



Installation Instructions

Condenser Fan Control Retrofit

RTAC Air-Cooled Chillers

Kits CNT07650 and CNT07651

Model Number: RTAC

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.



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General Information

Important: Read this manual thoroughly before operating or servicing this unit.

The purpose of this document is to advise customers of the parts and procedures required to replace the variable speed drive originally used to control condenser fans in RTAC units built prior to end of 2011 (design sequence A0 - V0). These parts were present on RTAC chillers when ordered with the low and wide ambient operation options. The retrofit closely matches the most current design sequence for RTAC chillers. 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.
- For units with 3 or 4 compressors, the retrofit can be done on a single circuit. Both circuits do not have to be changed unless needed.

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, p. 5](#) below. In addition to the correct drive replacement kit, some additional field-provided material will be required. See ["Field-Provided Material," p. 7](#) for a suggested list of materials.

Table 1. Kit selection

Unit Voltage	Kit Part Number	Kit Description
200/60/3 230/60/3	CNT07651	RTAC Fan Drive Retrofit 230V
380/60/3 400/50/3 460/60/3 575/60/3	CNT07650	RTAC 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. 6](#) for physical dimensions and configuration. See [Table 3, p. 6](#) for a list of service parts. See [Table 4, p. 7](#) for a list of parts shipped loose.

Device Designator Information

The device designators for the kits will differ from the device designators of the existing unit controls. Also, the same device designators will be used differently depending on application. This is true for the drives and all other supporting components. Refer to the table below for examples of original device designators and replacement device designators. A complete list of device designators and how they connect to existing equipment can be found in the schematics (507118960001) included in the kit.

Table 2. Device designator

Application Description	VFD Device Designator	
	Original	Replacement
2-compressor RTAC	3U3	1U28
	4U3	2U28
3 and 4-compressor RTAC Circuit 1	3U3	1U28
	3U4	2U28
3 and 4-compressor RTAC Circuit 2	4U3	1U28
	4U4	2U28



General Information

Figure 1. Drive assembly

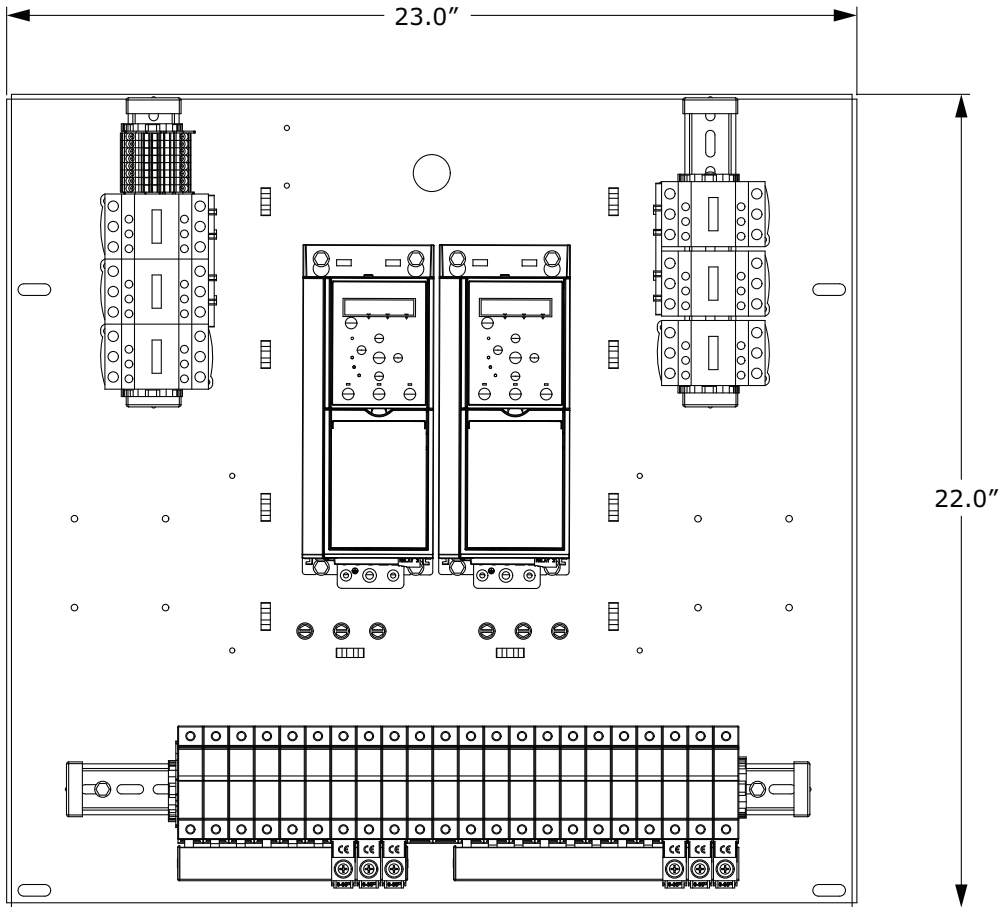


Table 3. Service parts

Device Designator	Part Description	Service Part Number	
		CNT07651 RTAC Fan Drive Retrofit 230V	CNT07650 RTAC Fan Drive Retrofit 460V
1U28	Variable Speed Drive – Circuit 1	DRV03113	DRV03114
2U28	Variable Speed Drive – Circuit 2	DRV03113	DRV03114
1F1-6, 1F7-12	Condenser Fan Fuses	FUS01010 (30-A CC Fuse) 200, 230 V	FUS01010 (30-A CC Fuse) 380, 400, 460, 575 V
1F13-14	Control Power Transformer Primary Fuses	FUS01386 (10-A CC Fuse) – 200 V FUS01752 (8-A CC Fuse) – 230 V ^(a)	FUS02275 (5-A CC Fuse) – 380, 400, 460 V ^(a) FUS02272 (4-A CC Fuse) – 575 V
1F15	Control Power Transformer Secondary Fuse, 115-V Circuit	FUS01386 (10-A CC Fuse) 200, 230 V	FUS01386 (10-A CC Fuse) 380, 400, 460, 575 V
1F16	Control Power Transformer Secondary Fuse, Low Voltage Circuit	FUS02275 (5-A CC Fuse) 200, 230 V	FUS02275 (5-A CC Fuse) 380, 400, 460, 575 V
1F18-23	Inverter Drive Fuses	FUS01010 (30-A CC Fuse) 200, 230 V	FUS01010 (30-A CC Fuse) – 380, 400, 460 V ^(a) FUS02279 (6-A CC Fuse) – 575 V
1K10-1K12, 1K14-1K16	Condenser Fan Contactors	CTR02006	CTR02708

(a) As-shipped configuration.

Table 4. Loose shipped parts

Reference	Part Number	Description	Qty	UOM
1	BRD04873	Module; Dual Binary Input, UCP3	1	EA
2	BRD04875	Module; Analog I/O, Dual, CH530, Vertical Headers	1	EA
3	SO-SVN051*-EN	Installation Instructions (20 Pages 8.5-in. x 11-in.)	1	EA
4	570922770100	Plate; Inverter Cover, (16 GA) -RTAC	2	EA
5	X13500224070	Rail; Din Terminal Block, 35 mm, 4.00 LG	1	EA
6	X13490948010	Terminal Block; 2P 20A 600 Volt	8	EA
7	X13490948140	Pole Marking 1-10 Vert	1	EA
8	X13490948070	End Stop	2	EA
9	X13490948040	2P End Plate	2	EA
10	X13110674140 ^(a)	Fuse; Class CC, FNQ-R, Type, 10 Amp, 600 Volt	2	EA
11	X45091639010	Cap; Din Rail End	2	EA
12	507118960001 Rev C or most current	Schematics; RTAC Fan Control Retrofit	1	EA
13	X13110674100 ^(b)	Fuse; Class CC, FNQ-R, Type, 4 Amp, 600 Volt	2	EA
14	X13110674120 ^(b)	Fuse; Class CC, FNQ-R, Type, 6 Amp, 600 Volt	6	EA
15	531400880100 ^(b)	Guard; 575V Auto Transformer	2	EA
16	X25020740010 ^(b)	Screw; Hex Head M4X10	4	EA

^(a) CNT07651 only.

^(b) CNT07650 only.

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:

- Computer having the latest version of TechView™ service software.
- Cable to connect DynaView™ to a PC. Use a factory approved and tested USB-to-serial cable (Trane part number ADP01161). The Rover Adapter service tool provides the most reliable connection.
- RS-232 male DB9 to female DB9 pin to pin serial cable.
Note: *Cable must not be a null-modem cable. Cable must be less than 50 feet in length.*
- Magnetic screwdriver (South-pole magnet TOL01341).
- Crimping tool for barrel-crimped wire terminals.
- Rotary tool with cutting wheel.

Field-Provided Material

Some field provided material will be required to perform the RTAC 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.
- The 575V units require the reuse of the existing autotransformers (1T10 and 1T11 or 2T10 and 2T11). If the autotransformers are damaged or missing, order replacements. The service part number is TRR00957.
- Trane has determined that inverter duty motors provide a much more robust system when combined with variable speed drives. The fan motor should be replaced with an inverter duty rated motor if it is not already an inverter duty rated motor. The service part number for RTAC inverter duty motors are provided in the table below. For additional help, contact the local Trane Parts Center with the unit model number or serial number.
- 4-compressor units and circuit 1 of 3-compressor units use a single LLID relay to enable both drives on a circuit. Previous RTAC designs used an upstream contactor or paralleled enable signals to start the drives. Neither of



General Information

these configurations are applicable to the TR170 drives. An additional relay with the following minimum specifications is required: 2 pole, normally open, 24-VDC contacts, and 120-VAC coil. One of the fan contactors being replaced may be used, or relay RLY00636 and socket BAS00153 is recommended.

- 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 5. Inverter duty motor part numbers

Design Sequence	Motor Voltage	Motor Frequency	Open Dripproof Motor		Totally Enclosed Motor	
			Standard Duty Motor	Inverter Duty Motor	Standard Duty Motor	Inverter Duty Motor
A0 through N0	200-230	60	MOT10293	MOT14336 WIR04330 ^(a)	MOT10485	MOT14012 WIR04330 ^(a)
	460/380-415	60/50	MOT10294	MOT14337 WIR04330 ^(a)	MOT10483	MOT14013 WIR04330 ^(a)
P0 and V0	200-230	60	n/a	n/a	MOT12626	MOT14009
	380	60	n/a	n/a	MOT12627	MOT14010
	460/380-415	60/50	n/a	n/a	MOT12628	MOT14011

(a) Wire adapter WIR04330 only required on the first change out.

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 beneath the condenser coil behind the control panel(s) of each circuit. See [Figure 2, p. 9](#) and [Figure 3, p. 9](#) for examples of original drive mounting. Be aware that original chiller controls may include exposed energized bus bar and terminals. Disconnect power and follow all lockout/tagout procedures before controls mounting or wiring.

Figure 2. Original drive enclosure



Figure 3. Original drive installation

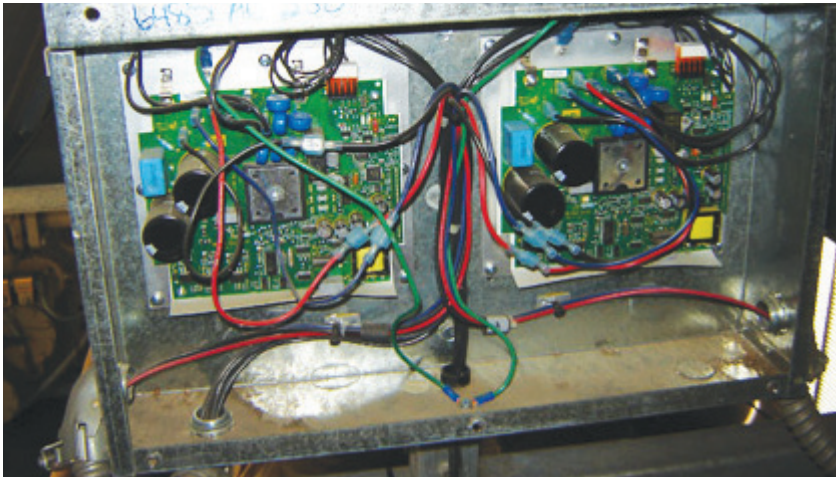
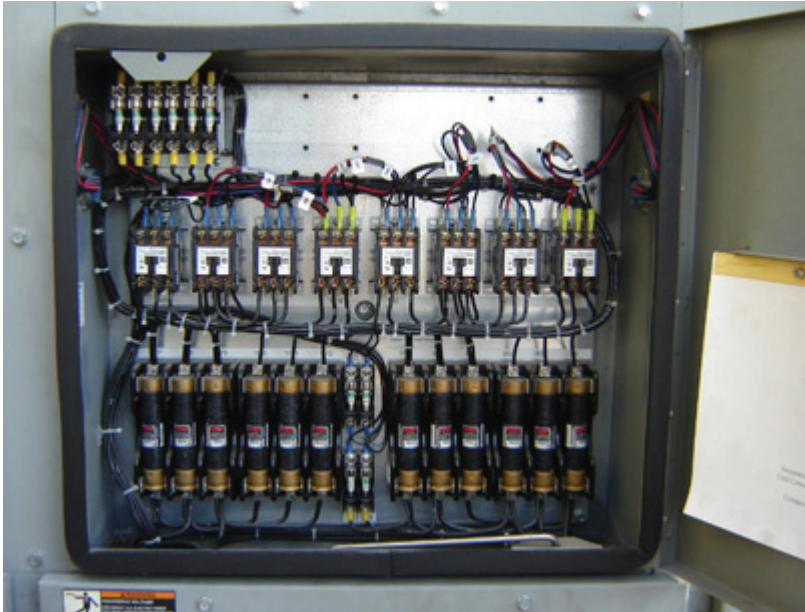


Figure 4. Typical RTAC fan control panel


⚠ 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. Connect a computer running TechView™ service software to the DynaView™ or EasyView™.
2. **Verify the unit is running the most updated chiller software.** If it is not, load the latest software.
Note: Minimum software version for retrofit is MP46.
3. If updated software was downloaded, run the chiller and verify no alarms are present on the CH530.
4. Turn off power to the machine, water pumps, and any field provided control power.
5. Secure all disconnect switches following lockout/tagout safety procedures.
6. Open the control panel doors and verify all power has been removed.
7. Remove any louvers or wire panels that may prevent access to the existing variable speed drives.

8. Verify the appropriate condenser fan motor(s) are inverter duty rated. If it is not, replace the motor(s). See [Table 5, p. 8](#) for motor identification.
9. 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

Control Panel Modifications

⚠ WARNING

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Removal of Existing Controls

1. Locate original drive enclosure underneath the condenser coil. See [Figure 2, p. 9](#).
2. Remove the drive enclosure cover.
3. Remove the variable speed drives being replaced.
4. Speed and fault signal wiring may be removed.
5. Locate the cover plates (PNL20506) in the loose parts of the kit.
6. Install the cover plates over the opening left by the drives.
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 labeled as device designator:
 - 3TB1 for 2-compressor units.
 - 3TB1 for 3- or 4-compressor units, circuit 1.
 - 4TB1 for 3- or 4-compressor units, circuit 2.
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 old drive enclosure back to the fan control panel.
11. Connect the motor wires to the wires running back to the control panel. These wires are color coded. See [Table 6, p. 11](#) for connections.

Table 6. Drive enclosure connections

Connection ^(a)	Color	Description
3TB1-1 or 4TB1-1	Red	Fan 1 - L1
3TB1-2 or 4TB1-2	Blue	Fan 1 - L2
3TB1-3 or 4TB1-3	Black	Fan 1 - L3
3TB1-4 or 4TB1-4	Green	Fan 1 - GND

Table 6. Drive enclosure connections (continued)

Connection ^(a)	Color	Description
3TB1-5 or 4TB1-5	Red	Fan 2 - L1
3TB1-6 or 4TB1-6	Blue	Fan 2 - L2
3TB1-7 or 4TB1-7	Black	Fan 2 - L3
3TB1-8 or 4TB1-8	Green	Fan 2 - GND

(a) See [Step 9](#) for terminal block device designation information.

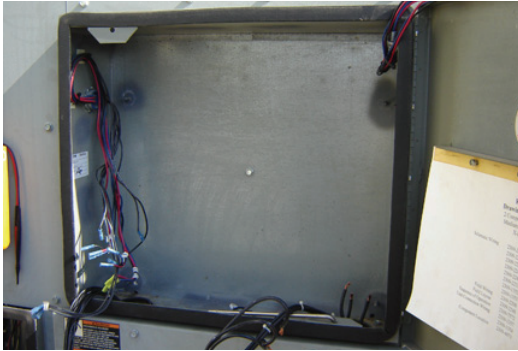
12. Replace the enclosure cover of the former VFD enclosure.
13. Open the fan control panel door. The new VFD(s) will be installed here.
14. The new drive assembly is deeper than the original controls. The document holder must be removed to prevent interference. Use a small cutting wheel to cut the welds holding the document holder to the door. See [Figure 5, p. 11](#) for an example of a control panel door with the document holder removed.

Figure 5. Fan control panel with document holder removed



15. Identify, label, and disconnect wires that will be reused. See [Table 6, p. 11](#) for a full list of reused connections. Wire numbers are provided for reference; however, the installer must verify this information for the unit being upgraded.
16. Remove the four nuts holding the controls assembly to the back of the panel.
17. Lift out the existing fan control assembly. See [Figure 6, p. 12](#) for an example of the control panel with controls removed.

Note: For 575V units, do not discard original autotransformers. These will be reused.

Figure 6. Fan control panel with controls removed


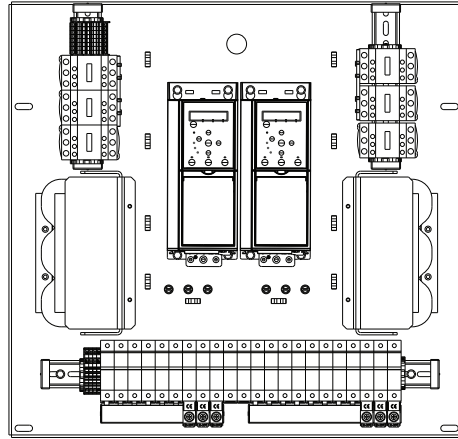
18. Open the lower left control panel door.
19. Locate the Dual Inverter Interface LLID (1U3).
20. Unplug 1U3 from the IPC Bus and remove the connected wiring.
21. Remove 1U3 from the LLID mounting back plate.

New Controls Installation

1. Lift the new controls assembly into the enclosure and align the mounting slots with the existing mounting studs.
2. Secure the assembly using the original mounting nuts.
3. See [Figure 7, p. 12](#) for an example of the new mounted fan control assembly.

Figure 7. Mounted fan control assembly


4. For 575-V units, the autotransformers from the original fan control assembly must be reused. For all other units, proceed to [Step 5](#).
 - a. Remove the autotransformers from the original fan control assemblies.
 - b. Using the original autotransformer mounting hardware, mount the autotransformer to the new fan control assembly. Predrilled holes are located below the contactor mounting rails. When mounting, face the wiring connections towards the center of the assembly. See [Figure 8, p. 12](#) for typical layout.

Figure 8. Typical layout


- c. Locate two 4-A fuses in the loose parts of the kit. Replace 1F13 and 1F14 with these fuses.
- d. Locate six 6-A fuses in the loose parts of the kit. Replace 1F18-1F23 with these fuses.
- e. Locate the two transformer guards and four M4 screws in the loose parts of the kit. These guards and mounting screws are intended to cover the exposed autotransformer wiring terminals. Set these parts to the side so that they may be installed after the parts are wired.
5. Locate the DUAL BINARY INPUT LLID (BRD04873) in the loose parts in the kit.
6. Install this LLID in an open spot on the LLID mounting back plate.
7. Label the LLID 1U26 if installed in control panel 1 or 2U26 if installed in control panel 2.
8. Plug 1U26 (control panel 1) or 2U26 (control panel 2) into the IPC Bus.
9. Locate the DUAL ANALOG I/O LLID (BRD04875) in the loose parts in the kit.
10. Install this LLID in an open spot on the LLID mounting back plate.
11. Label the LLID 1U27 if installed in control panel 1 or 2U27 if installed in control panel 2.
12. Plug 1U27 (control panel 1) or 2U27 (control panel 2) into the IPC Bus.
13. If installing this kit on a 4-compressor unit or circuit 1 of a 3-compressor unit, an addition relay is required. See ["Field-Provided Material," p. 7](#) for minimum requirements. One of the contactors being discarded may be reused for this purpose. Mount this relay on the controls backplate. Label the relay 1K20 if installed in control panel 1 or 2K20 if installed in control panel 2.

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 terminated on the new drive assembly. The same kit is used for all unit configurations. Refer to the original unit schematics and the schematics provided in the kit to determine which configuration is going to be used. [Table 7, p. 13](#) indicates the wiring connections that must be made.

Note: *Wire numbering may vary from unit to unit due to configuration and design sequence. 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.*

Table 7. Wiring connections

Wire Identification	From Existing Unit Connection	To Drive Assembly Connection
1E or 501E	Incoming Power Connection Device	1X1-1
2E or 502E	Incoming Power Connection Device	1X1-2
3E or 503E	Incoming Power Connection Device	1X1-3
1J, 1R, 4C, or 501R	Incoming Power Connection Device	1X2-1
2J, 2R, 5C, or 502R	Incoming Power Connection Device	1X2-2
3J, 3R, 6C, or 503R	Incoming Power Connection Device	1X2-3
3B3 or 4B3 (RED)	3TB1 or 4TB1-1	1TB8-1
3B3 or 4B3 (BLU)	3TB1 or 4TB1-2	1TB8-2
3B3 or 4B3 (BLK)	3TB1 or 4TB1-3	1TB8-3
3B3 or 4B3 (GND)	3TB1 or 4TB1-4	1TB8-4
3B13, 4B3, or 4B13 (RED)	3TB1 or 4TB1-5	1TB8-5
3B13, 4B3, or 4B13 (BLU)	3TB1 or 4TB1-6	1TB8-6
3B13, 4B3, or 4B13 (BLK)	3TB1 or 4TB1-7	1TB8-7
3B13, 4B3, or 4B13 (GRD)	3TB1 or 4TB1-8	1TB8-8
3B4, 3B13, 3B4, or 4B4 (RED)	CKT 1 or 2, FAN BANK 2	1K10-2
3B4, 3B13, 3B4, or 4B4 (BLU)	CKT 1 or 2, FAN BANK 2	1K10-4
3B4, 3B13, 3B4, or 4B4 (BLK)	CKT 1 or 2, FAN BANK 2	1K10-6
74A or 574A	1U15 or 2U15-J2-7	1K10-A1
63K or 563K	1TB5 or 2TB5-11	1K10-A2
3B4, 3B5, or 4B5 (RED)	CKT 1 or 2, FAN BANK 3	1K11-2
3B4, 3B5, or 4B5 (BLU)	CKT 1 or 2, FAN BANK 3	1K11-4
3B4, 3B5, or 4B5 (BLK)	CKT 1 or 2, FAN BANK 3	1K11-6
75A or 575A	1U15 or 2U15-J2-4	1K11-A1
63Q or 563Q	1K12-A2	1K11-A2
3B5, 3B6, 4B5, or 4B13 (RED)	CKT 1 or 2, FAN BANK 3 or 4	1K12-2
3B5, 3B6, 4B5, or 4B13 (BLU)	CKT 1 or 2, FAN BANK 3 or 4	1K12-4
3B5, 3B6, 4B5, or 4B13 (BLK)	CKT 1 or 2, FAN BANK 3 or 4	1K12-6
76A or 576A	1U15 or 2U15-J2-1	1K12-A1
63J or 563J	1K10-A2	1K12-A2
3B6, 4B4, 4B6, or 4B13 (RED)	CKT 1 or 2, FAN BANK 2 or 4	1K14-2
3B6, 4B4, 4B6, or 4B13 (BLU)	CKT 1 or 2, FAN BANK 2 or 4	1K14-4
3B6, 4B4, 4B6, or 4B13 (BLK)	CKT 1 or 2, FAN BANK 2 or 4	1K14-6
87A	1U20-J2-7	1K14-A1
63U	1TB5-13	1K14-A2
4B4 or 4B5 (RED)	CKT 2, FAN BANK 3	1K15-2
4B4 or 4B5 (BLU)	CKT 2, FAN BANK 3	1K15-4
4B4 or 4B5 (BLK)	CKT 2, FAN BANK 3	1K15-6



Control Panel Modifications

Table 7. Wiring connections (continued)

Wire Identification	From Existing Unit Connection	To Drive Assembly Connection
88A	1U20-J2-4	1K15-A1
63X	1K16-A2	1K15-A2
3B16, 4B5, 4B6, or 4B16 (RED)	CKT 1 or 2, FAN BANK 4	1K16-2
3B16, 4B5, 4B6, or 4B16 (BLU)	CKT 1 or 2, FAN BANK 4	1K16-4
3B16, 4B5, 4B6, or 4B16 (BLK)	CKT 1 or 2, FAN BANK 4	1K16-6
89A	1U20-J2-1	1K16-A1
63W	1K14-A2	1K16-A2
125A	1T1 or 2T1-H1	1F13
126A	1T1 or 2T1-H2	1F14
61A	1T1 or 2T1-X1	1F15
62A	1TB5 or 2TB5-1	1F15
116A	1T1 or 2T1-X4	1F16
117A	1U2 or 2U2-J2-2	1F16

In addition to the reused unit wiring, field provided wiring must be provided to connect the new drives to unit controls (LLIDS). LLID designators are provided for reference, but they may be different on the actual unit. See [Table 8, p. 14](#) and kit schematics for required control wiring. Remove any existing wiring from terminals being reused.

Note: 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 Quad Relay LLID to directly enable a drive, remove all existing wires connected to LLID terminals J2-10, 11, & 12 before connecting these terminals to the drive. When using an isolation relay to enable two drives on one circuit, use an individual pole for each drive.

Table 8. Field-provided drive control wiring

From		To		Note
Location	Description	Location	Description	
1U27-J2-1 or 2U27-J2-1	Analog I/O LLID	1U28-53	Drive 1 Speed Command	
1U27-J2-3 or 2U27-J2-3	Analog I/O LLID	1U28-55	Drive 1 Common	
1U27-J2-4 or 2U27-J2-4	Analog I/O LLID	2U28-53	Drive 2 Speed Command	
1U27-J2-6 or 2U27-J2-6	Analog I/O LLID	2U28-55	Drive 2 Common	
1U26-J2-1 or 2U26-J2-1	Digital Input LLID	1U28-01	Drive 1 Alarm	
1U26-J2-2 or 2U26-J2-2	Digital Input LLID	1U28-03	Drive 1 Alarm	
1U26-J2-3 or 2U26-J2-3	Digital Input LLID	2U28-01	Drive 2 Alarm	
1U26-J2-4 or 2U26-J2-4	Digital Input LLID	2U28-03	Drive 2 Alarm	
1U15 or 2U15-J2-12	Quad Relay LLID	1U28-12	Drive 1 +24 VDC	(a)
1U15 or 2U15-J2-10	Quad Relay LLID	1U28-18	Drive 1 Enable	(a)
1U20-J2-12	Quad Relay LLID	2U28-12	Drive 2 +24 VDC	(b)
1U20-J2-10	Quad Relay LLID	2U28-18	Drive 2 Enable	(b)
1U15 or 2U15-J2-12	Quad Relay LLID	1TB5-3, 1TB5-5, or 2TB5-3	120V Hot	(c),(d)
1U15 or 2U15-J2-10	Quad Relay LLID	1K20-Coil-1 or 2K20-Coil-1	Relay Coil	(c)
1K20-Coil-2 or 2K20-Coil-2	Relay Coil	1TB5-11, 1TB5-13, or 2TB5-11	120-V Neutral	(c)
1K20-1 or 2K20-1	Relay Contact 1	1U28-12	Drive 1 +24 VDC	(c)
1K20-2 or 2K20-2	Relay Contact 1	1U28-18	Drive 1 Enable	(c)
1K20-3 or 2K20-3	Relay Contact 2	2U28-12	Drive 2 +24 VDC	(c)
1K20-4 or 2K20-4	Relay Contact 2	2U28-18	Drive 2 Enable	(c)

- (a) 2-compressor and circuit 2 of 3-compressor units only.
- (b) 2-compressor units only.
- (c) 4-compressor and circuit 1 of 3-compressor units only.
- (d) This connection may be existing.

For 575V units, the autotransformers will need to be wired between the drive fusing and the drives. See [“New Controls Installation,” p. 12, Step 4](#) for details regarding the mounting of

the transformer. See [Table 9, p. 15](#) and kit schematics for details regarding transformer wiring. After wiring, mount the transformer guards included in the kit.

**Table 9. Field provided wiring modifications
for 575V units**

From Autotransformers Connection	To Drive Assembly Connection
1T10-H1 or 2T10-H1	1F18
1T10-H2 or 2T10-H2	1F19
1T10-H3 or 2T10-H3	1F20
1T10-X1 or 2T10-X1	1U28-91 (L1)
1T10-X2 or 2T10-X2	1U28-92 (L2)
1T10-X3 or 2T10-X3	1U28-93 (L3)
1T11-H1 or 2T11-H1	1F21
1T11-H2 or 2T11-H2	1F22
1T11-H3 or 2T11-H3	1F23
1T11-X1 or 2T11-X1	2U28-91 (L1)
1T11-X2 or 2T11-X2	2U28-92 (L2)
1T11-X3 or 2T11-X3	2U28-93 (L3)



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 "Binding," p. 16.

Note: For 3- or 4-compressor units, go to Configuration-Custom, and select the circuit you are modifying. Go to Variable Speed Fan Inverter Interface, and make proper selection.

- Upgraded Drive: Voltage Speed signal 0 to 10VDC
- Original Drive: Defined by manufacturing location (model number digit 9) and design sequence (model number digits 10,11).

Binding

Important: For 3- or 4-compressor units on which only once circuit was modified, the following steps should only be performed for the modified circuit.

1U26 and 1U27 must be bound to the unit controls for proper operations.

1. Connect a computer running Techview™ Service software to the Dynaview.
2. Enter the configuration view.
3. Locate the field **Variable Speed Fan Inverter Interface** and change the selection to **Voltage Speed Signal 0 to 10VDC**.
4. When all the configuration inputs are complete, click on the Load Configurations button at the bottom of the screen. The computer will go into think mode for a few seconds. Then a window called Binding View will pop up.

Note: The LLIDs appearing on this list are dependent on selections made previously in configuration.

5. Initially, 1U26 and 1U27 will show up as red frowning faces indicating they are unbound or not communicating.
6. Select the LLID to be bound and click on the Bind button in the task bar.
7. Locate the targeted LLID in the control panel, unit or starter and place the Trane provided magnetic screwdriver (South-pole magnet) near the LED under the SW1 arrow. The green LED turns on at the device.
8. Click **Yes** in the dialog box.

If the binding is successful, the red square changes to a green circle next to that LLID on the binding view menu.

If the wrong type of LLID was selected during this binding process, an error message appears. Check the LLID Type column entry to be sure it corresponds to the physical LLID you selected with your magnet.

9. Repeat [Step 6](#) through [Step 8](#) for the other LLID.
10. Record in the control panel the new model number and confirmation code generated by the controls. This information will be required in the event the Dynaview™ needs to be replaced in the future.

Entering Drive Parameters

Drives are shipped with generic settings. These setting must be updated to reflect the drive application. [Table 10](#) 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 to 12 will cause a drive error. Parameter 5 to 12 **MUST** be set to **(0) No Operation**.

Table 10. 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
		1-72	Start function	(0) DC Hold
		1-73	Flying start	(1) Enable
	1-8	1-82	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	380V -- 115% Other than 380V -- 125%
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 to 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 to 12 will cause a drive error. Parameter 5 to 12 must be set to **(0) No Operation**.

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 10, p. 17](#).
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.



General Start-Up Review

- 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.

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. Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized.

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.
 - 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. Verify wiring: U-Red, V-Blu, W-Blk. If wiring is correct, switch the blue and black wires 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. Connect the Dynaview™ to a computer running Techview™ Service Software.
8. Because fixed-speed fan wiring has been modified, each fan bank must be checked for correct rotational direction. Use **binding view** to turn on each fixed-speed fan bank. Each fixed-speed fan bank will run for a short time.
9. Observe each fan rotational direction.
 - a. If the fan bank rotates in the wrong direction, turn off power to the machine, water pumps, and any field provided control power.
 - 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 load side of the fan contactors.
- e. Restore unit power.
- f. Return to [Step 7](#).
10. Return the machine to standard operating condition.

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