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**

<table>
<thead>
<tr>
<th>Code number</th>
<th>Kit description</th>
</tr>
</thead>
<tbody>
<tr>
<td>130B1884</td>
<td>Dual IGBT Module 1200 V, 150 A</td>
</tr>
<tr>
<td>130B1885</td>
<td>Dual IGBT Module 1200 V, 200 A</td>
</tr>
</tbody>
</table>

**Table 2: Code Numbers for Isolation Foils**

<table>
<thead>
<tr>
<th>Code number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>134B7124</td>
<td>Foil for covering the sides and the bottom of the frame, see step 1 in the mounting procedure.</td>
</tr>
<tr>
<td>134B6480</td>
<td>Foil for covering the IGBTs, see step 3 in the mounting procedure.</td>
</tr>
<tr>
<td>134B6497</td>
<td>Foil for covering the busbar, see step 5 in the mounting procedure.</td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>Voltage [V]</th>
<th>4</th>
<th>7</th>
<th>15</th>
<th>20</th>
<th>30</th>
<th>40</th>
</tr>
</thead>
<tbody>
<tr>
<td>200–240</td>
<td>1.1–3.7 (1.50–5)</td>
<td>–</td>
<td>5.5–45 (7.5–60)</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>380–480</td>
<td>1.1–7.5 (1.50–10)</td>
<td>–</td>
<td>11–90 (15–121)</td>
<td>–</td>
<td>–</td>
<td>315–1000 (450–1350)</td>
</tr>
<tr>
<td>400</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>90–315 (121–450)</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>500</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>110–355 (150–500)</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>525</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>75–315 (100–450)</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>525–600</td>
<td>1.1–7.5 (1.50–10)</td>
<td>–</td>
<td>11–90 (15–121)</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>690</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>90–315 (100–350)</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Voltage [V]</th>
<th>4</th>
<th>7</th>
<th>15</th>
<th>20</th>
<th>40</th>
</tr>
</thead>
</table>
### Table 5: Discharge Time, VLT® AQUA Drive FC 202

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

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

<table>
<thead>
<tr>
<th>Voltage [V]</th>
<th>Minimum waiting time (minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>7 15 20 30 40</td>
</tr>
<tr>
<td>200–240</td>
<td>0.25–3.7 (0.34–5.0) 5.5–37 (7.5–50)</td>
</tr>
<tr>
<td>380–500</td>
<td>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)</td>
</tr>
<tr>
<td>400</td>
<td>– – 90–315 (125–450)</td>
</tr>
<tr>
<td>500</td>
<td>– – 110–355 (150–450)</td>
</tr>
<tr>
<td>525</td>
<td>– – 55–315 (75–400)</td>
</tr>
<tr>
<td>525–600</td>
<td>0.75–7.5 (1–10) 11–75 (15–100)</td>
</tr>
<tr>
<td>Voltage [V]</td>
<td>Minimum waiting time (minutes)</td>
</tr>
<tr>
<td>------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>525–690</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>1.5–7.5 (2–10)</td>
</tr>
<tr>
<td></td>
<td>11–75 (15–100)</td>
</tr>
<tr>
<td></td>
<td>37–315 (50–450)</td>
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<tr>
<td></td>
<td>355–1200 (450–1550)</td>
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<tr>
<td></td>
<td>355–2000 (450–2050)</td>
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<tr>
<td></td>
<td>355–710 (400–950)</td>
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<tr>
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<td>–</td>
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<tr>
<td></td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>55–315 (75–400)</td>
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<td>–</td>
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<td>–</td>
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</tbody>
</table>
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.
1 Foil mounted over rectifier busbar
2 Double-sided tape