



TRANE®

General Service Bulletin

Rockwell LF 2.0 Drives AFDE Service Pak upgrade

Order Number: CTV-SVB30A-EN

DATE: January 2007

Introduction

The purpose of this bulletin is to explain the Trane upgrade on CVHE/F with the Refrigerant cooled Rockwell Drives AFDE. The Field office will need to contact Rockwell to coordinate the retrofitting of the Drives in their area. This may be to schedule site visits to install necessary upgrade items, or for certain offices, to set up training visit. The Coordination of the site visits where Rockwell does the retrofits will be between the local Trane Office and Rockwell. We have identified which upgrades are to be installed on each drive.

NOTICE: Warnings and Cautions appear at appropriate sections throughout this literature. Read these carefully.

⚠ 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, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

CAUTION: Indicates a situation that may result in equipment or property-damage only accidents.

Units Affected

AFDE LF 2.0 Drives Shipped on CVHE/F Prior to Oct. 2006

Discussion

Trane and Rockwell have been working together to identify product enhancements areas. The intent of this retrofit bulletin is to identify which product changes are required on each LF 2.0 chiller and to give you instructions of how to complete the retrofit.



Previously the input of the drive, the Rectifier fired the IGBTs at 4 khz carrier frequency while the drive output, the inverter, fired the IGBTs at only 2 khz. The upgrade of the Line Carrier frequency synchronization will change the drive output, the inverter, to also fire at the 4 khz rate, and synchronize this firing to prevent the electrical disturbances identified in lab tests.

This upgrade involves two board replacements, plus a jumper wire addition, onto the right handle side of the Frame 3 (405 and 608amp) power module. Frame 4 has the hardware already.

With the hardware installed Rockwell / Trane will enable this feature. Trane has been shipping this hardware since approx mid July 2005; Trane began enabling this feature in Mid March 2006. Ref CTV-SVB26A-EN.

Additionally we intend to upgrade the CH530 Main processor software to current revision while on the site visit.

⚠ WARNING **Hazardous Voltage w/Capacitors!**

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 an appropriate voltmeter that all capacitors have discharged. Failure to disconnect power and discharge capacitors before servicing could result in death or serious injury.

Note: For additional information regarding the safe discharge of capacitors, see PROD-SVB06A-EN or PROD-SVB06A-FR

SECTION I

Upgrade Items to be performed in this retrofit:

Items 1, 2, 3 & 5 have to do with the Rockwell drive itself and item 4 has to do with the CH530 software upgrade. Depending on ship dates, some drives may require all three where others only two, or one.

Note:

- Frame 3 drives are 405 and 608 amp.
- Frame 4 drives are 850 and 1210 amps. Briefly the three items are:

Item 1. Frame 3 Drives: Install the Line Carrier frequency synchronization hardware KIT14713, and enable the synchronization feature. (Rockwell)

The Line Synch Retrofit Kit is TRANE KIT14713 .

Each kit consists of:

- KIT 14713
 1 pc 180063-A01 Rectifier Control Board
 1 pc 180064-A01 Inverter Control Board
 1 pc 180945-C01 Jumper Cable



1.1) on Frame 3 drives which already have the new control assy pcs the only firmware will be upgraded if necessary.

Item 2. Frame 3 Input Power Kit KIT14714. (Rockwell)

Each kit consisting of:

- KIT 14714
 1 pc 24797-033-03 MOV Assembly
 1 pc 149862 5 amp Control Fuse
 1 pc 181116-C04 1mfd Capacitor

Note: With each KIT14714 also order one door wiring diagram label LBL00278.





2.1) Install MOV and 1 uF cap to the 2A6 filter assembly. The purpose of a Metal Oxide Varistor and 1 micro farad capacitor are to dissipate electrical disturbances that could be harmful to the drive electronic components (such as IGBT).

2.2) additionally, only on Frame 3 (405 and 608amp) drives, we will upgrade to a 5 amp 2F3 fuse. The Fuse 2F3 was 4 amps and periodically this has been found to blow. This has been changed to 5 amps on Frame 3 Drives.

Item 3. Firmware Flashing. (Rockwell)

Firmware

All Drives: RECOMM Firmware 1.007.027.

TRANE RECOMM (LLID) firmware upgrade; the RECOMM printed circuit board is the communication device coordinating communications between the Drive and Trane CH530. This board also contains Default Drive setup parameters written to the drive upon power.

The following features are upgraded with Drive RECOMM Firmware;

3.1) This will enable the 4 kHz Rectifier carrier frequency as default, and will implement up AND when the Trane AFD Configuration is set to YES.

3.2) The Power loss reset time of 60 will also provide an anti cycle time equal to same setting. Default is 60 seconds. Short cycling has shown to cause over current conditions if the drive is only off line for 15 seconds or so as can happen with variable water flow applications and some water flow loss and power loss scenarios. The TechView adjustable setting will remain at 60 seconds but not provide the timing for two functions; power loss reset time, and the minimum time from drive stop to restart. The Chiller restart inhibit still can override this timer, if the free starts are consumed.

3.3) AFD Output Phase Loss: Changes the % current imbalance allowed to 20% from 15%, and time from 5 seconds to 9 seconds.

Frame 3 drives (405 and 608 amps) with factory installed line sync control PCBs shipped prior to June 2006: these PCB's need to have to firmware revision checked. Use the OIM to check the revision. (Note: Upgrade firmware on the Line Synchronization pcbs if necessary.)

3.4) LiquiFlo 2.0 Inverter Control PCB 1.008.039

3.5) Active Rectifier Control PCB 1.011.023

Note: After down load of Firmware(s), check that CH530 AF configuration states "Use Trane Defaults = Yes. If not, then change to Yes and load. With Yes loaded, then cycle power to drive so the ReComm powers up with Yes present which will load the new "hidden" parameters into the drive. Check that PI5I in the inverter now is set to 4K.

Step 4. Trane service

CH530 Dynaview main processor application download.

4.1) Down load version 9, or 10 if available, Main processor software into the Dynaview. (Do not continue operation with version 8 if installed.

Step 5. Visual inspections and checks (Trane)

- See Section V on intranet for illustrations

5.1) Filter capacitor fuses; Check for proper size. Check continuity with ohm meter

5.2) Check Precharge Contactor power wiring routing for sharp edges and any conductor insulation damage

5.3) Check the CH530 Diagnostics history using TechView for Drive instantaneous over current. Check Drive Faults for any DSAT faults.

Repair Summary

- Rockwell to visit site and do the Drive upgrade with Trane Assistance.
- Trane to do work if trained or prior experience doing Firmware downloading.
- Action

Parts

Note: PARTS Will BECOME AVAILABLE JAN, 2007

DO NOT ORDER PARTS PRIOR TO THEIR AVAILABILITY

Jobs that do not require parts can be upgraded prior to then; (ie Where Firmware and CH530 software upgrade, & visual checks only)

Order your required parts.

- KIT14713 Line Synch Retrofit Kit (Frame 3)
- KIT14714 Input Power Kit (Frame 3) & label LBL00278

Tools

Trane Tech view and cables. Rockwell VS utilities cable (TRANE KIT: KIT12151) KIT12151 = RECOMM-VSU232 . Contains the CD, RS-232 device, and necessary cables.



Questions

For general questions contact the CTV Technical Service department in La Crosse at 608-787-3943 or e-mail at TechService@trane.com.



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For more information contact your local district office or e-mail us at comfort@trane.com

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Trane has a policy of continuous product data and product improvement and reserves the right to change design and specifications without notice. Only qualified technicians should perform the installation and servicing of equipment referred to in this bulletin.