Instruction Manual

Fisher Scientific Isotemp® *Plus* Chromatography and General Purpose Laboratory Refrigerators

Fisher Scientific

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.

Table of Contents

Introduction **1**
Unpacking **1**
Visible Loss or Damage 1
Concealed Loss or Damage 1
Packing List 2
Installation **2**
Selecting a Location 2
Legs 2
Installing Casters and Leveling 2
Shelves 3
Electrical Connection 3
Operation **4**
Control Layout 5
Menus 5
Temperature Set-point 5
Units 5
Calibration 6
Hold Off Time 6
Temperature Digression 7
Error Codes 7
Interior Lighting 7
Convenience Outlet 7
Trouble Shooting Table **8**
Maintenance **9**
Cabinet Cleaning 9
Cleaning the Condenser 9
Condensate Evaporator Pan 9
Replacement Parts **10**
Performance Characteristics **10**
Wiring Diagrams **11**

Catalog Number Designation

Isotemp Plus Laboratory Refrigerators

120V Versions	230V Versions	220V International Versions
13-986-120/120R	13-986-121/121R	13-986-121HK/121RHK
13-986-122/122R	13-986-123/123R	13-986-123HK/123RHK
13-986-124/124R	13-986-125/125R	13-986-125HK/125RHK
13-986-126/126R	13-986-127/127R	13-986-127HK/127RHK
13-986-128/128R	13-986-129/129R	13-986-129HK/129RHK
13-986-128S/128SR	13-986-129S/129SR	13-986-129SHK/129SRHK
13-986-130/130R	13-986-131/131R	13-986-131HK/131RHK
13-986-132/132R	13-986-133/133R	13-986-133HK/133RHK

Isotemp Plus Chromatography Refrigerators

120V Versions	230V Versions	220V International Versions
13-986-134/134R	13-986-135/135R	13-986-135HK/RHK
13-986-136/136R	13-986-137/137R	13-986-137HK/RHK
13-986-136S/136SR	13-986-137S/137SR	13-986-137SHK/SRHK
13-986-138/138R	13-986-139/139R	13-986-137HK/RHK
13-986-138X/138RX/138AX	13-986-139X/139RX/139AX	
13-986-140/140R	13-986-141/141R	13-986-141HK/RHK

Isotemp Plus Laboratory Refrigerators with Drawers

120V Versions	230V Versions
13-986-134D, 13-986-134DR	13-986-135D, 13-986-135DR
13-986-138D, 13-986-138DR	13-986-139D, 13-986-139DR
13-986-140D, 13-986-140DR	13-986-141D, 13-986-141DR

R – Addition of Chart Recorder
HK – International Refrigerators are 220v, 50Hz.



These refrigerators are not approved for the storage of blood or blood products!

Introduction

Your satisfaction and safety are important to Fisher Scientific, 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.



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



This product is not intended, nor can it be used, as a sterile or patient connected device. It is not approved for the storage of blood or blood products. 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 to 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 refrigerator 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. Power Switch Key
5. Chart Recorder Instructions (Catalog No.'s with "R")

Installation

Selecting a Location

Choose a location for the refrigerator that will provide **at least three inches of clearance** between the cabinet and any adjacent vertical surface at the sides and rear. Appropriate electrical power must be available. Locate the refrigerator within 6 feet of the power outlet so that no extension cord is required.

Legs

Refrigerators with sliding doors have four legs already threaded into the base of the unit. The legs are located in the corners of the unit and are threaded all the way in.

Installing Casters and Leveling

Isotemp Plus refrigerators and 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.

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

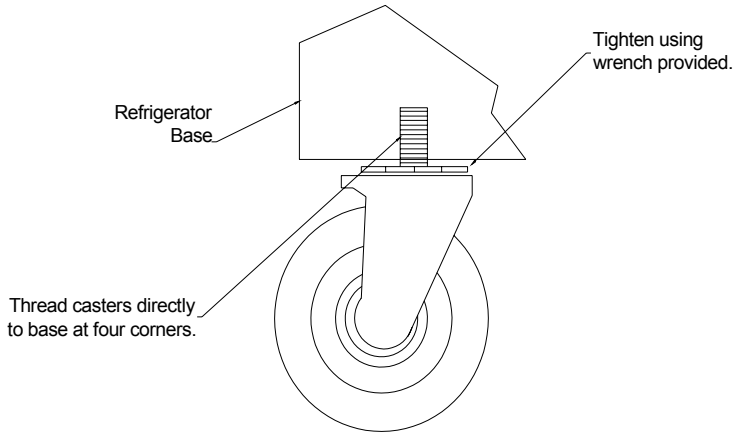


Figure 1

Shelves

Shipped inside each cabinet is a set of epoxy coated shelves. Epoxy coated filler shelves are provided for units with more than one door. Shelf supports, located in the plastic bag, are pushed into the side pilasters, one in each corner, at the desired shelf height. Replacement shelves are available individually. See page 11 for shelf part numbers.

NOTE: Chromatography units include additional ½ shelves, which can be used in place of the full shelves.



Figure 2

Electrical Connection

Determine the total amount of current presently being used by other apparatus connected to the circuit that will be used by this refrigerator. It is critical that this added current demand and other equipment on this circuit not exceed the rating of the fuse or circuit breaker in use.

CAUTION: Be sure that the power supply is the same voltage that is specified on the refrigerator's data plate.

The frequency and nominal voltage requirements for the unit are specified on the data plate, which is located on the interior upper left side. Plug the unit only 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.

WARNING: For personal safety this unit must be properly grounded. DO NOT under any circumstance cut or remove the ground prong from the power cord. DO NOT use a plug adapter that eliminates the ground prong.

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 the proper power supply. NEMA configurations for the various plugs are given below, along with their mating receptacles.

Laboratory Refrigerators

Catalog No.'s	NEMA Plug	NEMA Receptacle
13-986-120 \ 122	5-15P	5-15R
13-986-124 \ 126 \ 128	5-15P	5-15R
13-986-128S \ 130 \ 132	5-15P	5-15R
13-986-121 \ 123	L14-20P	L14-20R
13-986-125 \ 127 \ 129	L14-20P	L14-20R
13-986-129S	6-15P	6-15R
13-986-131 \ 133	L14-20P	L14-20R

Chromatography Refrigerators

Catalog No.'s	NEMA Plug	NEMA Receptacle
13-986-134	5-20P	5-20R
13-986-136 \ 136S \138 \ 140	5-20P	5-20R
13-986-135 \ 137 \ 137S	L14-20P	L14-20R
13-986-139 \ 141	L14-20P	L14-20R



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.



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

Operation

Before operation, become familiar with the refrigerator controls located on the refrigerator header panel. A layout of the controls is given on the following page.



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



WARNING: This product is <u>NOT</u> approved for storage of flammable or explosive materials. Also, it is <u>NOT</u> 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 refrigerator chamber. Turning the key switch to the ON (|) position will energize the evaporator fans and the digital controller.

NOTE: The refrigerator has a built in delay time before compressor activations. Upon initial start-up, the unit will delay before cooling begins.

Control Layout

The digital temperature controller is located on 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 refrigerator is factory set at 4°C. When the unit is first energized the evaporator fans will operate, however it will not immediately cool. A compressor delay time is programmed into the controller to verify the system pressure is low enough to activate the motor. When the delay time is over, the *Cool* LED will illuminate, the compressor will run and the chamber will cool.

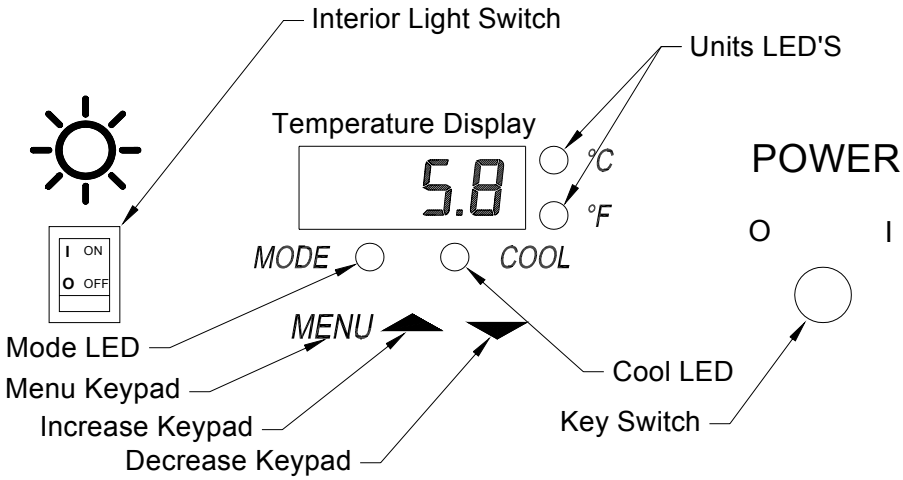


Figure 3

Menus

By gently pressing the keypads shown above, the refrigerator can be set to operate anywhere in the 1.0 to 12.0°C (33.8 to 53.6°F) temperature range in units of °C or °F. When the *MENU* keypad is pressed, the *MODE* LED will illuminate, indicating the operating parameters, set point (SP), temperature offset (oS), hold-off time (Ho), or units (CF) can be set to the customer's preference.

Temperature Set-point

Pressing the *MENU* keypad once will bring up the set-point menu. The display will flash SP, followed by the last set temperature in units indicated by the *Units* LED. Use the Increase or Decrease keypad to change the set temperature to the desired target temperature (1.0 to 12.0°C, 33.8 to 53.6°F). Press the *Menu* keypad to enter the set temperature and bring up the units select menu.

Units

Temperatures can be displayed in either °C or °F. The units select menu follows the set-point menu. Or, from the temperature display mode (default mode) press the menu key until the display flashes *CF* followed by a single C or F, which indicates the most recent units selected. Use the Increase or Decrease keypad to change the units from °C to °F or vice versa. Press the *Menu* keypad again to enter the desired units and return to the temperature display mode.

Once selected, the appropriate units LED should be lit.



NOTE: While in any of the controller mode setups (temp set, offset or units), the controller will wait 15 seconds for a new 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.

Calibration

In the event the refrigerator needs to be calibrated, a simple routine is available to adjust the display and control point to a referenced standard. To set a temperature offset while in the temperature display mode (mode LED off), simply press and hold the *Menu* key for 5 seconds. The display will flash "*oS"* followed by the last temperature offset value. The factory setting is 0.0. To change the offset value, press the Increase or Decrease keypad to the value which when algebraically added to the last displayed temperature, will agree with the reference temperature. Next, press the *Menu* key two more times. The value shown in the display will be added to the previous temperature reading.

For Example:
The display indicates 4°C but a reference thermometer in the refrigerator chamber indicates 6°C. The operator holds in the *Menu* KEY and changes the display value from 0.0 to 2.0. The *Menu* key is pressed two additional times so that the controller again displays chamber temperature. Now the display indicates a chamber temperature of °6 C and the controller begins to cool to the desired temperature of 4°C.

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



CAUTION: INCREASING the offset value DECREASES the temperature at which the system controls. If the offset is inadvertently set too high, the chamber temperature can fall below zero and cause evaporator freeze-up.

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 allow additional time for the evaporator to defrost. This can reduce the chance of evaporator freeze-up during times of high humidity. Pressing the *Menu* keypad while in the Ho mode, enters the hold-off time displayed, and returns controller operation to the temperature display mode.

Temperature Digression

By pressing the Increase keypad, the display will show the warmest temperature recorded since the unit was energized or the digression values were reset. Pressing the Decrease keypad will display the coldest temperature recorded since the unit was energized or the digression values were reset.

To reset the temperature digression values, simply press the Increase and Decrease keypads at the same time. The display will show *Clr*, indicating the controller will begin recording new warm and cold digressions once more.

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 Lighting

The interior lamp(s) is controlled next by a rocker switch located on the header panel. This light may be operated any time the cabinet power is turned on at the keyed power switch. If the interior lamp fails, replace with the same size and wattage lamp. DO NOT USE REDUCED WATTAGE LAMPS. The reduced wattage lamps generally fail to light below 60 °F (15 °C).

Convenience Outlet

(Chromatography Refrigerators Only)

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The Chromatography Refrigerators come equipped with a convenience outlet located in the center of the back wall. Models 140,141 (three doors) have two convenience outlets. The power to the outlets is protected by a circuit breaker. The breaker is located just below and to the right of the outlet. Pressing the breaker button resets the breaker after a fault



WARNING: The convenience outlet is LIVE at any time the unit is connected to an electrical power source, regardless of the position of the key switch.

Trouble Shooting Table

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

Symptom	Probable Cause	Action
Does Not Run	Unit Unplugged Blown fuse or tripped circuit breaker	Plug in Unit Check fuse or circuit breaker at breaker box
Runs Continuously	Frost buildup on refrigeration coils **Note: Evaporator freeze-up can be caused by improper offset (oS) value. See page 8.**	Defrost unit
Clicking Sound	The compressor is equipped with a thermal protector. This device shuts off the compressor when it becomes to hot. A clicking sound occurring about every 30 seconds indicates this protector is working	Disconnect power and allow unit to sit for about an hour, then retry. If condition persists, call for service.
Insufficient Cooling	Set temp is to high	Reduce temperature setting, verify *Cool* LED is on.
	Offset (oS) value is too low.	Increase offset value.
	Condenser coil dirty	Clean condenser coil with a vacuum cleaner
	Unit frosted	Defrost unit
	Evaporator frozen.	Verify internal circulating fans are operating.

Maintenance



CAUTION: When servicing the unit, disconnect from the electrical power source

Cabinet Cleaning

The cabinet interior should be cleaned frequently. Any spilled liquid should be wiped off immediately. Stains resulting from some spills can be permanent if not quickly removed. The cabinet exterior should be cleaned occasionally. 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 and exterior of the cabinet. All surfaces should be rinsed and thoroughly dried.]



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

Cleaning the Condenser

For efficient operation, it is recommended that the condenser coil and fan be cleaned every 4 to 6 months. On a *swinging door* model, the condenser coil is located behind the vented part of the header panel (left side). Remove the header panel for access. The condenser coil on a *sliding glass door* model is located behind the base grille, at the bottom of the unit.

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.



Caution: Accessing and cleaning the condenser coil or evaporator pan should be done by qualified personnel.

Condensate Evaporator Pan

The *condensate evaporator pan* is located behind the compressor fan, which is on the top, left side of the swinging door model refrigerators, and behind the base grill of the sliding door model refrigerators. This pan should be cleaned at least once a year to prevent foul odors and operate efficiently. Vacuum clean if dry, or sponge clean with soapy water.

Replacement Parts

Replacement parts for Laboratory Refrigerators, serviceable by the user, may be ordered by part number from Fisher Scientific Co. @ 1-800-766-7000.

Item	Part Number
Epoxy Coated Shelves	
13-986-120/121/126/127/130 to 135 /138 to 141 (gray)	13-986-210E
13-986-122/123/124/125 (gray)	13-986-210M
13-986-128S/129S/136S/137S (white)	13-986-210W
13-986-128/129/136/137 (gray)	13-986-210L
Epoxy Coated ½ Shelves	Part Number
13-986-120/121/126/127/130 to135 /138 to 141 (gray)	13-986-210K
13-986-122/123/124/125 (gray)	13-986-210N
13-986-128S/129S/136S/137S (white)	13-986-210Y
13-986-128/129/136/137 (gray)	13-986-210P
Zinc Coated Shelves	Part Number
13-986-120/121/126/127/130 to 135 /138 to 141 (gray)	13-986-211E
13-986-122/123/124/125 (gray)	13-986-211M
13-986-128S/129S/136S/137S (white)	13-986-211P
13-986-128/129/136/137 (gray)	13-986-211C
Zinc Coated ½ Shelves	Part Number
13-986-120/121/126/127/130 to 135 /138 to 141 (gray)	**13-986-211K**
13-986-122/123/124/124 (gray)	**13-986-211N**
13-986-128S/129S/136S/137S (white)	**13-986-211Q**
13-986-128/129/136/137 (gray)	**13-986-211H**

Compressor Relay (K1)	SPN88616
*Temperature Controller	SPN104161
International Version (220V) Controller	SPN105402
Condensate Pan Wick, 23.1 & 30 Cu. Ft	SPN107670
Condensate Pan Wick, 47.6 & 74 Cu. Ft.	SPN107671
Condenser Pan Wick (-128S, -136S)	106961
Shelf Support	SPN103265
Chart Recorder Manual	SPN104118
Drawer and slide assembly	SPN13999DRAW

Performance Characteristics

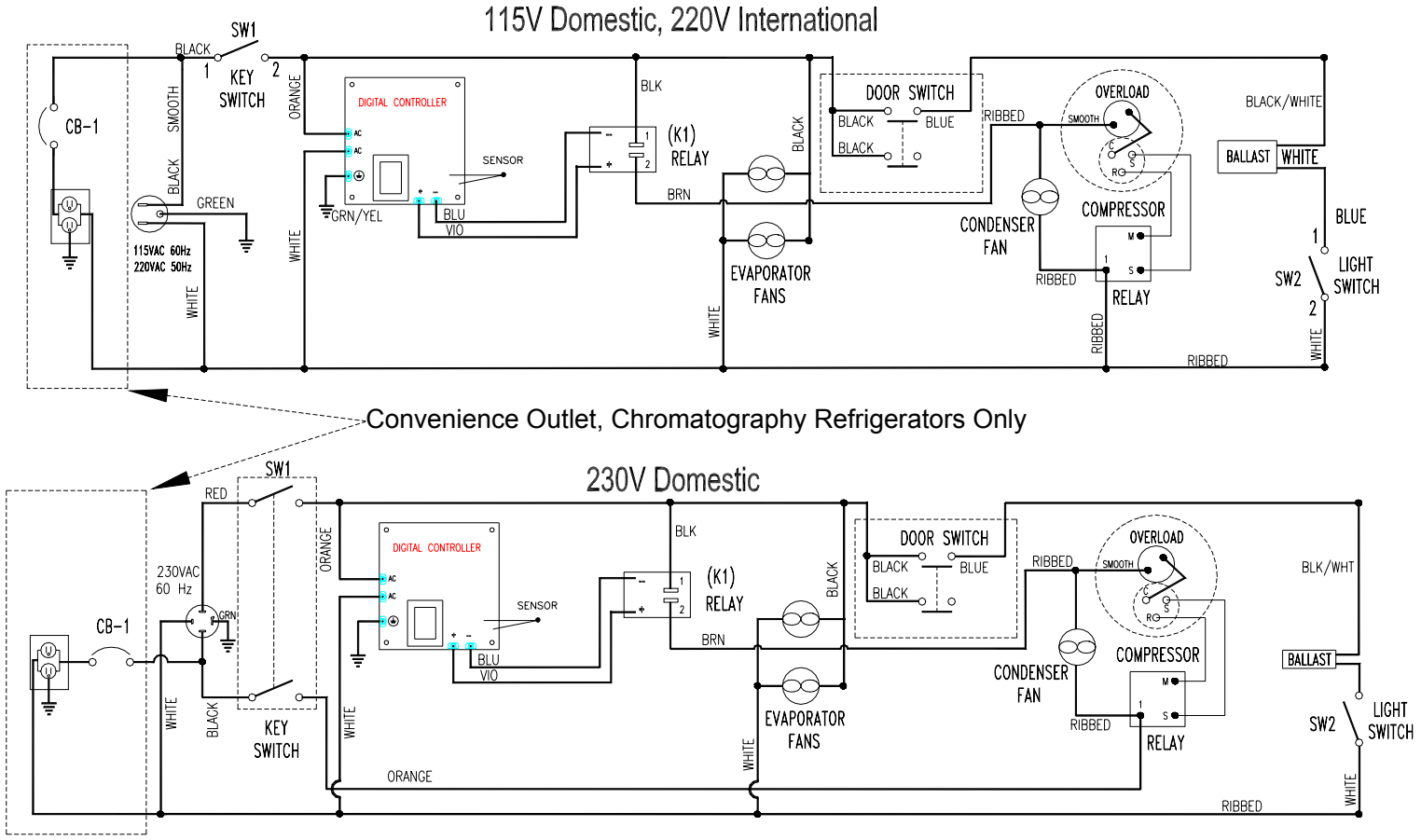
Temperature Range: 1° to 12°C (34° to 54°F)

Temperature Stability: +/- 3°C

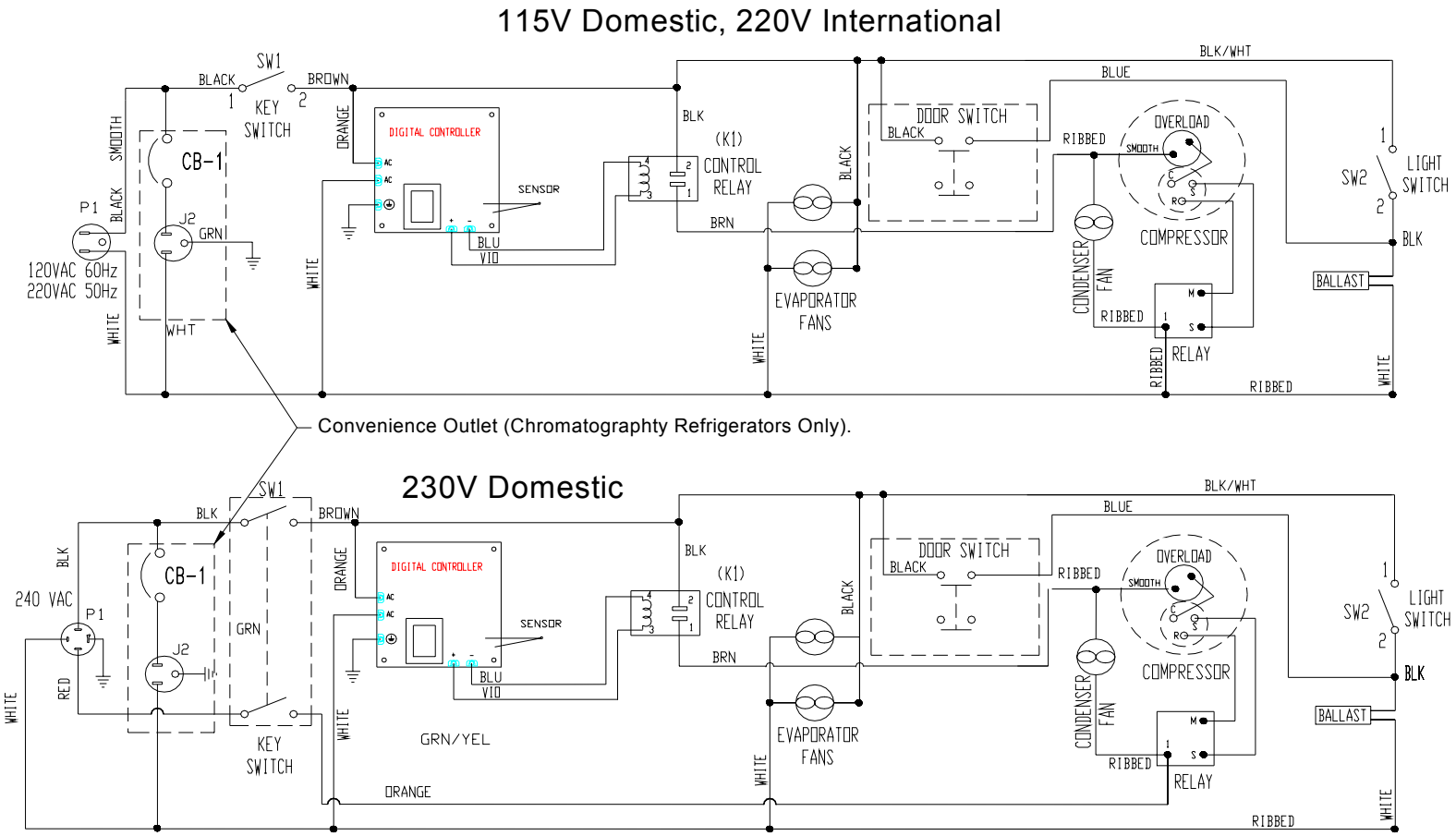
* Check part number on PCB.

Wiring Diagrams

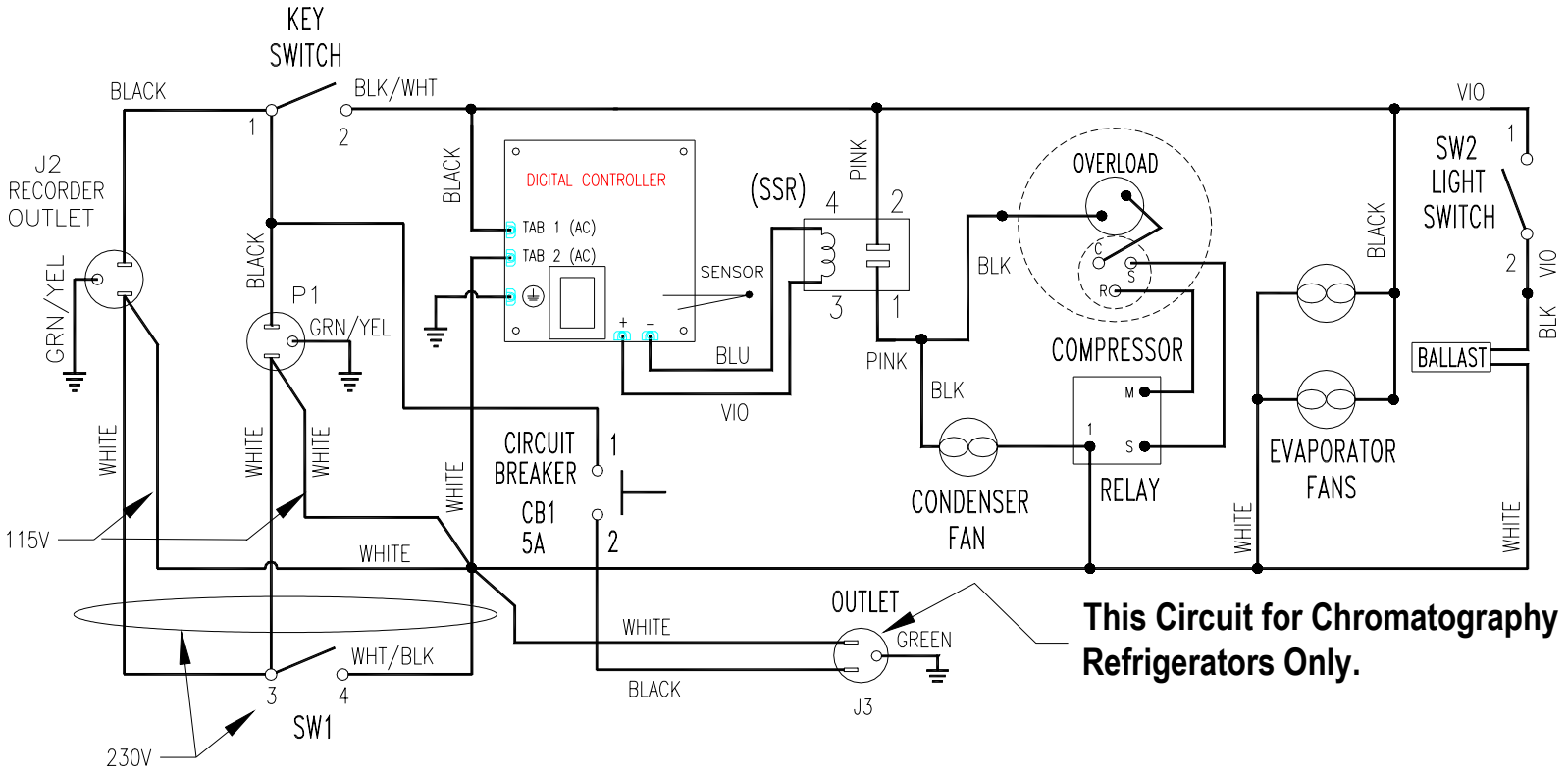
For refrigerators with SOLID, SWINGING doors.



1. For refrigerators with SWINGING GLASS doors.



For refrigerators with SLIDING GLASS doors.



Part No. 104214 Rev J
Isotemp Plus Refrigerators
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2000 Park Lane
Pittsburgh, PA 15275