Installation Instructions

RTAF R’newal

Model: RTAF_R

This document applies to service offering applications only.

Distribution/use of this document is limited to the Trane sales and service organization in support of the R’newal service program and is not intended for independent third party use or for use apart from compressor service under Trane’s R’newal service program.

⚠SAFETY WARNING

Only qualified personnel should install and service the equipment. The installation, starting up, and servicing of heating, ventilating, and air-conditioning equipment can be hazardous and requires specific knowledge and training. Improperly installed, adjusted or altered equipment by an unqualified person could result in death or serious injury. When working on the equipment, observe all precautions in the literature and on the tags, stickers, and labels that are attached to the equipment.

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Introduction

Read this manual thoroughly before operating or servicing this unit.

Warnings, Cautions, and Notices

Safety advisories appear throughout this manual as required. Your personal safety and the proper operation of this machine depend upon the strict observance of these precautions.

The three types of advisories are defined as follows:

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

⚠CAUTION Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury. It could also be used to alert against unsafe practices.

NOTICE Indicates a situation that could result in equipment or property-damage only accidents.

Important Environmental Concerns

Scientific research has shown that certain man-made chemicals can affect the earth's naturally occurring stratospheric ozone layer when released to the atmosphere. In particular, several of the identified chemicals that may affect the ozone layer are refrigerants that contain Chlorine, Fluorine and Carbon (CFCs) and those containing Hydrogen, Chlorine, Fluorine and Carbon (HCFCs). Not all refrigerants containing these compounds have the same potential impact to the environment. Trane advocates the responsible handling of all refrigerants.

Important Responsible Refrigerant Practices

Trane believes that responsible refrigerant practices are important to the environment, our customers, and the air conditioning industry. All technicians who handle refrigerants must be certified according to local rules. For the USA, the Federal Clean Air Act (Section 608) sets forth the requirements for handling, reclaiming, recovering and recycling of certain refrigerants and the equipment that is used in these service procedures. In addition, some states or municipalities may have additional requirements that must also be adhered to for responsible management of refrigerants. Know the applicable laws and follow them.

⚠WARNING

Proper Field Wiring and Grounding Required!

Failure to follow code could result in death or serious injury. All field wiring MUST be performed by qualified personnel. Improperly installed and grounded field wiring poses FIRE and ELECTROCUTION hazards. To avoid these hazards, you MUST follow requirements for field wiring installation and grounding as described in NEC and your local/state/national electrical codes.

⚠WARNING

Personal Protective Equipment (PPE) Required!

Failure to wear proper PPE for the job being undertaken could result in death or serious injury. Technicians, in order to protect themselves from potential electrical, mechanical, and chemical hazards, MUST follow precautions in this manual and on the tags, stickers, and labels, as well as the instructions below:

- **Before installing/servicing this unit, technicians MUST put on all PPE required for the work being undertaken (Examples; cut resistant gloves/sleeves, butyl gloves, safety glasses, hard hat/bump cap, fall protection, electrical PPE and arc flash clothing). ALWAYS refer to appropriate Safety Data Sheets (SDS) and OSHA guidelines for proper PPE.**
- **When working with or around hazardous chemicals, ALWAYS refer to the appropriate SDS and OSHA/GHS (Global Harmonized System of Classification and Labeling of Chemicals) guidelines for information on allowable personal exposure levels, proper respiratory protection and handling instructions.**
- **If there is a risk of energized electrical contact, arc, or flash, technicians MUST put on all PPE in accordance with OSHA, NFPA 70E, or other country-specific requirements for arc flash protection, PRIOR to servicing the unit. NEVER PERFORM ANY SWITCHING, DISCONNECTING, OR VOLTAGE TESTING WITHOUT PROPER ELECTRICAL PPE AND ARC FLASH CLOTHING. ENSURE ELECTRICAL METERS AND EQUIPMENT ARE PROPERLY RATED FOR INTENDED VOLTAGE.**

⚠WARNING

Follow EHS Policies!

Failure to follow instructions below could result in death or serious injury.

- **All Trane personnel must follow the company's Environmental, Health and Safety (EHS) policies when performing work such as hot work, electrical, fall protection, lockout/tagout, refrigerant handling, etc. Where local regulations are more stringent than these policies, those regulations supersede these policies.**
- **Non-Trane personnel should always follow local regulations.**

⚠WARNING

Refrigerant May Be Under Positive Pressure!

Failure to follow instructions below could result in an explosion which could result in death or serious injury or equipment damage.
System contains refrigerant and may be under positive pressure; system may also contain oil. Recover refrigerant to relieve pressure before opening the system. See unit nameplate for refrigerant type. Do not use non-approved refrigerants, refrigerant substitutes, or non-approved refrigerant additives.

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Model Number Descriptions

Chiller

Digits 1, 2, 3, 4, 5 — Chiller Model

RRTAF = RTAF R'newal

Digits 6, 7, 8 — Unit Nominal Capacity

115 = 115 Nominal Tons
130 = 130 Nominal Tons
150 = 150 Nominal Tons
170 = 170 Nominal Tons
180 = 180 Nominal Tons
200 = 200 Nominal Tons
215 = 215 Nominal Tons
230 = 230 Nominal Tons
250 = 250 Nominal Tons
270 = 270 Nominal Tons
280 = 280 Nominal Tons
310 = 310 Nominal Tons
350 = 350 Nominal Tons
390 = 390 Nominal Tons
410 = 410 Nominal Tons
450 = 450 Nominal Tons
500 = 500 Nominal Tons
520 = 520 Nominal Tons

Digit 9 — Unit Voltage

C = 380/60Hz/3PH
E = 460/60Hz/3PH
F = 575/60Hz/3PH

Digits 10, 11 — Renewal Design Sequence

A0 = First Release

Digit 12 — Original Refrigerant Type

1 = Refrigerant R-513A
2 = Refrigerant R-134A

Digit 13, 14 — Original Design Sequence

AA = First Production Release
AB = AB Design Sequence
AC = AC Design Sequence
AD = AD Design Sequence
AE = AE Design Sequence
AF = AF Design Sequence
AG = AG Design Sequence
AH = AH Design Sequence
AJ = AJ Design Sequence
AK = AK Design Sequence

Digit 15 — Original Factory Installed Flow Switch

1 = Other Fluid (15cm/s)
2 = Water 2 (35cm/s)
3 = Water 3 (45cm/s)

Digit 16 — Unit Application

X = Standard Ambient (14 to 115˚F)
L = Low Ambient (-4 to 115˚F)
H = High Ambient (14 to 130˚F)
W = Wide Ambient (-4 to 130˚F)

Digit 17 — Free Cooling

X = None
F = Free Cooling - Direct

Digit 18 — Compressor 1A Replacement

X = No Compressor Rework or Replacement
A = Renewal Compressor
C = Failed Compressor

Digit 19 — Compressor 1B Replacement

X = No Compressor Rework or Replacement
A = Renewal Compressor
C = Failed Compressor

Digit 20 — Compressor 2A Replacement

X = No Compressor Rework or Replacement
A = Renewal Compressor
C = Failed Compressor

Digit 21 — Compressor 2B Replacement

X = No compressor Rework or Replacement
A = Renewal Compressor
C = Failed Compressor

Digit 22 — Reassembly Kit of Circuit 1

X = No Replacement
1 = Replace Reassembly Kit of Circuit 1

Digit 23 — Reassembly Kit of Circuit 2

X = No Replacement
1 = Replace Reassembly Kit of Circuit 2

Digit 24 — Condenser Coil Replacement

X = No Replacement
B = Replace Both Circuits
1 = Replace Circuit 1 Only
2 = Replace Circuit 2 Only

Digit 25 — Free Cooling Coil Replacement

X = No Replacement
B = Replace Both Circuits
1 = Replace Circuit 1 Only
2 = Replace Circuit 2 Only

Digit 26 — Expansion Valve Circuit Replacement

X = No Replacement
B = Replace Both Circuits
1 = Replace Circuit 1 Only
2 = Replace Circuit 2 Only

Digit 27 — Expansion Valve and Module Replacement

X = No Replacement
A = Replace both EXV and Module (only for Original DSEQ=AA)
B = Replace Module Only (for Original DSEQ=AB and Later)
C = Replace Both EXV and Module (for Original DSEQ=AB and Later)

Digit 28 — Evaporator Accessories Replacement

X = No Replacement
1 = Replace EVAP Accessories

Digit 29 — Transducer Replacement

X = No Replacement
B = Replace Both Circuits
1 = Replace Circuit 1 Only
2 = Replace Circuit 2 Only

Digit 30 — Oil Separator Accessories Replacement

X = No Replacement
B = Replace Both Circuits
1 = Replace Circuit 1 Only
2 = Replace Circuit 2 Only

Digit 31 — Fan Blades and Motors Replacement

X = No Replacement
B = Replace Both Circuits
1 = Replace Circuit 1 Only
2 = Replace Circuit 2 Only

Digit 32 — Fan Grills and Ducts Replacement

X = No Replacement
B = Replace Both Circuits
1 = Replace Circuit 1 Only
2 = Replace Circuit 2 Only

Digit 33 — Lubricant Replacement

X = No Replacement
B = Replace Both Circuits
1 = Replace Circuit 1 Only
2 = Replace Circuit 2 Only

Digit 34 — Refrigerant R-513A Conversion

X = No Conversion
C = R-513A Conversion

Digit 35 — Unit Control Type

X = No Control Upgrade
1 = Upgrade Unit to Symbio™ 800
2 = Add on Accessories for Symbio 800

Digit 36 — Compressor Contactor Replacement

X = No Replacement
B = Replace Compressor Contactors

Digit 37 — Compressor VFD Replacement

X = No Replacement
B = Replace Both Circuits
1 = Replace Circuit 1 Only
2 = Replace Circuit 2 Only

Symbio™ Upgrade

Digits 1, 2, 3, 4 — RCDB Symbio 800 Upgrade

RCDB = Symbio™ 800 Control Upgrade

Digit 5 — Chiller Type

D = RTAF UC800 to Symbio 800
0 = Add on Accessories

Digit 6 — Display Option

0 = No Display Replacement
1 = Display without Mounting Hardware

Digit 7 — Air-Fi® Option

0 = Without Air-Fi Module
1 = With Air-Fi Module

Digit 8 — Wi-Fi Option

0 = Without Wi-Fi Module
1 = With Wi-FI Module

Digit 9 — LTE Option

0 = Without LTE Modem
1 = With LTE Modem

Digits 10, 11 — Design Sequence

AA = Symbio 800 Upgrade Release

Digit 12 — BAS Interface

0 = BACnet® and Modbus® Included as Standard
1 = Generic BAS Controls
2 = Lontalk® Communication

Digit 13

0 = Reserved for Future Use

Digit 14 — Flow Switches

0 = Reuse Existing Switches

Digit 15 — Unit Voltage

J = 380/60Hz/3PH
4 = 460/60Hz/3PH
5 = 575/60Hz/3PH

Digit 16 — Energy Power Meter

0 = Without Energy Meter

Digit 17 — Global Connector Kit

0 = Without Global Connector Kit

Digit 18 — AdaptiView™ Cover

0 = Without AdaptiView Cover
1 = Select AdaptiView Cover

Digits 19, 20, 21 — Unit Nominal Capacity

000 =Not Required

Digit 22 — Unit Type

0 = Not Required

Digit 23 — USB Waterproof Cover

0 = No Additional USB Waterproof Cover

Digit 24 — Potential Transformers

0 = Not Required

Digit 25 — Outdoor Air Temperature Sensor

0 = Without Outdoor Air Temperature Sensor

Digit 26 — Water Flow Measurement

0 = None

General Information

Refer to the following documents:

- *Sintesis™ Air-Cooled Chilllers Model RTAF Installation, Operation, and Maintenance* (RTAF-SVX001*-EN).
- Sky Hook Compressor Lifting Tool to replace screw compressor at the field. https://hub.tranetechnologies.com/thread/29041.

Nameplate

Two nameplates are included.

1. Attach the RTAF R'newal nameplate under the chiller main nameplate.
2. Attach the Symbio™ 800 upgrade control nameplate inside the control panel door.

Recommended Preliminary Instructions

The following service procedures are required prior to completing the RTAF R'newal process. When performing steps below, technicians MUST refer to and follow all safety recommendations, warnings, and cautions in *Sintesis™ Air-Cooled Chilllers Model RTAF Installation, Operation, and Maintenance* (RTAF-SVX001*-EN).

- Inspect the expansion valves for proper operation.Repair or replace as necessary.
- Capture the Data Recorder files and run a Chiller Service Report. Upgrade the main processor software to the latest version and verify proper unit configuration. Check for the presence of diagnostics and determine appropriate actions, if necessary.
- Inspect the pressure transducers for proper operation. Repair or replace as necessary.
- Inspect the temperature sensors for proper operation. Repair or replace as necessary.
- Verify that all control settings are adjusted properly according to the application.
- Inspect relief valves and replace, if lifted.
- Inspect the unit insulation and repair, if necessary.
- Inspect the starter and verify proper operation. Check all wires for tightness, auxiliaries for wire tightness and proper actuation, contact for wear, coil resistance, and proper mechanical linkage between the shorting and run contactors for wye-delta starter. Repair, if necessary.
- Inspect the operation of both the heat ape and immersion heaters for evaporator freeze protections. Repair or replace as necessary.
- Inspect the communication bus and replace, if necessary.
- Inspect the low ambient inverters (drives for proper operation). Replace, if necessary.
- Inspect all fans and brackets for cracking or wear. Verify all fan motors are working and rotating correctly. Fan kits are available through the R'newal program, if necessary.
- Inspect the Adaptive View for fading and replace if necessary.
- Do a visual inspection of the unit to detect any unusual conditions. Repair as necessary.
- Measure approach temperatures in the evaporator.
- Inspect the flow switch for proper operation. Repair or replace as necessary.
- Add touch-up paint as required.
- Verify the unit mounting/isolators are in working condition and not damaged or compressed.
- Leak-check the chiller.
- Check oil level.
- Measure subcooling and add charge, if necessary.

Other Required Manuals

This manual should be used with the following publications:

- *Sintesis™ Air-Cooled Chillers Model RTAF Installation, Operation, and Maintenance* (RTAF-SVX001*-EN)
- *Sintesis™ Air-Cooled Chillers Model RTAF Service Guide* (RTAF-SVG001*-EN)
- *TR200 New D-Frame, 110-400 kW Service Manual* (BAS-SVM01*-EN)
- *RCDB - Symbio™ 800 Control Upgrade Kit For RTAF UC800 Installation Instructions* (SO-SVN054*-EN)

Required Tools

Sky Hook Compressor Lifting Tool
(https://hub.tranetechnologies.com/thread/29041)

Field-Provided Parts

The following parts must be obtained locally.

- Schrader valve core and cap (see table below)
- Refrigerant R-513A (for refrigerant conversion only)
- Temperature sensor insulation

Table 1. Schrader valve part numbers

Item	Part Number	MNE Number
Schrader Valve Core	X17550004000	COR00006
Schrader Valve Cap	X17260048010	CAP00072

RTAF R’newal Offerings

The following RTAF R’newal offerings are available to meet the varying needs of RTAF owners.

Standard Offerings

Standard offerings are for users who have adequate equipment but would like to maximize the life of the electrical system, controls, and compressors. These offerings address known wear items while reducing air leaks and saving energy.

Optional Offerings

Optional offerings include select components that address specific unit updates.

These options are similar to retrofits and can be added to the R’newal offering with minimal disruption. The options are generally done as part of an overall plan to extend the life of the unit. These options generally require substantial planning and effort to implement. The optional offerings are orderable and configured as a part of the R'newal offering. An example of a major option is replacing the condenser coils due to corrosion of fins that are beyond repair. This substantial project may be a preferable alternate to unit replacement.

Table 2. RTAF R’newal offerings

Section	Offerings	Standard	Optional
Compressor section	Compressors	X	
	Compressor installation kit	X	
	Gasket for junction box	X	
	Compressor solenoid coil kit	X	
Reassembly section	Circuit accessory installation kit	X	
	Circuit relief valve	X	
	Circuit temperature sensor kit	X	
	Angle valve	X	
Control panel door gasket	Control panel door gasket	X	
Water piping section	Water piping installation kit – Free cooling	X	
Nameplate	RTAF R'newal nameplate	X	
Common section	RTAF R’newel common kit	X	
Coil section	Condenser coil		X
	Free cooling coil		X
	Coil installation kit		X
Condenser fan section	Condenser fan grill and duct kit – AJ version and later		X
	Condenser fan motor, Bracket and Blade kit – AJ version and later		X
	Condenser fan grill – AA to AH version		X
	Condenser fan and motor – AA to AH version		X
Evaporator section	Evaporator accessory kit		X
Other components	Circuit transducer		X
	Oil separator accessory		X
	Expansion valve assembly and module		X
Refrigerant R-513A section	Refrigerant R-513A conversion label kit		X
Lubricant section	Lubricant		X
Compressor starter section	Compressor contactor kit		X
	Compressor VFD		X
Symbio™ 800 section	Symbio 800 accessories		X
	Symbio 800 upgrade kit	X[(a)]	

(a) Included only if original unit does not have Symbio 800 controls.

Field-Provided List

Schrader valve core and cap are field-provided.

Table 3. Schrader valve part numbers

Item	Part Number	MNE Number
Schrader Valve Core	X17550004000	COR00006
Schrader Valve Cap	X17260048010	CAP00072

Figure 1. Schrader valve core

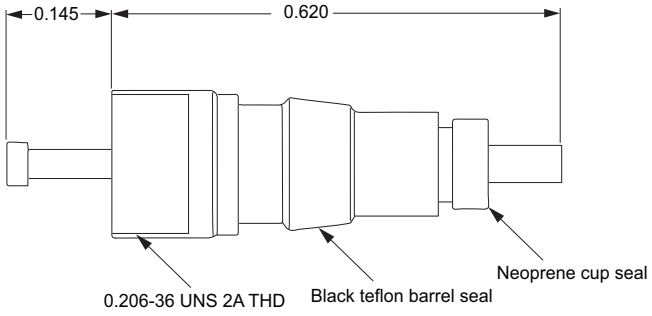
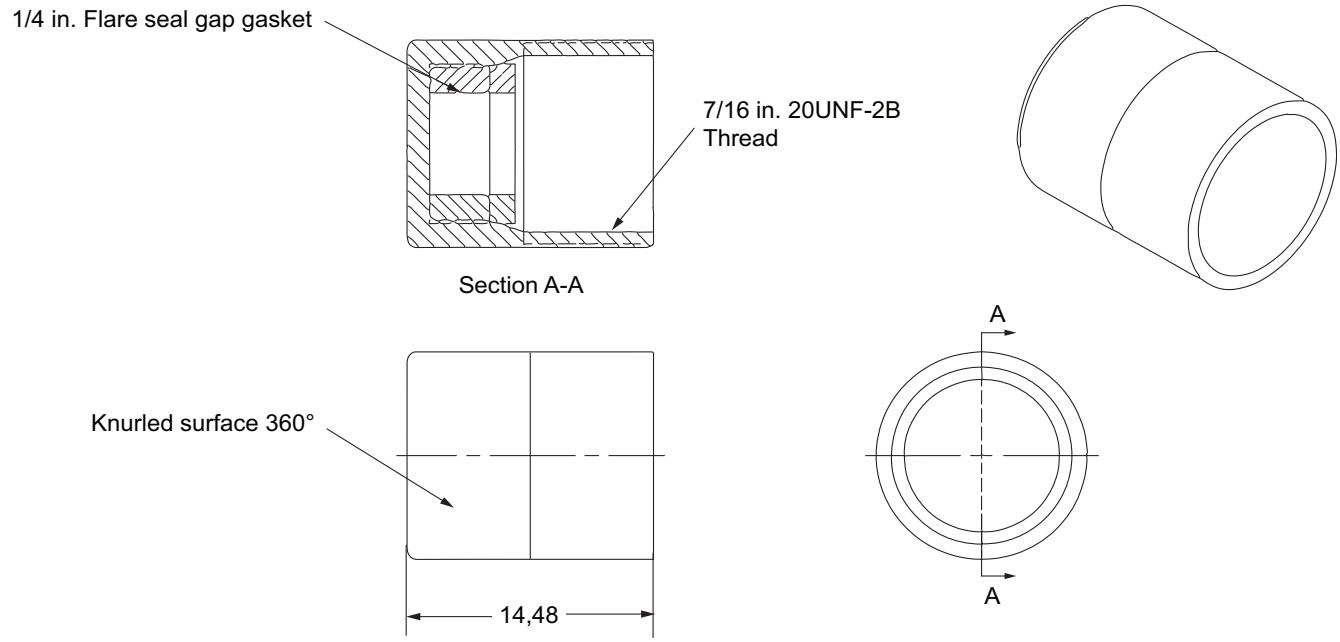


Figure 2. Schrader valve cap



Unit Configuration

Components

The following tables provide general RTAF unit configuration information.

Table 4. General data – 115 to 215 ton units

Unit Size (tons)		115	130	150	170	180	200	215
Compressor Model (ckt1/ckt 2)[a]		55/55	65/65	70/70	85/70	85/85	100/85	100/100
Quantity	#	2	2	2	2	2	2	2
Evaporator								
Water Connection Size	in	4	4	5	5	5	6	6
Passes	#	2	2	2	2	2	2	2
Water Storage	gal	14.0	15.8	19.3	20.6	21.6	21.9	23.9
	L	53.1	59.9	73.2	78.0	81.9	82.8	90.5
Minimum Flow[b]	gpm	128	150	171	187	199	202	228
	L/s	8.1	9.5	10.8	11.8	12.6	12.8	14.4
Maximum Flow[b]	gpm	470	551	626	684	731	742	835
	L/s	29.7	34.8	39.5	43.2	46.1	46.8	52.7
Condenser								
Qty of Coils (ckt 1/ckt 2)		5/5	5/5	6/6	6/6	6/6	7/7	7/7
Coil Length	in	77.4	77.4	77.4	77.4	77.4	77.4	77.4
	mm	1967	1967	1967	1967	1967	1967	1967
Coil Height	in	47.8	47.8	47.8	47.8	47.8	47.8	47.8
	mm	1214	1214	1214	1214	1214	1214	1214
Free-Cooling Coils								
Qty of Coils (ckt 1/ckt 2)		5/4	5/4	6/5	6/5	6/5	7/6	7/6
Coil Length	in	75.8	75.8	75.8	75.8	75.8	75.8	75.8
	mm	1925	1925	1925	1925	1925	1925	1925
Coil Height	in	37.0	37.0	37.0	37.0	37.0	37.0	37.0
	mm	941	941	941	941	941	941	941
Condenser Fans								
Quantity (ckt 1/ckt 2)	#	5/5	5/5	6/6	6/6	6/6	7/7	7/7
Diameter	in	29	29	29	29	29	29	29
	mm	736.6	736.6	736.6	736.6	736.6	736.6	736.6
Nominal speed	rpm	855	855	855	855	855	960	960
Airflow	cfm	9760	9760	9760	9760	9760	11,000	11,000
Airflow with Free-Cooling Coil	cfm	8338	8338	8338	8338	8338	9567	9567
	m^3/s	4.6	4.6	4.6	4.6	4.6	5.2	5.2
Ambient Temperature Range								
Standard Ambient	°F (°C)	14 to 115 (-10 to 46)						
Low Ambient	°F (°C)	-4 to 115 (-20 to 46)						
High Ambient	°F (°C)	14 to 130 (-10 to 54.4)						
Wide Ambient	°F (°C)	-4 to 130 (-20 to 54.4)						
General Unit								
Refrigerant		R-134a or R-513A						
Refrigerant Ckts	#	2	2	2	2	2	2	2
Minimum Load	%	15	15	15	15	15	15	15
Refrigerant Charge (ckt 1/ckt 2)	lb	86.4/84.9	86.6/84.9	101.4/99.0	111.1/99.0	109.0/96.3	134.3/129.4	134.7/129.8
	kg	39.2/38.5	39.3/38.5	46.0/44.9	50.4/44.9	49.5/43.7	60.9/58.7	61.1/59.0
Oil		Trane OIL00315 (1 gal)/OIL00317 (5 gal)						
Oil Charge/ckt	gal	1.53	1.56	1.56	1.56	1.64	1.96	2.01
	L	5.8	5.9	5.9	5.9	6.2	7.4	7.6

(a) Nominal tonnage at 60 Hz.
(b) Minimum and maximum flow rates apply to constant-flow chilled water system running at AHRI conditions, without freeze inhibitors added to the water loop.

Table 5. General data – 230 to 520 ton units

Unit Size (tons)		230	250/270	280	310	350/390	410	450	500/520
Compressor Model (ckt 1/ckt 2)[a]		120/100	120/120	100-100/70	100-100/100	100-120/120	100-100/ 100-100	100-120/ 100-120	120-120/ 120-120
Quantity	#	2	2	3	3	3	4	4	4
Evaporator									
Water Connection Size	in	6	6	8	8	8	8	8	8
Passes	#	2	2	1	1	1	1	1	1
Water Storage	gal	28.5	30.6	31.2	32.6	35.8	41.8	44.8	46.1
	L	107.7	115.9	118.1	123.3	135.4	158.1	169.5	174.7
Minimum Flow[b]	gpm	261	288	304	323	367	446	487	506
	L/s	16.5	18.2	19.2	20.4	23.1	28.1	30.7	31.9
Maximum Flow[b]	gpm	957	1055	1113	1183	1345	1635	1786	1855
	L/s	60.4	66.6	70.2	74.6	84.9	103.2	112.7	117.1
Condenser									
Qty of Coils (ckt 1/ckt 2)		7/7	7/7	12/6	14/6	14/6	12/12	14/14	14/14
Coil Length	in	77.4	77.4	77.4	77.4	77.4	77.4	77.4	77.4
	mm	1967	1967	1967	1967	1967	1967	1967	1967
Coil Height	in	47.8	47.8	47.8	47.8	47.8	47.8	47.8	47.8
	mm	1214	1214	1214	1214	1214	1214	1214	1214
Free-Cooling Coils[c]									
Qty of Coils (ckt 1/ckt 2)		7/6	7/6	11/5	13/5	13/5	11/11	13/13	13/13
Coil Length	in	75.8	75.8	75.8	75.8	75.8	75.8	75.8	75.8
	mm	1925	1925	1925	1925	1925	1925	1925	1925
Coil Height	in	37.0	37.0	37.0	37.0	37.0	37.0	37.0	37.0
	mm	941	941	941	941	941	941	941	941
Condenser Fans									
Quantity (ckt 1/ckt 2)	#	7/7	7/7	12/6	14/6	14/6	12/12	14/14	14/14
Diameter	in	29	29	29	29	29	29	29	29
	mm	736.6	736.6	736.6	736.6	736.6	736.6	736.6	736.6
Nominal Speed	rpm	960	960	960	960	960	960	960	960
Airflow	cfm	11,000	11,000	11,000	11,000	11,000	11,000	11,000	11,000
Airflow w/ Free-Cooling Coil[c]	cfm	9567	9567	9567	9567	9567	9567	9567	9567
	m^3/sec	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2
Ambient Temperature Range									
Standard Ambient	°F (°C)	14 to 115 (-10 to 46)							
Low Ambient	°F (°C)	-4 to 115 (-20 to 46)							
High Ambient[c]	°F (°C)	14 to 130 (-10 to 54.4)							
Wide Ambient[c]	°F (°C)	-4 to 130 (-20 to 54.4)							
General Unit									
Refrigerant		R-134a or R-513A[d]							
Refrigerant Ckts	#	2	2	2	2	2	2	2	2
Minimum Load	%	15	15	15	15	15	15	15	15
Refrigerant Charge (ckt 1/ckt 2)	lb	155.4/154.8	155.4/154.8	263.1/118.4	272.5/120.0	276.0/121.2	253.0/259.7	266.9/278.8	275.1/287.8
	kg	70.7/70.4	70.7/70.4	119.6/53.8	123.8/54.5	125.4/55.1	115.0/118.0	121.3/126.7	125.0/130.8
Oil			Trane OIL00315 (1 gal)/OIL00317 (5 gal)						
Oil Charge (ckt 1/ckt 2)	gal	2.35/2.35	2.35/2.35	4.24/2.17	4.26/2.17	4.27/2.17	4.26/4.29	4.30/4.33	4.33/4.37
	L	8.9/8.9	8.9/8.9	16.1/8.2	16.1/8.2	16.2/8.2	16.1/16.2	16.3/16.4	16.4/16.5

(a) Nominal tonnage at 60 Hz. Where there are 2 compressors on a circuit, they are indicated 1A-1B/2A-2B.
(b) Minimum and maximum flow rates apply to constant-flow chilled water system running at AHRI conditions, without freeze inhibitors added to the water loop.
(c) Not available for 270, 390, and 520 ton units. Free cooling is not available for 230, 250, 350, and 500 ton 575V units. High and wide ambient are not available for all 575V units.
(d) R-513A is not available on 270, 290, and 520 ton units.

Free-Cooling System

Glycol Volumes

Note: *Volumes listed in table below are in addition to the fluid volume for standard unit configuration.*

Table 6. Free-cooling system glycol volume

Unit Size	Total Glycol Volume	
tons	gal	l
115	59.25	224.27
130	59.25	224.27
150	75.36	285.26
170	75.36	285.26
180	75.36	285.26
200	89.97	340.59
215	89.97	340.59
230	89.97	340.59
250	89.97	340.59
280	201.53	762.89

Table 6. Free-cooling system glycol volume (continued)

Unit Size	Total Glycol Volume	
tons	gal	l
310	211.97	802.38
350	211.97	802.38
410	247.12	935.44
450	282.27	1068.50
500	282.27	1068.50

Compressor Locations

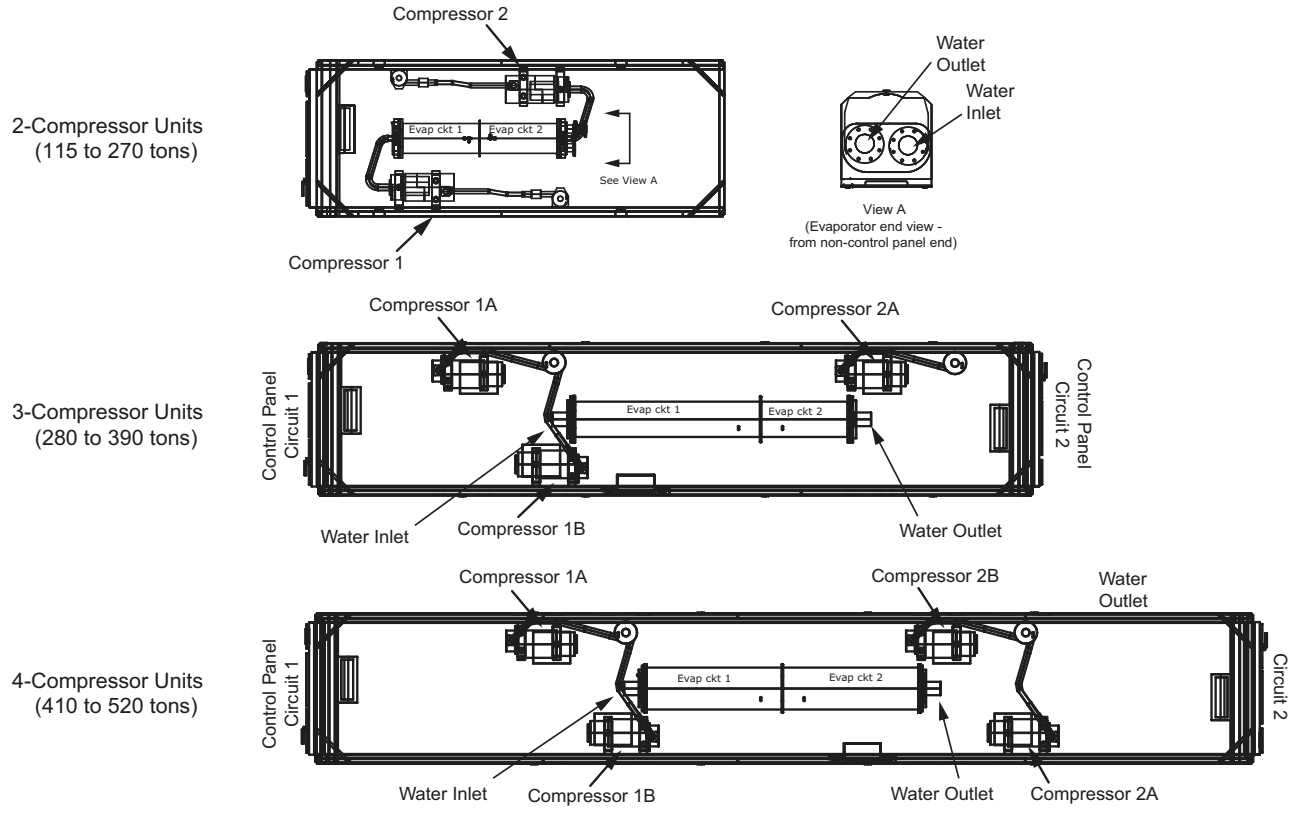
Evaporator Piping and Compressors

Figure below shows the location of compressors for the various unit configurations.

Evaporator orientation and water flow direction are also shown.

Important: *On 3- and 4-compressor units, location of compressor 2A varies with unit size. See unit labels to verify component designation.*

Figure 3. Evaporator piping and compressor locations



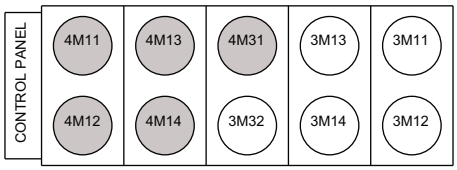
Condenser Fans Location

The location of the circuit 1 and circuit 2 fan banks varies by unit size. See figure below for locations.

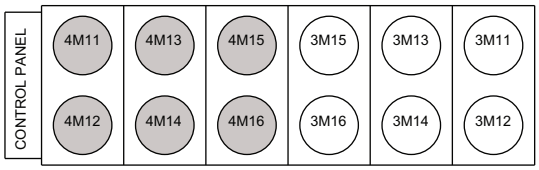
Note: *Circuit 2 fans are shaded. For more information, see unit component location drawings listed in Wiring section Table 21, p. 31.*

Figure 4. Condenser fan locations

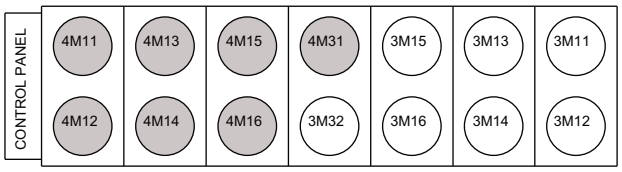
115T, 130T



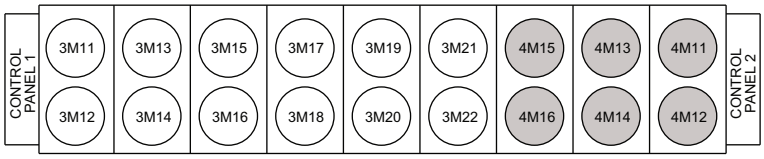
150T, 170T, 180T



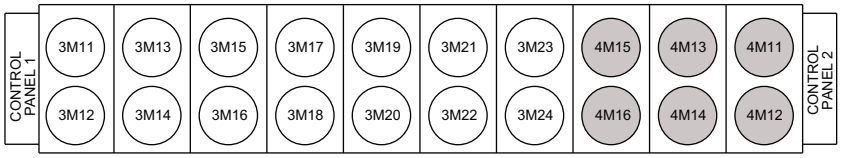
200T, 215T, 230T, 250T, 270T



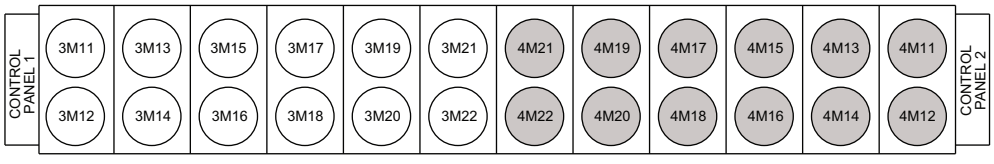
280T



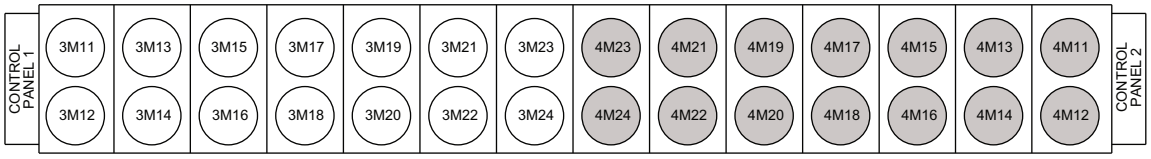
310T, 350T, 390T



410T



450T, 500T, 520T



Standard Offering

Refrigerant and Lubricant Section

Send refrigerant and lubricant samples to Trane ClimateLabs for testing as the first step of conducting the R'newal process. Confirm the samples are marked as **R'newal**. You will be notified of the refrigerant and the complete oil analysis results and recommendations. Failure to meet this requirement and the analysis recommendations will void the R'newal warranty. The sample submission process and use of the ClimateLabs tool can be found on the Hub.

https://hub.tranetechnologies.com/community/communities/climatelabs.

Access ClimateLabs by:

3. Direct URL: https://climatelabs.mendixcloud.com/index.html.
4. Use the **Sample Submission** link in ComfortSite Model Number Lookup https://www.comfortsite.com/ebiz/home/Home.asp?StartPage=%2fEBiz%2fhome%2fHomeSplash.asp.

Compressor Section

Install compressor(s), compressor installation kit, and compressor solenoid coil kit for a given circuit (or both circuits).The sky hook compressor lifting tool document at the link below provides the recommended tool and procedure to conduct the screw compressor replacement. https://hub.tranetechnologies.com/thread/29041.

Table 7. Compressor section R'newal offerings

Figure callout	Offerings	Item	Qty reference
1	Compressors	Compressors	Per selection
2	Compressor installation kit	Crankcase heaters	Per COMP. selection
3		Filter drier	
4		Grommet isolator	
5		High pressure cutout	
6		Adapter	
7		Sleeve	
8		Nut	
9		O-rings	
10		O-rings (Suction line side)	
11		Gasket (Discharge line side)	
12		Solenoid coil (Oil return line)	
13		Coupling	
14	Gasket for junction box	Gasket (Junction box), Raw Material, 188T x 0.50W x ROLL	Per unit
15	Compressor solenoid coil kit	Solenoid coil (COMP)	Per COMP. selection
16		O-rings	

Notes:
- All the items are listed.
- Figure 5 to Figure 7 display the compressor section items.

Figure 5. Compressor location - two compressor unit

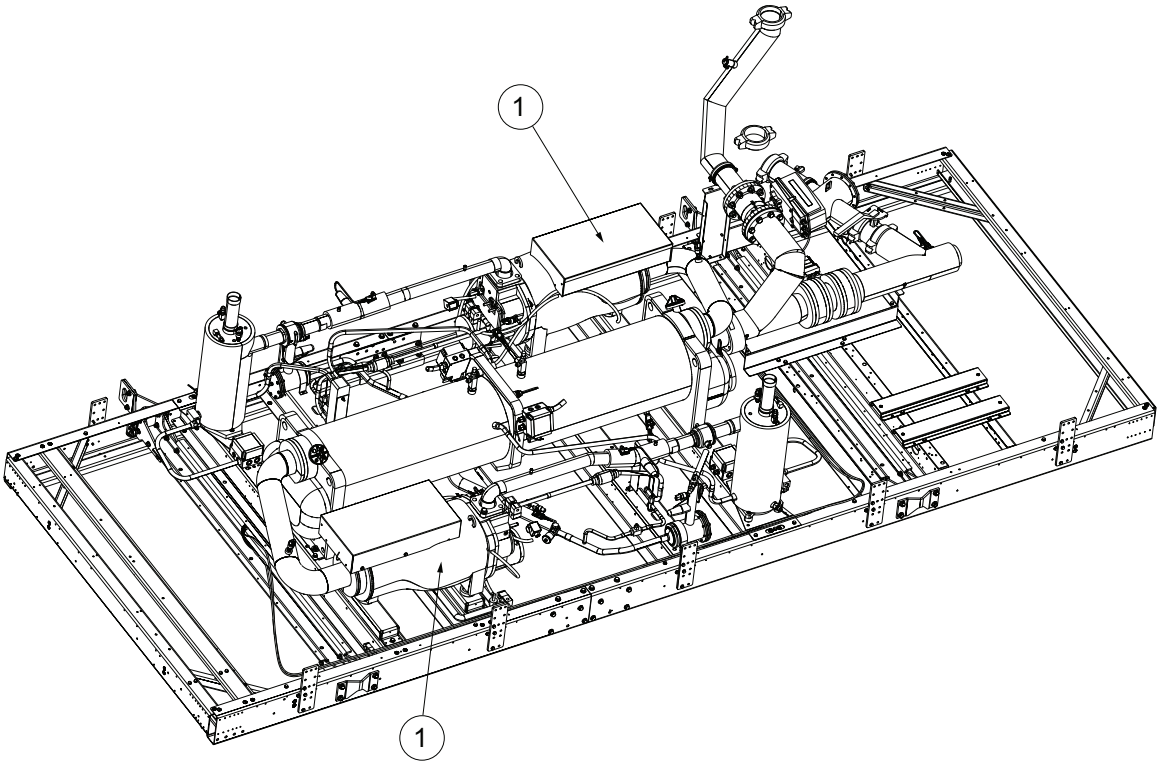
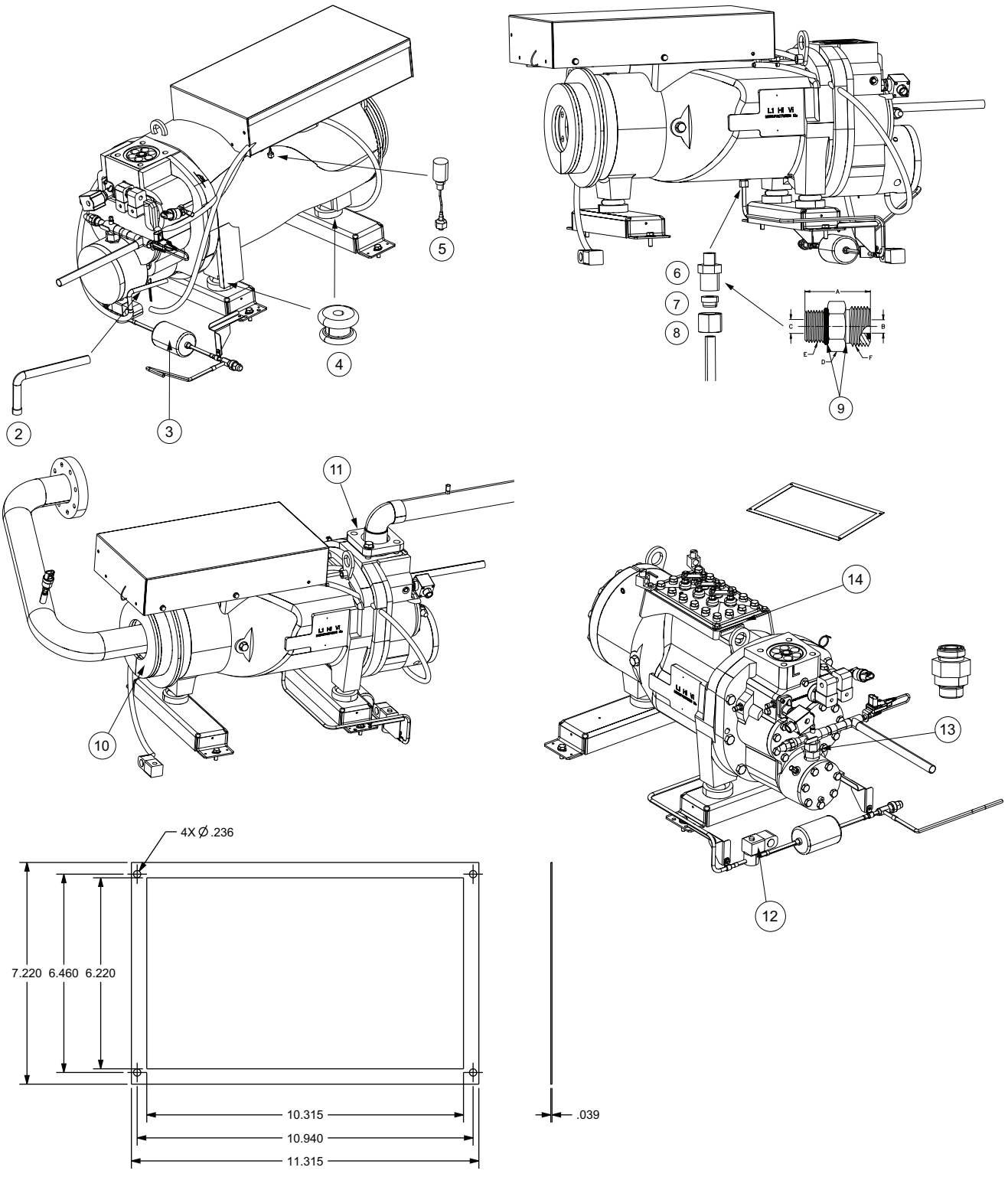
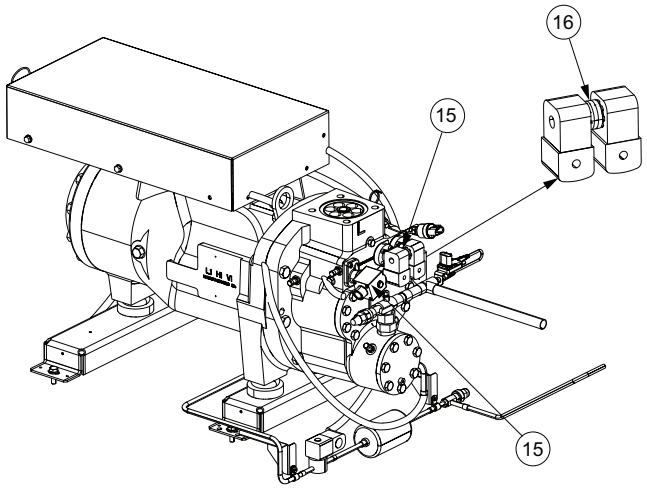


Figure 6. Compressor installation kit and gasket



Junction box gasket is provided in bulk roll. Cut to size using dimensions (in inches) as outlined in the figure above (in inches).

Figure 7. Compressor solenoid coil kit



Reassembly Section

Install circuit accessory installation kit, circuit relief valve, and circuit temperature sensor kit.

Note: *Replace the Schrader valve cores and caps, acquire locally.*

Table 8. Reassembly section R'newal offerings

Figure callout	Offerings	Item	Qty reference
1	Circuit accessory installation kit	Access valve (EXV Assy., Suction line, Oil separator)	Per circuit
2		Filter core	
3	Circuit relief valve	Relief valve (Oil separator, Evaporator)	Per circuit
4	Circuit temperature sensor kit	Temperature sensor (Compressor, Discharge line, Evaporator, EXV Assy., Ambient)	Per circuit
5		Strain relief connector (Compressor, Discharge line, Evaporator, EXV Assy., Ambient)	
6		Temperature sensor bracket (Compressor)	
7		Temperature sensor O-ring (Evaporator)	
8	Angle valve	Angle valve (Evaporator)	Per unit
9		O-ring	

Notes:
- All the items are listed.
- Figure 8 to Figure 15 display the compressor section items.

Figure 8. Subassembly location

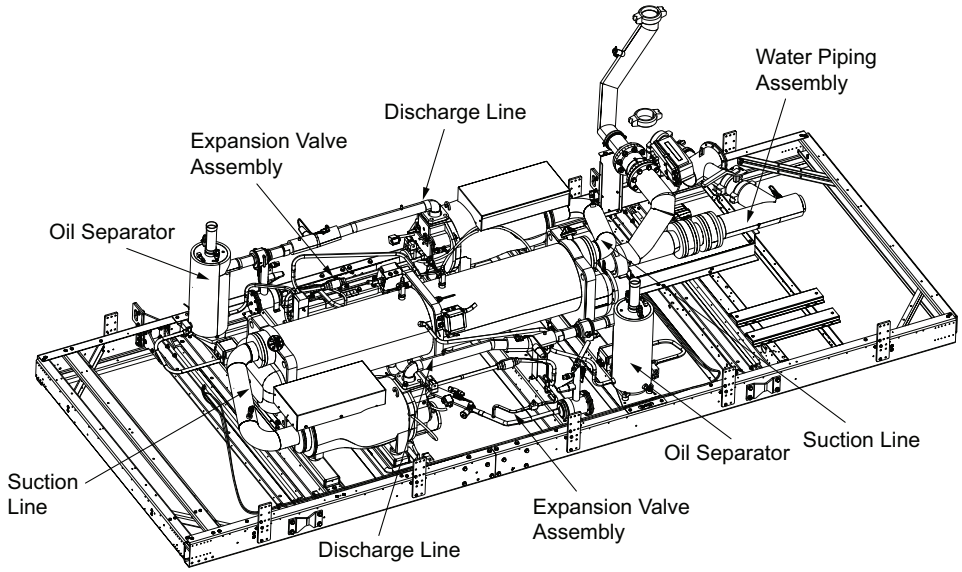


Figure 9. Expansion valve assembly

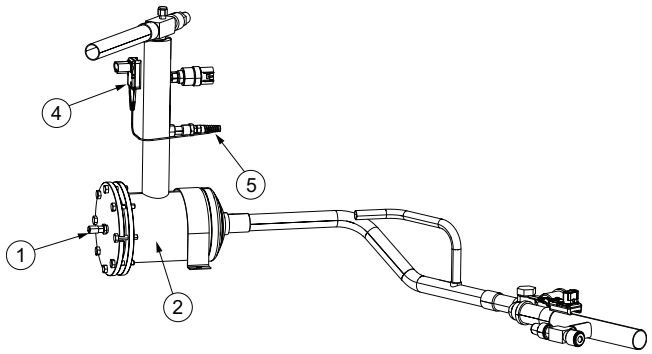


Figure 10. Suction line

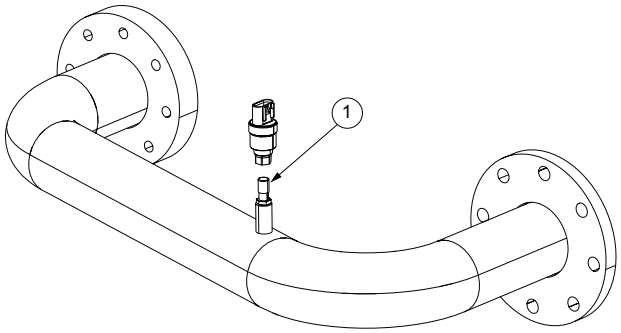


Figure 11. Oil separator

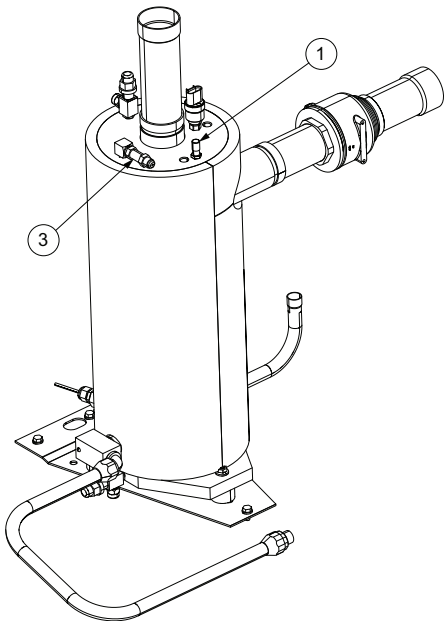


Figure 12. Evaporator

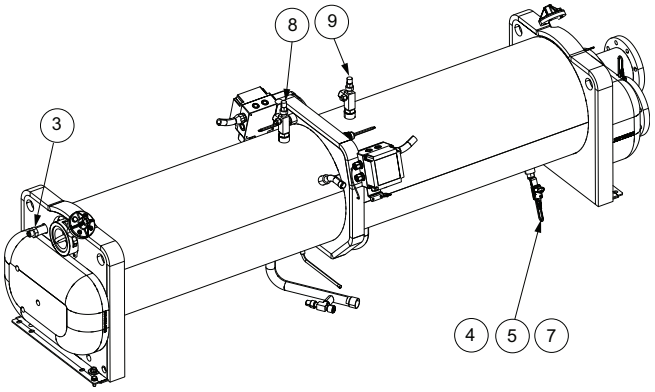


Figure 13. Discharge line

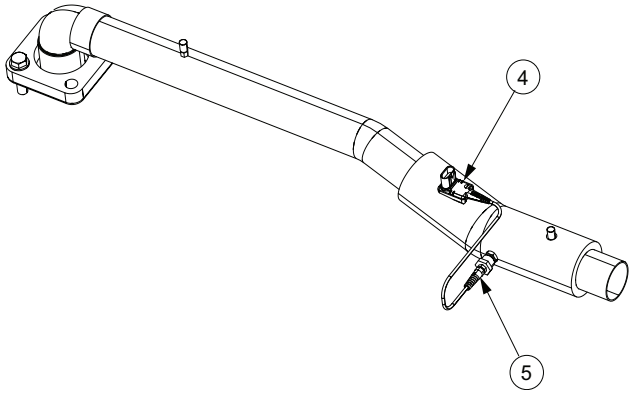


Figure 14. Compressor temperature sensor

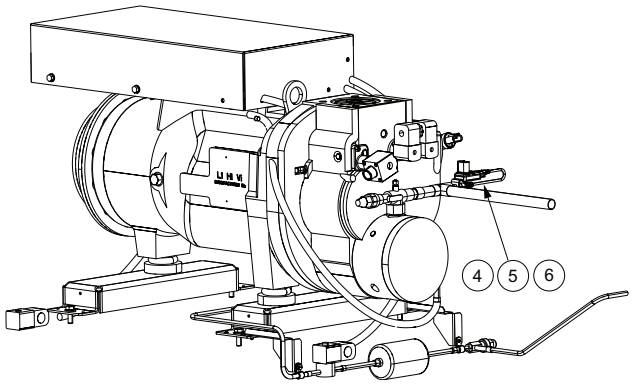
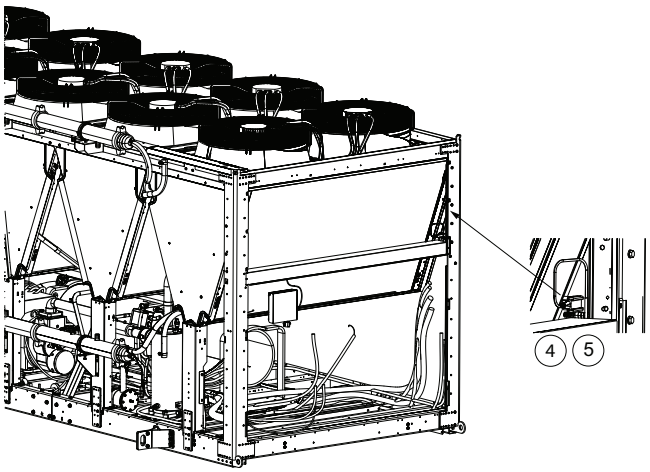


Figure 15. Ambient temperature sensor



Temperature Sensors Insulation Information

The following table lists the three temperature sensors that must be insulated. Insulation and insulation tape is field-provided.

Table 9. Sensor insulation information

Sensor location	Insulation and Tape information
High-Temp. Sensor **Discharge Line**	Insulation; Elastomeric rubber, 1 1/8-in. ID, 1/2-in. Wall
	Tape; 51 mm for Insulation
Temp. Sensor **Evaporator Body**	Insulation; Elastomeric rubber, 1 3/8-in. ID, 1/2-in. Wall
	Tape; 102 mm for Insulation
Temp. Sensor **Expansion Valve Assembly**	Insulation; Elastomeric rubber, 1 1/8-in. ID, 1/2-in. Wall
	Tape; 51 mm for Insulation

Note: Figure 16 to Figure 18 display insulation for sensors at the different locations.

Figure 16. Discharge line

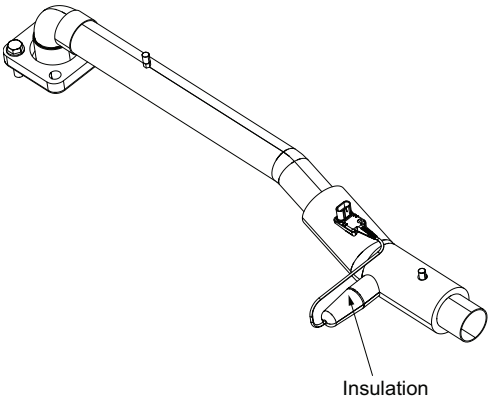
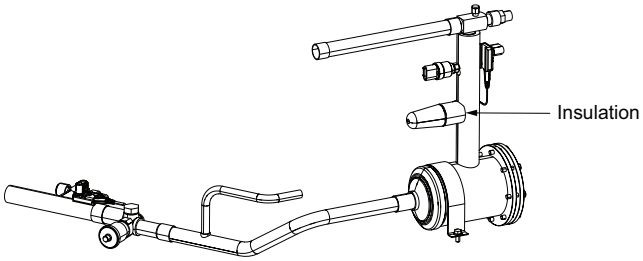


Figure 17. Evaporator body

Figure 18. Expansion valve assembly



Control Panel Door Gasket

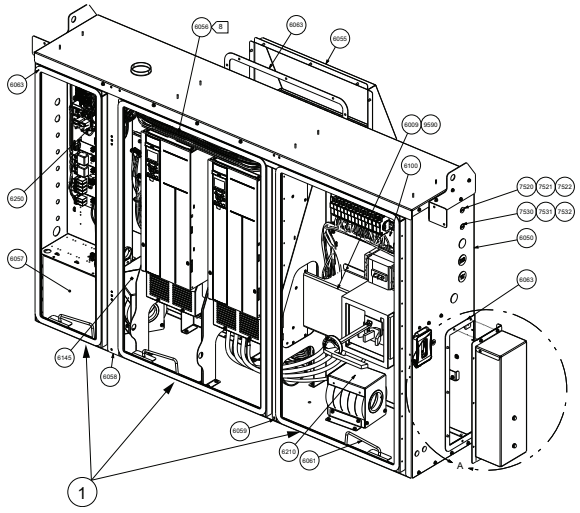
Install control panel door gasket.

Table 10. Control panel door gasket R'newal offerings

Figure callout	Offerings	Item	Qty reference
1	Control panel door gasket	Control panel door gasket	Per unit

Notes:
- All the items are listed.
- Figure 19 displays the control panel door gasket.

Figure 19. Control panel door gasket



Water Piping Section

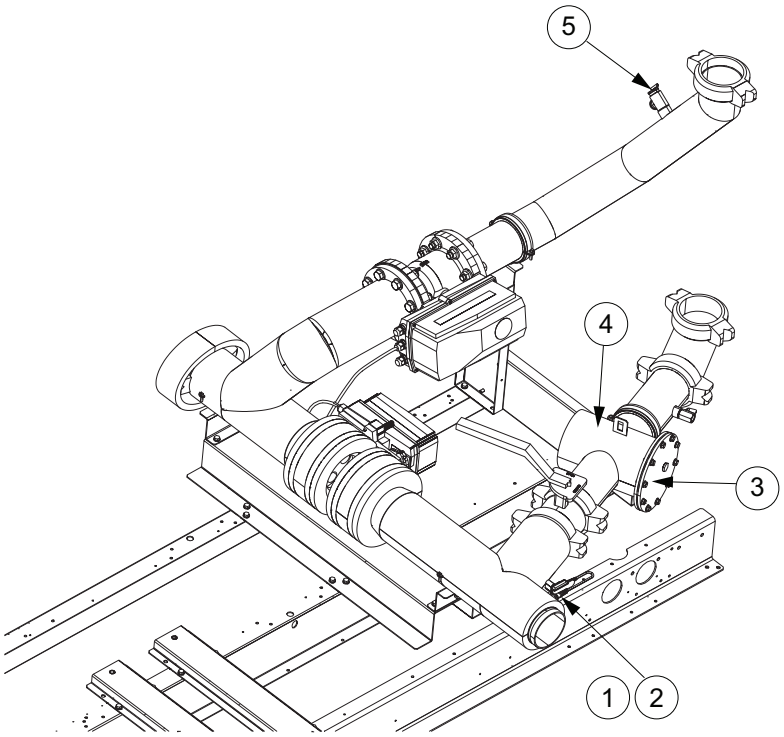
Install water piping installation kit.

Table 11. Water piping installation kit R'newal offerings

Figure callout	Offerings	Item	Qty reference
1	Water piping installation kit	Temperature sensor	Per unit
2		Temperature sensor bracket	
3		Gasket	
4		Strainer core	
5		Relief valve	

Notes:
- All the items are listed.
- Figure 20 displays the water piping section.

Figure 20. Water piping installation kit items



Common Kit

Table 12. Common kit

Figure callout	Offerings	Item	Qty reference
1	RTAF R'newal Common kit	Brass Plaque	Per unit
2		RTAF R'newal Literature	

Note: *Attach the brass Series R® R'newal Service Program plaque to the front of the control panel.*

Optional Offerings

Coil Section

Install condenser coil, free-cooling coil, and coil installation kit.

Table 13. Coil section R'newal offerings

Figure callout	Offerings	Item	Qty reference
1	Condenser coil	Condenser coil	Per circuit
2	Free cooling coil	Free cooling coil	Per circuit
3	Coil installation kit	Gasket	Per coil selection
4		Spacer	
5		Gasket; MCHE Seal washer	
6		Nut	

Figure 21. Condenser coil

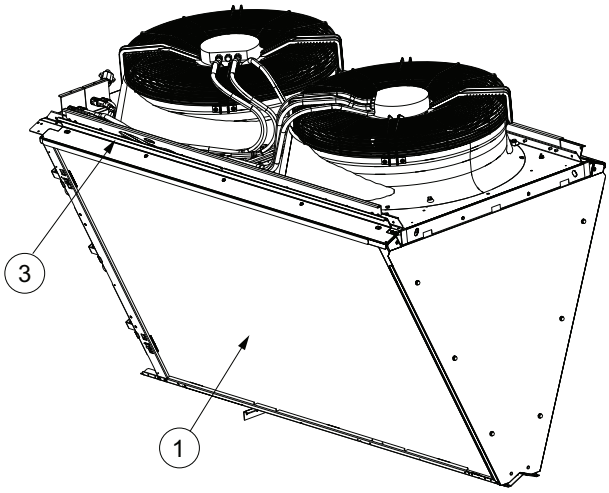


Figure 22. Free-cooling coil

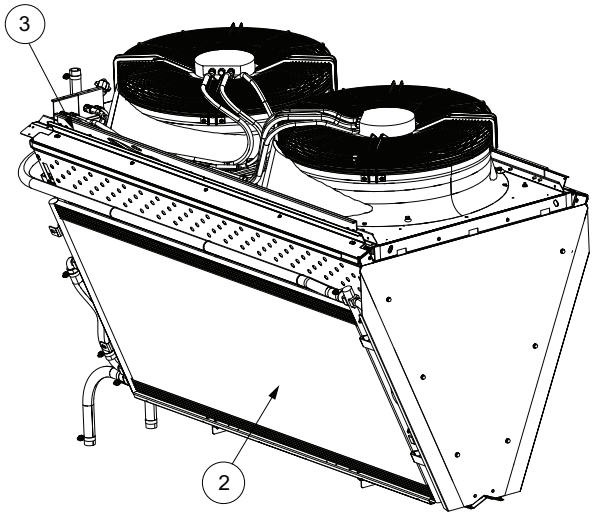
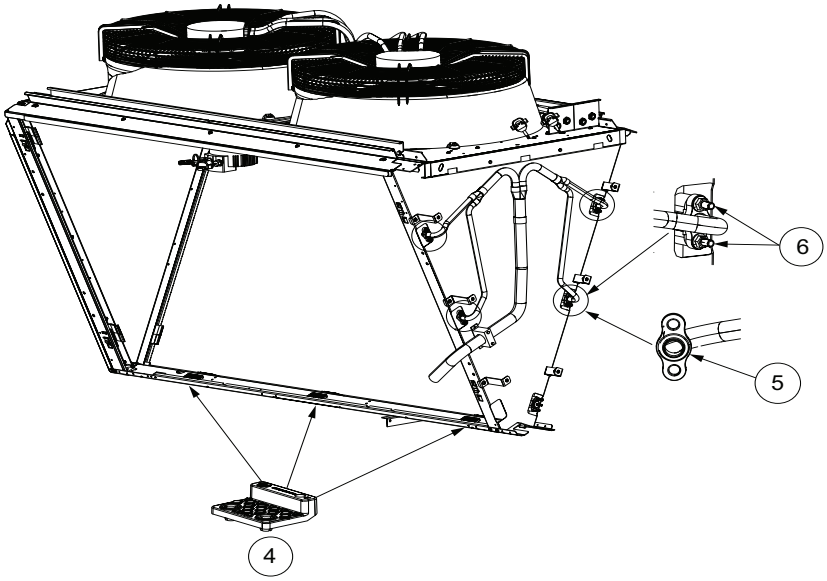


Figure 23. Coil installation kit items



Condenser Fan Section

Requirements for the condenser fan section are dependent on chiller design sequence. Modifications for each design sequence are as follows:

- Design sequence AJ or later:
  - Condenser fan grill and duct kit
  - Condenser fan motor, bracket and blade kit
- Design sequence AA to AH:
  - Condenser fan grill
  - Condenser fan and motor

See table below and Figure 25 through Figure 31 for details.

Table 14. Condenser fan section R'newal offerings

Figure callout	Offerings	Item	Qty reference
1	Condenser fan grill and duct kit[a]	Grill	Per circuit
2		Duct	
3		Screw; Hex HD cap thread roll M8 x 25 mm coated	
4		Washer; 8 mm (Nom.) ID x 25 mm OD	
5	Condenser fan motor and bracket and blade kit[a]	Motor	Per circuit
6		Motor bracket	
7		Blade	
8		Screw; M8 x 20 mm, Hex cap with thread locking adhesive	
9		Washer; 8 mm (Nom.) ID x 25 mm OD	
10		Screw; M8 x 20 Hex, Serrated flange head, Zinc PLD, Case HD	
11		Screw; Hex HD cap thread roll M8 x 16 mm coated	
12		Screw; M6 x 16 Hex, Serrated flange head, Zinc PLD, Case HD	
13	Condenser fan grill[b]	Grill	Per circuit
14		Screw; Socket head Torx, M6-1.00 x 14 mm	
15	Condenser fan and Motor[b]	Fan and motor	Per circuit
16	Condenser fan grill[c]	Grill	Per circuit
17		Screw; Socket head Torx, M8-1.25 x 25 mm	
18	Condenser fan and Motor[c]	Fan and motor	Per circuit
19	Coupling[b],[c]	Coupling	Per circuit

(a) Design sequence AJ or later.
(b) Design sequence AC to AH.
(c) Design sequence AA to AB.

Figure 24. Condenser fan (design sequence AJ or later)

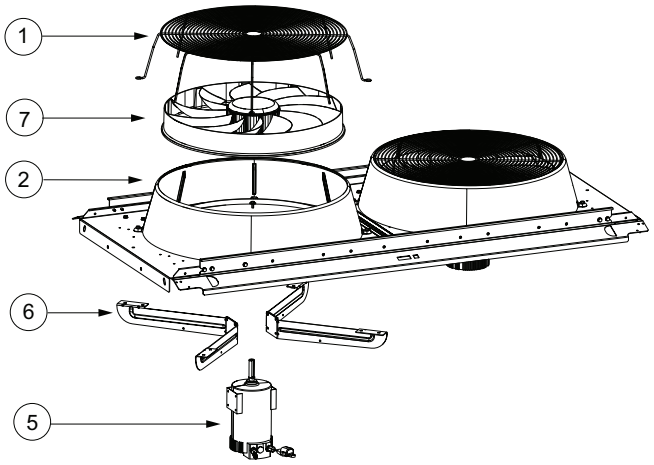


Figure 25. Grill and duct replacement (design sequence AJ or later)

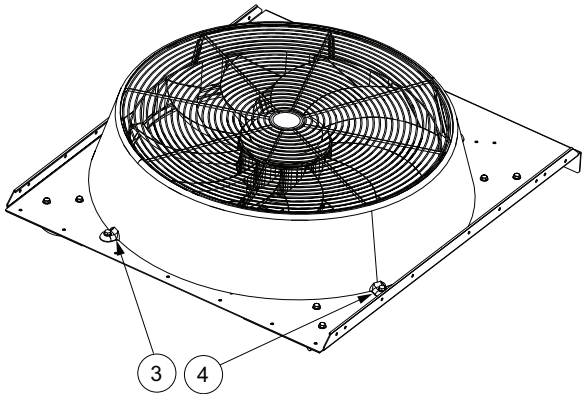


Figure 26. Motor and blade replacement (design sequence AJ or later)

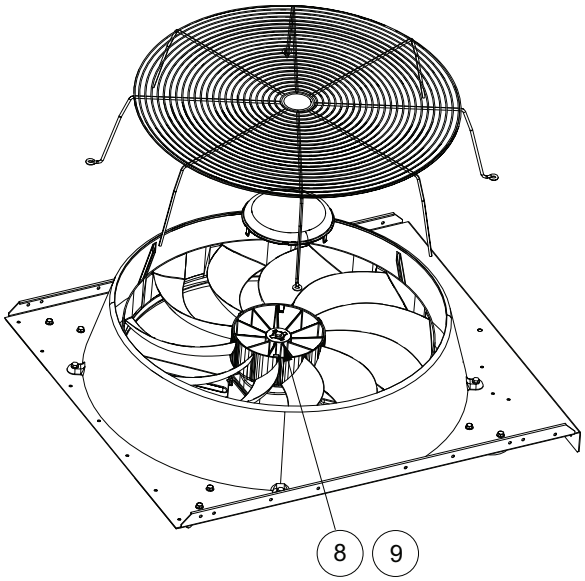


Figure 27. Fan motor bracket replacement (design sequence AJ Version or later)

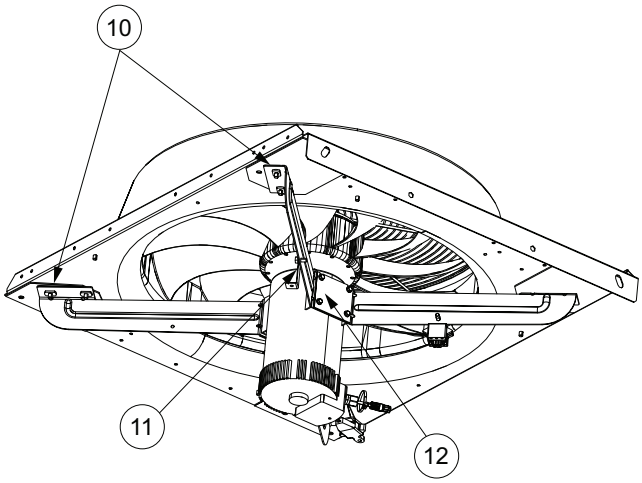


Figure 28. Condenser fan (design sequence AA to AH)

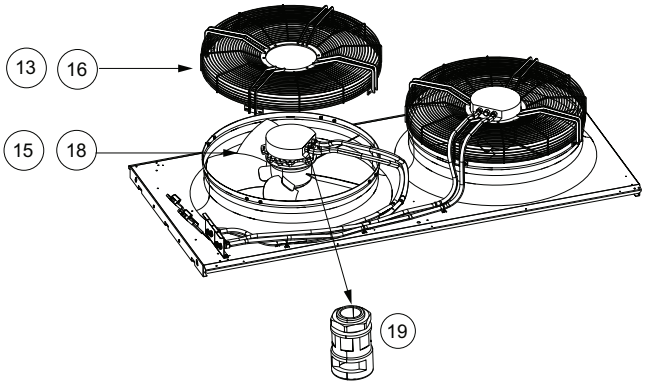


Figure 29. Grill replacement (AC to AH Version)

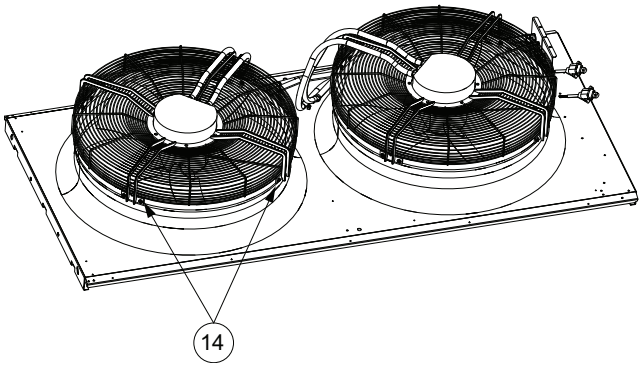
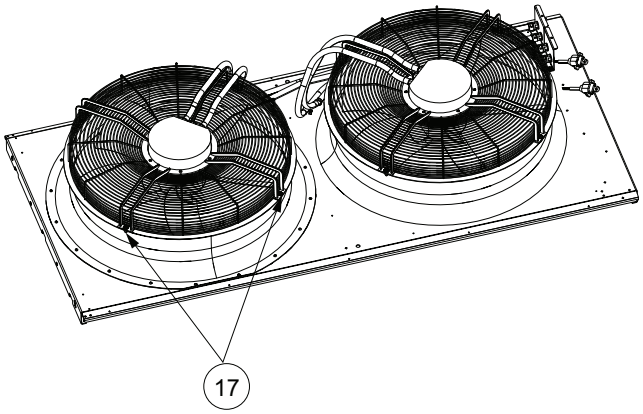


Figure 30. Grill replacement (design sequence AA to AB)



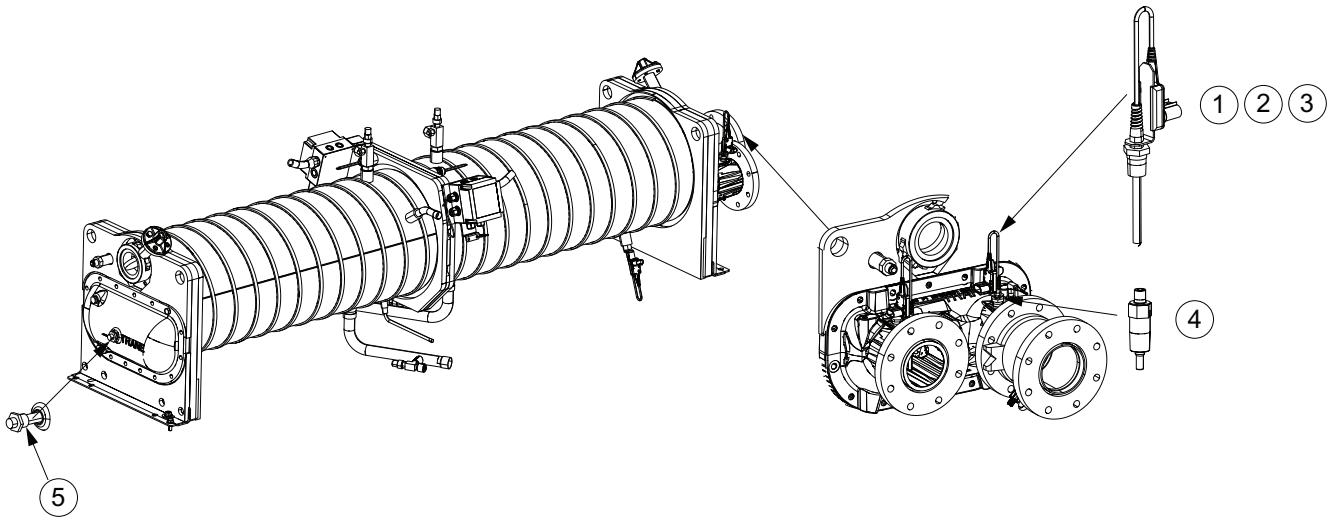
Evaporator Section

Install Evaporator Accessory Kit.

Table 15. Evaporator section R'newal offerings

Figure callout	Offerings	Item	Qty reference
1	Evaporator accessory kit	Temperature sensor (EVAP waterbox inlet and outlet)	Per unit
2		Temperature sensor bracket (EVAP waterbox inlet and outlet)	
3		Strain relief connector (EVAP waterbox inlet and outlet)	
4		Flow sensor	
5		Submersible heater	

Figure 31. Evaporator accessory kit



Other Optional Kits

Install circuit transducer, oil separator accessory, and expansion valve assembly and module.

Table 16. Other optional kits R'newal offerings

Figure callout	Offerings	Item	Qty reference
1	Expansion valve assembly installation	Expansion valve	Per circuit
2		Expansion valve module	
3	Oil separator accessories	Submersible heater	Per circuit
4		Optical sensor	
5	Circuit transducer	Transducer (EXV Assy., Oil separator, Suction line and Compressor Assy.)	Per circuit

Figure 32. Expansion valve assembly installation

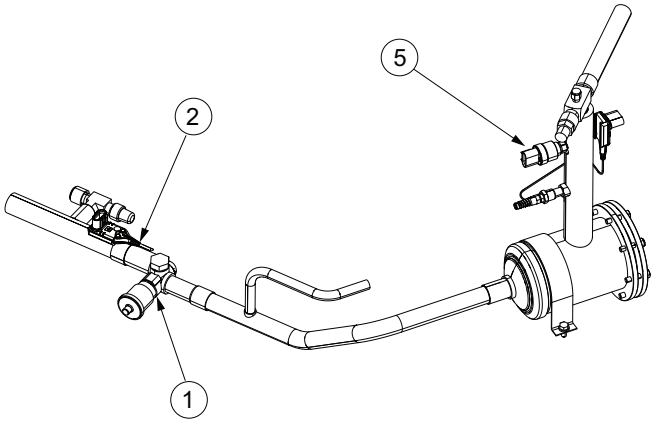


Figure 33. Oil separator accessory

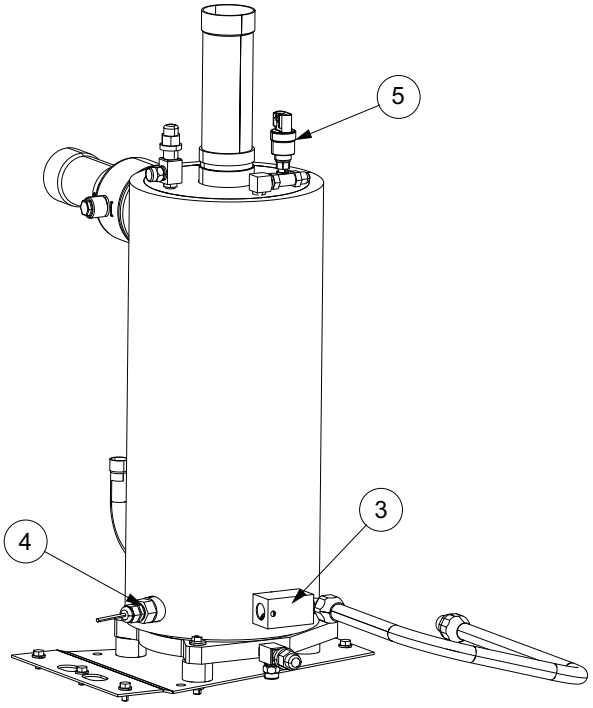


Figure 34. Compressor assembly transducer

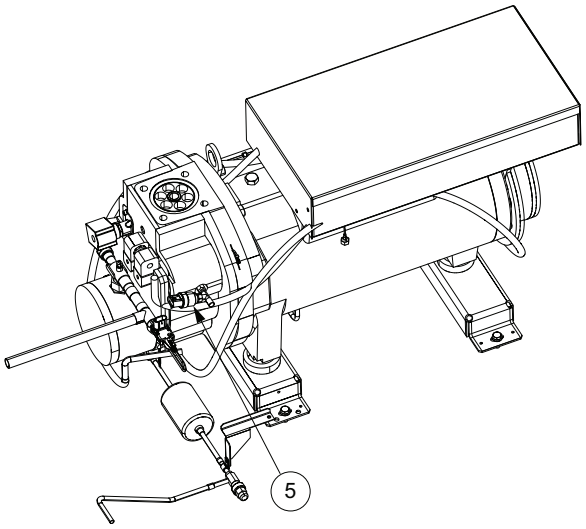
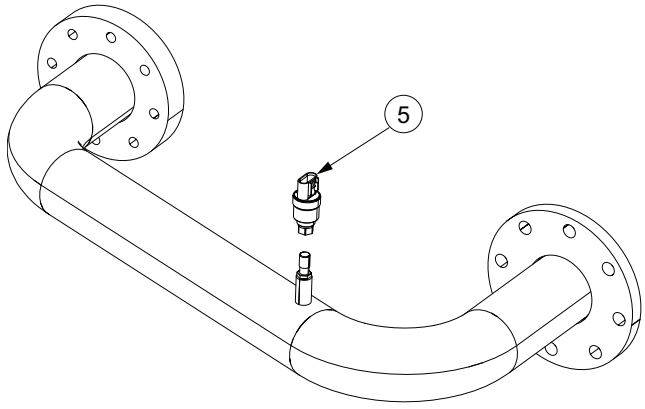


Figure 35. Suction line transducer



Additional Software Setting for Expansion Valve

If the control module is upgraded from UC800 to Symbio™ 800, set the control program as shown in table below.

Settings are depending on chiller design sequence.

Table 17. Expansion valve software setting

Unit size (tons)	Circuit	Included in Symbio 800 (design sequence AB to AK version EXV)	Included in Symbio 800 (design sequence AA version EXV)
115,130	CK1	SERI-LS (X13650736___, 130 or greater) SLS2 [6],	SERI-LS (X13651474010)
	CK2	SERI-LS (X13650736___, 130 or greater) SLS2 [6],	SERI-LS (X13651474010)
150	CK1	SERI-LS (X13650736___, 130 or greater) SLS2 [6],	SERI-KS (X13651474010)
	CK2	SERI-LS (X13650736___, 130 or greater) SLS2 [6],	SERI-KS (X13651474010)
170	CK1	SEHI-175 (X13650736___, 130 or greater) S172 [7],	SEHI-175 Integrated Electronics
	CK2	SERI-LS (X13650736___, 130 or greater) SLS2 [6],	SERI-KS (X13651474010)
180, 200, 215	CK1	SEHI-175 (X13650736___, 130 or greater) S172 [7],	SEHI-175 Integrated Electronics
	CK2	SEHI-175 (X13650736___, 130 or greater) S172 [7],	SEHI-175 Integrated Electronics
230, 250, 270	CK1	SEHI-175 (X13650736___, 130 or greater) S172 [7],	None
	CK2	SEHI-175 (X13650736___, 130 or greater) S172 [7],	
280, 310, 350, 390	CK1	SEHI-400 (X13650736___, 130 or greater) SY12 [8],	
	CK2	SEHI-175 (X13650736___, 130 or greater) S172 [7],	
410, 450, 500, 520	CK1	SEHI-400 (X13650736___, 130 or greater) SY12 [8],	
	CK2	SEHI-400 (X13650736___, 130 or greater) SY12 [8],	

Refrigerant R-513A Section

Install refrigerant R-513A, labels, and tags.

Note: *R-513A refrigerant is field-provided.*

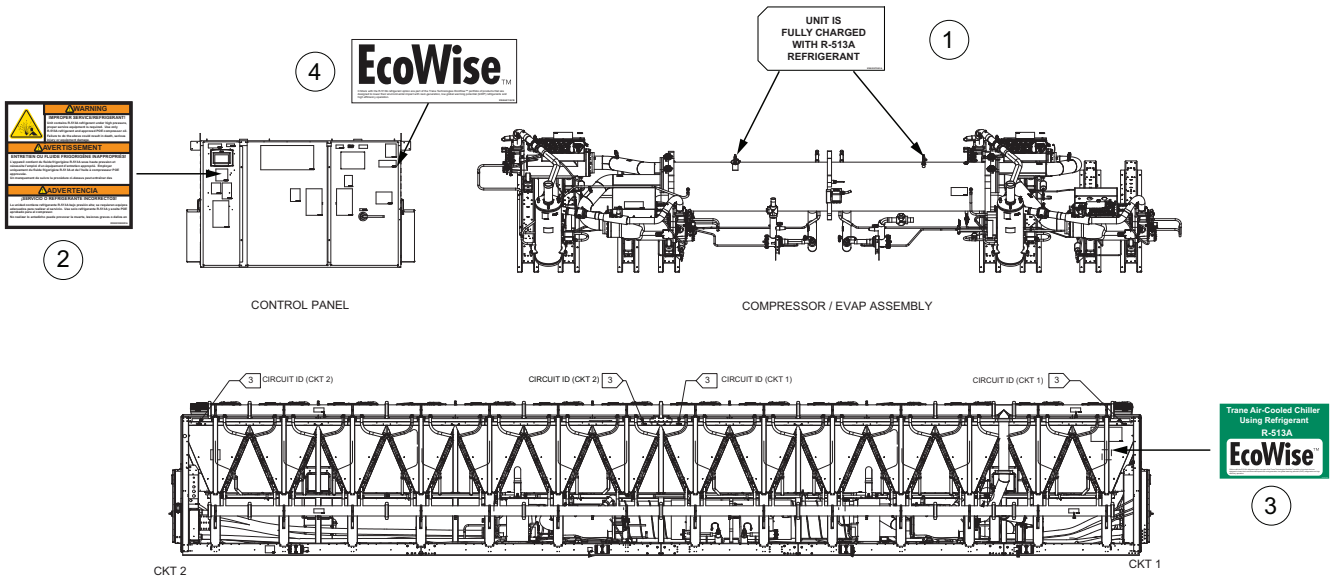
After completing the conversion to R-513A refrigerant, install the R-513A labels and tags at the appropriate locations to cover the R-134a labels and tags.

Note: *Unit sizes 115 to 270 tons do not include EcoWise™ labels (items 3 and 4).*

Table 18. Expansion valve software setting

Figure callout	Offerings	Item	Qty reference
1	Refrigerant R-513A Tag and Label kit	Tag; R-513A refrigerant charge	Per unit
2		Label; Warning (PS) Improper service/ Refrigerant R-513A	
3		Label; Air-Cooled chiller with R-513A, EcoWise	
4		Label; EcoWise chiller with R-513A	
—	Refrigerant R-513A	R-513A	Per unit

Figure 36. Location - R-513A labels and tags



Compressor Starter Section

Starter configuration depends on unit configuration:

- 115 to 270 ton units:
  - Two compressors,
  - One AFD starter.
  - See Figure 38 for AFD location.
- 280 to 520 ton units:
  - Three or four compressors,
  - AFD starters for compressors 1A and 2A
  - Wye-delta starteds for compressors 1B and 2B (2B is only available in 410 to 520 ton units)
  - See Figure 40 for AFD and Wye-Delta contactors kit location.

Table 19. Expansion valve software setting

Figure callout	Offerings	Item	Qty reference
1	Compressor AFD	AFD	Per circuit
2	Compressor contactor kit	Contactor	Per unit

Figure 37. Compressor AFD location (115 to 270 ton units)

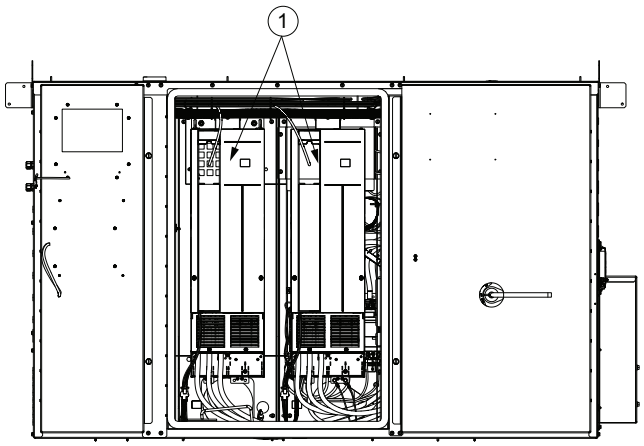
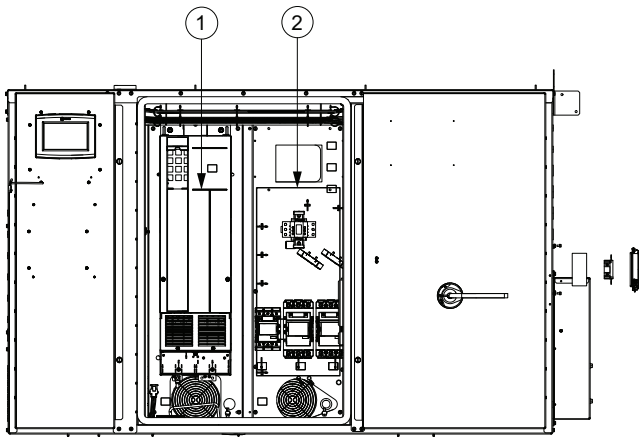


Figure 38. Compressor AFD and contactor location (280 to 520 ton units)



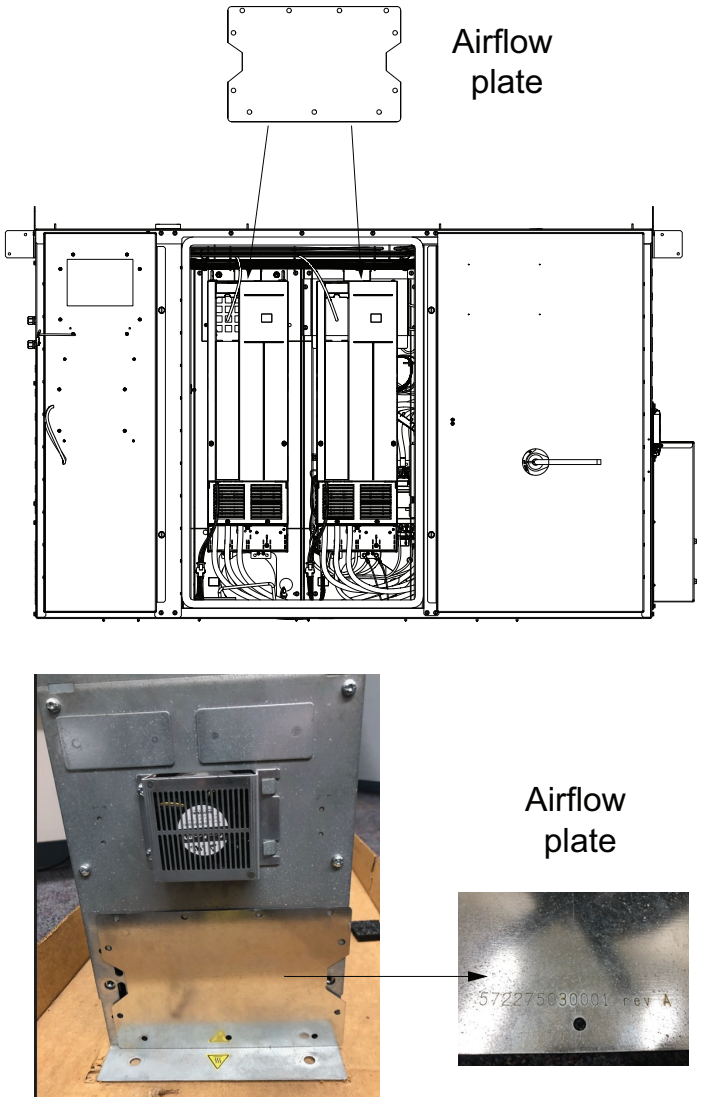
AFD Installation

See *Sintesis™ Air-Cooled Chilllers Model RTAF Installation, Operation, and Maintenance* (RTAF-SVX001*-EN) and *TR200 New D-Frame, 110-400 kW Service Manual* (BAS-SVM01*-EN) for AFD installation and programming.

Note: *Field replacement drives must be programmed via the keypad interface. All wiring must be reconnected. See wiring diagrams listed in Wiring section.*

Important: *Verify airflow plate is reinstalled on the top of the drive after AFD replacement as shown in the following figures. (Airflow plate part number 572275030001.)*

Figure 39. Airflow plate



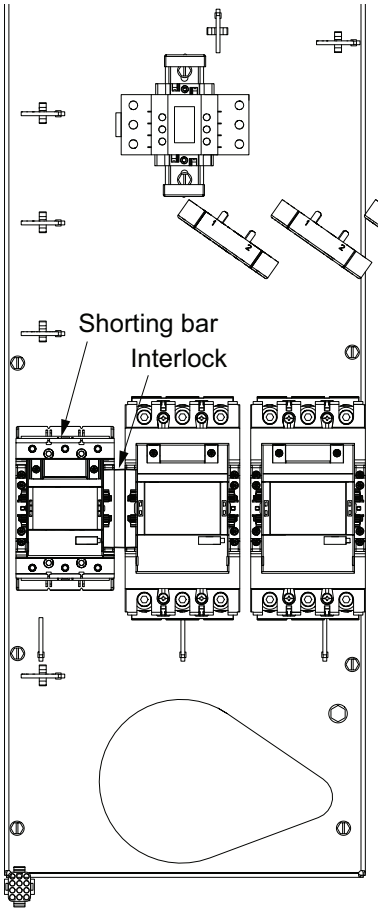
Contactor Installation

Depending on the chiller design sequence, original control panel contactors may be either A or AF series. The design kit currently offers only AF series replacements.

For units with AF series original contactors:

1. Remove the old contactors and accessories (shorting bar, interlock).
2. Install the new contactors and accessories in the same locations as the originals.

Figure 40. AF contactors kit



For units with original A series contactors, additional holes are required for 1Q27/2Q27. See Figure 41.

1. Remove the old contactors and accessories (shorting bar, interlock).
2. Drill four M4/3.3 mm holes on the small bracket. See Figure 42 for the hole location.
3. Install 1Q27/2Q27 in the new mounting hole locations.
4. Install remaining contactors in the same locations as the originals.
5. Install AF series shorting bar and interlock in design kit. See Figure 40 for location.

Figure 41. A-series contactors kit

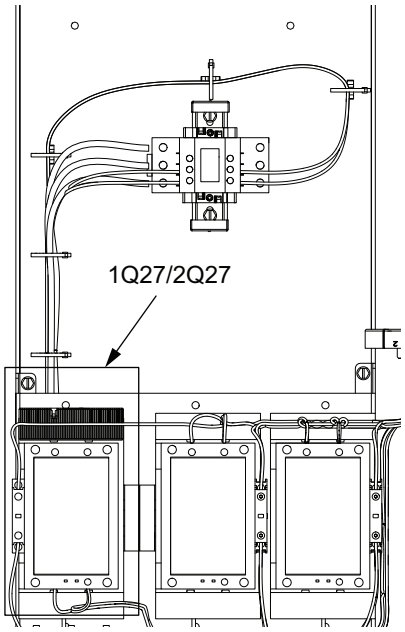
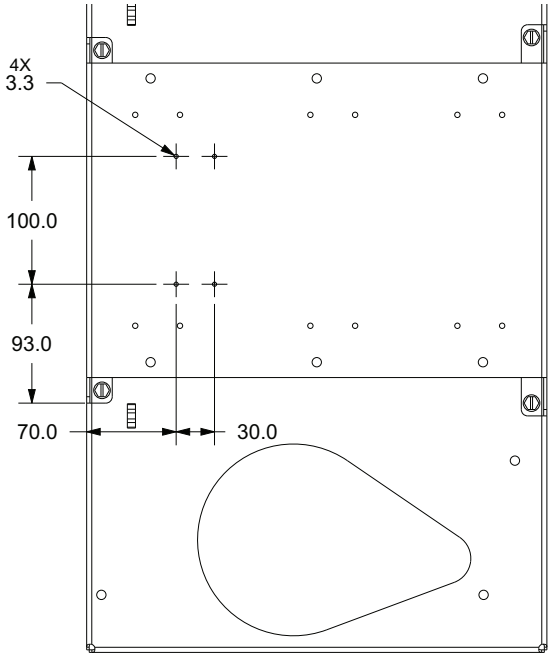


Figure 42. New mounting hole location



Note: *All wiring must be reconnected. See wiring diagrams listed in Table 21, p. 31 section.*

Symbio™ 800 Section

If the unit control module is UC800, the Symbio™ 800 Upgrade kit is required.

If the unit includes Symbio 800 controls, the Symbio 800 accessories kit is optional.

For Symbio 800 upgrade or accessory kit details, see *RCDB - Symbio™ 800 Control Upgrade Kit For RTAF UC800 Installation Instructions* (SO-SVN054*-EN).

Table 20. Symbio 800 section R'newal offerings

Figure callout	Offerings	Item	Qty reference
1	Symbio 800 upgrade kit	Symbio 800 upgrade kit	Per unit
2	Symbio 800 accessories kit	Symbio 800 accessories kit	Per unit

Additional Instructions

Compressor contactors are condenser fan optional offerings are available.

Wiring

The table below lists applicable wiring diagrams. Wiring diagrams are available in e-Library, and provide detailed wiring information, including sensors, compressor contactors, and other electrical components.

Table 21. RTAF unit wiring drawing numbers

Drawing	Description
RTAF Unit sizes 115 to 270 tons	
2311-5911	Schematic diagram – 115 to 270 ton units
5722-9582	Panel component location diagram – 115 to 270 ton units
5722-7580	Unit component location – 115 to 270 ton units
5722-9573	Field wiring – 115 to 270 ton units
5722-9579	Field wiring – 115 to 270 ton units
RTAF Unit sizes 280 to 520 tons	
2311-5913	Schematic diagram – 280 to 520 tons
5722-9583	Panel component location diagram – 280 to 520 ton units
5722-7905	Unit component location – 280 to 520 ton units
5722-9574	Field wiring – 280 to 520 ton units
5722-9580	Field layout – 280 to 520 ton units

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