Carrier TRANSICOLD United Technologies

Truck Refrigeration

Operator's Manual for 35X with Standby 40X & 50X Truck Refrigeration Units

with Cab Command Two Controller

62-11045 Rev C

Operator's Manual
for
35X with Standby
40X & 50X
Truck Refrigeration Units

with Cab Command Two Controller

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Introduction

This guide has been prepared for the operator of Carrier Transicold 35X with Standby, and 40X and 50X Truck Refrigeration units with Cab Command, Two Controller. It contains basic instructions for the daily operation of the refrigeration unit as well as safety information, and other information that will help you to deliver the load in the best possible condition. Please take the time to read the information contained in this booklet and refer to it whenever you have a question about the operation of your Carrier Transicold unit.

Your refrigeration unit has been engineered to provide long, trouble-free performance when it is properly operated and maintained. A comprehensive maintenance program will help to insure that the unit continues to operate reliably. Such a maintenance program will also help to control operating costs, increase the unit's working life and improve performance.

This guide is intended as an introduction to your unit and to provide general assistance when needed. More comprehensive information can be found in the Operation and Service Manual for your unit. This manual can be obtained from your Carrier Transicold dealer.

When having your unit serviced, be sure to specify genuine Carrier Transicold replacement parts for the highest quality and best reliability.

At Carrier Transicold, we are continually working to improve the products that we build for our customers. As a result, specifications may change without notice.

Safety

Your Carrier Transicold refrigeration unit has been designed with the safety of the operator in mind. During normal operation, all moving parts are fully enclosed to help prevent injury. During all pre-trip inspections, daily inspections, and problem troubleshooting, you may be exposed to moving parts; please stay clear of all moving parts when the unit is in operation.

⚠ WARNING

Beware of unannounced starting of the fans caused by the thermostat and the start/stop cycling of the unit.

Refrigerants

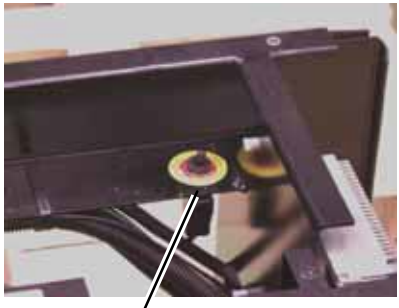
The refrigerant contained in the refrigeration system of your unit can cause frostbite, severe burns, or blindness when in direct contact with the skin or eyes. For this reason, and because of legislation regarding the handling of refrigerants during system service, we recommend that whenever your unit requires service of the refrigeration system you contact your nearest Carrier Transicold authorized repair facility for service.

⚠ WARNING

Inspect battery cables for signs of wear, abrasion or damage at every pretrip inspection and replace if necessary. Also check battery cable routing to ensure that clamps are secure and that cables are not pinched or chafing against any components.

Emergency Switch (40/50X units only)

The unit can be completely shut down manually by the emergency switch inside the frame of the condenser unit. The emergency switch must be in the on position to allow the unit to restart with the “ON” key of the cab command.

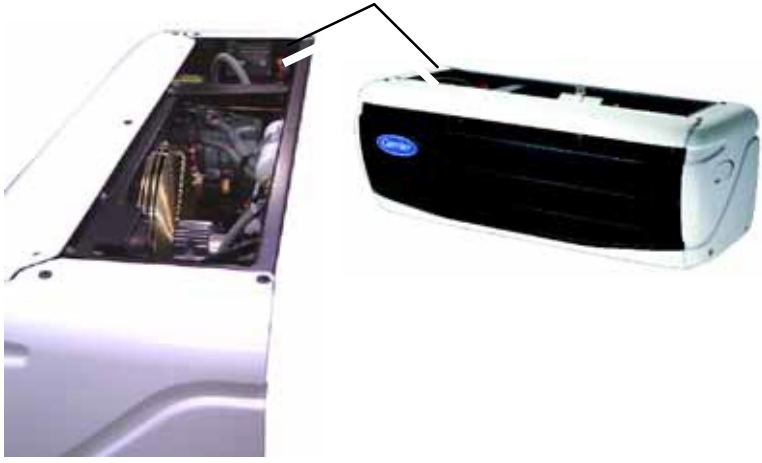


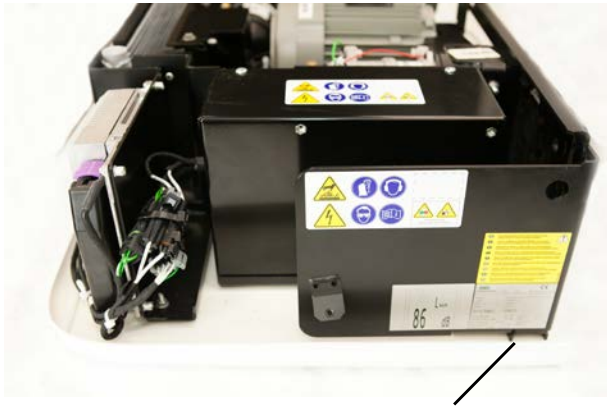
Unit Identification

The unit is identified by a nameplate attached to the frame of the unit. This nameplate identifies the complete model number of the unit, the serial number, the type of refrigerant and charge, and the date the unit was placed in service.

If a problem occurs, please refer to the information on this plate, and make a note of the model and serial number before calling for assistance. This information will be needed when you contact a technician or Carrier Transicold Service Engineer so that they may properly assist you.

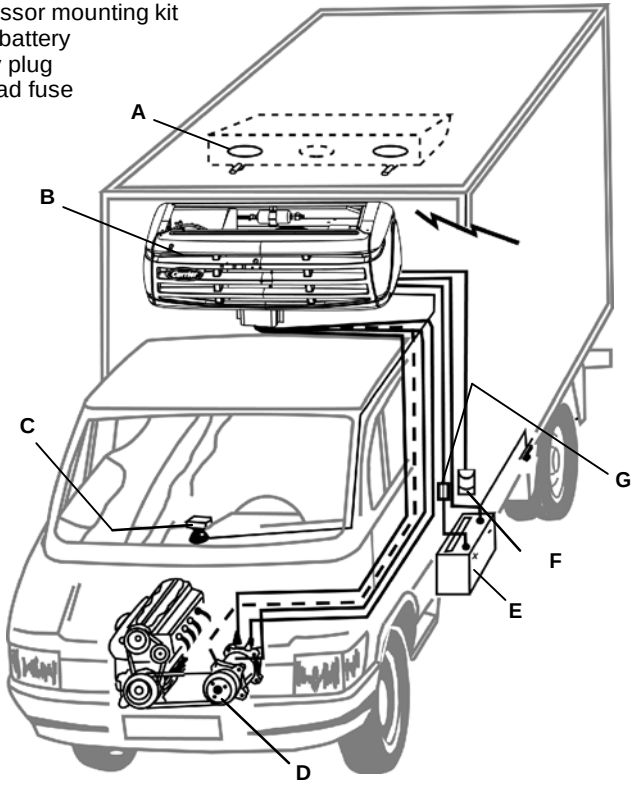
40/50X Nameplate





35X Nameplate

A : Evaporator
B : Condenser
C: Cab control
D : Compressor mounting kit
E : Vehicle battery
F : Standby plug
G : Main road fuse



Unit Operation

Operating Principle

After starting up the refrigeration unit by pressing the **ON** key on the Cab Command Two Controller, unit start-up and shutdown are automatic.

- **On Road operation**: An open-type compressor is driven by the vehicle's engine. The vehicle battery powers the evaporator and condenser fans. The unit automatically shuts down when the engine is switched off with the ignition key.
- **On Standby operation**: A standby compressor is energized, and a transformer is used to power the evaporator and condenser fans. The power connection is detected by the controller, which automatically starts up in the unit in Standby mode.
- If the ignition key is switched on while the unit is connected to power or the unit is connected to standby power while the engine is operating, the controller triggers a visual alarm in the form of a flashing red malfunction light and readout.
- In all cases, the unit can be completely shut down manually by pressing the OFF key on the Cab Command Two Controller.

Keypad and Display

Readout

Standby operation display

Road operation display

Manual defrost control key

Unit start-up key Unit

shut-down key Data

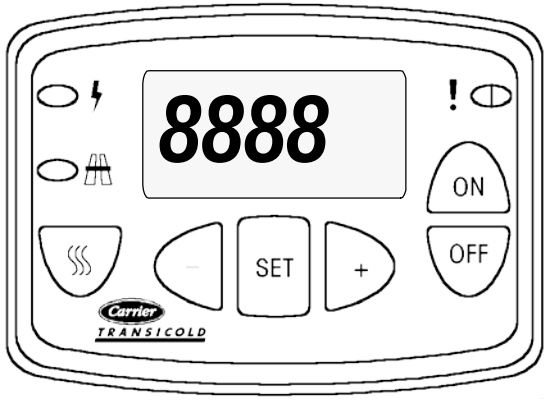
selection key

Selected data decrease key

Selected data increase key

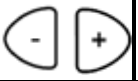
Unit operation display

- Green = In-Range (left half)
- Red = Alarm (right half)

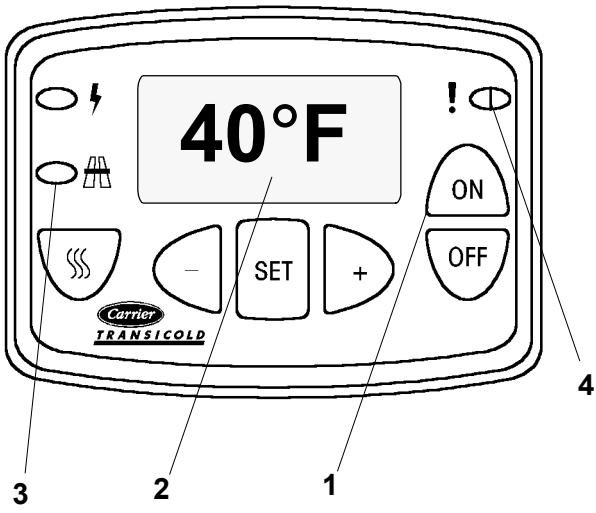


Additional Key Features

To access additional key functions, press and hold the SET key for five seconds. The microprocessor will provide a set of additional functions as the SET key is pressed additional times after the five second hold. The sequence for the additional functions is as follows:

	Press SET for five seconds. This enables access to the alarm codes
	Press to display the alarm list
	Press again to display software versions
	Press to display the cab command software version
	Press again to display road hour meter (Road LED ON)
	Press again to display standby hour meter (Standby LED ON)
	Press to display the present interval between defrosts (min) as calculated by the microprocessor.
	Press to display the elapsed time (min) since the last defrost
	Press to return to box temperature

Starting - Engine Operation



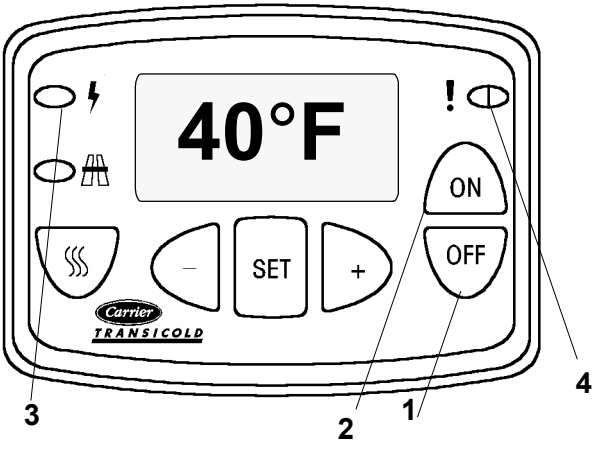
1. Press the ON key. Start-up may be time-delayed.

2. Check if box temperature is displayed.

3. Check that the road operation light is on.

NOTE: If standby power cord is plugged in, the controller will trigger a visual alarm in the form of a flashing red alarm light and readout (4), and the unit will run in standby mode.

Starting - Standby Operation



1. Press the OFF key and plug in power supply.
2. Press the ON key. Start-up may be time-delayed.
3. Check that the standby operation light is on.

NOTE: If the ending is operating when the unit is connected to power, the controller will trigger a visual alarm in the form of a flashing red alarm light and readout (4), and the unit will run in engine mode.

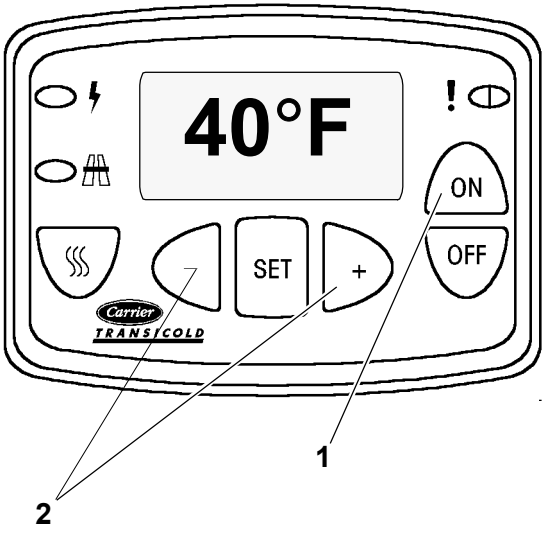
WARNING

Make sure the power plug is clean and dry before connecting to any power source.

WARNING

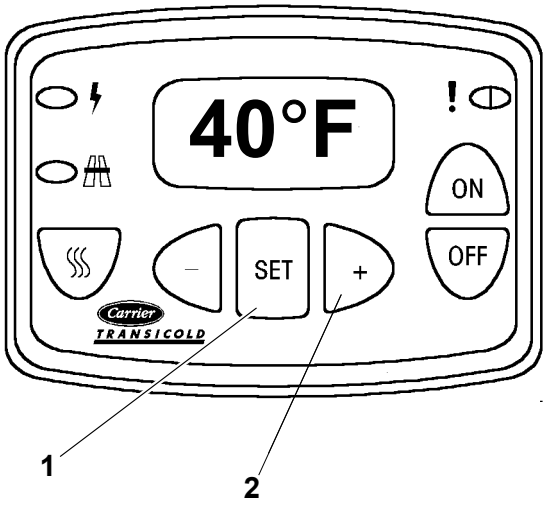
Do not attempt to connect or remove power plug before ensuring the unit is OFF (press OFF key on Cab Command) and external power circuit breaker is open.

Changing Display Brightness



1. Press the ON key.
2. Within five seconds, press the + (plus) or - (minus) key to increase or decrease display brightness.

Temperature Setpoint

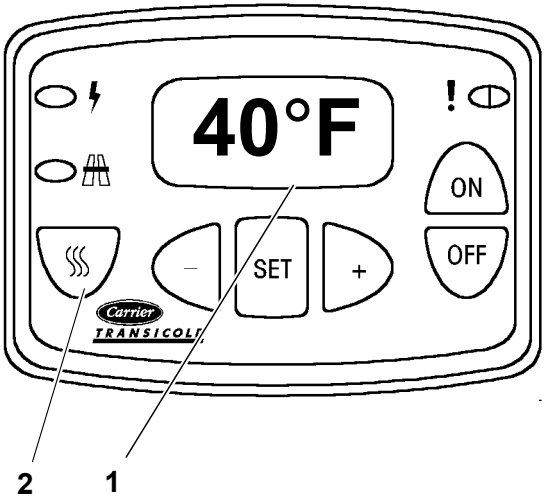


1. Press the SET key

2. Press the + (plus) key to increase setpoint or press the - (minus) key to decrease setpoint.

3. Press SET key when desired setpoint is displayed to lock in new setpoint.

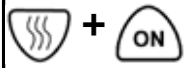
Manual Defrost



1. Check that box temperature is 40° F or lower.
2. Press the Manual Defrost key to initiate manual defrost.

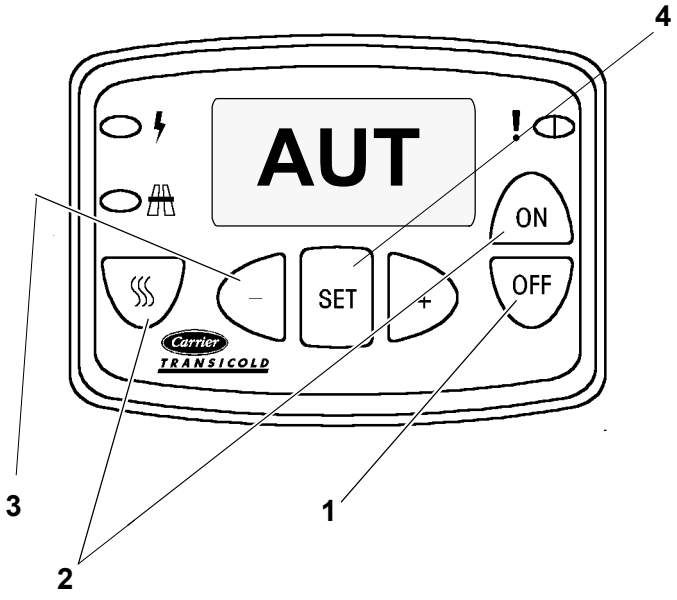
Defrost Parameters

The procedure for modifying defrost parameters is as follows:

	Shut down unit
	Display parameters
	Modify parameters
	Validate modified settings Return to display of box temperature.

Defrost Interval

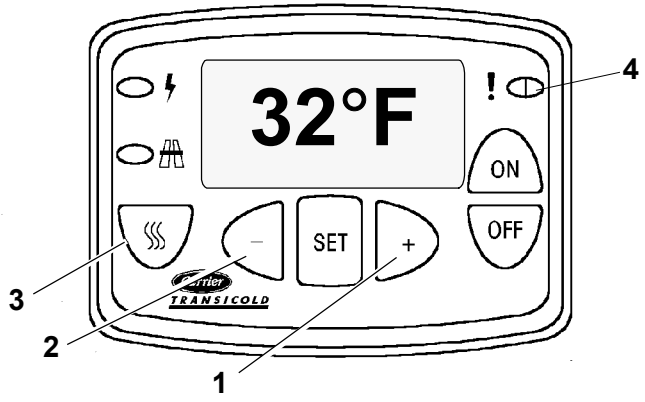
Defrost Interval in Hours: 0, 1, 1.5, 2, 2.5, 3, 4, 5 & 6
AUT: The microprocessor calculates the time, factoring in length of the last defrost and time between the two defrost cycles in relation to setpoint and cargo.



1. Press the OFF key.
2. Press Defrost and ON key to display the previously selected defrost interval.
3. Press - (minus) or + (plus) key to select defrost interval.
4. Press the SET key to validate modified value.

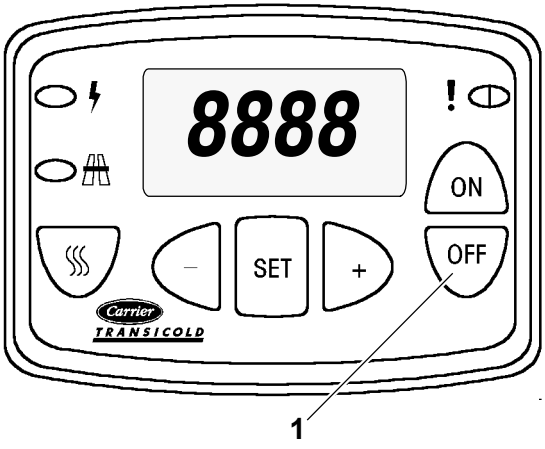
Minimum/Maximum Setpoint, Out-of-Range and Continuous Flow

Minimum Setpoint Settings: 32°F (0 °C), 68°F (20° C) or -20° F (-29° C)
Maximum Setpoint Settings: 68°F (20° C) or 86° F (30° C)
Out-of-Range Settings: 1.8, 3.6 or 5.4°F (1, 2 or 3°C)
Continuous Airflow Settings: F/ON or F/OFF



1. Turn unit on. Press and hold + (plus) key.
2. Press and hold - (minus) key.
3. Press and hold Defrost key.
4. Check that the **!** light flashes green.
5. The operator can select a minimum setpoint. Press+ (plus) key or - (minus) key to change setting.
6. Press SET key to save setting. Maximum Setpoint setting will appear next.
7. Press + (plus) key to increase Maximum Setpoint setting. Press - (minus) key to decrease setting.
8. Press SET key to save Maximum Setpoint setting.
9. Next setting is Out-of-Range. Press + (plus) key to increase Out-of-Range setting. Press - (minus) key to decrease setting.
10. Continuous Airflow determines whether the evaporator fan is on or off at setpoint. Press + (plus) or - (minus) key to select the desired operating mode. Press the SET key to save fan mode setting.

Stopping Unit



Press the OFF key.

Product Loading

Before Loading

- Pre-cool the body. This will remove much of the heat from the inside of the body and give the product much better protection when it is loaded.
- Place the unit in a defrost cycle immediately before loading. This will remove moisture accumulated on the evaporator coil.

During Loading

- Turn the unit off!
- Check product temperature during loading.
- Ensure the air return and supply opening remain unobstructed.
- Leave approximately 4 to 5 inches between the load and the front wall for air return to the unit.
- Leave at least 10 to 12 inches between the top of the load and the ceiling to ensure that there is nothing to prevent airflow to the rear of the body.
- Load product on pallets to provide free air return to unit and improve product protection.

Proper air circulation in the truck body – air that can move around and through the load – is a critical element in maintinaing product quality during transport. If air cannot circulate completely around the load, hot spots or top freeze can occur.

The use of pallets is highly recommended. When loaded so air can flow freely through the pallets to return to the evaporator, pallets help protect the product from heat passing through the floor of the truck. When using pallets, it is important to refrain from stacking extra boxes on the floor at the rear of the truck, which cuts off the air flow.

Product stacking is another important factor in protecting the product. Products that generate heat – fruits and vegetables for example, - should be stacked so the air can flow through the product to remove the heat. This is called “air stacking” the product. Products that do not create heat – meats and frozen products – should be stacked tightly in the center of the trailer.

All products should be kept away from the side walls of the body to allow air flow between the body and the load. This prevents heat filtering through the walls from affecting the product.

It is important to check the temperature of the product being loaded to ensure that it is at the correct temperature for transport. The refrigeration unit is designed to maintain the temperature of the product at the temperature at which it was loaded; it was not designed to cool warm product.

Recommended Transport Temperatures

Below are some general recommendations on product transport temperatures and operating modes for the unit. These are included for reference only and should not be considered preemptive of the set point required by the shipper or receiver.

More detailed information can be obtained from your Carrier Transicold dealer.

Product	Setpoint Range	
	°F	°C
Bananas	56 to 58	13 to 14
Fresh fruits and vegetables	33 to 38	0.5 to 3
Fresh meats and seafood	28 to 32	-2 to 0
Dairy Products	33 to 38	0.5 to 3
Ice*	15 to 20	−10 to −7
Frozen fruits and vegetables*	−10 to 0	-23 to -18
Frozen meats and seafood*	−10 to 0	-23 to -18
Ice Cream*	−20 to −15	-29 to -26

During delivery cycles that include frequent stops and door openings, it is recommended that the unit be turned off during the time the body doors are open to help conserve the product temperature.

* Variations may be necessary for very high or very low ambient temperatures.

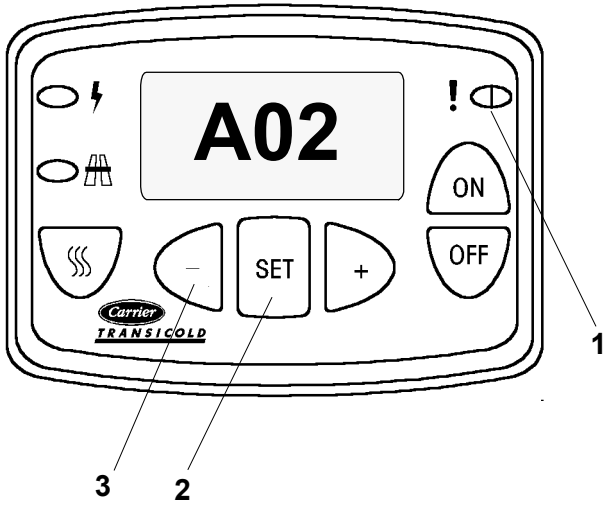
Problems and Alarms

Everything possible has been done to ensure that your unit is the most reliable, trouble-free equipment available today. However, if you run into problems the following section may be of assistance.

If you do not find the trouble that you have experienced listed, please call your Carrier Transicold dealer for assistance.

General Problems	
Unit does not power up	• Check battery condition • Check battery connections • Check all fuses
Unit does not start	Check all fuses
Unit does not run	Check all fuses
Unit shut down	Check alarm codes
Unit not cooling properly	• Check minimum setpoint setting (see page 15) • Defrost unit • Check evaporator for airflow restrictions. • Check condenser for airflow restriction • Check body for damage or air leaks • Check product is loaded properly • Check refrigerant charge

Alarm and Error Display



1. When an Alarm is activated, the **!** light flashes red.

   The **!** light flashes green when the unit is operating correctly.

2. Press the SET key for five seconds to display alarms.

3. Press + or - key to view additional alarms.

4. Press SET key to return to box temperature display.

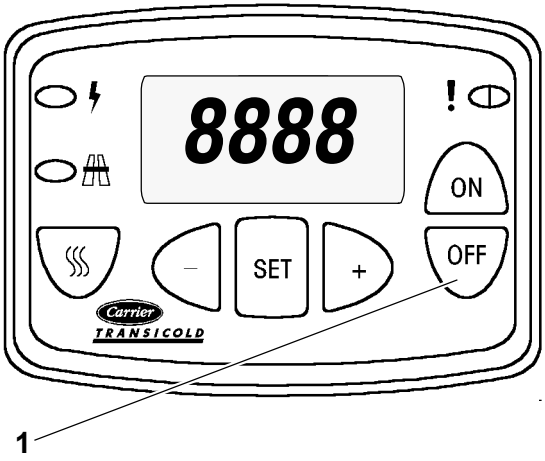
NOTE: There are two types of Alarms
Axx (example: A02)
Pxx (example: P02)

Axx	Designates Active Alarms
Pxx	Designates Past Alarms, which are alarm conditions that existed previously, but that are no longer active.

Alarm List

Alarm	Alarm/Error Description
A00	No Malfunction
A01	Low Pressure Switch (LP) Open
A02	High Pressure Switch (HP1) Open
A03	Standby Compressor Over Heated
A04	Road Compressor Clutch
A05	Standby Contactor (high amp draw)
A06	Condenser Fan Motor (high amp draw)
A07	Evaporator Fan Speed Alarm
A08	Hot Water Solenoid (high amp draw) (option)
A09	Hot Gas Valve (HGS1) (high amp draw)
A10	Quench Valve (BPV)(high amp draw)
A11	Condenser Pressure Control Valve (HGS2)
A12	Out-of-Range High Temperature
A13	Out-of-Range Low Temperature
A14	Defrost Cycle >45 minutes
A15	Setpoint out of range - 20°F to 86°F
A16	Drain Water Resistor Heater (DWR1) High amp draw
A17	Transformer/Rectifier (RBT) thermal overload
A18	Electrical Heating Relay (high amp draw) (option)
A20	Low Pressure Switch jumper open
A21	Compressor Contactor Open
A22	Condenser Fan Motor Open Circuit
A23	Hot Water Solenoid Open Circuit (option)
A24	Hot Gas Valve (HGS1) Open Circuit
A25	Quench Valve (BPV) Open Circuit
A26	Condenser Pressure Control Valve (HGS2) Open Circuit
A27	Drain Water Resistor (DWR) Open Circuit (option)
A28	Heating Relay (EHR) Open Circuit (option)
A45	EEPROM Failure
A46	5BPV Coil Short Circuit
A47	SBPV Open Circuit
2EP	Functional parameters have not been set or have been lost. Press and hold the SET key to clear the alarm.
EE	Return Air Sensor
bAt	Low Battery Voltage
⁃ ⁃ ⁃ ⁃ ⁃ ⁃ ⁃ ⁃ ⁃	Using Road & Standby Compressors at the Same Time.
Err	Programming mistake of maximum setpoint by user.
⁃⁃⁃	Setpoint lower than maximum setpoint but in the range --20° F to 86° F

Alarm Reset



Press the OFF key to clear Active Alarm list. Unit can now be restarted if no Active Alarm condition remains.

Standby Operation Guidelines

For safe, reliable operation in Standby mode, it is important to follow a few guidelines:

- Always check that the unit is OFF by pressing OFF key on controller before connecting or disconnecting the unit from the power source.
- The circuit breaker and power cord used for Standby operation must comply with legislations currently applicable for site of use and with unit specifications in table below.

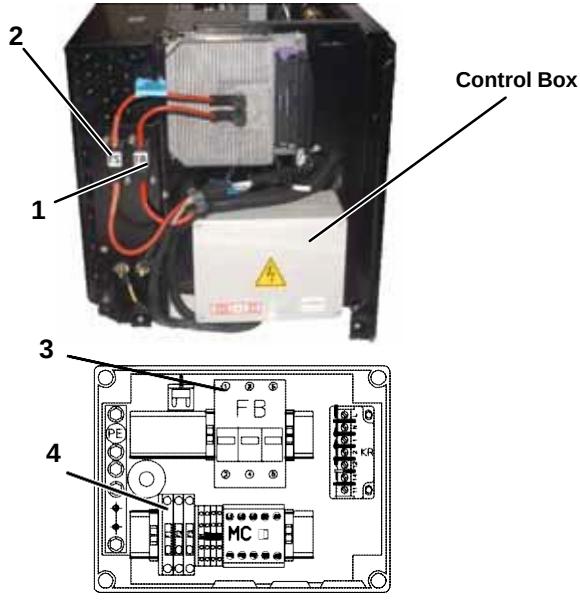
Unit	Operating Voltage	Maximum Unit Operating Amperage
35X	115/1/60	23.2 A
	230/1/60	11.2 A
	230/3/60	8.9 A
40X	230/1/60	24 A
	230/3/60	14 A
50X	230/1/60	25 A
	230/3/60	15 A

When multiple units are in use, each unit must be operated on its own electrical circuit. You should never operate more than one unit on a circuit breaker.

Important note: The above information is provided as a guideline only. When preparing a circuit for operation of the refrigeration unit, a licensed electrician should be contracted. A licensed electrician is familiar with all local ordinances and special requirements for your area and can ensure that the circuits are properly designed, installed, and connections are correct.

Fuses - 40/50X

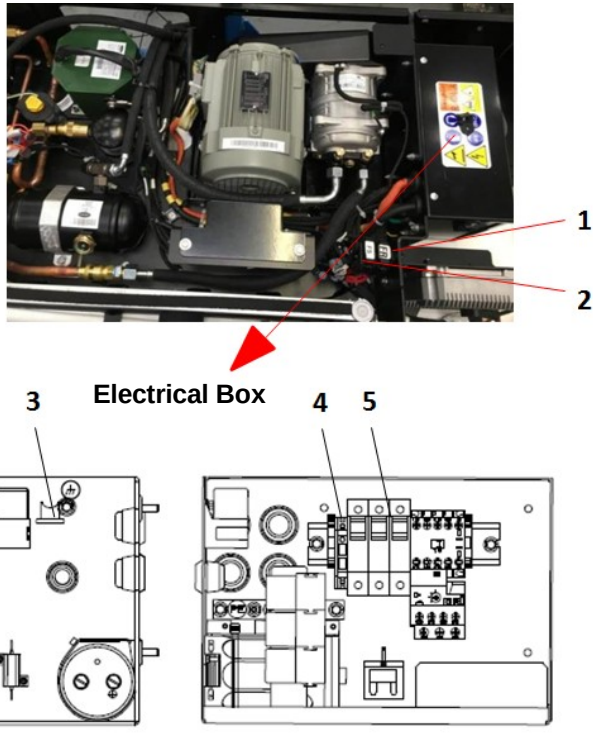
To access the road and standby fuses, remove the left side cover (fastened by four screws). To access transformer fuses, remove control box cover.



Item	Purpose	230/3/60	230/1/60
1	Road Supply Fuse (FR)	50 A	50 A
2	Standby Supply Fuse (FS)[a]	50 A	50 A
3	Main Standby Fuse (FB) (x3)[b]	(3) 15 A	–
4	Transformer Primary Fuses (Standby) F1/F2/F3 (Three Phase) F1 (Single Phase)	(3) 15 A	5 A
	Main Road Fuse (FR1) [d]	60 A	60 A
	Ignition Fuse (FI)[e]	1 A	1 A
	Suction Bypass Fuse (FSBP)[e]	3 A	3 A

(a) Standby units only
(b) Standby units only
(c) Standby units only - Located in standby plug (not shown)
(d) Not shown - Located close to the vehicle battery (12V).
(e) Not shown - Located inline

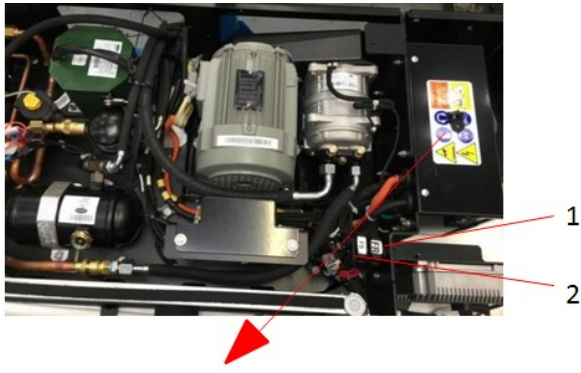
Fuses - 35X - 230/3/60



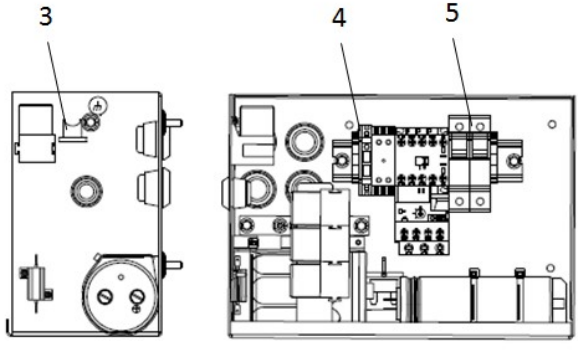
Inside Left Side
Electrical Box

Item	Location	Purpose	230/3/60
1	Condenser	Road Supply Fuse (FR)	50A
2	Condenser	Standby Supply Fuse (FS)	50A
3	Standby Box	Standby Clutch Fuses (FC)	5A
4	Standby Box	Transformer Fuse (F1)	5A
5	Standby Box	Electrical Motor Fuse (FB)	12A
6	Engine Compartment	Ignition Fuse (F1) Inline (not shown)	1A

Fuses - 35X - 230/1/60



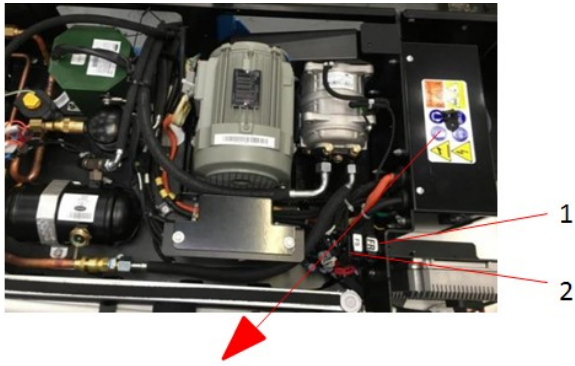
Electrical Box



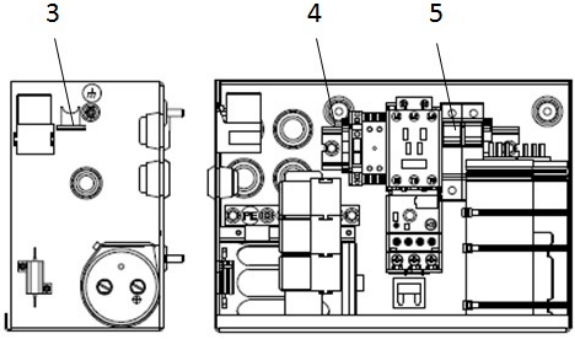
Inside Left Side of Electrical Box

Item	Location	Purpose	230/3/60
1	Condenser	Road Supply Fuse (FR)	50A
2	Condenser	Standby Supply Fuse (FS)	50A
3	Standby Box	Standby Clutch Fuses (FC)	5A
4	Standby Box	Transformer Fuse (F1)	5A
5	Standby Box	Electrical Motor Fuse (FB)	16A
6	Engine Compartment	Ignition Fuse (F1) Inline (not shown)	1A

Fuses - 35X - 115/1/60



Electrical Box



Inside Left Side of Electrical Box

Item	Location	Purpose	230/3/60
1	Condenser	Road Supply Fuse (FR)	50A
2	Condenser	Standby Supply Fuse (FS)	50A
3	Standby Box	Standby Clutch Fuses (FC)	5A
4	Standby Box	Transformer Fuse (F1)	8A
5	Standby Box	Electrical Motor Fuse (FB)	25A
6	Engine Compartment	Ignition Fuse (F1) Inline (not shown)	1A

Unit Maintenance

WARNING
Before working on unit, check that:

- The unit is off (press OFF key on controller).
- It is impossible for unit to automatically start-up during maintenance.

Refrigerant Charge: R-404A

Refrigerant Charge	
Unit	**Charge**
35X	3.3 lbs (1.5 kg)
40X	6 lbs (2.7 kg)
50X	6.5 lbs (2.9 kg)

Compressor Oil - Mobil Arctic EAL 68		
Unit	**Oil Charge**	
	Road	**Standby**
35X	6 ounces (180ml)	6 ounces (180ml)
40/50X	6 ounces (180ml)	6 ounces (180ml)

For the most reliable operation and for maximum life, your unit requires regular maintenance. Maintenance should be performed on the following schedule:

Preventive Maintenance Schedule

Hours	Service A	Service B	Service C	Service D
100	X			
1000	X	X		
2000	X	X	X	
3000	X	X		
4000	X	X	X	X
5000	X	X		
6000	X	X	X	
7000	X	X		

Service Schedule	
Service A	1. Check the tension of the alternator/compressor belt. 2. Check that the vehicle engine runs correctly at low speed and that the compressor mounting kit is correctly tightened and that belt tension is correct. 3. Check the tightness of bolts and screws and that the unit is correctly fastened onto the box.
Service B	1. Clean condenser and evaporator coils. 2. Replace road compressor belt. 3. Check and, if required, replace filter drier. 4. Check operation of Cab Command Two Controller. 5. Check the defrost: • Cut-in • Fan shut-down • Cut-out • Defrost water drain(s)
Service C	1. Check the operation of the evaporator and condenser fans. 2. Change condenser motor brushes. The evaporator is equipped with brushless fan motors, brush maintenance is not required. 3. Change compressor oil Use polyol ester oil (POE) approved by Carrier Transicold.
Service D	Change the removable fuses and capacitors (if any) in the control box.

Emergency Road Service

At Carrier Transicold, we are working hard to give you complete service when and where you need it. That means a worldwide network of dealers that offer 24-hour emergency service. These service centers are manned by factory trained service personnel and backed by extensive parts inventories that will assure you of prompt repair.

Should you experience a problem with your unit during transit, follow your company's emergency procedure or contact the nearest Carrier Transicold service center. Consult the Shortstop Service Centers directory, or visit www.trucktrailer.carrier.com and click on "Dealer Locator" to locate the service center nearest you. The Shortstop directory may be obtained from your Carrier Transicold dealer.

You can also download the Carrier Transicold North America Truck/Trailer Dealer Locator App to your smart phone. The Dealer Locator App provides:

- Location information for every Carrier Transicold dealer in North America
- The nearest dealer to your present location
- Dealer look-up capability
- Dealer services (Trailer, Truck, APU, Mobile Support, etc.)
- Addresses
- Maps to easily find dealers
- Directions and navigation to the dealerships
- Phone number and 24-hour emergency hot-lines where available
- Auto dialing
- Hours of operation
- Link to dealer website
- Ability to add dealers to Contacts

To download the Carrier Transicold North America Truck/Trailer Dealer Locator App, scan this QR code, or go directly to your App store.

If you are unable to reach a service center, call our 24-hour Action Line: (800) 448-1661

We will do everything we can to get your problem taken care of by an authorized CTD dealer and get you back on the road.

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CALIFORNIA
Proposition 65 Warning

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects,and other reproductive harm.

Specifications are subject to change without notice.
Warranty: Product warranty and limitations are outlined in Form 62-11019. This warranty applicable only in North America. Consult your Carrier Transicold representative for warranty coverage elsewhere.

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