



General Purpose Refrigerator and Freezers

Operating and Maintenance Instructions

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IMPORTANT Read this instruction manual. Failure to follow the instructions in this manual can result in damage to the unit, injury to operating personnel, and poor equipment performance.

CAUTION All internal adjustments and maintenance must be performed by qualified service personnel.

Material in this manual is for informational purposes only. The contents and the product it describes are subject to change without notice. Thermo Fisher Scientific makes no representations or warranties with respect to this manual. In no event shall Thermo be held liable for any damages, direct or incidental, arising from or related to the use of this manual.

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Models

The following table shows the models covered in this Operating and Maintenance Manual.

Table 1. Applicable Models

Models	Temperature @ Factory set point
TSG400R	0 to +9°C
TSG700R	
TSG1500R	
TSG400F	-10 to -25°C
TSG700F	
TSG1500F	

Models	Factory set point	Adjustment Limits
TSG400R	+5°C	+2 to +15°C
TSG700R		
TSG1500R		
TSG400F	-20°C	-10 to -25°C
TSG700F		
TSG1500F		

Safety Considerations

Read this user manual carefully.



Any maintenance operations must be carried out by personnel authorized by the manufacturer ThermoFisher Scientific.



The corresponding warranty will become immediately void in the event of use or maintenance of equipment not in compliance with specifications by the manufacturer ThermoFisher Scientific.



Provide all the information required regarding operation of the device being tested in order to request technical support from ThermoFisher Scientific.



Natural gas but inflammable R290. The refrigerator contains fuel refrigerant, even if permanently sealed according to the standard UNI EN 1127-1.

Do not damage refrigerant circuit tubes. The environment of installation must have, in compliance with EN378, a volume of 1 m³ every 8 grams of R290 refrigerant contained in the circuit. The quantity of gas included in the circuit is declared on the silver data plate attached inside the device.

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General Information

Certification

All refrigerated cabinets are built in accordance with the relevant European Directives applicable at the time of release in the market.

The Refrigerated cabinets are certified in accordance with Directives 2006/42/EC, 2014/30/EC, 2014/35/EC and subsequent integrations, built according to the safety requirements for electrical appliances for use in the laboratory (CEI EN 61010-1).

Testing

The machine is tested at our factory in accordance with current regulations and it is shipped ready to use.

Purpose, Content and Recipients of the Manual

This manual has been drafted for the purpose of providing all the instructions necessary for correct use of the machine and for maintaining it in perfect condition, in particular with regard to the user's safety. The following professional figures shall be defined in order to identify tasks and responsibilities:

Installer: Qualified technician who performs machine placement and commissioning in accordance with the instructions in this manual.

User: Person who, after carefully reading this manual, uses the machine for his own permitted uses. It is mandatory for the user to read the manual carefully and make reference to it.

Routine maintenance worker: Qualified technician able to carry out routine maintenance on the machine, following the instructions in this manual.

Special maintenance worker: Qualified technician authorized by the manufacturer, able to carry out special maintenance on the machine.

The manufacturer declines any responsibility for improper or unreasonable use of the machine and for all

those operations carried out on the same ignoring the instructions in this manual.

The manual must be kept in an accessible location known to all operators (installers, users, routine and special maintenance workers).

No part of this manual may be reproduced and/or disclosed by any means and in any form whatsoever.

Arrangements Prepared by the Customer

The following arrangements are set by the customer:

- The machine electrical connection
- Installation site arrangement
- Routine maintenance
- Refrigerator cleaning and the products used for it

Requests for Technical Support

Provide all the information required regarding operation of the device being tested in order to request technical support from ThermoFisher Scientific.

For this purpose, send the table in **Annexes**

Annex 1, “**1. User Data for Technical Support Request**” filled.

If your request arrives from an affiliated service center, you must also provide Annex 2, “**2. Service Data for Technical support on Controller**”

For more information refer “**Contact Information**” section.

Safety

General Safety Rules

Read this manual carefully and follow the instructions contained herein.

The user assumes full responsibility in case of operations carried out without observing the instructions in the manual.

Below is a list of the main safety rules:

- Do not touch the equipment with moist or wet hands or feet.
 - Do not insert screwdrivers or other objects into the guards or moving parts.
 - Do not pull the power cord to disconnect the appliance from the electrical mains.
 - Do not allow the machine to be used by unauthorized users.
 - Before performing any cleaning or maintenance, disconnect the machine from the electrical mains by switching it off and disconnecting the plug.
 - In case of failure and/or malfunction, switch off the machine and do not attempt to repair or service it on your own. It is absolutely necessary to contact qualified personnel.
- **Moving parts:** All components with the possibility of movement have been designed, built and configured to avoid risk. Some parts are also protected by fixed guards to prevent contact or injury.

The following is a list of measures adopted to protect against other risks:

- **Electrical power:** The machine has been designed, built and fitted with the aim of preventing risks of electric shock, in compliance with established safety regulations.
- **Noise:** The machine has been designed and built to minimize risks related to the emission of acoustic noise (always lower than 70 dB).

The following is strictly forbidden:

- Tampering with or removing the evaporator cover enclosure that protects the user from a risk of cutting on the evaporator fins
- Removal of the data plates fixed in the inside edge of the motor compartment that contain technical specifications and earth connection warnings
- Removal of the data plate fixed on the evaporator unit guard and near the electrical wiring inside the motor compartment, which warns the user to disconnect power before working on the unit.



Safety and Accident Prevention

This machine has been designed with suitable measures to assure safety and the health of the user. The following is a list of protections adopted against mechanical risks:

- **Stability:** The machine has been designed and built in order to guarantee its stability in all foreseen operating conditions, even with shelves/drawers extracted, without any risk of tipping, falling, or sudden movement.
- **Surfaces, edges, corners:** Within the limits permitted by their functions, accessible parts of the machine have no sharp corners, sharp edges or rough surfaces that could cause injury.



The manufacturer declines any responsibility for safety of the machine if the above recommendations are not observed.

Contradictions

The refrigerated cabinet must not be used:

- Exposed to weathering
- With adapters or extension cords
- In explosive atmospheres or where there is a risk of fire
- Near to heat sources (radiators, etc.)

Warning on the Refrigerant Gas

These devices contain R290 as refrigerant (Flammable Gas).



Ensure to follow the precautions given below:

- To avoid damages to the refrigerant circuit, do not use mechanical devices to accelerate defrost process.
- Position the appliance in an environment of suitable dimensions in compliance with EN 378: the environment must have a volume of 1m³ every 8 grams of R290 refrigerant. The quantity of gas contained in the circuit is declared on the silver data plate attached inside the cabinet.
- Do not use the equipment if damaged.
- Make sure that air grids are always free to guarantee a certain ventilation to the device.
- If there is refrigerant leakage, avoid using open flames, remove from the device flammable products and ventilate immediately the environment.
- Do not store potential explosive substances (for example spray cans containing flammable gases) inside the device.

Do not use electrical appliances inside the refrigerated cabinet.

If any malfunction, disconnect the equipment from the mains.

Extraordinary maintenance should be performed only by qualified personnel.

Product Description

Technical Description

The refrigerated cabinet covered by this manual produces cold by means of low-pressure vaporisation of a liquid refrigerant R290 inside a heat exchanger (evaporator). The vapor thus obtained is brought back to the liquid state by means of a higher pressure mechanical compression (via a compressor) followed by cooling in another heat exchanger (condenser). The correct, uniform distribution of air inside the cabinet is guaranteed by one or more fan motors, depending on the model.

The machine is composed of a modular monocoque coated with different materials and insulated with polyurethane foam at a density of 43 kg/m³.

The instrumentation is grouped on the front panel. On some models, the motor compartment, where the condenser unit and electrical wiring can be housed, closes automatically.

Inside, the machine is equipped with brackets suitable for supporting wire shelves, extractable drawers and steel baskets.

The doors on all machines are equipped with a closing device with automatic return and door lock and easily replaceable magnetic seals for perfect tightness. Measures were taken during design and construction to obtain a machine that meets specific safety requirements, such as internal rounded corners, condensate liquid drainage, no rough surfaces, fixed guards on moving or potentially dangerous parts, and so on.

The maximum capacity of shelves and drawers load on all models is 30 kg with weight uniformly distributed.



CAUTION All models are for indoor use and cannot be installed outdoors. Warranty will immediately expire, if equipment is installed improperly.

Intended Use

All the listed models are suitable for storage. For this reason, we suggest only storing products that have already been refrigerated or frozen (depending on the model).

We declare that any use outside of those allowed by the machine is considered as “improper use” and therefore the manufacturer declines all responsibility.

Laboratory Devices

Laboratory devices are suitable for:

- Storage of correctly packaged drugs, vaccines, and reagents that are not liquids or body tissues intended for administration or introduction into the body.
- Storage of other substances or materials for general use in a non-flammable or non-explosive hospital, laboratory or pharmaceutical environment.
- They are not to be used for the storage of blood, fluids or body tissues.

Transport and Handling

The machine must be transported and handled solely in a vertical position and following the instructions printed on the packaging. This precaution is necessary to avoid contamination of the compressor with oil which may cause the rupture of valves, of the cooling coils and problems with electric motor starting.

The accessories supplied with the machine (slides, wire shelves, drawers, baskets, etc.) are shipped inside the unit. The machine is fixed on a wooden pallet by means of screws, wrapped with polyethylene and packaged in cardboard or a wooden crate.

The machine must be handled using a forklift or pallet truck with suitable forks (fork length at least equal to 2/3 length of the unit).



CAUTION If the machine needs to be set down in order to bring it into the installation location, it is absolutely necessary to wait at least 6 hours before switching it on.

The manufacturer declines any responsibility for problems due to transport carried out in any condition different from those specified above.

Positioning

Incorrect positioning can cause damage to the machine and create dangerous conditions for users; therefore, the installer must comply with the following general rules:

- Position the machine keeping a minimum distance of 100 mm from all walls. If the machine is embedded in any type of furniture, a correct air flow of the condensing unit (compressor/fan motors) must be always ensured. The warranty will immediately expire, if this is not guaranteed.

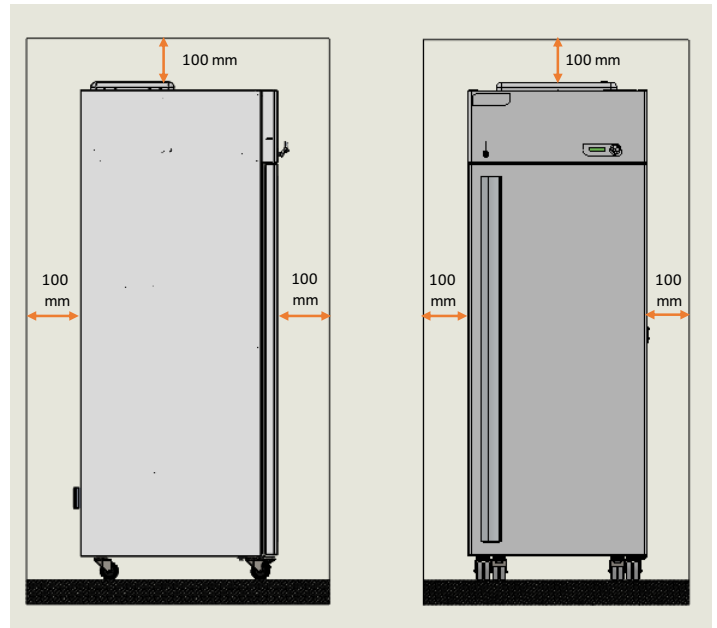


Figure 1. Equipment Position

Set the machine in a sufficiently ventilated environment.

- Place the machine far from heat sources and far from sources of electromagnetic interferences (such as motors, generators, infrared beams, telephones) which can have negative effects on equipment functioning.
- Avoid exposure to direct sunlight and air conditioning flows.
- Remove the supplied accessories and the wooden pallet base.
- Position the machine with the aid of a spirit level.

Cleaning

Equipment is shipped already cleaned. However, it is advised to carry out a further washing following the instructions below:

- Remove the protective PVC film from the external surfaces of the machine.

- Clean the inside of the chamber with a cloth dampened with alcohol in order to eliminate the protective oil.



The glass door must be cleaned using a cloth dampened with water.

Do not therefore use chemicals.

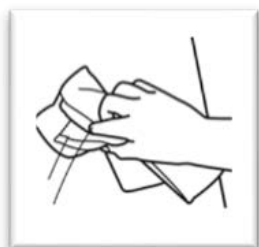


Figure 2. Glass Cleaning Label

Wiring and Electrical Connection

The electrical system and connection must be set up by qualified personnel.

Follow the instructions below for safety reasons:

- Make sure that the system is suitably sized for the absorbed power of the machine.
- It is essential to properly connect the machine to an effective grounding system set in accordance with current legislation.
- In the event of incompatibility between the outlet and machine plug, replace the outlet with a suitable type, provided that the part is approved according to the laws in force.
- If electrical cable is damaged, it must be replaced by qualified personnel to prevent any risk.
- If the freezer is supplied without a plug, connect it directly under the switch board.
- Do not interpose adapters and/or reducers.

Electrical Protections

ThermoFisher Scientific devices are equipped with 2 safety fuses (phase and neutral) with integral protection against electric shocks, short circuits and over-currents, and according to the standards for laboratory devices.

The fuses can be accessed from the front: open the refrigerator door and the fuses will be found behind the front control unit panel. The replacement must be done by qualified personnel.

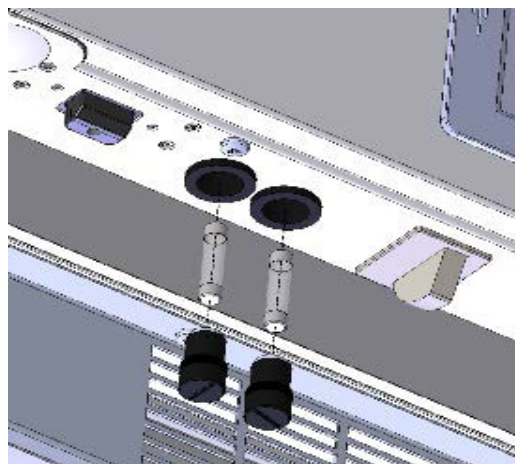


Figure 3. Fuse Housing

Set-Up Operations

Before turning on the appliance, it is necessary to check that it has not been damaged during transport, handling and installation.

- Check the condition of the packaging (it must not show dents and/or breakages).
- Check the condition of the external frame (it must not show dents and/or breakages).
- Check the condition of the power cord (it should not have scratches or cuts).
- Check that the wheels are stable.
- Check that door opens correctly and closes hermetically
- Check door gaskets (they should not have scratches or cuts).
- Check that display do not show cracks.

Use of Internal Compartment or Material Storage

The stainless-steel rack system allows for the installation of shelves.

Shelves Installation

Position the shelf supports on the rack at the desired position, inserting them into the special slots and turning them of 90° to block them. At this point, insert shelves.

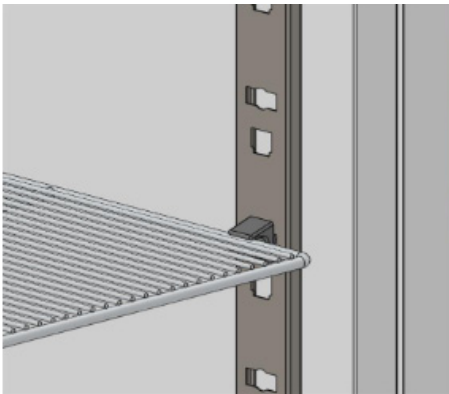
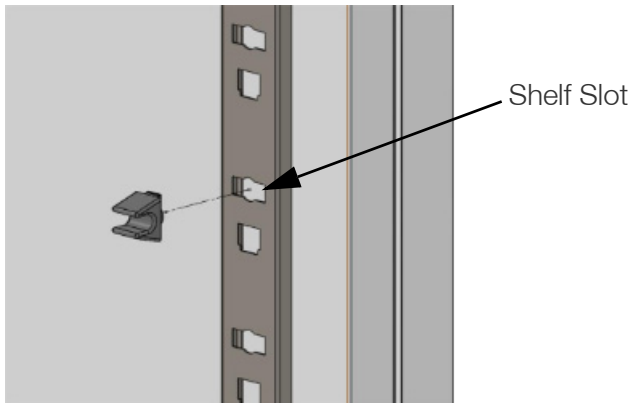


Figure 4. Shelves Installation

Placing Material Inside the Compartment

Care must be taken when loading material, to avoid malfunctions and allow air flow to ensure temperature uniformity inside the refrigerated compartment.

Observe the following instructions:

- Do not place material over the label indicating the maximum permitted loading level, if present.
- Store material leaving a distance of at least 6 cm from sides and at least 18 cm from the top of the compartment



Figure 5. Max. level label

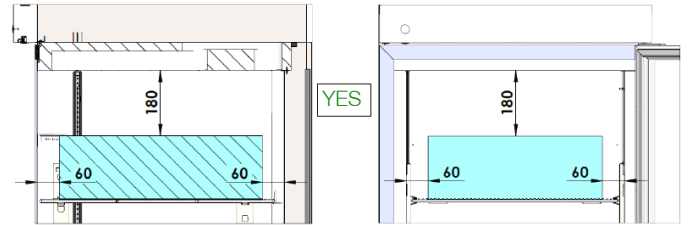


Figure 6. Correct Material Storage

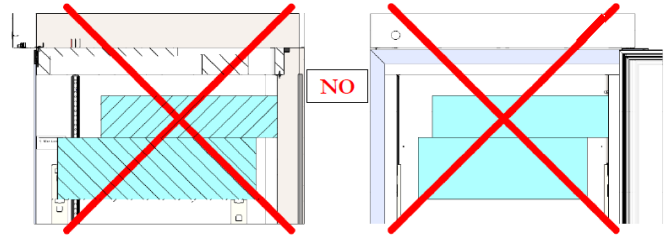


Figure 7. Incorrect Material Storage

- Do not position material in contact with or near the temperature probes



Figure 8. Probes Position

- Do not block air vents.

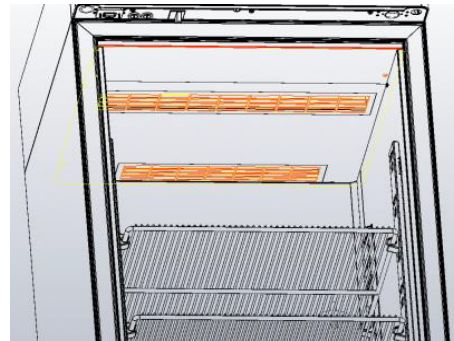


Figure 9. Air Vents at the Top of the Compartment

Indication of Optimal Use

The following instructions are provided to the user to follow in order to get the best equipment performances:

- The power supply must comply with the information provided on the technical data plate ($\pm 10\%$).
- The units have been designed and built to work in environment with temperatures falling within the climatic class temperatures indicated on the technical data plate (see **Machine Data Plates**) and at a relative humidity of 60%.
- Do not block the motor compartment air vents.
- Load stored material gradually at ambient temperature to grant proper refrigeration.
- Store material on shelves (or drawers). Do not place products directly on the bottom, or against the wall, doors or fixed guards of the unit.
(see **Placing Material Inside the Compartment**)
- Make sure doors are closed properly.
- Limit how many times and how long doors are opened. Each time the door is opened, the internal temperature will alter and there will be possible ice formation on the evaporator.
- Keep the defrost water drain outlet clear.
- Follow a regular maintenance schedule.
(see **Maintenance**)

Using the Display

The refrigerator is equipped with a latest generation Electronic Controller, with an alphanumeric LCD display that shows the temperature and operating status with increments of 0.1°C. The controller ensures maximum safety in case of alarms and fault conditions, promptly signaling critical conditions and recording every event to help the service engineer to speed up analysis and thus fix problems.

Control Unit

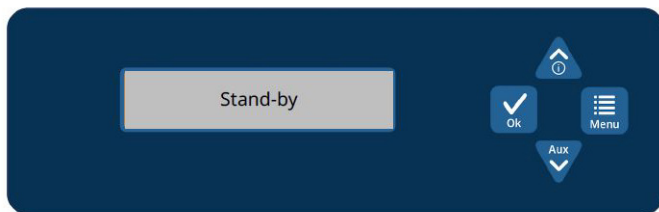
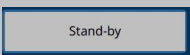


Figure 10. User Interface

Table 2. Keyboard function

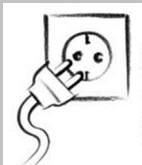
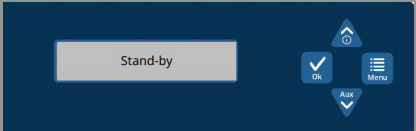
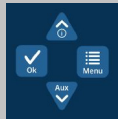
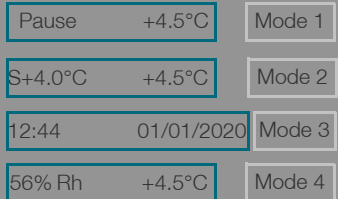
UI	Command
	To confirm the selection
	Value increase button, menu scrolling and DOCTOR VIEW function
	To enter the main menu and Esc function from all menus
	Value decrease button, menu scrolling Glass door LIGHT on/off
	Alphanumeric back-lit LCD display

Controller Operation

Switching On

To switch on the equipment for the first time follow these below instructions:

Table 3. Steps to Switch On

Action	Display
1 Connect the plug to the electric socket.	
2 The display shows "STAND-BY" which indicates the presence of mains power.	
3 Press any button for approximately 2 seconds to switch on the refrigerator.	
4 The LCD display can be configured in four different display modes by pressing the button OK.	

Display Configuration and Reading

The LCD display can be configured in four different display modes by pressing the button .

Mode 1	Mode 2	Mode 3	Humidity mode
Pause +4.5°C Working status and temperature	S+4.0°C +4.5°C Setpoint and temperature	12:44 01/01/2021 Date and time	56% Rh +4.5°C Relative humidity and temperature

In Mode 1 the following strings can be visualized:

Table 4. Action Strings

String	Operation in Progress
Pause	The compressor is OFF, waiting for next cooling cycle
Cool	The compressor is ON to reach setpoint
Defrost	The refrigerator defrosts, warming up the evaporator
Dripping	Last phase of defrosting to allow evaporator dripping
Recovery	The compressor is ON after defrosting to re-acquire the temperature
Door	Door open
Heating	Heating action active

Controller Menu Functions

Use the button  to access the list of available functions.

Scroll the Menu using the buttons  and .



IMPORTANT To exit from the different menus,

press  to go back to the set display.

Table 5. User Menu Functions

Function	Description of the Function
TURN OFF m1	Switches off the controller and stops temperature control
CHANGE SET m2	Customises temperature setpoint
MIN/MAX S1 m3	Displays the temperature values saved at the last reset
DEFROST m4	Allows forced manual defrosting
ALARMS LIST m5	Displays the list of alarms
LANGUAGE m6	Changes the text strings language
PASSWORD m7	Allows a user password to be set to access the menu
SERVICE MENU m8	Allows access to functions for technical support
CLOCK SET m9	Allows the controller data and time to be set

Turning off the Refrigerator

Press the button  and the string

TURN OFF m1

will appear. Press the button  to confirm.

At this point, the controller requests further confirmation of the command:

<<Confirm Esc>>

To confirm, press the button  again or  to cancel the operation (Esc) and go back to main menu.

Changing the Setpoint

Press the button  and by using the buttons  or  stops at the string

CHANGE SET m2

.

Confirm with the button . The display will start flashing the actual Temperature Setpoint

SETPOINT -20.4°C

. This can be modified using buttons  or , with increments of 0.1°C.

Confirm by pressing the button . The display will show a message asking to confirm or to exit from the Menu with the message

<<Confirm Esc>>

.

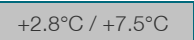
Confirm again with the button . The display will show the message  and the controller will start adjustment with the new temperature setpoint value.

Instead, press the button  to cancel the operation and go back to main menu.

MIN/MAX S1 Function

The minimum and maximum temperature values detected by the S1 ambient probe are continuously monitored and stored in memory, to be displayed in the special MIN/MAX frame.

Press the button  and by using the buttons  or  stops at the string .

Confirm with the button . The display will show the values recorded up to display .

Press the button  to access the value reset function and re-start monitoring .

Re-confirm with the button . The display will flash the message  and the controller will re-start monitoring.



Info: Minimum and maximum temperature detection occurs continuously, and its display is continually updated during normal refrigerator device operation.
A brief door opening and defrosting until the next setpoint is reached inhibit maximum temperature updating as it is not due to a malfunction or misuse of the device.

Note: Minimum and maximum temperature updating will not be carried out during door opening and for 240 seconds after it has been closed. This same occurs during defrosting, during dripping and during the entire recovery phase.

Manual defrosting function

ThermoFisher Scientific cabinets are equipped with automatic, intelligent defrosting, or rather defrosting which only occurs if deemed necessary by the controller. The number of daily defrosts is therefore

significantly reduced, resulting in considerable energy savings.
However, it may sometimes be necessary to perform manual defrosting. This function is enabled by following the procedure below.

Press the button  and by using the buttons  or  stops at the string .

Confirm by pressing the button . The display will show a message asking to confirm or to exit from the Menu The display will show a message asking to confirm or to exit from the Menu with the message .

Confirm again with . The controller acquires the defrosting order and the display shows the message .

If manual defrost cannot be enabled until the conditions required for its implementation are detected, the display will show the message .

If defrost is delayed by the controller due to certain pre-set managing parameters, the display will show the message .

At the end of defrost, the phases  and  will proceed until the next setpoint is reached.

Recorded Alarms Log

The controller signals four types of temperature alarm and records the last 16 events in the corresponding .

Alarms are recorded as follows:

Table 6. Types of temperature alarms

Alarm description	Alarm code
HIGH TEMP	Ht
HIGH TEMP DURING POWER FAILURE (with batteries installed)	M
POWER FAIL	B
LOW TEMP	Lt

Press the button , positioning yourself using the buttons  or  on the string **ALARMS LIST m5**.

Confirm with the button . The display will show the total number of alarms present in the memory up to that moment -> **NOTICED N.07**. If there are no alarms in the memory, this will be indicated with the string

NO EVENT.

If there are alarms to be seen, press the button  to view the details of the last recorded event. Use the button  to scroll back to the first in memory.

The information available is described in the following frame.

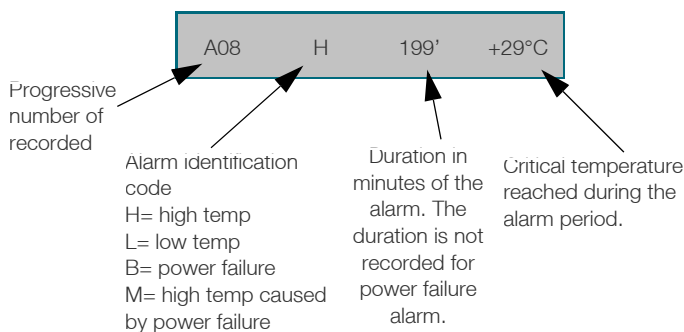


Figure 11. Information on recorded alarm

Pressing repeatedly the button  the start date/time (S) **S 14:10 24/01/20** and the end date/time of the alarm **E 14:34 24/01/20** are displayed.

Language Selection

Press the button  and use the buttons  or  to move to the menu corresponding to the language selected **LANGUAGE m6**.

Use the arrows  or  and confirm with  to select the desired language from:

- LINGUA ITALIANA
- ENGLISH LANGUAGE
- LANGUE FRANCAISE
- IDIOMA ESPANOL
- DEUTSCHE SPRACHE

Setting the User Password

This menu lets you set a new user password which will be asked when switching on and off the controller and when setting the setpoint.

Press the button  and use the buttons  or  to move to the menu corresponding to the password

PASSWORD m7.

Press the button  and the password currently in use will be requested, which then you will be able to edit (if any password has been entered, nothing is requested). Select the password in use using the buttons  or  and confirm with . If entered correctly, you will then be able to edit it by setting a new value and confirming with .



IMPORTANT Setting the password = 00 will disable password protection. If the password is lost, contact the manufacturer or technical support to retrieve it.

Service Menu

Denied access to service menu – only technical service can enter in this menu.

Setting the Date and Time

Press the button  and by using the buttons  or  stops at the menu **CLOCK SET m9**.

Confirm with . The display will show the date and time, with the time flashing. Adjust using buttons  or  and confirm with , until you reach the last two digits which relate to the year.



CAUTION: If the time is lost (low battery), the display will show the flashing frame h00 m00:00.

Doctor View Test function

Press for few seconds the button  to activate DOCTOR-VIEW function. This TEST checks buzzer for 5 sec. (TEST BUZZER); then, it shows by sequence the SETPOINT, EVAPORATOR temperature, CONDENSER temperature, high and low set limits, alarm time delay, the maximum duration allowed when DOOR is open and battery tension (if battery is installed).

If any button is pressed during the test, this will stop automatically.

Alarm and Failure Signals

Fault in Progress Warning

In the event of any system abnormality, an audible and visual warning is immediately signalled to the user by means of the flashing display and the sound of the buzzer.

In the event of a temperature alarm, the display will also show the string ALARM DETECTED alternating with the pre-set display mode.

Press any button at any time to silence the buzzer.

The faults that the controller can detect are as follows:

Table 7. Faults detected by the controller

Message	Type of Fault in Progress
HIGH TEMP.	High temperature inside the chamber
LOW TEMP.	Low temperature inside the chamber
POWER FAIL HT	High temperature due to power failure
MAINS FAILURE	Power failure
DOOR	Open door
PROBE S1	Faulty thermostat control probe (call Service)
PROBE S2	Faulty evaporator probe (call Service)

Table 7. Faults detected by the controller

Message	Type of Fault in Progress
PROBE S3	Faulty auxiliary probe (call Service)
LOW EVAPORAT	Low evaporation temperature reached (call Service)
HIGH CONDENS	High condenser temperature reached (call Service)
HT EVAPORAT	High evaporator temperature reached (call Service)
h00:m00	Clock-data loss (call Service)
DEFROST TIME	Inadequate defrosting time (call Service)
COMPRES. WORK	Maximum percentage of continuous operation of the compressor in 24 hours reached (call Service)
I2C	Events or strings memory failure (call Service)
CLEAN CONDEN	Inadequate thermal exchange: clean or free the condenser
NO BATTERY	Back-up battery disconnected
BATTERY FAILURE	Battery faulty or worn (check the battery status)
NOTICED ALARM	A temperature alarm occurred in the presence or absence of mains



IMPORTANT: With all above-mentioned signals, the refrigerator will continue to function correctly until the arrival of a service engineer.

Fault Ended Warning

When the alarm condition is finished, the display will alternately visualize the message ALARM NOTICED with the standard pre-set display until the user accesses the Alarm list menu.



IMPORTANT: During this phase, press the button  to directly access the recorded alarm list visualization menu and the ALARM NOTICED message will stop being visualized even if the user exits from the display using the Esc. button.

Buffer Battery for Alarm in the Event of Power Failure

A buffer battery which permits the controller to operate autonomously for approximately 48 hours for alarms in the event of power failure.

The controller itself will recharge the battery, keeping it charged and ensuring availability when needed.



Figure 12. Battery label



Figure 13. Buffer Batteries

Short-Term Power Failure

The controller detects the presence or absence of the mains.

In the event of a short mains failure, the display will show the message NO MAINS alternating with the main display frame. The buzzer will activate and the display will flash. Buzzer MUTING is carried out by pressing any button.

Any relays configured as a remote alarm are not activated during this phase, avoiding alarm-ism in the event of a short power failure.

Long-Term Power Failure

In the event of power failure lasting more than 2 minutes, the display will show the message MAINS FAILURE alternating with the frame of the selected mode. The buzzer will activate, and the display will flash

for 5 minutes and then start again after 15 more minutes, unless muted from the keyboard.

Battery Faults

If the battery is disconnected, the display will show the message **NO BATTERY** and connection will have to be verified.

If battery voltage is $V_{batt} < 7.0$ Volt, on the display the message **BATTERY FAILURE** will appear and it will have to be replaced.

The battery pack position is indicated by the label in **Figure 12**.

External Terminal Board for Connection to the Alarm Relay

External terminal board is present on the back of the refrigerator, connection can be made to a centralized alarm system via output AL1. The contact switches operates in relation with the alarm/fault conditions of the controller.



Figure 14. Label for Remote Alarm Connection

- AL1 Potential free contact 1 to remote controlled alarms/faults (max 500 mA)
- AL1 (if present) Potential free contact 2 to remote controlled alarms/faults (max 500 mA)

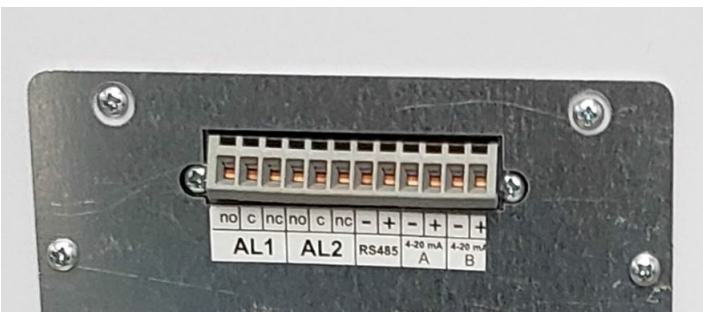


Figure 15. Position of the Terminal Board for Alarm Relay

Maintenance

The information in this section is addressed to both users (non-specialized personnel) and routine maintenance workers.

Prohibition of Safety Device Removal

Do not remove safety protections without having switched off the refrigerator cabinet and disconnecting it from the electrical mains.

The manufacturer disclaims all liability that may arise if this regulation is not observed.

Cleaning the Unit

We recommend cleaning both inside and outside surfaces of the unit at least twice a year. Disconnect the power cord before any cleaning.

The following is indicated for this purpose:

- **Cleaning products:** Water and non-abrasive neutral detergents. DO NOT USE SOLVENTS OR THINNERS.
- **Cleaning method:** Use a cloth or sponge soaked in a suitable cleaning product to clean the inside and outside parts of the cabinet.
- **Disinfection:** Do not use substances that can alter the organoleptic characteristics of stored products.
- **Rinsing:** Use a cloth or sponge soaked in water. DO NOT USE WATER JETS.
- **Frequency:** At least twice a year or at different intervals depending on the type products stored.

Cleaning the Condenser

Failure to clean the condenser, as well as temperature being too high in the environment in which it is installed, is one of the main causes of difficult cabinet operation. Cleaning must be carried out every 2-3 months, even in the cleanest environments.

You must access the condenser coil, placed in all models in the technical compartment near the compressor, and clean it with one of the following:

- Long bristle brush
- Vacuum cleaner
- Compressed air



CAUTION: DO NOT USE METAL BRUSHES. DO NOT BEND CONDENSER FINS.



CAUTION: ALWAYS DISCONNECT THE POWER CORD BEFORE THIS OPERATION.

In order to ensure optimal unit operation, follow the manufacturer instructions, arranging for periodic maintenance to be carried out by qualified technicians.

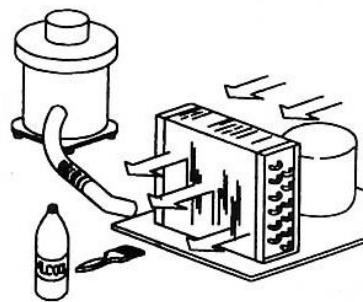


Figure 16. Representation of Condenser

Follow these below cleaning instructions according to the bought model:

1. TSG400R & TSG400F

- **PHASE 1:** Use a Phillips head screwdriver to remove the guard (3 screws).
- **PHASE 2:** Use a vacuum cleaner, air jet, or a long bristle brush to remove any dust on the condenser fins. Perform this procedure backwards to restore correct fastening of the guard.
- **PHASE 3:** Restore the electrical current and switch back on the device.

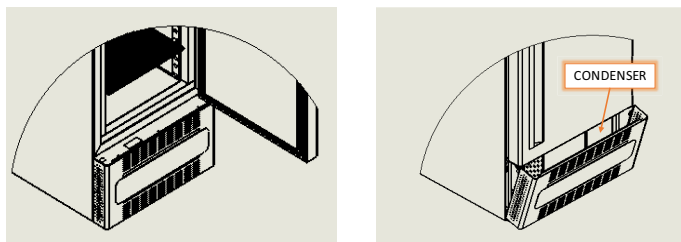


Figure 17. Condenser Position in Models with Lower Compartment Motor

2. Model TSG700R, TSG1500R, TSG700F & TSG1500F

- **PHASE 1:** In models with higher motors (700-1500L), the condenser can be accessed directly from the outside using a ladder.
- **PHASE 2:** Use a vacuum cleaner, air jet, or a long bristle brush to remove any dust on the condenser fins.
- **PHASE 3:** Restore the electrical current and switch back on the device.

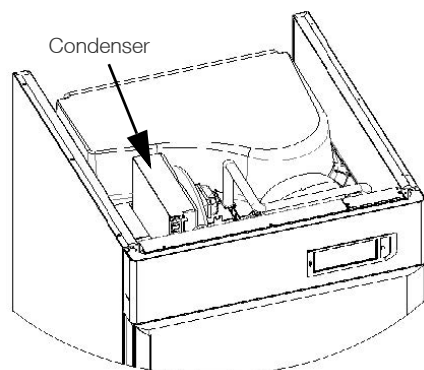


Figure 18. Condenser Position

Condensate Water Draining

Defrosting causes the formation of condensate water. The water evaporates automatically in models with motor compartment in lower position.

Replacing Buffer Batteries

To ensure maximum efficiency, we suggest periodically changing backup batteries at least every 2 years. This operation can be performed by users, easily accessing the housing located.

- At the rear of the device

- At the upper of the device (models with upper motor compartment)

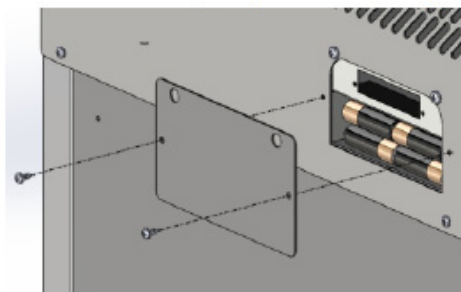


Figure 19. Battery position

Disposal



This unit is marked in compliance with European Directive 2012/19/EU (WEEE)

The symbols on the product means that it must not be considered as domestic waste but it must be given to the competent authority for the recycling of electric and electronic appliances.

Before scrapping the machine, make it unusable by cutting the power cord, and removing the doors, shelves and drawers so that children cannot access the unit. Do not leave it unattended even for a few days.

For further information about the treatment, retrieval and recycling of the product contact local officials, the domestic waste collection service or the distributor.

Please comply with applicable laws.

The gas present into the system must be extracted by authorized personnel.

Labeling

Machine Data Plates

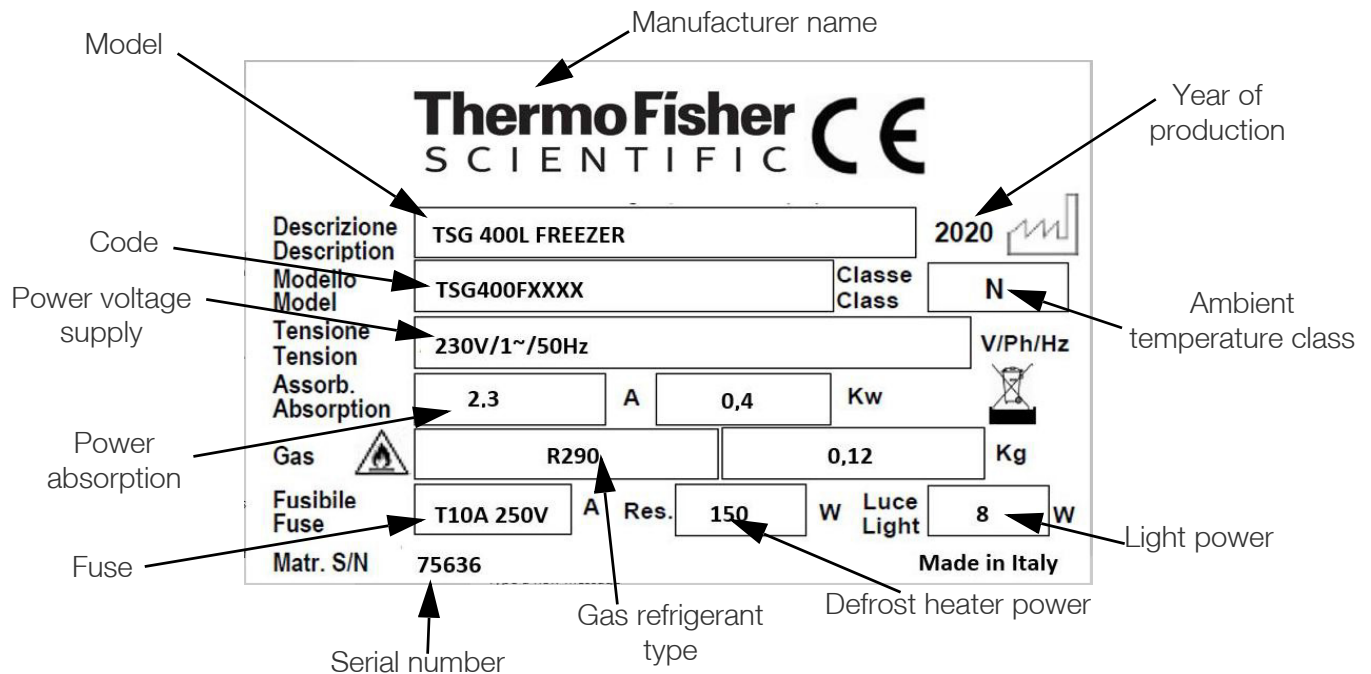


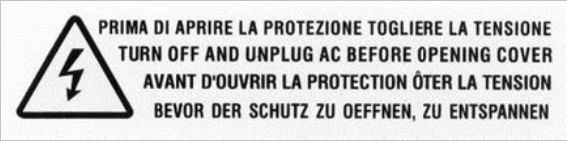
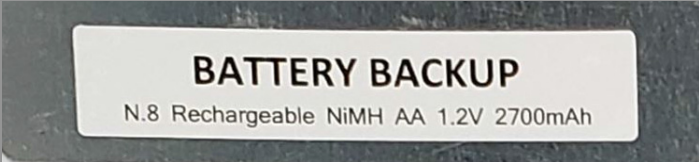
Figure 20. Data Plate

*Ambient temperature caption:

- SN (da +10°C a +32°C)
- N (da +16°C a +32°C)
- ST (da +18°C a +38°C)
- T (da +18°C a +43°C)
- C (da +10°C a +25°C)

Other Labeling

Table 8. Labels

Label	Description
	Cut off power before removing the guard.
	Periodic condenser cleaning
	Earthing symbol
	Attention: risk of fire
	Do not exceed the indicated level
	Position of batteries for alarms

Consumable Materials

Table 9. Consumable Material

Type / Characteristics	Application	Image
BATTERY 3V Lithium Coin Cell Battery, type CR 1220	Clock battery on the board	
BATTERIES type AA rechargeable, NiMH 1.2 V, 2.7 Ah	Acoustic and visual alarm battery backup	

Troubleshooting

The table below lists information regarding the possible causes and actions to be taken for the most common faults, which do not need automatically technical servicing.

Servicing on the electrical system must also be carried out by trusted electricians.

Problem	Possible Cause	Solution
The unit does not switch on.	Controller set to “Stand-by”	Switch on the controller.
	No mains	Check the plug, outlet, fuses and electrical line.
	Power plug not connected to the electrical outlet.	Connect the power cord to the electrical socket.
	Control panel fault	Contact Technical Support.
Unit does not reach the set temperature.	Too much material has been placed in the compartment.	Reduce the quantity and leave space between the shelves and walls. Place products in the cabinet a few at a time after the temperature has stabilised.
	Material was placed in the freezer area at room temperature (i.e. +25°).	Store only already frozen products.
	Prolonged or too frequent door openings	Reduce door openings and close the door more quickly.
	Ambient temperature is too high.	Air condition the environment.
	Condenser clogged by dust or dirt.	Clean the condenser.
	Electronic controller operating fault	Contact Technical Support.
	Cooling system operating fault	Contact Technical Support.
The unit is noisy	Unit instability	Eliminate the cause.
	Contact with objects (e.g. cardboards, polystyrene or other materials)	Move and/or remove objects touching the equipment.
Repeated alarm or fault signals or alarm noticed	Unit has detected an alarm.	Visualize alarms
Products wet	Formation of ice in the evaporator or sudden defrosting	Contact Technical Support.
	High humidity level in the environment	Air condition or ventilate the environment.
Glass door wet	High humidity level in the environment	Air condition or ventilate the environment.

Diagnostic

The table below lists information regarding the possible causes and actions to be taken for the most common faults, which do not need automatically technical servicing.

Servicing on the electrical system must also be carried out by trusted electricians.

Visual and Acoustic Alarms	Solution
LOW EVAPORAT	Switch off the refrigerator from the keyboard -STAND BY. Then, disconnect the electrical plug, wait a few seconds and then re-connect the plug. Switch the refrigerator back on from the keyboard and, once the temperature is displayed, press "OK" so that the acoustic and visual alarms disappear.
	Check that door is closed.
	If the problem persists, contact Technical Support.
HIGH CONDENS	Switch off the refrigerator from the keyboard -STAND BY. Then, disconnect the electrical plug, wait a few seconds and then re-connect the plug. Switch the refrigerator back on from the keyboard and, once the temperature is displayed, press "OK" so that the acoustic and visual alarms disappear.
	Air condition the environment.
	Check that installation has been properly performed
	Clean the condenser
COMPRES WORK.	If the problem persists, contact Technical Support.
	Air condition the environment.
	Clean the condenser
	Check that installation has been properly performed
	Switch-off the equipment from keypad and then, switch it on again.
DEFROST TIME	Check that door is closed.
	Switch-off the equipment from keypad and then, switch it on again.
	Check ambient conditions (environment should be neither too hot nor too cold).
	Check that installation has been properly performed
HIGH TEMP alarm	If the problem persists, contact Technical Support.
	Check that products have been correctly stored in the chamber
	Check ambient conditions (environment should be neither too hot nor too cold).
	Clean the condenser
	Check that door is closed.
	Air condition the environment.

Visual and Acoustic Alarms	Solution
LOW TEMP alarm	Contact Technical Support.
MAINS FAILURE	Check the electrical system or accidental disconnection of the plug.
POWER FAIL HT	Check list alarms
H 00:m00	Replace button battery on electronic board.
NO BATTERY	Replace the battery.
BATTERY FAILURE	Replace the battery.
PROBE S1-S2-S3-S4	Contact Technical Support. Refrigerator functioning is guaranteed anyway.

Warranty

The warranty is valid for 36 months from the date of delivery and establishes the right to repair/replace parts that are defective, not including electrical and electronic parts. Apparent defects and any deviations from orders must be communicated to the manufacturer within 5 days of receipt of the goods under penalty of invalidation of the warranty.

Any other defects (not apparent) must be communicated within 5 days of discovery, and in any case within the maximum 6 months warranty period. The customer will only be entitled to the repair or replacement of goods, with the absolute exclusion of any direct or indirect damages of any kind. In any case, the right to repair or replacement of materials must be exercised within the maximum time limit provided by the warranty, with the time limits having been contractually reduced with respect to those established by law.

Repair or replacement of defective materials will occur at the manufacturer's factory, where materials must be delivered with freight prepaid. The manufacturer will then return them carriage forward

Annexes

The following documents are referred:

- Declaration of conformity with DIRECTIVE 2006/42/EC
- Declaration of conformity with DIRECTIVE 2014/30/EC
- Declaration of conformity with DIRECTIVE 2014/35/EC
- Declaration of conformity with DIRECTIVE 2011/65/EC (RoHS)
- Declaration of conformity with DIRECTIVE 93/42/ECC (For Medical Devices only)
- Electric safety check receipt
- Wiring diagram

1. User Data for Technical Support Request

Fill in the following tables in order to provide all data necessary for technical support. If possible, leave the refrigerator in operation for 1 hour or, even better, 24 hours to allow the controller to fully collect information.

MODEL*:

SERIAL NUMBER*:

Device traceability, see the silver plate at the end of this manual.

1. Has periodic cleaning of the condenser been carried out as per the use and maintenance manual?

YES No

If Yes, indicate the date of the last cleaning and the names of personnel who performed it.

2. Have the problems been verified according to the information stated in the use and maintenance manual?

YES No

Fill out the following table.

Table 10. Fault signal table

Equipment:	yes	no
Does not cool		
Does not reach the set temperature		
Does not switch on		
Equipment built into furniture		
Power cable connected to multiple sockets or adapters of the power outlet		
The refrigerator unit is noisy		
Display off		
The Display signals:		
The Display signals:	yes	no
Evaporator		
Condenser		
No battery		
Battery failure		
Comp. work		
Invalid SD		

SENT ON:

SIGNATURE:
(legible)

Note: Failure to submit a properly completed request (*required fields) will result in a failure to open servicing with a resulting delay in the resolution of issues.

2. Service Data for Technical support on Controller

Enter into the service section SERVICE MENU, confirm with ✓ and enter password 255. Enter into the “status data” menu with ✓ and scroll the items, noting the values in the table below.

Table 11. Service status data for support

Item	Value	U.M.
KEYPAD ON		n
POWER ON		n
RESET		h
CONTROLLER		h
COMP		h
COMP%		%
COMP%		%
COMP ON		“
COMP OFF		“
Max Evap		°C
Min Evap		°C
DTM Cond		°C
Max Cond		°C
Min Cond		°C

Table 12. Faults list for assistance

N	Fault	Date/Hour
F01		
F02		
F03		
F04		
F05		
F06		
F07		
F08		
F09		

WEEE Compliance

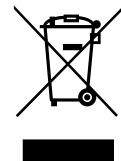
WEEE Compliance. This product is required to comply with the European Union's Waste Electrical & Electronic Equipment (WEEE) Directive 2012/19/EU. It is marked with the following symbol. Thermo Fisher Scientific has contracted with one or more recycling/disposal companies in each EU Member State, and this product should be disposed of or recycled through them. Further information on our compliance with these Directives, the recyclers in your country, and information on Thermo Scientific products which may assist the detection of substances subject to the RoHS Directive are available at www.thermofisher.com/WEEERoHS.

Great Britain



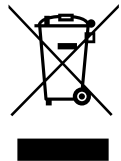
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Deutschland



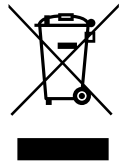
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Italia



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France



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Contact Information

Thermo Fisher Scientific products are backed by a global technical support team ready to support your applications. We offer cold storage accessories, including remote alarms, temperature recorders, and validation services. Visit www.thermofisher.com/cold or call:

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Netherlands	+31 76 571 4440
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