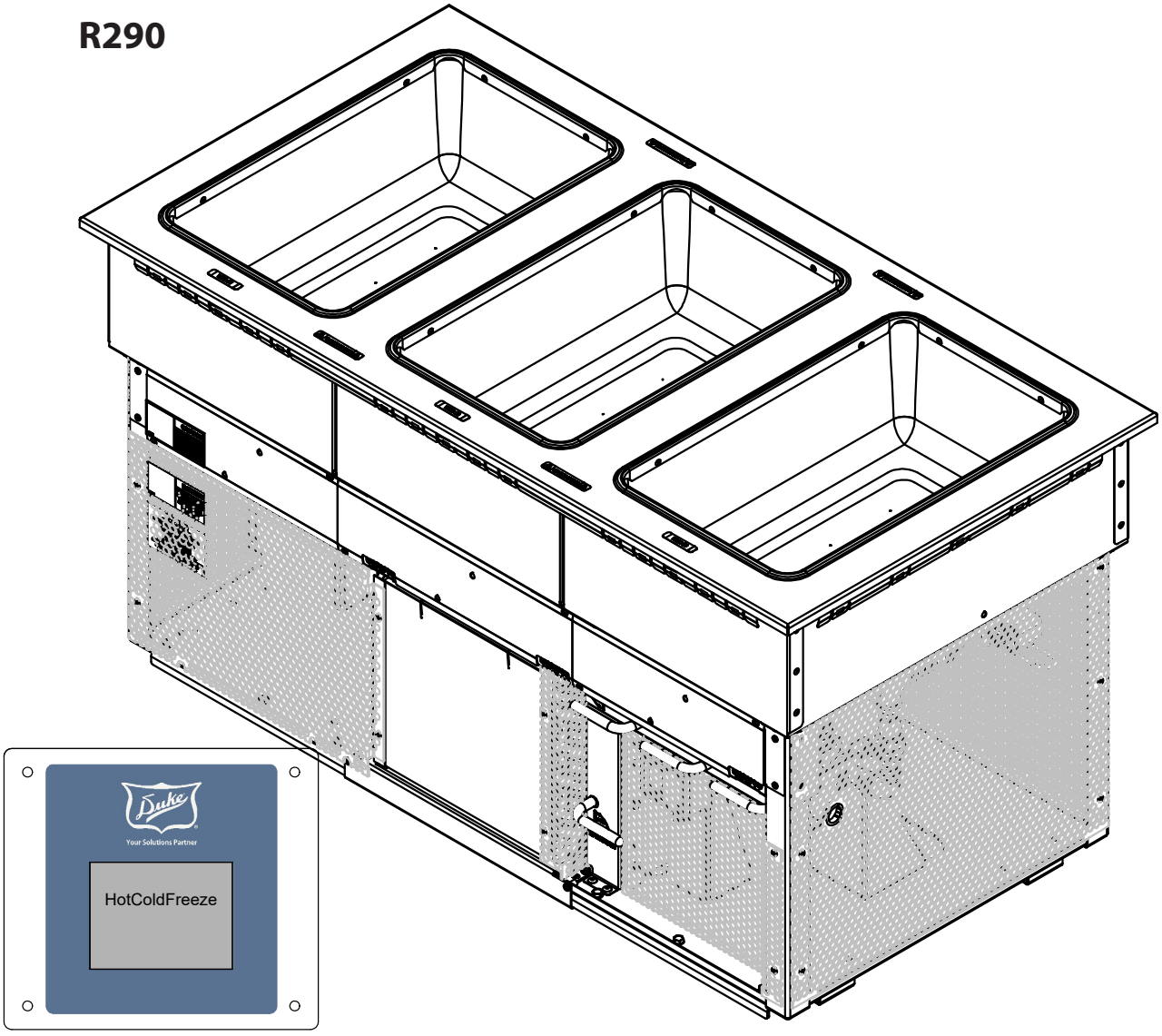
Installation and Operation Manual

Duke HOTCOLDFREEZE

SERVE • HOLD™

R290



CAUTION: Please read this manual completely before attempting to install, operate or service this equipment

WARNING for CA residents: go to www.dukemfg.com/prop65 for prop 65 warning

P/N 529190
REV B 01/21/2025

TABLE OF CONTENTS

IMPORTANT SAFETY INSTRUCTIONS

Throughout this manual, you will find the following safety words and symbols that signify important safety risks with regards to operating or maintaining the equipment.

⚠WARNING — **Indicates a hazardous situation which, if not avoided, could result in death or serious injury.**

⚠CAUTION — **Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.**

CAUTION — **Indicates Important Information**

 **Indicates electrical shock hazard which, if not avoided, could result in death or serious injury and/or equipment damage.**

 **Indicates hot surface which, if not avoided, could result in minor or moderate injury.**

⚠WARNING — **The device is not suited for direct washing with a water jet. Therefore, do not use a pressure water jet to clean the device!**

In addition to the warnings and cautions in this manual, use the following guidelines for safe operation of the unit.

- Read all instructions before using equipment.
- For your safety, the equipment is furnished with a properly grounded cord connector. Do not attempt to remove or disconnect the grounded connector.
- Install or locate the equipment only for its intended use as described in this manual.
- Do not use corrosive chemicals on this equipment.
- Do not operate this equipment if it has a damaged cord or plug, if it is not working properly, or if it has been damaged or dropped.
- This equipment should be serviced by qualified personnel only. Contact the nearest Duke authorized service facility for adjustment or repair.
- Do not block or cover any openings on the unit including providing free air flow around the fan unit.
- Do not immerse cord or plug in water.
- Keep cord away from heated surfaces.
- Do not allow cord to hang over edge of table or counter.
- Turn the unit off, disconnect the power source and allow unit to cool down before performing any service or maintenance on the unit.
- The procedures in this manual may include the use of chemical products. You must read the Material Safety Data Sheets before using any of these products.
- The unit should be grounded according to local electrical codes to prevent the possibility of electrical shock. It requires a grounded receptacle with dedicated electrical lines, protected by fuses or circuit breaker of the proper rating, in accordance with all applicable regulations.
- Disposal of the unit must be in accordance with local environmental codes and/or any other applicable codes.
- This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.
- This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:
  1. This device may not cause harmful interference, and
  2. This device must accept any interference received, including interference that may cause undesired operation.
- Changes or modifications to this equipment not expressly approved by the DUKE Manufacturing Co. Will void the user's authority to operate the equipment.

WARNING **Do Not store explosive substances such as aerosol cans with a flammable propellant in this appliance.**

WARNING **Do not drop or jar this unit as it contains a flammable refrigerant that could be released if the braised connections are damaged.**

WARNING

ELECTRICAL SHOCK HAZARD UNIT MUST BE SAFETY GROUNDED, EARTHED. DO NOT MODIFY, DEFEAT ELECTRICAL CONNECTIONS OR ALTER PLUG.

ELECTRICAL CONNECTIONS

WARNING ***BEFORE CONNECTING THE UNIT TO THE POWER SOURCE, VERIFY THAT THE VOLTAGE AND PHASE OF THE POWER SOURCE ARE IDENTICAL TO THE VOLTAGE AND PHASE INFORMATION ON THE DATA LABEL.***

WARNING

ALL MAINS DISCONNECT MUST BE INCORPORATED IN THE FIXED WIRING IN ACCORDANCE WITH LOCAL WIRING RULES

EARTHING INSTRUCTIONS

1. THE UNIT MUST BE GROUNDED. Grounding reduces risk of electric shock by providing an escape wire for the electric current if an electrical short occurs. This unit is equipped with a cord having a grounding wire with a grounding plug. The plug must be plugged into a receptacle that is properly installed and grounded.
2. Consult a qualified electrician or service agent if grounding instructions are not completely understood, or if doubt exists as to whether the unit is properly grounded.
3. DO NOT USE AN EXTENSION CORD. If the product power cord is too short, have a qualified electrician install a three-slot receptacle (or the country specific receptacle for International Units). This unit should be plugged into a dedicated circuit with the electrical rating as provided on the product data plate.

INSTALLATION CODES AND STANDARDS

In the United States, the Unit must be installed in accordance with the following:

1. State and local codes.
2. National Electrical Code (ANSI/NFPA No. 70, latest edition) available from the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.
3. Vapor Removal from Cooking Equipment, (NFPA-96, latest edition) available from NFPA.
4. Sealed to the counter upon which the equipment is placed per NSF/ANSI 4 standard.
5. 60335-1 & 60335-2-89

In Canada, the Unit must be installed in accordance with the following:

1. Local codes.
2. Canadian Electrical Code (CSA C22.2 No. 3, latest edition) available from the Canadian Standards Association, 5060 Spectrum Way, Mississauga, Ontario, Canada L4W 5N6.
3. 60335-1 & 60335-2-89

For CE Units, the Unit must be installed in accordance with the following:

1. Local codes.
2. European (IEC/CENELEC) Electrical Code
3. IEC 60335-1 & 60335-2-89

EXTERNAL EQUIPOTENTIAL BONDING TERMINAL (EXPORT ONLY)

1. This equipment has supplemental bonding terminal. The terminal provides an external bonding connection used in addition to the earthing prong on the plug. The terminal provides a connection for bonding to the equipment enclosure. The external equipotential bonding terminal located on the rear outside surface of the unit, the terminal is marked with the symbol to the right.

INTRODUCTION

Important to Note:

- This unit has been designed to hold and maintain your hot or cold products to the NSF4/NSF7 standard.
- Wells can be expected to reach set point temperature within a 30 to 60-minute time frame. No cool-down period is needed to switch from Hot to Cold/Freeze.
- When operating your Hot Cold Freeze in Wet Heat mode, make sure that the drain valves are in the closed position and that the wells have cooled to room temperature before proceeding. Once the wells have cooled to room temperature, add at least 1" of water but do not exceed X" of water to the well prior to turning it on. ***CAUTION*** NEVER add water to a hot well until it has had time to cool as noted above. This will ensure your safety and will avoid warping or damaging the well. Use caution when removing pans from a hot well as the surface or steam can cause severe burns.

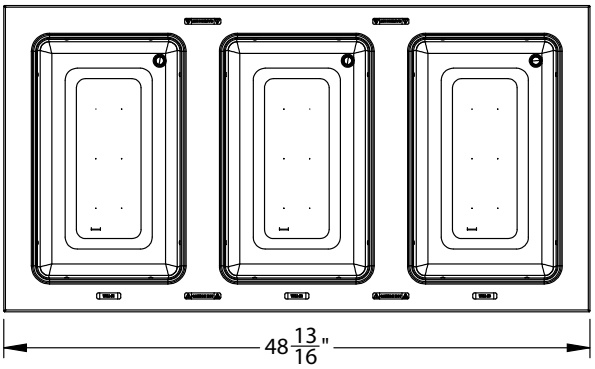
RECEIVING AND INSPECTION

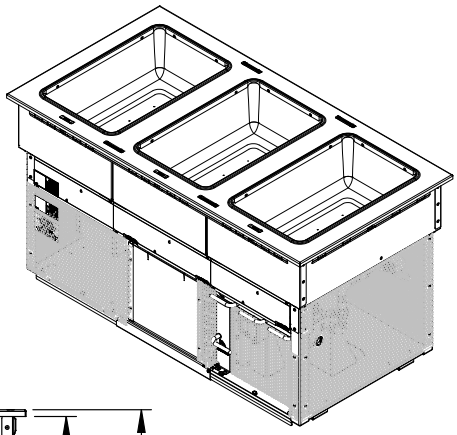
UNPACKING UNIT

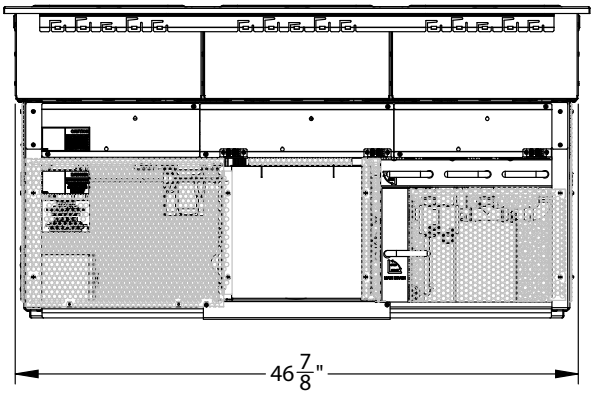
- Inspect the shipping carton and/or container, carefully noting any exterior damage on the delivery receipt
- Note any damage not evident on the outside of the shipping container (concealed damage). Contact the carrier immediately and file a damage claim with them.
- Save all packing materials when filing a claim. Freight damage claims are the responsibility of the purchaser and are not covered by the warranty.
- Report any dents or breakage to source of purchase immediately.
- **Do not attempt to use unit if damaged.**
- Remove all materials from unit interior.
- Remove unit from carton.
- If unit has been stored in extremely cold area, wait a few hours before connecting power.

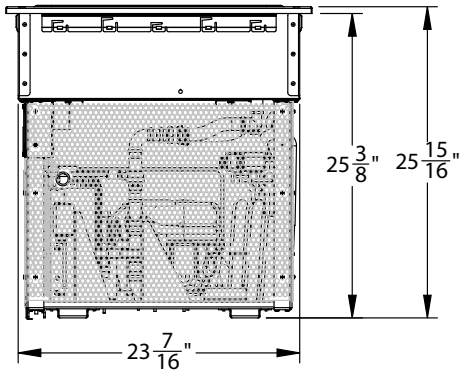
SPECIFICATIONS

ANSI /NSF 169

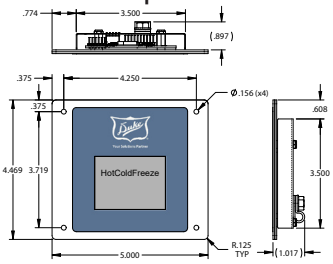




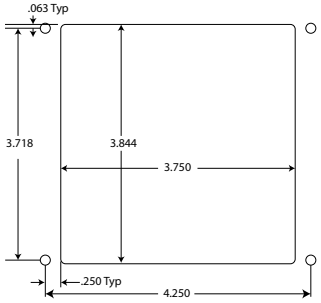




Control Specifications



Control Cutout



Model HCF-3 Shown

ELECTRICAL SPECIFICATIONS:

Model	120V/60Hz		120 / 208V 60Hz		120 / 240V 60Hz		Refrigeration				Minimum Room Floor Area Required	
	Amps	NEMA	Amps	NEMA	Amps	NEMA		HP	Refrig.	Grams	(A) Square Meters (m²)	Square Feet (f²)
HCF-1	5.5	5-15P	5.5	L14-20P	5.5	L14-20P		1/3	R290 A3	100	4.785	51.51
HCF-2	10.7	5-15P	10.0	L14-20P	10.0	L14-20P		1/3	R290 A3	170	8.134	87.55
HCF-3	18.4	L5-30P	18.4	L14-30P	18.4	L14-30P		1/2	R290 A3	220	10.526	113.30
HCF-4	23.6	L5-30P	18.4	L14-30P	18.4	L14-30P		1/2	R290 A3	300	14.354	154.51
HCF-5	29.1	5-50P	28.4	14-50P	28.4	14-50P	Sys-1	1/3	R290 A3	170	10.526	113.30
							Sys-2	1/2	R290 A3	220		

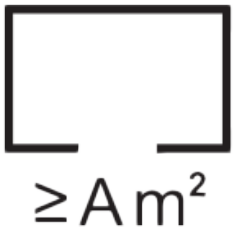
DIMENSIONS:

FREIGHT CLASS: 100

Model	Unit dimensions						Liner Widths		Drain Location				Cutout Dimensions				Cube ft. Crated	Weight	
	Length		Depth		Height				D1		D2		Length		Width				
	in	cm	in	cm	in	cm	in	cm	in	cm	in	cm	in	cm	in	cm		lbs	kg
HCF-1	17.50	44.45	25.5	64.77	25.94	65.89	23.82	60.50	2.81	7.14	2.94	7.47	16.00	40.64	24.00	60.96	12.5	95	43
HCF-2	33.19	79.22	25.5	64.77	25.94	65.89	23.82	60.50	22.44	57.0	2.31	5.87	31.69	80.50	24.00	60.96	21.0	145	65.8
HCF-3	48.82	124.00	25.5	64.77	25.94	65.89	23.82	60.50	7.63	19.38	7.31	18.57	47.38	120.35	24.00	60.96	28.9	198	89.8
HCF-4	64.50	163.82	25.5	64.77	25.94	65.89	23.82	60.50	23.0	58.42	7.63	19.38	63.00	160.02	24.00	60.96	38.0	287	130.2
HCF-5	80.19	203.68	25.5	64.77	25.94	65.89	23.82	60.50	38.94	101.45	7.31	18.57	79.00	200.66	24.00	60.96	45.0	340	154.2

INSTALLATION

Symbols



Appliances having a REFRIGERANT CHARGE within any REFRIGERATING CIRCUIT exceeding 4 times the lower flammability limit (LFL) for refrigerants having a flammability classification of Class A3, shall be marked with symbol IEC 60417-6412 (2019-03).
In the event of storage or service to this appliance, the minimum room floor area MUST be calculated using the formula with the above symbol and the values of A below by equipment model. Should you have any questions about this, please contact Duke Manufacturing Company Service Department at 1-800-735-3853

WARNING

Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.

The appliances shall be stored in a room without continuous ignition sources (for example: open flames, an operating gas appliance or an operating electric heater.

Do not pierce or burn.

Be aware that refrigerants may not contain an odor.

MESE EN GARDE

Ne pas utilliser de moyens autres que ceux recommandés par le fabricant pour accélérer le processus de dégivrage ou pour nettoyer l'apparell

L'apparell doit être entreposés dans un local ne contenant pas de sources d'inflammation permanentes (flammes nues, apparell àgaz ou dispositif de chauffage à, par exemple).

Ne pas percer ni brûler.

Attention, les fluides frigorigénes peuvent ne pas dégager d'odeur.

If you install this equipment in spaces where refrigerant pipes are allowed, the installation of pipe-work shall be kept to a minimum, and piping material, pipe routing, and installation shall include protection from physical damage in operation and service, and be in compliance with national and local codes and standards, such as ANSI/ASHRAE 15, IAPMO Uniform Mechanical Code, ICC International Mechanical Code, or CSA B52. Precautions shall be taken to avoid excessive vibration or pulsation.

Unventilated areas

For appliances containing more than m1 for any refrigerating circuit, the manual shall include a statement advising that an unventilated area where the appliance using FLAMMABLE REFRIGERANTS is installed shall be so constructed that in the event of any refrigerant leak, it will not stagnate so as to create a fire or explosion hazard. This shall include:

a. A warning that the non-FIXED APPLIANCE shall be stored in an area where the room size corresponds to the room area as specified for operation;
b. A warning that the non-FIXED APPLIANCE shall be stored in a room without continuously operating open flames (for example an operating gas appliance) or other potential ignition sources (for example an operating electric heater, hot surfaces).

INSTALLATION

Qualification of workers

Any work required for maintenance, service, and repair operations of this equipment, SHALL/MUST be carried out by a Duke Manufacturing Company authorized and qualified personnel. This equipment contains an A3 refrigerant that is subject to fire or explosion.

Ventilated area

Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any hot work. A degree of ventilation shall continue during the period that the work is carried out. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.

Cabling

Check that cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges, or any other adverse environmental effects. The check shall also take into account the effects of aging or continual vibration from sources such as compressors or fans.

Detection of flammable refrigerants

Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant leaks. A halide torch (or any other detector using a naked flame) shall not be used.

The following leak detection methods are deemed acceptable for all refrigerant systems. Electronic leak detectors may be used to detect refrigerant leaks but, in the case of FLAMMABLE REFRIGERANTS, the sensitivity might not be adequate, or might need recalibration.

(Detection equipment shall be calibrated in a refrigerant-free area.) Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed, and the appropriate percentage of gas (25 % maximum) is confirmed. Leak detection fluids are also suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine can react with the refrigerant and corrode the copper pipe-work.

If a leak is suspected, all naked flames shall be removed/extinguished. If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated (by means of shut off valves) in a part of the system remote from the leak.

Removal and evacuation

When breaking into the refrigerant circuit to make repairs – or for any other purpose – conventional procedures shall be used. However, for flammable refrigerants it is important that best practice be followed, since flammability is a consideration. The following procedure shall be adhered to:

a. Safely remove refrigerant following local and national regulations
b. Purge the circuit with inert gas
c. Evacuate
d. Purge with inert gas
e. Open the circuit by cutting or brazing

The refrigerant charge shall be recovered into the correct recovery cylinders if venting is not allowed by local and national codes. For appliances containing flammable refrigerants, the system shall be purged with oxygen-free nitrogen to render the appliance safe for flammable refrigerants. This process might need to be repeated several times. Compressed air or oxygen shall not be used for purging refrigerant systems.

For appliances containing flammable refrigerants, refrigerants purging shall be achieved by breaking the vacuum in the system with oxygen-free nitrogen and continuing to fill until the working pressure is achieved,

INSTALLATION

then venting to atmosphere, and finally pulling down to a vacuum. This process shall be repeated until no refrigerant is within the system. When the final oxygen-free nitrogen charge is used, the system shall be vented down to atmospheric pressure to enable work to take place.

Ensure that the outlet for the vacuum pump is not close to any potential ignition sources and that ventilation is available.

Charging procedures

In addition to conventional charging procedures, the following requirements shall be followed:

a. Ensure that contamination of different refrigerants does not occur when using charging equipment. Hoses or lines shall be as short as possible to minimize the amount of refrigerant contained in them.

b. Cylinders shall be kept in an appropriate position according to the instructions.

c. Ensure that the REFRIGERATING SYSTEM is earthed prior to charging the system with refrigerant.

d. Label the system when charging is complete (if not already).

e. Extreme care shall be taken not to overfill the REFRIGERATING SYSTEM.

Prior to recharging the system, it shall be pressure-tested with the appropriate purging gas. The system shall be leak-tested on completion of charging but prior to commissioning. A follow up leak test shall be carried out prior to leaving the site.

Recovery

When removing refrigerant from a system, either for servicing or decommissioning, it is recommended good practice that all refrigerants are removed safely.

When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed. Ensure that the correct number of cylinders for holding the total system charge is available. All cylinders to be used are designated for the recovered refrigerant and labeled for that refrigerant (i.e., special cylinders for the recovery of refrigerant). Cylinders shall be complete with pressure-relief valve and associated shut-off valves in good working order. Empty recovery cylinders are evacuated and, if possible, cooled before recovery occurs.

The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of all appropriate refrigerants including, when applicable, FLAMMABLE REFRIGERANTS. In addition, a set of calibrated weighing scales shall be available and in good working order. Hoses shall be complete with leak-free disconnect couplings and in good condition. Before using the recovery machine, check that it is in satisfactory working order, has been properly maintained and that any associated electrical components are sealed to prevent ignition in the event of a refrigerant release. Consult manufacturer if in doubt.

The recovered refrigerant shall be returned to the refrigerant supplier in the correct recovery cylinder, and the relevant waste transfer note arranged. Do not mix refrigerants in recovery units and especially not in cylinders.

If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that FLAMMABLE REFRIGERANT does not remain within the lubricant. The evacuation process shall be carried out prior to returning the compressor to the suppliers. Only electric heating to the compressor body shall be employed to accelerate this process. When oil is drained from a system, it shall be carried out safely.

INSTALLATION

⚠ DANGER

EXPLOSION HAZARD:

• Do NOT puncture refrigerant tubing. Use extreme caution and follow all local/regional codes for transportation or relocation of hydrocarbon equipment.

This unit uses R290 flammable refrigerant. Follow handling instructions carefully in compliance with US and/or Canadian government regulations.

This unit must be installed in an isolated cabinet with a partition when necessary.

Keep all ventilation openings clear of obstructions at all times.

Do NOT use electrical appliances inside of the food storage compartments or inside the cabinet under the unit.

Do NOT use mechanical devices or any other means to accelerate the defrosting process.

1. Cut the appropriate opening in the counter top for the unit being installed. Refer to "Counter top Cutout Dimensions" in this section.
2. Cut opening in the cabinet for intake vent.
   a. The cutout must be 100% of the condenser coil size.
3. Cut opening in the cabinet for exhaust vent.
   a. The opening for the exhaust must be cut no more than 1" (25 mm) from cabinet floor.
   b. The opening should be a minimum of 150% of the intake area
   c. The opening for the exhaust must be located on the opposite side of the condensing unit.

Survey the installation site

Take into account the need for louvered or grill-style openings in the cabinetry to provide proper ventilation for the unit as well as access to the control panel.
One of these ventilation openings must be in front of the condensing coils with the other on the opposite side of the condensing coils. If multiple refrigerated wells are installed in the same counter, each unit must intake cool air and expel hot air. The user side of the cabinet can be fully open or the cabinet may be enclosed on all four sides. The condensing unit/condenser mechanical assembly must be isolated from GFCI outlets, adjacent appliances and other electronic devices not supplied with the original appliance using full partitions.

Partitions must fully extend from the back of the unit to the front user side and from the bottom base shelf to the bottom of the counter top.

The cabinet must be designed to allow access for ventilation of 100% intake area and a minimum of 150% exhaust area, control access, and maintenance/cleaning access.

INSTALLATION

⚠WARNING

- Cabinet design may be fully enclosed as show in installation figure A, or in a cabinet with the user side open as shown in figure B.
- Unit must be isolated using a full partition within the cabinet between all other appliances and electrical devices
- If a GFCI is to be installed in any cabinet configuration, a full partition is required to isolate it from the condenser coil assembly. In addition to isolating the GFCI.
- Convenience Outlets – are prohibited and cannot be used with R290 models.
- **DO NOT** use installation cabinet for storage of any items. Cabinet must be used only to keep condensing unit isolated from all other objects.

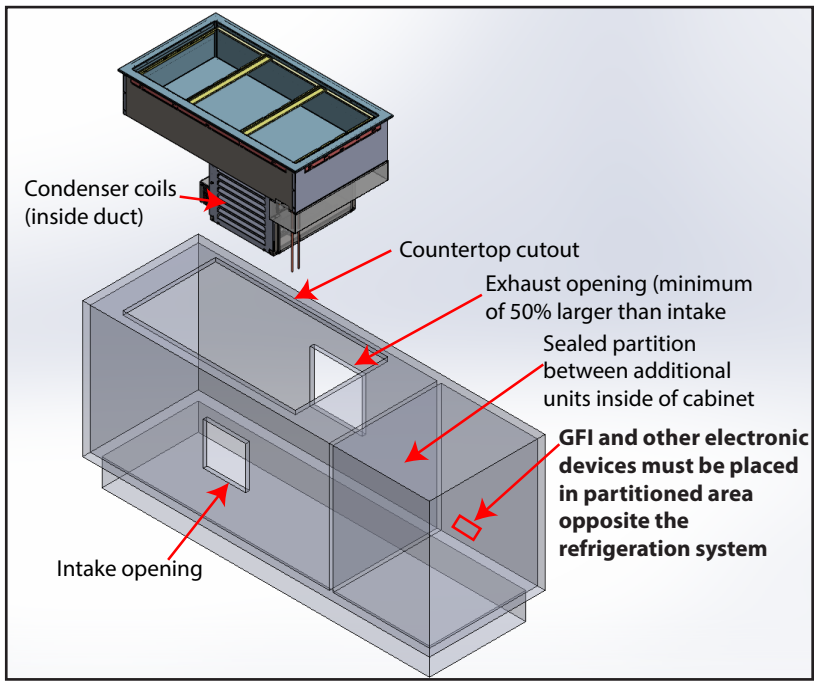


Figure A

KNOCKOUT FOR PARTITION WALL

If the application requires that a hole or an electrical knockout be placed in the partition wall, please adhere to the following requirements.

- The electrical cut-out shall be located at the bottom rear of the partition wall, 3" from the rear wall and 3" from the base and be no more than 2-3/4" in diameter to allow the usage of a 3" diameter bladder grommet or air-block grommet must be used.
- Once the electrical cord has been installed, verify that the there are not air gaps surrounding the grommet or supply cord. If there are any air gaps present, the area must be sealed with silicone sealant.

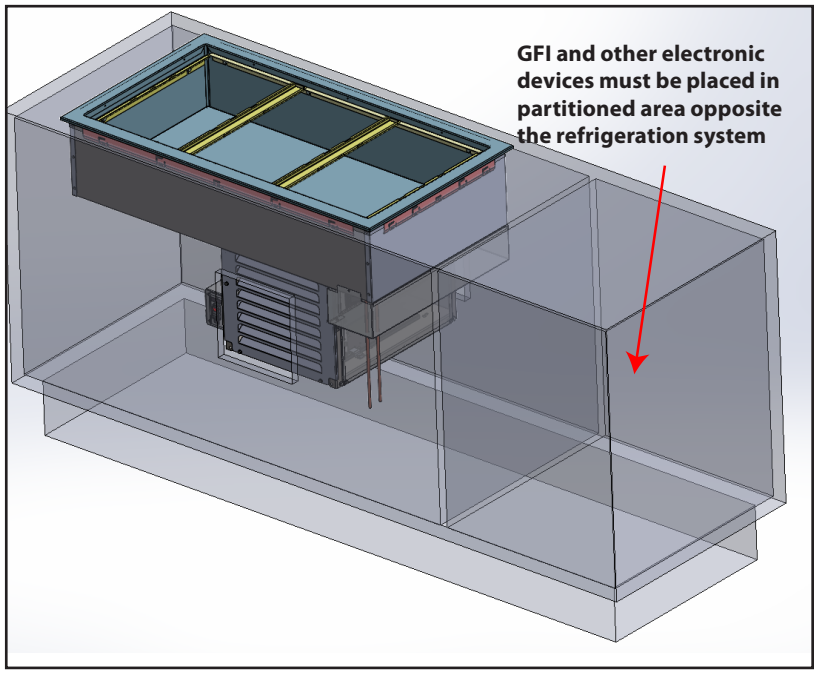


Figure B

INSTALLATION

⚠WARNING **RISK OF ELECTROCUTION!**

Device may cause injuries due to improper installation!

Before installation, check the data of the local power grid with the technical specifications of the unit (see nameplate). Connect the device only if they match! Follow the safety instructions!

- The unit must be installed by a qualified technician.

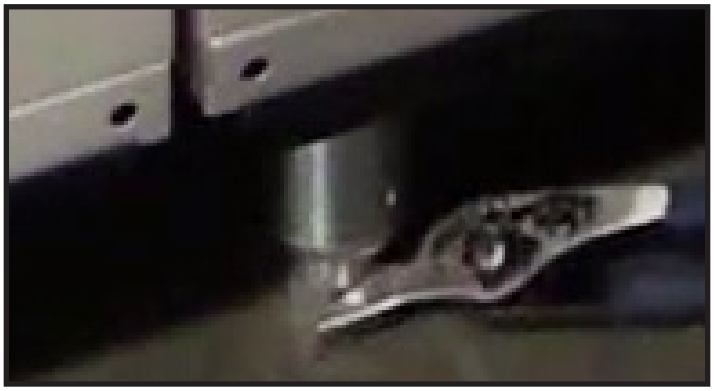
Note: Before commissioning, leave unit to stand for at least 15min, in a horizontal position.

- The unit must be secured in accordance with local electrical codes.
- Required air flow - supply and exhaust:
  - Intake minimum 16" X 16" (256 square inches) open directly in front of the condenser.
  - Exhaust minimum 20" X 20" (400 square inches 125%) opening located as close to the condenser fan discharge as possible.

Step 1

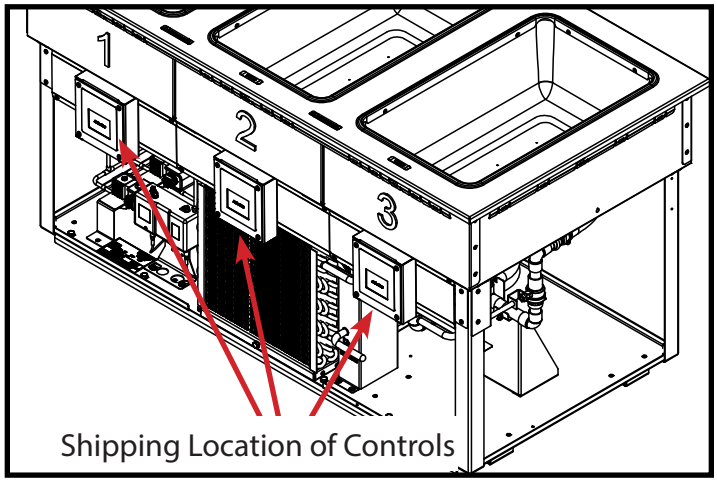
Set unit in desired place and level.

NOTE: Adjustment can be made by turning the legs using adjustable pliers.



Step 2

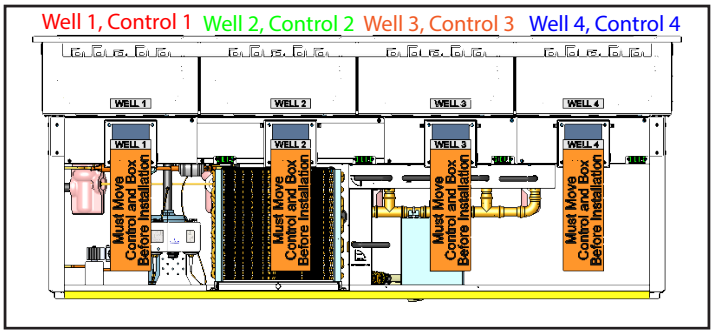
Relocate controls to body of unit. See Specification page for cut out size.



Note: Remove control shipping bracket before installation.

Step 3

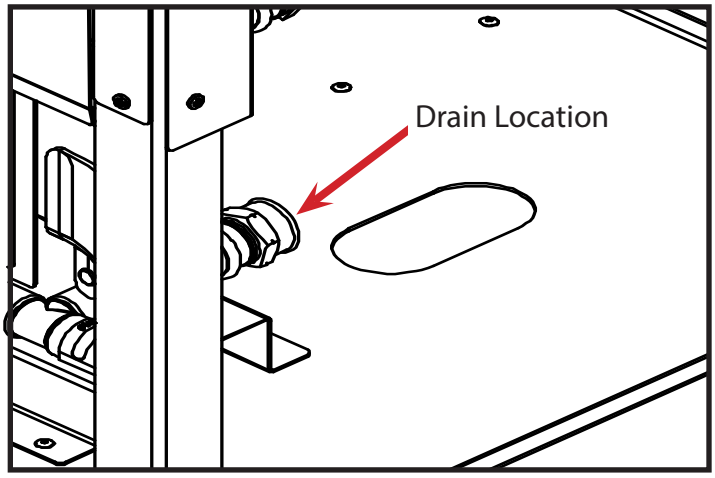
Controls must be located in the front panel in the same order they were shipped.



⚠WARNING **If above step is not completed the unit will not operate correctly.**

Step 4

Connect drain 3/4" FTP according to local code requirements.



Step 5

Connect power cord to proper power source.

INSTALLATION - Service Panel Access

NOTE: The following access panels are required on an enclosed body. See specifications below.

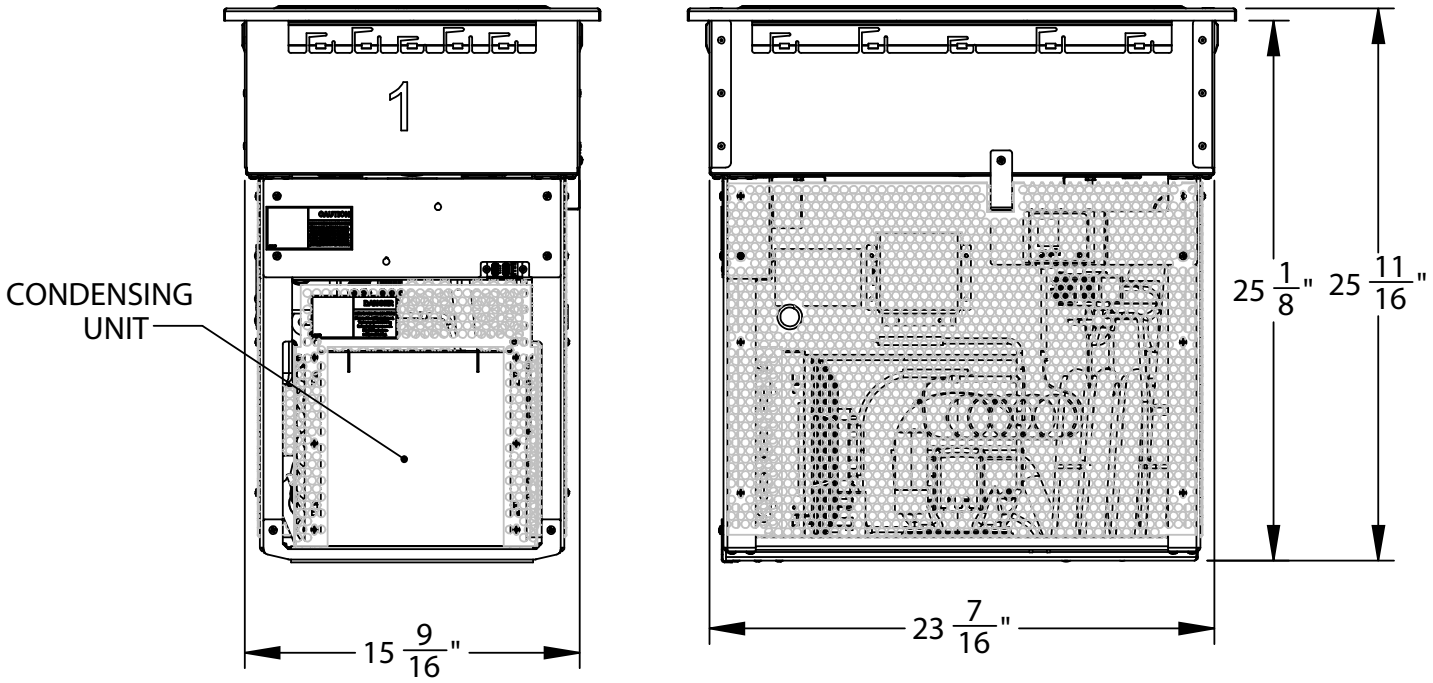
Enclosure Access Panels

◊ Electrical access panels
◊ Condensing Unit for slide out service
◊ Drain Handle/s
◊ Solenoid Switches and Dual Pressure Switch
◊ Side wall clearance to thermo engine cage minimum four (4) inches.
◊ Required air flow - supply and exhaust:

- Intake minimum 16" X 16" (256 square inches) open directly in front of the condenser.
- Exhaust minimum 20" X 20" (400 square inches 125%) opening located as close to the condenser fan discharge as possible.
- If a panel with louvers, slots or other openings is provided, the total of those openings should be equivalent to the required minimum opening size.

Electrical Service access panels located behind control mounting box.

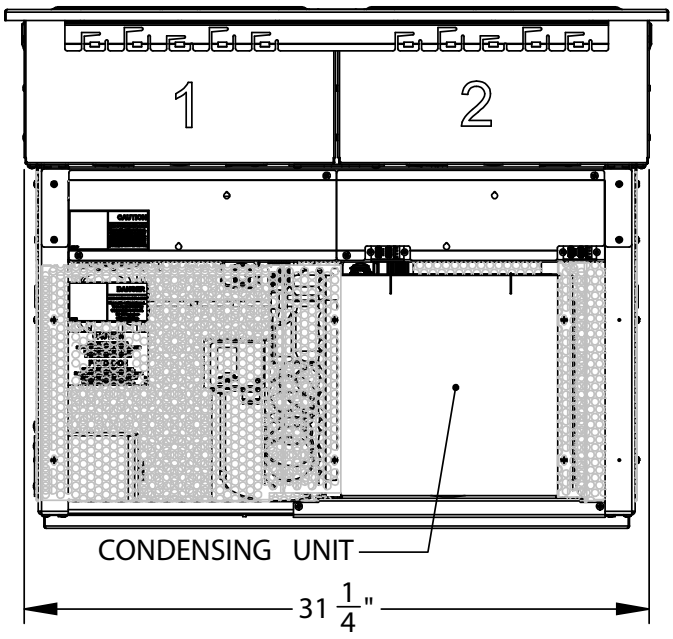
Single Well Unit

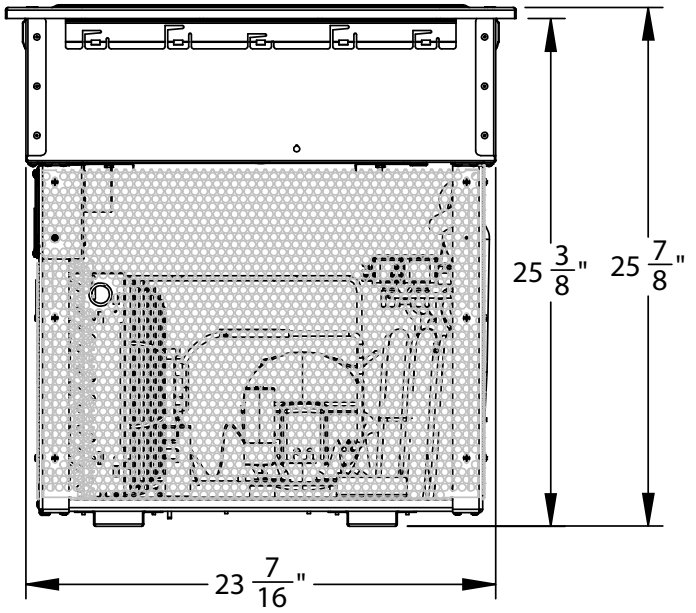


INSTALLATION

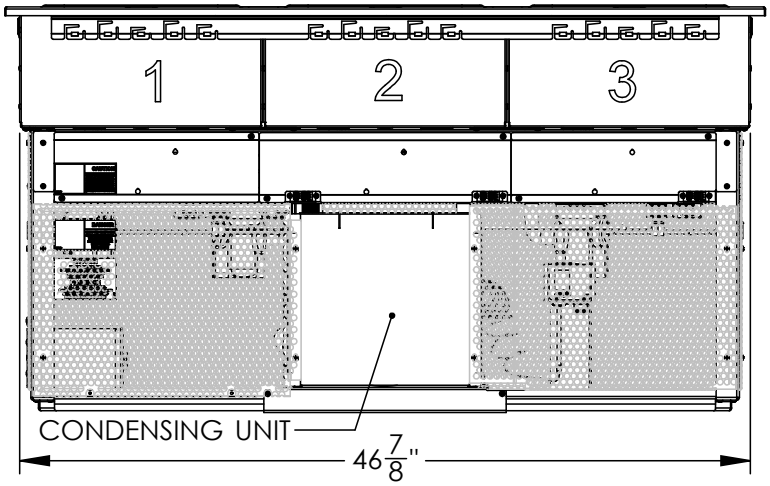
Electrical Service access panels located behind control mounting box.

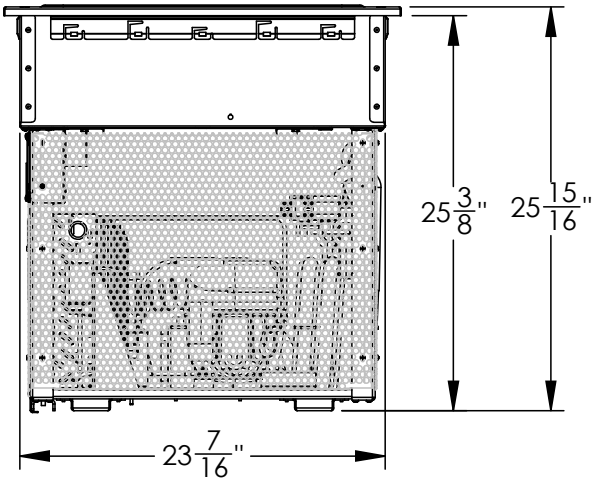
Two (2) Well Unit





Three (3) Well Unit

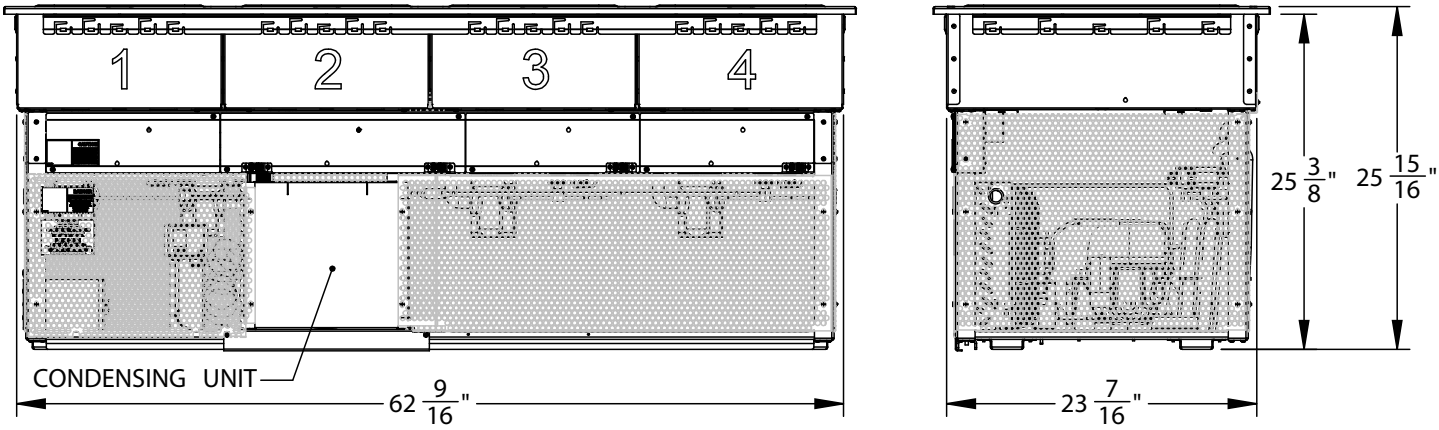




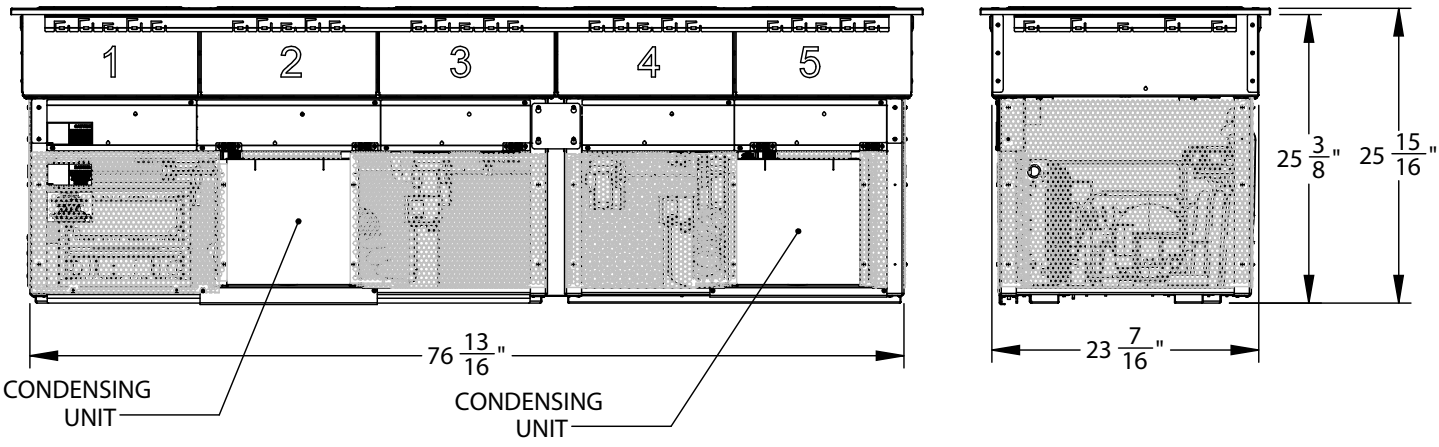
INSTALLATION

Electrical Service access panels located behind control mounting box.

Four (4) Well Unit



Five (5) Well Unit



OPERATION

⚠WARNING

- The device may only be operated when connected to a properly installed grounded socket.
- Make sure that the cable does not come into contact with heat sources or sharp edges.

CAUTION 

Hot surface! During operation, some parts of the device become very hot. To avoid burns, do not touch hot parts.

- Do not use this device if it is not working properly or is damaged.
- Do not use any accessories and spare parts which are not recommended by the manufacturer. These could pose a hazard to the user or cause damage to the device and cause personal injury, and also void the warranty.
- Do not move the device during operation and do not tip it over.
- Never heat food or liquids in sealed containers or bottles. This builds up a pressure which can cause the container or bottle to explode.
- The unit must not be used as a storage area. Accidental activation or residual heat can cause objects left there to melt or burn .
- Do not place food directly in the unit. All foods, whether hot or cold, should always be placed in appropriate food pans.

How to Operate the Duke Controls:

The controls have the option of operating each individual well in the following modes:

- Dry Heat – No water needed. DH1, DH2, and DH3 where DH3 is the hottest.
- Wet Heat – Requires a minimum of 1" of water in the well. WH1, WH2, and WH3 where WH3 is the hottest.
- Cold – No water needed. C1, C2, and C3 where C1 is the coldest.
- Freeze – No water needed and only one setting, F.

CAUTION

The use of heat lamps and/or incandescent lighting, with the cold or freeze modes, will reduce the performance of the units.

Startup sequence:

1. On the control panel, power the unit on and then select the desired holding platform. (See quick reference guide)
2. Once the well has reached the preset temperature the control will show "READY" and you are now okay to load preheated or pre-chilled products.
3. To switch to another holding platform simply press the back arrow to the main screen prior to switching to Dry Heat, Freeze or Cold you will need to make sure that there is no water inside of the well.
4. To power off the unit simply press the back arrow to the main screen and press the power button.
5. Daily the unit should be powered off and allowed to reach room temperature. Each well should be dried out and any water build-up, drained. Clean the wells and the exterior stainless top with a non-corrosive cleaner and a soft cloth.

OPERATION

Control Panel

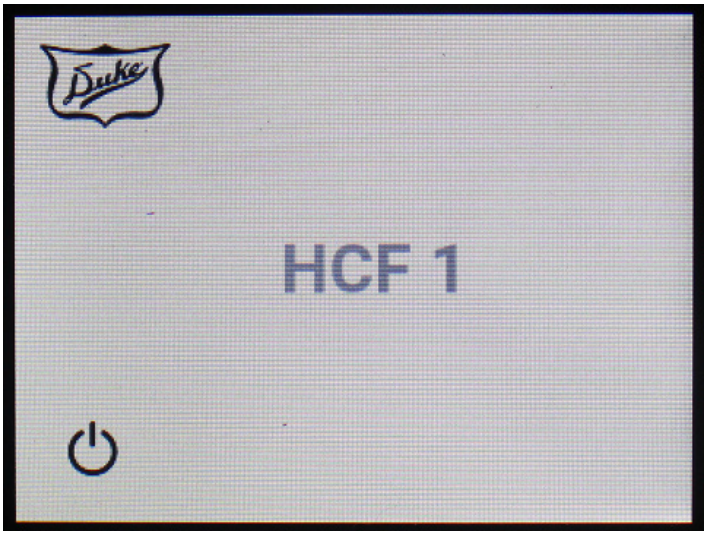
The Duke HotColdFreeze™ control is operated via the touch screen control panel mounted on the front.

WARNING **DO NOT use sharp objects to operate control.**

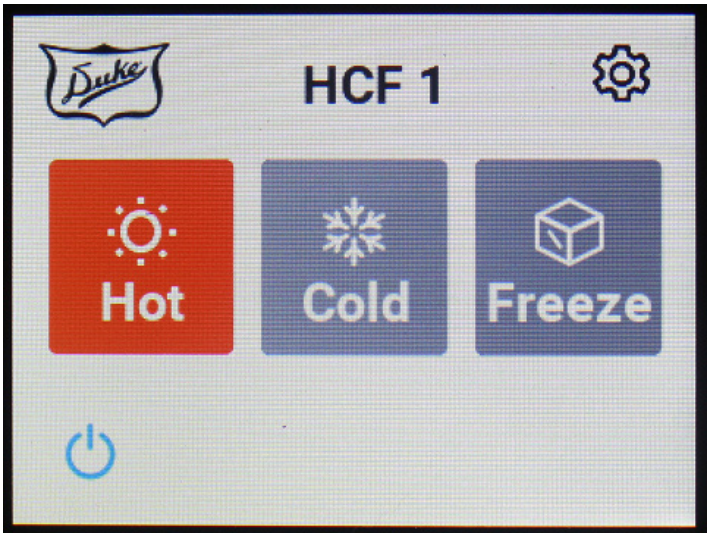
Icon/Symbol Legend

On/Off Button	Switches the controller on or off.	Left Arrow	Go back to prior screen or decrement (-) number value
Hot	Puts unit into Hot mode	Right Arrow	Go to next screen or increment (+) number value
Cold	Puts unit into cold mode	Edit	Go to edit screen
Freeze	Puts unit into freeze mode	Cancel	Cancel and return to prior screen
Back or Return Arrow	Go back to prior screen	Check	Save and return to prior screen
Tool	Secondary screen access for edits & configurations		

Step 1
Plug in unit and touch on/off button.



Power Up Screen



Mode Selection Screen

OPERATION - continued

Step 2

Select the applicable mode of the unit: Hot Cold Freeze

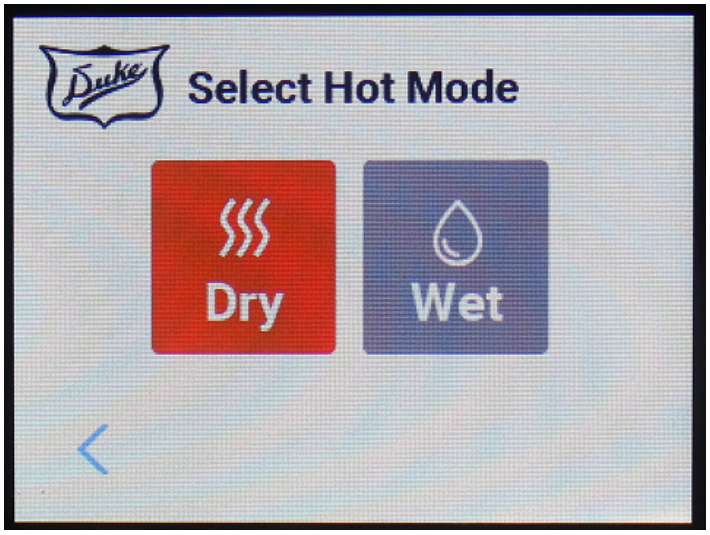
Step 3

Go to section related to your choice.

HOT MODE

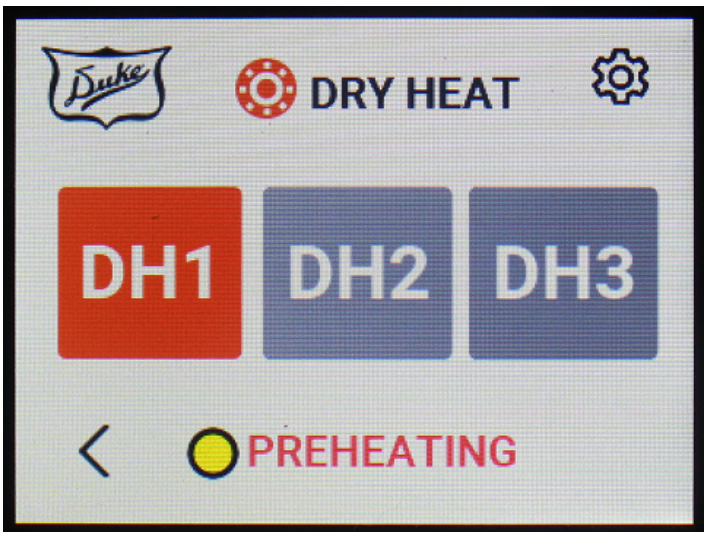
HOT-1

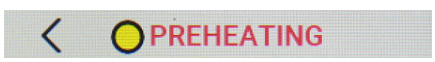
Select Dry or Wet



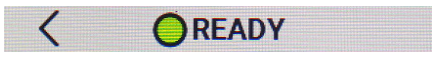
HOT-2

Select Temperature for your application





Preheat displayed during heating

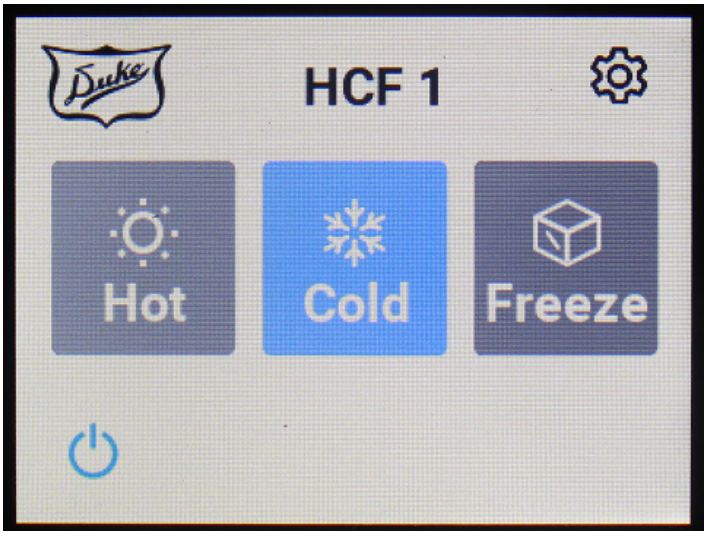


Unit is ready

OPERATION - continued

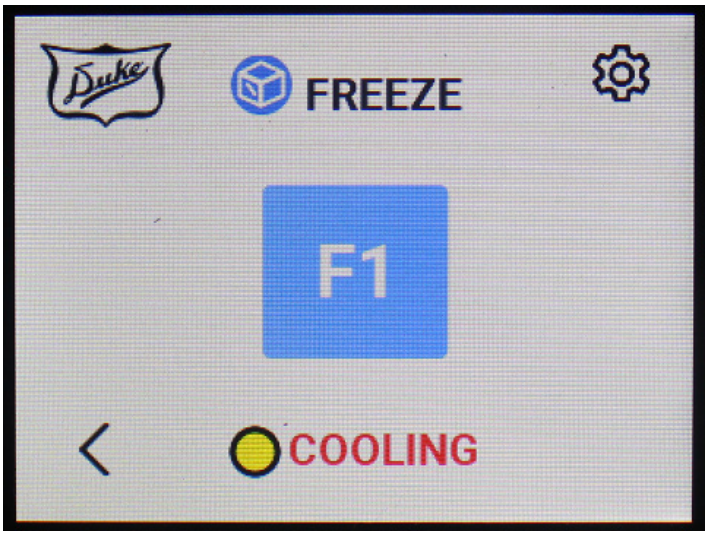
Cold MODE

Cold-1
Select Temperature for your application

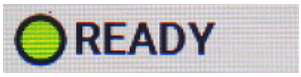


Freeze MODE

Freeze-1
Unit in Freeze mode



Cooling displayed during cooling.

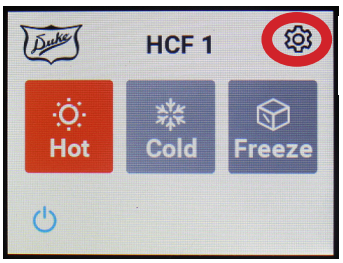


Unit is ready

Changing Settings

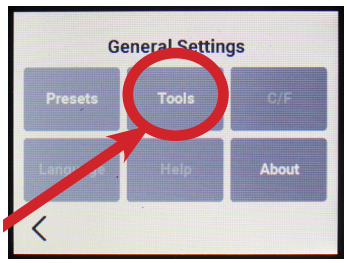
CAUTION

A change in the preset parameters should only be done by a qualified service technician.

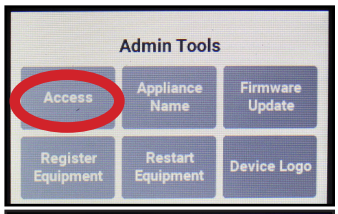


Select Tool Icon

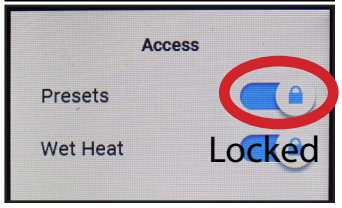
Select Tools

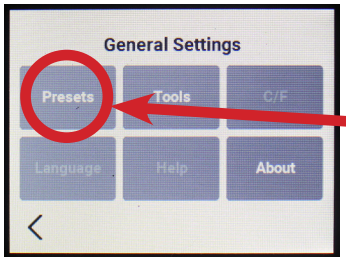


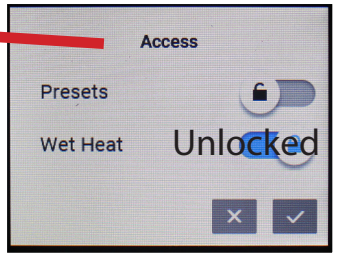
Access must be unlocked before any changes.



Touch the locked icon to unlock

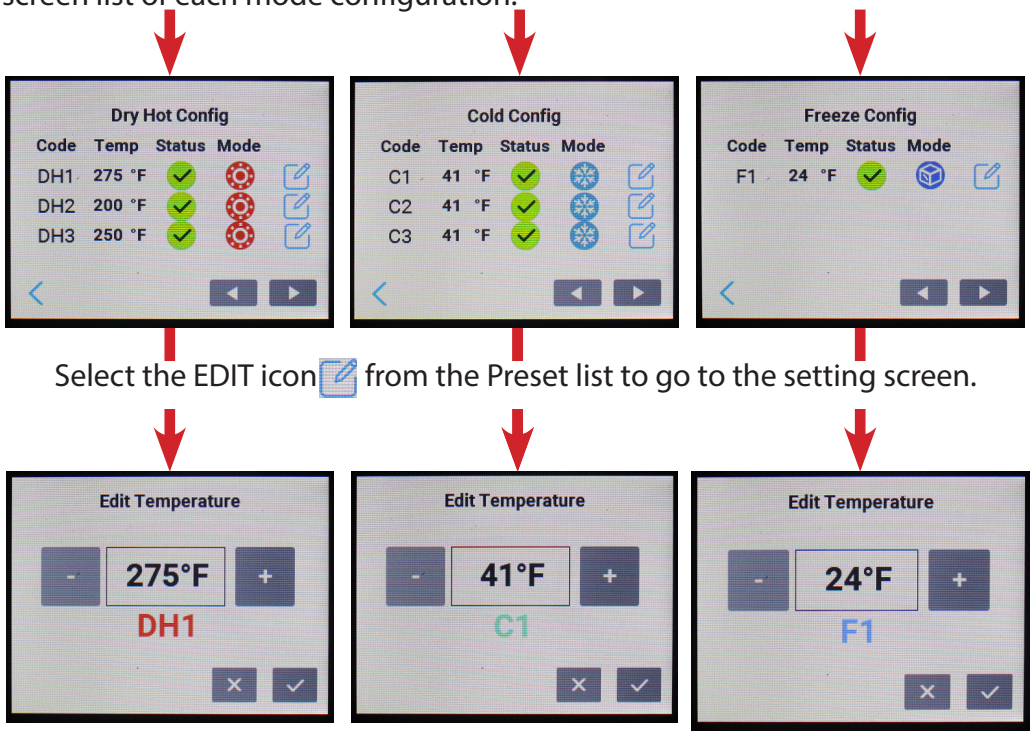






OPERATION - continued

After gaining access, select the PRESETS button to go to a list of: HOT, COLD, FREEZE set points. Use the right or left arrow buttons to go to a screen list of each mode configuration.



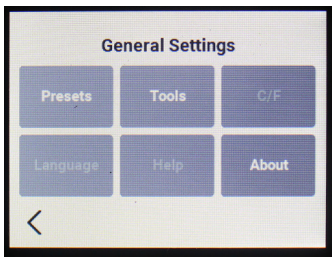
Select the EDIT icon from the Preset list to go to the setting screen.

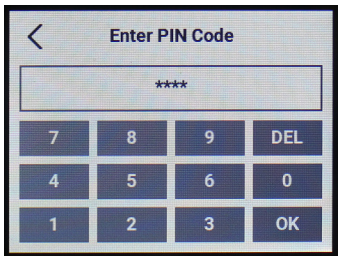
Use the plus + or minus - buttons to adjust the set point.
Select the Check Mark to save the changes.

Note: Go back and re-lock your settings

Note: If the Edit Icon is gray or not functioning the access is locked.

Note: Some configurations and functions require a **PIN** code to enter.
These items are outside normal use of the unit.





FOOD RECOMMENDATIONS

Dry1 / Wet1	Dry2 / Wet2	Dry3 / Wet3	C1	C2	C3	Freeze
Pasta with sauce	Pizza	Cheese sticks	Individual yogurts	Leafy Lettuce	Potato salad	Cold pies
Soups	Pinwheels	Popcorn chicken	Fruit salad	Cold sandwiches	Jello	Slushes
Chili	Hot sandwiches	Fish sticks	Pasta salad	Tomatoes	Pudding	Ice cream
Pulled pork/ chicken	Waffles	Nuggets	Fruit cups			
Eggs	French toast	Corn dogs				
Vegetables	Pancakes	Breaded shrimp				
Cobblers						

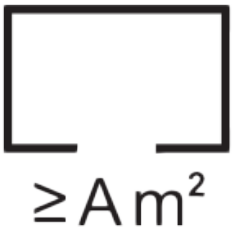
CLEANING

- Before cleaning the unit, switch it off with the button.
- Leave the unit to cool.
- Finally, wipe the unit down with warm soapy water.
- All housing parts are made of stainless steel and can be cared for and treated with commercially available stainless steel cleaning products.
- Do not use abrasives, steel wool or similar.
- After cleaning, use a soft cloth to dry and polish the surface.

WARNING **The device is not suited for direct washing with a water jet. Therefore, do not use a pressure water jet to clean the device!**

MAINTENANCE AND REPAIR

Symbols



Appliances having a REFRIGERANT CHARGE within any REFRIGERATING CIRCUIT exceeding 4 times the lower flammability limit (LFL) for refrigerants having a flammability classification of Class A3, shall be marked with symbol IEC 60417-6412 (2019-03).

In the event of storage or service to this appliance, the minimum room floor area MUST be calculated using the formula with the above symbol and the values of A below by equipment model. Should you have any questions about this, please contact Duke Manufacturing Company Service Department at 1-800-735-3853

WARNING

Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.

The appliances shall be stored in a room without continuous ignition sources (for example: open flames, an operating gas appliance or an operating electric heater.

Do not pierce or burn.

Be aware that refrigerants may not contain an odor.

MESE EN GARDE

Ne pas utilliser de moyens autres que ceux recommandés par le fabricant pour accélérer le processus de dégivrage ou pour nettoyer l'apparell

L'apparell doit être entreposés dans un local ne contenant pas de sources d'inflammation permanentes (flammes nues, apparell àgaz ou dispositif de chauffage à, par exemple).

Ne pas percer ni brûler.

Attention, les fluides frigorigénes peuvent ne pas dégager d'odeur.

If you install this equipment in spaces where refrigerant pipes are allowed, the installation of pipe-work shall be kept to a minimum, and piping material, pipe routing, and installation shall include protection from physical damage in operation and service, and be in compliance with national and local codes and standards, such as ANSI/ASHRAE 15, IAPMO Uniform Mechanical Code, ICC International Mechanical Code, or CSA B52. Precautions shall be taken to avoid excessive vibration or pulsation.

MAINTENANCE AND REPAIR

Unventilated areas

For appliances containing more than m1 for any refrigerating circuit, the manual shall include a statement advising that an unventilated area where the appliance using FLAMMABLE REFRIGERANTS is installed shall be so constructed that in the event of any refrigerant leak, it will not stagnate so as to create a fire or explosion hazard. This shall include:

a. A warning that the non-FIXED APPLIANCE shall be stored in an area where the room size corresponds to the room area as specified for operation;
b. A warning that the non-FIXED APPLIANCE shall be stored in a room without continuously operating open flames (for example an operating gas appliance) or other potential ignition sources (for example an operating electric heater, hot surfaces).

Qualification of workers

Any work required for maintenance, service, and repair operations of this equipment, SHALL/MUST be carried out by a Duke Manufacturing Company authorized and qualified personnel. This equipment contains an A3 refrigerant that is subject to fire or explosion.

Information on servicing

1Checks to the area

Prior to beginning work on systems containing FLAMMABLE REFRIGERANTS, safety checks are necessary to ensure that the risk of ignition is minimized. For repair to the REFRIGERATING SYSTEM, the following shall be completed before starting work on the system.

Work procedure

Work shall be undertaken under a controlled procedure so as to minimize the risk of a flammable gas or vapor being present while the work is being performed.

General work area

All maintenance staff and others working in the local area shall be instructed on the nature of the work being carried out. Work in confined spaces shall be avoided.

Checking for presence of refrigerant

The area shall be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware of potentially toxic or flammable atmospheres. Ensure that the leak detection equipment being used is suitable for use with all applicable refrigerants, i.e., non-sparking, adequately sealed, or intrinsically safe.

Presence of fire extinguisher

If any hot work is to be conducted on the refrigerating equipment or any associated parts, appropriate fire extinguishing equipment shall be available on hand. A dry chemical or CO2 fire extinguisher should be adjacent to the charging area.

No ignition sources

No person carrying out work in relation to a REFRIGERATING SYSTEM which involves exposing any pipe work shall use any sources of ignition in such a manner that it may lead to the risk of fire or explosion. All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removing and disposal, during which refrigerant can possibly be released to the surrounding space. Prior to work taking place, the area around the equipment shall be surveyed to make sure that there are no flammable hazards or ignition risks. “No Smoking” signs shall be displayed.

MAINTENANCE AND REPAIR

Ventilated area

Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any hot work. A degree of ventilation shall continue during the period that the work is carried out. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.

Checks to the refrigerating equipment

Where electrical components are being changed, they shall be fit for the purpose and to the correct specification. At all times, the manufacturer's maintenance and service guidelines shall be followed. If in doubt, consult the manufacturer's technical department for assistance at 1-800-735-3853.

The following checks shall be applied to installations using FLAMMABLE REFRIGERANTS:

a. The actual REFRIGERANT CHARGE is in accordance with the room size within which the refrigerant containing parts are installed.
b. The ventilation machinery and outlets are operating adequately and are not obstructed.
c. If an indirect refrigerating circuit is being used, the secondary circuit shall be checked for the presence of refrigerant. Marking to the equipment continues to be visible and legible.
d. Markings and signs that are illegible shall be corrected.
e. Refrigerating pipe or components are installed in a position where they are unlikely to be exposed to any substance which may corrode refrigerant containing components, unless the components are constructed of materials which are inherently resistant to being corroded or are suitably protected against being so corroded.

Checks to electrical devices

Repair and maintenance to electrical components shall include initial safety checks and component inspection procedures. If a fault exists that could compromise safety, then no electrical supply shall be connected to the circuit until it is satisfactorily dealt with. If the fault cannot be corrected immediately but it is necessary to continue operation, an adequate temporary solution shall be used. This shall be reported to the owner of the equipment, so all parties are advised. Initial safety checks shall include:

a. That capacitors are discharged: this shall be done in a safe manner to avoid possibility of sparking;
b. That no live electrical components and wiring are exposed while charging, recovering or purging the system;
c. That there is continuity of earth bonding.

Repairs to sealed components

During repairs to sealed components, all electrical supplies shall be disconnected from the equipment being worked upon prior to any removal of sealed covers, etc. If it is absolutely necessary to have an electrical supply to equipment during servicing, then a permanently operating form of leak detection shall be located at the most critical point to warn of a potentially hazardous situation.

Particular attention shall be paid to the following to ensure that by working on electrical components, the casing is not altered in such a way that the level of protection is affected. This shall include damage to cables, excessive number of connections, terminals not made to original specification, damage to seals, incorrect fitting of glands, etc. Ensure that the apparatus is mounted securely. Ensure that seals or sealing materials have not degraded to the point that they no longer serve the purpose of preventing the ingress of flammable atmospheres. Replacement parts shall be in accordance with the manufacturer's specifications.

MAINTENANCE AND REPAIR

Repair to intrinsically safe components

Do not apply any permanent inductive or capacitance loads to the circuit without ensuring that this will not exceed the permissible voltage and current permitted for the equipment in use. Intrinsically safe components are the only types that can be worked on while live in the presence of a flammable atmosphere. The test apparatus shall be at the correct rating. Replace components only with parts specified by the manufacturer. Other parts can result in the ignition of refrigerant in the atmosphere from a leak.

Cabling

Check that cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges, or any other adverse environmental effects. The check shall also take into account the effects of aging or continual vibration from sources such as compressors or fans.

Detection of flammable refrigerants

Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant leaks. A halide torch (or any other detector using a naked flame) shall not be used.

The following leak detection methods are deemed acceptable for all refrigerant systems. Electronic leak detectors may be used to detect refrigerant leaks but, in the case of FLAMMABLE REFRIGERANTS, the sensitivity might not be adequate, or might need recalibration.

(Detection equipment shall be calibrated in a refrigerant-free area.) Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed, and the appropriate percentage of gas (25 % maximum) is confirmed. Leak detection fluids are also suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine can react with the refrigerant and corrode the copper pipe-work.

If a leak is suspected, all naked flames shall be removed/extinguished.

If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated (by means of shut off valves) in a part of the system remote from the leak.

Removal and evacuation

When breaking into the refrigerant circuit to make repairs – or for any other purpose – conventional procedures shall be used. However, for flammable refrigerants it is important that best practice be followed, since flammability is a consideration. The following procedure shall be adhered to:

a. Safely remove refrigerant following local and national regulations
b. Purge the circuit with inert gas
c. Evacuate
d. Purge with inert gas
e. Open the circuit by cutting or brazing

The refrigerant charge shall be recovered into the correct recovery cylinders if venting is not allowed by local and national codes. For appliances containing flammable refrigerants, the system shall be purged with oxygen-free nitrogen to render the appliance safe for flammable refrigerants. This process might need to be repeated several times. Compressed air or oxygen shall not be used for purging refrigerant systems.

For appliances containing flammable refrigerants, refrigerants purging shall be achieved by breaking the vacuum in the system with oxygen-free nitrogen and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum. This process shall be repeated until no refrigerant is within the system. When the final oxygen-free nitrogen charge is used, the system shall be vented down to atmospheric pressure to enable work to take place.

MAINTENANCE AND REPAIR

Ensure that the outlet for the vacuum pump is not close to any potential ignition sources and that ventilation is available.

Charging procedures

In addition to conventional charging procedures, the following requirements shall be followed.

a. Ensure that contamination of different refrigerants does not occur when using charging equipment. Hoses or lines shall be as short as possible to minimize the amount of refrigerant contained in them.
b. Cylinders shall be kept in an appropriate position according to the instructions.
c. Ensure that the REFRIGERATING SYSTEM is earthed prior to charging the system with refrigerant.
d. Label the system when charging is complete (if not already).
e. Extreme care shall be taken not to overfill the REFRIGERATING SYSTEM.

Prior to recharging the system, it shall be pressure-tested with the appropriate purging gas. The system shall be leak-tested on completion of charging but prior to commissioning. A follow up leak test shall be carried out prior to leaving the site.

Recovery

When removing refrigerant from a system, either for servicing or decommissioning, it is recommended good practice that all refrigerants are removed safely.

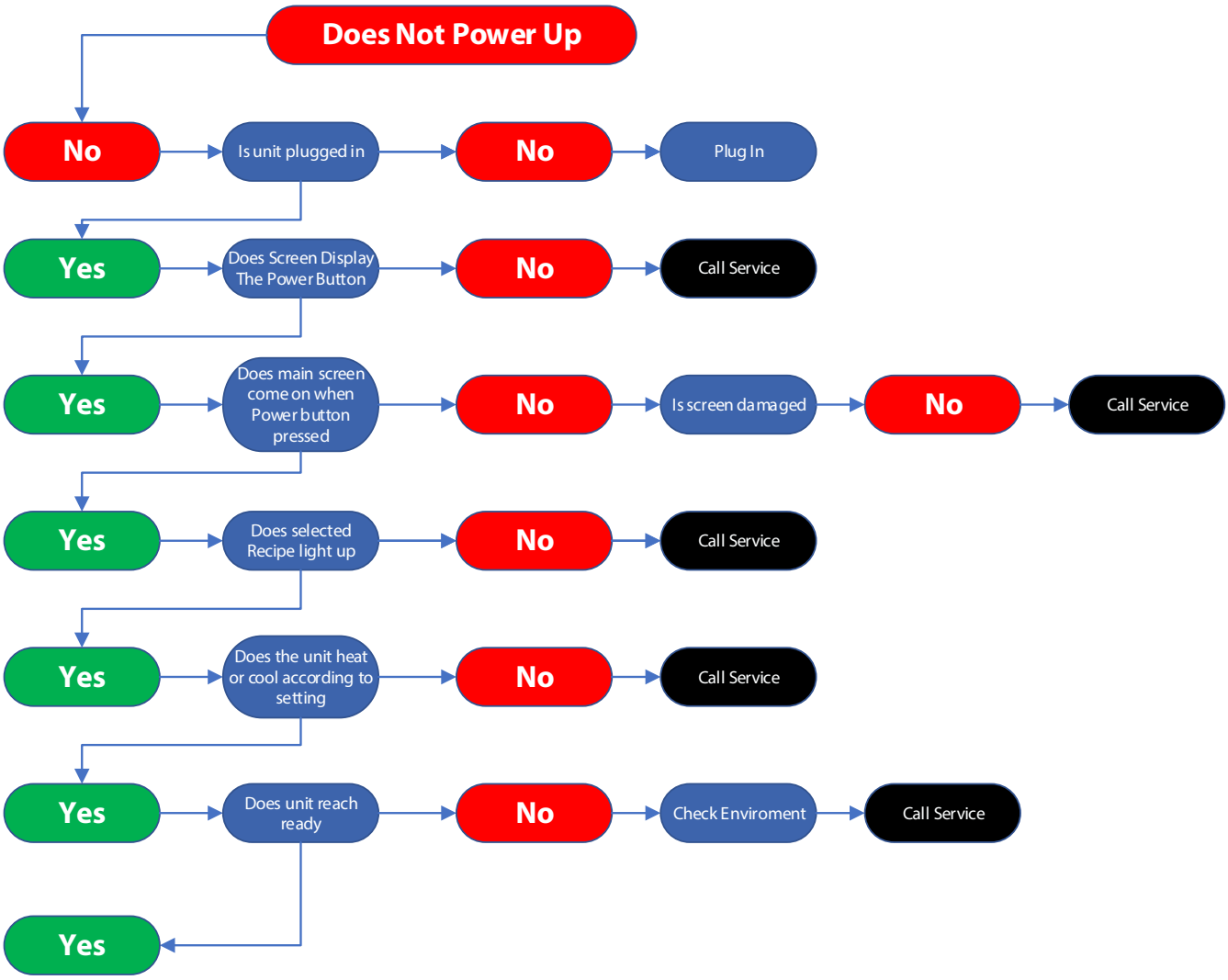
When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed. Ensure that the correct number of cylinders for holding the total system charge is available. All cylinders to be used are designated for the recovered refrigerant and labeled for that refrigerant (i.e., special cylinders for the recovery of refrigerant). Cylinders shall be complete with pressure-relief valve and associated shut-off valves in good working order. Empty recovery cylinders are evacuated and, if possible, cooled before recovery occurs.

The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of all appropriate refrigerants including, when applicable, FLAMMABLE REFRIGERANTS. In addition, a set of calibrated weighing scales shall be available and in good working order. Hoses shall be complete with leak-free disconnect couplings and in good condition. Before using the recovery machine, check that it is in satisfactory working order, has been properly maintained and that any associated electrical components are sealed to prevent ignition in the event of a refrigerant release. Consult manufacturer if in doubt.

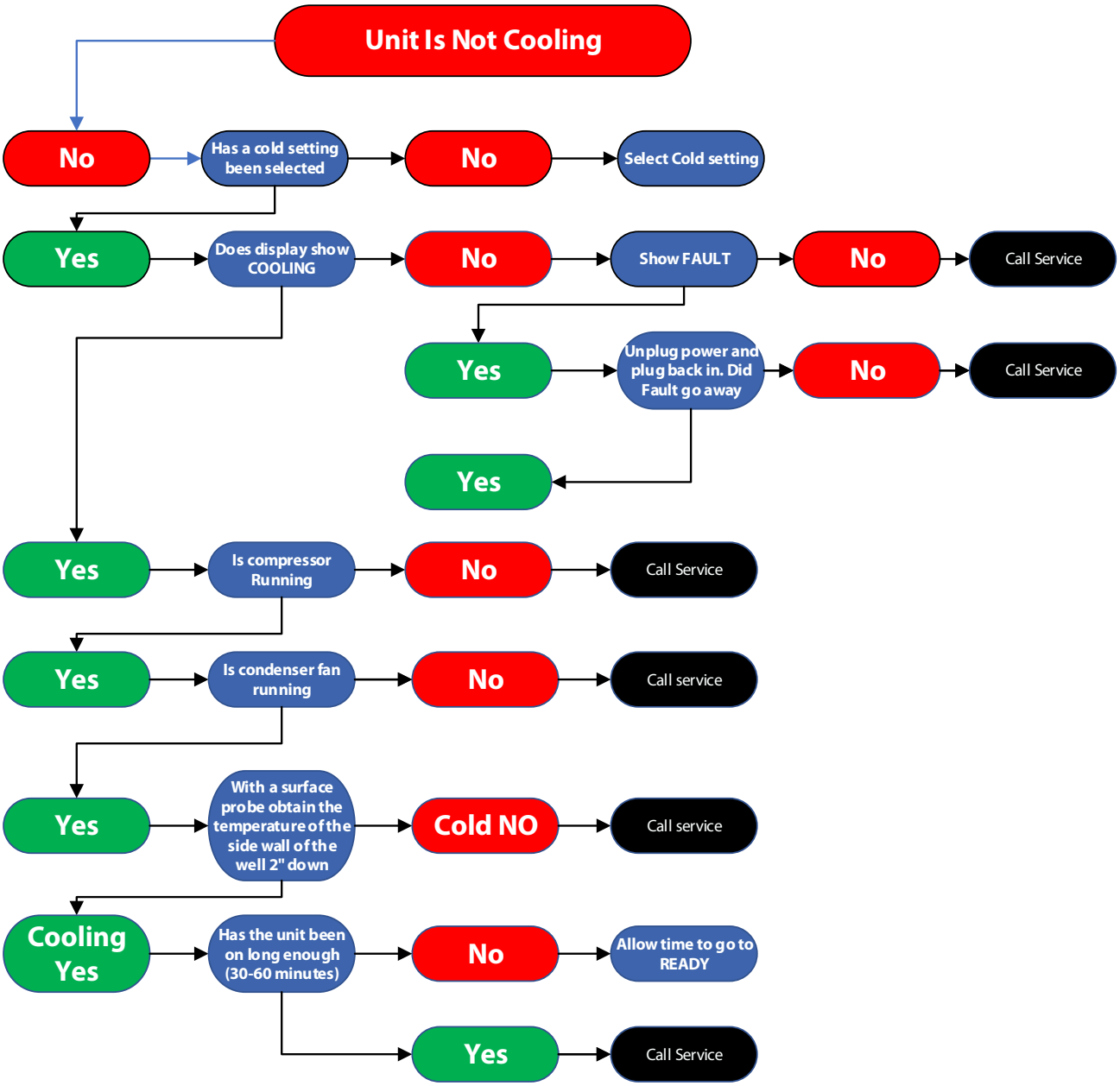
The recovered refrigerant shall be returned to the refrigerant supplier in the correct recovery cylinder, and the relevant waste transfer note arranged. Do not mix refrigerants in recovery units and especially not in cylinders.

If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that FLAMMABLE REFRIGERANT does not remain within the lubricant. The evacuation process shall be carried out prior to returning the compressor to the suppliers. Only electric heating to the compressor body shall be employed to accelerate this process. When oil is drained from a system, it shall be carried out safely.

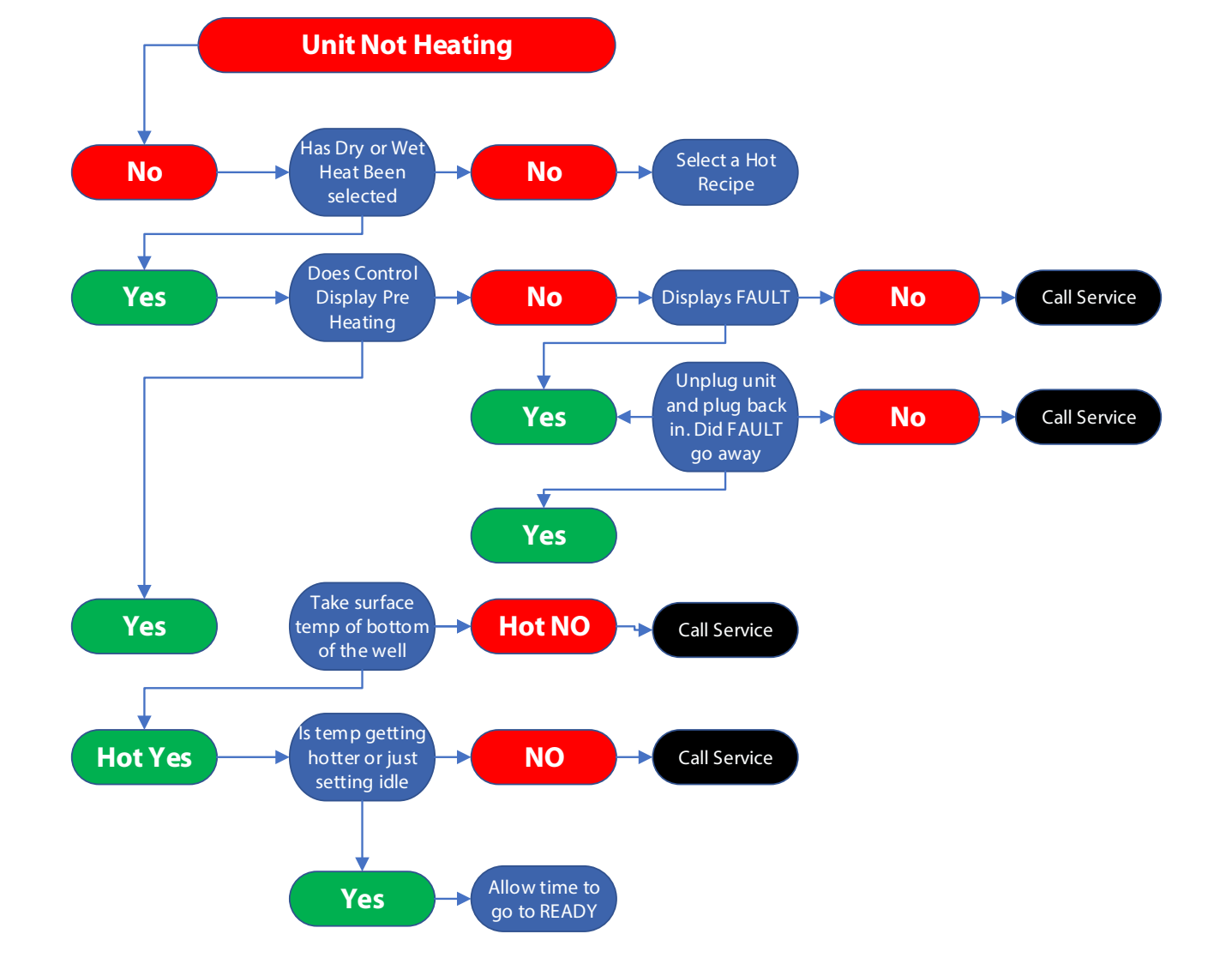
TROUBLE SHOOTING - CONTROL



TROUBLE SHOOTING - COOLING



TROUBLE SHOOTING - HEATING



The problems listed above are for guidance and must be seen as examples. Should these or similar problems occur, immediately turn off the device and discontinue use. Contact a qualified specialist or the manufacturer immediately.

Noise during operation

To keep the selected temperature constant when cooling, from time to time, the hot/cold Plate switches the compressor of the cooling unit on. The sounds which occur are related to functionality. They will reduce automatically as soon as the unit has reached operating temperature. The humming noise comes from the compressor.

PREVENTIVE MAINTENANCE R290

Cleaning the Condenser Coil Every 60 Days

⚠WARNING

THE POWER MUST BE TURNED OFF AND DISCONNECTED AT ALL TIMES DURING MAINTENANCE OR REPAIR FUNCTIONS.

⚠CAUTION

To clean the condenser, never use a high-pressure water wash, which can damage electrical components located at or near the condenser coil.

⚠CAUTION A3

Failure to maintain a clean condenser coil can cause high temperatures and excessive run times. Check coils every 3 months. Continuous operation with dirty or clogged condenser coils can result in compressor failure. Neglecting the condenser coil cleaning procedures will void all warranties and repair or replacement costs associated with the compressor.

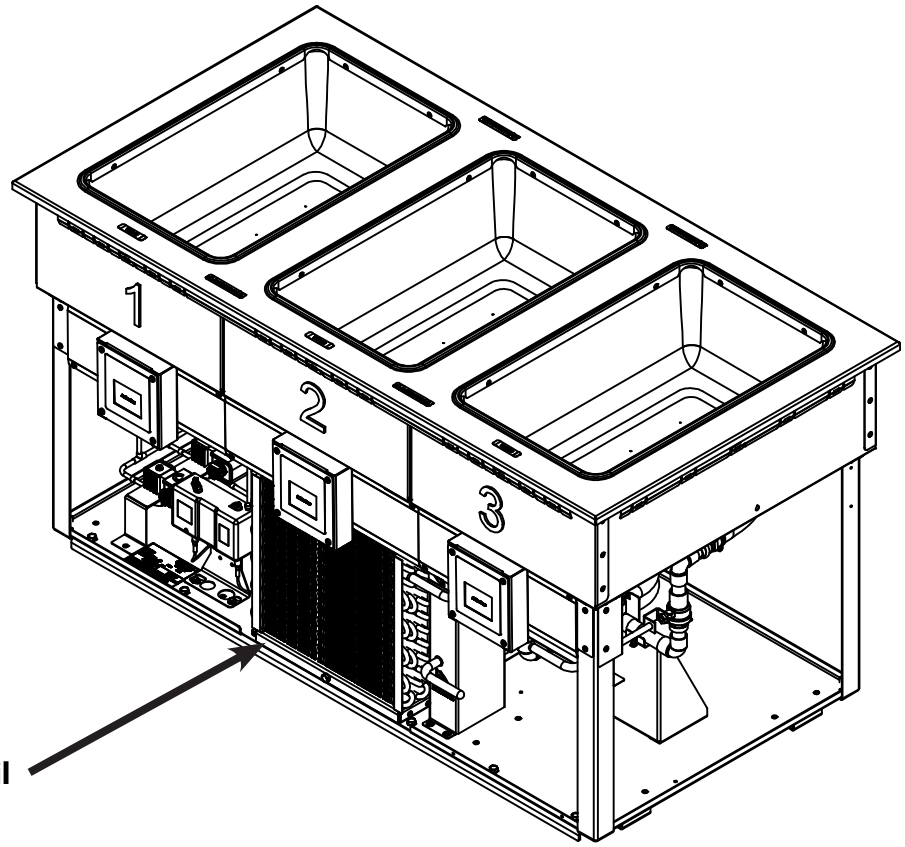
The condenser coil is located and accessed from the operators side of the unit. The condenser coil requires regular cleaning and should be done every 60 days. However, if large amounts of dust and grease accumulate sooner, clean the condenser coil every 30 days.

For light dust, use a soft, non-wire brush. For heavier dust, use a vacuum or blow with compressed air.

For heavy grease, use a decreasing agent made specifically for condenser coils on refrigeration units. Spray the decreasing agent on the coil and then blow with compressed air. Never wash with high-pressure water, which can damage the electrical components located at or near the condenser coil.

⚠CAUTION

Be careful not to bend the fins of the condenser.



Location of Condensing Coil

PREVENTIVE MAINTENANCE

- Check the power cord for damage from time to time. Do not use the device if the power cord is damaged. If the power cord is damaged, it must be replaced by customer service or a qualified electrician to avoid risks.
- In case of damage or malfunction, please contact your dealer or our customer service department. Keep in mind the information on troubleshooting in section 7.
- Maintenance and repair work may only be performed by qualified professionals using original spare parts and accessories. **Never try to carry out repairs to the unit yourself.**

DECOMMISSIONING

Symbols

WARNING

Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.

The appliances shall be stored in a room without continuous ignition sources (for example: open flames, an operating gas appliance or an operating electric heater.

Do not pierce or burn.

Be aware that refrigerants may not contain an odor.

MESE EN GARDE

Ne pas utilliser de moyens autres que ceux recommandés par le fabricant pour accélérer le processus de dégivrage ou pour nettoyer l'apparell

L'apparell doit être entreposés dans un local ne contenant pas de sources d'inflammation permanentes (flammes nues, apparell àgaz ou dispositif de chauffage à, par exemple).

Ne pas percer ni brûler.

Attention, les fluides frigorigénes peuvent ne pas dégager d'odeur.

Qualification of workers

Any work required for maintenance, service, and repair operations of this equipment, SHALL/MUST be carried out by a Duke Manufacturing Company authorized and qualified personnel. This equipment contains an A3 refrigerant that is subject to fire or explosion.

DECOMMISSIONING

Information on servicing

Checks to the area

Prior to beginning work on systems containing FLAMMABLE REFRIGERANTS, safety checks are necessary to ensure that the risk of ignition is minimized. For repair to the REFRIGERATING SYSTEM, the following shall be completed before starting work on the system.

Work procedure

Work shall be undertaken under a controlled procedure so as to minimize the risk of a flammable gas or vapor being present while the work is being performed.

General work area

All maintenance staff and others working in the local area shall be instructed on the nature of the work being carried out. Work in confined spaces shall be avoided.

Checking for presence of refrigerant

The area shall be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware of potentially toxic or flammable atmospheres. Ensure that the leak detection equipment being used is suitable for use with all applicable refrigerants, i.e., non-sparking, adequately sealed, or intrinsically safe.

Presence of fire extinguisher

If any hot work is to be conducted on the refrigerating equipment or any associated parts, appropriate fire extinguishing equipment shall be available on hand. A dry chemical or CO2 fire extinguisher should be adjacent to the charging area.

No ignition sources

No person carrying out work in relation to a REFRIGERATING SYSTEM which involves exposing any pipe work shall use any sources of ignition in such a manner that it may lead to the risk of fire or explosion. All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removing and disposal, during which refrigerant can possibly be released to the surrounding space. Prior to work taking place, the area around the equipment shall be surveyed to make sure that there are no flammable hazards or ignition risks. "No Smoking" signs shall be displayed.

Detection of flammable refrigerants

Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant leaks. A halide torch (or any other detector using a naked flame) shall not be used.

The following leak detection methods are deemed acceptable for all refrigerant systems. Electronic leak detectors may be used to detect refrigerant leaks but, in the case of FLAMMABLE REFRIGERANTS, the sensitivity might not be adequate, or might need recalibration.

(Detection equipment shall be calibrated in a refrigerant-free area.) Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed, and the appropriate percentage of gas (25 % maximum) is confirmed. Leak detection fluids are also suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine can react with the refrigerant and corrode the copper pipe-work.

If a leak is suspected, all naked flames shall be removed/extinguished.

If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated (by means of shut off valves) in a part of the system remote from the leak.

DECOMMISSIONING

Removal and evacuation

When breaking into the refrigerant circuit to make repairs – or for any other purpose – conventional procedures shall be used. However, for flammable refrigerants it is important that best practice be followed, since flammability is a consideration. The following procedure shall be adhered to:

a. Safely remove refrigerant following local and national regulations
b. Purge the circuit with inert gas
c. Evacuate
d. Purge with inert gas
e. Open the circuit by cutting or brazing

The refrigerant charge shall be recovered into the correct recovery cylinders if venting is not allowed by local and national codes. For appliances containing flammable refrigerants, the system shall be purged with oxygen-free nitrogen to render the appliance safe for flammable refrigerants. This process might need to be repeated several times. Compressed air or oxygen shall not be used for purging refrigerant systems.

For appliances containing flammable refrigerants, refrigerants purging shall be achieved by breaking the vacuum in the system with oxygen-free nitrogen and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum. This process shall be repeated until no refrigerant is within the system. When the final oxygen-free nitrogen charge is used, the system shall be vented down to atmospheric pressure to enable work to take place.
Ensure that the outlet for the vacuum pump is not close to any potential ignition sources and that ventilation is available.

Decommissioning

Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment and all its detail. It is recommended good practice that all refrigerants are recovered safely. Prior to the task being carried out, an oil and refrigerant sample shall be taken in case analysis is required prior to re-use of recovered refrigerant. It is essential that electrical power is available before the task is commenced.

a. Become familiar with the equipment and its operation.
b. Isolate the system electrically.
c. Before attempting the procedure, ensure that:
   i. Mechanical handling equipment is available, if required, for handling refrigerant cylinders;
   ii. All personal protective equipment is available and being used correctly;
   iii. The recovery process is supervised at all times by a competent person;
   iv. Recovery equipment and cylinders conform to the appropriate standards.
d. Pump down refrigerant system, if possible.
e. If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.
f. Make sure that cylinder is situated on the scales before recovery takes place.
g. Start the recovery machine and operate in accordance with instructions.
h. Do not overfill cylinders (no more than 80 % volume liquid charge).
i. Do not exceed the maximum working pressure of the cylinder, even temporarily.
j. When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off.
k. Recovered refrigerant shall not be charged into another REFRIGERATING SYSTEM unless it has been cleaned and checked.

DECOMMISSIONING

Labeling

Equipment shall be labeled stating that it has been decommissioned and emptied of refrigerant. The label shall be dated and signed. For appliances containing FLAMMABLE REFRIGERANTS, ensure that there are labels on the equipment stating the equipment contains FLAMMABLE REFRIGERANT.

Recovery

When removing refrigerant from a system, either for servicing or decommissioning, it is recommended good practice that all refrigerants are removed safely.

When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed. Ensure that the correct number of cylinders for holding the total system charge is available. All cylinders to be used are designated for the recovered refrigerant and labeled for that refrigerant (i.e., special cylinders for the recovery of refrigerant). Cylinders shall be complete with pressure-relief valve and associated shut-off valves in good working order. Empty recovery cylinders are evacuated and, if possible, cooled before recovery occurs.

The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of all appropriate refrigerants including, when applicable, FLAMMABLE REFRIGERANTS. In addition, a set of calibrated weighing scales shall be available and in good working order. Hoses shall be complete with leak-free disconnect couplings and in good condition. Before using the recovery machine, check that it is in satisfactory working order, has been properly maintained and that any associated electrical components are sealed to prevent ignition in the event of a refrigerant release. Consult manufacturer if in doubt.

The recovered refrigerant shall be returned to the refrigerant supplier in the correct recovery cylinder, and the relevant waste transfer note arranged. Do not mix refrigerants in recovery units and especially not in cylinders.

If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that FLAMMABLE REFRIGERANT does not remain within the lubricant. The evacuation process shall be carried out prior to returning the compressor to the suppliers. Only electric heating to the compressor body shall be employed to accelerate this process. When oil is drained from a system, it shall be carried out safely.

For Customer Care

To aid in reporting this unit in case of loss or theft, please record below the model number and serial number located on the unit. We also suggest you record all the information listed and retain for future reference.

MODEL NUMBER	_____	SERIAL NUMBER	_____
DATE OF PURCHASE	_____		
DEALER	_____	TELEPHONE	_____
SERVICER	_____	TELEPHONE	_____

Your Solutions Partner

Duke Manufacturing Co.
2305 N. Broadway
St. Louis, MO 63102

Phone: 314-231-1130
Toll Free: 1-800-735-3853
Fax: 314-231-5074

www.dukemfg.com