

ROTARY 7S U.L.

INSTRUCTION MANUAL

115V~ 60Hz

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Figure 1

ROTARY COOLER

Doc. E32640

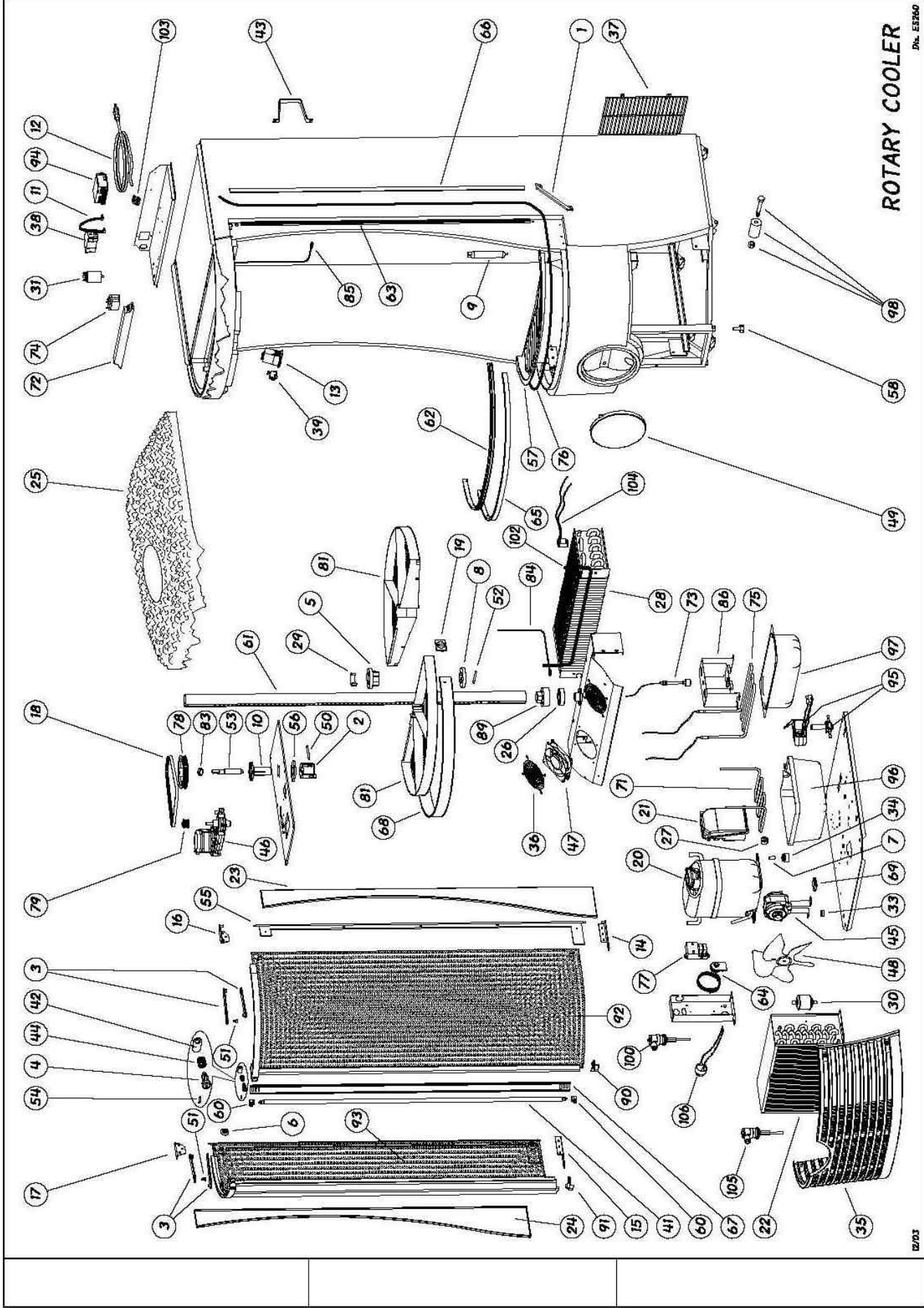
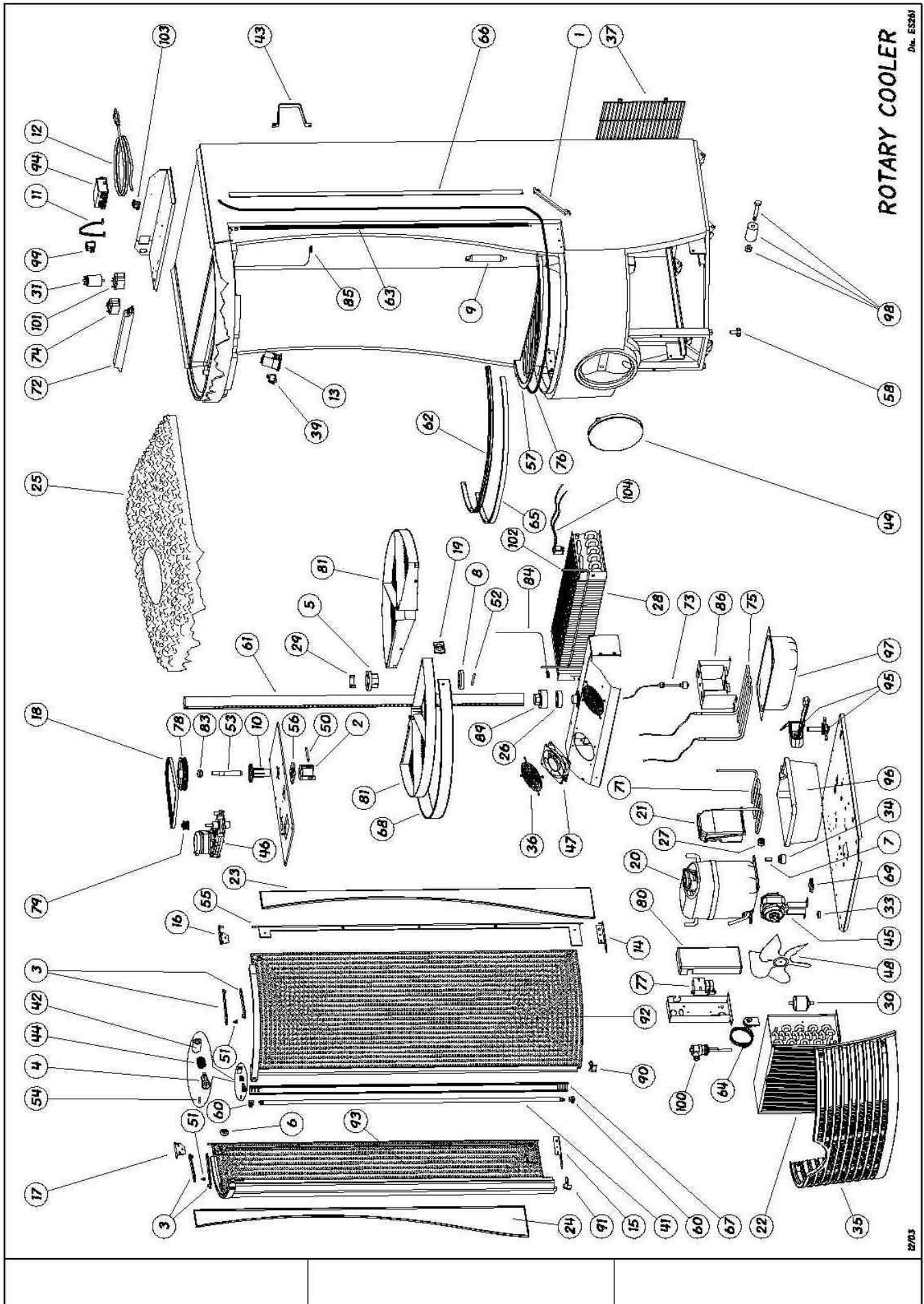


Figure 2

12/03



ROTARY COOLER

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Figure 3

1 FUNCTIONAL DESCRIPTION OF THE UNIT

1.1 FOREWORD

The ROTARY 7S model is a vertical open display cooler with rotating shelves, capable of pulling down product temperature to 38 °F (3.3 °C) in a certain time prescribed by the specific climate class.

An electronic controller takes and displays the internal temperature, operates the thermostatic cycle of the compressor, controls the efficiency of the refrigerating circuit and is programmed to periodically defrost the evaporator by way of an electrical heater. The water resulting from defrost is conveyed to a collecting tray located in the compressor compartment and automatically evaporated.

A lighting system, made by 2 fluorescent tubes located vertically on the 2 glass doors, illuminates the product, inside the cooler.

It is possible to show an illuminated brand mark, placed in the bottom front of the cabinet.

1.2 REFRIGERATING CIRCUIT DESCRIPTION

Fig. 2 and 3 show the exploded drawing of the unit. In the following description every component will be identified by its code in the wiring diagram in sec. 5.1 and by its number on the exploded drawing.

1.2.1 THERMODYNAMIC CYCLE

The refrigerating cycle used by Rotary 7S is by gas compression. With reference to the wiring diagrams in section 5.1 the main components are:

- Compressor (CO) (20) and compressor relay (RC) (101);
- Stainless steel tube for water evaporation (71);
- Defrosting relay (RS) (74), water evaporation heater (RVR) (75) and safety thermostat (KFS) (104);
- Condenser (22) and condenser motor fan (MC) (45+48);
- Dryer (30);
- Cut off valve (VM) (95);
- Capillary tube as expansion device;
- Evaporator (28) and evaporator motor fans (MI) (47);
- Liquid splitter (9).

The refrigerant used is R404a, CFC e HCFC free.

1.2.2 TEMPERATURE CONTROL

The inner temperature control is made by the electronic controller (CE) (13) acting directly on the cut off valve (VM) (95) and indirectly on the low pressure switch (PBP) (100), both located in the compressor compartment.

Using keys on the electronic controller display the set point temperature can be adjusted by the user, if the controller is programmed to do so (by factory default the controller is locked to the end user). When the inner temperature reaches the set point value, the compressor (CO) (19) and the condenser motor fan (MC) (22+25) control L.E.D. by the low pressure switch (PBP) (100) stop, making the temperature rise. When the programmed differential value is reached they start again and the pause duration depends on the ambient temperature and on the quantity of product stored inside the unit.

1.2.3 DEFROSTING CYCLE

During cooling, the humidity present in the air deposits on the evaporator, making heat exchange more difficult.

In order to solve this problem an automatic defrosting system periodically melts the ice on the evaporator using an electrical heater (REV) (102). The accumulated water is firstly collected into the plastic tray (96), where a stainless steel tube connected to the high pressure line of the compressor warms it up, and subsequently into the stainless steel tray (97), where the electrical heater (RVR) (75) activated by the electronic relay (RE) (77) controlled by the level sensor (ILA) (73) provides its evaporation.

The defrosting cycle is enabled by the controller (CE) (13) every 6 hours, and has a maximum duration of 20 minutes: during it the evaporator motor fans run, in order to help the ice melting on the evaporator.

1.2.4 OTHER FUNCTIONS

In abnormal ambient or working conditions, it is possible that an excessive ice formation on the evaporator will take place. The controller (CE) (13) will start the “Anti-Freeze” function, which monitors the compressor’s continuous running time. If this time is greater than 1 hour the compressor is stopped for 7 minutes.

1.3 ELECTRICAL WIRING DESCRIPTION

The electrical wiring drawing SE0311/02 of ROTARY 7S is shown in section 5.1. Refer to that drawing during the following description.

The Rotary Electrical Wiring (EW) can be divided in the following sections:

- *Compressor compartment EW;*
- *Inner tank EW;*
- *Doors EW;*
- *Top cabinet EW.*

The *compressor compartment EW* takes the supply from the *Top cabinet EW* and gives it to the compressor (CO) (2) and relative electrical accessories located in the box (21), to the condenser motor fan (MC) (45 and 48), to the low pressure switch (PBP) (100), to the “cut off” valve (VM) (95) and to the water evaporation system made of: water evaporation heater (RVR) (75), level sensor floating switch (ILA) (73), electronic relay (RE) (77) and safety thermostat (KS) (64).



Figure 4

The *Inner tank EW* takes supply from *Top cabinet EW* and is located in the lower part of the inner tank (Fig. 4) enclosed by the evaporator cover panel (marked with “1”), by the motor fan support panel (marked with “2”) and by the tank plastic cover (marked with “3”); it gives the supply to the evaporator motor fans (MI) (47), to the evaporator heater (REV) (102) and to the end of defrosting thermostat (KFS) (104).

The *Doors EW* gives supply to the tank vertical fluorescent tubes (LV) (41) 28W rated, located inside the door side profiles and covered by the light covers (67).

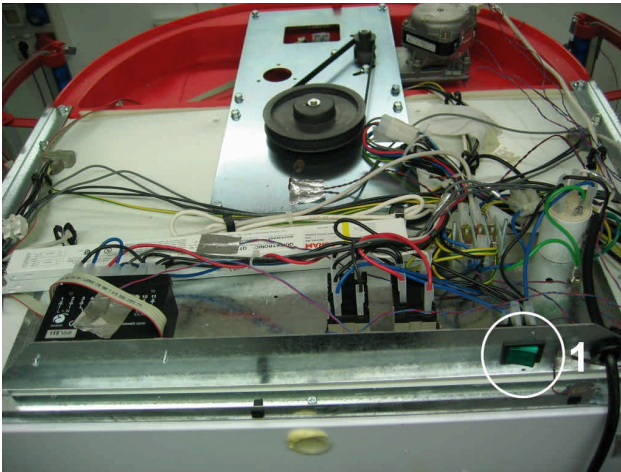


Fig. 5 (standard bi-polar lighting main switch)

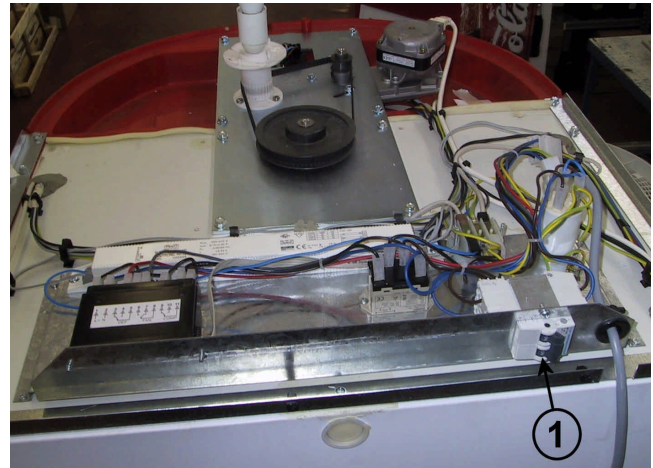


Fig. 6 (circuit breaker main switch)

The *Top cabinet EW* is the main wiring and gives supply to all wiring sections and is located at the top cabinet, enclosed by the top cover (25).

It's made up of:

- *Electrical components support base plate* (Fig. 5 e Fig. 6);
- *Motor gear for shelves rotation* (Fig. 5);
- *Controller and light switch support plate* (Fig. 7).

On the *Electrical components support base plate* you will find:

- Power cord with plug (CS) (12) and relative strain relief (103);
- filter for EMC (FRF) (31);
- Main switch (IG) (99);
- Electronic ballast for lamps supply (R2) (72);
- Controller power unit (UP) (94);
- Wires terminal board;
- Compressor power relay (RC) (101);
- Defrosting relay (RS) (74).

The *Motor gear for shelves rotation* is consisting of:

- Rotation Motor (M) (46) with gear box;
- Driving spool (79);
- Driving belt (18);
- Gearwheel for shelves rotation (78);
- Articulated transmission joint.

On the *Controller and light switch support plate* you will find:

- Light switch (IL) (39);
- Controller master unit with temperature display (CE) (13) (fig. 7).

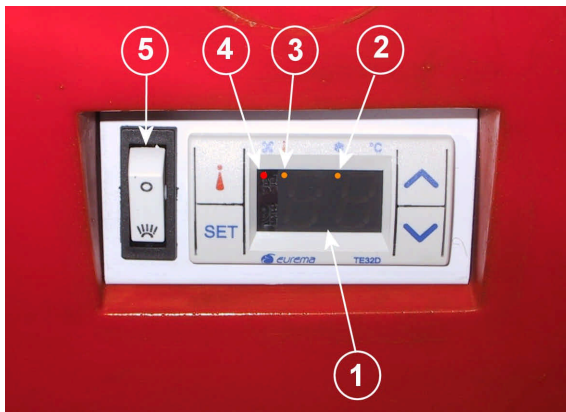


Figure 7

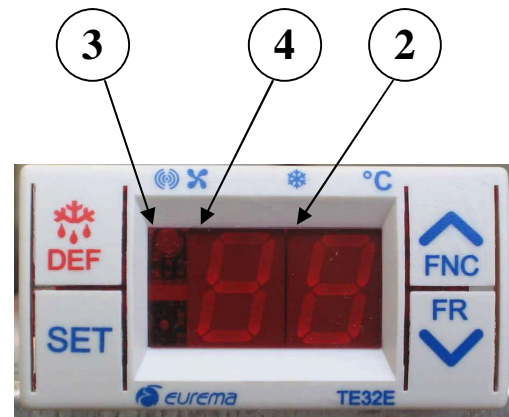


Figure 7a - TE32E model

1.3.1 ELECTRICAL WIRING FUNCTIONALITY

A power cord with USA plug (CS) (18) rated 15 ampere allows the connection to main electrical net 115 Volt rated.

By the main switch (IG) (99), located in the top back of the unit, the cooler can be disconnected from supply.

By the light switch (IL) (39), located on the *Controller and light switch support plate*, the tank illumination can be switched on or off.

In order to comply to EMC directive, a capacitive filter (FRF) (31) is adopted.

The temperature regulation, evaporator defrosting and evaporation of condensate are automatically controlled.

1.3.2 COOLER'S MAIN COMPONENTS

The refrigerator's main devices can be divided into 4 categories:

- Control devices;
 - Safety devices;
 - Driving devices;
 - Functional devices;
 - Sensor and signalling devices.
- To the first category belong devices getting any signal and converting it in an electrical signal for driving devices;
 - The Safety devices provide for the safety of the unit in abnormal conditions;
 - To the third category belong devices getting the electrical signal from the control devices and permitting the enabling/disabling of the functional devices;
 - The functional devices are those necessary to make the specific functions;
 - The sensor and signalling devices measure a physical quantity and give any signal to the control devices or to the user, in order to identify the state of the system.

Control devices

- Electronic Controller Master Unit (CE) (13). It performs the following functions:
 - Product temperature regulation: this function is indirectly fulfilled by periodically switching on and off the compressor (thermostatic cycle). In order to perform this function, the temperature probe gets the internal temperature and informs the controller.
 - Evaporator defrosting: every 6 hours this function is enabled for a maximum duration of 20 minutes. The compressor is switched off and the evaporator heater is enabled to melt the ice formed. The end of defrosting probe gets the evaporator temperature and switches off the evaporator heater when ice is completely melted, reducing the time

necessary for defrosting to the minimum. The number of defrostings per day, and their duration, are programmable and can be modified at any time if necessary.

- Evaporator motor fans control (MI) (47): they are enabled only if the evaporator has already reached the right working temperature.
- Low Pressure Switch (PBP) (100): it directly controls the compressor switching on and off and permits the enabling of the evaporator heater during defrosting.
- Water level floating switch (ILA) (73): it controls the water level in the stainless steel tray and drives the electronic relay (RE) (77);
- Main switch (IG) (99): enables the functioning of all devices.
- Lights switch (IL) (39): enables the functioning of the tank lights.

Safety devices

- End of defrosting thermostat (KFS) (104): it monitors the evaporator temperature and enables the functioning of the evaporator heater (REV) (102). As a safety device it shuts off the evaporator heater in case of overheating.
- Water evaporation safety thermostat (KS) (64): it monitors the water heater (RVR) (75) temperature and shuts off the water heater in case of overheating. A pushbutton is present in case of overheating for thermostat reset.
- High Pressure Switch (PAP) (105): when present protects the compressor too high condensing pressures.

Driving devices

- Controller power unit (UP) (94). Connected to the Master unit by the connecting flat cable (11) and drives the following devices:
 - Cut off valve (VM) (95): it stops the refrigerant flow to the evaporator every time the compressor must be switched off.
 - Defrosting relay (RS) (74): at any defrosting cycle it allows the functioning of the evaporator heater.
 - Evaporator motor fans (MI) (47): are enabled only if the evaporator has already reached the right working temperature.
- Defrosting relay (RS) (74): it enables the evaporator heater (REV) (102);
- Cut off valve (VM) (95): it cuts off the refrigerant flow to the evaporator and indirectly acts on the compressor (CO) (20) through the low pressure pressostat (PBP) (100);
- Compressor relay (RC) (101): it drives the compressor on and off according to the signal coming from the low pressure pressostat (PBP) (100);
- Electronic relay (RE) (77): it switches the water heater (RVR) (75) on and off according to the signal coming from the level sensor floating switch (ILA) (73). In order to avoid too frequent cycles, due to vibrations of the water level, it performs a 1 minute delay of response with respect to the floater signal.
- Lights ballast (BA) (72): it gives supply to the vertical fluorescent tubes.

Functional devices

- Compressor (CO) (20): pumps up refrigerant pressure in order to permit the state variation in the condenser (22);
- Condenser motor fan (MC) (45+48): permits the refrigerant state change in the condenser and fulfils the compressor cooling;
- Evaporator motor fans (MI) (47): they perform the internal air circulation and its cooling through the evaporator;
- EMC filter (FRF) (31): it cuts electromagnetic noise;
- Motor gear: by the driving belt (18) it puts in rotation the shelves support shaft (61);
- Inner lights (LV) (41): they are 2 fluorescent tubes T5 type (o.d. 16 mm) 28 W rated;
- Cabinet frame heater (RCA) (76): it avoids condensation on the external part of the cabinet exposed to the cold air circulation;
- Evaporator heater (REV) (102): it gives the necessary heat to defrost the evaporator (28);

- Water heater (RVR) (75): it performs the condensate evaporation in the stainless steel collecting tray (97).

Sensor and signalling devices

- Evaporator probe (H) (84): It monitors the evaporator temperature and send a signal to the controller master unit (CE) (13);
- Temperature probe (I) (85): it monitors the cooler's inner temperature and send a signal to the controller master unit (CE) (13);
- Master Unit Display: it integrates the following devices (see section 5.1):
 - Digital thermometer (marked with "1" in Fig. 7): it shows the cooler internal temperature and informs the user on the state of the cooler using special codes;
 - Compressor L.E.D. (marked with "2" in Fig. 7): it informs on the compressor's (CO) (20) state; it lights when the compressor is running, is switched off with compressor off and is flashing when the compressor is on stand-by;
 - Evaporator motor fans (MI) (47) light (marked with "3" in Fig. 7): it informs on the evaporator motor fans state (MI)(47); it lights with fans running, is switched off with fans off and is flashing when fans are on stand-by;
 - Alarm L.E.D. (marked with "4" in Fig. 7): flashing during a "warning phase", lit during an "alarm phase"and switched off in normal conditions.

1.3.3 ILLUMINATION

The cooler is provided with 2 fluorescent vertical tubes (LV) (41) 28W rated T5 type (o.d. 16 mm) located on the external side of the doors. For wiring and component description see section 4.

The lights are wired to the light switch (IL) (39) located on the top tank enclosure (Fig. 7) beside the controller master unit. The electronic ballast (BA) (72) provides supply to the tubes.



Figure 8

2 STRUCTURAL DESCRIPTION OF THE UNIT

2.1 EXTERNAL ASPECT

The external aspect is showed in fig. 1: the cabinet has an external and internal enclosure made of zinc coated and plasticized steel sheet and ABS panels, between them the insulating polyurethane is injected.

In the front side are present, from bottom to top, the compressor compartment front grill (35), the bottom tank front enclosure with the round logo (49) optionally with lights, the rotating shaft (61) supporting the round shelves (81), the side glass doors (92 and 93) and the top cabinet enclosure (25).

In the back wall of the cabinet there is the compressor compartment rear grill (12) and 2 handles (43) to facilitate transportation.

2.2 USER CONTROLS AND SETTINGS

The following controls are available to the user:

- Main switch (IG) (99) and (38) (marked with "1" in Fig. 5 and Fig. 6), placed in the top rear part of the cabinet.
- Light switch (IL) (39), placed in the tank top front enclosure beside the controller master unit;
- Controller Master Unit, located in the tank top front enclosure beside the light switch (Fig. 8). The display has four buttons for user interface: see section 5.1 for relative instruction.

2.3 ELECTRICAL AND MECHANICAL COMPONENTS IN THE TANK

The inner tank has a top and bottom front enclosure made of roto-moulded PET; the side, back top and bottom enclosures are made by galvanized and plasticized steel sheet. Two rear panels (marked with "1" in Fig. 10) provide correct air circulation and distribution; behind the left one the temperature probe (I) (85) is located.

The product (cans or bottles) can be stored on round shelves, divided into 2 semicircular sections (81) and 6 dividers in total (Fig. 9); their position can be adjusted on the support shaft by the user following the procedure indicated in section 2.3.1.

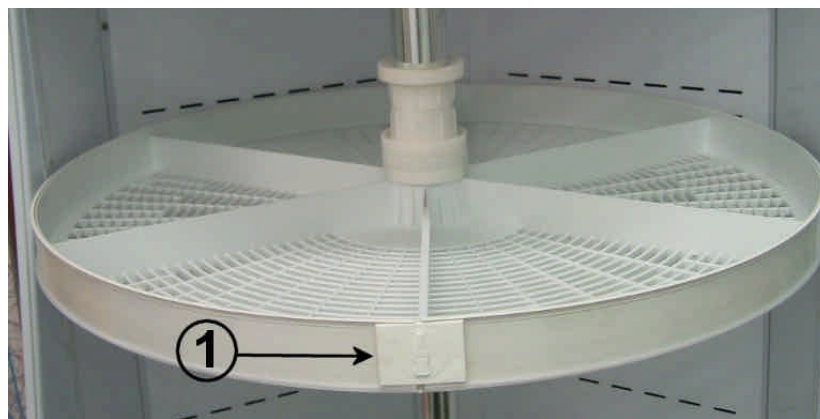


Figure 9

The evaporator (28), the defrosting heater (REV) (102), the evaporator probe (H) (84) and the defrosting thermostat (KFS) (104) are located in the bottom tank end are enclosed by the metal cover marked with "3" in fig. 10 and by the motor fans support plate marked with "2" in fig. 11. The evaporator motor fans (MI) (47) and relative protection grills (36) are mounted on it. The red plastic cover (57), marked with "2" in fig. 10, has function to protect the evaporator motor fans from spillages and condensate.

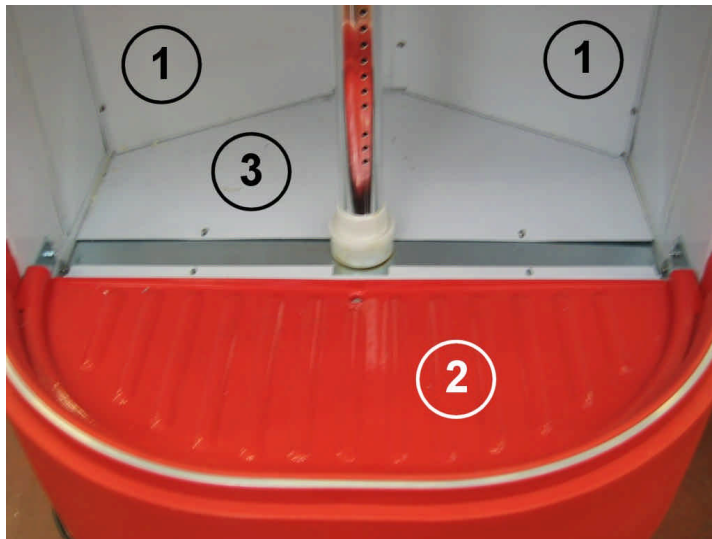


Figure 10

The plastic tank floor works as a collecting tray and funnels the condensate into the draining tube and subsequently to the evaporating trays (96) and (97), located in the compressor compartment.



Figure 11

2.3.1 INSTRUCTIONS TO ACCESS THE COMPONENTS

2.3.1.1 CONTROLLER MASTER UNIT (CE) (13) AND LIGHT SWITCH (IL) (39) REPLACEMENT

To access the Controller Master Unit (CE) (13) and the Light Switch (IL) (39), remove the top plastic cover (25), by removing the 4 screws at the back of the unit marked with “1” in Fig. 12 and the top screw marked with “1” in Fig. 13.



Figure 12

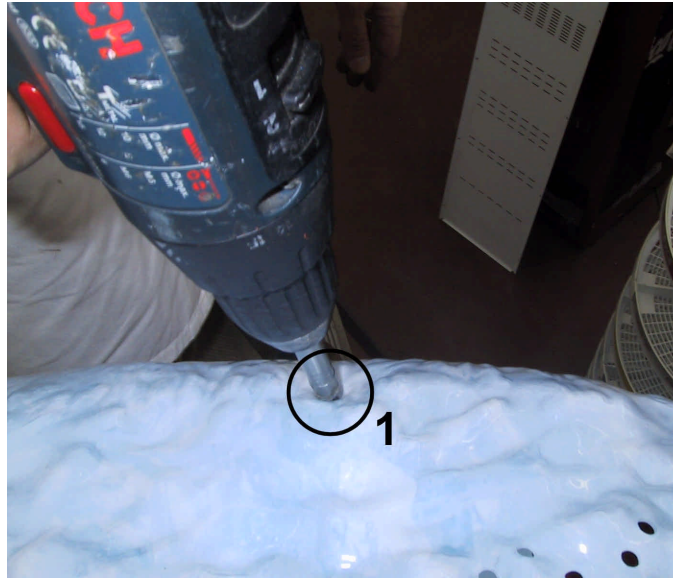


Figure 13

The Master Unit and the Light Switch are accessible through the opening marked with “1” in Fig. 14. The Master Unit is snap fitted on the metal support. To replace it, disconnect the Temperature Probe (I) (85) with black sheathing, the Evaporator Probe (H) (84) with white sheathing and the connection cable to the Power unit. The Light Switch is snap fitted too. To replace it, remove the two wires connected.

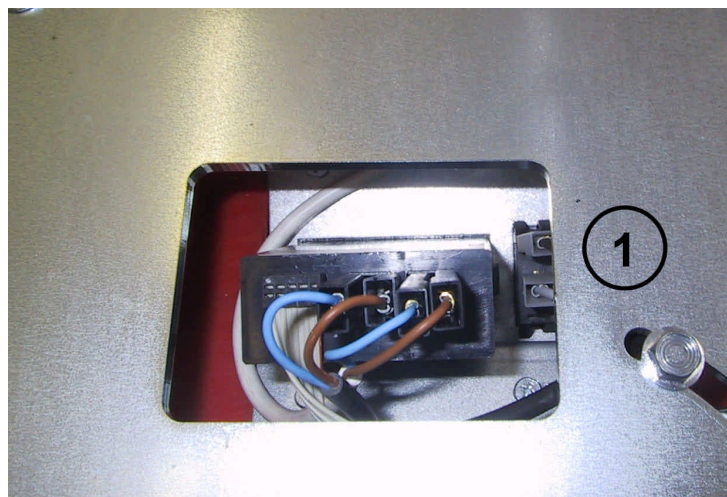


Figure 14

2.3.1.2 EVAPORATOR MOTOR FANS SUPPORT DISASSEMBLY

To disassemble the evaporator motor fans support (marked with “2” in fig. 11), remove the red plastic cover (57) (marked with “2” in fig. 10) by unscrewing the screw marked with “1” in Fig. 15. Then remove the motor fans support plate by unscrewing the screws marked with “1” in

Fig. 11. The evaporator motor fans (MI) (47) and relative protection grills (36) are fixed together by 4 screws each and one of them is also grounded. Remove these screws and the supply wires before the motor fan replacement (Fig. 16). On each of the new motor fans remember to ground one screw again.

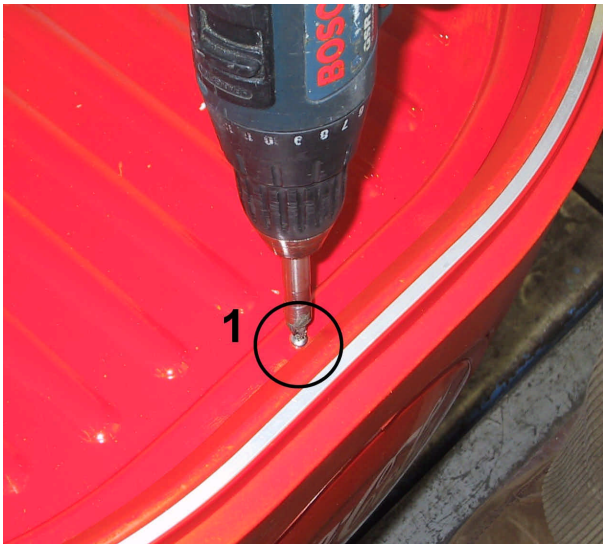


Figure 15

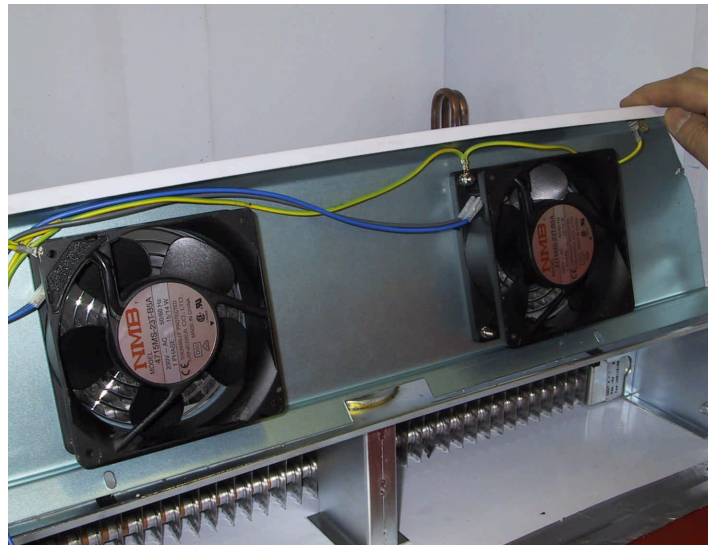


Figure 16

2.3.1.3 SHELF ADJUSTMENT

Referring to the figure 17, remove the stopper (29) marked with “1”. The shelf is held in position by the 2 plastic collets (5) marked with “2” and by the support ring (8) marked with “3”. This ring is fixed at the shaft (61) by the pin (52) marked with “4”, and rotates with it. The shelf rotates as well too thanks to the friction between the collet and the ring. If for any reason the shelf is stopped, the shaft and its motor are not forced as they are free to rotate.

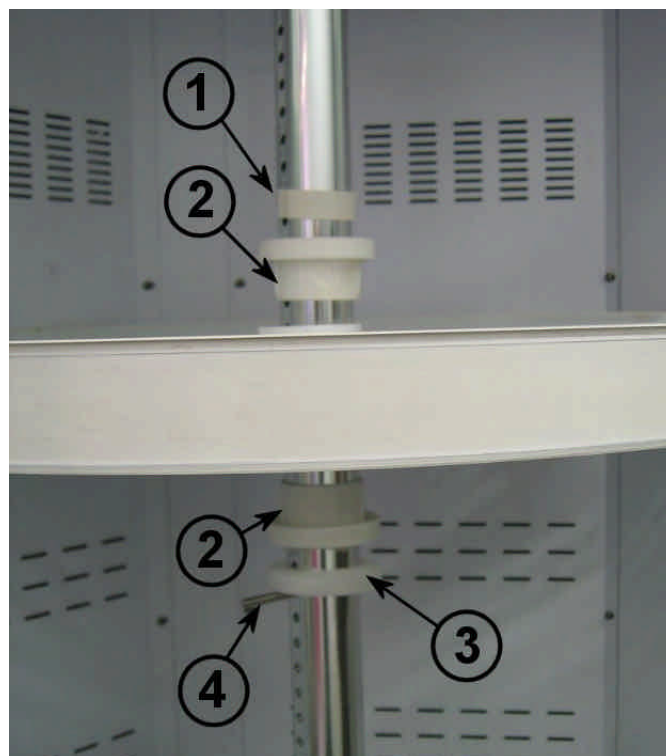


Figure 17

To adjust the shelf just fix the ring (8) marked with “3” in a different position by removing the pin (52) from its hole in the shaft and inserting it in the new position.

2.3.1.4 SHELF REPLACEMENT (81)

Open the doors (92 and 93) completely, by releasing the locking system located in the top door head profile of each door (Fig. 18). Push the nut (4), marked with “1” in Fig. 18, and simultaneously rotate it counter-clockwise, till the fixing lever (42) marked with “2” in Fig. 18 is free. Then pull the door from the bottom to open it.

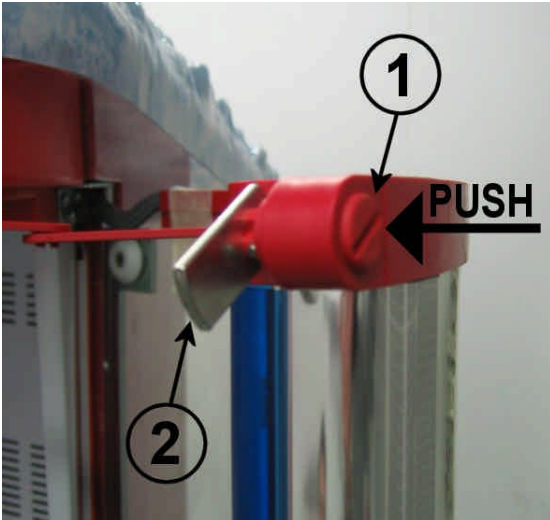


Figure 18



Figure 19

To replace the shelves we can proceed in 2 different ways:

1 – by removing the hole structure Shaft + Shelves on (see chapter 2.3.1.5) and then each shelf from the shaft;

2 – by disassembling the shelf itself without removing the shaft.

By the procedure nr 1, the upper and lower bushes (5) (marked with “2” in fig. 17) and the support ring (8) (marked with “3” in fig. 17) will remain mounted on the shaft, leaning on the lower shelf: this procedure will be described in the next paragraph; consecutively the instructions relative to procedure nr 2.

To replace the shelf, remove the price strip (68) and its fixing clip (19), marked with “1” in Fig. 9, and remove the nylon stopper (29) too, marked with “1” in Fig. 17, whose function is to lock the shelf axially on the shaft. Then unscrew the assembling screws of the two semicircular sections (81), indicated in fig. 19, and press vertically to separate them. To extract the shelf supports it is necessary to remove the shaft, as indicated in the following section 2.3.1.5.

2.3.1.5 SHELVES SUPPORT SHAFT (61) REMOVAL

The shelves support shaft leans on the axial thrust-ball bearing (26) that supports the entire load of the shelves and it's protected by the plastic cover (89) visible in fig. 20. On the other side it is fixed by the pin (50) to the axel joint (2) of movement transmission.



Figure 20

To remove the shaft with shelves on the axial joint (2) must be oriented with it's open side towards the front of the refrigerator, as par fig. 22.

Open the doors (92 and 93) completely, as indicated in the previous section, then extract the pin (50) as indicated in Fig. 21 and 22 and finally remove the shaft as indicated in Fig. 23.



Figure 21



Figure 22



Figure 23

2.3.1.6 BACK PANELS REMOVAL

To remove the tank back panels, marked with “1” in Fig. 10, firstly remove the shelves support shaft (61) as described in the previous section 2.3.1.5.

Loosen the screws marked with “1” in Fig. 24 and remove the panels starting from the bottom. In this way the wires that give supply to the evaporator motor fans (MI) (47), to the compressor compartment components, to the temperature probe (I) (85) and to the evaporator probe (H) (84) are accessible (see Fig. 25).



Figure 24



Figure 25

2.4 ELECTRICAL AND MECHANICAL COMPONENTS IN THE COMPRESSOR COMPARTMENT

The compressor compartment is located in the bottom part of the unit, protected in the front by the front grille (35) and at the back by the rear steel wire grille (37).

The grilles protect the components and avoid the possibility to reach live components: for safety reasons it's absolutely necessary to keep the grilles in their original positions and verify that nothing can obstruct them in order to leave the necessary air flow through the condenser.

In the compressor compartment there is a base plate upon which the following components are fixed:

- compressor (CO)(20) and relative accessories box with start relay (21), start and run capacitors, bushes (7) and grommets (34);
- condenser (22);
- condenser motor fan (MC)(45) with aluminium blade (48) and grommet (33);
- Low pressure switch (PBP) (100);
- Cut off valve (VM) (95);
- Dryer (30);
- Safety thermostat (KS) (64);
- Electronic relay (RE) (77);
- Stainless steel piping (71) for water pre-heating with spacers (27);
- Plastic tray for settling and water pre-heating (96);
- Water level floating switch (ILA) (73);
- Water heater (75);
- Stainless steel tray (97) with relative fixing bracket (86).

The High pressure switch (PAP) and its relative sound alarm (AA) can also be present.

To facilitate the servicing the base plate can be completely pulled out from the back of the cooler.

2.4.1 INSTRUCTIONS TO ACCESS THE COMPONENTS

All the cooling circuit piping connections are located in the rear side of the compressor compartment. To access them read the instructions in the following sections.

2.4.1.1 BACK GRILL REMOVAL

The back grill (37) can be removed unscrewing the screws marked with "1" in Fig. 26.



Figure 26

2.4.1.2 COMPRESSOR BASE PLATE REMOVAL

Remove the back grill as described in the previous section 2.4.1.1: the compressor base plate can be pulled out by removing the screws marked with “1” in Fig. 27.

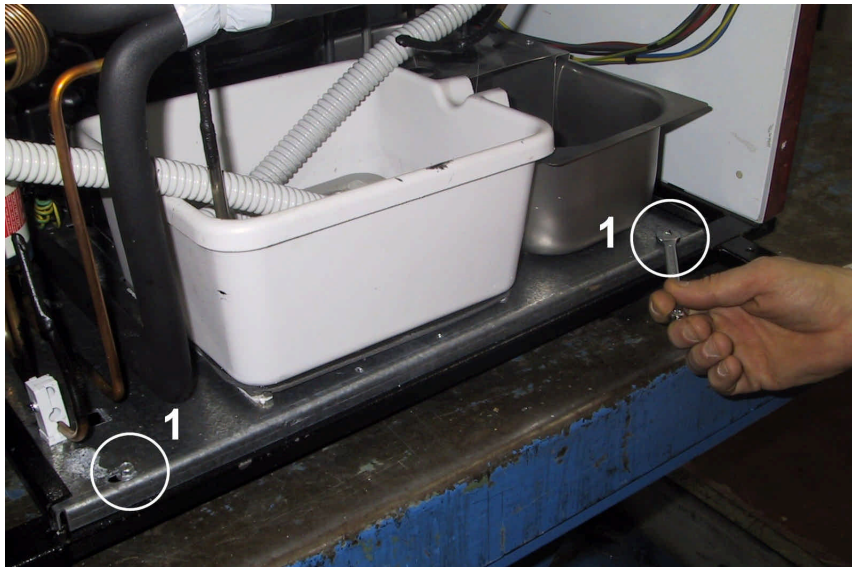


Figure 27

A top view of the base plate is represented in Fig. 28. From front to back are located the condenser (22), with the dryer (30) on the right and the High Pressure Switch (PAP) (105) on the left (when present). The condenser motor fan (MC) (45+48) is sucking air through the condenser and blowing it towards the compressor and the back grille.

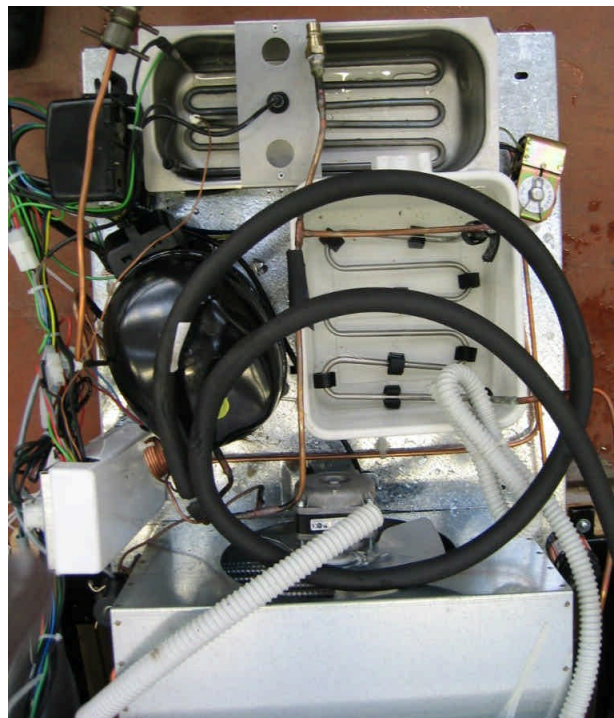


Figure 28

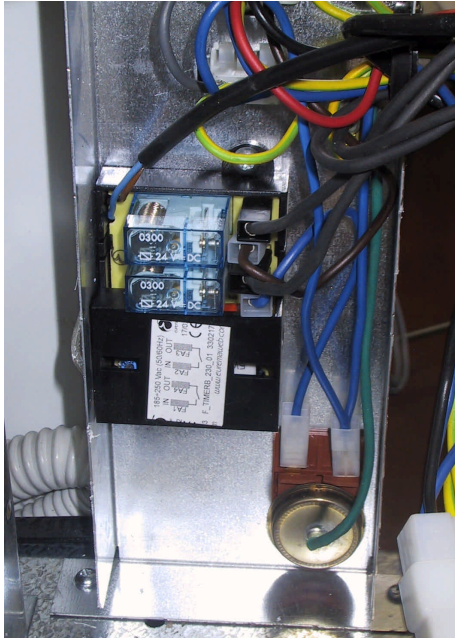


Figure 29

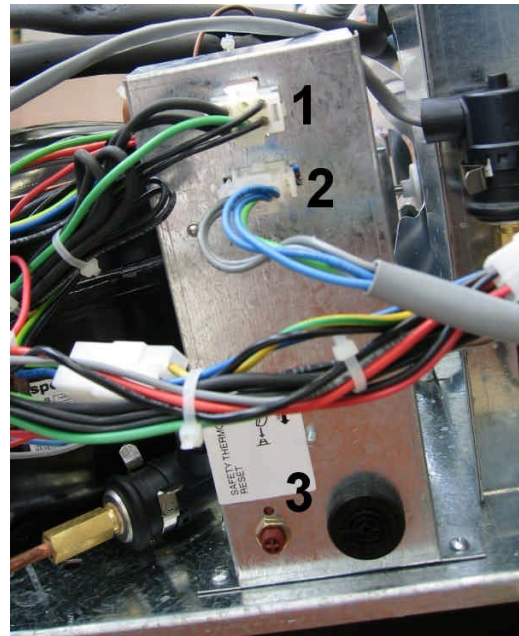


Figure 30

Behind the motor fan is the electrical component support (Fig. 29 and 30), enclosed by the cover (80), where the safety thermostat (KS) (64), electronic relay (RE) (77), Acoustic alarm (AA) (when the High Pressure Switch (PAP) is present), terminal connector of the evaporator heater (REV) (102) (marked with “1” in Fig. 30) and the connector of the evaporator motor fans (MI) (47) (marked with “2” in Fig. 30) are located. The compressor (20) is located behind the condenser motor fan on the left, together with the Low Pressure Switch (PBP) (100). Behind the compressor are located the electrical accessories box (21). The plastic tray for settling and water pre-heating (96) is behind the motor fan on the right with its relative stainless steel pipe (71). The water overflowing from it is collected in the stainless steel tray (97) with water heater (REV) (75), fixing bracket (86) floater switch (ILA) (73). Behind the stainless steel tray (97) is the Cut off valve (VM) (95).

2.4.1.3 FRONT GRILL REMOVAL

Unscrew the 6 screws marked with “1” in Fig. 31 (on grill front) and 32 (on grill side).

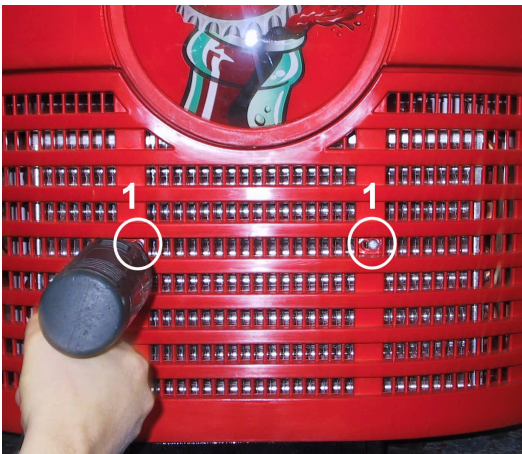


Figure 31

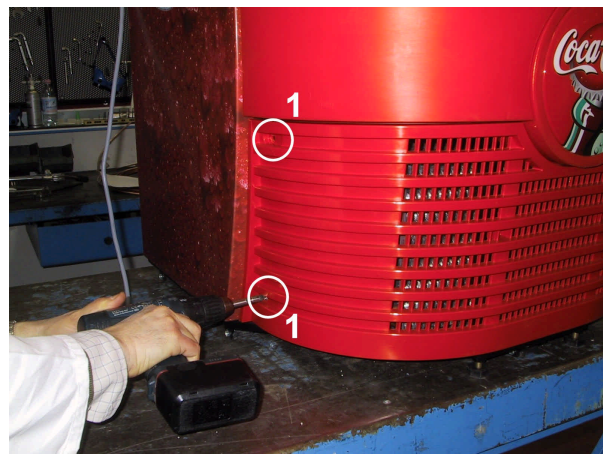


Figure 32

2.5 ELECTRICAL AND MECHANICAL COMPONENTS IN THE TOP CABINET

On the top of the cabinet, under the top cover (25), is a support base plate (Fig. 5 and 6) with the following components:

- EMC Filter (FRF) (31);
- Main Switch (IG) (99) and strain relief (103);
- Inner lights Ballast (BA) (72);
- Controller Power Unit (UP) (94);
- Terminal board;
- Compressor Relay (RC) (101);
- Defrosting Relay (RS) (74);

Another base plate (see Fig. 26) supports the motor gear and transmission group for the shelf rotation. In particular:

- Rotation Motor (M) (46) with gear box;
- Driving spool (79);
- Driving belt (18);
- Gearwheel for shelves rotation (78);

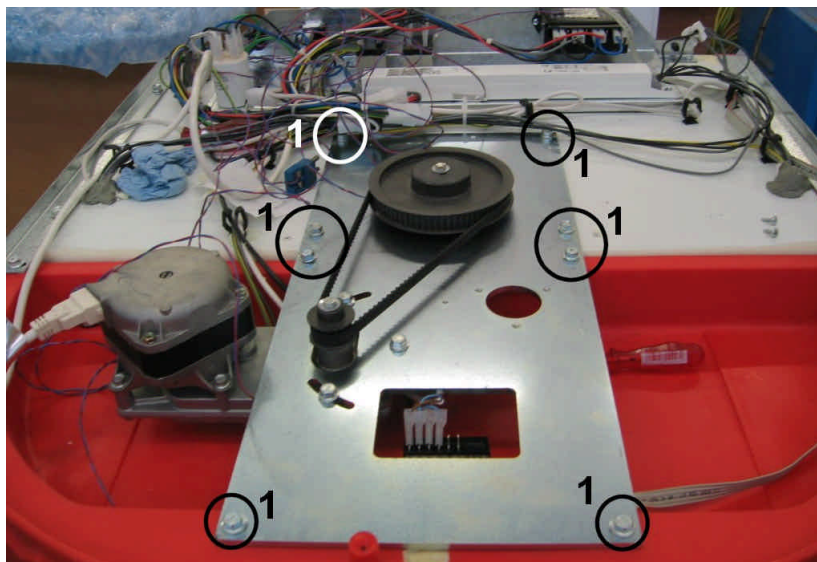


Figure 33

2.5.1 INSTRUCTIONS TO ACCESS THE COMPONENTS

Remove the top plastic cover (25) as indicated in section 2.3.1.1.

Looking at the cooler from the rear, the supplying wires for the electrical components located in the inner tank and in the compressor compartment pass through the top wall in the top right position.

2.5.1.1 MOTOR GEAR COMPONENTS ACCESS

To reach the motor gear components located on the support base plate, remove it by unscrewing the screws marked with "1" in Fig. 33.

2.6 ELECTRICAL AND MECHANICAL COMPONENTS IN THE CABINET

On the cabinet there is the Cabinet Frame Heater (RCA) (76) and the doors (92 and 93).

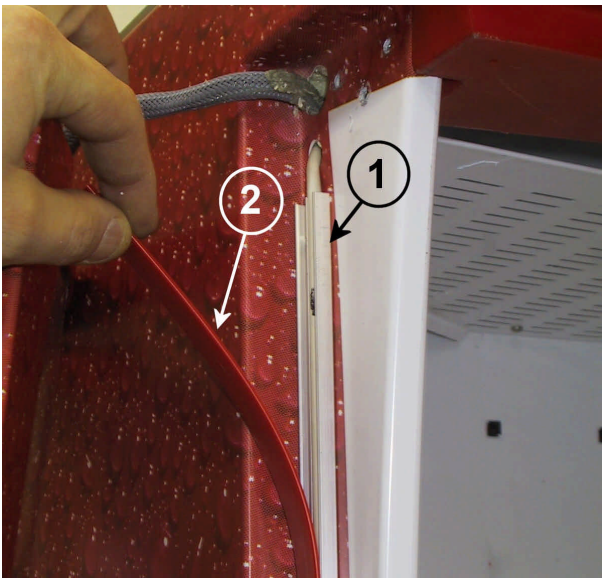


Figure 34

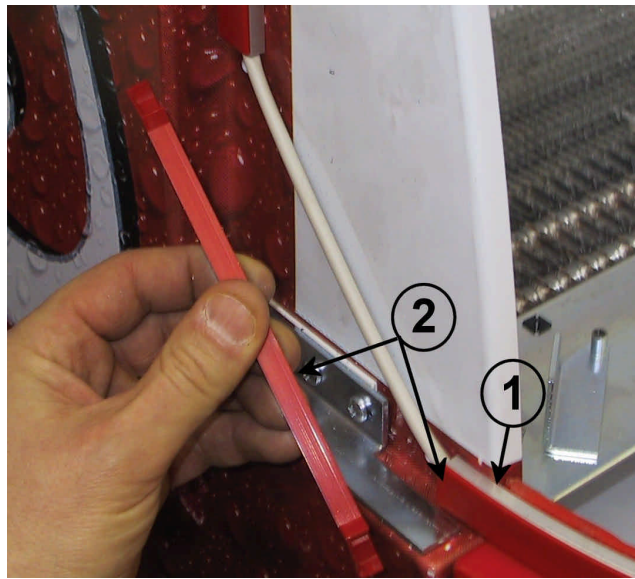


Figure 35

The cabinet frame heater takes the supply directly from the line and is controlled by the main switch (IG) (99). It's located in the aluminium profiles (62 and 63), marked with "1" in Fig. 34 and 35, and is protected by plastic cover profiles (1, 65 and 66), marked with "2" in Fig. 34 and 35.

The door (92 e 93) is made by a curved glass on top of which is glued a plastic header profile supporting the door locking system (see fig. 19). The door lock is made up of the nut (4), the closing bracket (42), the spring (44) and the pin (54). An aluminium profile is fixed on the inner vertical side of the glass, closed at the bottom by the stopper (90), which supports the lamp (LV) (41).

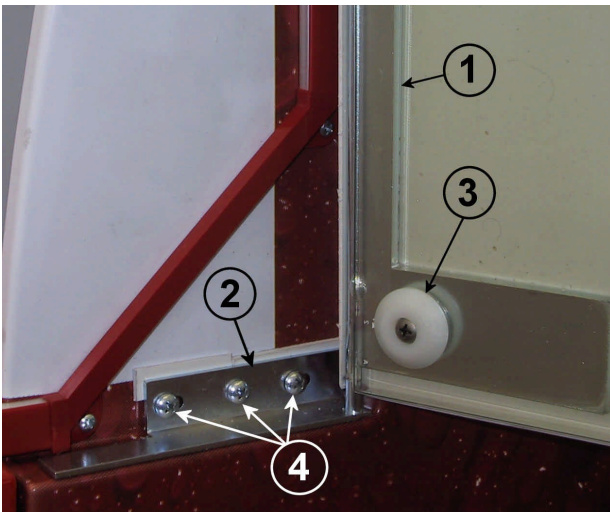


Figure 36

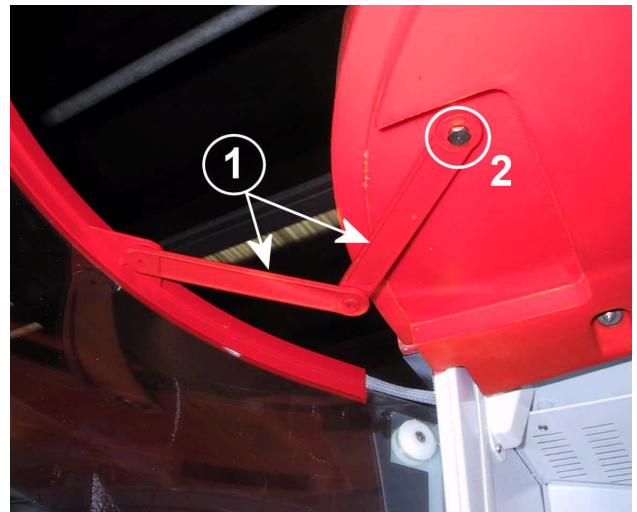


Figure 37

With reference to the fig. 36, the glass is fixed to a galvanized steel frame (55) (marked with "1") by screws and plastic bushes, marked with "3". The steel frame (55) is fitted to the lower hinge (14 and 15), marked with "2", and to the upper hinge (16 and 17), and is hidden by the plastic covers (23 and 24) stuck to the glass. Two brackets (3), marked with "1" in fig. 37 and fixed to the cabinet by the pin (51) marked with "2", serve to limit the door opening.

The tank lamps (LV) (41), located inside the aluminium door side profiles and fixed by the lamp holders (60), are protected by the lamp cover profiles (67), snap fitted to the aluminium profiles (fig. 38).

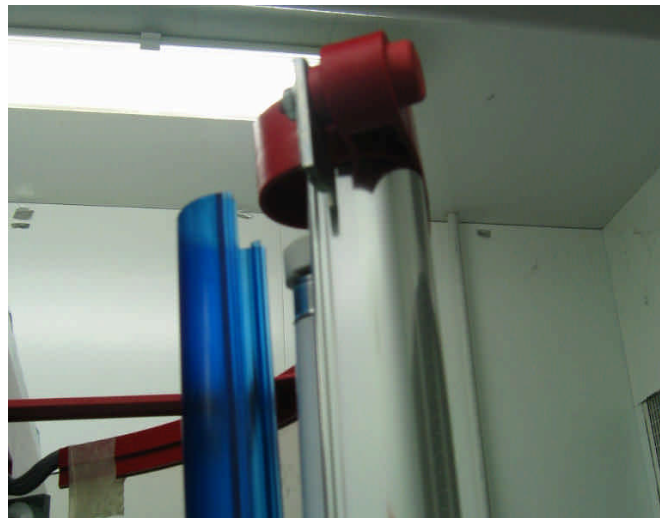


Figure 38

2.6.1 INSTRUCTIONS TO ACCESS THE COMPONENTS

2.6.1.1 LAMP COVER PROFILE (67) REMOVAL

The lamp cover profiles (67) are snap fitted and can be removed by simply pulling them out from the aluminium profiles (Fig. 38).

2.6.1.2 DOOR REPLACEMENT (92 AND 93)

Remove the top cover (25) as described in the section 2.3.1.1 and then disconnect the lamp supply wires from the ballast (BA) (72) using a bit as indicated in fig. 39 and 40. Then remove the plastic cover marked with “1” in fig. 41 by unscrewing the screw marked with “2” in order to release the door supply wires.

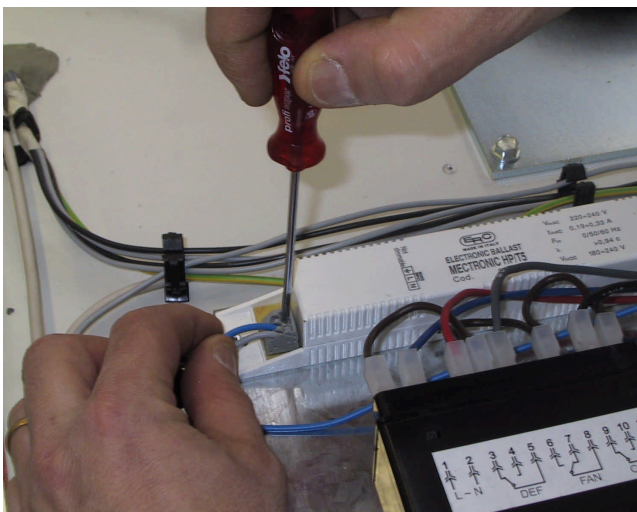


Figure 39

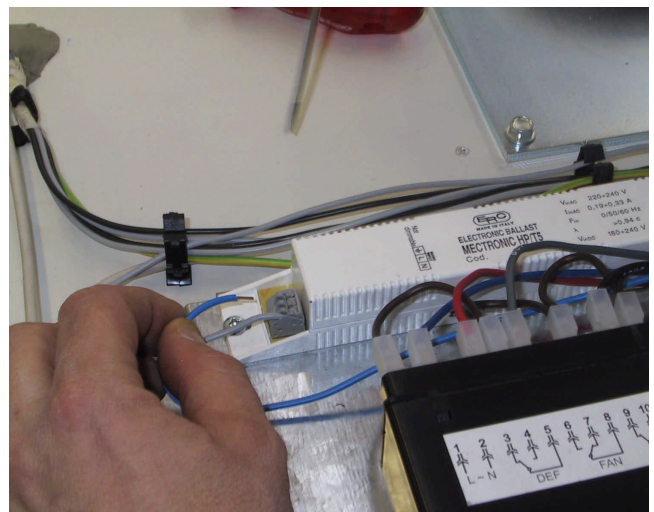


Figure 40

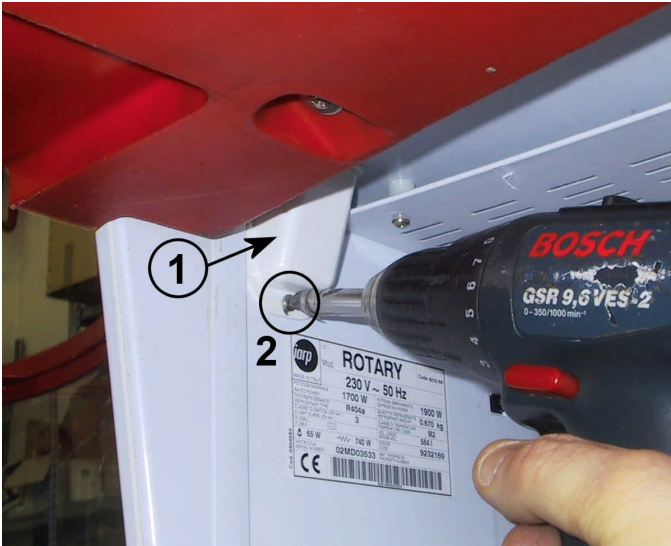


Figure 41

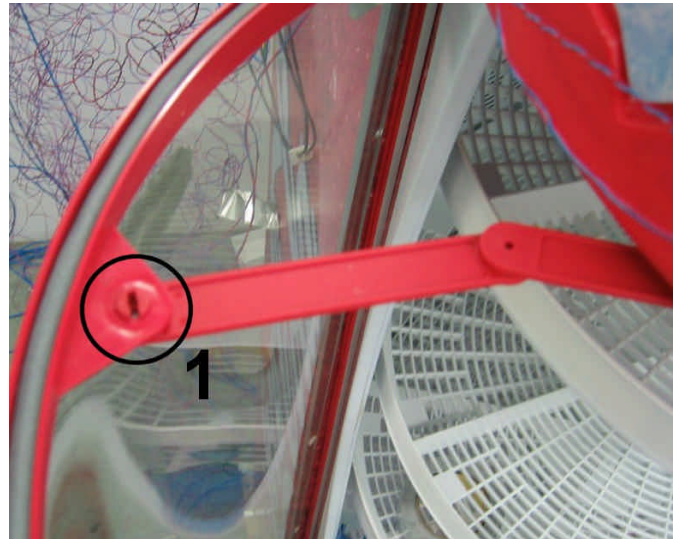


Figure 42

Subsequently remove the door brackets by removing the screw marked with “1” in fig. 42. Finally remove the lower hinge (14 and 15), unscrewing the screws marked with “4” in fig. 36. Be sure to hold the door so as to avoid its falling down.

3 RULES FOR THE CORRECT FUNCTIONING

3.1 START-UP INSTRUCTIONS

After removing the packaging and installing the refrigerator in its final location, adjust the level feet (58) until the refrigerator is locked in place, on a flat surface.



Figura 43

Figure nr. 43 shows one of the front feet rested on the ground: make sure that the unit is perfectly installed on a flat surface otherwise the door may not close properly.

Plug the power cord into an outlet able to receive the type of plug supplied with the unit.

Be sure that the electrical supply voltage matches the one shown on the rating plate of the refrigerator.

Upon plugging in the unit, the compressor, the condenser fan motor and the internal fan will start working, the lamps will be on and the shelving shaft will start to rotate.

As soon as the internal temperature reaches the one set up on the display, the compressor will stop working and the thermostatic cycle that maintains the temperature will start.

The unit can bring down the temperature for a load of 420 0.33 l. cans from 32°C to 3°C (37,4° F) in 16 hours maximum.

3.2 BASIC SAFETY RULES

The supply voltage net, to which the refrigerator shall be plugged, must have an additional safety earth circuit.

The unit must be plugged in an outlet with the earth pole protected by a differential magnetothermic switch with rated Power = 15A and differential Power = 30mA.

Do not use extension cords and/or multiple sockets.

Do not remove the protective grilles: no actions to solve possible malfunctions can be done by the user on the protected parts of the appliance.

Do not move the unit while plugged in.

Plug in the power cord into the outlet accurately. If it doesn't fit, do not force it and plug in the power cord in a different socket.

If no suitable socket is available, contact a skilled electrician to install one.

Do not plug in the power cord and do not keep it plugged in if the unit is not locked in place and levelled by its feet (58).

Handle the machine carefully. Avoid shocks or rough movements to the whole structure and in particular on the moving parts (doors, shelves).

The system, in the conditions it has been shipped from the factory, can guarantee an adequate protection level against electric shocks provided all panels, protection grills and remain intact and in their original position.

It is highly recommended not to expose the glass doors to possible shocks and not to force the doors whilst in their maximum open position.

Do not move the refrigerator when it is plugged in to an electrical socket. In any case, avoid disassembling any part of the refrigerator until it has been disconnected.

While unplugging the unit, do not pull the power cord. Act directly on the plug. Never bend the power cord.

Do not put any connection device, such as multiple sockets, reduction gears, extensions and so on, between the power cord and the socket.

Do not lean against the upper part of the door until it is open.

Do not wash the unit with running water. In any case avoid direct jets of water toward the refrigerator.

Do not touch the unit with wet hands and/or feet.

Before carrying out any kind of maintenance operation make sure that the machine is disconnected.

For any maintenance operation, contact the technical assistance.

3.3 RULES TO IMPROVE THE EFFICIENCY OF THE SYSTEM

Since the machine is a glass door refrigerator, it cannot be exposed directly to the sun rays, otherwise there would be an abnormal absorption of heat.

In any case, install the unit far away from heat sources.

Do not obstruct the external openings (front and back grills) so as to ensure the correct air circulation inside the compressor compartment. Be sure to leave enough space around the unit.

Clean the condenser from dirt and accumulated debris: a dirty condenser reduces performance and reduces the life of the compressor. Depending on the environment/dirt, the condenser should be cleaned once between every 4 months and once a year.

Do not load the product directly on the bottom of the unit. In order to allow the correct air circulation, load the product only on the shelves.

4 MAINTENANCE INSTRUCTION

Before servicing make sure that the machine is not plugged in.

4.1 MAINTENANCE OF THE CABINET

4.1.1 REPLACEMENT COMPONENTS ONT THE UPPER SUPPORT

See par. 2.5.1 and Fig. no. 5.

4.1.1.1 MAIN (GREEN) SWITCH (IG) (99)

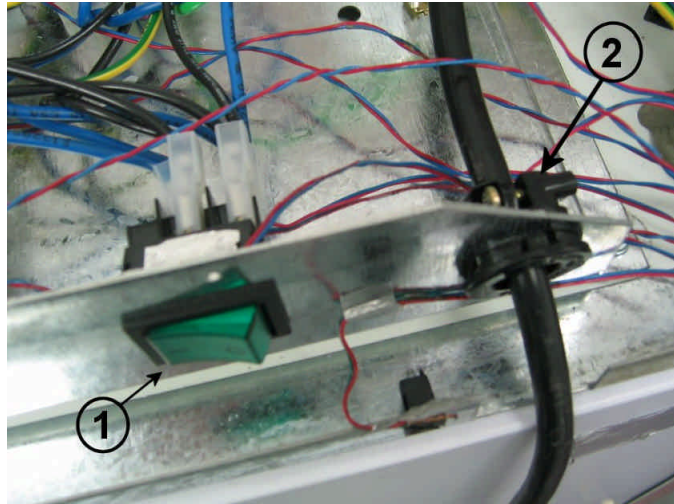


Figure 44

Fig. no. 44 shows the main switch (“1”) connected to the system through the spade connectors and snap fitted onto the components support. By pressing the lateral fins and pulling them outwards it is possible to remove and replace it. Disconnect the connectors first.

4.1.1.2 POWER CORD (12) AND STRAIN RELIEF (103)

The strain relief (103) indicated with the no. “2” in the Fig. no. 44 is snap fitted onto electronic components support. In order to remove and replace it, unscrew the screw “2” to release the cord, press the lateral fins and pull the strain relief outwards.

4.1.1.3 EMC FILTER (31)

As shown in the Fig. no. 45 it is connected to the system through spade terminals and it is linked to the components support through a screw. In order to replace it, the terminals must be disconnected and the filter needs to be unscrewed.

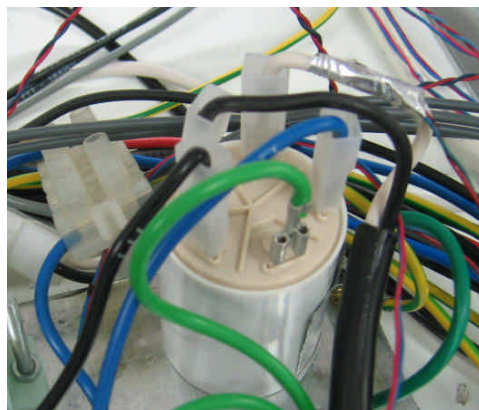


Figure 45

4.1.1.4 ELECTRONIC BALLAST (BA) (72)

The electronic ballast (BA) (72) for the lamps (LV) (41) has a junction-box. The wires can be disconnected using a screwdriver or a center-punch. The ballast can be replaced by lifting the junction-box first, taking out the wires (see Fig. nos. 39 and 40) and finally unscrewing the screws.

4.1.1.5 DEFROST RELAY (RS) (74)

As seen when looking at the components support located on the back of the unit, the defrost relay (indicated with the no. 1 in the Fig. no. 46) is attached to the electric support components through two screws and connected to the electrical system through fast-on terminals. In order to replace the defrost relay the terminals need to be disconnected and the

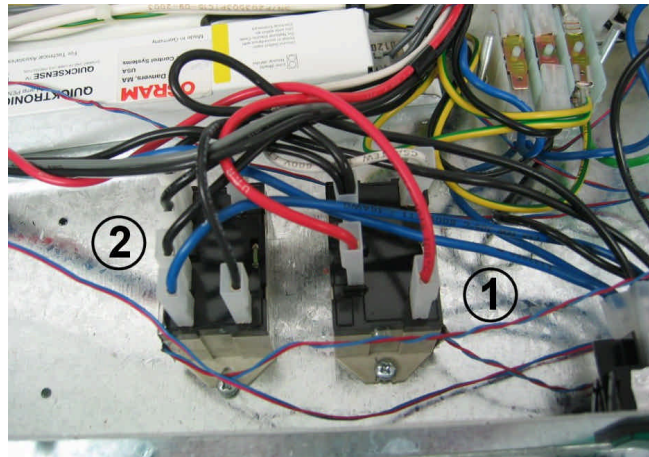


Figure 46

screws need to be unscrewed.

4.1.1.6 COMPRESSOR RELAY (RC) (101)

As seen when looking at the components support located on the back of the unit and in the Fig. no. 48, the compressor relay (indicated as "2") is fitted onto the electric components support through two screws and connected to the system through fast-on terminals. It can be replaced after disconnecting the terminals and unscrewing the screws.

4.1.1.7 POWER UNIT (UP) (94)

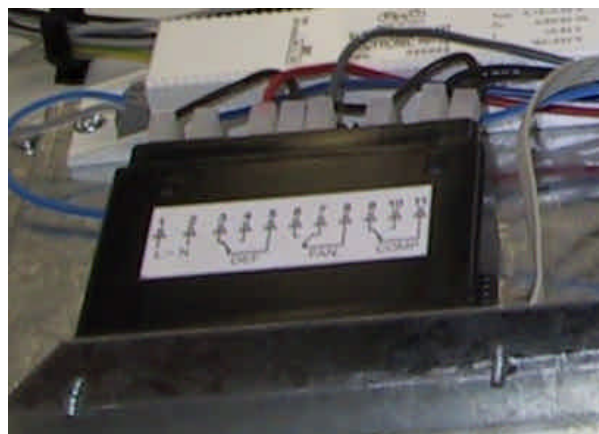


Figure 47

Since the power unit (Fig. No. 47) is fitted to the electric components support by two screws which are connected to the system through the "fast-on" terminals and to the control board (13) through the connection cable (11), it can be replaced after disconnecting all the connections and unscrewing the screws.

4.1.1.8 GEAR ELECTRIC MOTOR GROUP

In order to access the components of the gear motor group see par. 2.5.1.1.

The gear motor step wheel (79), the toothed belt (18) and the shelving shaft step wheel (78) can be replaced without removing the metallic support.

The gear motor (M) (46) can be removed after lifting the metallic support and unscrewing the screws shown as no. "1" in the Fig. no. 48.

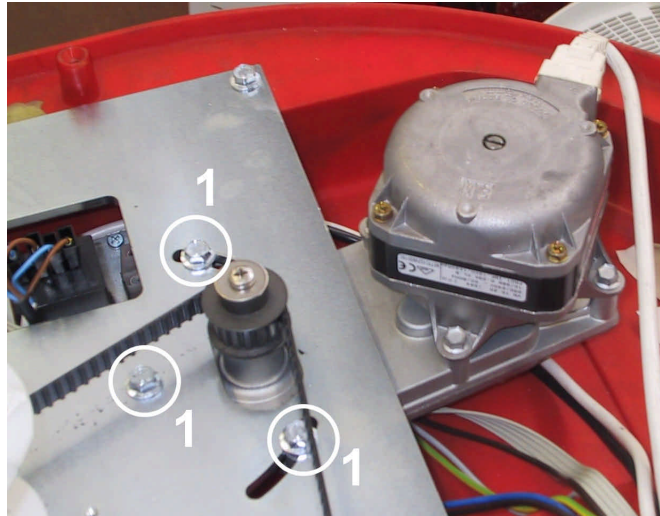


Figure 48

4.1.2 DOOR LOCK SYSTEM REPLACEMENT (4+42+44+54)

To replace the door lock system open the door use a flat head screwdriver and key (as shown in Fig. 49) and turn them in opposite directions.



Figure 49

4.1.3 LAMPS REPLACEMENT (LV) (41)

The lamps installed in the unit are T5 type with G13 attachment, 28W. Their ballast is located on the upper electric components support (see par. 2.5).

To replace the lamps (LV) (41) they must be turned. In order to access them and the lamp-sockets (60) the neon cover (67) must be removed first (see par. 2.6.1.1).

4.1.4 LAMP HOLDERS REPLACEMENT (60)

After removing the lamps (LV) (41) as indicated above, disconnect the wires of the lamp holders and by pressing the plastic fins, pull them out.

4.1.5 DOOR REPLACEMENT (92 e 93)

To replace the door refer to par. 2.6.1.2. Before taking out each door, disassemble the bulbs (LV) (41) and the bottom cover (90).

4.1.6 DOOR STOP CONNECTING ROD REPLACEMENT (3+51)

In order to replace the door stop connecting rods it is necessary to unscrew the rods (51) (shown as "2" in Fig. 37) and press the plastic screw against the top of the door. With door opened remove the fixing pin (51), marked with "2" in fig. 37, and press the plastic screw marked with "1" in fig. 42, in order to remove it from its location.

4.1.7 FRONT GRILLE REPLACEMENT (35)

Refer to par. 2.4.1.3.

4.1.8 BACK GRILLE REPLACEMENT (37)

Refer to par. 2.4.1.1.

4.1.9 CABINET FRAME HEATER REPLACEMENT (RCA) (76)

In order to reach the cabinet frame heater (RCA) (76) it is necessary to remove the top of the unit (25) as explained in par. 2.3.1.1., the wiring cover located on the inner upper side of the tank (Fig. 41) and the doors (92 and 93) as indicated in par. 2.6.1.2.

Then remove the side (66) and front (65) bayblend red profiles (66) (Fig. 34) (fitted on their aluminum profiles) (63 e 62) and the bayblend heater cover angles (1) (Fig. 35) by unscrewing the two screws shown as "1" in Fig. 50 and disconnecting the power supply on the upper electric components support.



Figure 50

4.2 MAINTENANCE OF THE INNER TANK

4.2.1 INTERNAL FAN MOTOR (MI) (47) AND GRILLE (36) REPLACEMENT

Remove the red water drip (57) and the carter as explained in par.2.3.1.2., by unscrewing the 4 screws supporting the internal fan motor (47) and the grille (36) as shown in Fig. 51 and disconnecting the fan motor wires (Fig. 17).

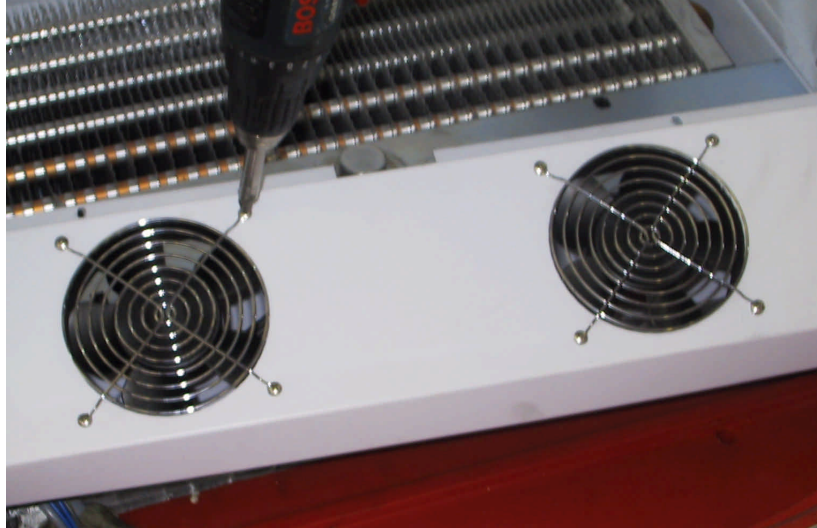


Figure 51

4.2.2 EVAPORATOR REPLACEMENT (28)

Before replacement it's necessary to remove the shelves' support shaft (61), as indicated in par. 2.3.1.4., the motor fans support (upon disconnecting the fan motor cables), as indicated in par. 2.3.1.2., the back panel of the inner tank as shown in par. 2.3.1.5. and the evaporator cover by unscrewing the two screws indicated as "1" in Fig. 52.

Empty the refrigerant circuit and recover the refrigerant.

Unscrew the two evaporator fixing screws from the aluminum profile shaft ("1" in Fig. 53); slide the probe (H) (84) from the copper bulb support welded on the evaporator side (Fig. 55).

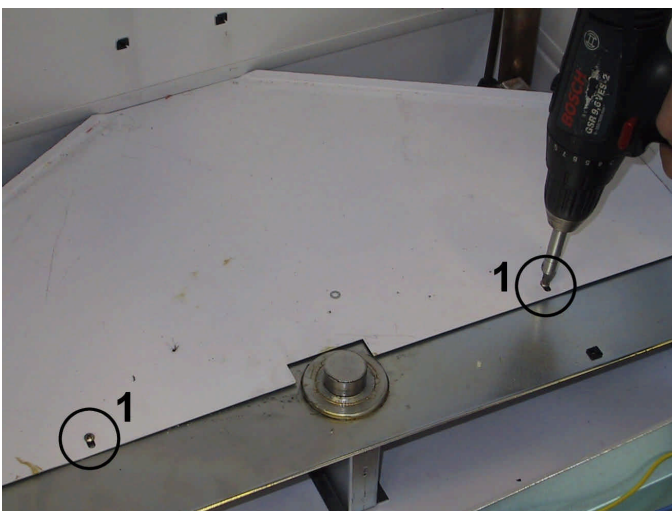


Figure 52

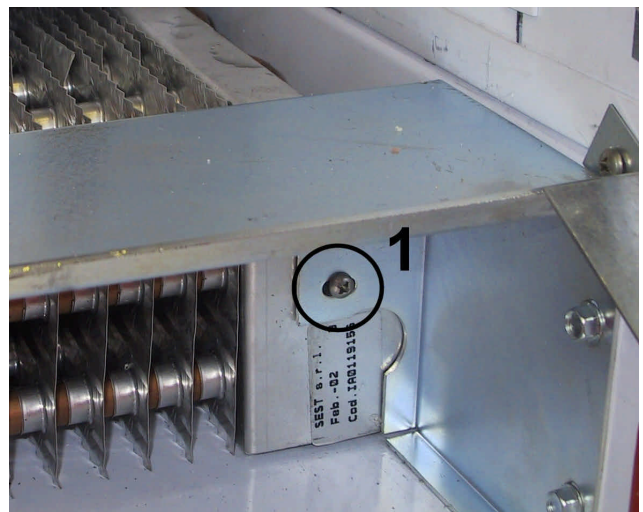


Figure 53

Remove the end defrost thermostat (KFS) (104) (“1” in Fig. 55) and the evaporator heater (REV) (102) (“1” in Fig. 56) and unweld the pipes connecting the evaporator to the circuit:



Figure 54

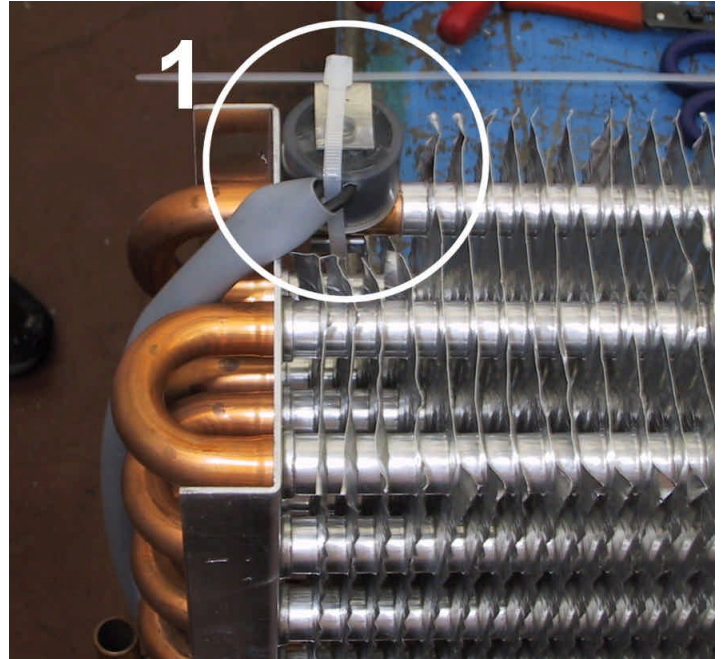


Figure 55

these pipes are located in the back left part of the compressor compartment, behind the rear grill and covered by insulating material, as par fig. 57: remove the insulating material, disconnect the pipes and replace the evaporator.

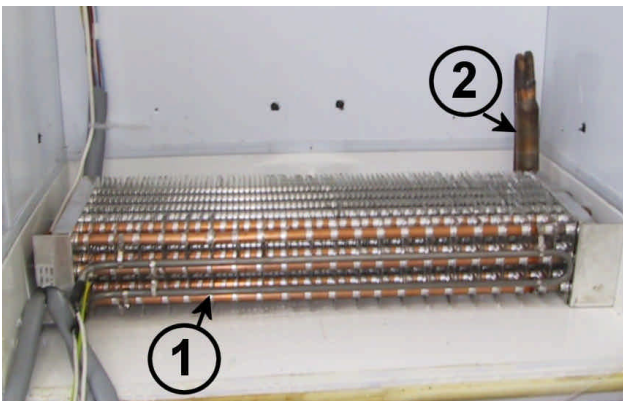


Figure 56

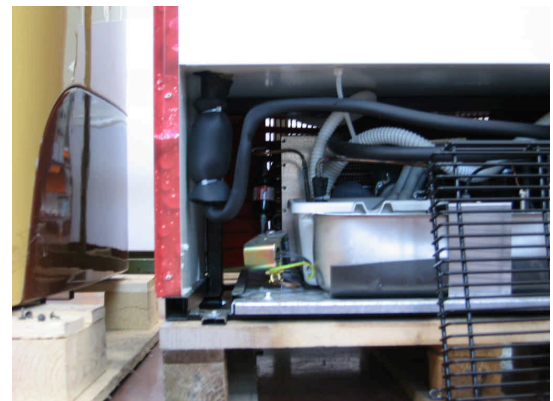


Figure 57

4.2.3 END OF DEFROSTING GREY PROBE REPLACEMENT (H) (84)

Remove the top of the unit (25) as explained in par. 2.3.1.1., the pipes cover on the upper section of the inner tank as explained in par. 2.6.1.2., the aluminum profile shelves shaft as explained in par. 2.3.1.4., the back panels of the inner tank as explained in par. 2.3.1.5. and the evaporator cover as explained in par. 4.2.2.

Slip off the probe from the sensor holder located on the evaporator (Fig. 56), disconnect it from the control board (CE) (13) located on the upper section of the tank (Fig. 15) (accessible removing the top of the unit (25)) and remove it.

4.2.4 EVAPORATOR HEATER REPLACEMENT (REV) (102)

In order to reach the evaporator heater (REV) (102) (shown as “1” in Fig. 56), follow the instructions explained in par. 4.2.2. To reach the connector located on the electric components support inside the compressor compartment, take off the basement referring to par. 2.4.1.1. and 2.4.1.2..

Cut the metal strips supporting the heater, slip off the terminal connector (“1” in Fig. 30) from the electric components support (push the upper winglet and pull) and slip off the terminals from the connector (the two black ones on the left side of the connector block as shown in Fig. 30) by pressing the cilindric therminals (Molex) (see Fig. 58) with the specific tool (Fig. 59).

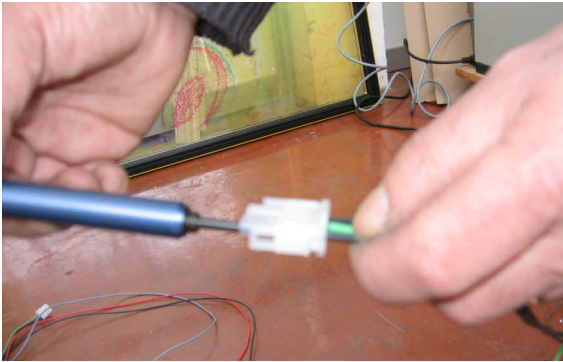


Figure 58



Figure 59

4.2.5 END DEFROSTING CLIXON CABLE REPLACEMENT (KFS) (104)

In order to reach the end defrosting clixon cable (REV) (102) (indicated as “1” in Fig. 55) follow the instruction listed in par. 4.2.2. and take out the basement as per par. 2.4.1.2.

The end defrosting clixon is connected to the first upper pipe on the upper left side of the evaporator and is kept in position by a clip therefore the thermostat metal sensor touches the evaporator copper pipe.

To remove the end defrosting clixon cable, slip off from the components support (located on the basement) the connector shown as “1” in Fig. 30 (push the upper fin and pull) and take off the wires (the two black ones on the right side of the connection block) from the connector pressing on the cilindric therminals (Molex) (see Fig. 58) with the specific tool (Fig. 59).

When installing the new thermostat make sure that the sensor touches the evaporator copper pipe and the bracket is well connected to the pipe itself otherwise the thermostat could activate the evaporator heater and the frame heater.

4.2.6 TEMPERATURE BLACK PROBE REPLACEMENT (I) (85)

In order to have access to the black probe (I) (85) (Fig. 25) remove the top of the unit (25) as described in par. 2.3.1.1., the wires cover on the upper section of the inner tank as explained in par. 2.6.1.2., the aluminum profile shelves shaft (61) as per par. 2.3.1.4. and the back panels of the inner tank as indicated in par. 2.3.1.5. Open the strip supporting the probe bulb, disconnect the probe from the control board (CE) (13) located on the upper section of the tank (Fig. 14) (accessible after removing the top of the unit (25)) and take it out.

4.2.7 SHELVES SHAFT REPLACEMENT (61)

Refer to par. 2.3.1.4.

4.2.8 SHELVES SHAFT AXIAL JOINT (2) AND FIXING PLASTIC PLATE (56) REPLACEMENT

To reach the shelves shaft joint (2) that transmit the rotation to the shelving support shaft (60) and its fixing plate (56), located on the upper section of the inner tank, it is necessary to remove the shaft as per section 2.3.1.4. and unscrew both the fixing screw indicated as “1” in Fig. 61 and the two screws indicated as “2”.

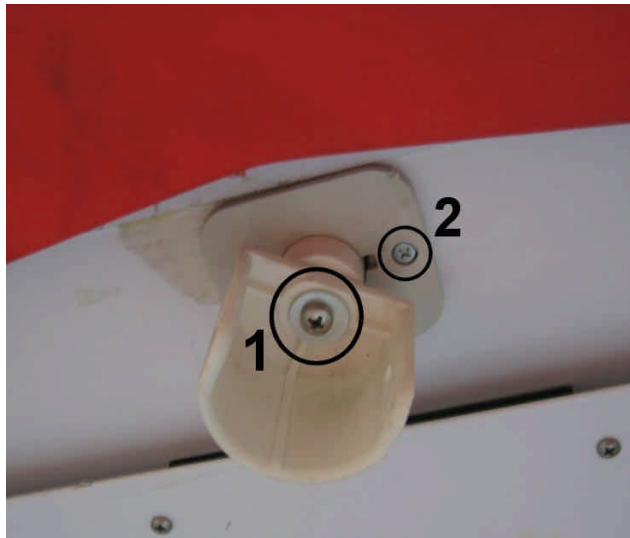


Figure 60

4.2.9 CONTROL BOARD (CE)(13) AND LIGHT SWITCH REPLACEMENT (IL)(39)

Refer to par. 2.3.1.1.

4.3 MAINTENANCE OF THE COMPRESSOR COMPARTMENT

4.3.1 COMPRESSOR FAN MOTOR REPLACEMENT (MC) (45+48)

Take out the compressor basement support as described in par. 2.4.1.2. Disconnect the fan motor detaching the connector from the wiring system of the compressor compartment.

Unscrew the hexagonal head screws shown as "1" in Fig. 61 fixing the motor support to the basement with a 10 mm spanner. Move the fan motor to the compressor side; unscrew the hexagonal screws fastening the blade (48) to the motor (45) and unscrew the screws fastening the motor to the support.



Figure 61

4.3.2 WATER EVAPORATION GROUP REPLACEMENT

In order to replace the water evaporator heater (RVR) (75) it is necessary to take out the basement as per par. 2.4.1.2.

The water evaporation system is made by (fig.36):

- Plastic drain tray (96) for condensate collecting, settling and pre-heating;
- Stainless steel evaporation tray (97);
- Water level floating switch (ILA) (73);
- Floating switch support with fixing bracket (86);
- Electrical heater (RVR) (75);
- Water heater electronic relay (RE) (77), located in the electrical component support;
- Safety thermostat (KS) (64) with reset nutton, located in the electrical component support;
- Tube (T) for thermostat sensor location.

A plastic tube collects the condensate coming from the evaporator into the plastic drain tray (96), where is pre-heated by a hot stainless steel pipe (71) directly connected to the compressor delivery; when the tray is full, the water flows into the second stainless steel tray (97), where an automatic system with floater and electrical heater evaporate it.

The heater (RVR) 75 is connected to the electronic relay (RE) (77) (see fig. 29) located on the electronic components support inside the compressor compartment: to access the electronic relay (RE) (77) the electric components support cover (80) must be removed.

The heater is locked inside the inox tray (97) by a bracket supporting the water level float (ILA) (73); the bracket fixes the inox tray (97) to the compressor support basement too.

The safety thermostat (KS) (64) avoid any overheating due to a malfunction of the system by disconnecting the heater from supply; it's sensor is located inside an inox pipe (fig. 62) that touches the heater and detects eventual malfunction either of the electronic relay or the floating switch.



Figure 62

When the safety thermostat cuts off the heater there is always an overheating due to a malfunction of the system: for this reason its functionality must be manually restored only after having eliminated the cause of the problem, by pressing the thermostat reset button placed on the electrical component support in the compressor compartment, just below the electronic relay (Fig. 30 nr 3).

4.3.2.1 FLOATING SWITCH REPLACEMENT (ILA) (73)

Disconnect the electrical terminals. If the unit has an electronic relay the switch is connected directly to the relay connection wires as shown in the wiring diagrams SE0311/00 and SE0311/02 in the section 5.2.

Remove the water evaporator tray fixing bracket (86) from the inox tray by unscrewing the screws indicated as "1" in Figure 63 and located on only one side. To remove the switch (ILA) (73) unscrew the fixing nut shown as "1" in Fig. 64.

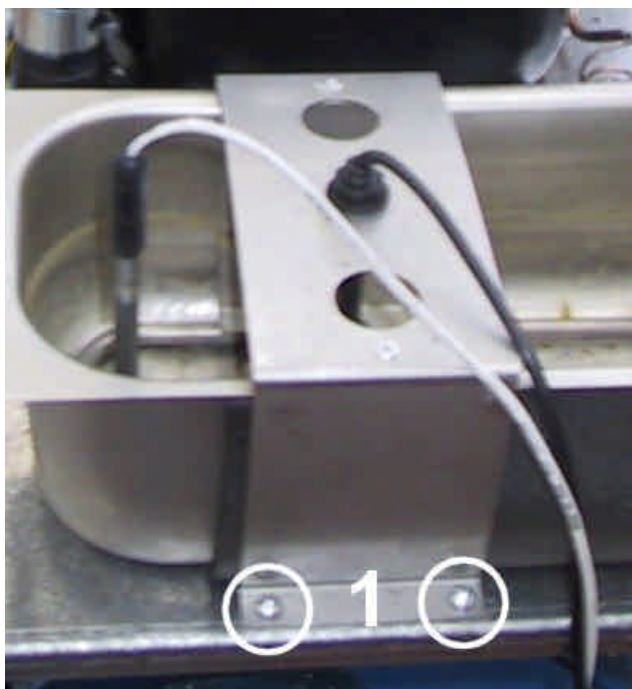


Figure 63

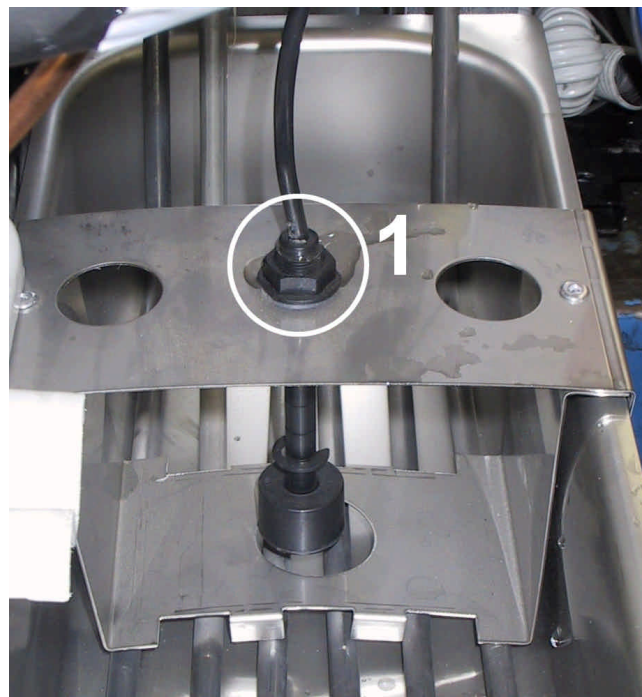


Figure 64

4.3.2.2 ELECTRONIC RELAY REPLACEMENT (RE) (77)

In order to replace the electronic relay (RE) (77) (Fig. 29) fastened to the electronic components support inside the compressor compartment it is necessary to take out the basement as explained in par. 2.4.1.2.

After disconnecting the relay from the wiring circuit of the compressor compartment (slipping off all the spade connectors) unscrew the two fixing screws and take it out.

4.3.2.3 THERMOSTAT REPLACEMENT (KS) (64)

In order to replace the thermostat (KS) (64) (Fig. 29) connected to the electronic components support located inside the compressor compartment, it is necessary to take out the basement as explained in par. 2.4.1.2.

Disconnect the fast-on terminals from the thermostat (Fig. 29), remove the fixing nut shown as "3" in Fig. 30 and remove the sensor from the inox pipe.

Inserting the new sensor in the heater pipe make sure that it reaches the end of the pipe otherwise eventual overtemperature cannot be correctly detected.

4.3.2.4 WATER EVAPORATOR HEATER REPLACEMENT (RVR) (75)

In order to replace the water evaporator heater (RVR) (75) located inside the inox tray (97) (Fig. 63 and 65) it is necessary to pull out the basement as shown in par. 2.4.1.2. and remove the fixing bracket (86) of the evaporator inox tray (97) supporting the floating switch (ILA) (73) as indicated in par. 4.3.2.1.

Remove the thermostat sensor from the inox pipe: inserting the sensor in the new heater pipe make sure that it reaches the end of the pipe otherwise eventual overtemperature cannot be correctly detected. Before removing the heater disconnect the heater itself from the electronic relay (RE) (77) located on the electronic components support inside the compressor compartment (Fig. 29) by slipping off the terminals.

4.3.2.5 VERIFYING THE FUNCTIONING OF THE WATER EVAPORATION SYSTEM

When replacing the water evaporation system components it is necessary to check the correct functioning of it: **this procedure is mandatory in order to guarantee the safety of the unit.**

After cleaning the inox tray from eventual accumulated debris, insert a voltmeter parallel to the heater as shown in Fig. 65: an alternative solution is the use of an amper clamp-meter as shown in the same figure.



Figure 65

This test must be conducted in dry condition only: be sure that no water is present in the stainless steel tray.

Plug in the unit and lift the floating switch as shown in Fig. 66: the water heater will be enabled after about a minute by the electronic relay. Check using the voltmeter whether or not

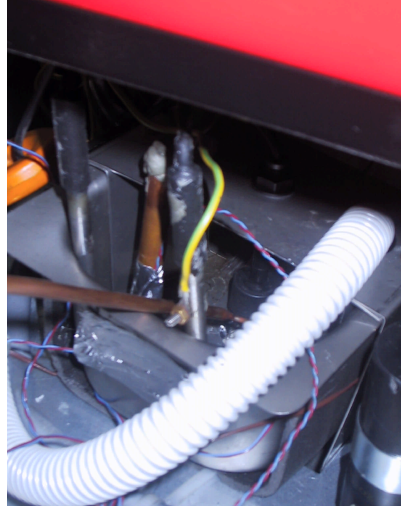


Figure 66

the terminals of the heater have voltage (115V) or check using the amperemeter the current consumption (about 3.8 Amp). Lift the floating for approximately 5 minutes until the thermostat cuts off the supply to the heater: check whether or not the voltmeter and the Amperemeter shows absence of voltage or current.

The test is finished: disconnect the cooler from power supply.

The thermostat needs to be reset: wait for approximately 15 minutes and press the reset button located on the electric components support shown, as "3" in Fig. 66.

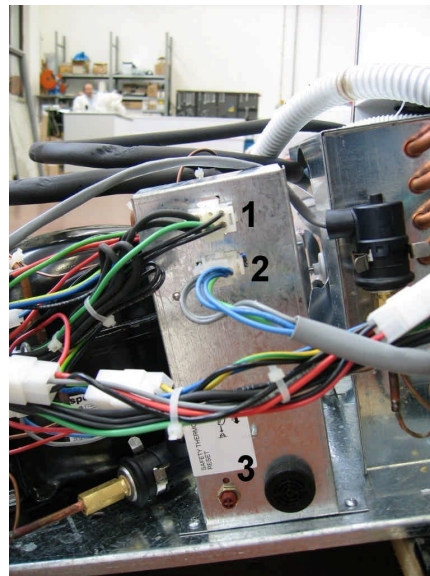


Figure 67

Before resetting wait at least 10 minutes, as the thermostat needs to reach ambient temperature: to speed the process put some water into the tray.

If the thermostat is not reset the heater will never be activated again and water can overflow onto the floor during the functioning of the cooler.

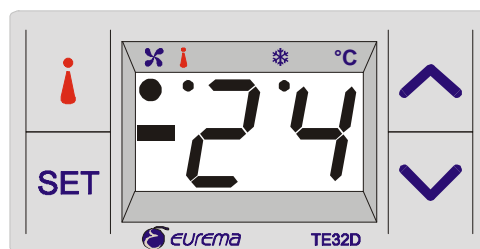
5 UTILITIES

5.1 CONTROL BOARD MANUAL (CE) (13) TE32D.

CONTROLLO ELETTRONICO DI TEMPERATURA E SBRINAMENTO PER UNITA' REFRIGERANTI A VENTILAZIONE INTERNA.

*ELECTRONIC TEMPERATURE AND DEFROSTING CONTROLLER FOR "FORCED
INTERNAL AIR CIRCULATION" REFRIGERATORS.*

TE 32 D



DESCRIZIONE GENERALE

Il modello TE32 D è un regolatore per unità refrigeranti ventilate. E' dotato di tre uscite a relè (per il controllo di compressore, sbrinamento e ventola evaporatore) separate dal controllo e di due ingressi per sonde di temperatura di tipo PTC per la rilevazione della temperatura in cella e sull'evaporatore. Lo sbrinamento può essere sia elettrico sia a gas caldo (inversione di ciclo) ed è programmabile come frequenza, durata massima e temperatura di conclusione. La ventola sull'evaporatore si attiva se è raggiunta la temperatura impostata sull'evaporatore (F0) o si è esaurito il ritardo d'attivazione dopo lo sbrinamento (F2).



E' prevista la possibilità di proteggere i parametri ed il setpoint da manipolazioni non volute.

MAIN FEATURES



The model TE32D is designed for "forced air circulation" applications for both high and low temperature ranges. Three output relays, controlling compressor, defrosting cycle and evaporator fan, and two PTC sensors input for cell temperature measurement and defrost termination are available. Defrost takes place with either electric heat or hot gas (reverse cycle); the defrost type, as well as its frequency, time-out and termination temperature, are programmable. Complete evaporator fan control is available like delay and temperature lock-out after defrost, fan-compressor interlock.

The access to the controller programming may be inhibited.







IMPOSTAZIONE DEL SETPOINT

SET: tenendo premuto il tasto il display visualizza la temperatura a cui il compressore viene spento (indicazione lampeggiante); per modificarla è sufficiente agire sui tasti  o . Rilasciando **SET** il nuovo valore è memorizzato ed il display torna a visualizzare la temperatura in cella.

SETPOINT TEMPERATURE

SET: keeping pressed down this button the compressor off-switch temperature (indication blinking) is shown; in order to vary its value the  and  buttons must be pressed. Releasing **SET** the new value is stored.

MODIFICA DEI PARAMETRI

SET + . Premendo simultaneamente i due tasti, il display passerà a visualizzare il codice del parametro **A1**; rilasciando  si visualizza il valore impostato del parametro selezionato: con  o  è possibile variarlo. Premendo nuovamente  si visualizza il codice del successivo parametro, rilasciando  si visualizza il valore del parametro e così via.

PARAMETERS PROGRAMMING

SET + . Press both keys to display the first parameter label **A1** (the complete parameters list is at the end of this paragraph); release to display the value of each parameter and operate on **▲** and **▼** buttons to vary it. Press again to display the next parameter label.

PROTEZIONE DEI PARAMETRI

Il parametro **PP** permette l'impostazione di tre differenti livelli di protezione all'accesso da parte dell'utente dei parametri e del setpoint.

- **PP=0** nessuna protezione né sui parametri né sul setpoint
- **PP=1** protezione solo sui parametri, ma non sul setpoint
- **PP=2** protezione sia sui parametri sia sul setpoint

Per modificare i parametri, con la protezione attiva, è necessario spegnere la centralina, riaccenderla ed entrare nella modalità di programmazione, come indicato, entro 45 secondi. Oltre questo tempo sarà possibile visualizzare il valore di ogni parametro e del setpoint, ma non modificarli.

PARAMETERS AND SETPOINT PROTECTION AGAINST ACCESS BY THE USER

By the **PP** parameter three level of parameters and/or setpoint access protection can be set:

PP=0 no protection; **PP=1** only parameters protected; **PP=2** parameters and setpoint protected.

With protection enabled (E.D. (**PP=1** or **PP=2**), in order to modify the parameters/setpoint, the controller must be switched off; on turning it on again the access to parameters/setpoint is permitted within 45 seconds: after this time is expired the protection is activated and you can only see the par/set, but you are not allowed to modify it.

FILTRO SULLA VISUALIZZAZIONE SONDA TEMPERATURA

Si può scegliere se visualizzare sul display la temperatura istantanea (**P8=0**) oppure il valore medio in un certo periodo, impostabile con **P8** (per es. **P8=15** temperatura media degli ultimi 15 minuti).

DISPLAYED TEMPERATURE FILTERING

The temperature displayed can be selected between the instant value read by the thermostat probe (**P8=0**) or the average value within a certain period selectable by **P8**; ie if **P8=15** then the temperature displayed is the average value on 15 minutes.

BLOCCO TEMPERATURA VISUALIZZATA DURANTE LO SBRINAMENTO

Mediante il parametro **C2** è possibile bloccare la temperatura visualizzata al valore corrispondente all'inizio dello sbrinamento (**C2=1**) o visualizzare il codice PA; se **C2=0** il valore visualizzato è quello reale.

Nel caso in cui si abiliti la funzione di blocco della visualizzazione durante lo sbrinamento (**C2=1** o PA), è possibile mantenerla bloccata anche per un certo tempo dopo la fine dello sbrinamento (impostabile con **C8** in minuti).

DISPLAYED TEMPERATURE DURING DEFROST

By the **C2** par. the display mode during defrosting cycle can be locked: if **C2=0** the displayed temperature is the real value, if **C2=1** the display shows the temperature read at defrost starting and if **C2=2** the display shows the PA code. In case **C2=1** or **2**, when defrosting and drainage has finished, the control will display the same value for an additional time, programmable by **C8** in minutes.

VISUALIZZAZIONE TEMPERATURA SONDA EVAPORATORE

▲ : premendo questo tasto il display mostra la temperatura letta dalla sonda evaporatore.

DEFROSTING PROBE

▲ : keeping pressed this button the display will show the temperature read by the defrosting probe.

SBRINAMENTO MANUALE

! : premendo il relativo tasto per 5 secondi si dà inizio ad un ciclo di sbrinamento. Per azzerare il contatore del tempo tra uno sbrinamento ed il successivo, dopo aver effettuato uno sbrinamento manuale, occorre impostare il parametro **C4=1**.

MANUAL DEFROSTING

! : keeping this button pressed for 5 seconds, a defrost cycle will start. If **C4=1**, after a manual defrosting, the defrost interval timer is reset to 0.





PROTEZIONE SUL TEMPO MASSIMO INSERZIONE COMPRESSORE

Il parametro **F8** indica quanti minuti di funzionamento continuo può effettuare il compressore; successivamente, se **F9=0** viene forzato un ciclo di sbrinamento, mentre se **F9≠0** compressore effettua una pausa forzata di **F9** minuti. Se **F8=0** la funzione (Anti Freeze) viene disabilitata.





ANTI FREEZE FUNCTION

F8 sets the maximum continuous on-switch time for the compressor; when this time elapses and the compressor has never switched off, a defrost cycle starts if **F9=0**, while if **F9≠0** the compressor is forced off for **F9** minutes. If **F8=0** this function (Anti Freeze) is disabled.


FUNZIONE ABBATTIMENTO TEMPERATURA

+: premendo simultaneamente i due tasti si attiva la funzione, con visualizzazione della sigla **AP**. Il ciclo consiste nella forzatura del compressore attivo per 4 ore consecutive (by-pass del termostato), al termine delle quali viene effettuato un ciclo di sbrinamento. La eventuale protezione sul tempo massimo inserzione compressore (Anti Freeze) viene disabilitata. Il ciclo può essere interrotto premendo nuovamente i due tasti +. La funzione non è attivabile durante lo sbrinamento. **F1=0** disabilita la funzione.

DEEP FREEZE FUNCTION

+: press both keys to start a “deep freeze” cycle: the label “AP” is displayed. During a “deep freeze” cycle the compressor is forced on for 4 hours and a defrost cycle is started at the end. Press both keys + to stop the cycle. **F1=0** disables the function. During defrosting cycle the function is disabled.

MEMORIZZAZIONE DELLE TEMPORIZZAZIONI IN CASO DI MANCANZA TENSIONE DI RETE

Se viene interrotta la tensione di rete, la centralina mantiene in memoria i dati delle temporizzazioni per un tempo minimo di 30 minuti. Alla successiva riaccensione, se i dati sono ancora presenti in memoria, il segno meno lampeggerà per 10 secondi. È possibile azzerare il contenuto della memoria premendo  per 3 sec a centralina spenta.

TIME AND STATE MEMORY IN CASE OF VOLTAGE BLACK OUT

All the time counters (ie defrost interval counter) keep their values for 30 minutes at least if a voltage black out occurs. At the start-up the minus L.E.D. blinks for 10 seconds if all the values are been successfully saved.

SETPOINT ASSOLUTO E VISUALIZZAZIONE Sonda Pt2

Su alcune versioni il setpoint è rappresentato come un numero assoluto (1, 2, 3 ...) che vale **A1-SET+1** e la temperatura visualizzata è la temperatura letta dalla sonda Pt2: a numero superiore corrisponde una temperatura più fredda.

ABSOLUTE SETPOINT AND DISPLAY OF DEFROSTING PROBE

On some version of the controller, the setpoint can be regulated by numbers (equal to **A1-SET+1**) and the temperature displayed corresponds to the defrosting (Pt2) probe: at bigger numbers correspond colder temperatures.

MESSAGGI / MESSAGES			
Status light	display	funzione	function
		Compressore ON	Compressor ON
 flashing		Partenza comp. ritardata	Comp. Start-up delay
	AP	Sbrinamento in corso	defrosting
		Ventola ON	Fan ON
	AP	Abbattimento temp. attivo	Deep freeze cycle
	E1	Sonda termostato difettosa	Thermostat probe fault
	E2	Sonda sbrinamento difettosa	Defrost probe fault

PARAMETRI		PARAMETERS			
Cod	Descrizione	description	min	max	unit
SET	temperatura di lavoro	setpoint	A2	A1	°C
A1	SETPOINT massimo	higher setpoint	-50	+25	°C
A2	SETPOINT minimo	lower setpoint	-50	+25	°C
A3	differenziale	differential	0.5	9.5	°C
A8	intervallo tra due sbrinamenti	<i>Defrost interval</i>	0	12	ore
C0	durata massima sbrinamento	Defrost time out	5	99	min
C2	blocco display durante sbrinamento: 0 = no 1 = si PA = indicazione "PA"	display lock during defrost: 0=no 1=yes PA=label "PA2 is displayed"	0	2	flag
C3	tipo di sbrinamento: 0= elettrico, con ventola off 1= gas caldo, con ventola off 2= elettrico con ventola on 3= gas caldo, con ventola on	defrost type: 0= electric, fan off 1= reverse cycle / hot gas, fan off 2=electric, fan on 3= reverse cycle / hot gas, fan on	0	3	flag
C4	Sbrin. manuale resetta conteggio intervallo sbrin: 0 = no 1 = si	Manual defrost restart defrost interval counter: 0=no 1=yes	0	1	flag
C5	Temperatura fine sbrinamento: Pt2 esclusa se C5=50	Defrost stop temperature Pt2 disabl.E.D. if C5=50	0	+50	°C
C8	Prolungamento blocco display dopo fine sbrinamento	Display locking time after defrost	0	31	min
C9	Tempo di sgocciolamento	Drainage time	0	15	min
F0	Temperatura partenza ventola	<i>Fan start temperature</i>	-50	+99	°C
F1	Funzione abbattimento temperatura: 0 = disattivata, 1 = attivata	Deep freeze: 0=disabl.E.D., 1=enabl.E.D.	0	1	flag
F2	Ritardo partenza ventola dopo sbrinamento: -1 = ventola sempre disabilitata	Fan delay after defrost: -1=fan disabl.E.D.	-1	20	min
F5	Offset sonda cella	Room probe offset	-10	+10	°C
F8	Tempo max inserzione compressore: 0 = funzione disabilitata 1...15 = 16...240 minuti	Maximum continuous activation time of the compressor: 0=function disabl.E.D. 1...15=16...240 minutes	0	15	16 min
F9	Tempo arresto compressore: 0 = sbrinamento 1...99 minuti	Compressor off time: 0=defrost cycle 1...99=minutes	0	99	min
FA	ritardo accensione compr.	Comp. delay after shut-down.	0	15	min
P7	Se errore sonda termostato E1: 0=compr. OFF 1=compr. ON	If Pt1 sensor fail "E1": 0=compr. OFF 1=compr. ON	0	1	flag
P8	Costante tempo filtro visulaizzaz. sonda: 0 = nessun filtro	Time constant of displayed temperature filter: 0=no filtering	0	15	Min
P9	Fan - compressor interlock: 0 = no, 1 = yes	Fan - compressor interlock: 0 = no, 1 = yes	0	1	flag
PP	0 = nessuna protezione 1 = protezione solo dei parametri 2 = protezione parametri e setpoint	0=no protection 1=parameters protected 2=parameters and setpoint protected	1	2	flag

UNIVERSAL ELECTRONIC CONTROLLER
FOR REFRIGERATING APPLIANCES
WITH TEMPERATURE ALARM
HACCP

MS20 IARP

**ELETRONIC CONTROLLER MS20 IARP
MASTER UNIT**



Figure 2 – TE32E Eurema Display



Figure 3 – Eliwell Display



Figure 4 – FDA Display

MASTER UNIT TECHNICAL SPECIFICATION

Housing

- ABS self extinguishing - 32x64 mm
- Depth 83 mm max; Frontal protection: IP 65.

Mounting system

- Snap fitted - panel hole dimension 25x58 mm

Connections

- Fast-on 4.5x0.8 mm for temperature probes and digital input
- 5 pins connector for connection to slave unit type COMATEL 476.0395.105.440

Supply

- By 5 wires flat cable from slave unit

Keyboard

- 4 keys type

Display

- Two digits and one led for minus sign (-); 3 leds for compressor, evaporator motor fan and alarm.
- Display height 13 mm. Red led as standard.

Analogical input

- 1 Temperature PTC probe and 1 evaporator PTC probe (end of defrosting control)

Digital input

- To control the evaporator motor fans by door switch

Temperatures

- Functioning: [-10...+50] °C / [+14...+122] °F
- Storing: [-20...+60]°C / [-4...+140] °F

Measuring and regulating field

- [-50 ...+50]°C / [-58...+122] °F

Resolution

- 1°C / 1.8 °F

Precision

- ± 2 °C / ± 3.6 °F within the measuring field

SLAVE UNIT TECHNICAL SPECIFICATION

Housing

- ABS self extinguishing
- Protection IP 20

Fixing system

- by 2 screws

Connections

- Faston 6.3 x 0.8 mm to loads
- 5 wires flat cable to Master Unit by connector COMATEL 476.0395.105.440

Supply

- 230 Vac 50/60Hz +/-15% terminals 1 and 2
- 115 Vac 50/60Hz +/-15% on request with UL specifications

Digital output

- Compressor: 1 relay SPDT 16A terminals 9 nc, 10 no and 11com)
- Defrosting: 1 relay SPDT 8A terminals 3 nc, 4 no and 5 com
- Evaporator motor fan: 1 relay SPDT 5A terminals 6 nc, 7 no e 8 com

Temperatures

- Functioning: [-10...+55]°C / [+14...+122] °F
- Storing: [-20...+60]°C / [-4...+140] °F

ALARM UNIT TECHNICAL SPECIFICATION (OPTIONAL)

Housing

- ABS self extinguishing
- Protection IP 20

Fixing system

- by 2 screws

Connections

- Alarm relay with fast-on 6.3 x 0.8 mm
- 5 wires flat cable to Slave Unit by connector COMATEL 476.0395.105.440
- 5 wires flat cable to Master Unit by connector COMATEL 476.0395.105.440

Supply

- By 5 wires flat cable from Slave unit

Digital output

- Alarm relay: 1 relay SPST 5A terminals 1 no, 2 com

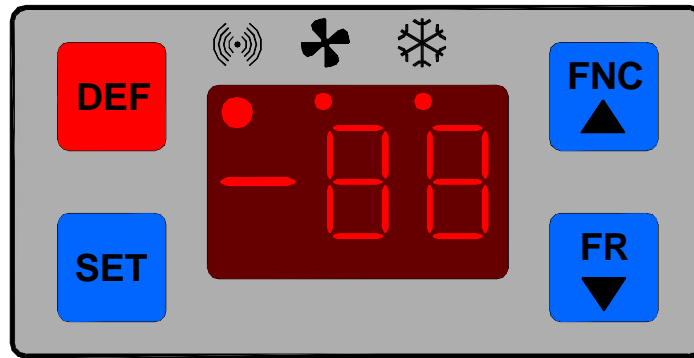
Signal output

- Pulsating buzzer

Temperatures

- Functioning: [-10...55]°C / [+14...+122] °F
- Storing: [-20...+60] °C / [-4...+140] °F

KEYBOARD AND USER INTERFACE



SET key functions

- Keeping pushed for 3 sec. it shows the Set point value blinking. The value may be increased by the **UP ? (FNC)** key and decreased by the **DOWN ? (FR)** key. The new value is automatically recorded by exiting the Set point mode (time-out: 10 sec) or by pressing the **SET** button again.
- Keeping pressed together with the **FNC** key for 3 sec., within 30 sec. from the on-switch, it enables the **Vector** programming mode. During the programming mode has confirmation function.
- Pressing it together with the **FNC** key for 3 sec., after 30 sec. from the on-switch, enables the **Single value** programming mode. During the programming mode has confirmation function.
- Pressing it together with the **DEF** key for 6 sec deletes the alarms (buzzer, relay and led) and the relative code (**AO** or **AA**).
- Pressing it together with the **FR** key for 6 sec reset all the parameters to the default values and the last programmed vector.

FNC key functions

- Keeping pushed for 1 sec. deletes the **Ct** code (max. time for compressor on) or the **dt** code (anomalous defrosting stopped by time) or the **CL** code (extended warning phase for product loading).
- Keeping pushed for 3 sec., within 60 sec. from the on-switch, disables the on-switch alarm and shows the **Pd** code (extended warning phase at refrigerator on-switch for temperature Pull Down).
- Keeping pushed for 3 sec., after 60 sec. from the on-switch, enables the extended warning phase for product loading and the **CL** code is lighting alternate with the inner temperature value throughout the pre-alarm time **A2**. An extra push of the key disables the function and the **CL** code.
- Keeping pressed together with the **SET** key for 3 sec., within 30 sec. from the on-switch, enables the **Vector** programming mode.
- Pressing it together with the **SET** key for 3 sec., after 30 sec. from the on-switch, enables the **Single value** programming mode.
- Pressing it together with the **DEF** key for 6 sec resets the controller (time, mode and alarm): stops the defrosting (if running) and resets the defrosting time counter, deletes the alarms (buzzer, relay and led) and the relative code (**AO** or **AA**) and resets the A2 time counter, disables the **Deep freeze**, **Anti freeze** and **Test** functions (if enabled).

DEF key functions

- Keeping pushed for 3 sec enables the defrosting cycle (when programmed).
- Pressing it together with the **FNC** key for 6 sec resets the controller (time, mode and alarm): stops the defrosting (if running) and resets the defrosting time counter, deletes the alarms (buzzer, relay and led) and the relative code (**AO** or **AA**) and resets the A2 time counter, disables the **Deep freeze**, **Anti freeze** and **Test** functions (if enabled).
- Pressing it together with the **SET** key for 6 sec deletes the alarms (buzzer, relay and led) and the relative code (**AO** or **AA**).

FR key functions

- Keeping pushed for 3 sec. enables the **deep freeze** function and the **Fr** code or the **Pull Up** function and the **PU** code. To disable the function press the **FR** key again.
- Keeping pushed for 3 sec. within 60 sec. from the end of the **Vector** programming mode, enable the **production end test** function. To disable the function press the **FR** key again.
- Pressing it together with the **SET** key for 6 sec resets all the parameters to the default values and the last programmed vector.

Relay displaying mode

- **Decimal point on right:** lighting = compressor on; flashing = waiting; off = compressor stopped
- **Decimal point on left:** lighting = inner fans on; flashing = inner fans waiting by door switch; off = inner fans stopped.
- **Minus sign:** flashing = *vector* programming mode enabled.
- **Alarm led:** flashing = Pre-Alarm mode; lighting = alarm mode.
- **All leds and digits:** flashing = Master unit not programmed.

User interface function keys summary

The keys combinations are summarized as follows:

Programming functions

- **Vector** programming mode: **SET + FNC** for 3 sec. within 30 sec. from refrigerator on-switch;
- **Single Value** programming mode: **SET + FNC** for 3 sec. after 30 sec. from refrigerator on-switch.

Cooling functions

- *Thermostatic cycle set point:* **SET** for 3 sec.;
- *Thermostatic cycle set point adjustment:* **UP ? (FNC)** to increase **DOWN ? (FR)** to decrease;
- *Defrosting cycle:* **DEF** for 3 sec.;
- *Deep Freeze or Pull Up function:* **FR** for 3 sec.;
- *Test function (for production test only):* **FR** for 3 sec. within 60 sec. after a **Vector** programming.

Reset functions

- **Ct, dt and CL** codes reset: **FNC** for 1 sec.;
- *Controller mode, time and alarm reset:* **DEF + FNC** for 6 sec.;
- *Controller reset to factory default parameters:* **SET + FR** for 6 sec.
- *Alarm signal reset:* **SET + DEF** for 6 sec.

Alarm functions

- *Extended warning phase at refrigerator on-switch:* **FNC** for 3 sec. within 60 sec. after a refrigerator on-switch;
- *Extended warning phase for product loading:* **FNC** for 3 sec., after 60 sec. from a refrigerator on-switch;
- *Alarm signal reset:* **SET + DEF** for 6 sec.

PROGRAMMING FUNCTIONS

Generalities

The MS20 IARP controller is made by 1 Master Unit and 1 Slave Unit, connected together by a 5 pins flat cable; optionally an Alarm Unit can be inserted between the 2 units in order to acoustically advise of an occurred alarm.

The Master unit has 29 programmable parameters, 9 "Standard" and 20 "Customized": the 9 standard parameters are common to all models of IARP refrigerating appliances, whereas the 20 customized one are different model by model. The customized parameters are mustered in vectors, each of them represents one refrigerator: all the vectors are memorized in the Master unit memory, so that just one Master unit code is necessary for all IARP products.

The universal Master unit is blank by default and must be programmed when assembled on the refrigerator: the 9 standard parameters are joined to the 20 stored in vectors when one of them is selected and activated by the "*Vector programming procedure*". The last selected vector is kept in memory as the factory default and the master unit can be refreshed to this default value at any time by pressing and keeping pressed contemporary for 6 sec. the **SET + FR** keys: following to this operation the display blinks 2 times to confirm the selection.

A blank Master unit does not enable any load when switched on: the display shows all leds and digits flashing and any function is disabled except the **SET** and **FNC** keys which, pressed together, allow the **Vector** programming mode.

Vector programming mode

To enter the **Vector** programming mode on blank Master units keep pushed together the **SET** and **FNC** keys for 3 sec.; with master unit already programmed keep pushed together the **SET** and **FNC** keys for 3 sec. within 30 sec. from the on-switch. The **minus sign start blinking** in order to identify this programming mode and the display shows the default vector number (from **01** to **23**). Any vector has 20 parameters (E₀₁–E₂₀) which define the control and functioning on the specific refrigerator: refer to section 11 for parameters value. By the UP ? (**FNC**) and down ? (**FR**) keys the Vectors are displayed shifting. No vector modification will be enabled without confirmation: the vector is enabled by pressing for 1 sec the **SET** key; the new value will blink 2 times to confirm the recording. After 10 sec. from the last input (time out) the control automatically exits from Vector programming mode, leaving any not confirmed modification.

There is no necessity for the final user to enter this programming mode and for this reason it is strongly recommended to distribute already programmed units only: the particular procedure needed to enter it (double keys with time, reduced operating time, switching off and request of confirmation conditions), makes highly unlikely the possibility to unintentionally modify the already programmed vector.

Single value programming mode

When the controller has already been programmed, it is anyway possible to modify each of the 20+9 parameters by the **Single Value** programming mode: to enter it keep contemporary pushed for 3 sec. **SET** and **FNC** keys after 30 sec. from the on-switch. The parameters code **A₁, A₂...A_i...B_j...C_k**, will appear in sequence by pressing the UP ? (**FNC**) and DOWN ? (**FR**) key. The correspondent parameter value will be shown by pressing the **SET** key. By the ? (**FNC**) and ? (**FR**) keys it will be possible to increase or decrease this value. No modification will be enabled if not confirmed: the new value will be recorded in memory only by pressing for 1 sec. the **SET** key: the new value will blink 1 time to confirm the right procedure and the display will show the next parameter **A_{n+1}**. After 10 sec. from the last input (time out) the control automatically exits from the programming mode, leaving any not recorded changement.

There is no necessity for the final user to enter this programming mode: the particular procedure needed to enter it (double keys with time and request of confirmation conditions), makes unlikely the possibility to unintentionally modify the parameters.

REFRIGERATING UNIT CONTROL FUNCTIONS

Generalities

The Master unit control is able to fulfill the following functions :

- **Temperature control;**
- **Defrosting cycle;**
- **Deep freeze or Pull Up cycle;**
- **Evaporator ice build-up (anti freeze) control;**
- **Compressor protection off-switch minimum time;**
- **Evaporator motor fans control;**
- **Refrigerator test cycle;**
- **Audible Temperature Alarm;**
- **Digital label for high temperature alarm;**
- **Digital label for Black out alarm;**
- **Digital label for door open alarm;**
- **Digital output Alarm relay (for modem or similar devices);**
- **Reset to factory default values;**
- **Auto detection temperature sensors failure.**

Bad events managing

The Master Unit is able to detect and manage some bad happenings that could compromise the right functioning logic:

- Black out during a writing procedure on the Eeprom;
- Time and mode memory after a voltage black out;
- Lost data on memory (code *EE* blinking alternating with temperature): in this case the compressor starts the protection cycles with On and Off periods defined by the *B2* parameter. In order to restore the right data is necessary to call the service centre.
- S1 probe failure (short circuited or disjointed): **E1** code is shown, fixed if displayed temperature is S1 (**A4=0**) alternate with temperature if displayed temperature is S2 (**A4=1**).
- S2 probe failure (short circuited or disjointed): **E2** code is shown, fixed if displayed temperature is S2 alternate with temperature if displayed temperature is S1.

Temperature scale

The controller is available with thermometer scale either in Celsius or in Fahrenheit degrees unit. Due to the fact that 2 digits are available on display, temperatures greater than 99 Fahrenheit (37.2 °C) are displayed by using letters with the following criterion: 100=a, 110=b, 120=c; for instance we can have the following values on temperature display: a3=103°F (39.4°C); a8=108°F (42.2°C); b7=117°F (47.2°C), c0=120°F (48.9°C); c2=122°F (50.0°C). The same is also used for the parameters values.

Displayed Set point temperature managing

When the thermostatic temperature is much different from the product average temperature, the **B0** parameter may show the thermostat set point by a non-dimensional scale: if **B0 = 0** the shown value is in °C (or °F) and corresponds to **SET**, whilst if **B0 = 1** the shown value is:

$$\mathbf{A9 \text{ (Set Point upper limit) - SET + 1}}$$

and can be considered only a number without dimensional unit. In this way the number 01 is always representing the 'warm' limit of the set point (**SET = A9**) and for every degree of temperature reduction (**SET < A9**) there is an increase of 1 unit. For example, if A8= -30°C and A9= -10°C and the desired temperature is -10°C, the set point must be positioned on 01; if the desired temperature is -30°C the set point must be 21 (-10 +30 +1); with set point positioned on 11 the correspondent temperature is -20°C.

By setting **C7=1** the user access to the Set Point adjustment can be inhibited: in this way the final user is not able to modify the set temperature. The default value is **C7=0** (free access to the set point adjustment): in order to modify this value enter the Single Value programming mode.

Compressor managing

Thermostat function

The set point enables the compressor off-switch temperature; the compressor on-switch temperature is set by the **A7 + SET**. The final user can access and adjust by default (**C7=0**) the set point between a max and a min defined by the **A8** and **A9** parameters: to modify the set point press for 3 sec. the **SET** key and the display will show the set point value blinking. By the UP ? (**FNC**) and DOWN ? (**FR**) keys this value can be increased or decreased: the new value is automatically recorded (no confirmation required) after 10 sec. (time out) or by pressing the **SET** key again for 3 sec.

To inhibit the Set Point adjustment to the final user, enter the Single Value programming mode and set **C7=1**.

Short compressor off-switch period protection

The **B1** parameter set the delay time in minutes for compressor on-switch between one stop and the following compressor restart. In order to avoid a not necessary pause after the first on-switch of the refrigerating unit, the **B1** parameter is connected to the **C3** parameter (evaporator motor fan delayed by temperature), so that if the defrosting probe reads a temperature **P12 > C3** the compressor starts immediately.

When the temperature probe is disabled (**C1 ≥ 50°C** or **C1 ≥ 120°F**) on the first on-switch the compressor always makes the delay set by **B1**. With Fahrenheit scale the evaporator probe is disabled setting **C1 ≥ c0 °F (120°F)**.

Anti freeze function

The **B3** parameter, in tenth of minutes, set the maximum allowable running time for the compressor, useful in case of open units where the ice formation on the evaporator can quickly decrease the cooling performances: if **B3=0** the function is disabled. If **B3?0** you can choose what to do when the compressor runs more than **B3** tenth of minutes by the **B4** parameter, in minutes: if **B4=0** the controller makes a defrosting cycle whilst if **B4?0** the control makes a compressor stop for a period in minutes set by the **B4** parameter itself: during this mode the displayed temperature value is alternated to the **Ct** (compressor time) code.

Deep Freeze or **Pull Up** function

By keeping pushed the **FR** key for 3 sec, the compressor is forced ON or OFF for a period in tenth of minutes set by the absolute value of **B5** parameter, neglecting the set point value; if **B5=0** the function is disabled; if **B5>0** the compressor is forced **ON** for **B5** tenth minutes and the display shows the code **FR** alternate with temperature, whilst if **B5<0** the compressor is forced **OFF** for $|B5|$ minutes and the display shows the code **PU** alternate with temperature. In case the function is enabled the controller makes a defrosting cycle (if necessary and if programmed) in order to have the maximum cooling capacity for the Pull Down or to help the Pull Up, and the display shows the **df** code alternate with **Fr** or **PU** code. If the defrosting cycle is not necessary (for example on the first starting when **Pt2 > C1** or with defrosting disabled), the **Deep Freeze** or **Pull Up** function is immediately enabled and the display shows the **Fr** or **PU** code alternate with the internal temperature. By pressing again the **FR** key for 3 sec the function is disabled.

Defrosting managing

The defrosting cycles are periodically and automatically executed for a maximum time in minutes set by the **B8** parameter. The period in hours, between two consecutive defrosting cycles, is set by the **B7** parameter: if **B7=0** the defrosting cycle is disabled, whilst if **B7?0** and **B8=0** the controller will apply just the dripping period set by **B9**. You can also start a defrosting cycle at any time by keeping pressed the **DEF** button for 3 sec. During a defrosting cycle and for the further dripping period (**B9** parameter) and internal motor fans delay period (**C3** parameter), the the **df** code appears fixed on the display. By the **C1** parameter you can enable or disable the end of defrosting probe: setting **C1=50°C** in case of Celsius scale or **C1=120°F** in case of Fahrenheit scale the controller consider the evaporator probe **S2** disabled. With evaporator probe **S2** enabled, the defrosting cycle ends when the **S2** probe reads the evaporator temperature bigger than **C1**: this is the standard behaviour, as the maximum time is normally grater than necessary to clean the evaporator; for this reason, when the defrosting cycle ends on maximum time (**B8** parameter), the **dt** code appears alternate with the temperature. The code disappears automatically at the next defrosting ended by the evaporator probe or by keeping pushed for 1 sec. the **FNC** key. If the end of defrosting probe is disabled (**C1=50°C** or **C1=120°F**) the defrosting cycles continues for the entire **B8** period and the **dt** code will not appear; if the **S2** probe is faulty the defrosting cycles continues for the entire **B8** period and the **dt** code will appear together with the **E2** code.

The **B6** parameter set the defrosting type: if **B6=0** the defrosting is made by electrical heater and the compressor is forced off during all the defrosting period, whilst if **B6=1** the defrosting is made by hot gas, and the compressor is forced on.

Defrosting types

Manual defrosting:	By keeping pushed the DEF key for 3 sec.
Automatic defrosting:	starts every B7 hours.
Forced defrosting:	starts when the Deep Freeze or Anti Freeze function are enabled if B4=0 .

The time elapsed from the last defrosting is monitored and If a voltage black out occurs the controller keeps in memory this value: at the voltage restoring the controller will count down the time remaining to complete the **B7** period; the defrosting time counter is reset after a manual or automatic or forced defrosting and on the restoring of the voltage if the **Pt2** temperature (**S2** probe) exceeds the end of defrosting temperature, or after a controller reset (by keeping pushed the **DEF** and **FNC** keys contemporary for 6 sec).

Displayed temperature managing

By the **A4** parameter we can choose which temperature is to be displayed: if **A4=0** the display shows the temperature corresponding to the probe **S1** (thermostat probe), whilst if **A4=1** the display shows the temperature corresponding to the probe **S2** (evaporator probe). The **A5** parameter (Offset of the displayed temperature) acts in order to vary the displayed temperature and the Set Point values. The Set Point temperature values in the vectors, include the offset: as a consequence the set point value always corresponds to the displayed one. When the setpoint scale is absolute (**B0=1**) the setpoint value is obviously independent from the offset.

Displayed temperature filter

By the **C6** parameter great excursions of displayed temperature due to big differential value (**A7** par.) can be reduced: as a consequence the display will show shorter temperature excursions compared with the set point value. Due to the different mass thermal capacities between air and stored product, the displayed temperature may vary much more than the stored product temperature, though having the same average values: in order to reduce this difference a simulated mass thermal capacity can be added to the temperature probe by the **C6** parameter: its value in minutes gives the response delay of the display to a temperature increase. No delay is given to a temperature decrease: as a consequence the average displayed temperature will appear slightly colder than normal. Above -5°C (or $+23^{\circ}\text{F}$) the function is automatically disabled and If **C6=0** the filter is always disabled.

Evaporator motor fans managing

The evaporator motor fans may function in parallel with the compressor or continuously or may be disabled by the **C2** parameter: if **C2=0** the fans are disabled (static cooling units); if **C2=1** they are independent from the compressor (High internal humidity) and if **C2=2** they are in parallel with the compressor (Low internal humidity). A motor fans set point

temperature, set by the **C3** parameter (motor fans starting by temperature on the evaporator probe) with Histeresys **C4**, is available in order to avoid dangerous thermal overloads on the evaporator.

If the end of defrosting probe is disabled, the motor fans control is independent from **C3**.

During defrosting and for the following dripping period the fans are controlled by **C5** parameter: if **C5=0** the fans are stopped and if **C5=1** the fans are running.

Door switch digital input

The **A6** parameter enable the door switch function. If **A6=0** the function is disabled; if **A6=1** the evaporator motor fans are connected to a NO switch (fans stopped with open circuit), and if **A6=2** the switch is NC (fans stopped with closed circuit). When a door switch stops the internal fans the fan led is blinking. An alarm function is connected to the door switch: every time the door is opened the alarm led starts flashing and if the door is leaved open for more than 60 sec. the *door open alarm* will start.

TEMPERATURE MONITORING AND ALARM FUNCTIONS

Generalities

The alarm functions are performed by showing alarm codes on the display and optionally by a warning buzzer located in the alarm unit: this unit can be connected at any moment, as it must be inserted in series between the Master unit and the Slave unit, it does not need independent electric supply, because takes it from the Slave unit.

The temperature monitoring and alarm functions are performed monitoring 2 variables: one *temperature*, defined by **A1** and **A3** parameters, and one *time*, defined by the **A2** parameter. An internal temperature is considered dangerous when 2 conditions happen: it overcomes the *max temperature threshold value* (TTV) set at **A1 + set point** and persists in this condition for a period longer than **A2** (Alarm delay time = ADT).

Consequently the control philosophy is based on 2 phases: the **Warning phase**, if temperature overcomes the TTV, and the **Alarm phase**, if the warning phase persists for a period longer than ADT.

In order to detect possible product overheating due to voltage black out, the controller, at its on-switch, sets an *extended temperature threshold value* (ETTV) to **A3 + set point** (bigger than TTV = **A1 set point**), connected to a fixed period of 60 seconds as ADT: this function is called **On-switch Warning phase**. To avoid unwanted alarms when the refrigerator is switched on the first time, a special procedure shuts off the alarm phase and start the **Extended On-switch Warning phase**.

A similar condition, that could result in unwanted alarms, comes true during refrigerator product loading operations, where the door remains opened for a relatively long time: in this situation is possible to run the **Extended Warning phase for product loading**, that delays the eventual alarm phase.

With door switch enabled (A6?0), if the door is kept open more than 60 sec. a **Door open alarm** will start.

Warning phase

When the internal temperature exceeds TTV (**A1 + set point**), the control starts the *warning phase*: the alarm led on the display is blinking for a period not bigger than ADT (parameter **A2**) afterwards the control starts the *alarm phase*. If during a standard warning phase the temperature goes below the TTV, the warning phase ends and the ADT counter is reset to 0.

On-switch warning phase

When, following to a refrigerator on-switch, the internal temperature is higher than ETTV (**Set point + A3**) the controller starts the *on-switch warning phase*: this phase has a shortened ADT of 60 sec., as it is not possible to measure the length of the voltage black out period; the alarm led on the display is blinking for 60 seconds afterwards the control starts the *alarm phase*. As at the first installation the internal temperature will surely be higher than TTV, the controller will start an *On-switch warning phase*: if you do not want an alarm follow the instructions of the next section 7.4 in order to start a pull down phase and inhibit the alarm.

If, during the *on-switch warning phase*, the temperature goes below TTV, the warning phase automatically ends and the ADT counter is reset to 0.

Extended On-switch warning phase (On-switch alarm inhibition) – Pull Down phase

During the 60 seconds period of an *on-switch warning phase* it is possible to avoid the alarm by extending the ADT to the **A2** value and avoid an unwanted alarm by pushing the **FNC** key for 3 sec.: when “- - -” appears on display release the key. After this procedure the display shows the code **Pd (Pull Down)** alternating with temperature till the ADT time is elapsed.

This function is useful to avoid an unwanted alarm at the first installation of the unit: the operator must be informed on the enabling procedure.

By this procedure the warning phase is extended from the standard 60 sec. to the **A2** value. After a time equal to **A2** is elapsed and in case temperature is higher than ETTV, the control goes in *Alarm phase*; on the contrary, if temperature is lower than ETTV but bigger than TTV, the control starts a *warning phase* for another **A2** period: practically the refrigerator has a period equal to $2 \times A2$ in order to pull down temperature below the TTV. At last, if after a $2 \times ADT$ period temperature is still higher than TTV, the control enters the *Alarm phase*.

The *Extended on-switch warning phase* ends when temperature falls below TTV.

Extended warning phase on product loading (Product loading alarm inhibition)

After 60 sec are elapsed from an on-switch, by pressing the **FNC** key for 3 seconds, the *Extended warning phase* is enabled: when “- - -” appears on display the key can be released. Enabling this procedure the display shows the code **CI** (Cooler loading) alternating with temperature till the ADT time is elapsed.

This function is useful to avoid an unwanted alarm during product loading operations: the operator must be informed on the enabling procedure. This function can not be enabled during a warning or alarm phase.

By this procedure the warning phase is enabled when temperature exceeds the ETTV (**A3+set point**) instead of TTV (**A1+set point**) value. After a time equal to **A2** is elapsed and in case temperature is still higher than ETTV, the control enters the *Alarm phase*; if temperature is still within ETTV and TTV, the control starts the *warning phase* for another ADT period: practically the refrigerator has a time equal to $2 \times A2$ value to pull down the temperature below the TTV. At last, if after a $2 \times ADT$ period temperature is still higher than TTV, the controller enters the *Alarm phase*. The *Extended warning phase* ends when temperature falls below TTV.

Alarm phase

When the ADT is elapsed during a warning phase and temperature is still over TTV or ETTV the control enters the *Alarm phase*: the display shows the **AO** code alternating with temperature and the alarm led on display stops flashing and lights continuously; if an alarm unit is connected the buzzer blows and the alarm relay is enabled.

The alarm phase ends automatically when temperature falls below the TTV: it is possible to shut down the alarm phase by the *alarm reset* (**DEF + SET** for 6 sec.) or the *controller reset* (**DEF + FNC** for 6 sec.) procedures, but the controller will restart a warning phase, as temperature is bigger than TTV.

During the alarm phase the displayed temperature is refreshed only if the new value is bigger than the previous one: in this way **the display is always showing the max temperature during the alarm phase**.

Door open alarm

When the refrigerator door is opened the controller immediately starts a *warning phase* (alarm led flashing) for 60 seconds: if the door is kept open for more than 60 sec. the controller enters the *door open alarm phase*: the display shows the **dO** code alternated with temperature and the alarm led lights continuously; if an alarm unit is connected, the buzzer blows and the alarm relay is enabled.

The *door open alarm phase* ends automatically when the door is closed again. With door switch disabled (**A6=0**) the door open alarm is disabled too.

Alarm inhibition

By setting **A1=0** the monitoring function is excluded and all the alarms, included the door open one, are disabled. Since **A3** parameter cannot be smaller than **A1**, any modification on the **A1** parameter is submitted to the control **A1 = A3**: when this condition is confused the control automatically refresh the **A3** value, setting **A3 = A1**.

Alarm reset

By pressing contemporary the **SET** and **DEF** keys for 6 sec. the controller exits the alarm mode and the alarm code is deleted. The same result is obtained with the controller reset procedure, by contemporary pressing the **DEF** and **FNC** keys for 6 sec.: in this case all the time counters and the controller mode are reset too.

TEST FUNCTION

Generalities

This function helps the test of the unit at the end of production process. It's enabled by pressing the **FR** key for 3 sec. only within 60 sec. after a Vector programming has been executed: by pressing the **FR** key again the function is disabled. By pressing the **FR** key after 60 sec. from a Vector programming, the *Deep Freeze* function will be executed. When the *Test function* is enabled the monitoring and alarm function is disabled for all the test duration. The test has 2 phases:

Test function phase	Duration
• F1 = Pull Down Phase	A2 * 10 minutes
• F2 = Defrosting phase	max B8 + B9 minutes

Phases F1 and F2

At the test starting the **F1** phase is enabled: the control forces the compressor on for a period equals to **A2** * 10 minutes, bypassing the set point:, in order to control the max cooling power of the unit. At the end of **F1** phase, the **F2** phase starts, and the controller forces a defrosting cycle only if **B7?0**: if no defrosting is programmed the **F2** phase is jumped and the function ends at the end of phase **F1**.

After the test function has been executed the controller turns the refrigerator to the normal functioning, driving the internal temperature to the set point value. During all the Test function period the display shows the code of the relative phase **F1** or **F2** alternate with temperature.

TABLE OF MESSAGES

Message	Displayed Code	Limits	Delay or duration	Message type	Enabling way	Enabling procedure
Standard High temperature alarm	AO + alarm led lighting	TTV = [SET + A1]	ADT = A2 * 10 min.	Alternated with temperature	Automatic	Automatic if programmed
On-switch High temperature alarm	AA + alarm led lighting	ETTV = [SET + A3]	60 sec.	Alternated with temperature	Automatic	Automatic if programmed
Door open alarm	dO + alarm led lighting	door open more than 60 sec.	60 sec.	Alternated with temperature	Automatic	Automatic if programmed
Standard warning phase	alarm led blinking	ETTV = [SET + A1]	ADT = A2 * 10 min.	-	Automatic	Automatic if programmed
Standard on-switch warning phase	alarm led blinking	ETTV = [SET + A3]	60 sec.	-	Automatic	Automatic if programmed
Extended on-switch warning phase - Pull Down phase (On-switch alarm inhibition)	Pd + alarm led blinking	ETTV = [SET + A3]	max 2* A2 min.	Alternated with temperature	Manual	FNC for 3 sec within 60 sec from on-switch
Extended warning phase during product loading (Product loading alarm inhibition)	CL + alarm led blinking	ETTV = [SET + A3]	max 2* A2 min.	Alternated with temperature	Manual	FNC for 3 sec after 60 sec from on-switch
Compressor on	compressor led lighting	-	-	-	Automatic	Automatic
delayed compressor on-switch	compressor led blinking	B1 ? 0 and Off time < B1	Max B1 min.	-	Automatic	Automatic
Evaporator motor fans on	motor fan led lighting	-	-	-	Automatic	Automatic
Delayed evaporator motor fans on-switch	motor fan led blinking	Pt2 > C3	variable	-	Automatic	Automatic
Evaporator motor fans forced off by door switch	motor fan led blinking	-	-	-	Door switch	Automatic at door opening
Defrosting	df	T = B7 and Pt2 < C1	max B8 min + B9 min. + evap. motor fans delay	Fixed	Automatic	Automatic if programmed
		Pt2 < C1			Manual	DEF for 3 sec if programmed
		B3?0 and B4=0 and Pt2 < C1			Forced by Deep freeze	FR for 3 sec if programmed
		B5 ? 0 and Pt2 < C1			Alternated with Fr or PU	Forced by Anti-freeze or Pull Up
Long defrosting	dt	Defr. duration = B8	-	Alternated with temperature	Automatic	Automatic if programmed
Deep Freeze or Pull Up function	Fr	B5 > 0	B5*10 min	Fr Alternated with temp.	Manual	FR for 3 sec if programmed
	PU	B5 < 0	B5 *10 min	PU Alternated with temp.		
Anti Freeze function	Ct	t_on = B3	B4 min. or max B8 min	Alternated with temperature	Automatic	Automatic if programmed
Test function	F1	-	A2 * 10 min.	Alternated with temperature	Manual	FR for 3 sec within 60 sec after a vector programming
	F2	B8 ? 0	max B8 min			
Programming mode	Minus sign blinking	-	-	-	Manual	Vector Programming: SET+ FNC for 3 sec within 60 sec from on-switch
						Single value Programm.: SET + FNC for 3 sec after 60 sec from on-switch
Defective temperature probe	E1	-	-	Fixed or Alternating with temperature	Automatic	Automatic
Defective evaporator probe	E2	-	-			
Defective eeprom	EE	-	-	Fixed or Alternated with temperature	Automatic	Automatic
Blank memory	All leds blinking	Vector not programmed	-	-	Automatic	Automatic

TABLE OF PARAMETERS

Code	Parameter function	Unit	Range	STP	Vx
<i>Alarm</i>					
A1	Temperature Threshold Value (TTV) respect to set point for Alarm function	°C	00 = disabled	-	E01
A2	Alarm Delay Time (ADT)	min*10	-	06	-
A3	Extended Temperature Threshold Value (ETTV) respect the set point for Alarm function	°C	-	-	E02
<i>Display</i>					
A4	Displayed temperature: Pt1 or Pt2	flag	00 = Pt1 01 = Pt2	-	E03
<i>Temperature offset</i>					
A5	Displayed temperature offset	°C		-	E04
<i>Digital Input</i>					
A6	Door switch input	flag	00 = disabled 01 = enabled NO 02 = enabled NC	-	E05
<i>Compressor</i>					
A7	Histeresys (differential Start/stop)	°C		-	E06
A8	Lower set point limit	°C		-	E07
A9	Upper set point limit	°C		-	E08
B0	Absolute Set point	flag	00 = no 01 = yes	-	E09
B1	Compressor minimum off-switch period	min	00 =disabled	03	-
B2	Minutes of compressor start and stop when Pt1 probe is defective	min		05	-
B3	Max allowable time for compr. continuous running for anti freeze function	min*10	00 = disabled	-	E10
B4	Compressor functioning mode after an anti freeze function intervention	min	00 = defrosting 01 ÷ 255 pause	-	E11
B5	Time of compressor forced on for deep freeze function or off for Pull Up function	min*10	00 = disabled B5>0 compr. On B5<0 compr. Off	24	-
B6	Compressor functioning mode during defrosting (Electrical or Hot gas defrosting)	flag	00 = off 01 = on	-	E12
<i>Defrosting</i>					
B7	Time between 2 consecutive defrosting	hours	00 = disabled	-	E13
B8	Maximum duration of defrosting	min		-	E14
B9	Dripping period	min		03	-
C1	End of defrosting temperature for evaporator probe Pt2	°C	Pt2 disabled if >= 50	-	E15
<i>Evaporator motor fans</i>					
C2	Motor fans functioning mode during cooling respect to compressor	flag	00 = excluded 01 = continuous 02 = parallel	-	E16
C3	Motor fans maximum starting temperature	°C		-	E17
C4	Motor fans off-switch temperature differential respect to C3	°C		08	-
C5	Evaporator motor fans functioning mode during defrosting	flag	00 = off 01 = on	-	E18
<i>Displayed temperature</i>					
C6	Filter on temperature increase	min	00 = excluded	-	E19
C7	Set Point user access inhibition	flag	00 = off 01 = on	00	-
SET	Set point (not included in the parameter menu)	-		-	E20

Note: The highlighted parameters are common to all the refrigerating units and are not included in the vectors E_x (1<x<20). The STP column gives the factory default values.

VECTORS TABLE

Code	Unit	Description	V01		V02		V03	
			AB 400 PV - AB 500 PV		B02 - MAD		IDEA 60 - IDEA 100	
			°C	°F	°C	°F	°C	°F
A1	°C	Temperature differential to the set point for Alarm function	7	13	7	13	12	23
A3	°C	Extended temperature differential to the set point for Alarm function	12	22	11	20	17	32
A4	flag	Displayed temperature: Pt1 or Pt2	00	00	00	00	00	00
A5	°C	Offset displayed temperature	00	00	00	00	00	00
A6	flag	Door switch enabling	01	01	00	00	00	00
A7	°C	Histeresys (differential Start/stop)	2	4	3	5	5	9
A8	°C	Lower set point limit	-5	+23	-30	-22	-5	+23
A9	°C	Upper set point limit	+10	+50	-15	+5	+10	+50
B0	flag	Absolute Set point	0	0	0	0	0	0
B3	min*10	Max time of compressor on for anti freeze function	00	00	00	00	7	7
B4	min	Compressor functioning mode after an anti freeze function intervention	00	00	00	00	15	15
B6	flag	Compressor functioning mode during defrosting (Electrical or Hot gas defr.)	01	01	01	01	00	00
B7	hours	Time between 2 consecutive defrost.	06	06	06	06	06	06
B8	min	Maximum duration of defrosting	20	20	20	20	20	20
C1	°C	End of defrosting temperature for Pt2	+15	+59	+12	+54	+10	+50
C2	flag	Motor fans functioning mode during cooling respect to compressor	01	01	00	00	01	01
C3	°C	Evap. motor fans starting temperature	+7	+45	-50	-40	+10	+50
C5	flag	Evap. motor fans functioning mode during defrosting	00	00	00	00	01	01
C6	flag	Filter on temperature increase	0	0	0	0	0	0
SET	°C	Set point	0	+32	-23	-9	+2	+35

Code	Unit	Description	V04		V05		V06	
			EIS 25-45-55 HGD - EFX N		EIS 23		EIS 21 - K2	
			°C	°F	°C	°F	°C	°F
A1	°C	Temperature differential to the set point for Alarm function	10	18	8	15	8	15
A3	°C	Extended temperature differential to the set point for Alarm function	15	27	12	22	12	22
A4	flag	Displayed temperature: Pt1 or Pt2	00	00	00	00	00	00
A5	°C	Offset displayed temperature	+3	+6	+3	+5	00	00
A6	flag	Door switch enabling	01	01	00	00	00	00
A7	°C	Histeresys (differential Start/stop)	6	11	4	7	2	4
A8	°C	Lower set point limit	-35	-31	-35	-31	-5	+23
A9	°C	Upper set point limit	-10	+14	-15	+5	+10	+50
B0	flag	Absolute Set point	0	0	0	0	0	0
B3	min*10	Max time of compressor on for anti freeze function	00	00	00	00	00	00
B4	min	Compressor functioning mode after an anti freeze function intervention	00	00	00	00	00	00
B6	flag	Compressor functioning mode during defrosting (Electrical or Hot gas defr.)	01	01	01	01	01	01
B7	hours	Time between 2 consecutive defrost.	06	06	00	00	08	08
B8	min	Maximum duration of defrosting	15	15	0	0	15	15
C1	°C	End of defrosting temperature for Pt2	+9	+48	+50	c0	+15	59
C2	flag	Motor fans functioning mode during cooling respect to compressor	01	01	00	00	00	00
C3	°C	Evap. motor fans starting temperature	+1	+34	-50	-40	-50	-40
C5	flag	Evap. motor fans functioning mode during defrosting	00	00	00	00	00	00
C6	flag	Filter on temperature increase	8	8	8	8	0	0
SET	°C	Set point	-22	-8	-23	-9	+2	+35

Code	Unit	Description	V07		V08		V09	
			SHOT COOLER *		COUNTER U *		ARTICA HGD	
			°C	°F	°C	°F	°C	°F
A1	°C	Temperature differential to the set point for Alarm function	00	00	00	00	8	15
A3	°C	Extended temperature differential to the set point for Alarm function	00	00	00	00	13	24
A4	flag	Displayed temperature: Pt1 or Pt2	01	01	01	01	00	00
A5	°C	Offset displayed temperature	-2	-4	+2	-4	+2	+4
A6	flag	Door switch enabling	00	00	00	00	00	00
A7	°C	Histeresys (differential Start/stop)	8	14	4	7	3	6
A8	°C	Lower set point limit	-35	-31	-30	-22	-35	-31
A9	°C	Upper set point limit	-15	+5	-11	+12	-10	+14
B0	flag	Absolute Set point	1	1	1	1	0	0
B3	min*10	Max time of compressor on for anti freeze function	00	00	00	00	00	00
B4	min	Compressor functioning mode after an anti freeze function intervention	00	00	00	00	00	00
B6	flag	Compressor functioning mode during defrosting (Electrical or Hot gas defr.)	01	01	01	01	01	01
B7	hours	Time between 2 consecutive defrost.	00	00	00	00	08	08
B8	min	Maximum duration of defrosting	0	0	0	0	20	20
C1	°C	End of defrosting temperature for Pt2	00	+32	00	+32	+15	+59
C2	flag	Motor fans functioning mode during cooling respect to compressor	00	00	00	00	00	00
C3	°C	Evap. motor fans starting temperature	-50	-40	-50	-40	-50	-40
C5	flag	Evap. motor fans functioning mode during defrosting	00	00	00	00	00	00
C6	flag	Filter on temperature increase	10	10	22	22	0	0
SET	°C	Set point	11 (-25)**	19 (-13)**	04 (-14)	06 (+7)	-20	-4

Code	Unit	Description	V10		V11		V12	
			AB PV PHARMACY		ROTARY HGD		ASIA 2T	
			°C	°F	°C	°F	°C	°F
A1	°C	Temperature differential to the set point for Alarm function	00	00	00	00	10	18
A3	°C	Extended temperature differential to the set point for Alarm function	00	00	00	00	15	27
A4	flag	Displayed temperature: Pt1 or Pt2	00	00	00	00	00	00
A5	°C	Offset displayed temperature	0	0	+4 +3	+7 +6	+4	+7
A6	flag	Door switch enabling	01	01	00	00	00	00
A7	°C	Histeresys (differential Start/stop)	2	4	6 5	11 9	4	7
A8	°C	Lower set point limit	0	+32	-10	+14	-35	-31
A9	°C	Upper set point limit	+15	+59	+10	+50	-15	+5
B0	flag	Absolute Set point	0	0	0	0	0	0
B3	min*10	Max time of compressor on for anti freeze function	00	00	6	6	00	00
B4	min	Compressor functioning mode after an anti freeze function intervention	00	00	7	7	00	00
B6	flag	Compressor functioning mode during defrosting (Electrical or Hot gas defr.)	00	00	01	01	00	00
B7	hours	Time between 2 consecutive defrost.	4	4	6	6	8	8
B8	min	Maximum duration of defrosting	20	20	15	15	20	20
C1	°C	End of defrosting temperature for Pt2	+50	c0	+10 +6	+50 +43	+12	+54
C2	flag	Motor fans functioning mode during cooling respect to compressor	02	02	01	01	00	00
C3	°C	Evap. motor fans starting temperature	+40	+99	+7 +15	+45 +60	-50	-40
C5	flag	Evap. motor fans functioning mode during defrosting	01	01	00	00	00	00
C6	flag	Filter on temperature increase	0	0	0	0	0	0
SET	°C	Set point	+2	+35	+1 0	+34 +32	-20	-4

** = green led and green cover

Code	Unit	Description	V13		V14		V15	
			COUNTER N		SHELLY 70		ROTARY ED	
			°C	°F	°C	°F	°C	°F
A1	°C	Temperature differential to the set point for Alarm function	00	00	00	00	00	00
A3	°C	Extended temperature differential to the set point for Alarm function	00	00	00	00	00	00
A4	flag	Displayed temperature: Pt1 or Pt2	01	01	01	01	00	00
A5	°C	Offset displayed temperature	+4	+7	+2	+4	+2	+4
A6	flag	Door switch enabling	00	00	00	00	00	00
A7	°C	Histeresys (differential Start/stop)	8	14	9	16	6	11
A8	°C	Lower set point limit	-39	-38	-10	+14	-10	+14
A9	°C	Upper set point limit	-19	-2	+10	+50	+10	+50
B0	flag	Absolute Set point	01	01	01	01	00	00
B3	min*10	Max time of compressor on for anti freeze function	00	00	5	5	6	6
B4	min	Compressor functioning mode after an anti freeze function intervention	00	00	12	12	7	7
B6	flag	Compressor functioning mode during defrosting (Electrical or Hot gas defr.)	01	01	00	00	00	00
B7	hours	Time between 2 consecutive defrost.	00	00	6	6	6	6
B8	min	Maximum duration of defrosting	00	00	20	20	20	20
C1	°C	End of defrosting temperature for Pt2	00	+32	+49	+99	+6	+43
C2	flag	Motor fans functioning mode during cooling respect to compressor	00	00	01	01	01	01
C3	°C	Evap. motor fans starting temperature	-50	-40	+40	+99	+6	+43
C5	flag	Evap. motor fans functioning mode during defrosting	00	00	01	01	01	01
C6	flag	Filter on temperature increase	10	10	0	0	0	0
SET	°C	Set point	11 (-29)	19 (-20)	14 (-3)	23 (+26)	+1	+34

Code	Unit	Description	V16		V17		V18	
			IMPULS N - JAZZ N		IMPULS P - ECX P-JAZZ P		STOK BT	
			°C	°F	°C	°F	°C	°F
A1	°C	Temperature differential to the set point for Alarm function	00	00	00	00	7	14
A3	°C	Extended temperature differential to the set point for Alarm function	00	00	00	00	11	21
A4	flag	Displayed temperature: Pt1 or Pt2	00	00	00	00	00	00
A5	°C	Offset displayed temperature	+8	+14	+3	+6	-2	-4
A6	flag	Door switch enabling	00	00	00	00	01	01
A7	°C	Histeresys (differential Start/stop)	8	14	6	11	3	5
A8	°C	Lower set point limit	-40	-40	-15	+5	-30	-22
A9	°C	Upper set point limit	-10	+14	+5	+41	-10	+14
B0	flag	Absolute Set point	0	0	0	0	0	0
B3	min*10	Max time of compressor on for anti freeze function	00	00	00	00	00	00
B4	min	Compressor functioning mode after an anti freeze function intervention	00	00	00	00	00	00
B6	flag	Compressor functioning mode during defrosting (Electrical or Hot gas defr.)	01	01	01	01	00	00
B7	hours	Time between 2 consecutive defrost.	12	12	8	8	6	6
B8	min	Maximum duration of defrosting	20	20	20	20	17	17
C1	°C	End of defrosting temperature for Pt2	+10	+50	+6	+43	+10	+50
C2	flag	Motor fans functioning mode during cooling respect to compressor	01	01	01	01	01	01
C3	°C	Evap. motor fans starting temperature	0	+32	+2	+36	0	+32
C5	flag	Evap. motor fans functioning mode during defrosting	00	00	00	00	00	00
C6	flag	Filter on temperature increase	6	6	6	6	0	0
SET	°C	Set point	-28	-18	-2	+28	-24	-11

Code	Unit	Description	V19		V20		V21	
			STOK PN		STOK P		EIS 25-45-55 ED	
			°C	°F	°C	°F	°C	°F
A1	°C	Temperature differential to the set point for Alarm function	6	12	6	12	10	19
A3	°C	Extended temperature differential to the set point for Alarm function	10	20	10	20	15	27
A4	flag	Displayed temperature: Pt1 or Pt2	00	00	00	00	00	00
A5	°C	Offset displayed temperature	-1	-2	-1	-2	+3	+6
A6	flag	Door switch enabling	01	01	01	01	01	01
A7	°C	Histeresys (differential Start/stop)	2	4	2	4	6	11
A8	°C	Lower set point limit	-5	+23	+1	+34	-35	-31
A9	°C	Upper set point limit	+15	+59	+15	+59	-10	+14
B0	flag	Absolute Set point	0	0	0	0	0	0
B3	min*10	Max time of compressor on for anti freeze function	00	00	00	00	00	00
B4	min	Compressor functioning mode after an anti freeze function intervention	00	00	00	00	00	00
B6	flag	Compressor functioning mode during defrosting (Electrical or Hot gas defr.)	00	00	00	00	00	00
B7	hours	Time between 2 consecutive defrost.	6	6	6	6	6	6
B8	min	Maximum duration of defrosting	17	17	17	17	18	18
C1	°C	End of defrosting temperature for Pt2	+15	+59	+50	c0	+12	+54
C2	flag	Motor fans functioning mode during cooling respect to compressor	01	01	01	01	01	01
C3	°C	Evap. motor fans starting temperature	+15	+59	+15	+59	+1	+34
C5	flag	Evap. motor fans functioning mode during defrosting	00	00	01	01	00	00
C6	flag	Filter on temperature increase	0	0	0	0	8	8
SET	°C	Set point	-2	+28	+2	+35	-22	-8

Code	Unit	Description	V22		V23		V24	
			AB 700 P		ARTICA ED		AFRIKA 2C HGD	
			°C	°F	°C	°F	°C	°F
A1	°C	Temperature differential to the set point for Alarm function	00	00	8	15	8	15
A3	°C	Extended temperature differential to the set point for Alarm function	00	00	12	23	13	23
A4	flag	Displayed temperature: Pt1 or Pt2	00	00	00	00	00	00
A5	°C	Offset displayed temperature	0	0	+2	+4	+2	+4
A6	flag	Door switch enabling	00	00	00	00	00	00
A7	°C	Histeresys (differential Start/stop)	2	4	3	6	3	6
A8	°C	Lower set point limit	0	+32	-35	-31	-35	-31
A9	°C	Upper set point limit	+15	+59	-10	+14	-10	+14
B0	flag	Absolute Set point	0	0	00	00	00	00
B3	min*10	Max time of compressor on for anti freeze function	00	00	00	00	00	00
B4	min	Compressor functioning mode after an anti freeze function intervention	00	00	00	00	00	00
B6	flag	Compressor functioning mode during defrosting (Electrical or Hot gas defr.)	00	00	00	00	01	01
B7	hours	Time between 2 consecutive defrost.	04	04	12	12	08	08
B8	min	Maximum duration of defrosting	20	20	20	20	15	15
C1	°C	End of defrosting temperature for Pt2	+50	c0	+10	+50	+15	+59
C2	flag	Motor fans functioning mode during cooling respect to compressor	01	01	00	00	01	01
C3	°C	Evap. motor fans starting temperature	+40	+99	-50	-40	+50	C2
C5	flag	Evap. motor fans functioning mode during defrosting	01	01	00	00	00	00
C6	flag	Filter on temperature increase	0	0	0	0	0	0
SET	°C	Set point	+2	36	-18	0	-20	-4


5.3 WIRING DIAGRAM

Here below the wiring diagrams SE0311/00 (if the unit has a H/P pressostat (PAP) (105)) and SE0311/02 describe how the unit works.

REF.	DEVICE	DISPOSITIVO
AA	High pressure acoustic signal	Segnalatore acustico di allarme alta pressione
BA	Ballast	Reattore
CE	Electronic control board display	Display entralina elettronica
CO	Compressor	Compressore
CS	Power supply cord	Cavo spina
FRF	EMC filter	Filtro antidisturbo
H	Defrosting probe	Sonda sbrinamento
I	Thermostat probe	Termostato controllo temperatura
IG	Main switch	Interruttore generale
IL	Light switch	Interruttore luci
ILA	Floater switch	Interruttore livello acqua
KFS	End of defrosting thermostat	Termostato fine sbrinamento
KS	Safety thermostat	Termostato di sicurezza
LV	Neon lamp	Lampada
M	Shelves Rotation motor	Motore di rotazione ripiani
MC	Condensing motor fan	Motoventola condensatore
MI	Evaporator motor fan	Motoventola evaporatore
PAP	High pressure switch (with reset button)	Pressostato alta pressione (con riarmo manuale)
PBP	Low pressure switch	Pressostato di bassa pressione
RC	Compressor relay	Relay compressore
RCA	Frame heater	Resistenza cornice mobile
RE	Water evapor. electronic relay	Relay elettronico evaporazione acqua
REV	Evaporator heater	Resistenza evaporatore
RS	Defrosting relay	Relay di sbrinamento
RVR	Evaporation water heater	Resistenza evaporazione acqua
UP	Power unit	Unità di potenza
VM	Cut off valve	Valvola di mandata

SOSTITUISCE DIS. N° _____ MODIFICHE _____

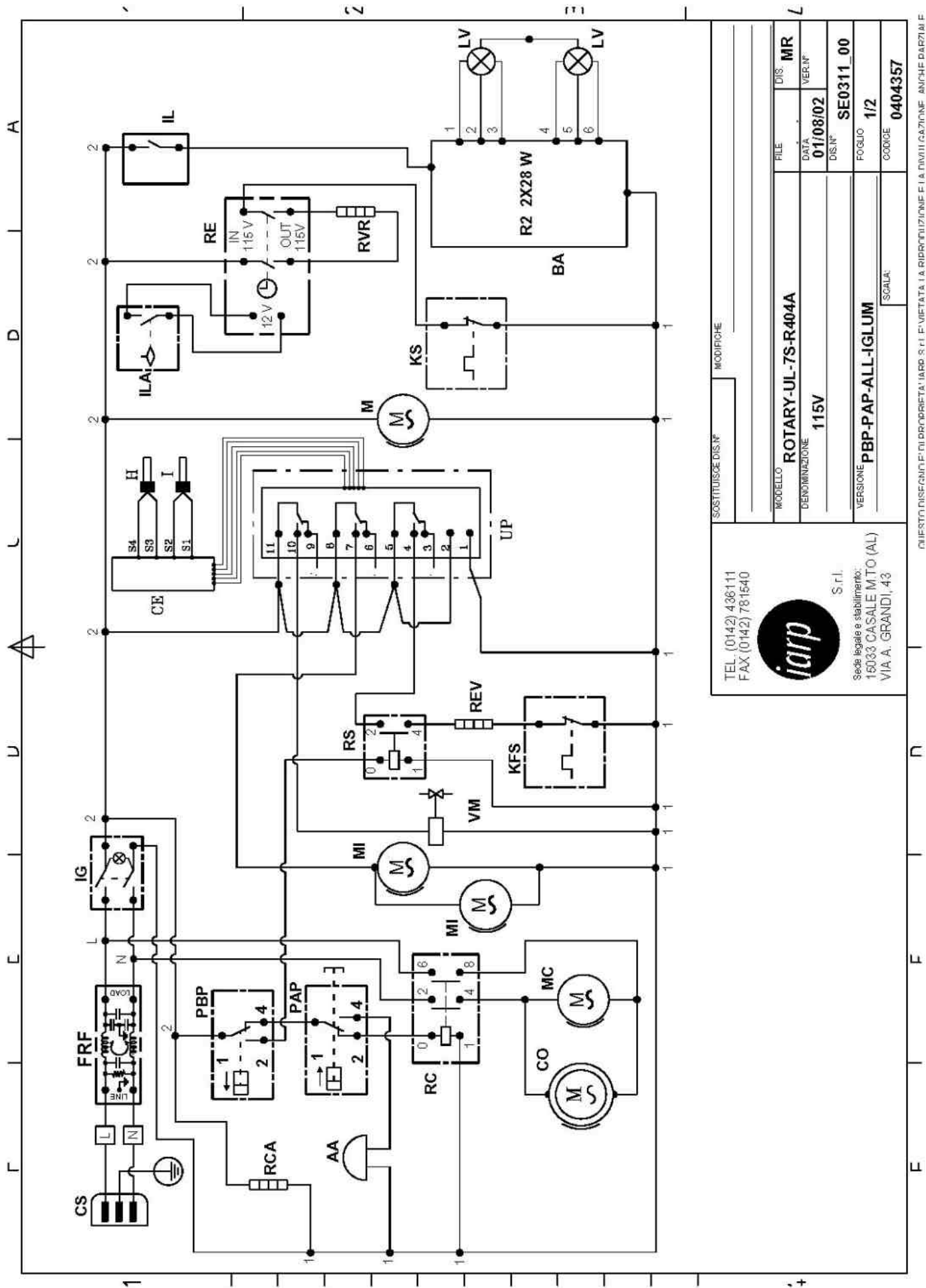
TEL. (0142) 436111
FAX (0142) 781540



S.r.l.
Sede legale e stabilimento:
15033 CASALE M.TO (AL)
VIA A. GRANDI, 43

MODELLO	ROTARY-UL-7S-R404A	FILE	DIS	MR
DENOMINAZIONE	115V	BAST.	DIS. N°	VER. N°
VERSIONE	PBP-PAP-ALL-IGLUM	FOGLIO	DIS. N°	SE0311_00
	SCALA	CODICE		2/2
				0404357

QUESTO INSEGNAMENTO È DI PROPRIETÀ IARP S.r.l. È VIETATA LA RIPRODUZIONE E LA DISTRIBUZIONE IN TUTTE LE FORME, ANCHE PARZIALI.



SOSTITUISCE DISIN°

MODIFICHE

TEL. (0142) 436111
FAX (0142) 781540




S.r.l.
Sede legale e stabilimento:
15033 CASALE MTO (AL)
VIA A. GRANDI, 43

MODELLO	ROTARY-UL-7S-R404A	FILE	DIS.	MR
DENOMINAZIONE	115V	DATA	01/08/02	VER.N°
VERSIONE	PBP-PAP-ALL-IGLUM	DISIN°	SE0311_00	
		FOGLIO	1/2	
		CODICE	0404357	
		SCALA:		

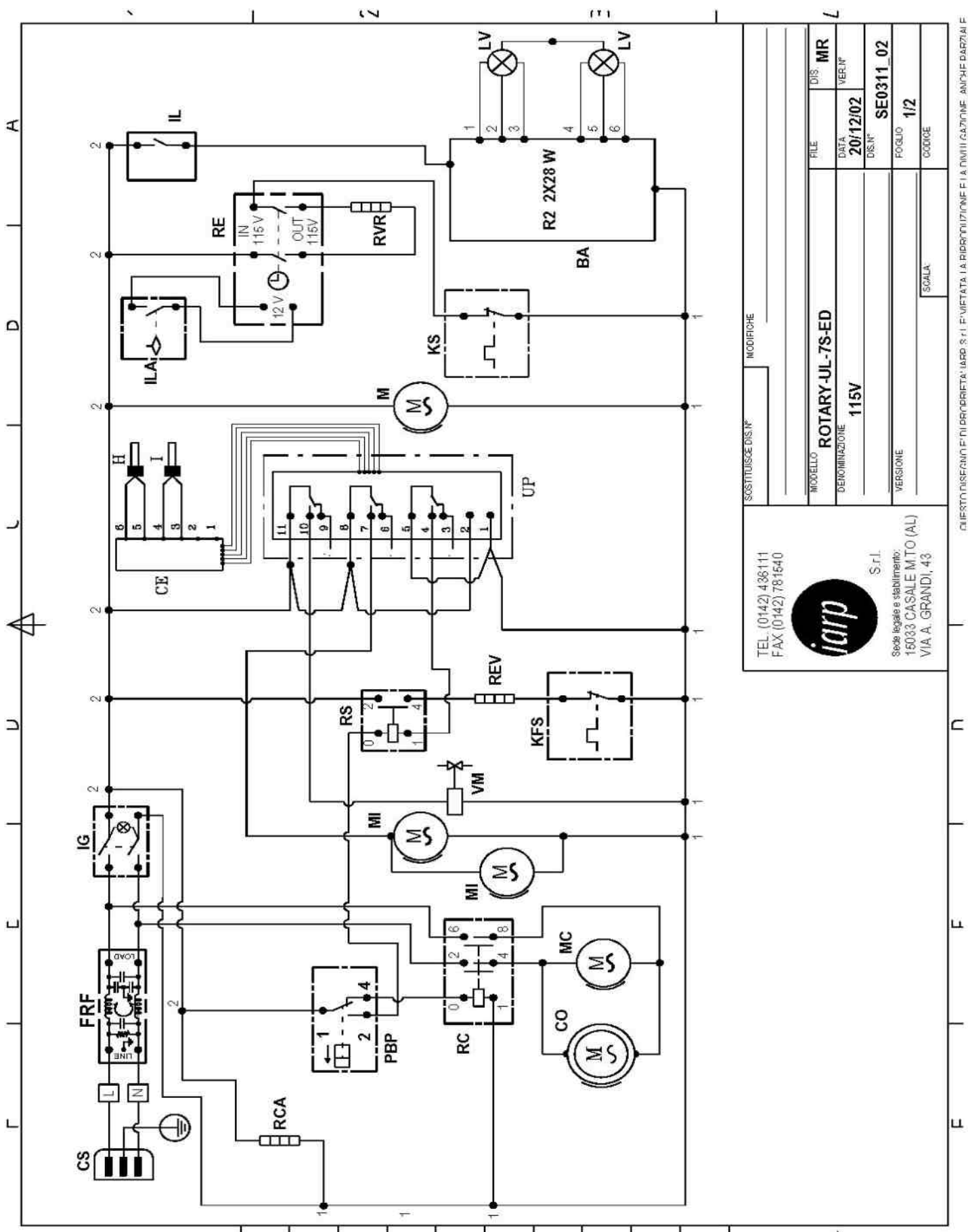
QUESTO DISSEGNO È DI PROPRIETÀ IARP S.r.l. È VIETATA LA RIPRODUZIONE E LA DIMISSIONE ANCHE PARZIALE

REF.	DEVICE	DISPOSITIVO
BA	Ballast	Reattore
CE	Electronic control	Centralina elettronica
CO	Compressor	Compressore
CS	Power supply cord	Cavo spina
FRF	EMC filter	Filtro antidisturbo
H	Defrosting probe	Sonda sbrinamento
I	Thermostat probe	Termostato controllo temperatura
IG	Main switch	Interruttore generale
IL	Light switch	Interruttore luci
ILA	Floater switch	Interruttore livello acqua
KFS	End of defrosting thermostat	Termostato fine sbrinamento
KS	Safety thermostat	Termostato di sicurezza
LV	Neon lamp	Lampada
M	Rotation motor	Motore di rotazione
MC	Condensing motor fan	Motoventola condensatore
MI	Evaporator motor fan	Motoventola evaporatore
PBP	Low pressure switch	Pressostato di bassa pressione
RC	Compressor relay	Relay compressore
RCA	Frame heater	Resistenza cornice mobile
RE	Water evap. electronic relay	Relay evaporaz. acqua elettronico
REV	Evaporator heater	Resistenza evaporatore
RS	Defrosting relay	Relay di sbrinamento
RVR	Evaporation water heater	Resistenza evaporazione acqua
UP	Power unit	Unità di potenza
VM	Cut off valve	Valvola di mandata


SOSTITUISCE DIS.N° _____ MODIFICHE _____
 MODELLO **ROTARY-JUL-7S-ED** FILE DIS. **AP**
 DENOMINAZIONE **115V** DATA **20/12/02** VERN° _____
 VERSIONE _____ DIS.N° **SE0311_02** FOGLIO **2/2**
 SCALA: _____ CODICE _____

TEL. (0142) 436111
 FAX (0142) 781540
 S.r.l.
 Sede legale e stabilimento:
 15033 CASALE M.TO (AL)
 VIA A. GRANDI, 43

QUESTO DISEGNO È DI PROPRIETÀ IARP S.r.l. È VIETATA LA RIPRODUZIONE E LA DIVULGAZIONE ANCHE PARZIALE

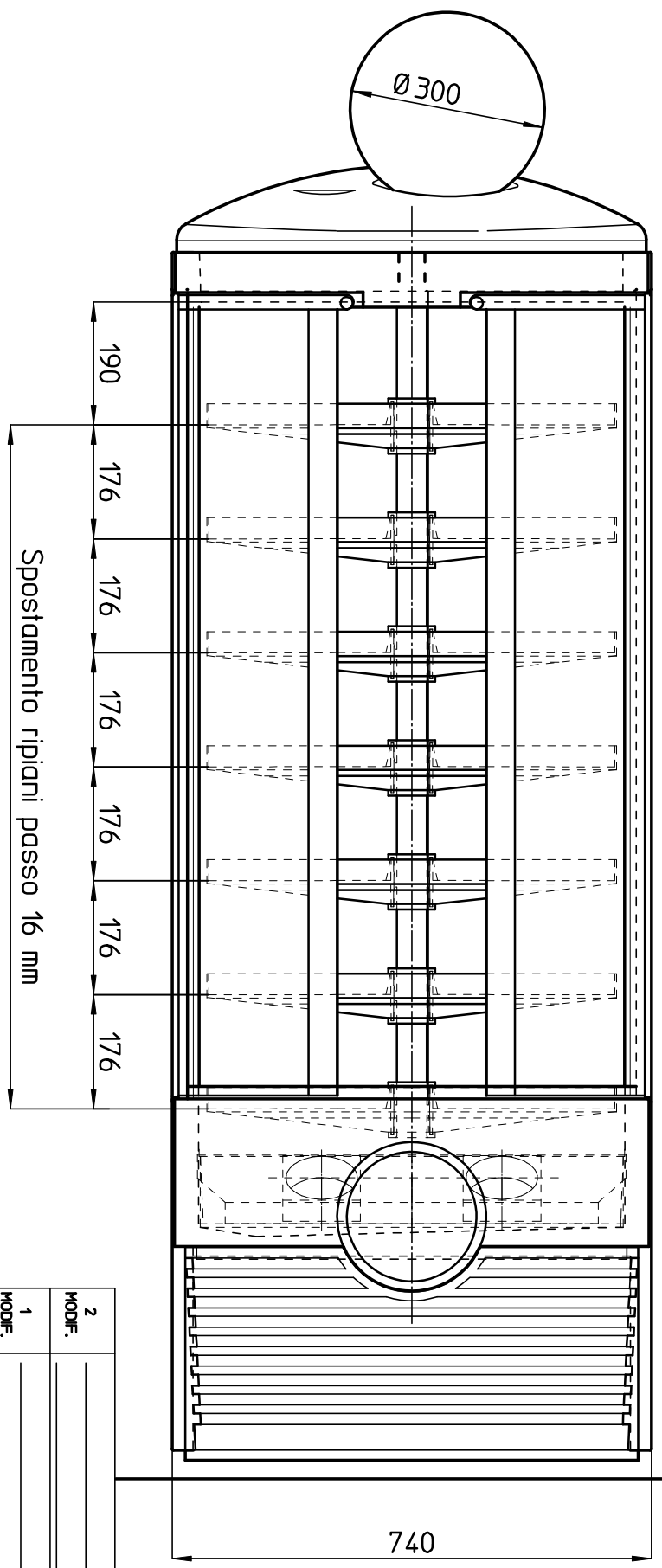
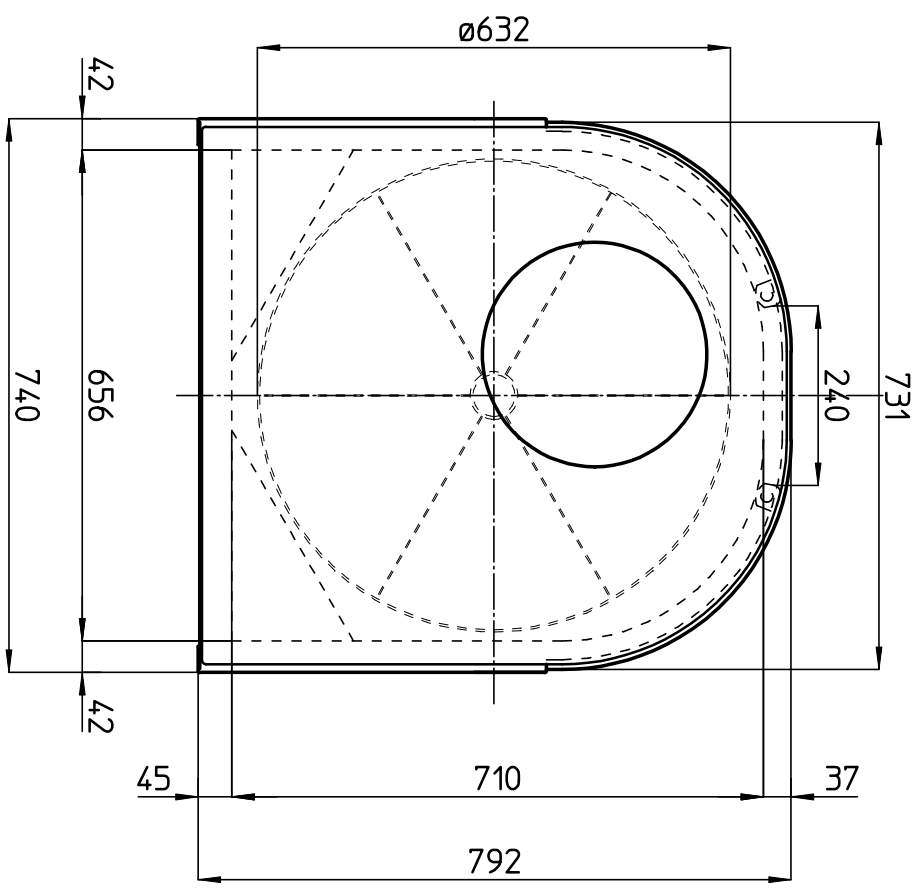
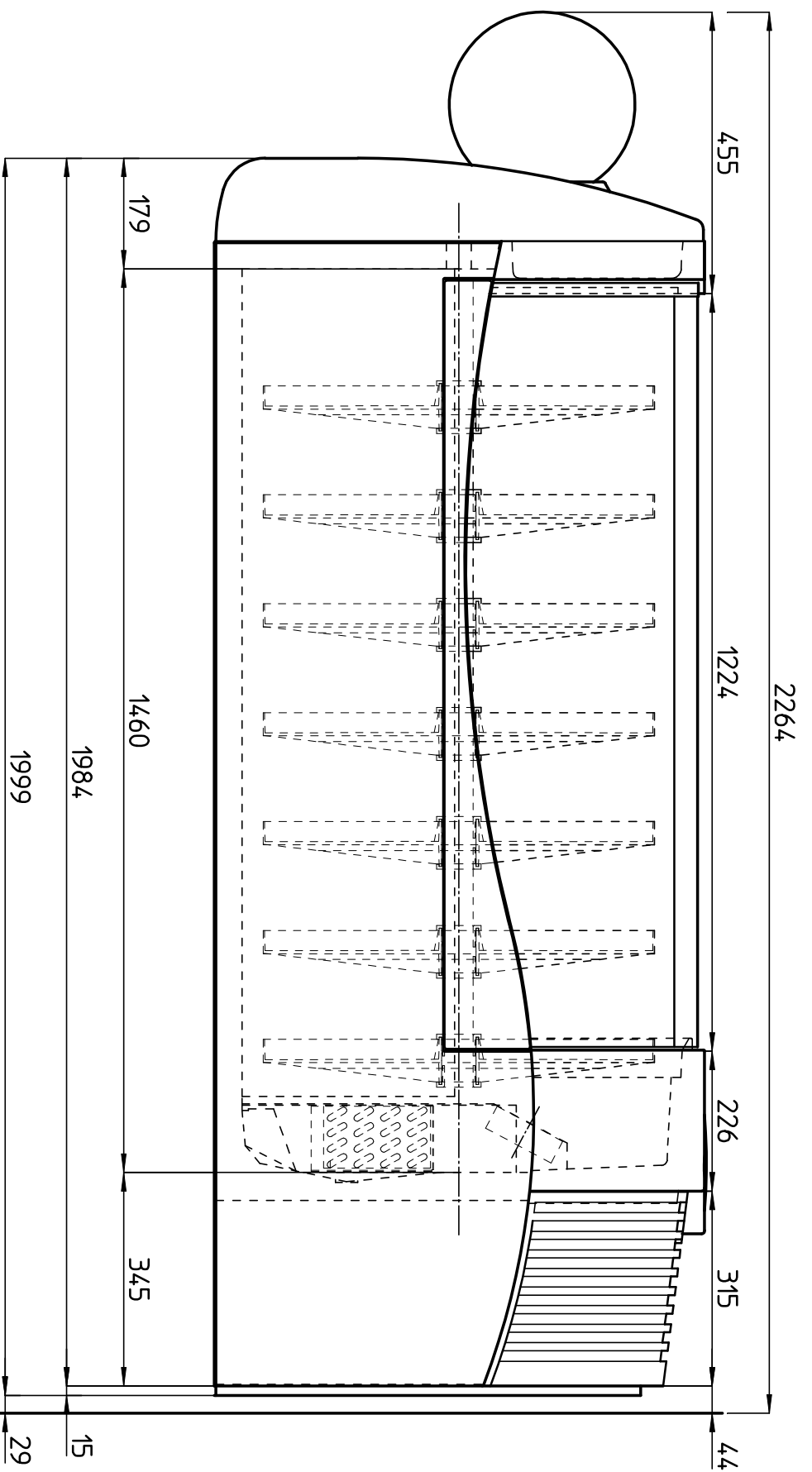


SOSTITUISCE DIS. N° _____ MODIFICHE _____
 TEL. (0142) 438111
 FAX (0142) 781640


 S.r.l.
 Sede legale e stabilimento:
 15033 CASALE M.TO (AL)
 VIA A. GRANDI, 43

MODELLO	ROTARY-JUL-7S-ED	FILE	DIS. MR
DENOMINAZIONE	115V	DATA	VER. N°
VERSIONE		DIS. N°	SE0311_02
		FOGLIO	1/2
		SCALA	

QUESTO DISPOSITIVO È PIÙ PROPRIETÀ: IARD S.P.A. È VIETATA LA RIPRODUZIONE E L'ADATTAMENTO IN TUTTE LE FORME.



N° 60 bott./latt. ø67 per ripiano
 N° 36 bottiglie ø91 per ripiano

2 MODIF.	4 MODIF.	PROGRAMMA
1 MODIF.	3 MODIF.	SCALA
		PEZZI N.
		1:10
		DATA
		10-5-2001
		STATO
		PESO
		DIS. N°
		VP4667/00
		SOSTITUISCE
		DIS. N°
		CODICE

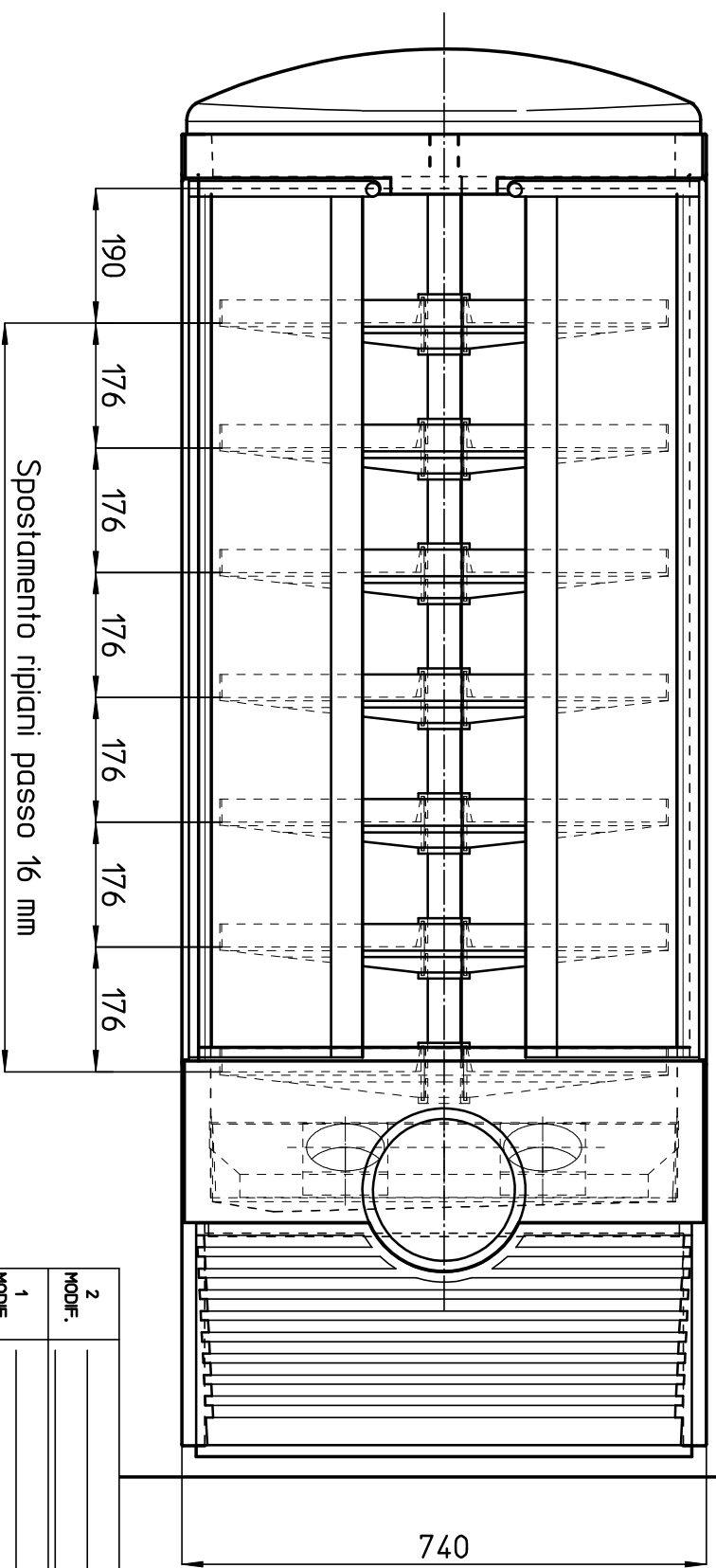
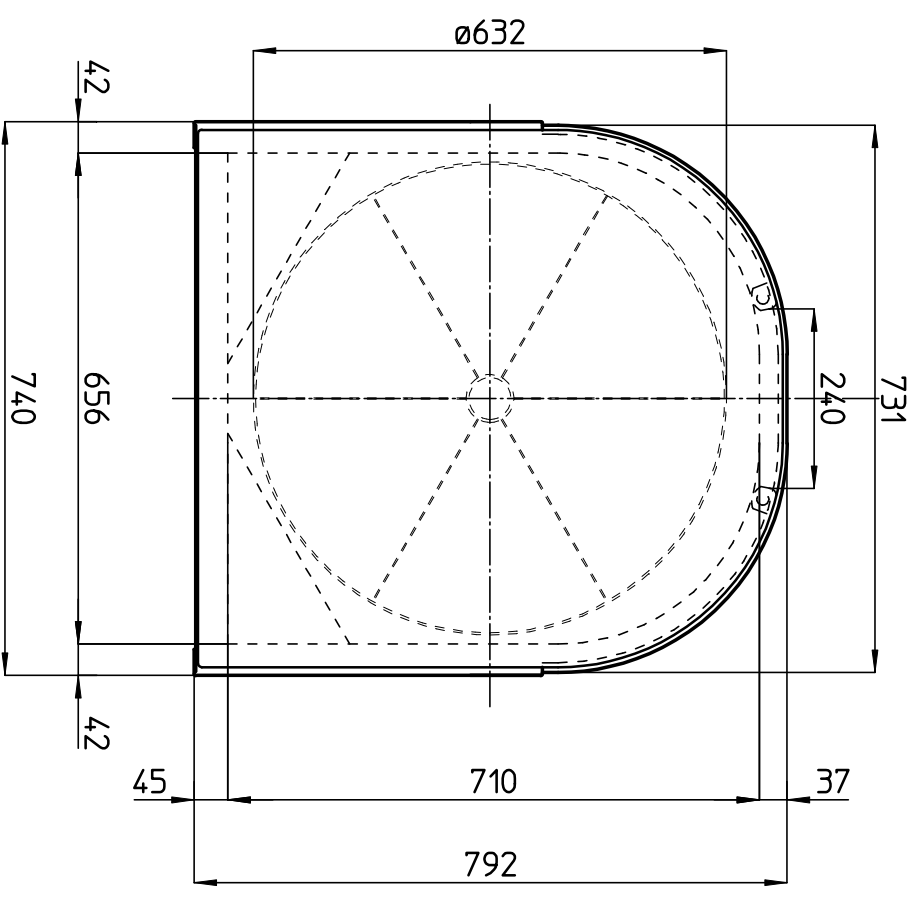
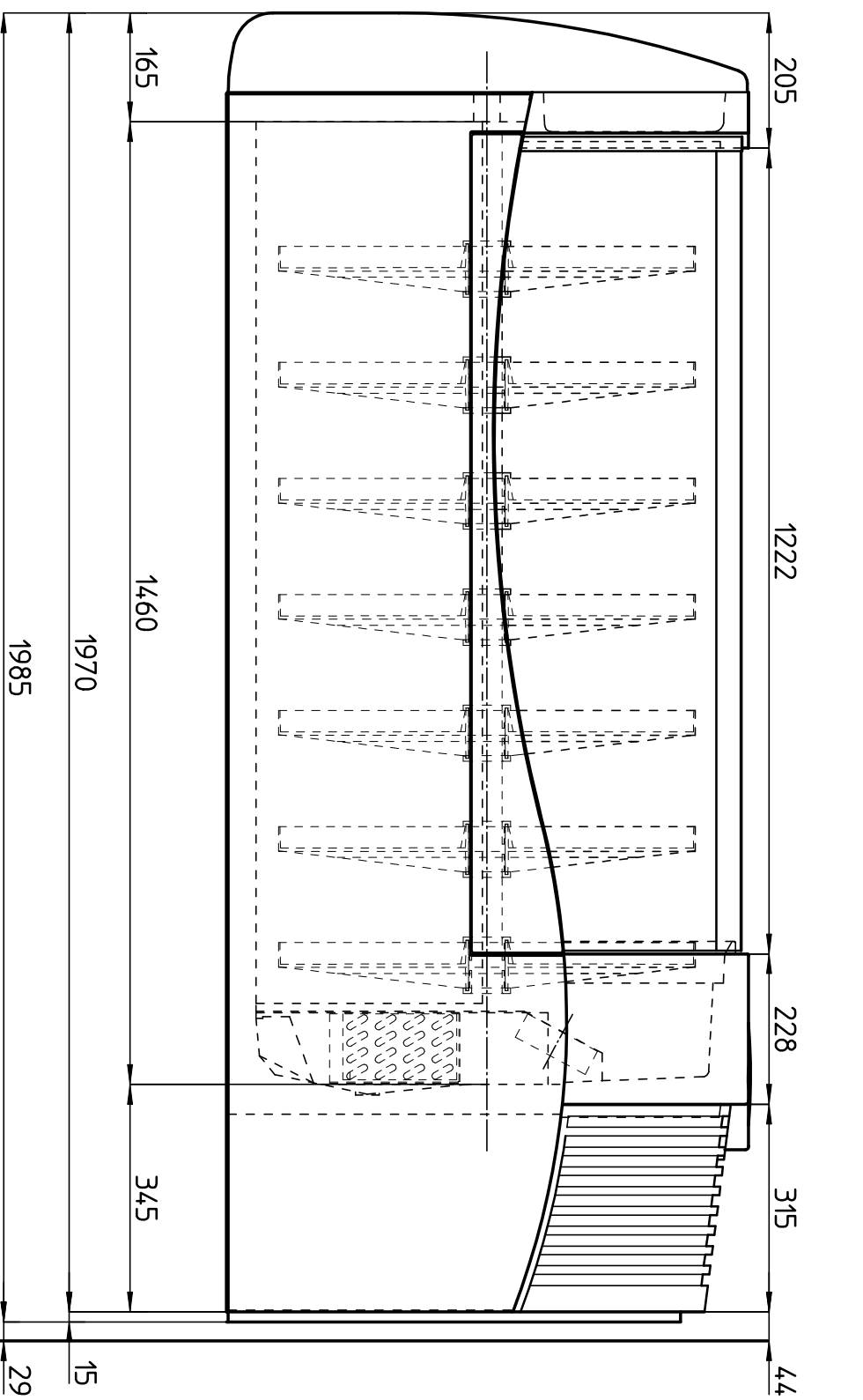


S.r.l.

Sede legale e stabilimento:
 15033 CASALE MONFERRATO (AL)
 VIA A. GRANDI, 43

TEL. 0142436111
 TELEFAX 0142781540

QUESTO DISEGNO E' DI PROPRIETA' IARP S.r.l.
 E' VIETATA LA RIPRODUZIONE E DIVULGAZIONE



N° 60 bott./latt. ø67 per ripiano
 N° 36 bottiglie ø91 per ripiano

2 MODIF.	4 MODIF.	PROGRAMMA	PEZZI N.
1 MODIF.	3 MODIF.	SCALA	1:10
MODELLO ROTARY		DATA	9-4-2002
DENOMINAZIONE BOZZETTO (Senza sferra)		STATO	PESO
MATERIALE		DIS. N.	VP5072/00
		SOSTITUISCE	DIS. N°
		CODICE	

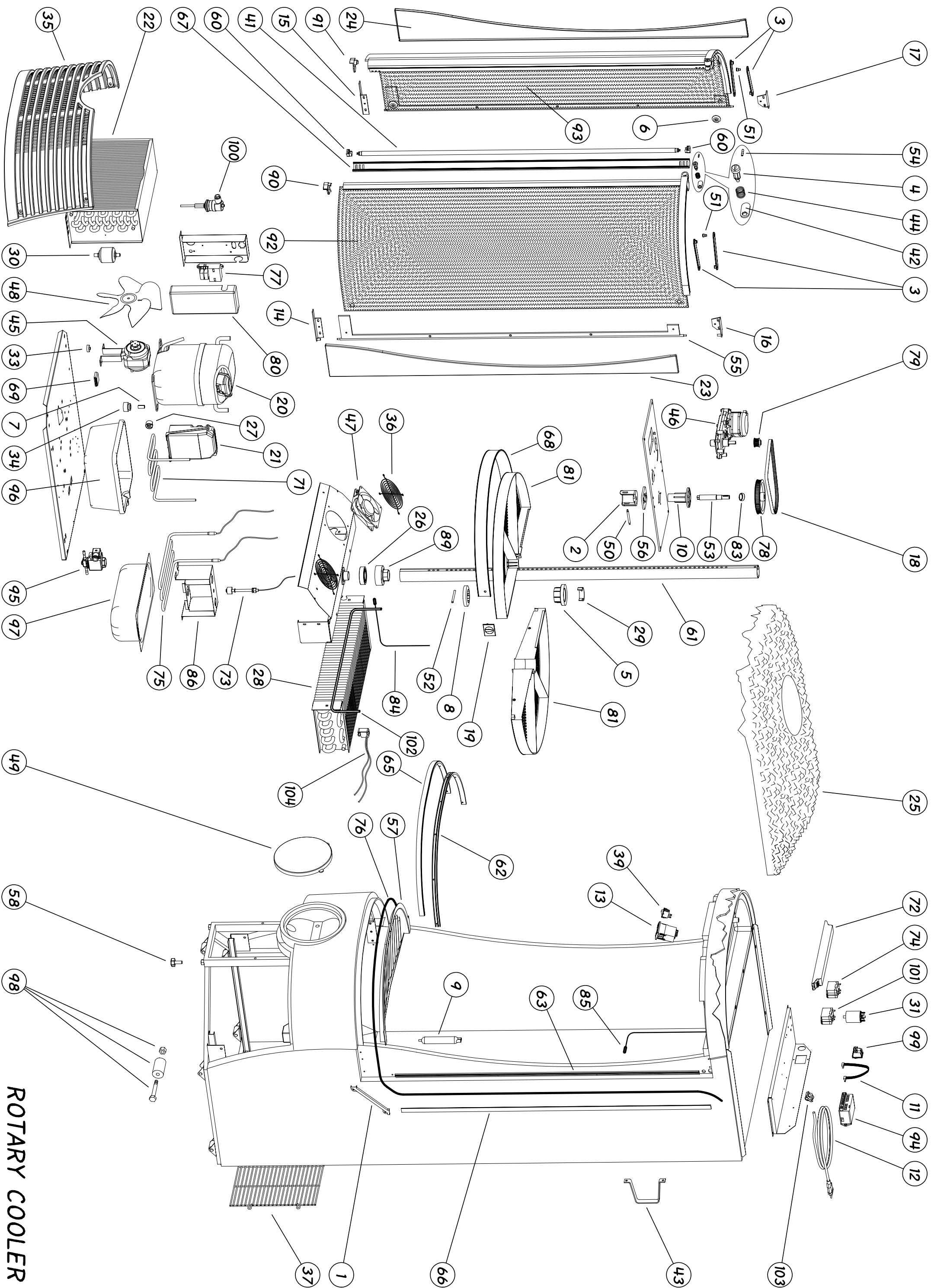


S.r.l.

TEL. 0142436111
 TELEFAX 0142781540

Sede legale e stabilimento:
 15033 CASALE MONFERRATO (AL)
 VIA A. GRANDI, 43

QUESTO DISEGNO E' DI PROPRIETA' IARP S.r.l.
 E' VIETATA LA RIPRODUZIONE E DIVULGAZIONE



ROTARY COOLER

TALL ROTARY code: 9232196

GENERAL LIST

Ref.	Description	Qty	Code	USD \$
1	ANG.COP.RESIST.ROTARY BAYBLEND	2	0431147	
	BAYBLEND HEATER COVER ANGLES			
2	ATTACCO PER ALBERO RIP.VASCA	1	0431148	
	SHELVES SHAFT COUPLING SLEEVE			
3	BIELLA ARRESTO VETRI ROTARY	4	0530101	
	STOP GLASS CONNECTING ROD			
4	BLOCCO CHIUS.VETRO ROTARY	2	0423066	
	ROTARY GLASS STOP BLOCK			
5	BOCCOLA FISS.RIPIANO VASCA	14	0534030	
	SHELF FIXING BUSH			
6	BOCCOLA NYLON FISSAGGIO VETRO	4	3302441	
	FIXING GLASS NYLON BUSH			
7	BOCCOLA PER GOMMINO 4016950	4	0534003	
	BUSH 4016950			
8	BOCCOLA SUPP.RIPIANI ROTARY	6	0534029	
	ROTARY SHELVES SUPPORT BUSH			
9	BOYLER 30X140 F.8,2-8,2	1	0140060	
	LIQUID RECEIVER 30X140 H.8.2			
10	CANOTTO SUPP.PERNO ALBERO RIP.	1	0543104	
	JOURNAL SHAFT BUSH SUPPORT			
11	CAVO CONNESSIONE MASTER SLAVE	1	3303049	
	MASTER SLAVE CONNECTING CABLE			
12	CAVO SPINA 3X1,5 MM4000 USA	1	3302331	
	USA PLUG CABLE 3X1,5 MM4000			
13	CENTRALINA UNIV.MASTER LED	1	0233089	
	UNIVERSAL CONTROL BOARD			
14	CERN.INF.VETRO ROTARY DX	1	0415136	
	ROTARY RIGHT GLASS LOWER HINGE			
15	CERN.INF.VETRO ROTARY SX	1	0415137	
	ROTARY LEFT GLASS LOWER HINGE			
16	CERN.SUP.VETRO ROTARY SX	1	0415139	
	ROTARY LEFT GLASS UPPER HINGE			
17	CERN.SUP.VETRO ROTARY DX	1	0415138	
	ROTARY RIGHT GLASS UPPER HINGE			
18	CINGHIA DENTATA GATES 250XL037	1	0325040	
	TOOTHED BELT MOD.GATES250XL037			
19	CLIP FERMA PORTAPREZZI ROTARY	8	0401011	
	ROTARY PRICE HOLDER STOP CLIP			
20	COMPR.NE9213GK 115/60 100/50	1	0210523	
	COMPRES.NE9213GK 115/60 100/50			
	RELAY GE.3ARR 3B25 U3	1	0210524	
	RELAY GE 3ARR 3B25 U3			
21	COND.DI SPUNTO 72/88 MF 330V	1	0210483	
	START. CAPACITOR 72/88 MF 330V			
	COND.DI MARCIA 20 MF 450V	1	0210426	
	WORKING CAPACITOR 20MF 450V			

TALL ROTARY code: 9232196				
GENERAL LIST				
Ref.	Description	Qty	Code	USD \$
22	CONDENS.ALETT.38T.ROTARY U.L.	1	0130090	
	FINNED CONDENS.38T. ROTARY UL			
23	COP.VETRO DX ROTARY CCOLA ABS	1	3700369	
	ROTARY ABS RIGHT GLASS COVER			
24	COP.VETRO SX ROTARY CCOLA ABS	1	3700370	
	ROTARY ABS LEFT GLASS COVER			
25	CUPOLINO ROTARY CCOLA'2002	1	3700401	
	CCOLA 2002 ROTARY TOP			
26	CUSCINETTO 7206B-RS	1	0530090	
	BALL BEARING 7206B-RS			
27	DISTANZ.TUBO INOX EVAP.ACQUA	9	0544003	
	NYLON SPACER TUBE INOX			
28	EVAP ALETT.18T.ROTARY U.L.	1	0119168	
	FINNED EVAPORATOR 18T.			
29	FERMARIPIANO ROTARY NYLON 6.6	7	0312365	
	ROTARY NYLON 6.6 FIXING SHELF			
30	FILTRO CARTUCCIA SOLIDA DCL32S	1	0145031	
	SOLID CORE DRYER DCL32S			
31	FILTRO EMC FNC 16.10.474.472	1	3302470	
	FILTER EMC FNC 16.10.474.472			
33	GOMMINO AMMORT.D.24X6 NERO	1	0403007	
	BLACK MOTOR SHOCK ABSORB.D24X6			
34	GOMMINO 4016910 NECCHI	4	0403017	
	COMPR.SHOCK ABSORB.4016910 NEC			
35	GRIGLIA ANT.ROTARY ABS ROSSO	1	0440321	
	ROTARY RED ABS FRONT GRID			
36	GRIGLIA MOTOVENTOLA B02/AB PV	2	0427017	
	MOTOR FAN GRATE			
37	GRIGLIA POST.ROTARY 2003 NERA	1	0427627	
	ROTARY 2003 BLACK REAR GRID			
39	INTERR.UNIP.TASTO BIANCO CR1	1	0202085	
	WHITE CR1 SINGLE-POLE SWITCH			
41	LAMPADA 28W D.16 MM1149 T5/FH	2	0200061	
	NEON 28W D.16 MM1149			
42	LEVA PER CHIUSURA VETRO ROTARY	2	0423067	
	ROTARY GLASS LOCK LEVER			
43	MANIGLIA GIADA'2000 POSTERIORE	2	0400082	
	REAR HANDLE GIADA '2000			
44	MOLLA RITORNO BLOCCO CHIUSURA	2	0541029	
	LOCK SYSTEM RETURN SPRING			
45	MOTORE 9W20 T3 115/60 UL C500	1	0220078	
	MOTOR FAN 9W20 T3 115/60ULC500			
	STAFFA MOTOV.TIPO B DIR.H.72	1	0221044	
	MOT.FAN BRACKET T.B VERT.H.72			
46	MOTORIDUTTORE RN 9-20-2,7/301	1	0221124	
	GEAR MOTOR RN 9-20-2,7/301			

TALL ROTARY code: 9232196				
GENERAL LIST				
Ref.	Description	Qty	Code	USD \$
47	MOTOVENTOLA 4715 MS12TB50	2	3302856	
	MOTOR FAN 4715 MS12TB50			
48	PALA ALLUMINIO A 230-34	1	0407013	
	ALUMINIUM FAN BLADE A 230-34			
49	PANN.ANT.MOB.ROTARY CCOLA'2002	1	3700333	
	ROTARY FRONT LOGO'S PANEL			
50	PERNO FISS.ALBERO RIPIANI	1	0530099	
	SHELVES SHAFT BLOCKING JOURNAL			
51	PERNO FISS.BIELLA ARR.VETRI	2	0530102	
	STOP GLASS CONNECTING ROD BOLT			
52	PERNO FISS.BOCOLA SUPP.RIP.	6	0530089	
	SHELVES SUPPORT BUSH BOLT			
53	PERNO MOV.ALBERO RIPIANI VASCA	1	0530091	
	SHELVES SHAFT MOVEMENT BOLT			
54	PERNO PER BLOCCO CHIUSURA	2	0530100	
	LOCKING SYSTEM BOLT			
55	PERNO PER VETRO CURVO ROTARY	2	3302439	
	ROTARY CURVED GLASS JOURNAL			
56	PIASTRINA BLOCCAGGIO CANOTTO	1	0543022	
	DRAINING TUBE FIXING PLATE			
57	PIATTELLO VASCA ROTARY ROSSO	1	3700334	
	ROTARY RED WATER DRIP			
58	PIEDINO ESAGONALE 10MAX25 R128	2	0403015	
	HEXAG.ADJUST.FEET 10MAX25 R128			
60	PORTALAMPADA G5 108661 U.L.	4	3301793	
	G5 108661 U.L. LAMP-SOCKET			
61	PROF.ALL.ALBERO RIPIANI ROTARY	1	3601822	
	ALUMINUM PROFILE SHELVES SHAFT			
62	PROF.ALL.PORTARESIST.ROTARY	1	3601832	
	ROTARY RESISTANCE HOLDER			
63	PROF.ALL.27455LB MM1200CROMATO	2	3500582	
	ALUM. PROFILE MM1200 27455LB			
64	TERMOSTATO LM7-P5072/110°C	1	3300496	
	THERMOSTAT LM7-P5072/110°C			
65	PROF.BAYBLEND P1574 MM1020ROSS	1	3601834	
	BAYBLEND RED PROF P1574 MM1020			
66	PROF.BAYBLEND P1574 MM1100ROSS	2	3601835	
	BAYBLEND RED PROF P1574 MM1100			
67	PROF.POLIC.COPRILAMPADA MM1194	2	0320868	
	POLIC.NEON COVER PROF. MM1194			
68	PROF.PORTAPREZZI ROTARY PVC	8	0313224	
	ROTARY PRICE-HOLDING PVC PROF.			
69	PROF.PVC PO928 AMMORTIZZ.MOTOV	Mt.0,05	0320140	
	MOTORFAN SHOCK ABSORB.PVC PROF			
71	RACCORDERIA EV.ACQUA INOX	1	3602225	
	EVAPOR. WATER INOX PIPE-FITTING			

TALL ROTARY code: 9232196

GENERAL LIST

Ref.	Description	Qty	Code	USD \$
72	REATTORE Elett.MEctRONIC HP/T5	1	3302858	
	ELECTRONIC BALLAST MEctRONIC			
73	REG.DI LIV.L143 1V DEN060HGY2	1	3300790	
	WATER LEVEL REGULATOR L143			
74	RELE'G7L-1A-TUB 120VCA	1	3300708	
	RELAY G7L-1A-TUB 120VCA			
75	RES.COR.INOX 345W EVAP.ACQUA	1	0205375	
	WATER EVAP.INOX ARM.HEAT.345W			
76	RES.SILIC.10W/MT CORNICE MOB.	1	0205359	
	CABIN. FRAME SILIC.HEAT.10W/MT			
77	RITARDATORE TIMER FTIMERB 115V	1	3302513	
	TIMER DELAYER FTIMERB 115V			
78	RUOTA DENTATA ALBERO RIPIANI	1	0402027	
	SHELVES SHAFT STEP WHEEL			
79	RUOTA DENTATA MOTORIDUTTORE	1	0402029	
	GEAR MOTOR STEP WHEEL			
80	SCATOLA PROT.CABL.SHELLY ABS	1	3700090	
	ABS PROT. CABLE BOX SHELLY			
81	SEMI-RIPIANO VASCA ROTARY ABS	8	0440317	
	ROTARY ABS HALF-SHELF			
83	SNODO SFERICO AUTOLUBRIFICANTE	1	0530092	
	SELF-LUBRIFICATING BALL-JOINT			
84	SONDA PTC GRIGIA MM3500	1	0205389	
	PTC GREY PROBE MM3500			
85	SONDA PTC NERA MM1700	1	0205383	
	PTC BLACK PROBE MM1700			
86	STAFFA FISS.VASCH.EV.ACQUA	1	3602295	
	WATER EVAP. TRAY FIXING BRACKET			
89	TAPPO INF.ALBERO RIPIANI	1	0430089	
	SHELVES SHAFT BOTTOM PLUG			
90	TAPPO INF.PROF.PORTALAMPADA DX	1	3302443	
	RIGHT SUPPORT LAMP BOTTOM PLUG			
91	TAPPO INF.PROF.PORTALAMPADA SX	1	3302445	
	LEFT SUPPORT LAMP BOTTOM PLUG			
92	TESTAT.SUP.VETRO ROTARY DX	1	3302444	
	ROTARY RIGHT GLASS TOP PROFILE			
	PROF.ALL.PORTARESIST.ROTARY	2	3601833	
	ROTARY RESISTANCE HOLDER			
	VETRO 1 STRATO ROTARY CURVO	2	3302438	
ROTARY CURVED GLASS				
93	TESTAT.SUP.VETRO ROTARY SX	1	3302446	
	ROTARY LEFT GLASS TOP PROFILE			
	PROF.ALL.PORTARESIST.ROTARY	2	3601833	
	ROTARY RESISTANCE HOLDER			
	VETRO 1 STRATO ROTARY CURVO	2	3302438	
ROTARY CURVED GLASS				

TALL ROTARY code: 9232196

GENERAL LIST

Ref.	Description	Qty	Code	USD \$
94	UNITA'DI POT.SLAVE 115V 3R	1	3303046	
	115V 3R SLAVE POWER UNIT			
95	VALVOLA SOL.EVR3 115/60 U.L.	1	0189033	
	SOLENOID VALVE EVR3 115/60 UL			
	BOBINA PER VALVOLA SOL.EVR3	1	3301892	
	COIL FOR SOLENOID VALVE EVR3			
96	VASCHETTA EV.ACQUA IDEA60	1	0425041	
	WATER EVAPORATOR TRAY IDEA60			
97	VASCHETTA EV.ACQUA ROTARY	1	0425074	
	WATER EVAPORATOR TRAY ROTARY			
98	RULLINO NYLON D.23 MM 38	5	0402000	
	PLASTIC WHEEL D.23 MM 38			
	DADO 6MA AUTOBLOCCANTE	5	0505004	
	6MA LOCKED BOLT			
	PERNO D.7 FIL. M6 MM 55	5	0530013	
	PIVOT D.7 M6 MM 55			
99	INTERR.BIP.LUM.VERDE C.NERA	1	0202080	
	BIPOLAR LUMIN. GREEN SWITCH			
100	PRESSOSTATO G60P1221.600 B.PR.	1	0189034	
	L.P. PRESSOSTAT G60P1221			
101	RELE'G7L-2A-TUB 120VCA	1	3301807	
	RELAY G7L-2A-TUB 120VCA			
102	RES.COR.INOX 196W EVAPORATORE	1	0205424	
	EVAPOR.196W INOX ARM.HEATER			
103	SERRACAVO PA107 S/VITI	1	3300866	
	CABLECLAMP PA107 WITHOUT SCREW			
104	CABL.KLIXON F.SBRINAMENTO	1	3601786	
	END DEFROSTING CLIXON CABLE			