



TRANE PART-SVN258A-EN CFMB Combustion Blower Motor Control Board Instruction Manual

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TRANE PART-SVN258A-EN CFMB Combustion Blower Motor Control Board



Product Information

- The Danfoss VLT Micro Drive is a Variable Frequency Drive (VFD) designed to replace the factory installed CFMB combustion blower motor control board. This drive is specifically used to address recurring CFMB diagnostics. Please note that the graphics shown in the manual are for representation purposes only, and the actual model may differ in appearance.
- It is important to emphasize that only qualified personnel should handle the installation and servicing of this equipment. The installation, starting up, and servicing of heating, ventilating, and air conditioning equipment can be hazardous and require specific knowledge and training. Improper installation, adjustment, or alteration of the equipment by an unqualified person can result in death or serious injury. Therefore, it is crucial to observe all precautions mentioned in the literature, as well as on the tags, stickers, and labels attached to the equipment.
- The manual contains safety advisories throughout, which are categorized as follows:
 - **WARNING:** Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury.
 - **CAUTION:** Indicates a potentially hazardous situation that, if not avoided, could result in minor or moderate injury. It may also be used to alert against unsafe practices.
 - **NOTICE:** Indicates a situation that could result in equipment or property damage only accidents.
- The manual also highlights the importance of wearing proper Personal Protective Equipment (PPE) for the job being undertaken. Failure to do so can result in death or serious injury. Technicians must follow the precautions mentioned in the manual, as well as on the tags, stickers, and labels attached to the equipment.
- Furthermore, it is crucial to follow Environmental Health and Safety (EHS) policies to avoid any potential risks. Failure to do so can result in death or serious injury.
- Proper field wiring and grounding are essential for safety. Failure to follow code regulations can 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, it is necessary to follow the requirements for field wiring installation and grounding as described in the National Electrical Code (NEC) and

your local/state/national electrical codes.

Product Usage Instructions

The Danfoss VLT Micro Drive installation requires the following parts:

S. No.	Part Description	Qty
1	VFD – Danfoss VLT FC51 PK37	1
2	VFD Shield/Sheet Metal Bracket	1
3	LCP Remote Mounting Kit (only for Voyager 2)	1
4	Remote Mount Keypad Bracket (only for Voyager 2)	1
5	Wiring* (see Table 2)	*
6	Sticky – Back Wire Anchors*	–
7	Wire ties*	–
8	Screw for VFD shield/sheet metal bracket	5
9	Screw for VFD mounting on shield/sheet metal bracket	1
10	Screw	3
11	Washer	6
12	Lock Nut	3
13	Screw for VFD remote mount keypad bracket (only for Voyager 2)	–

- Please refer to Table 2 in the manual for wiring details.
- Ensure that you follow all safety precautions mentioned in the manual when installing and using the Danfoss VLT Micro Drive. Failure to do so can result in serious injury or damage to the equipment.
- If you have any questions or need further assistance, please consult the user manual or contact our customer support.

SAFETY WARNING

Only qualified personnel should install and service the equipment. The installation, starting up, and servicing of heating, ventilating, and airconditioning 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.

Safety Section

- Read this manual thoroughly before operating or servicing this unit. 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 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.

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.

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.

Parts List

S. No.	Part Description	Qty
1	VFD – Danfoss VLT FC51 PK37	1
2	LCP Keypad Display – VLT® Control Panel LCP 11 w/o potmeter	1
3	VFD Shield/Sheet Metal Bracket	1
4	LCP Remote Mounting Kit (only for Voyager 2)	1
5	Remote Mount Keypad Bracket (only for Voyager 2)	1
6	Wiring* (see Table 2)	*
7	Sticky – Back Wire Anchors*	–
8	Wire ties*	–
9	Insulated ¼" male and female quick connect terminals*	–
10	Screw for VFD shield/ sheet metal bracket	5
11	Screw for VFD mounting on shield/ sheet metal bracket	
	Screw	3
	Washer	6
	Lock Nut	3
12	Screw for VFD remote mount keypad bracket (only for Voyager 2)	2
13	Grommet/Bushing (only for Voyager 2)	1
14	Wiring Diagram (Voyager 2)	1
	Wiring Diagram (Voyager 3)	1

Field supplied materials

Table 1: Parts List for Voyager 2 and Voyager 3 The below listed 18 AWG wires are field supplied and are not

included in the kit. The installer must bring these wires while installing the kit.

Wiring	
18 AWG (Rated 600 V 105C) – Red	Est. at least 50 feet
18 AWG (Rated 600 V 105C) – White	Est. at least 40 feet
18 AWG (Rated 600V 105C) – Blue	Est. at least 40 feet
18 AWG (Rated 600V 105C) – Green	Est. at least 40 feet
18 AWG (Rated 600V 105C) – Black	Est. at least 70 feet

Shield/Sheet Metal Brackets for VFD Installation

Refer to the figures below to select the correct shield/ sheet metal brackets for VFD installation.

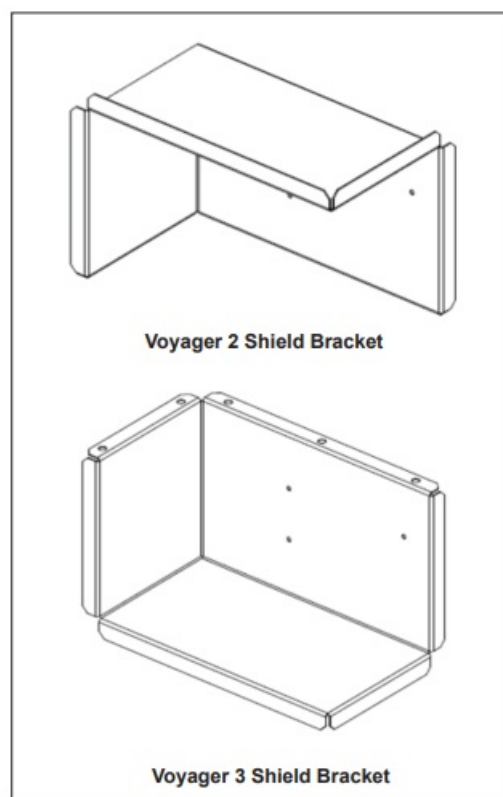


Figure 1: Shield/Sheet Metal Brackets

Installation

Voyager 2 – Downflow & Horizontal flow Unit

VFD Installation

Note: The suggested mounting location is on the nonaccess side of the indoor supply fan blower assembly. Refer to the figures and installation instructions for details.

1. Remove the back panel from back side of the supply section of V2 unit.
2. Mount the VFD shield bracket to the vertical wall/ divider panel as per the dimensions given in Figure 2 and Figure 4.

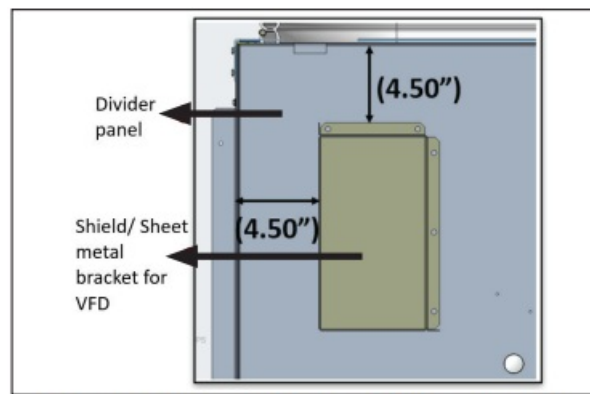


Figure 2: Placement of the shield/sheet metal bracket on the divider panel

3. Mount the VFD to the shield/ sheet metal bracket. See Figure 3.

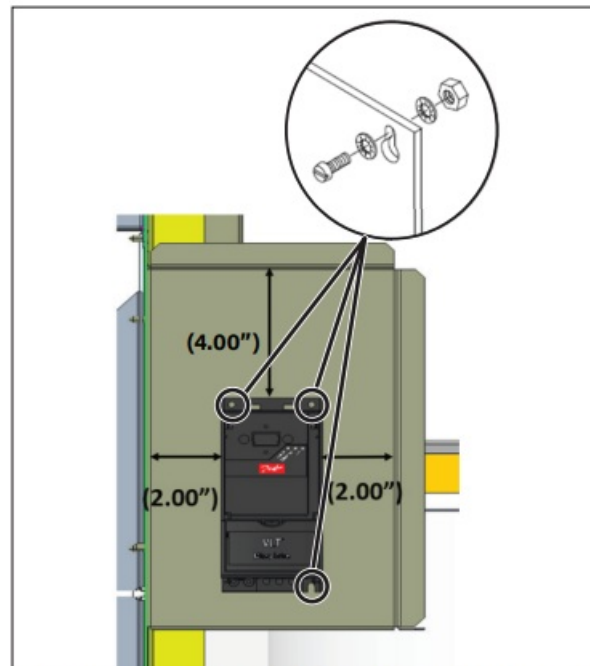


Figure 3: Placement of VFD inside the shield/ sheet metal bracket

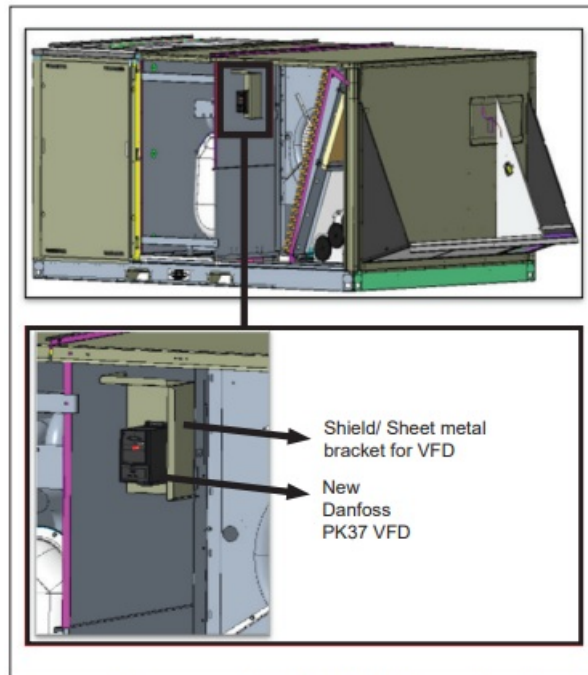


Figure 4: Placement of VFD in Unit (EFlex unit, unit with a convenience outlet or the convenience transformer)

LCP Keypad Bracket Installation

1. Mount factory provided keypad bracket on the access side of the unit in an open area. See Figure 5.

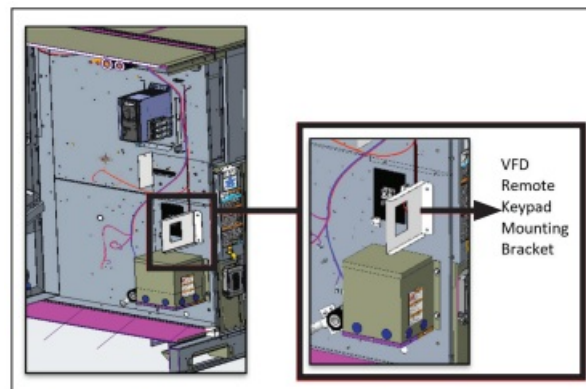


Figure 5: Placement of VFD remote keypad on divider panel

2. Using the LCP remote mounting kit, mount the LCP keypad display into the keypad bracket. Refer to the LCP remote mounting kit instructions shown in Figure 6.

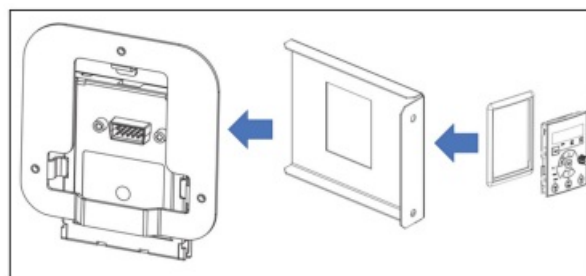


Figure 6: LCP remote mounting kit instructions

3. Route the LCP Keypad display remote mount extension wire to the VFD and connect staying away from hot surfaces, moving parts, and sharp edges.
4. Use wire ties and wire tie anchors to provide strain relief for the harness.

Note: When connecting the keypad extension cable to the VFD, do not overtighten the screws to prevent stripping.

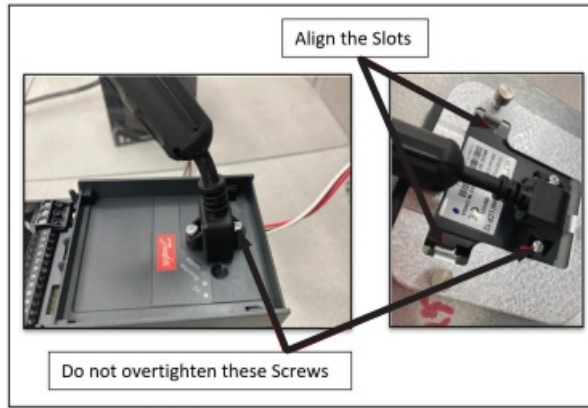


Figure 7: LCP Keypad display remote mount extension wire routing

Voyager 3 – 27.5 to 50T Units

VFD Installation

1. Remove the front door of the supply section of V3 unit.
2. Mount the VFD shield bracket to the divider panel as per the dimensions given in Figure 8 and Figure 10

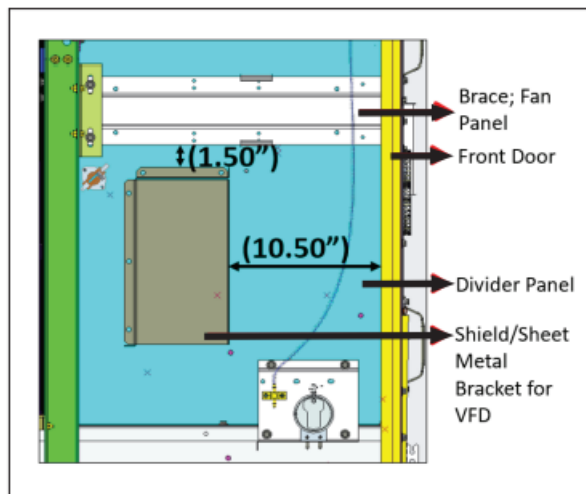


Figure 8: Placement of the shield metal bracket on the divider panel

3. Mount the VFD to the shield/ sheet metal bracket. See Figure 9.

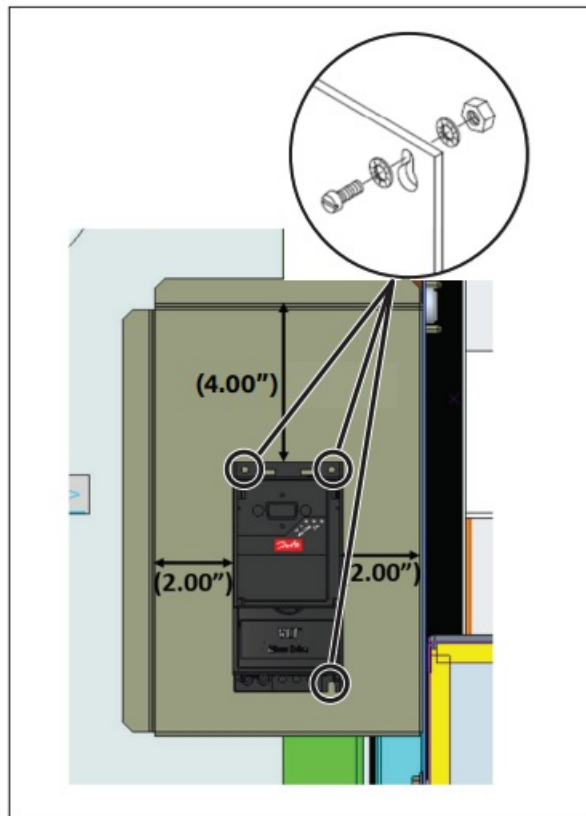


Figure 9: Placement of VFD inside the sheet metal bracket

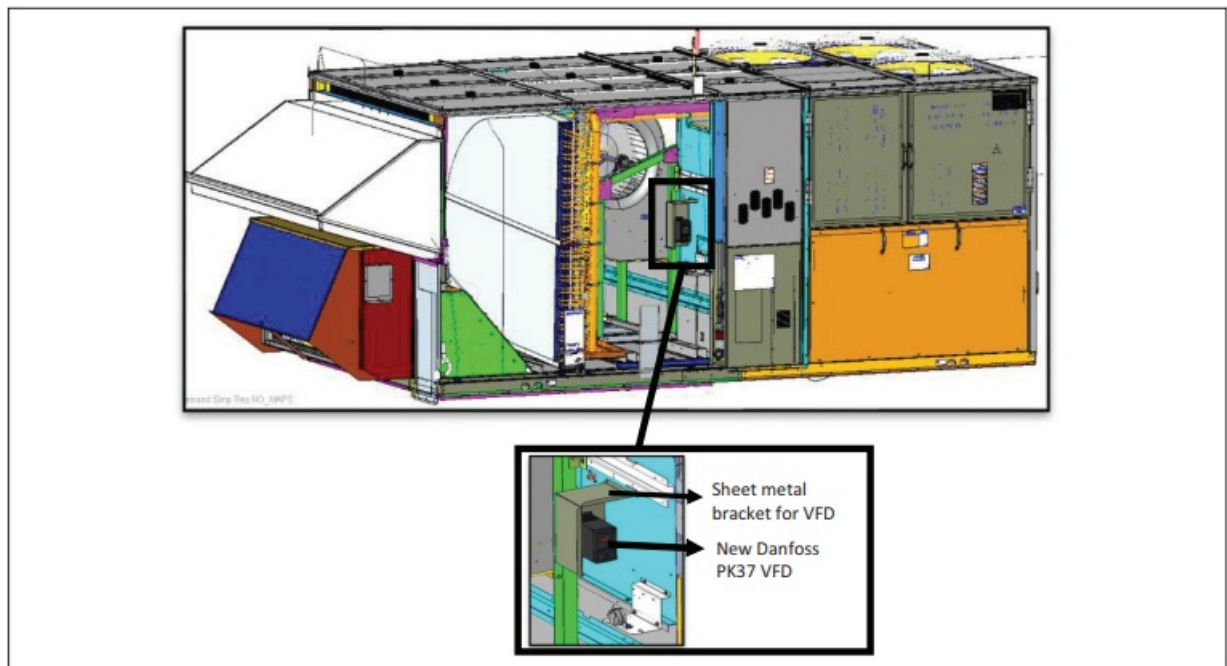


Figure 10: Placement of VFD in the unit

VFD Wiring Connections for Voyager 2 and Voyager 3:

Follow the instructions below when routing and connecting the VFD wiring. Refer to the figures 11, 12, 13 and 14 for the detailed wiring instructions.

1. Follow existing wire paths where possible
2. Keep wiring away from hot surfaces, moving parts, and sharp edges.
3. Use sticky-back wire tie anchors where needed.
4. Match existing unit harness colors.
5. Remove the VFD terminal cover. See Figure 13.

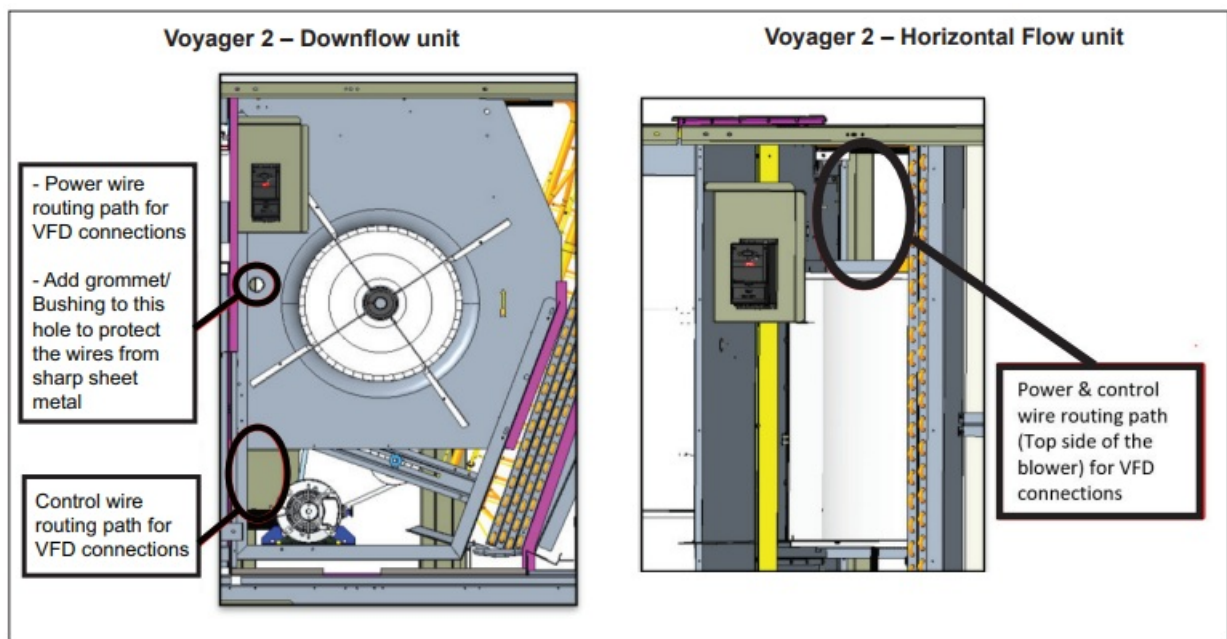


Figure 11: VFD wiring connections for Voyager 2

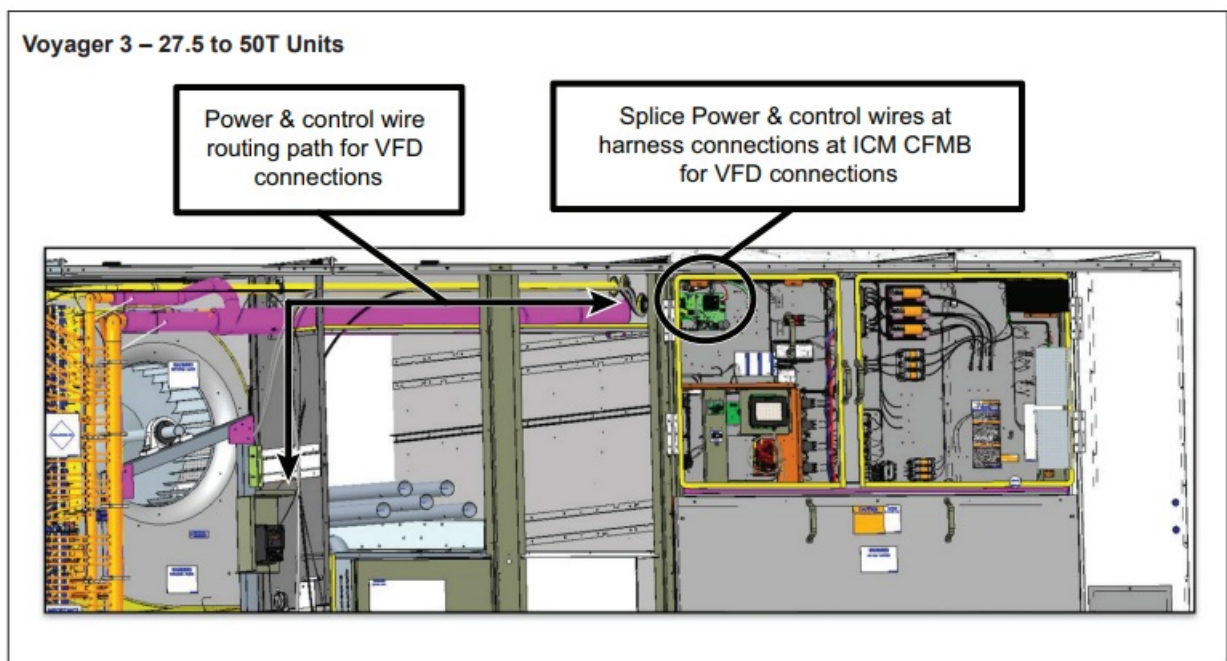


Figure 12: VFD wiring connections for Voyager 3 units

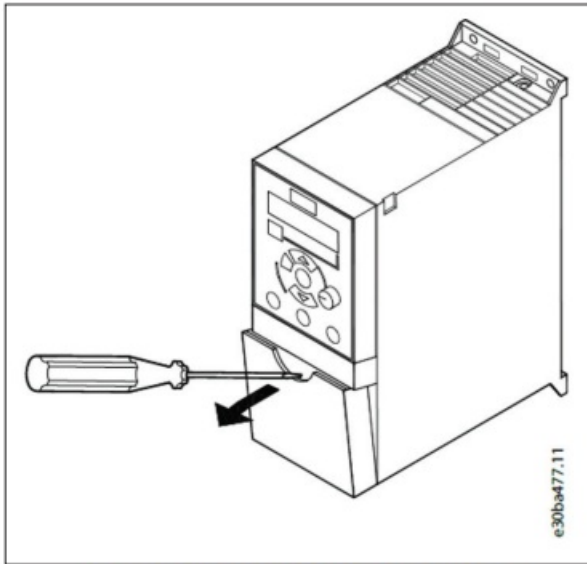


Figure 13: Remove VFD terminal cover

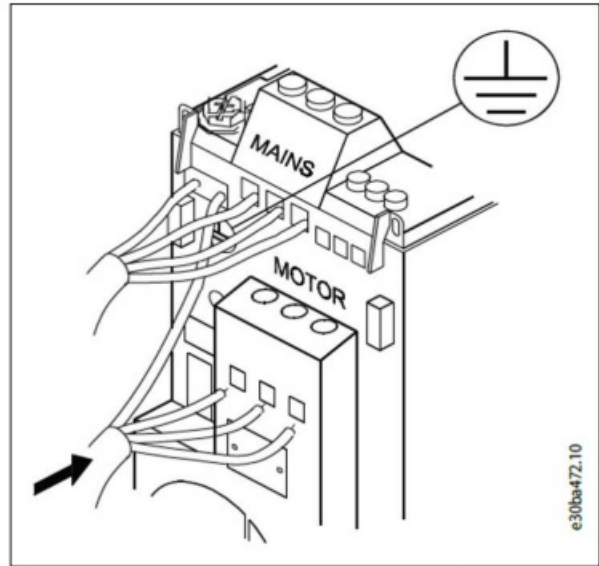


Figure 14: Connect the ground cable, mains and motor wires

Voyager 2 – Controls diagrams with connections (Refer Part # 121348190001)

Wiring VFD Control Signal:

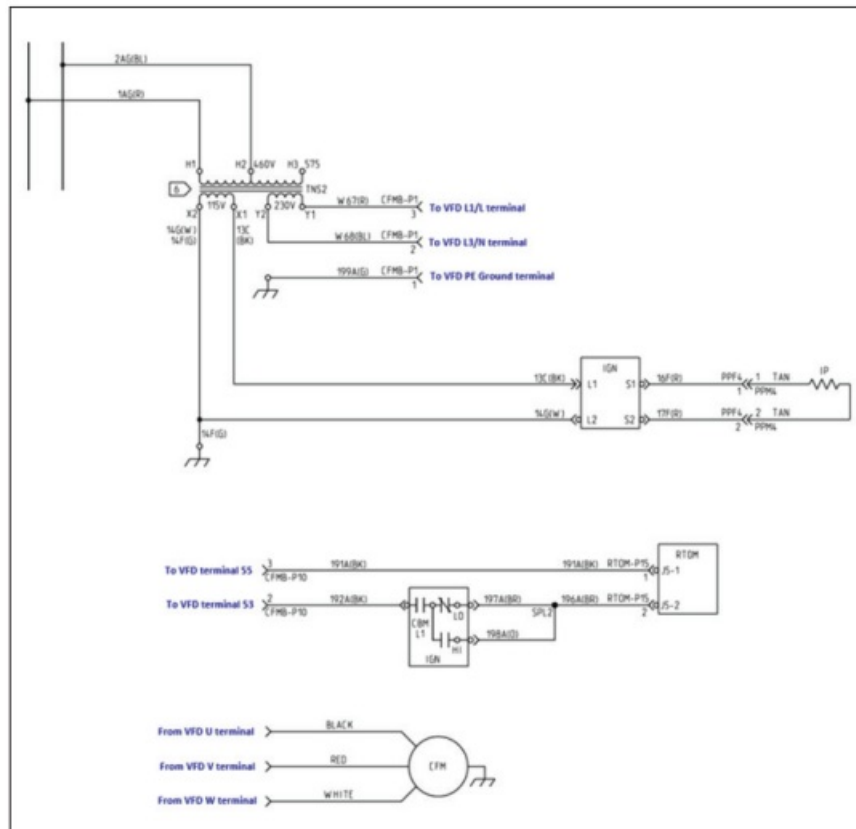
1. Connect unit harness wire 191A(BK) to VFD terminal 55 for signal common.
2. Connect unit harness wire 192A(BK) to VFD terminal 53 for 2-10 VDC signal.

VFD Input Power and Ground Wiring:

1. Connect unit harness wire W67(R) to VFD terminal L1/L for high voltage connection.
2. Connect unit harness wire W68(BL) to VFD terminal L3/N for high voltage connection.
3. Connect unit harness wire 199A(G) to VFD terminal PE for ground connection.

Combustion Blower Motor Wiring:

1. Connect combustion blower motor harness Blac wire to VFD terminal U.
2. Connect combustion blower motor harness Red wire to VFD terminal V.
3. Connect combustion blower motor harness White wire to VFD terminal W.



Voyager 3 – Controls diagrams with connections (Refer Part # 121348200001)

Wiring VFD Control Signal:

1. Connect unit harness wire 262A to VFD terminal 55 for signal common.
2. Connect unit harness wire 261A to VFD terminal 53for 2-10 VDC signal.

VFD Input Power and Ground Wiring:

1. Connect unit harness wire W12 to VFD terminal L1/L for high voltage connection.
2. Connect unit harness wire W14 to VFD terminal L3/N for high voltage connection.
3. Connect unit harness wire 245E(G/Y) to VFD terminal PE for ground connection.

Combustion Blower Motor Wiring:

1. Connect combustion blower motor harness Black wire to VFD terminal U.
2. Connect combustion blower motor harness Red wire to VFD terminal V.
3. Connect combustion blower motor harness White wire to VFD terminal W.

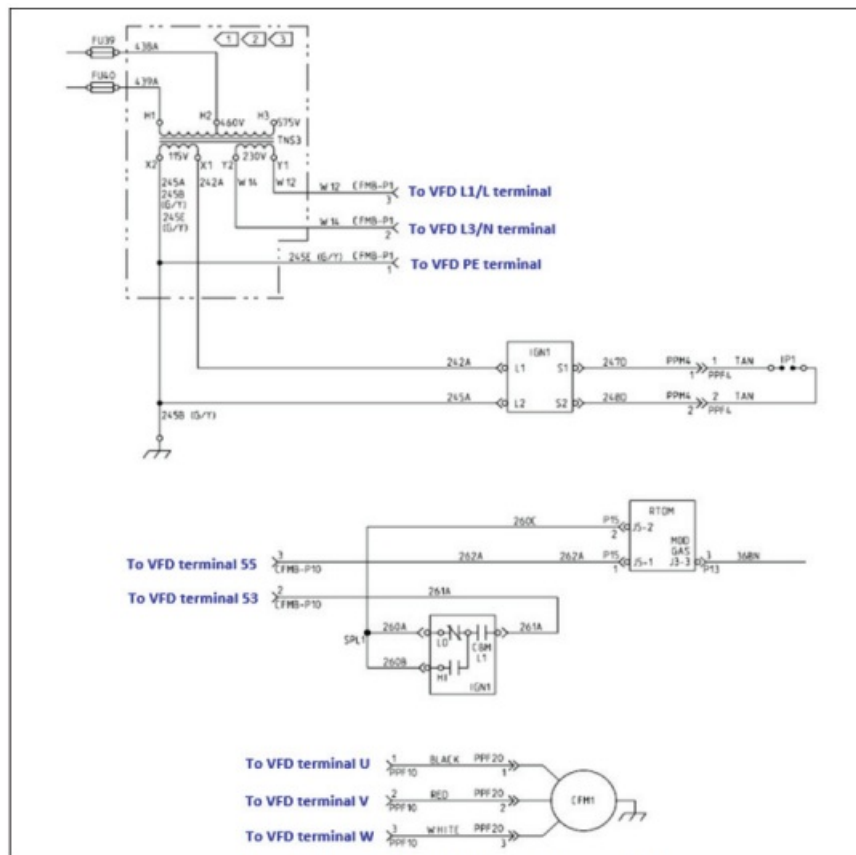


Figure 16: Voyager 3 controls diagram with connections

VFD Parameters for Voyager 2 and 3

*See programming by hand with the LCP instructions below this table.					
Menu	ID	Name	Setting	Unit	Notes
Operation/Display	0-03	Regional Settings	[1] North America	—	
	0-40	[Hand on] Key on LCP	[0] Disabled	—	
Load and Motor	1-03	Torque Characteristics	[0] Constant Torque	—	
	1-20	Motor Power	0.33 HP	—	
	1-22	Motor Voltage	220	VAC	
	1-23	Motor Frequency	160	Hz	
	1-24	Motor Current	1	A	
	1-25	Motor Nominal Speed	4600	RPM	
	1-30	Stator Resistance (Rs)	7.36		
	1-33	Stator leakage Reactance	6.5		
	1-35	Main Reactance	695.8		defaults to 695.8
	1-73	Flying Start	[1] Enabled	—	

Brakes	2-00	DC Hold Current	0	%	
	2-01	DC Brake Current	0	%	
	2-04	DC Brake Cut in Speed	0	Hz	defaults to 0
Reference/Ramps	3-02	Minimum Ref	35	Hz	
	3-03	Maximum ref	160	Hz	
	3-15	Reference 1 source	[1] Analog in 53	–	defaults to 1
	3-16	Reference 2 source	[0] No Function	–	
	3-17	Reference 3 source	[0] No Function	–	
	3-41	ramp up time	10	s	
	3-42	ramp down time	10	s	
Limits/Warnings	4-12	Motor Low spd	35	Hz	
	4-14	Motor High spd	160	Hz	
Digital In/Out	5-10	Terminal 18 DI	[0] No Operation	–	
	5-11	Terminal 19 DI	[0] No Operation		
	5-12	Terminal 27 DI	[0] No Operation	–	
	5-13	Terminal 29 DI	[0] No Operation	–	
	5-15	Terminal 33 DI	[0] No Operation	–	
Analog In/Out	6-10	Terminal 53 Low Voltage	2	VDC	
	6-11	Terminal 53 High Voltage	10	VDC	defaults to 10
	6-14	Terminal 53 Low Ref	35	Hz	
	6-15	Terminal 53 High Ref	160	Hz	
	6-19	Terminal 53 mode	[0] Voltage mode	–	defaults to 0
	6-80	LCP Potmeter Enable	[0] Disabled	–	
Comm. And Options	8-30	Protocol	[0] FC	–	defaults to 0

Smart Logic	13-00	SL Controller Mode	[1] On	—	
	13-01	SL Start	[22] Comparator 0	—	
	13-02	SL Stop	[23] Comparator 1	—	
	13-10	Comparator Operand 0	[12] Analog Input 53	—	enter 0-group
	13-11	Comparator Operator 0	[2] Greater Than	—	enter 0-group
	13-12	Comparator Value 0	2.0	—	enter 0-group
	13-10	Comparator Operand 1	[12] Analog Input 53	—	enter 1-group
	13-11	Comparator Operator 1	[0] Less Than	—	enter 1-group
	13-12	Comparator Value 1	1.0	—	enter 1-group
	13-10	Comparator Operand 2	[12] Analog Input 53	—	enter 2-group
	13-11	Comparator Operator 2	[2] Greater Than	—	enter 2-group
	13-12	Comparator Value 2	1.0	—	enter 2-group
	13-51	SL Controller 0 Event	[24] Comparator 2	—	enter 0-group
	13-52	SL Controller 0 Action	[22] Run	—	enter 0-group
Special Functions	14-01	Switching Frequency	[4] 16kHz	—	
	14-20	Reset Mode	[5] Auto Rest 5	—	
	14-21	Automatic Restart Time	10.0	s	defaults to 10
	14-26	Action at Inverter Fault	[1] Warning	—	defaults to 1

Notes:

- Unit must be powered ON to complete adding VFD parameters.
- Remove Emergency Stop factory jumper on LTB1-5, 6 or field installed wire at LTB1-6 to disable unit during LCP programming.
- Verify 24VAC is no longer present at LTB1-6 before starting programming.

Programming by hand with the LCP instructions:

1. When programming the parameters, go in order from top of the table above to bottom. Before beginning this step, press the “Off/Reset” button to stop the drive so that it will not run.

2. On the LCP, press menu twice to enter the main menu and enable parameter selection. Then press up or down to select the correct group (from groups 0 to 14).
3. Press OK to enter that group, then up or down to select the specific parameter in that group. Example, 14-01 is group 14 parameter 01.
4. Press OK to edit the parameter and it will flash, then press up or down to change the value. Press OK when done and it will stop flashing and is saved automatically.
5. Program the value in column "FC". If it's a numerical value, it may be necessary to hold the up or down arrow to get to the correct value faster. If it's an enumerated value, example "[4]", choose that number from the list.
6. Parameters 13-10 to 13-52 have sub-groups. First select group 13, then select from group 0 to 2, then adjust the value setting. See column "Notes" for which sub-group to enter.
7. Push the "Auto/On" button to ready the drive to be started and controlled.

How to copy VFD parameters to the keypad (Danfoss FC51):

Note: This is highly recommended if more than one VFD is installed.

1. Press the menu button twice. The keypad should look as follows:



2. Press one of the two arrow buttons until the number 0-50 appears.



3. Press OK and the number 0 will flash, then press upper arrow until the number 1 appears, then press OK.




4. When the operation completes, the word done will be shown briefly on the keypad. All the VFD parameters have now been saved to the internal memory of the keypad. To return to the VFD status on the keypad, press back twice.

5. You can now take the LCP to other VFDs that require programming. Go back to the parameter 0-50 and select option [2] all from LCP. This will copy parameters from the LCP to VFD.

Trane – by Trane Technologies (NYSE: TT), a global climate innovator – creates comfortable, energy efficient indoor environments for commercial and residential applications. For more information, please visit trane.com or tranetechnologies.com.

Documents / Resources

	<p>TRANE PART-SVN258A-EN CFMB Combustion Blower Motor Control Board [pdf] Instruction Manual</p> <p>PART-SVN258A-EN CFMB Combustion Blower Motor Control Board, PART-SVN258A-EN, CFMB Combustion Blower Motor Control Board, Combustion Blower Motor Control Board, Blower Motor Control Board, Motor Control Board, Control Board, Board</p>
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References

-  [Trane Heating & Air Conditioning](#)
-  [Trane Technologies | A Leader in Climate and Sustainability](#)