

# PRESERVATION CABINETS TECNOMAC



**TC 60-N** -10 / -22 °C

**TC 60-P** +8 / -2 °C

**TC 60-C** +15 / +2 °C  
HR 40% / 90%



ISO 9001  
Cert. N° 0412/2



OUR SYSTEMS COMPLY WITH DIRECTIVES 73/23 EEC - 89/336 EEC

# Tecnomac®

# INSTRUCTION MANUAL

Cod. 71503560/0 - 12/2003

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# 1. GENERAL DOCUMENTATION

## 1.1. General information

- This manual is an integral part of the product and provides all the information necessary for ensuring correct appliance installation, operation and maintenance.
- Read the manual carefully, and always consult it for appliance operation. Keep the manual in a well-known place accessible to all authorised operators (installers, users and maintenance personnel). The appliance complies with Directives 73/23/EEC (low-voltage), 89/336/EEC (electromagnetic compatibility) and machines 98/37/EC (for some models only).
- The appliance is designed for professional use and therefore must only be operated by qualified personnel.
- The appliance must only be used for its designed purpose, i.e. for preserving food products.  
The appliance must not be used for products requiring constant temperature control and recording, such as
  - heat-sensitive chemicals,
  - medicines
  - blood derivatives.
- The manufacturer declines all responsibility for any damage caused by incorrect or unreasonable use, such as:
  - improper use by untrained persons
  - technical modifications or operations that are not specific to the models
  - use of non-original or non-specific spare parts
  - failure to follow the instructions given in this manual

## 1.2 Installation

The appliance must only be installed by specialised personnel authorised by Tecnomac, according to the instructions given in this manual.

If the appliance is fitted with a remote condenser unit, the installer is responsible for checking all connections in compliance with the instructions given by Castelmac for plant and appliance installation.

## 1.3 Transport and handling

- Loading or unloading the appliance and/or subsystems from/onto the means of transport can be done with a lift truck or fork lift equipped with forks at least half the length of the cabinet; or a crane if the appliance is fitted with eyebolts. Choose lifting equipment suitable for the weight and overall dimensions of the packed appliance/components.
- When handling the appliance/subsystems, take all necessary precautions to prevent damage, complying with the indications given on the packing (fig. 1)



## 1.4 Unpacking

- Remove all packing in cardboard, wood or boxes from the wood base on which they are placed. Lift the appliance/subassemblies with suitable means (e.g. lift truck), remove the wood base, then position the appliance/subassemblies in the required place.
- After removing the packing, check the integrity of the appliance.
- Remove the protective PVC film on the panels, from all internal and external

surfaces (fig. 2)



- **Always wear protective gloves when handling packing material and the wood base.**
- NB: Dispose of packing materials in compliance with current regulations in the country where the appliance is installed. Do not disperse materials in the environment.

## 1.5 General safety regulations

The user is fully responsible in case of any operations carried out on the appliance and not in compliance with the instructions given in this manual. The main safety regulations are as follows:

- **do not touch the appliance with moist or wet hands or feet - do not operate on the appliance when barefoot;**
- **do not insert screwdrivers, kitchen utensils or any other object between the guards and moving parts**
- **before performing cleaning or routine maintenance operations, disconnect the machine from the power supply by operating the main switch, also disconnecting the main knife switch (if present)**
- **do not pull the power cable to disconnect the appliance from the power supply**

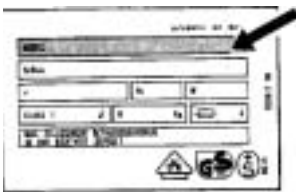


**WARNING !!!**  
**THESE OPERATIONS MUST BE ONLY**  
**PERFORMED BY A**  
**LICENSED INSTALLER**

## 2. INSTALLATION

### 2.1 Data plate information

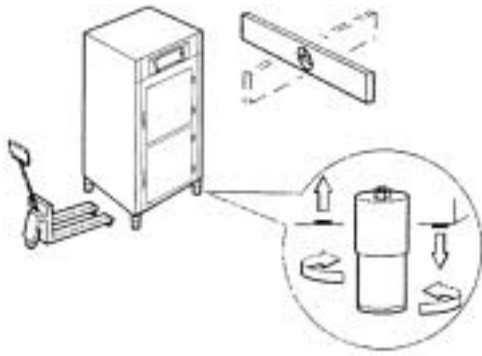
- Check that the data specified on the plate correspond to the characteristics of the power supply (V, kW, Hz, no. phases and power available)
- The data plate with appliance specifications is located at the



rear exterior of the machine and/or on the electrical control boxes. Any preparation of individual appliances for the positioning of condensing units must comply with the current fire-prevention regulations in the country of installation (see the local fire department for the necessary details). Bear in mind that any intervention of safety valves or fuse plugs in the refrigerating circuit will lead to the immediate discharge of refrigerant into the environment.

### 2.2 Positioning

- The appliance must be installed and commissioned in full compliance with safety regulations, procedures and current laws
- The installer must ensure compliance with any fire-prevention provisions (see the local fire department for the necessary details).
- Position the appliance in the allocated site
- Adjust the feet until the appliance is perfectly level. For levelling heavy appliances, use appropriate lifting means

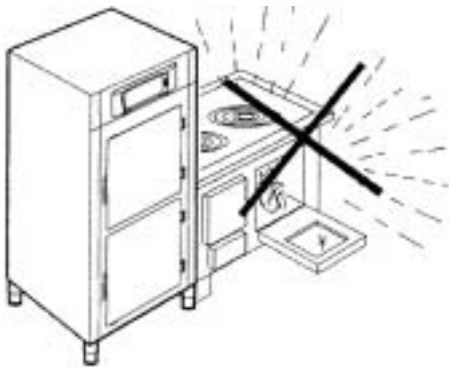


(fig. 1)

- If the appliances are not perfectly level, their correct operation and condensate run-off may be compromised.

#### AVOID

- direct exposure to sunlight
- closed sites with high temperatures and poor air circulation
- Do not install the appliance near any heat sources (fig. 4).



### 2.3 Ambient temperature and air circulation

For air-cooled refrigerating units, the maximum ambient temperature for operation is 32°C. Correct operation cannot be guaranteed at higher temperatures.

The appliance can operate safely up to 38°C.

Remote condensing units must be installed in special rooms or outdoors, in a place protected against direct sunlight; if necessary the installer must evaluate the use of a covering or roof structure (the costs are borne by the purchaser).

In any case, sufficient air interchange must be guaranteed.

### 2.4 Electrical connections

A differential thermal-magnetic circuit breaker complete with disconnecting switch must be installed ahead of every appliance, in accordance with current regulations in the country of installation.

- Electrical connection cables must comply with the characteristics given in the technical data (see appliance wiring diagrams, the installer's responsibility)

The earth wire must be correctly connected to an efficient earthing system.

**THE MANUFACTURER DECLINES ALL LIABILITY AND WARRANTY OBLIGATIONS IN THE EVENT OF INJURY TO PERSONS OR DAMAGE TO EQUIPMENT AND THINGS, DUE TO INCORRECT INSTALLATION AND/OR FAILURE TO COMPLY WITH CURRENT LAWS.**

### 2.5 Connection of refrigerator-remote units

Appliance feed lines are sized for installation distances of up to 10 metres. For greater distances, contact Castelmac.

### 2.6 Condensate drainage connection

For all models, fit a condensate/wash water drainage hose with a minimum diameter of 1" ("geberit" type or similar).

### 2.7 Information for the installer

Before starting up the machine, check that it has been correctly installed and commissioned (test report)

1. Make sure there are no gas leaks from welds or joints made during the installation phase.
2. Check that the pipes connecting the condenser to the remote condensing unit have been well insulated.

3. Check all wiring connections.
4. Check electrical input.
5. Check the standard pressure of the refrigerating system.
6. Check the water connection with adjustment of the pressure switch valve during operation and the correct flow of condensing water (in water-cooled units).
7. Check that the preservation unit reaches the set temperature and do a manual defrost.

If the appliance or the remote condensing unit have not been transported in an upright position (e.g. horizontally) or have been overturned during installation, wait at least 4 hours before starting up the equipment.

- Inform the customer of the exact use of the appliance, with specific reference to the use and requirements of the customer. **Installation and commissioning must be carried out by authorised Castelmac personnel.**

## 2.8 Safety and control systems

- Door microswitch: shuts off fans in the cell when the door is opened.
- Main fuses: protect the power circuit against short circuiting and overloads
- Safety thermostat: intervenes when the appliance overheats due to extended operation of evaporator defrosting elements
- Safety pressure switch: intervenes in the event of overpressure in the refrigerant circuit
- Mechanism to open door from inside should the door accidentally close
- Chamber temperature control: controlled by the electronic board by means of the sensor located inside the cell
- End of defrost temperature control: controlled by the electronic board by means of the sensors on the evaporator.
- Internal humidity control (for TC 60-C only) This is controlled by the electronic board by means of the sensor located inside the cell.

## 2.9 Appliance disposal

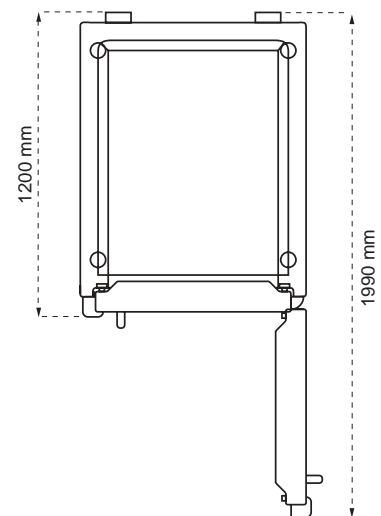
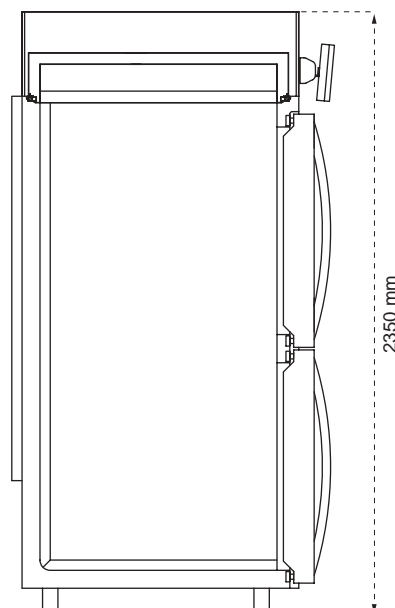
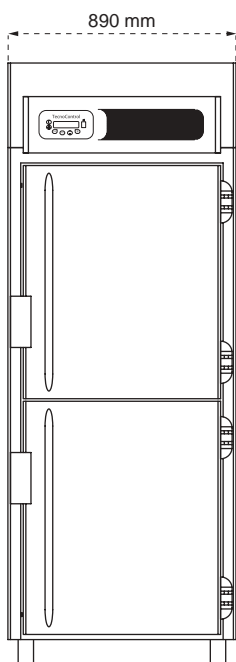
The appliance must be demolished and disposed of in compliance with current regulations in the country of installation, above all with regard to the refrigerant gas and compressor lubricant oil.

### 3. THECNICAL CHARACTERISTICS

		TC60-N	TC60-P	TC60-C
Outside dimensions mm.	Width	890	890	890
	Depth	1200	1200	1200
	Height	2350	2350	2350
Thickness of insulation		70 mm		
Tray size		600 x 800 mm (not supplied)		
Max. no trays (distance between trays 50mm): 30 (600 x 800 mm); 60 (600 x 400 mm)				
Distance setting between trays 10mm				
20 pairs of guides for 600 x 800 mm trays provided.				

#### TECHNICAL SPECIFICATIONS

Temperature °C	-10 / -22	+8 / -2	+15 / +2
Power supply	220-230V/50HZ	220-230V/50HZ	220-230V/50HZ
Refrigerant R404a	R404a	R404a	R404a
Current absorbed	7.5 A	4.2 A	5 A
Input power	886 W	700 W	860 W
Defrosting	Hot gas		
Dehumidification control	Can be programmed from 40% to 90% (available with TC60-C version only)		
HACCP	24/7 internal temperature control with alarm registration		
Built-in condensation unit (remote-controlled on request)			

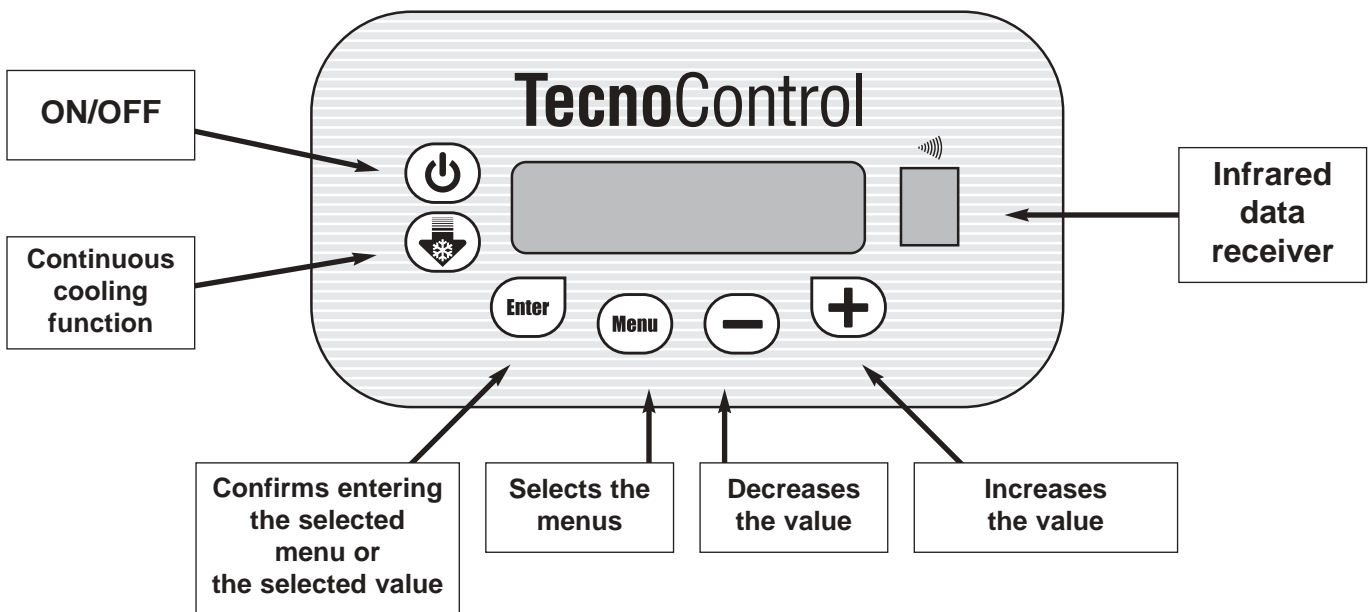


(\*) Evaporation temperature -10 °C  
 (\*\*) Evaporation temperature -28 °C

Δ 120x165x360 mm.



## 4. PROGRAMMING INSTRUCTION



### 4.1 Starting up the appliance

Power up the preservation unit using the main switch.

Switch on the controller, holding down the **ON/OFF** pushbutton. The controller will display the welcome message and show the installed software and go to the following box:

PAUSE	>>OK
CELL	-14,5°C

Message with compressor switched off and display of temperature inside cell.

The cabinet prepares for operation at the preset temperature.

COOLING	>>OK
CELL	-14,5°C

Message with compressor switched on and display of temperature inside cell.

The display shows the temperature detected by the sensor inside the cell.

To switch off the controller, hold down the **ON/OFF** (power) pushbutton for 5 seconds; after this the controller will go on a low voltage

stand-by operation mode and will display the following boxes:

OFF
-----

WAITING _
-----------

The message displayed on the LCD screen in OFF is WAITING with cursor flashing.

**IMPORTANT: to turn off the power to the controller use the main switch.**

### 4.2 Language setting

Press the **MENU** button and with the (+) or (-) buttons go to **MENU 7 LANGUAGE**; press the **ENTER** button to display the first language. When the (+) or (-) button is pressed again the available languages are selected.

Menu 7 LANGUAGE
--------------------

When the desired language is displayed, press the **ENTER** button; the controller requests a second confirmation, displaying **EXIT** or **CONFIRM**.

Press the **+** button to confirm or the **ENTER** button to exit and return to the first box.

#### 4.3 Date and time setting

Press the **MENU** button and with the **+** or **-** buttons go to **MENU 8 SET CLOCK**; press **ENTER** and the date and time will be displayed with the first figure of the day flashing. Change the figure with the or buttons and confirm the value with the **ENTER** button; the new value is stored and the month figure will flash.

Repeat the procedure until arriving at the seconds value, then press the **ENTER** button. When the values have been stored, the date and time will flash.

Date:	12/04/03
Time:	11:54:23

#### 4.4 Set-point display and setting

Press the **MENU** button and with the **+** or **-** buttons go to **MENU 2 CHANGE SET POINT**; press the **ENTER** button; the set temperature and the temperature to be modified will be displayed. Modify the **NEW SET** temperature using the **+** button to increase the value by N degrees and the **-** button to decrease the value by N degrees. To store the new set temperature press the **ENTER** button.

The new value will flash to confirm it has been stored.

Menu 2 CHANGE SETPOINT
---------------------------


NEW SET:	-15 °C
PRESENT:	-15 °C

#### 4.5 HUMIDITY ADJUSTMENT (on TC60C only)

Press the **MENU** and use the **+** or **-** buttons to open the **MENU 3 - CHANGE HUMIDITY** window; press **ENTER**; the current humidity level and the new one to be set will be shown. Use the **+** or **-** buttons to change the humidity **NEW RH%** and press **ENTER** to confirm. The value will blink to confirm it has been accepted.

Humidity values can be varied within an accepted range of 40% to 90%.

#### 4.6 CONTINUOUS COOLING FUNCTION

Hold the button  for a few seconds to turn on the continuous cooling function.

**CONTINUOUS COOLING** will appear on the display; press **+** or **-** to set the continuous running time limit of the compressor (MAX 6 HOURS). With this function, HIGH/LOW temperature alarms are inhibited. At the end of Continuous Cooling the preservation unit returns to normal working conditions.

#### 4.7 Door microswitch function

The controller signals door opening, showing the following box on the display:

DOOR OPEN	>>OK
Cell	-21 °C

The evaporator fans will stop each time one of the doors is opened and will restart when the door is closed. If the door stays open for more than 5 minutes, the warning buzzer is activated and the evaporator fans will restart as though the door were closed.

## 5. DEFROST MANAGEMENT

### 5.1 Manual defrost

A manual defrost can be activated: press the **MENU** button, with the **+** or **-** buttons go to **MENU 4 DEFROST** and press the **ENTER** button.

The controller requests a further confirmation, displaying **EXIT** or **CONFIRM**. Press the **+** button to confirm or the **ENTER** button to exit and return to the first box.

```
Menu 4
DEFROST
```

Message with defrost active:

```
DEFROST      >>OK
CELL         -18°C
```

At the end of defrosting the compressor will restart and the display will show the word **REGENERATION** until the set-point temperature is reached.

```
REGENERATION >>OK
CELL         -10,5°C
```

Defrosting is completed when the set-point is reached (detected by the two sensors located on the evaporator) or when the maximum defrost time is reached.

In the case of maximum time being reached the controller signals the anomaly with the following intermittent alarm message and the buzzer:

```
DEFROST TIME
-> Call SERVICE
```

```
F18 DEFROST TIME
S 19/02/02 06:09
```

The controller memorises the type of alarm, date and time.

To cancel the alarm message press the **ENTER** button.

In any case, the alarm is stored in the controller's alarms memory.

### 5.2 Periodic defrosting

For all models, defrosting can be repeated automatically at regular intervals, beginning immediately after the appliance is switched on.

The time between automatic defrosts is factory-set at 6 hours.

Also in this case, defrosting is completed on reaching the set-point (detected by the two sensors on the evaporator) or when the maximum defrost time is reached.

The anomaly is signalled as in the case of manual defrosting.

### 5.3 Timed defrosting

It is possible to set the starting time for 4 daily automatic defrosts that will always be repeated in a 24-hour time period. In this mode, automatic periodic defrosts are disabled.

Defrosting is completed as described above.

## 6. MANAGING AND SILENCING DETECTED ALARMS

### 6.1 Storing alarms

The controller is equipped with visual and acoustic signalling of alarms caused by appliance operation anomalies.

A maximum of 16 alarm events are stored; further alarms will overwrite those already recorded. The alarms are signalled by a buzzer and the display will show the type of alarm.

There is signalling delay only for HIGH/LOW cell temperature alarms, which are signalled 60 minutes after being detected.

The controller will show the HIGH or LOW temperature pre-alarm on the display, storing it in the alarms list when the time has elapsed.

COOLING	>>Ht
Cell	-18°C

Cell high temperature pre-alarm message

PAUSE	>>Lt
CELL	-24°C

Cell low temperature pre-alarm message

When the pre-alarm time has elapsed the controller will show the following message:

ALARM DETECTED	
CELL	-24,0 °C

To cancel the alarm enter the **MENU 1 ALARMS LIST**.

### 6.2 Silencing alarms

To silence the buzzer during an alarm press the **ENTER button**

### 6.3 Alarms list

It is possible to display the alarms that the controller stored during its operation.

To enter the display press **MENU**, with the **+** or **-** buttons go to **MENU 1 ALARMS LIST** and press **ENTER**.

Using the **+** or **-** buttons scroll the alarms stored by the controller.

The controller stores the type of alarm, the start date of the alarm and its duration in minutes.

If the **+** and **-** buttons are pressed at the same time the date of the last alarm reset is displayed. The maximum and minimum temperature alarm also displays the maximum and minimum temperatures reached.

In the blackout alarm the date/time of power failure start and finish is recorded. If no alarms have been stored the controller displays **NO EVENTS IN MEMORY**.

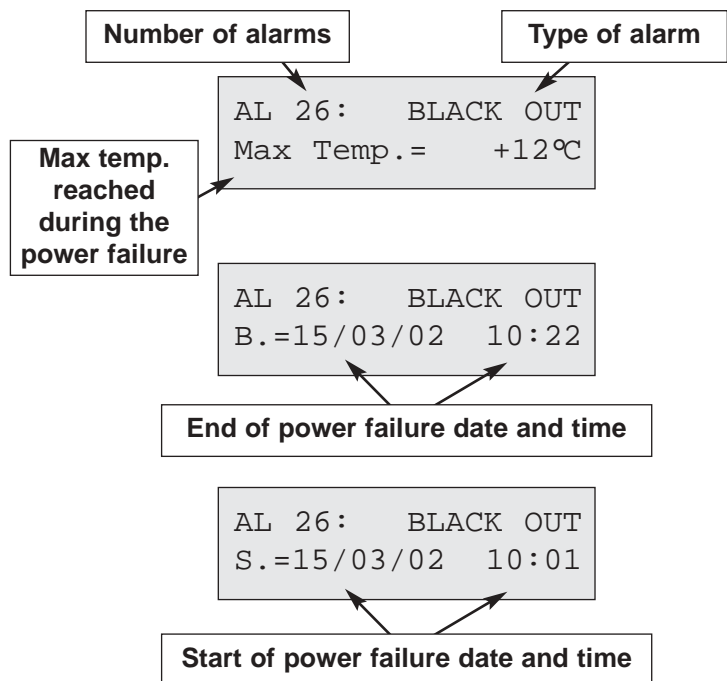
Example of high temperature alarm:

AL 27:	HIGH TEMP.
Max Temp. =	+25°C

AL 27:	HIGH TEMP.
S. =	18/03/02 12:29

AL 27:	HIGH TEMP.
Duration	015'

Example of power failure (blackout) alarm:



```

    ALARM DETECTED
    CELL          -24,0 °C
  
```

To cancel this indication, enter the alarms list as described in the previous paragraph

### 6.4 Serious alarms list

**SERIOUS** alarms can cause the preservation unit to function incorrectly.

They are displayed in the same way as the other alarms and the buzzer is activated. To silence the buzzer press **ENTER**.

Cancellation occurs automatically when the fault is eliminated, but the alarm is still stored in the **ALARMS MENU**.

## IMPORTANT!

**IN THE EVENT OF A SERIOUS ALARM,  
CONTACT THE AUTHORISED  
TECNOMAC SERVICE CENTRE.**

In the case of HIGH/LOW temperature alarms, a pre-alarm time of 60 minutes is counted before they are stored; when this time has elapsed the controller records the alarm in the alarms list and shows the following message on the display:

### FAULT MESSAGES (they compromise appliance operation - CALL THE TECHNICAL ASSISTANCE SERVICE)

MESSAGE	DISPLAY	CAUSE	CANCELLATION
ERR. SENSOR S1	Intermittent	Temperature sensor fault	Automatic on elimination of fault
ERR. SENSOR S2	Intermittent	Evaporator sensor fault	Automatic on elimination of fault
ERR. SENSOR S6	Intermittent	Evaporator sensor fault	Automatic on elimination of fault
ERR. SENSOR IN	Intermittent	Sensor reading out of range	Switch the controller off and on
DEFROST TIME	Intermittent	Long defrost time	Press <b>ENTER</b>
COMP. USE	Intermittent	Long compressor operation time	Press <b>ENTER</b>
LOW EVAP T	Intermittent	Evaporator temperature below the set-point	Press <b>ENTER</b> on Elimination of fault
PROTECTION	Intermittent	Intervention of max. pressure switch or compressor thermal-magnetic circuit breaker	Reset high pressure switch or thermal-magnetic circuit breaker Switch the controller off and on

**WARNING MESSAGES** (they do not compromise appliance operation)

MESSAGE	DISPLAY	CAUSE	CANCELLATION
>>HT	CONTINUOUS	high temperature pre-alarm	Automatic cancellation
>>LT	CONTINUOUS	low temperature pre-alarm	Automatic cancellation
ALARM DETECTED	CONTINUOUS	alarm recorded in the memory	Eliminate the cause of the alarm and enter MENU 1 to reset the controller alarms list
SET CLOCK	loss of clock data	Set clock data	

**6.5 List of other operating faults not indicated:**

FAULT	CAUSE	CURE
Compressor does not operate	1 - No power	1 - Check connection to power supply
Fans do not rotate	1 - No power 2 - Faulty fan 3 - Faulty condenser 4 - Protection fuse blown	1 - Check connection to power supply 2 - Contact a technician for replacement 3 - Contact a technician for replacement 4 - Contact a technician for replacement
Electronic board does not switch on	1 - No power supply 2 - Protection fuse blown	1 - Check connection to power 2 - Contact a technician for replacement
Compressor operates but does not cool cell	1 - No refrigerant gas 2 - Dirty condenser	1 - Contact a technician 2 - Clean the condenser

## 7. ROUTINE MAINTENANCE



**IMPORTANT !! !! !!**  
**THESE OPERATIONS MUST**  
**BE PERFORMED ONLY**  
**BY A LICENSED INSTALLER**

The information and instructions given in this section are intended for all personnel operating on the appliance: the user, the maintenance man and also non-specialised personnel.

**Ensure that the electrical power to the system has been disconnected before carrying out any cleaning or maintenance work on the appliance.**

### 7.1 BASIC SAFETY REGULATIONS

To safely carry out all cleaning and routine maintenance operations, follow these rules:

- do not touch the machine with moist or wet hands or feet.
- do not operate the machine when barefoot;
- do not insert screwdrivers, kitchen utensils or any other object between the guards and moving parts.
- before performing cleaning or routine maintenance operations, disconnect the machine from the power supply at the main switch and pull out the plug.
- do not pull the power cable to disconnect the appliance from the power supply.

Removal of guards and safety devices for the purposes of routine maintenance is strictly prohibited. The manufacturer declines all responsibility for accidents caused by non-compliance with the above obligation.

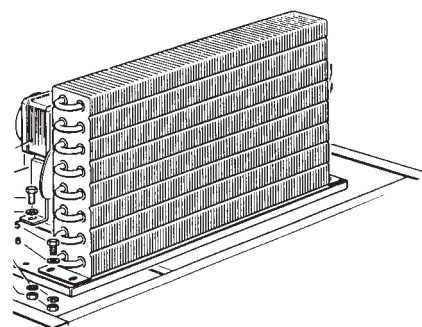
Before starting up the appliance, carefully clean the inside of the cell.

### 7.2 CLEANING THE CONDENSER

To ensure correct and efficient air condenser operation, it must be kept clean to allow free circulation of air. This operation should be performed at least every 30 days. Use a non-metal brush to remove all dust and debris from the condenser fins.

Use a vacuum cleaner to prevent the dust removed from being dispersed in the environment. To remove greasy deposits, use a brush soaked in alcohol.

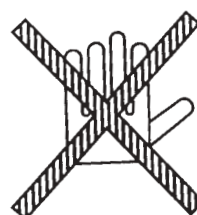
**DO NOT USE SHARP OR ABRASIVE OBJECTS TO SCRAPE THE SURFACES**



**PERFORM THIS OPERATION ONLY WITH THE APPLIANCE SHUT DOWN**

#### IMPORTANT

The condenser has sharp edges. Always wear protective gloves, glasses and breathing masks when carrying out the above operations.



### 7.3 CELL CLEANING

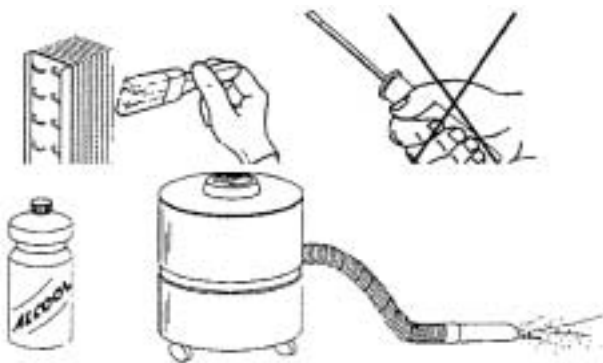
To guarantee hygiene and ensure the quantity of the preserved foods, clean the interior of the cell frequently, according to the type of food stored.

- Weekly cleaning is recommended.

The cell interior and components can be cleaned with a soft cloth or sponge.



Clean with water and non-abrasive neutral detergents. Rinse with a cloth or sponge soaked with water, or with a gentle jet of water (not stronger than mains pressure). Do not use sharp or abrasive instruments to scrape the surfaces. **DO NOT USE ABRASIVE FLUIDS, SOLVENTS OR THINNERS.**



NB: Always wear protective gloves when cleaning.

### 7.4 DEFROST WATER DRAINAGE

The system is arranged for automatic and manual defrosting, as required.

Make sure that the water from the evaporator drains correctly into the collection bowl, and that the drain tube is not clogged.



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