SERVICE MANUAL

Even Thaw Reach-In Refrigerator Service Manual

This manual is applicable for all models using:

R-450-A Refrigerant

RE132E/ RET132EUT One Section Even-Thaw
RE232E/ RET232EUT
RE232N/ RET232NUT Two Section Even-Thaw
RE232L/ RET232LUT
RE232E Two Section Hi-Capacity Mega-Thaw

Please Note: This manual is intended for use with the above referenced equipment manufactured in or after 2023. To obtain a copy of the correct Service Manual to support the same products manufactured prior to this date, please contact Traulsen Service at **(800) 825-8220.**

4401 Blue Mound Road Fort Worth, Texas 76106 (USA)
Phone: 800.825.8220 | E-mail: service@traulsen.com | Website: traulsen.com
Form Number: TR00369 | Revision Date: 6-2024

Hours of Operation: Monday - Friday 7:30 a.m. - 4:30 p.m. (CST)

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1. Introduction

Traulsen provides this manual as an aid to the service technician in installation, operation, and maintenance. When used properly, this service manual can help the service technician maintain, troubleshoot, and diagnose the majority of issues that may occur. While we believe that most aspects of service are covered in this manual, should you encounter a condition not addressed, please contact:

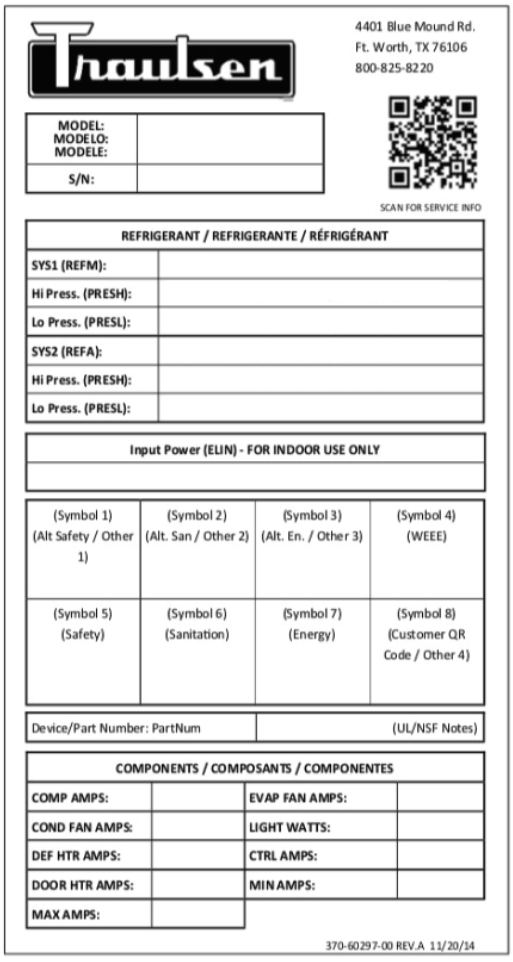
ITW Refrigeration
Traulsen
4401 Blue Mound Road
Fort Worth, Texas 76106

Attn: Service Department
Call for Technical Support:
Tel: **(800) 825-8220**
Email: **service@traulsen.com | p19parts@traulsen.com**

IMPORTANT: To improve your service communication experience, be sure to have the following available when contacting technical support:

Serial Number
Model Number
A detailed description of the issue

1.1 The Serial Tag


Traulsen
4401 Blue Mound Rd.
Ft. Worth, TX 76106
800-825-8220

MODEL: MODELO: MODELE:	
S/N:	

SCAN FOR SERVICE INFO

REFRIGERANT / REFRIGERANTE / RÉFRIGÉRANT	
SYS1 (REFM):	
Hi Press. (PRESH):	
Lo Press. (PRESL):	
SYS2 (REFA):	
Hi Press. (PRESH):	
Lo Press. (PRESL):	

Input Power (ELIN) - FOR INDOOR USE ONLY

(Symbol 1) (Alt Safety / Other 1)	(Symbol 2) (Alt. San / Other 2)	(Symbol 3) (Alt. En. / Other 3)	(Symbol 4) (WEEE)
(Symbol 5) (Safety)	(Symbol 6) (Sanitation)	(Symbol 7) (Energy)	(Symbol 8) (Customer QR Code / Other 4)

Device/Part Number: PartNum	(UL/NSF Notes)

COMPONENTS / COMPOSANTS / COMPONENTES			
COMP AMPS:		EVAP FAN AMPS:	
COND FAN AMPS:		LIGHT WATTS:	
DEF HTR AMPS:		CTRL AMPS:	
DOOR HTR AMPS:		MIN AMPS:	
MAX AMPS:			

370-60297-00 REV.A 11/20/14

Fig. 1.1 Sample Serial Tag

*****All parts are optional, based on make/model*****
****(Part Numbers are subject to change)****

1.2 Serial Tag & Location

The serial tag is a permanently affixed label on which is recorded vital electrical and refrigeration data about your Traulsen product, as well as the model and serial number. This tag is in the upper left interior compartment of all Even Thaw refrigerator and freezer models.

1.2.1 Reading the Serial Tag

Model = The model number of your Traulsen unit

Serial (S/N) = The permanent ID number of your Traulsen unit

Refrigerant SYS1 = System 1 refrigerant type used and refrigerant charge

Design Pressure = System 1 high and low pressure

Refrigerant SYS2 = System 2 refrigerant type used and refrigerant charge

Design Pressure = System 2 high and low pressure

Volts = Voltage

Hz = Cycle

PH = Phase

Total Current = Maximum amp draw

Minimum Circuit Amps = Minimum circuit ampacity

Lights = Light wattage

Agency Labels = Designates agency listings

Components = Component ratings

NOTE: Design pressure is the maximum pressure system components can handle and NOT the operating pressure.

1.3 Understand Even Thaw Model Numbers

R-Series Reach-In Even-Thaw Models

II. b - MODEL DESIGNATIONS:
The first letter indicates the series, "R"
R = Stainless Steel Exterior & Interior

The next two letters indicate the product type
ET = Even-Thaw Refrigerator

The first number indicates the number of sections
2 = Two Section

The next two numbers indicates the product depth
32 = 32" Deep Over Body (not including hardware)

The next letter indicates the product width
N = 2 Section: 52-1/8"

If "UT" is present the product is self-contained. If "UT" is not present the product is remote.

Fig. 1.3
R-450A Even Thaw Reach-in Model Numbers
(See Product Reference Guide TR35700)

1.4 Reading Traulsen Serial Number

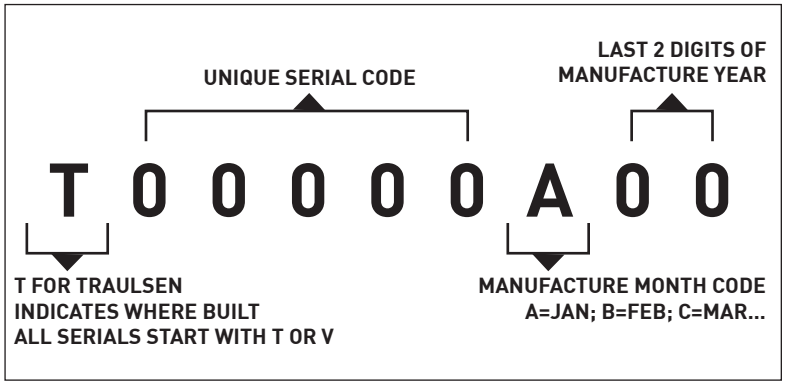


Fig. 1.4a
FORMAT IF MANUFACTURED BEFORE APRIL 2021

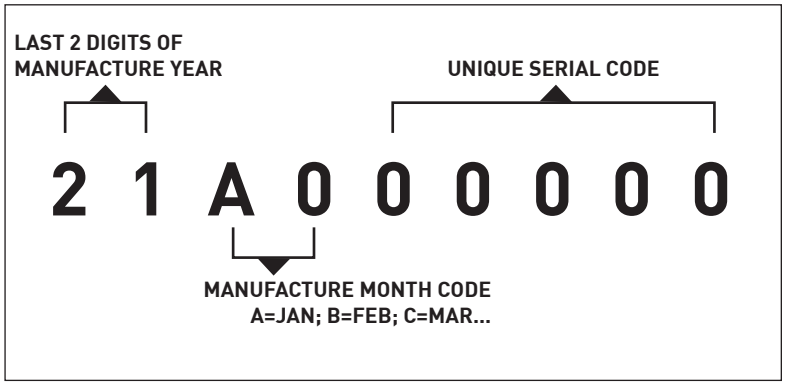


Fig. 1.4b
FORMAT IF MANUFACTURED AFTER APRIL 2021

1.5 Refrigerants

1.5.1 Terminology

Zeotropic Blend = A mixture of two or more refrigerants that have different boiling points that evaporate or condense together. All 400 series refrigerants are zeotropic blends.

Azeotropic Blend = A mixture of two or more refrigerants that boil at the same temperature so that they evaporate and condense together. All 500 series refrigerants are azeotropic blends.

Temperature Glide = The temperature difference between the the starting and ending temperature of a refrigerant phase change within a system at a constant pressure. This can be seen on a Pressure Temperature chart as the difference between bubble and dew temperatures.

Fraction of Refrigerant = The change in composition of a blend because one or more of the components is lost or removed faster than the others.

Bubble Point = The temperature at which the liquid of a refrigerant blend starts to boil.

Dew Point = The temperature at which the vapor of a refrigerant blend starts to condense.

Superheat = The heat added to a refrigerant after its saturation point or heat added after a refrigerant boils

Subcooling = The heat removed from a refrigerant after its saturation point or heat removed after a refrigerant condenses.

1.5.2 R-450A Refrigerant

R-450 refrigerant is a refrigerant Traulsen uses in medium temperature applications. This refrigerant is technically a zeotropic blend, but has such a small temperature glide that is could be considered a near azeotropic blend.

42%	**R-134A**
58%	**R1234ze(E)**

Table 1.5.2a
R-450A Refrigerant Composition

When charging any Even Thaw refrigerator with R-450A refrigerant, care should be taken to weigh the proper amount of liquid refrigerant into the system according to the data plate. It is important to charge with refrigerant in a liquid state to avoid fractionating.

Pressure (psig)	Dew (°F)	Bubble (°F)
10	13.2	12.9
15	21.7	20.6
20	29.2	28.0
25	35.8	34.7
30	41.8	40.7
35	47.4	46.2
40	52.5	51.4
45	57.3	56.2
50	61.8	60.7
55	66.1	64.9
60	70.1	68.9
65	73.9	72.7
70	77.5	76.4
75	81.0	79.9
80	84.4	83.2
85	87.6	86.4
90	90.6	89.5
95	93.6	92.5
100	96.5	95.3
105	99.3	98.1
110	102.0	100.8
115	104.6	103.4

Table 1.5.2b
Pressure/ Temperature Chart for
R-450A Refrigerant

NOTE: Use the Dew temperatures when calculating superheat and bubble temperatures when calculating subcooling.

1.6 Shipping and Assembly

1.6.1 Location
Select a proper location for your Traulsen unit, away from extreme heat or cold. Allow enough clearance between the unit and the side wall in order to make use of the door stay open feature at 120° (self-closing feature operates up to 90°). The door(s) must be able to open a minimum of 90° in order to make use of the maximum clear door width available.

1.6.2 Packaging
All Traulsen units are shipped from the factory bolted to a sturdy wooden pallet and packaged in a durable cardboard container. The carton is attached to the wooden skid with the use of large staples. These should first be removed to avoid scratching the unit when lifting off the crate.

Most exterior stainless steel surfaces have a protective vinyl covering to prevent scratching during manufacturing, shipping and installation. After the unit is installed in place of service, remove and discard the covering from all surfaces.

To remove the wooden pallet, first if at all possible, we suggest that the cabinet remain bolted to the pallet during all transportation to the point of final installation. The bolts can then be removed with a 3/4" socket wrench. Avoid laying the unit on its front, side or back for removal of the pallet.

NOTE: DO NOT LAY THE UNIT ON ITS SIDE DURING

Transportation or Installation.
Roll-thru models also include special interior wood bracing, intended to protect the cabinet during shipment. This bracing should under no circumstances be removed prior to the unit being installed in its final location.

⚠ WARNING Read and review these instructions, in their entirety, BEFORE attempting to disassemble and remove the interior bracing. If either of the diagonal or upper ceiling braces are dropped, they could cause personal injury or damage to the equipment. To disassemble the bracing, first open the doors and carefully remove the banding that holds the two diagonal braces together.

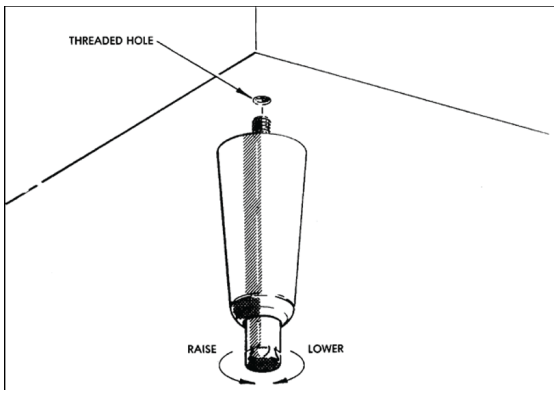
⚠ WARNING The diagonal braces will now be loose and can fall out of position and possibly permit the ceiling corner brace to fall.

Carefully remove one diagonal brace while supporting the ceiling corner brace, so that it does not fall. Next, remove the ceiling brace, the remaining diagonal brace, and lastly the floor brace - then discard. Repeat as necessary for each section of the unit.

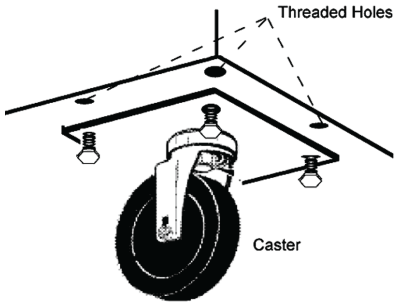
1.6.3 Installed Legs or Casters
6" High stainless steel legs are supplied standard for all Traulsen reach-in and pass-thru units. Casters in lieu of legs are available as an optional accessory for the same models. These are shipped from the factory packed inside a cardboard box which is strapped to one of the shelves. Remove the nylon strap and open the box, it should contain either four (4) legs or four (4) casters and sixteen (16) bolts.

⚠ WARNING THE CABINET MUST BE BLOCKED AND STABLE BEFORE INSTALLING LEGS OR CASTERS.

To install the legs or casters, first raise and block the reachin a minimum of 7" from the floor. For installing legs, thread the legs into the threaded holes on the bottom of the cabinet. Be certain that all legs are tightly secured (legs and casters should be tightened to 300 inch/pounds, max). When the unit is set in its final position, it is important for proper operation that the unit be level. The legs are adjustable for this purpose; turn the bottom of the leg counter- clockwise to raise it, clockwise to lower it. Level the unit from front to back as well as side to side in this manner, using a level placed in the bottom of the cabinet.



Please note that Traulsen units are not designed to be moved while on legs. If the unit requires moving, a pallet jack or forklift should be used to prevent damage. For installing casters, the casters are "plate" type, and require the use of four (4) bolts each to secure them firmly to the cabinet bottom at each corner. The caster bolts are tightened using a 1/2" socket wrench.



1.6.4 Shelf Pins

The unit is supplied with shelves and shelf pins installed. Check all shelf pins to assure they are tightened down as they may have come loose during shipping. Rotate the pins clockwise until they are secured against the side of the cabinet.

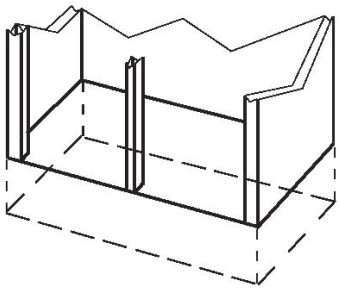
1.6.5 Roll-In Model Installation

Roll-in cabinets set on the floor require the floor area to be flat and level. In addition, after the cabinet is set in place, sealant should be used around the perimeter of the base to comply with National Sanitation Foundation requirements. After sealing the unit, the enclosed ramp should then be installed.

SEALING THE BASE OF ROLL-IN MODELS

A sealant must be used around the perimeter of the base of cabinet as shown to fully comply with sanitary requirements.

A recommended sealant is Dow Corning Silastic RTV



A stainless steel threshold ramp(s) is included to facilitate roll-in racks. It is shipped wrapped in brown paper and secured to the rack guides inside the cabinet. To secure it in place, remove the two thumb screws in the breaker strip near the bottom door opening. Next, loosen the thumb screws located along the floor at the threshold. Place the ramp(s) on top of the loosened thumb screws and secure tabs on each end to breaker strips with thumb screws previously removed. After installing the ramp(s), it too should be sealed to the floor.

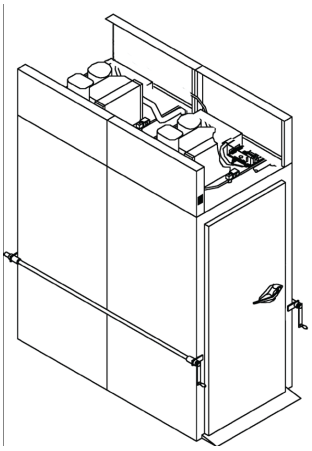
Bumper strips are secured to the back of roll-in models with thumb screws. Loosen these and make them finger tight to conform with the requirements of the National Sanitation Foundation (NSF).

1.6.6 Attaching Double Depth Units Together

Double depth roll-in/roll-thru units are shipped as two separate components which must be attached together at the jobsite. To accomplish this, first, place the front and rear cabinets in close proximity to each other being careful to align the drain from the front of the rear unit to the drain of the front unit. It will be necessary to level both units together at this time.

Next, using two pipe clamps, pull the units together. Install the covers over the gap formed between the units From inside the cabinets, using the screws provided, install the breaker strips using the strip as a template.

Using two pipe clamps, pull the two units together and using the screws provided. Align the breaker strips as a template for the screw pattern inside and outside the cabinet



1.6.7 Installing the Condensate Evaporator

A condensate evaporator is normally supplied on all self contained models (remote models require provision of either a floor drain or an optional condensate evaporator). On those models supplied with a top-mounted evaporator coil compartment, the condensate evaporator is also secured to the top of the cabinet. Check that the condensate pan is properly located underneath the drain tube.

NOTE: Some models, such as single section dual temperature refrigerator/freezers, are supplied with a bottom-mounted condensate evaporator. This is shipped in a cardboard carton secured to the cabinet interior, and must be PROPERLY installed prior to use (see instructions supplied with the condensate evaporator).

1. After the cabinet has been uncrated and the legs/casters attached, you must install the bottom-mounted condensate evaporator.
2. Locate the four (4) holes on the exterior bottom towards the rear of the cabinet.
3. Using the provided 10-32 screws, attach the mounting rails to the bottom, (the folded flange is to be turned up and be towards the drain line).
4. Slide condensate pan into the mounting rails.
5. Screw the "U-Trap" on to the drain line located on the rear of the cabinet.
6. Screw the drain extension into the "U-Trap".

NOTE: The use of the "U-TRAP" supplied is required. Failure to use this component may allow cold air to migrate down the drain line, resulting in condensation on the rear of the cabinet.

A remote model is normally supplied configured for condensate to be run to a floor drain unless purchased with a condensate evaporator. The installer is responsible for making the required extension to the floor drain in accordance with good practice and local regulations.

1.6.8 Remote Installation

Remote models are supplied without compressors, solenoid valves, etc. The correct voltage, amp listing and refrigerant are listed on the units serial tag. It is the responsibility of the installer to specify and supply the correct size compressor(s) based upon this information and on-site requirements. Refrigerant line installation must be done in accordance with good practice and local regulations. See section "1.6.7" for information concerning condensate removal for remote models.

1.6.9 Cord & Plug

Most self-contained models are supplied with a cord & plug attached. It is shipped coiled at the top of the cabinet, secured by a nylon strip. For your safety and protection, all units supplied with a cord and plug include a special three-prong grounding plug on the service cord. Select only a dedicated electrical outlet with grounding plug for power source.

NOTE: Do not under any circumstances, cut or remove the round grounding prong from the plug, or use an extension cord.

1.6.10 Power Supply

The supply voltage should be checked prior to connection to be certain that proper voltage for the cabinet wiring is available (refer to the serial tag to determine correct unit voltage). Make connections in accordance with local electrical codes. Use qualified electricians.

Use of a separate, dedicated circuit is required. Size wiring to handle indicated load and provide necessary over current protector in circuit (see amperage requirements on the unit's serial tag).

1.6.11 Wiring Diagram

Refer to the wiring diagram for any service work performed on the unit. Should you require one, please contact Traulsen Service at **(800) 825-8220**, and provide the model and serial number of the unit involved.

1.6.12 Clearance

In order to assure optimum performance, the condensing unit of your Traulsen unit MUST have an adequate supply air for cooling purposes. Therefore, the operating location must either have a minimum of 12" clearance overhead of the condensing unit or allow for unrestricted air flow at the back of the unit. Clearance of at least 12" above is required in order to perform certain maintenance tasks.

1.6.13 Cleaning the Exterior

Exterior stainless steel should be cleaned with warm water, mild soap and a soft cloth. Apply with a dampened cloth and wipe in the direction of the metal grain.

Avoid the use of strong detergents and gritty, abrasive cleaners as they may tend to mar and scratch the surface. Do NOT use cleansers containing chlorine, this may promote corrosion of the stainless steel.

Care should also be taken to avoid splashing the unit with water, containing chlorinated cleansers, when mopping the floor around the unit.
For stubborn odor spills, use baking soda and water (mixed to a 1 TBSP baking soda to 1 pint water ratio).

1.6.14 Cleaning the Interior

For cleaning both stainless steel and anodized aluminum interiors, the use of baking soda as described in section "1.6.13" is recommended. Use on breaker strips as well as door gaskets. All interior fittings are removable without tools to facilitate cleaning.

1.6.15 Adjusting the Shelves

For shelves mounted on pins, first select the desired location and remove the white plastic covers in the interior back and sides by rotating them counter-clockwise. Remove the shelf pins by rotating them counter-clockwise. Install the pins in the desired location by rotating clockwise. Make sure the pin is securely tightened down. Do not over tighten. Slide the shelf into its new position, and replace the white plastic covers into the holes vacated by the shelf pins.

1.6.16 Replacing the Light Bulb

All Traulsen Even Thaw models are supplied with LED lighting with the exception of heated units. Optional tube style display lighting is available (except for sliding glass door models for which fluorescent lights are supplied standard).

The standard LED bulb is a 115 or 230 volt / 4-watt, T-6 intermediate clear refrigerator lamp. It is mounted at the top front of the cabinet at the center and is located behind a plastic light cover on refrigerator and freezer model.

Heated units (RHF/AHF/RIH/AIH/RDH/ADH/RIDH/AIDH) are equipped with a 115 or 230 volt / 25-watt, T-6 incandescent bulbs. LEDs have not evolved enough yet to take the heat. This bulb is shatterproof because these models do not include a plastic light cover.

To replace the bulb, first remove the light cover (if so equipped). This can be accomplished by squeezing it together on both sides until it comes free. Replace the light bulb, then squeeze both sides of the light cover together and replace in its original position.

1.6.17 Troubleshooting Guide

Before calling for service, please check the following:

Is the electrical cord plugged in?

Is the fuse OK or circuit breaker on?

Clean condenser coil?

Is the power switch on?

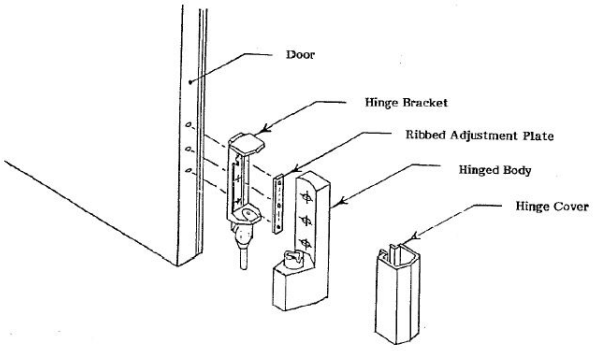
If after checking the above items and the unit is still not operating properly, please contact an authorized Traulsen service agent. A complete list of authorized service agents was provided along with your Traulsen unit. If you cannot locate this, you may also obtain the name of a service agent from the Tech Service page at traulsen.com. If service is not satisfactory, please contact our in-house service department at: Traulsen

4401 Blue Mound Road
Fort Worth, TX 76106
800.825.8220

Traulsen reserves the right to change specifications or discontinue models without notice.

1.6.18 Door Hinge Adjustments

All doors must be properly adjusted to insure they close properly. The door should close freely over the ramp. To remove the door, you will need to remove the safety screw in the bottom of all hinges. The door should lift off the cabinet at this point. There are three screws holding the hinge bracket to the cabinet. Loosen the three screws but do not remove them. You can now adjust the hinge up or down and side to side. Tighten the three screws and replace the door and safety screws. Open and close the door several times to make sure it closes freely.



Lock-keeper Adjustment

To adjust the lock-keeper, you will need to remove the two screws holding the lock-keeper. Loosen the two screws in the bracket mounted on the cabinet but do not remove them. The bracket can be move slightly from side to side. Tighten the screws in the bracket and replace the lock-keeper. Make sure the lock bolt catches the lock-keeper so the door can be locked.

1.6.19 Per Sanitation Standard: Commercial Refrigerators and Freezers, NSF/ANSI 7-2023

Traulsen products designed and manufactured to be sealed to the floor or counter shall be provided with written installation instructions that include the following:

- A statement indicating the equipment is required to be sealed to the floor or counter to establish proper sanitary operation; and
- Procedures for how the equipment is intended to be sealed to the floor or counter, indicating any recommended sealing materials and mounting surface characteristics; and
- A statement indicating that once sealed in accordance with these procedures, the result is intended to prevent liquid spillage on adjacent surfaces of the floor or counter top from passing under inaccessible portions of the equipment.

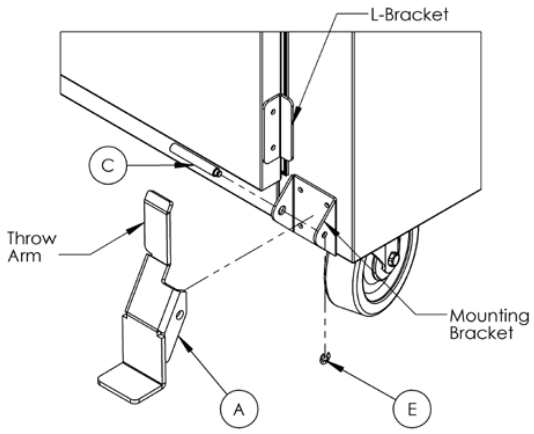
1.6.20 EZ-Open Foot Pedal

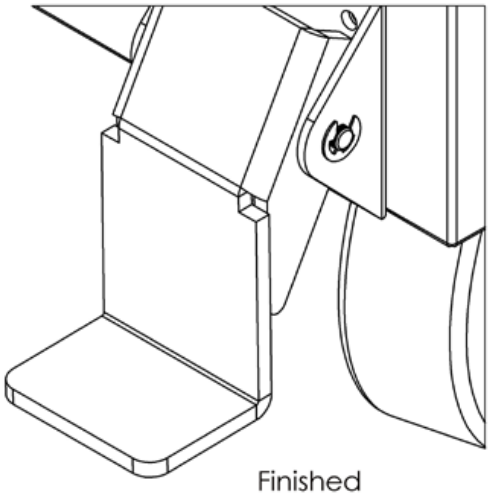
Installation Instructions

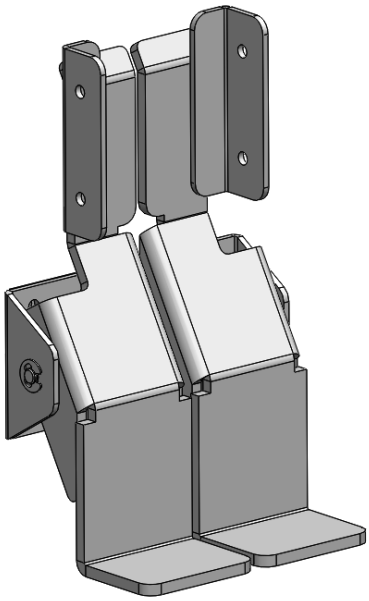
1 Foot Pedal Installation:
1) Install casters/legs before installing foot pedal
2) Remove ring E and pin C
3) Place foot pedal A in center of mounting bracket
4) Ensure Throw Arm is between unit and L-Bracket when door is in closed position
5) Insert pin C and attach ring E to secure

Item	Description
A	Foot Pedal Right Extended
B	Foot Pedal Left Extended
C	Pin Pivot Foot Pedal (1 foot pedal)
D	Pin Pivot Foot Pedal (2 foot pedal)
E	E-Style Retaining Ring

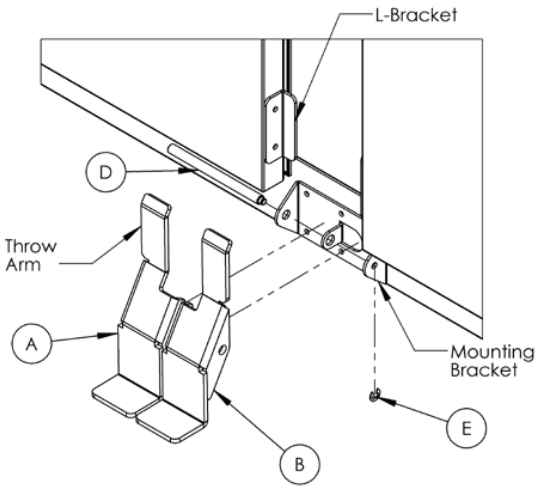
* **Brackets Factory Installed**
** **Pedal(s) Field Installed**

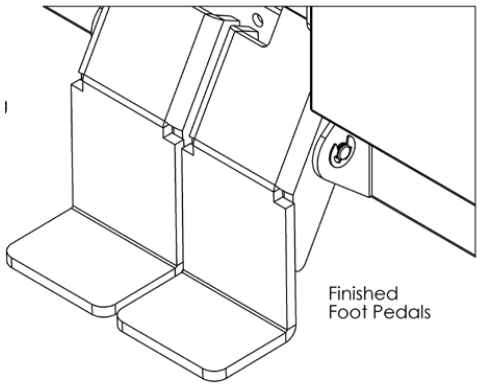






2 Foot Pedal Installation:
1) Install casters/legs before installing foot pedal
2) Remove ring E and pin D
3) Place foot pedals A and B in center of mounting bracket
4) Ensure Throw Arms are between unit and L-Brackets when door is in closed position
5) Insert pin D and attach ring E to secure





1.7 Even Thaw Operation

The Even-Thaw is designed to thaw product at safe temperatures. By keeping the cabinet temperature from rising above 40°F, the Even-Thaw inputs small amounts of heat while moving large volumes of air around the product. This design allows the product to thaw at temperatures that minimize bacteria growth. When in Even-Thaw mode, the refrigeration system is disabled and a second control adds enough heat to keep the cabinet at the upper limit of normal refrigerator temperatures. The rate at which the frozen product absorbs heat gradually slows as it warms. During the Even-Thaw process, the unit will continue to operate in this mode (refrigeration OFF, blower and heater ON) until the product being thawed can no longer absorb the heat as fast as it is being put into the cabinet. When this happens, the air temperature will slowly rise to 40°F at which time the heater will turn OFF and the refrigeration system will begin to cycle. As the refrigeration system begins to cycle the product continues to thaw. Based on the product being thawed and the way it is loaded, the end-user will have to determine how much time it takes to thaw each particular product.

1.7.1 Product Loading Guidelines: The Even Thaw is designed to be loaded top capacity for each Even Thaw Cycle.

When the unit is cycling at refrigerator temperatures (approximately 36°F to 39°F), load the cabinet with frozen product to be thawed. If possible, remove all packaging and place the product directly on aluminum sheet pans for optimum heat transfer. While it is possible to Even Thaw product that is wrapped, it will be slower than if it were unwrapped. At the very least the packaging should be opened to allow air to circulate. Also, it is not recommended to thaw product that is stored or packaged in cardboard boxes. Product should be placed on the pans in a single layer; each pan should be filled with as much product as can arranged with out the pieces touching each other. The cabinet should be loaded with as many pans as it will hold and still allow air circulation on all sides of the pan.

1.7.2 Starting the Even Thaw Cycle
With the cabinet filled with frozen product and the doors closed, the compressor will run until the air temperature falls to its lower set point. The blower will continue to run, circulating air across the frozen product, which will lower the air temperature further. At approximately 32°F, the unit will automatically switch to the Even-Thaw mode, disabling the compressor and enabling the heater. If the doors are not left open too long during the loading stage, this automatic switching to Even-Thaw mode normally takes 5 - 10 minutes. An amber light on the upper left hand face of the cabinet indicates Even-Thaw mode. Even-Thaw mode can also be initiated manually by the start button located between the green (refrigeration) and amber (Even Thaw) indicator lights.

1.7.3 Conclusion of Even Thaw Cycle

The Even-Thaw cycle will end automatically (return to refrigeration mode), when the air circulating in the cabinet reaches 40°F. At this point the unit can be used as a holding cabinet at refrigerator temperatures with no operator action required. If the unit is needed for thawing additional frozen product, all previously thawed product should be moved to another unit.

1.7.4 Interior Arrangements

Standard interior arrangements include Twenty Eight (28) specialty type tray slides and supports to accommodate two (2) 12.5" x30" pans per level.

Roll-in even-thaw models are designed to accommodate two (2) 27" wide by 29" deep by 66" high roll-in racks (measurements with wheels inboard of frame).

1.7.5 Test Parameters
To provide a general performance baseline, Traulsen performed some controlled testing in our lab which may provide the operator with an approximate idea on what to expect from their Even-Thaw unit. Full load batches of frozen product were used as follows:

One section models
336 lbs. of chicken, distributed between 14 tray levels. Each level consisted of 24 lbs. of product loaded into two pans (four 6 lb. pkgs. of frozen product total per level/two 6 lb. pkgs. per tray).

Two section models
672 lbs. of chicken, distributed between 28 tray levels. Each level consisted of 24 lbs. of product loaded into two pans (four 6 lb. pkgs. of frozen product total per level/two 6 lb. pkgs. per tray). 1008 lbs. of chicken, for two section mega-thaw loads.

1.7.6 Test Results:
Under these actual load parameters, the one-section model generally required approximately 15-19 hours in order to completely thaw the entire load. The two section model requires approximately 18-22 or mega-thaw models 22-24 hours to completely thaw the entire load.

1.7.7 Incomplete Thawing :
In operation, incomplete thawing (i.e. bags of product in which not every piece was completely thawed) has been found to usually be the result of those pkgs. Respective pan level having had restricted airflow due to overloading (from stacked pkgs. or irregular shaped packages that blocks air from getting to the pkgs. Closest to the cabinet interior side wall or rear). Allowing for proper air-flow around each pkgs. of frozen product should eliminate this situation from occurring.

1.7.8 Equipment issues:
If improper loading has been eliminated as a possible cause for extended thaw cycle times, there are several system checks which can be done to diagnose the Traulsen Even-Thaw unit. First, the amp draw should be checked early in the thaw cycle. This is a 1300 watt heater, 115 vac, is about 11.3 amps. Add 4 blowers at 1.1 amps and a few amps for the controls and the total amp draw should be approximately 16 to 16.5 amps. If your amp reading is different, call Traulsen technical support to help diagnose the problem.

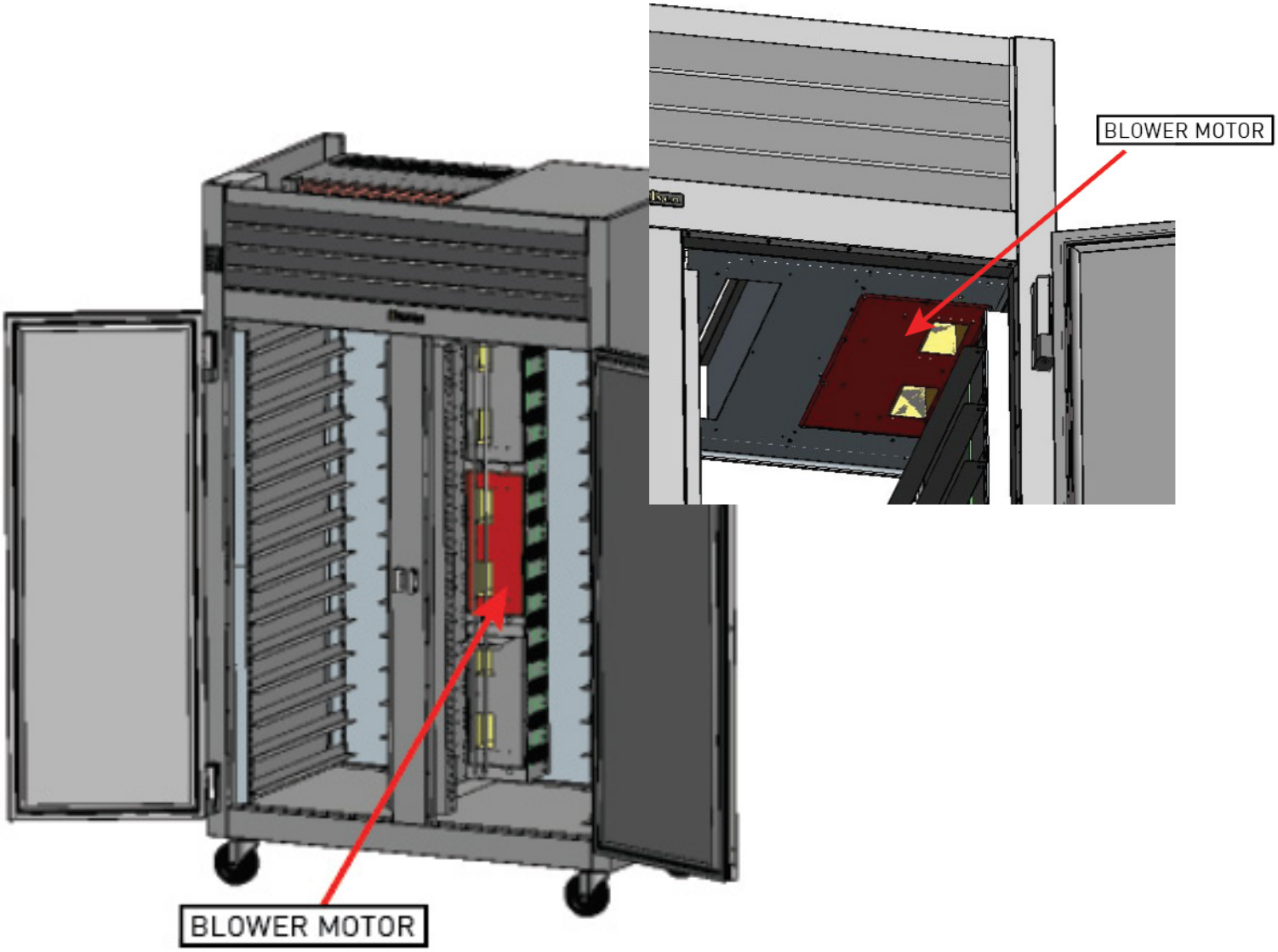
1. Starts in **Cooling Mode** (Refrigeration only)
   a. Heater off, Evaporator fan on, Aux fan off
   b. Compressor cut in 34°F
   c. Compressor cut out 36°F
   d. Defrost evaporator coil every hour

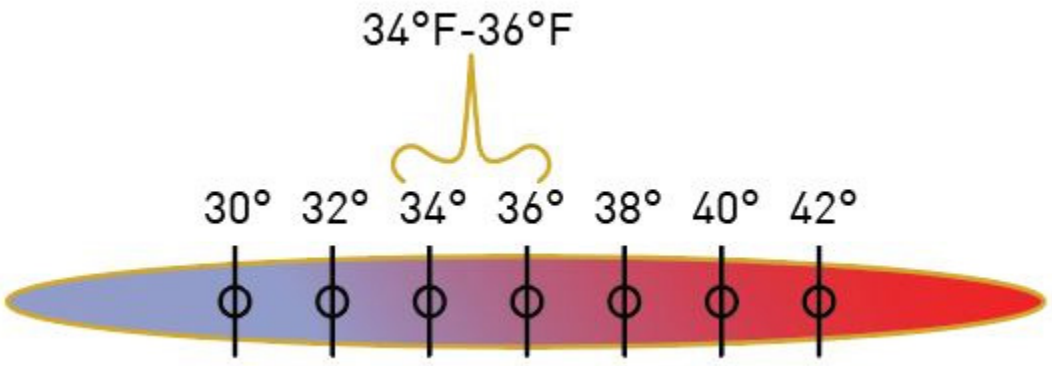
2. Starts **Thaw Mode** at 33°F
   a. All fans on
   b. Thaw heater full on 33°F-36°F
   c. Thaw heater pulsed 36°F-38.5°F

3. **Re-cooling Mode** starts at 39°F
   a. All fans on
   b. Compressor cut in 39°F
   c. Compressor cut our 37°F
   d. 8 hours duration
   e. Defrost Evaporator coil every hour

1.7.9 Cooling Mode

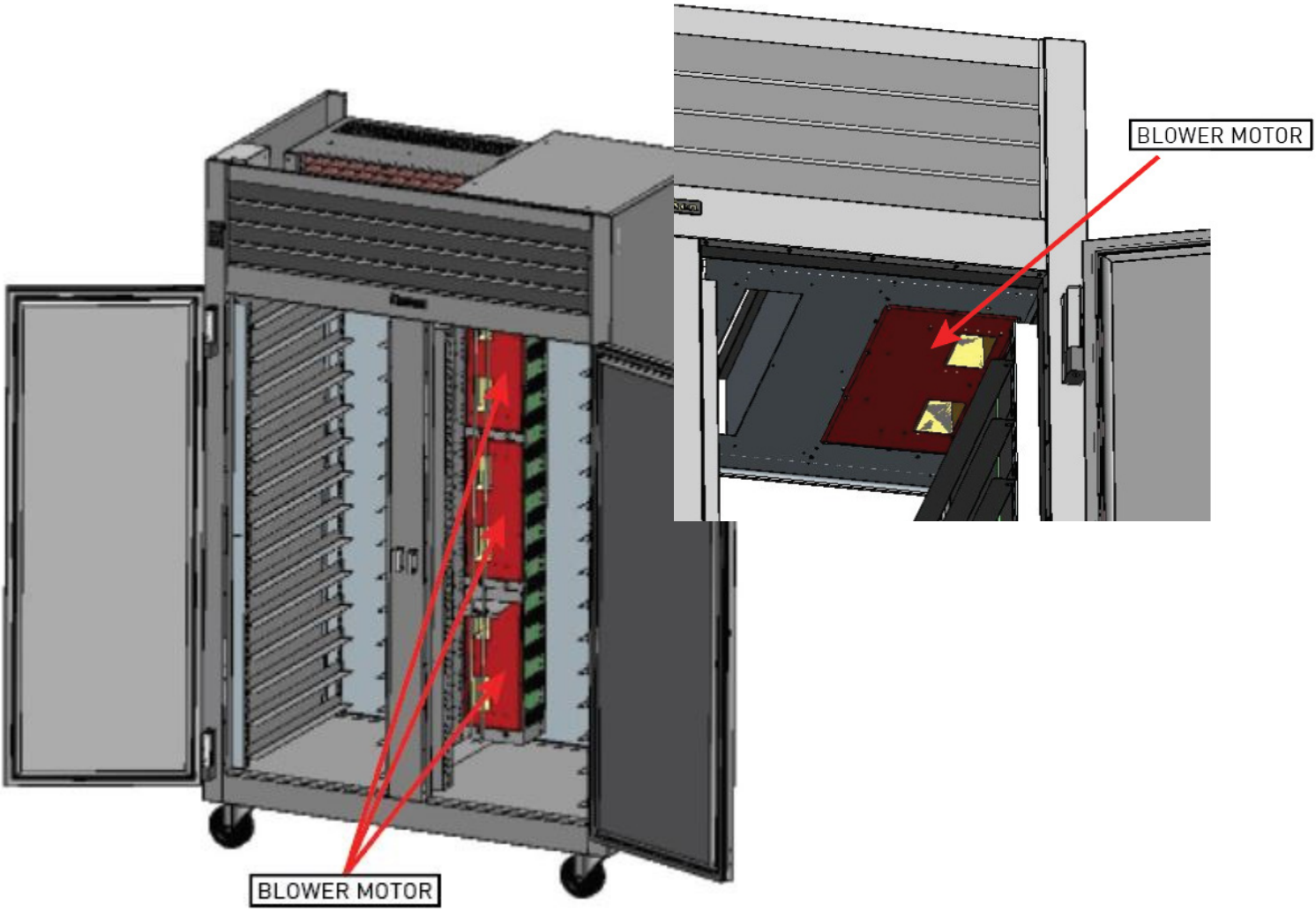
Evaporator Fan & Canter Cabinet Fan Only

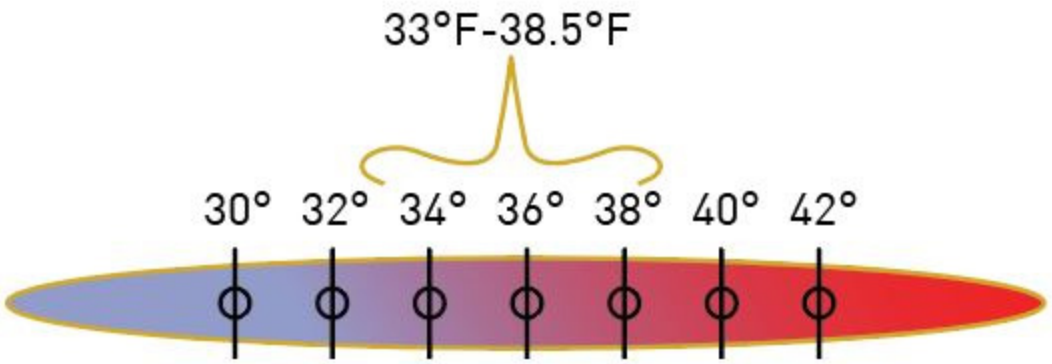




1.7.10 Thawing Mode

All Fan Motors in Use

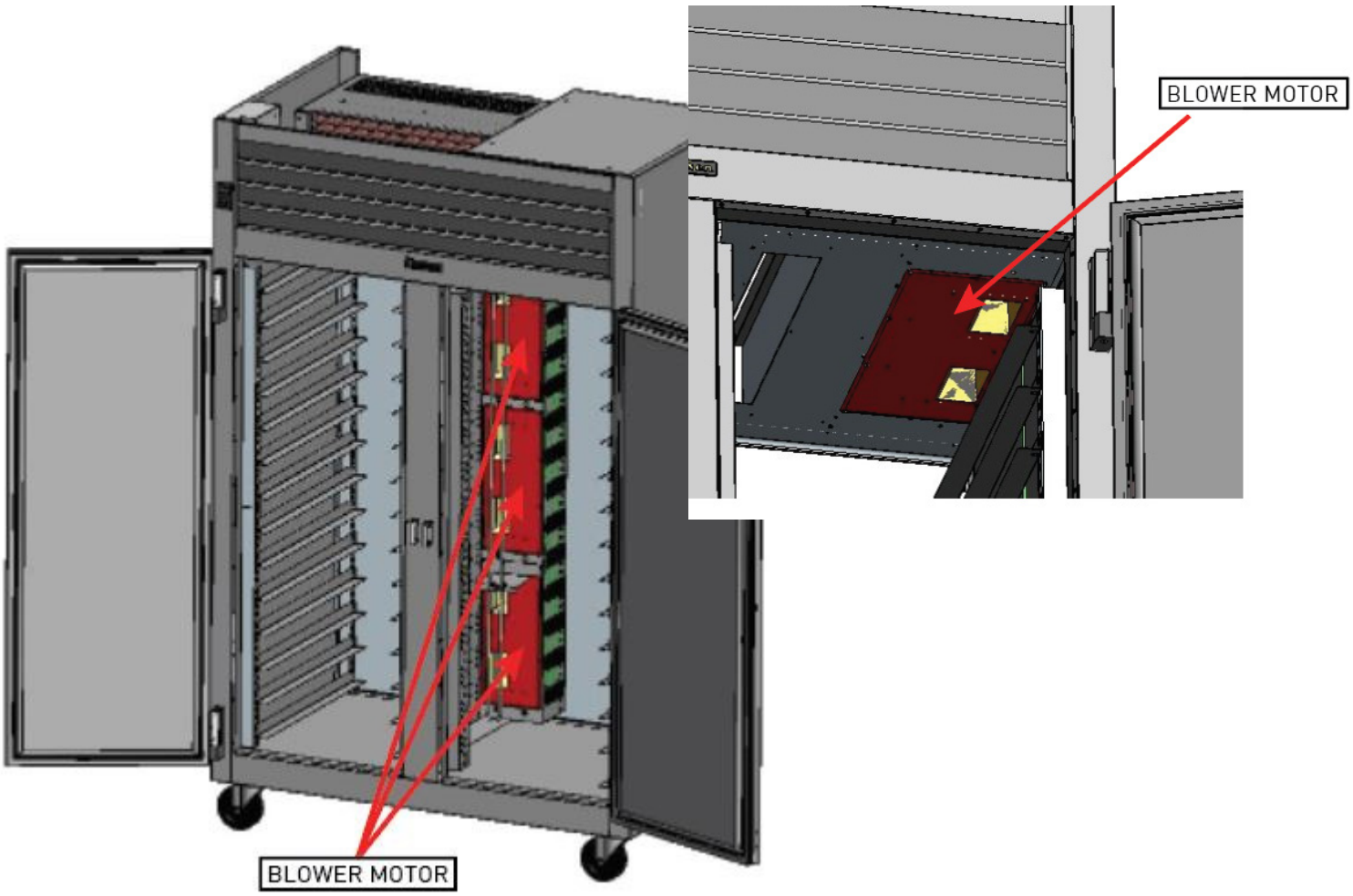


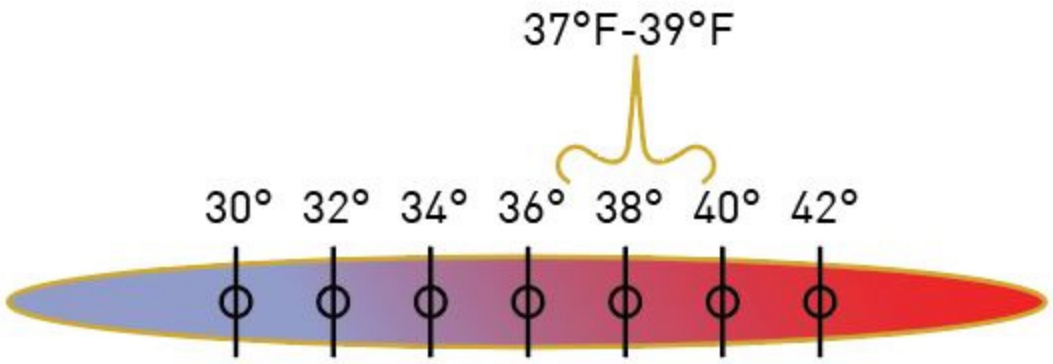


****Mega Thaw Models include an Additional Blower Motor****

1.7.11 Re-Cooling Mode

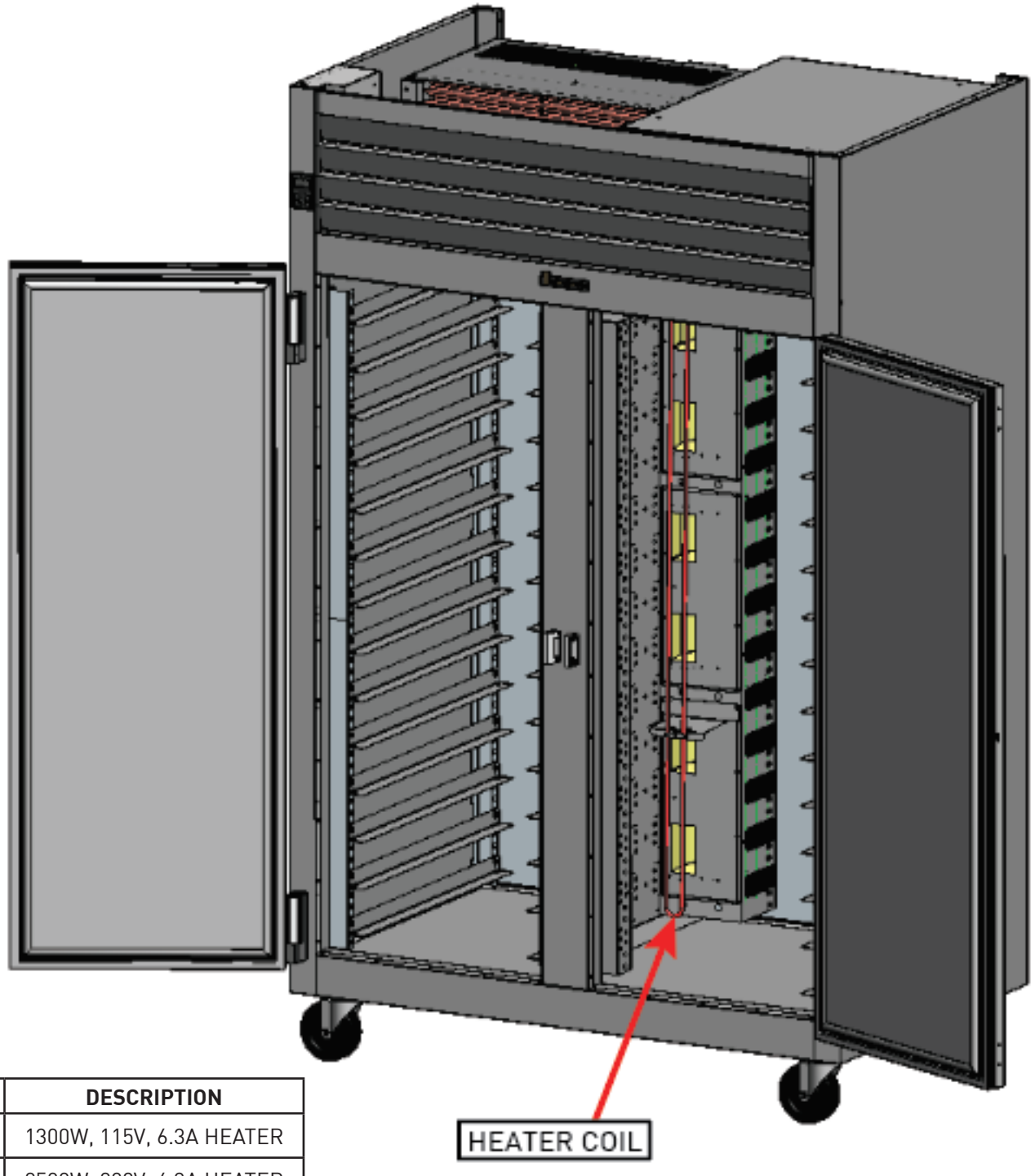
All Fan Motors in Use



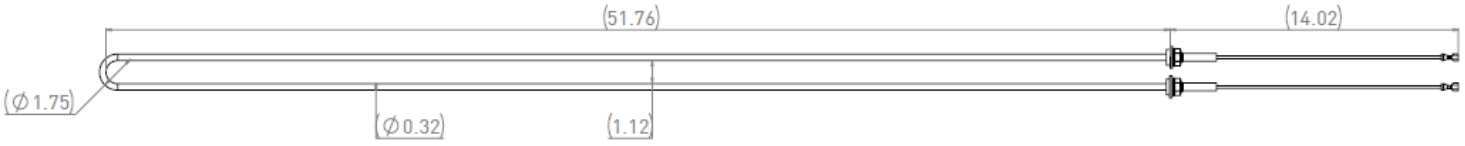


1.7.12 Heater

In the "Thawing" state all cooling activity ceases, the thaw heater is turned on 100% while the cabinet temperature is below 36° F When the cabinet temperature is between 36° F and 38.5° F (HSP) the heaters are pulsed, this is called the proportional band The heaters are turned off when the temperature rises above 38.5° F The unit transitions to the Re-cooling state when the cabinet temperature reaches 40° F (ThawSP+ThawSPDiff).



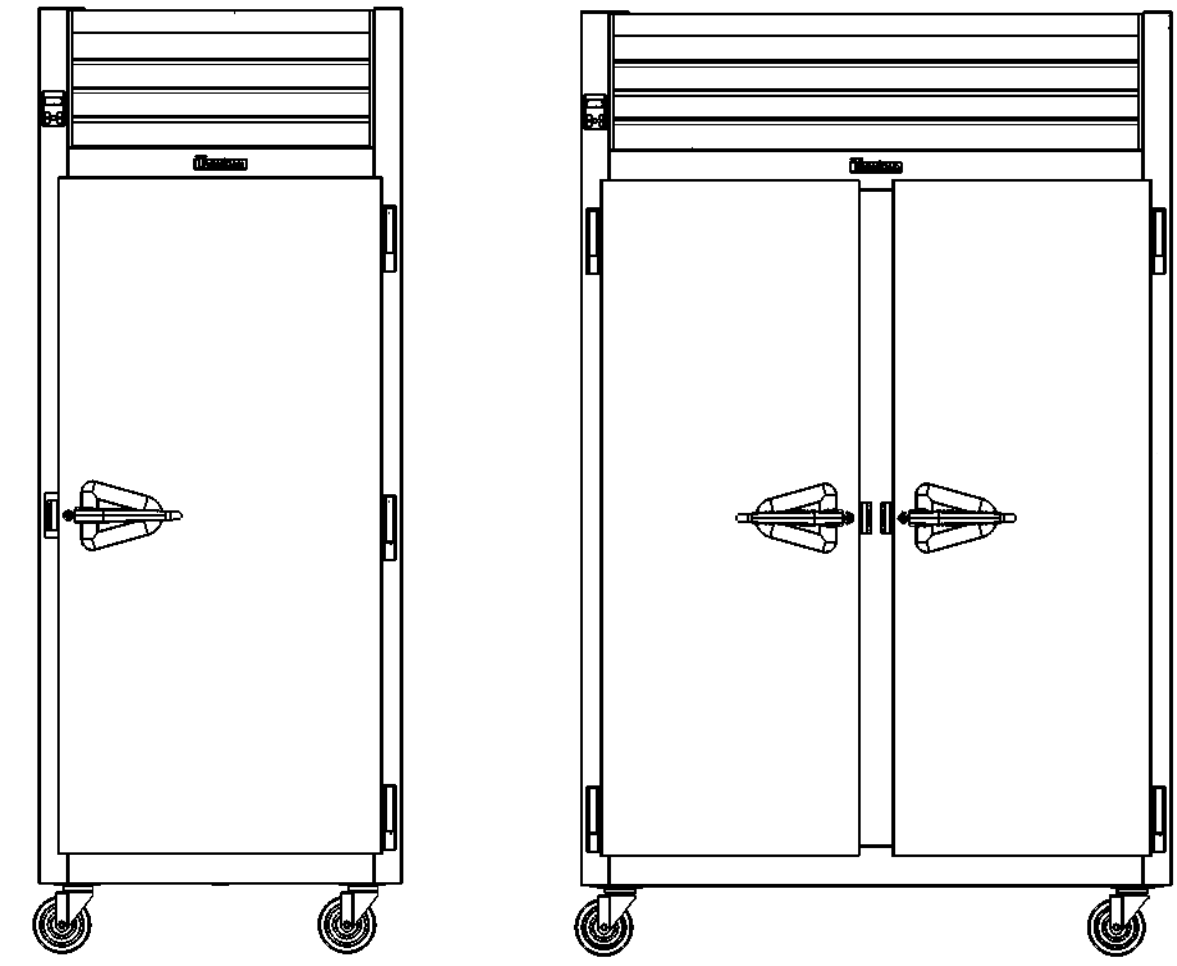
PART NUMBER	DESCRIPTION
329-60048-00	1300W, 115V, 6.3A HEATER
329-60048-01	2500W, 208V, 6.3A HEATER
329-60048-02	1300W, 208V, 6.3A HEATER



1.8 Specifications

DIMENSIONS	1 Section Cabinet	2 Section Cabinet
Height - Overall on 6" Casters	83-1/4" (211.4 cm)	83-1/4" (211.4 cm)
Width	32" (81.3 cm)	52-1/8" (132.4 cm)
Depth	35" (88.8 cm)	35" (88.8 cm)
Net Capacity cu. ft.	18.18	36.36

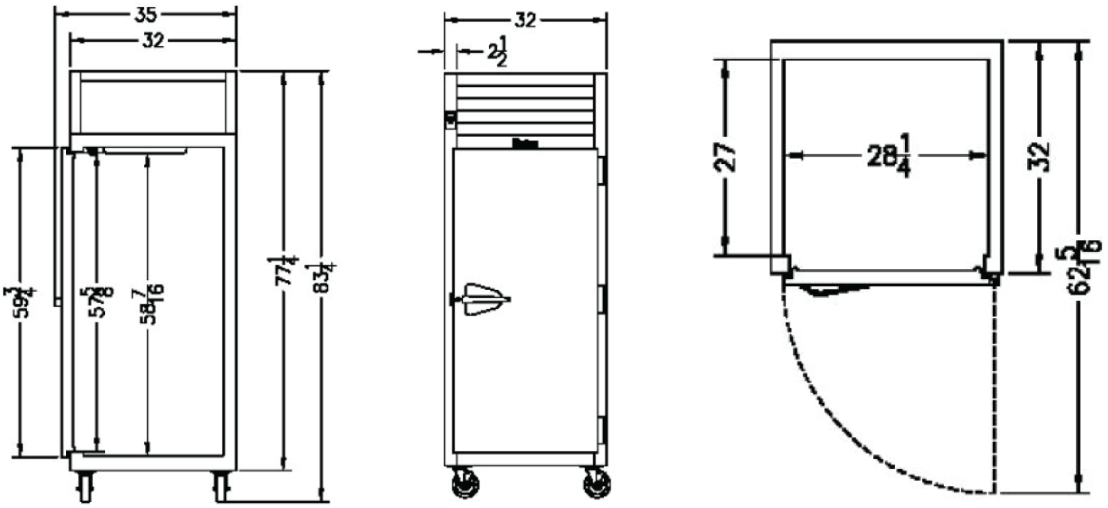
Table 1.8
TRAULSEN Cabinet Specifications



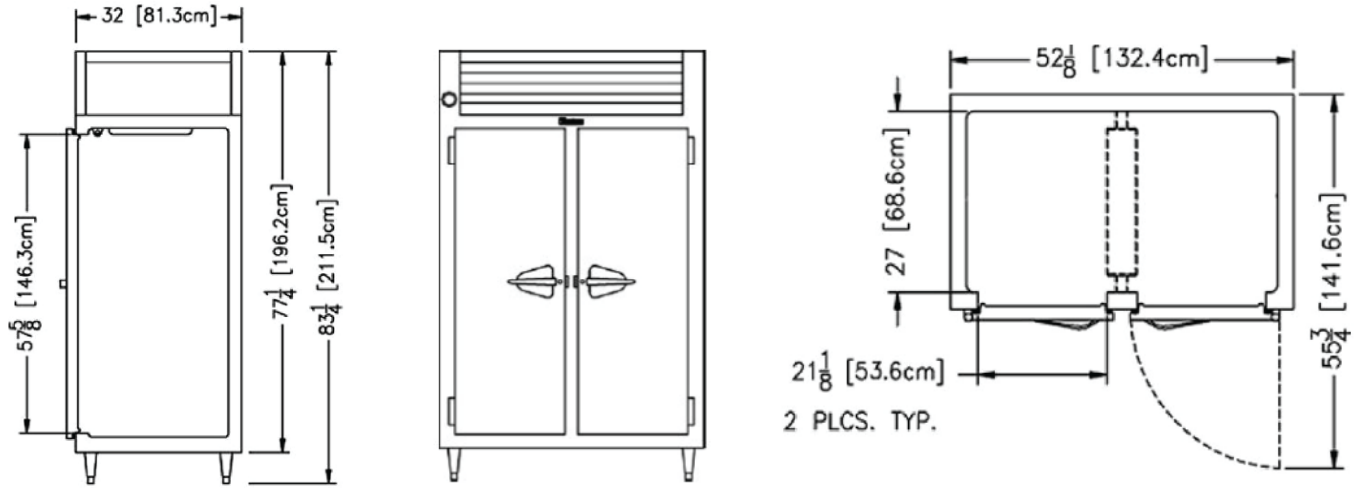
FRONT VIEW ONE SECTION CABINET

FRONT VIEW TWO SECTION CABINET

Fig. 1.8a
FRONT VIEW of 1&2 Section



ONE SECTION CABINET



TWO SECTION CABINET

Fig. 1.8b
1 & 2 Section Cabinets

2. Preventive Maintenance

This section is to inform the recommended preventive maintenance (PM) procedures.
Depending on application, PM schedule may vary.

2.1 Inspect & Clean Unit:

Why	Sanitation & prolong cabinet life	
Frequency	Daily	
Time required	3 minutes to prepare	3 minutes to complete
Preparation	Have a soft cloth. Baking soda & water mixed to a 1 TBSP (15mL) baking soda to 1 pint (473.2mL) water ratio.	
Cleaning	Apply with a dampened cloth, wipe in the direction of the metal grain. (Avoid the use of strong detergents and gritty, abrasive cleaners as they may tend to mar and scratch the surface. Do NOT use cleansers containing chlorine; this may promote corrosion of the stainless steel.)	
Inspection	Visually inspect the unit for signs of wear that may require repair.	

Table 2.1
Cleaning PM Procedure

2.2 Inspect & Clean Door Gasket:

Why	Long reliable service life
Frequency	Every 3 months
Time required	10 minutes to complete
Inspection	Open cabinet door(s) to inspect gasket. Pull gasket with hand & visually inspect gasket for tears, dirt, mold or wear. Clean with mild soap & water. **Do NOT use cleaners containing chlorine or chlorides.** Replace as needed. 341-60256-00 - Full-Height Gasket

Table 2.2
Door Gasket Cleaning PM Procedure

2.3 Clean Condenser Coil:

⚠ WARNING **Disconnect electrical power supply before cleaning any parts of the unit.**

Why	Long reliable service life, extended compressor life	
Frequency	Every 3 months	
Time required	5 minutes to prepare	15 minutes to complete

Table 2.3a
Condenser Cleaning PM Procedure

INSPECTING EVAPORATOR COIL DRAIN PAN & DRAIN:

Clear out any debris. Spray water on coil to ensure drain pan is flowing out of the drain.

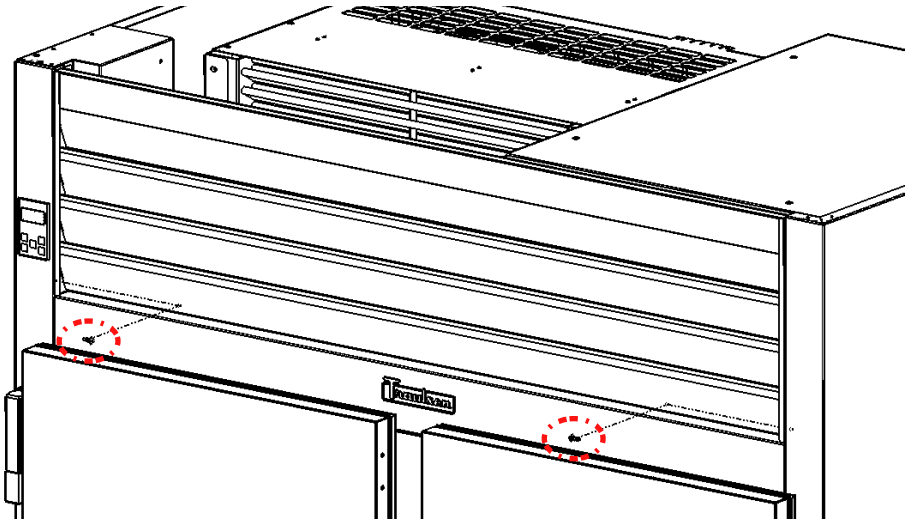
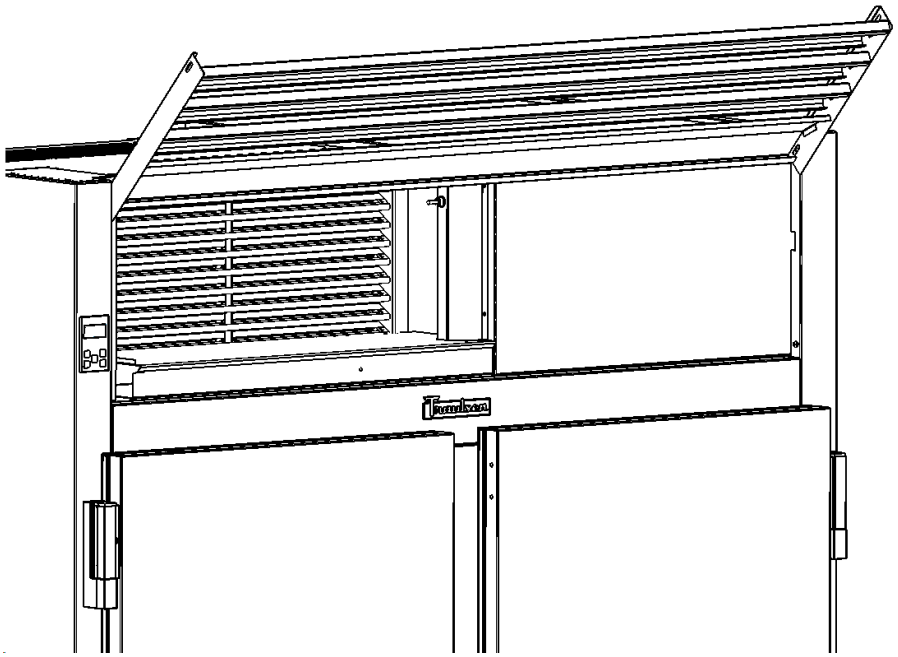
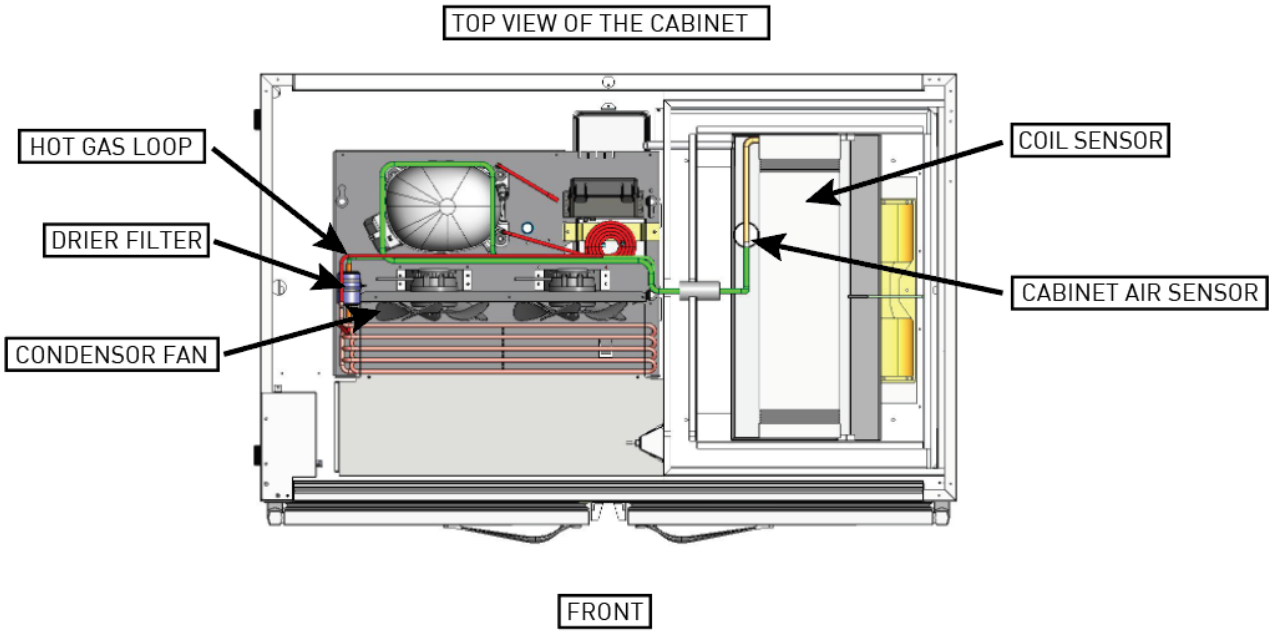
Preparation	  To clean the condenser, first disconnect electrical power to the cabinet and lift the front louver assembly. To lift this, remove the two screws located on both sides at the bottom of the louver assembly. Once the screws are removed, the panel can be pivoted upwards allowing full access to the front-facing condenser.
Cleaning	Use a soft bristle brush to remove any dirt, lint or dust from the finned condenser coil, around the compressor and other cooling system parts as indicated. Be sure to brush in the direction of the fins to prevent damage. If significant dirt is clogging the condenser fins, use compressed air to blow this clear. When finished, reverse the louver removal process as instructed above. **Compressor warranty claims will not be paid for units with dirty condensers.**

Table 2.3b
Condenser Cleaning PM Procedure



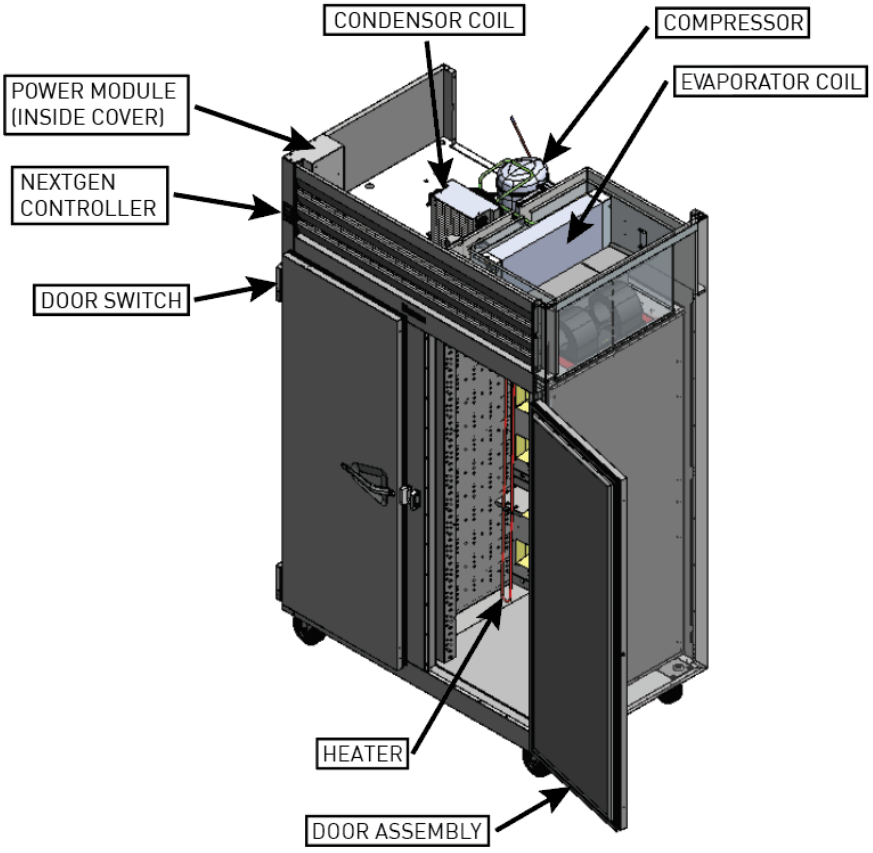


Fig. 2.3c
System View

3. Doors & Hardware

3.1 Hinges

3.1.1 Removing the Doors & Hardware

To fit through narrow (less than 35") doorways, it may be necessary to remove the door(s), and/or hinges. To remove any solid door, begin by removing the safety screw at the bottom of the top hinge which secures the door in place. Remove this with a #2 Phillips screwdriver and the door can then be lifted off the hinges. After removing the door, it may be necessary to remove the hinge assembly and hardware from the door itself. If it is necessary to remove the hing hardware from the cabinet, begin by removing the (3) Phillips-head screws which hold it in place. Set these components aside for later reassembly.

The lock keeper may also require removal to reduce the overall cabinet depth to 32".

First remove the lock keeper strike plate by removing the (2) Phillips-head screws which secure it in place- exposing the adjustment screws. Then remove both adjustment screws from the mounting plate. To reinstall the door and/or hinges, please reverse the appropriate sections of the preceding procedure.

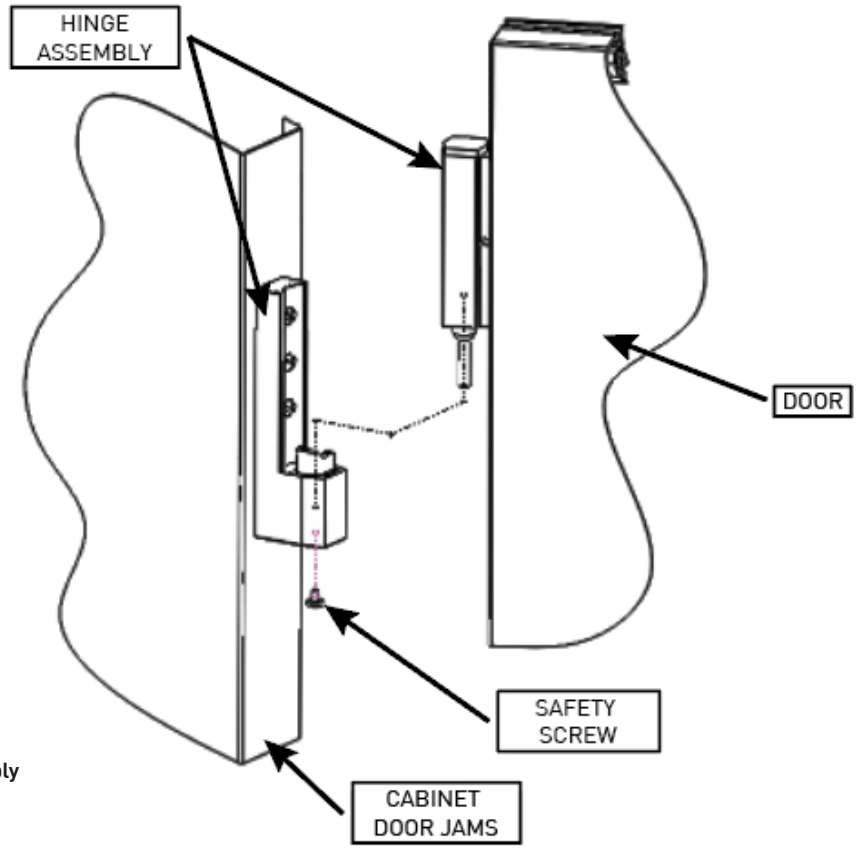


Fig. 3.1a
Hinge Assembly

WARNING

WHEN REMOVING DOORS ENSURE THEY ARE SET ASIDE IN A SECURE POSITION TO PREVENT FALL/SLIP THAT MAY CAUSE PERSONAL INJURY.

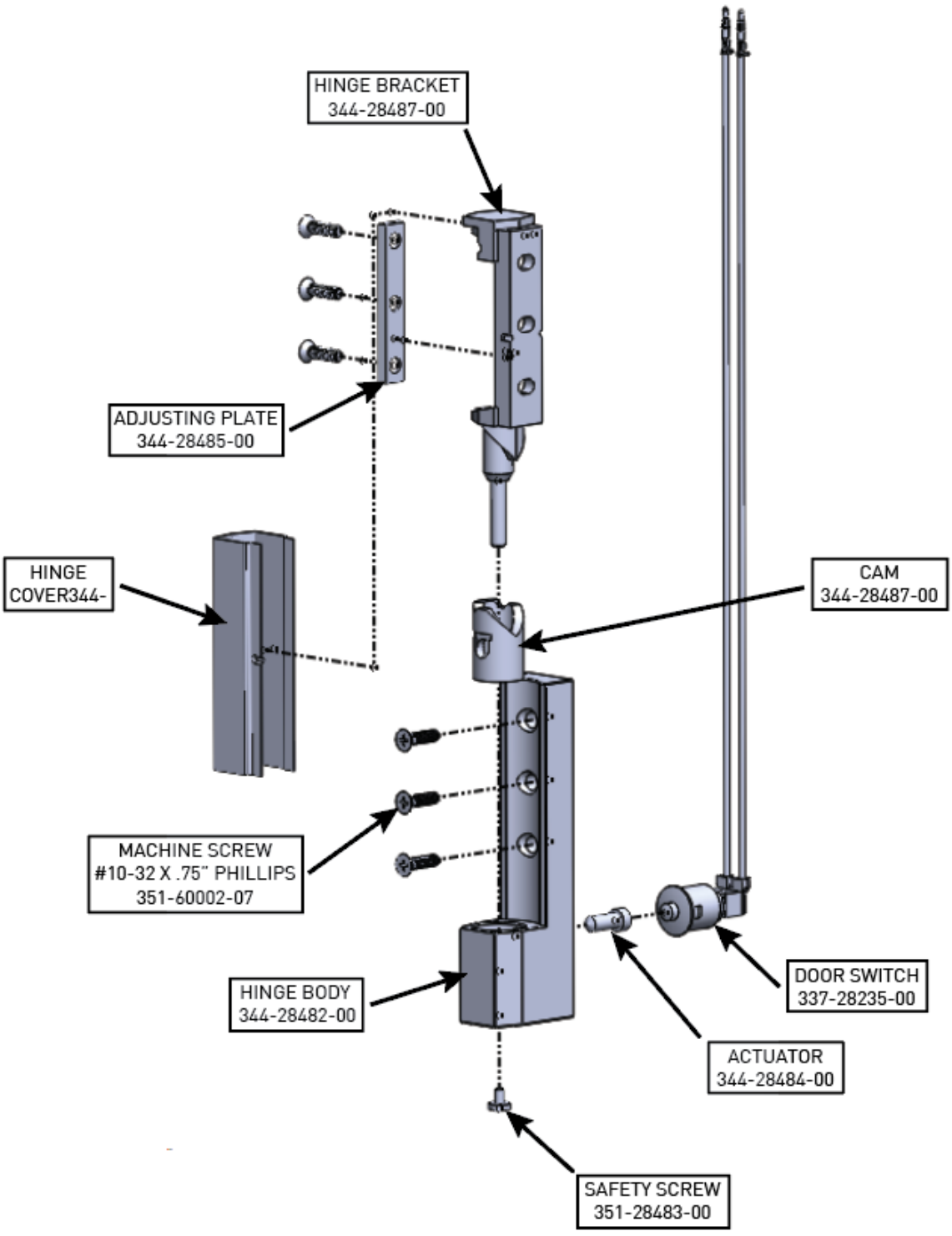


Fig. 3.1b
Hinge Exploded View

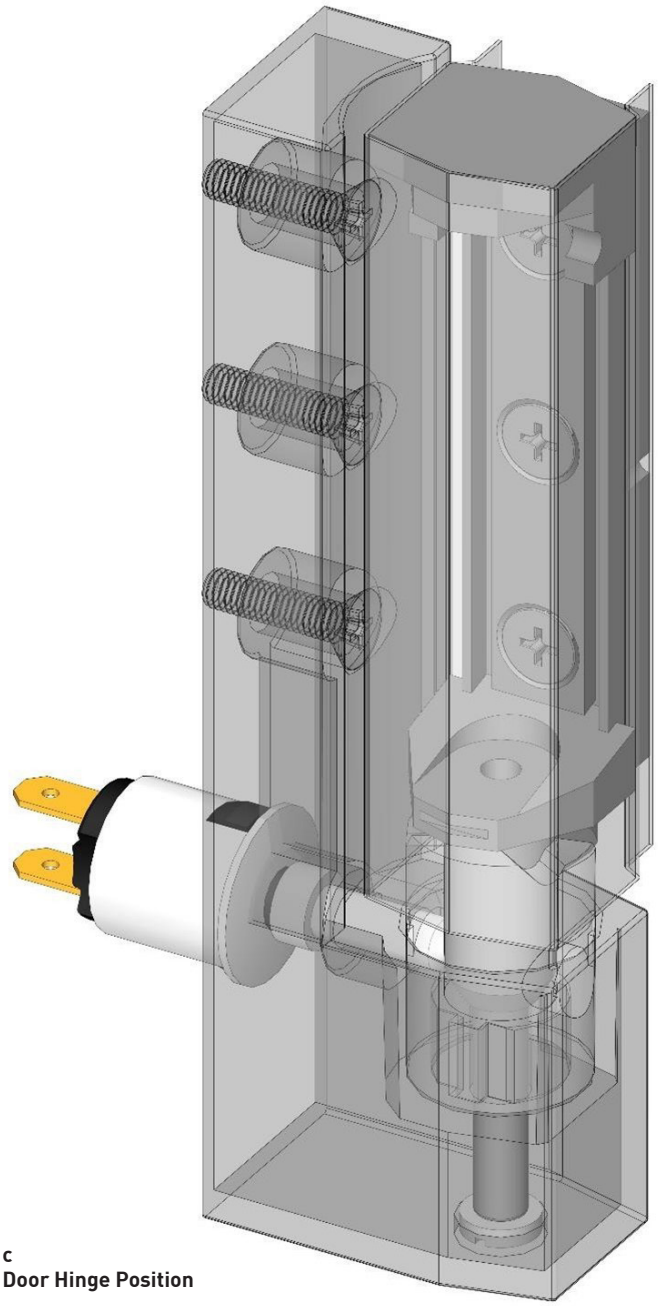


Fig. 3.1c
Closed Door Hinge Position

*** "Scan for Door Switch Troubleshooting & Service Videos!" ***

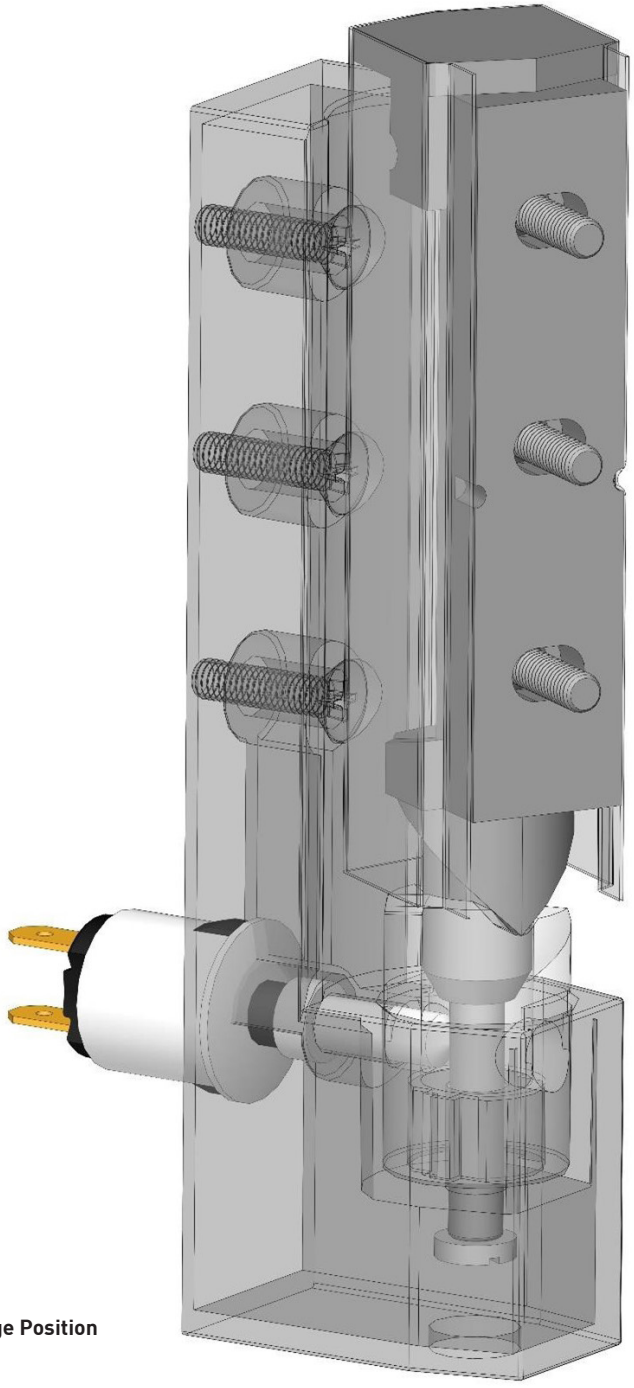


Fig. 3.1d
Open Door Hinge Position

Closing the Door:

The hinge bracket travels along the cam & the thicker portion of the hinge bracket stem **pushes the actuator** into the door switch, opening the circuit.

- Light turns off
- Fans come back on (if board is calling for fans)

Opening the Door:

The hinge bracket travels along the cam- exposing the thinner hinge bracket stem and the door switch pushes the actuator out, closing the circuit.

- Light turns on
- Fans turn off (this helps prevent ice buildup on evaporator coil from ambient air moisture)

3.2 Adjustments

Performing a Door Adjustment:

These instructions are intended to aid the technician in the field perform hinge adjustments and may not cover all situatuations that could arise. Final diagnosis of field-based equipment is the sole responsibility of the technician performing any work required.

1. Remove the hinge safety screw.
2. Remove the door and gently lay it on the floor to slide the hinge cover off of the hinge bracket.
3. Loosen the (3) bolts securing the hinge bracket to the door.
4. Install the door without hinge covers.
5. Position the adjusting plate to the desired fit, tighten the screws and replace the hinge covers.

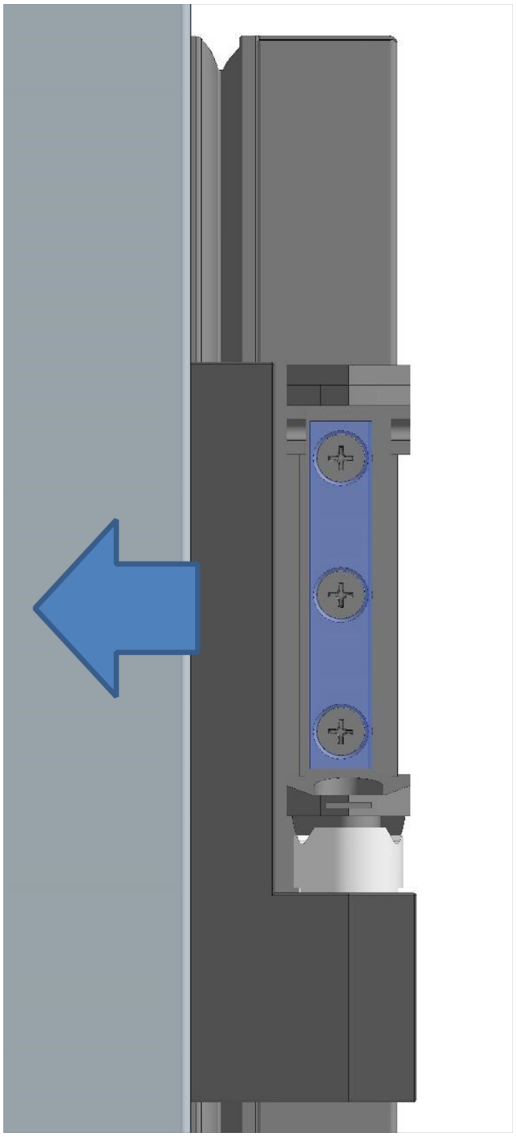


Fig. 3.2a
Door Adjustment Inward

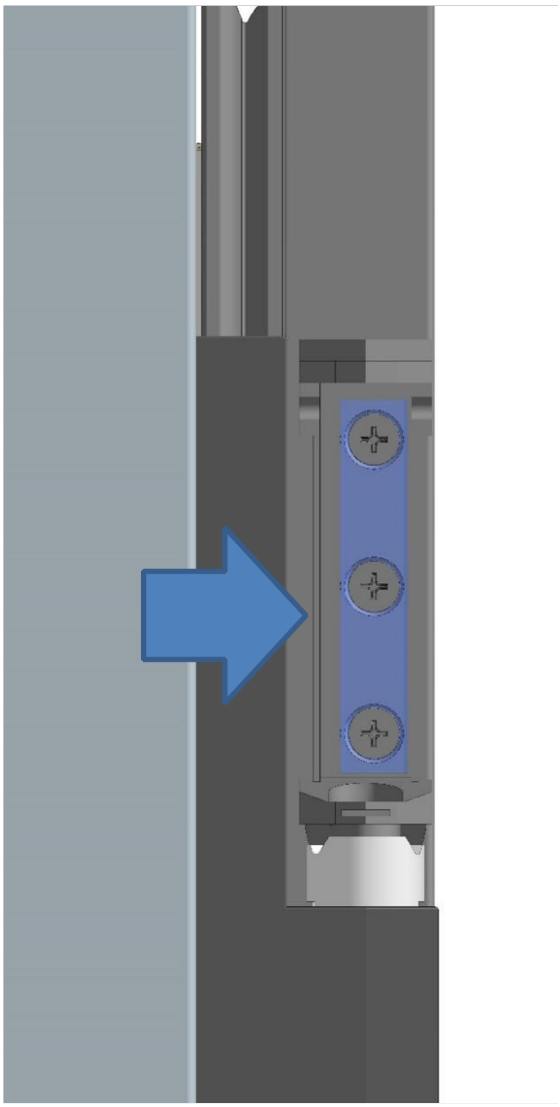


Fig. 3.2b
Door Adjustment Outward

3.3 EZ-Clean Gaskets

Door Gasket Replacement:

Remove an old gasket by grasping it firmly by one corner and pull it out. Install the new gasket by inserting all (4) corners first. After the corners are properly inserted, work your way towards the center from both ends- pushing the dart into the retainer until the gasket is completely seated in place. Check for a proper seal all the way around the door.

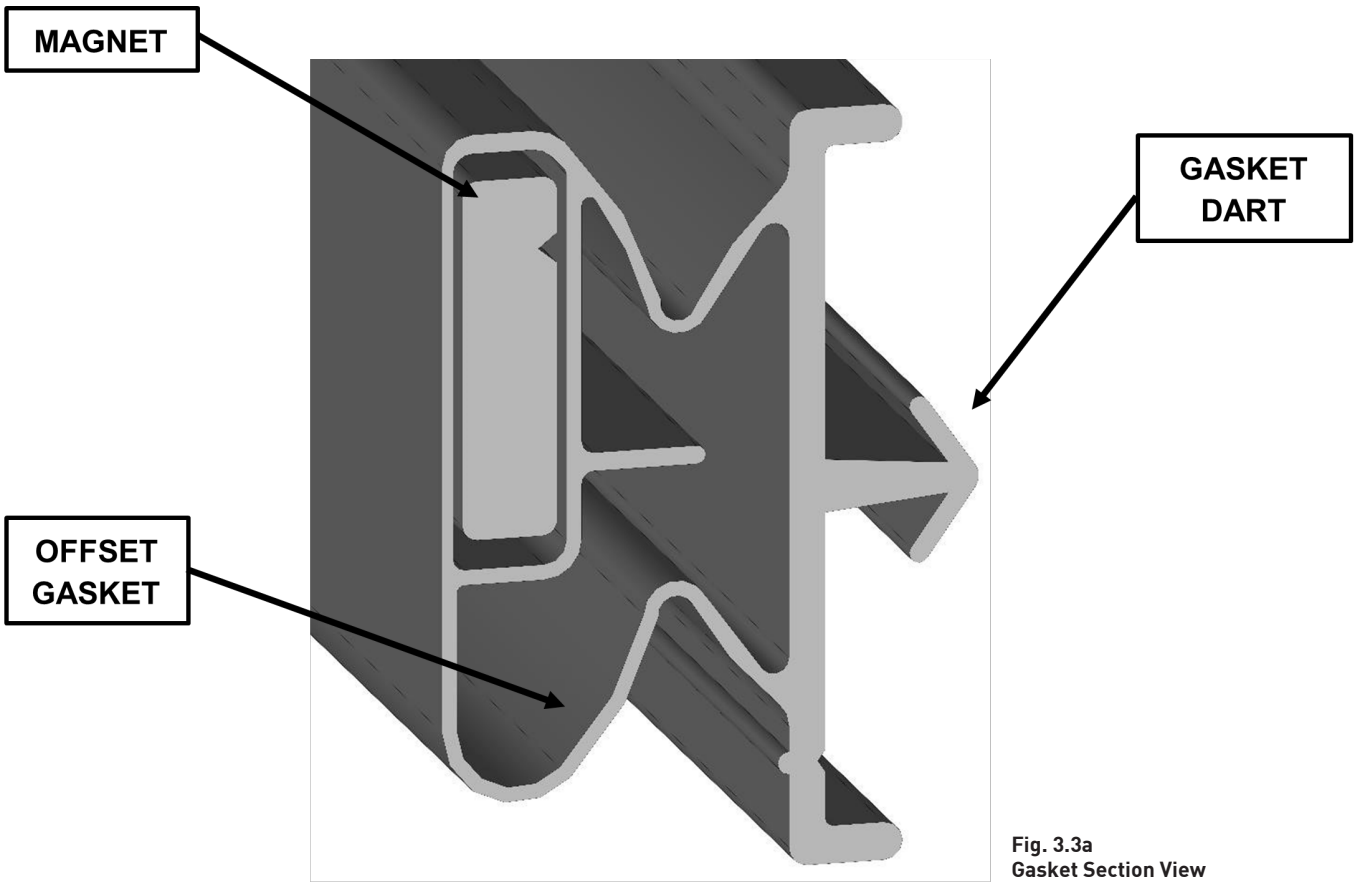


Fig. 3.3a
Gasket Section View

Description	Part Number
Door Gasket (28.527" x 59.75")	341-60273-00
Full-Height Door Gasket (22.814" x 59.75")	341-60256-00

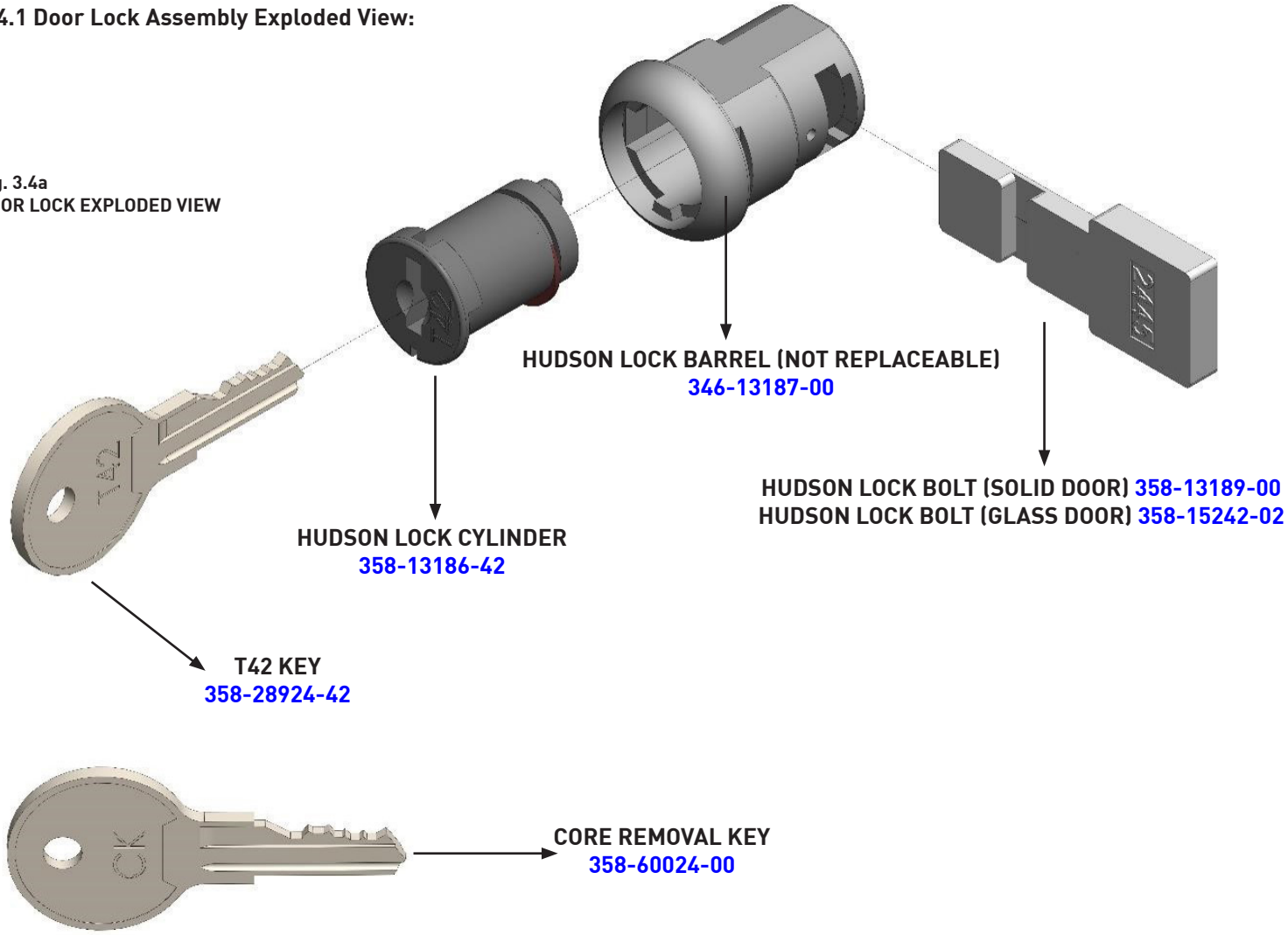
Table 3.3b
Door Gasket Part Numbers

***** "Scan for Gasket Installation & Service Videos!" *****

3.4 Locks

3.4.1 Door Lock Assembly Exploded View:

Fig. 3.4a
DOOR LOCK EXPLODED VIEW



NOTE: Core removal key should only be used to remove door lock assembly. A damaged Hudson lock barrel requires door replacement.

Service Kit Numbers:

Solid Door Lock Kit	SER-13186-42
Glass Door Lock Kit	358-13186-02

Table 3.4b
Door Lock Service Kit Part Numbers

3.4.2 Door Lock Replacement Instructions

Disassembly of Lock:
To remove the lock cylinder for replacement, insert the core removal key into the lock- causing the spline to lower so the lock cylinder can be removed. Move the key up & down, then pull backwards; the core key will pull the lock cylinder along with it. The lock bolt is now free to slide out of the lock barrel for replacement (if applicable).

Assembly of Lock:
Insert the lock bolt into the lock barrel until the groove in the bolt is approximately in the locked position. Insert the core removal key into the lock cylinder (causing the spline to lower) and insert the lock cylinder into the lock barrel **(NOTE: Lock stud must be lined up with lock bolt groove)**. Use one hand to firmly hold the lock cylinder in place, then remove the core key with the other (causing spline to rise & securing lock cylinder).

NOTE: Lock barrel is assembled to the door during production at the factory. A damaged lock barrel requires door replacement. Core removal key should only be used for lock replacement. Use of core removal key to lock & unlock the door will cause the lock cylinder to fall out.

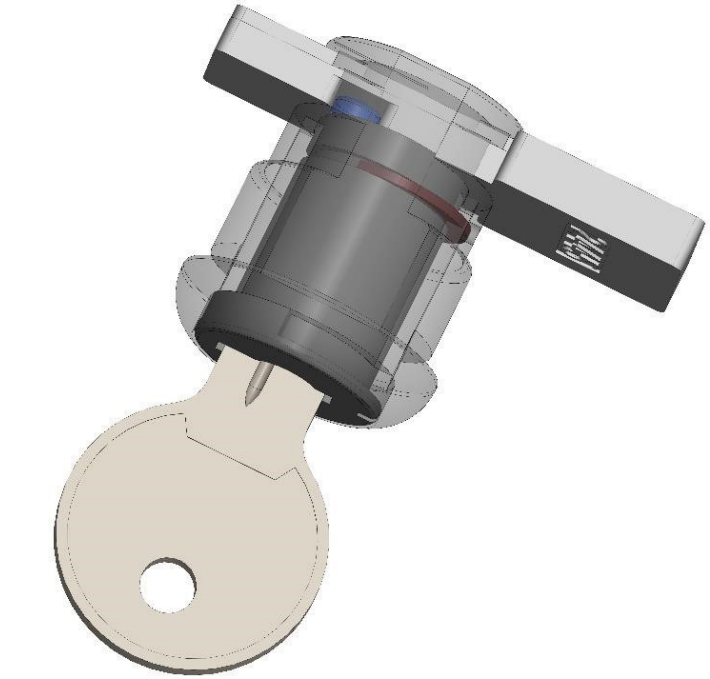


Fig. 3.4.2a
Unlock Position

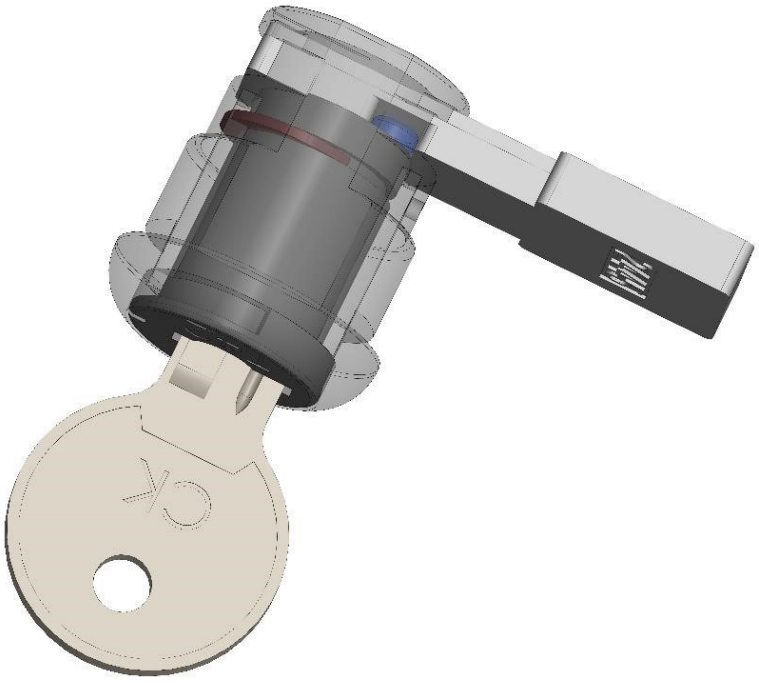
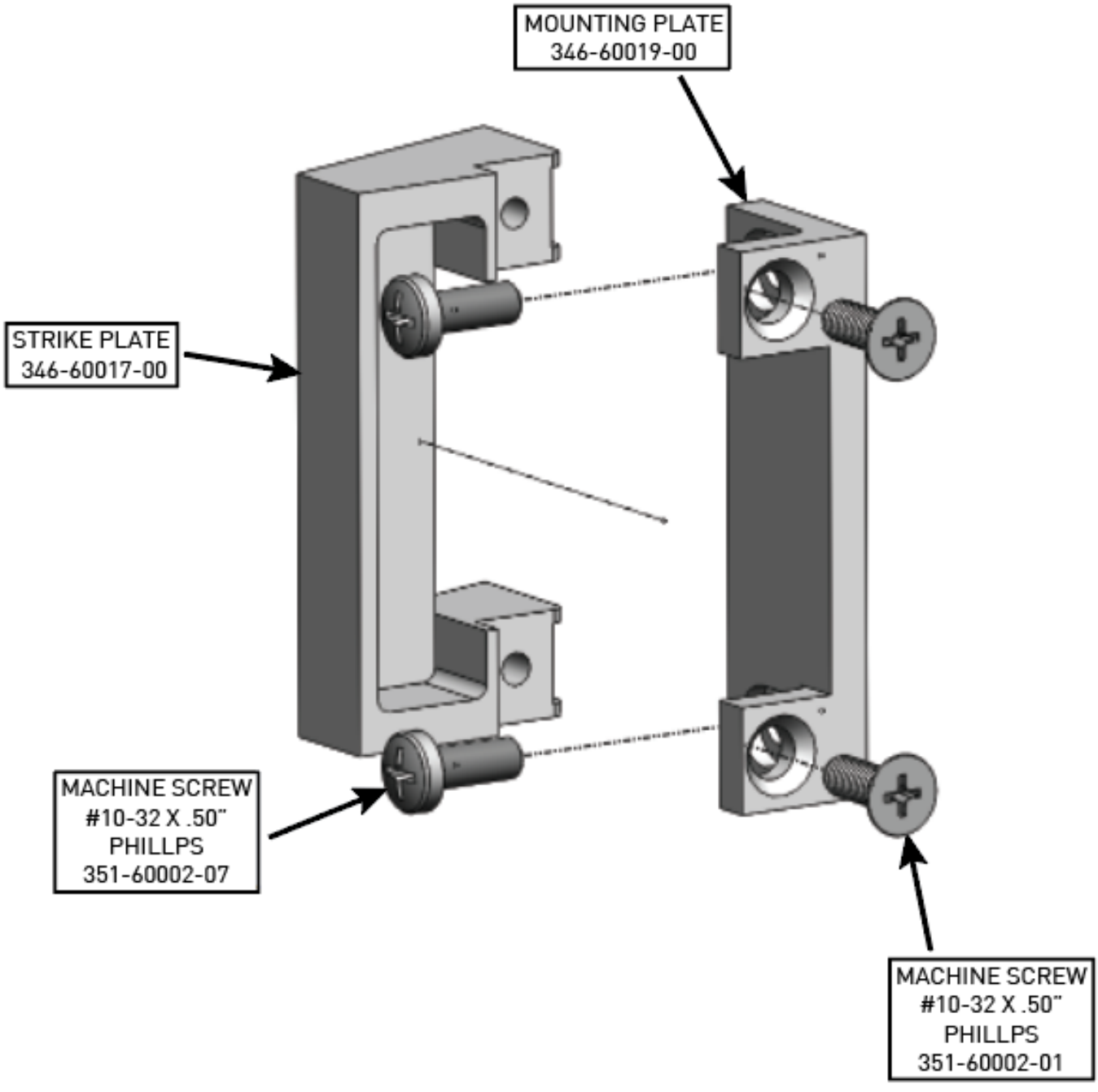


Fig. 3.4.2b
Lock Position

Fig. 3.4.2c
Lock Keeper Exploded View



Adjusting the Lock Keeper:

1. Remove the (2) machine screws holding the strike plate to the mounting plate using a #2 Phillips screwdriver.
2. Remove the strike plate.
3. Loosen the (2) machine screws holding the mounting plate to the cabinet.
4. Adjust the mounting plate (left or right) until:
    A. The lock keeper does not interfere with the door opening or closing.
    B. The lock bolt extends far enough in the locked position to be stopped by the strike plate, locking the door.

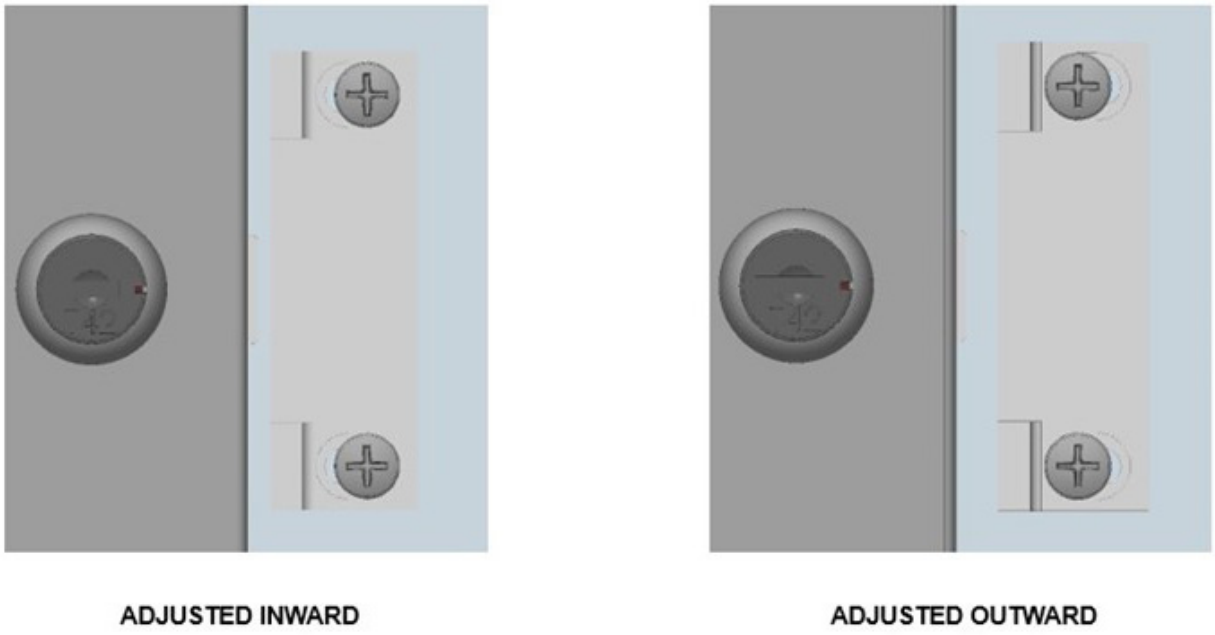


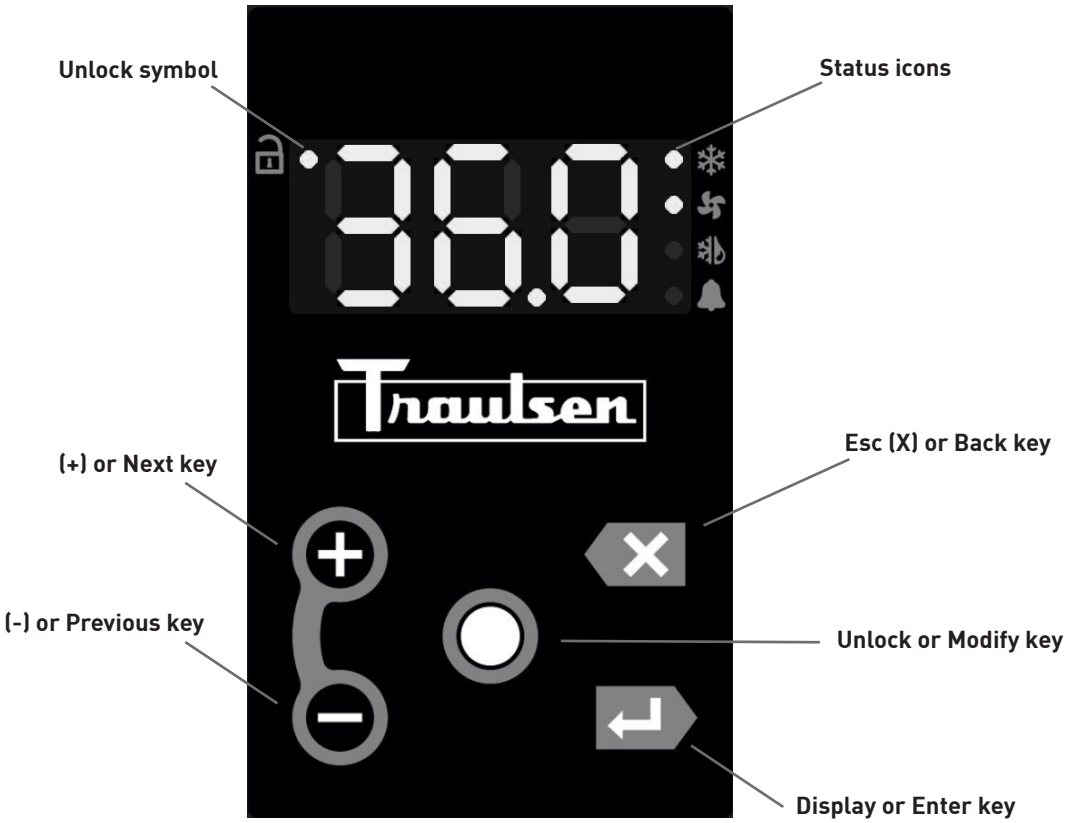
Fig. 3.4.2d
Lock Keeper Adjustment

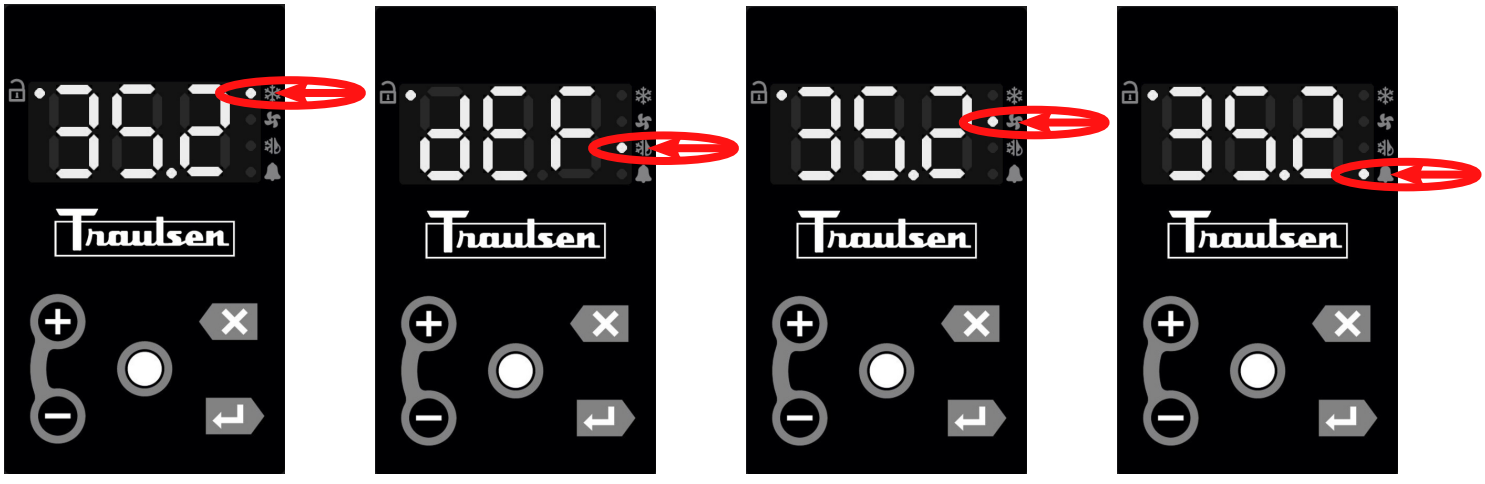
4. Controls

ParamName	Mnemonic	Access Level	ParaType	Description
TempCabSP	SP	0	Config	Temp Setpoint
TempCabSPLow	SRL	8	Config	Temp Setpoint Range Low
TempCabSPHigh	SRH	8	Config	Temp Setpoint Range High
TempCabSPDiff	SPD	1	Config	Cabinet Temp Differential
ThawSP	TSP	5	Config	Thaw Setpoint Temp
ThawSPDiff	TSD	5	Config	Thaw End Temp Setpoint
HeaterSP	HSP	5	Config	Heater PWM SP Temp
HeaterSPDiff	HSD	5	Config	Heater PWM SP Differential
RecoolSP	RSP	5	Config	Cooling State Cab Temp Setpoint
RecoolSPDiff	RSD	5	Config	Cooling State Cab Temp Setpoint Diff
ThawMode	THO	9	Config	Thaw Mode
RecoolTotalRunTime	RRT	9	Config	Time in Cooling State
ThawHystDuration	THD	9	Config	Thaw End Duration
ThawPeriod	THP	9	Config	Thaw Duty Cycle

4. Controls

4.1 Understanding the Display



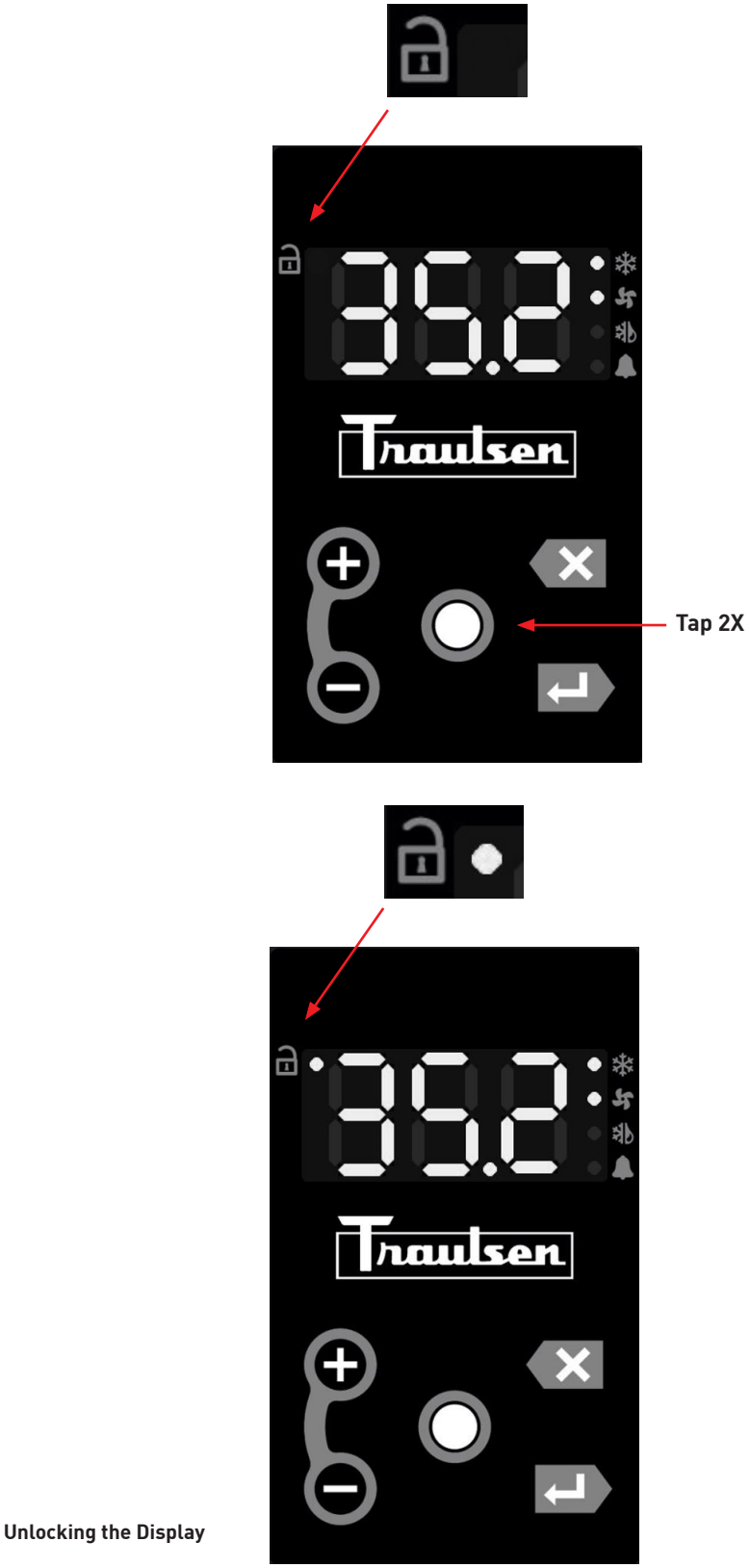


Compressor On | Defrosting | Evap Fan On | Alarm

Displays Status Icons

4.2 Unlocking the Display

The **Unlock Key** is a white dot in the bottom middle of the display, centered between the other four control keys. Press the Unlock Key twice within a second to unlock the keypad (think "tap-tap"). The **Keypad Unlocked LED** will turn on to indicate the keypad is now live. The keypad will stay unlocked until 3 minutes of inactivity have passed- at which time it will automatically lock the keypad.



Unlocking the Display

There are (2) operations the user can perform without having to enter a password: 1. Change the temperature setpoint & 2. Indicate a defrost operation.

4.3 Changing the Setpoint

The Traulsen Even Thaw is preset at the Factory to operate within a strict temperature parameters. Should these settings require adjustments please contact Traulsen (800)-825-8220. The setpoint to the unit can be changed simply by pressing the **Plus or Minus Key**. There will be a slight delay at first to prevent an accidental change, so it will be necessary to hold the key for (3-4) seconds until the value starts to flash. The flashing value indicates the setting is being modified. To raise the setpoint, press the **Plus Key** to increment to the setpoint you want. Similarly, press the **Minus Key** to lower the setpoint. When the desired value is reached, press the **Enter/Display Key** to lock in the value. Pressing the **Esc Key** will abort the process and keep the original setpoint. The keypad must be unlocked to change the setpoint using the shortcut method.

4.4 Initiating a Defrost

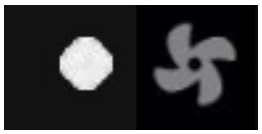
To initiate a manual defrost for troubleshooting purposes, press the **Minus Key** and the **Esc Key** simultaneously and hold for (5) seconds.

Fig. 4.4a
ONLY Fan Icon Illuminates with Off-cycle Defrost

Off-Cycle Defrost
Compressor Icon OFF
Fan Icon ON
Defrost Icon OFF

Table 4.4
OFF-CYCLE DEFROST

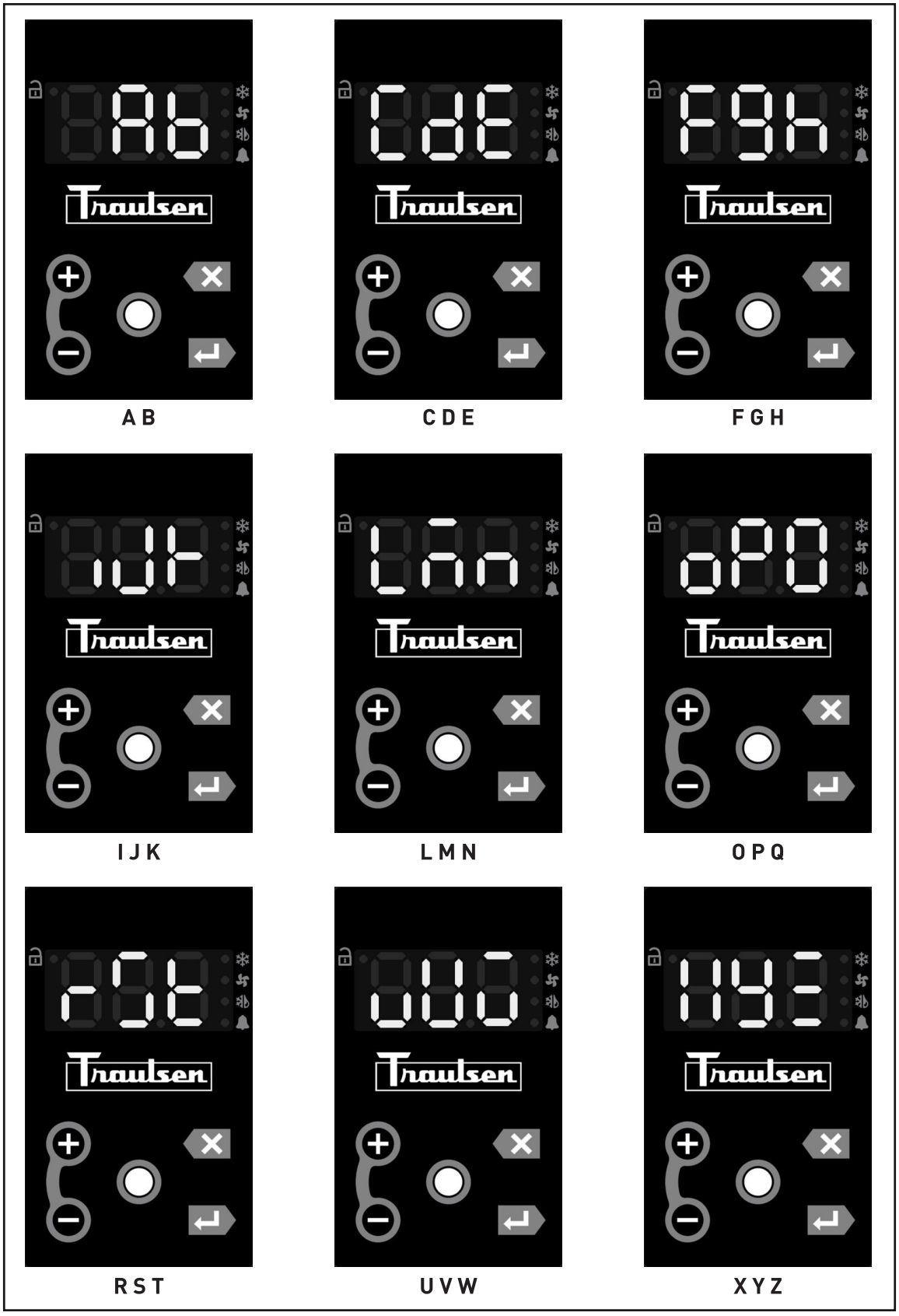
Compressor



Evaporator Fan

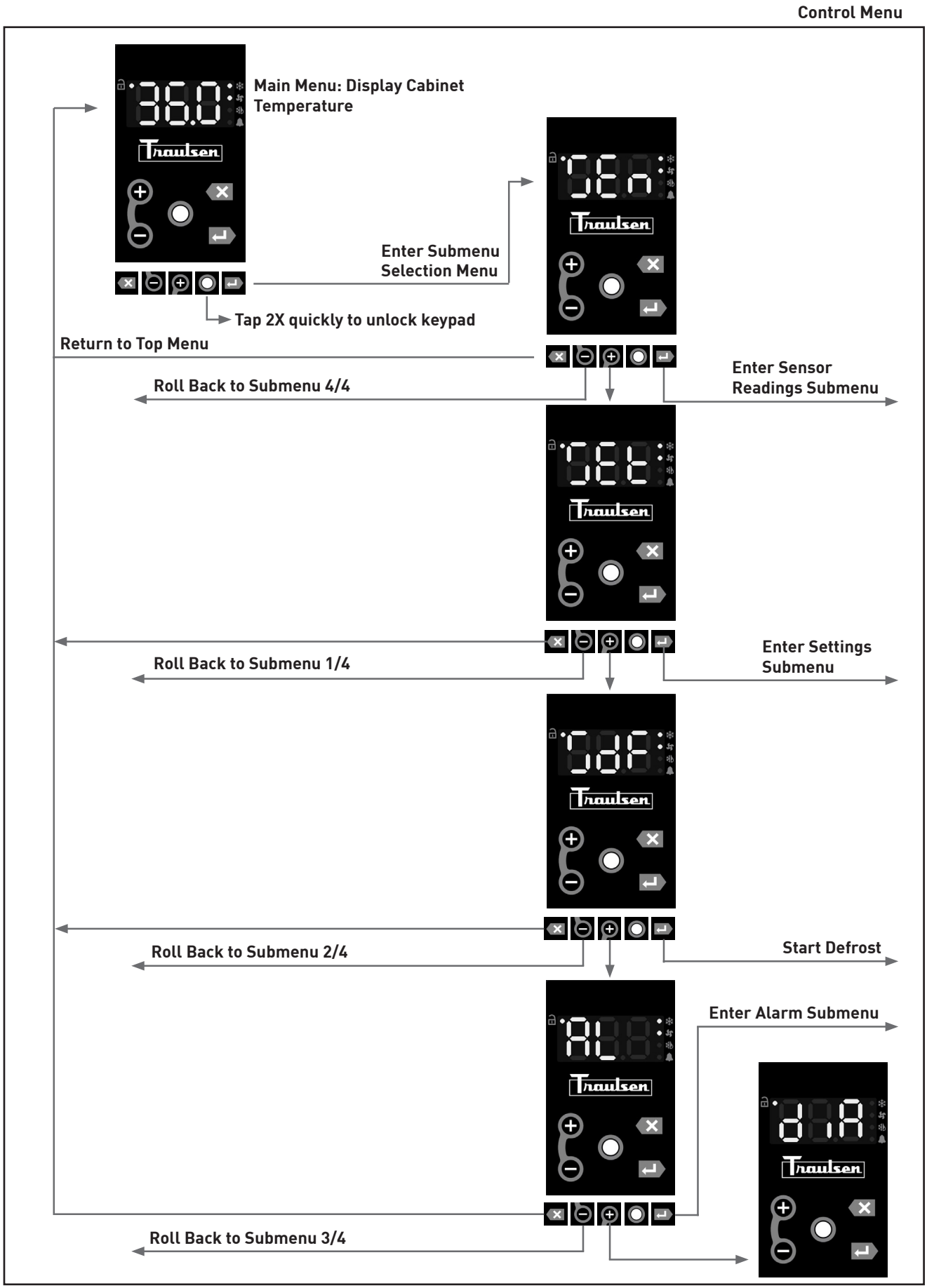
Defrost Heat Icon

4.5 Decode Alphabet

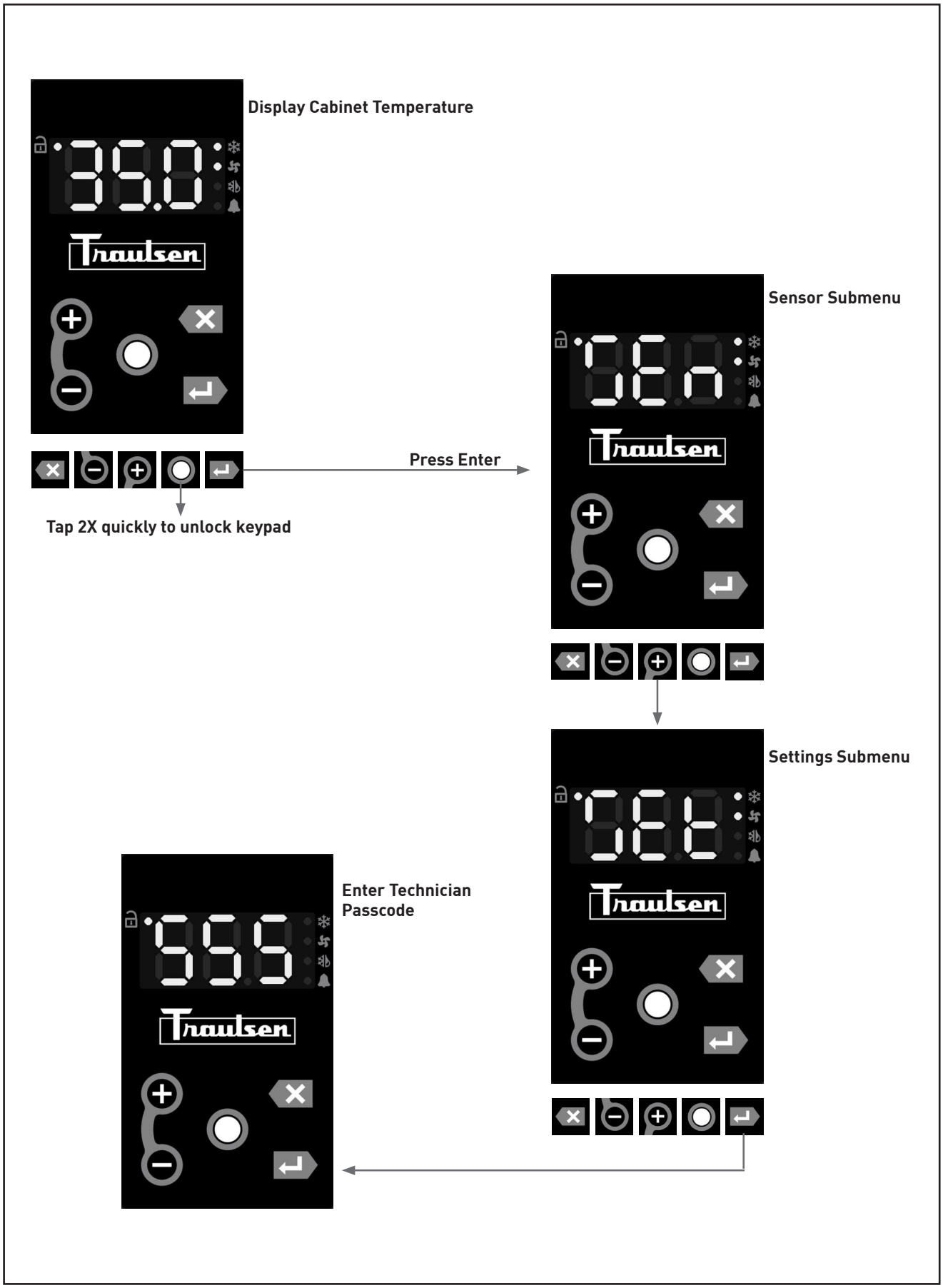


Decoding the display
ALPHABET

4.6 Understanding the Menu System



4.7 Defrost Settings



4.8 Defrost Setpoint

Defrost Setpoint - Evaporator Coil Temperature at Defrost Heat Termination

Press enter to view setting

Defrost Setpoint

Freezer Setting

Refrigerator Setting

4.9 Defrost Mode

1) Defrost Mode - Determines how defrost is initiated

2) Optimize - Control is set to 'Optimize' at the factory. This mode takes into consideration the dewpoint, door openings, and Defrost Interval Setting when deciding when to start a defrost.

3) Time - When defrost mode is set to 'Time' defrost is initiated based strictly on the Defrost Interval setting.

1)

2)

3)

4.10 Defrost Interval

1) Defrost Interval - Determines how many hours between each defrost

2) Refrigerator Off-Cycle Defrost - Defrost Interval set to h02 for refrigerators utilizing Electric Defrost

3) Freezer Electric Defrost - Defrost Interval set to h04 for freezers utilizing Electric Defrost

4) **Refrigerator Electric Defrost -** Defrost Interval set to h08 for refrigerators utilizing Electric Defrost

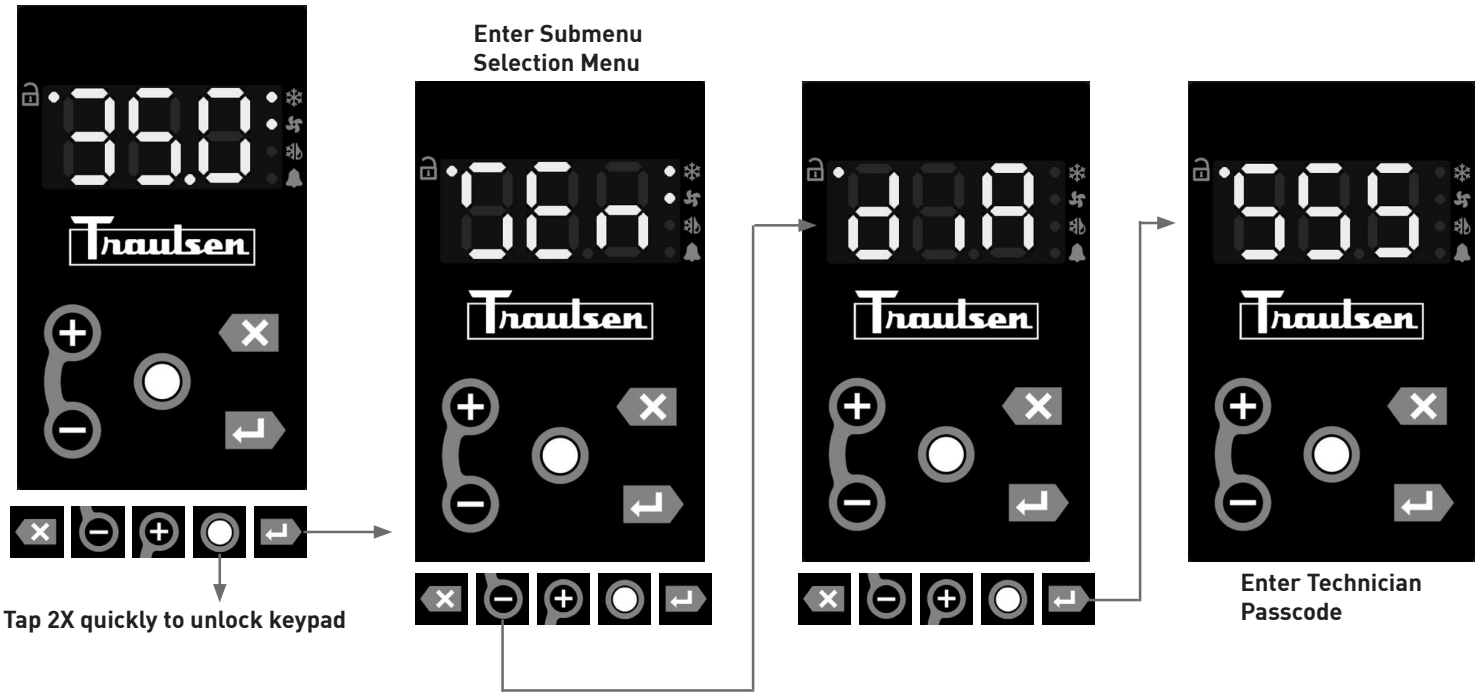
1)

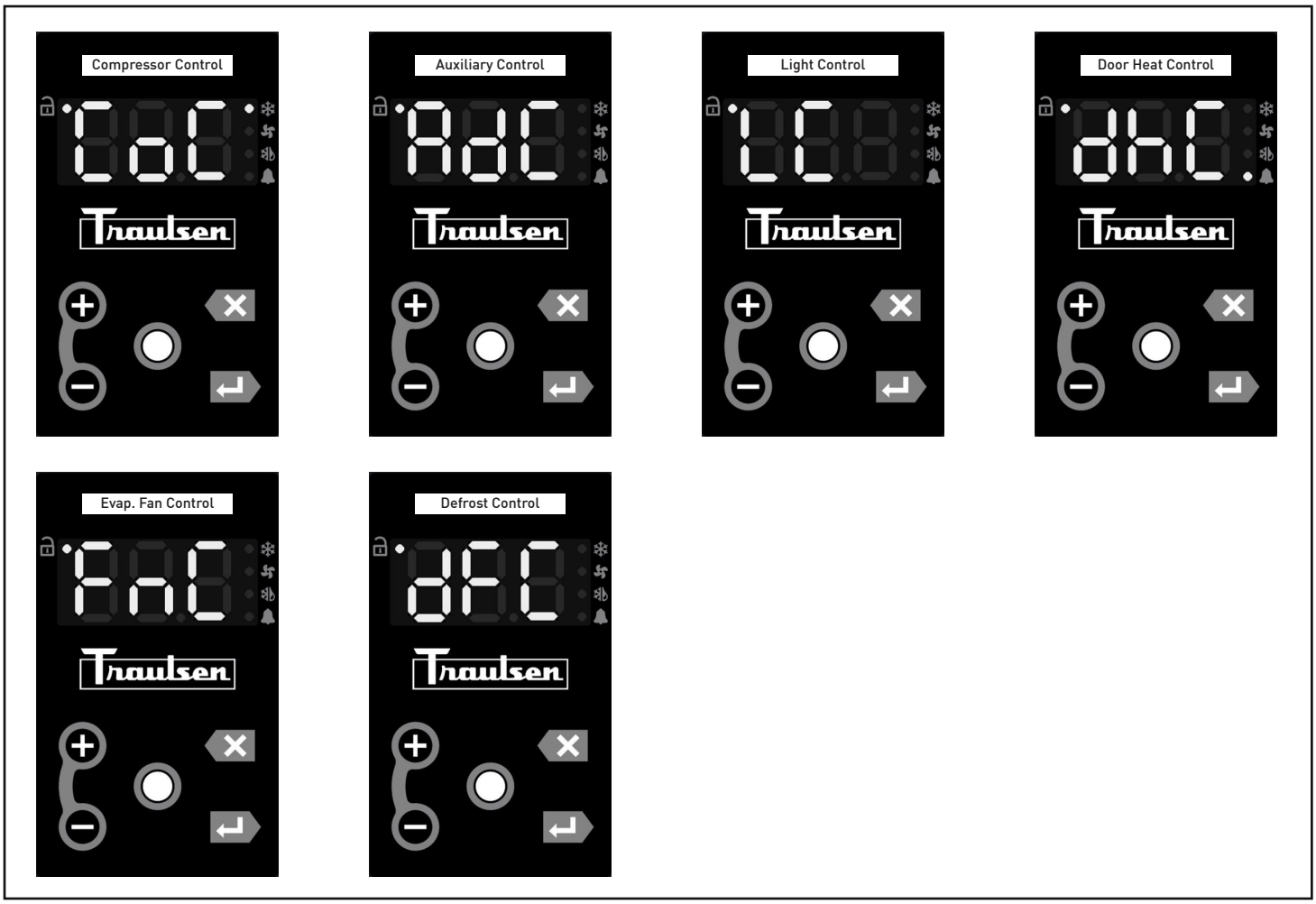
2)

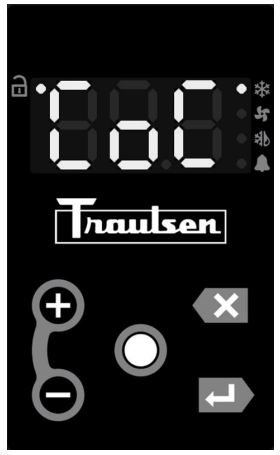
3)

4)

4.11 Diagnostic Menu

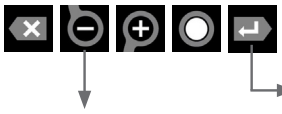






Tap & hold the Modify key for 2 seconds

ACt will begin to flash



Press enter to Activate (energize the compressor & condenser fan motor)

Tap & hold the Modify key for 2 seconds

Press enter to Deactivate (de-energize the compressor & condenser fan motor)

4.12 Control Cover Removal & Components

4.12.1 Removing the Display

Remove bottom louver screws & rotate louver up out of the way. Disconnect cable from the back of the controller. Lastly, squeeze the (4) tabs holding on the back side of the display & push outward to remove the display. See figure 4.12.1.

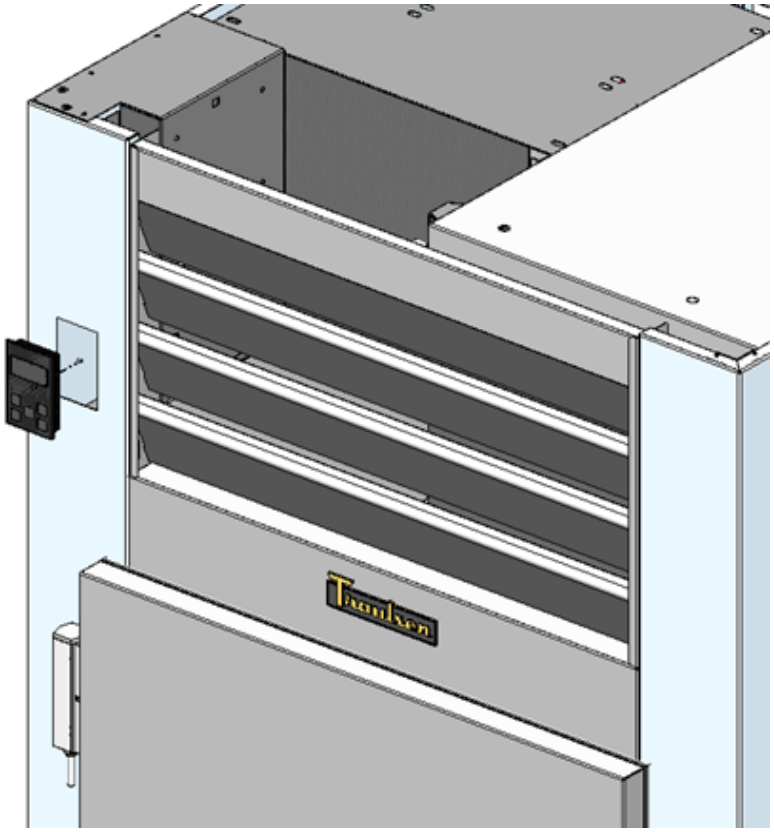


Fig. 4.12.1 Display Removal

4.12.2 Installing the Display

Line up the display with the cutout on the cabinet. Firmly press the (4) outside corners (do not press the center) of the controller into the cabinet until the (4) tabs click into place. Make sure to reconnect the cable to the display.

NOTE: Do not press on the center of the display during installation to avoid causing damage.

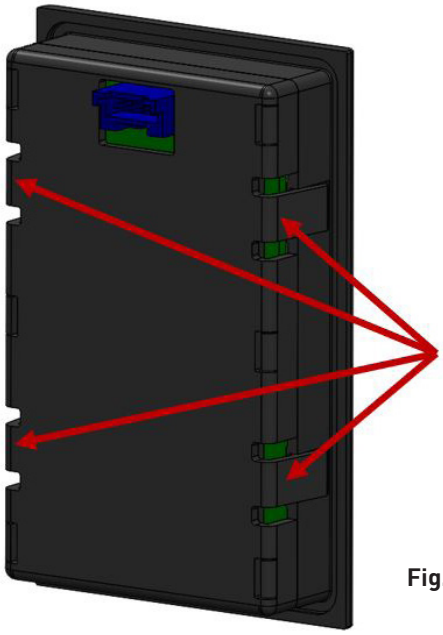


Fig. 4.12.2 Display Install
PART #950-60510-00

4.12.3 Accessing the Power Module (Control Board)
Use a #2 Phillips screwdriver to remove (3) screws (see figure 4.12.3) and lift on bracket.

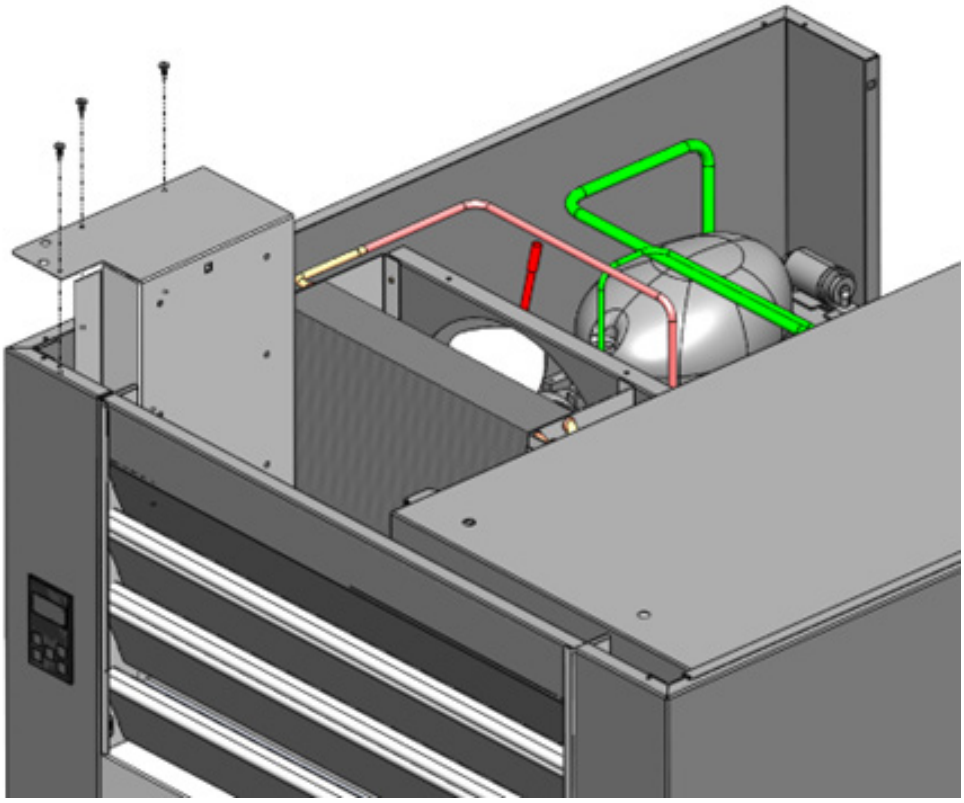


Fig. 4.12.3 Power Module Access (Control Board)

The **Power Module (Control board)** is located at the top of the unit, making it easily accessible for maintenance and troubleshooting. To gain access, you'll need to remove the securing screws using a #2 Phillips screwdriver, which allows the bracket to be lifted and the control board exposed.

This design also ensures that all critical components, including the display and associated wiring, are centralized and accessible from the top. This not only facilitates easy inspection and servicing but also minimizes the risk of damage to internal components during maintenance. The placement of the control board at the top of the unit streamlines the repair process, reducing downtime and ensuring that technicians can efficiently address any issues that arise.

4.13 Power Module Connections Overview

Part Number: 950-60509-02 **Blue factory installed ,**950-60509-01 **Green Replacement board** pictured below (**NOTE:** Serial & Model #'s necessary for power module replacement due to programming)
Picture below illustrates inout/output connection points

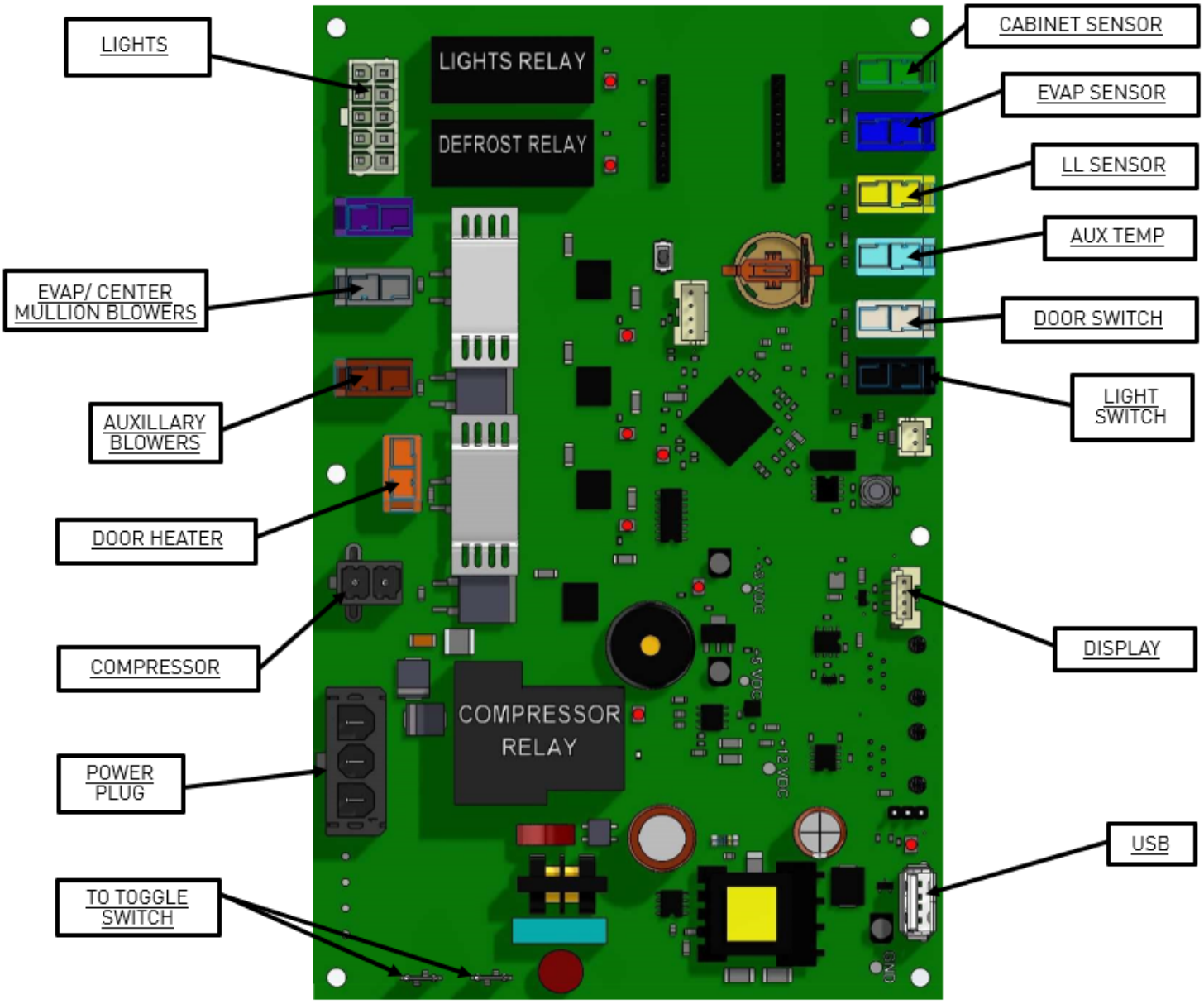


Fig. 4.13 Power Module Access (Control Board)

4.14 Power Module LED's & Reset Button Overview

NOTE: To reboot the board press the reset button (see figure 4.14) for 1 second or until all LED lights flash, shut off, and then come back on again.

The reset button does not restore programming back to factory settings.

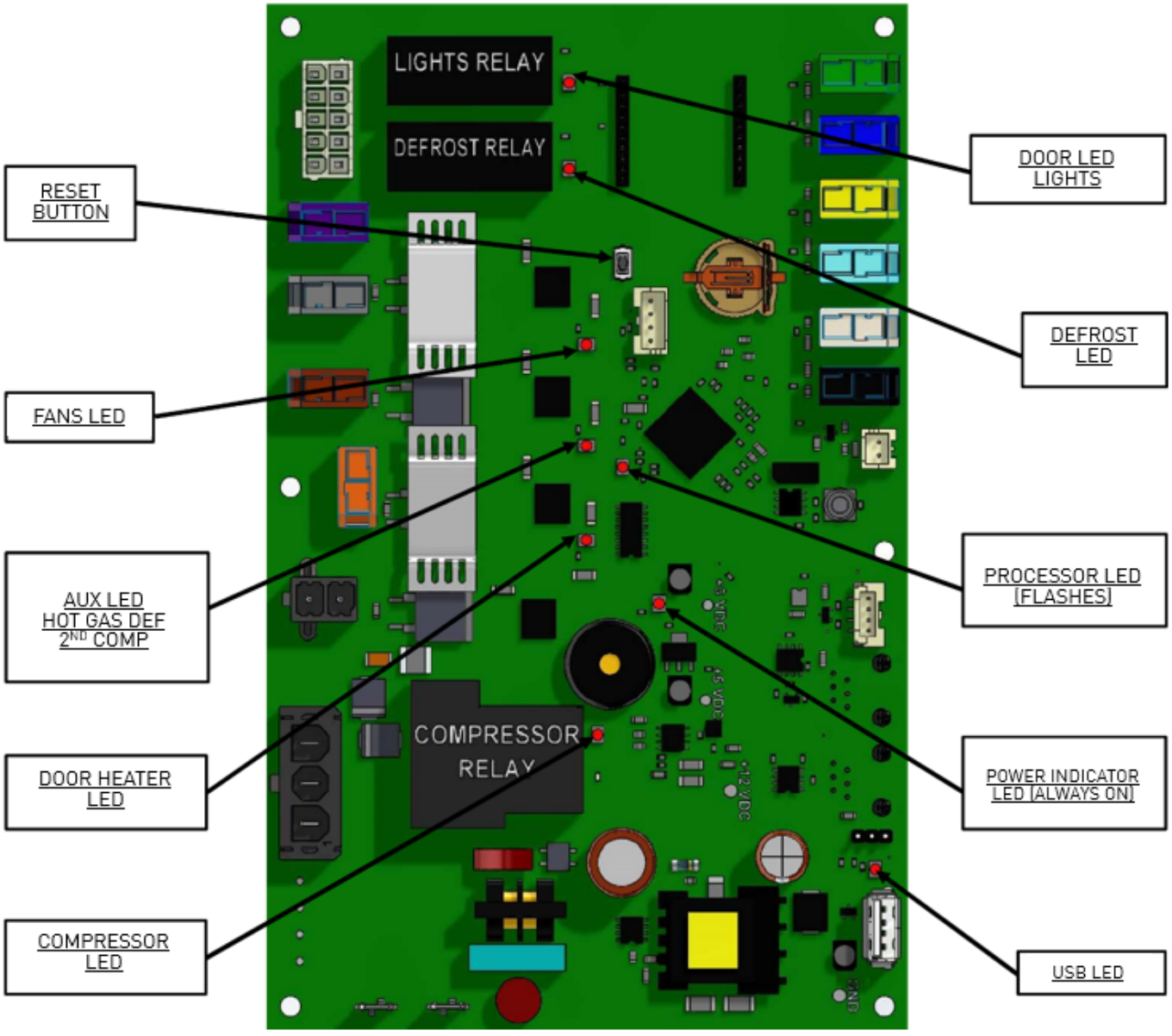


Fig. 4.14a Power Module LED & Reset Button Overview

Reset	To reboot the board press the reset button (See Figure 2) for 5 seconds or until all the LED lights flash, shut off and then come back on again.
Toggle Switch	Toggle switch disconnects power to all controls and components. When you turn on toggle switch there is a 5 second time delay before start up.
Door Switch	12VDC to Door Switch. When you open door there is a 1 second delay before the light comes on.
Data Logging	8 GB SanDisk USB drive logs data every 10 secs for up to 10 years
High Voltage Outputs	All high voltage component outputs can be isolated from the rest of the circuit by disconnecting their respective 2 pin connector form the board. All components may be tested with direct power ONLY when disconnected from the board. DO NOT jumper power at the board.

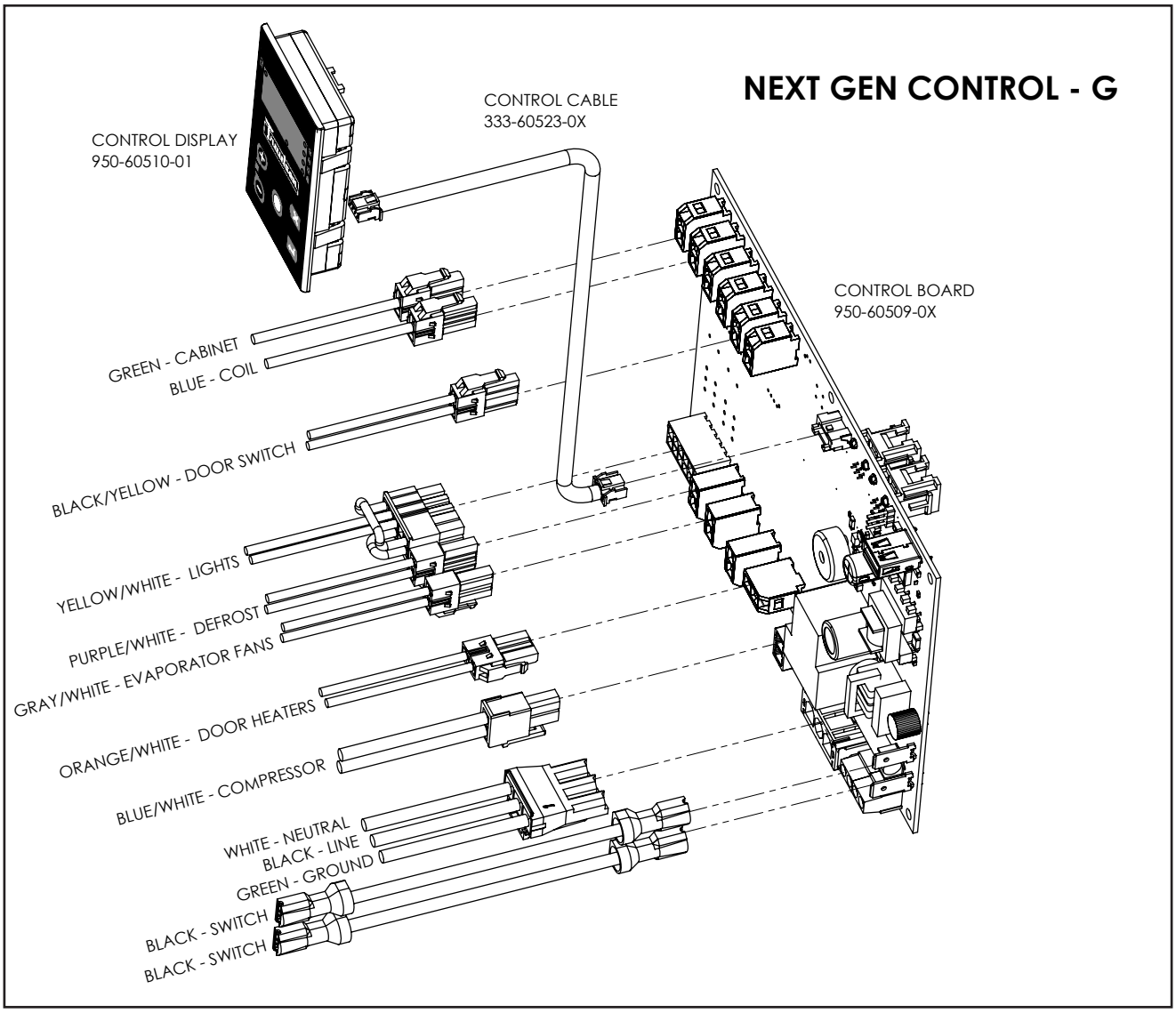
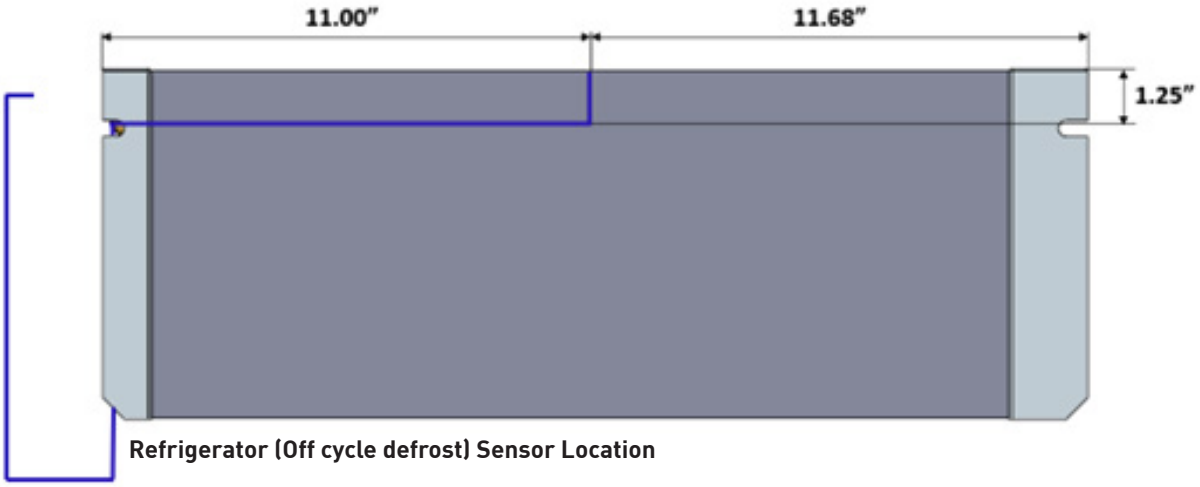


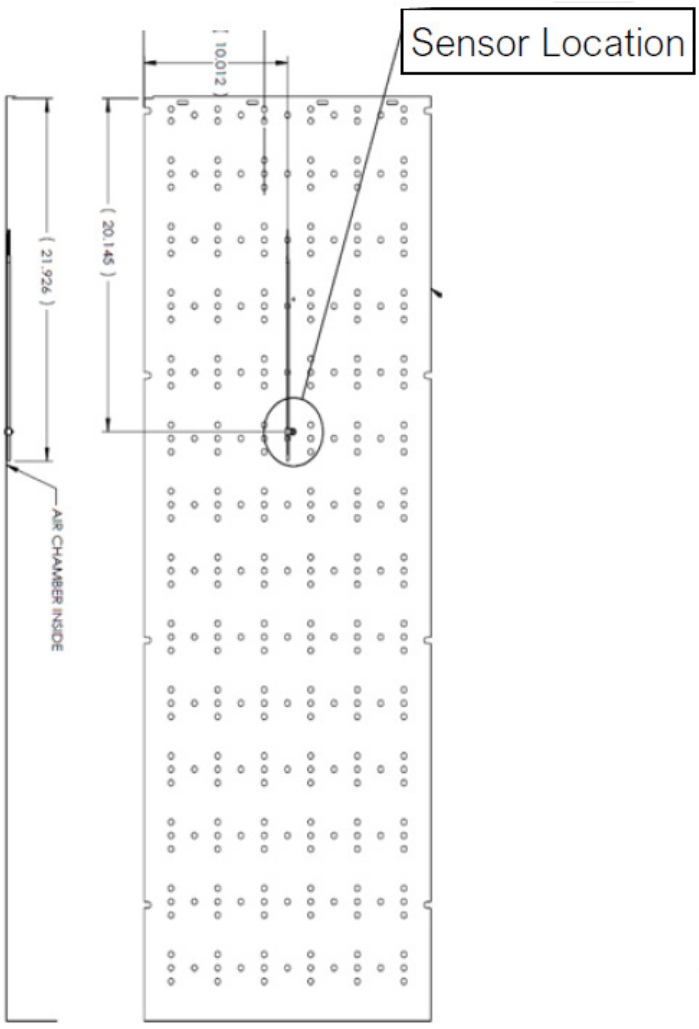
Fig. 4.14b Power Module & Display Schematics

5. Sensor Location

This section is an overview of the various sensors located throughout the cabinet.



Refrigerator (Off cycle defrost) Sensor Location



Refrigeration Cabinet (Green Sensor)
Begind Assembly Blower Housing

5.1 Sensor Control Value Test

1. Submerge sensor bulb into a 32° F ice bath.
2. Follow steps below to view control value.

Press Enter

Press 2X quickly to unlock keypad

Enter Technician Passcode

GOOD SENSOR READING

tC = Cabinet Return Air Temperature

tE = Evaporator Coil Temperature

5.2 Sensor Resistance Test

To check if the sensor is reading accurately:

- Place sensor bulb in a glass of ice with a little bit of water in it (32° F)
- Use Ohm meter to test resistance. At 32° F resistance should be 32.7KΩ.

Resistance Curve:

Temp C	Resistance K Ohms	Resistance Ohms	Temp F
-40.0	OL	OL	-40.0
-20.5	99.900	99000.0	-5.0
-17.7	85.200	85200.0	0.0
-15.0	72.900	72900.0	5.0
-12.2	62.400	62400.0	10.0
-9.4	53.700	53700.0	15.0
-6.7	46.200	46200.0	20.0
-3.9	39.900	39900.0	25.0
-1.1	34.600	34600.0	30.0
0.0	32.700	32700.0	32.0
1.7	30.100	30100.0	35.0
4.4	26.100	26100.0	40.0
7.2	22.800	22800.0	45.0
10.0	19.900	19900.0	50.0
12.8	17.400	17400.0	55.0
15.6	15.300	15300.0	60.0
18.3	13.500	13500.0	65.0
21.1	11.900	11900.0	70.0
23.9	10.500	10500.0	75.0
26.7	9.3100	93100.0	80.0
29.4	8.2500	82500.0	85.0
32.2	7.3400	73400.0	90.0
35.0	6.5300	65300.0	95.0
37.8	5.8200	58200.0	100.0
100.0	0.6790	679.0	212.0

Table 5.2 RESISTANCE TEST CURVE

6. UL/IEC/CE

6A.1 Electrical outputs for refrigerant detection system

The device shall have an output to indicate the presence of a refrigerant concentration exceeding the set point.

The REFRIGERANT SENSORS and controls shall be configured such that a failure of the controls or sensor turns on the indoor fan to deliver Qmin or greater as defined in Annexes GG and 101.DVG. For ADD-ON HEATPUMPS a failure of the REFRIGERANT SENSOR or controls shall turn on the indoor fan at the highest available speed or to not less than Qmin as determined in Annex GG.

Vibration requirements of IEC 60079-29-1 for fixed gas detection sensors need not apply to the entire appliance.

6A.2 Refrigerant detection system self-test routine

The refrigerant detection system shall include a means for self-testing to determine if a REFRIGERANT SENSOR or sensing element malfunction has occurred. The self-test shall include missing REFRIGERANT SENSOR (open circuit), by-passed REFRIGERANT SENSOR (shorted circuit), and REFRIGERANT SENSOR output out of range.

The test shall be run at least every hour, and if a failure is detected, the device shall take the actions in accordance with Clause 6.1

If the REFRIGERANT SENSOR is a LIMITED LIFE REFRIGERANT SENSOR and requires replacement after a given period, then the device shall take the actions prescribed in Clause 6.1 at the end of the specified life and shall provide indication that replacement is required. Compliance is checked by inspection.

6A.3 Serviceability

REFRIGERANT SENSORS shall be accessible for inspection, and replacement. REFRIGERANT SENSORS for replacement shall be specified by the appliance manufacturer.

6A.4 Refrigerant Sensor Identification

The REFRIGERANT SENSORS shall be marked or tagged with

A) name, trademark, or identification mark of the manufacturer or responsible vendor;

B) reference number or other means for identifying the refrigerant sensor; and

C) “This refrigerant sensor shall only be replaced with manufacturer approved sensor”. If the SENSOR is only replaceable as part of an assembly of parts, then the assembly shall be marked.

6A.5 Qualification of workers

To minimize the risk of possible ignition due to improper service or incorrect parts. Servicing shall only be carried out by factory authorized service personnel certified to work on refrigeration systems containing flammable refrigerants.

EPA Section 608

Certified Refrigeration Service Technician (CRST)

6A.6 Information on servicing

6A.6.1 Checks to the area

This appliance is marked with thew ISO 7010-W021 warning label to indicate the presence of FLAMMABLE REFRIGERANTS. Prior to beginning work on systems containing FLAMMABLE REFRIGERANTS, safety checks are necessary to ensure the risk of ignition is minimized. For repair to the REFRIGERATING SYSTEM, follow the instructions outlined in sections 6A.6.2 to 6A.6.5 prior to conducting work on the system.

Verifying refrigerant is important for the safe and efficient operation of HVAC systems. Refrigerant testing can help identify contaminants like moisture, acid, and particulate matter, which can damage equipment and compromise performance. It can also help identify leaks, which can lead to refrigerant loss and environmental damage.

6A.6.2 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.

6A.6.3 General work area

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

6A.6.4 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.

6A.6.5 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.

6A.6.6 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.

6A.6.7 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.

6A.6.8 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.

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;

D) marking to the equipment continues to be visible and legible. 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.

6A.6.9 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.

6A.7 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.

6A.8 Repair to intrinsically safe components

Do not apply any permanent inductive or capacitive 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.

NOTE The use of silicon sealant can inhibit the effectiveness of some types of leak detection equipment. Intrinsically safe components do not have to be isolated prior to working on them.

6A.9 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.

6A.10 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.

NOTE Examples of leak detection fluids are

- Bubble method,
- Fluorescent method agents.

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 of refrigerant shall be according to.

6A.11 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 (optional for A2L). 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.

6A.12 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.

6A.13 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 is 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.

6A.14 Labeling

Equipment shall be labeled stating that it has been de-commissioned 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.

6A.15 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.

6A.16 Warning Notices

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.

WARNING Children should be supervised to ensure that they do not play with the appliance.

This appliance is rated for use in Climatic Class 5. This appliance can operate in an environment with maximum ambient temperatures of 104° F (40° C) and 40% RH.

Product is suitable for use up to 6500 ft (2000m).

WARNING Power cord should only be replaced with a Traulsen-specified part.

WARNING Appliances that use a flammable refrigerant shall indicate that component parts shall be replaced with like components so as to minimize the risk of possible ignition due to incorrect parts.

Maximum loading per shelf is 200 lbs (91 kg)

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

Review all flammable refrigerant cautions for completeness.

WARNING Keep clear of any obstructions for all ventilation openings of the appliance enclosure.

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

WARNING Do not damage the refrigerating circuit. Do not pierce or burn.

WARNING Do not use electrical appliances inside the food/ice storage compartments unless they are of the type recommended by the manufacturer.

Taking care to avoid causing a fire by igniting flammable material.

Install in accordance with the Safety Standard for Refrigeration Systems, ANSI/ASHRAE 15.

WARNING Do not use means to accelerate the defrosting process or to clean, other than those reco0mended by the manufacturer.

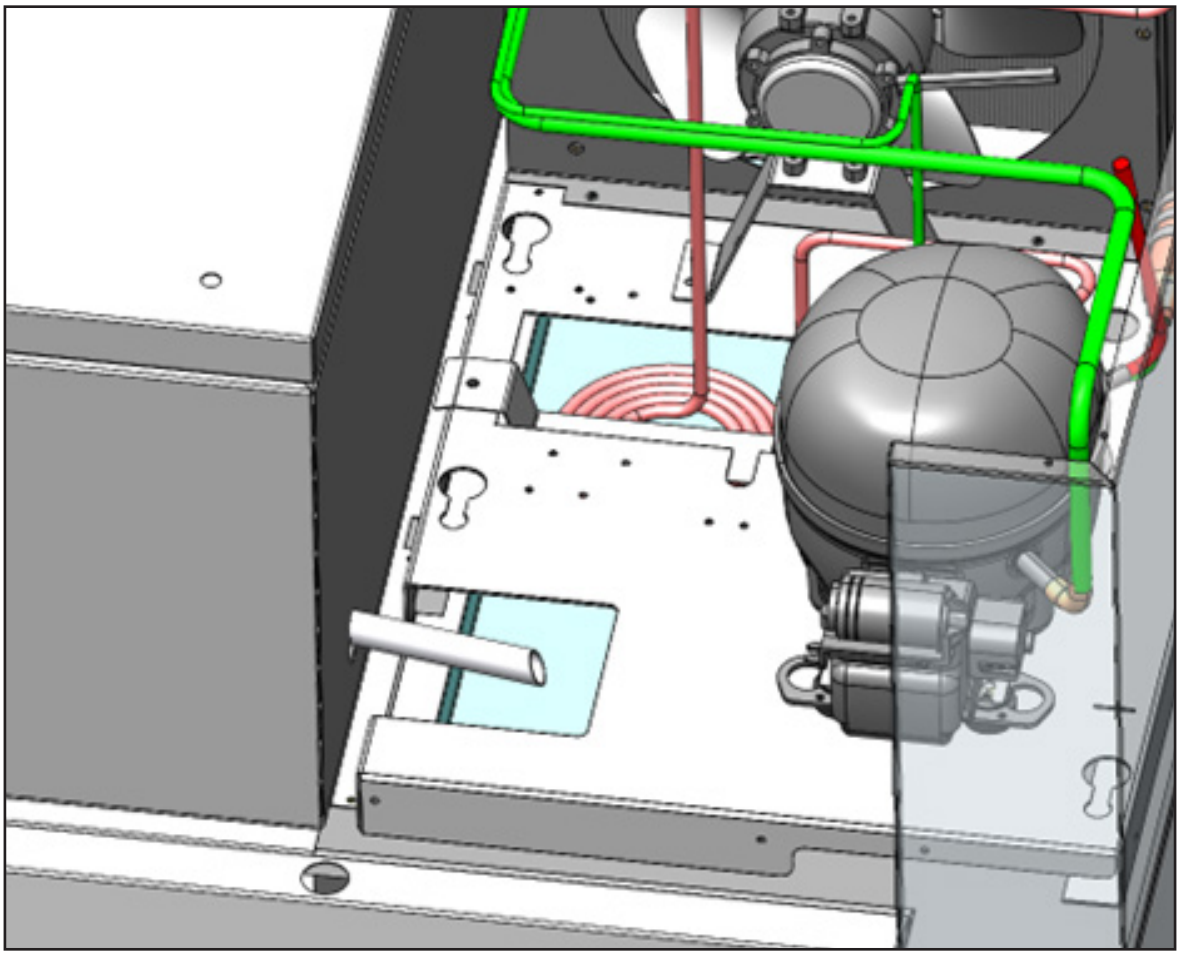
WARNING The appliance shall be stored in a room with out continuously operating ignition sources (for example: open flames, an operating gas appliance or an operating electric heater.

WARNING Be aware that refrigerants may not contain an odor.

6B Troubleshooting

6B.1 Condensate Overflow Troubleshooting

6B.1.1 Condensate Overflow



The condensate pan generally does not overflow unless there is an excess of ambient air infiltrating the cabinet.

- Hump Cover not sealed properly (i.e. torn or missing Foam Tape).
- The door is not sealed properly.
- Door not self-closing (see door section).
- Putty not fully sealing refrigeration lines penetrating evaporator compartment.
- On refrigerators with electric defrost- shorting the time between defrost may help to reduce the amount of water (see control section).

6B.2 Leak Checking System

A number of means for leak detection may be considered:

- Bubble test
- Holding pressure test (refer to serial tag for maximum system pressure)
- Electronic leak detector

Never use any dyes or other contaminants when working with Traulsen refrigeration systems.

6B.3 Accessing the Refrigeration System

Piercing valves can be used to access the refrigeration system. Access ports should be temporarily placed on the process tube (suction and/or liquid line) as close to the end of the process tube as possible.

Do **NOT** leave piercing valves on this system. If you cannot finish the repair you will need to use Lock/Out-Tag/Out procedures.

- Pinch line off just before the temporary access port three times using a crimper tool.
- Verify that there are no leaks.
- Remove the piercing valve/temporary access port.
- Cut off the copper tubing between the location of the temporary access port removed in step 3 and the crimps made in step 1.
- Braze open end shut.
- Leak check the system.

6B.4 Refrigerant Recovery

For refrigeration systems using R-450A, the U.S. EPA requires the refrigerant to be recovered whenever the refrigerant must be removed from the system for service. It is **ILLEGAL** to vent these refrigerants to the atmosphere. Use the following process with the se of a recovery machine.

1. Evacuate the empty recovery cylinder into a vacuum.
2. Using an accurate refrigerant scale, zero out the refrigerant scale and weigh the empty recovery cylinder prior to adding refrigerant gauges or hoses, notate this weight.
3. Securely connect the evacuated cylinder to the refrigeration system using refrigerant gauges and hoses.
4. Open the refrigerant gauges to allow refrigerant to flow through the gauges to the recovery cylinder.
5. Once the pressures have equalized, valve off the refrigerant gauges and the recovery cylinder securely.
6. Carefully remove the refrigerant hose from the recovery cylinder.
7. Zero out the refrigerant scale and weigh the recovery cylinder, notate this weight. Subtract the weight notated from line 2 from line 7. This is the amount of refrigerant recovered into the cylinder.
8. If necessary, repeat this process with another empty recovery cylinder until the system refrigerant charge is removed. Note trace amounts of refrigerant will remain trapped in the compressor oil.

6B.5 Repair of Leaks

It is of utmost importance to properly repair refrigerant leaks as soon as they are discovered. If they cannot be repaired immediately, the refrigerant charge should be removed from the system until the point at which the leak can be repaired. A number of considerations are relevant when attempting to repair a leak:

- Repair the leak properly - this means removing the refrigerant, examining the leak source, determining the reason for the leak and carrying out the proper course of action.
- Before repairing the leak, ensure that the refrigerant has been removed and the system flushed with nitrogen if brazing is to take place.
  - It is **absolutely not acceptable** to leave line tap valves or piercing valves attached to the system.

6B.6 Charging the System

After the proper evacuation of the system, the following process should be followed:

1. Process Tube needs to be extended.
   - Remove the crimped tubing and piercing or saddle valve from the process tube.
   - Extend the process tube a minimum of 12".
   - Crimp and braze the process tube extension.
   - Install piercing or saddle valve just after the last crimp.
2. Evacuate the system following the SYSTEM EVACUATION section in this document.
3. Charge the system.
   - **DO NOT OVERCHARGE THE SYSTEM.** You must weigh in the exact charge.
   - Prior to charging, ensure the system has been leak checked.
   - Hoses or lines should be as short as possible to minimize the amount of refrigerant contained in them.
   - Evacuate the hoses and manifold prior to charging to avoid contamination of the refrigerant.
   - Upon completion of charging, a further leak check must be carried out prior to leaving the site.
   - After charging, carefully disconnect the hoses, attempting to minimize the release of refrigerant.
   - After charging, all access ports must be removed following the **REMOVE ACCESS PORTS** section in this document.

6B.7 Remove Access Ports

Do **NOT** leave piercing valves on this system. If you cannot finish the repair you will need to use Lock/Out-Tag/Out procedures.

1. Pinch line off just before the temporary access port three times using a crimper tool.
2. Verify that there are no leaks.
3. Remove the piercing valve/temporary access port.
4. Cut off the copper tubing between the location of the temporary access port removed in step 3 and the crimps made in step 1.
5. Braze open end shut.
6. Leak check the system following the **LEAK CHECKING SYSTEM** section in this document.

6B.8 Compressor Troubleshooting

6B.8.1 Terminology:

OEM - Original Equipment Manufacturer, refers to the manufacturer of a piece of equipment or component.

RLA - Rated Load Amps, the OEM test conditions amperage rating (does not necessarily indicate the normal running amperage as conditions and applications can vary from OEM test conditions).

LRA - Locked Rotor Amps, the OEM test condition lock rotor amperage rating indicating the expected amperage at which a motor does not turn when power is applied.

Microfarad - This is a unit of measure for capacitance; the symbol for **Microfarad** is **µF.**

Current - The flow of electrons in an electrical circuit measured in Amps with an Amp Meter.

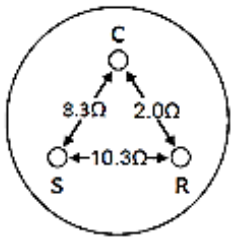
Resistance - The opposition to the flow of electrical current measured in Ohms with an Ohm Meter; the symbol for Ohms is **Ω**.

Back EMF - The voltage generated by the start winding once the compressor runs which is higher than line voltage.

Pick-up Voltage - The back EMF value at which the normally closed contacts of a potential relay open.

First verify that the Call for Cooling LED on this display is illuminated. See Control Section.

Ω= OHM= Unit Resistance
R= Run
S= Start
C= Common
Figure 6 shows the readings of the resistance through the compressor motor windings. (C-S C-R). If the windings are good the start winding resistance (C-S) will always be higher than the run winding resistance (C



Example

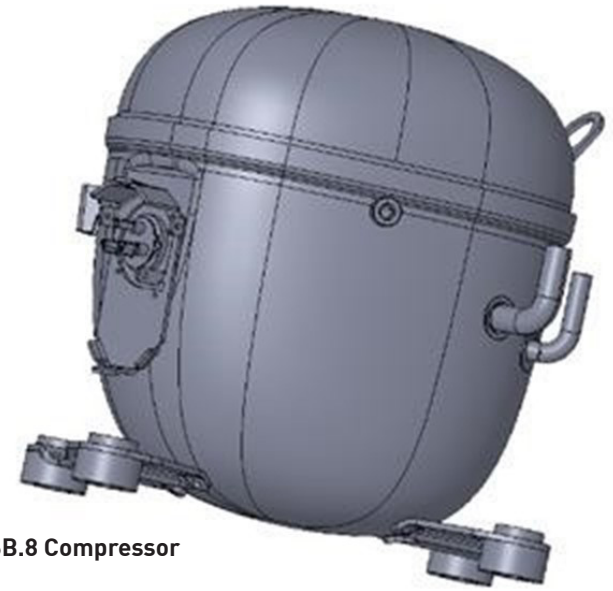


Fig. 6B.8 Compressor

6B.8.2 Accessing the Compressor

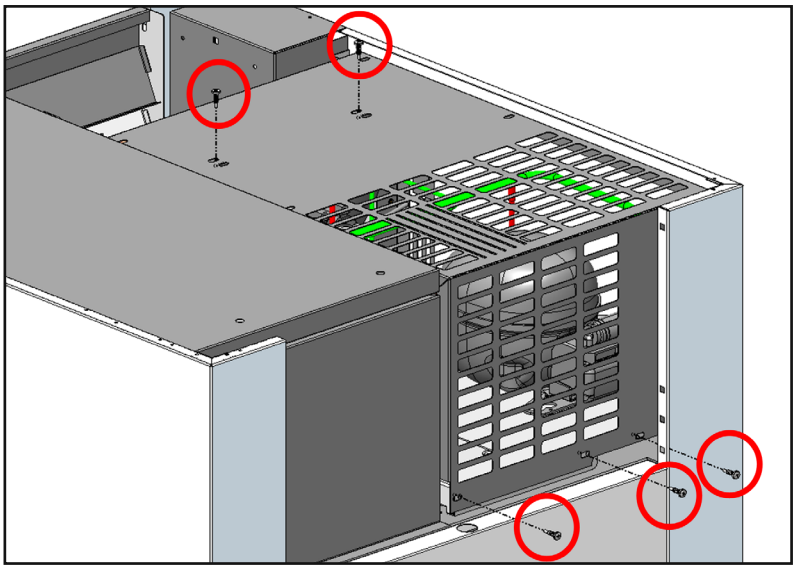


Fig. 6B.8.2a Remove (5) Screws

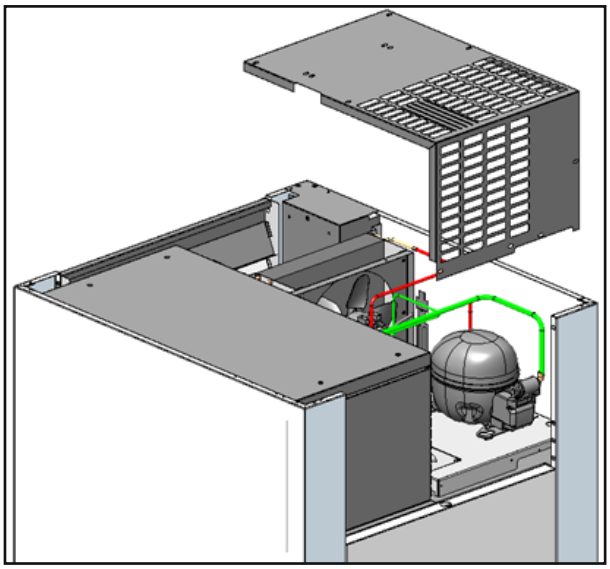


Fig. 6B.8.2b Remove Condenser Housing

6B.8.3 Compressor Not Running

If the condenser fan motor is running but not the compressor, the compressor may be overheated. Carefully place your hand on the dome of the compressor. If the compressor is very hot, the external overload protector may be open. Disconnect power to the unit and give the compressor ample time to cool.

6B.8.4 Testing the Windings of the Compressor

After the compressor has been sufficiently cooled, remove all the start components from the compressor. Now use an Ohms Meter to measure the resistance of the windings, comparing the resistance values measured with the values given **in the table above**. Be careful when measuring resistance to make a good connection to each terminal with your meter lead. Take several measurements to ensure you are consistently getting the same values. If the resistance values are consistent but do not match the values given below, replace the compressor with OEM replacement.

6B.8.5 Resistance and Amp Values of Even Thaw Compressors

Compressor Information			Resistance		Current	
Traulsen Part Number	Embraco Model	Copeland Model	Start Winding	Run Winding	RLA	LRA
321-60215-10	NT6217ZV	RRT64C1E-CAA	2.60 Ω	0.51 Ω	11.0	45.00

Table 6B.8.5 Resistance and AMP Values

6B.8.6 Troubleshooting External Overload Protector

If the windings of the compressor match the values given above, the overload can be tested with an Ohms Meter for continuity. A closed switch should have continuity indicative of a complete circuit. If the external overload will not close after cooling, replace the overload protector. If the compressor starts and runs while the current is at or below the RLA, but the overload still opens, replace the external overload protector with OEM replacement.

6B.8.7 Measuring for Excessive Voltage Drop

Now that the compressor has cooled down, measure the voltage supplied to the cabinet while the compressor is trying to start. If the voltage drops below 104 volts, you may have a problem with the power supply, try a different circuit.

6B.8.8 Troubleshooting Potential Relay

Disconnect the power supply, remove wires and measure for continuity between pins 1 & 2 (normally closed contacts) of Potential Relay. If continuity is not detected replace the Potential Relay.

Clamp amp probe onto blue wire connected to pin number 1 of the Potential Relay. Apply power and measure the current. If the current does not drop out after the compressor starts, then the contacts between pins 1 & 2 are stuck in the closed position. In this case, the Potential Relay must be replaced.

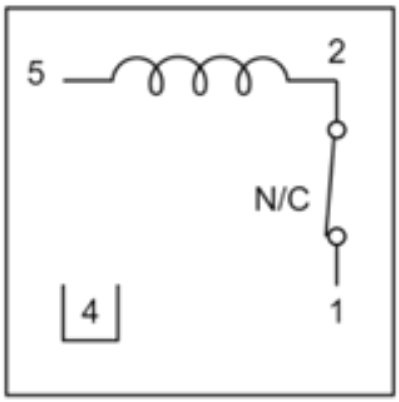


Fig. 6B.8.8 Potential Relay Schematic

6B.8.9 Troubleshooting Start Capacitor (BLACK PLASTIC CASING)

If the voltage measures 115 volts +/- 10% but the compressor doesn't start, measure the current with your amp meter at the common terminal of the compressor. If the current spikes very high but the compressor doesn't start, disconnect the power so that you can remove all the start components for testing. Start capacitors can be tested with a microfarad tester. For the most accurate measurement, remove the resistor from the start capacitor. **The start capacitor should never be used without the resistor as this will damage the start relay.** If microfarads measured do not match the values in the table below, replace the start capacitor.

6B.8.10 Troubleshooting Run Capacitor (METAL CASING)

If the compressor starts and runs with an amp draw higher than the RLA and the compressor is a capacitance run compressor (which means it requires a run capacitor), disconnect the power so that you can remove the run capacitor from the circuit for testing with a microfarad tester. Connect the microfarad tester across both terminals of the run capacitor. If the microfarads measured do not match the specs given, replace the run capacitor.

Note: If the run capacitor is swollen or leaking fluid, it must be replaced.

Compressor	Start Capacitor		Run Capacitor	
Traulsen Part Number	Spec	PN	Spec	PN
321-60250-10	340-408 µf 250vac	334-60411-26	40 µf 370VAC	334-60412-06

Table 6B.8.10a Capacitor Specs

Compressor	Start Components				
Traulsen Part Number	Start Capacitor PN	Run Capacitor PN	Relay	Overload	Start Kit Includes all 4 Components
321-60250-10	334-60411-26	334-60412-06	334-60409-02	n/a	SER-60695-29

Table 6B.8.10b Even Thaw Start Component Part Numbers

6B.8.11 Locked Up Compressor

After all start components have been properly tested and determined to be good and the proper voltage has been verified, the compressor does not start while the current spikes up to the LRA, this could be indicative of an internal mechanical problem within the compressor. If so, replace the compressor with OEM replacement. See **Table 6B.10.5** for Traulsen part number and OEM model number.

6B.8.12 Current Climbs Above RLA

See section on Troubleshooting Run Capacitor first. If the amps start out at RLA but climb higher until the external overload protector opens, this could be an indication of poor air circulation through the condenser coil resulting in higher head pressure. The solution could be as simple as cleaning the condenser coil or a problem with the condenser fan motor, such as tight bearings or a fan blade that has been installed backwards. If none of the above, this could also be a symptom of an internal mechanical problem within the compressor. If so, replace the compressor with OEM replacement.

Note: When a system is overcharged, the compressor current may be above RLA.

6B.8.13 Replacing the Compressor

If you have taken all the proper steps outlined above to troubleshoot the compressor, and therefore have determined the compressor has failed, **be sure to replace the liquid line filter drier along with the compressor (Traulsen Part Number 325-60103-00).** Traulsen recommends that you use a nitrogen flow regulator to purge with low pressure nitrogen as you braze all connections. After you have brazed all connections and have checked thoroughly for leaks, change the oil in your vacuum pump before connecting to system with a micron gauge. Pull a deep vacuum of 200 microns to remove moisture from the system.

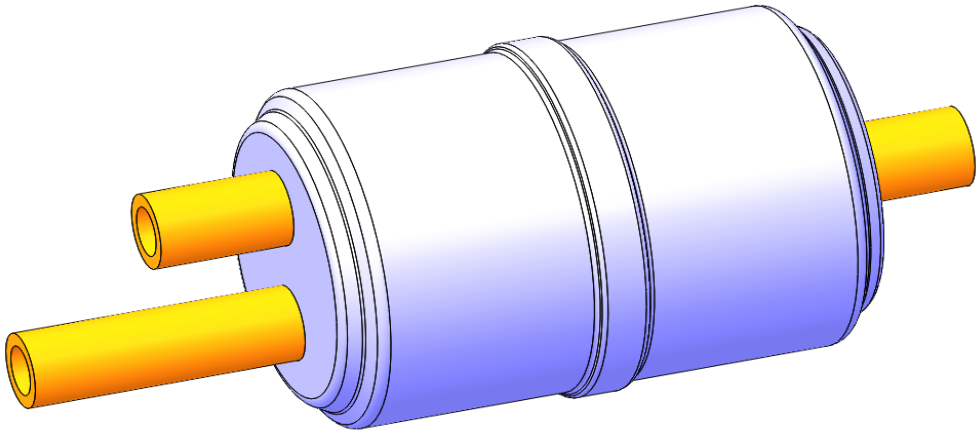


Fig. 6B.8.13 R-450 Filter Drier
P/N: 325-60103-00

6B.8.14 Compressor Wiring Schematics

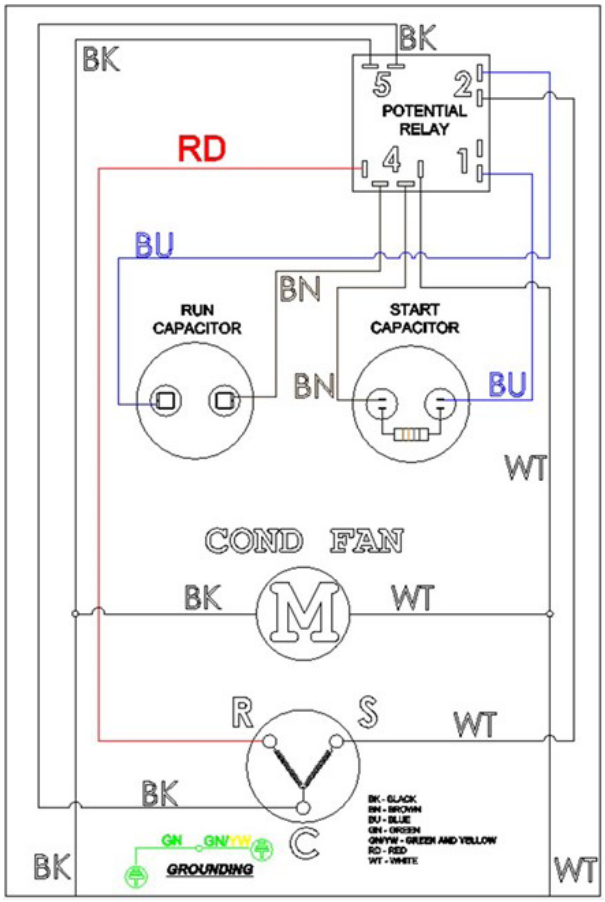


Fig. 6B.8.14a Capacitor Run/ Capacitor Start Compressors

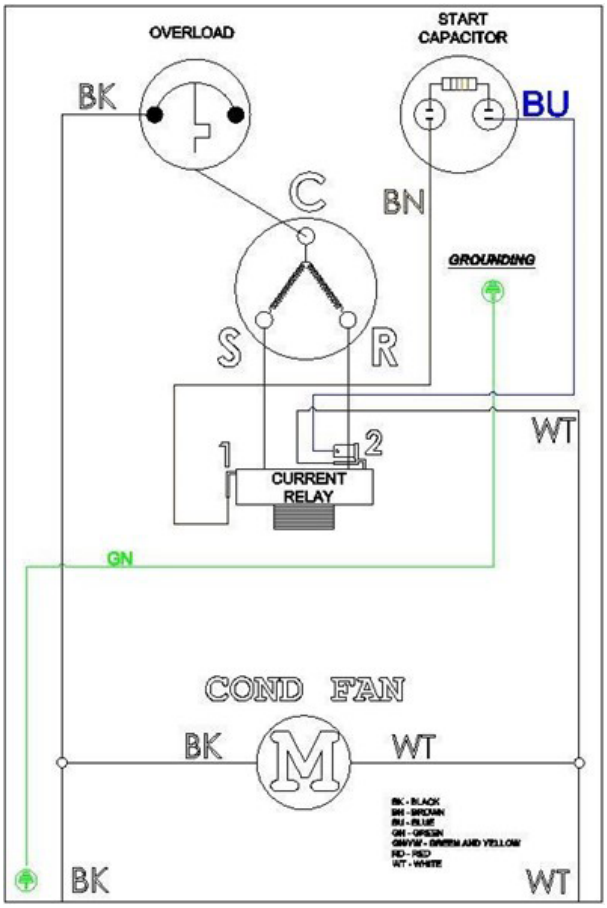
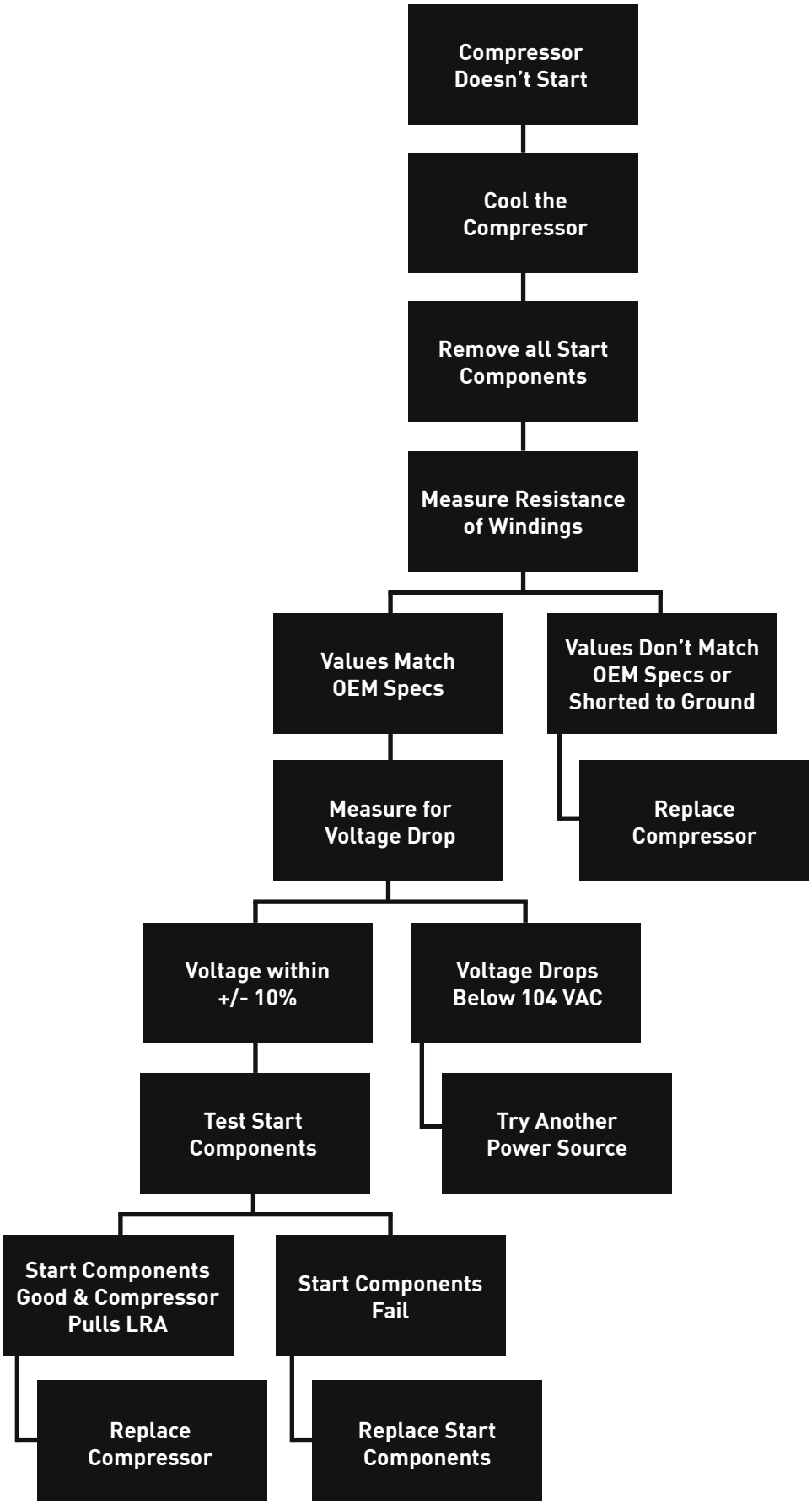
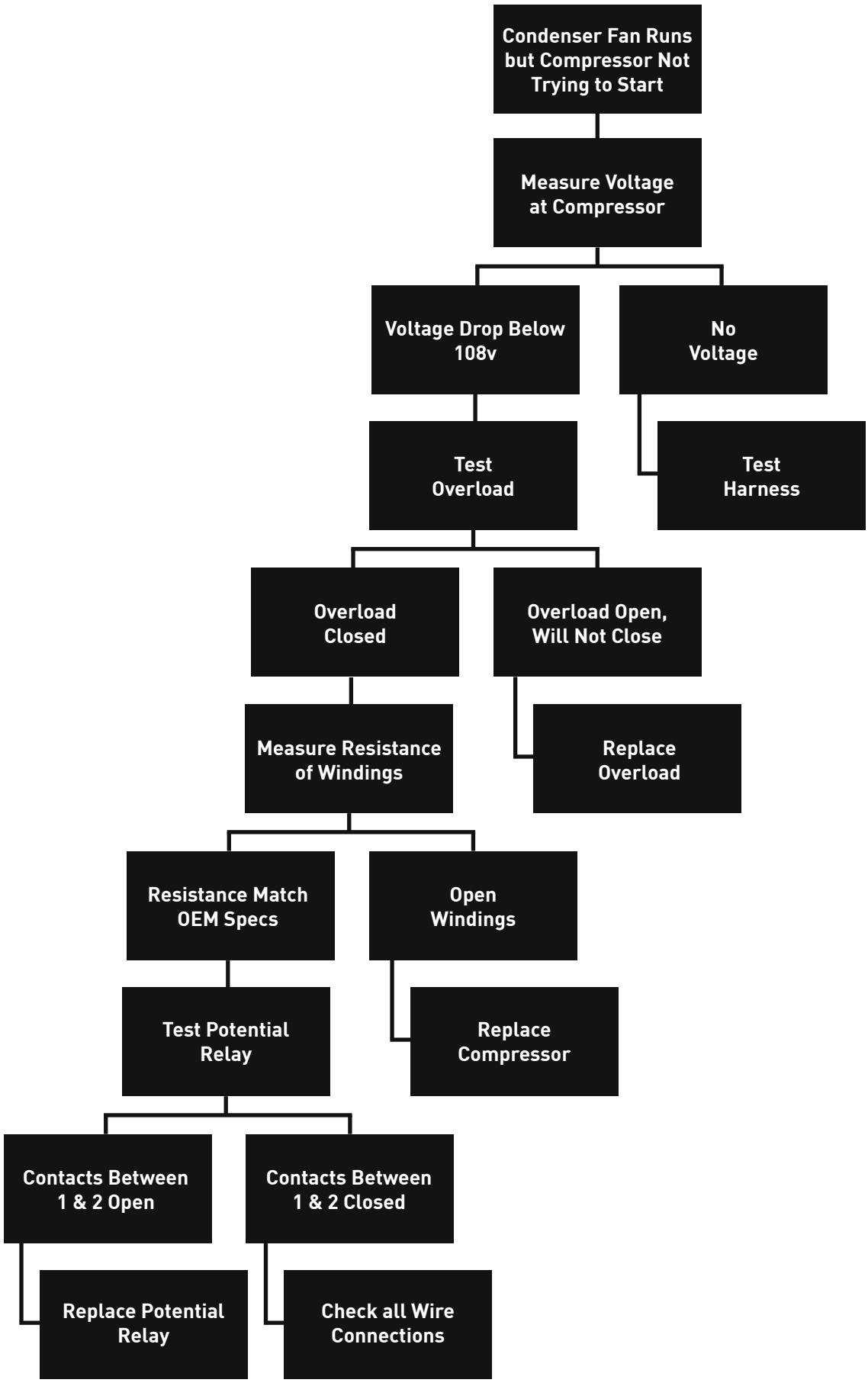


Fig. 6B.8.14b Induction Run Capacitor Start Compressors

6B.8.15 Compressor Short Cycles on Overload Protection



6B.8.16 Compressor Not Trying to Start



6B.9 Evaporator Fan Troubleshooting

6B.9.1 Steps for Troubleshooting Even Thaw Evaporator Fan

1. First verify fan icon is illuminated on the display indicating a call for the evaporator fan. Remember- the fan will shut off when door is open, so if you open door to physically check if fan is running you will need to disconnect white door switch connector from control board.

Fig. 6B.9.1a Evaportor Fan Icon on Display

2. Next use an amp meter to prove the evaporator fan motor is running.
3. If fan motor is not running use voltage meter to measure the voltage at fan motor if measurement within +/- 10% of rated voltage replace the fan motor.

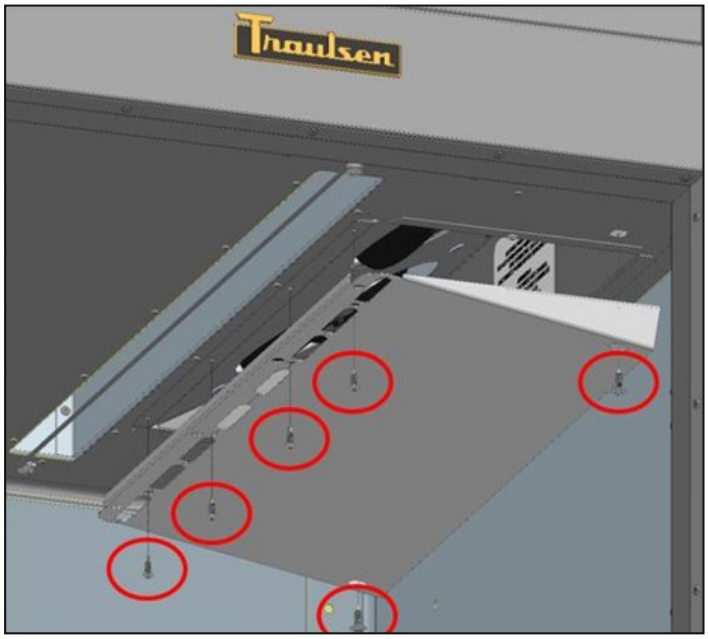


Fig. 6B.9.1b Duct Removal

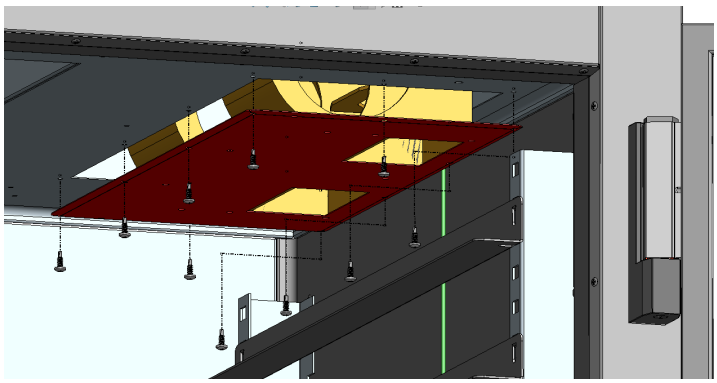


Fig. 6B.9.1c Evaporator Fan Assembly Removal
PN: 325-60071-01- ASSEMBLY BLOWER EVAP

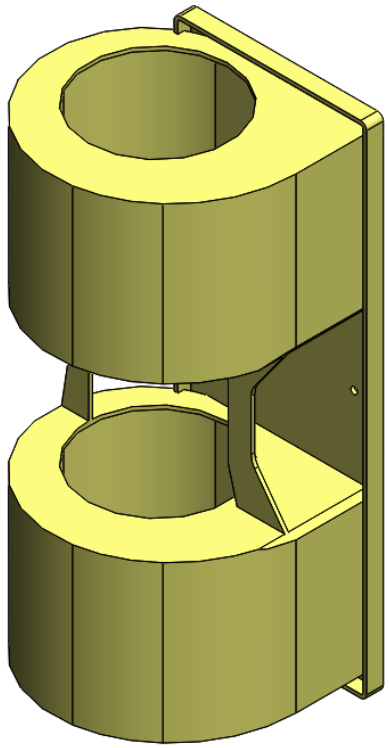


Fig. 6B.9.1f ECM Fan Motoro CW From Lead End (LOCATED BEHIND BLOWER HOUSING)
TRAULSEN P/N: 325-60013-10 "EVAPORATOR SECTION"
TRAULSEN P/N: 325-60071-01 "ASSEMBLY BLOWER HOUSING PANEL"

DESCRIPTION/ SPECIFICATION	MANUFACTURER
	N/A
PART NUMBER	325-60013-TAB
OUTPUT	111/159 WATTS
AMPS	0.95/1.21 A
VOLTAGE	120 VAC
FREQUENCY	60 Hz
SPEED	2,000/3,000 RPM
ROTATION	CW
AIR FLOW	252 CFM

Table 6B.9.1f ECM Fan Motor Specs -OLD PART NUMBER

DESCRIPTION/ SPECIFICATION	MANUFACTURER
	N/A
PART NUMBER	325-60073-TAB
OUTPUT	55 WATTS
AMPS	0.47 A
VOLTAGE	120 VAC
FREQUENCY	50/60 Hz
SPEED	1,550 RPM
ROTATION	CW
AIR FLOW	117 CFM

Table 6B.9.1f ECM Fan Motor Specs -NEW PART NUMBER

6B.10 Condenser Fan Troubleshooting

6B.10.1 Troubleshooting the Condenser Fan Motor on Even Thaw

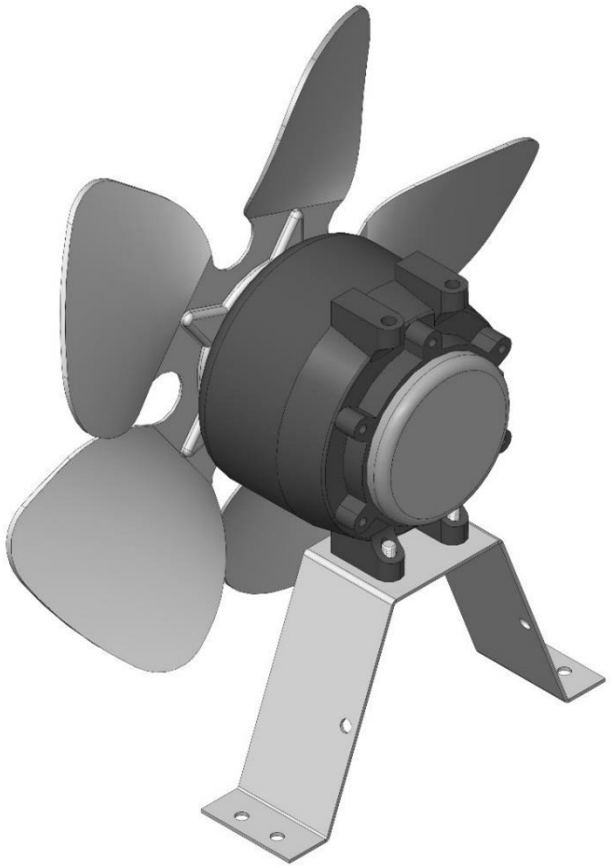


Fig. 6B.10.1a CFM Assembly View

Fig. 6B.10.1b Led Display

First verify that the Call for Cooling LED on the display is illuminated. If the compressor is running but not the condenser fan motor, you should measure voltage at the condenser fan motor. If you measure +/- 10% of rated voltage but the motor doesn't run, replace the fan motor.

6B.10.2 Motor Bearing Failure

Problems with motor bearings can be easily overlooked- as the motor will run while the cabinet drops in temperature until the motor overheats. Once the motor overheats it will shut off on the internal overload until the motor cools sufficiently. If the condenser fan motor is making a loud grinding noise, leaking oil from the bearings, and pulling excessive current to the motor, the bearings have failed. If the condenser fan motor exhibits these motor bearing failure symptoms, replace the fan motor.

TRAULSEN CAST IRON 9 WATT CONDENSER MOTOR P/N: 338-60050-00

DESCRIPTION/ SPECIFICATION	MANUFACTURER	
	MORRILL MOTORS, INC.	ELECTRIC MOTORS
MODEL	SP-B16LE12	SPFBG161
PART NUMBER	-	-
OUTPUT	16 WATT	16 WATT
AMPS	0.80 A	1.0 A
VOLTAGE	115 VAC	115 VAC
FREQUENCY	50/60 Hz	60 Hz
SPEED	1,550 RPM	1,550 RPM
ROTATION	CW	CW

Table 6B.10.2 Condenser Fan Motor

6B.10.3 Access and Removal of Condenser Fan Motor

STEP 1:

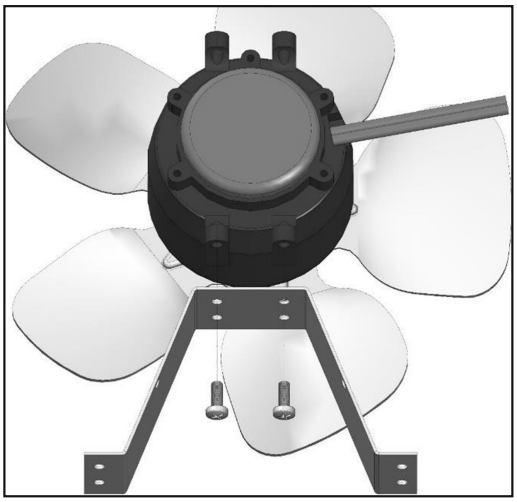


Fig. 6B.10.3.1a Remove Fan Mounting Bolts

STEP 2:

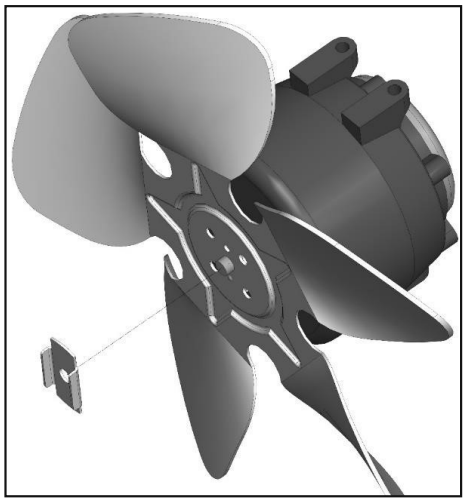


Fig. 6B.10.3.1b Remove Speed Nut

STEP 3:

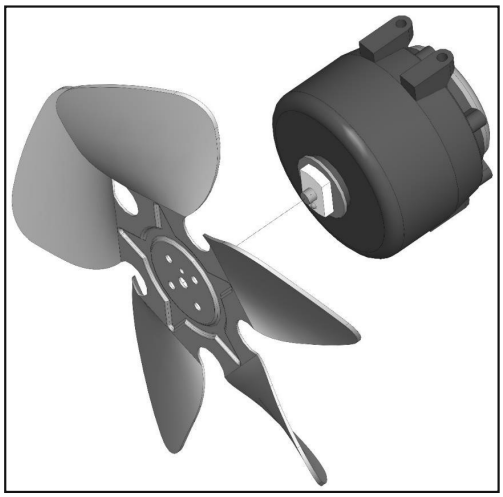


Fig. 6B.10.3.1c Remove Fan Blade

6B.10.4 Replacing the Condenser Fan Motor

DESCRIPTION	TRAULSEN PART NUMBER
16-WATT 115 VOLT CW SHADED POLE	338-60050-00

Table 6B.10.4a Condenser Fan Motor

When replacing the motor, be sure to note the direction of air flow as well as the position of the fan blade. The motor is designed to pull air through the condenser coil. The fan blade should be installed with the concave toward the motor using speed nut included with the motor. The vibration washer, which is supplied with the motor, must be installed between the motor and fan blade. Torque speed nut to 10 IN-LB.

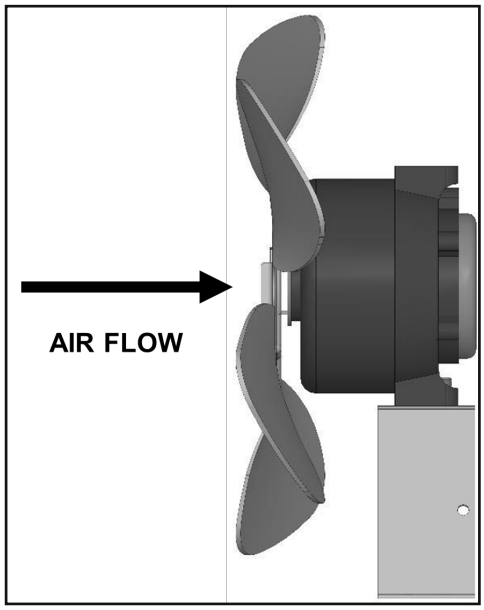


Fig. 6B.10.4b Fan Blade Orientation

Refer to the figure above to confirm the fan blade orientation when mounted on the bracket.

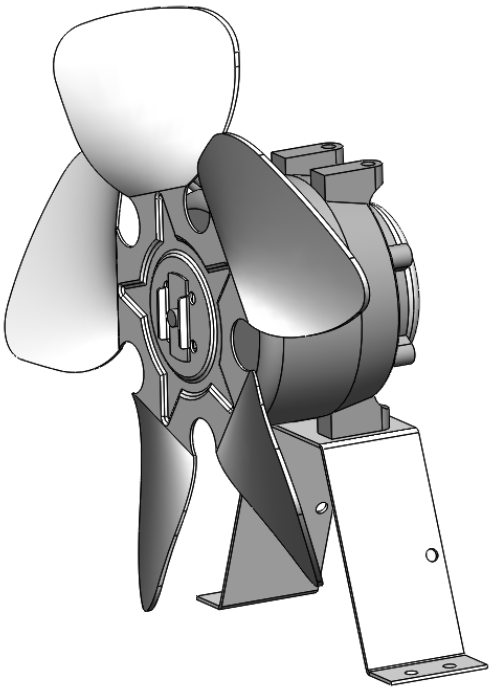


Fig. 6B.9.1d C-Frame (Saded Pole) Fan Motor
TRAULSEN P/N 338-60050-00

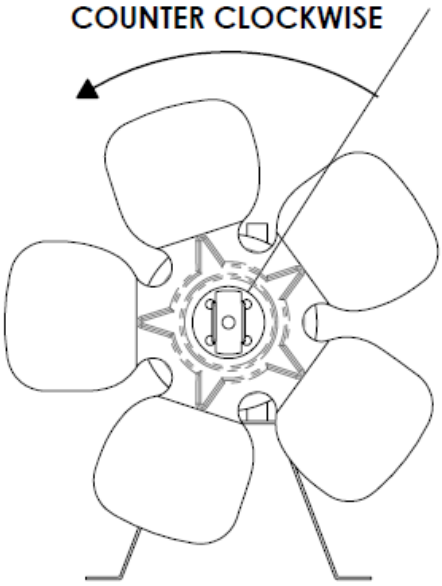
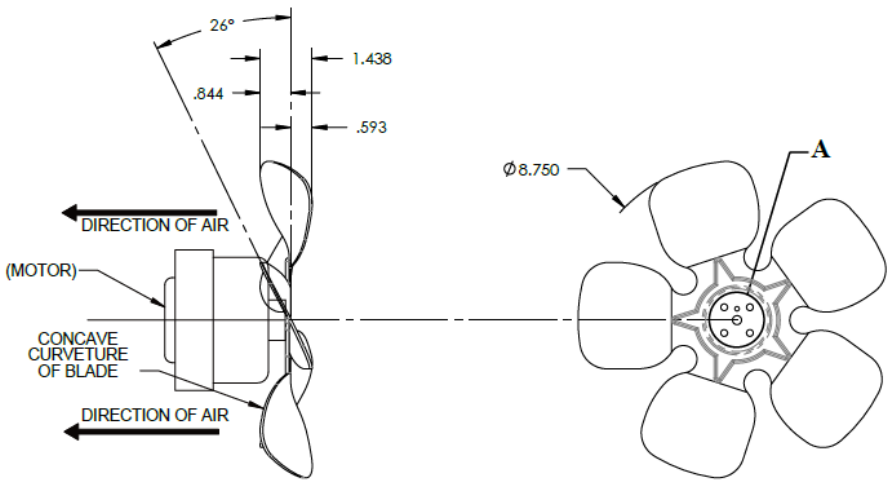


Fig. 6B.9.1e Condenser Fan Blade Ø8.75 With 26° Pitch
TRAULSEN P/N 325-60135-00

DESCRIPTION/ SPECIFICATION	MANUFACTURER	
	MORRILL MOTORS, INC.	ELECTRIC MOTORS
Part Number	SP-B16LE12	SPFBG161
Amps	.80 A	1.0 A
Voltage	115 VAC	115 VAC
Frequency	50/60 Hz	60 Hz
Speed	1,500 RPM	1,550 RPM
Rotation	CW	CW

Table 6B.9.1d C-Frame Fan Motor Specs



6B.11 Troubleshooting Thermostatic Expansion Valve

All Traulsen Even Thaw refrigerators and freezers are equipped with Thermostatic Expansion Valve (TXV). The TXV is a type of metering device that meters liquid refrigerant into the evaporator coil. A TXV is superior to a capillary tube metering device, as it can respond to load changes. The TXV is designed to control the superheat value of the refrigerant leaving the evaporator coil. This control of superheat is accomplished by a sensing bulb that is secured to the outlet of the evaporator coil at the suction line. When the temperature of the suction line increases at the sensing bulb (which is charged with refrigerant), the pressure in the sensing bulb increases- opening the valve. This is the only opening force upon the valve, so if the refrigerant charge is lost in the sensing bulb (powerhead) the TXV will close- starving the evaporator coil. If the sensing bulb is not attached to the suction line properly, the valve will likely open too much- flooding the evaporator.

DESCRIPTION	TRAULSEN PART NUMBER
TXV 132EUT	325-60080-102
2 Section TXV	325-60080-104
R450A/MT 1-1/4 O-3/8	RFGB10-0.23-310

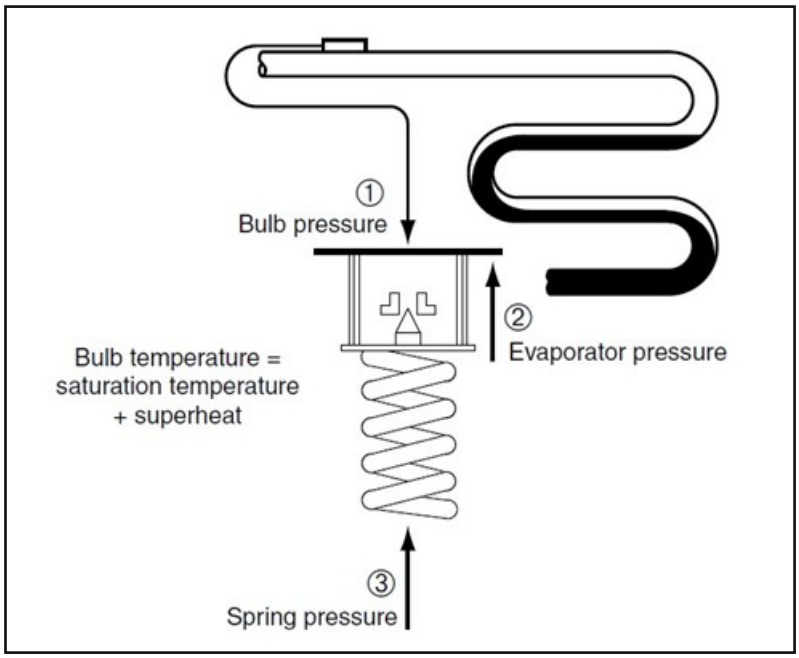


Fig. 6B.11 TXV 3 Pressures

6B.11.1 Three Pressures

There are three pressures at work on a TXV:

(1) The bulb pressure which is the only opening force.
(2) The evaporator pressure which is a closing force.
(3) The spring pressure which is a closing force.

All the TXV's used in Traulsen Even Thaw models are internally equalized, which means that the evaporator pressure closing force is applied internally from the inlet evaporator. The spring pressure is technically adjustable, but it should not be necessary to adjust any TXV on Traulsen equipment- as the superheat will be properly adjusted by Traulsen.

6B.11.2 Non- Bleed Type

The TXV used in Traulsen Even Thaw equipment is a non-bleed (hard shut-off) type of TXV, which means that the pressures do not equalize during the off-cycle.

6B.11.3 Maximum Operating Pressure

The TXV used in a Traulsen Even Thaw equipment is a MOP valve with Maximum Operating Pressure. The MOP valve is designed to limit the suction pressure from rising above the MOP value. Therefore, you will never see the suction pressure rise above the MOP value- not even during a hot pull down or after a defrost cycle.

6B.11.4 Measuring Superheat

When troubleshooting a TXV, it may become necessary to measure superheat- this can be done without connecting pressure gauges. All Traulsen Even Thaw refrigeration systems are sealed without access for pressure test. Installing pressure test access valves should be the last resort. Superheat can be measured with two thermometers securely attached to refrigerant lines.

(T1) Measure the temperature at the inlet of the evaporator coil after the TXV valve body.
(T2) Measure the temperature at the outlet of the evaporator coil after the TXV sensing bulb.

Subtracting (T1) from (T2) will equal the superheat. The superheat should measure somewhere between 4° to 12° F.

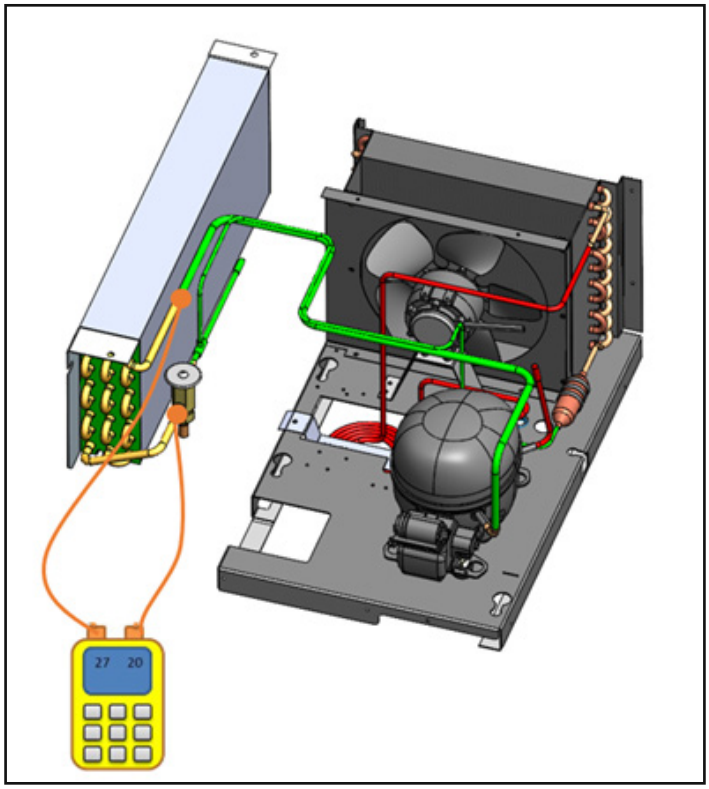


Fig. 6B.11.4 Measuring Superheat

6B.11.5 Restrictions

If the flow of refrigerant becomes restricted at the TXV, the valve will be very cold to the point of freezing, but the evaporator coil will be warm with high superheat and subcooling. Both low side and high side pressures will drop. Although, if refrigerant is added to the system, the high side pressure will rise but the low side will not.

6B.11.6 Replacing the TXV

If it becomes necessary to replace the TXV, care should be taken to replace it with the exact OEM part. When brazing the TXV into the system, care should be taken not to overheat the valve. This is best accomplished by wrapping the valve with a cold wet rag. A dry nitrogen purge of 10 SCFH should be used to displace the oxygen to prevent the creation of an oxidized film inside the piping- which could lead to system contamination or a restriction. Too much nitrogen pressure will blow back through the joint and cause pinholes. After replacing the TXV, be sure to pull a deep vacuum of 500 microns.

6B.12 Removing the Refrigeration System

6B.12.1 Condenser Assembly

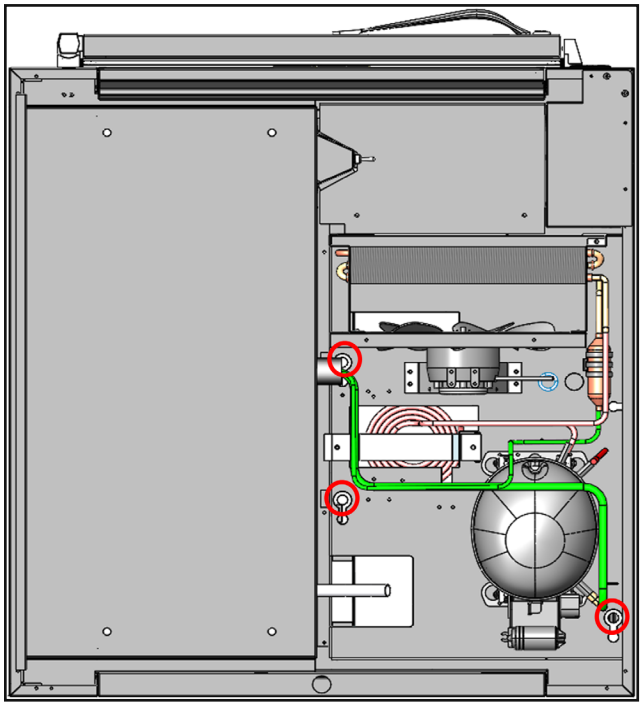


Fig. 6B.12.1a Fastener Locations

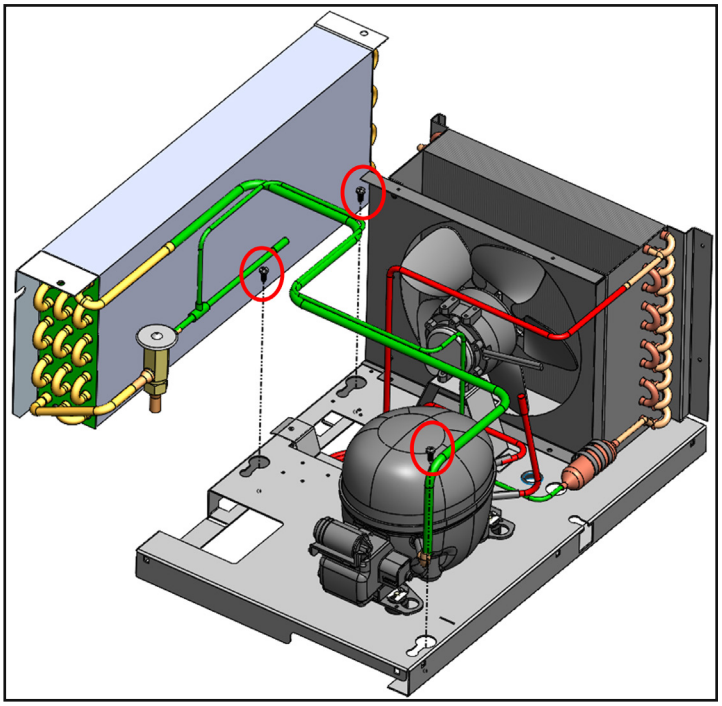


Fig. 6B.12.1b Remove Fastener Locations

6B.12.2 Defrost Troubleshooting

Traulsen uses two different types of defrost on the Even Thaw refrigerators. The last cabinet temperature before the defrost started will be displayed throughout the entire defrost cycle.

2. Electric Defrost

During an electric defrost, we shut off the compressor and the evaporator fan motor but energize an electric heating element- at which time the melting snowflake is illuminated. The electric defrost is initiated by time every eight hours on Even Thaw refrigerators, but then terminated when the evaporator coil temperature reaches 40° F or a maximum of 25 minutes. After the defrost heat is terminated, a drip time begins. During the drip time the coil temperature will continue to rise until two minutes of drip time is completed- at which time the compressor is energized. Once the evaporator coil temperature drops to 30° F, the evaporator fan motor will be energized.

Fig. 6B.12.2b Display During Electric Defrost

*On Even Thaw, Traulsen only uses one type of defrost:

7. General Wiring Diagrams

EU Wiring Standards for Service Technicians

This section of the service manual provides an overview of the European Union (EU) wiring standards relevant to service technicians working with electrical equipment rated at various voltages and frequencies.

Voltage and Frequency Specs:

EVEN-THAW

- Voltage: 115V, 208V-230V
- Frequency: 50-60Hz

MEGA-THAW

- Voltage: 208V-230V
- Frequency: 50-60Hz

Voltage Conversion:

Equipment designed for the US standard of 120V or 220V may require voltage conversion to match EU standards. Use appropriate voltage converters or transformers to ensure compatibility.

Plug and Socket Types:

Familiarize yourself with EU plug/socket standards, such as the Schuko plug/socket (Type F), which is common across the EU. Ensure compatibility with the specific plug/socket types used in the region where you are working.

Color Coding:

Be aware of differences in wire color coding between the US and EU. Follow EU standards for proper wiring and connections, ensuring safety and compliance with regulations.

Regulatory Compliance:

Adhere to relevant regulations and standards set by organizations such as the International Electro-technical Commission (IEC) and the European Committee for Electro-technical Standardization (CENELEC) to ensure safety and compliance with EU electrical standards.

Grounding and Earthing:

Ensure proper grounding and earthing practices in accordance with EU regulations. Securely make all grounding connections and verify that earthing systems comply with standards for electrical safety.

Voltage Tolerance:

Understand the voltage tolerance levels specified for equipment operating in the EU. Check equipment specifications to ensure compatibility with the voltage range and frequency of the EU electrical system.

Service technicians must be familiar with EU wiring standards when working with electrical equipment rated at voltages like 115V, 208V-230V, and frequencies of 50-60Hz. Adhering to these standards and regulations ensures safety, compliance, and optimal performance of equipment in European electrical systems.

7.1 Refrigerator Wiring Diagram

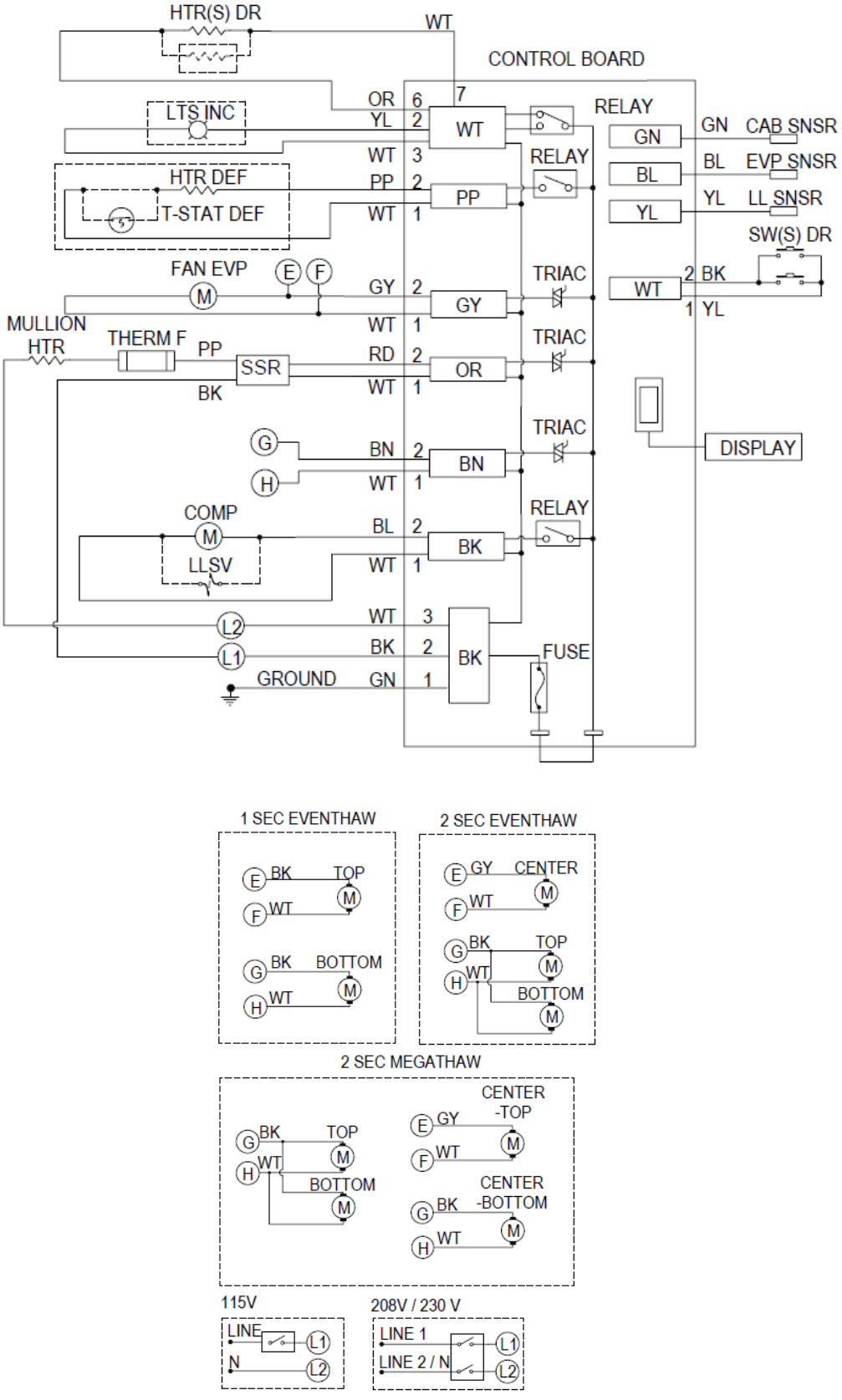


Fig. 7.1 Refrigerator Wiring Diagram

8. Warranty Information

NOTES STANDARD DOMESTIC WARRANTY

TRAULSEN & CO., INC. Warrants new equipment to the original purchaser, when installed within the United States against defective material and workmanship for one (1) year from the date of original installation. Under this warranty, TRAULSEN & CO., INC. will repair or replace, at its option, including service and labor, all parts found to be defective and subject to this warranty. The compressor part is warranted for an additional four (4) years. During this period TRAULSEN & CO., INC. will supply replacement compressor(s) if deemed defective, however, all installation, recharging and repair costs will remain the responsibility of the owner.

This warranty does not apply to damage resulting from fire, water, burglary, accident, abuse, misuse, transit, acts of God, attempted repairs, improper installation by unauthorized persons, and will not apply to food loss.

THERE ARE NO ORAL, STATUTORY OR IMPLIED WARRANTIES APPLICABLE TO TRAULSEN, INCLUDING BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF. TRAULSEN SHALL HAVE NO OBLIGATION OR LIABILITY FOR CONSEQUENTIAL OR SPECIAL DAMAGES, GROWING OUT OF OR WITH RESPECT TO THE EQUIPMENT OR ITS SALE, OPERATION OR USE, AND TRAULSEN NEITHER ASSUMES NOR AUTHORIZES ANYONE ELSE TO ASSUME FOR IT ANY OBLIGATION OR LIABILITY IN CONNECTION WITH THE EQUIPMENT OR ITS SALE, OPERATION OR USE OTHER THAN AS STATED HEREIN.

INTERNATIONAL COMMERCIAL WARRANTY

(For Canadian warranties see domestic US warranty)

TRAULSEN & CO., INC. Warrants to the original purchaser the Refrigeration Equipment manufactured and sold by it to be free from defects in material and workmanship under normal use and service for a period of one (1) year from date of shipment. Under this warranty, TRAULSEN & CO., INC. will reimburse the purchaser for the replacement of any part of said equipment (excluding dryers & refrigerant gas) which then proves to be defective. This warranty is void if said equipment or any part thereof has been subject to misuse, damage in transit, accident, negligence or alteration.

TRAULSEN'S standard warranty does not apply to Export Sales. Rather, for a period of one (1) year from date of original installation not to exceed Fifteen (15) months from date of shipment from factory, TRAULSEN:

will replace, F.O.B. Factory, any defective parts normally subject to warranty.

will not cover the cost of packing, freight or labor such costs being the sole responsibility of the dealer.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES EITHER EXPRESSED OR IMPLIED AND CONSTITUTES TRAULSEN'S FULL OBLIGATION AND LIABILITY. WARRANTIES NOT AVAILABLE ON REMOTE MODELS.

8.1 Unit Part Numbers

Component	RET132 Existing P/N (Pre-2024')	RET232 Existing P/N (Pre-2024')
Compressor	321-60215-10	321-60215-10
Condenser	325-60123-03	325-60122-03
Condenser Motor	338-60050-00	338-60050-00
Condenser Fan Blade	325-60135-00	325-60135-00
Evaporator	322-60003-00	322-60047-00
TXV	325-60080-102	325-60080-10
Drier Filter	325-60103-00	325-60103-00
Harness	333-60407-00	333-60342-00
Cond Pan	700-60663-00	700-60663-00
Refrigerant	328-60011-00	328-60011-00
Suction Line	315-60306-60	315-10089-00
Liquid Line	315-60305-60	315-10092-00
Hot Gas Loop	315-60307-60	315-60310-00
Process Tube @ Comp	315-10040-00	315-10040-00

NOTES:

4401 Blue Mound Road Fort Worth, Texas 76106 (USA)
Phone: 800.825.8220 | E-mail: service@traulsen.com | Website: traulsen.com
Form Number: TR00393 | Revision Date: 6-2024

Hours of Operation: Monday - Friday 7:30 a.m. - 4:30 p.m. (CST)