



Installation Guide

Variable Frequency Drive

Conversion TR1 to TR170

IntelliPak, CGAM, and RTAC only

Models:

120 to 500 ton (RTAC)

Drives:

DRV03113

DRV03114

▲ 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.



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:



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



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.



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-including industry replacements for CFCs and HCFCs such as saturated or unsaturated HFCs and HCFCs.

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.

<p style="text-align: center;">⚠ WARNING</p> <p>Proper Field Wiring and Grounding Required!</p> <p>Failure to follow code could result in death or serious injury.</p> <p>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.</p>
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⚠ 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 Labelling 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

- TR170 VFD Program Parameters section is moved to Set the VFD Programming Parameters chapter.
- Updated Modify Parameters section.
- Updated Reset Parameters Back to Factory Defaults section.



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General Information

About This Manual

The step-by-step instructions outlined in this manual describe the procedures required to successfully retrofit a Trane TR1 variable frequency drive (VFD) on RTAC™ air-cooled chillers to a Trane TR170 VFD. Drives are required for low and wide ambient operation. The Trane TR1 VFD was originally installed for RTAC design sequences W0 through 1C. An affected RTAC will have two, three, or four condenser fan drives. The number of drives will match the number of compressors. For example, a three-compressor RTAC will have three condenser fan drives.

The installation instructions in this manual are divided into three general topic areas:

- Removal of existing TR1 VFD.
- Installation of replacement TR170 VFD.
- TR170 programming of parameters.

Follow start-up and troubleshooting procedures outlined in the service manuals of the unit and/or the literature that is included with this TR170 control.

Tools Required

Very few tools are required to perform this installation. A service technician with a well-stocked tool chest should have the right tools to perform the job.

Removing the Existing VFD and Components

The section that follows describes the procedure used to remove a TR1 VFD from its panel assembly in the IntelliPak II, CGAM and RTAC main control panels.

Programming parameters are supplied with the VFD that must be set based on unit specifications. See "TR170 VFD Program Parameters," p. 14.

Remove the VFD from the Back Panel Assembly

1. Locate the existing TR1 VFD unit enclosure for Intellipak II, CGAM, and RTAC units as shown in the following figures.
2. Identify the correct VFD for replacement.

The IntelliPak II rooftops with low ambient option always have two condenser fan VFDs. CGAM and RTAC products could have up to 4 VFDs located in the main control box section. For the exact location of each VFD, please refer to the following figures.

Figure 1. Typical IntelliPak II 90 to 130 ton configuration

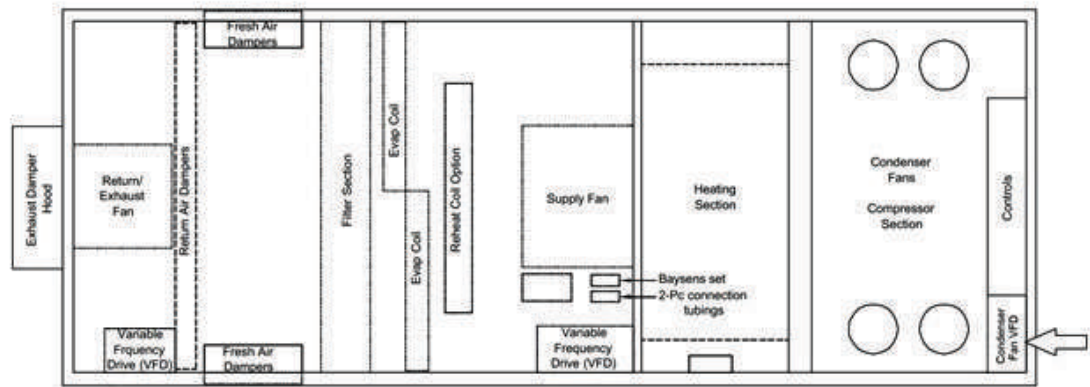


Figure 2. Typical Ipk II control panel illustration and low ambient option VFD location

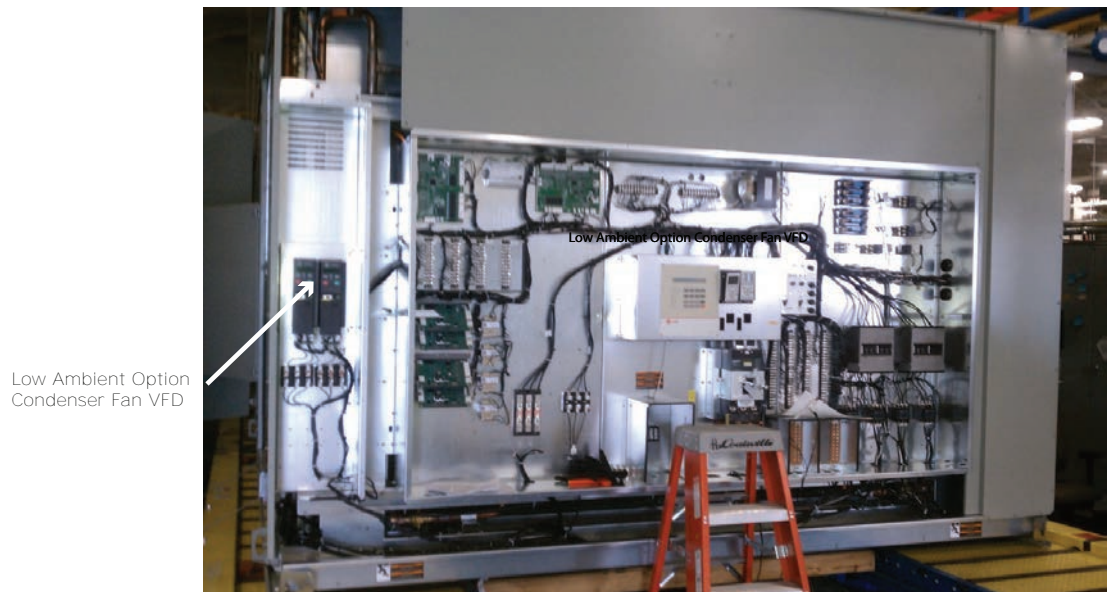


Figure 3. CGAM panel configuration

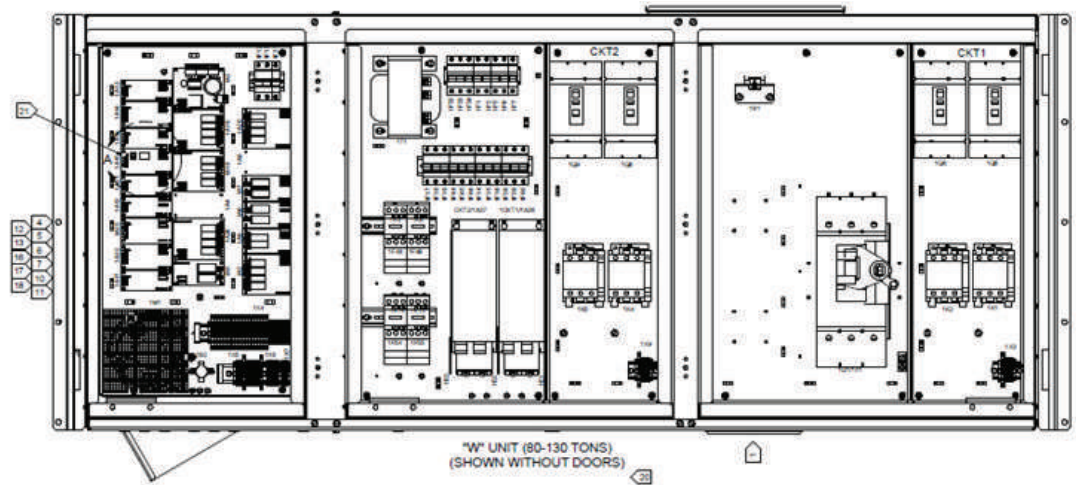


Figure 4. Typical CGAM 70 ton panel illustration and low ambient option VFD location

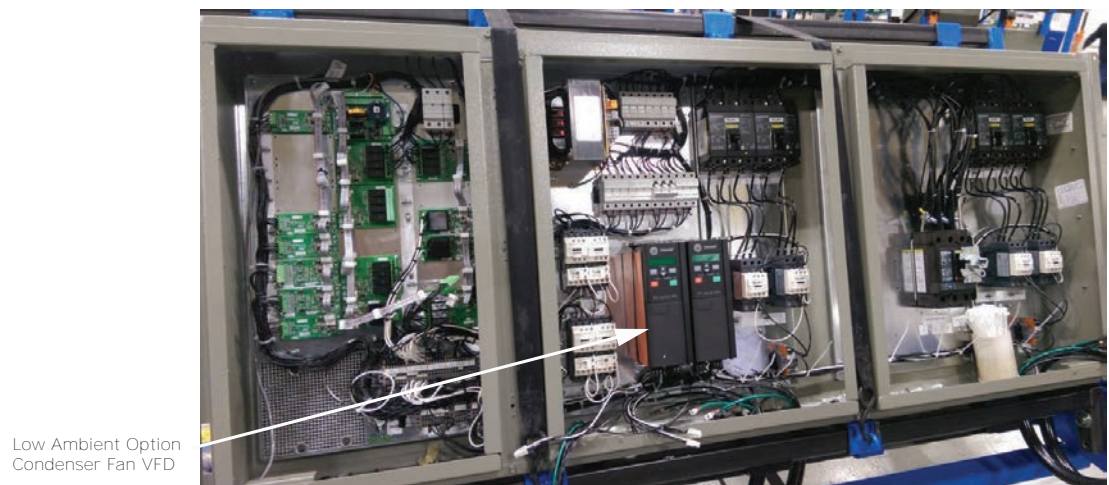


Figure 5. RTAC panel configuration

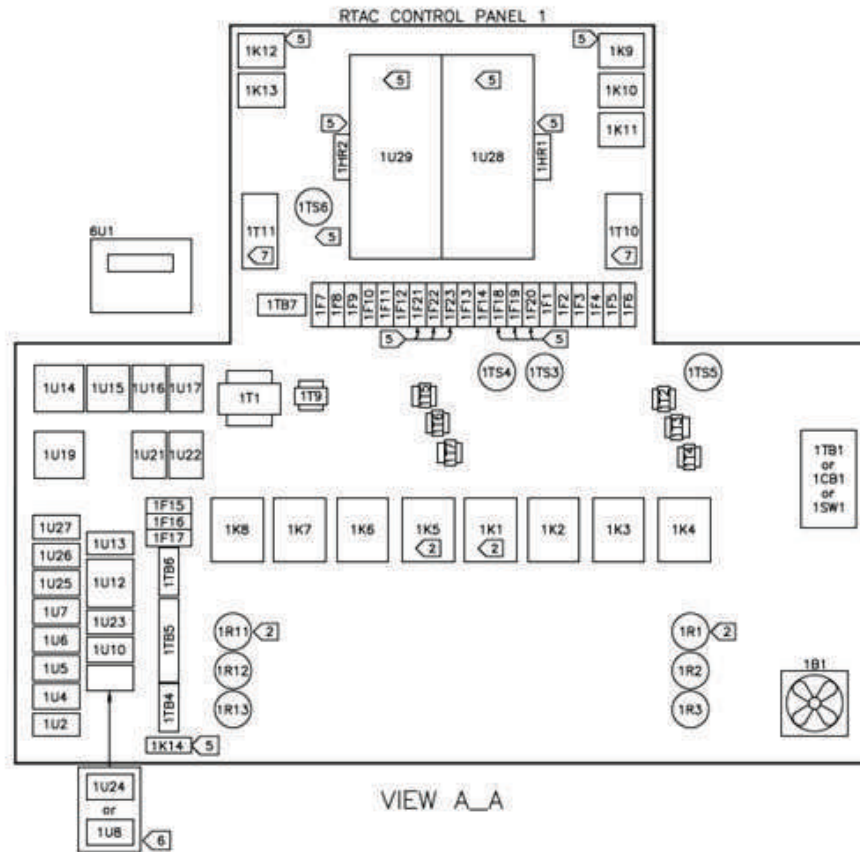


Figure 6. Typical RTAC 200 ton panel illustration and low ambient option VFD location



⚠ 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.
For additional information regarding the safe discharge of capacitors, see PROD-SVB06-EN.*

Note: For additional information regarding the safe discharge of capacitors, see PROD-SVB06x-EN or PROD-SVB06x-FR.

Remove the Power Supply Wiring

Disconnect the following power supply and control wires from each VFD. The following instructions relate to either the IntelliPak II, CGAM or RTAC VFD.

1. Disconnect power supply wires from VFD connection points 91, 92, 93 (L1, L2, L3 respectively).
2. Disconnect output power wires from VFD connection points 96, 97, 98, 95 (T1, T2, T3, GND respectively).

Remove the Control Wiring

Complete the following steps to remove the control wiring.

1. Disconnect all control wires from the TR1 VFD itself and note the connection point numbers.
 The TR1 and TR170 have the same connection point numbers. See the following table, which applies to IntelliPak II, CGAM, and RTAC drives except as noted, for common control wiring and their connection point numbers.

Table 1. Typical control wires to remove from the TR1 and reinstall on the TR170

Control Wiring						VFD	Description
Intellipak II		CGAM		RTAC ^(a)			
Fan 1	Fan 2	Fan 1	Fan 2	Fan 1	Fan 2	Connection Point	
710B	712B	549B	555B	151A	651A	12	+24V
711B	713B	550B	556B	152A	652A	18	Digital Input (Run)
710C	712C	Not Used				27	Digital Input (Coast)
584C	586C	807B	809B	119A	122A	53	Analog Input (0-10VDC)
585C	587C	808B	810B	128A	129A	55	GND
Not Used		803B	805B	120A	123A	1	Relay 1 - Common
		804B	806B	121A	124A	3	Relay 1 - Normally Closed

^(a) Wire numbers shown only for RTAC with 2 VFDs.



Removing the Existing VFD and Components

⚠ WARNING

Heavy Object!

Failure to follow instructions below could result in unit dropping which could result in death or serious injury, and equipment or property-only damage.

Ensure that all the lifting equipment used is properly rated for the weight of the unit being lifted. Each of the cables (chains or slings), hooks, and shackles used to lift the unit must be capable of supporting the entire weight of the unit. Lifting cables (chains or slings) may not be of the same length. Adjust as necessary for even unit lift.

2. Locate and remove the four (4) fasteners securing the TR1 drive to its back panel after all cables and power supply wiring have been disconnected. (Be sure to retain the fasteners.)

See the following table for the estimated weight of each drive. Verify actual weights before lifting. Follow safe procedures for lifting and removing the fan VFD drive (or back panel assembly) from the compartment.

Table 2. Estimated drive weights

Motor Voltage	Motor Horsepower	Estimated Weight		Motor Voltage	Motor Horsepower	Estimated Weight	
VAC	Hp	lb	kg	VAC	Hp	lb	kg
200 or 230	1.5	4.6	2.1	460	1.5	4.6	2.1



Installing TR170 VFD and Components

Remove Trane TR170 drive from the box, verify the VFD model number, and complete the following procedures.

Install the TR170 Drive

1. Attach the new drive heater, HTR16716, to the side of the new drive. If another drive is present in the panel, the heater should be placed on the side of the drive that will not face the other drive. The heater has adhesive pre-applied to one side. Remove the protective film from the heater and press it against the side of the drive.
2. Hold the drive up to the back plate and mark the mounting hole locations on the backplate.
Note: The Trane TR170 drive has a mounting hole pattern different than the original drive.
3. Drill a 3/16" hole at each marked location. Be careful to protect other electrical components from metal shavings and clean all metal shavings from the enclosure when drilling is completed.
4. Line up the TR170 on the mounting hole-pattern and fasten the drive with the fasteners retained from the original drive to the back panel.

Wire the Power Supply and Controls to the TR170

The TR1 and TR170 have the same connection point numbers, however, a four-compressor unit or circuit 1 of a three-compressor unit requires an additional relay. These units will require the unit schematics to be marked up or replaced. Schematics document numbers may be found in "Wiring Diagram Matrix," p. 21. Print a copy from e-Library (if accessible) or contact the local Trane representative to obtain a copy.

1. Reconnect power supply wires to VFD connection points 91, 92, 93, 95 (L1, L2, L3, GND respectively) and output power wires to VFD connection points 96, 97, 98, 99 (T1, T2, T3, GND respectively).
2. Reconnect all control wires to the TR170 VFD according to the connection point numbers noted during TR1 removal. The TR1 and TR170 have the same connection point numbers. (See the "Typical Control Wires" table in "Remove the Control Wiring," p. 9 for common control wires and their connection point numbers.)
3. Connect the new drive blanket heater wiring to 1TB7-3,4 or 2TB7-3,4.

Installing the Drive On a Four-Compressor Unit or Circuit 1 of a Three-Compressor Unit (RTAC)

If you are installing the drive on a four-compressor unit or circuit 1 of a three-compressor unit, an addition relay is required.

1. Mount this relay and base on the controls backplate.
2. Label the relay 1K9 if installed in control panel 1 or 2K9 if installed in control panel 2.
3. Make the wiring modifications presented in the following table:

Table 3. Intermediate relay wiring

Control Panel 1			
Wire Number	Description of New Function	Original Connections	New Connections
151A	+24 VDC	1U28-12 to 1TB6-6	1U28-12 to 1K9-1
152A	Digital Input (RUN)	1U28-18 to 1TB6-7	1U28-18 to 1K9-2
151B	+24 VDC	1U29-12 to 1TB6-6	1U29-12 to 1K9-3
152B	Digital Input (RUN)	1U29-18 to 1TB6-7	1U29-18 to 1K9-4
151C	Control Power Hot	1U15-J2-12 to 1TB6-6	1U15-J2-12 to 1TB5-3 (Node 62)

Table 3. Intermediate relay wiring (continued)

Control Panel 1			
Wire Number	Description of New Function	Original Connections	New Connections
152C	Fan Run Signal	1U15-J2-10 to 1TB6-7	1U15-J2-10 to 2K9-Coil
Field Provided	Control Power Neutral	-	1K9-Coil to 1TB5-12(Node 63)
Control Panel 2			
Wire Number	Description of New Function	Original Connections	New Connections
651A	+24 VDC	2U28-12 to 2TB6-6	2U28-12 to 2K9-1
652A	Digital Input (RUN)	2U28-18 to 2TB6-7	2U28-18 to 2K9-2
651B	+24 VDC	2U29-12 to 2TB6-6	2U29-12 to 2K9-3
652B	Digital Input (RUN)	2U29-18 to 2TB6-7	2U29-18 to 2K9-4
651C	Control Power Hot	2U15-J2-12 to 2TB6-6	2U15-J2-12 to 2TB5-3 (Node 562)
652C	Fan Run Signal	2U15-J2-10 to 2TB6-7	2U15-J2-10 to 2K9-Coil
Field Provided	Control Power Neutral	-	2K9-Coil to 2TB5-12(Node 563)

Set the VFD Programming Parameters

Complete the following tasks to set and verify the TR170 parameters listed in the tables in “TR170 VFD Program Parameters,” p. 14 section.

Power Up the VFD

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.
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.

⚠ 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.

Reset Parameters Back to Factory Defaults

Note: In the event the drive parameters are inaccessible or the drive display fails, a “hard reset” may be accomplished by holding “OK” and “Menu” buttons while cycling the drive power.

To reset all programming parameters back to the factory defaults:

1. Go to parameter **14-22 Operation Mode**.
2. Press **OK**.
3. Select **2 “Initialization”**.
4. Press **OK**.

5. Cut off the main supply and wait until the display turns off.
6. Reconnect the main supply.
The frequency converter is now reset.
7. Ensure parameter 14–22 Operation Mode has reverted back to “Normal Operation”.

Notes:

- *Step 5 resets the drive to the default factory settings. The program parameters listed in Table 4, p. 14, Table 5, p. 15 and Table 6, p. 16 will need to be verified or changed as described in the previous Modify Parameters procedure.*
- *Some of the parameters listed in the Table are motor specific. Due to various motors and efficiencies available, use only the values stamped on the specific motor nameplate. Do not use the Unit nameplate values.*
- *A backup copy of the current setup may be saved to the LCP before changing parameters or resetting the drive. See LCP Copy in the VFD Operating Instructions for details.*

Modify Parameters

Please refer to BAS-SVP16*-EN (TR150 and TR170 Programming Guide), or the most recent version, for complete programming information.

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 is Coast inverse which will cause a drive error on Products that do not need that function. Verify Parameter 5-12 is set per Table 4, p. 14, Table 5, p. 15 and Table 6, p. 16 for the given Product you are installing the drive into (parameter 5-12 will be set to either Coast Inverse or No Function depending on your Product). Products that utilize the Coast inverse function will have a control wire going to terminal 27 on the drive.*

Perform the following steps to modify each parameter:

1. On the first power up of the drive, a parameter wizard may appear. Press the **Back** button to leave the wizard screen.
2. Press the **Main Menu** button.
(Press the **Back** button if the main menu does not display.)
3. Use the **Up** and **Down** buttons to find the parameter menu group (first part of parameter number).
4. Press **OK**.
5. Use the **Up** and **Down** buttons to select the correct parameter sub-group, indicated by the first digit of the second part of the parameter number.
6. Press **OK**.
7. Use the **Up** and **Down** buttons to select the specific parameter.
8. Press **OK**.
9. Use the navigation buttons to move to a different digit within a parameter setting.
The highlighted area indicates the digit selected for modification.
10. Use the **Up** and **Down** buttons to adjust the digit.
11. Press **Cancel** to disregard the change, or press **OK** to accept the change and enter the new setting.
12. Repeat steps 1 through 11 for each menu selection setting in the parameters table.
13. After verifying that the VFD(s) are operating properly, press the STOP key at the Human



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Interface Module to stop the unit operation.

14. Follow the applicable steps in the "Final Unit Checkout" section in the unit Installation, Operation, Maintenance Manual (IOM) to return the unit to its normal operating mode.

Note: If a problem with a VFD occurs, ensure that the programmed parameters listed for condenser fan VFD (see the [Table 4, p. 14](#), [Table 5, p. 15](#) and [Table 6, p. 16](#)) have been set before replacing the drive.

TR170 VFD Program Parameters

Drives are shipped with generic settings. These settings must be updated to reflect the drive application. The following table defines the parameters that must be modified for the Trane TR170 drives used in condenser fan applications on RTAC products.

Important: Pressing the "MENU" button once will enter the drive parameter wizard. **DO NOT** use the parameter wizard. The parameter wizard does not access all the required parameters and may cause drive errors. Pressing the "MENU" button twice will allow access to all parameters. **ALWAYS** use this method.

Table 4. TR170 VFD drive parameter RTAC

Parameter Number	Parameter Description	RTAC Setting	Units
0-03	Regional Settings	North America for 60 Hz, International for 50 Hz	—
0-06	Grid Type	Depends on Grid Type	—
0-40	[Hand on] Key on LCP	Disable (0)	—
1-20	Motor Power	(Motor Specific)	kW
1-22	Motor Voltage	(Motor Specific)	V
1-23	Motor Frequency	(Motor Specific)	Hz
1-24	Motor Current	(Motor Specific)	A
1-25	Motor Nominal Speed	(Motor Specific)	RPM
1-71	Start Delay	3	s
1-72	Start Function	DC Hold (0)	—
1-73	Flying Start	Enabled (1)	—
1-82	Min Speed for Function at Stop [Hz]	0.1	Hz
1-90	Motor Thermal Protection	ETR Trip 1 (4)	—
2-00	DC Hold/Motor Preheat Current	Default Value	%
2-02	DC Braking Time	Default Value	s
2-10	Brake Function	Off (0)	—
3-03	Maximum Reference	50/60 ^(a)	—
3-16	Reference 2 Source	No function (0)	—
3-17	Reference 3 Source	No function (0)	—
3-41	Ramp 1 Ramp Up Time	5	s
3-42	Ramp 1 Ramp Down Time	20	s
4-10	Motor Speed Direction	Clockwise (0)	—
4-12	Motor Speed Low Limit [Hz]	3	Hz
4-14	Motor Speed High Limit [Hz]	50/60 ^(a)	Hz
4-18	Current Limit	If p122 = 380V then 115 Else 125	%

Table 4. TR170 VFD drive parameter RTAC (continued)

Parameter Number	Parameter Description	RTAC Setting	Units
5-12	Terminal 27 Digital Input	No operation (0)	—
5-40	Function Relay	Alarm (9)	—
6-10	Terminal 53 Low Voltage	0	V
6-14	Terminal 53 Low Ref./Feedb. Value	0	—
6-15	Terminal 53 High Ref./Feedb. Value	50/60 ^(a)	—
14-01	Switching Frequency	5	kHz
14-12	Function at Mains Imbalance	De-rate (3)	—
14-20	Reset Mode	Auto Reset x10 (10)	—
14-21	Automatic Restart Time	30	s
14-50	RFI Filter	Off (0)	—

^(a) 60 or 50Hz for Pueblo Production, 50Hz for Charmes production. Otherwise, set for maximum speed rating of motor/fan.

The following table defines the complete set of parameters for the TR170 VFD drives used in condenser fan applications on low ambient option IPAK II products.

Table 5. TR170 VFD drive parameters Ipak II

Parameter Number	Parameter Description	Ipak II Setting	Units
0-03	Regional Settings	North America for 60 Hz, International for 50 Hz	—
0-06	Grid Type	Depends on Grid Type	—
0-40	[Hand on] Key on LCP	Disable (0)	—
1-20	Motor Power	1.1 (8) (Motor Specific)	kW
1-22	Motor Voltage	460 (Motor Specific)	V
1-23	Motor Frequency	60 (Motor Specific)	Hz
1-24	Motor Current	2.7 (Motor Specific)	A
1-25	Motor Nominal Speed	1140 (Motor Specific)	RPM
1-71	Start Delay	Default Value	s
1-72	Start Function	Default Value	—
1-73	Flying Start	Enabled (1)	—
1-82	Min Speed for Function at Stop [Hz]	0.1	Hz
1-90	Motor Thermal Protection	ETR Trip 1 (4)	—
2-00	DC Hold/Motor Preheat Current	0	%
2-02	DC Braking Time	0	s
2-10	Brake Function	AC Brake is active (2)	—
3-03	Maximum Reference	60	—
3-16	Reference 2 Source	No function (0)	—
3-17	Reference 3 Source	No function (0)	—
3-41	Ramp 1 Ramp Up Time	10	s
3-42	Ramp 1 Ramp Down Time	10	s



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Table 5. TR170 VFD drive parameters Ipak II (continued)

Parameter Number	Parameter Description	Ipak II Setting	Units
4-10	Motor Speed Direction	Clockwise (0)	—
4-12	Motor Speed Low Limit [Hz]	22	Hz
4-14	Motor Speed High Limit [Hz]	60	Hz
4-18	Current Limit	137	%
5-12	Terminal 27 Digital Input	Coast and reset inverse (3)	—
5-40	Function Relay	Default Value	—
6-10	Terminal 53 Low Voltage	0	V
6-14	Terminal 53 Low Ref./Feedb. Value	22	—
6-15	Terminal 53 High Ref./Feedb. Value	60	—
14-01	Switching Frequency	5	kHz
14-12	Function at Mains Imbalance	De-rate (3)	—
14-20	Reset Mode	Auto reset x3 (3)	—
14-21	Automatic Restart Time	5	s
14-50	RFI Filter	Off (0)	—

Note: *60 or 50Hz for Pueblo Production, 50Hz for Charmes production. Otherwise, set for maximum speed rating of motor/fan.

The following table defines the complete set of parameters for the TR170 VFD drives used in condenser fan applications on CGAM products.

Table 6. TR170 VFD drive parameters CGAM

Parameter Number	Parameter Description	CGAM Setting	Units
0-03	Regional Settings	North America for 60 Hz, International for 50 Hz	—
0-06	Grid Type	Depends on Grid Type	—
0-40	[Hand on] Key on LCP	Disable (0)	—
1-20	Motor Power	(Motor Specific)	kW
1-22	Motor Voltage	(Motor Specific)	V
1-23	Motor Frequency	(Motor Specific)	Hz
1-24	Motor Current	(Motor Specific)	A
1-25	Motor Nominal Speed	(Motor Specific)	RPM
1-71	Start Delay	3	s
1-72	Start Function	DC Hold (0)	—
1-73	Flying Start	Default Value	—
1-82	Min Speed for Function at Stop [Hz]	0.1	Hz
1-90	Motor Thermal Protection	ETR Trip 1 (4)	—
2-00	DC Hold/Motor Preheat Current	Default Value	%
2-02	DC Braking Time	Default Value	s
2-10	Brake Function	Off (0)	—
3-03	Maximum Reference	50/60	—

Table 6. TR170 VFD drive parameters CGAM (continued)

Parameter Number	Parameter Description	CGAM Setting	Units
3-16	Reference 2 Source	No function (0)	—
3-17	Reference 3 Source	No function (0)	—
3-41	Ramp 1 Ramp Up Time	5	s
3-42	Ramp 1 Ramp Down Time	20	s
4-10	Motor Speed Direction	Clockwise (0)	—
4-12	Motor Speed Low Limit [Hz]	5/6	Hz
4-14	Motor Speed High Limit [Hz]	50/60	Hz
4-18	Current Limit	If p122 = 460V then 115 Else 110	%
5-12	Terminal 27 Digital Input	No operation (0)	—
5-40	Function Relay	Alarm (9)	—
6-10	Terminal 53 Low Voltage	1	V
6-14	Terminal 53 Low Ref./Feedb. Value	5/6	—
6-15	Terminal 53 High Ref./Feedb. Value	50/60	—
14-01	Switching Frequency	5	kHz
14-12	Function at Mains Imbalance	De-rate (3)	—
14-20	Reset Mode	Auto Reset x10 (10)	—
14-21	Automatic Restart Time	30	s
14-50	RFI Filter	Off (0)	—

Note: *60 or 50Hz for Pueblo Production, 50Hz for Charmes production. Otherwise, set for maximum speed rating of motor/fan.

Copying Parameters to Multiple Drives

If you are installing multiple drives, the drive LCP (local control panel) can be used to copy parameters from one drive to another. This method can save time and reduce errors.

Uploading Data to the LCP

1. Go to 0-50 LCP copy.
2. Press **OK**.
3. Select **All from LCP**.
4. Press **OK**.

A progress bar shows the uploading process

5. Press **Hand on** to return to normal operation.

Remove the LCP from the configured drive and install it on the unconfigured drive.

Downloading Data from the LCP

1. Go to 0-50 LCP copy
2. Press **OK**
3. Select **All from LCP**
4. Press **OK**.

A progress bar shows the uploading process

5. Press **Hand on** to return to normal operation.



Additional Resources

- [TGE Online Help](#)
- [Tracer Ensemble Online Help](#)
- [Tracer Ensemble User Guide \(BAS-SVU09\)](#)
- [Tracer SC Online Help](#)
- [Tracer TU Online Help](#)

Install the Heater Blanket

Each TR170 VFD kit is supplied with either a one or two heater blanket system that needs to be installed during VFD replacement. For most applications, the heater blanket installation only requires replacing one heater blanket, but in some IPak II applications, an additional heater blanket as well as applicable wiring and accessories may also need to be installed to make heater blankets operational.

The following two diagrams show installation of heater blankets and their applicable wiring and accessories in IPak II Low Ambient applications and shows the 460V option.

Figure 7. Heater blanket installation in IPak II low ambient applications

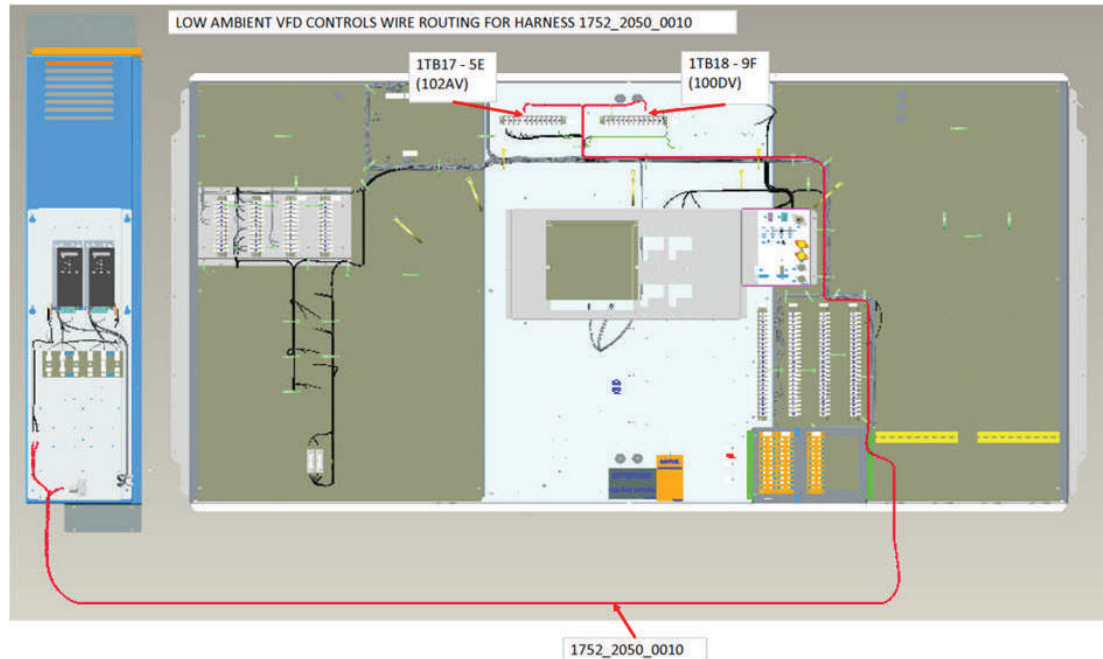
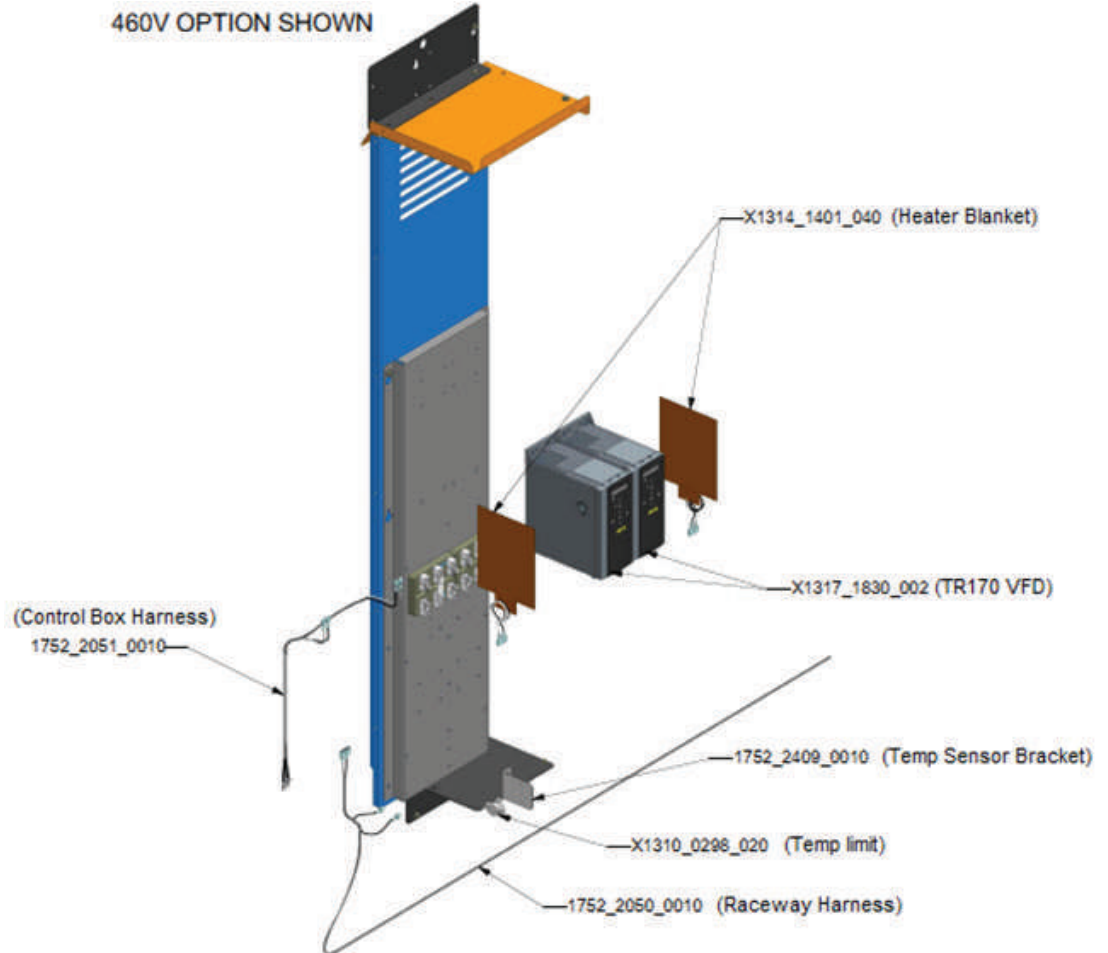


Figure 8. Heater blanket installation in IPak II (460 volt option)



See "Wire the Power Supply and Controls to the TR170," p. 11 for the procedure used to wire the power supply and controls to the TR170.



Wiring Diagram Matrix

Table 7. TR170 VFD IntelliPak II™ wiring schematics and connection diagrams

Wiring Diagram Number	Description
2313-0831	SCHEMATIC, POWER - 90-105 TON - STANDARD WITH LOW AMBIENT
2313-0832	SCHEMATIC, POWER - 90-105 TON - WITH SUPPLY VFD AND WITH LOW AMBIENT
2313-0833	SCHEMATIC, POWER - 90-105 TON - WITH EXHAUST OR RETURN VFD AND WITH LOW AMBIENT
2313-0834	SCHEMATIC, POWER - 90-105 TON - WITH SUPPLY AND EXHAUST OR RETURN VFD & W/ LOW AMBIENT
2313-0835	SCHEMATIC, POWER - 90-105 TON - STANDARD WITH LOW AMBIENT
2313-0836	SCHEMATIC, POWER - 90-105 TON - WITH SUPPLY VFD AND WITH LOW AMBIENT
2313-0837	SCHEMATIC, POWER - 90-105 TON - WITH EXHAUST OR RETURN VFD AND WITH LOW AMBIENT
2313-0838	SCHEMATIC, POWER - 90-105 TON - WITH SUPPLY AND EXHAUST OR RETURN VFD & W/ LOW AMBIENT
2313-0843	SCHEMATIC, POWER - 120-150 TON - STANDARD WITH LOW AMBIENT
2313-0844	SCHEMATIC, POWER - 120-150 TON - WITH SUPPLY VFD AND WITH LOW AMBIENT
2313-0845	SCHEMATIC, POWER - 120-150 TON - WITH EXHAUST OR RETURN VFD AND WITH LOW AMBIENT
2313-0846	SCHEMATIC, POWER - 120-150 TON - WITH SUPPLY AND EXHAUST OR RETURN VFD & W/LOW AMBIENT
2313-0847	SCHEMATIC, POWER - 120-150 TON - STANDARD WITH LOW AMBIENT
2313-0848	SCHEMATIC, POWER - 120-150 TON - WITH SUPPLY VFD AND WITH LOW AMBIENT
2313-0849	SCHEMATIC, POWER - 120-150 TON - WITH EXHAUST OR RETURN VFD AND WITH LOW AMBIENT
2313-0850	SCHEMATIC, POWER - 120-150 TON - WITH SUPPLY AND EXHAUST OR RETURN VFD & W/LOW AMBIENT
2313-0839	SCHEMATIC, POWER - 90-105 TON - STANDARD WITH LOW AMBIENT
2313-0840	SCHEMATIC, POWER - 90-105 TON - WITH SUPPLY VFD AND WITH LOW AMBIENT
2313-0841	90-105 TON - WITH EXHAUST OR RETURN VFD AND WITH LOW AMBIENT SCHEMATIC, POWER
2313-0842	SCHEMATIC, POWER - 90-105 TON - WITH SUPPLY AND EXHAUST OR RETURN VFD & W/ LOW AMBIENT
2313-0851	SCHEMATIC, POWER - 120-150 TON - STANDARD WITH LOW AMBIENT
2313-0852	SCHEMATIC, POWER - 120-150 TON - WITH SUPPLY VFD AND WITH LOW AMBIENT
2313-0853	SCHEMATIC, POWER - 120-150 TON - WITH EXHAUST OR RETURN VFD AND WITH LOW AMBIENT
2313-0854	SCHEMATIC, POWER - 120-150 TON - WITH SUPPLY AND EXHAUST OR RETURN VFD & W/LOW AMBIENT
1213-1563	CONNECTION, CONTROL BOX - 90-105T, STANDARD W/ LOW AMBIENT
1213-1564	CONNECTION, CONTROL BOX - 90-105T, W/SUPPLY VFD W/ LOW AMBIENT
1213-1565	CONNECTION, CONTROL BOX - 90-105T, W/EXH/RTN VFD W/ LOW AMBIENT
1213-1566	CONNECTION, CONTROL BOX - 90-105T, W/SUP & EXH/RTN VFD W/ LOW AMBIENT
1213-1567	CONNECTION, CONTROL BOX - 90-105T, STANDARD W/ LOW AMBIENT
1213-1568	CONNECTION, CONTROL BOX - 90-105T, W/SUPPLY VFD W/ LOW AMBIENT
1213-1569	CONNECTION, CONTROL BOX - 90-105T, W/EXH/RTN VFD W/ LOW AMBIENT
1213-1570	CONNECTION, CONTROL BOX - 90-105T, W/SUP & EXH/RTN VFD W/ LOW AMBIENT
1213-1571	CONNECTION, CONTROL BOX - 120-150T, STANDARD W/ LOW AMBIENT
1213-1572	CONNECTION, CONTROL BOX - 120-150T, W/SUPPLY VFD W/ LOW AMBIENT



Wiring Diagram Matrix

Table 7. TR170 VFD IntelliPak II™ wiring schematics and connection diagrams (continued)

Wiring Diagram Number	Description
1213-1573	CONNECTION, CONTROL BOX - 120-150T, W/EXH/RTN VFD W/ LOW AMBIENT
1213-1574	CONNECTION, CONTROL BOX - 120-150T, W/SUP & EXH/RTN VFD W/ LOW AMBIENT
1213-1575	CONNECTION, CONTROL BOX - 120-150T, STANDARD W/ LOW AMBIENT
1213-1576	CONNECTION, CONTROL BOX - 120-150T, W/SUPPLY VFD W/ LOW AMBIENT
1213-1577	CONNECTION, CONTROL BOX - 120-150T, W/EXH/RTN VFD W/ LOW AMBIENT
1213-1578	CONNECTION, CONTROL BOX - 120-150T, W/SUP & EXH/RTN VFD W/ LOW AMBIENT

Note: Wiring diagrams are available via e-Library (if accessible) or contact the local Trane representative to obtain a copy.

Table 8. TR170 VFD CGAM™ wiring schematics and connection diagrams

Wiring Diagram Number	Description
2309-2075	SCHEMATIC; CGAM, S, V, W

Note: Wiring diagrams are available via e-Library (if accessible) or contact the local Trane representative to obtain a copy.

Table 9. TR170 VFD RTAC™ wiring schematics and connection diagram

Wiring Diagram Number	Description
2309-2097	RTAC; 2 COMPRESSOR
2309-4621	RTAC; 3 COMPRESSOR, X-LINE STARTER
2309-4622	RTAC; 3 COMPRESSOR, WYE-DELTA STARTER
2309-4623	RTAC; 4 COMPRESSOR, X-LINE STARTER
2309-4624	RTAC; 4 COMPRESSOR, WYE-DELTA STARTER

Note: Wiring diagrams are available via e-Library (if accessible) or contact the local Trane representative to obtain a copy. See the Series R Air-Cooled Helical Rotary Liquid Chillers Wiring Manual (RTAC-SVE01-EN) (Refer to version E or subsequent versions).*

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