

In-back/Out-back Cooling Kit for FK09a/FB09a and FK10a/FB10a

iC7 Series Frequency Converters

1 Overview

1.1 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](#).

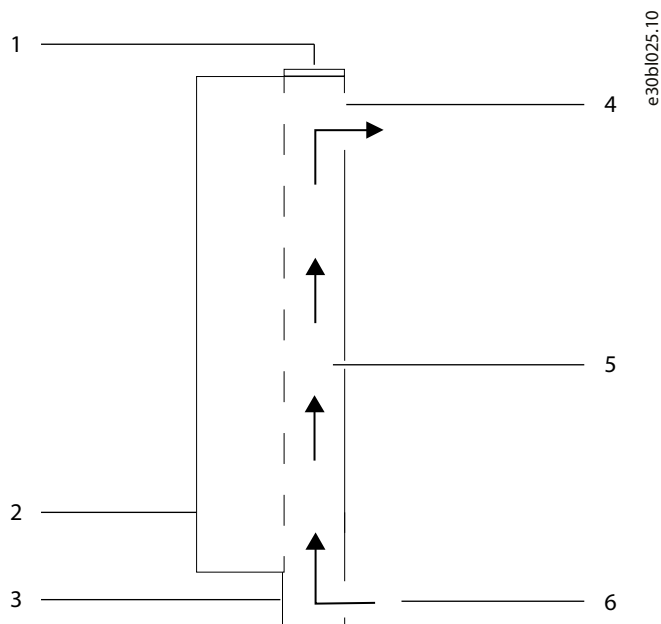


Illustration 1: Direction of Airflow with Kit Installed

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

1.2 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

1.3 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

2 Installation

2.1 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 in accordance with the corresponding service guide.
- Use the standard fastener torque values from the service guide, unless the torque value is specified in these instructions.

⚠ WARNING ⚠

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.

⚠ WARNING ⚠

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.

NOTICE

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.

2.2 Installation Overview

NOTICE

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.

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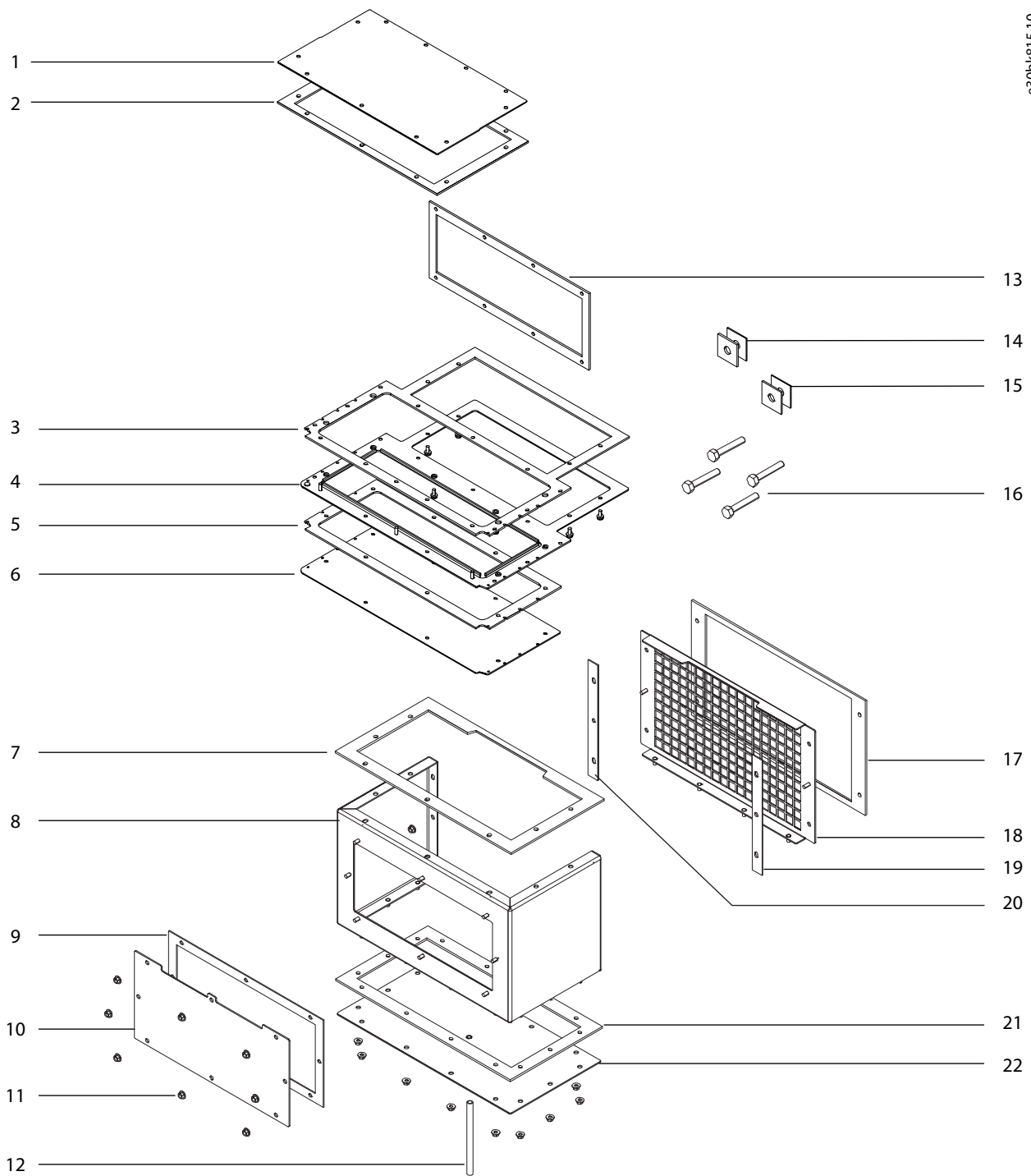


Illustration 2: Overview of In-back/Out-back Cooling Kit

1	Top cover	12	Drain tube
2	Top cover gasket	13	Back vent gasket
3	Base plate gasket	14	Seal plates
4	Base plate with M5x12 screws	15	Seal plate gaskets
5	Cable entry gasket	16	M10x30 mm mounting screws
6	Cable entry plate	17	Grill gasket
7	Duct frame top gasket	18	Back grill
8	Duct frame	19	Side gasket, left
9	Duct front gasket	20	Side gasket, right
10	Duct front cover	21	Bottom gasket
11	M5 nut	22	Bottom cover plate

2.3 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.

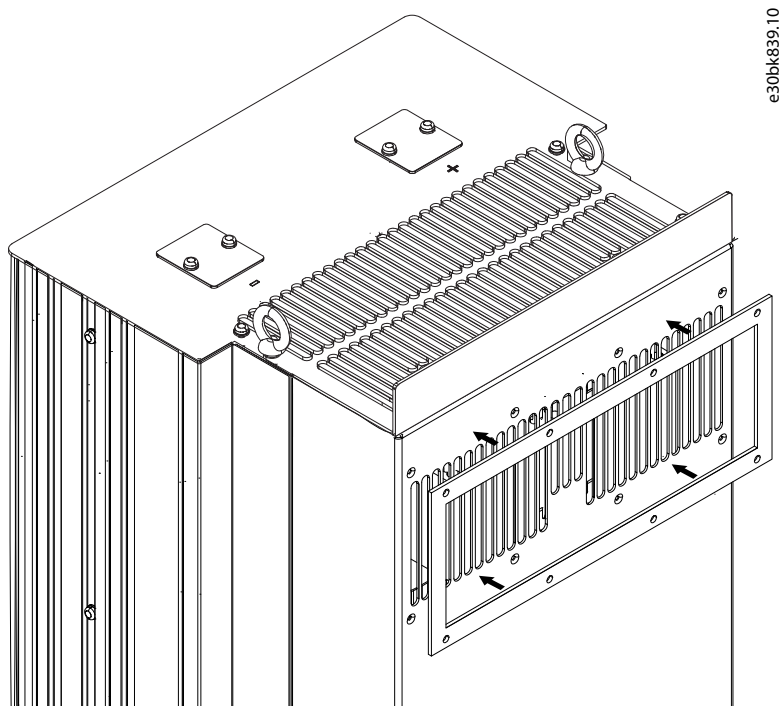


Illustration 3: Installation of Back Vent Gasket

2.4 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 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.

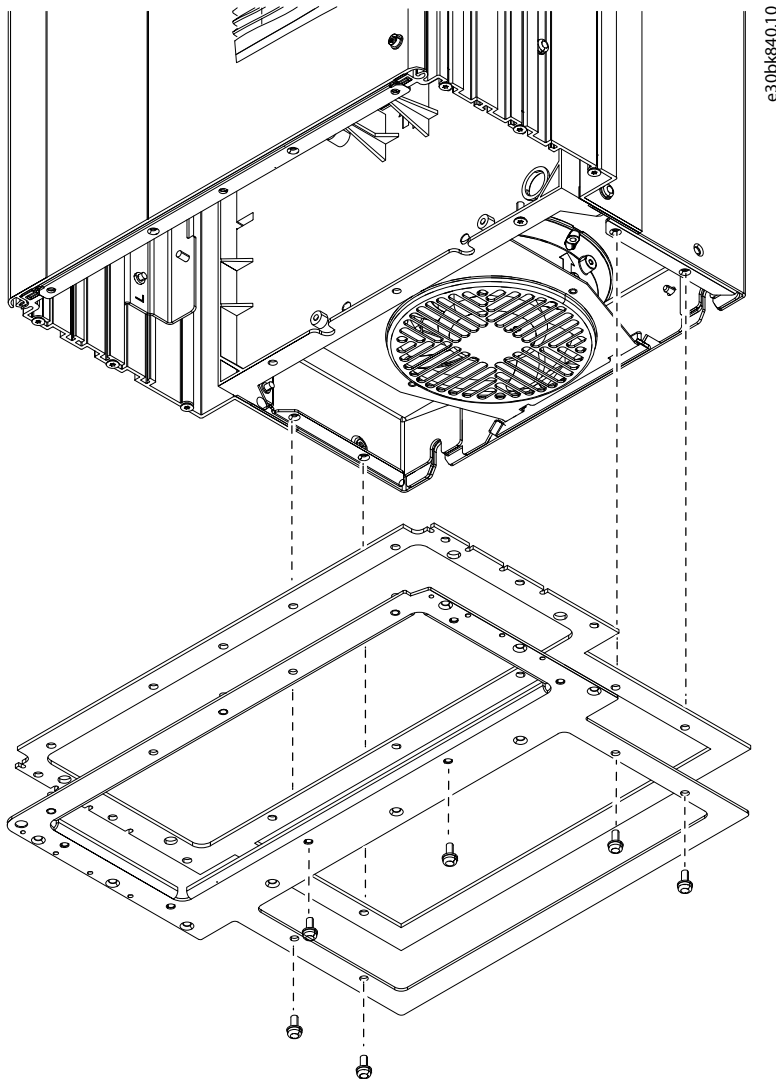


Illustration 4: Base Plate Installation

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.
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- d. Secure the cable entry plate to the base plate using 8 M5x12 screws (T25) screws removed in step 1.

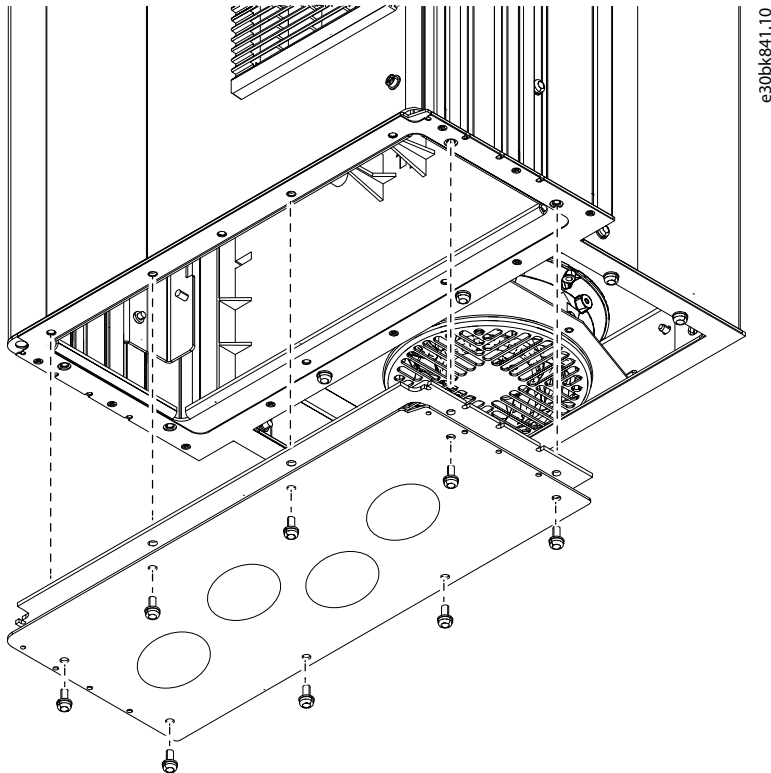


Illustration 5: Cable Entry Plate Installation

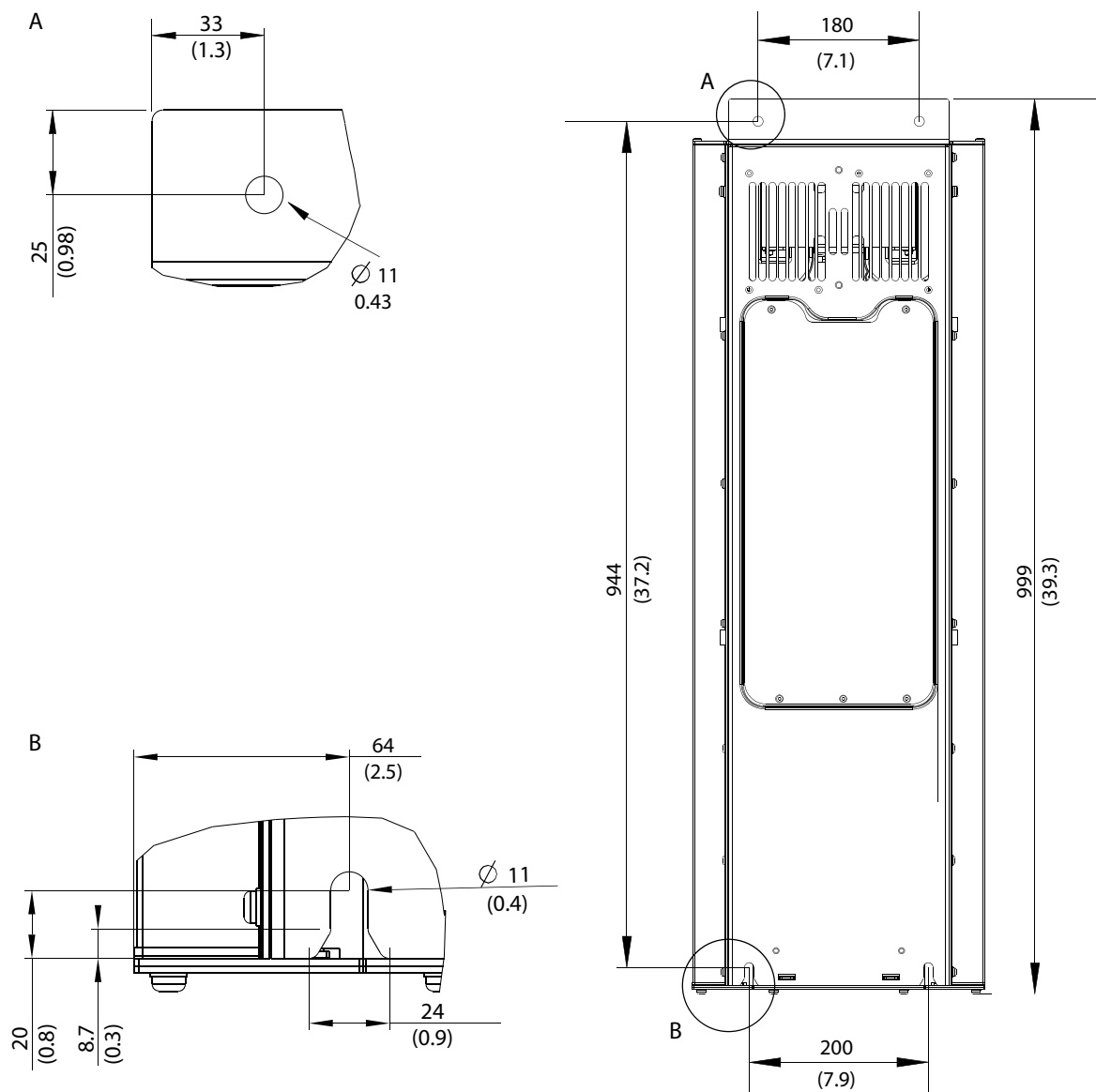
2.5 Mounting the Frequency Converter

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.



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Illustration 6: Dimensions for Mounting FK09a/FB09a Frequency Converter

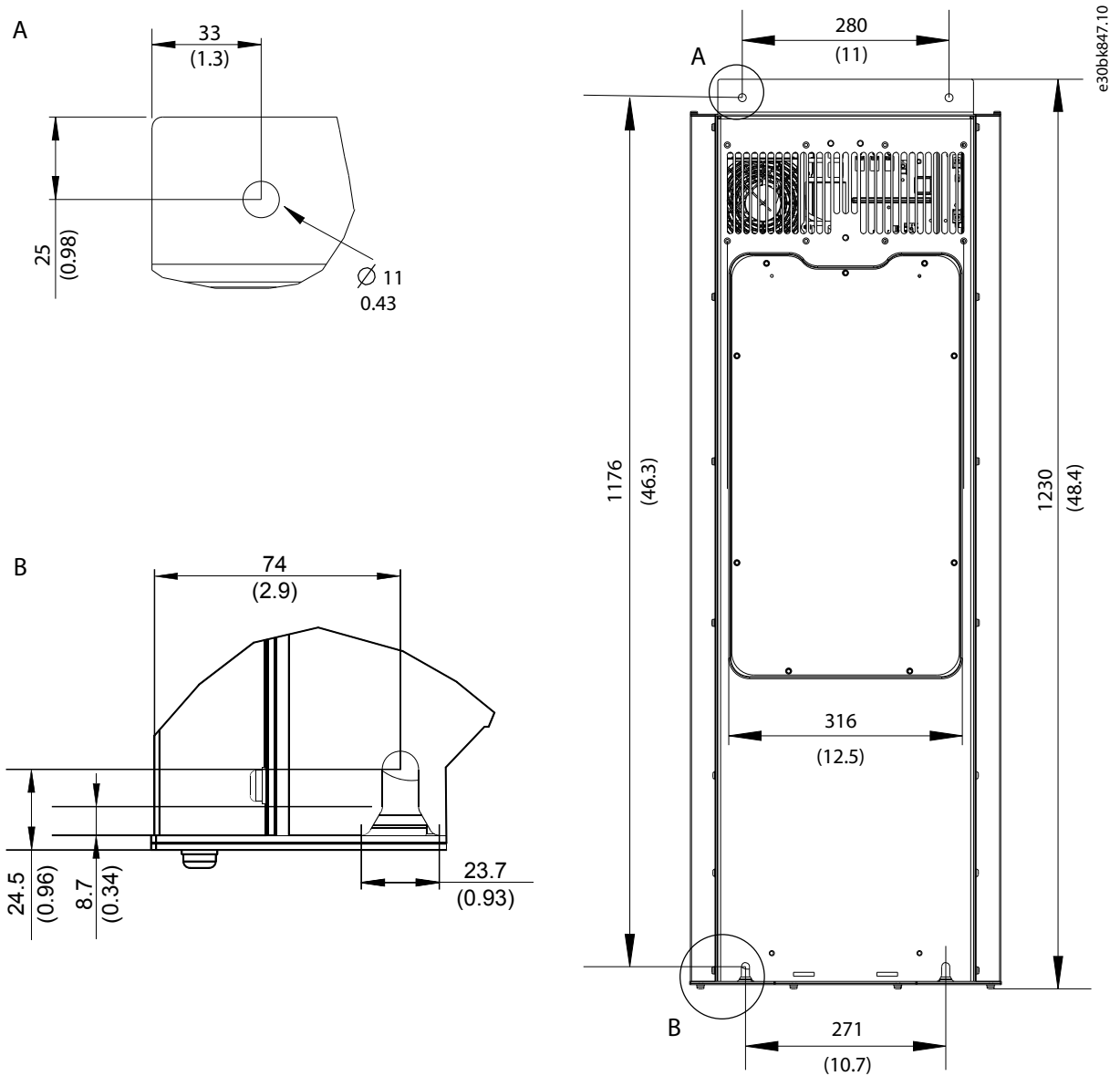
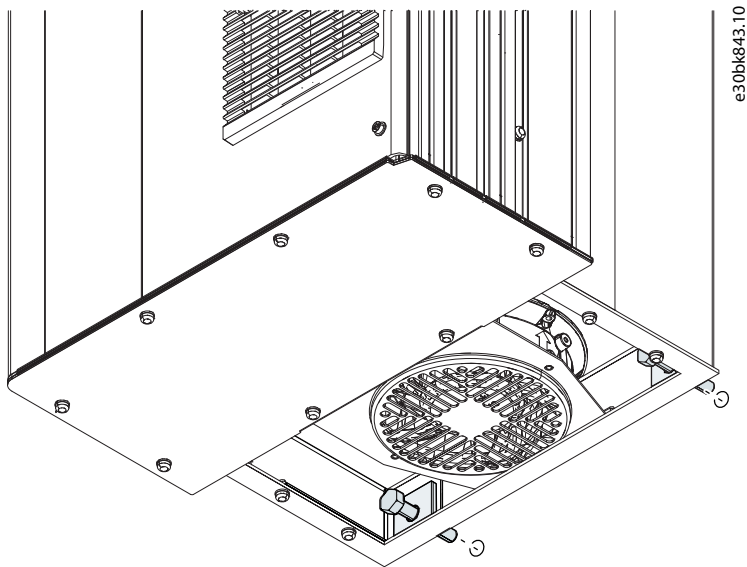


Illustration 7: Dimensions for Mounting FK10a/FB10a Frequency Converter

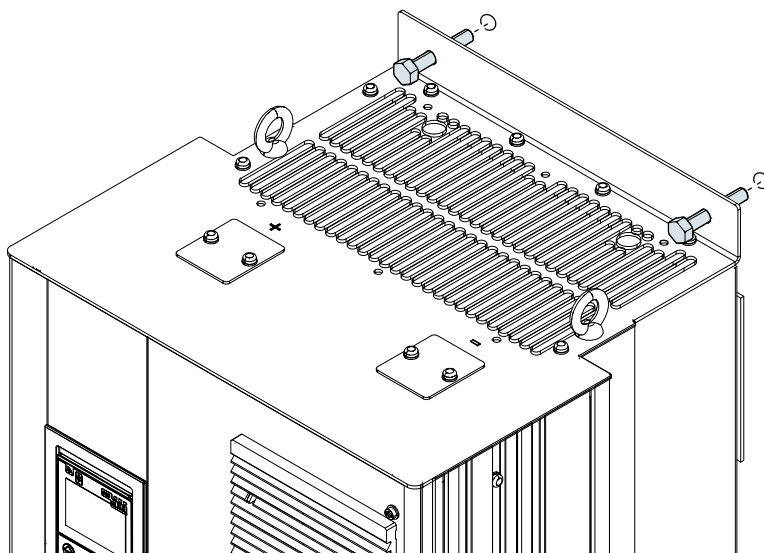
2. Adhere the 2 seal plate gaskets to the seal plates, 1 per plate.
3. Place 2 seal plates inside the back channel and over the 2 mounting slots in the lower edge of the frequency converter enclosure.
4. Lift the frequency converter and fasten 4 M10x30 mm screws, 2 in the upper mounting holes and 2 in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



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Illustration 8: Lower Mounting Screws with Seal Plates



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Illustration 9: Upper Mounting Screws

2.6 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.

- 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).

- Place the duct front gasket on the front of the duct frame, making sure the holes in the frame and gasket align.
- 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.

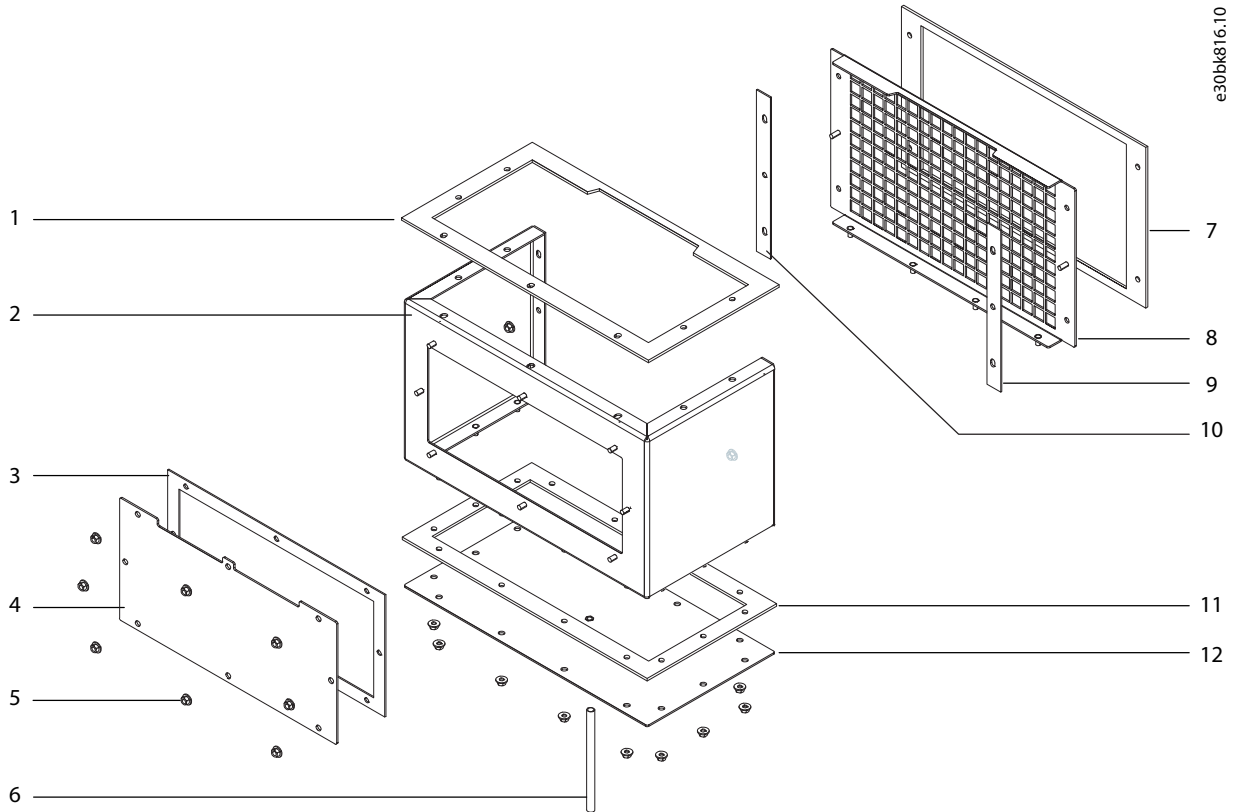


Illustration 10: Lower Duct Assembly

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

2.7 Installing the Lower Duct

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

Procedure

- Remove 6 screws (T25) from the base plate.

Keep the screws for installing the lower duct.

- 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.

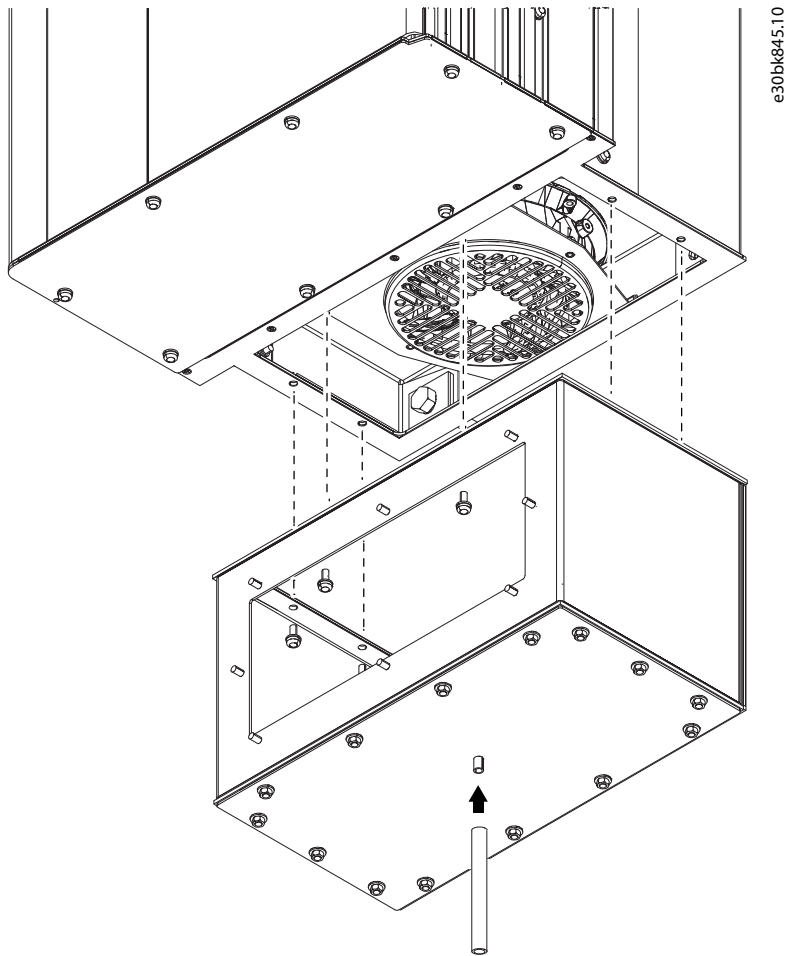


Illustration 11: Installation of Lower Duct and Drain Tube

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

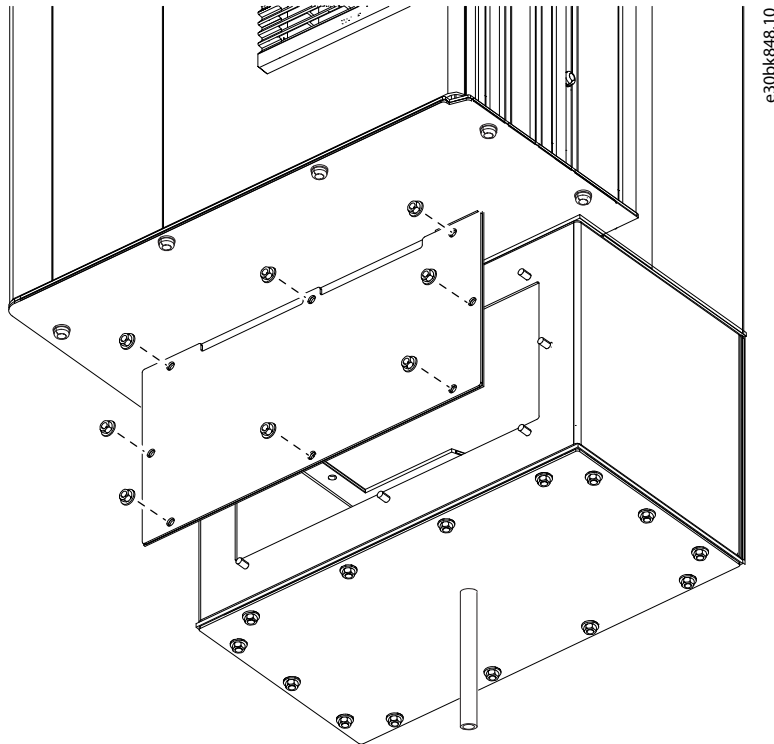


Illustration 12: Front Duct Cover Installation

2.8 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).

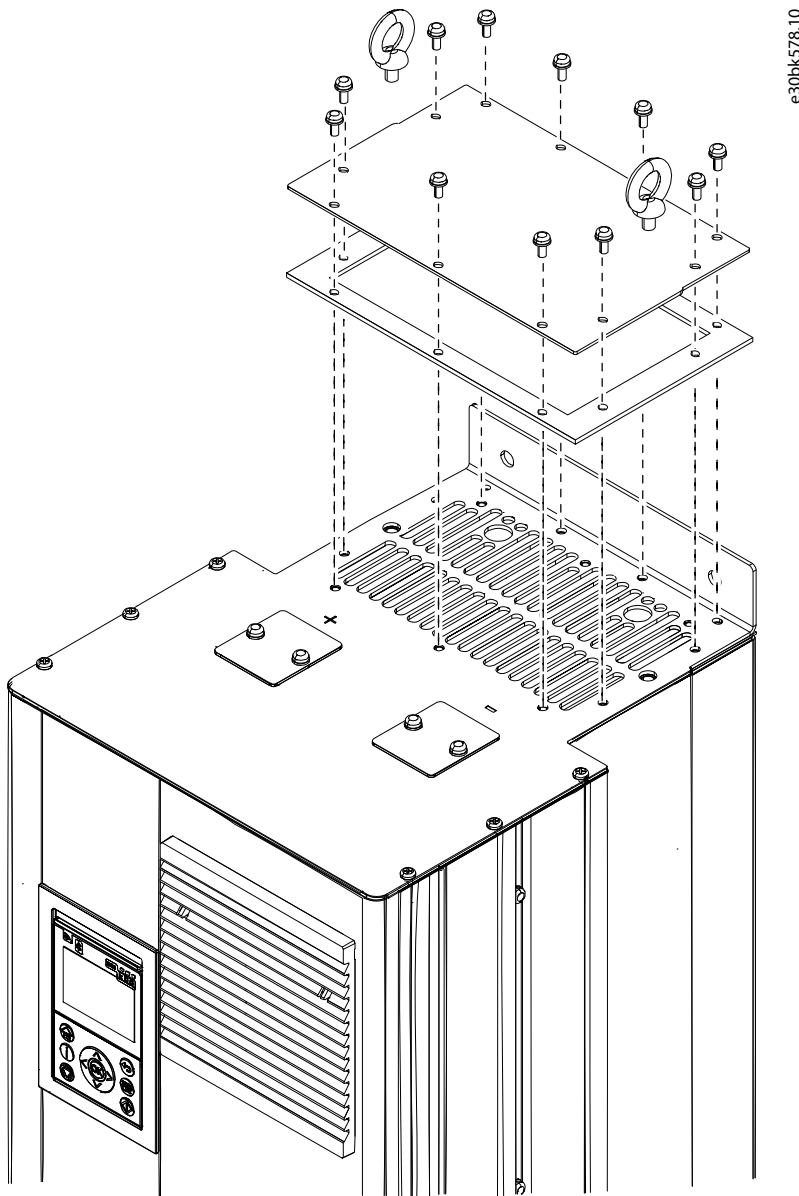


Illustration 13: Top Cover Installation

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