment door.

The safety door switch permits the rotation of the drums for loading, using the internal push-button panel, and disconnects the compressor and lamps; the display will indicate the message "Loading with door open" and vending is disabled.

The safety switch for the payment systems door is activated when the side door is opened, disabling vending and permitting programming and loading with the main door closed, opening and rotating the drums automatically (see programming manual); the display will indicate the message "Loading" and the external buttons take on a different function.

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

H05 RN – F copper with a 3 x 1.5 mm² section

H05 V V – F " " " "

H07 RN – F " " " "

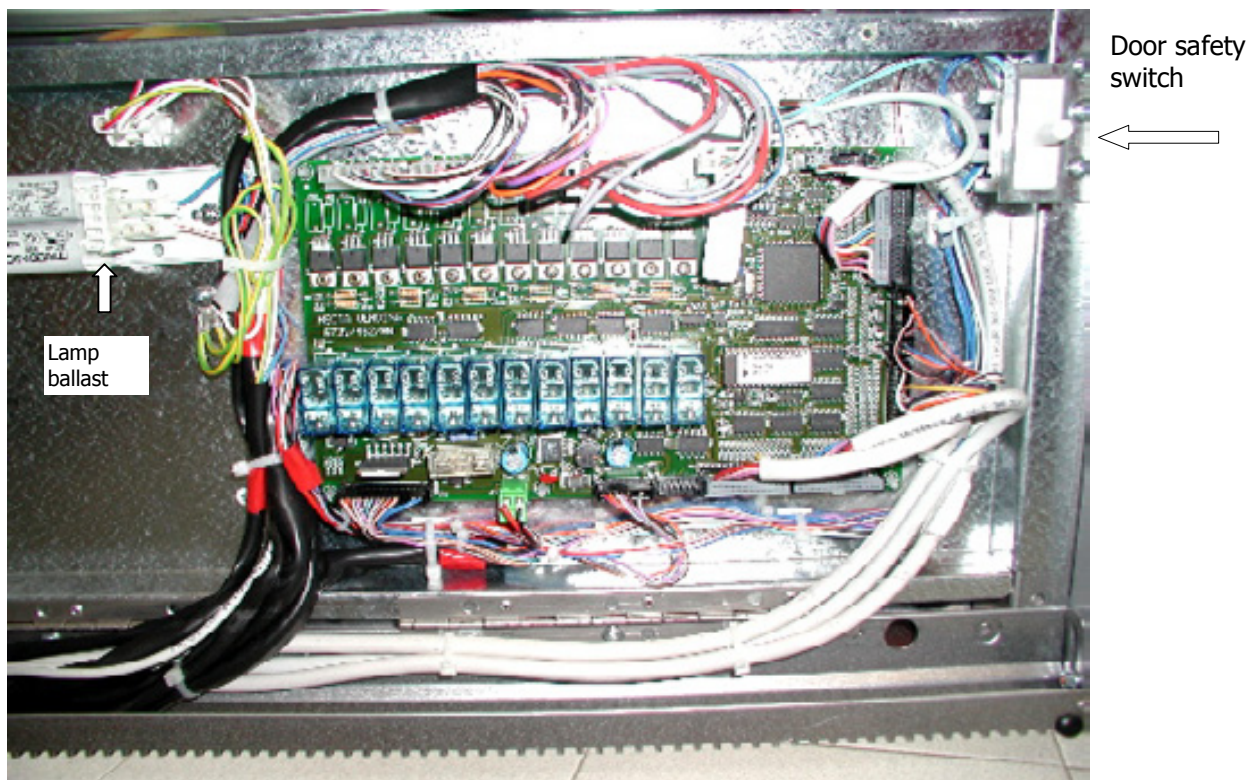
Fitted with a fixed SCHUKO plug.

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 "StarFood" 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.



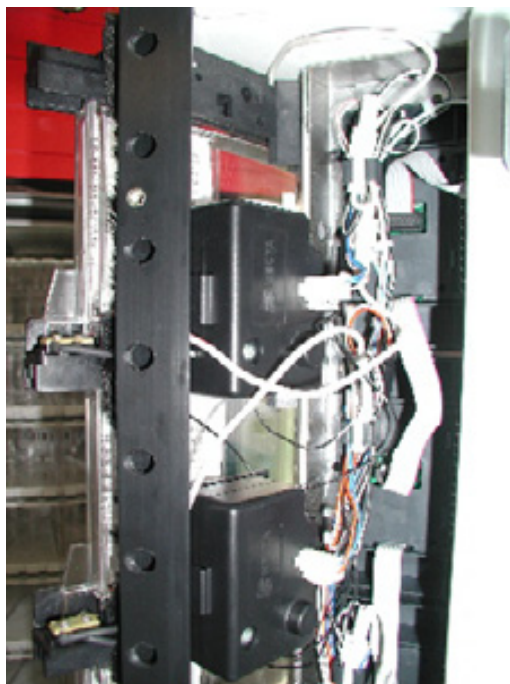
ACTUATION BOARD AND CONNECTIONS

2.1 - ELECTRONIC BOARDS CONNECTIONS

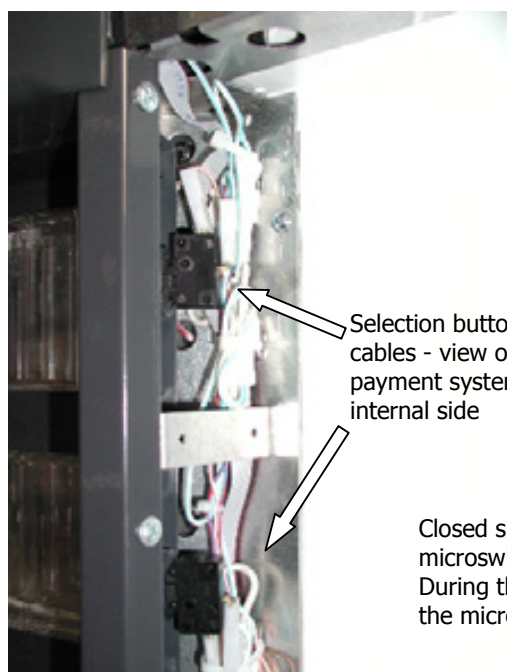
ELECTRICAL AND BOARD CONNECTIONS:



CPU BOARD AND CABLES + SERVICE BUTTONS
(view without protective casing)

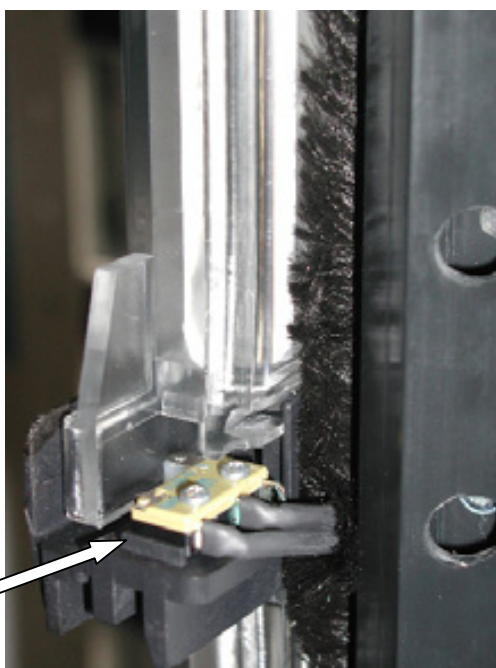


SLIDER OPERATION RATIOMOTORS
INTERNAL SIDE WITH ISOLATING DOOR
OPEN

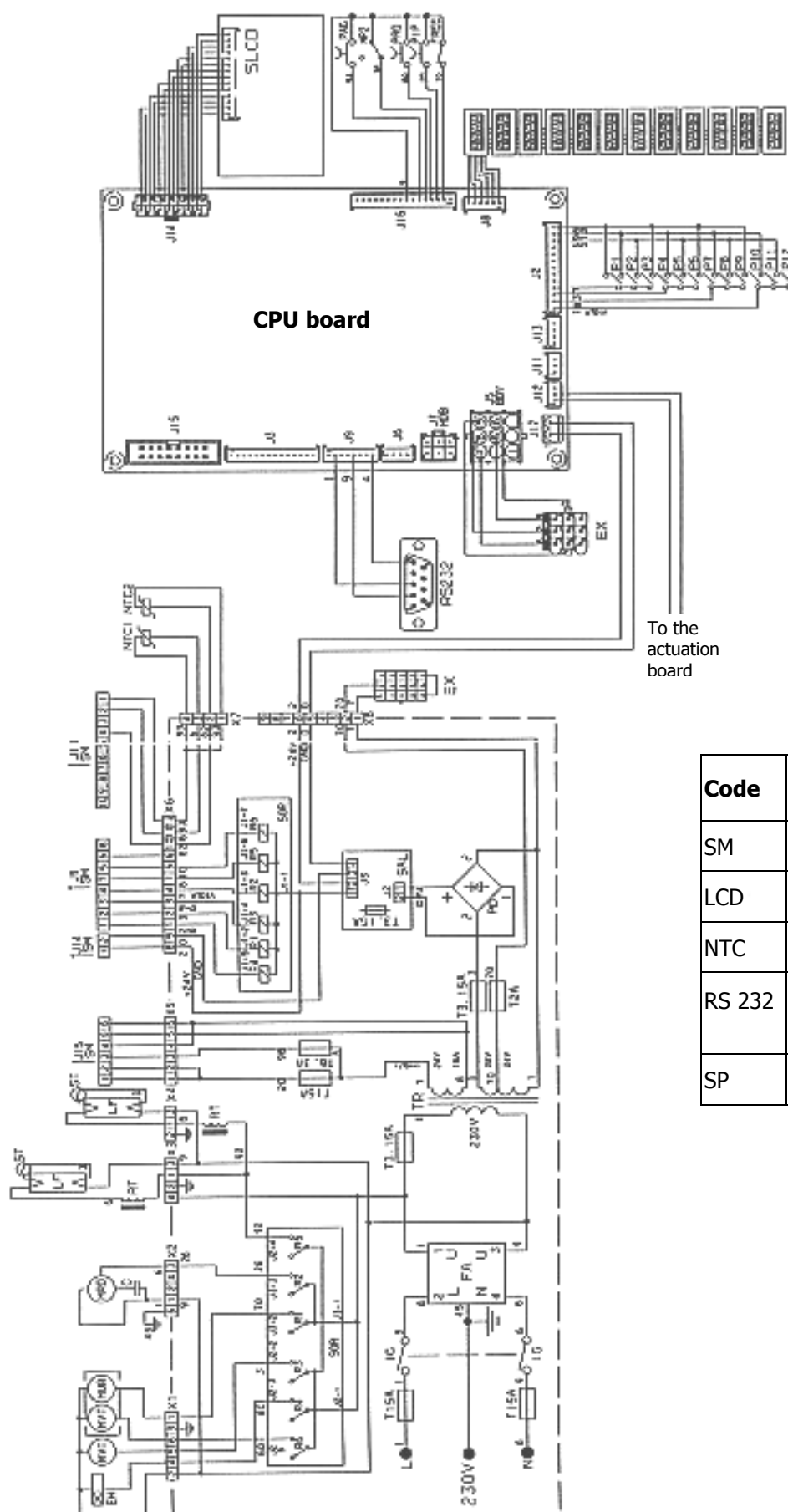


Selection buttons and
cables - view of
payment system door
internal side

Closed slider signal
microswitch
During the opening movement
the microswitch is open.



BOARD CONNECTION DIAGRAM



Code	Description
SM	Actuation and control board
LCD	LCD display card
NTC	Temperature control probe
RS 232	Printer or data reading device port (only if the relevant optional board is installed)
SP	Push-button board

ACTUATION BOARD

J7-J8

Stop magnets for drums 1-12

J1 Counter microswitch sectors 1-12

J16

Slider heating elements

J11 Connection main door microswitch sensors

J6 - Slider ratiomotors

SM

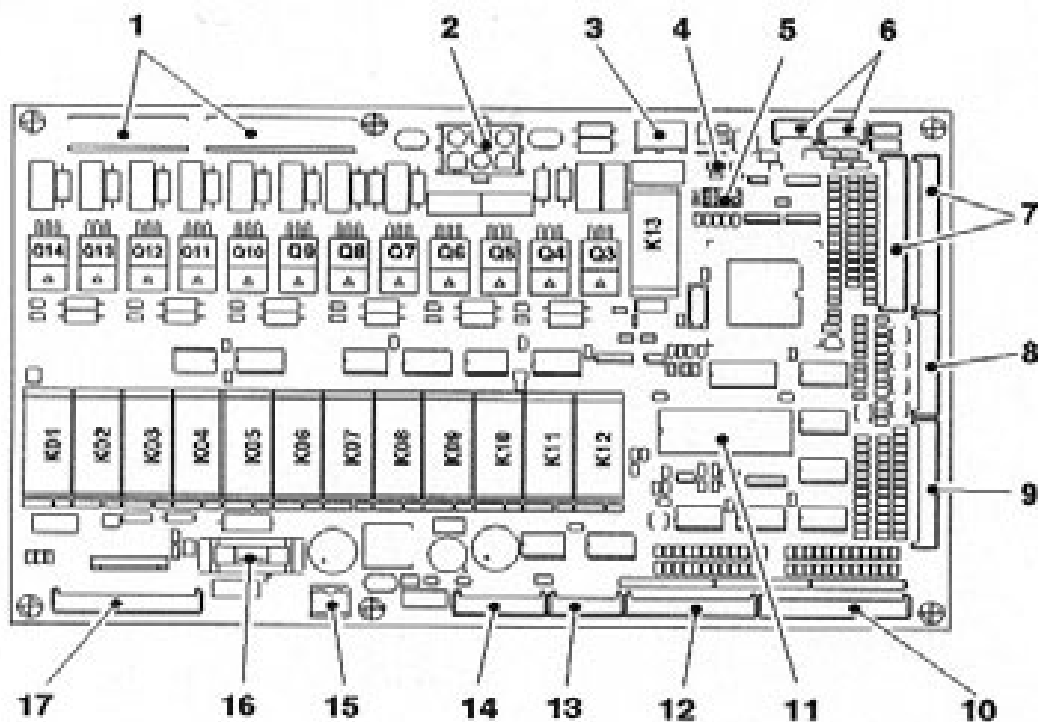
J5 - Limit switch for sliders 1-12

J2 - Origin magnetic sensors

J15 - to the board
Power supply

J3-J4
Push-button board

ACTUATION BOARD LAYOUT



ACTUATION BOARD

Actuation board components legend	
N.	Drum-stop magnets connector
1	Slider heating elements and magnets power supply connector
2	Slider heating elements connection
3	GREEN LED (blinking at 1 second intervals during normal operation)
4	Board configuration minidip: 1-4 OFF - 2-3 ON
5	CPU board connector
6	Internal loading buttons connector
7	NTC probe connector
8	Slider limit microswitches' connector
9	Drum origin magnetic sensors' connector
10	EPROM
11	Drum sector microswitches' connector
12	Free
13	230 V AC user relays' connector
14	24 V DC power supply connector
15	Main fuse for slider motors
16	Drum-stop magnets connector
17	Slider heating elements and magnets power supply connector

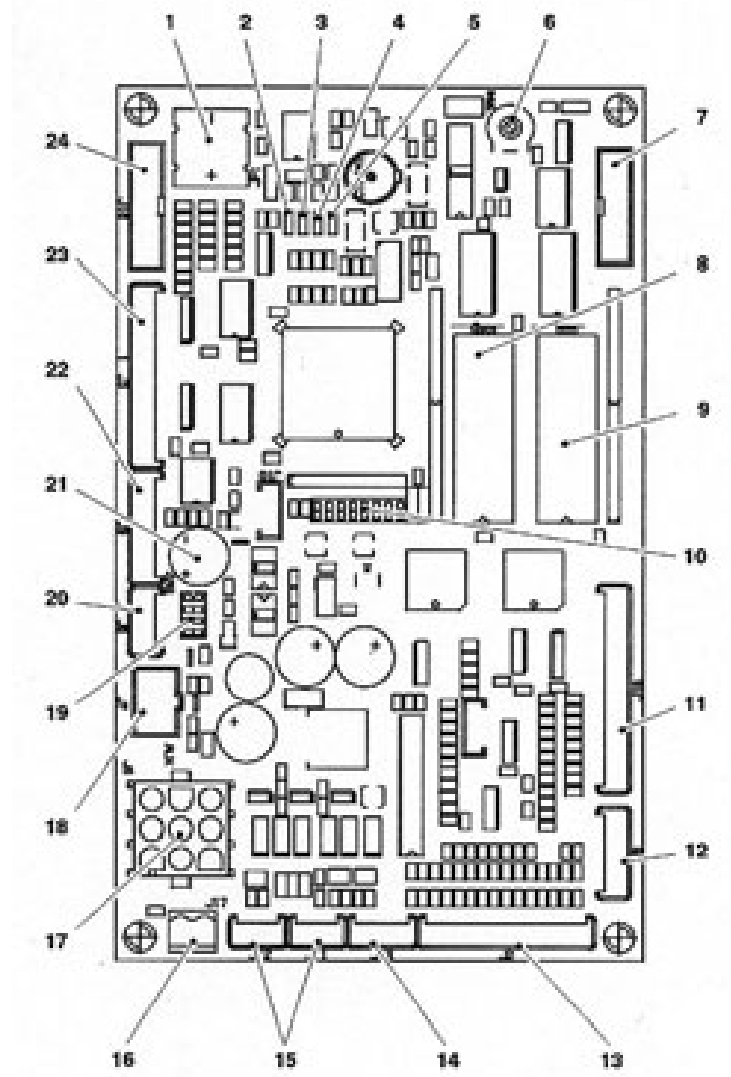
By means of relays or TRIACs, the actuation board activates the 230 V AC and 24 V DC power users (see list at page 8).

A FLASH EPROM is used also on this board, with the option of programming the SW without needing to replace it.

For programming, it is sufficient to have the special SW and a personal computer or the "Programmer" unit (available as optional feature).

FUNCTION OF RELAY K01 - K12 AND TRIAC Q03 - Q14			
RELAY CODE	Application	TRIAC CODE	Application
K 01	Motor for slider 1	Q03	Magnet for drum 1
K 02	Motor for slider 2	Q04	Magnet for drum 2
K 03	Motor for slider 3	Q05	Magnet for drum 3
K 04	Motor for slider 4	Q06	Magnet for drum 4
K 05	Motor for slider 5	Q07	Magnet for drum 5
K 06	Motor for slider 6	Q08	Magnet for drum 6
K 07	Motor for slider 7	Q09	Magnet for drum 7
K 08	Motor for slider 8	Q10	Magnet for drum 8
K 09	Motor for slider 9	Q11	Magnet for drum 9
K 10	Motor for slider 10	Q12	Magnet for drum 10
K 11	Motor for slider 11	Q13	Magnet for drum 11
K 12	Motor for slider 12	Q14	Magnet for drum 12
K 13	Heating elements for sliders 1-12		

CPU BOARD



COMPONENT AND CONNECTION DESCRIPTION	
Ref.	Description
1	Battery
2	Green LED - RUN
3	Yellow LED - 5 V DC
4	Red LED - program error
5	Red LED - board reset
6	LCD contrast adjustment trimmer
7	LCD display connector
8	Flash EPROM: EVEN
9	Flash EPROM: ODD
10	Configuration Minidips
11	Service button connectors
12	Selection price display connector
13	Selection button connector
14	Connector not used
15	Machine board connector
16	24 V DC board power supply
17	BDV connector
18	MDB connector
19	Coin mechanism setting minidip
20	Connector not used
21	Buzzer
22	RS232 connector (Programmer)
23	Connector not used
24	Validator connector

PRINTED BOARD FUNCTIONS AND INDICATOR LIGHTS

Configuration

CPU BOARD

The CPU board is housed in the payment system compartment, communicates with the machine board and handles the input signals from the selection buttons and from the payment system and controls the Display. It is fitted with a trimmer for adjusting the machine display contrast.

The board is fitted with Two FLASH EPROMs, containing the operating programs, and two series of configuration minidips, to adapt the machine to the different payment system and coin mechanism protocols, also to display the messages on the display in the desired language (see below).

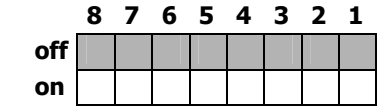
There are various coloured LEDs with the following functions:

Green LED (2) blinking during the normal and correct operation of the CPU board

Yellow LED (3) glowing to indicate the presence of 5 V DC

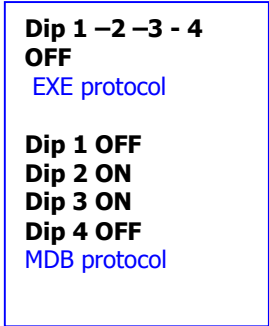
Red LED (4) glowing if there is a program error

Red LED (5) glowing during the board reset phase

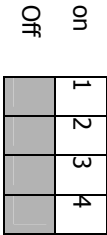


MINIDIP 1 - 8

- Dip 1 = OFF** normal operation
ON autotest operation
- Dip 2 = OFF** base machine
ON Rear door
- Dip 3 =** Not used
- Dip 4 =** Not used
- Dip 5 =** Not used
- Dip 6 =** Country (Italy 6-7-8 OFF)
- Dip 7 =** Country
- Dip 8 =** Country



MINIDIP 1 - 4



3 - VENDING AND LOADING SYSTEMS

The "**Star Food**" is a S & F vending machine of the **DRUM** type (current use term referring to the shape of the complete disk assembly); more specifically they are drums divided in various sectors containing a products, normally of the "**snack & food**" type, rotating to pre-set positions to bring the product into a dispensing position; most competitors use a manual solution to pick up the product by opening the sliders or other.

The "**Star Food**" is innovative and equipped with automatic systems for opening the sliders, having the following characteristics:

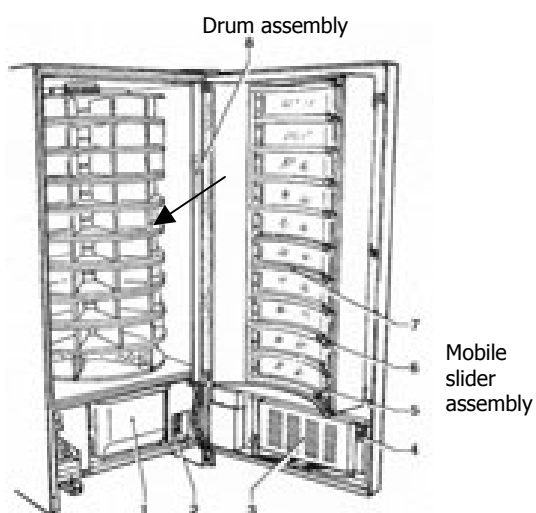
From **8** to **12** drums maximum, with a height of **50 - 90 - 130 mm**, the drums are clutched to each other to allow **FIFO** or **SHOPPER** control or both, with some drums in **FIFO** and others in **SHOPPER** mode.

FIFO control permits dispensing of products according to the order of loading: the first product to be loaded will also be the first one to be sold; this method is also used to set the products' expiry dates.

The drums can be divided into sectors with the following options: **6 - 12 - 18 - 24 - 36**; however, it is **NECESSARY** that the sectors are identical in the same drum, i.e. the entire drum with **6** or **12** sectors, and so on, having the same width.

The **FIFO** drum control must be enabled via SW, and then all is automatic; by pressing the buttons for the desired selection the drum rotates to the correct vending position and the slider opens automatically; the customer must pick up the product within the pre-set default time.

SHOPPER control allows the product to be picked up as desired from the drums programmed for such function. When pressing the **SHOPPER** button all drums are rotated through a special mechanism (see photo), except the ones programmed for **FIFO**, which stay still.



According to the drum partitioning, the mechanical stop for the automatic slider maximum opening must be adjusted manually. Move the stop to the correct position by loosening and tightening the fastening screw.

During a selection, the ratiomotor is activated, rotating the gear meshing with the rack, thus opening the curved slider along the guides.

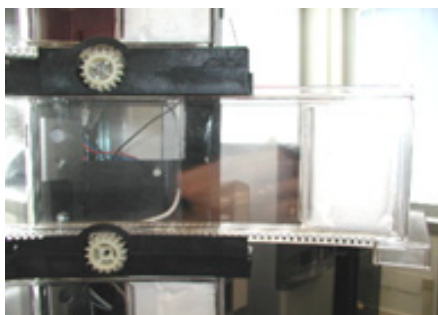
When the protrusion **A** hits the stop **B**, the motor torque increase causes an increase in current (mA) absorption and the SW, after analysing such absorption, stops the motor and sets the inverse rotation to close the slider.

In the case of SW malfunctions or short-circuit in the TRIAC, a thermo amperometric PTC protection connected in series on the motors' common conductor is triggered, and measuring a current that is higher than the expected one it heats up preventing the passage of current, causing the motor to stop.

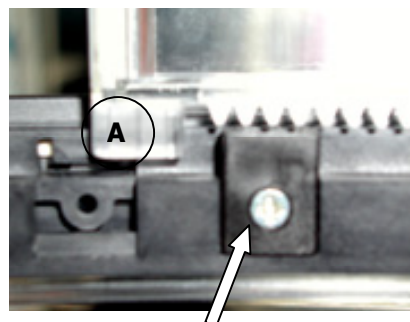
The system is self-resetting; therefore the problem to the board must be corrected as soon as possible.



**Detail of slider movement gears:
View from internal side**



**Detail of drum movement during
the opening phase**



**B Slider opening mechanical
stop: full open position**

The drums are controlled by means of the **"Stop assembly"**, having different functions and characteristics:

- Hold the drums still during stand-by
- Block the drums configured as FIFO during the shopper rotation (the drums are clutched against each other)
- Ensure the drums' origin position
- Compute the drums' partitions, permitting the perfect stop positioning

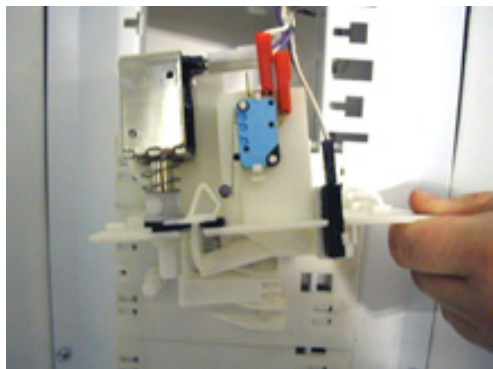
The drums can be removed from the support column by opening them into two halves (drawing 1)

The drums can be divided with partitions in various sectors (however all equal in each drum) (drawing 2)

The drums can be removed completely from the cabinet with a simple operation (drawing 3)

The entire drum assembly is rotated by a professional type ratiomotor powered with 230 V AC

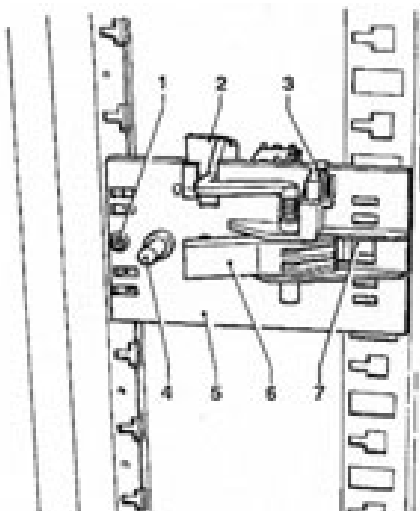
DRUM CONTROL SYSTEM COMPONENTS



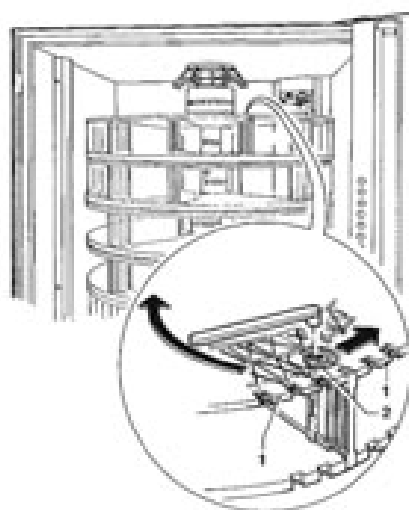
Counting unit, drum origin and stop in tilted position

- 1 – Fastening screw
- 2 – Separator counter lever
- 3 – Origin magnetic sensor (FIFO zero position)
- 4 – Stop magnet sliding pin
- 5 – Drum control device
- 6 – Anti-rotation lever
- 7 – Quick fastening hook

The assembly can be moved by undoing screw 1 and the quick positioning hook 7. Such movement is necessary when the drum height configuration is changed.



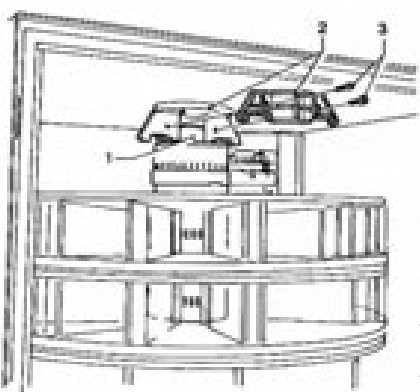
Counting unit, drum origin and stop in operating position



DRAWING 1

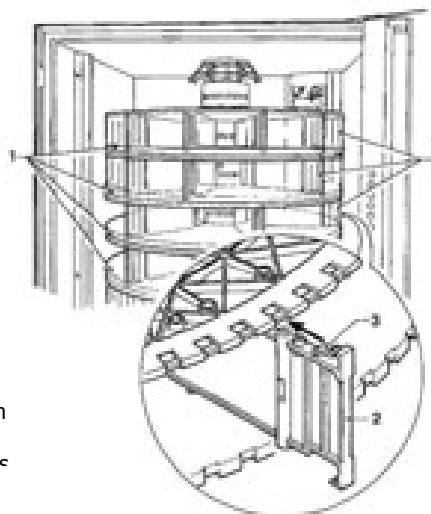
Rotate the lever to release the two drum halves lock

Then rotate the entire drum assembly 180° to remove a complete drum at the time.



DRAWING 3

Remove shell half 2 to extract the entire drum assembly, (because of the weight two persons are required) tilt at the entire assembly, easily extract it.



DRAWING 2

Release tangs 3 to change the width of the sector, extract and reinsert the tangs into the new position. For safety against theft some fastening point for screws have been provided.

4 - WIRING

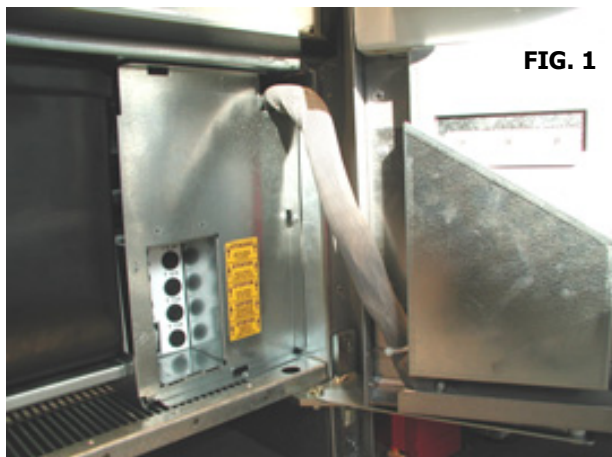


FIG. 1

The StarFood 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).

VIEW OF POWER SUPPLY UNIT WITH PROTECTIVE CASING CONNECTORS

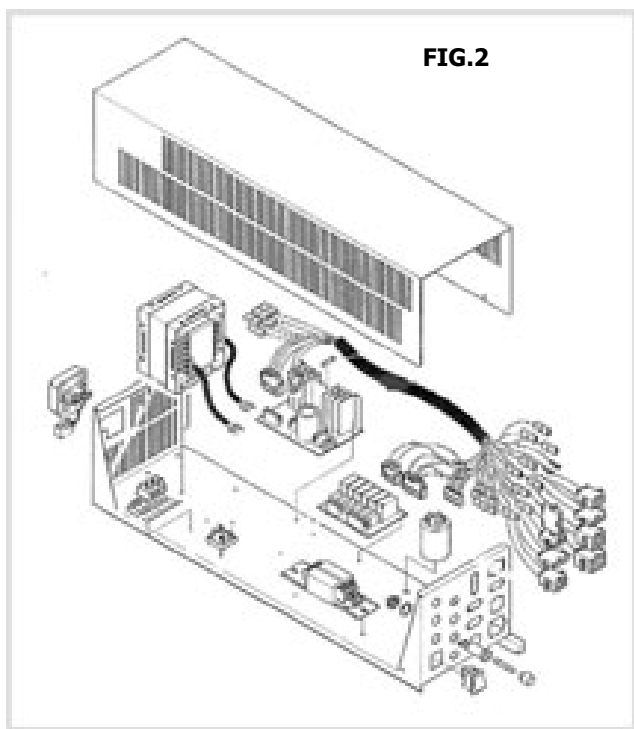


FIG.2

View of power supply main wiring

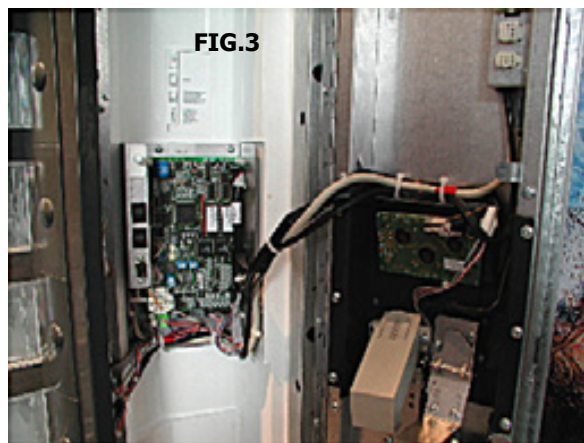
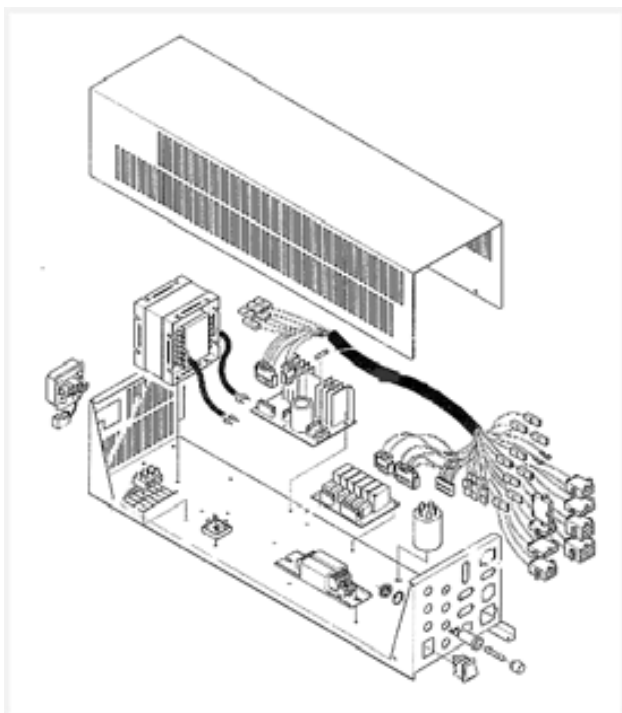


FIG.3

View of cables from the CPU board

5 – POWER SUPPLY



Exploded view of power supply unit

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.

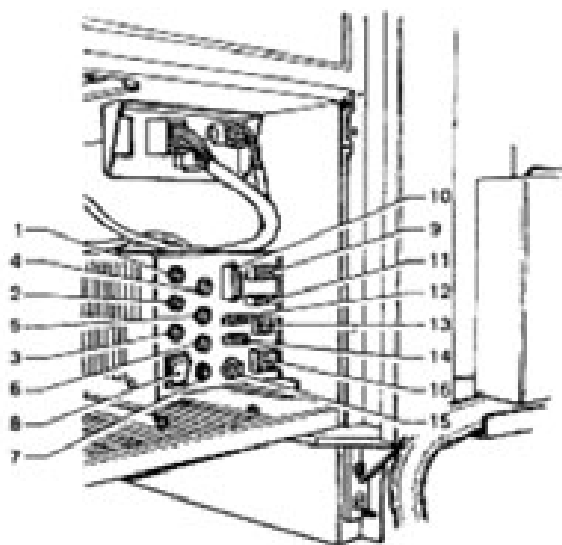
The input from the mains is protected with a main switch and two fuses on both phases.

It is also fitted with a noise suppressor.

The CPU boards controls also a relay card (6 relays) for the 230 V 50 Hz actuations.

Lamps, central ratiomotor, 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.

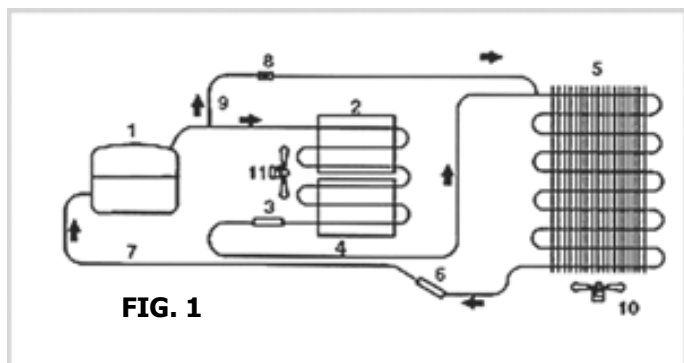


Detail of fuse and connectors

REF.	DESCRIPTION
1	Fuse on transformer primary winding: T 3.15 A
2	Fuse on Executive coin mechanism: T 3.15 A
3	24 V DC fuse: T 3.15 A
4	Fuse on heating elements: T
5	Fuse on drum magnets: T
6	Line fuse: T 15 A
7	Line fuse: T 15 A
8	Mains power supply switch
9	Connector for power supply to drum magnets and heating elements
10	Column's motor connector
11	Door lamp connector
12	Refrigerated box lamp connector
13	Coin mechanism and CPU power supply connector
14	Probes' connector
15	Cooling unit connector
16	Actuation board connector

6 – COOLING UNIT AND INTERNAL VENTILATION

A highly innovative cooling unit is used for the StarFood series, with unique features that make it stand out among the solutions normally used by the competition.



Operating diagram and refrigerating gas flow lines.

Under normal operating conditions, the gas exits condenser **2**, and through the capillary line **4** reaches and expands in the evaporator **5**, such expansion creates cold. Then the gas is sucked out by the compressor, which compressing the gas again re-creates the previous cycle, and so on until the pre-set temperature inside the refrigerated box is read by the probe that at this point stops the compressor.

During the defrosting cycle, set via SW, the solenoid valve **8** opens and changes the gas flow, delivering hot gas directly to the evaporator, thus speeding up defrosting.

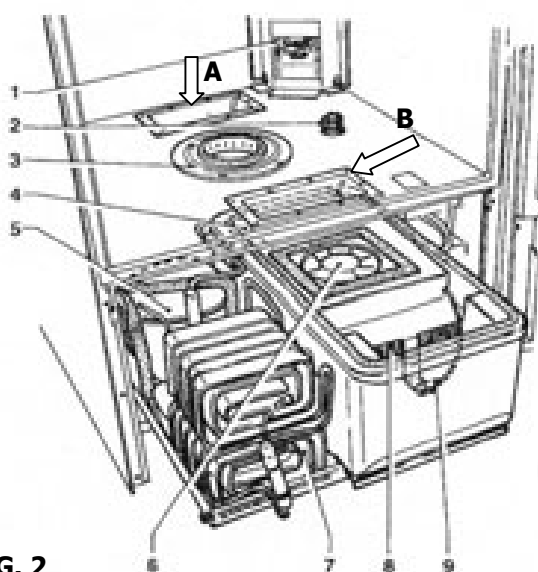
The internal temperature control is by means of an NTC type electronic probe fitted with an internal 2267-ohm resistance (± 7 ohm) at a temperature of 3° C.

As the internal temperature decreases the resistance is increased progressively as indicated in the following table.

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

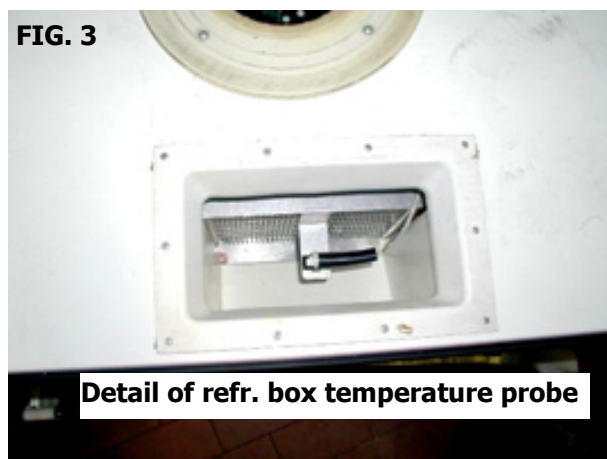
The unit is equipped with a hot-gas defrosting system controlled by an NTC probe, positioned on the evaporator, suction end (FIG. 3). When, during defrosting, the evaporator reaches a temperature of 4° C the defrosting cycle is stopped. The defrosting timing is set via SW, with repeatable cycles.

NOTE: the defrosting cycle is set to 6 hours by default.



Detail of cooling unit being removed

FIG. 3



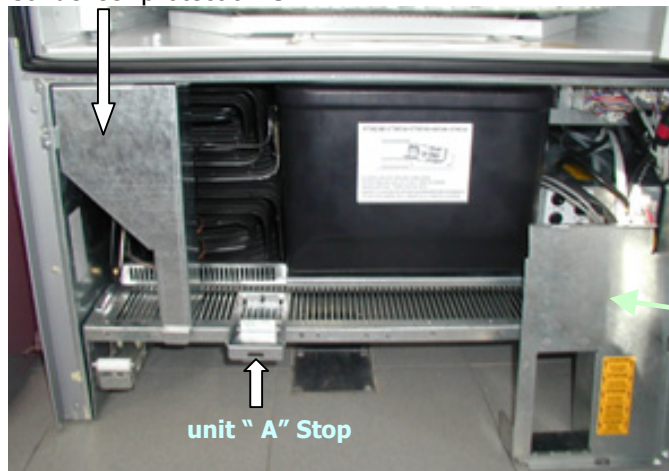
The evaporator is split to achieve better efficiency in distributing refrigerated air (see exploded view **B**), the condenser (**7**) is of the ... type with a spiral shape, also split to ensure better ventilation without needing periodical maintenance, as this solution is self-cleaning by means of the fan's action.

In addition, the entire unit is conceived as a "slide-in", very compact and will all components located in the same module.

It is therefore possible to extract and replace the whole unit in a few minutes (FIG. 2).

To disassemble the cooling unit follow the instructions indicated below:

Condenser protection **C**



Power supply unit casing **B**

To be able to slide out the cooling unit it is necessary to:

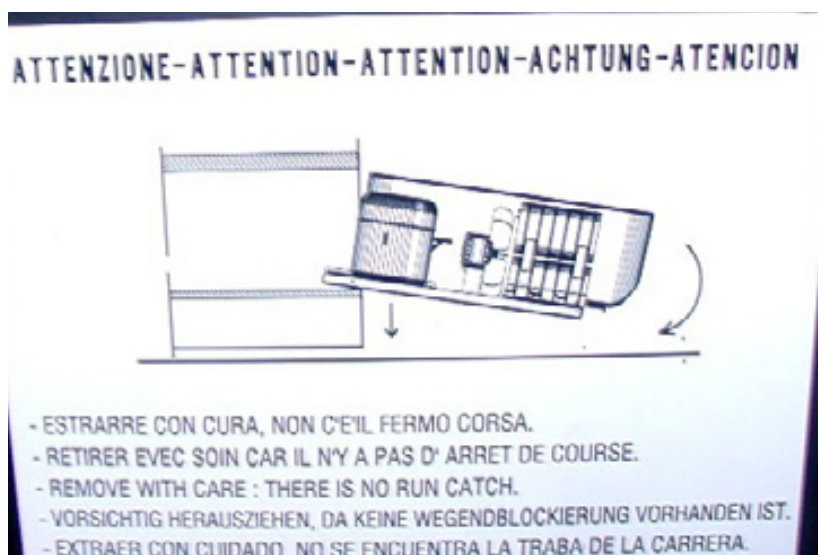
- 1) Remove the protective casing from the power supply unit **B**
- 2) Remove the protective casing from the condenser **C**
- 3) Remove the Stop from the unit **A**
- 4) Partially slide out the unit so that the wiring can be disconnected

The thermal break between the hot zone of the unit and the refrigerated box occurs through a slight interference between the seal and the bottom of the box.



Condenser casing fastening screw

Cooling unit stop screw



Pay attention when sliding out the unit, as it needs to be rested onto a pallet for easier handling.

The unit is reassembled in the reverse order of disassembly.

VERTICAL SECTION OF THE REFRIGERATED AIR CIRCULATION INSIDE THE CABINET

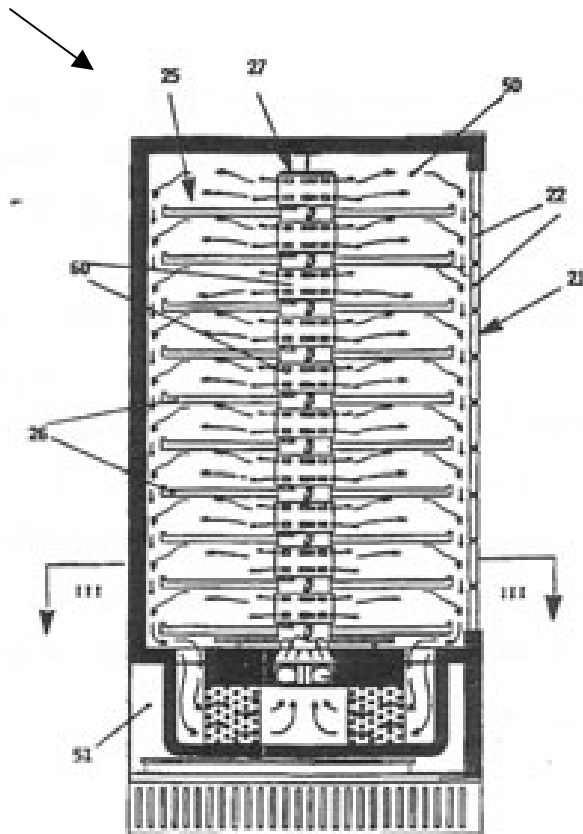


FIG. 2

Description of the internal ventilation operation

The axial fan **6** (FIG. 2) sucks the refrigerated air through the double evaporator (the air is taken by the 2 slots **A-B** positioned at the base).

The air is conveyed and forced inside the drum column's hollow and pushed out through a series of holes (**60**) located evenly at the centre of each drum (**26**) and at the centre of each sector. This way the temperature is uniform in each drum and each sector, as programmed in the **SW**, therefore if 3° C is set in each sector there will be 3° C ($\pm 1^\circ$ C).

Some competitors have used this solution already for some time, but it is not suitable if both Food and Snack products are to be dispensed by the same vending machine.

The solution conceived by **NECTA** allows also a differentiated internal temperature setting.

By suitably rotating the circular sectors positioned on the column, the slots at the height of each drum, where air flows out, can be closed.

If blocking off the refrigerated air flow into the drums filled with products that do not need refrigeration (e.g. snacks) the temperature will increase until achieving the value indicated in diagram **A**.

While the temperature in the lower part corresponds to the programmed temperature, the one in the upper part will be a direct consequence and is not controlled.

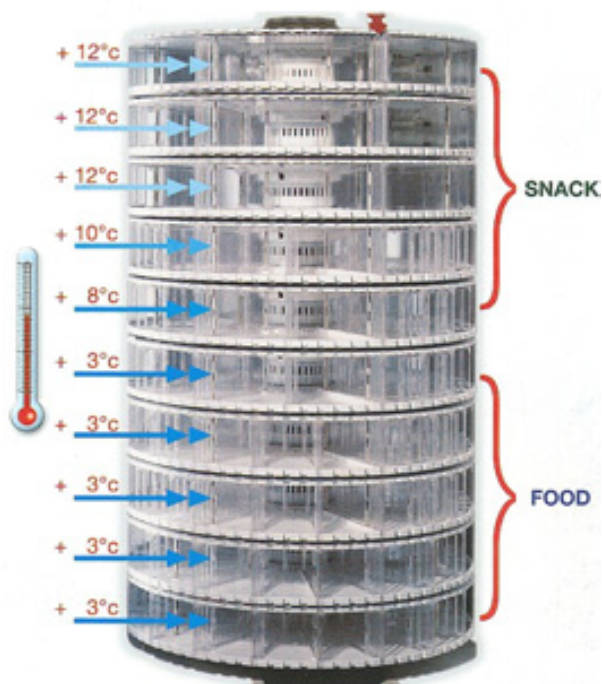
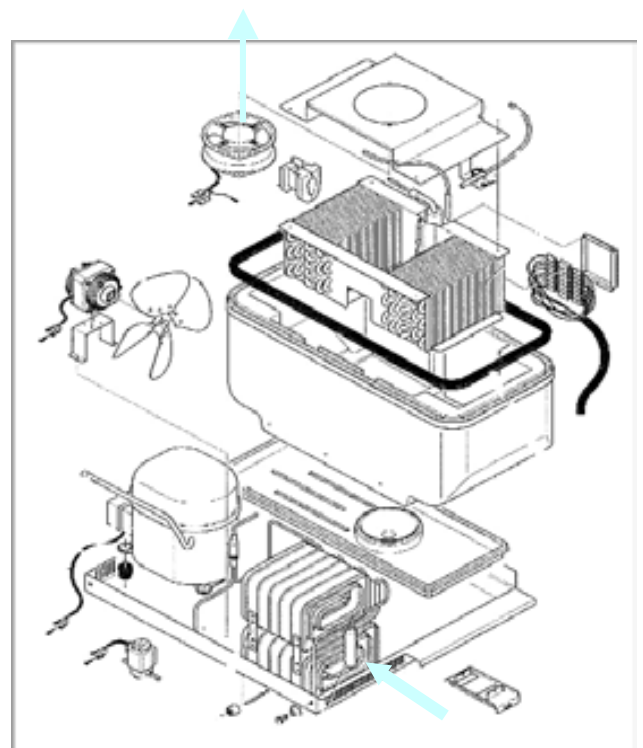


Diagram A: temperature achieved with a differentiated temperature setting

Important! Always have the lower drums with "food" temperature setting, therefore never needing to be completely closed (cold airflow closed off).



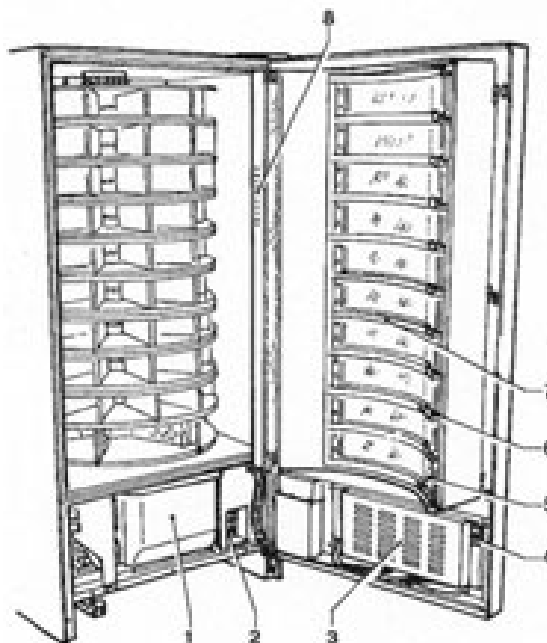
Exploded view of cooling unit

7 – CABINET

The cabinet is made with pre-varnished sheet-metal, assembled with rivets and different type of reinforcements; polyurethane foam insulation, made with R134 A gas (safe for the ozone layer), is placed between the external pre-varnished sheet-metal skin and the internal skin.

As well as providing optimum insulation the foam contributes to the stiffness of the structure.

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. The hinges are very sturdy and reflect the logic of C & B vending machines.



8 – DOOR

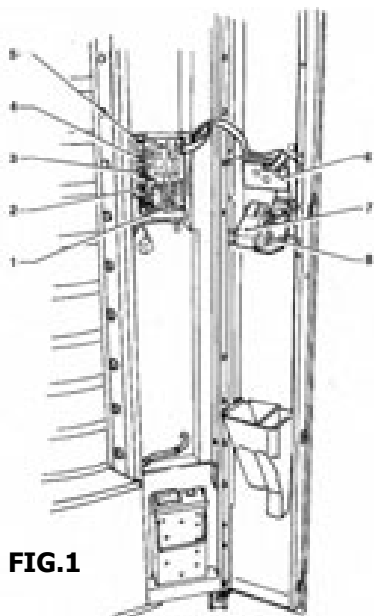


FIG.1

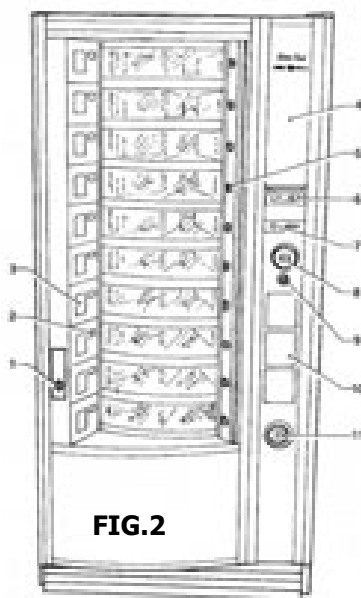


FIG.2

The door is of isolated double-glazing type, fitted with a smaller door to access the payment systems and the CPU board. FIG. 1.

The door is divided into various sliders; each slider is fitted with a selection button and display for prices. (FIG 2)

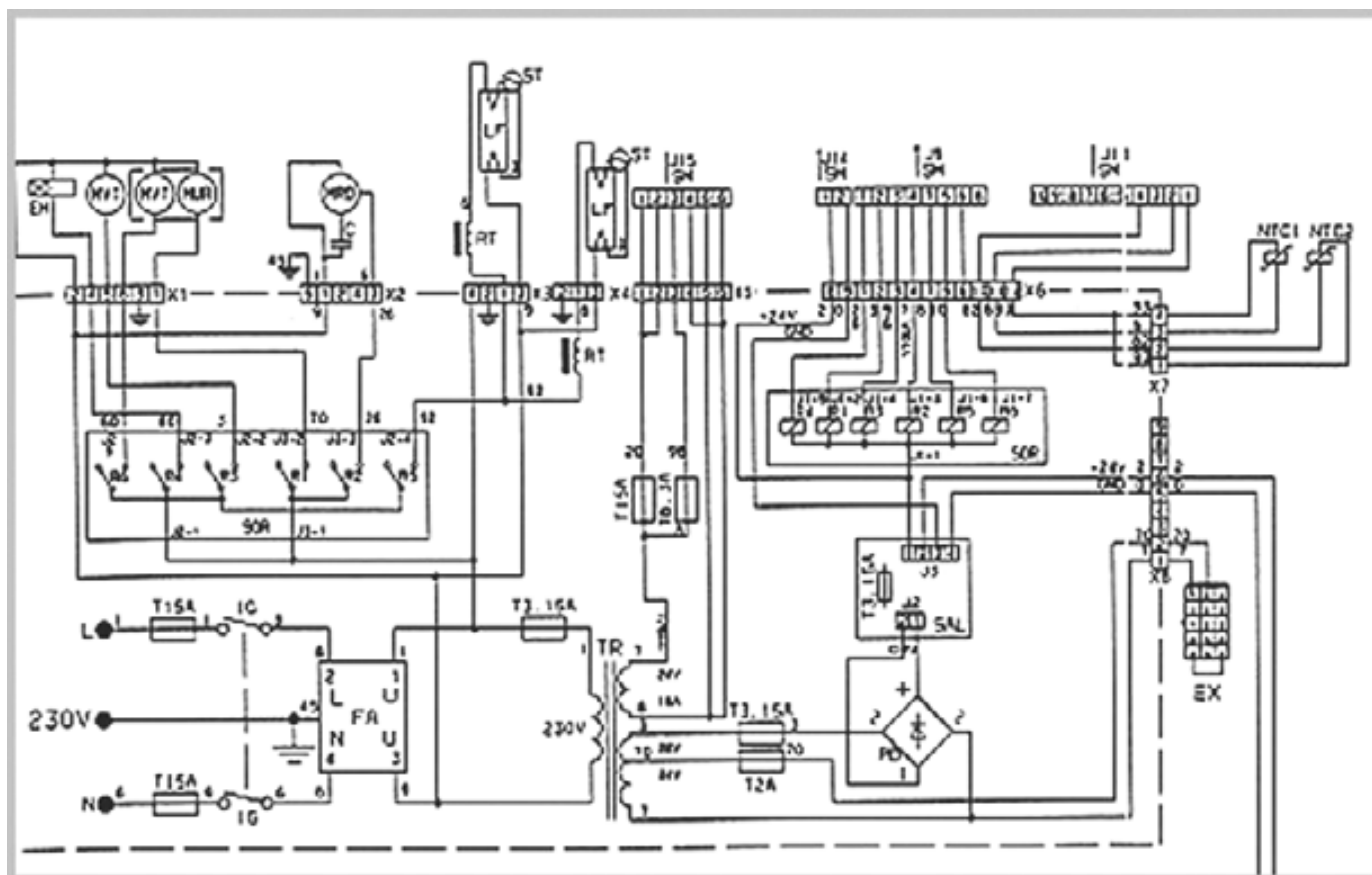
The following are located on the payment system door: main display, coin-slot and coin-return button, the Shopper button and the lock, ensuring a 3-point lock.

The main door is closed with a lever-type lock, controlling a rod for two-point lock. When opening the main door, a microswitch is triggered, setting the machine to loading with the door open.

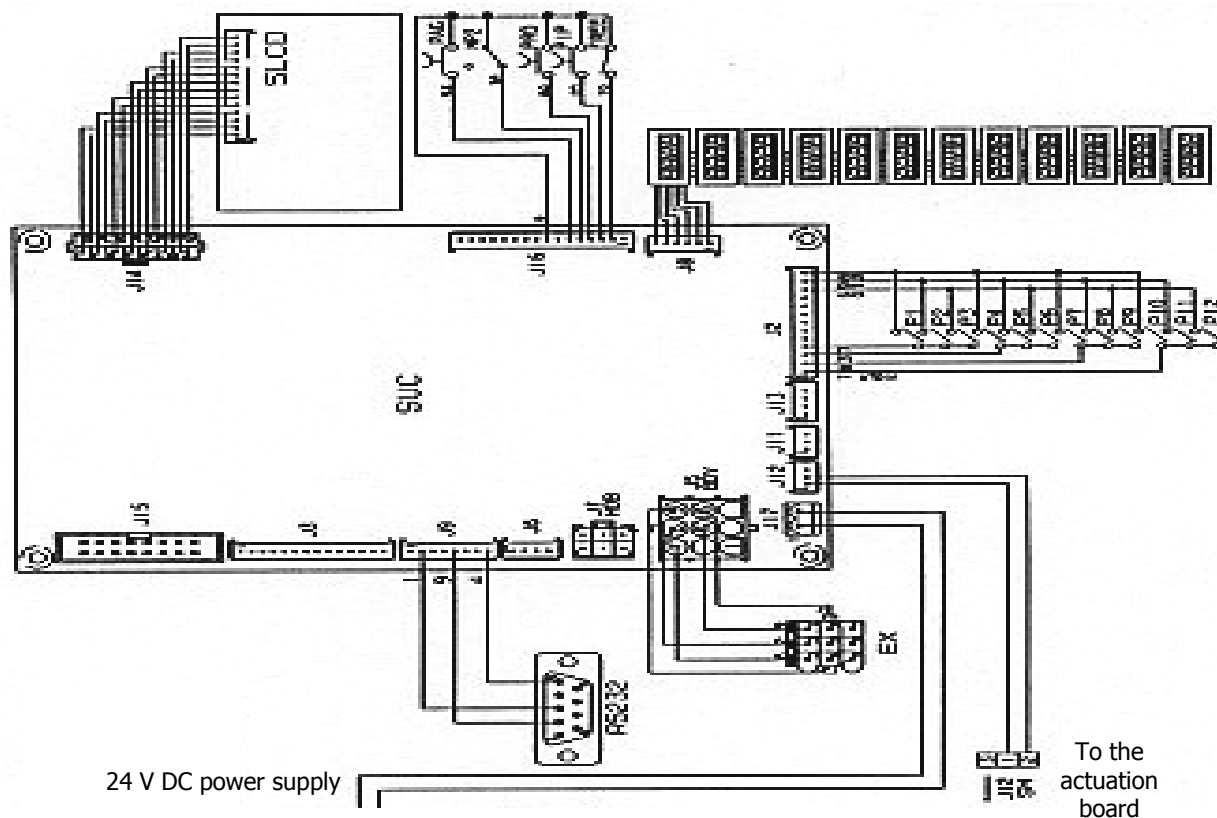
The payment system compartment door is also fitted with a microswitch, which activates the loading with door-closed function, or it allows access to programming.

9 – WIRING DIAGRAMS

POWER SUPPLY AND LIGHTING DIAGRAM



CPU CONNECTION DIAGRAM (SUC)



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 NTC triggered. Failure to the hot-gas defrosting solenoid valve. Obstruction in the rear grille.	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 the correct actuation of the solenoid valve. 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 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.	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.
The display indicates the message: "Probe"	The temperature control probe in the refrigerated box is of the PTC 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 -11° 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 +41°C).	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.
The display indicates the message: "Machine board"	The CPU board and the machine board (actuators) exchange data during the entire vending machine operating time. If there is no such communication, the machine locks and the selections are disabled. Check the CPU board function and the connection cables. Check the actuation board function, check the SW updating for both boards.	Replace the CPU board with a bench tested one that is certain to work; if the malfunction persists replace also the actuation board, if the still malfunction persists replace the cable or check for the suitability of the connections. The machine was designed in compliance with the EMC directive, however if placed in an area with high interference immunity problems could be caused; therefore in the event of such problem, try moving the machine to a new location.

Problem (and/or indication on the display)	Possible cause	Solution
The display indicates the message "Gas temperature probe"	The temperature control probe on the evaporator, for defrosting, is of the NTC type, with the internal resistance that changes as the temperature changes. If the probe is interrupted defrosting is also stopped; if the probe is short-circuited the vending machine locks and the selections disabled.	The SW monitors the probe's internal resistance, therefore in the event of an interruption the malfunction is detected immediately; in this case, check that connection is correct and then replace the probe with one of the same type. In the event of short-circuit, the probe indicates an excessive temperature, therefore the SW disables all selections.
All sliders do not open	The sliders' ratiomotors are protected both at a SW level and at a HW level. However, in the event of a failure to a motor activation TRIAC, the PTC amperometric sensor is triggered, blocking all motors.	Check that the PTC was triggered, if that is the case replace the TRIAC for the relevant actuation or the entire board; the problem should be corrected. The PTC system is self-resetting; therefore until the problem is corrected the system will be activated and deactivated cyclically, without anyway causing any safety problems.
The display indicates the message "Slider failure"	When activated, the current absorption (in mA) of the slider opening/closing control ratiomotor is monitored by the CPU. If during the opening actuation the absorption is zero or higher than expected and programmed in the SW the power supply is disconnected and the relevant selection disabled. This problem could occur also after replacing the ratiomotors with non-original ones.	Check the connections to the ratiomotor and ensure that the correct voltage reaches the connectors (24 V DC). If all correct, replace the ratiomotor with an original one. In the event of excessive absorption, the problem could be due to an excessive sliding effort; remove the motor and manually operate the slider, which should slide smoothly and with no effort. Remove the motor and check the no-load and load absorption using a precision digital multimeter (0-300 mA), the max no-load absorption must be ... max load absorption ... Check the functioning of the motor actuation relay K1-K12.
The display indicates the message "Slider open"	When closed the slider triggers a limit microswitch. In the event that, due to a mechanical block, it is not closed completely or in the case of interference by an object or by the customer's hand, the ratiomotor absorbs a greater current in mA than the one programmed in the SW, therefore it stops against the obstacle and opens completely; if after three consecutive attempts the problem is closing persists, the machine is disabled.	Ensure that the problem was not due to a blockage or interference. Otherwise check the functioning of the microswitch using a multimeter and if necessary replace. If the problem is not due to an accidental blockage or with the microswitch, check the circuit to the board.

Problem (and/or indication on the display)	Possible cause	Solution
The display indicates the message "Drum failure"	A magnetic sensor called "origin" detects the angle positioning of a drum; the positioning of a sector is detected by a spacer that triggers a microswitch after the product in such sector is sold. If after a complete rotation the "origin" magnetic sensor is not triggered, or if after a vend from a sector the microswitch is not triggered, the selection is disabled.	Check that when in the origin position the drum "triggers" the magnetic sensor; if not, check that the sensor and receiver are aligned, otherwise realign the components. If after this operation the problem is still unsolved, check the functioning of the microswitch that must be triggered each time a sector moves one position. Then check the functioning of the drum stop magnet, and more specifically that the safety klixon was not triggered (self-resetting type).
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). There is also a main switch.	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 slider closes too quickly	The factory default setting is for a maximum wait time of 10 seconds before starting to close. If the closing time is shorter, check the parameter setting for the slider function.	In programming mode scroll through the menu items until displaying Drum/sliders, confirm and select slider parameters, check the time setting; if necessary increase up to the maximum setting using the up and down arrow keys.
The drums continue to rotate also after the shopper button is released or it does not rotate when the button is pressed	The drums can be programmed for "FIFO" or "Shopper" vending. In the case of drums programmed for FIFO, such drums must stay still when the Shopper button is pressed. In the case of a drum programmed for Shopper, the drum must rotate when the button is pressed and stop when released.	Check the functioning of magnets. Check the functioning of the "ORIGIN" magnetic sensors. Check the functioning of the SHOPPER button. Check the functioning of the TRIAC on the actuation board, check the functioning of the sector positioning microswitch.
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.	Check the functioning of the neon lamps and of the starters. Check the functioning of the 230 v AC power supply SOR board.
The sliders fog-up considerably	To prevent the sliders from fogging up, due to the temperature and humidity difference between inside and outside, special heating elements are provided on each slider.	Check that the heating elements work and that the relevant actuations are efficient (relay K13).
A sector programmed for FIFO is empty	Drums that are programmed for FIFO must be filled with the FIFO logic, therefore all drums must be full.	Check that the drum stop works correctly and that there were not loading mistakes.
The display indicates the message: "Loading" or "Loading with door open" The doors are closed correctly	Closing of the CPU and payment system compartment door is monitored by a microswitch that when is not triggered sends the signal for "LOADING". The main door is monitored by a microswitch that when is not triggered sends the signal for "LOADING WITH DOOR OPEN".	Check that the microswitches are triggered correctly; check the cables are not damaged or disconnected. Replace microswitches and/or 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.

CLEANING THE MACHINE

Carefully observe the following cleaning instructions! Considering that:

The **StarFood** normally dispenses packaged products; however it can be enabled to dispense food products that **ARE NOT** packaged, and in this case cleaning must be stricter.

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

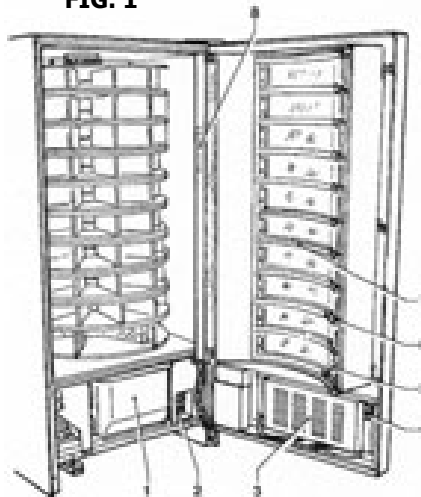
- Clean the machine, preferably at the end of the day or in the morning before the machine is used, and before loading the products to be sold.
- Fill in the checklist log for cleaning operations.
- When the display indicates an error message immediately check the trouble-shooting sheet.
- Use only recommended 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 inside of the sliders with a damp cloth soaked in chlorine-based detergents.

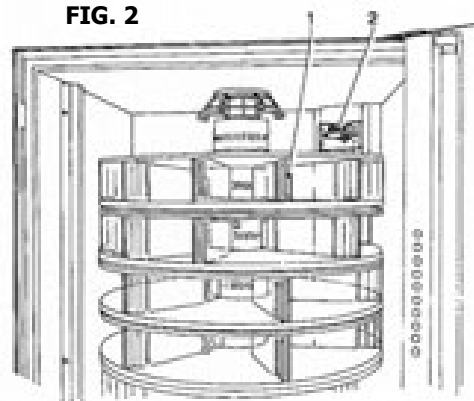
Clean the surface where the product are place using a clean cloth (before loading the products in the morning)

(FIG 2)

Dust all of the inside of the refrigerated box, especially the base.

Enter the operation in the HACCP log.

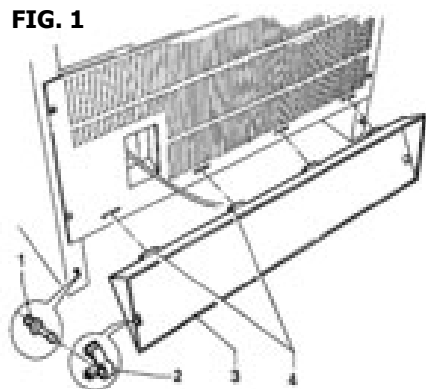
FIG. 2



WEEKLY CLEANING AND HYGIENE

(Expected time 6 min.)

FIG. 1



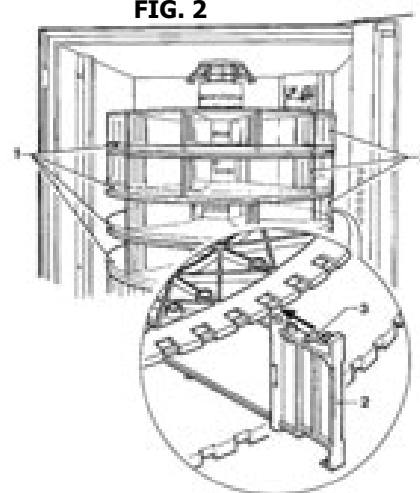
In addition to the daily cleaning operations:

clean the rear grille with a brush and if necessary the inside of the conveyor.

Vacuum clean any dust (**FIG. 1**)

Clean the support surface of the drums and make hygienic.

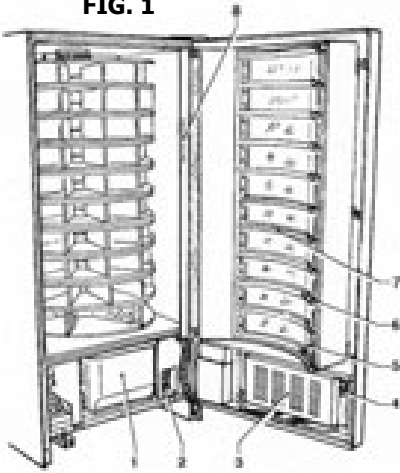
FIG. 2



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**) Completely remove the drum column (**FIG. 2**) doing as indicated.

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**)

Clean the internal conduit of the drum column.

Reinstall the drum column into its operating position.

Clean all internal parts of the drum sectors, especially the partition walls (**FIG. 5**).

Reinstall the cooling unit (**FIG. 3 – 4**).

Reinsert into the operating position.

Clean the external parts, especially the coin-return compartment and the push-buttons (**FIG. 6**).

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

Load all vending products.

FIG. 2

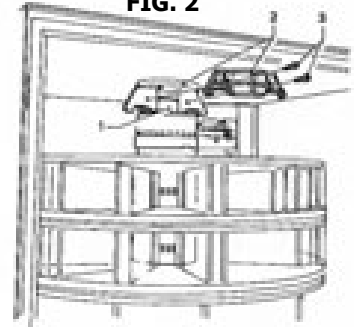


FIG. 3

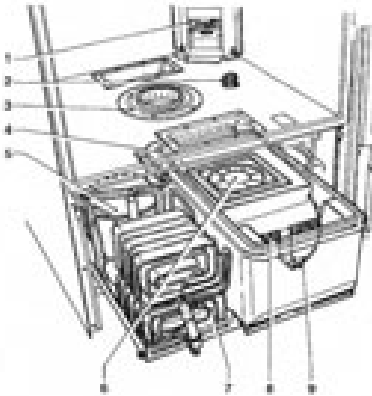


FIG. 5

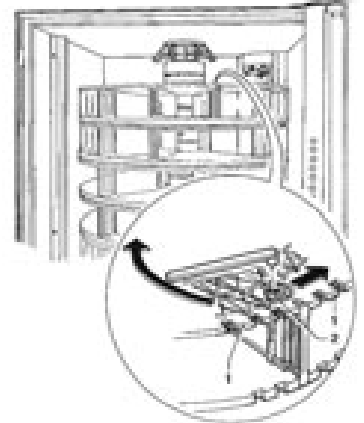


FIG. 4

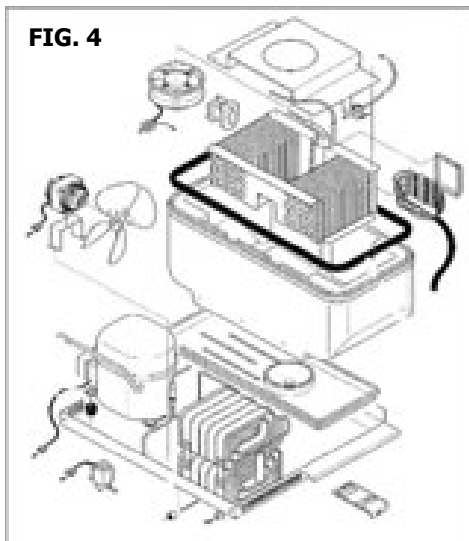
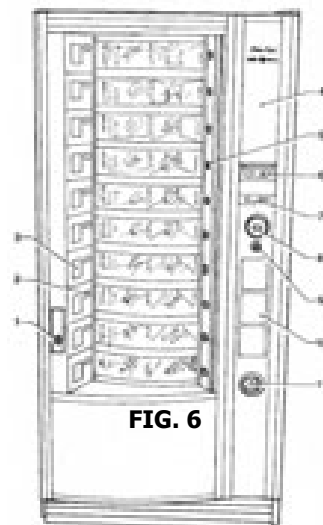


FIG. 6



NB: Annual cleaning should be done at the vendor's, as some operations are more complicated and therefore requiring the service of qualified technicians