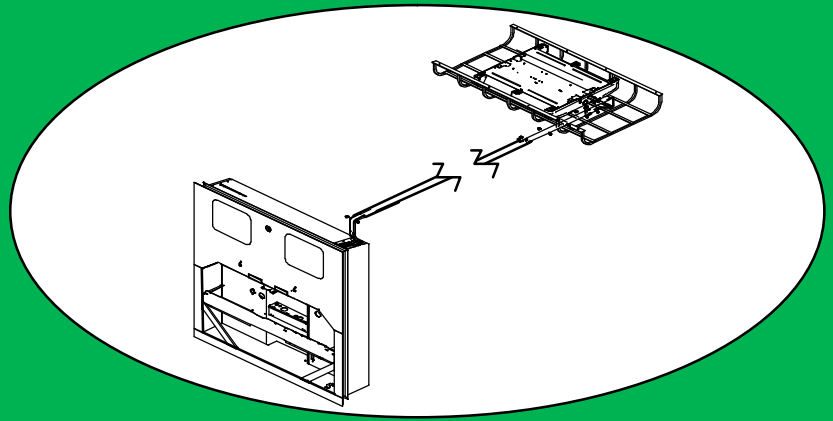
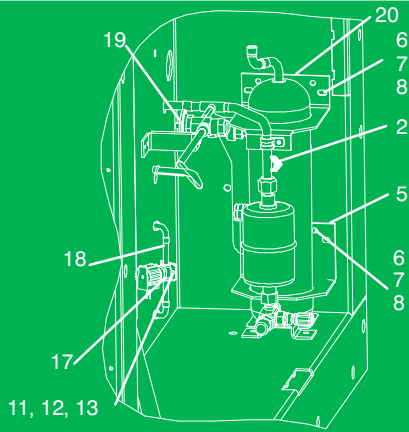




Container Refrigeration



OPERATION, SERVICE AND PARTS SUPPLEMENT

For

Dual Temperature Container Refrigeration Units

69NT40-541-304 and 69NT40-541-345



OPERATION, SERVICE AND PARTS SUPPLEMENT

For

Dual Temperature Container Refrigeration Units

69NT40-541-304 and 69NT40-541-345

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SECTION 1

SAFETY SUMMARY

1.1 GENERAL SAFETY NOTICES

The following general safety notices augment the specific warnings and cautions appearing elsewhere in this supplement. They are recommended precautions that must be understood and applied during operation and maintenance of the equipment covered herein. The general safety notices are presented in the following three sections labeled: First Aid, Operating Precautions and Maintenance Precautions. A listing of the specific warnings and cautions appearing elsewhere in the supplement follows the general safety notices.

1.2 FIRST AID

An injury, no matter how slight, should never go unattended. Always obtain first aid or medical attention immediately.

1.3 OPERATING PRECAUTIONS

Always wear safety glasses and hearing protection.

Keep hands, clothing and tools clear of the evaporator and condenser fans.

No work should be performed on the unit until all circuit breakers and start-stop switches are turned off, and power supply is disconnected.

Always work in pairs. Never work on the equipment alone.

In case of severe vibration or unusual noise, stop the unit and investigate.

1.4 MAINTENANCE PRECAUTIONS

Beware of unannounced starting of the evaporator and condenser fans. Do not open the condenser fan grille or evaporator access panels before turning power off, disconnecting and securing the power plug.

Be sure power is turned off before working on motors, controllers, solenoid valves and electrical control switches. Tag circuit breaker and power supply to prevent accidental energizing of circuit.

Do not bypass any electrical safety devices, e.g. bridging an overload, or using any sort of jumper wires. Problems with the system should be diagnosed, and any necessary repairs performed, by qualified service personnel.

When performing any arc welding on the unit or container, disconnect all wire harness connectors from the modules in both control boxes. Do not remove wire harness from the modules unless you are grounded to the unit frame with a static safe wrist strap.

In case of electrical fire, open circuit switch and extinguish with CO₂ (never use water).

1.5 UNIT LABEL IDENTIFICATION

To help identify the label hazards on the unit and explain the level of awareness each one carries, an explanation is given with the appropriate consequences:



DANGER – warns against an immediate hazard which WILL result in severe personal injury or death.



WARNING – warns against hazards or unsafe conditions which COULD result in severe personal injury or death.



CAUTION – warns against potential hazard or unsafe practices which could result in minor personal injury.

NOTICE

NOTICE – warns against potential product or property damage.

1.6 SPECIFIC WARNING AND CAUTION STATEMENTS

The statements listed below are applicable to the refrigeration unit and appear elsewhere in this manual. These recommended precautions must be understood and applied during operation and maintenance of the equipment covered herein.

WARNING

Beware of unannounced starting of the evaporator and condenser fans. The unit may cycle the fans and compressor unexpectedly as control requirements dictate.

WARNING

Do not attempt to remove power plug(s) before turning OFF start-stop switch (ST), unit circuit breaker(s) and external power source.

WARNING

Make sure the power plugs are clean and dry before connecting to any power receptacle.

WARNING

Never use air for leak testing. It has been determined that pressurized, air-rich mixtures of refrigerants and air can undergo combustion when exposed to an ignition source.

CAUTION

Pre-trip inspection should not be performed with critical temperature cargoes in the container.

CAUTION

When Pre-Trip key is pressed, dehumidification and bulb mode will be deactivated. At the completion of Pre-Trip activity, dehumidification and bulb mode must be reactivated.

CAUTION

When condenser water flow is below 11 lpm (3 gpm) or when water-cooler is not in use, the CFS switch **MUST** be set to position “1” or the unit will not operate properly.

CAUTION

Pre-trip inspection should not be performed with critical temperature cargoes in the container.

CAUTION

When Pre-Trip key is pressed, dehumidification and bulb mode will be deactivated. At the completion of Pre-Trip activity, dehumidification and bulb mode must be reactivated.

 **CAUTION**

When a failure occurs during automatic testing the unit will suspend operation awaiting operator intervention.

 **CAUTION**

When Pre-Trip test Auto 2 runs to completion without being interrupted, the unit will terminate pre-trip and display “Auto 2” “end.” The unit will suspend operation until the user depresses the ENTER key!

 **CAUTION**

The unit will remain in the full cooling mode as long as the emergency bypass switch is in the BYPASS position and the MODE SWITCH is in the FULL COOL position. If the cargo may be damaged by low temperatures, the operator must monitor container temperature and manually cycle operation as required to maintain temperature within required limits.

 **CAUTION**

The unit will remain in the DEFROST mode as long as the emergency defrost switch is in the DEFROST position. To prevent cargo damage, the operator must monitor container temperature and manually cycle operation as required to maintain temperature within required limits.

 **CAUTION**

To prevent trapping liquid refrigerant in the manifold gauge set, be sure set is brought to suction pressure before disconnecting.

 **CAUTION**

Do not over tighten or damage the enclosing tube assembly. Torque to 200-inch pounds (2.3 Mkg). Also make sure all parts are placed on the enclosing tube in proper sequence to avoid premature coil burnout.

SECTION 2

DESCRIPTION

INTRODUCTION

This technical supplement contains information specific to the 69NT40-541-304 and 69NT40-541-345 dual temperature system. It is to be used in conjunction with the Service Parts List and the Operation and Service Manual for 69NT40-541-300 to 399 series units. The information in this manual is designed to supplement both the Service Parts List and the Operation and Service Manual.

The Carrier Transicold model 69NT40-541-304 and 69NT40-541-345 dual temperature system combines the standard ThinLine host evaporator with a dual discharge remote evaporator, which is used for refrigeration in a second compartment. The remote evaporator is mounted on the ceiling of the rear compartment and connected to the host unit by refrigerant lines and control wiring. The two compartments are separated by an insulated bulkhead, which can be moved within a range of 12 feet to accommodate varied load sizes.

CONFIGURATION IDENTIFICATION

Unit identification information is provided on a plate located near the compressor. The plate provides the unit model number, the unit serial number and the unit parts identification number (PID). The model number identifies the overall unit configuration, while the PID provides information on specific optional equipment, factory provision to allow for field installation of optional equipment and differences in detailed parts.

Configuration identification for the models covered herein may be obtained on the Container Products Group Information Center by authorized Carrier Transicold Service Centers.

2.1 GENERAL DESCRIPTION

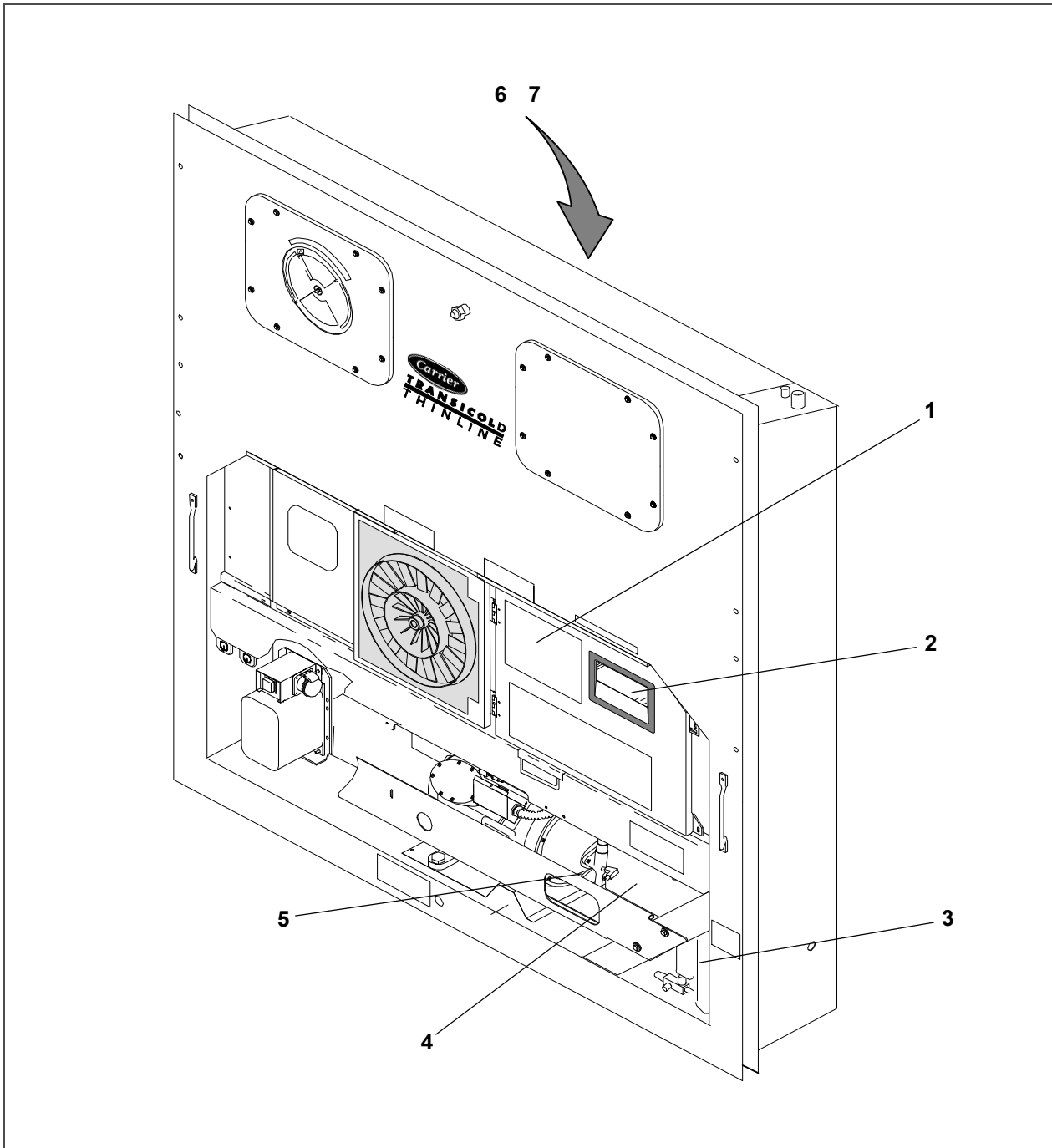
2.1.1 Refrigeration Unit - Front Section

The design of the refrigeration unit allows for access to the majority of components from the front (see [Figure 2.1](#)). The unit model number, serial number, and parts identification number (PID) can be found on the serial plate to the left of the compressor.

The dual temperature system utilizes a remote evaporator kit, which contains the components necessary for dual temperature operation.

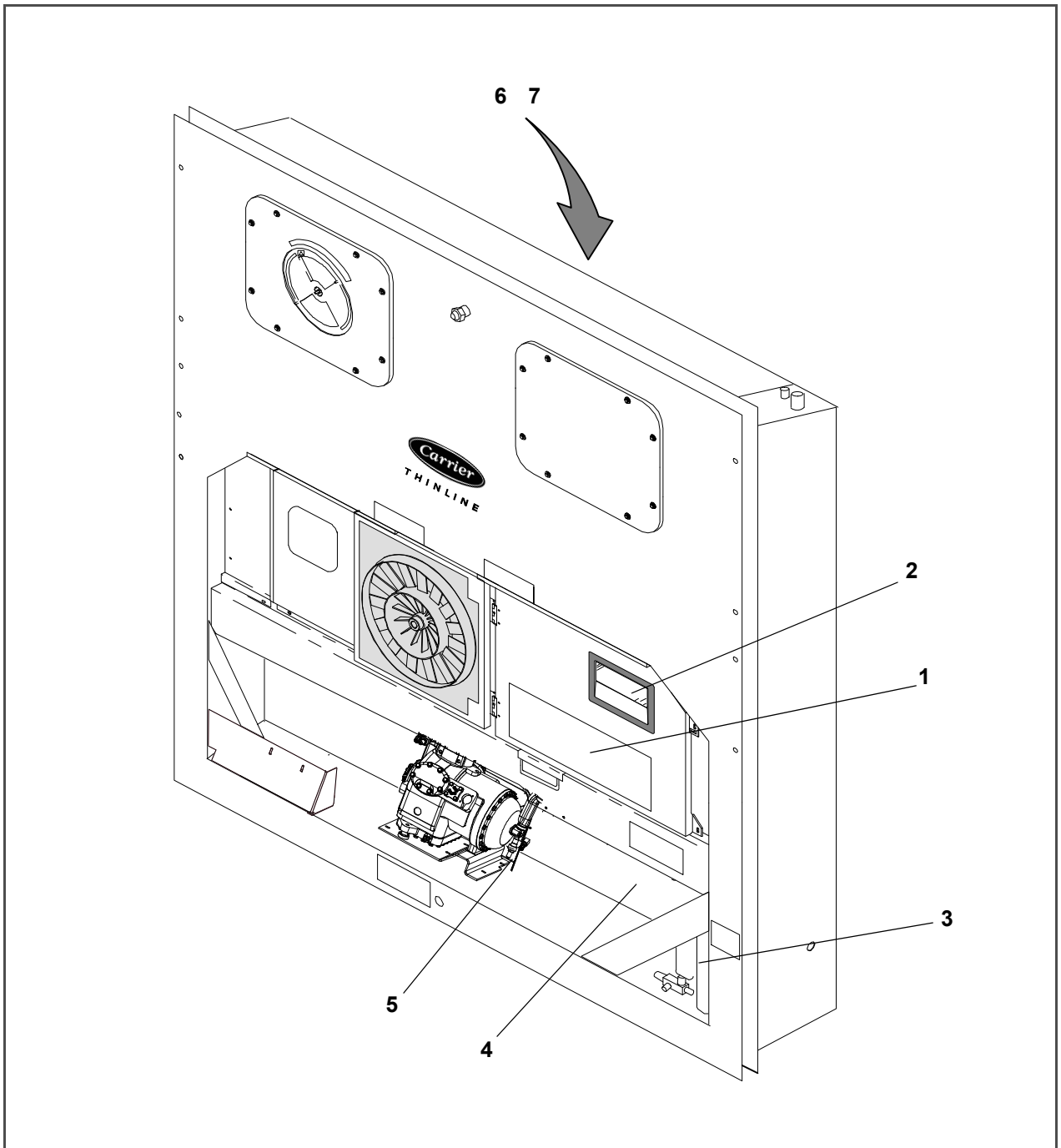
This configuration also affects the refrigeration unit, adding refrigerant connections for the remote evaporator, additional contactors in the electrical kit, a larger receiver, a host evaporator liquid line solenoid valve, and a different function code label.

Figure 2.1 Refrigeration Unit Front Section (69NT40-541-304)



- | | |
|---|------------------------|
| 1. Labels and Decals | 5. Compressor Tubing |
| 2. Control Box | 6. Evaporator Coil |
| 3. Receiver | 7. Back Panel Assembly |
| 4. Host Liquid Line Solenoid Valve (Location) | |
-

Figure 2.2 Refrigeration Unit Front Section (69NT40-541-345)

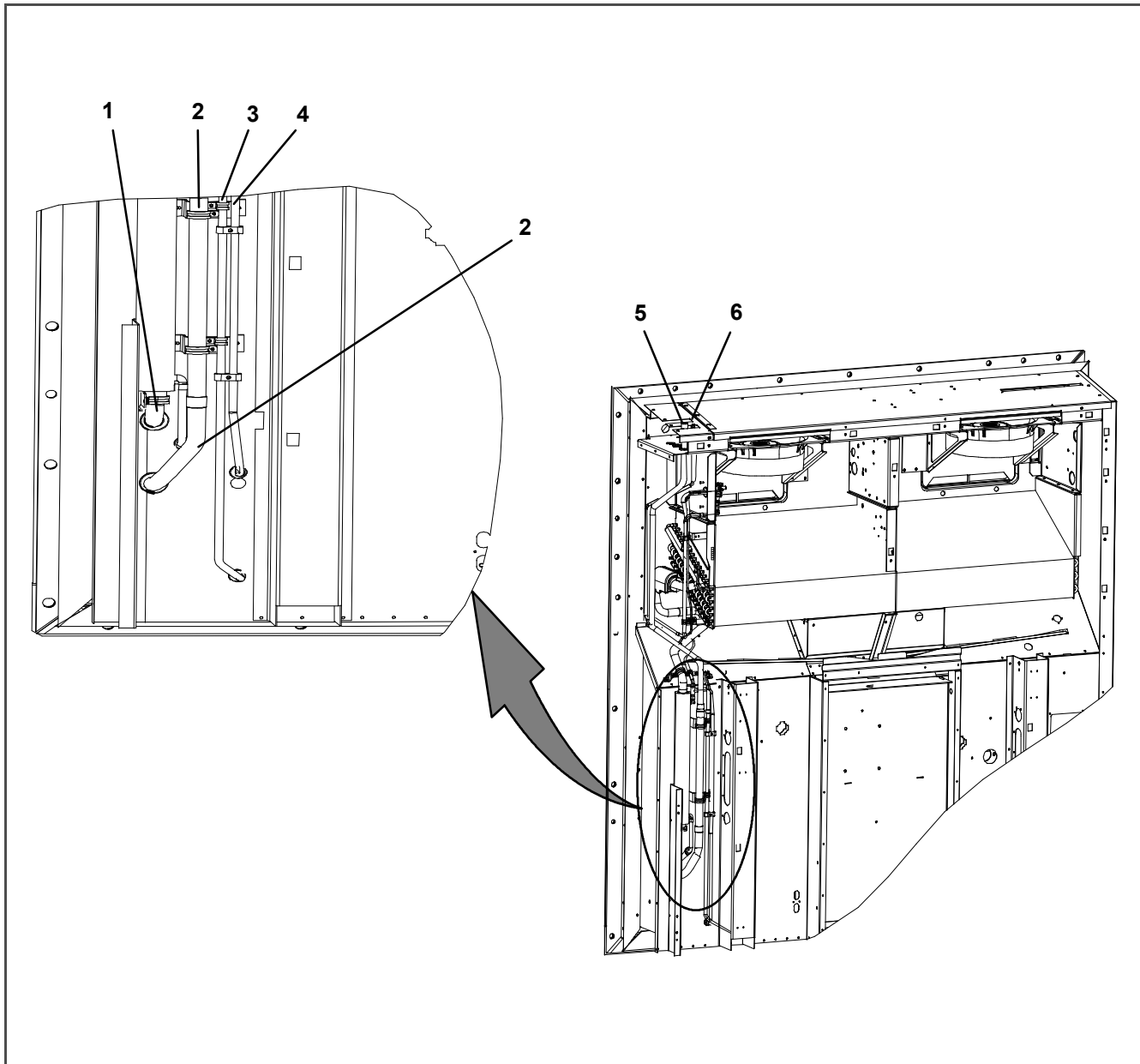


- | | |
|---|------------------------|
| 1. Labels and Decals | 5. Compressor Tubing |
| 2. Control Box | 6. Evaporator Coil |
| 3. Receiver | 7. Back Panel Assembly |
| 4. Host Liquid Line Solenoid Valve (Location) | |

2.1.2 Evaporator Section

The evaporator section is equipped with additional refrigerant piping required to accommodate the remote evaporator assembly (see [Figure 2.3](#)).

Figure 2.3 Evaporator Section

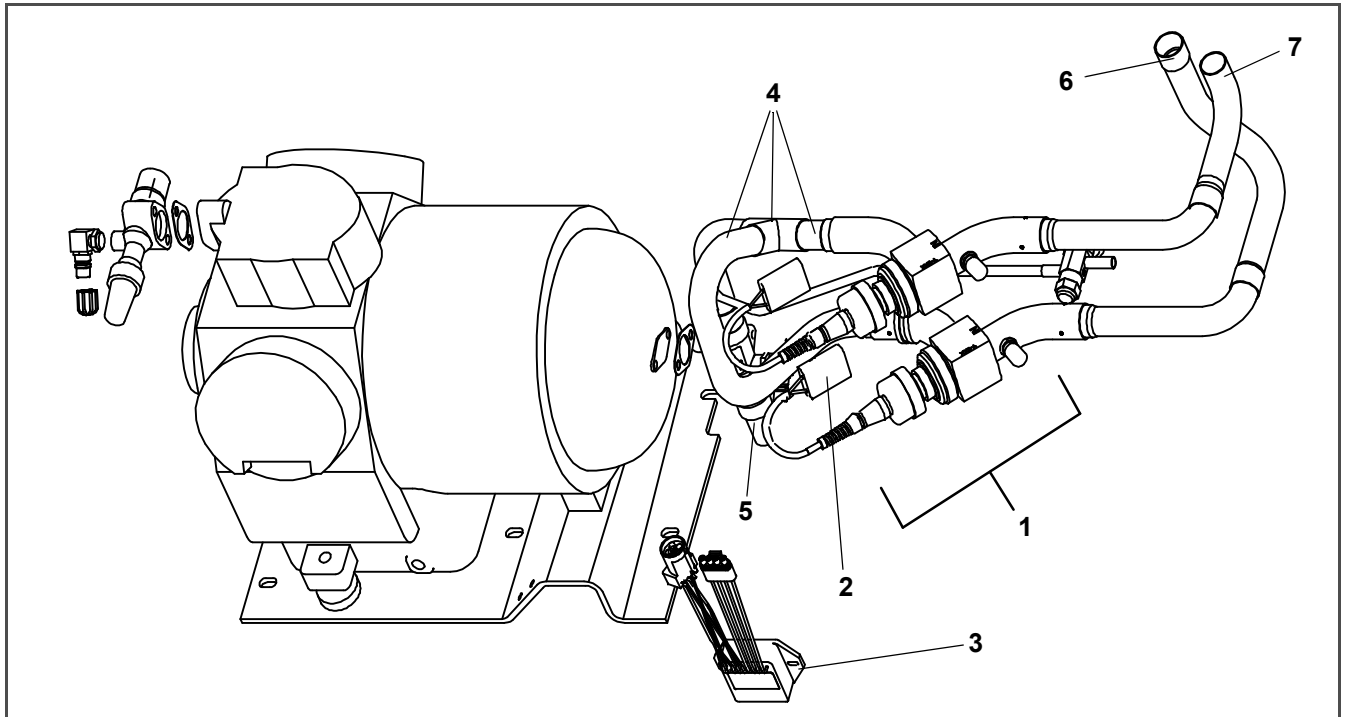


- | | |
|---|--|
| 1. Host Unit Suction Line | 4. Liquid Line to HLSV |
| 2. Suction Line from Remote Evaporator | 5. Suction Line from Remote Evaporator |
| 3. Liquid Line from Host Liquid Solenoid Valve (HLSV) to Host TXV | 6. Liquid Line to Remote Evaporator |
-

2.1.3 Compressor Tubing

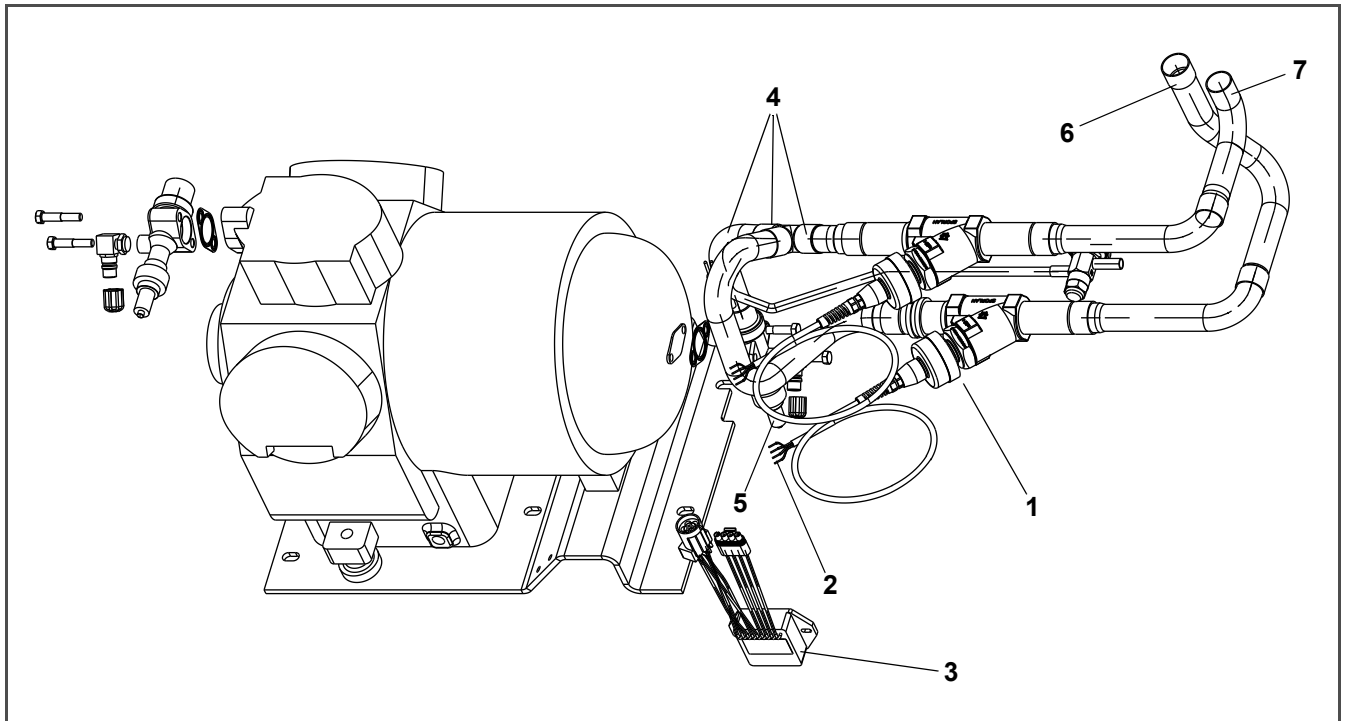
Units equipped with the dual temperature system include a secondary compressor suction line assembly. This assembly includes a stepper motor valve and a stepper motor power pack. The secondary tubing line runs parallel to the primary line.

Figure 2.4 Compressor Section (69NT40-541-304)



- | | |
|---|--|
| 1. Stepper Motor Valve Assembly | 4. Tube Assembly |
| 2. Connector to Power Pack | 5. Suction Service Valve |
| 3. Stepper Motor Power Pack for Remote Evaporator SMV | 6. Suction Line from Remote Evaporator |
| | 7. Suction Line from Host Evaporator |

Figure 2.5 Compressor Section (69NT-541-345)

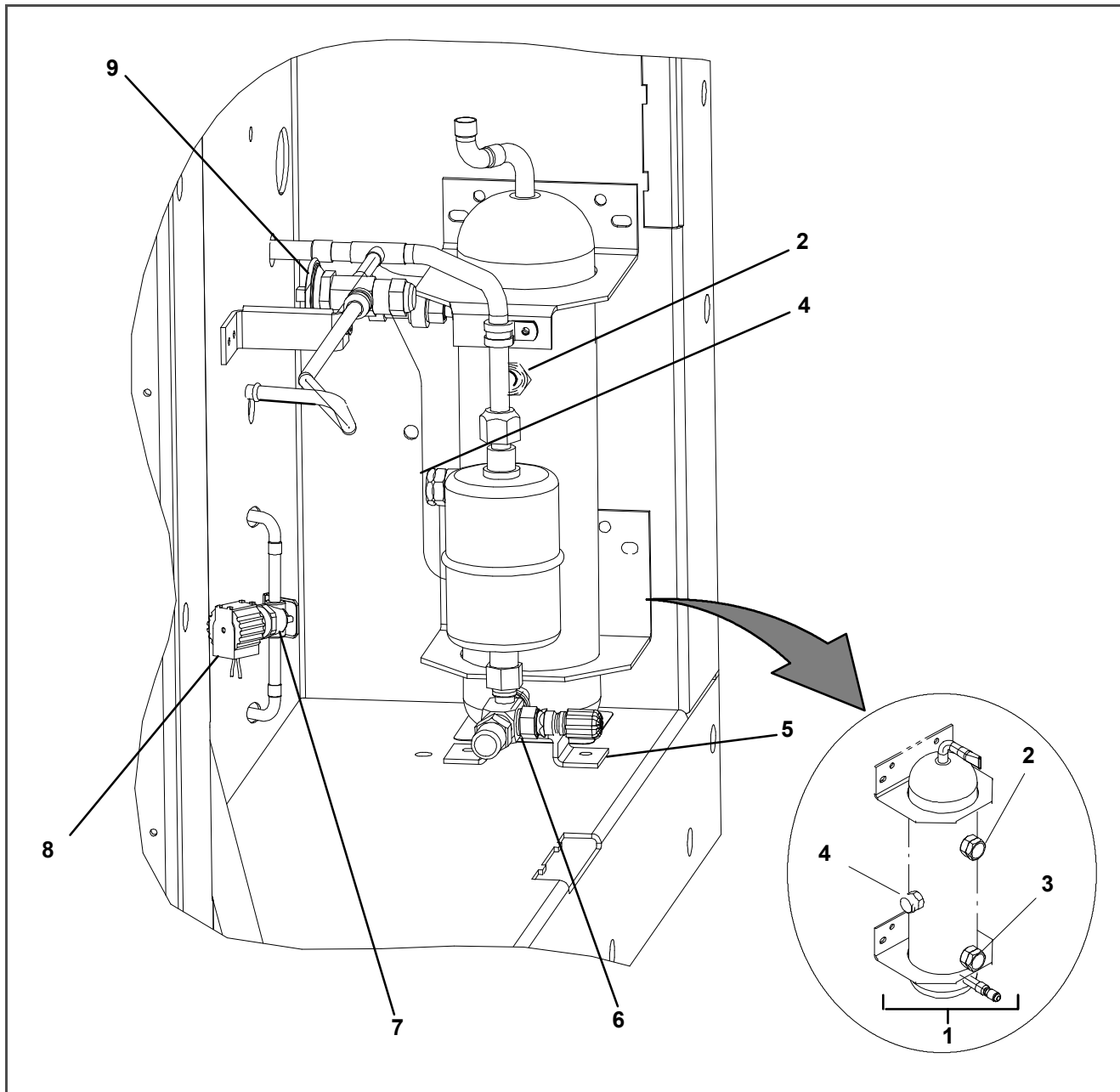


- | | |
|---|--|
| 1. Stepper Motor Valve Assembly | 4. Tube Assembly |
| 2. Connector to Power Pack | 5. Suction Service Valve |
| 3. Stepper Motor Power Pack for Remote Evaporator SMV | 6. Suction Line from Remote Evaporator |
| | 7. Suction Line from Host Evaporator |

2.1.4 Receiver

The dual temperature system includes a larger receiver designed to accommodate the additional refrigerant required for this configuration.

Figure 2.6 Condenser Section



- | | |
|---------------------------------|---|
| 1. Receiver | 6. Liquid Line Valve |
| 2. Sight Glass | 7. Host Liquid Line Solenoid Valve Body |
| 3. Moisture-Liquid Indicator | 8. Host Liquid Line Solenoid Valve Coil |
| 4. Fusible Plug OR Rupture Disc | 9. Quench Valve |
| 5. Liquid Line Valve Bracket | |

2.1.5 Control Box

The dual temperature system includes four additional contactors (PA, PB, VE, VH) and an auxiliary contact as illustrated in [Figure 2.7](#).

Figure 2.7 Control Box (69NT40-541-304)

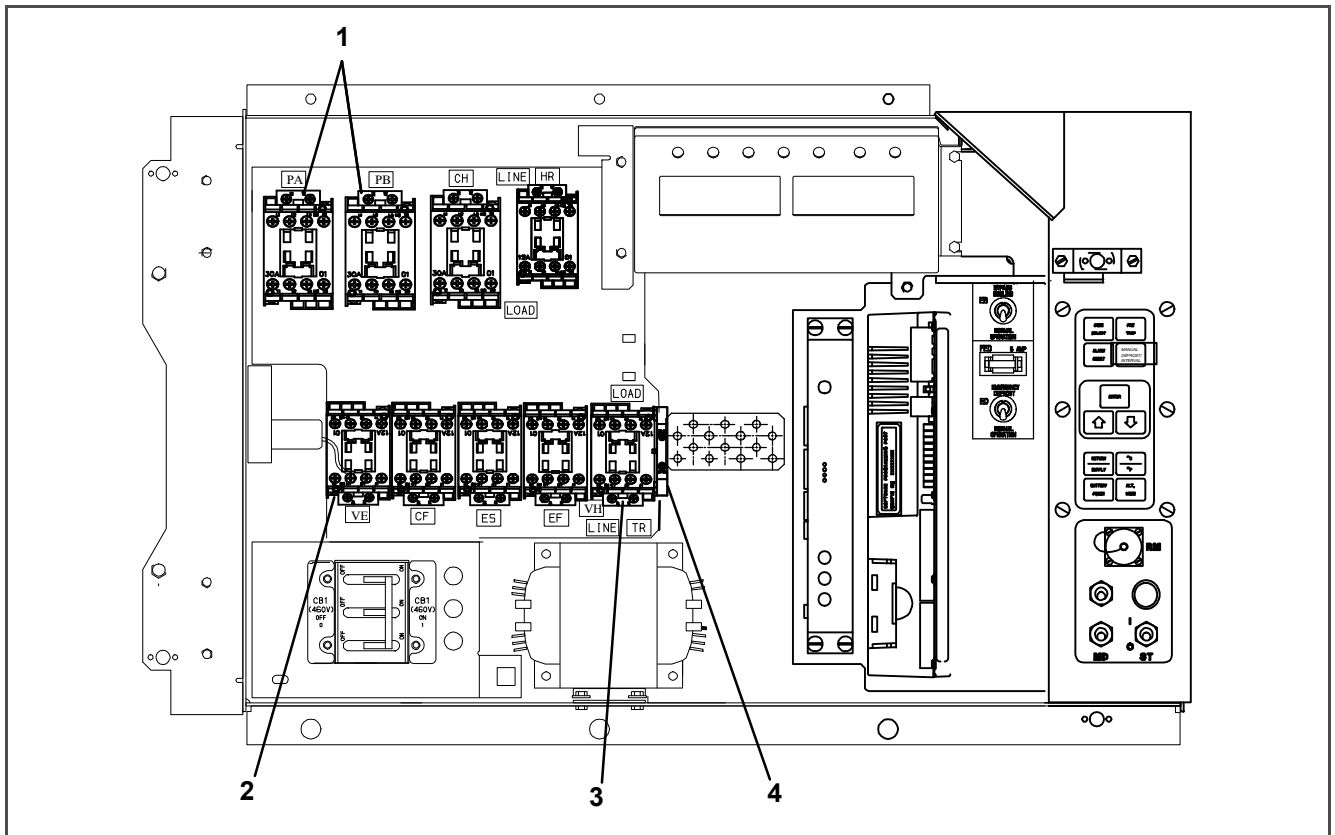
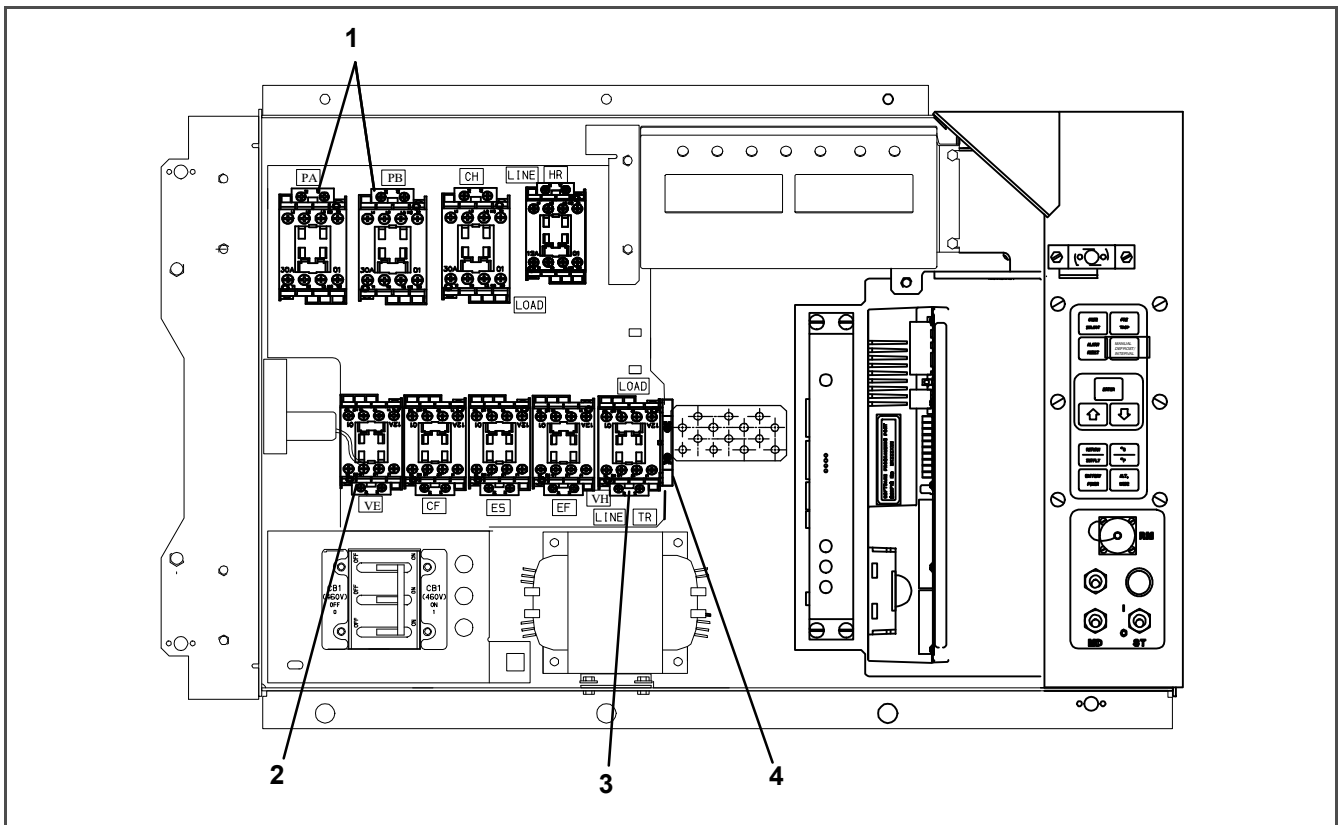


Figure 2.8 Control Box (69NT40-541-345)

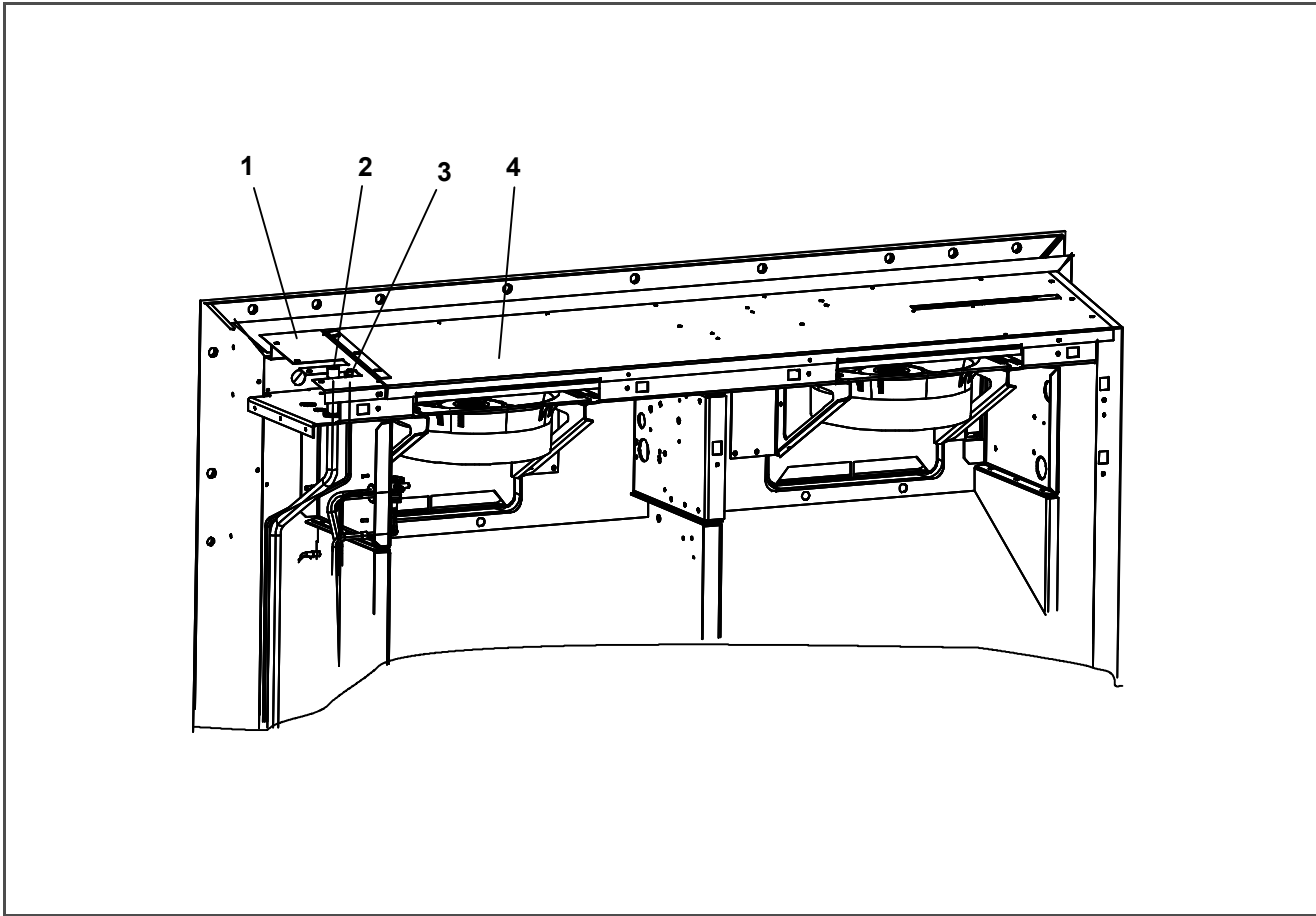


- | | |
|---|---|
| 1. Phase Contactors (PA, PB) | 3. Remote Defrost Heater Contactor (VH) |
| 2. Remote Evaporator Fan Contactor (VE) | 4. Auxiliary Contactor |

2.1.6 Back Panel Assembly

The dual temperature system includes a grille insert with slots for the remote connections as illustrated in [Figure 2.9](#).

Figure 2.9 Back Panel Assembly



- 1. Grille Insert
- 2. Suction Line from Remote Evaporator
- 3. Liquid Line to Remote Evaporator
- 4. Top Grill

2.2 REMOTE EVAPORATOR

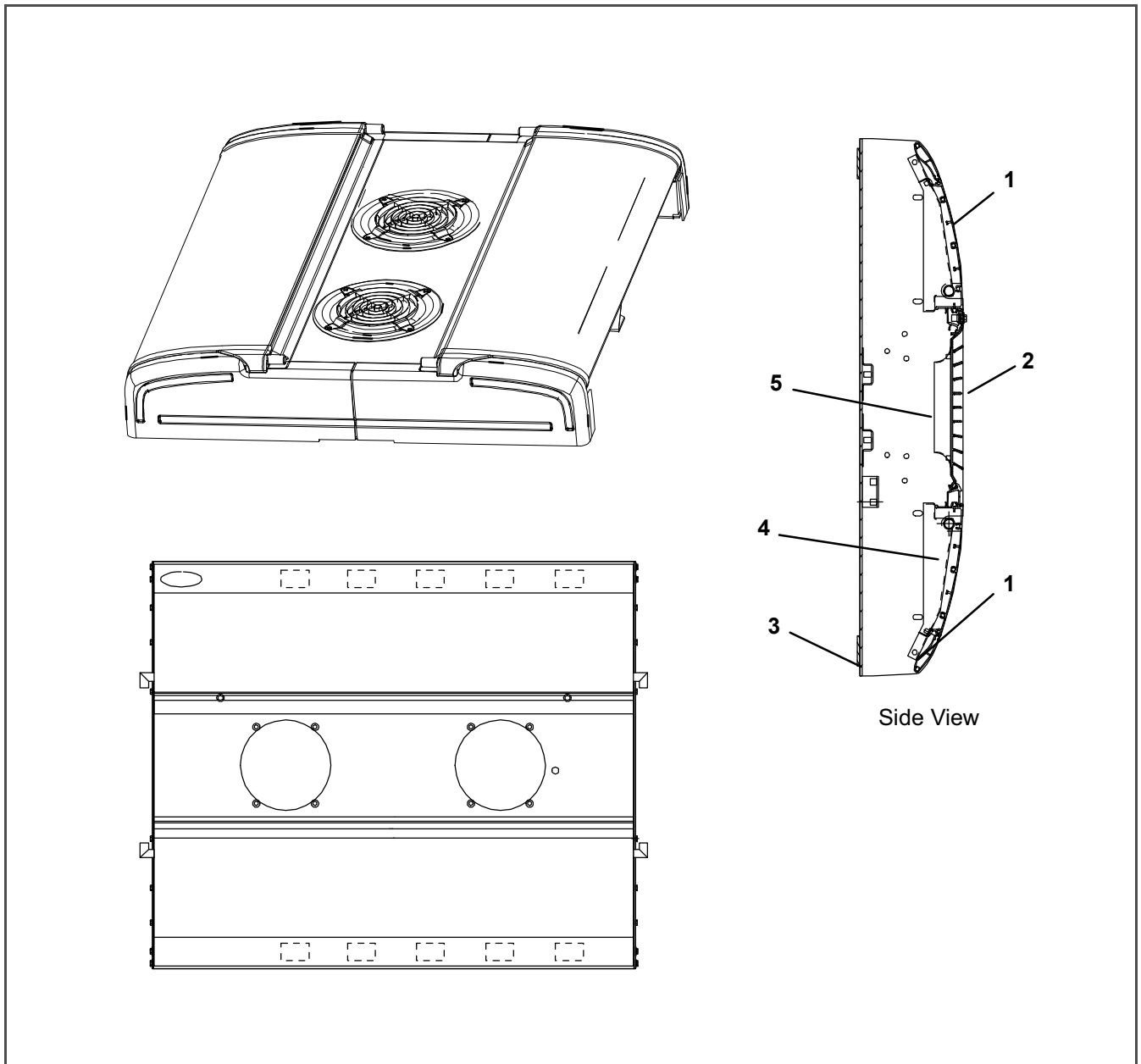
The dual temperature system includes a remote evaporator assembly. This assembly consists of three major components: the frame, the guard, and several clamp assemblies that accommodate the additional lines.

Refrigerant piping and wiring harness are mounted within the ceiling box recess to guard against damage to the components.

2.2.1 Frame

The remote evaporator frame accommodates the refrigeration components, electrical kit, wire harness, and heater kit (see [Figure 2.10](#)).

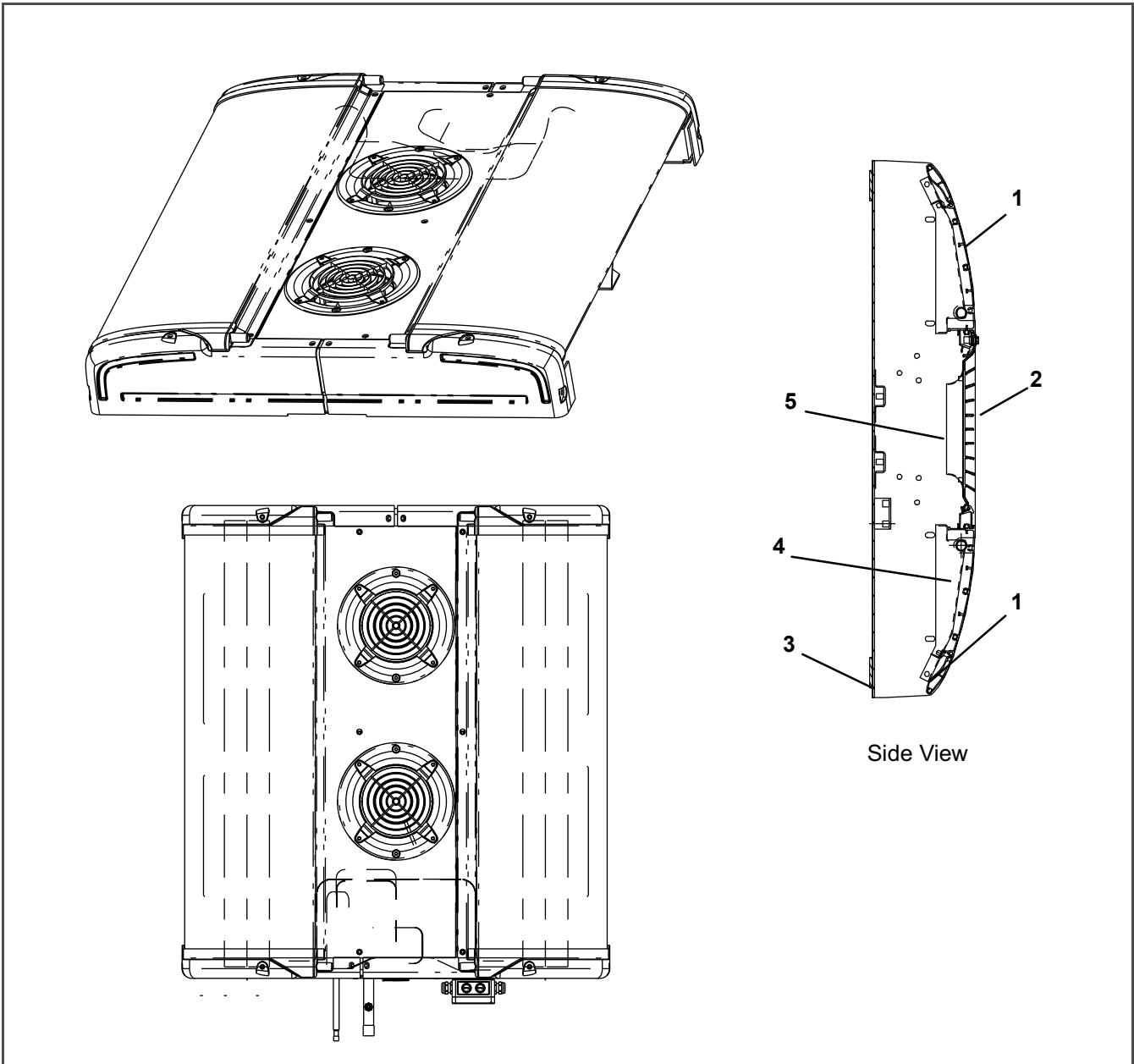
Figure 2.10 Remote Evaporator - Frame (69NT40-541-304)



1. Evaporator Skin Assembly
2. Evaporator Access Panel
3. Evaporator Top Frame

4. Evaporator Drain Pan
5. Blower Motor Venturi Ring

Figure 2.11 Remote Evaporator - Frame (69NT40-541-345)



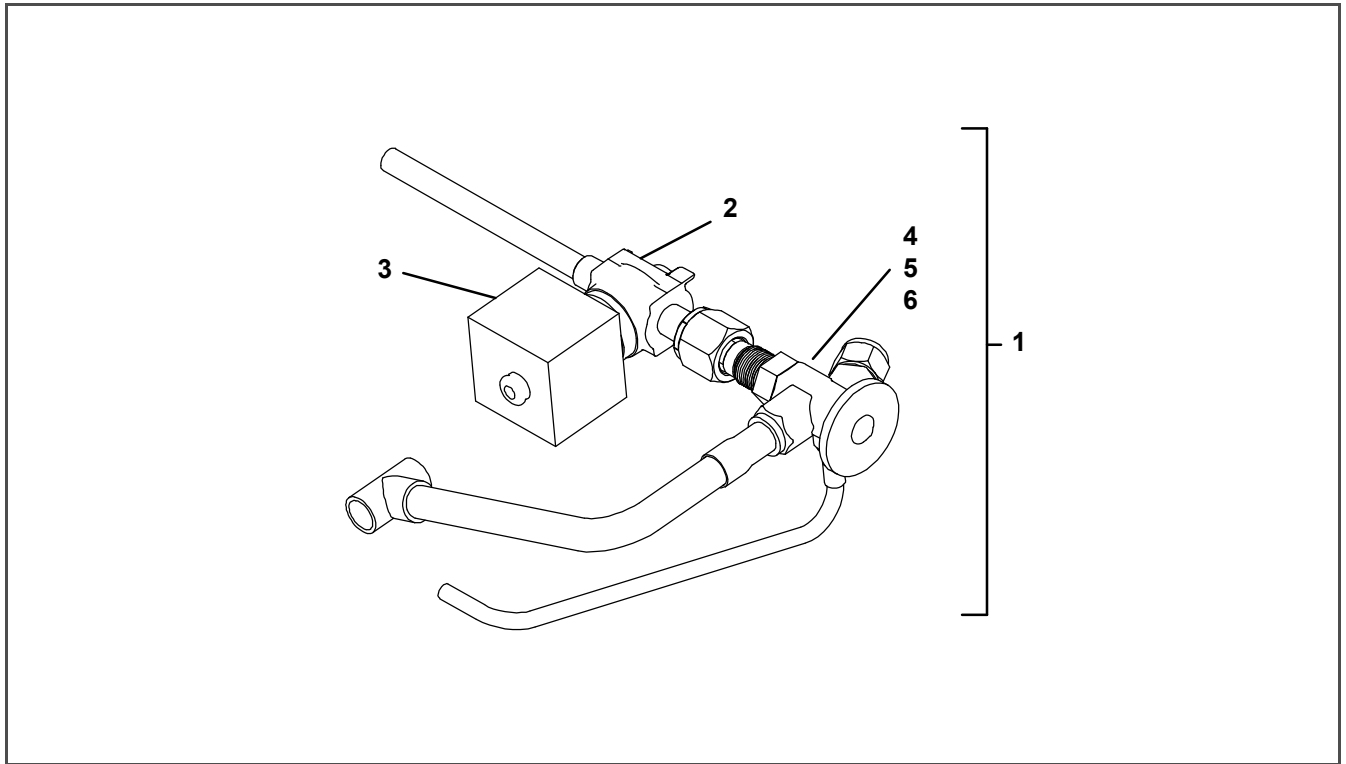
- 1. Evaporator Skin Assembly
- 2. Evaporator Access Panel
- 3. Evaporator Top Frame

- 4. Evaporator Drain Pan
- 5. Blower Motor Venturi Ring

2.2.2 Refrigeration

An additional liquid line solenoid valve assembly is included in the dual temperature system. This assembly consists of a solenoid valve, solenoid coil, and a thermal expansion valve as illustrated in [Figure 2.12](#). The solenoid valve assembly is housed in the remote evaporator frame.

Figure 2.12 Remote Evaporator - Refrigeration

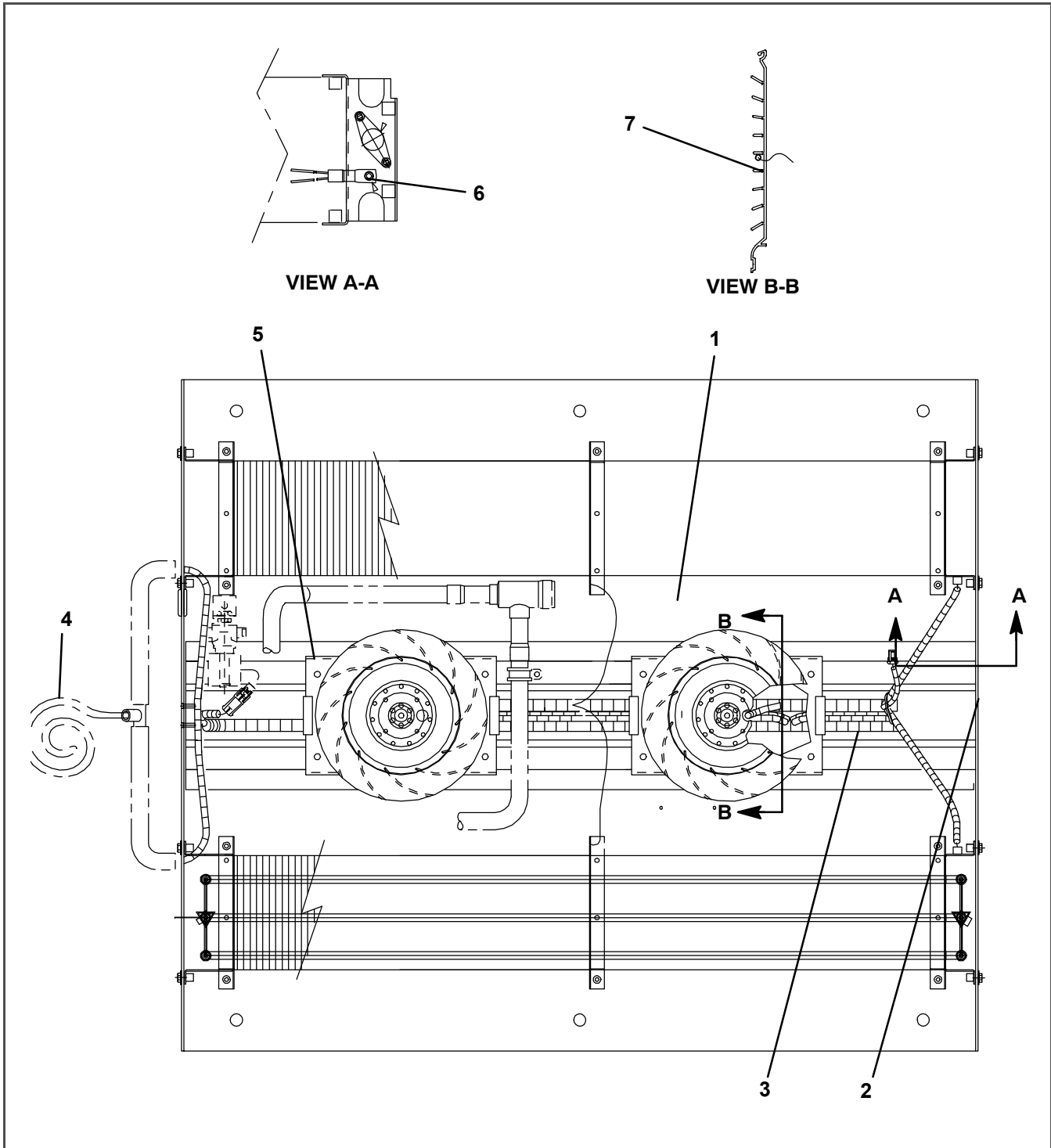


- | | |
|---|------------------------|
| 1. Remote Liquid Line Solenoid / TXV Valve Assembly | 4. TXV Adapter |
| 2. Remote Liquid Line Solenoid Valve (RLSV) | 5. TXV Orifice |
| 3. Solenoid Coil | 6. TXV Expansion Valve |

2.2.3 Electrical Kit

The dual temperature system includes an additional electrical kit (see [Figure 2.13](#)). This kit consists of two motor/fan assemblies, a defrost sensor thermistor assembly, a harness, and trim. This assembly is housed in the remote evaporator frame.

Figure 2.13 Remote Evaporator - Electrical Kit

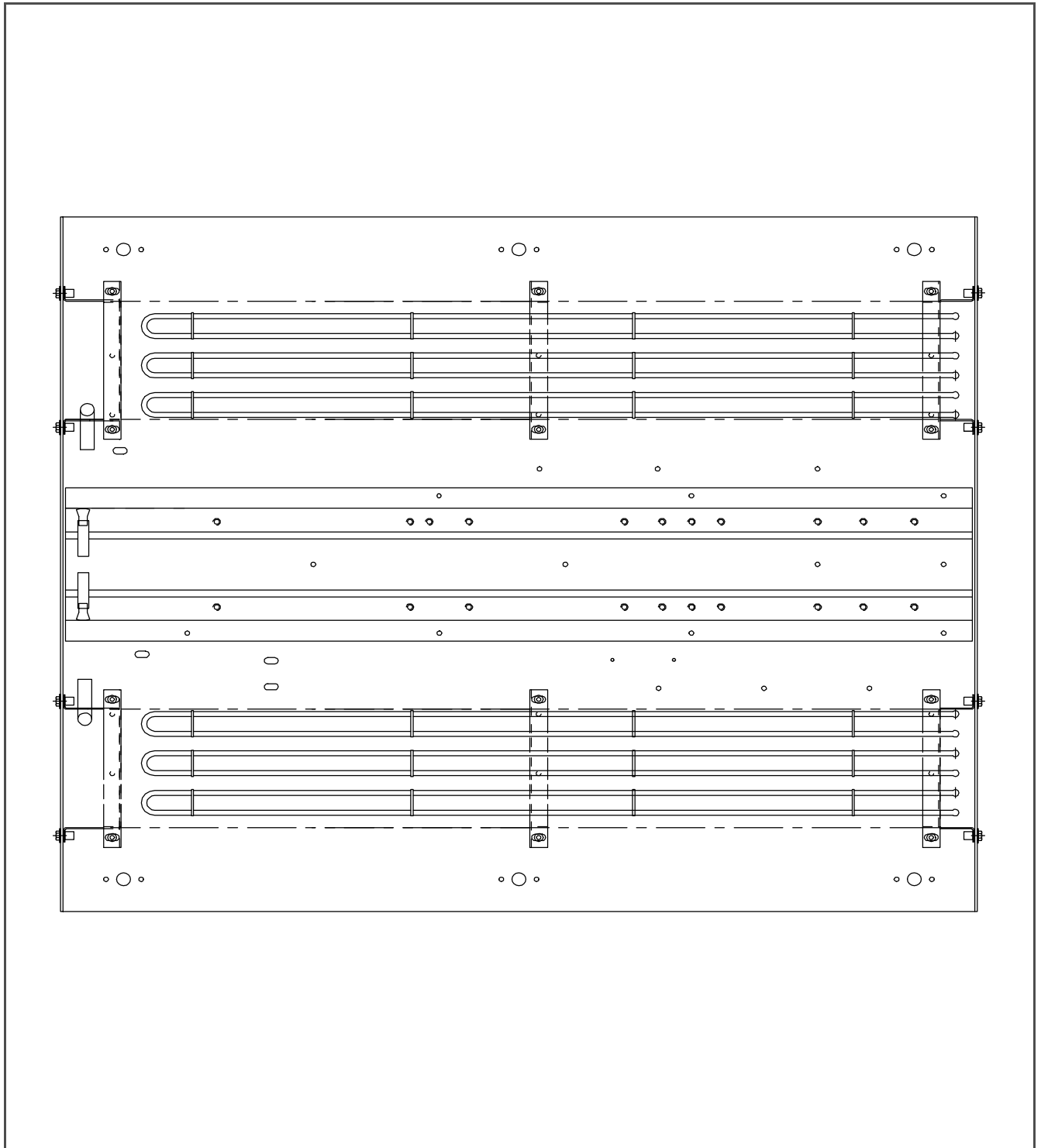


- | | |
|------------------------------------|---|
| 1. Motor Fan Assembly | 5. Fan Motor Bracket |
| 2. MHD-1100 Decal (S/N Plate) | 6. Remote Defrost Sensor Thermistor Assembly (RDTS) |
| 3. MHD-1100 Evaporator Harness | 7. Remote Return Air Sensor Assembly |
| 4. Remote Drain Line Heater (RDLH) | |

2.2.4 Heater Kit

The dual temperature system includes an additional heater kit (see [Figure 2.14](#)). This kit is located in the remote evaporator frame, and consists of six resistance heaters and stainless steel heater clips.

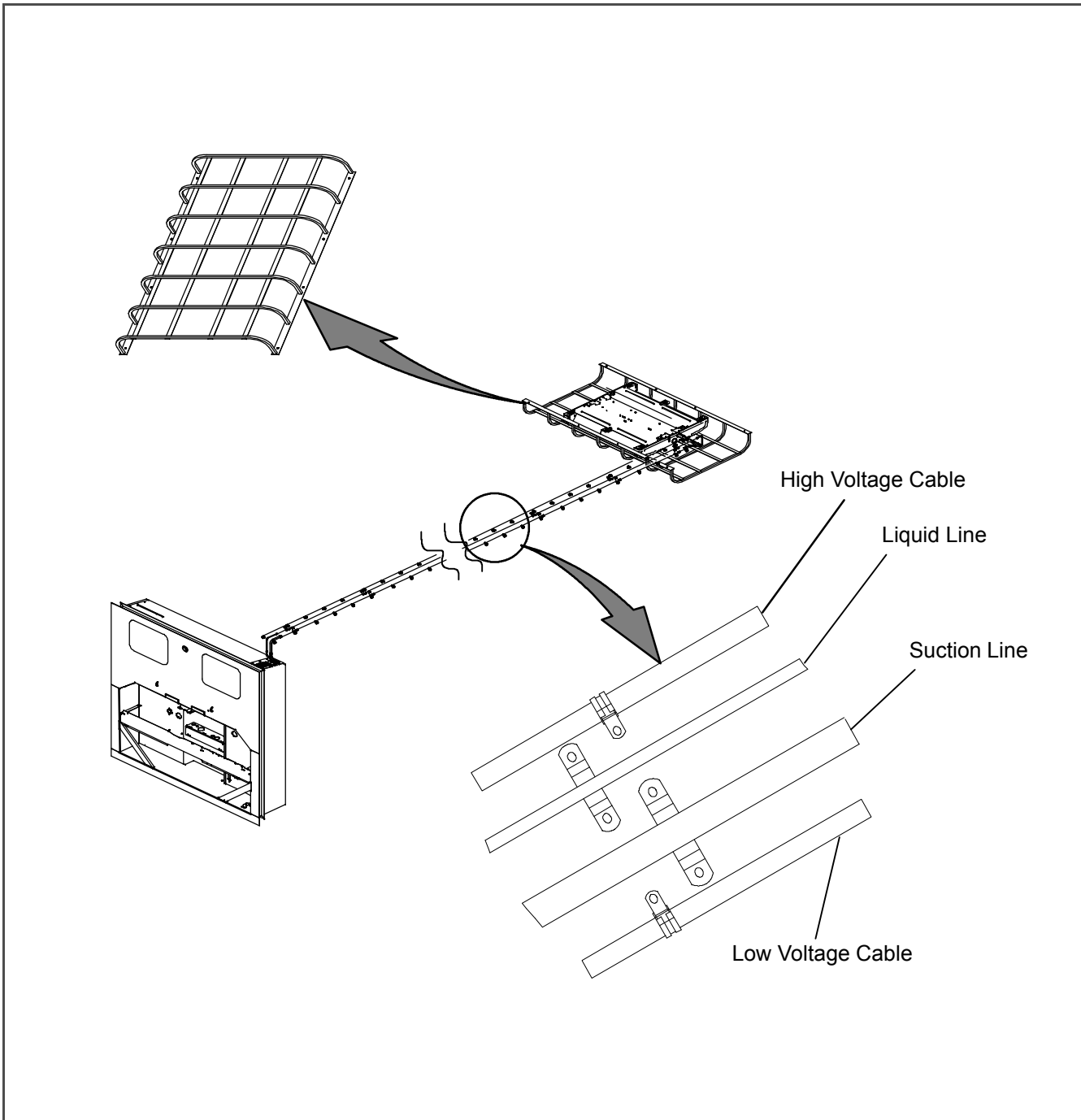
Figure 2.14 Remote Evaporator - Heater Kit



2.3 DUAL TEMP ASSEMBLY INSTALLATION KIT

The dual assembly installation kit includes tube and ring clamps, which are used to secure the high voltage cable, liquid line, suction line, and low voltage cable that connect the remote evaporator to the refrigeration unit. The remote guard is used to protect the remote evaporator frame assembly from damage. It is fastened to the underside of the frame assembly (see [Figure 2.15](#)).

Figure 2.15 Remote Evaporator - Dual Temperature Installation Kit



2.4 REFRIGERATION SYSTEM DATA

a. Compressor/Motor Assembly	Number of Cylinders	6
	Model	06DR
	CFM	41
	Weight (Dry)	118 kg (260 lb)
	Approved Oil	Castrol Icematic
	Oil Charge degrees	3.6 liters (7.6 US pints)
	Oil Sight Glass	The oil level range, with the compressor off, should be between the bottom and one-eighth level of the sight glass
b. Expansion Valve Superheat	Host Unit	Verify at -18°C (0°F) container box temperature -13.3 to -11.1°C (8 to 12°F)
	Remote Unit	Verify at 0°C (32°F) container box temperature -10 to -6.1°C (14 to 21°F)
c. Heater Termination Thermostat	Host Unit	Opens: 54 (± 3)°C = 130 (± 5)°F Closes: 38 (± 4)°C = 100 (± 7)°F
	Remote Unit	Opens: 49 (± 3)°C = 120 (± 5)°F Closes: 26 (± 4)°C = 79 (± 7)°F
d. High Pressure Switch	Cutout	25 (±1.0) kg/cm ² = 350 (±10) psig
	Cut-In	18 (± 0.7) kg/cm ² = 250 (± 10) psig
e. Refrigerant Charge	Unit Configuration	Charge Requirements: R-134a
	Receiver	4.25 kg (9.37 lbs)
f. Condenser Pressure Transducer	Condenser Fan Starts	Condenser fan will start if condenser pressure is greater than 14.06kg/cm ² (200psig) OR the condenser fan is OFF for more than 60 seconds.
	Condenser Fan Stops	Condenser fan will stop if condenser pressure is less than 9.14kg/cm ² (130psig) AND the condenser fan remains ON for at least 30 seconds.
g. Unit Weight	Refer to unit model number plate.	
h. Water Pressure Switch	Cut-In	0.5 ± 0.2 kg/cm ² (7 ± 3 psig)
	Cutout	1.6 ± 0.4 kg/cm ² (22 ± 5 psig)
i. Discharge Pressure Regulating Valve	Factory Setting	32.7 ± 2.5kg/cm ² (72 ± 5.5 psig)

2.5 ELECTRICAL DATA

a. Circuit Breaker	CB-1 Trips at	29 amps
	CB-2 (50amp) Trips at	62.5 amps
	CB-2 (70amp) Trips at	87.5 amps
b. Compressor Motor	Full Load Amps (FLA)	17.6 amps @ 460VAC (with current limiting set at 21 amps)

c. Condenser Fan Motor		380 VAC, Single Phase, 50 Hz	460VAC, Single Phase, 60hz
	Full Load Amps	1.3 amps	1.6 amps
	Horsepower	0.43 hp	0.75 hp
	Rotations Per Minute	1425 rpm	1725 rpm
	Voltage and Frequency	360 - 460 VAC ± 2.5 hz	400 - 500 VAC ± 2.5 hz
	Bearing Lubrication	Factory lubricated, additional grease not required.	
	Rotation	Counter-clockwise when viewed from shaft end.	
Single-Phase Evaporator Fan Motors			
d. Host Evaporator Fan Motor (s)		380 VAC/50 Hz	460 VAC/60 Hz
	Full Load Amps High Speed	1.6	2.0
	Full Load Amps Low Speed	0.8	1.0
	Nominal Horsepower High Speed	0.70	0.84
	Nominal Horsepower Low Speed	0.09	0.11
	Rotations Per Minute High Speed	2850 rpm	3450 rpm
	Rotations Per Minute Low Speed	1425 rpm	1750 rpm
	Voltage and Frequency	360 - 460 VAC ± 1.25 hz	400 - 500 VAC ± 1.5 hz
	Voltage and Frequency using power autotransformer	180 - 230 VAC ± 1.25 hz	200 - 250 VAC ± 1.5 hz
	Bearing Lubrication	Factory lubricated, additional grease not required	
	Rotation	CW when viewed from shaft end	
Three-Phase Evaporator Fan Motors			
e. Host Evaporator Fan Motor (s)		380 VAC/3 PH/50 Hz	460 VAC/3 PH/60 Hz
	Full Load Amps High Speed	1.0	1.2
	Full Load Amps Low Speed	0.6	0.6
	Nominal Horsepower High Speed	0.49	0.84
	Nominal Horsepower Low Speed	0.06	0.11
	Rotations Per Minute High Speed	2850 rpm	3450 rpm
	Rotations Per Minute Low Speed	1425 rpm	1725 rpm
	Voltage and Frequency	360 - 460 VAC ± 1.25 hz	400 - 500 VAC ± 1.5 hz
	Bearing Lubrication	Factory lubricated, additional grease not required	
	Rotation	CW when viewed from shaft end	

f. Remote Evaporator Fan Motor	Full Load Amps	1 amp
g. Evaporator Coil Heaters	Number of Heaters	6
	Rating	750 watts +5/-10% each @ 230VAC
	Resistance (cold)	66.8 to 77.2ohms @ 20°C (68°F)
	Type	Sheath
h. Fuses	Control Circuit	7.5 amps (F3A, F3B)
	Controller/DataCORDER	5 amps (F1 & F2)
	Emergency Defrost	5 amps (FED)
	Drain Line Heater	5 amps (FDH)
	Humidity Power Transformer	5 amps (FH)
i. Compressor Crankcase Heater		180 watts @ 460 VAC
j. Humidity Sensor	Orange wire	Power
	Red wire	Output
	Brown wire	Ground
	Input voltage	5 vdc
	Output voltage	0 to 3.3 vdc
	Output voltage readings vs relative humidity (RH) percentage:	
	30%	0.99 V
	50%	1.65 V
	70%	2.31 V
	90%	2.97 V
k. Controller	Setpoint Range	-30 to +30°C (-22 to +86°F)

2.6 SAFETY AND PROTECTIVE DEVICES

Unit components are protected from damage by safety and protective devices listed in the following table. These devices monitor the unit operating conditions and open a set of electrical contacts when an unsafe condition occurs.

Table 2-1 Safety and Protective Devices

UNSAFE CONDITION	SAFETY DEVICE	DEVICE SETTING
Excessive current draw	Fuse, Defrost Line Heater (FDLH)	5 amps

2.7 REFRIGERATION CIRCUIT

Starting at the compressor (see [Figure 2.16](#)), the suction gas is compressed to a higher pressure and temperature.

The gas flows through the discharge service valve into the pressure regulating valve. During periods of low ambient operation, the discharge pressure regulating valve maintains the flow of refrigerant to a preset minimum discharge pressure. Refrigerant gas then moves into the air-cooled condenser. Air flowing across the coil fins and tubes cools the gas to saturation temperature. By removing latent heat, the gas condenses to a high pressure/high temperature liquid and flows to the receiver, which stores the additional charge necessary for low temperature operation.

The liquid refrigerant continues through the liquid line service valve, the filter-drier (which keeps refrigerant clean and dry), and a heat exchanger (that increases subcooling of the liquid) through the RLSV or HLSV to the thermostatic expansion valves (TXV). As the liquid refrigerant passes through the variable orifice of the expansion valve, some of it vaporizes into a gas (flash gas). Heat is absorbed from the return air by the balance of the liquid, causing it to vaporize in the evaporator coil(s). The vapor then flows through the suction modulating valves to the compressor.

The evaporators are equipped with liquid solenoid valves that open or close depending on the need for cooling in the remote or host compartments, as well as an externally equalized TXV.

The TXV is activated by the bulb strapped to the suction line near the evaporator outlet(s). The valve maintains a constant superheat at the coil outlet(s) regardless of load conditions.

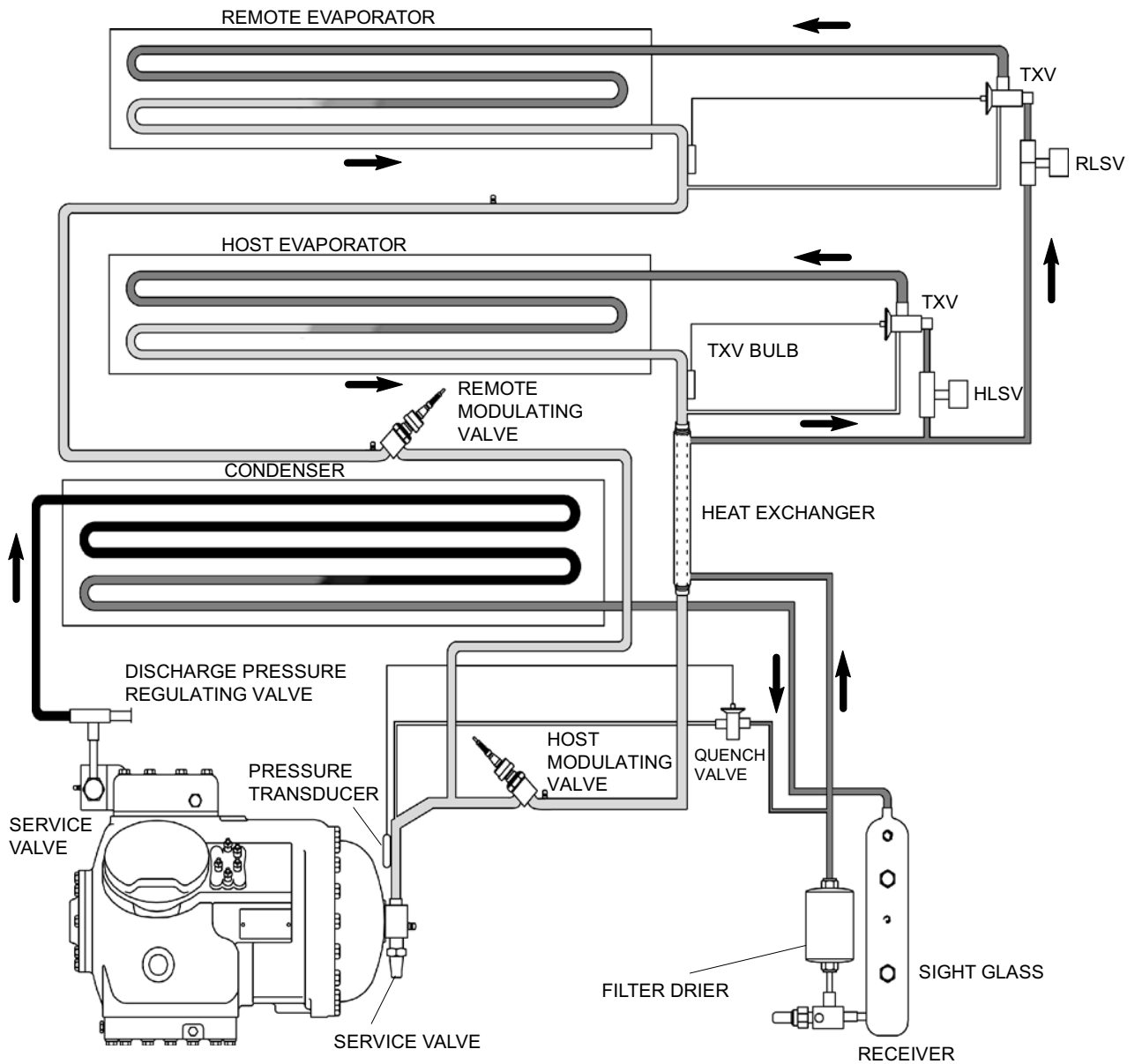
During periods of low load, the suction modulating valve decreases flow of refrigerant to the compressor. This action balances the compressor capacity with the load and prevents operation with low coil temperatures. In this mode of operation, the quench valve will open as required to provide sufficient liquid refrigerant flow into the suction line for cooling of the compressor motor. The quench valve senses the temperature of refrigerant entering the compressor and provides additional coolant to the compressor motor.

The refrigeration system is also fitted with a condenser pressure transducer, which feeds information to the controller. The controller programming will operate the condenser fan so as to attempt to maintain discharge pressures above 130 psig in low ambients. At ambients below 27 degrees C (80 degrees F), the condenser fan will cycle on and off, depending on condenser pressure and operating times:

1. The condenser fan will start if the condenser pressure is greater than 200 psig OR the condenser fan has been OFF for more than 60 seconds.
2. The condenser fan will stop if the condenser pressure is less than 130 psig AND the condenser fan has been running for at least 30 seconds.

At ambients above 27 degrees C (80 degrees F), condenser pressure control is disabled and the condenser fan runs continuously.

Figure 2.16 Refrigeration Circuit Schematic



- Suction
- Liquid
- Discharge

SECTION 3

MICROPROCESSOR

3.1 TEMPERATURE CONTROL MICROPROCESSOR

The temperature control Micro-Link 3 microprocessor system consists of a keypad, display module, control module (controller), and interconnecting wiring. This section addresses functions specific to the dual temperature platform. For more detailed system information, refer to Section 3 of the Operations and Service manual for 69NT40-541-300 to 349 series units.

3.1.1 Display Module

The display module (**Figure 3.1**) consists of two 5-digit displays and seven indicator lights. The indicator lights include:

1. Cool - White LED: Energized when the refrigerant compressor is energized.
2. Heat - Orange LED: Energized to indicate heater operation in the heat or defrost mode.
3. Defrost - Orange LED: Energized when the unit is in the defrost mode.

NOTE

The in-range light is not illuminated until both compartments are in range.

4. In-Range - Green LED: Energized when the controlled temperature probe is within specified tolerance of set point.

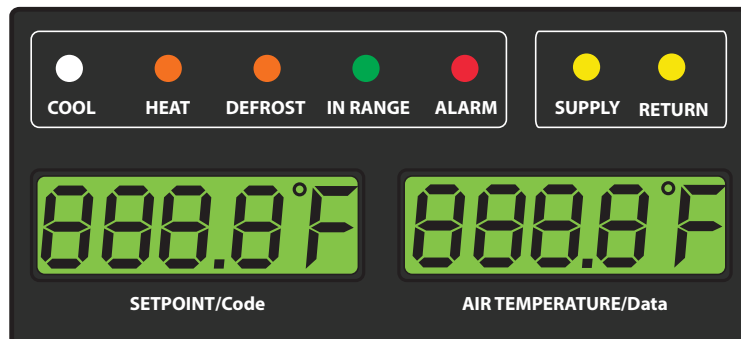
NOTE

The host unit controlling probe in the perishable range will be the SUPPLY air probe and the controlling probe in the frozen range will be the RETURN air probe. The Supply/Return light always indicates the Host unit controlling probe.

5. Supply - Yellow LED: Energized when the supply air probe is used for control. When this LED is illuminated, the temperature displayed in the AIRTEMPERATURE display is the reading at the supply air probe. This LED will flash if dehumidification or humidification is enabled. The supply probe is used by the Remote compartment to control the temperature.
6. Return - Yellow LED: Energized when the return air probe is used for control. When this LED is illuminated, the temperature displayed in the AIRTEMPERATURE display is the reading at the return air probe. This LED will flash if dehumidification or humidification is enabled.
7. Alarm - Red LED: Energized when there is an active or an inactive shutdown alarm in the alarm queue.

The two displays include SETPOINT/Code and AIR TEMPERATURE/Data sections. The temperature display will alternate between the Host and Remote evaporator compartment values. The Remote compartment values are distinguishable by the “r” in the lower left hand corner of the left display.

Figure 3.1 Display Module



3.1.2 Keypad

The keypad ([Figure 3.2](#)) is mounted on the right-hand side of the control box. The keypad consists of 11 push button switches that act as the user's interface with the controller. Descriptions of the switch functions are provided in [Table 3-1](#).

Figure 3.2 Keypad

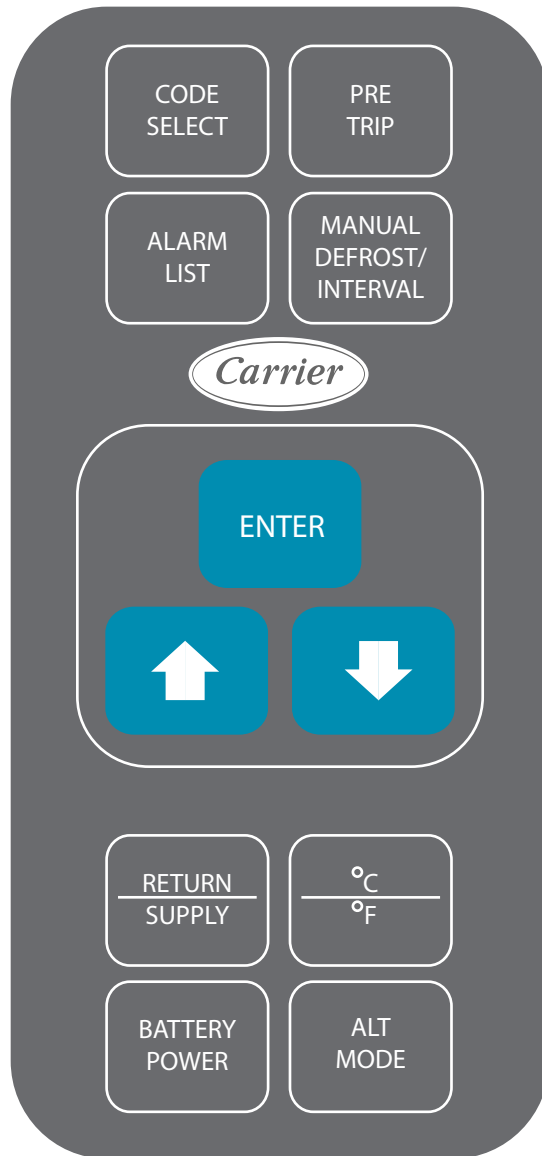


Table 3-1 Keypad Function

KEY	FUNCTION
Code Select	Accesses function codes.
Pre-Trip	Displays the pre-trip selection menu. Discontinues pre-trip in progress.
Alarm List	Displays alarm list and clears the alarm queue.
Manual Defrost/ Interval	Displays selected defrost mode. Depressing and holding the Defrost interval key for five seconds will initiate defrost using the same logic as if the optional manual defrost switch was toggled on.
Enter	Confirms a selection or saves a selection to the controller.

Table 3–1 Keypad Function

KEY	FUNCTION
Arrow Up	Change or scroll a selection upward Pre-trip advance or test interruption.
Arrow Down	Change or scroll a selection downward. Pre-trip repeat backward.
Return/Supply	Displays non-controlling probe temperature (momentary display).
Degrees C/F	Displays alternate English/Metric scale (momentary display). When set to degrees Fahrenheit, pressure is displayed in psig and vacuum in “/hg. “P” appears after the value to indicate psig and “i” appears for inches of mercury. When set to degrees Celsius, pressure readings are in bars. “b” appears after the value to indicate bars.
Battery Power	Initiate battery backup mode to allow set point and function code selection if AC power is not connected.
ALT. Mode	This key is pressed to switch the functions from the temperature software to the DataCORDER Software. The remaining keys function the same as described above except the readings or changes are made to the DataCORDER programming.

3.2 OPERATIONAL SOFTWARE

The host unit is operable in Frozen or Perishable modes, with a set point range of -22 to 86°F (-30 to 30°C). For detailed information on modes of operation for the host unit, refer to Section 3 of the Operations and Service manual for 69NT40-541-300 to 349 series units.

The remote evaporator unit is designed to operate in perishable mode only, with a set point range of 28 to 70°F (-2 to 21°C). The remote evaporator unit functions within Dual Temperature Mode, which is enabled via Code Select Code 52 (Cd52). If Cd52 is disabled (OFF), the menu options will not be available and remote evaporator fans will be disabled. When Code 52 is ON, press the ENTER key to scroll to the desired function code (refer to [Table 3–2](#)).

Table 3–2 Dual Temp Display/Select Functions

CODE	FUNCTION
SEtPt	Remote supply set point
PSPLy	Remote supply air temperature
SSPLy	Remote secondary supply temperature
rEtUR	Remote return air temperature
dtS	Remote defrost temperature sensor
rESV	Remote SMV position
dFrST	Remote defrost interval
rEnbl	Remote enable temperature
rtΔ	Remote minimum temperature delta

3.2.1 Enabling Dual Temperature Operation

Dual temperature operation is enabled via Function Code 52 (Cd52). All selectable parameters associated with the remote compartment are viewed and set through Cd52. If Cd52 is disabled (OFF), the menu options will not be available.

To enable dual temperature operation, perform the following steps:

1. Press the CODE SELECT key, then press an arrow key until the left window displays “Cd52”.
2. The right window will display the value of this item for five seconds before returning to the normal display mode.
3. If more time is needed, press the ENTER key to extend the time to 30 seconds.

3.2.2 Remote Compartment Set Point Change (SEtPt)

For independent readings of remote set point and supply or return air temperature, use the following steps:

1. Ensure Cd52 is enabled and press the ENTER key.
2. The left display window will display “SEtPt”.
3. The right display window will display the present set point.
4. To change the set point, move arrow key up or down until the desired set point is displayed in the left window. This value will keep flashing, and range from 28.0 to 70.0°F (-2.2 to 21.1°C) in 0.1 degree increments.
5. Press the **ENTER** key to initiate set point change. If **ENTER** is not selected, set point will not change.

3.2.3 Remote Compartment Sensor Data

To display sensor readings for the remote air supply air temperature, the remote secondary supply temperature, or the remote defrost temperature sensor, use the following steps:

1. From Cd52, press the ENTER key to scroll to the desired sensor.
2. The left display windows will display the desired sensor:
 - PSPLY** - Remote Supply Air Temperature
 - SSPLY** - Remote Secondary Supply Temperature
 - rErUR** - Remote Return Air Temperature
 - dtS** - Remote Defrost Temperature Sensor
3. The right display window will display the present sensor reading.

3.2.4 Remote Evaporator SMV Position

The unit is capable of maintaining supply air temperature to within ± 1.8 degrees F (1.0 degrees C) of set point. Supply air temperature is controlled by positioning of the suction modulation valve (SMV), cycling of the compressor, and cycling of the heaters. Use the following steps to display the remote evaporator RSMV position:

1. From Cd52, press the **ENTER** key to scroll to the desired sensor.
2. The left display window will display “rESV”.
3. The right display window displays the remote evaporator SMV position in 0 - 100 in 1% increments.

3.2.5 Remote Evaporator Defrost Interval

Both compartments will defrost simultaneously if initiated manually by pressing the Manual Defrost interval key for 5 seconds. Both compartments will defrost automatically and independently at the user selected time interval. Defrost can only occur when DTS is below a set value, indicating that box temperatures are low enough to allow frost on the evaporator coil. Termination will occur when DTS reaches a set value. If DTS does not reach this value within 2 hours, the controller will terminate the defrost cycle and an alarm will be activated, indicating that defrost terminated abnormally.

There are two modes for initiating defrost on the dual temperature platform - either user-selected timed intervals or manual defrost control. The user-selected values are 3, 6, 9, 12, or 24 hours. The factory default for the timed interval is 12 hours (some units may be configured to allow defrost to be disabled altogether; in this case, a user-selected value of **OFF** will be available).

All defrost interval times reflect the number of compressor runtime hours since the last defrost de-ice cycle. The minimum defrost interval under the automatic setting is three hours while the maximum is 24. In frozen mode, the amount of wall-clock time necessary to accumulate a given amount of defrost interval time will exceed the defrost interval time by a factor of two to three depending on the compressor duty-cycle. Defrost interval time is not accumulated in any mode until the defrost termination sensor reads less than the preset value.

To change the remote evaporator defrost interval, use the following steps:

1. From Cd52, press the **ENTER** key until the left window displays “dFrSt”.

2. The right display window will display the current defrost interval - either 3, 6, 9, 12, or 24 hours.
3. To change defrost interval, use the arrow keys to toggle to the new interval and press the **ENTER** key. If the **ENTER** key is not pressed, the interval will not be changed.
4. After a new defrost interval is selected, the newly selected value will be used immediately.

3.2.6 Remote Enable Temperature

Remote enable temperature is a user selectable parameter that sets the temperature the host unit needs to reach prior to enabling full remote cooling capacity.

This function is only applicable with host frozen set point (below 14 degrees F). If attempt to access this function is made in host perishable mode, the display will show -----. Remote enable must be set below the host's set point.

To set remote enable temperature, use the following steps:

1. From Cd52, press the **ENTER** key to scroll to the desired sensor.
2. The left display window displays "rEnbL".
3. The right display window displays the current remote enable temperature.
4. Remote enable is user selectable in 0.1 degree increments from -13.0 to 24.8 degrees F. The default value is 14.0 degrees F.

3.2.7 Remote Minimum Temperature Delta

The remote minimum temperature delta is a user-selectable parameter and is only applicable in the host frozen pull-down mode. This value reflects the difference between the remote evaporator return and supply air temperatures. This parameter can only be set if the host has a frozen set point, and the host return temperature is above the remote enable temperature.

The remote temperature delta temperature prioritizes capacity between the two compartments during frozen pull-down. For example, a low remote temperature delta setting (i.e. 0.9 degrees F) will give the majority of cooling to the host unit. A high remote temperature delta setting (i.e. 14.4 degrees F) will send the majority of the cooling to the remote unit causing the host unit to take longer to reach its remote enable temperature.

To set the remote minimum temperature delta, use the following steps:

1. From Cd52, press the **ENTER** key to scroll to the desired sensor.
2. The left display window displays "rtΔ".
3. The right display window displays the current remote minimum temperature delta.
4. Remote minimum temperature delta ranges from -0.9 degrees F to 14.4 degrees F. The default value is 3.6 degrees F.

3.3 REMOTE COMPARTMENT ALARMS

Alarm display is an independent controller software function. If an operating parameter is outside of expected range or a component does not return the correct signals back to the controller, an alarm is generated.

A fault in the remote compartment refrigeration system will trigger an AL 04 alarm. The display window will display "AL 04", alternate with the set point. This is a general fault alarm.

The AL 04 will light the alarm light, which will stay lit until the fault is corrected. Specific fault alarms for the remote evaporator are stored in the remote alarm list ("rAL") and are accessible through ALT MODE (see [Table 3-3](#)).

NOTE

The rAL alarm codes correspond to the host alarm numbers. For example, the rAL22 (remote evaporator motor IP) corresponds to the AL22 (host evaporator motor IP).

The alarm philosophy balances the protection of the refrigeration unit and that of the refrigerated cargo. The action taken when an error is detected always considers the survival of the cargo. Rechecks are made to confirm that an error actually exists.

Some alarms requiring compressor shutdown have time delays before and after to try to keep the compressor on line. An example is alarm code “LO”, (low main voltage). When a voltage drop of over 25% occurs, an indication is given on the display, but the unit will continue to run.

An alarm is indicated by flashing an alarm code on the display panel, and for some alarms, by the alarm light illuminating.

When an Alarm Occurs:

1. The red alarm light will illuminate for AL04.
2. If a detectable problem is found to exist, its alarm code will be alternately displayed with the set point on the left display.
3. The user should scroll through the alarm list to determine what alarms exist or have existed. Alarms must be diagnosed and corrected before the Alarm List can be cleared.

To Display Alarm Codes:

1. Press the ALT. MODE key once, and using Arrow keys, scroll through the DataCORDER menu until “rAL” is displayed in the left display window.
2. Press Enter. The rAL will display the individual component alarm that triggered the AL04.

Alarm codes specific to the dual temperature system are located in [Table 3–3](#). Pre-trip tests and test codes for the general unit are provided in the Operation and Service Manual for 69NT40-541-300 to 399 series units.

3.4 UNIT PRE-TRIP DIAGNOSTICS

Pre-Trip diagnostics is an independent controller function that will suspend normal refrigeration controller activities and provide preprogrammed test routines. The test routines include auto mode testing, which automatically performs a pre-programmed sequenced of tests or manual mode testing, which allows the operator to select and run any of the individual tests.



Pre-Trip inspection should not be performed with critical temperature cargoes in the container.



When the Pre-Trip key is pressed, dehumidification and bulb mode will be deactivated. At the completion of Pre-Trip activity, dehumidification and bulb mode must be reactivated.

NOTE

It is recommended for the container to be partitioned during pre-trip diagnostics.

Testing may be initiated using either the keypad or via communication. When testing is initiated by communication, the controller will execute the entire battery of tests (auto mode). Pre-trips perform diagnostic checks on main components of the remote compartment when Code 52 is active.

At the end of a pre-trip test, the message “P,” “rSLTs” (pretest results) will be displayed. Press the ENTER key to see the results for all sub-tests. The results will be displayed as either “PASS” or “FAIL” for all the tests run to completion.

Pre-trip tests and test codes specific to the dual temperature system are located in [Table 3–4](#). Pre-trip tests and test codes for the general unit are provided in the Operation and Service Manual for 69NT40-541-300 to 399 series units.

Table 3–3 Remote Controller Alarm Indications

CODE	TITLE	DESCRIPTION
rAL15	Remote Evaporator Loss of Cool	Alarm 15 is triggered when the RESMV is greater than 20% for a period of 4 minutes, the RLSV is open, and the compressor has run check for a temperature delta of 1 degree C across the remote coil. If there is not a 1 degree C difference in temperature across the coil, the HLSV will close for a period of 1 minute and again check for a temperature delta of 1 degree C across the remote coil. If there is not 1 degree C change in temperature across the coil, the alarm will be triggered.
rAL22	Remote Evaporator Fan Motor Safety	Alarm 22 responds to the remote evaporator motor internal protectors. The alarm is triggered by opening of either internal protector. It will disable all control outputs until the motor protector resets.
rAL26	All Remote Supply and Return Temperature Sensors Failure	Alarm 26 is triggered if the controller determines that all of the remote control probe sensors are out-of-range. This can occur for box temperatures outside the range of -58°F to +158°F.
rAL52	Remote Alarm List Full	Alarm 52 is activated whenever the remote alarm list is determined to be full; at start-up or after recording an alarm in the list. Alarm 52 is displayed, but is not recorded in the alarm list. This alarm can be reset by clearing the alarm list. This can be done only if all alarms written in the list are inactive.
rAL54	Remote Primary Supply Temperature Sensor Failure (STS)	Alarm 54 is activated by an invalid remote primary supply temperature sensor reading that is sensed outside the range of -58°F to +158 °F or if the probe check logic has determined there is a fault with this sensor. If Alarm 54 is activated and the remote primary supply is the control sensor, the remote secondary supply sensor will be used for control if the unit is so equipped. If the remote unit does not have a secondary supply temperature sensor, and AL54 is activated, the remote primary return sensor reading, -2°C will be used for control.
rAL56	Remote Primary Return Temperature Sensor Failure (RTS)	Alarm 56 is activated by an invalid remote primary return temperature sensor reading that is outside the range of -58°F to +158°F. If Alarm 56 is activated and the remote primary return is the control sensor, the remote secondary return sensor will be used for control. If return sensors fail, the remote primary supply sensor will be used for control.
rAL59	Remote Heat Termination Thermostat	Alarm 59 is triggered by the opening of the remote heat termination thermostat (RHTT) and will result in the disabling of the heater. This alarm will remain active until the thermostat resets.
rAL60	Remote Defrost Temperature Sensor Failure	Alarm 60 is an indication of a probable failure of the remote defrost temperature sensor. It is triggered by the opening of the remote heat termination thermostat (RHTT) or the failure of the RDTS to go above set point within two hours of defrost initiation. After one-half hour with a frozen range set point, or one-half hour of continuous compressor run time, if the return air falls below 7°C (45°F), the Controller checks to ensure the DTS reading has dropped to 10 C or below. If not, a DTS failure alarm is given and the defrost mode is operated using the return temperature sensor. The defrost mode will be terminated after one hour by the Controller.
rAL61	Remote Heaters Failure	Alarm 61 is triggered by detection of improper amperage resulting from remote heater activation or deactivation. Each phase of the power source is checked for proper amperage. This alarm is a display alarm with no resulting failure action, and will be reset by a proper amp draw of the heater.
rAL70	Remote Secondary Supply Sensor Failure	Alarm 70 is activated by an invalid remote secondary supply sensor reading outside the range of -58°F to +158°F. The alarm is reset when the remote secondary supply sensor has a reading that is within the proper range.

Table 3–4 Remote Controller Pre-Trip Test Codes

CODE	TITLE	DESCRIPTION
<p>NOTE</p> <p>The following pre-trip codes perform diagnostic checks on main components of the remote evaporator component when Code 52 (Cd52) is active. The system must be configured for a Dual Temperature Unit for pre-trip codes to be activated.</p>		
P4-2	Remote Evaporator Fans On Test	<p>Setup: Evaporator fans start in the OFF condition, current draw is measured, then evaporator fans will be turned on. After 60 seconds, the current draw is measured again. The change in current draw is then recorded.</p> <p>Pass/Fail Criteria: Passes if change in current draw is in specified range.</p>
P4-3	Remote Evaporator Fans Off Test	<p>Setup: Evaporator fans are turned off. After 10 seconds, the current draw is measured. The change in current draw is then recorded.</p> <p>Pass/Fail Criteria: Passes if change in current draw is in specified range.</p>
P5-6	Remote Evaporator Fan Direction Test	<p>Setup: With evaporator fan running on high speed, turn the heaters on for 30 seconds, then measure the temperature difference between the primary supply and primary return probes.</p> <p>Pass/Fail Criteria: Passes if primary supply temperature is 1.0 degrees higher than primary return temperature. Test P5-0 must pass before this test is run.</p>
P6-8	Host Liquid Solenoid Valve (HLSV) Test	<p>Setup: The system is allowed to run (remote evaporator, condenser and compressor) for 1 minute with the SMV at 100% and HLSV open. A current draw test is performed and the values are saved. The HLSV is then closed, and a 15 second delay follows. A current draw test is again performed and the values are compared to the original saved values.</p> <p>Condenser Pressure Control logic should be used for this test if the controller is configured for it. The quench valve, if configured, will operate according to normal operating rules.</p> <p>Pass/Fail Criteria: Passes if current draw drops below acceptable value.</p>
P6-9	Remote Liquid Solenoid Valve (RLSV) Test	<p>Setup: Once the HLSV pre-trip has completed, open the RLSV and allow the remote unit to run (remote evaporator, condenser and compressor) for 1 minute with the SMV at 100% and HLSV and host evaporator fans off. A current draw test is performed and the values are saved. The RLSV is then closed, and a 15 second delay follows. A current draw test is again performed and the values are compared to the original saved values.</p> <p>Condenser Pressure Control logic should be used for this test if the controller is configured for it. The quench valve, if configured, will operate according to normal operating rules.</p> <p>Pass/Fail Criteria: Passes if current draw drops below acceptable value.</p>
P6-10	Remote Suction Modulation Valve (RESMV) Close Test	<p>Setup: Once the RLSV pre-trip has completed, open the RLSV and allow the remote unit to run (remote evaporator, condenser and compressor) for 1 minute with the SMV at 100% and HLSV and host evaporator fans off. A current draw test is performed and the values are saved. The RRESMV is then closed to 1% and a 30 second delay follows. A current draw test is again performed and the values are compared to the original saved values.</p> <p>Condenser Pressure Control logic should be used for this test if the controller is configured for it. The quench valve, if configured, will operate according to normal operating rules.</p> <p>Pass/Fail Criteria: Passes if current draw drops below acceptable value.</p>

SECTION 4 OPERATION

4.1 INSPECTION (BEFORE STARTING)

WARNING

Beware of unannounced starting of the evaporator and condenser fans. The unit may cycle the fans and compressor unexpectedly as control requirements dictate.

If container is empty, check inside for the following:

1. Check channels or "T" bar floor for cleanliness. Channels must be free of debris for proper air circulation.
2. Check container panels, insulation and door seals for damage. Make permanent or temporary repairs.
3. Visually check evaporator fan motor mounting bolts for proper securement.
4. Check for dirt or grease on evaporator fan or fan deck and clean if necessary.
5. Check evaporator coil for cleanliness or obstructions. Wash with fresh water.
6. Check defrost drain pans and drain lines for obstructions and clear if necessary. Wash with fresh water.
7. Check panels on refrigeration unit for loose bolts and condition of panels. Make sure T.I.R. devices are in place on access panels.
8. Check condenser coil for cleanliness. Wash with fresh water.
9. Open control box door. Check for loose electrical connections or hardware.
10. Check color of moisture-liquid indicator.
11. Check oil level in compressor sight glass.

NOTE

Proper maintenance of the bulkhead is important to prevent airflow between the front and rear compartments.

Two critical items must be completed on every pre-trip:

1. Inspect the bulkhead for damage or a breakdown in its ability to seal against the container walls, ceiling and floor.
2. Carefully install foam blocks in the T-bar floor during loading so that they line up with the bulkhead. When installing foam blocks, ensure that there are no spots of open airflow between compartments.

4.2 CONNECT POWER

WARNING

Do not attempt to remove power plug(s) before turning OFF START/STOP Switch (ST), unit circuit breaker(s) and external power source.

WARNING

Make sure the power plugs are clean and dry before connecting to any power receptacle.

4.3 STARTING AND STOPPING INSTRUCTIONS



Make sure that the unit circuit breaker(s) (CB-1 & CB-2) and the START-STOP switch (ST) are in the “O” (OFF) position before connecting to any electrical power source.

4.3.1 Starting the Unit

1. With power properly applied, the fresh air damper set and (if required) the water-cooled condenser connected, place the START-STOP switch to “I” (ON).
2. Continue with Start Up Inspection, [Section 4.4](#).

4.3.2 Stopping the Unit

1. To stop the unit, place the START-STOP switch in position “O” (OFF).

4.4 START-UP INSPECTION

4.4.1 Physical Inspection

1. Check rotation of condenser and evaporator fans.
2. Check compressor oil level (Refer to paragraph 6.8.6 in the Operation and Service Manual for 69NT40-541-300 to 349 series units).

4.4.2 Check Controller Function Codes

Check and, if required, reset controller Function Codes (Cd27 through Cd39, and Cd 52) in accordance with desired operating parameters. Refer to [Section 3.2](#).

4.4.3 Complete Inspection

Allow unit to run for five minutes to stabilize conditions and perform a pre-trip diagnosis in accordance with the following paragraph.

4.5 PRE-TRIP DIAGNOSIS



Pre-trip inspection should not be performed with critical temperature cargoes in the container.



When Pre-Trip key is pressed, dehumidification and bulb mode will be deactivated. At the completion of Pre-Trip activity, dehumidification and bulb mode must be reactivated.

NOTE

It is recommended for the container to be partitioned during pre-trip diagnostics.

Pre-Trip diagnosis provides automatic testing of the unit components using internal measurements and comparison logic. The program will provide a “PASS” or “FAIL” display to indicate test results.

The testing begins with access to a pre-trip selection menu. The user may have the option of selecting one of three automatic tests (depending on software revision installed). These tests will automatically perform a series of individual pre-trip tests. The user may also scroll down to select any of the individual tests. The contents of the menus are as follows:

Table 4–1 Pre-Trip Selection Menu

Auto or Auto 1	Auto 2	Auto 3
P, P1, P2, P3, P4, P5, P6, rSLts	P, P1, P2, P3, P4, P5, P6, P7, P8, P9, P10, rSLts	P, P1, P2, P3, P4, P5, P6, P7, P8, rSLts

A detailed description of the pre-trip test codes for the dual temperature operation is listed in [Table 3–4](#). If no selection is made, the pre-trip menu selection process will terminate automatically. However, dehumidification and bulb-mode must be reactivated manually if required.

Scrolling down to the “rSLts” code and pressing ENTER will allow the user to scroll through the results of the last pre-trip testing run. If no pre-testing has been run (or an individual test has not been run) since the unit was powered up “-----” will be displayed.

Before Starting a Pre-Trip Test:

- Prior to starting tests, verify that unit voltage (Function Code Cd 07) is within tolerance and unit amperage draw (Function Codes Cd04, Cd05, Cd06) is within expected limits. Otherwise, tests may fail incorrectly.
- All alarms must be rectified and cleared before starting tests.

Starting a Pre-Trip Test:

NOTE

Pre-trip diagnosis may also be initiated via communications. The operation is the same as for the key pad initiation described below except that should a test fail, the pre-trip mode will automatically terminate. When initiated via communications, a test may not be interrupted with an arrow key, but the pre-trip mode can be terminated with the PRE-TRIP key.

1. Press the PRE-TRIP key. This accesses a test selection menu.
 - a. TO RUN AN AUTOMATIC TEST: Scroll through the selections by pressing the UP ARROW or DOWN ARROW keys to display AUTO, AUTO 2 or AUTO 3 as desired and then press the ENTER key.
 - The unit will execute the series of tests without any need for direct user interface. These tests vary in length, depending on the component under test.
 - While tests are running, “P#-#” will appear on the left display, where the #'s indicate the test number and sub-test. The right display will show a countdown time in minutes and seconds, indicating how much time there is left remaining in the test.



When a failure occurs during automatic testing the unit will suspend operation awaiting operator intervention.

When an automatic test fails, it will be repeated once. A repeated test failure will cause “FAIL” to be shown on the right display, with the corresponding test number to the left. The user may then press the DOWN ARROW to repeat the test, the UP ARROW to skip to the next test or the PRE-TRIP key to terminate testing. The unit will wait indefinitely, until the user manually enters a command.



When Pre-Trip test Auto 2 runs to completion without being interrupted, the unit will terminate pre-trip and display “Auto 2” “end.” The unit will suspend operation until the user depresses the ENTER key!

When an Auto test runs to completion without a failure, the unit will exit the pre-trip mode, and return to normal control operation. If configuration variable CnF42 is set to IN, a Data-CORDER trip start will be entered. If CnF42 is set to OUT, the trip start will not be entered. However, dehumidification and bulb mode must be reactivated manually if required.

- b. TO RUN AN INDIVIDUAL TEST: Scroll through the selections by pressing the UP ARROW or DOWN ARROW keys to display an individual test code. Pressing ENTER when the desired test code is displayed.
 - Individually selected tests, other than the LED/Display test, will perform the operations necessary to verify the operation of the component. At the conclusion, PASS or FAIL will be displayed. This message will remain displayed for up to three minutes, during which time a user may select another test. If the three minute time period expires, the unit will terminate pre-trip and return to control mode operation.
 - While the tests are being executed, the user may terminate the pre-trip diagnostics by pressing and holding the PRE-TRIP key. The unit will then resume normal operation. If the user decides to terminate a test but remain at the test selection menu, the user may press the UP ARROW key. When this is done all test outputs will be de-energized and the test selection menu will be displayed.
 - Throughout the duration of any pre-trip test except the P-7 high pressure switch tests, the current and pressure limiting processes are active.
2. At the end of the pre-trip test selection menu, the message "P," "rSLts" (pre-trip results) will be displayed. Pressing the ENTER key will allow the user to see the results for all subtests (i.e., 1-0, 1-1, etc). The results will be displayed as "PASS" or "FAIL" for all the tests run to completion since power up. If a test has not been run since power up, " - - - - - " will be displayed.
3. Once all pre-test activity is completed, dehumidification and bulb mode must be reactivated manually if required.

4.6 DEFROST OPERATION

4.6.1 Dual Temperature Remote Defrost

The remote evaporator fans will shut off in defrost and timed defrost is independent of the host unit. When a manual defrost is initiated in the host unit, it will also defrost the remote. Remote defrost will be terminated on remote DTS temperature. The remote high temperature thermostat (RHTT) is wired in series with the heater contactor for safety.

SECTION 5 TROUBLESHOOTING

NOTE

This section contains information specific to the dual temperature system. For additional troubleshooting information, refer to Section 5 of the Operation and Service Manual for 69NT40-541-300 to 399 series units.

CONDITION	POSSIBLE CAUSE	REMEDY
5.1 REMOTE EVAPORATOR NOT RUNNING		
Remote evaporator does not run	Host unit has not reached set point.	Wait for host unit to reach set point
	All remote temperature sensors have failed.	Check/Replace
5.2 REMOTE EVAPORATOR RUNS BUT HAS INSUFFICIENT COOLING		
Remote evaporator provides air circulation only	Code Select Cd52 is disabled.	Enable
	Remote Liquid Line Solenoid Valve (RLSV) inoperative.	Check/Replace
5.3 REMOTE SUPPLY SENSOR MALFUNCTION		
Remote Secondary Supply Sensor (SSPLy) is controlling the Remote evaporator	Remote Primary Supply Sensor (PSPLy) has failed.	Check/Replace
Remote Primary Return Sensor (rEtUR) minus 3.5 degrees F is controlling the remote evaporator	Both the Remote Secondary Supply Sensor (SSPLy) and the Remote Primary Supply Sensor (PSPLy) have failed.	Check/Replace
5.4 HOST UNIT TRIGGERS A SHUTDOWN ALARM		
Shutdown alarm is triggered in the Host unit	If the cooling components needed to operate the remote evaporator are available, the unit will still operate.	None

SECTION 6

DUAL TEMPERATURE SERVICE

NOTE

To avoid damage to the earth's ozone layer, use a refrigerant recovery system whenever removing refrigerant. When working with refrigerants, you must comply with all local government environmental laws. In the United States, refer to EPA section 608.

NOTE

This section addresses functions specific to the dual temperature platform. For more detailed system information, refer to Section 6 of the T-318 Operations and Service manual.

6.1 SECTION LAYOUT

Service procedures are provided herein beginning with refrigeration system service, then refrigeration system component service, electrical system service, temperature recorder service, and general service. Refer to the Table Of Contents to locate specific topics.

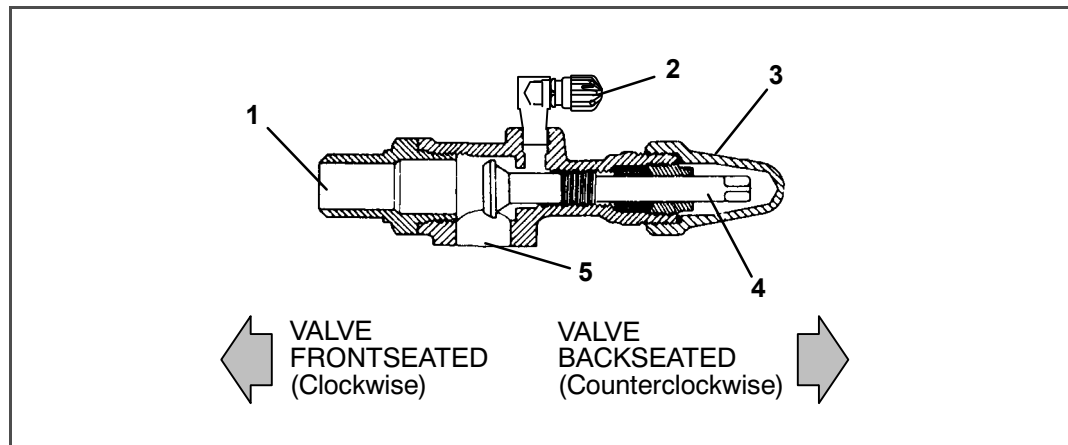
6.2 SERVICE VALVES

The compressor suction, compressor discharge, and liquid line service valves (see [Figure 6.1](#)) are provided with a double seat and a gauge connection, which enable servicing of the compressor and refrigerant lines. Turning the valve stem clockwise (all the way forward) will frontseat the valve to close off the suction, discharge or liquid line and open the gauge port to the compressor or low side. Turning the stem counterclockwise (all the way out) will backseat the valve to open the connections and close off the port.

With the valve stem midway between frontseat and backseat, the lines are open to both the connections and the gauge connection.

For example, the valve stem is first fully backseated when connecting a manifold gauge to measure pressure. Then, the valve is opened 1/4 to 1/2 turn to measure the pressure.

Figure 6.1 Service Valve

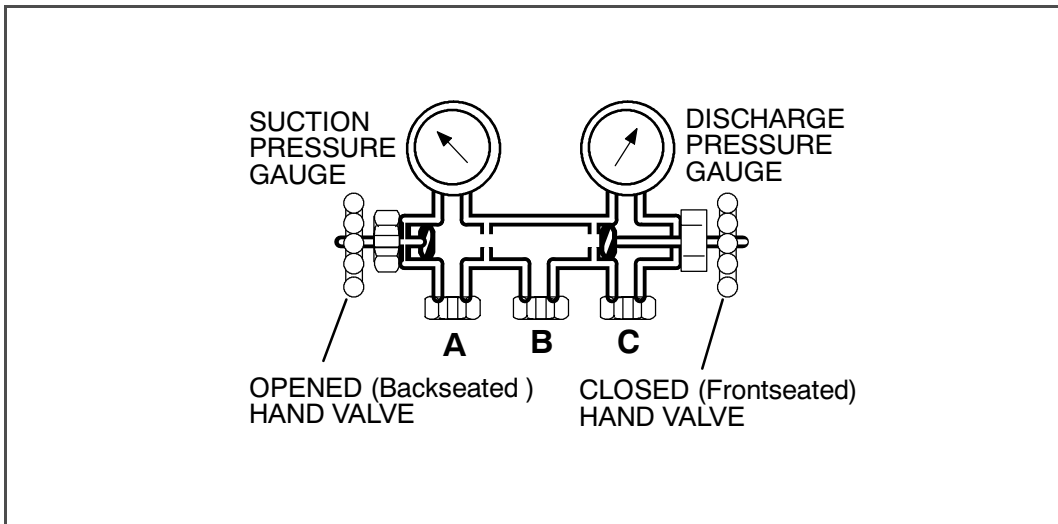


- | | |
|---|--|
| 1. Suction, Discharge or Liquid Line Connection | 4. Valve stem |
| 2. Service Port | 5. Compressor Or Filter Drier Inlet Connection |
| 3. Stem Cap | |

6.3 MANIFOLD GAUGE SET

The manifold gauge set (see [Figure 6.2](#)) is used to determine system operating pressure, add refrigerant charge, and to equalize or evacuate the system.

Figure 6.2 Manifold Gauge Set



- A. Connection to Low Side of System
- B. Connection to either: Refrigerant Cylinder or Oil Container
- C. Connection to High Side of System

When the suction pressure hand valve is frontseated (turned all the way in), the suction (low) pressure can be checked. When the discharge pressure hand valve is frontseated, the discharge (high) pressure can be checked. When both valves are open (turned counter-clockwise all the way out), high pressure vapor will flow into the low side. When the suction pressure valve is open and the discharge pressure valve shut, the system can be charged. Oil can also be added to the system.

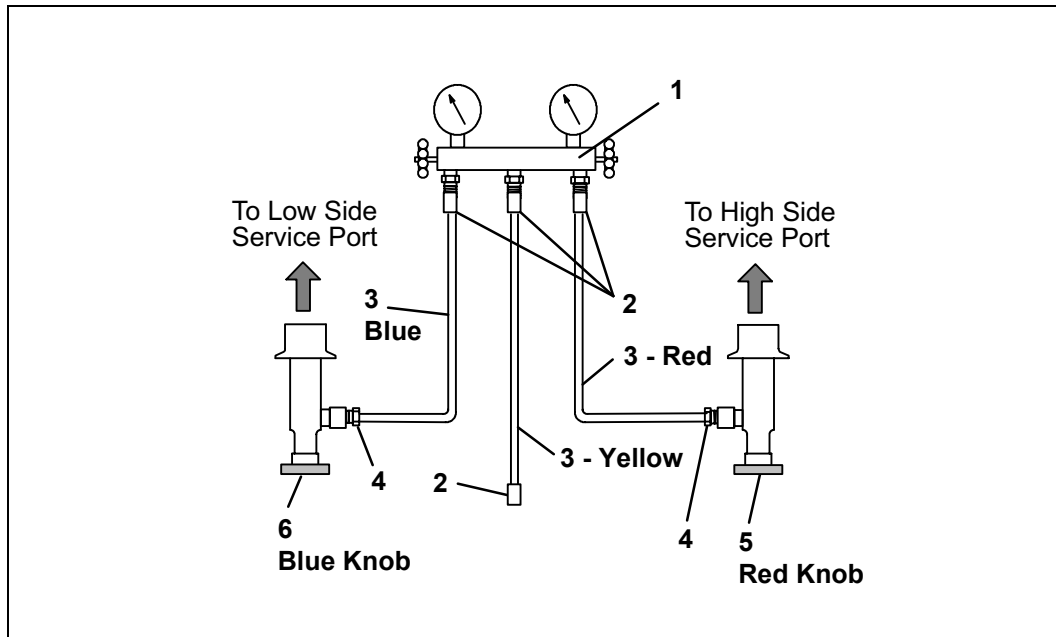
A R-134a manifold gauge/hose set with self-sealing hoses (see [Figure 6.3](#)) is required for service of the model covered within this manual. The manifold gauge/hose set is available from Carrier Transicold. (Carrier Transicold P/N 07-00294-00, which includes items 1 through 6, [Figure 6.3](#)). To perform service using the manifold gauge/hose set, do the following:

a. Preparing Manifold Gauge/Hose Set For Use

If the manifold gauge/hose set is new or was exposed to the atmosphere, it will need to be evacuated to remove contaminants and air as follows:

1. Back seat (turn counterclockwise) both field service couplings (see [Figure 6.3](#)) and midseat both hand valves.
2. Connect the yellow hose to a vacuum pump and refrigerant 134a cylinder.
3. Evacuate to 10 inches of vacuum and then charge with R-134a to a slightly positive pressure of 0.1 kg/cm² (1.0 psig).
4. Front seat both manifold gauge set valves and disconnect from cylinder. The gauge set is now ready for use.

Figure 6.3 R-134a Manifold Gauge/Hose Set



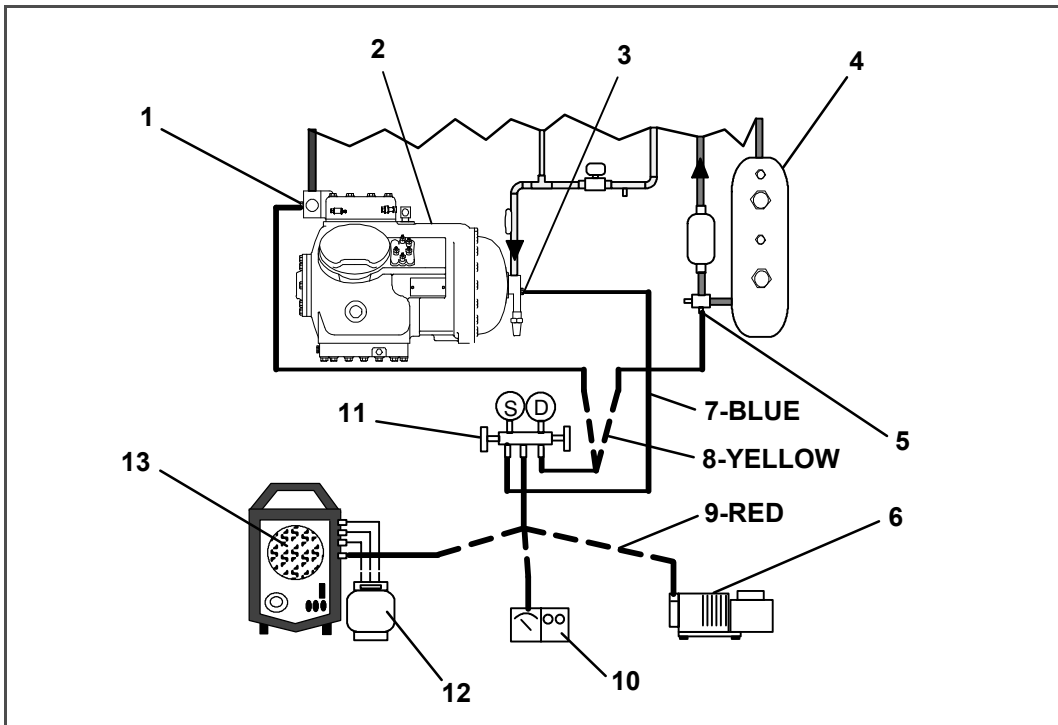
- | | |
|--|--------------------------------------|
| 1. Manifold Gauge Set | 4. Hose Fitting w/O-ring (M14 x 1.5) |
| 2. Hose Fitting (0.5-16 Acme) | 5. High Side Field Service Coupling |
| 3. Refrigeration and/or Evacuation Hose (SAE J2196/R-134a) | 6. Low Side Field Service Coupling |
-

b. Connecting Manifold Gauge/Hose Set

Connection of the manifold gauge/hose set (see [Figure 6.4](#)) is dependent on the component being serviced. If only the compressor is being serviced, the high side coupling is connected to the discharge service valve. For service of the low side (after pump down), the high side coupling is connected to the liquid line service valve. The center hose connection is brought to the tool being used. To connect the manifold gauge/hose set, do the following:

1. Remove service valve stem caps and check to make sure they are backseated. Remove service port caps (See [Figure 6.1](#)).
2. Connect the high side field service coupling (see [Figure 6.3](#)) to the discharge or liquid line valve service valve port.
3. Turn the high side field service coupling knob (red) clockwise, which will open the high side of the system to the gauge set.
4. Connect the low side field service coupling to the suction service valve port.
5. Turn the low side field service coupling knob (blue) clockwise, which will open the low side of the system to the gauge set.
6. To read system pressures, slightly midseat the high side and suction service valves.

Figure 6.4 Refrigeration System Service Connections



- | | |
|---------------------------------------|-----------------------------|
| 1. Discharge Service Valve | 8. Center Hose |
| 2. Compressor | 9. High Side Hose |
| 3. Suction Service Valve | 10. Electronic Vacuum Gauge |
| 4. Receiver or Water Cooled Condenser | 11. Manifold Gauge Set |
| 5. Liquid Service Valve | 12. Refrigerant Cylinder |
| 6. Vacuum Pump | 13. Reclaimer |
| 7. Low Side Hose | |

⚠ CAUTION

To prevent trapping liquid refrigerant in the manifold gauge set, be sure set is brought to suction pressure before disconnecting.

c. Removing the Manifold Gauge Set

1. While the compressor is still ON, backseat the high side service valve.
2. Midseat both hand valves on the manifold gauge set and allow the pressure in the manifold gauge set to be drawn down to suction pressure. This returns any liquid that may be in the high side hose to the system.
3. Backseat the suction service valve. Backseat both field service couplings and frontseat both manifold set valves. Remove the couplings from the service ports.
4. Install both service valve stem caps and service port caps (finger-tight only).

6.4 PUMPING DOWN THE UNIT

To service the filter-drier, liquid line solenoid valves, expansion valves, suction modulation valves, quench valve, or evaporator coils, pump the refrigerant into the high side as follows:

1. Attach manifold gauge set to compressor service valves (refer to [Section 6.3](#)).
2. Start the unit and run both compartments in perishable cooling mode for 10 to 15 minutes. Set both the Host and Remote evaporator set points to temperatures lower than the ambient/box temperature while the container door and remote compartment partition are open.

3. Frontseat the liquid line service valve. Check both host (Cd1) and remote (Cd52) SMV openings. Ensure that the SMVs are not throttling. If necessary, lower set point(s) slightly to increase SMV percentage opening.
4. Place Stop/Start switch in the Off position when the suction pressure reaches a positive pressure of 0.1 kg/cm² (1.0 psig).
5. Frontseat the suction service valve. The refrigerant will be trapped between the compressor suction service valve and the liquid line valve.
6. When opening up the refrigerant system, certain parts may frost. Allow the part to warm to ambient temperature before dismantling. This avoids internal condensation, which puts moisture in the system.
7. After repairs have been made, be sure to perform a refrigerant leak check (refer to [Section 6.5](#)), and evacuate and dehydrate the low side (refer to [Section 6.6](#)).
8. Check refrigerant charge and re-charge as required (refer to [Section 6.7](#)).

6.5 REFRIGERANT LEAK CHECKING



Never use air for leak testing. It has been determined that pressurized, air-rich mixtures of refrigerants and air can undergo combustion when exposed to an ignition source.

The recommended procedure for finding leaks in a system is with a R-134a electronic leak detector. Testing joints with soapsuds is satisfactory only for locating large leaks.

1. If the system is without refrigerant, charge the system with refrigerant 134a to build up pressure between 2.1 to 3.5 kg/cm² (30 to 50 psig). Remove refrigerant cylinder and leak-check all connections.

NOTE

Only refrigerant 134a should be used to pressurize the system. Any other gas or vapor will contaminate the system, which will require additional purging and evacuation of the system.

2. If required, remove refrigerant using a refrigerant recovery system and repair any leaks.
3. Evacuate and dehydrate the unit (refer to [Section 6.6](#)).
4. Charge unit per [Section 6.7](#).

6.6 EVACUATION AND DEHYDRATION

6.6.1 General

Moisture is the deadly enemy of refrigeration systems. The presence of moisture in a refrigeration system can have many undesirable effects. The most common are copper plating, acid sludge formation, “freezing-up” of metering devices by free water, and formation of acids, resulting in metal corrosion.

6.6.2 Preparation

1. Evacuate and dehydrate only after pressure leak test (refer to [Section 6.5](#)).
2. Essential tools to properly evacuate and dehydrate any system include a vacuum pump (8 m³/hr = 5 cfm volume displacement) and an electronic vacuum gauge. The pump is available from Carrier Transicold (P/N 07-00176-11).
3. If possible, keep the ambient temperature above 15.6° C (60° F) to speed evaporation of moisture. If the ambient temperature is lower than 15.6° C (60° F), ice might form before moisture removal is complete. Heat lamps or alternate sources of heat may be used to raise the system temperature.
4. Additional time may be saved during a complete system pump down by replacing the filter-drier with a section of copper tubing and the appropriate fittings. Installation of a new drier may be performed during the charging procedure.

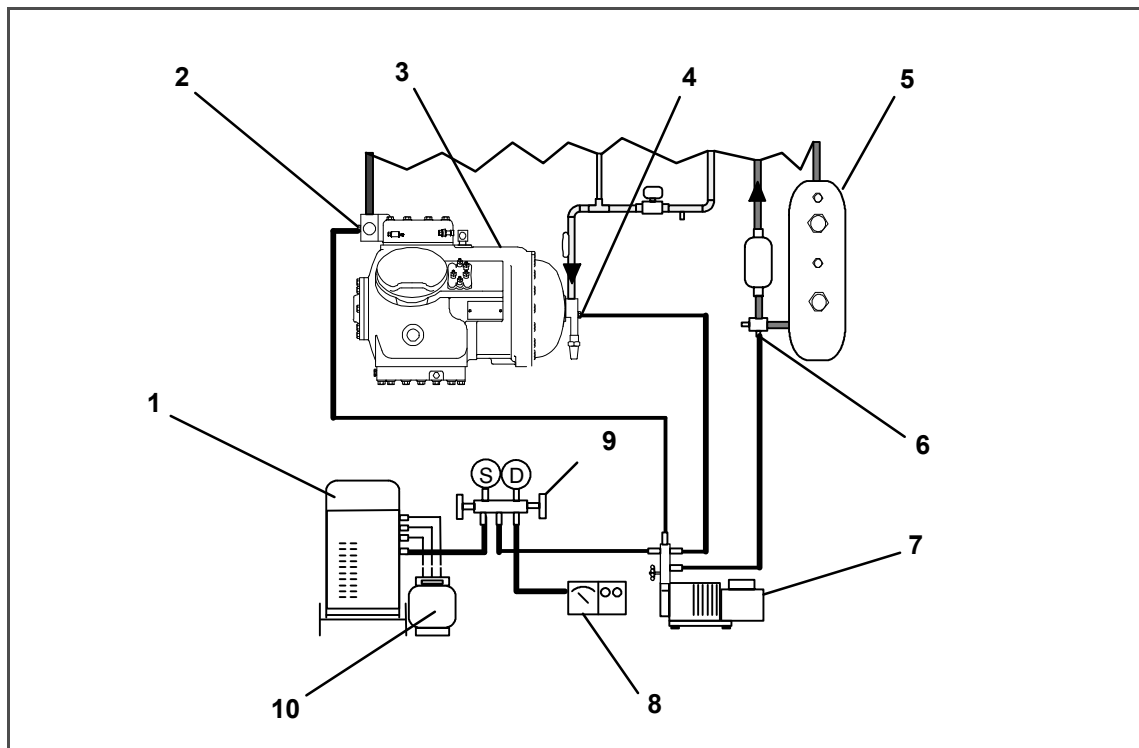
NOTE

24 VAC of power must be provided from TRX1 of the control transformer to KB1 and KC3 to energize HLSV and RLSV respectively, using a jumper wire.
HLSV and RLSV must be opened for full system evacuation.

6.6.3 Procedure - Complete System

1. Remove all refrigerant using a refrigerant recovery system.
2. The recommended method to evacuate and dehydrate the system is to connect three evacuation hoses (see [Figure 6.5](#)) to the vacuum pump and refrigeration unit. Be sure the service hoses are suited for evacuation purposes.

Figure 6.5 Compressor Service Connections



- | | |
|---------------------------------------|----------------------------|
| 1. Reclaimer | 6. Liquid Service Valve |
| 2. Discharge Service Valve | 7. Vacuum Pump |
| 3. Compressor | 8. Electronic Vacuum Gauge |
| 4. Suction Service Valve | 9. Manifold Gauge Set |
| 5. Receiver or Water Cooled Condenser | 10. Refrigerant Cylinder |

3. Test the evacuation setup for leaks by backseating the unit service valves and drawing a deep vacuum with the vacuum pump and gauge valves open. Shut off the pump and check to see if the vacuum holds. Repair leaks if necessary.
4. Midseat the refrigerant system service valves.
5. Open the vacuum pump and electronic vacuum gauge valves, if they are not already open. Start the vacuum pump. Evacuate unit until the electronic vacuum gauge indicates 2000 microns. Close the electronic vacuum gauge and vacuum pump valves. Shut off the vacuum pump. Wait a few minutes to be sure the vacuum holds.
6. Break the vacuum with clean dry refrigerant 134a gas. Raise system pressure to approximately 0.2 kg/cm² (2 psig), monitoring it with the compound gauge.
7. Remove refrigerant using a refrigerant recovery system.

8. Repeat steps 5. and 6. one time.
9. Remove the copper tubing and change the filter-drier. Evacuate unit to 500 microns. Close the electronic vacuum gauge and vacuum pump valves. Shut off the vacuum pump. Wait five minutes to see if vacuum holds. This procedure checks for residual moisture and/or leaks.
10. With a vacuum still in the unit, the refrigerant charge may be drawn into the system from a refrigerant container on weight scales. Continue to [Section 6.7](#).

6.6.4 Procedure - Partial System

1. If the refrigerant charge has been removed from the compressor for service, evacuate only the compressor by connecting the evacuation set-up at the compressor service valves. Follow evacuation procedures of the preceding paragraph except leave compressor service valves frontseated until evacuation is completed.
2. If refrigerant charge has been removed from the low side only, evacuate the low side by connecting the evacuation set-up at the compressor suction service valve and liquid service valve except leave the service valves frontseated until evacuation is completed.
3. Once evacuation has been completed and the pump has been isolated, fully backseat the service valves to isolate the service connections and then continue with checking and, if required, adding refrigerant in accordance with normal procedures.

6.7 REFRIGERANT CHARGE

6.7.1 Checking the Refrigerant Charge

NOTE

To avoid damage to the earth's ozone layer, use a refrigerant recovery system whenever removing refrigerant. When working with refrigerants you must comply with all local government environmental laws. In the U.S., refer to EPA section 608.

1. Connect the gauge manifold to the compressor discharge and suction service valves.
2. Bring the container temperature to approximately 1.7°C (35°F) or -17.8°C (0°F). Set the host controller set point to -25°C (-13°F) to ensure that the suction modulation valve is at maximum allowed open position.
3. Partially block the condenser coil inlet air. Increase the area blocked until the compressor discharge pressure is raised to approximately 12 kg/cm² (175 psig).
4. On units equipped with a receiver, the level should be between the glasses. If the refrigerant level is not correct, continue with the following paragraphs to add or remove refrigerant as required.

6.7.2 Adding Refrigerant to System (Full Charge)

1. Evacuate unit and leave in deep vacuum (refer to [Section 6.6](#)).
2. Place cylinder of R-134a on scale and connect charging line from cylinder to liquid line valve. Purge charging line at liquid line valve and then note weight of cylinder and refrigerant.
3. Open liquid valve on cylinder. Open liquid line valve half-way and allow the liquid refrigerant to flow into the unit until the correct weight of refrigerant (refer to [Section 2.4](#)) has been added as indicated by scales.

NOTE

It may be necessary to finish charging unit through suction service valve in gas form, due to pressure rise in high side of the system (refer to section [Section 6.7.3](#)).

4. Backseat manual liquid line valve (to close off gauge port). Close liquid valve on cylinder.
5. Start unit in cooling mode. Run approximately 10minutes and check the refrigerant charge.

6.7.3 Adding Refrigerant to System (Partial Charge)

1. Examine the unit refrigerant system for any evidence of leaks. Repair as necessary (refer to [Section 6.5](#)).
2. Maintain the conditions outlined in [Section 6.7.1](#).

3. Fully backseat the suction service valve and remove the service port cap.
4. Connect charging line between suction service valve port and cylinder of refrigerant R-134a. Open VAPOR valve.
5. Partially frontseat (turn clockwise) the suction service valve and slowly add charge until the refrigerant appears at the proper level.

6.8 SERVICING SOLENOID VALVES

6.8.1 Host Solenoid Valves

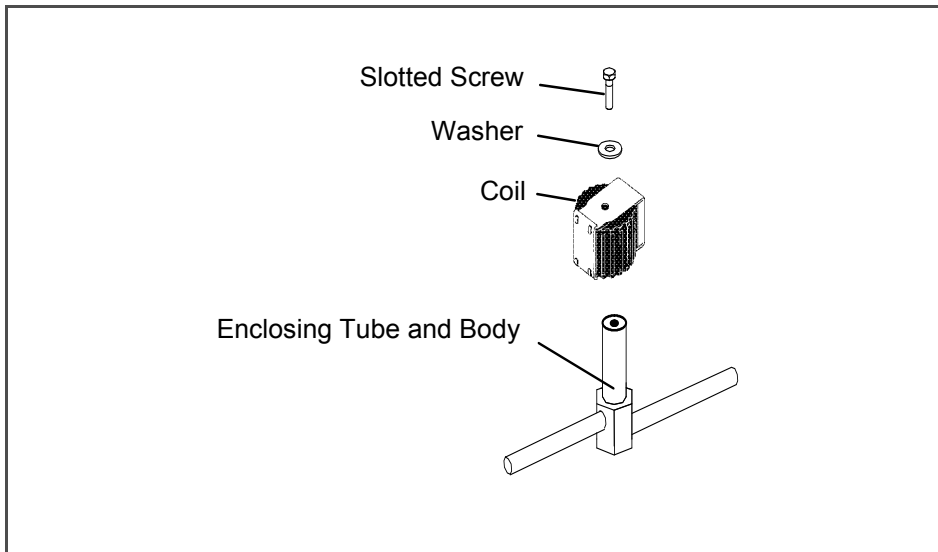
a. Replacing the Coil

NOTE

The coil may be replaced without removing the refrigerant.

1. Be sure electrical power is removed from the unit. Disconnect leads. Remove top screw and washer. Lift off coil. (See [Figure 6.6](#)).
2. Verify coil type, voltage and frequency of old and new coil. This information appears on the coil housing.

Figure 6.6 Host Solenoid Valve



b. Replacing Valve

1. To replace the unloader, economizer, liquid injection or expansion bypass valve, pump down the unit. Refer to [Section 6.4](#). Evacuate if unit is not equipped with service valves. Refer to [Section 6.6.4](#) to replace the oil return valve. Remove the refrigerant charge.
2. Be sure electrical power is removed from the unit. Disconnect leads. Remove top screw and washer. Lift off coil. (See [Figure 6.6](#)).
3. Unbrazed valve from unit and braze new valve in place.
4. Install coil. Evacuate low side and place unit back in operation. Check charge.

6.8.2 Remote Solenoid Valves



Do not over tighten or damage the enclosing tube assembly. Torque to 200-inch pounds (2.3 Mkg). Also make sure all parts are placed on the enclosing tube in proper sequence to avoid premature coil burnout.

a. Replacing the Coil

NOTE

The coil may be replaced without removing the refrigerant or pumping the unit down.

1. Unplug from wiring harness, remove coil retainer and coil assembly.
2. Verify coil type, voltage and frequency. This information appears on the coil housing.
3. Place new coil over enclosing tube, retainer and connect wiring.

6.8.3 Replacing Solenoid Valve Internal Parts

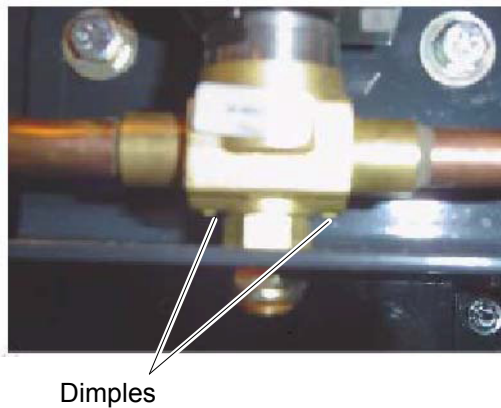
The remote liquid line solenoid valve (RLSV) may be serviced by pumping the unit down. (Refer to [Section 6.4.](#))

1. Remove coil retainer and coil assembly from valve. Remove enclosing tube assembly and related items.
2. Check for foreign material in valve body.
3. Install new parts.

NOTE

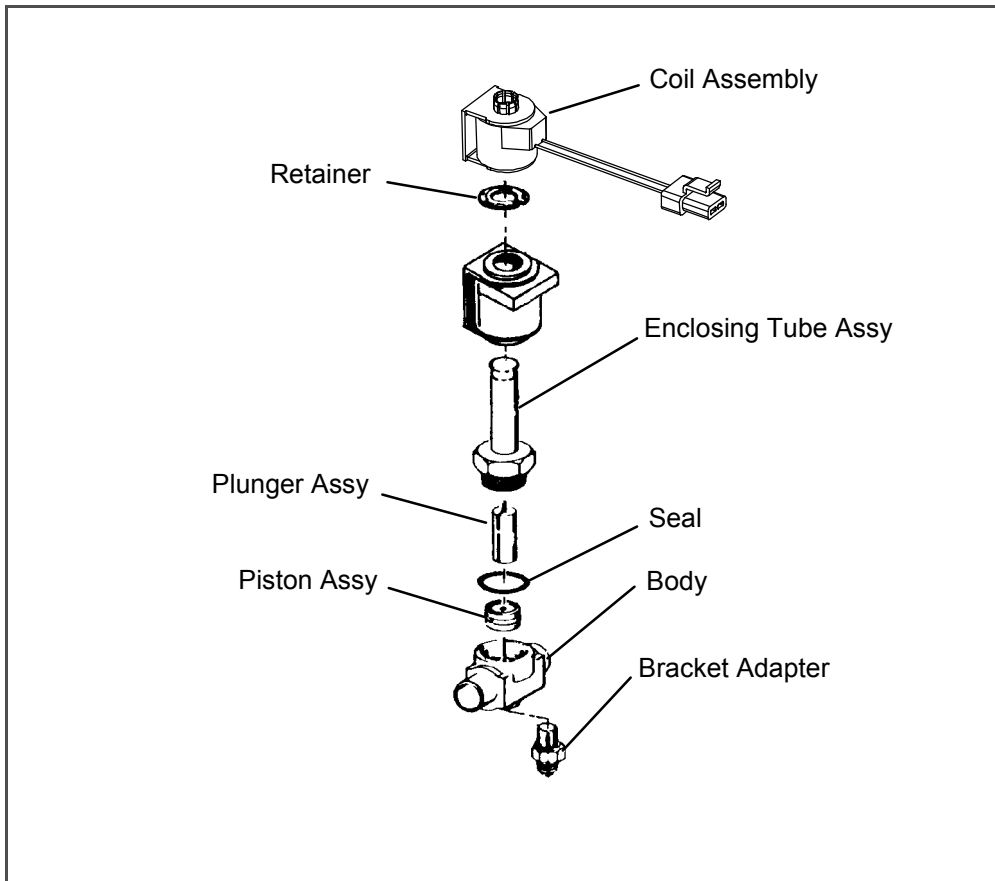
Solenoid valve repair kit (P/N 14-00150-51) contains both a black neoprene seal and a white teflon seal. Use the one that matches seal in existing valve. The valve with the teflon seal can be identified by two dimples in the housing. (See [Figure 6.7](#))

Figure 6.7 Remote Solenoid Valve



4. Tighten enclosing tube assembly to a torque value of 200 inch pounds (2.3 Mkg) and leak check the valve. (Refer to [Section 6.5](#))
5. Install coil assembly and retainer.
6. Start unit and check refrigerant charge per [Section 6.7.1](#).
7. Check refrigeration cycles.
8. Run Pretrip. (Refer to [Section 4.5](#)).

Figure 6.8 Remote Solenoid Valves - Internal Parts



SECTION 7

ELECTRICAL WIRING SCHEMATIC

7.1 INTRODUCTION

This section contains the electrical schematics and wiring diagrams for units with the dual temperature system. The diagrams are presented as follows:

For 69NT40-541-304:

Figure 7.1 provides the legend for use with all figures.

Figure 7.2 provides the schematic diagram for units equipped with the dual temperature system.

Figure 7.3 provides the wiring diagram (sheet 1) for units equipped with the dual temperature system.

Figure 7.4 provides the wiring diagram (sheet 2) for units equipped with the dual temperature system.

For 69NT40-541-345:

Figure 7.5 provides the legend for use with all figures.

Figure 7.6 provides the schematic diagram for units equipped with the dual temperature system.

Figure 7.7 provides the wiring diagram (sheet 1) for units equipped with the dual temperature system.

Figure 7.8 provides the wiring diagram (sheet 2) for units equipped with the dual temperature system.

Figure 7.1 Legend (69NT40-541-304)

LEGEND

<u>SYMBOL</u>	<u>DESCRIPTION (Schematic Location)</u>	<u>SYMBOL</u>	<u>DESCRIPTION (Schematic Location)</u>
AMBS	AMBIENT SENSOR (D-23)	PB	PHASE REVERSAL CONTACTOR (L-2, L-6, L-7)
C	CONTROLLER (K-23)	RDH	REMOTE DEFROST HEATER (T-6, T-7, T-8)
CB1	CIRCUIT BREAKER - 460 VOLT (D-1)	RDLH	REMOTE DRAIN LINE HEATER (J-6, L-6)
CF	CONDENSER FAN CONTACTOR (M-11, P-5)	RDTS	REMOTE DEFROST TEMPERATURE SENSOR (R-24)
CI	COMMUNICATIONS INTERFACE MODULE (A-3)	RE	REMOTE EVAPORATOR FAN MOTOR (G-9, J-9, T-10, T-11)
CH	COMPRESSOR CONTRACTOR (M-8, P-1)	RHTT	REMOTE HEAT TERMINATION THERMOSTAT (F-14)
CM	CONDENSER FAN MOTOR (F-11, G-11, T-5)	RLSV	REMOTE LIQUID SOLENOID VALVE (J-14)
CP	COMPRESSOR MOTOR (E-8, T-1)	RPRS	REMOTE PRIMARY RETURN TEMPERATURE SENSOR (H-24)
CPT	CONDENSER PRESSURE TRANSDUCER (H-22)	RPSS	REMOTE PRIMARY SUPPLY TEMPERATURE SENSOR (K-23)
CPDS	COMPRESSOR DISCHARGE SENSOR (B-22)	RRS	RETURN RECORDER SENSOR (C-22)
CPSS	COMPRESSOR SUCTION SENSOR (E-22)	RSMV	REMOTE SUCTION MODULATION VALVE (B-24)
CR	CHART RECORDER [TEMPERATURE RECORDER] (A-17)	RSSS	REMOTE SECONDARY SUPPLY TEMPERATURE SENSOR (J-23)
CS	CURRENT SENSOR (G-2)	RTS	RETURN TEMPERATURE SENSOR (C-22)
DHBL	DEFROST HEATER - BOTTOM LEFT (R-3)	SPT	SUCTION PRESSURE TRANSDUCER (J-22)
DHBR	DEFROST HEATER - BOTTOM RIGHT (T-3)	SRS	SUPPLY RECORDER SENSOR (L-21)
DHML	DEFROST HEATER - MIDDLE LEFT (R-3)	SD	STEPPER POWER PACK (D-23)
DHMR	DEFROST HEATER - MIDDLE RIGHT (T-3)	ST	START - STOP SWITCH (E-4)
DHTL	DEFROST HEATER - TOP LEFT (R-3)	TC	CONTROLLER RELAY - COOLING (K-8)
DHTR	DEFROST HEATER - TOP RIGHT (T-3)	TCP	CONTROLLER RELAY - PHASE REVERSAL (K-7)
DPT	DISCHARGE PRESSURE TRANSDUCER (K-22)	TE	CONTROLLER RELAY - HIGH SPEED EVAPORATOR FANS (K-12)
DTS	DEFROST TEMPERATURE SENSOR (D-22)	TH	CONTROLLER RELAY - HEATING (K-14)
EF	EVAPORATOR FAN CONTACTOR [HIGH SPEED] (K-13, L-12, P-12, P-14)	THL	CONTROLLER RELAY - HOST LIQUID LINE VALVE (F-16)
EM	EVAPORATOR FAN MOTOR (E-12, G-12, T-13, T-15)	TN	CONTROLLER RELAY - CONDENSER FAN (K-11)
ES	EVAPORATOR FAN CONTACTOR [LOW SPEED] (L-13, P-12, P-14)	TP	TEST POINT (F-11, J-8, J-11, J-12, J-14, N-17)
F	FUSE (C-7, D-6, D-7, E-6, E-19, F-19)	TR	TRANSFORMER (G-3)
FDLH	FUSE, DEFROST LINE HEATER (D-6)	TRL	CONTROLLER RELAY - REMOTE LIQUID LINE VALVE (F-15)
FLA	FULL LOAD AMPS	TV	CONTROLLER RELAY - LOW SPEED EVAPORATOR FANS (K-13)
HC	HIGH VOLTAGE CONNECTOR (P-6, P-9, R-6, R-9)	TVE	CONTROLLER RELAY - REMOTE EVAPORATOR FANS (D-9)
HLSV	HOST LIQUID SOLENOID VALVE (J-15)	TVH	CONTROLLER RELAY - REMOTE DEFROST HEATING (E-10)
HPS	HIGH PRESSURE SWITCH (G-9)	VE	REMOTE EVAPORATOR FAN CONTACTOR (L-9, L-10)
HR	HEATER CONTACTOR (L-14, P-3)	VH	REMOTE DEFROST HEATER CONTACTOR (F-6, L-10, P-6)
HS	HUMIDITY SENSOR (G-23)	VPS	VENT POSITIONING SENSOR (P-17)
HSMV	HOST SUCTION MODULATION VALVE (R-17)	WCR	WETTING CURRENT RELAY (H-11)
HTT	HEAT TERMINATION THERMOSTAT (G-14)	WP	WATER PRESSURE SWITCH (E-12)
ICF	INTERROGATOR CONNECTOR FRONT (P-21)		
IP	INTERNAL PROTECTOR (E-8, E-12, F-11, G-9, G-12, J-9)		
LC	LOW VOLTAGE CONNECTOR (F-9, G-6, G-10, G-14, J-10, K-9, L-14, M-6)		
PA	PHASE REVERSAL CONTACTOR (L-1, L-6, L-7)		

Figure 7.2 Schematic (69NT40-541-304)

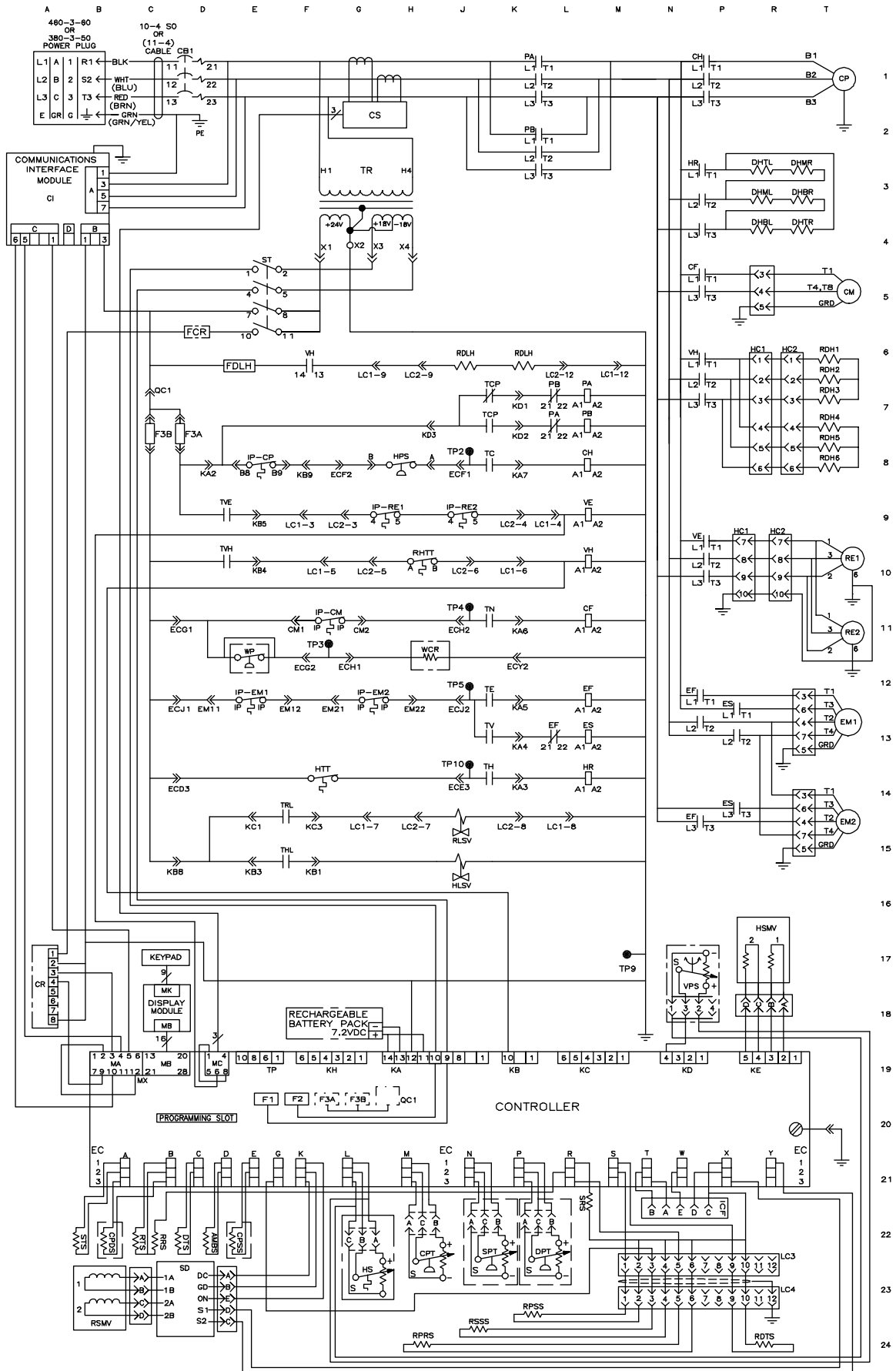


Figure 7.3 Unit Wiring Diagram - Sheet 1 (69NT40-541-304)

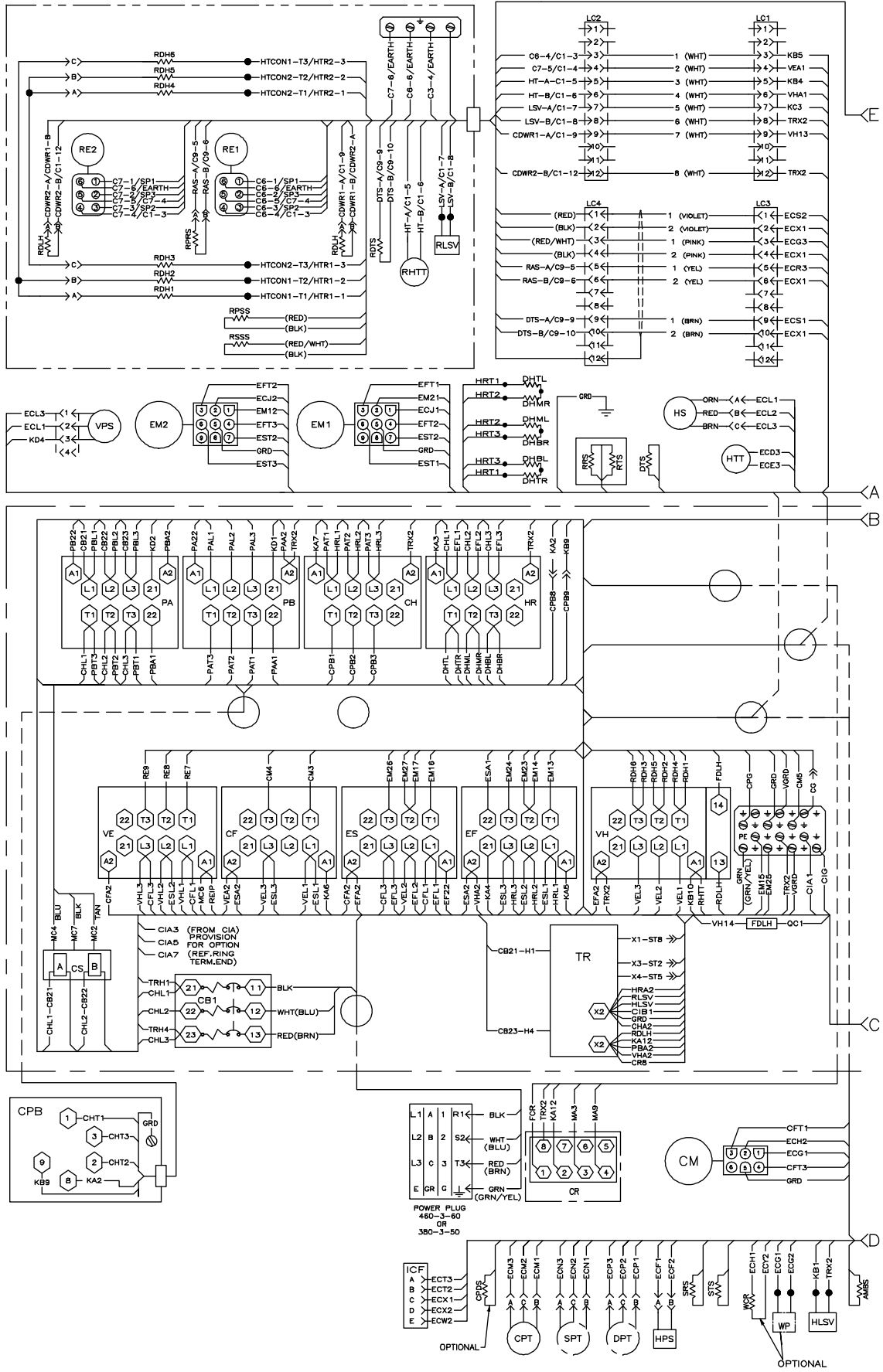


Figure 7.4 Unit Wiring Diagram - Sheet 2 (69NT40-541-304)

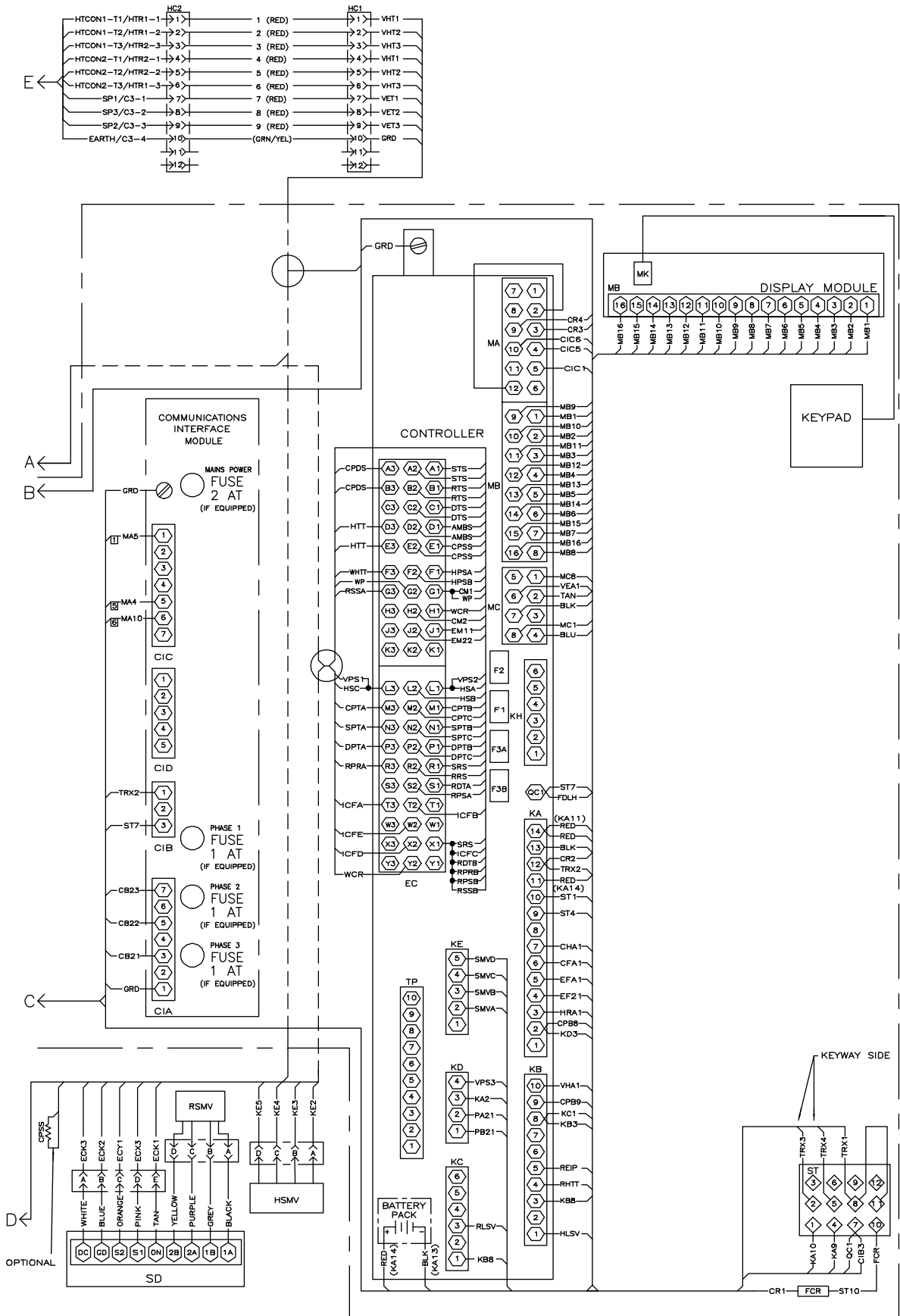
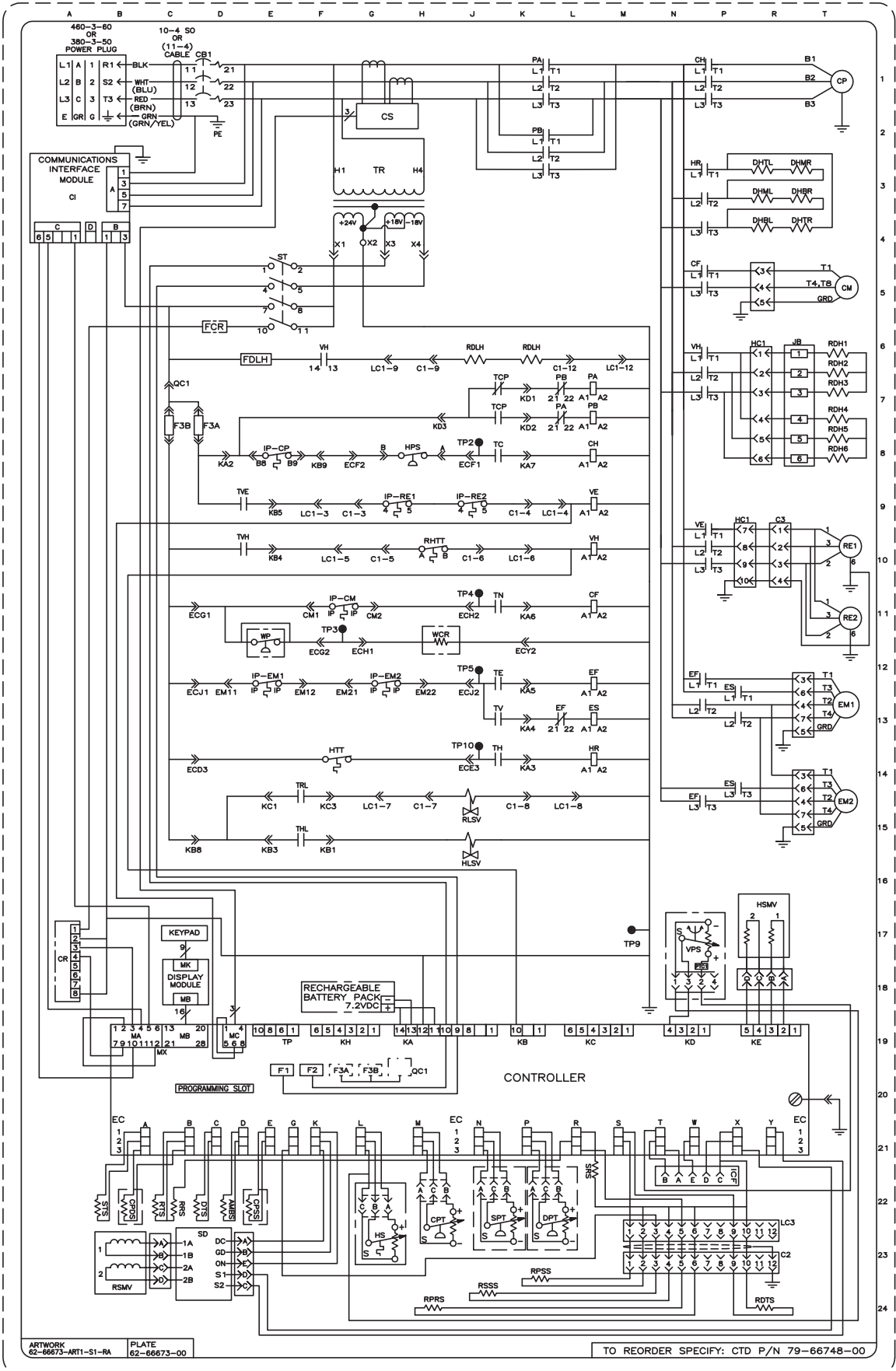


Figure 7.5 Legend (69NT40-541-345)

<u>ZONE</u>	<u>SYMBOL</u>	<u>DESCRIPTION</u>
D23	AMBS	— AMBIENT SENSOR
K21	C	— CONTROLLER
H6,L6,K9,F9,J10, G10,K14,H14	C1	— REMOTE LOW VOLTAGE CONNECTOR 1
R23		
R9	C3	— REMOTE HIGH VOLTAGE CONNECTOR
D1	CB1	— CIRCUIT BREAKER 460V
M11,P5	CF	— CONDENSER FAN CONTACTOR
A3	CI	— COMMUNICATIONS INTERFACE MODULE (OPTION)
M8,P1	CH	— COMPRESSOR CONTRACTOR
F11,G11,T5	CM	— CONDENSER FAN MOTOR
E8,T1	CP	— COMPRESSOR MOTOR
H22	CPT	— CONDENSER PRESSURE TRANSDUCER
B22	CPDS	— DISCHARGE TEMPERATURE SENSOR (TEMP.)
E22	CPSS	— SUCTION TEMPERATURE SENSOR (TEMP.)
A17	CR	— CHART RECORDER
G2	CS	— CURRENT SENSOR
R3	DHBL	— DEFROST HEATER — BOTTOM LEFT
T3	DHBR	— DEFROST HEATER — BOTTOM RIGHT
R3	DHML	— DEFROST HEATER — MIDDLE LEFT
T3	DHMR	— DEFROST HEATER — MIDDLE RIGHT
R3	DHTL	— DEFROST HEATER — TOP LEFT
T3	DHTR	— DEFROST HEATER — TOP RIGHT
K22	DPT	— DISCHARGE PRESSURE TRANSDUCER
D22	DTS	— DEFROST TEMPERATURE SENSOR
K13,L12, P12,P14	EF	— EVAPORATOR FAN CONTACTOR (HIGH SPEED)
E12,G12, T13,T15		
L13, P12,P14	EM	— EVAPORATOR FAN MOTOR
C7,D7,D6, E6,E19,F19		
P6,P9	ES	— EVAPORATOR FAN CONTACTOR (LOW SPEED)
J15	F	— FUSE
G9	FLA	— FULL LOAD AMPS
L14,P3	HC	— HIGH VOLTAGE CONNECTOR
G23	HLSV	— HOST LIQUID SOLENOID VALVE
R17	HPS	— HIGH PRESSURE SWITCH
G14	HR	— HEATER CONTACTOR
P21	HS	— HUMIDITY SENSOR (OPTION)
E8,E12,F11, G9,G12,J9	HSMV	— HOST SUCTION MODULATION VALVE
R6	HTT	— HEAT TERMINATION THERMOSTAT
F9,G6,F10,G14, K10,L9,L14,M6,R22	ICF	— INTERROGATOR CONNECTOR FRONT
L1,L6,L7 L2,L6,L7	IP	— INTERNAL PROTECTOR
N18	JB	— REMOTE DEFROST HEATER JUNCTION BOX
T6,T7,T8	LC	— LOW VOLTAGE CONNECTOR
J6,L6	PA	— PHASE REVERSAL CONTACTOR
R24	PB	— PHASE REVERSAL CONTACTOR
G9,J9,T10,T11	PTC1	— PTC FOR VENT POSITION SENSOR (UPPER)
F14	RDH	— REMOTE DEFROST HEATER
J14	RDLH	— REMOTE DRAIN LINE HEATER
H24	RDS	— REMOTE DEFROST TEMPERATURE SENSOR
K23	RE	— REMOTE EVAPORATOR FAN MOTOR
C22	RHTT	— REMOTE HEAT TERMINATION THERMOSTAT
B24	RLSV	— REMOTE LIQUID SOLENOID VALVE
J23	RPRS	— REMOTE PRIMARY RETURN TEMPERATURE SENSOR
C22	RPSS	— REMOTE PRIMARY SUPPLY TEMPERATURE SENSOR
J22	RRS	— RETURN RECORDER SENSOR
L21	RSMV	— REMOTE SUCTION MODULATION VALVE
D23	RSSS	— REMOTE SECONDARY SUPPLY TEMPERATURE SENSOR
E4	RTS	— RETURN TEMPERATURE SENSOR
K8	SPT	— SUCTION PRESSURE TRANSDUCER
K7	SRS	— SUPPLY RECORDER SENSOR
K12	SD	— STEPPER POWER PACK
K14	ST	— START-STOP SWITCH
F16	TC	— CONTROLLER RELAY (COOLING)
K11	TCP	— CONTROLLER RELAY (PHASE REVERSAL)
F11,J8,J11, J12,J14,N17	TE	— CONTROLLER RELAY (HIGH SPEED EVAPORATOR FANS)
G3	TH	— CONTROLLER RELAY (HEATING)
F15	THL	— CONTROLLER RELAY (HOST LIQUID LINE VALVE)
K13	TN	— CONTROLLER RELAY (CONDENSER FAN)
D9	TP	— TEST POINT
E10	TR	— TRANSFORMER
L9,P10	TRL	— CONTROLLER RELAY (REMOTE LIQUID LINE VALVE)
F6,L10,P6	TV	— CONTROLLER RELAY (LOW SPEED EVAPORATOR FANS)
P17	TVE	— CONTROLLER RELAY (REMOTE EVAPORATOR FANS)
H11	TVH	— CONTROLLER RELAY (REMOTE DEFROST HEATING)
E12	VE	— REMOTE EVAPORATOR FAN CONTACTOR
	VH	— REMOTE DEFROST HEATER CONTACTOR
	VPS	— VENT POSITION SENSOR (UPPER) (OPTION)
	WCR	— WETTING CURRENT RESISTOR (OPTION)
	WP	— WATER PRESSURE SWITCH (OPTION)

Figure 7.6 Schematic (69NT40-541-345)



ARTWORK 62-6673-AR11-S1-RA PLATE 62-6673-00

TO REORDER SPECIFY: CTD P/N 79-66748-00

Figure 7.7 Unit Wiring Diagram - Sheet 1 (69NT40-541-345)

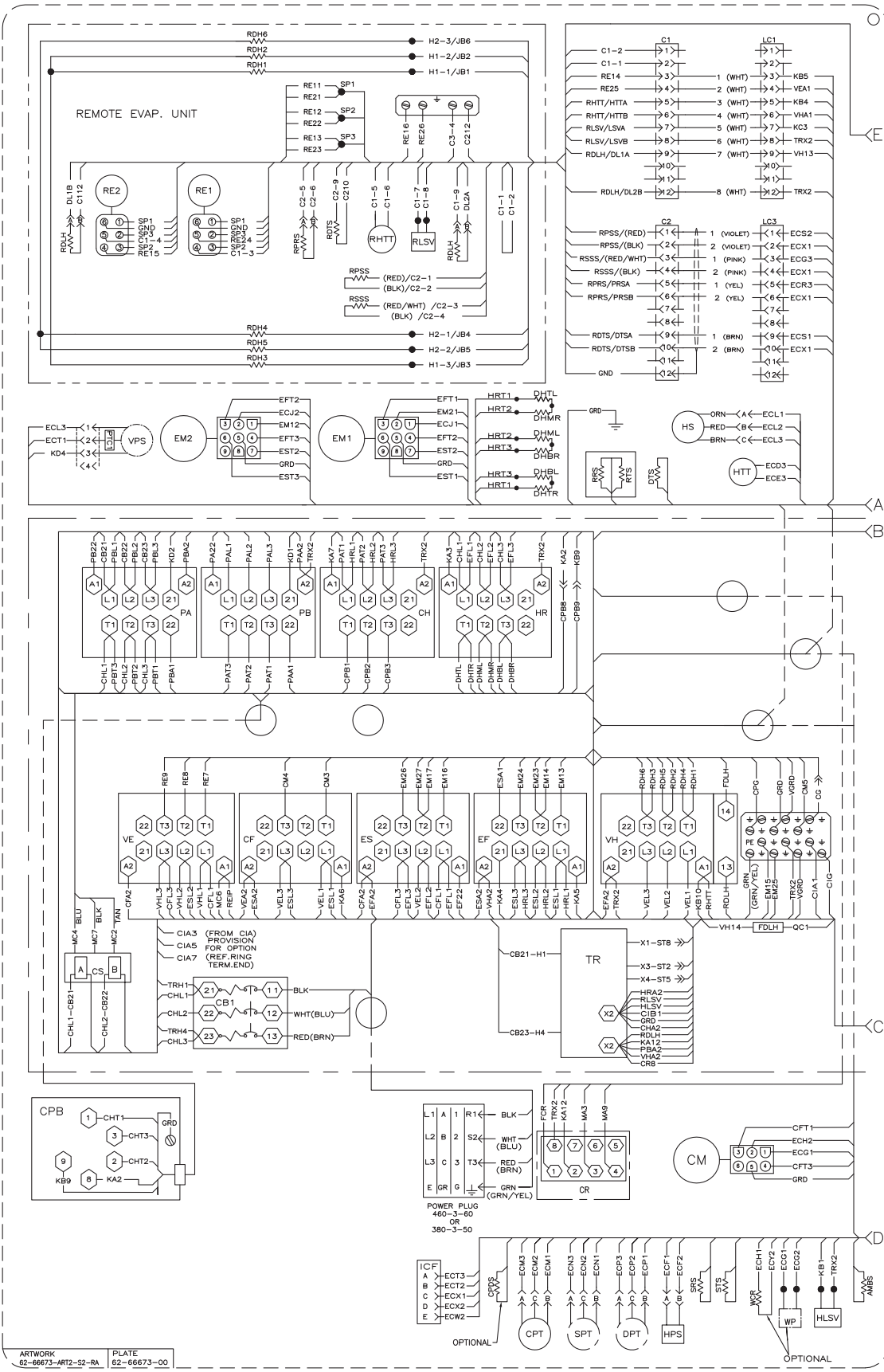
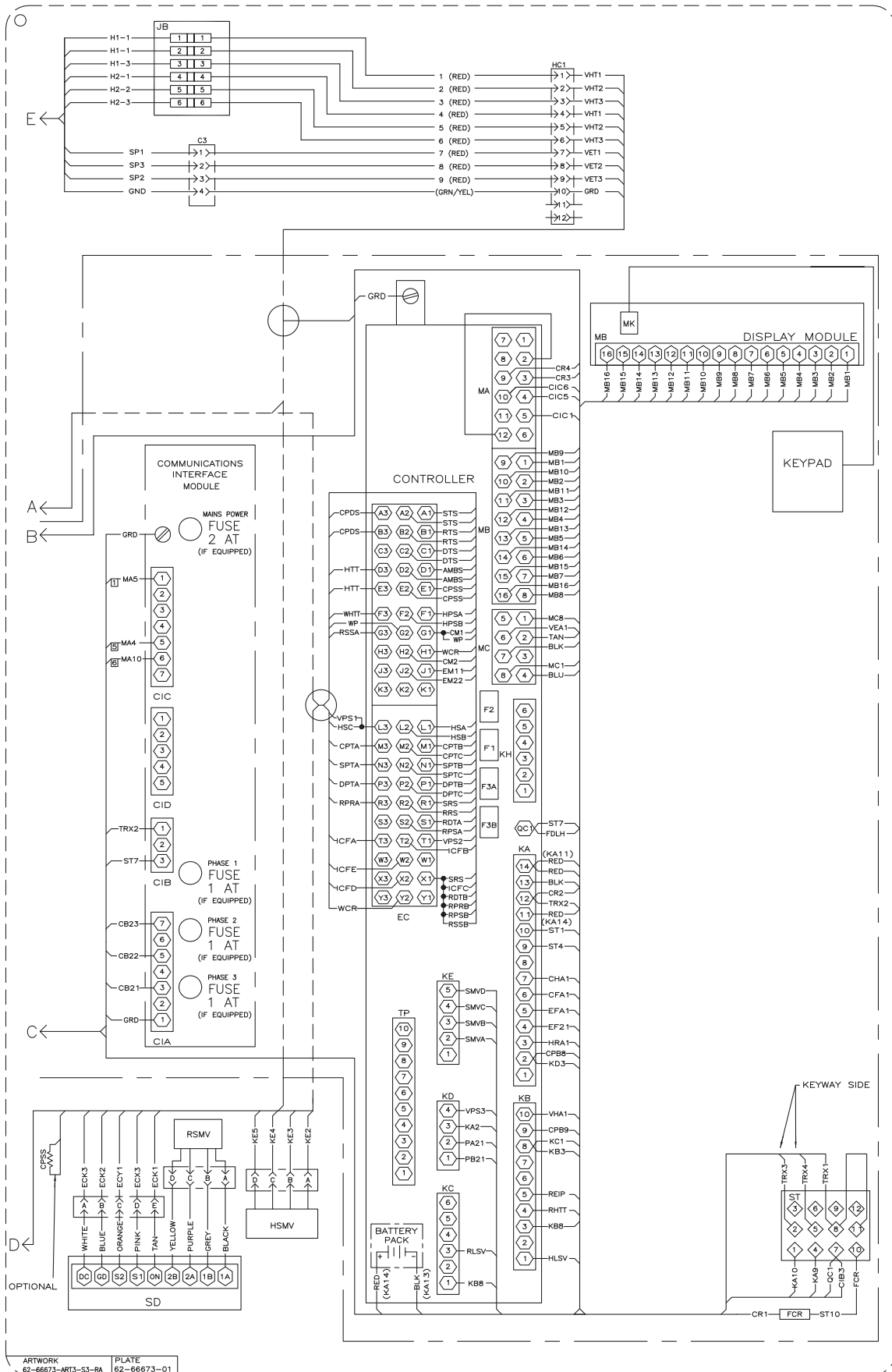


Figure 7.8 Unit Wiring Diagram - Sheet 2 (69NT40-541-345)



ARTWORK 62-66673-RT3-S3-BA

PLATE 82-66673-01

SECTION 8

SERVICE PARTS

8.1 INTRODUCTION

All orders and inquiries for parts must include: Parts Identification Number (**PID**), Model Number, Unit Serial Number, Part Number, description of part as shown on list, and quantity required. Address all correspondence for parts to the following address:

CARRIER TRANSICOLD DIVISION
Replacement Components Group, TR-20
P.O. Box 4805, Syracuse, New York 13221
or FAX to: (315) 432-3778

The following letter designations are used to classify parts throughout this list:

A/R = As Required

N/A = Not Available

NS = Not Shown in illustration

NSS = Not Sold Separately - order next higher assembly or kit

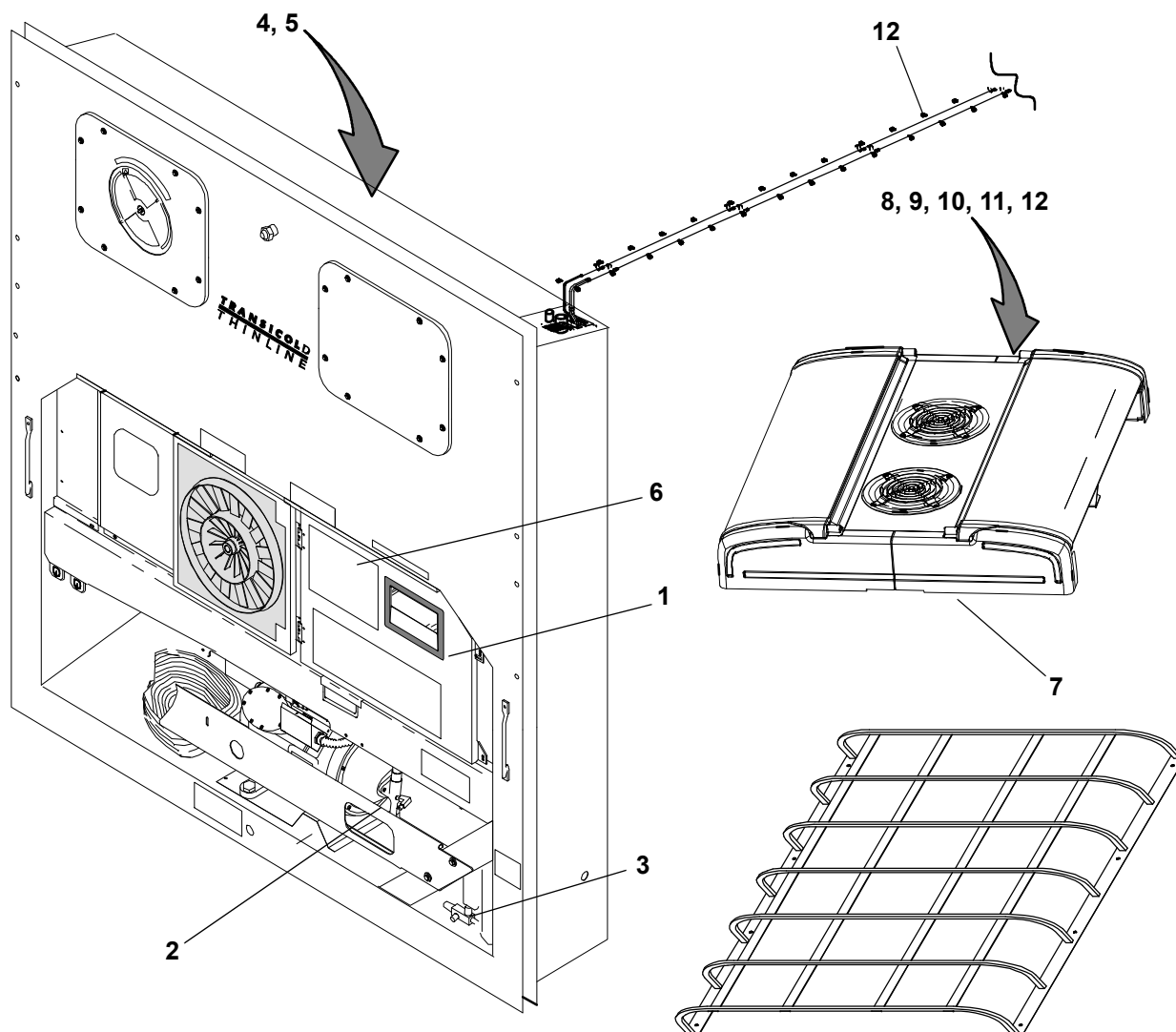
PID = Parts Identification Number - essential to identify unit configuration.

PL = Purchase Locally

SST = Stainless Steel - 300 Series unless otherwise specified.

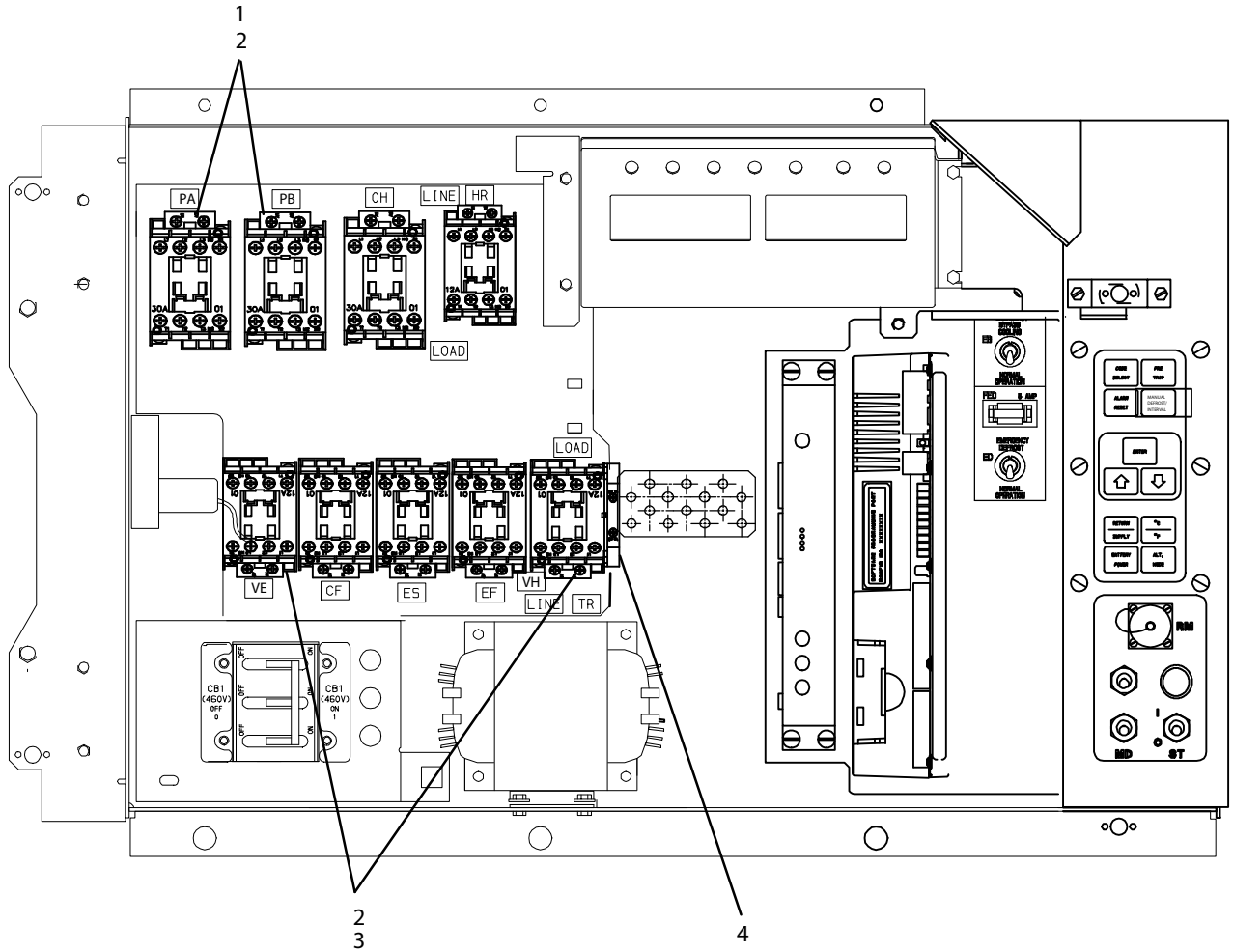
SV = Suffix SV - added to part number designates service replacement part.

9 REFRIGERATION UNIT - AREA LOCATOR



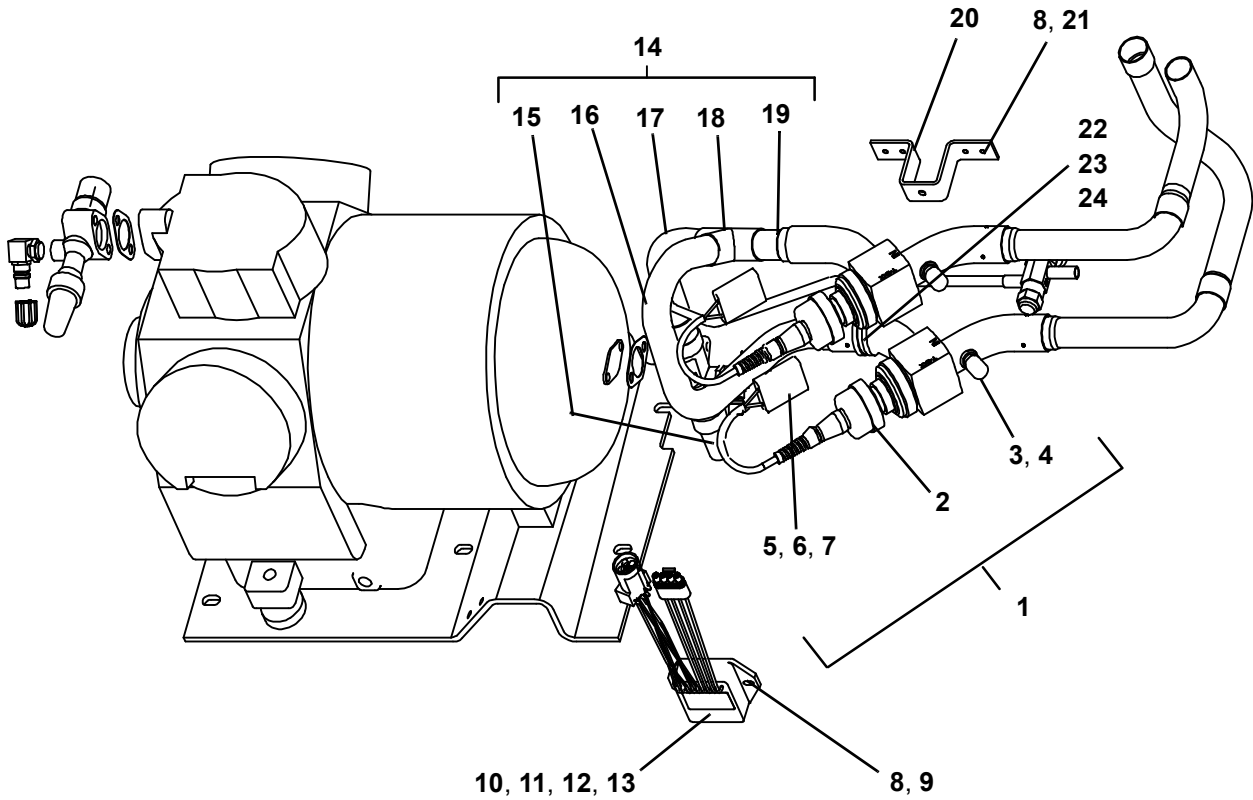
Item	Section Number in Current Document	Section Number in Manual T-318PL. Refer to:	Area Description
1	Section 10	Section 2.7	Control Box
2	Section 11	Section 2.12	Compressor Tubing
3	Section 13	Section 2.13	Receiver
4	Section 14	Section 2.20	Evaporator Coil
5	Section 15	Section 2.22	Back Panel Assembly
6	Section 16	Section 2.33	Labels and Decals
7	Section 17	—	Remote Evaporator - Frame
8	Section 18	—	Remote Evaporator - Refrigeration
9	Section 19	—	Remote Evaporator - Electrical Kit
10	Section 21	—	Remote Evaporator - Wire Harness
11	Section 23	—	Remote Evaporator - Heater Kit
12	Section 25	—	Remote Evaporator - Installation Components

10 CONTROL BOX - SHIELDS REMOVED, STD ELECTRICAL COMPONENTS



Item	Part Number	Description	Qty
1	10-00431-07	Contactors, Compressor, (PA) (PB) (30 Amp)	2
2	34-06243-00	Screw, Pan Head, (Thread Cutting), #8-32 x 3/4 Long - SST	8
3	10-00431-06	Contactors, (VE) (VH) (12 Amp)	2
4	10-00431-03	Contact, Auxiliary	1

11 COMPRESSOR TUBING (69NT40-541-304)

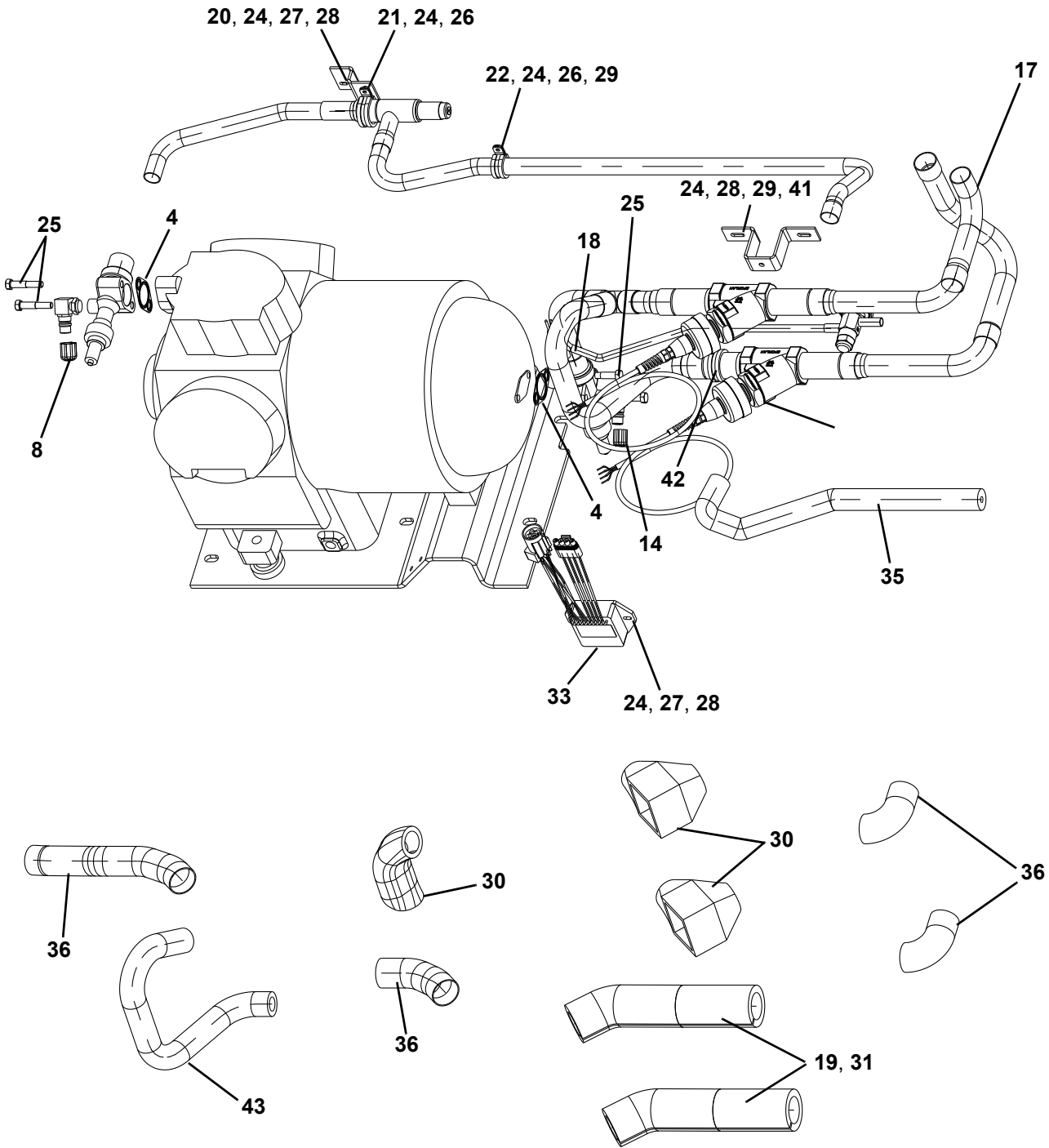


Item	Part Number	Description	Qty
1	14-00263-00	Valve, Stepper Motor - Includes:	1
2	14-00263-20	Piston and Motor Assembly - Includes:	1
3	14-00263-23	O-Ring	1
4	14-00263-22	Cap	1
5	22-02392-03	Connector (To Power Pack)	1
6	22-02393-01	Pin, 18-20 Gauge (Used on 22-02392-03)	4
7	22-02394-03	Seal (Used on 22-02392-03)	4
8	34-06053-05	Washer, Mylar, 0.205 ID x 0.60 OD	6
9	66-U---1--5321-8	Washer, Flat, #10 - SST	2
10	10-00388-00	Power Pack, Stepper Motor - Includes:	1
11	22-01835-00	Packard Block	1

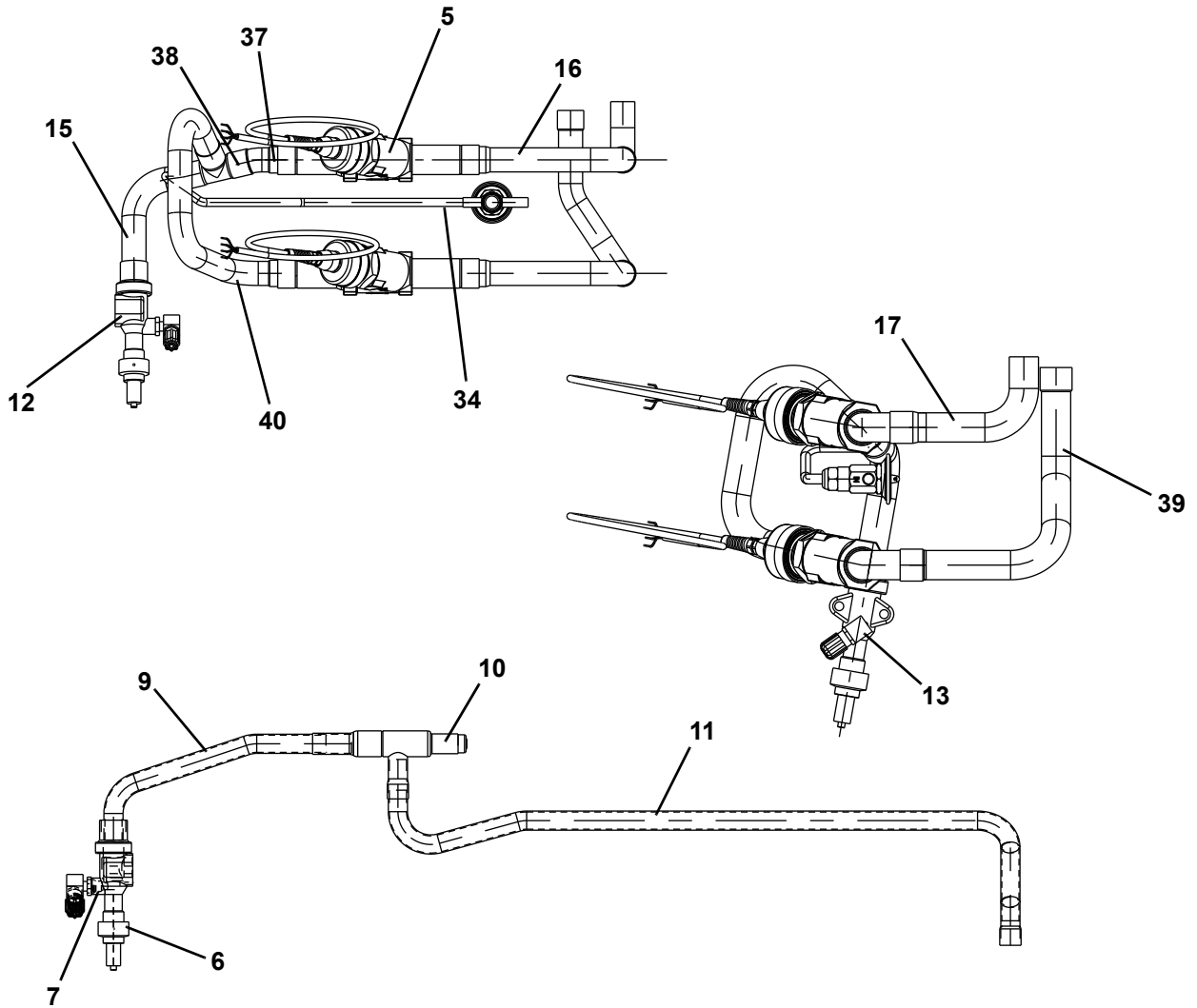
11 COMPRESSOR TUBING (69NT40-541-304)

12	22-01566-01	Packard Terminal	5
13	22-02394-02	Cable Seal	5
14	76-66611-00	Tube Assembly - Includes:	1
15	14-00206-00	Valve, Service Suction	1
16	56-66712-00	Tube, 1-1/8 OD	1
17	56-66711-00	Tube, 1-1/8 OD	1
18	DE40BA-701	Tee, 1-1/8 OD	1
19	56-66710-00	Tube, 1-1/8 OD	1
20	68-86015-00	Bracket 0.125 Thick Aluminum	1
21	34-00928-09	Rivet, Blind, 0.156 Diameter, 0.126-0.250 - SST	4
22	34-06053-00	Washer, Mylar, 0.25 ID x 0.80 OD	1
23	66-U---1--5371-6	Screw, Machine Hex Head, #10-24 x 0.75 Long - SST	3
24	34-00373-69	Clamp, Tube, 1.38 Diameter, Cushion - SST	1

12 COMPRESSOR TUBING (69NT40-541-345)



12 COMPRESSOR TUBING (69NT40-541-345)

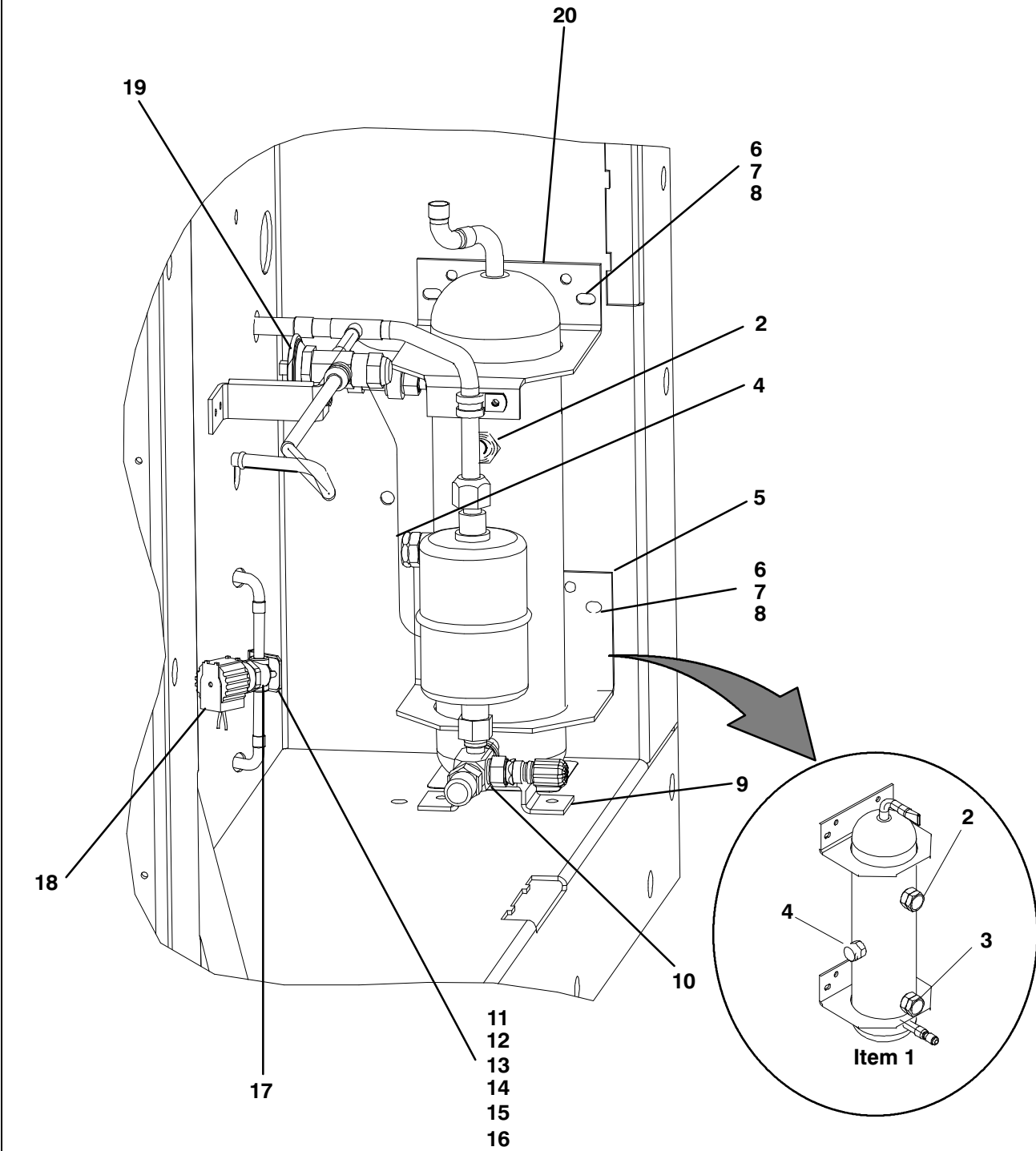


Item	Part Number	Description	Qty
1	14-00353-04	Valve, Stepper Motor - Includes:	1
2	14-00353-20	Piston and Motor Assembly - Includes:	1
3	14-00353-21	Gasket	1
4	42-66644-00	Gasket, Suction	2
5	14-00353-04	Valve	2
6	14-00206-01	Valve, Service Discharge	1
7	40-00542-01	Elbow, Adapter High Pressure	1
8	40-00520-03	Cap M10 X 1.0-6G	1
9	69NT--35--1056	Tube 7/8 OD x 0.045W CU	1
10	14-00204-04	Valve, Head Pressure Reg	1
11	69NT--35--1228	Tube 7/8 OD x 0.045W CU	1
12	14-00206-01	Valve, Service Suction	1
13	40-00542-00	Elbow Adapter, Low Pressure	1

12 COMPRESSOR TUBING (69NT40-541-345)

14	40-00520-02	Cap M8 x 1.0-6G	1
15	56-66711-00	Tube, Suction 1-1/8OD x 0.050W CU	1
16	56-07455-00	Tube, Suction 1.125 O.D.	2
17	56-07323-00	Tube, Suction 1.125 O.D.	1
18	99TS0528CK002000	Tube 5/16 OD x 0.028 W	1
19	42-00425-116	Insulation, Tube	2
20	69NT--41---702	Bracket Assembly	1
21	66-U---1--3632-24	Clamp, Tube 1.18 Dia Cushion	1
22	66-U---1--3632-20	Clamp, Tube 0.88 Dia Cushion	1
23	66-U---1--5371-7	Screw, Machine Hex Head #10-24 x 0.500 SLTD	1
24	66-U---1--5371-6	Screw, Machine Hex Head #10-24 x 0.750 SLTD	8
25	66-U---1--5361-46	Screw, Cap Hex Head	4
26	34-06053-00	Washer 0.250 ID x 0.800 OD	2
27	66-U---1--5321-8	Washer, Plain #10 Type A	3
28	34-06053-05	Washer 0.205 ID x 0.600 OD	6
29	34-06212-10	Washer, Plain #10 Type A	2
30	42-00032-11	Insulation 0.25THK x 2.0 x 7.5	12
31	66-U---1--3882-3	Wire Tie 1/16-4.0 SELFLKNG	12
32	66-U---1--3882	Wire Tie 1/16 - 1 3/4 SELFLKNG	6
33	10-00388-00	Power Pack, Stepper Motor	1
34	56-07435-00	Tube, Quench Line 1SP	1
35	42-00425-20	Insulation, Tube	1
36	42-00032-12	Insulation 0.12THK x 2.0 x 7.5	9
37	56-66710-00	Tube 1-1/8OD x 0.050W CU	1
38	--DE--40BA-701	Tee 1-1/8C	1
39	56-66685-00	Tube 1-1/8OD x 0.050W CU	1
40	56-66712-00	Tube 1-1/8OD x 0.050W CU	1
41	68-86015-00	Bracket, 0.125 THK	
42	34-00373-69	Clamp, Tube 1.38 Dia Cushion	1
43	42-66616-00	Insulation Tube	1

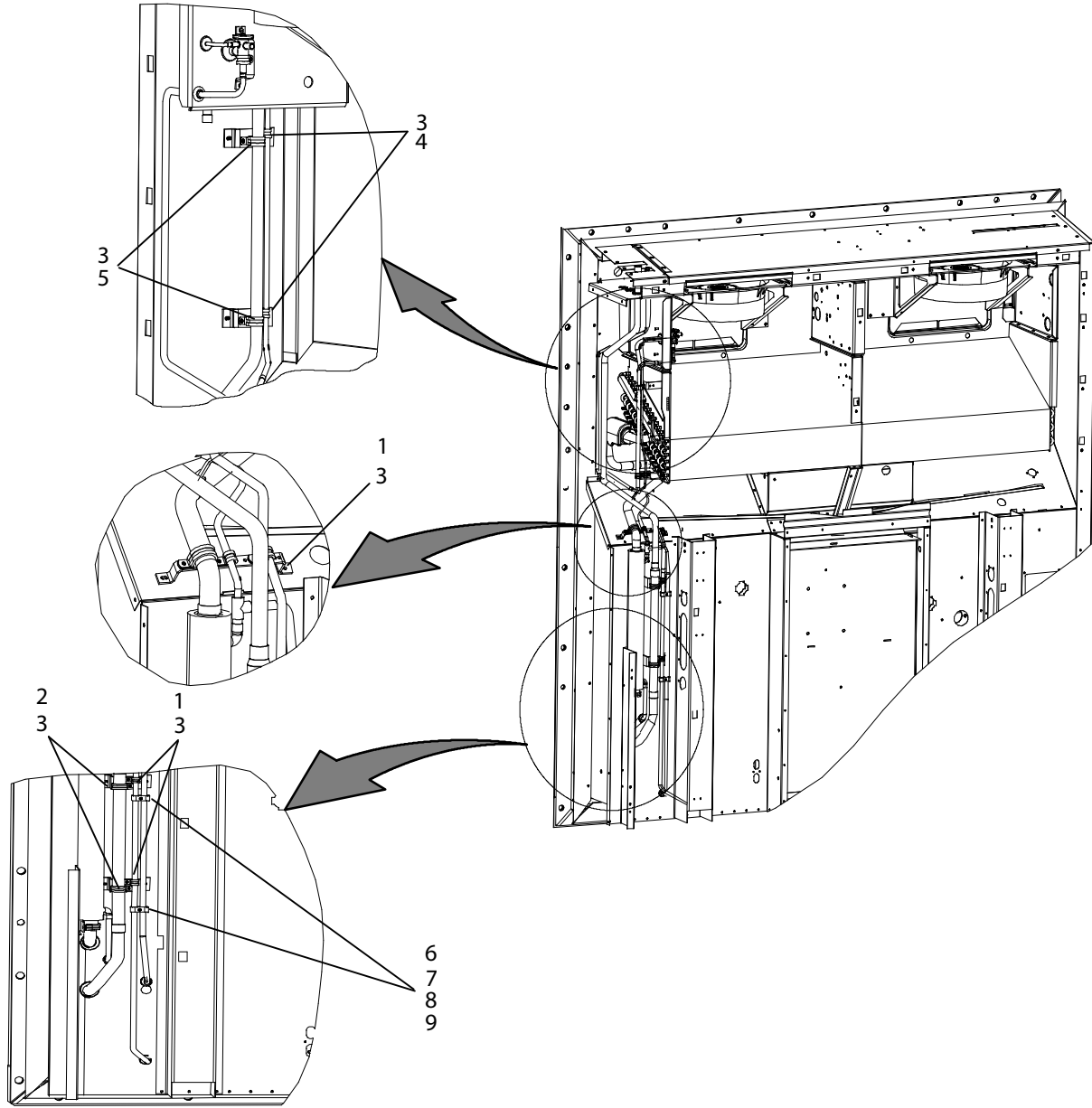
13 RECEIVER



13 RECEIVER

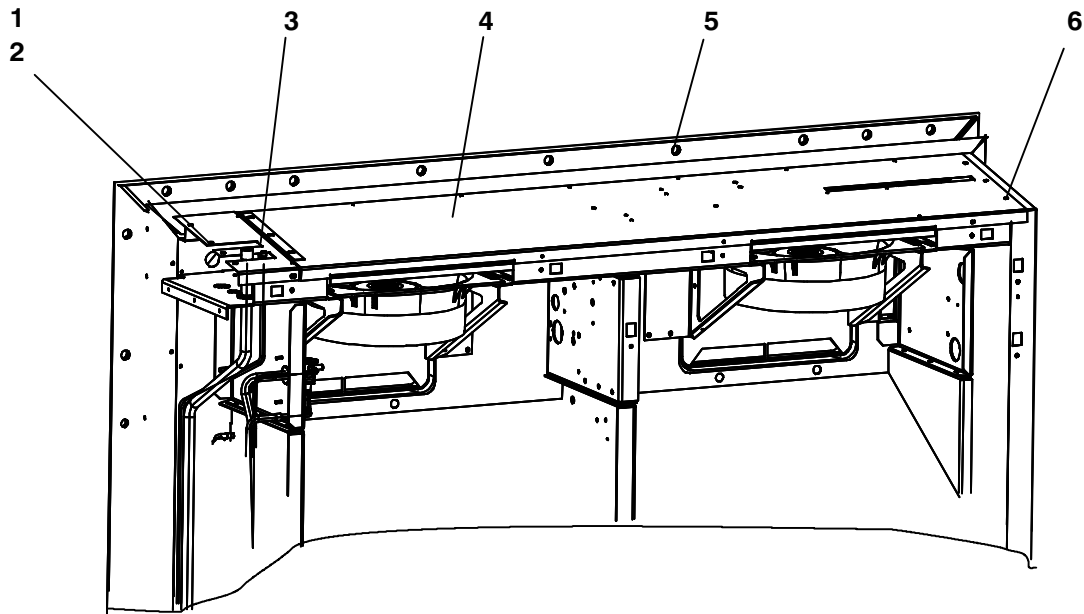
Item	Part Number	Description	Qty
1	65-00185-03	Receiver, Electro-Coated Modular, Copper - Includes:	1
2	14-00220-04	Glass, Sight, w/Red Balls, 1/2-14 NPT	1
3	14-00221-03	Indicator, Moisture, Liquid	1
4	14-01032-14	Plug, Fusible, 3/8 NPT - Brass	A/R
	14-00215-06	Disc, Rupture, 3/8 NPT - Alternate	A/R
5	58-04026-69	Protector	1
6	66U1-5361-25	Screw, Hex Head, 1/4-20 x 3/4 Long - SST	4
7	66U1-5321-7	Washer, Flat, 1/4 - SST	4
8	34-06053-00	Washer, Mylar, 0.250 ID x 0.800 OD	4
9	68-86030-00	Bracket, Liquid Line Valve	1
10	14-00221-00	Valve, Liquid Line	1
11	34-06053-05	Washer, Mylar, 0.205 ID x 0.60 OD	2
12	68-86023-00	Bracket 0.125 Thick Aluminum	1
13	58-04026-72	Protector	1
14	66U1-5321-2	Washer, Plain #8	2
15	66U1-5371-5	Screw, Machine Hex Head, #8-32 x 0.75 Long	2
16	66U1-5371	Screw, Machine Hex Head, #8-32 x 0.50 Long (Mount Solenoid Valve to Bracket)	2
17	14-01090-14	Solenoid Valve Body	1
18	14-01091-02	Solenoid Valve Coil	1
19	14-00212-02SV	Valve, Quench, Thermostatic Expansion - Includes:	1
NS	14-00212-21	Kit, Repair - Includes:	1
NS	NSS	Power Head	1
20	58-04026-71	Protector, Mylar	1
4	14-01032-14	Plug, Fusible, 3/8 NPT - Brass	A/R
	14-00215-06	Disc, Rupture, 3/8 NPT - Alternate	A/R
5	58-04026-69	Protector	1

14 EVAPORATOR COIL - REAR PANELS REMOVED



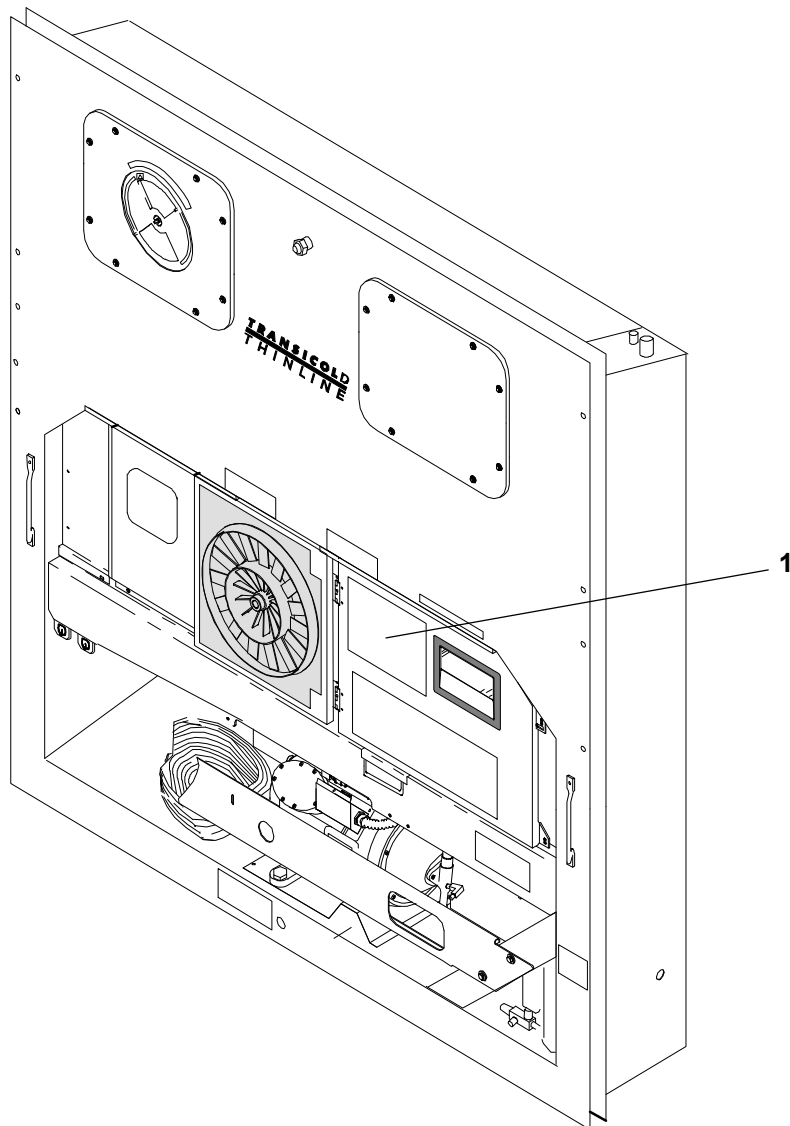
Item	Part Number	Description	Qty
1	44-00370-03	Clamp, Tube, 0.50 Diameter	1
2	44-00370-08	Clamp, Tube, 1.125 Diameter	1
3	66U1-5381-1	Screw, Hex Head, #10-24 X.75 Thread Cutting	2
4	44-00370-02	Clamp, Cushioned, 0.38 Diameter	2
5	34-00373-11	Clamp Tube, 0.88 Diameter	2
6	44-01143-08	Clamp 1/2 and 1/2 Diameter	3
7	34-00655-10	Screw, Hex Head, 1/4-20 x 1.25 Long	3
8	34-00667-11	Nut, Self-Locking, 1/4-20	3
9	66U1-5321-3	Washer, Plain 1/4N	6

15 BACK PANEL ASSEMBLY



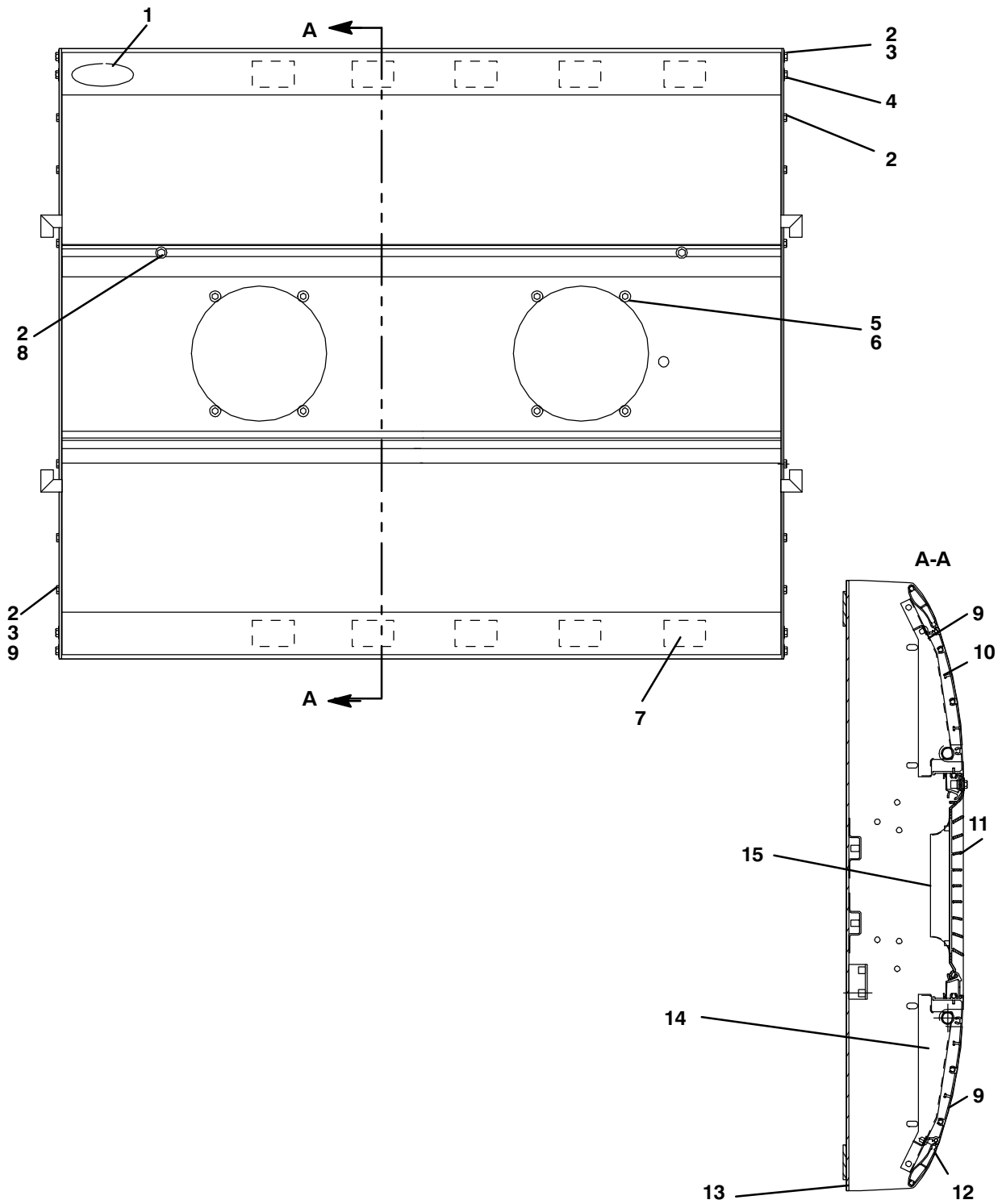
Item	Part Number	Description	Qty
1	66U1-5371-7	Screw, Machine Hex Head, #10-24 x 0.50 Long	7
2	66U1-5321-8	Washer, Plain, #10 Type A	7
3	68-86028-00	Grille, Top	1
4	68-86029-00	Grille, Top (Unpainted)	1
5	34-00928-07	Rivet, Blind, 5/32 Diameter, Grip Range - 1/16-1/8	7
6	34-00928-09	Rivet, Blind, 5/32 Diameter, Grip Range - 1/8-1/4	3

16 LABELS AND DECALS



Item	Part Number	Description	Qty
1	62-66679-00	Label, Function Code - <i>English</i>	1

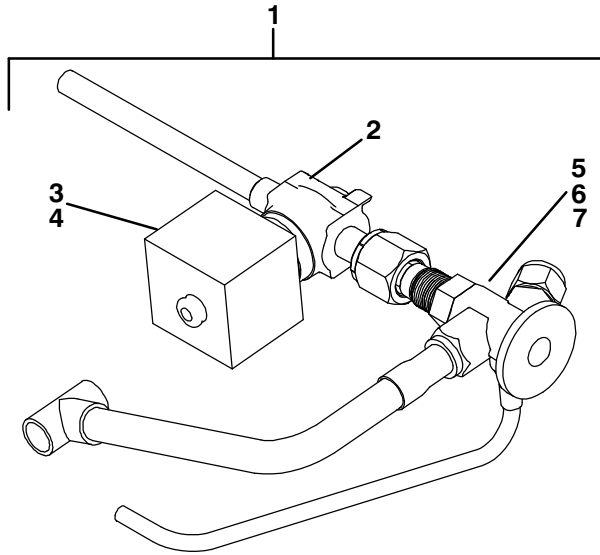
17 REMOTE EVAPORATOR - FRAME



17 REMOTE EVAPORATOR - FRAME

Item	Part Number	Description	Qty
1	62-60219-00	Decal, Carrier Transicold	1
2	34-00793-12	Screw, Self-Tapping, Hex Head, 1/4 Inch X 0.75	16
3	34-00663-11	Washer, Lock, 1/4 Spring	2
4	34-01152-20	Screw, Cap, Hex Head, M6 X 20 MM	6
5	34-60000-16	Screw, Machine, Hex Head, M5 X 16 MM	8
6	34-60095-25	Washer, Lock, M5	8
7	42-00032-00	Insulation, Prestite	A/R
8	34-00662-11	Washer, Plain, 1/4 Inch	10
9	42-01203-05	Insulation, 0.16 Thick	2
10	79-60326-04	Skin Assembly, Evaporator	1
11	48-60143-01	Panel, Access, Evaporator	1
12	79-60325-04	Skin Assembly, Evaporator	1
13	79-60388-02	Frame, Evap, Top	1
14	79-60377-02	Drain Pan, Evaporator	2
15	68-60245-01	Venturi Ring, Blower Motor	2

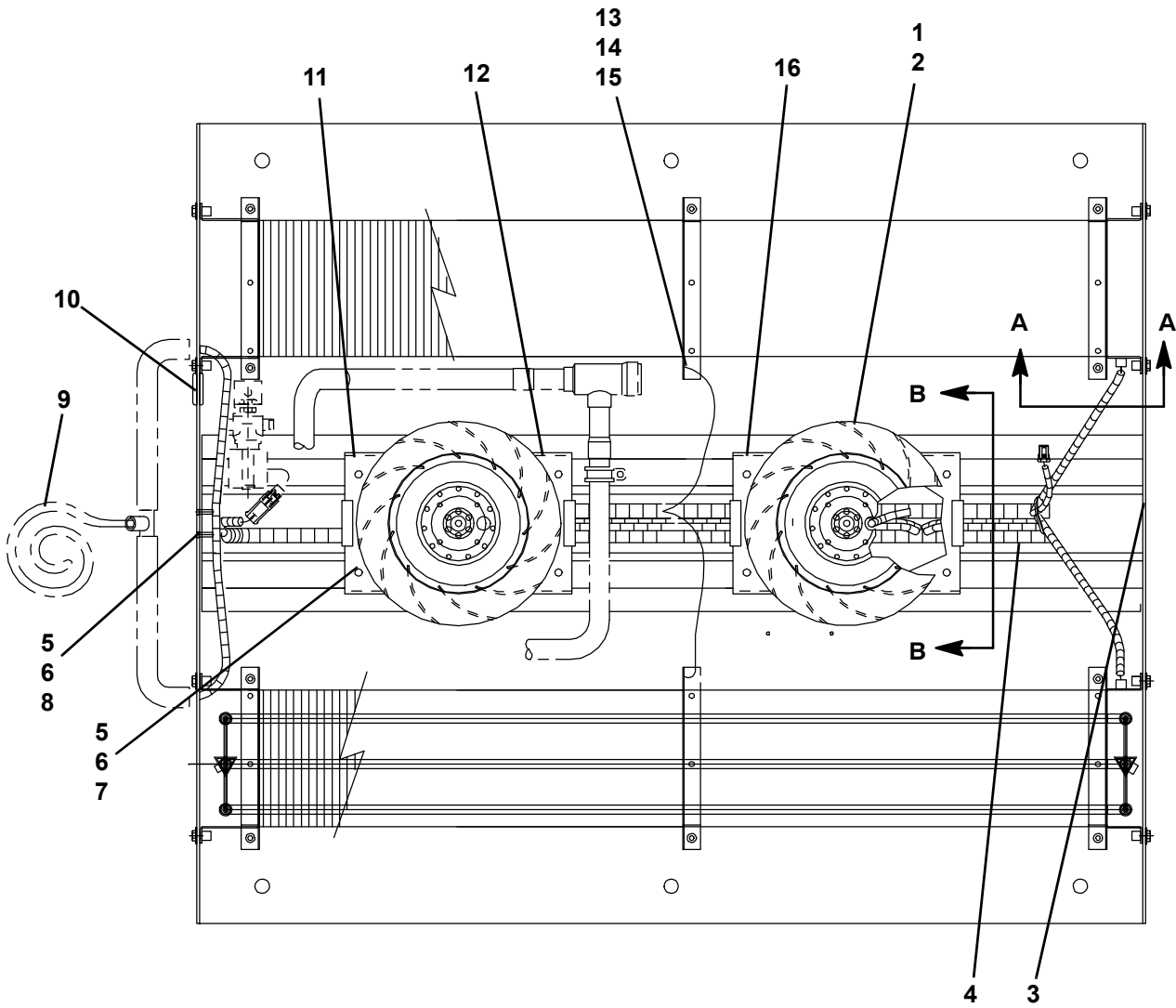
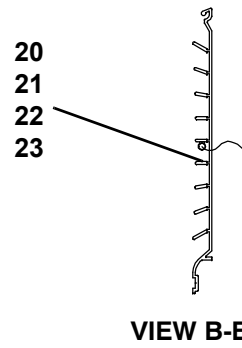
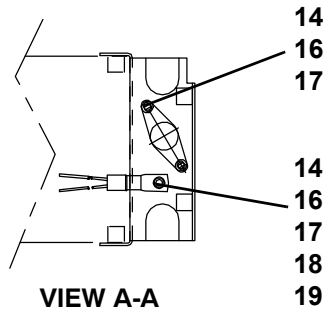
18 REMOTE EVAPORATOR - REFRIGERATION



8 - SOLENOID VALVE REPAIR KIT

Item	Part Number	Description	Qty
1	81-02628-00	Valve Assembly, Liquid Line Solenoid / TXV Assembly - Includes:	1
2	14-00350-02	Valve, Solenoid, 3/8 OD Less Coil	1
3	22-02579-00	Coil, Solenoid - Includes:	1
4	22-50078-02SV	Connector, 2-Wire (Mates with 22-50078-01SV)	1
5	14-60007-02	Adapter, TXV, O-Ring Seal	1
6	14-60009-03	Orifice, TXV, #3, Brazed-On	1
7	14-60039-00	Expansion Valve, TXV	1
8	14-00150-51	Repair Kit, Solenoid Valve (for 14-00350-00 Valve)	1

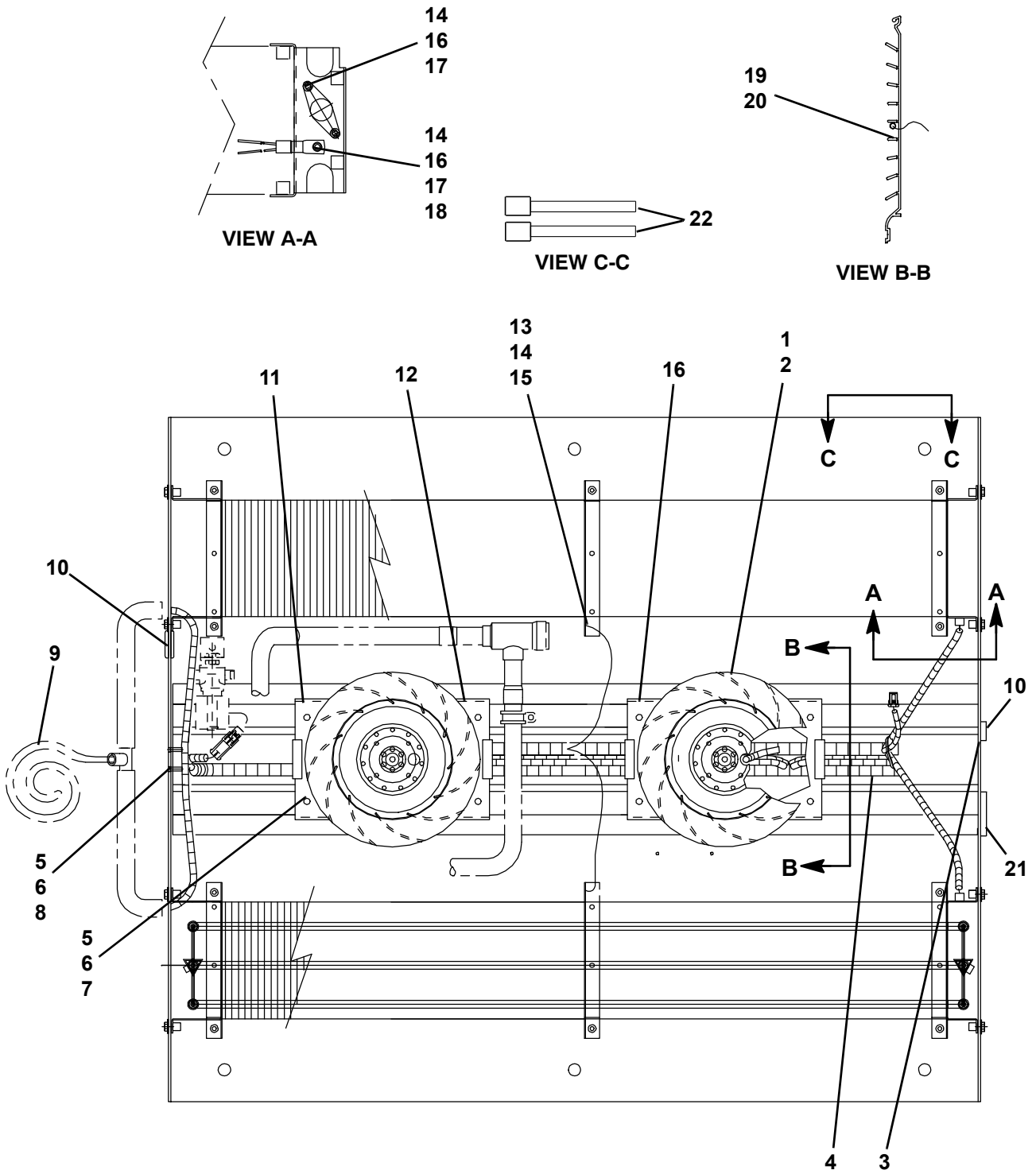
19 REMOTE EVAPORATOR - ELECTRICAL KIT (69NT40-541-304)



19 REMOTE EVAPORATOR - ELECTRICAL KIT (69NT40-541-304)

Item	Part Number	Description	Qty
1	54-60022-09	Motor/Fan Assembly - Includes:	2
2	22-01613-16	Connector, 6-Wire (Mates with 22-01613-18)	2
3	62-11111-01	Decal, MHD-1100	1
4	22-04078-01	Harness, MHD-1100 Evaporator	1
5	34-00662-11	Washer, Plain, 1/4	10
6	34-00663-11	Washer, Lock, 1/4 Spring	10
7	34-01152-20	Screw, Cap, Hex Head, M6 X 20 MM	8
8	34-00666-11	Nut, Hex, 1/4-20	2
9	24-60002-08	Heater, Drain Hose, 13 Watts	1
10	58-00065-65	Grommet, 0.75 ID	1
11	68-60301-00	Bracket, Fan Motor	2
12	42-00183-00	Trim, Flexible, Black, 25-Foot Roll	19
13	34-00658-06	Screw, Mach Hex Head, #10-32 X 0.75	2
14	34-00662-09	Washer, Plain, #10	6
15	34-00733-00	Nut, Hex, Keps, #10-32	4
16	34-01197-10	Screw, Cap, Hex Head, M4 X 10 MM	14
17	34-00945-04	Washer, Lock, M4 Spring	6
18	12-00576-01	Thermistor Assembly, Defrost Sensor - Includes:	1
19	22-01585-00SV	Connector, 2-Wire (Mates with 22-02392-00)	1
20	22-60010-01	Sensor Assembly, Return Air - Includes:	1
21	12-01072-11	Thermistor, Return Air	1
22	22-50078-01SV	Connector, 2-Wire (Mates with 22-50078-02SV)	1
23	58-00065-02	Grommet, 0.25 ID	2

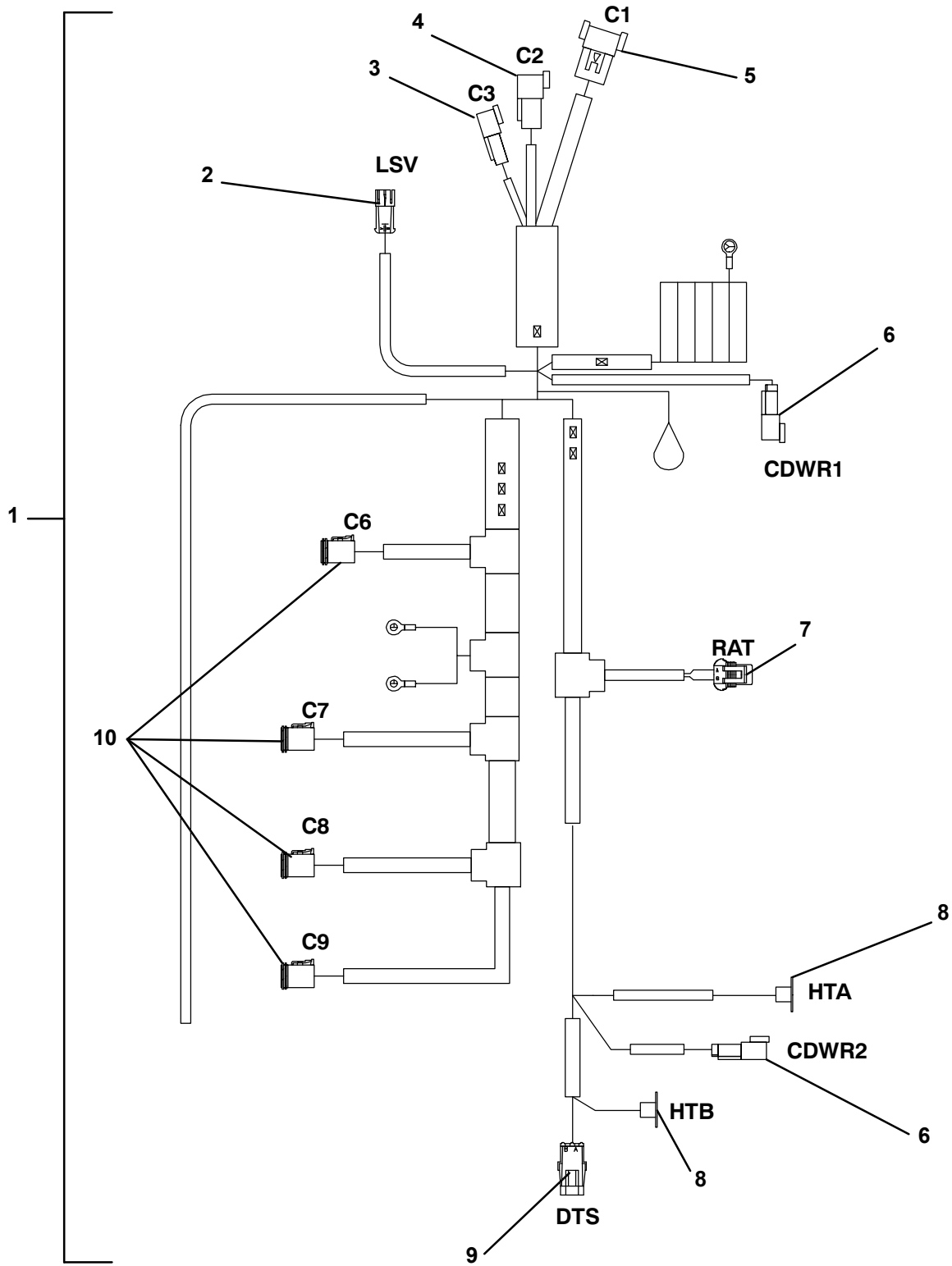
20 REMOTE EVAPORATOR - ELECTRICAL KIT (69NT40-541-345)



20 REMOTE EVAPORATOR - ELECTRICAL KIT (69NT40-541-345)

Item	Part Number	Description	Qty
1	54-60022-09	Motor/Fan Assembly - Includes:	2
2	22-01613-16	Connector, 6-Wire (Mates with 22-01613-18)	2
3	62-11111-01	Decal, MHD-1100	1
4	22-66689-00	Wire Harness	1
5	34-00662-11	Washer, Plain, 1/4	10
6	34-00663-11	Washer, Lock, 1/4 Spring	10
7	34-01152-20	Screw, Cap, Hex Head, M6 X 20 MM	8
8	34-00666-11	Nut, Hex, 1/4-20	2
9	24-60002-06	Heater, Drain Hose, 25 Watts	2
10	58-60298-03	Grommet, Tap 14-20N	2
11	68-60301-00	Bracket, Fan Motor	2
12	42-00183-00	Trim, Flexible, Black, 25-Foot Roll	19
13	34-00658-06	Screw, Mach Hex Head, #10-32 X 0.75	2
14	34-00662-09	Washer, Plain, #10	6
15	34-00733-00	Nut, Hex, Keps, #10-32	4
16	34-01197-10	Screw, Cap, Hex Head, M4 X 10 MM	14
17	34-00945-04	Washer, Lock, M4 Spring	6
18	12-00576-00	Thermistor, Defrost Sensor	1
19	12-00566-50	Sensor Assembly, Return Air - Includes:	1
20	22-50078-01SV	Connector, 2-Wire (Mates with 22-50078-02SV)	1
21	58-60298-05	Grommet, Tap 26/35	1
22	12-00500-02	Thermistor, Supply Sensors	2

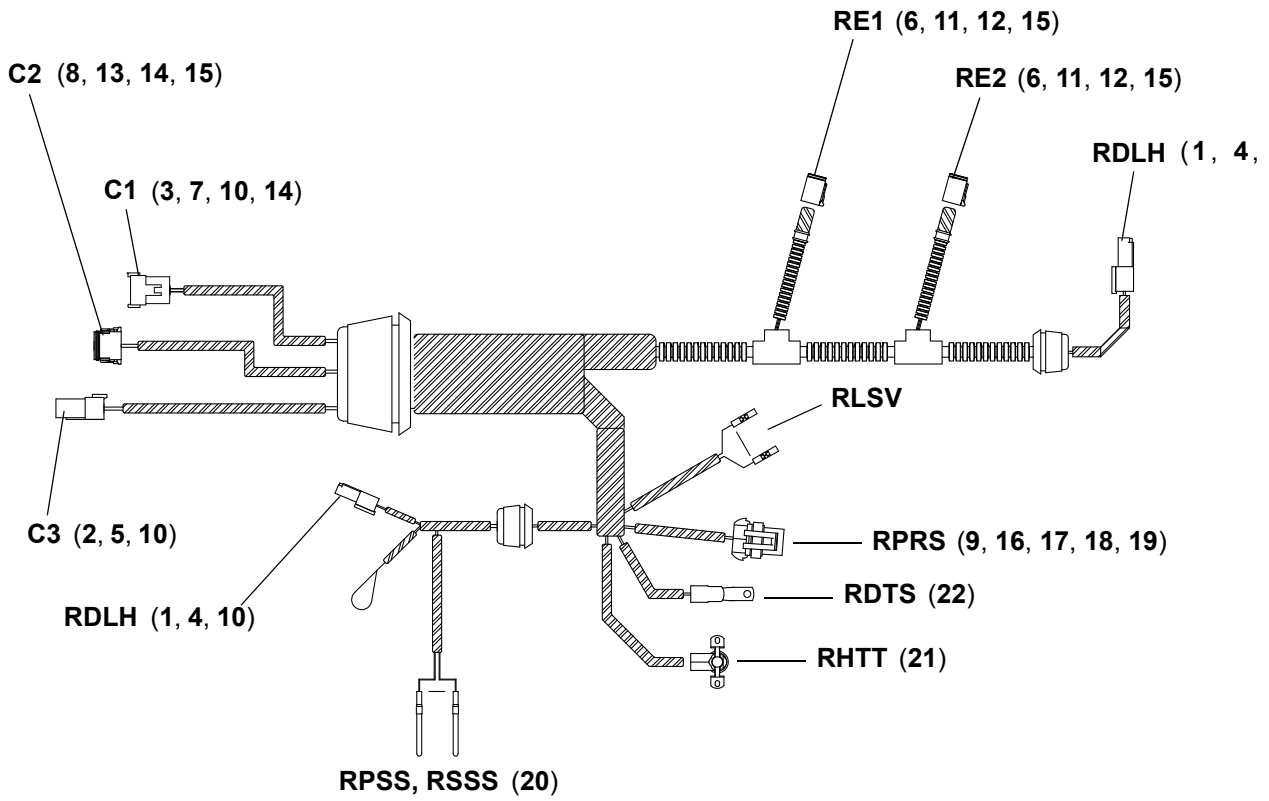
21 REMOTE EVAPORATOR - WIRE HARNESS (69NT40-541-304)



21 REMOTE EVAPORATOR - WIRE HARNESS (69NT40-541-304)

Item	Part Number	Description	Qty
1	22-04078-01	Wire Harness, Evap - Includes:	1
2	22-50078-01SV	Connector, 2-Wire (Mates w/ 22-50078-02SV), LSV	1
3	22-01613-08	Connector, 4-Wire (Mates w/ 22-01613-10), C3	1
4	22-01613-16	Connector, 6-Wire (Mates w/ 22-01613-18), C2	1
5	22-01613-33	Connector, 12-Wire (Mates w/ 22-01613-30), C1	1
6	22-01613-00	Connector, 2-Wire (Mates w/ 22-01613-02), CDWR1, CDWR2	2
7	22-50078-02SV	Connector, 2-Wire (Mates w/ 22-50078-01SV), RAT	1
8	12-01144-00	Thermostat, Defrost Termination, HTA, HTB	2
9	22-02392-00SV	Connector, 2-Wire (Mates w/ 22-01585-00SV), DTS	1
10	22-01613-18	Connector, 6-Wire (Mates w/ 22-01613-16), C6, C7, C8, C9	2

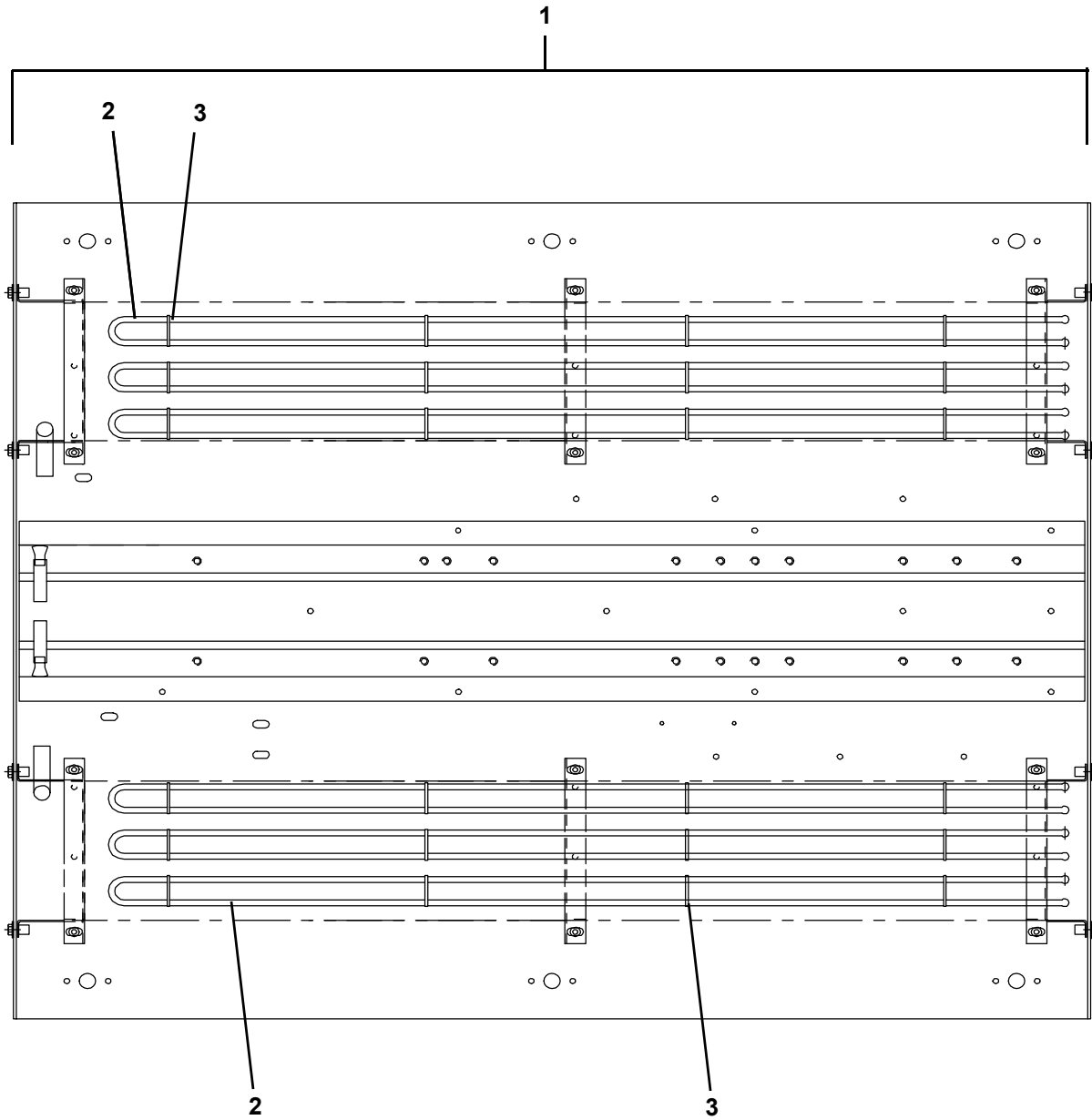
22 REMOTE EVAPORATOR - WIRE HARNESS (69NT40-541-345)



22 REMOTE EVAPORATOR - WIRE HARNESS (69NT40-541-345)

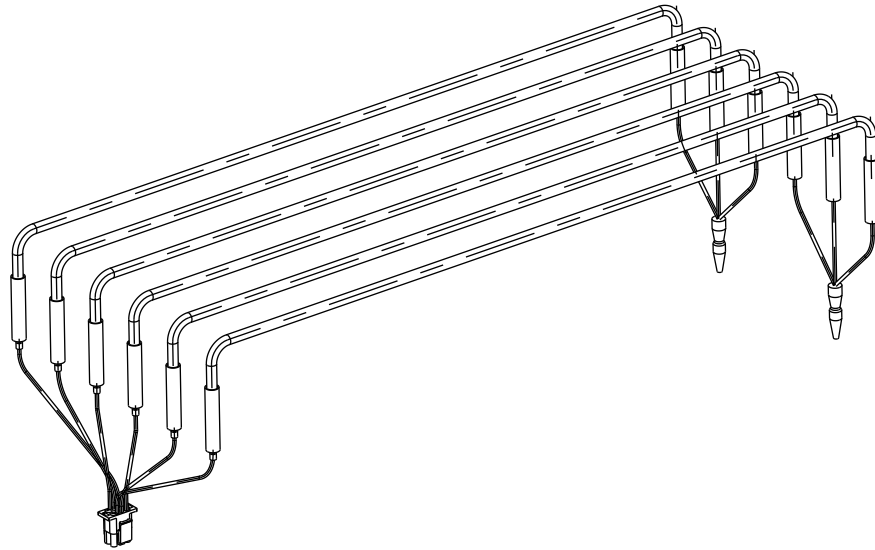
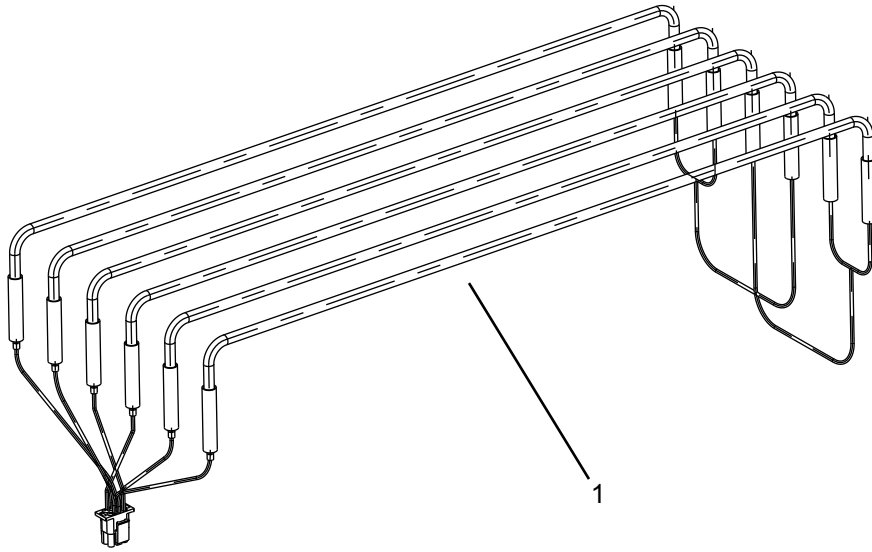
Item	Part Number	Description	Qty
1	22-01613-00	Receptacle [RDLH]	1
2	22-01613-08	Receptacle [C3]	1
3	22-01613-33	Receptacle [C1]	1
4	22-01613-01	Secondary Lock [RDLH]	1
5	22-01613-09	Secondary Lock [C3]	1
6	22-01613-19	Secondary Lock [RE1, RE2]	1
7	22-01613-28	Secondary Lock [C1]	1
8	22-01613-29	Secondary Lock [C2]	1
9	22-50078-01A	Secondary Lock [RPRS]	1
10	22-01613-14	Pin [C1] Pin [C3] Pin [RDLH]	10 4 2
11	22-01613-34	Pin [RE1, RE2]	1
12	22-01613-18	Plug [RE1, RE2]	1
13	22-01613-30	Plug [C2]	1
14	22-01660-08	Plug [C1] Plug [C2]	2 3
15	22-01613-15	Socket [C2] Socket [RE1, RE2]	9 5
16	22-02394-00	Seal [RPRS]	2
17	22-50078-02	Connector [RPRS]	1
18	22-50078-02B	Connector Seal [RPRS]	1
19	22-50078-47D	Terminal [RPRS]	2
20	12-00500-02	Thermistor [RPSS, RSSS]	2
21	12-00554-01	Thermostat [RHTT]	1
22	12-00576-00	Thermistor [RDTS]	1

23 REMOTE EVAPORATOR - HEATER KIT (69NT40-541-304)



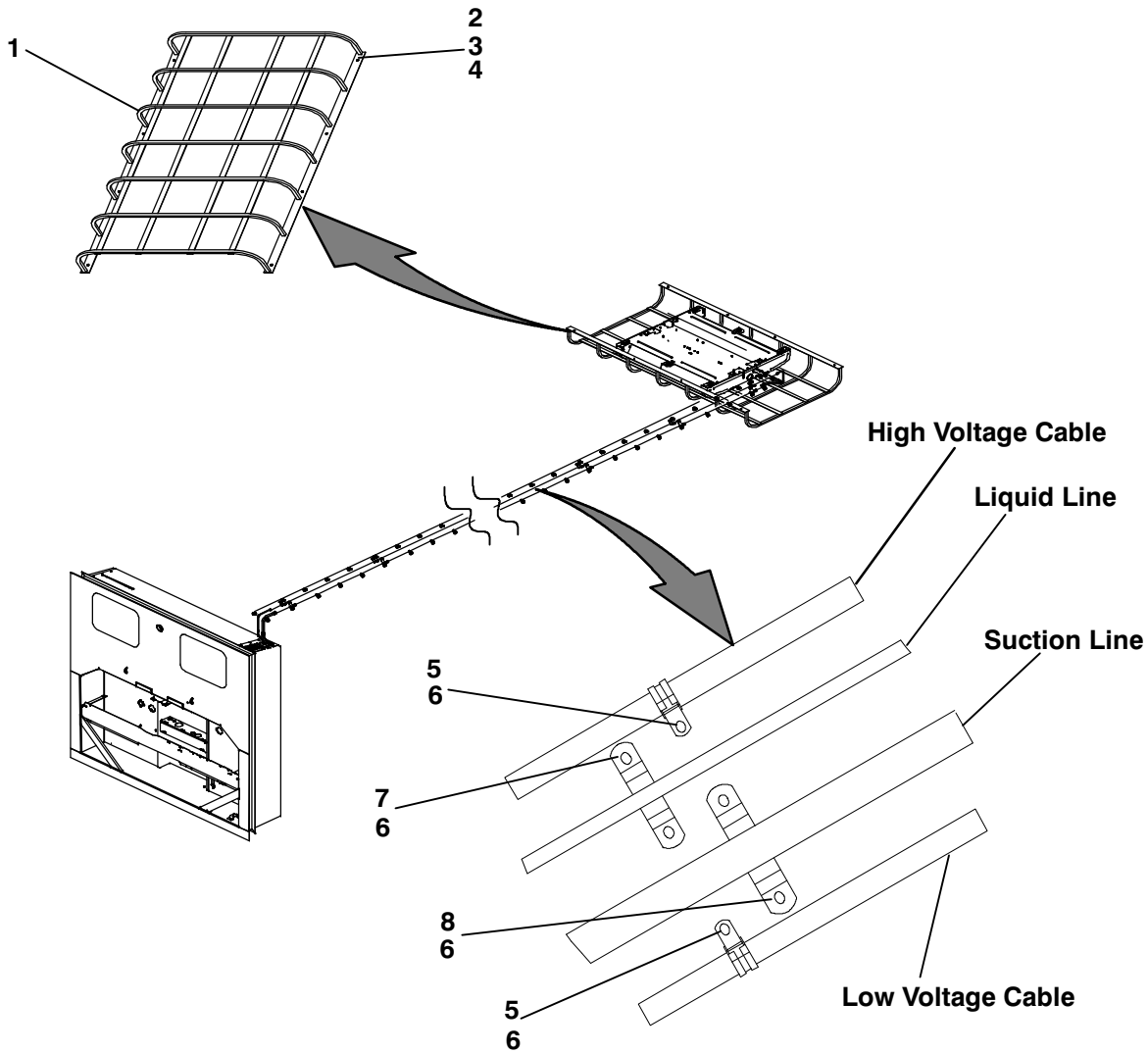
Item	Part Number	Description	Qty
1	24-02021-21	Heater Assembly - Includes:	2
2	24-02021-01	Heater, Resistance	6
3	44-60060-00	Clip, Heater, Stainless Steel	24

24 REMOTE EVAPORATOR - HEATER KIT (69NT40-541-345)



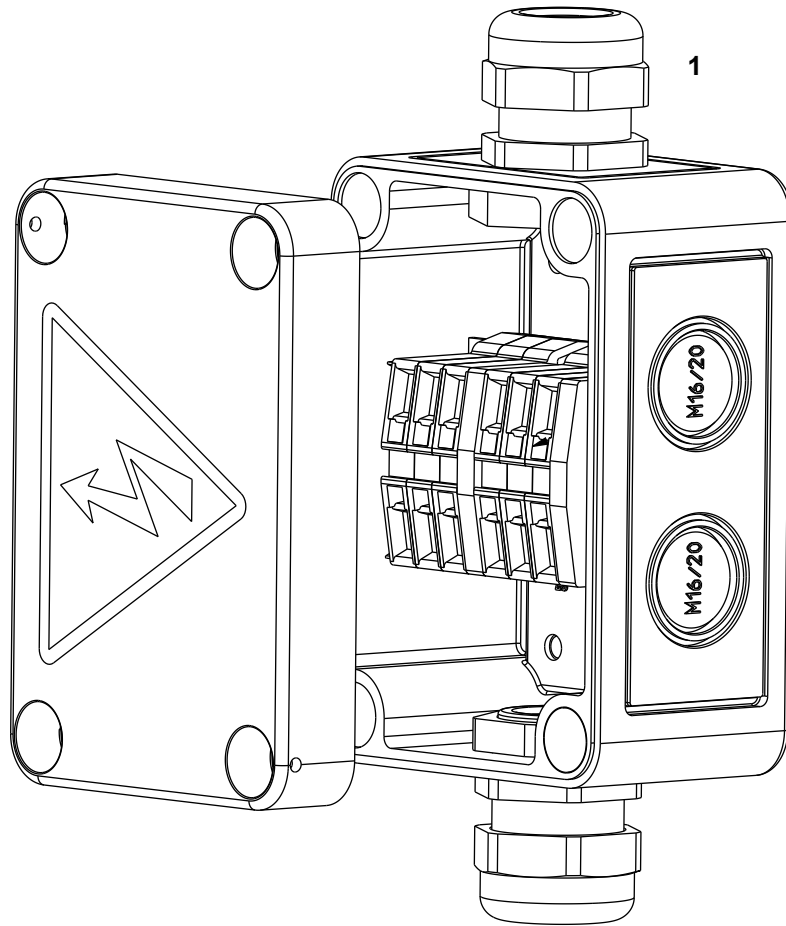
Item	Part Number	Description	Qty
1	24-60044-13	Heater: 2400W, 260VAC	1
2	44-60084-00	Clip	18

25 REMOTE EVAPORATOR - INSTALLATION COMPONENTS



Item	Part Number	Description	Qty
1	86-66696-00	Guard, Remote	1
2	34-06248-30	Screw, Cap Hex Head, M8, 30 MM Long	8
3	66U1-5321-4	Washer, Plain, 5/16 N	8
4	34-00663-12	Washer, Lock, 5/16	8
5	34-00373-56	Clamp, Tube	64
6	66U1-5321-3	Washer, Plain	96
7	44-00181-08	Clamp, Ring	9
8	44-00181-12	Clamp, Ring	9

26 REMOTE EVAPORATOR - HEATER JUNCTION BOX



Item	Part Number	Description	Qty
1	91-60331-02	Heater Junction Box	1

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