



Installation Instructions

Condenser Fan Control Retrofit

RTAA Air-Cooled Chillers and
RTAC Air-Cooled Condensers
Kits CNT07652 and CNT07653

Model Numbers: RTAA, RTCA

This document applies to service offering application only.

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.



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.

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Revision History

Document updated to reflect Service Offering number.



Table of Contents

General Information	5
Kit Selection and Contents	5
Field-Provided Material	6
Pre-Installation	8
Control Panel Modifications	10
Removal of Existing Controls	10
New Drive Installation	10
EPROM Installation	11
Wiring	12
General Start-Up Review	13
Entering Drive Parameters	13
Optional Drive Parameter Copy Procedure ..	14
Verify Fan Function	14



General Information

Read this manual thoroughly before operating or servicing this unit.

The purpose of this bulletin is to advise customers of the parts and procedures required to replace the variable speed drive originally used to control condenser fans in RTAA and RTCA units. These parts were present on 70 to 125 ton, RTAA chillers and RTCA condensers when ordered with the low ambient operation option. The original drive will be phased out, and the parts mentioned below will be the most up-to-date and cost effective substitutes.

Notes:

- *This upgrade has been designed for units in good working order. It is assumed that unit is charged with the correct amount of refrigerant and oil. Review all coils, fan blades, starters, and controls to determine if any other service procedures are required during equipment downtime.*
- *RTCA condensers are most commonly paired with RTUA chillers. These instructions have been written for this configuration.*

Kit Selection and Contents

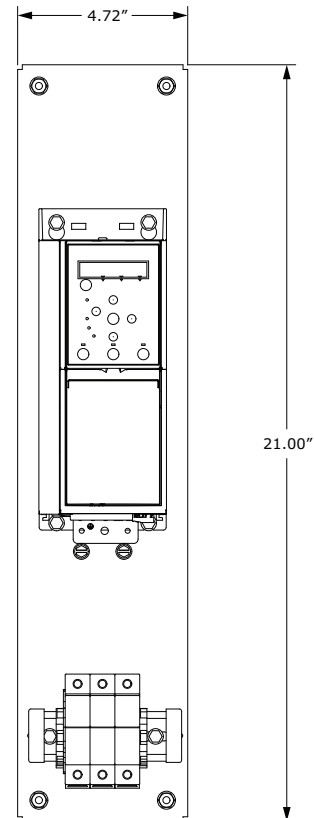
Obtain the required parts from the local Trane Parts Center. If the specific part number cannot be determined, contact the local Trane Parts Center with the unit model number or serial number. Two kits are available. Select the correct drive replacement kit based on the existing unit voltage per [Table 1](#) below. In addition to the correct drive replacement kit, some additional field-provided material will be required. See "[Field-Provided Material](#)," [p. 6](#) for a suggested list of materials.

Table 1. Kit selection

Unit Voltage	Kit Part Number	Kit Description
200/60/3 230/60/3	CNT07653	RTAA Fan Drive Retrofit 230V
380/60/3 400/50/3 460/60/3 575/60/3	CNT07652	RTAA Fan Drive Retrofit 460V

Each kit consists of an assembly and several loose parts. The assembly includes a variable speed drive and associated components mounted to a back plate. See [Figure 1, p. 5](#) for physical dimensions and configuration. See [Table 2, p. 6](#) for a list of service parts. See [Table 3, p. 6](#) for a list of parts shipped loose.

Figure 1. Drive assembly





General Information

Table 2. Service parts

Device Designator	Part Description	Service Part Number	
		CNT07653 RTAA Fan Drive Retrofit 230V	CNT07652 RTAA Fan Drive Retrofit 460V
1U28	Variable Speed Drive	DRV03113	DRV03114
1F1 1F2 1F3	Drive Fusing	FUS01010 (30-A Fuse)	FUS01010 (30-A Fuse)

Table 3. Loose shipped parts

Reference	Part Number	Description	Qty	UOM
1	570922770100 (PNL20506)	Plate; Inverter Cover, (16 ga)	1	EA
2	X13500224070	Rail; DIN Terminal Block, 35 mm, 4.00 lg	1	EA
3	X13490948010	Terminal Block; 2P 20A 600V	4	EA
4	X13490948140	Pole Marking 1-10 Vert	1	EA
5	X13490948070	End Stop	2	EA
6	X13490948040	2P End Plate	1	EA
7	X45091639010	Cap; DIN Rail End	2	EA
8	SO-SVN049*-EN	Installation Instructions (16 pages, 8.5 x 11-in.)	1	EA
9	507118990001 (CNT07684)	AVNET Integrated Circuit 6400039050 - EPROM, UV 32KX8, CMOS 250 NS Vpp =12.5V -40 to 85C 28 DIP 27C256 Software – 6200005021	1	EA
10	X22010076080	Lock - 1/4, External Toothed	4	EA
11	X25020623250	Screw; M6x01 x 16, PH Thd Roll	4	EA
12	X22050228060	Washer; 0.265-in. ID x 0.500-in. OD, PL	4	EA
13	507119000001	Schematics; RTAA Fan Control Retrofit	1	EA

Tools Required

Common hand tools and hand-held power tools are required to perform the retrofit. A trained service technician with a well-stocked tool chest should have all of the necessary tools to perform the job. The following list is a sampling of the tools that one could expect to find inside the technician's tool chest:

- Electric drill and bit set
- Screwdrivers
- Wrenches
- Ratchet and socket set
- Nut driver set
- Wire cutter
- Wire stripper

The following special tools are also required to perform the retrofit:

- If possible, an EPROM extractor should be used to remove the existing EPROM. Suggested EPROM extractor is Digikey K158-ND. If an EPROM extractor is not available a small flat blade screwdriver may be used.

Field-Provided Material

Some field provided material will be required to perform the RTAA/RTCA fan controls retrofit. A partial list of material is provided here to help the technician plan ahead and to avoid material shortages at the job site.

- Wire, #16 AWG – Control wire will be required to make the connections between components.
- Wire markers will be required to identify field wiring.
- Wire nuts and splicers may be required if splicing wires in the control panel.
- Cable ties help to **clean up** wiring runs.
- Assorted fasteners for component mounting and/or relocation.
- Trane has determined that inverter duty motors provide a much more robust system when combined with variable speed drives. As with the previous drive, the fan motor should also be replaced with an inverter duty rated motor if it is not already an inverter duty rated motor. The service part numbers for RTAA/RTCA inverter duty motors are found in the table below. For additional help, contact the local Trane Parts Center with the unit model number or serial number.

- The fan drive retrofit kits have been sized to fit in the main RTAA control enclosure. Some existing components may need to be relocated. The standard RTCA control enclosure is not large enough for the drive retrofit kits. A separate enclosure is required for RTCA. PNL34974 is recommended. PNL34974 may optionally be used with RTAA if additional cabinet space is desired.
- When using a separate enclosure, such as PNL34974, additional mounting hardware may be required depending on the selected mounting location. Additional conduit, fittings, and wire will also be required.
- Previous applications of TR170 drives, including earlier versions of this kit, included a blanket heater and temperature control to protect the drives from low temperatures. This heater and control is no longer required and has been removed from this kit. These service parts, HTR16716 and CNT06627, may be purchased separately if desired.

Table 4. RTAA/RTCA fan motor part numbers

RTAA Design Sequence	RTCA Design Sequence	Motor Voltage	Motor Frequency	Standard Duty Motor	Inverter Duty Motor
A0 - L0	A0-E0	200-460/400	60/50	MOT06367	MOT14610
M0 - R0	F0-G0	200-230	60	MOT09903	MOT14016
		460/380-415	60/50	MOT09903	MOT14017
T0 and Later	H0 and Later	200-230	60	MOT12634	MOT14014
		460/380-415	60/50	MOT12636	MOT14015

Pre-Installation

WARNING

PPE for Arc/Flash Required!

Failure to wear appropriate PPE could result in death or serious injury.

On this unit, if the handle shield is cracked the circuit breaker could arc/flash when reset. To avoid being injured, technicians **MUST** put on all necessary Personal Protective Equipment (PPE), in accordance with NFPA70E for arc/flash protection, **PRIOR** to entering the starter panel cabinet.

This retrofit consists of replacing and installing components and wiring in the control panel and in an electrical enclosure under the condenser coil. See [Figure 2](#) and [Figure 3, p. 8](#) for examples of original drive mounting.

Figure 2. Original drive enclosure



Figure 3. Original drive installation

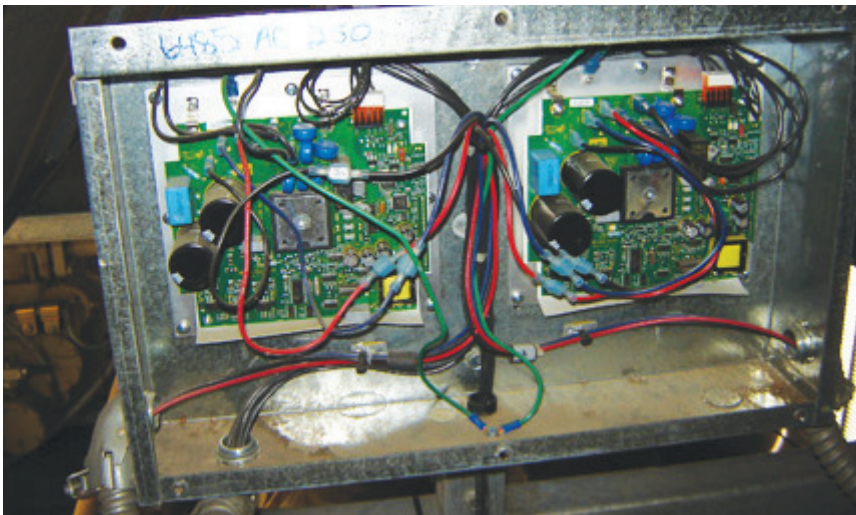
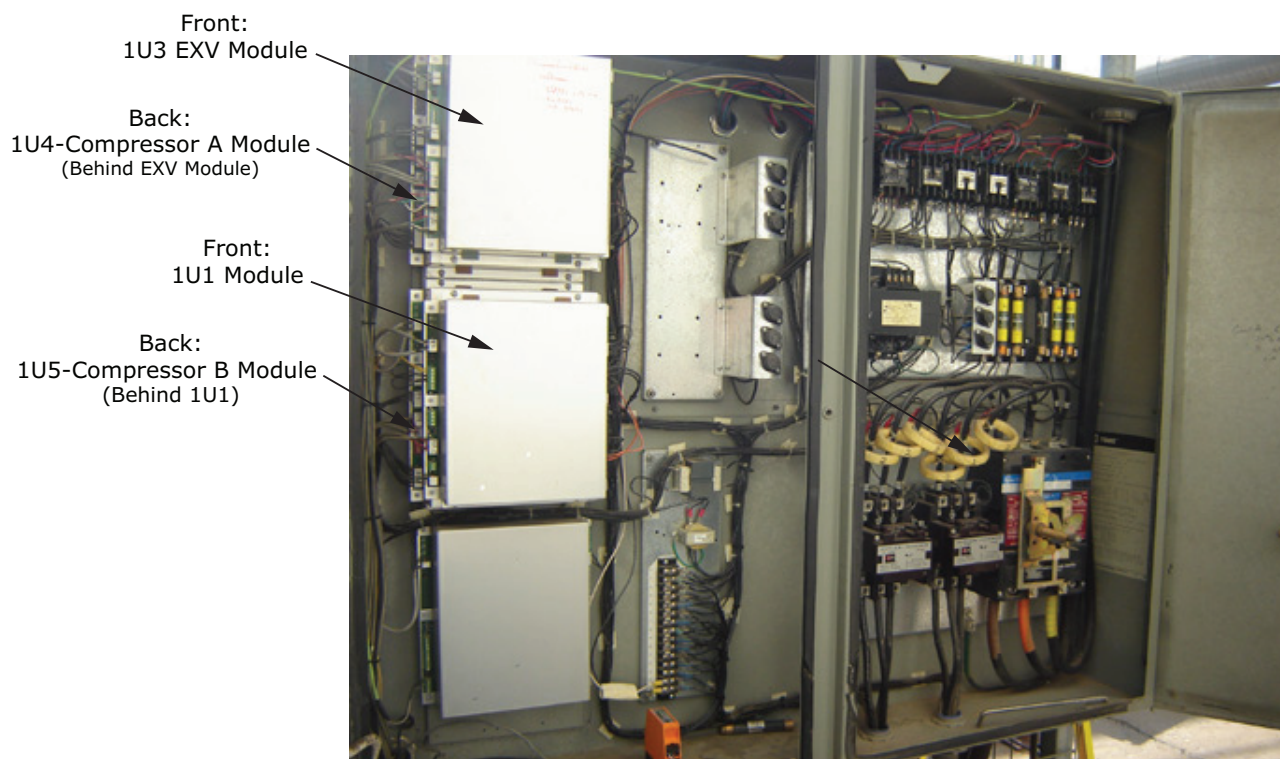


Figure 4. Typical RTAA control panel



⚠ WARNING

Hazardous Voltage w/Capacitors!

Failure to disconnect power and discharge capacitors before servicing could result in death or serious injury. Disconnect all electric power, including remote disconnects and discharge all motor start/run capacitors before servicing. Follow proper lockout/tagout procedures to ensure the power cannot be inadvertently energized. For variable frequency drives or other energy storing components provided by Trane or others, refer to the appropriate manufacturer's literature for allowable waiting periods for discharge of capacitors. Verify with a CAT III or IV voltmeter rated per NFPA 70E that all capacitors have discharged.

1. Turn off power to the machine, water pumps, and any field provided control power.
For RTCA units, also remove the power from the associate chiller (RTUA).
2. Secure all disconnect switches following lockout/tagout safety procedures.
3. Open the control panel doors and verify all power has been removed.
4. Remove any louvers or wire panels that may prevent access to the existing variable speed drives.
5. Verify the condenser fan motor is inverter duty rated. If it is not, replace the motor. See ["Field-Provided Material," p. 6](#) for motor identification.
6. Record the following information from the condenser fan motor nameplate. This information will be needed during drive configuration.
 - Motor Power
 - Motor Voltage
 - Motor Frequency
 - Motor Current
 - Motor Nominal Speed
7. If using a new additional enclosure, such as PNL34974, for drive mounting, select a convenient location and mount. Avoid mounting the enclosure under the condenser coil or in any location that would prevent access to other serviceable components.

Control Panel Modifications

⚠ WARNING

Hazardous Voltage w/Capacitors!

Failure to disconnect power and discharge capacitors before servicing could result in death or serious injury. Disconnect all electric power, including remote disconnects and discharge all motor start/run capacitors before servicing. Follow proper lockout/tagout procedures to ensure the power cannot be inadvertently energized. For variable frequency drives or other energy storing components provided by Trane or others, refer to the appropriate manufacturer's literature for allowable waiting periods for discharge of capacitors. Verify with a CAT III or IV voltmeter rated per NFPA 70E that all capacitors have discharged.

Removal of Existing Controls

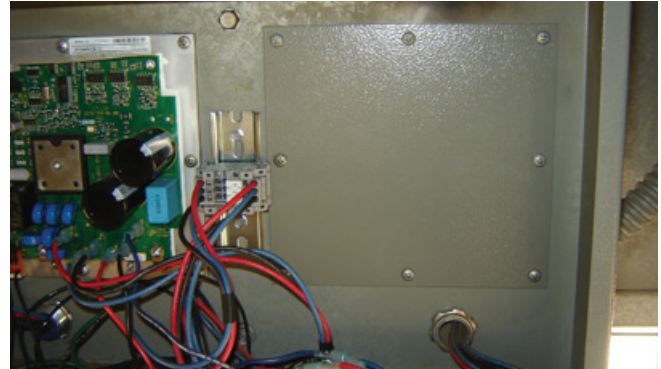
1. Locate original drive enclosure underneath the condenser coil. See [Figure 2, p. 8](#).
2. Remove the drive enclosure cover.
3. Remove the variable speed drive being replaced.
4. Speed and fault signal wiring may be pulled back into the control panel.
5. Locate the cover plate (PNL20506) in the loose parts of the kit.
6. Install the cover plate over the opening left by the drive.
7. Locate the DIN rail, DIN rail caps, terminal blocks, end plate, terminal labels, and end stops in the loose parts of the kit.
8. Mount the DIN rail and caps in a convenient location in the existing drive enclosure.
9. Mount the terminal blocks, end plate, terminal labels, and end stops onto the DIN rail. This terminal block may be labelled 2TB1.
10. The new drive in the control panel will require a direct ground connection from the motor to the drive. Run a new ground wire from the drive enclosure back to the control panel.
11. Connect the motor wires to the wires running back to the control panel. These wire are color coded. See [Table 5](#) for connections.

Table 5. Drive enclosure connections

Connection	Color	Description
2TB1-1	Red	L1
2TB1-2	Blue	L2
2TB1-3	Black	L3
2TB1-4	Green	GND

12. See [Figure 5](#) for an example of the drive enclosure with one drive removed.

Figure 5. Enclosure with original drive removed



13. Replace the enclosure cover.

New Drive Installation

1. Locate a convenient location in the control panel for installation. This may be a new enclosure such as PNL34974. The front of the drive will need to be accessible for entering drive parameters. The top and bottom of the drive require 4 inches of clear space for ventilation. The drive assembly must be mounted directly to the back of the enclosure to allow the door to close. Some existing components may need to be relocated. For example, 575-V units have an autotransformer that may be moved to under the panel mullion. This kit is for a single drive replacement, however the other drive may need to be replaced in the future. Leave enough space for another drive to be installed in the future.
2. Place the drive assembly in the desired location and mark locations for the drive assembly mounting holes on the back of the enclosure. Remove the assembly.
3. The following hardware is provided for mounting the drive assembly. Drill a 3/16-inch pilot hole at each marked location. Lift the assembly back into place and mount using the included hardware.

Part Number	Description	Qty	UOM
X22010076080	Lock - 1/4, External Toothed	4	EA
X25020623250	Screw; M6x01 x 16, PH Thd Roll	4	EA
X22050228060	Washer; 0.265 ID x 0.500 OD, PL	4	EA

Note: Field-provided hardware can be substituted, however, thread-rolling fasteners or sealing washers are required to prevent moisture from entering the control panel.

4. See [Figure 6](#) for an example of a mounted drive assembly inside an RTAA control panel.

Figure 6. Mounted drive assembly



EPROM Installation

NOTICE

Static Sensitive Components!

Static charge on the human body can regularly reach voltages of more than 12,000 volts. You **MUST** follow instructions below to reduce the risk of damage to the electronics. Before handling the module, discharge yourself by touching the panel sheet metal or use an anti-static wrist strap.

For RTAA units, the following controls work should be completed in the unit control panel. For RTCA units, the EPROM work needs to be completed in the RTUA control panel.

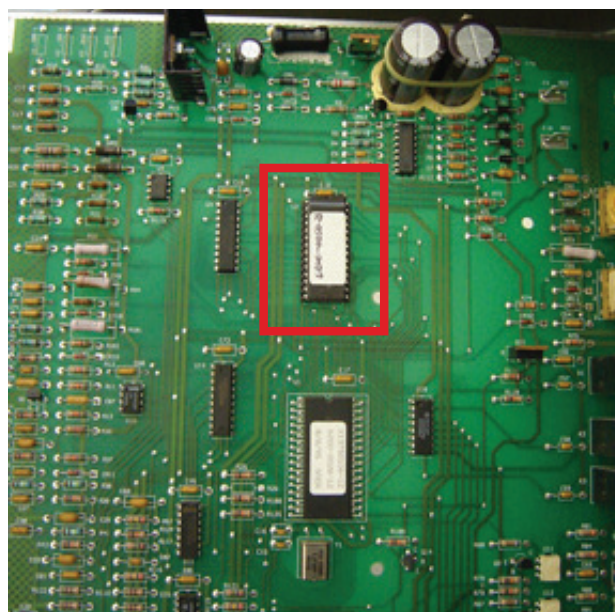
1. Record the software part number and extension found on the EPROM provided in the upgrade kit, before installing into the module. These numbers will be used later to verify the correct EPROM was installed.
2. Disconnect power from the compressor module.
3. Before handling the compressor module, discharge yourself by touching the panel sheet metal or use an anti-static wrist strap.

Important: See [Figure 4, p. 9](#) for module locations. Compressor modules 1U4 and 1U5 are located **BEHIND** other modules.

4. Remove 1U4 (compressor A) and 1U5 (compressor B) modules from the panel. The modules have key holes so the mounting screws need only be loosened but not removed. Note where the various wires are plugged into the module connectors. The plugs may be labeled to avoid confusion when reconnecting. If the module is beneath another, the connectors on just one side of the upper module may be removed and the module hinged out to access the lower module.

5. Place the module on a conductive bench, i.e. metal surface. While working, you and the module must be in contact with the bench to avoid you or the module from developing a damaging static discharge.
6. Remove the fish paper insulator.
7. Remove the screws securing the PCB assembly to the sheet metal cover. The screws are located under the fish paper. Touch the screw driver to the metal bench before use to avoid a damaging static discharge to the module.
8. There are eight #6-32 screws located under the compressor module. Remove all eight.
9. The EPROM is the chip that is installed in the socket. It is designated as U2 on the compressor module. This is shown below in [Figure 7](#).
10. Note the orientation of EPROM before removing. The notch in the EPROM should line up with the notch in the socket and the notch drawn in the outline on the PCB.

Figure 7. EPROM location



11. Touch the screw driver used to remove the EPROM to the metal bench before use to avoid a damaging static discharge to the module. The screwdriver must be a small blade type with a 1/8 to 3/16-inch blade.
12. Remove the EPROM by inserting a small blade-type screwdriver between the EPROM and socket. Keep the blade near either row of pins of the EPROM since the socket has no bottom in its center. The screwdriver could damage the PCB if it enters this center region. Avoid contacting the screwdriver to other components. Pry the EPROM up, trying not to bend any pins. Work the screw driver further under the EPROM keeping the blade snug to the row of pins.
13. Lift the EPROM from its socket.



Control Panel Modifications

14. Install the new EPROM. Align the notch in the EPROM to the notch in the socket and on the PCB as the original EPROM was. Make sure that the PCB assembly is lying flat on the bench surface when pressing down on the EPROM. Press the EPROM firmly into place.
15. Inspect the EPROM and the socket to make sure that all pins are lined up and inserted correctly. Verify that there are no bent pins.
16. Install the sheet metal cover and fish paper. Torque screws 8 in-lbs minimum and 11 in-lbs maximum.
17. Install the module.
18. Verify that all of the connections are correct and that the mounting screws are tight.
19. The EPROM includes a sticky label that indicates the replacement of the EPROM. Apply the label to the outside of the compressor module. This will alert a technician that a replacement EPROM will need to be ordered in the event of module replacement.

Wiring

⚠ WARNING

Hazardous Voltage w/Capacitors!

Failure to disconnect power and discharge capacitors before servicing could result in death or serious injury. Disconnect all electric power, including remote disconnects and discharge all motor start/run capacitors before servicing. Follow proper lockout/tagout procedures to ensure the power cannot be inadvertently energized. For variable frequency drives or other energy storing components provided by Trane or others, refer to the appropriate manufacturer's literature for allowable waiting periods for discharge of capacitors. Verify with a CAT III or IV voltmeter rated per NFPA 70E that all capacitors have discharged.

Power wiring, motor wiring, and drive signal wiring all must be relocated from the fan contactor and drive fuses to the new drive assembly. [Table 6](#) indicates the wiring connections that must be made. Remove any existing wiring from terminals being reused.

Note:

- Wire numbering may vary from unit to unit. Wire identification numbers are provided for reference only, and must be verified in the field. Refer to the included kit schematics for a more detailed description of kit wiring.
- Replacement drives utilize a dry contact as an **ENABLE** signal. Connecting any external voltage source to drive terminals 12 or 18 will result in damage to the drives. When using a contactor to enable a drive, remove all existing wires connected to the line and load terminal before connecting these terminals to the drive. Use an individual pole as the **ENABLE** signal.

Table 6. Wiring connections

Replacing Circuit 1 Drive		Replacing Circuit 2 Drive		To Drive Assembly Connection
Wire Identification	From Existing Unit Connection	Wire Identification	From Existing Unit Connection	
20A, 44B, or 47A ^(a)	1F1 or 1T10-X1 ^(a)	23A, 50B, or 53A ^(a)	1F4 or 1T11-X1 ^(a)	1F1
21A, 45B, or 48A ^(a)	1F2 or 1T10-X2 ^(a)	24A, 51B, or 54A ^(a)	1F5 or 1T11-X2 ^(a)	1F2
22A, 46B, or 49A ^(a)	1F3 or 1T10-X3 ^(a)	25A, 52B, or 55A ^(a)	1F6 or 1T11-X3 ^(a)	1F3
Red	2TB1-1 (3B2[RED])	Red	2TB1-1 (4B2[RED])	1U28-96 (U)
Blue	2TB1-2 (3B2[BLU])	Blue	2TB1-2 (4B2[BLU])	1U28-97 (V)
Black	2TB1-3 (3B2[BLK])	Black	2TB1-3 (4B2[BLK])	1U28-98 (W)
Field Provided	2TB1-4 (Motor Ground)	Field Provided	2TB1-4 (Motor Ground)	1U28-99 (PE)
29A or 29C	1U4-J9-6 or 1TB9-1	36A or 36C	1U5-J9-6 or 1TB9-5	1U28-53 (Speed)
56A or 59C	1U4-J9-5 or 1TB9-2	57A or 57C	1U5-J9-5 or 1TB9-6	1U28-55 (Common)
30A or 30C	1U4-J9-4 or 1TB9-3	37A or 37C	1U5-J9-4 or 1TB9-7	1U28-03 (Alarm)
31A or 31C	1U4-J9-3 or 1TB9-4	38A or 38C	1U5-J9-3 or 1TB9-8	1U28-01 (Alarm)
Field Provided	1K9-L1	Field Provided	1K13-L1	1U28-12 (+24VDC)
Field Provided	1K9-T1	Field Provided	1K13-T1	1U28-18 (Enable)

(a) 575V units only.

General Start-Up Review

1. When all components have been mounted and wired, close all electrical enclosures.
2. Restore machine power.
3. Place the unit in **STOP** to prevent unintended operation.

⚠ WARNING

PPE for Arc/Flash Required!

Failure to wear appropriate PPE could result in death or serious injury.

On this unit, if the handle shield is cracked the circuit breaker could arc/flash when reset. To avoid being injured, technicians **MUST** put on all necessary Personal Protective Equipment (PPE), in accordance with NFPA70E for arc/flash protection, **PRIOR** to entering the starter panel cabinet.

4. Open the cover or door over the drive and verify the drive has powered up.

Note: The drive cooling fan may be operating, even if the unit is in standby mode.

5. Proceed to entering drive parameters.

Entering Drive Parameters

Drives are shipped with generic settings. These setting must be updated to reflect the drive application. [Table 7](#) lists the drive parameters that must be changed for correct operation.

Notes:

- Pressing the **MENU** button once will enter the drive parameter wizard. The parameter wizard does not access all the required parameters.
- To access ALL parameters, press the **MENU** button twice.
- The parameters are set by different levels. Click OK to access Level 1 and Level 2.
- The default setting for Parameter 5-12 will cause a drive error. Parameter 5-12 **MUST** be set to **(0) No Operation**.

Table 7. Drive parameters

Level 1	Level 2	Level 3	Description	Settings
0 - **	0-0	0-03	Regional settings	North America
		0-06	Grid Type	Unit Voltage
	0-4	0-40 ^(a)	[Hand on] Key on LCP	(0) Disable
1 - **	1-2	1-20	Motor Power	---HP ^(b)
		1-22	Motor Voltage	---V ^(b)
		1-23	Motor Frequency	--Hz ^(b)
		1-24	Motor Current	--A ^(b)
		1-25	Motor Nominal speed	--rpm ^(b)
	1-7	1-71	Start Delay	3 s ^(b)
		1-72	Start function	(0) DC Hold
		1-73	Flying start	(1) Enable
		1-8	Min speed	0.1 Hz
	1-9	1-90	Motor Thermal Protection	(4) ETR Trip 1
2 - **	2-1	2-10	Brake Function	(0) Brake Function Off
3 - **	3-0	3-02	Minimum Reference	0
		3-03	Maximum Reference	50/60 ^(c)
	3-4	3-41	Ramp 1 Ramp Up time	5 s
		3-42	Ramp 1 ramp Down Time	20 s
4 - **	4-1	4-10	Motor Speed Direction	(0) Clockwise
		4-12	Motor Speed Low Limit	3 Hz
		4-14	Motor Speed High Limit	50/60 Hz ^(c)
		4-18	Current Limit	140%
5 - **	5-1	5-12 ^(d)	Terminal 27 Digital Input	(0) No Operation
	5-4	5-40	Function Relay	(0) Alarm (9)
6 - **	6-1	6-10	Terminal 53 Low Voltage	0 V
		6-14	Terminal 53 Low Ref/Feeb Value	0
		6-15	Terminal 53 High Ref/Feeb. Value	50/60 ^(c)
14 - **	14-0	14-01	Switching Frequency	5 KHz
	14 - 1	14-12	Function at mains Imbalance	(3) De-Rate
	14-2	14-20	Reset Mode	(10) Auto Reset x 10
		14-21	Automatic Restart Time	30 s
	14-5	14-50	RFI Filter	(0)

(a) Parameter 0-40 may be enabled for drive/rotation troubleshooting.

(b) Parameters are from motor nameplate.

(c) Use when the frequency is either 50 or 60 Hz.

(d) The default setting for parameter 5-12 will cause a drive error. Parameter 5-12 must be set to **(0) No Operation**.



General Start-Up Review

Optional Drive Parameter Copy Procedure

If chiller has multiple drives, the following procedure can be used to copy parameter settings from one drive to another.

Note: [Step 2](#) can also be used to backup drive parameter settings.

1. Program first drive (#1) per [Table 7, p. 13](#).
2. On the programmed drive, upload data to the local control panel (LCP #1) as follows:
 - a. Go to 0-50 LCP copy.
 - b. Press [OK].
 - c. Select All to LCP.
 - d. Press [OK]. A progress bar shows the uploading process.
 - e. Press [Hand on] to return to normal operation.
3. Remove LCP #1 from programmed drive (#1).
4. Replace LCP on drive to be programmed (#2), with LCP #1, removed from drive #1.
5. Download data onto drive #2 as follows:
 - a. Go to 0-50 LCP copy.
 - b. Press [OK].
 - c. Select All from LCP.
 - d. Press [OK]. A progress bar shows the downloading process.
 - e. Press [Hand on] to return to normal operation.
6. Remove LCP #1 and reinstall LCP #2 on drive #2.
7. Repeat [Step 4](#) through [Step 6](#) for any additional drives to be programmed.
8. Reinstall LCP #1 on drive #1.

- b. Secure all disconnect switches following lockout/tagout safety procedures.

WARNING

Hazardous Voltage w/Capacitors!

Failure to disconnect power and discharge capacitors before servicing could result in death or serious injury. Disconnect all electric power, including remote disconnects and discharge all motor start/run capacitors before servicing. Follow proper lockout/tagout procedures to ensure the power cannot be inadvertently energized. For variable frequency drives or other energy storing components provided by Trane or others, refer to the appropriate manufacturer's literature for allowable waiting periods for discharge of capacitors. Verify with a CAT III or IV voltmeter rated per NFPA 70E that all capacitors have discharged.

- c. Open the control panel doors and verify all power has been removed.
 - d. Switch the blue and black wire at the drive terminals.
 - e. Restore unit power.
 - f. Return to [Step 1](#).
4. Increase speed and verify the fan operates over the full speed range.
 5. Return drive to **AUTO** mode.

Note: Change parameter 40 to **Disable**.
 6. Close the control panel.
 7. Return the machine to standard operating condition.

Verify Fan Function

WARNING

Rotating Components!

Failure to disconnect power before servicing could result in rotating components cutting and slashing technician which could result in death or serious injury. During installation, testing, servicing and troubleshooting of this product it may be necessary to work with live and exposed rotating components. Have a qualified or licensed service individual who has been properly trained in handling exposed rotating components, perform these tasks.

1. Place the drive in **HAND** mode.

Note: Parameter 40 will need to be enabled.
2. Turn the fan to low speed.
3. Observe the fan rotational direction.
 - a. If the fan rotates in the wrong direction, turn off power to the machine, water pumps, and any field provided control power.

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