



# **XBF40 Series Blast Freezers**

**(Model Number: XBF40D)**

**Installation, Operation and Service**

325334H02    Rev. G    February 2020

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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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# 1 Specifications

## 1.1 Dimensions\*

Height	Interior: 51.23 in. (130.1 cm) Exterior: 78 in. (196 cm)
Width	Interior: 34 in. (85 cm) Exterior: 43.7 in. (111 cm)
Depth	Interior (Cabinet): 28.22 in. (71.1 cm) Interior (Freeze Area): 14.5 in. (36.8 cm) Exterior: 38.4 in. (96 cm)
Weight	754 lbs. (341 Kg)

## 1.2 Power Requirements

Voltage	208/230V Unit will not operate outside specified voltage range.
Frequency	60Hz only
Amperage	Minimum 20A
NEMA receptacle required 6-20R	
Dedicated circuit required for proper operation.	

## 1.3 Environmental Operating Conditions

Pollution Degree	2
Installation Category	II
Altitude	2000m MSL (mean sea level)
Humidity	max 60% in ambient up to 32 °C (90 °F)
Voltage Tolerance	±10%
Ambient Temperature	15-32 °C (59-90 °F)
Product Usage	Indoor Use Only

## 1.4 Refrigerant Types and Charges

R-404a	41 oz. (1.162 Kg)
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\* Published interior volumes are nominal; usable capacities may be offset by shelves, carrying baskets, blower coils, or cabinet protrusions.

## 2 Safety Precautions

In this manual and on labels attached to this product, the words **WARNING** and **CAUTION** mean the following:



**WARNING:** A potentially hazardous situation which, if not avoided, could result in serious injury or death.



**CAUTION:** A potentially hazardous situation which, if not avoided, may result in minor or moderate injury, or damage to the equipment.



This symbol when used alone indicates important operating instructions which reduce the risk of injury or poor performance of the unit.



**CAUTION:** This indicates a situation which may result in property damage.



**WARNING:** This symbol indicates situations where dangerous voltages exist and potential for electric shock is present.



The snowflake symbol indicates low temperatures and risk of frost bite. Do not touch bare metal or samples with unprotected body parts.

Before installing, using or maintaining this product, please be sure to read this manual and product warning labels carefully. Failure to follow these instructions may cause this product to malfunction, which could result in injury or damage.

Below are important safety precautions that apply to this product:



Use this product only in the way described in the product literature and in this manual. Before using it, verify that this product is suitable for its intended use. If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.



Do not modify system components, especially the controller. Use Thermo Scientific exact replacement equipment or parts. Before use, confirm that the product has not been altered in any way.



**WARNING:** Your unit must be properly grounded in conformity with national and local electrical codes. Never connect the unit to overloaded power sources.



**WARNING:** Disconnect the unit from all power sources before cleaning, troubleshooting, or performing other maintenance on the freezer or its controls.



**WARNING:** This unit is not for storage of flammable materials.



**WARNING:** Unauthorized repair of your freezer will invalidate your warranty. Contact Technical Service at 1-800-438-4851 for additional information.



**WARNING:** No equipment that uses an open flame should be placed inside the freezer. This will harm the unit, hamper functionality and compromise your safety.



**CAUTION:** Do not use any battery powered or externally- powered equipment in the freezer.



**WARNING:** During normal operation, the freezer interior and loaded product will be extremely cold. **Never touch the freezer interior or frozen product without insulated gloves.**



**CAUTION:** Never drill holes in or near the cabinet walls. Drilling could damage the insulation and make the freezer inoperable.



**CAUTION:** When moving the freezer, always grasp cabinet surfaces; never pull the freezer by the latch handle. Do not move freezer with any product inside.

### 3 Unpacking

At delivery, examine the exterior for physical damage while the carrier's representative is present. If exterior damage is present, carefully unpack and inspect the unit and all accessories for damage.

If there is no exterior damage, unpack and inspect the equipment within five days of delivery. If you find any damage, keep the packing materials and immediately report the damage to the carrier. ***Do not return goods without written authorization.*** When submitting a claim for shipping damage, request that the carrier inspect the shipping container and equipment.

Refer to the drawing on the next page for instructions on removing the freezer from the pallet.

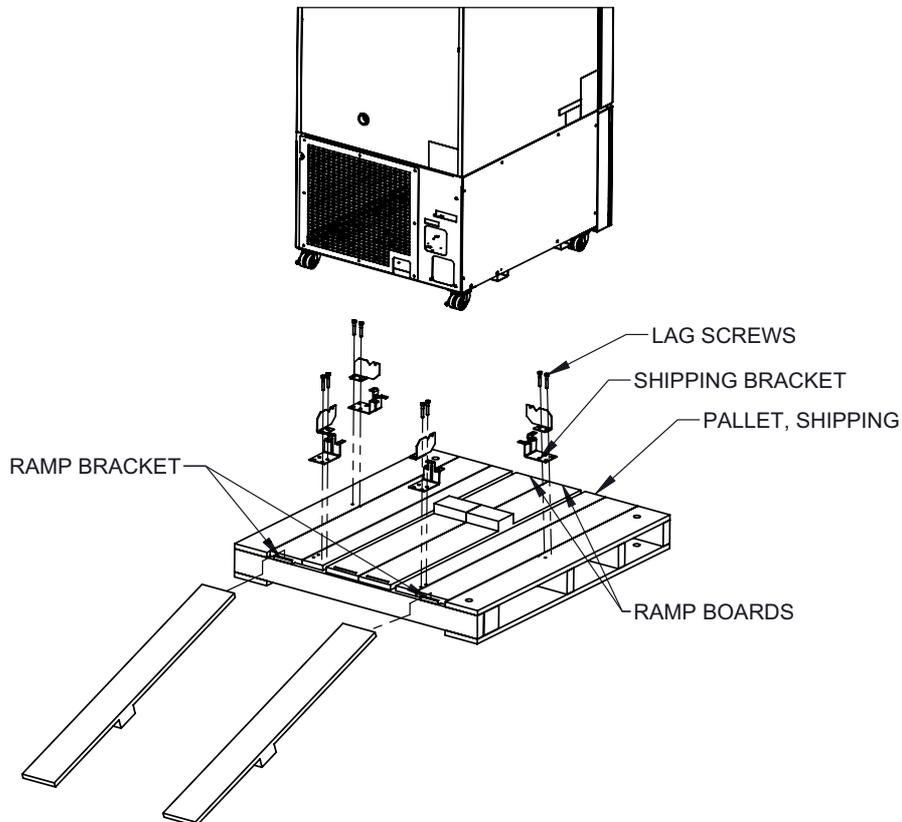


**CAUTION:** This freezer is heavy, be sure you have enough personnel moving the freezer to prevent tipping.



**CAUTION!** THIS FREEZER IS HEAVY. USER TO MAKE AVAILABLE REQUISITE NUMBER OF PERSONNEL TO SAFELY MOVE THE UNIT

### REMOVING THE FREEZER FROM PALLET



**CAUTION!** CONSIDER USING APPROPRIATE HARNESS TO PREVENT FROM TIPPING AND RUN AWAY SITUATION

#### INSTRUCTIONS:

1. USE YOUR FACILITIES APPROPRIATE PERSONAL PROTECTION EQUIPMENTS (PPE)
2. USING A 1/2"(1.3 cm) WRENCH, REMOVE ALL SCREWS SECURING THE SHIPPING BRACKETS TO THE PALLET
3. DISCARD ALL SHIPPING BRACKETS
4. REMOVE THE RAMP BOARDS FROM THE SHIPPING PALLET WITH PHILLIPS SCREW DRIVER AND LOCATE THE SLOTTED END OVER THE RAMP BRACKET WITH THE SUPPORT BLOCKS ON UNDERSIDE
5. ALIGN THE CASTERS WITH THE RAMP BOARDS
6. BE SURE TO USE ENOUGH PERSONNEL TO ROLL THE FREEZER OFF THE PALLET. BRACE THE PALLET ON THE OPPOSITE SIDE TO PREVENT TIPPING

## 4 Transport and Storage

For transport, do not lift the device using the doors or components attached to the device as lift points which may result in personal injury and damage to the product itself.



**CAUTION:** Heavy loads! Lift only with a forklift! Or at minimum a pallet jack!

To avoid injury through physical strain, such as strain trauma and slipped discs, do not attempt to lift the refrigerator without the use of a forklift! Or at minimum a pallet jack!

To avoid injury, use local PPE protocols such as safety shoes, when lifting or moving the blast freezer. Use appropriate number of personal to avoid injury.

### 4.1 Preparation for storage

If the unit is going to be stored in an off condition, allow the unit to warm up and dry out with the door open before moving into storage.

## 5 Intended Use

The XBF40 described in this manual is not intended for use as a medical device and is not intended for in vitro diagnostic cases. This product is intended to be used to rapidly cool samples at air temperatures between  $-30^{\circ}\text{C}$  ( $-22^{\circ}\text{F}$ ) to  $-40^{\circ}\text{C}$  ( $-40^{\circ}\text{C}$ ). This product is not intended for long-term storage.

## 6 Installation



**CAUTION:** Improper operation of the equipment could result in dangerous conditions. Follow all instructions and operate within design limits noted on the data plate.



**CAUTION:** Do not move the unit using the drain pan on the back. This could cause damage to the equipment.

### 6.1 Location

Install the unit in a level area free from vibration with a minimum of eight inches (20 cm) of space on the top and sides, and six inches (15 cm) in back.



**CAUTION:** Do not position the unit in a way that impedes access to the disconnecting device or circuit breaker in back of the unit.

Allow enough clearance so that the door can swing open at least 90 degrees.

The rear spacing posts provided with the freezer can be used to ensure proper clearance. To install the spacing posts, screw them into the back of the rear deck area,

Do not position the equipment in direct sunlight or near heating diffusers, radiators, or other sources of heat. The ambient temperature range at the location must be 15 to 32 °C (59 to 90°F).



**CAUTION:** Do not attempt to operate the unit in ambient temperatures above 32 °C (90 °F).



**CAUTION:** Do not move the unit while loaded. Unit shall always be moved when empty and by pushing slowly at handle level or lower on the unit. Be especially careful on any uneven surfaces.

### 6.2 Leveling

The unit must be level. If the unit is out of level, you may need to shim the corners or casters with thin sheets of metal.



**CAUTION:** The casters on this unit are provided for installation purposes only. Be sure to set the brakes on the casters before use. The unit should only be moved when it is empty of stored product.



**CAUTION:** An unlevel unit may result in instability and performance issues for the doors and drawers.

### 6.3 Wiring

Before connecting your freezer to a power source, be sure to check the data plate for correct voltage. Wiring diagrams are attached to the back of the cabinet.



The power connector is a NEMA 6-20P. Therefore the installation site must have the corresponding receptacle, NEMA 6-20R.



Power requirement is 208/230V. A minimum 20A service is required.



Due to the capacity of this unit it may not start reliably on marginal outlets with high voltage drop, even if the unloaded voltage is in the required range. Supply conductors and connections must be sufficient to provide NEMA-compliant power quality.



**WARNING:** All electrical work must be performed by a qualified electrician in accordance with applicable local and national codes.



**CAUTION:** Connect the equipment to the correct power source. Incorrect voltage can result in severe damage to the equipment.

Always connect the equipment to a dedicated (separate) circuit. Electrical codes require time delay fuse or circuit breaker protection for branch circuit conductors.



**CAUTION:** For personal safety and trouble-free operation, this unit must be properly grounded while in use. Failure to ground the equipment may cause personal injury or damage to the equipment. Always conform to the National Electrical Code and local codes. Do not connect the unit to overloaded power lines.

### 6.4 Door Seal

Door seal integrity is critical for freezers. A loose fitting gasket allows moist air to be drawn into the cabinet, resulting in quicker frost buildup on the evaporator coil, longer running time, poor temperature performance, and increased operation cost.

To check the door seal, complete the following steps:

1. Open the door.

2. Insert a strip of paper (a couple of inches wide) between the door gasket and the cabinet flange and close the door.
3. Slowly pull the paper strip from the outside. You should feel some resistance.
4. Repeat this test at 4-inch intervals around the door. If the door does not seal properly, replace the gasket.

## 6.5 Installing a Drain Line (Optional)

In normal operation, the refrigeration system will produce a quantity of water that is condensed out of the air and melted off during the defrost cycle. As delivered, this unit routes the water to a stainless steel pan, where it will be evaporated back into the room by compressor heat. An optional drain kit can be installed to divert the water to a facility drain if desired.

**This installation should only be performed by a qualified and properly equipped service technician.**

To install the optional drain kit:

1. Make sure that the rear breaker switch is turned to “OFF”, the unit is unplugged, and there is no power present.
2. Remove the sheet metal side cover on the latch side of the unit.
3. Place the small end of the tubing adapter into the tubing included in the kit. A drop of liquid soap added to the fitting will enable the tubing to slide on more easily.
4. Locate the clear/white plastic drain hose in the machine compartment. Place the large end of the tubing adapter into the open end of the drain hose.
5. Route the clear tubing out the grate on the rear of the unit to a suitable facility drain. Ensure that the tube is not kinked or pinched and is protected from traffic and other potential sources of damage. Keep the tube at least 4 inches below the top of the unit’s machine compartment for the entirety of its run; rising above this level will cause water to back up into the refrigerated compartment.
6. Replace all side covers and grates.
7. Start or restart the unit, following instructions in “*Start Up*”.

The unit can be returned to evaporative mode (the installed drain line can be disabled) by removing the tubing adapter and small tube. In that case, ensure that the end of the large tube is securely pointed towards the evaporator pan before replacing the side panel.

## 6.6 Final Checks

Before start up, complete the following steps:

1. Make sure that the unit is free of all wood or cardboard shipping materials, both inside and outside.
2. Verify that the unit is connected to a dedicated circuit as per the data plate voltage requirements.

## 7 Operation

### 7.1 Temperature Settings

The factory default temperature setting is  $-40^{\circ}\text{C}$  ( $-40^{\circ}\text{F}$ ).



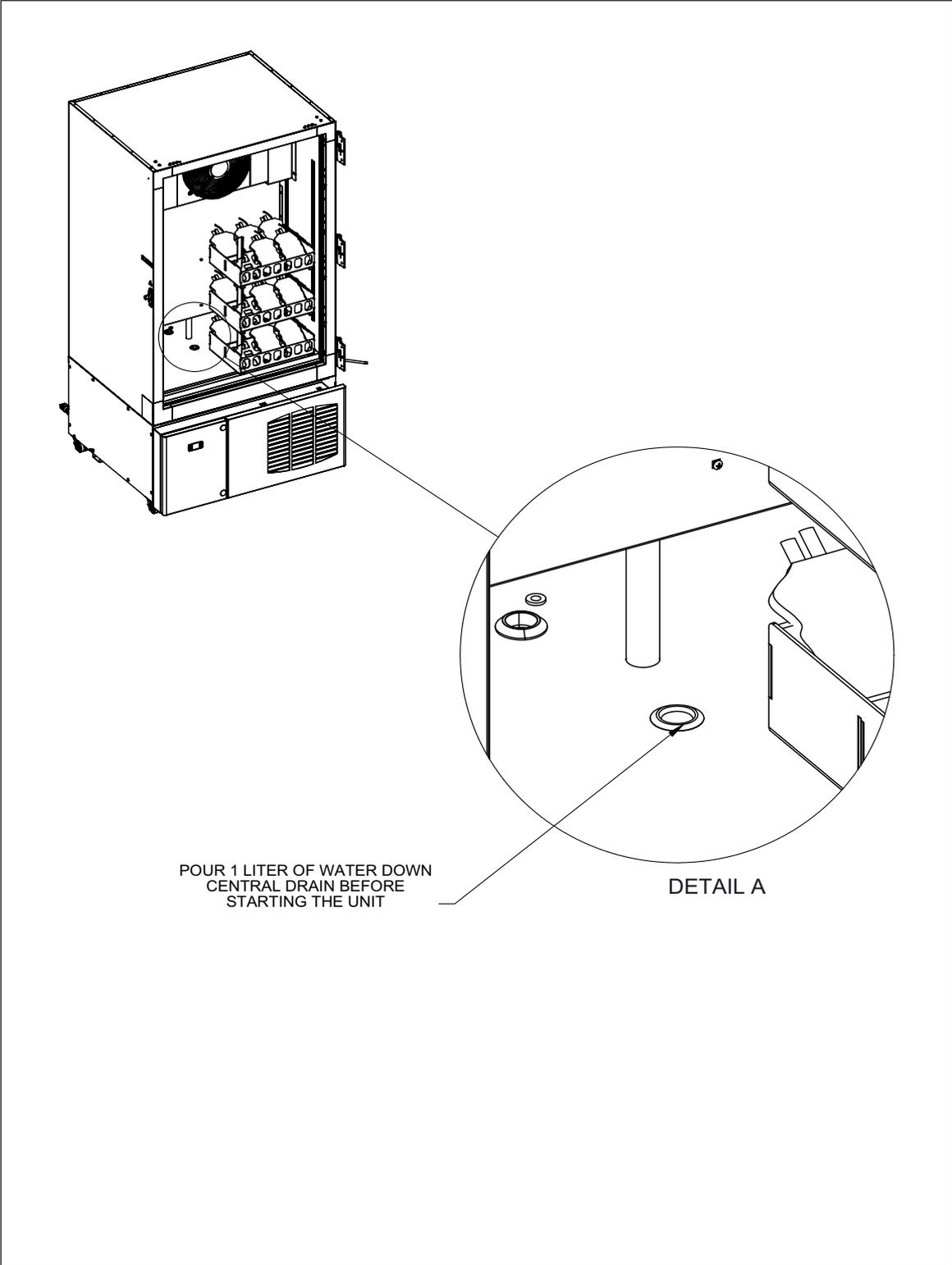
**CAUTION:** The freezers described in this manual are designed for optimum performance at  $-40^{\circ}\text{C}$  ( $-40^{\circ}\text{F}$ ). The settable range of the unit can be changed between  $-30^{\circ}\text{C}$  ( $-22^{\circ}\text{F}$ ) to  $-40^{\circ}\text{C}$  ( $-40^{\circ}\text{F}$ ), but it is advisable to call Technical service before changing the set point, as deviating from  $-40^{\circ}\text{C}$  ( $-40^{\circ}\text{F}$ ) may compromise the efficiency and efficacy of the freezer.

To change the factory temperature settings, refer to the “*Quick Start Guide*” preceding the controller instructions.

### 7.2 Start Up

To start up the freezer, complete the following steps:

1. Plug in the power cord.
2. Before starting the unit, pour a liter of water down the central drain, as shown in the drawing on the next page.
3. The breaker switch is located at the bottom rear of the unit. Switch it to the ON position. The condenser fan will start immediately. There is a time delay before the compressor will come on. The delay is indicated by a flashing snowflake symbol on the display.
4. Set the onboard clock to local time, following the instructions in the “*Quick Start Guide*” preceding the controller instructions.
5. Set defrost times to match your facility schedule, following instructions in the “*Quick Start Guide*” preceding the controller instructions. Defrost takes approximately 30 minutes. Recommended maximum run time without a defrost is eight hours; more frequent defrosts may be advisable depending on usage or ambient conditions.
6. Confirm that the snowflake and fan symbols are illuminated on the display and that the compressor and fans are running. Note that the evaporator fan does not run when the main cabinet door is open.
7. Allow the unit to run unloaded for at least 60 minutes before adding any product.



### 7.3 Loading

To achieve optimum performance, the unit should be loaded when the display reads  $-30\text{ }^{\circ}\text{C}$  ( $-22^{\circ}\text{F}$ ) or colder (typically within 60 minutes of initial startup).

The maximum rated load is 90 Liters of room-temperature fluid. Do not load the unit with product that is warmer than  $32\text{ }^{\circ}\text{C}$  ( $89.6^{\circ}\text{F}$ ).

The maximum load that can be placed on any shelf is 45 kg, evenly distributed. Do not overload shelves.

To optimize the alignment of the stainless steel shelves with the inner doors, the stainless steel shelves should be positioned in the following manner:

Bottom Shelf: Install shelf directly on the interior floor of the cabinet. Do not install on the pilasters.

Middle Shelf: Install shelf clips in position “26” on all four pilasters.

Top Shelf: Install shelf clips in position “18” on all four pilasters.

The maximum load that can be placed in each removable white basket is 10kg. Do not exceed the rated load of the basket.

When loading the unit, only open the inner door you need to open for shelf access. Do not leave the door open longer than necessary.

Do not load during timed or manual defrost modes.

Do not attempt to move the unit while it is loaded. The shifting weight inside a loaded unit can cause damage or injury.

*Depending on product load temperature and duration of door opening, it is normal for the temperature display to show warm-up after initial product load.*

### 7.4 Operation

The unit can be safely loaded at any time the unit is displaying a temperature of  $-30\text{ }^{\circ}\text{C}$  ( $-22^{\circ}\text{F}$ ) or below **and** not in defrost mode.



Defrost will be initiated automatically on the schedule programmed in the controller. Product may be left in the freezer if desired, but the freezing time will be extended due to the defrost heat load. If necessary, a defrost cycle can be triggered at any time by holding the controller snowflake key for two seconds (refer to the “*Quick Start Guide*” preceding the controller instructions).

## 7.5 Adjusting Shelves

The XBF40 comes standard with three (3) stainless steel shelves. For safety during shipping, the shelves are secured to the back panel with three (3) screws. To adjust the height of the shelves, be sure to remove the screws first. The screws do not need to be reinstalled when the height is adjusted. If the unit needs to be moved, it is recommended to secure the shelves to the back panel of the unit, using the screws provided.

## 8 Maintenance

### 8.1 Cleaning the Cabinet

The interior and exterior of the cabinet should be cleaned every three months, more often if necessary.

To clean the interior of the unit, use a dilute bleach (10% bleach and 90% water) or alcohol solution. The shelves and baskets may be removed for easier cleaning. Do not expose the surfaces to thinner, acid, or any other harsh solvent. Rinse the shelves and wipe them dry with a soft cloth.

Wipe down the freezer exterior using soap and water and a general use laboratory disinfectant. Rinse thoroughly with clean water and dry with a soft cloth.

### 8.2 Cleaning the Condenser



**CAUTION:** Condensers should be cleaned at least every two months. In heavy traffic areas, condensers load with dirt more quickly. Failure to keep the condenser clean can result in equipment warm-up or erratic temperatures.



**WARNING:** Be sure to disconnect the unit from main power before cleaning the condenser.



**CAUTION:** Never clean near condensers with your fingers. Some surfaces are sharp.

To clean the condenser:

1. Disconnect the power.
2. Slide the front grill to the right.
3. Remove both filters.
4. Use a vacuum cleaner with hose and soft brush attachments to clean the front face of the finned surface.
5. Clean up any loose dust, replace the filters (refer to *Section 6.3* for filter cleaning), and close the front grill.
6. Reconnect the power.

### 8.3 Cleaning the Condenser Filter

Clean the condenser filters every month, or more if required. To clean the filters:

1. Slide the front grill to the right.
2. Remove both filters.
3. Gently vacuum or shake the filters to remove loose dust.
4. Rinse in clean water, shake excess water from the filters, and replace the filters.
5. Reconnect the power.

### 8.4 Manual Defrost

Although the freezer has an automatic powered coil defrost, the entire cabinet should be defrosted at least once a week; more frequent defrost may be necessary depending on room ambient humidity and frequency of door opening. Defrost the freezer manually once a week or whenever the interior frost interferes with use or temperature performance.

To defrost:

1. Remove all products and place in a safe storage location.
2. Turn off the unit and open all outer and inner doors.
3. Wipe inner and outer doors with a dry soft cloth to prevent condensation.
4. Wipe the inner doors to minimize water dropping onto the floor.
5. Let the freezer stand open until the ice and frost buildup has melted. If desired a fan can be directed at the unit to accelerate the defrost.
6. Dispose of any pieces of ice and wipe out any water standing in the bottom of the cabinet and on the inner doors.
7. Close all the doors and restart the freezer.



**CAUTION:** When defrosting your freezer, never use sharp or heavy tools such as chisels or scrapers. Damage to the equipment can result. Let the ice melt enough so that it can be easily removed. Wear protective gloves when cleaning the interior.

If there is freezer odor, wash the interior with a solution of baking soda and warm water. Clean the exterior with any common household cleaning solution.

## **8.5 Drain Maintenance**

It is normal for water to collect at the bottom of the cabinet after a defrost cycle. When the water rises above the drain level, the water drains either to a heated condensate pan or to an external drain line if one is installed (refer to *Section 4.5*).

After a defrost cycle you may remove excess water using paper towels and, if desired, disinfectant.

Do not allow solid material to enter the drain, as this will clog the drain line.

To help keep the drain line clean, 0.5L of a 10% bleach solution should be poured down the drain every 3 months.

## 9 Troubleshooting



**WARNING:** Troubleshooting procedures involve working with high voltages which can cause injury or death. Troubleshooting should only be performed by trained personnel.

This section is a guide to troubleshooting equipment problems.

**Table 1: Troubleshooting Procedures**

Problem	Cause	Solution
Unit does not operate; display is blank	Power supply	Check that the cord is securely plugged in.
		Plug another appliance into the outlet to see if it is live. If the outlet is dead, check the circuit breaker or fuses.
Breaker trips on startup	Power supply	Contact an electrician to confirm whether the outlet is providing suitable power for the unit.
Temperature fluctuates	Controller Parameters	Make sure that the control is set correctly.
	Condenser	Make sure the condenser is clean.
Unit warms up	Door is open	Make sure the door is completely closed.
	Warm product recently loaded in unit	Allow ample time to recover from loading warm product.
	Power supply	Check for proper voltage to the unit. If there is no voltage to the unit, call an electrician.
	Compressor	If the compressor is not running, look for a green snowflake symbol on the controller display, indicating that the system is calling for the compressor to be on. If the snowflake is illuminated but you do not hear the compressor running, allow the unit 2 hours to reset its internal protector. If the compressor does not restart after 2 hours call Technical Service. If the snowflake is flashing, the unit is in Start Delay mode: wait for the flashing to stop and then see if the compressor starts. If the snowflake is not illuminated, check the controller parameters to make sure they are set correctly.
	Evaporator iced over	Trigger a manual defrost cycle by holding the "melting snowflake" key until the unit enters defrost mode.

**Table 1: Troubleshooting Procedures**

<b>Problem</b>	<b>Cause</b>	<b>Solution</b>
	Evaporator fan not functioning	<p>Confirm that the fan symbol is illuminated on the controller and that the evaporator fan is turning.</p> <p>If the fan symbol is not illuminated, check that the magnet on the bottom hinge side of the door is properly placed in the depression on the door.</p> <p>If the fan symbol is illuminated but the fan is not turning, check to make sure it is not blocked by frost buildup. If it free and turns freely, contact Technical Service.</p>
"P1" Alarm	Cabinet temperature probe failure	Replace cabinet temperature probe.
"P2" Alarm	Evaporator temperature probe failure	Replace evaporator temperature probe.
"HA" Alarm	High cabinet temperature alarm	Allow ample time to recover from loading warm product. Contact Service if unit does not recover.
"LA" Alarm	Low cabinet temperature alarm	Check controller parameters.
"dA" Alarm	Door open alarm	Close door. If alarm persists, check door switch magnet location. If magnet is placed correctly, contact Technical Service.
"rtc" Alarm	Real time clock alarm	Set controller clock.
"rtF" Alarm	Clock failure alarm	Contact Technical Service to replace controller.

## 10 Warranty (Domestic)

Domestic Warranty • 24 Months Full Warranty Parts and Labor

International Warranty • 18 Months parts only

The Warranty Period starts two weeks from the date your equipment is shipped from our facility. This allows for shipping time so the warranty will go into effect at approximately the same time your equipment is delivered. The warranty protection extends to any subsequent owner during the warranty period.

During the first twenty four (24) months from shipment, Thermo Fisher Scientific Inc, through its authorized Dealer or service organizations, will at its option and expense repair or replace any part found to be non-conforming in material or workmanship. Thermo Fisher Scientific Inc reserves the right to use replacement parts, which are used or reconditioned. Replacement or repaired parts will be warranted for only the unexpired portion of the original warranty.

This warranty does not apply to damage caused by (i) accident, misuse, fire, flood or acts of God; (ii) failure to properly install, operate or maintain the products in accordance with the printed instructions provided, (iii) causes external to the products such as, but not limited to, power failure or electrical power surges, (iv) improper storage and handling of the products, (v) use of the products in combination with equipment or software not supplied by Thermo Fisher; or (vi) installation, maintenance, repair, service, relocation or alteration of the products by any person other than Thermo Fisher or its authorized representative. To obtain proper warranty service, you must contact the nearest authorized service center or Dealer. Thermo Fisher Scientific, Inc's own shipping records showing date of shipment shall be conclusive in establishing the warranty period. At Thermo Fisher's option, all non-conforming parts must be returned to Thermo Fisher postage paid and replacement parts are shipped FOB Thermo Fisher's location.

### Limitation of Liability

THIS WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, WHETHER WRITTEN, ORAL, OR IMPLIED. NO WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE SHALL APPLY. THERMO FISHER DOES NOT WARRANT THAT THE PRODUCTS ARE ERROR-FREE OR WILL ACCOMPLISH ANY PARTICULAR RESULT.

THERMO FISHER SHALL NOT BE LIABLE FOR ANY INDIRECT OR CONSEQUENTIAL DAMAGES INCLUDING, WITHOUT LIMITATION, DAMAGES TO LOST PROFITS OR LOSS OF PRODUCTS.

## **11 Warranty (International)**

### **THERMO FISHER SCIENTIFIC FREEZER INTERNATIONAL WARRANTY**

The Warranty Period starts two months from the date your equipment is shipped from our facility. This allows for shipping time so the warranty will go into effect at approximately the same time your equipment is delivered. The warranty protection extends to any subsequent owner during the warranty period. Dealers who stock our equipment are allowed an additional four months for delivery and installation, providing the warranty card is completed and returned to the Technical Services Department.

During the first 18 months of the warranty period, component parts proven to be non-conforming in materials or workmanship will be repaired or replaced at Thermo's expense, labor excluded. Installation and calibration is not covered by this warranty agreement. The Technical Services Department must be contacted for warranty determination and direction prior to any work being performed. Expendable items, i.e., glass, filters, pilot lights, light bulbs and door gaskets are excluded from this warranty.

Replacement or repair of component parts or equipment under this warranty shall not extend the warranty to either the equipment or to the component part beyond the original 18 month warranty period. The Technical Services Department must give prior approval for the return of any components or equipment.

THIS WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, WHETHER WRITTEN, ORAL, OR IMPLIED. NO WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE SHALL APPLY. Thermo shall not be liable for any indirect or consequential damages including, without limitation, damages relating to lost profits or loss of products.

Your local Thermo Scientific Sales Office is ready to help with comprehensive site preparation information before your equipment arrives. Printed instruction manuals carefully detail equipment installation, operation, and preventive maintenance.

If equipment service is required, please contact your local Thermo Scientific office or local distributor.

We're ready to answer your questions on equipment warranty, operation, maintenance, service, and special applications. Outside the USA, contact your local Thermo Scientific office or distributor for warranty information.

## 12 Quick Start Guide

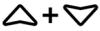
### 12.1 Operating Specifications

Power requirements	208/230V $\pm$ 10%, 60Hz, 20 amp breaker on a dedicated circuit
Operating environment	15 °C - 32 °C ambient temperature; maximum 60% relative humidity

### 12.2 Front Panel Keys

SET	To display target set point; in programming mode it selects a parameter or confirms an operation.
	<b>(DEF)</b> To start a manual defrost.
	<b>(UP)</b> To see the max stored temperature; in programming mode it browses the parameter codes or increases the displayed.
	<b>(DOWN)</b> To see the min stored temperature; in programming mode it browses the parameter codes or decreases the displayed.
	To switch the instrument on and off (when <b>onF = OFF</b> ).
	Not applicable.

### 12.3 Key Combinations

	To lock and unlock the keyboard.
SET + 	To enter in programming mode.
SET + 	To return to the room temperature display.

### 12.4 LED Descriptions

LED	MODE	FUNCTION
	ON	Compressor enabled.
	Flashing	Anti-short cycle delay enabled.
	ON	Defrost enabled.
	Flashing	Drip time in progress.
	ON	Fans enabled.
	Flashing	Fans delay after defrost in progress.
	ON	An alarm is occurring.
	ON	Continuous cycle is running.
°C/°F	ON	Measurement unit.
	Flashing	Programming phase.

## 12.5 Alarm Signals

MESSAGE	CAUSE
P1	Cabinet probe failure
P2	Evaporator probe failure
H2	Maximum temperature alarm
LA	Minimum temperature alarm
dA	Door open
rtc	Real time clock alarm
rtF	Real time clock board failure

## 12.6 Silencing Audible Alarm

The audible alarm can be silenced by pressing any key.

## 12.7 Setting the Real Time Clock

1	When the device is switched ON, it's necessary to program the time and day.
2	Enter the PR1 programming menu by pushing the <b>SET + DOWN</b> arrow keys for 3 seconds.
3	The <b>rtc</b> parameter is displayed. Push the SET key to enter the real time clock menu.
4	The <b>Hur</b> (hour) is displayed.
5	Push the <b>SET</b> key and set current hour by the <b>UP</b> and <b>DOWN</b> arrow keys then push <b>SET</b> to confirm the value.
6	Repeat the same operations on the <b>Min</b> (minutes) and <b>dAY</b> (day) parameters.
7	To exit: Push the <b>SET + UP</b> arrow keys or wait 15 seconds (without pushing any keys).

## 12.8 Manually Engage a Defrost Cycle

Push and hold the **DEF** key for more than 2 seconds and a manual defrost will start.

## 12.9 Changing The Set Point

1	Push and hold the <b>SET</b> key for more than 2 seconds to change the set point value.
2	The value of the set point will be displayed and the °C or °F LED starts blinking.
3	To change the set point value, push the <b>UP</b> or <b>DOWN</b> arrows within 10 seconds.
4	Push the <b>SET</b> key again or wait 10 seconds.

## 12.10 Changing the High/Low Alarms

1	Enter the programming mode by pressing the <b>SET + DOWN</b> arrow keys for 3 seconds (the °C or °F LED starts blinking).
2	Select the required alarm by pressing the <b>UP</b> or <b>DOWN</b> arrows ( <b>ALU</b> = max. temp. <b>ALL</b> = min. temp.)
3	Use the <b>SET</b> key to display the value.
4	Use the <b>UP</b> or <b>DOWN</b> arrows to change the value.
5	Press <b>SET</b> to store the new value and move to the next parameter.
6	To exit: press <b>SET + UP</b> arrow or wait 15 seconds without pressing a key.

## 12.11 Changing the Auto Defrost Cycle

1	Enter the programming mode by pressing the <b>SET + DOWN</b> arrow keys for 3 seconds (the °C or °F LED starts blinking).
2	Enter the hidden menu by pressing the <b>SET + DOWN</b> arrow keys for 3 seconds.
3	Select the required auto defrost by pressing the <b>UP</b> or <b>DOWN</b> arrows ( <b>Ld1</b> to <b>Ld3</b> ).
4	Use the <b>SET</b> key to display the value.
5	Use the <b>UP</b> or <b>DOWN</b> arrows to change the value (24 hr. clock format).
6	Press <b>SET</b> to store the new value and move to the next parameter.
7	To exit: press <b>SET + UP</b> arrow or wait 15 seconds without pressing a key.

## 13 End of Life Care

Be sure to follow local regulations when disposing of an old unit. Some suggestions are listed in the following.

1. Remove items and defrost unit. Be sure to clean up any biological safety hazards.
2. Remove the cabinet door to help prevent entrapment inside of a unit.

Have a certified technician remove the refrigerant and compressor, then drain the compressor and oil from the system. Dispose of components following local regulations

## **Service Section of Manual -- Not Intended for User**

## 14 Appendix



**CAUTION:** No user-serviceable components inside unit. All service work must be performed by a properly trained and equipped refrigeration/electronic service technician.

### 14.1 Theory Of Operation

The XBF40 is a  $-40\text{ }^{\circ}\text{C}$  ( $-40^{\circ}\text{F}$ ) single-stage refrigeration system with a Dixell controller. Although it has some unique features due to the blast freezing application, the basic operation of the unit is similar to any other low-temperature forced-air freezer.

The compressor is a hermetic reciprocating design with a remote-mounted run capacitor, start capacitor, and start relay. Waste heat from the compressor discharge line is used to evaporate condensate water produced during the defrost cycle.

The condenser fan runs continuously regardless of compressor status in order to provide condenser cooling during the off cycle and reduce the compressor starting load.

To ensure rapid load sensing and high heat transfer the evaporator fan runs near-continuously, only stopping for defrost and door openings. When running the fan forces cold air from the evaporator coil into the front part of the cabinet where it is directed downwards over the load before being pulled under the internal cabinet wall and directed up the rear of the unit to be cooled and distributed again. If the cabinet contents block this return air slot the airflow will be reduced and freezing performance will degrade.

The controller has an onboard real-time clock that is used to trigger defrost cycles. Up to 6 automatic defrosts can be programmed per day. The factory default is 3 with one occurring every 8 hours. Depending on the ambient humidity, number of door openings, and type of application more or fewer defrost cycles may be required to maintain performance. When the defrost cycle starts the compressor and evaporator fan turn off and electric heaters on the evaporator and drain tube are energized; melted water will drain from the evaporator into an evaporating pan in the base of the unit.

The defrost cycle will terminate when the programmed defrost time has elapsed or when the evaporator temperature probe reaches its programmed termination temperature. A bimetallic temperature safety switch is installed in the evaporator enclosure to prevent an overheat condition in the event of a control failure or programming fault. The evaporator fan and defrost heaters are powered through a cable that runs up the outside rear of the cabinet. This cable is protected by a sheet metal guard.

The controller is powered by 230VAC but switches 12VDC to control the freezer functions. A power supply located on the outside of the relay enclosure provides the 12VDC control power. The compressor is activated by a large 12VDC contactor that is located inside the relay enclosure. The evaporator fan and defrost heaters are controlled by two smaller 12VDC relays located on the outer surface of the relay enclosure. Both the contactor and relays are switching 230VAC that is driving the associated loads.

Refrigerant flow is managed by a thermostatic expansion valve (TXV) located in the evaporator enclosure, which opens and closes in response to evaporator outlet temperature.

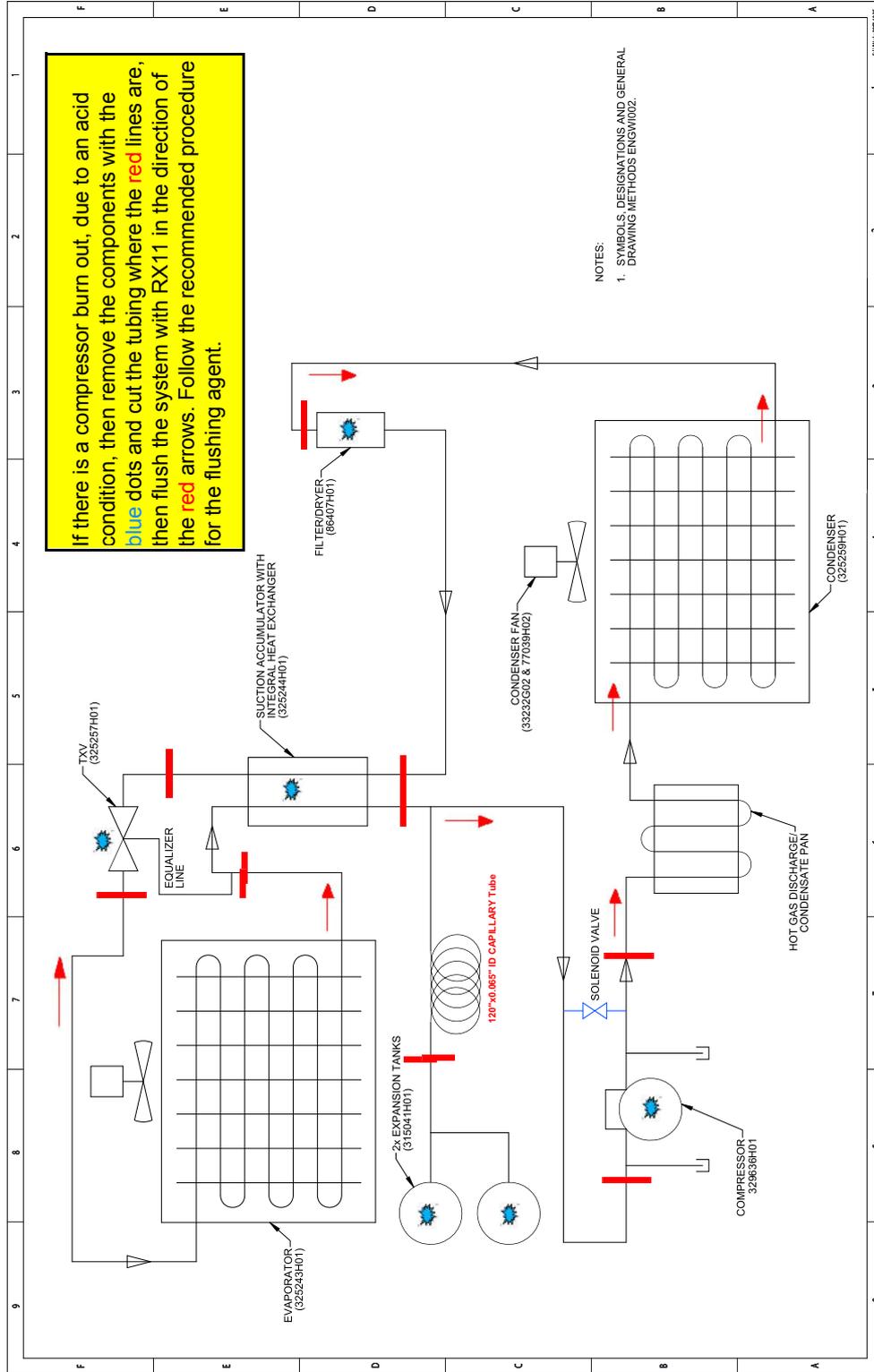
A solenoid valve between the compressor discharge and suction lines is opened during defrost in order to provide a balanced-pressure condition for compressor startup. Due to refrigerant flow through this valve, it is normal to hear a noticeable whistling noise from the refrigeration deck during the first few minutes of the defrost cycle.

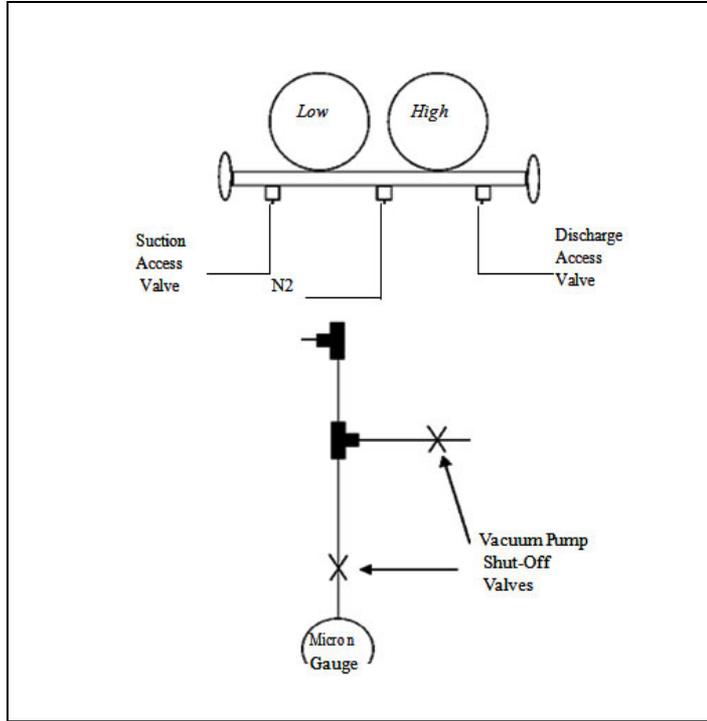
The suction accumulator is equipped with an internal heat exchanger where the liquid refrigerant line is passed through the accumulator before being sent to the expansion device. This subcools the liquid in order to increase system capacity while also heating the compressor suction stream to reduce the risk of liquid slugging.

In the event of a sensor failure or loss of communications with the evaporator or cabinet temperature probe the controller will display a fault alarm and switch to a modified running mode that permits continued usage with some features of the unit disabled. A problem with the cabinet probe will cause the compressor to run constant on, stopping only for defrosts. A problem with the evaporator probe will cause defrosts to terminate based on time only. Although continued short-term usage is possible with either of these faults, the resulting condition is less efficient than normal running and should be corrected as soon as possible.

Two tanks are connected to the compressor suction line through a capillary tube. These tanks hold charge at initial startup, and then gradually release it to the system once the compressor is running. The purpose of this system is to reduce the starting load on the compressor; once the system is running at temperature the tanks are effectively inert.

## 14.2 Refrigeration Circuit Diagram for Flushing, Evacuation and Troubleshooting





**Figure 1.** Manifold connections for Vacuum pump and Electronic Micron Gauge

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## 14.3 Troubleshooting

**CAUTION:** Only certified Refrigeration or Electronic Technicians should service the system.

**Note** *Before attempting to troubleshoot the unit, perform the following checks. Correct what is found wrong and re-evaluate the unit before continuing.*

Before troubleshooting, verify that the main power is supplied to the freezer.

**Table 2: Troubleshooting Procedures**

SYMPTOM	POSSIBLE CAUSE	TEST AND CORRECTION
Cabinet temperature colder than Control Setpoint.	<ol style="list-style-type: none"> <li>Control programmed incorrectly.</li> <li>Inoperative control.</li> <li>Temperature sensor defective.</li> </ol>	<ol style="list-style-type: none"> <li>Reprogram.</li> <li>Measure voltage on back of controller on Pins 1 &amp; 3, Replace control if necessary.</li> <li>Replace sensor.</li> </ol>
Displayed temperature does not match freezer temperature.	<ol style="list-style-type: none"> <li>Needs calibration.</li> <li>Defective sensor.</li> </ol>	<ol style="list-style-type: none"> <li>Recalibrate controller as specified in procedure.</li> <li>Replace.</li> </ol>
Frost build-up on breaker strip.	<ol style="list-style-type: none"> <li>Gasket not sealing properly.</li> <li>Door latch may need adjustment.</li> </ol>	<ol style="list-style-type: none"> <li>Gasket wrinkled, worn or torn. Check retaining means and replace if necessary. Frost will accumulate at the point of an air leak. Check carefully in the area of any concentrated frost build-up.</li> <li>Check door latch and adjust for proper door adjustment.</li> </ol>

**Table 2: Troubleshooting Procedures**

SYMPTOM	POSSIBLE CAUSE	TEST AND CORRECTION
Compressor does not run.	<ol style="list-style-type: none"> <li>1. No power.</li> <li>2. Low voltage.</li> <li>3. Inoperative control.</li> <li>4. Loose wiring at terminals.</li> <li>5. Inoperative compressor contactor.</li> <li>6. Open or grounded compressor windings.</li> <li>7. Defective starting components.</li> <li>8. Stuck/seized compressor.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check power source. If none, call qualified electrician.</li> <li>2. Read supply voltage while unit is running. Reading must equal rated <math>\pm 10\%</math>.</li> <li>3. Refer to the controller setup procedure.</li> <li>4. Inspect all electrical connections.</li> <li>5. Start compressor using a compressor analyzer.</li> <li>6. Disconnect compressor leads an dread phase to phase and for any phase to ground. If electrical checks are OK, Then, check the compressor start gear.</li> <li>7. Replace starting components.</li> <li>8. Test by using a compressor analyzer, if unsuccessful, replace compressor.</li> </ol>

**Table 2: Troubleshooting Procedures**

SYMPTOM	POSSIBLE CAUSE	TEST AND CORRECTION
<p>Unit runs but little or no refrigeration. Run times are getting longer.</p>	<ol style="list-style-type: none"> <li>1. Loss of refrigerant.</li> <li>2. Compressor will not pump.</li> <li>3. Inoperative condenser fan.</li> <li>4. Dirty insufficient air flow.</li> <li>5. High room temperature.</li> <li>6. Refrigerant leak.</li> <li>7. Condenser fan blade is loose.</li> <li>8. Excessive ice on or in evaporator.</li> <li>9. Improper TXV settings.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check for the leak, repair, evacuate and recharge.</li> <li>2. Install low-side gauge. If running pressure is no lower than starting pressure, replace compressor, evacuate and recharge.</li> <li>3. Check for fan blade obstruction. Replace fan motor if necessary.</li> <li>4. Remove/Clean condenser filter; ensure cabinet has a minimum of 6" clearance all around it. Check for fan blade obstruction. Replace fan motor if defective.</li> <li>5. Ensure room temperature is &lt;90 °F (32.2 °C).</li> <li>6. See Leak Check and Charging procedures.</li> <li>7. Tighten fan blade.</li> <li>8. Check defrosts settings on the controller. Defrosting required of the evaporator.</li> <li>9. Contact Service Support.</li> </ol>
<p>Displayed temperature does not match freezer temperature.</p>	<ol style="list-style-type: none"> <li>1. Needs calibration.</li> <li>2. Defective sensor.</li> </ol>	<ol style="list-style-type: none"> <li>1. Recalibrate per specified procedure.</li> <li>2. Replace Sensor.</li> </ol>

**Table 2: Troubleshooting Procedures**

SYMPTOM	POSSIBLE CAUSE	TEST AND CORRECTION
Unit runs continuously.	<ol style="list-style-type: none"> <li>1. Poor gasket seal.</li> <li>2. System undercharged.</li> <li>3. System overcharged.</li> <li>4. Non-condensable gas/air in system.</li> <li>5. Worn or inefficient compressor.</li> <li>6. Defective temperature sensor or control settings.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check and replace door gasket or adjust door alignment.</li> <li>2. Check operating pressures. If low, shut down, warm up overnight and check for refrigerant leak.</li> <li>3. Check operating pressures.</li> <li>4. Check operating pressures, discharge will be high and suction pressure low. Recover charge, evacuate and recharge.</li> <li>5. Replace Compressor.</li> <li>6. Replace sensor or check control programming.</li> </ol>

## 14.4 Repairing Leaks

Copper tubing joints are made using “Phos Copper” solder which is a high temperature brazing needing no flux and with good working characteristics. Leaks in these joints are usually caused by copper to copper or copper to steel contact (rubbing) which can cause a hole in the copper tubing.

Leaks occurring in components such as pressure controls or valves usually must be dealt with by replacing the offending component. Whenever a system has been opened for repair, it must be evacuated to a very low vacuum (50 microns or lower) and the drier must be replaced. Always replace the drier with the same BRAND AND SIZE as originally supplied.

### EVACUATION

A refrigeration system’s worst enemy is air in the system, because all air contains moisture. Moisture in a refrigeration system will mix with the oil which has refrigerants in it, and with the added compressor heat, it will or can cause an acid condition within the system. This acid will cause the compressor to eventually to fail. It is quite simple to purge air from a system but eliminating moisture is more difficult. There has always been a tendency with technicians to open a system and not replace the drier after doing so.

**Note** *The filter-drier must ALWAYS be replaced whenever the refrigeration system has been opened to atmosphere.*

## THE VACUUM PUMP

When evacuating a system, there is an initial flow of gases and moisture toward the vacuum pump but, as the vacuum becomes deeper, it is recommended to perform a triple evacuation to ensure that as much as possible moisture is removed. For this reason, a means of speeding up the evacuation process called triple evacuation is required. (See EVACUATION PROCEDURE).

Always start the vacuum pump procedure with new clean oil and should change it during after the first deep evacuation (while the oil is still hot) and after each evacuation job because it becomes contaminated during the process of evacuation. If the pump oil is contaminated, it will be apparent that the pump's capability to achieve a good deep vacuum will be compromised. Also, remember that moisture in the pump oil is a mortal enemy of the finely machined surfaces inside the pump and which will affect the life and performance of the pump. It is good practice to change the pump oil after each use, using the dry oil recommended by the pump manufacturer. The pump should be put away in a clean, dry condition ready for the next job.

### 14.5 Compressor Replacement



**CAUTION:** The following repair procedures are to be performed by qualified refrigeration technicians only.



**CAUTION:** Because cabinet temperatures affect refrigerant pressures, never attempt to repair, evacuate or charge a refrigeration system unless the freezer has been turned Off, unplugged, and left open for 24 hours.

1. Proper tools and equipment must be on hand to make a trouble free compressor replacement. Review the discussion covering the vacuum pump.



**CAUTION:** Preventing the entrance of air to the refrigeration system and its resultant contamination is vital to the success of any repair procedure that involves opening the system. Be sure to observe all current regulations prohibiting venting of refrigerants.

2. Turn off all power to the freezer and unplug the power cord.
3. Locate the compressor in the compressor deck.

4. Attach the gauge manifold to the suction and discharge process tubes via saddle valves.
5. Recover, and dispose of, the refrigerant charge in accordance with current regulations.

#### REMOVE THE COMPRESSOR

1. Cut Suction and Discharge lines to the failed compressor.
2. Remove the compressor mounting bolts.
3. Remove the cover from the electrical junction box on the side of the compressor. Label and disconnect the power leads.
4. Remove the compressor from of the machine compartment.
5. Test a sample of the compressor oil. If non-acidic, no backflush would be required. If there is an acid condition (see BACKFLUSH PROCEDURE) and follow the procedure to backflush the evaporator, condenser, and all of the tubing; the compressor, accumulators, expansion tanks, TXV and tubing that cannot be flushed MUST be replaced.

#### INSTALL THE NEW COMPRESSOR



**CAUTION:** Replacement compressors are pressurized with nitrogen and may only be installed by qualified refrigeration technicians. Also, while brazing in the replacement components, a very low purge of dry nitrogen must be applied to reduce oxidation from occurring during the brazing procedure. Purge the nitrogen through the system or components during brazing and allow it to vent from the open port through the manifold.

6. Mount compressor on base and reinstall rubber feet and bolts.
7. Braze the suction and discharge tubing to the new compressor. Also install any of the other components that may have been replaced if there was an acid condition.
8. Install process tube fittings to the end of the process tubes for evacuation and recharging.

### CHECK FOR LEAKS

1. After all the components and tubing has been brazed closed, pressurize the system with nitrogen to 150 psig and check all the joints using a leak soap mixture, if no leaks are detected, purge the nitrogen from the system and wipe the joints to remove the soap film. You now can now start the triple evacuation procedure as explained in the next steps.

### EVACUATION

2. The gauge manifold should be still attached to the process tubes; remove the center hose from the nitrogen tank manifold and install an electronic micron meter in line with the center hose from the manifold gauge and the vacuum pump.

### TRIPLE EVACUATION PROCEDURE

3. Perform a triple evacuation procedure as described; evacuating the system until the electronic vacuum gauge read 1500 microns, then break the micron level with about 5 psig of dry nitrogen and let it set for 5 minutes. Purge the 5 psig of nitrogen back to 1 psig and then start the vacuum pump again allow the system to evacuate until the electronic micron gauge reads 500 microns, follow the same procedure of breaking the evacuation with nitrogen back to 5 psig. Bleed the nitrogen back to 1 psig and turn on the vacuum pump again until the electronic vacuum gauge reads 50 microns or lower.
4. Close the vacuum pump inlet valve, leaving the pump running and watch the electronic micron gauge carefully.

**Note** *The vacuum gauge must be installed between the compressor and the pump shut-off valve to perform this check. The electronic vacuum gauge should not rise above 200 microns within a 20 minute blank off.*

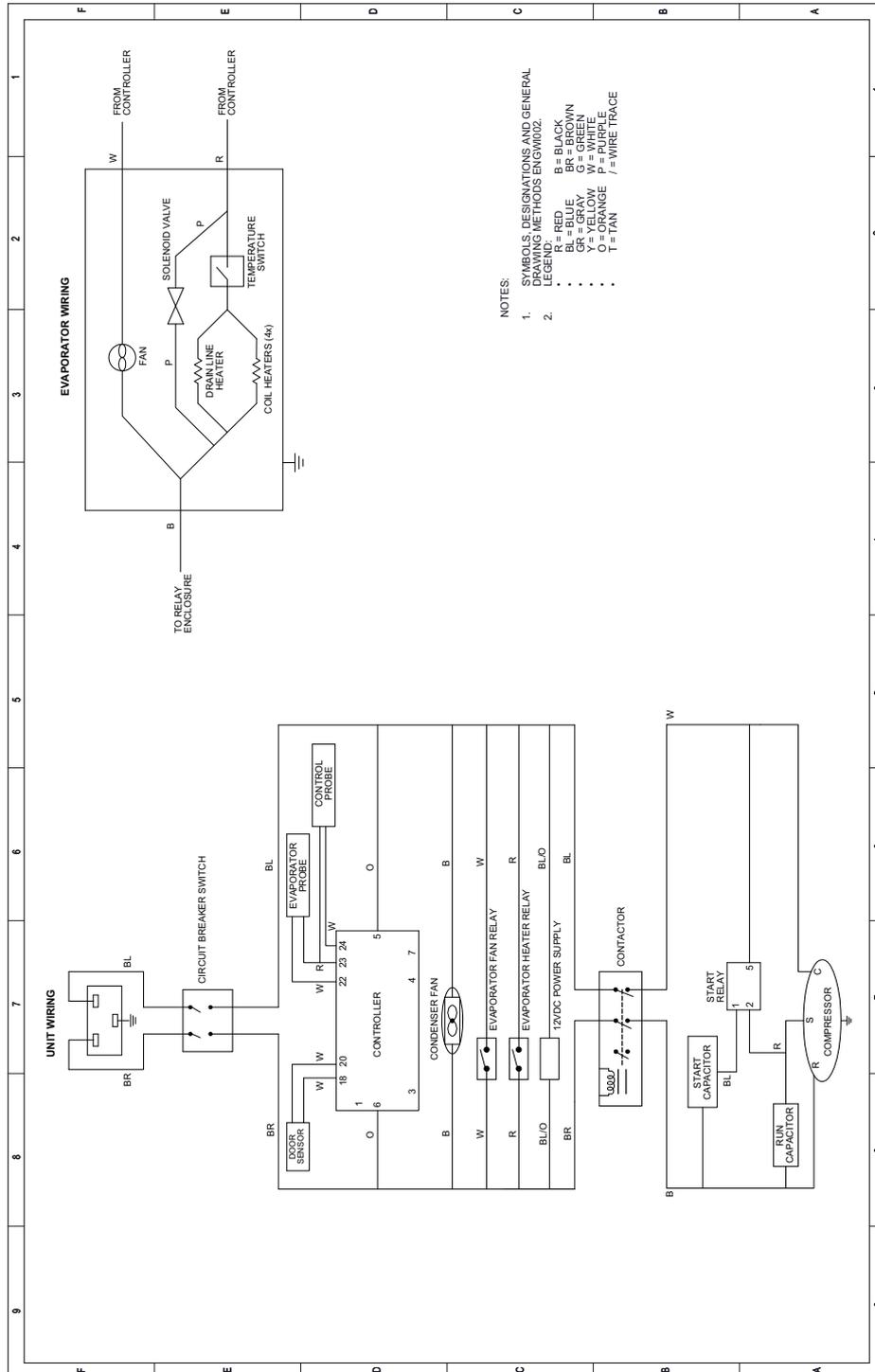
Evacuate the system following the above procedure; vacuum now should hold or meet the 200 micron level discussed earlier. If not, then this indicates either moisture in the system or a leak in the tubing or components. Check the system again for a leak, by as described above and then repeat this process as many times as necessary to obtain the required vacuum and holding time.

### BREAK THE VACUUM WITH REFRIGERANT AND CHARGING

5. Close the gauge manifold hand valves and the vacuum pump shut off valve. Shut the pump off and change the center manifold hose to the service cylinder of the appropriate refrigerant. Purge the center hose for one or two seconds with gas from the service cylinder and then crack the refrigerant cylinder valve and the manifold discharge hand valve. Gas will flow into the compressor crankcase.
6. Charge the system to the required data plate amount, this can be done by weighing the cylinder.
7. Remove gauge manifold and seal the fittings that were installed in the service valve gauge ports. Turn power on and begin the run test of the cabinet.

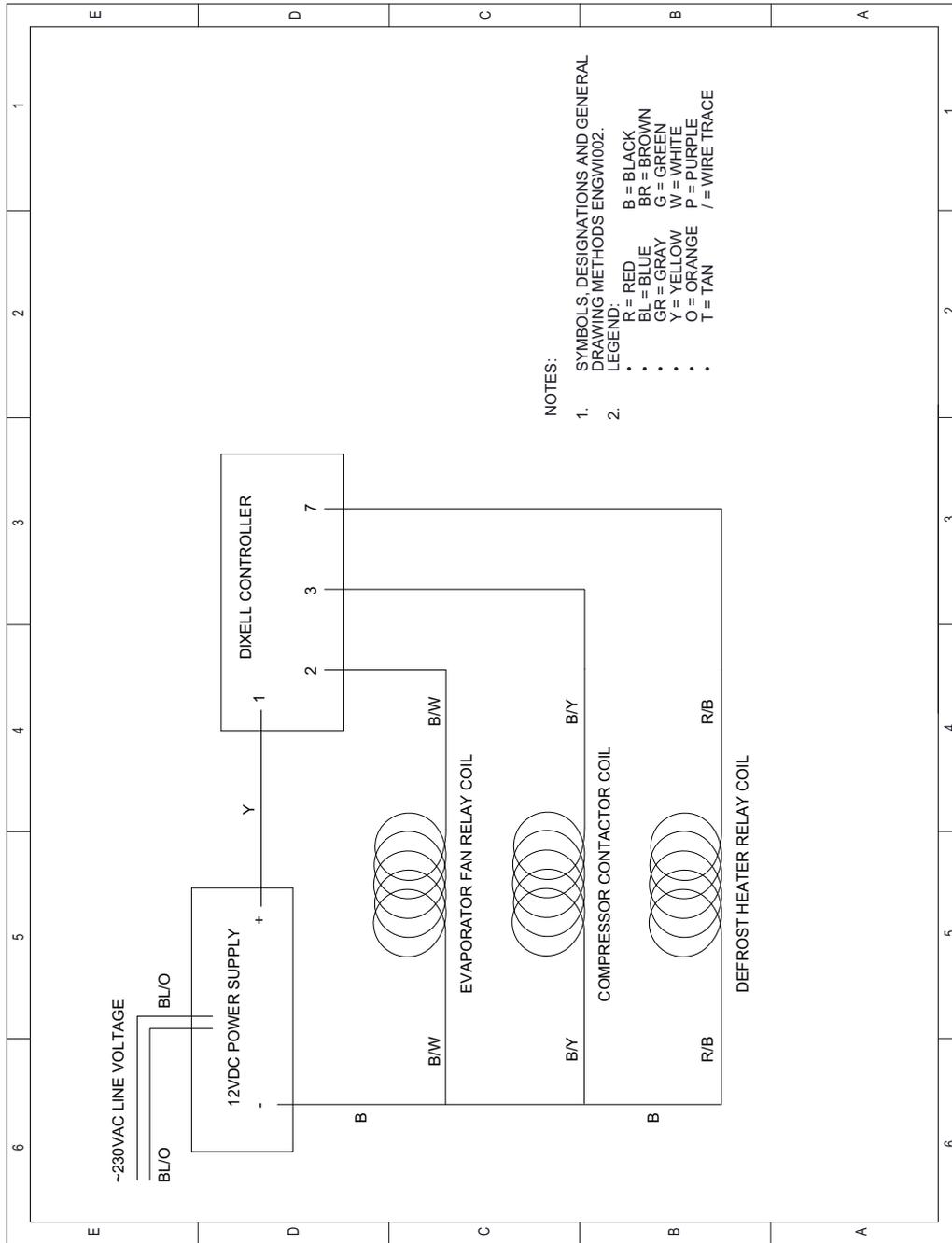
This completes the installation of a replacement compressor.

# 14.6 230VAC Chassis Power Wiring Diagram



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# 14.7 12VDC Control Power Wiring Diagram



## 14.8 Service Parts List

**Table 3: Service Parts List**

<b>Part Number</b>	<b>Description</b>
80945H01	Accumulator bracket
325251H01	Cabinet Spill Plate
330973G01	Compressor Service Kit
325259H01	Condenser
325324H01	Condensate Pan
325269H01	Condenser Fan Bracket
325267H01	Condenser Fan Shroud
326193H01	Controller
314044H01	Control and Evaporator Sensors
326113H01	Dixell Controller Hot Key
314208H01	Door Magnet
315203H01	Door Switch
325243H01	Evaporator
77039H02	Fan Blade
77037H01	Fan Motor
86416H06	Filter/Dryer clamp
314226H01	Filter/Dryer bracket
325423H01	Grip, Cushioned, Slide-on
325425H01	Harness, Blast Freezer
325426H01	Harness, Compressor, Blast Freezer
326660H01	Harness, Control harness
326661H01	Harness, Dixell Control Harness
325427H01	Harness, Evaporator, Blast Freezer
325428H01	Harness, Ground
326659H01	Harness Plug to Switch
326707H01	Harness, solenoid heater relay Harness, solenoid heater relay
326703H01	Harness, Switch to T stripe & Connector
315096H09	Inner Gasket, Outer Door

**Table 3: Service Parts List**

<b>Part Number</b>	<b>Description</b>
325372H01	Label, XBF40
326782H01	Label, XBF40-MD
315096H04	Outer Gasket, Outer Door
325504H01	Power Cord
327383H01	Brazil Power Cord
327921H01	South Korea, Philippines, Saudi Arabia, Taiwan Power Cord
325057H01	Power Supply
195763	Retaining Bracket for power cord
315282H01	Rocker Switch, 2 Pole, 240VAC, 20.0A
329660H01	Run Capacitor
325252H01	Shelves
24104H01	Solenoid Valve Body
24105G01	Solenoid Valve Coil
329659H01	Start Capacitor
315707H13	Start Relay
325244G01	Suction Accumulator
325257H01	Thermostatic Expansion Valve
325407G01	Weld Assembly, Dummy Door, Blast Freezer
315599H03	White board
325370H01	White Board Cover/Frame
325371H01	White board/End Trim
325306H01	XJ485USB-KIT (programming tool)
326516H01	12V relay
315024H01	2" Caster

## 14.9 Dixell Control Parameter and Defaults (Factory Default Settings)

**Table 4: Dixell Control Parameter and Defaults**

Group	Parameter	Description	Factory Default	Minimum	Maximum	Unit
Other	rtC	Access to clock menu	0			
Regulation	Hy	Differential	4	1	25	°C
Regulation	LS	Minimum set point	-40	-100	-40	°C
Regulation	US	Maximum set point	-30	-40	150	°C
Probes	ot	Thermostat probe calibration	0	-12	12	°C
Probes	P2P	Evaporator probe presence	yes			
Probes	oE	Evaporator probe calibration	0	-12	12	°C
Probes	P3P	Third probe presence	no			
Probes	o3	Third probe calibration	0	-12	12	°C
Probes	P4P	Fourth probe presence	no			
Probes	o4	Fourth probe calibration	0	-12	12	°C
Regulation	odS	Outputs delay at start up	1	0	255	Minutes
Regulation	AC	Anti-short cycle delay	5	0	50	Minutes
Regulation	rtr	P1-P2 percentage for regulation	100	0	100	
Regulation	CCt	Continuous cycle duration	0.00			Hours

**Table 4: Dixell Control Parameter and Defaults**

Regulation	CCS	Set point for continuous cycle	0	-100	150	°C
Regulation	Con	Compressor ON time with faulty probe	255	0	255	Minutes
Regulation	CoF	Compressor OFF time with faulty probe	0	0	255	Minutes
Regulation	CF	Temperature measurement unit	°C			
Regulation	rES	Resolution	in			
Regulation	Lod	Probe displayed	P1			
Regulation	rEd	X-REP display	P1			
Regulation	dLy	Display temperature delay	0.00			Minutes
Regulation	dtr	P1-P2 percentage for display	99	1	99	
Defrost	EdF	Defrost mode	rtC			
Defrost	tdF	Defrost type	EL			
Defrost	dFP	Probe selection for first defrost	P2			
Defrost	dSP	Probe selection for second defrost	P2			
Defrost	dtE	Defrost termination temperature first defrost	10	-55	50	°C
Defrost	dtS	Defrost termination temperature second defrost	10	-55	50	°C
Defrost	idF	Interval between defrost cycles	8	0	120	Hours
Defrost	MdF	(Maximum) length for first defrost	30	0	255	Minutes
Defrost	MdS	(Maximum) length for second defrost	30	0	255	Minutes
Defrost	dSd	Start defrost delay	0	0	255	Minutes

**Table 4: Dixell Control Parameter and Defaults**

Defrost	dFd	Displaying during defrost	rt			
Defrost	dAd	Max display delay after defrost	0	0	255	Minutes
Defrost	Fdt	Draining time	5	0	255	Minutes
Defrost	dPo	First defrost after start-up	no			
Defrost	dAF	Defrost delay after fast freezing	0.00			Hours
Fan	FnC	Fan operating mode	O_n			
Fan	Fnd	Fan delay after defrost	0	0	255	Minutes
Fan	FCt	Differential of temperature for forced activation of fans	0	0	50	°C
Fan	FSt	Fan stop temperature	50	-55	50	°C
Fan	Fon	Fan on time with compressor off	0	0	15	Minutes
Fan	FoF	Fan off time with compressor off	0	0	15	Minutes
Fan	FAP	Probe selection for fan	P2			
Auxiliary	ACH	Kind of action for auxiliary relay	CL			
Auxiliary	SAA	Set point for auxiliary relay	100	-100	150	°C
Auxiliary	SHy	Differential for auxiliary relay	1	1	25	°C
Auxiliary	ArP	Probe selection for auxiliary relay	P1			
Auxiliary	Sdd	Auxiliary relay switched off during defrost	no			
Alarm	ALP	Probe selection for temperature alarms	P1			
Alarm	ALC	Temperature alarms configuration	Ab			

**Table 4: Dixell Control Parameter and Defaults**

Alarm	ALU	Maximum temperature alarm	-10	-50	150	°C
Alarm	ALL	Minimum temperature alarm	-50	-100	-10	°C
Alarm	AFH	Differential for temperature alarm recovery	4	1	25	°C
Alarm	ALd	Temperature alarm delay	15	0	255	Minutes
Alarm	dAo	Delay of temperature alarm at start up	2.00			Hours
Alarm	AP2	Probe selection for condenser temperature alarms	nP			
Alarm	AL2	Condenser low temperature alarm	-4	-100	150	°C
Alarm	AU2	Condenser high temperature alarm	150	-100	150	°C
Alarm	AH2	Differ. for condenser temp. alarm recovery	10	1	25	°C
Alarm	Ad2	Condenser temperature alarm delay	15	0	255	Minutes
Alarm	dA2	Delay of condenser temper. alarm at start up	1.30			Hours
Alarm	bLL	Compressor off for condenser low temperature alarm	no			
Alarm	AC2	Compressor off for condenser high temperature alarm	no			
Alarm	tbA	Alarm relay switched off by pushing a key	yes			
Configuration	oA3	Third relay configuration	AUS			
Alarm	AOP	Alarm relay polarity	CL			
Digital inputs	i1P	Digital input 1 polarity	OP			

**Table 4: Dixell Control Parameter and Defaults**

Digital inputs	i1F	Digital input 1 configuration	dor			
Digital inputs	i2P	Digital input 2 polarity	CL			
Digital inputs	i2F	Digital input 2 configuration	ES			
Digital inputs	did	Digital input 2 alarm delay	15	0	255	Minutes
Digital inputs	doA	Door alarm delay	3	0	255	Minutes
Digital inputs	nPS	Number of activation of pressure switch	0	0	15	
Digital inputs	OdC	Compress and fan status when open door	FAn			
Alarm	rrd	Regulation restart with door open alarm	no			
Energy Saving	HES	Differential for Energy Saving	0	-30	30	°C
Other	Hur	Hour	0			
Other	Min	Minutes	0			
Other	dAY	Day of the week	0			
Regulation	Hd1	First day of week end	nu			
Regulation	Hd2	Second day of week end	nu			
Energy Saving	iLE	Working days Energy saving start time	0.00			Hours
Energy Saving	dLE	Working days Energy saving duration	0.00			Hours
Energy Saving	iSE	Holiday Energy saving start time	0.00			Hours
Energy Saving	dSE	Holiday Energy saving duration	0.00			Hours
Defrost	Ld1	1st working days defrost start time	7.00			Hours
Defrost	Ld2	2nd working days defrost start time	15.00			Hours

**Table 4: Dixell Control Parameter and Defaults**

Defrost	Ld3	3rd working days defrost start time	23.00			Hours
Defrost	Ld4	4th working days defrost start time	nu			Hours
Defrost	Ld5	5th working days defrost start time	nu			Hours
Defrost	Ld6	6th working days defrost start time	nu			Hours
Defrost	Sd1	1st Holiday defrost start time	6.00			Hours
Defrost	Sd2	2nd Holiday defrost start time	14.00			Hours
Defrost	Sd3	3rd Holiday defrost start time	20.00			Hours
Defrost	Sd4	4th Holiday defrost start time	nu			Hours
Defrost	Sd5	5th Holiday defrost start time	nu			Hours
Defrost	Sd6	6th Holiday defrost start time	nu			Hours
Other	Adr	Serial address	1	1	247	
Probes	PbC	Kind of probe	Pt1			
Configuration	OnF	On/off key configuration	OFF			
Other	dP1	Probe 1 value	0			
Other	dP2	Probe 2 value	0			
Other	dP3	Probe 3 value	0			
Other	dP4	Probe 4 value	0			
Other	rSE	Real Set point (SET + ES + SETd)	0			
Other	rEL	Firmware Release	0			
Other	Ptb	Map code	11	0	65535	



## 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.thermo.com/](http://www.thermo.com/)

### Great Britain



**WEEE Konformität.** Dieses Produkt muss die EU Waste Electrical & Electronic Equipment (WEEE) Richtlinie 2012/19/EU erfüllen. Das Produkt ist durch folgendes Symbol gekennzeichnet. Thermo Fisher Scientific hat Vereinbarungen getroffen mit Verwertungs-/Entsorgungsanlagen in allen EU-Mitgliedstaaten und dieses Produkt muss durch diese Firmen verwertet oder entsorgt werden. Mehr Informationen über die Einhaltung dieser Anweisungen durch Thermo Scientific, die Verwerter und Hinweise die Ihnen nützlich sein können, die Thermo Fisher Scientific Produkte zu identifizieren, die unter diese RoHS-Anweisung fallen, finden Sie unter [www.thermo.com/](http://www.thermo.com/)

### Deutschland



**Conformità WEEE.** Questo prodotto deve rispondere alla direttiva dell'Unione Europea 2012/19/EU in merito ai Rifiuti degli Apparecchi Elettrici ed Elettronici (WEEE).

È marcato col seguente simbolo. Thermo Fisher Scientific ha stipulato contratti con una o diverse società di riciclaggio/smaltimento in ognuno degli Stati Membri Europei. Questo prodotto verrà smaltito o riciclato tramite queste medesime. Ulteriori informazioni sulla conformità di Thermo Fisher Scientific con queste Direttive, l'elenco delle ditte di riciclaggio nel Vostro paese e informazioni sui prodotti Thermo Scientific che possono essere utili alla rilevazione di sostanze soggette alla Direttiva RoHS sono disponibili sul sito [www.thermo.com/](http://www.thermo.com/)

### Italia



**Conformité weee.** Ce produit doit être conforme à la directive euro-péenne (2012/19/EU) des Déchets d'Équipements Électriques et Électroniques (DEEE). Il est marqué par le symbole suivant. Thermo Fisher Scientific s'est associé avec une ou plusieurs compagnies de recyclage dans chaque état membre de l'union européenne et ce produit devrait être collecté ou recyclé par celles-ci. Davantage d'informations sur la conformité de Thermo Fisher Scientific à ces directives, les recycleurs dans votre pays et les informations sur les produits Thermo Fisher Scientific qui peuvent aider la détection des substances sujettes à la directive RoHS sont disponibles sur [www.thermo.com/](http://www.thermo.com/)

### France



## Important

For your future reference and when contacting the factory, please have the following information readily available:

Model Number: \_\_\_\_\_

Serial Number: \_\_\_\_\_

Date Purchased: \_\_\_\_\_

The above information can be found on the dataplate attached to the equipment. If available, please provide the date purchased, the source of purchase (manufacturer or specific agent/rep organization), and purchase order number.

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