

# Power Module IP20

## 1 Introduction

### 1.1 Description

This Installation Guide explains how to mount the 3 isolation foils required when replacing IGBTs in an IP20 drive produced before 18/11/2019.

The kits are designed for the following product series:

- VLT® HVAC Drive FC 102
- VLT® Refrigeration Drive FC 103
- VLT® AQUA Drive FC 202
- VLT® AutomationDrive FC 302

The spare part kits contain the following items:

#### Dual IGBT Module 1200 V, 150 A

- Package label for spare parts
- 4-pole gate wire for dual IGBT
- Safety sheet for heat compound
- IGBT 1.2 kV, 150 A dualpack45
- Insulation foil for IGBT, C3 and H7
- Foil rectifier, C3 and H7
- Double insulation for IGBT, C3
- Screw, metric 5 mm and 16 mm
- Heat compound
- Box
- Plastic bag
- Antistatic plastic bag

#### Dual IGBT Module 1200 V, 200 A

- Package label for spare parts
- 4-pole gate wire for dual IGBT
- Safety sheet for heat compound
- IGBT 1.2 kV, 200 A dualpack45
- Insulation foil for IGBT, C3 and H7
- Foil rectifier, C3 and H7
- Double insulation for IGBT, C3
- Screw, metric 5 mm and 16 mm
- Heat compound
- Box
- Plastic bag
- Antistatic plastic bag

## 1.2 Kit Code Numbers

Table 1: Code Numbers for Spare Part Kits

Code number	Kit description
130B1884	Dual IGBT Module 1200 V, 150 A
130B1885	Dual IGBT Module 1200 V, 200 A

Table 2: Code Numbers for Isolation Foils

Code number	Description
134B7124	Foil for covering the sides and the bottom of the frame, see step 1 in the mounting procedure.
134B6480	Foil for covering the IGBTs, see step 3 in the mounting procedure.
134B6497	Foil for covering the busbar, see step 5 in the mounting procedure.

## 2 Safety Instructions

### 2.1 Qualified Personnel

Only qualified personnel are allowed to install the parts described in this Installation Guide. Make sure to read and save this guide.

### 2.2 Safety Precautions

Only Danfoss authorized, qualified personnel is allowed to repair this equipment.

## ⚠ WARNING ⚠

### DISCHARGE TIME

The drive contains DC-link capacitors, which can remain charged even when the drive is not powered. High voltage can be present even when the warning indicator lights are off.

Failure to wait the specified time after power has been removed before performing service or repair work could result in death or serious injury.

- Stop the motor.
- Disconnect AC mains, permanent magnet type motors, and remote DC-link supplies, including battery back-ups, UPS, and DC-link connections to other drives.
- Wait for the capacitors to discharge fully. The minimum waiting time is specified in table *Discharge time* and is also visible on the nameplate on top of the drive.
- Before performing any service or repair work, use an appropriate voltage measuring device to make sure that the capacitors are fully discharged.

Table 3: Discharge Time, VLT® HVAC Drive FC 102

Voltage [V]	Minimum waiting time (minutes)					
	4	7	15	20	30	40
	[kW (hp)]					
200–240	1.1–3.7 (1.50–5)	–	5.5–45 (7.5–60)	–	–	–
380–480	1.1–7.5 (1.50–10)	–	11–90 (15–121)	–	–	315–1000 (450–1350)
400	–	–	–	90–315 (121–450)	–	–
500	–	–	–	110–355 (150–500)	–	–
525	–	–	–	75–315 (100–450)	–	–
525–600	1.1–7.5 (1.50–10)	–	11–90 (15–121)	–	–	–
690	–	–	–	90–315 (100–350)	–	–
525–690	–	1.1–7.5 (1.50–10)	11–90 (15–121)	–	400–1400 (500–1550) 450–1400 (600–1550)	–

Table 4: Discharge Time, VLT® Refrigeration Drive FC 103

Voltage [V]	Minimum waiting time (minutes)				
	4	7	15	20	40

Voltage [V]	Minimum waiting time (minutes)				
	[kW (hp)]				
200–240	0.25–3.7 (0.34–5.0)	–	5.5–37 (7.5–50)	–	–
380–480	0.25–7.5 (0.34–10)	–	11–75 (15–100)	110–315 (150–450)	355–450 (500–600) 355–560 (500–750)
525–600	0.75–7.5 (1.0–10)	–	11–75 (15–100)	–	–
525–690	–	1.5–7.5 (2–10)	11–75 (15–100)	55–400 (75–550)	450–630 (600–750) 450–800 (600–1075)

Table 5: Discharge Time, VLT® AQUA Drive FC 202

Voltage [V]	Minimum waiting time (minutes)					
	4	7	15	20	30	40
	[kW (hp)]					
200–240	0.25–3.7 (0.34–5.0)	–	5.5–37 (7.5–50)	–	–	–
380–480	0.25–7.5 (0.34–10)	–	11–75 (15–100)	110–315 (150–450)	–	315–1000 (450–1350) 355–560 (500–750)
525–600	0.75–7.5 (1–10)	–	11–90 (15–121)	–	400–1400 (550–1550)	–
525–690	–	1.1–7.5 (1.5–10)	11–90 (10–125)	75–400 (100–550)	–	450–800 (600–1075)

Table 6: Discharge Time, VLT® AutomationDrive FC 301/FC 302

Voltage [V]	Minimum waiting time (minutes)					
	4	7	15	20	30	40
	[kW (hp)]					
200–240	0.25–3.7 (0.34–5)	–	5.5–37 (7.5–50)	–	–	–
380–500	0.25–7.5 (0.34–10)	–	11–75 (15–100)	90–200 (150–350)	250–500 (450–750)	250–800 (450–1350) 315–500 (500–750)
400	–	–	–	90–315 (125–450)	–	–
500	–	–	–	110–355 (150–450)	–	–
525	–	–	–	55–315 (75–400)	–	–
525–600	0.75–7.5 (1–10)	–	11–75 (15–100)	–	–	–

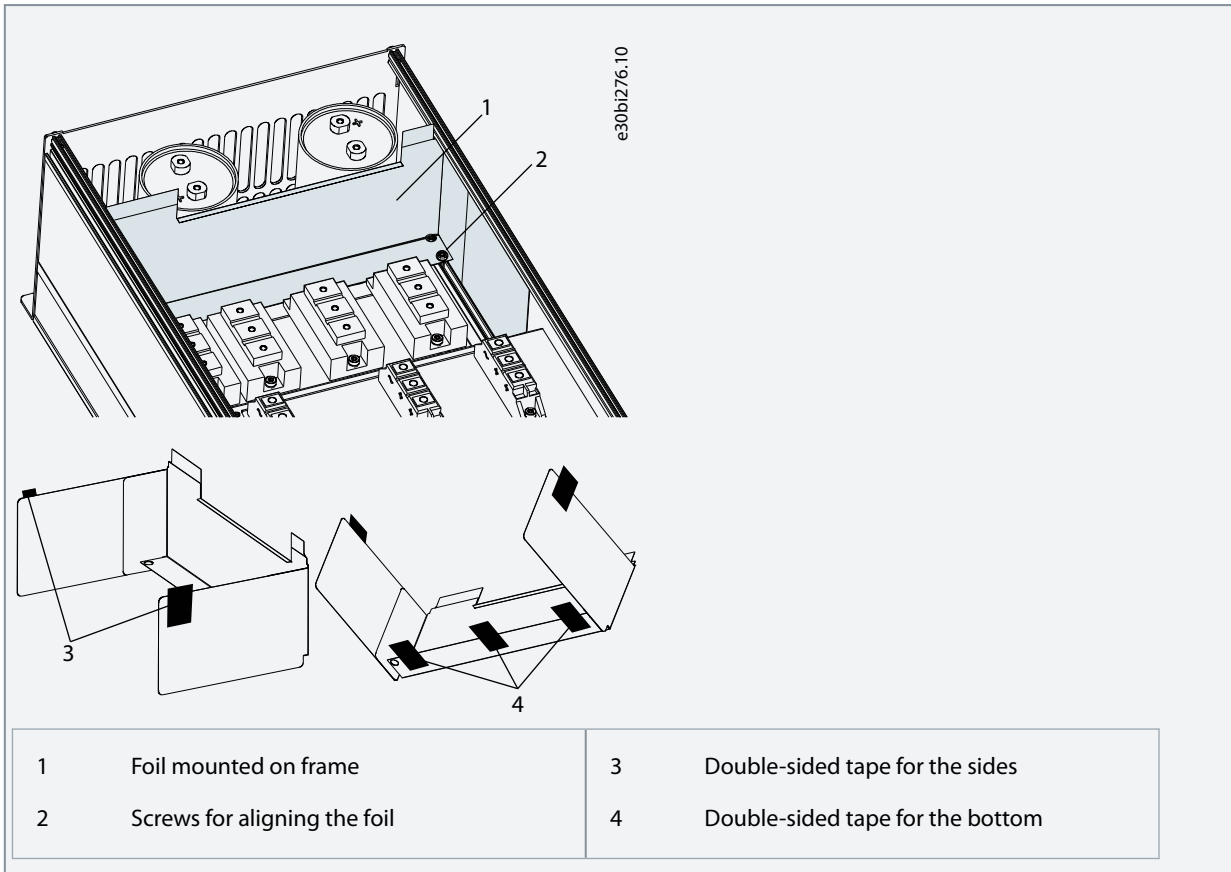
Voltage [V]	Minimum waiting time (minutes)					
525-690	-	1.5-7.5 (2-10)	11-75 (15-100)	37-315 (50-450)	355-1200 (450-1550)	355-2000 (450-2050) 355-710 (400-950)
690	-	-	-	55-315 (75-400)	-	-

### 3 Installation

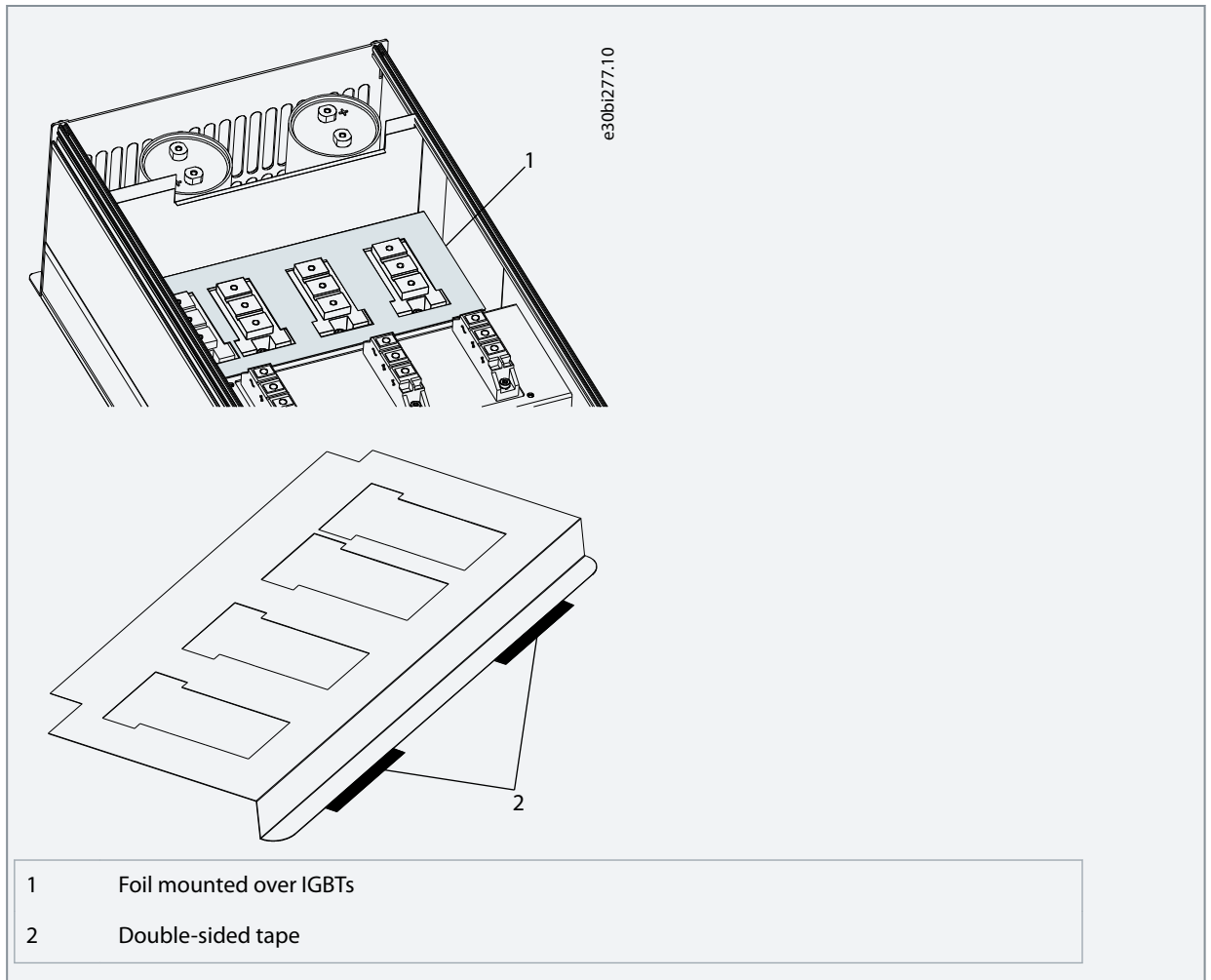
#### 3.1 Mounting the Foils

**Procedure**

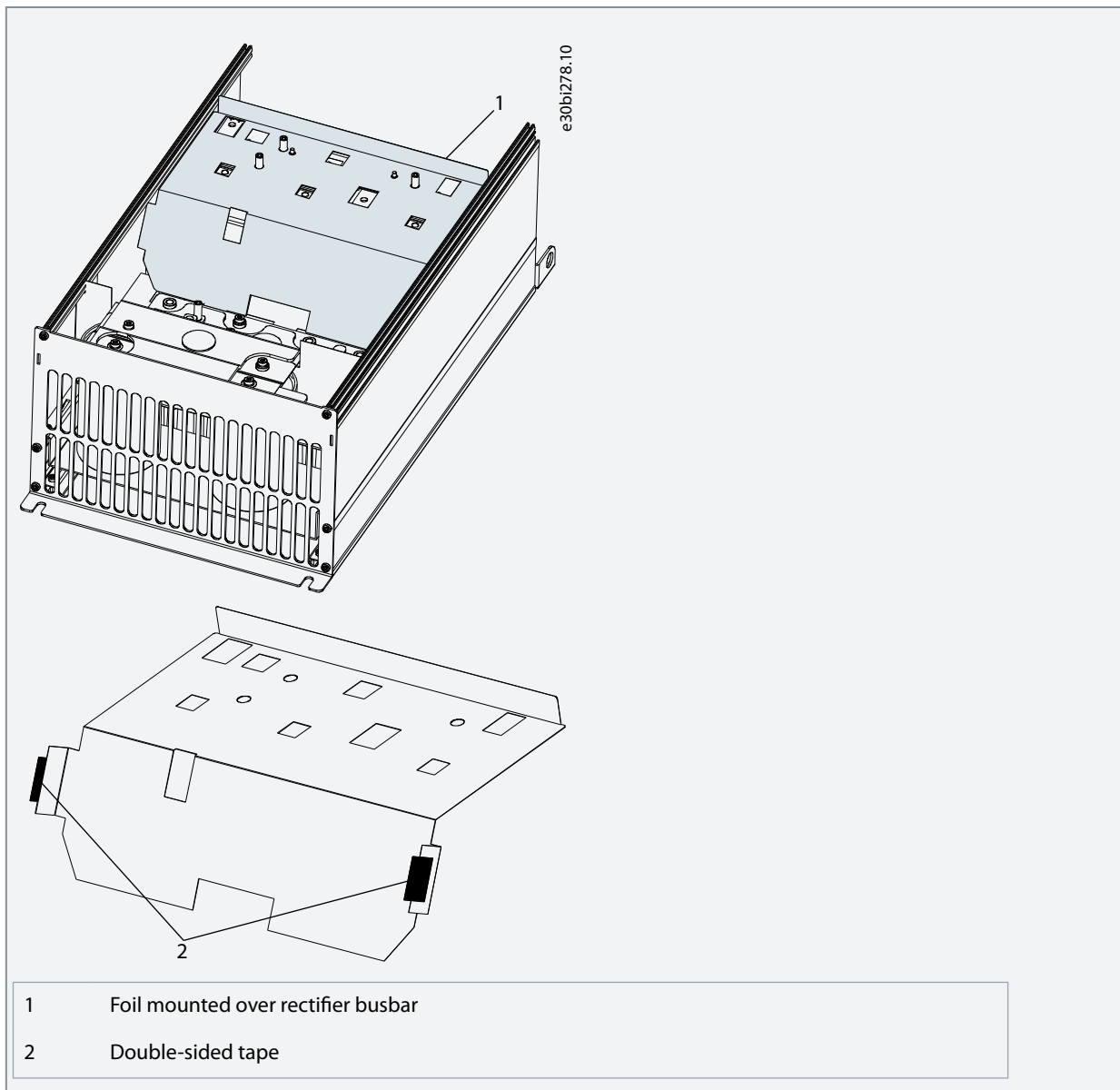
1. Place the foil 134B7124 on the sides of the frame by aligning with the screws.
2. Secure the foil with the double-sided tape.



3. Place the foil 134B6480 over the IGBTs.
4. Secure the foil with the double-sided tape.



5. Place foil 134B6497 over the rectifier busbar.
6. Secure the foil to the bottom with the double-sided tape.



**Danfoss A/S**  
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