

Installation Instructions

Input Options Kits

1 Introduction

1.1 Kits Covered in this Instruction

These instructions are for field installation of input plate option kits available for the VLT® series D- and E-frame frequency converters. The following product series are included in these kits:

- VLT® 4000
- VLT® 5000
- VLT® 6000
- VLT® 8000
- VLT® AutomationDrive FC 302
- VLT® AQUA Drive FC 202
- VLT® HVAC Drive FC 102

Check the part numbers of the kits in *Table 1.1*, *Table 1.2*, *Table 1.3*, and *Table 1.4* to confirm that the kit received is correct. A dash indicates that an option or kit is not available.

Enclosure size	380–480/500 V				Fuses	Disconnect fuses	RFI	RFI fuses	RFI disconnect fuses
	5122	4152	6152	8152					
D1/D3	5122	4152	6152	8152	176F8442	176F8450	176F8444	176F8448	176F8446
	5152	4202	6172	8202					
D2/D4	5202	4252	6222	8252	176F8443	176F8441	176F8445	176F8449	176F8447
	5252	4302	6272	8302					
	5302	4352	6352	8352					
E1/E2	5352	4452	6402	8452	176F0253	176F0255	176F0257	176F0258	176F0260
	5452	4502	6502	8502	176F0254	176F0256		176F0259	176F0262
	5502	4602	6552	8602					
	5552	4652	6602	8652					

Table 1.1 Input Plate Option Catalog Numbers: VLT® 4000, VLT® 5000, VLT® 6000, and VLT® 8000

Enclosure size	525–690 V				Fuses	Disconnect fuses	RFI
D1/D3	5042	–	–	8052	175L8829	175L8828	175L8824
	5052	–	–	8062			
	5062	–	–	8072			
	5072	4102	6102	8102			
	5102	4122	6122	8122	176F8442	176F8450	
	5122	4152	6152	8152			
	5152	4202	6172	8202			
D2/D4	5202	4252	6222	8252	175L8827	175L8826	175L8825
	5252	4302	6272	8302			
	5302	4352	6352	8352			
	5352	4402	6402	8402			
E1/E2	5402	4502	6502	8502	176F0253	176F0255	–
	5502	4602	6602	8602	176F0254	176F0288	
	5602	4652	6652	8652			

Table 1.2 Input Plate Option Catalog Numbers: VLT® 4000, VLT® 5000, VLT® 6000, and VLT® 8000

Enclosure size	380-480/500 V		Fuses	Disconnect fuses	RFI	RFI fuses	RFI disconnect fuses
	FC 302	FC 102/FC 202					
D1/D3	P90K T5	P110 T4	176F8442	176F8450	176F8444	176F8448	176F8446
	P110 T5	P132 T4					
D2/D4	P132 T5	P160 T4	176F8443	176F8441	176F8445	176F8449	176F8447
	P160 T5	P200 T4					
	P200 T5	P250 T4					
E1/E2	P250 T5	P315 T4	176F0253	176F0255	176F0257	176F0258	176F0260
	P315 T5	P355 T4	176F0254	176F0256		176F0259	176F0262
	P355 T5	P400 T4					
	P400 T5	P450 T4					

Table 1.3 Input Plate Option Catalog Numbers: VLT® AutomationDrive, VLT® AQUA Drive, and VLT® HVAC Drive

Enclosure size	525–690 V		Fuses	Disconnect fuses	RFI
	FC 302	FC 102/FC 202			
D1/D3	P37K T7	P45K T7	175L8829	175L8828	175L8824
	P45K T7	P55K T7			
	P55K T7	P75K T7			
	P75K T7	P90K T7			
	P90K T7	P110 T7	176F8442	176F8450	
	P110 T7	P132 T7			
	P132 T7	P160 T7			
D2/D4	P160 T7	P200 T7	175L8827	175L8826	175L8825
	P200 T7	P250 T7			
	P250 T7	P315 T7			
	P315 T7	P400 T7			
E1/E2	P355 T7	P450 T7	176F0253	176F0255	–
	P400 T7	P500 T7			
	P500 T7	P560 T7	176F0254	176F0288	
	P560 T7	P630 T7			

Table 1.4 Input Plate Option Catalog Numbers: VLT® AutomationDrive, VLT® AQUA Drive, and VLT® HVAC Drive

1.2 Kit Contents

The kit contains the following items:

- Replacement input plate (pre-assembled)
- Modification label
- These instructions

1.3 Tools Required

Tools required for all installations:

- Metric socket set 7–19 mm
- Socket extensions
- Torx driver set T10–T40
- Torque wrench 6–170 in-lbs.

Additional tools for disconnect option only:

- Drill
- Punch

1.4 Safety Information

⚠️ WARNING

DISCHARGE TIME

The frequency converter contains DC-link capacitors, which can remain charged even when the frequency converter is not powered. Failure to wait the specified time after power has been removed before performing service or repair work can result in death or serious injury.

- Stop the motor.
- Disconnect the AC mains and remote DC-link power supplies, including battery back-ups, UPS, and DC-link connections to other frequency converters.
- Wait for the capacitors to discharge fully before performing any service or repair work. See *Table 1.5* for minimum discharge times.

Enclosure size	Minimum waiting time (minutes)
D1, D2, D3, D4	20
E1, E2	40

Table 1.5 Discharge Time

⚠️ WARNING

HIGH VOLTAGE

Frequency converters contain high voltage when connected to AC mains input, DC power supply, or load sharing. Failure to perform installation, start-up, and maintenance by qualified personnel can result in death or serious injury.

- Installation, start-up, and maintenance must be performed by qualified personnel only.

All necessary work on electric drive units must only be performed by adequately qualified personnel (e.g. electrical engineers as specified in draft EN 50 110-1/DIN VDE 0105), who have the operating instructions provided and other product documentation available during any corresponding work and who are obliged to abide by the instructions contained therein. Qualified personnel are persons who are authorised due to training, experience, and instruction as well as their knowledge of relevant standards, rules, accident-prevention regulations, and operating conditions.

⚠️ CAUTION

The input plate has sharp edges that can cut skin.

- Use hand protection when removing and installing the input plate.

2 Remove the Existing Input Plate

The input plate can be replaced on a field-installed frequency converter. It is not necessary to remove the door.

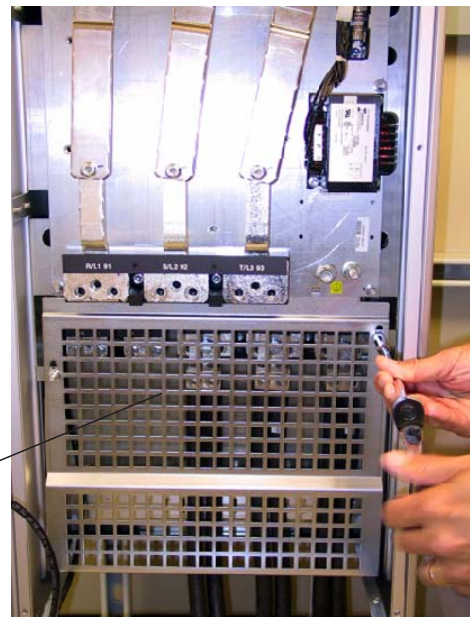
Illustration 2.1 shows a D2 VLT® 5000 with a basic input plate. Appearance of the input plate and connections vary by configuration.



1	Input plate
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Illustration 2.1 Input Plate Location

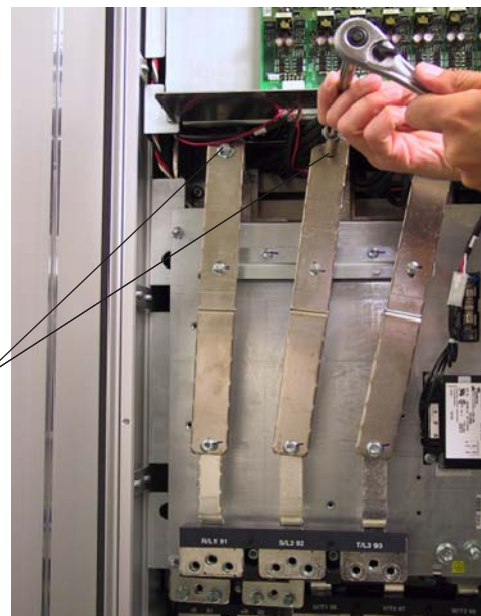
1. Disconnect the power and verify that there is no incoming power and that the capacitors have fully discharged before beginning work. Follow lockout/tagout procedures.
2. Disconnect the incoming power cables from the input terminals. It is not necessary to remove them from the unit completely. In multi-conductor applications, loosen or remove cable clamps to allow cables to be removed from the terminals.
3. Loosen, but do not remove, the 2 retaining nuts (10 mm) holding the EMC screen in place.
4. Lower the EMC screen in its slotted mounting holes to disengage it from the input plate.



1	EMC screen
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Illustration 2.2 EMC Screen Removal

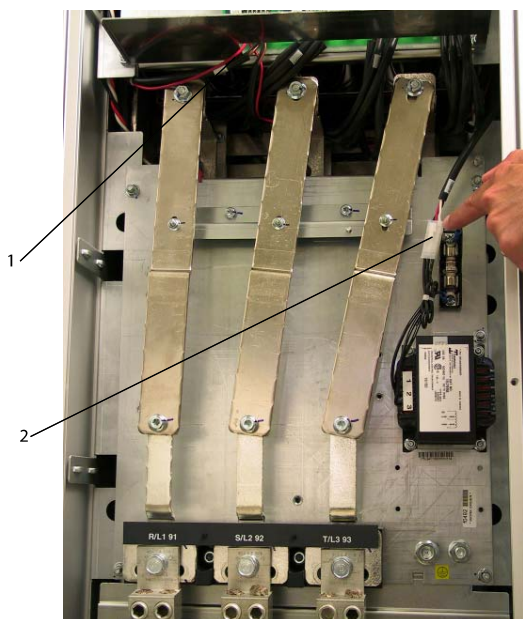
5. Remove the 3 retaining nuts (13 mm) that connect the input plate to the input bus bars. Do not damage the control wiring around the input plate.



1	Retaining nuts
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Illustration 2.3 Location of the Retaining Nuts

- Disconnect the fan transformer wiring harness using the connector, as shown in *Illustration 2.4*.



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1	Control wires
2	Fan transformer wiring harness connector

Illustration 2.4 Disconnecting the Fan Transformer Wiring

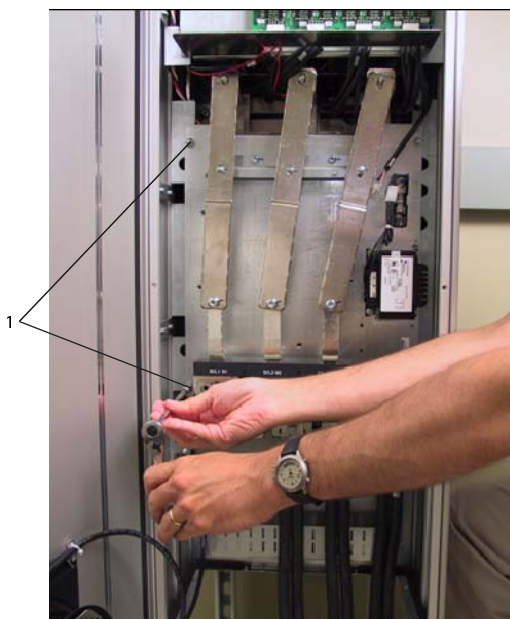
- Remove the input plate as shown in *Illustration 2.6*. Be careful not to damage the control wires near the top of the input bus bars.



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Illustration 2.6 Removing the Existing Input Plate.

- Remove the 5 retaining nuts (10 mm) from the input plate. The input plate is now held in place by 5 studs that are attached to the enclosure.

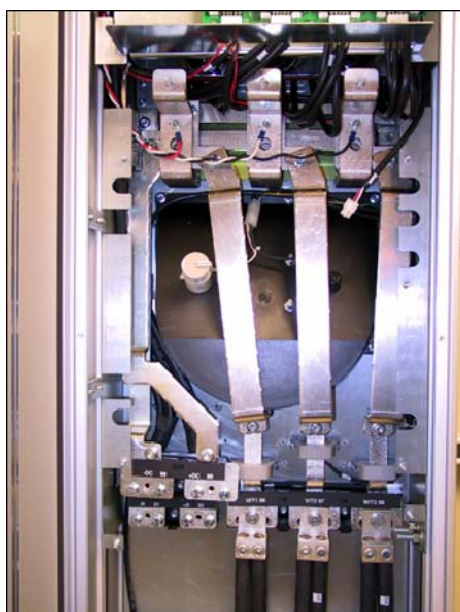


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1	Retaining nuts
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Illustration 2.5 Removing the Retaining Nuts

Illustration 2.7 shows the frequency converter with the input plate removed. The output bus bars and fan box are visible.



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Illustration 2.7 D2 Frequency Converter with Input Plate Removed

3 Installing the New Input Plate

CAUTION

RISK OF INJURY

The input plate weighs between 13 lbs. (6 kg.) and 77 lbs. (35 kg). Improper lifting can cause injury if dropped.

- Lift the input plate carefully using a 2-person lifting technique for the heavier varieties.

NOTICE

Be careful not to damage or restrict the control wires during installation.

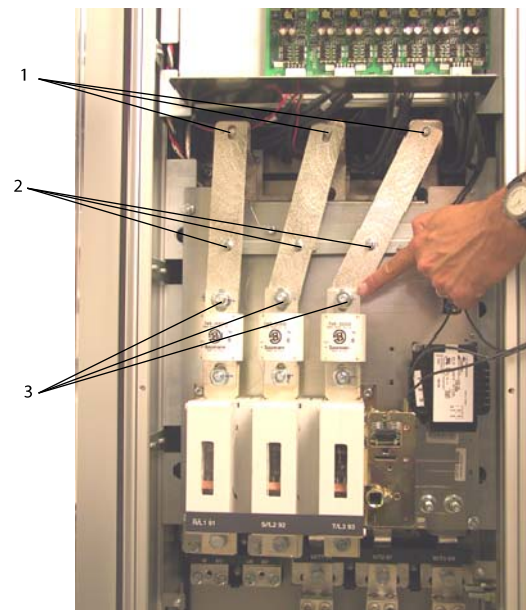
- Place the new input plate on the 5 studs mounted on the enclosure. *Illustration 3.1* shows an input plate with a fused disconnect. Align the bus bar tops with the studs located on the input bus bars. When the input plate is aligned with all the studs, push the entire assembly into place.



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Illustration 3.1 Align the Input Plate with Studs. Fused Disconnect Configuration Shown.

- If the bus bars do not fit with the studs on the main input bus bar, loosen the bus support nuts and lower bus bar connection nuts shown in *Illustration 3.2*. Loosening these connections allows enough movement to align the tops of the bus bars. Input plates equipped with RFI, disconnect, and fuses (*Illustration 3.3*) fit with no adjustment. Do not open the RFI to attempt further alignment.



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1	Main input bus bar studs
2	Bus support nuts
3	Lower bus bar connection nuts

Illustration 3.2 Loosen Connection to Adjust



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Illustration 3.3 Input Plate with RFI, Disconnect and Fuses

- Tighten the 5 input plate retaining nuts (10 mm) to 35 in-lbs (3.9 Nm). Tighten the 3 lower bus bar connection nuts (13 mm) to 85 in-lb (9.6 Nm). Tighten the 3 bus bar support nuts (8 mm) to 20 in-lbs (2.3 Nm).

4. Push the EMC screen up to engage the new input plate and tighten the 2 retaining nuts (10 mm) to 35 in-lbs (3.95 Nm). 2 notches on the bottom of the input plate hold the EMC screen in place.
5. Reconnect the input power wiring. Tighten all connections to the proper torque specifications (see the frequency converter operating instructions).
6. Mark the modification label supplied with the kit and affix it next to the VLT® product nameplate.
7. Reconnect the fan transformer wiring, as shown in *Illustration 3.4*.

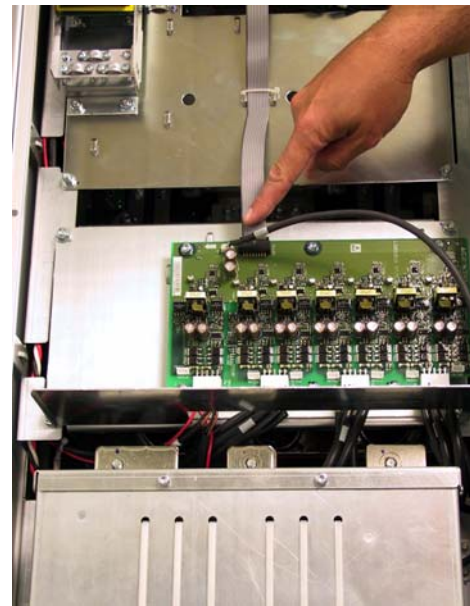


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Illustration 3.4 Reconnecting Fan Transformer Wiring

Additional steps for RFI input plates only:

8. Connect the RFI cable to the gate drive card as shown in *Illustration 3.5*.



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Illustration 3.5 RFI Cable Connected to Gate Drive Card

9. Set the RFI switch on the interface card to the ON position (*Illustration 3.6*).



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Illustration 3.6 RFI Switch on the Interface Card

4 Door Modification (Disconnect Option Only)

To accommodate the disconnect handle, input option plates with disconnect switches require additional holes in the frequency converter door. The photos in this instruction show the process with the frequency converter door removed for illustrative purposes. It is not necessary to remove the door for this procedure.

The hole pattern consists of a large hole for the disconnect handle shaft to pass through the door, and 4 smaller holes for mounting. This instruction presents one method for finding the initial hole location, but other methods are also acceptable.

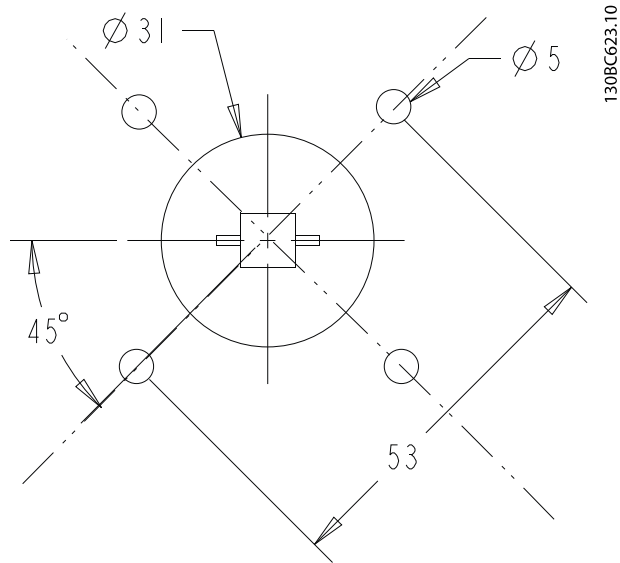
1. To find the location for the initial hole, remove the handle from the disconnect so the door can close against the disconnect handle shaft.
2. Apply a marking compound to the top of the shaft and close the door against it to mark the hole position on the inside of the door.
3. Use a punch to cut a 31 mm hole in the door for the handle shaft, being careful to keep metal particles and debris from entering the enclosure.



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Illustration 4.1 Punching the Disconnect Handle Shaft Hole

4. After punching the initial hole, use its position to find the locations of the 4 x 5 mm mounting holes, using the dimensions provided in *Illustration 4.2*.



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Illustration 4.2 Mounting Hole Location



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Illustration 4.3 Finished Punched Hole Pattern

5. After punching all the holes, use the instructions included with the handle to install it.

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