Danfoss FK09a iC7 Automation Frequency Converters Installation Guide

Contents

Danfoss FK09a iC7 Automation Frequency Converters

Product Information

Specifications:

- Product Name: In-back/Out-back Cooling Kit for FK09a/FB09a and FK10a/FB10a
- Series: iC7 Series Frequency Converters
- Kit Numbers:
  - 176F4184 – FK09a/FB09a in-back/out-back cooling kit
  - 176F4185 – FK10a/FB10a in-back/out-back cooling kit

Product Usage Instructions

Description:
The in-back/out-back cooling kit is designed for iC7 Series FK09a/FB09a and FK10a/FB10a Frequency Converters. It facilitates airflow from the lower duct to the upper back vent, as depicted in Illustration 1.

Kit Numbers:
Refer to the following kit numbers when using these instructions:

- 176F4184 – FK09a/FB09a in-back/out-back cooling kit
- 176F4185 – FK10a/FB10a in-back/out-back cooling kit

Items Supplied:
The kit includes various items listed in Table 2 of the installation guide, such as top cover, gaskets, screws, duct frame, drain tube, and more.

Safety Information:

NOTICE: Only qualified personnel should install the components per the provided instructions.

WARNING: ELECTRICAL SHOCK HAZARD

- Disassembly and reassembly must adhere to the service guide.
- Qualified electricians should handle the installation.
- Disconnect from power sources before installation or service.
- Follow guidelines and local electrical safety regulations.

WARNING: DISCHARGE TIME (20 MINUTES)

- Wait 20 minutes after power removal before servicing to avoid high voltage risks.
- Stop the motor and disconnect all power sources before service or repair work.

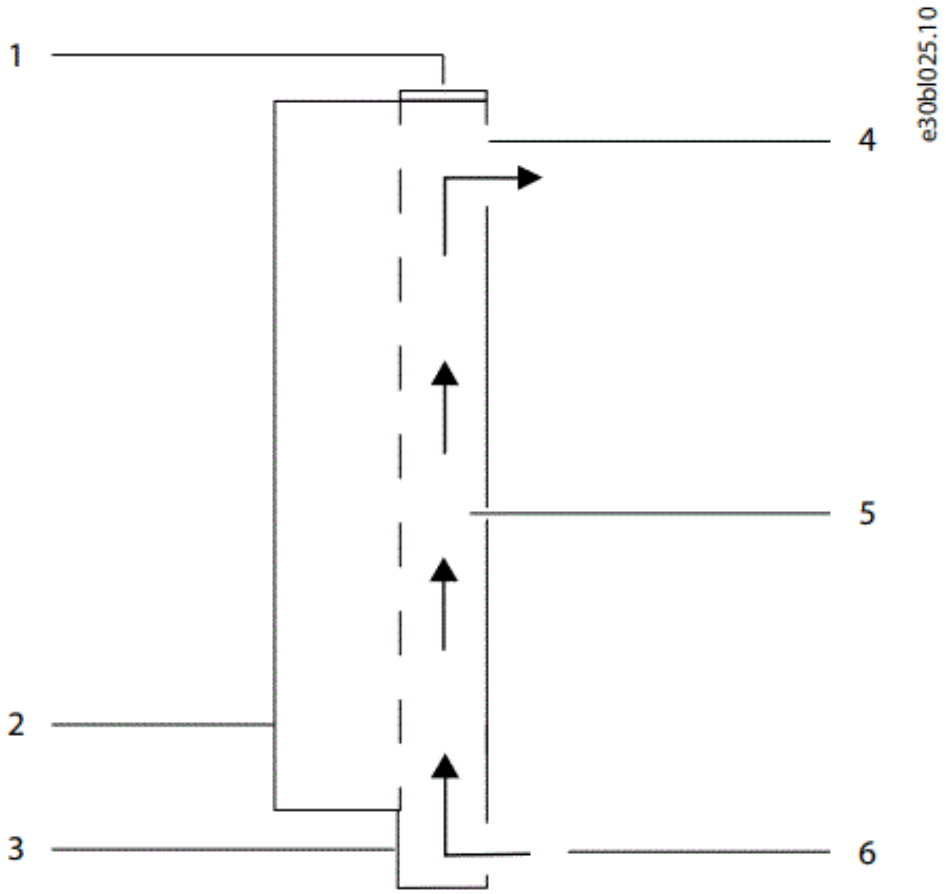
FAQ:

- Q: Can I install the cooling kit myself?
  A: It is recommended to have qualified personnel handle the installation to ensure safety and proper functioning of the equipment.
- Q: How often should I clean or maintain the cooling kit?
  A: Regular maintenance is advised as per the user manual to ensure optimal performance. Cleaning frequency may vary depending on environmental conditions.

n-back/Out-back Cooling Kit for FK09a/FB09a and FK10a/FB10a iC7 Series Frequency Converters

Overview

Description
The in-back/out-back cooling kit fits iC7 Series FK09a/FB09a and FK10a/FB10a Frequency Converters. When the kit is installed, air flows into the lower duct and out through the upper back vent. See Illustration 1.



1. Top cover
2. Frequency converter enclosure
3. Lower duct
4. Back vent
5. Cooling backchannel
6. Airflow direction

Kit Numbers
Use these instructions with the following kits.
Table 1: Numbers for In-back/Out-back Cooling Kits

Number	Kit description
176F4184	FK09a/FB09a in-back/out-back cooling kit
176F4185	FK10a/FB10a in-back/out-back cooling kit

Items Supplied
Table 2 provides a list of items included in the kit. Refer also to 2.2 Installation Overview.

Table 2: Items Supplied in In-back/Out-back Cooling Kits

Item	Quantity
Top cover	1
Top cover gasket	1
Base plate gasket	1
Base plate	1
M5x12 screw	17
Cable entry gasket	1
Cable entry plate	1
Duct frame top gasket	1
Duct frame	1
Duct front gasket	1
Duct front cover	1
M5 nut	4
Drain tube	1
Back vent gasket	1
Seal plate	2
Seal plate gasket	2
M10x30 mm mounting screw	4
Grill gasket	1
Back grill	1
Side gasket, left	1
Side gasket, right	1
Bottom gasket	1
Bottom cover plate	1

Installation

Safety Information
NOTICE

QUALIFIED PERSONNEL
Only qualified personnel are allowed to install the parts described in these installation instructions.

- Disassembly and reassembly of the frequency converter must be done per the corresponding service guide.
- Use the standard fastener torque values from the service guide, unless the torque value is specified in these instructions.

ELECTRICAL SHOCK HAZARD
The frequency converter contains dangerous voltages when connected to mains voltage. Improper installation, and installing or servicing with power connected, can cause death, serious injury, or equipment failure.

- Only use qualified electricians for the installation.
- Disconnect the frequency converter from all power sources before installation or service. Treat the frequency converter as live whenever the mains voltage is connected.
- Follow the guidelines in these instructions and local electrical safety regulations.

DISCHARGE TIME (20 MINUTES)
The frequency converter contains DC-link capacitors, which can remain charged even when the frequency converter is not powered. High voltage can be present even when the warning indicator lights are off.
Failure to wait 20 minutes after power has been removed before performing service or repair work can result in death or serious injury.

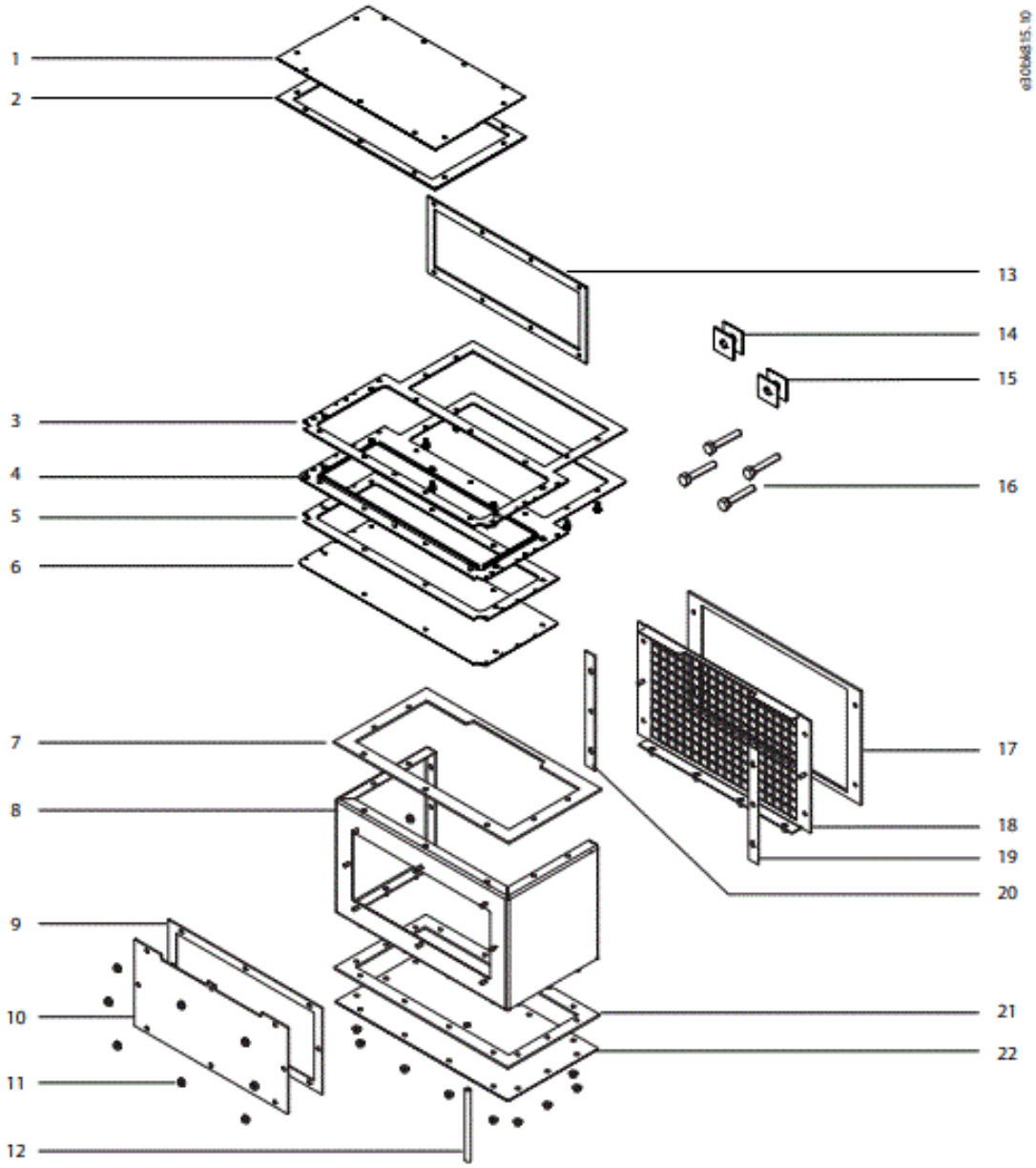
- Stop the motor.
- Disconnect AC mains, permanent magnet-type motors, and remote DC-link supplies, including battery backups, UPS, and DC-link connections to other frequency converters.
- Wait 20 minutes for the capacitors to discharge fully before performing any service or repair work.
- To verify full discharge, measure the voltage level.

ELECTROSTATIC DISCHARGE
Electrostatic discharge can damage components.

- Ensure discharge before touching internal frequency converter components, for example by touching a grounded, conductive surface or by wearing a grounded armband.

Installation Overview
APPLYING GASKETS
This kit contains self-adhesive gaskets to ensure a proper seal between metal parts.

- Before affixing a gasket, check that the part matches the gasket and that no holes are covered.



1. Top cover
2. Top cover gasket
3. Base plate gasket
4. Base plate with M5x12 screws
5. Cable entry gasket
6. Cable entry plate
7. Duct frame top gasket
8. Duct frame
9. Duct front gasket
10. Duct front cover
11. M5 nut
12. Drain tube
13. Back vent gasket
14. Seal plates
15. Seal plate gaskets
16. M10x30 mm mounting screws

17. Grill gasket
18. Back grill
19. Side gasket, left
20. Side gasket, right
21. Bottom gasket
22. Bottom cover plate

Installing the Back Vent Gasket
To install the back vent gasket, use the following steps. See Illustration 3.

Procedure

1. Peel the paper from the self-adhesive back vent gasket.
2. Attach the back vent gasket around the upper opening in the back of the frequency converter.

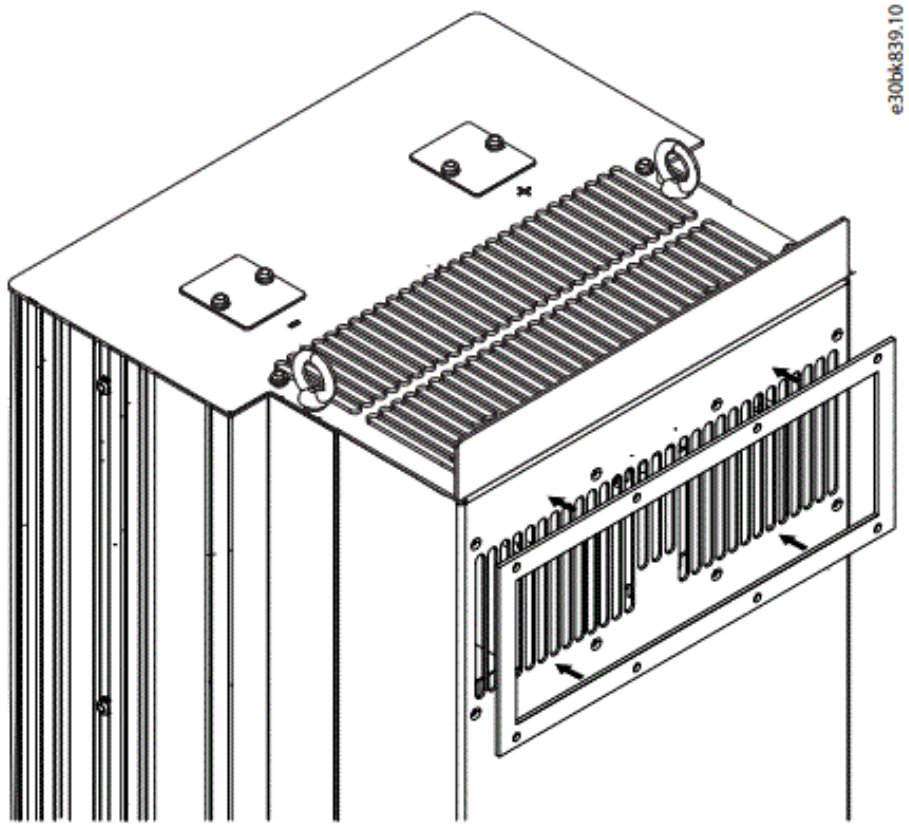


Illustration 3: Installation of Back Vent Gasket

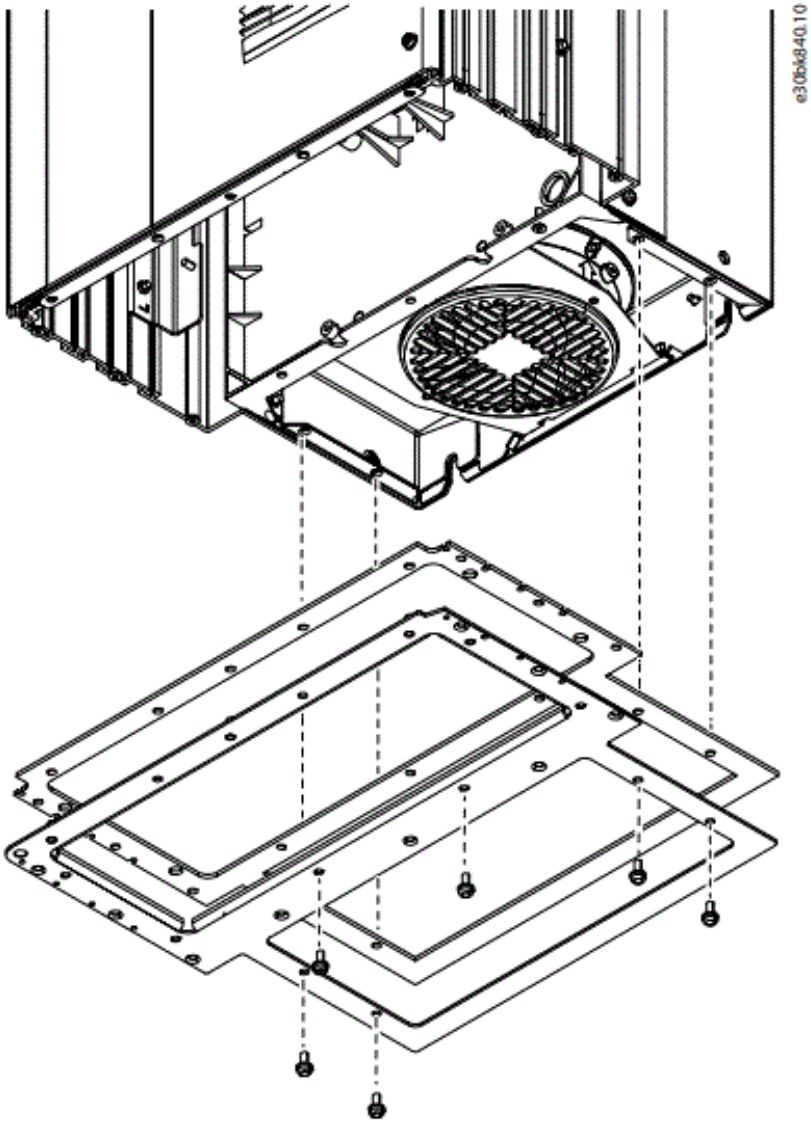
Installing the Base Plate
Use the following steps to attach the base plate and cable entry plate to the frequency converter. See Illustration 4 and Illustration 5.

Procedure

1. Unfasten 8 M5x12 screws (T25) from the existing cable entry plate (gland plate), and remove the plate from the bottom of the frequency converter.

   Keep the screws for the installation of the new cable entry plate.
2. Attach the base plate:

- a. Adhere the base plate gasket to the upper side of the base plate.
- b. Position the base plate at the bottom of the frequency converter.
- c. Secure the base plate using 6 M5x12 screws (T25) from the kit.



3. Install the cable entry plate:
    - a. Cut holes in the cable entry plate for the glands (not provided).
    - b. Adhere the cable entry gasket to the upper surface of the cable entry plate.
    - c. Position the cable entry plate over the opening in the base plate below the mains and motor terminals.
    - d. Secure the cable entry plate to the base plate using 8 M5x12 screws (T25) screws removed in step 1.

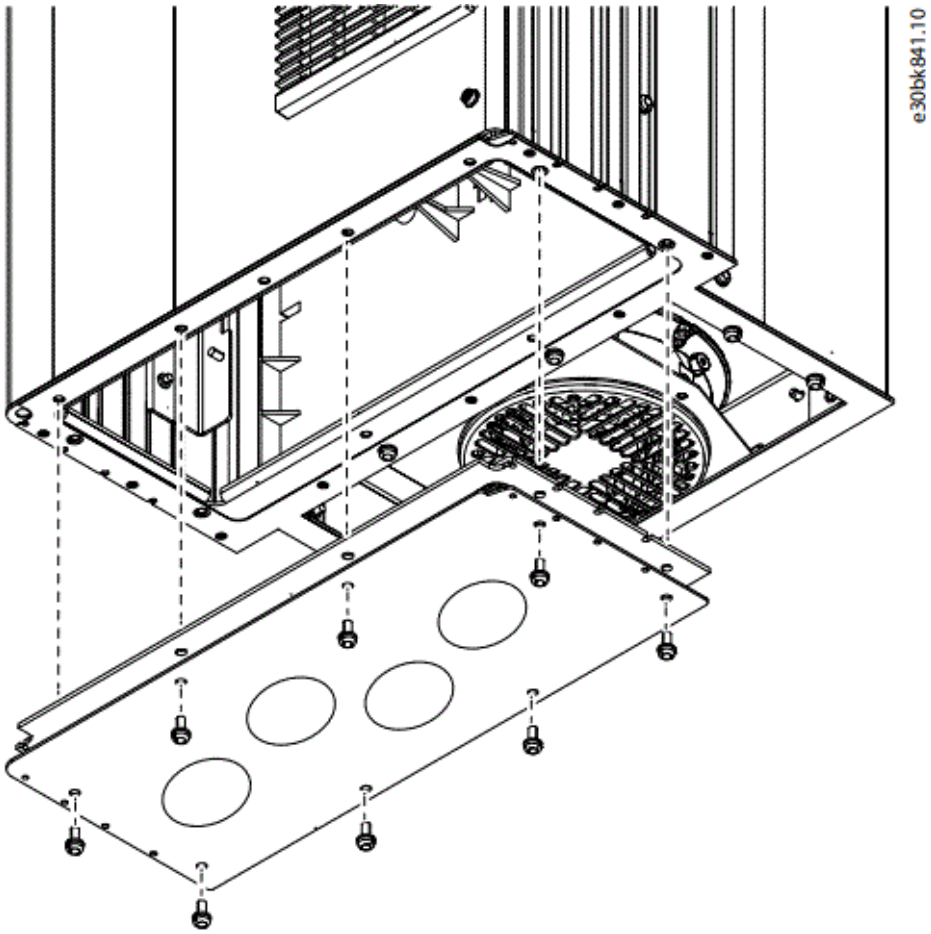


Illustration 5: Cable Entry Plate Installation

Mounting the Frequency Converter

To mount the frequency converter on a wall or mounting panel, use the following steps. The kit is not compatible with pedestal mounting.

Procedure

1. Using the dimensions in Illustration 6 for FK09a/FB09a or Illustration 7 for FK10a/FB10a, prepare the mounting surface.

   Determine proper placement of the frequency converter, considering the operating environment and cable access requirements. Ensure that the air intake and exhaust vents at the back of the frequency converter are not obstructed.

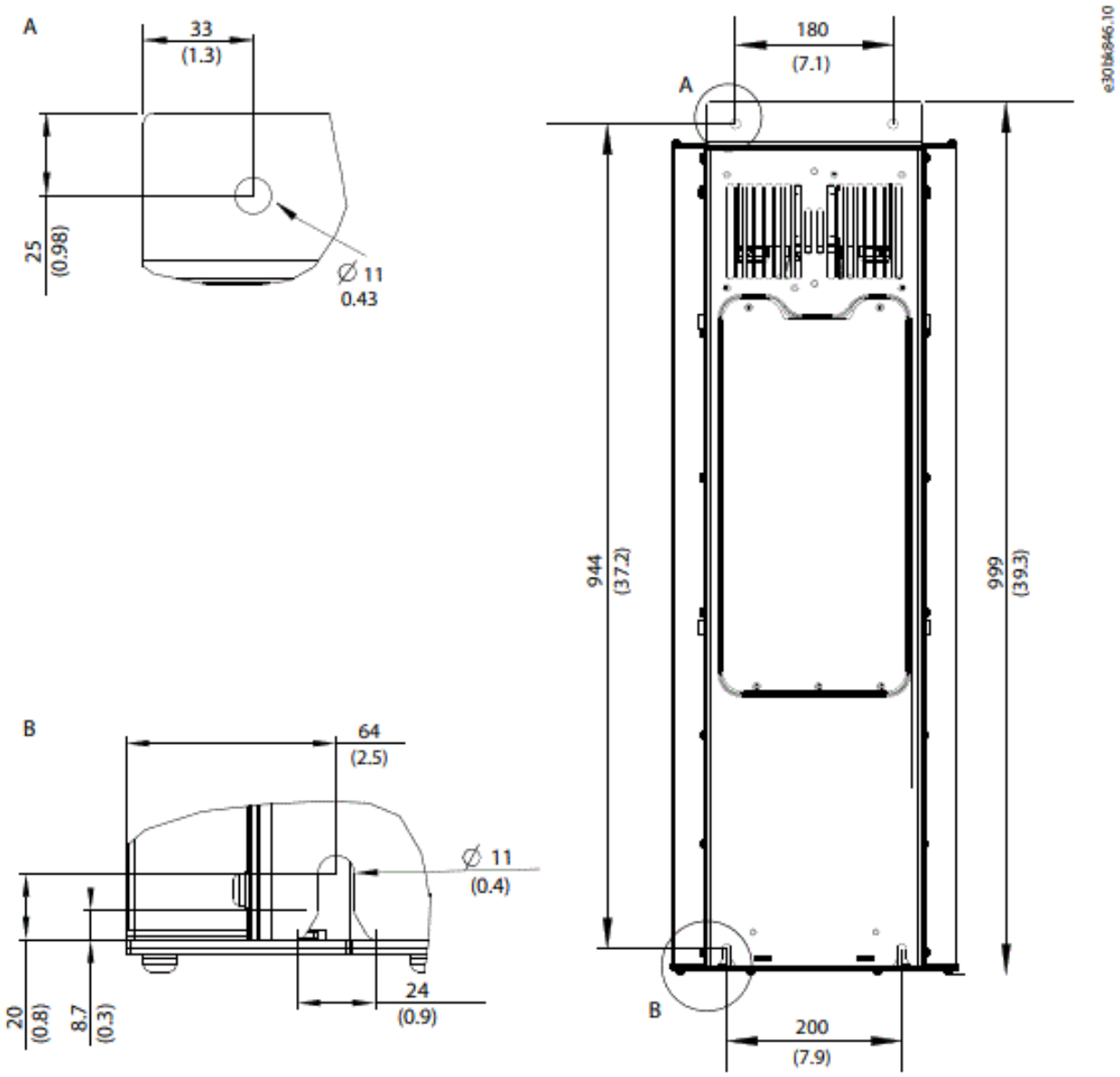
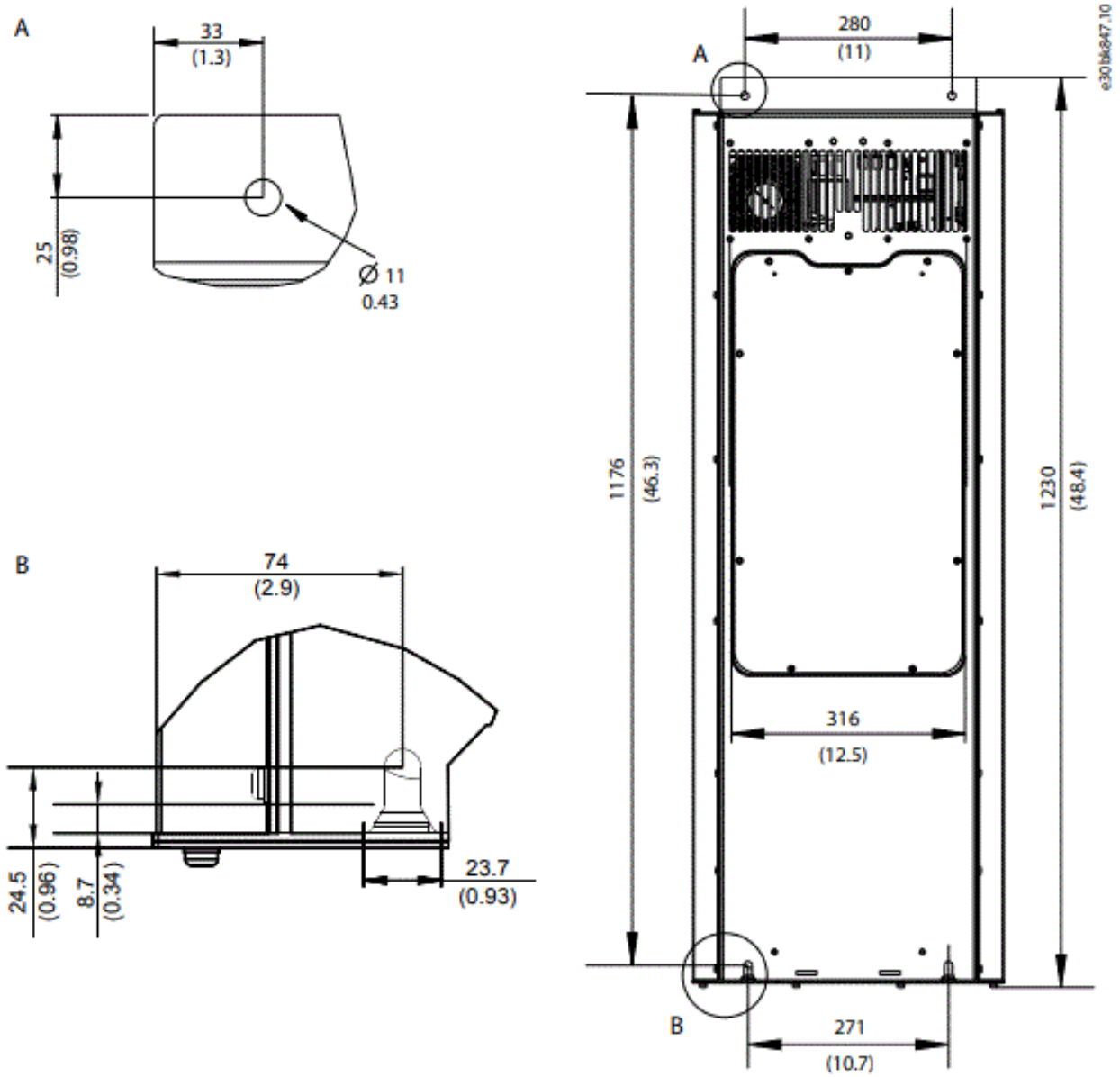


Illustration 6: Dimensions for Mounting FK09a/FB09a Frequency Converter



2. Adhere the 2 seal plate gaskets to the seal plates, 1 per plate.
3. Place 2 seal plates inside the back channel and over the 2 mounting slots in the lower edge of the frequency converter enclosure.
4. Lift the frequency converter and fasten 4 M10x30 mm screws, 2 in the upper mounting holes and 2 in the lower mounting holes.

   The 2 seal plates function as washers for the lower mounting screws. Torque all fasteners to 19 Nm (170 in-lb).

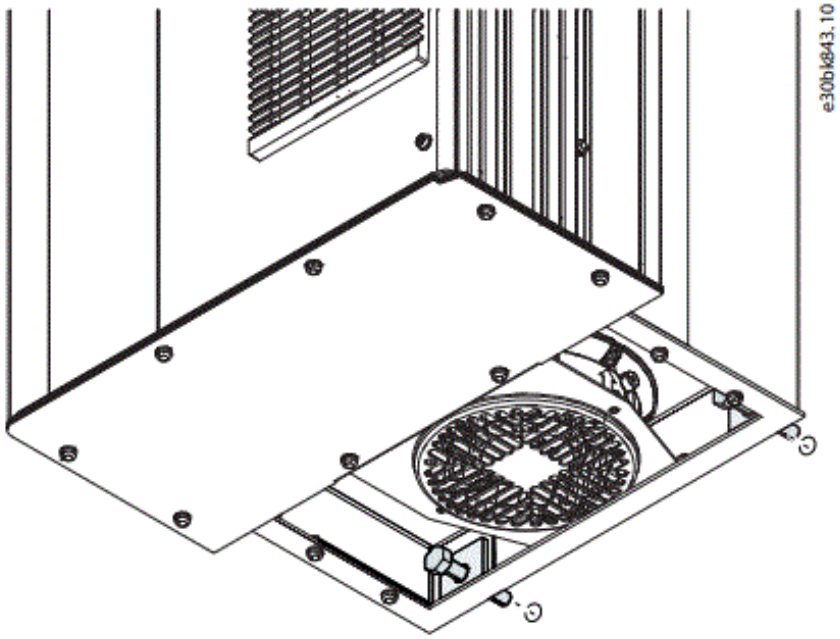


Illustration 8: Lower Mounting Screws with Seal Plates

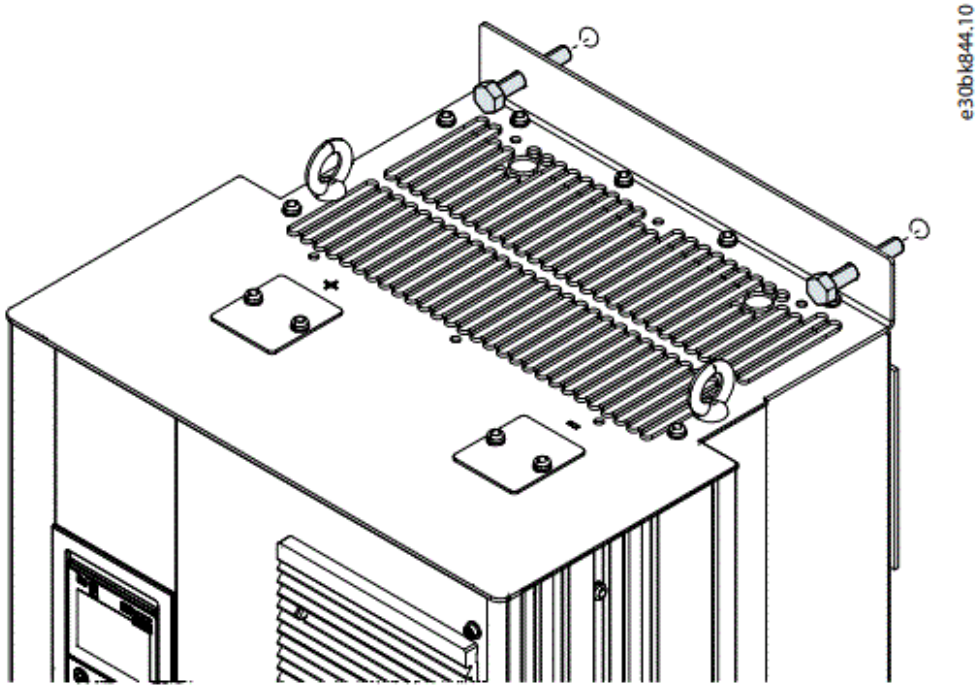


Illustration 9: Upper Mounting Screws

Assembling the Lower Duct

To assemble the lower duct, use the following steps. See Illustration 10 .

Procedure

1. Peel the paper from the left and the right side gaskets, and press to attach the gaskets to the duct frame.
   Align the holes in the side gaskets with the holes in the back opening of the duct frame.
2. Place the back grill over the left and right side gaskets.
   The threaded studs in the grill go through the middle holes in the gasket and into the duct frame.
3. Secure the back grill to the duct frame using 1 M5 nut on each stud.
   Torque to 2.3 Nm (20 in-lb).
4. Affix the grill gasket to the outer side of the back grill.

5. Affix the bottom cover gasket to the bottom cover plate.
6. Secure the bottom cover plate to the underside of the duct frame with 12 M5 nuts (for FK09a/FB09a) or 14 M5 nuts (for FK10a/FB10a).
   Torque to 2.3 Nm (20 in-lb).
7. Place the duct front gasket on the front of the duct frame, making sure the holes in the frame and gasket align.
8. Affix the top gasket to the top of the duct frame.
   Wait to attach the front duct cover until the assembled duct is attached to the frequency converter.

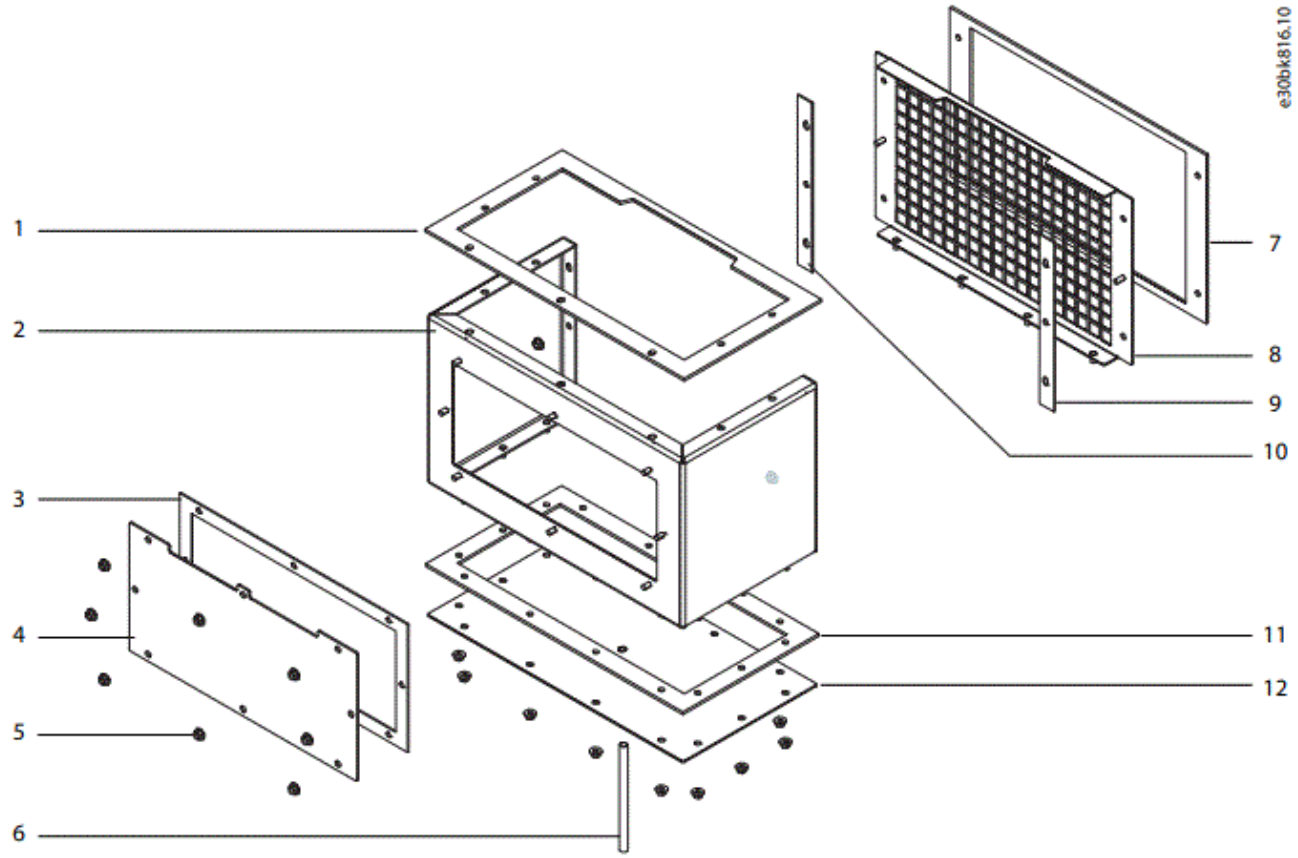


Illustration 10: Lower Duct Assembly

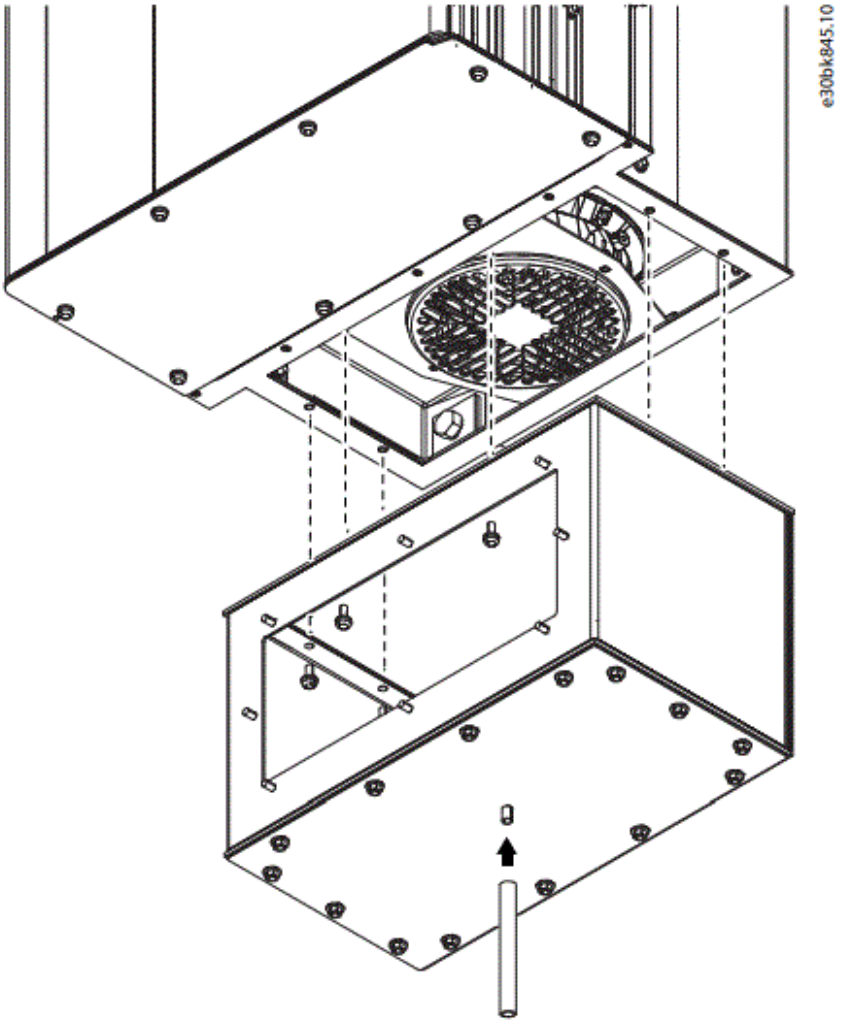
1. Duct frame top gasket
2. Duct frame
3. Duct front gasket
4. Duct front cover
5. M5 nut
6. Drain tube
7. Grill gasket
8. Back grill
9. Side gasket, left
10. Side gasket, right
11. Bottom gasket
12. Bottom cover plate

Installing the Lower Duct

After assembling the lower duct, use the following steps to attach it to the frequency converter.

Procedure

1. Remove 6 screws (T25) from the base plate.
   Keep the screws for installing the lower duct.
2. Secure the top flange of the duct frame to the bottom of the frequency converter using the screws removed in step 1.
3. Attach the drain tube to the opening in the bottom of the duct assembly.



4. Attach the front duct cover by fastening 8 M5 nuts (8 mm).

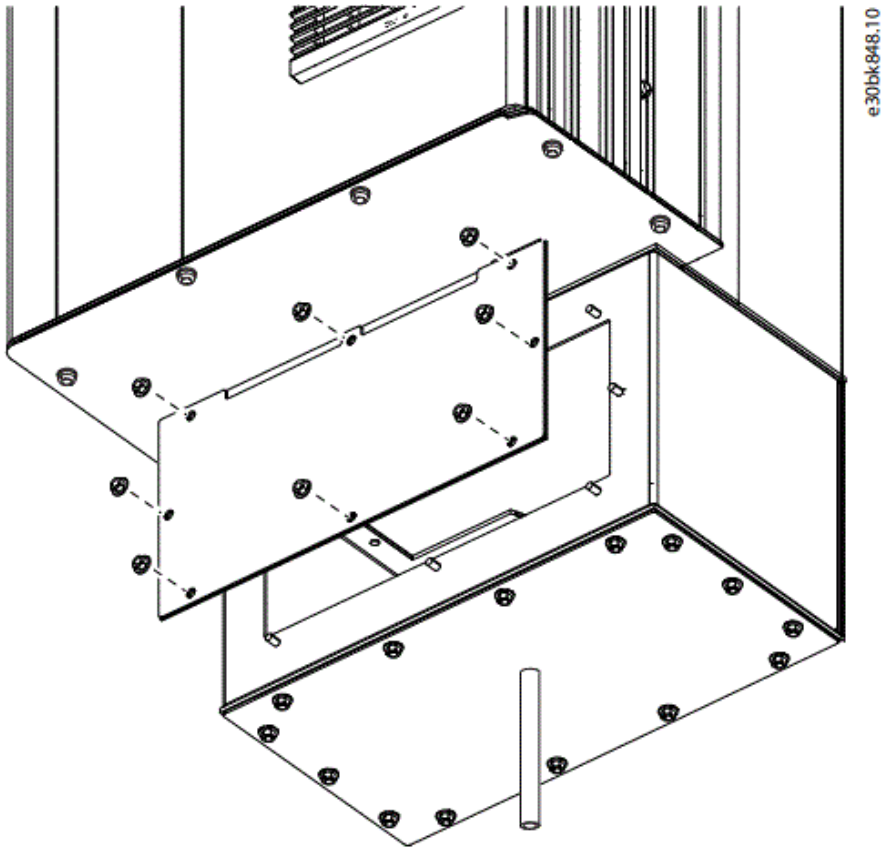


Illustration 12: Front Duct Cover Installation

Installing the Top Cover

To install the top cover of the cooling kit, use the following steps. See Illustration 13.

Procedure

1. Remove the 2 eyebolts from the top of the frequency converter.
   Keep the eyebolts for use when lifting the frequency converter.
2. Remove 8 M5x14 screws (T25) surrounding the sides and back of the vent in the top of the frequency converter.
3. Remove 3 M5x12 screws (T25) at the front of the vent in the top of the frequency converter.
   Retain the screws from steps 2 and 3 for cover installation.
4. Adhere the top cover gasket to the underside of the top cover.
5. Position the top cover over the vent opening in the top of the frequency converter.
6. Secure the top cover to the frequency converter with the screws removed in steps 2 and 3.
   Torque to 2.3 Nm (20 in-lb).

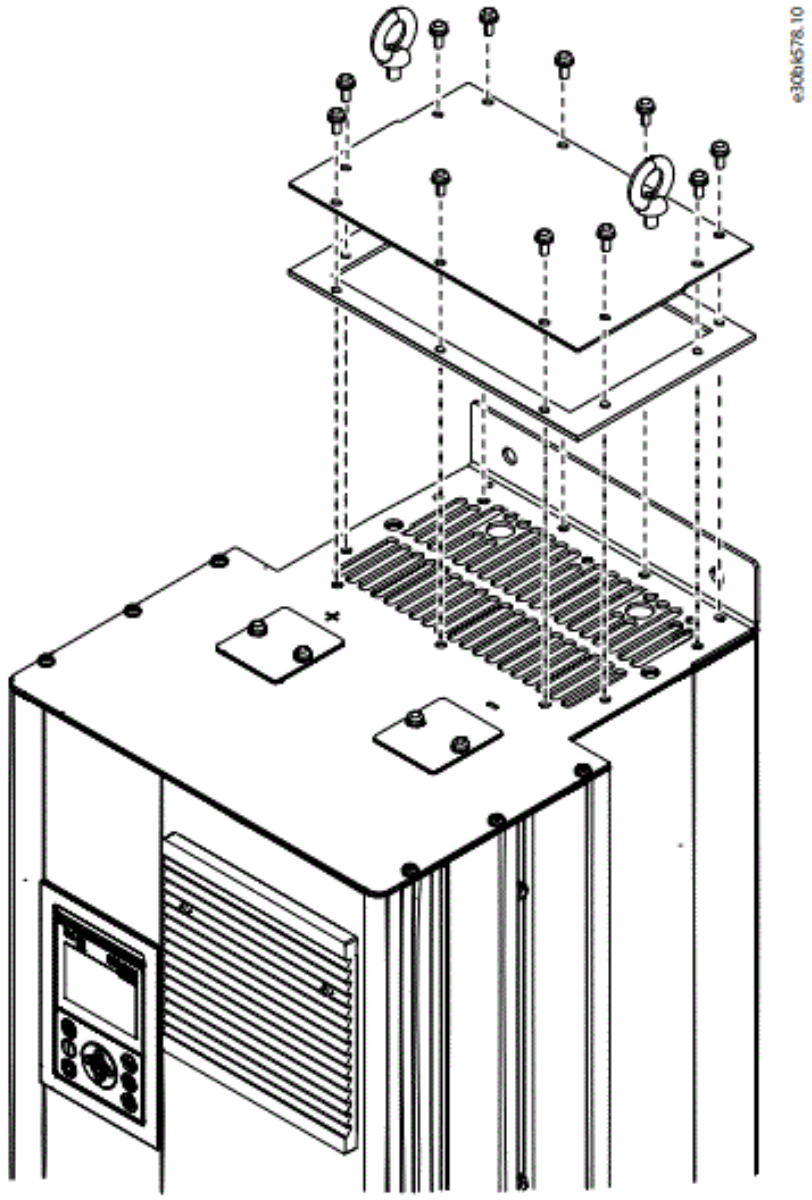


Illustration 13: Top Cover Installation

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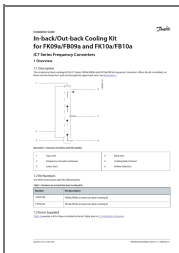
Documents / Resources

	Danfoss FK09a iC7 Automation Frequency Converters [pdf] Installation Guide FK09a iC7 Automation Frequency Converters, FK09a iC7, Automation Frequency Converters, Frequency Converters, Converters

References

- Global AC drive manufacturer - Danfoss Drives | Danfoss
- User Manual