INSTRUCTIONS
INSTALLATION OF NEMA-3R KIT FOR D3, D4 & E2 FRAME VLT® DRIVES INTO RITTAL ENCLOSURES

This instruction sheet is for the installation of NEMA 3R kits available for the IP00 VLT® drive frames D3, D4 and E2. These kits are designed and tested to be used with IP00/Chassis drives in Rittal TS8 NEMA-3R or NEMA-4 enclosures. The NEMA-3R enclosure is an outdoor enclosure that provides a degree of protection against rain and ice. The NEMA-4 enclosure is an outdoor enclosure that provides a greater degree of protection against weather and hosed water.

The minimum enclosure depth is 500 mm (600mm for E2 frame) and the kit is designed for a 600 mm (800mm for E2 frame) wide enclosure. Other enclosure widths are possible, however additional Rittal hardware is required. The maximum depth and width are as required by the installation.

Notes:

1. The current rating of D3 and D4 frame drives are de-rated by 3% when installed in a NEMA-3R enclosure. E2 frame drives require no de-rating when installed in a NEMA-3R enclosure.
2. A doorfan(s) is required on the enclosure to remove the heat losses not contained in the backchannel of the drive. The minimum airflow required (at the maximum rated ambient temperature) for the D3 and D4 frame drives is 391 m^3/h (230 cfm). The minimum airflow required (at the maximum rated ambient temperature) for the E2 frame drive is 782 m^3/h (460 cfm). If additional heat losses are added within the enclosure a calculation must be made to ensure the proper airflow is provided

Used with: VLT4000, VLT5000, VLT6000, VLT8000, VLT-HVAC, VLT-AQUA, VLT-Automation	
Frame D3 Kit Part No.	176F4600
Frame D4 Kit Part No.	176F4601
Frame E2 Kit Part No.	176F1852

Required Tools

- Metric Socket Set, 7-19mm
- Socket Extensions
- Torx Driver Set T10-T40
- Torque Wrench 6-50 in-lbs (.7-6 N-M)

Kit Contents

- Deflectors, vent covers
- Enclosure backplate
- Mounting hardware
- Gasket material

Torque Requirements

1. M5 screws/nuts torque to 20 in-lbs (2.3 N-M)
2. M6 screws/nuts torque to 35 in-lbs (3.9 N-M)
3. M10 nuts torque to 170 in-lbs (20 N-M)
4. T25 Torx screws torque to 20 in-lbs (2.3 N-M)

Attachment

Drawing 175R5921

VLT® is a registered trademark of Danfoss A/S

Kit Components

The kit consist of the following parts:

- Exterior air deflectors
- Gasket material
- Top vent cover
- Bottom vent cover
- Drive mounting plate
- Sealing plates and gaskets (not shown on this page)

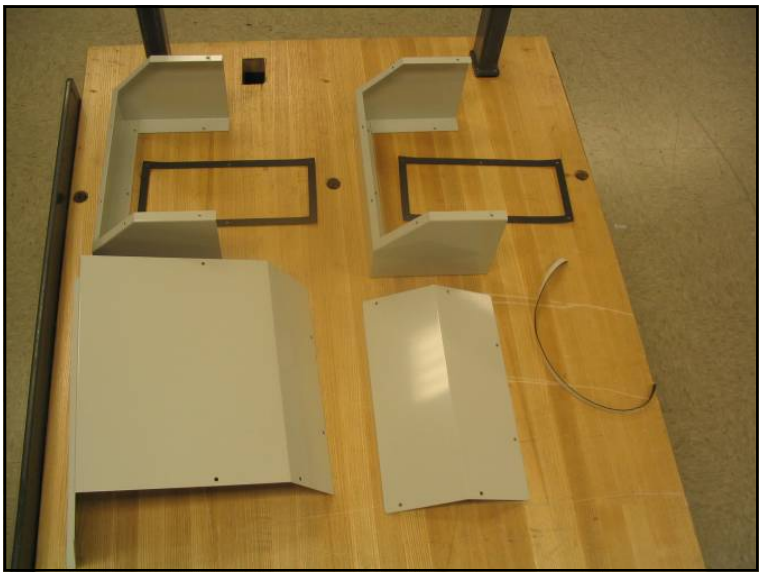


Figure 1. Air deflector components

Figure 2. Top vent cover

Figure 3. Bottom air inlet cover (with gasket)

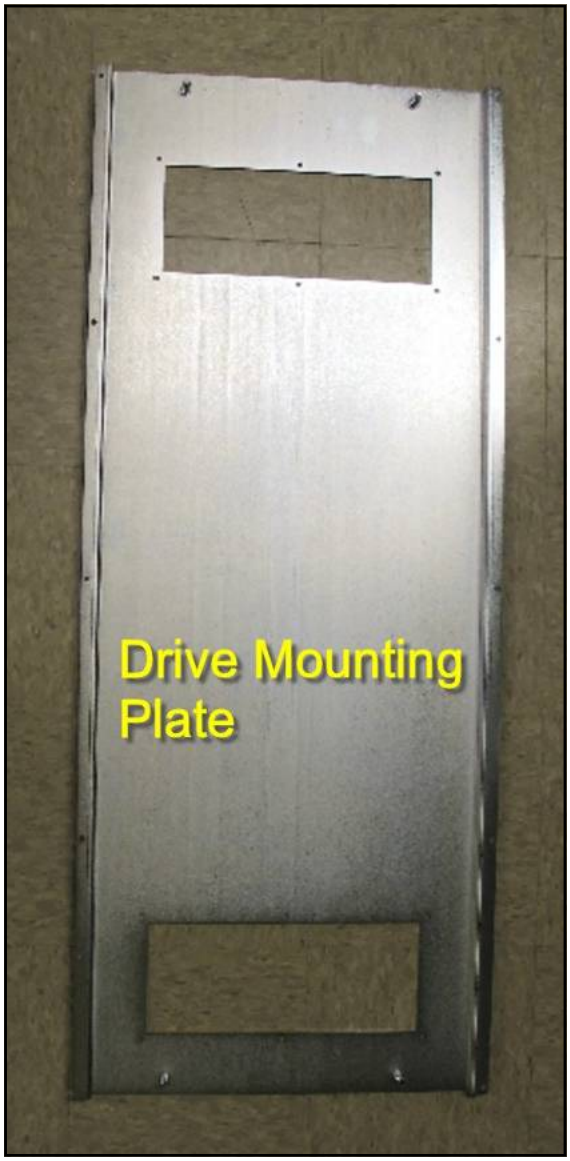


Figure 4. Drive mounting plate

Remove 7 torx screws from the top of drive. See Figure 5.

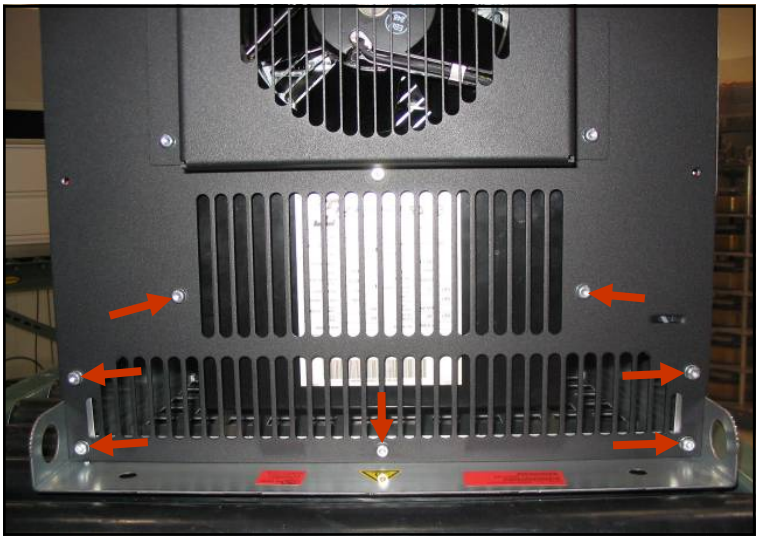


Figure 5. Screws to be removed from top of drive

Install the top duct cover plate as shown in Figure 6 using the new 16mm, M5 torx screws provided with the kit

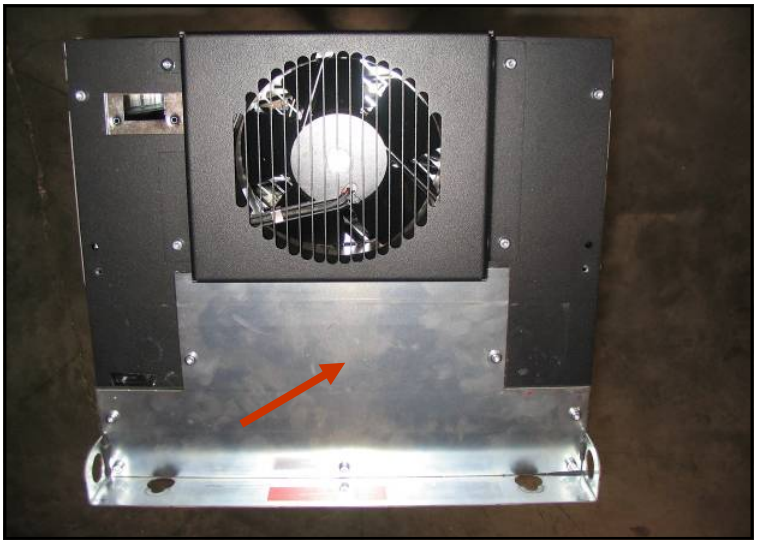


Figure 6. Top cover plate installed

At the bottom of the drive, install two mounting clips. See Figure 7.

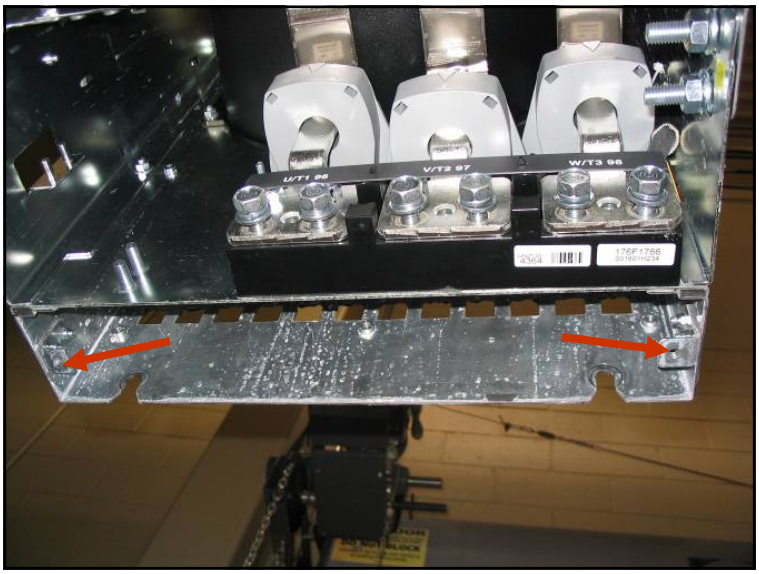


Figure 7. Mounting clips

Install the drive mounting plate in the enclosure using the “in frame” mounting position. See Figure 8.

Use the drive mounting plate as a template to mark the openings for the air intake and exhaust along with mounting screw holes on the rear panel of the enclosure.

Figure 8. Drive mounting plate installed with rear panel of enclosure removed

Remove the rear panel of the enclosure and cut openings and drill mounting holes. See Figure 9.

Figure 9. Rear panel of enclosure

Install gaskets on both sides of the drive mounting plate. See Figure 10.

Figure 10. Back of drive mounting plate with gaskets installed

Install the drive on the drive mounting plate using the four studs on the top and bottom of the mounting plate. M10 nuts are provided for drive mounting. See Figure 11.

Re-install the rear panel of the enclosure.

Figure 11. Drive installed on mounting plate

Two sealing plates and gaskets are provided in the kit. See Figure 12.

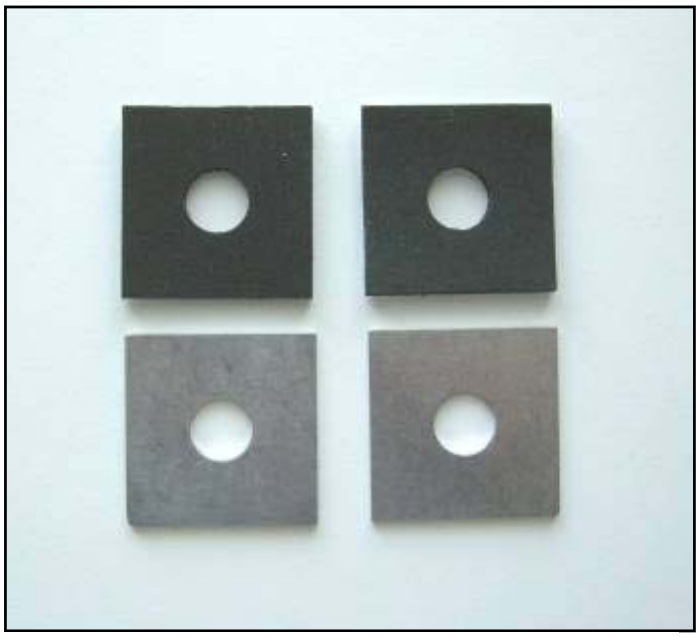


Figure 12. Sealing plates and gaskets

Apply gaskets to the sealing plates as shown in Figure 13.

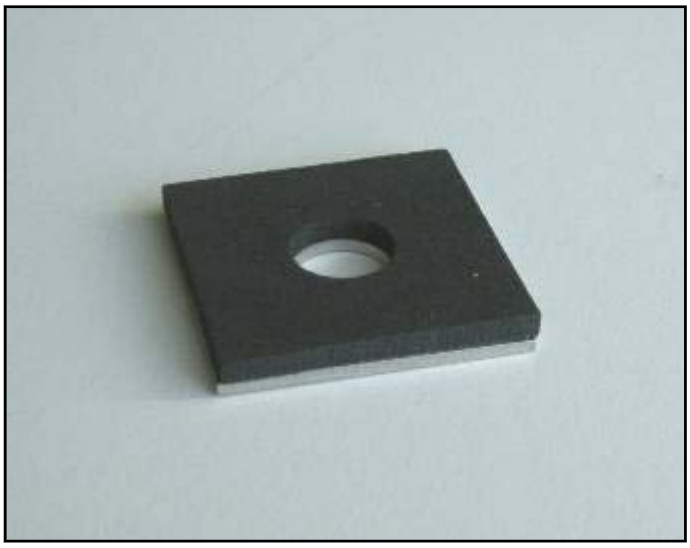


Figure 13. Gasket mounted on sealing plate

Install the sealing plates over the two bottom drive mounting studs and secure the drive with nuts. See Figures 14 and 15.

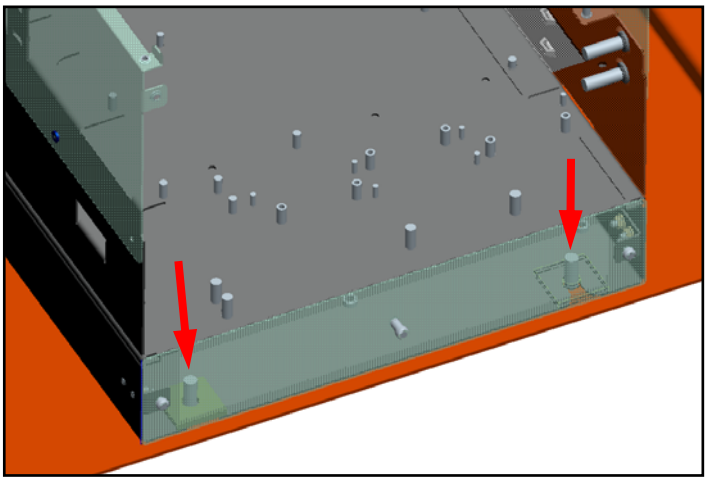


Figure 14. Bottom mounting locations

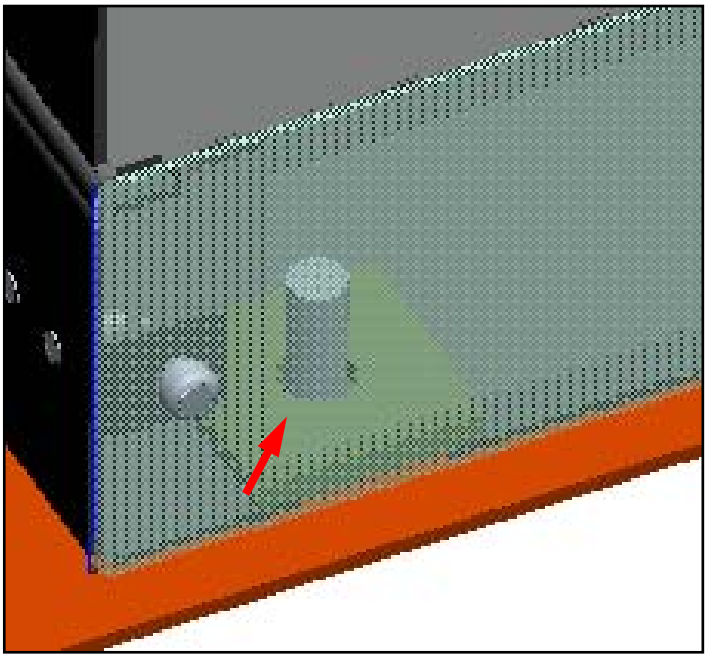


Figure 15. Sealing plate installed over mounting stud

Install the gasket material on the bottom air inlet cover and install using 2-M5 screws as shown in Figure 16.

A drain hose may be attached to the drain plug if there is concern that condensation may accumulate in the bottom of the duct. If not, plug the drain plug with a screw provided with the kit. It is recommended that Teflon tape be used with the screw to seal the drain plug.

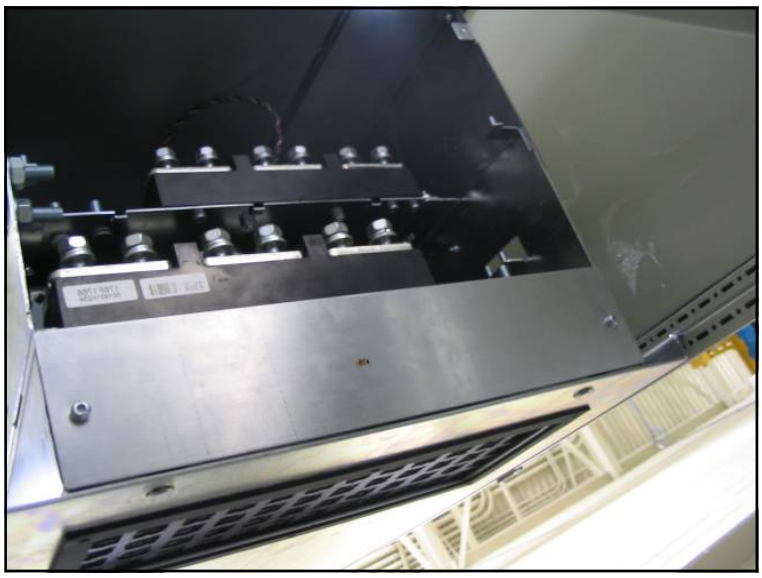


Figure 16. Bottom air inlet cover installed

The exterior upper and lower air deflector assemblies consist of a frame, a cover and gasket material. The frame is the same for both upper and lower assemblies. The cover is different for the upper and lower assemblies, the cover for the upper deflector assembly has a deflector to direct the exhaust air to the sides.

Figure 17. Deflector frames

Install gaskets on the outside of the rear enclosure panel as shown in Figure 18.

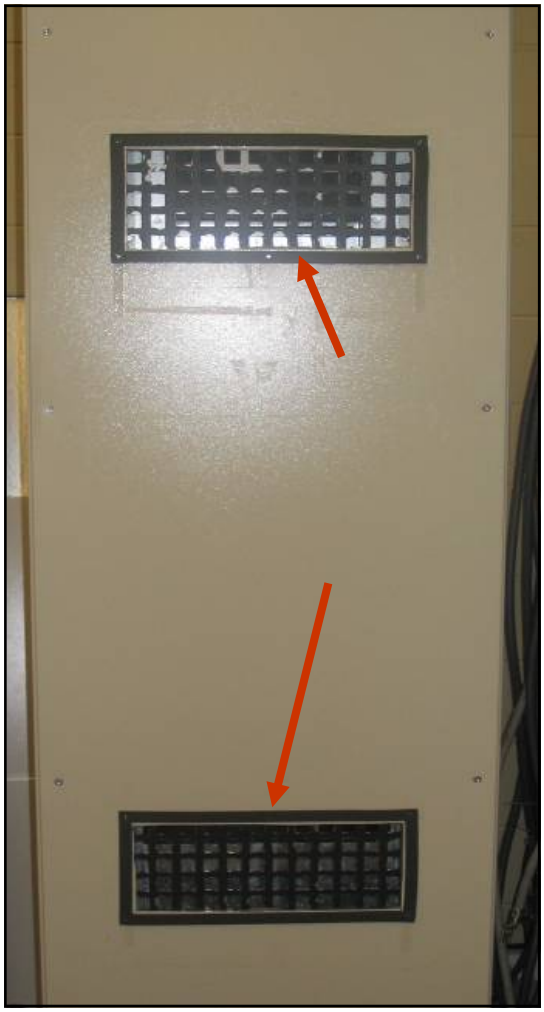


Figure 18. Gasket installed on the outside of the rear panel

Install the deflector frames as shown using the M5 screws provided. See Figure 19

Figure 19. Deflector frames installed on top and bottom openings

Apply gasket to upper deflector cover. The gasket is applied to the surface of the cover that is in contact with the enclosure rear panel. See Figure 20.

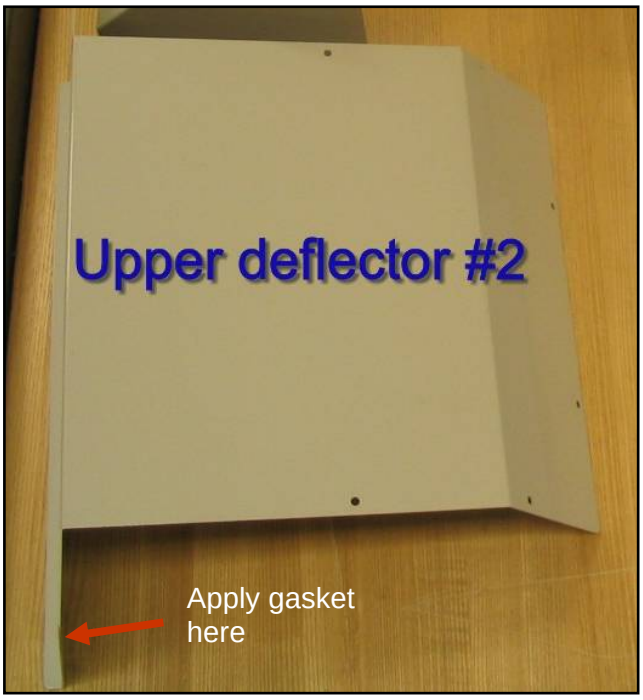


Figure 20. Upper deflector cover

Attach the cover using M5 torx screws as shown in Figure 21. This completes the upper deflector installation.

Figure 21. Upper deflector assembly installed

The lower deflector cover is shown in Figure 22.

Figure 22. Lower deflector cover

Install the lower deflector cover as shown in Figure 23. This completes the lower deflector installation.

Figure 23. Lower deflector assembly installed

Adequate clearance is required when using NEMA-3R kits due to the redirected flow of exhaust air. If adequate clearance is not provided the recirculation of exhaust air will negatively influence the performance of the drives.

As a result, side-by-side installation of NEMA-3R drive enclosures (as shown in Figure 25) must be avoided.

Two walls or obstruction surfaces are allowed close to the drive as shown in Figure 24. One surface on the back and one on either side is permitted.

The minimum distance to these surfaces is 500mm (20 inches) to prevent recirculation of the exhaust air from the drive.

See Figures 24 and 25.

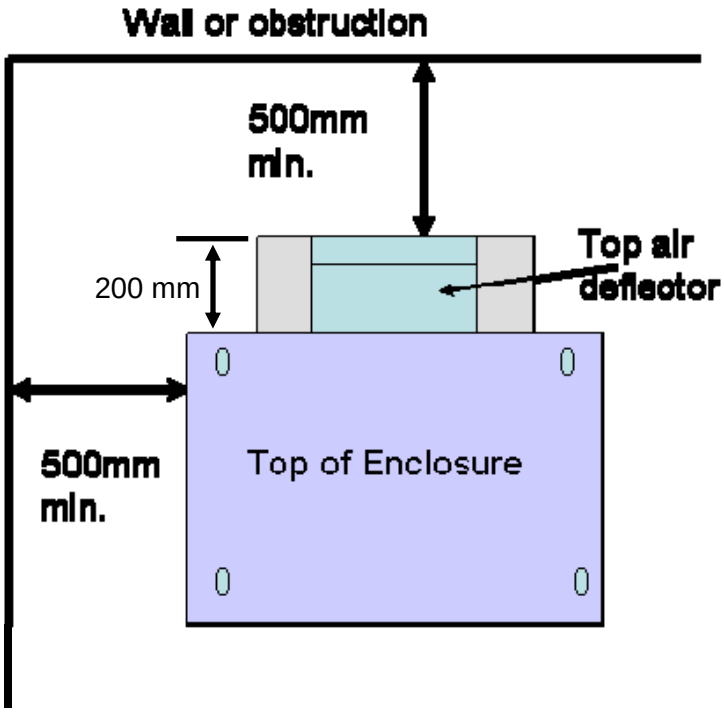


Figure 24. Single drive installation

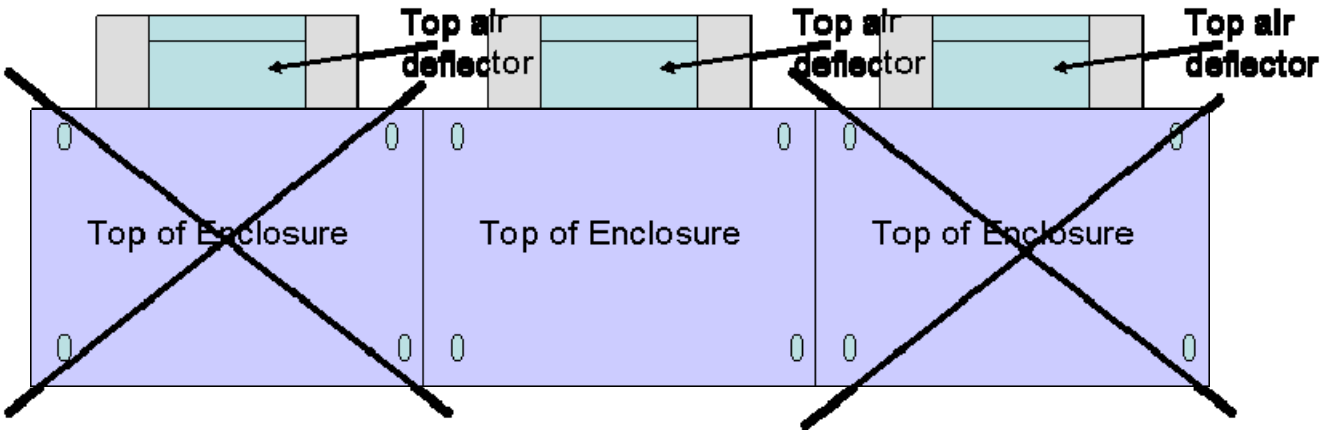
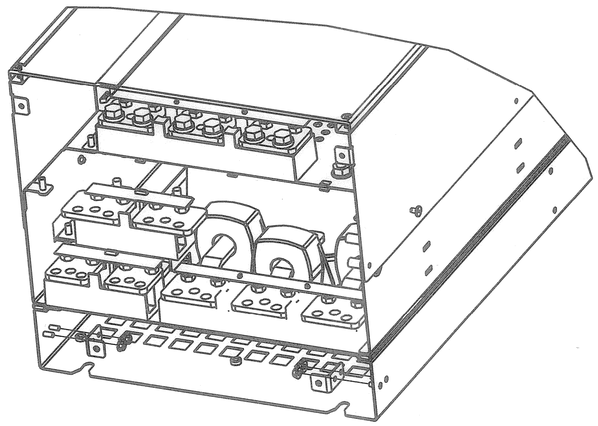
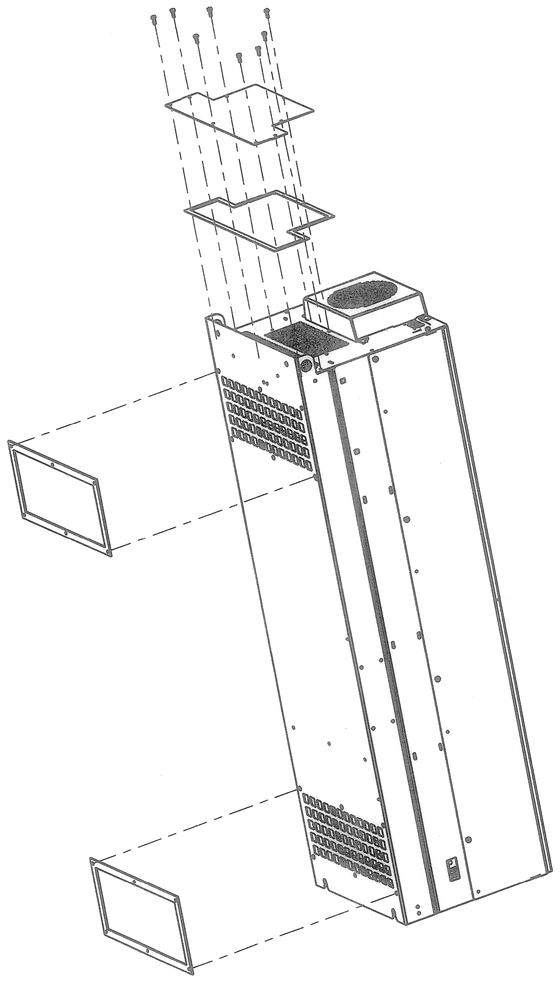
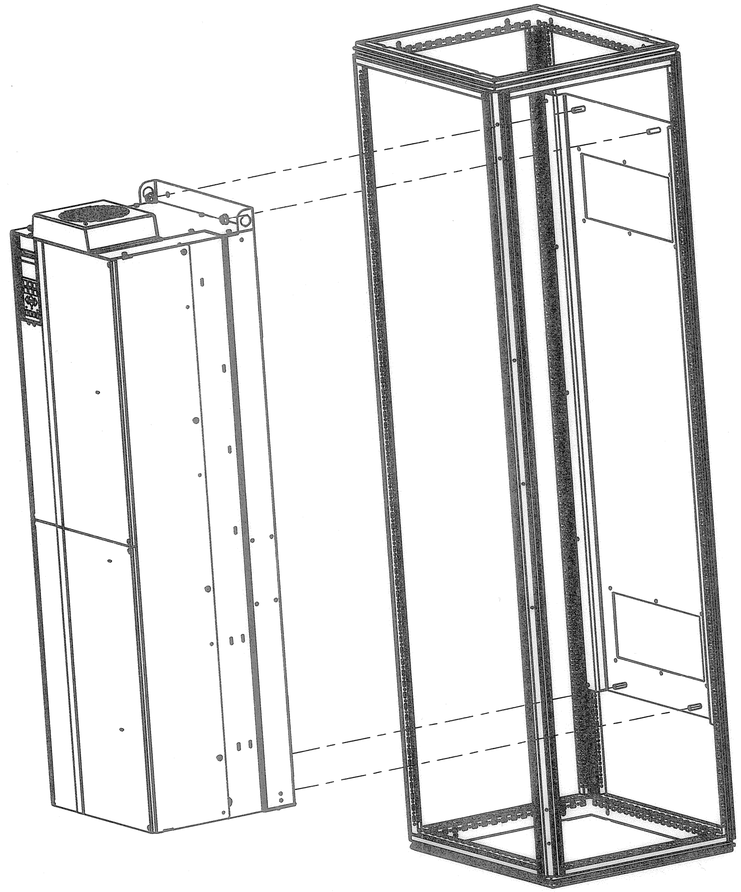
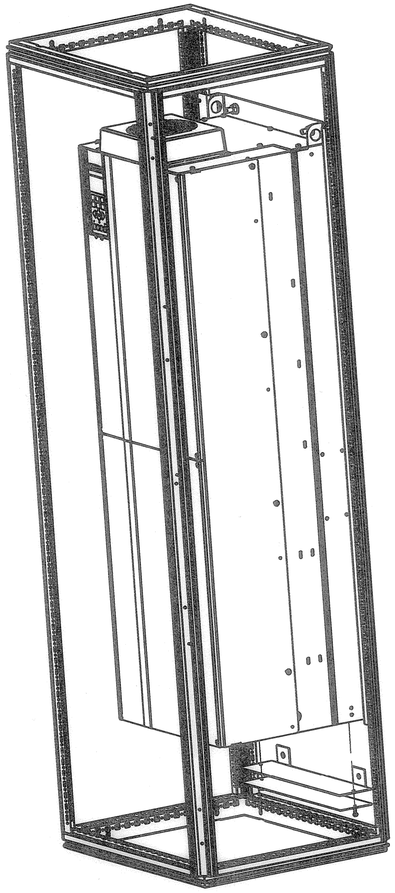


Figure 25. Improper multiple drive installation





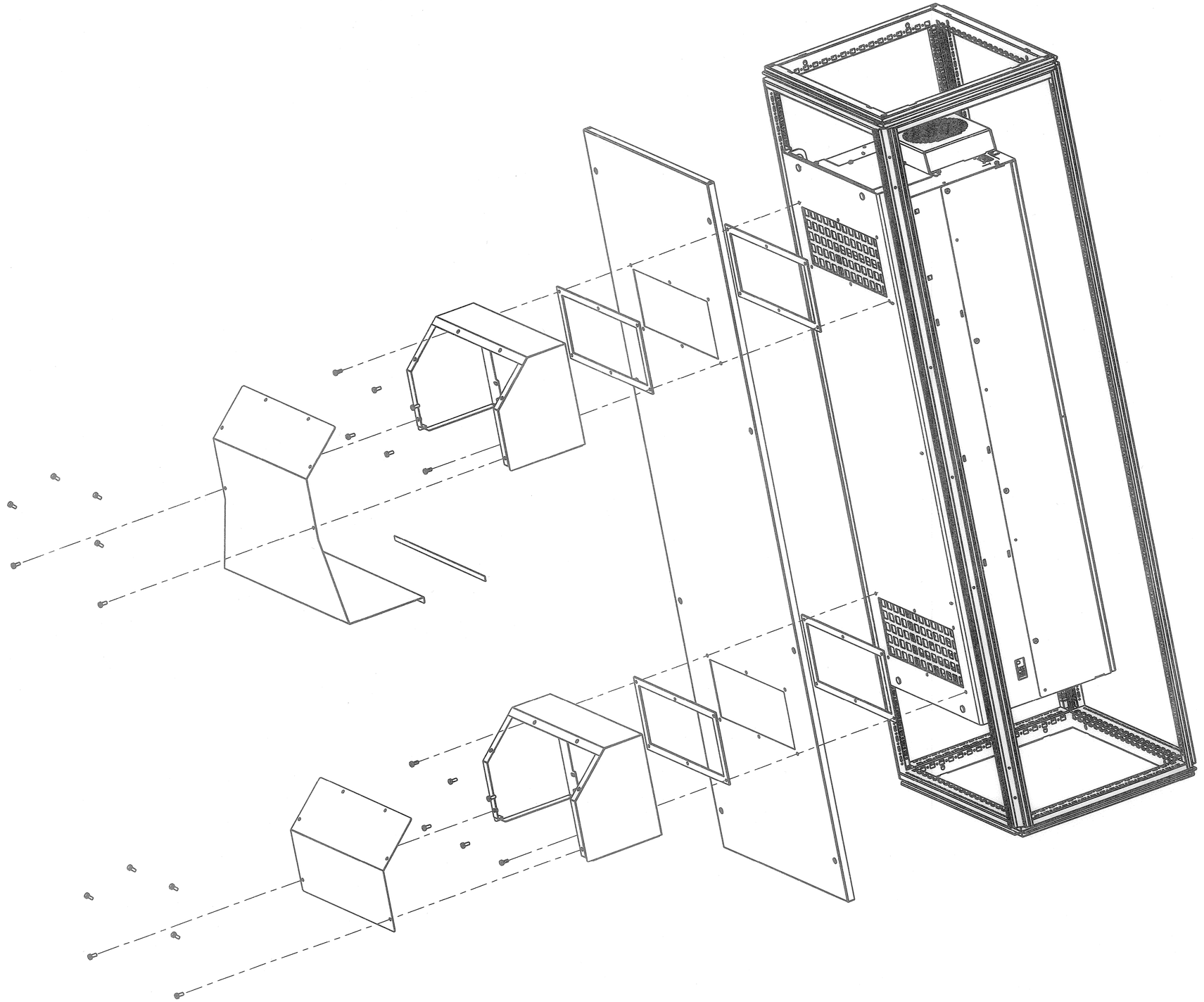




- NOTICE -

THIS DOCUMENT CONTAINS PROPRIETARY INFORMATION OF DANFOSS DRIVES. IT IS LOANED BY DANFOSS DRIVES SUBJECT TO THE CONDITIONS THAT IT AND THE THE INFORMATION EMBODIED THEREIN SHALL BE USED ONLY FOR RECORD AND REFERENCE PURPOSES, SHALL NOT BE USED OR CAUSED TO BE USED IN ANY WAY PREJUDICIAL TO THE INTERESTS OF DANFOSS DRIVES, SHALL NOT BE REPRODUCED OR COPIED IN WHOLE OR IN PART OR DISCLOSED TO ANYONE WITHOUT THE DIRECT WRITTEN PERMISSION OF DANFOSS DRIVES, AND SHALL BE RETURNED UPON REQUEST.

PRO-E ENTRY BY/DATE: MM 01/14/05	CHECKED BY/DATE: [illegible] 2/21/08	DANFOSS DRIVES 4401 N. BELL SCHOOL RD. LOVES PARK, ILLINOIS 61111 USA (815) 639-8600 FAX (815) 639-8899	
DESIGNED BY/DATE: MM 01/14/05	MFG. APPROVAL BY/DATE:		
APPROVAL:	ENG. APPROVAL BY/DATE: [illegible] 2/25/08	TITLE: DWG, REF, 3R, D3/D4/E2 FRAME, IP00	
LATEST E.C.N. NO.: HP08013	E.C.N. PRO-E ENTRY BY/DATE: MN 02/21/08	PLOT SCALE: NONE	PRO-E FILE: 175R5921
		SHEET: 1 OF: 2	DRAWING NO.: 175R5921 REV.: A



LATEST E.C.N. NO.:	E.C.N. PRO-E ENTRY BY/DATE:	PLOT SCALE:	PRO-E FILE:	SHEET:	OF:	DRAWING NO.:	REV.:
HP08013	MN 02/21/08	NONE	175R5921	2	2	175R5921	A

TITLE: DWG, REF, 3R, D3/D4/E2 FRAME, IP00