Fisher Scientific

Isotemp Laboratory Freezers

Freezer Models
13-986-223F/FA/FR, 13-986-223FHK/223FRHK/223FAHK
13-986-247F/FA/FR, 13-986-247FHK/247FRHK/247FAHK
13-986-274F/FA/FR, 13-986-274FHK/274FRHK/247FAHK

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Safety Information

Alert Signals

Warning
Warnings alert you to a possibility of personal injury.

Caution
Cautions alert you to a possibility of damage to the equipment.

Note
Notes alert you to pertinent facts and conditions.

Hot Surface
Hot surfaces alert you to a possibility of personal injury if you come in contact with a surface during use or for a period of time after use.

Warning
As a routine laboratory precaution, always wear safety glasses when working with this apparatus.

DANGER: RISK OF CHILD ENTRAPMENT. BEFORE YOU THROW AWAY YOUR OLD REFRIGERATOR OR FREEZER:

- TAKE OFF DOORS
- LEAVE THE SHELVES IN THE PLACE SO THAT CHILDREN MAY NOT EASILY CLIMB INSIDE.

Your satisfaction and safety are important to Fisher Scientific and a complete understanding of this unit is necessary to attain these objectives.

As the ultimate user of this apparatus, it is your responsibility to understand its proper function and operational characteristics. This instruction manual should be thoroughly read and all operators given adequate training before attempting to place this unit in service. Awareness of the stated cautions and warnings, and compliance with recommended operating parameters – together with maintenance requirements – are important for safe and satisfactory operation. The unit should be used for its intended application; alterations or modifications will void the Warranty.

This product is not intended, nor can it be used, as a sterile or patient connected device. In addition, this apparatus is not designed for use in Class I, II or III locations as defined by the National Electrical Code, unless otherwise noted.

Unpacking

Save all packing material if apparatus is received damaged. This merchandise was carefully packed and thoroughly inspected before leaving our factory.

Responsibility for its safe delivery was assumed by the carrier upon acceptance of the shipment; therefore, claims for loss or damage sustained in transit must be made upon the carrier by the recipient as follows:

Visible Loss or Damage

Note any external evidence of loss or damage on the freight bill, or express receipt, and have it signed by the carrier's agent. Failure to adequately describe such external evidence of loss or damage may result in the carrier's refusing to honor your damage claim. The form required to file such a claim will be supplied by the carrier.

Concealed Loss or Damage

Concealed loss or damage refers to loss or damage, which does not become apparent until the merchandise has been unpacked and inspected. Should either occur, make a written request for the carrier's agent within 15 days of the delivery date; then file a claim with the carrier since the damage is the carrier's responsibility.

If you follow the above instructions carefully, we will guarantee our full support of your claim to be compensated for loss from concealed damage.

DO NOT – FOR ANY REASON – RETURN THIS UNIT WITHOUT FIRST OBTAINING AUTHORIZATION

Packing List

The following items are packed in the envelope located inside the freezer chamber. If any of the following items are not present, report the missing item to your local Fisher representative.

1. Warranty Card
2. This Instruction Manual
3. Door Lock Key
4. Key Switch Key
5. Chart Recorder Instructions (13-986-2xxFR/FA versions only)
6. Charts

Performance Characteristics

Temperature Ranges

-30° to 0°C (-22° to 32°F)

Temperature Stability

±4°C

Electrical Requirements

Catalog Number	Volts (±10%)	Amps	Hz
13-986-223F/FA/FR	115	10.0	60
13-986-247F/FA/FR	230	10.5	60
13-986-274F/FA/FR	230	16.0	60
13-986-223FHK/FRHK/FAHK	220	6.2	50
13-986-247FHK/FRHK/FAHK	220	6.2	50
13-986-274FHK/FRHK/FAHK	220	6.2	50

Installation

Selecting a Location

Choose a location for the freezer that will provide at least three inches of clearance between the cabinet and any adjacent vertical surface at the sides and the rear. Appropriate electrical power must be available. Locate the freezer within six feet of the power outlet so that no extension cord is required.

Casters

Each Isotemp® Freezer is shipped with casters which are packaged separately and fastened inside the cabinet. Threaded legs are available as an option for Isotemp, Laboratory Freezers. Legs and casters screw directly into the weld nut provided in each corner of the base.

Note
The freezer must be level in order to provide adequate condensation drainage as well as proper door alignment and operation. The freezer should be in its final operating location and set so that it is firmly positioned on the floor.

Leveling the Unit

Isotemp Freezers come with four casters, which thread into the base of the unit, one in each corner. Use the wrench provided to thread the casters completely into the base of the unit. Back the casters in or out until the unit is level and resting on all four casters. See figure 1.

Level the cabinet front to rear and side to side using the leg inserts.

Warning
If the unit is tilted in excess of 30 degrees, do not apply electrical power for a minimum of 12 hours.

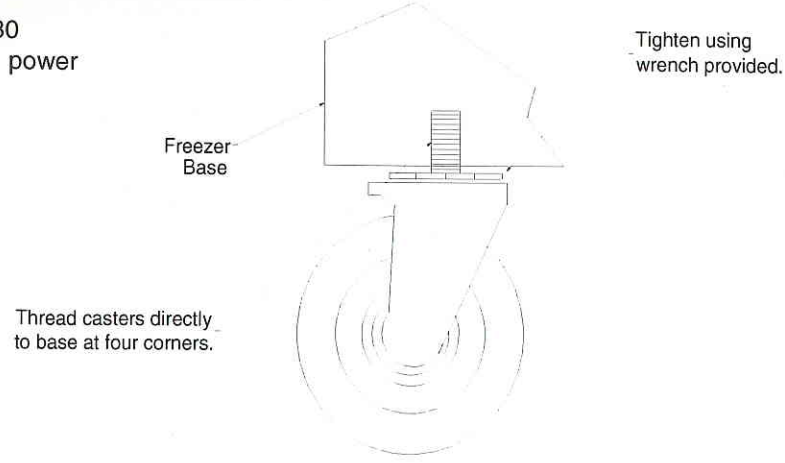


Figure 1

Shelves

Included are three (3) epoxy coated wire shelves per door opening. Also included are three epoxy coated filler shelves for the two and three door models. Shelf spacing is adjustable on half-inch centers with the enclosed shelf supports to suit requirements. Replacement shelves are available individually. See *Replacement Part* in this manual.

Shelf Installation

For each shelf, insert four shelf supports at equal heights onto the pilasters as shown in Figure 2 on the following page. Shelf supports (2) with 1/2" long tabs are placed in the two rear pilasters while the 1/4" shelf supports are placed on the two front pilasters. Place shelf on top of the shelf supports as shown on Figure 3.

Chart Recorder

Provided in the packing envelope is a set of instructions for setting up and using the optional chart recorder and alarm (when applicable). Freezer versions ending in A or R will be equipped with the chart recorders. Read the instruction sheet thoroughly before use.

Caution

Remove the banding around the compressor before operation. Verify the drain tube is not on top of the of the compressor foot.

Compressor Mounts

The compressor is secured with steel banding to prevent damage during shipping. Before operating the compressor, remove the banding. Removing the banding will allow free movement of the compressor while the freezer is running. After cutting the banding, verify the drain tube is not on top of the compressor foot.

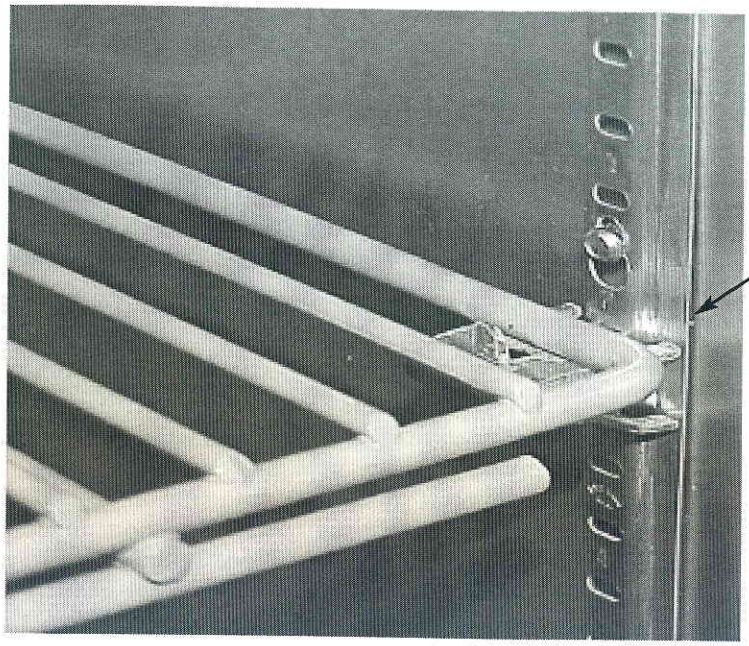


Figure 2

Figure 3

Caution
Insufficient line voltage is often the cause of compressor start-up failure, especially in 115V freezers. It is strongly recommended that a dedicated 20A circuit, conforming to the National Electrical Code, be used for powering the freezer.

Caution
Be sure that the power supply is the same voltage that is specified on the freezer's data plate.

Warning
For personal safety this unit must be properly grounded.

Warning
DO NOT under any circumstances cut or remove the third (ground) prong from the power cord. DO NOT use a two-prong adapter plug.

Where a two-prong wall receptacle is encountered, it is the personal responsibility and obligation of the user to have it replaced with a properly grounded three-prong receptacle.

Caution
Do not use an extension cord. Use of an ungrounded cord or an overloaded circuit VOIDS the compressor warranty.

Electrical Connection

The frequency and nominal voltage requirements for the unit are specified on the data plate, which is located on the interiors upper left side. Plug the unit into a power source that meets these requirements. Low line voltage is often the cause of service complaints. With the unit running, check that the line voltage is within ±10% of that specified on the data plate.

The power cord of the single door model is equipped with a **NEMA 5-20P** three-prong (grounding) plug which must mate with a standard **NEMA 5-20R** three-prong (grounding) wall receptacle. The customer should have the wall receptacle and circuit checked by a qualified electrician to verify the receptacle is properly grounded and is connected to 20 amp service minimum.

The power cord for the 13-986-247F/FA/FR and the 13-986-274F/FA/FR is equipped with a **NEMA L14-20P** four prong (grounding) plug which must mate with a standard **NEMA L14-20R** four-prong (grounding) receptacle. The customer should have the wall receptacle and circuit breaker checked by a qualified electrician to verify the receptacle is properly grounded and connected to a 20 amp service minimum. *CAUTION: Catalog numbers ending in HK are international **3-Wire** systems and should not be confused with 230V domestic units which are **4-Wire** systems. Consult a qualified electrician before powering this unit.*

Operation

Warning
This product is NOT approved for storage of flammable or explosive materials. Also, it is NOT approved for use in hazardous locations containing explosive atmospheres.

Begin operation by inserting the key into the key switch located on the header panel. The key switch is packed inside the envelope, which is shipped in the freezer chamber. Turning the key switch to the ON (|) position will energize the compressor and condenser fans and the digital controller. All models delay the evaporator fans from starting until the evaporator temperature has pulled down to 25°F. When the evaporator fans begin running, a switch behind each door will stop the fans while the door is opened. This is to minimize loss of cold air while the door(s) are open.

Control Layout

Before operation, become familiar with the freezer controls located on the header panel. A layout of the controls is given below:

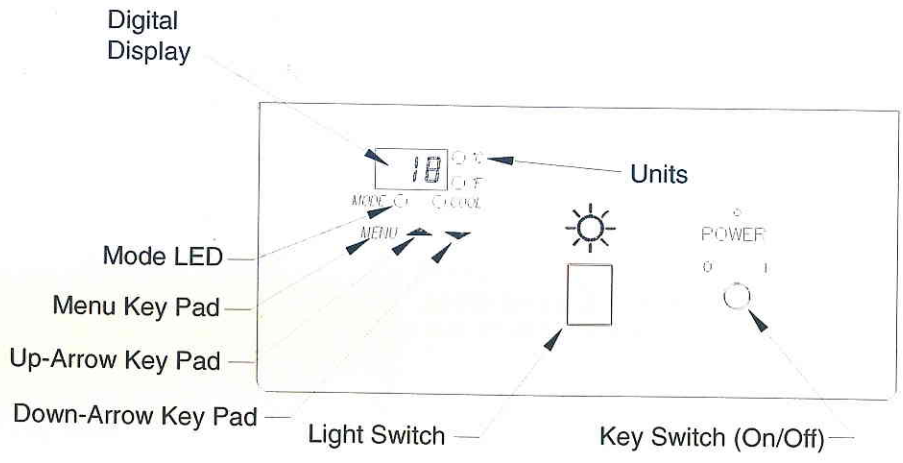


Figure 3

Temperature Controller

The digital temperature controller is located on the center of the header panel (See Figure 3). When the unit is initially turned on, the display will indicate current chamber temperature. The temperature units will be indicated by the °C or °F LED located just to the right of the temperature display. The freezer is factory set to -15°C.

Setting the Temperature

To change the set temperature, press and release the *Menu* keypad once. The display will flash SP and the Mode LED will be illuminated. The last set temperature will then be shown in the display. To change the temperature, press the *UP* or *DOWN* arrow key. The adjustable temperature range is 0 to -30°C (32 to -22°F). When the desired set temperature is displayed, press the *Menu* keypad to enter the set temperature and activate the *Units Select* menu.

Units Select

The second menu selects the units. The freezer control displays temperature in °C or °F. The factory setting is °C. Starting from the temperature display mode (Mode LED off), press the *Menu* key twice. The current temperature units are displayed. To switch between units, press the UP or DOWN arrow key to change to the desired units, then press the *Menu* key to select. The desired unit LED will be displayed on the right of the temperature display.

Calibration Offset

In the event the freezer needs calibrated, a simple routine is available to adjust the display and control point to a reference standard. To set the temperature offset, press and hold the *Menu* keypad for 5 seconds. The display will flash oS (offset) followed by the last temperature offset value. The factory setting is 0. To change the offset value, press the UP or DOWN arrow key, then press the *Menu* key. The value shown in the display will be added to the previous temperature reading. The maximum offset value is ±5°C (±9°F).

For Example:
The freezer has been operating at -15°C for 30 minutes. The display indicates -15°C but a reference thermometer in the chamber indicates -17°C. The operator presses and holds the *Menu* keypad for 5 seconds and changes the offset value from 0 to -2. The *Menu* key is pressed until the *Mode* LED goes out. Now the display indicates a

chamber temperature of -17°C and the system begins to control to the desired temperature of -15°C (as long as the 3 min. time delay has expired).

Allow an additional 30 to 40 minutes for the freezer to again stabilize. If the display is still inaccurate, repeat the calibration offset procedure.

Note
While in any of the controller mode setups (temp set, units or calibration offset), the controller will wait 15 seconds for a value to be entered. If there is no keypad operation within the 15-second time window, control will automatically revert to the temperature display mode and the *Mode* LED will turn off.

Hold-Off Time

Following the offset menu is the hold-off (Ho) menu. The display will momentarily flash "Ho", followed by a number. The number shown is the delay time in minutes between compressor activations. Use the UP/DOWN keypads to change the value.

Increasing the hold-off time will reduce the number of compressor activations, thus decreasing the amount of ice build up on the evaporator and reduce the defrost time. *NOTE*: Increasing the Hold-Off time should never substitute the automatic defrost cycle.

Error Codes

Error codes indicate when the controller is sensing a problem. A description of each is given below. See the Troubleshooting Table for additional information on error codes.

E1	Open sensor.
E2	Under temperature. Temperature at sensor is less than -36°C.
E3	Over temperature. Temperature at sensor is greater than 37°C.

Interior Light(s)

Each cabinet has interior light(s) activated by a door switch(s). The lights are automatically turned on or off by opening or closing the door(s). Replace with 40 watt refrigerator grade bulb.

Caution
Changes to the defrost cycle are not recommended and void the warranty.

Note
The freezer will not cool while in the defrost mode, even if the *Cool* LED is illuminated.

Defrost System

The defrost heaters are controlled by a defrost timer. The timer is a 24 hr. dial timer located in the wire termination box behind the header panel. The timer is factory set to provide four defrost cycles per 24 hour period (at 6 and 12 pm and am). The defrost heaters are deactivated by a thermal switch or by the defrost timer limit.

Troubleshooting

This table is intended to assist in resolving user-correctable freezer problems by relating symptoms to their likely causes. If service beyond the scope of this table is required, contact service at 1-800-395-5442.

Symptom	Probable Cause	Action
Does not run.	Unit unplugged.	Plug in unit.
	Blown fuse or tripped circuit breaker.	Check fuse or circuit breaker at breaker box.
Runs continuously, does not cool.	Frost buildup on refrigeration coils.	Defrost unit, increase Ho time, try again.
Clicking sound.	The compressor is equipped with a thermal protector. This device shuts off the compressor when it becomes too hot. A clicking sound occurring about every 30 seconds indicates this protector is working.	Disconnect power and call for service.
Insufficient cooling.	Set temp is too high.	Reduce temperature setting. Verify *Cool* LED is on.
	Condenser coil dirty.	Clean condenser coil with a vacuum cleaner.
	Incorrect calibration offset.	Perform calibration. See *Calibration Offset.*
	Relay (K1) is not functioning.	Replace relay.

Service Division (Repairs): 1-800-395-5442
Technical Support: 1-800-926-0505
Customer Service: 1-800-766-7000

Prior to calling for service, have the following information readily available:

Catalog Number: _____

Serial Number: _____

Date of Purchase: _____

The catalog number and serial number can be found on the data plate located on the left interior wall of the unit.

Maintenance

Warning
When servicing the unit, disconnect from the electrical power source.

Caution
Do not use any type of abrasive such as steel wool, or fluids such as gasoline, Naphtha, and thinner. These materials could be harmful to aluminum, plastic materials, door gasket, and painted surfaces.

Caution
Accessing and cleaning the condensate coil or pan should be done by qualified personnel.

Cabinet Cleaning

The exterior of the freezer cabinet should be cleaned with a solution of mild soap and water. Do not use caustic soap or abrasive cleaners since these may damage the cabinet finish. If stainless steel surface becomes discolored, scrub by rubbing only in the direction of the finished grain. The anodized aluminum interior and exterior should be cleaned with mild soap and water. Do not use steel wool.

The cabinet interior should be cleaned frequently. Any spilled liquid should be wiped off immediately since stains resulting from some spills could be permanent if not quickly removed.

A mild detergent and lukewarm water or a solution of Bicarbonate of Soda (1 tablespoon per gallon of water) is recommended for cleaning the interior or exterior of the cabinet. Surfaces should be rinsed and dried carefully and thoroughly.

Cleaning the Condenser

For efficient operation, it is recommended that the condenser coil and fan be cleaned every 4 to 6 months. The condenser coil is located behind the vented part of the header panel (left side). Remove the header panel for access. Vacuum clean the front surface of the coil thoroughly, or direct forced air through the condenser from the rear. If necessary, use a stiff bristled brush to loosen any dirt. Failure to clean the condenser will void the warranty.

Condensate Evaporator Pan

The condensate evaporator pan, located behind and below the condenser fan, must be cleaned periodically to prevent foul odors and to operate efficiently. Vacuum clean if dry or sponge clean with soap and water.

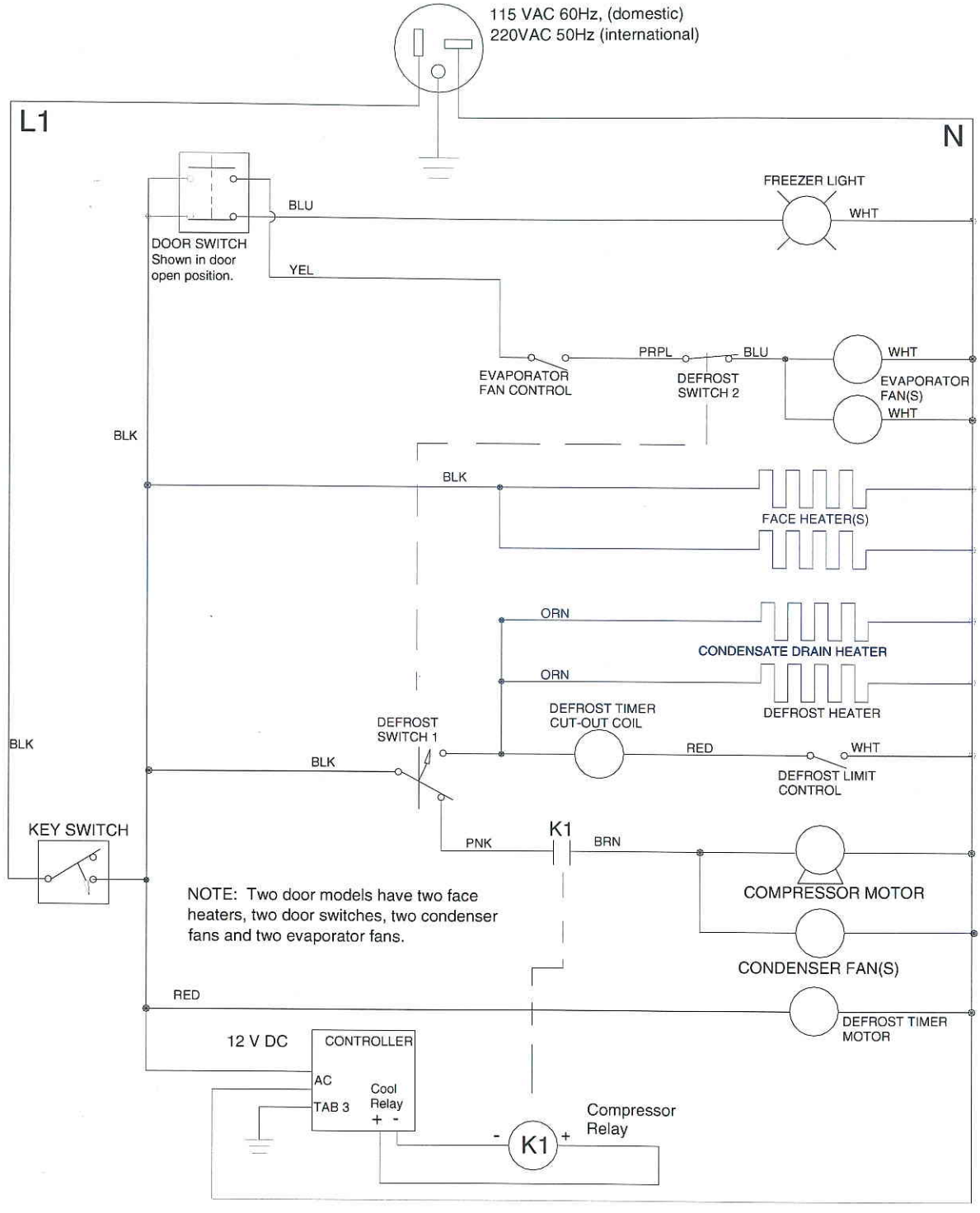
Replacement Parts

Replacements for Laboratory Freezer parts serviceable by the user may be ordered, by part number, from Fisher Scientific Co. at 1-800-766-7000.

Item	Part Number
Freezer Replacement Shelf	SPN13986210E
Solid State Relay (K1)	SPN88616
Temperature Controller W/Sensor	SPN103508
(220V) International Version Control	SPN105402
Front Shelf Support	SPN103264
Rear Shelf Support	SPN103265
Threaded Legs	SPN104434
Starter Component Kit	302-977A

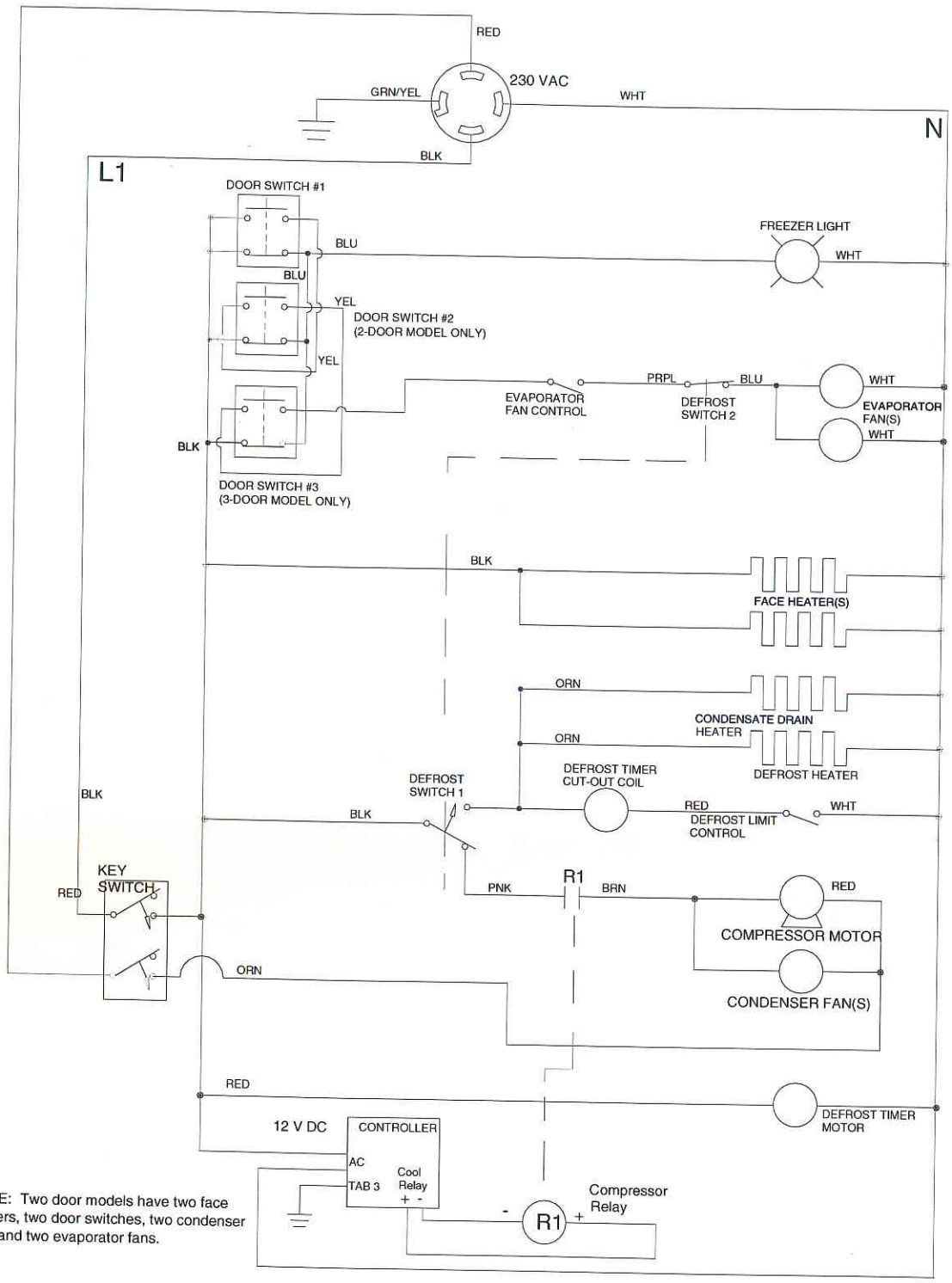
Wiring Diagrams

Catalog Numbers:
13-986-223F/FA/FR, 13-986-223FHK/223FRHK/223FAHK, 13-986-247FHK/247FRHK/247FAHK, 13-986-274FHK/FRHK/FAHK



WIRING DIAGRAMS

Catalog Numbers: *13-986-247F/FA/FR, 13-986-274F/FA/FR*



NOTE: Two door models have two face heaters, two door switches, two condenser fans and two evaporator fans.

Warranty

Laboratory instruments and equipment manufactured by Fisher Scientific Company L.L.C. – Laboratory Equipment Division (hereinafter called "the Company") are warranted only as stated below.

Subject to the exceptions and upon the conditions specified below, the Company agrees, at its election, to correct by repair, by replacement, or by credit to the purchaser, any defect of materials or workmanship which develops within one year (13 months for refrigerator and freezer products) from the date of purchase by the original purchaser by the Company or by an authorized dealer of the Company provided that investigation or factory inspection by the Company discloses that such defect developed under normal and proper use

The exceptions and conditions mentioned above are the following:

a. The Company makes no warranty concerning components or accessories not manufactured by it, such as tubes, batteries, etc. However, in the event of the failure of any component or accessory not manufactured by the Company, the Company will give reasonable assistance to the purchaser in obtaining from the respective manufacturer whatever adjustment is reasonable in the light of the manufacturer's own warranty.

b. The Company shall be released from all obligations under its warranty in the event repairs or modifications are made by persons other than its own service personnel or authorized dealer personnel unless such repairs by others are made with the written consent of the Company.

c. **THE COMPANY MAKES NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY, EXPRESS OR IMPLIED, EITHER IN FACT OF BY OPERATION OF LAW,...STATUTORY OR OTHERWISE.**

d. The above warranty and the above obligations to repair, replace, or credit are complete and exclusive and the Company expressly disclaims liability for lost profits or for special, indirect, incidental, consequential, or exemplary damages of any nature whether attributable to contract, warranty, negligence, strict liability, or otherwise even if the Company has been advised of the possibility of such damages.

e. Representations and warranties made by any person, including dealers and representatives of the Company, which are inconsistent or in conflict with the foregoing warranty shall not be binding upon the Company unless reduced to writing and signed by an officer of the Company.

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