

# Current Sensor Hex Busbar Kits (D1h-D8h)

VLT® FC Series FC 102, FC 103, FC 202, FC 302

## 1 Overview

### 1.1 Description

The current sensor hex busbar kits include all parts required to install the hex busbars in D1h–D8h drives. Each hex busbar is inserted through the center of a current sensor during installation. For more information, see the service guide.

### 1.2 Kit Numbers

Table 1: Numbers for Current Sensor Hex Busbar Kits for D1h–D8h Drives

Kit number	Kit description
176F4181	300A D1h/D3h/D5h/D6h LEM BB kit
176F4182	300A D2h/D4h/D7h/D8h LEM BB kit
176F4183	500A D2h/D4h/D7h/D8h LEM BB kit

### 1.3 Items Supplied

Table 2: Items Supplied in D1h/D3h/D5h/D6h Kit (178F4181)

Item	Quantity
Nomex® tube	3
U, V, W hex busbars	1 set of 3
M6x24 screw	3
Hex busbar support bracket	1
M6 nut	3
IGBT output busbars	3

Table 3: Items Supplied in D2h/D4h/D7h/D8h Kits (178F4182 and 178F4183)

Item	Quantity
Nomex® tube	3
U, V, W hex busbars	1 set of 3
M8x20 screw	3
IGBT output busbars	3

Nomex® is a registered trademark of E.I. du Pont de Nemours and Company.

### 1.4 Hex Busbar Identification

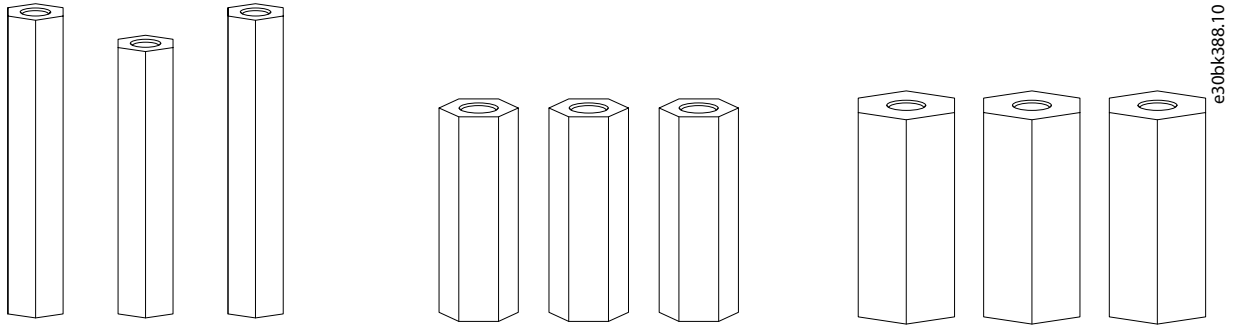


Table 4: Hex Busbar Comparison

Kit 176F4181	Kit 176F4182	Kit 176F4183
90/110/132 kW power rating	160 kW power rating	200/250 kW power rating
V busbar: 64 mm x Ø16 mm U/W busbars: 71 mm x Ø16 mm	U/V/W busbars: 49 mm x Ø19 mm	U/V/W busbars: 49 mm x Ø25 mm

## 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 drive must be done in accordance with the corresponding service guide.
- Use the standard fastener torque values in the service guide, unless the torque value is specified in these instructions.

#### ⚠ WARNING ⚠

##### ELECTRICAL SHOCK HAZARD

VLT® FC series drives contain 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 drive from all power sources before installation or service.
- Treat the drive as live whenever the mains voltage is connected.
- Follow the guidelines in these instructions and local electrical safety codes.

#### ⚠ WARNING ⚠

##### DISCHARGE TIME (20 MINUTES)

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 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 back-ups, UPS, and DC-link connections to other drives.
- Wait 20 minutes for the capacitors to discharge fully before performing any service or repair work.
- Measure the voltage level to verify full discharge.

#### NOTICE

##### ELECTROSTATIC DISCHARGE

Electrostatic discharge can damage components.

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

## 2.2 Assembling the Current Sensor Hex Busbars in D1h/D3h/D5h/D6h Drives

### ⚠ WARNING ⚠

#### NOMEX® TUBES REQUIRED

The heat-resistant Nomex® tubes are required to maintain proper electrical protection. Failure to install the Nomex® tubes can result in personal injury or equipment damage.

- Do not discard the Nomex® tubes.

Use the following steps to assemble the current sensor hex busbars in D1h/D3h/D5h/D6h drives. See [Illustration 1](#).

#### Procedure

1. Replace the existing IGBT output busbars with the 3 IGBT output busbars from the kit, and fasten the busbars to the IGBT modules.

See the service guide for detailed disassembly procedures.

2. Fasten the 3 hex busbars to the studs on the IGBT output busbars, 1 per busbar.

The shorter busbar is the V busbar and is mounted in the middle.  
Torque the hex busbars to 9.6 Nm (85 in-lb).

3. Place the 3 heat-resistant Nomex® tubes over the hex busbars, 1 per busbar.

Place the tube with the red marking over the shorter busbar.

4. Place the hex busbar support bracket over the 3 hex busbars and Nomex® tubes, and secure with 3 M6 nuts (10 mm).

The hex busbars and Nomex® tubes are inserted through the centers of the current sensors when installing the current sensors in the drive.

5. Position the 3 motor busbars (U/V/W) in the drive.

6. Fasten 3 M6x24 screws (T30) through the motor busbars and into the threads of the 3 hex busbars, 1 per busbar.

During installation in the drive, these 3 M6x24 screws (T30) fasten the motor busbars (U/V/W) to the 3 hex busbars.

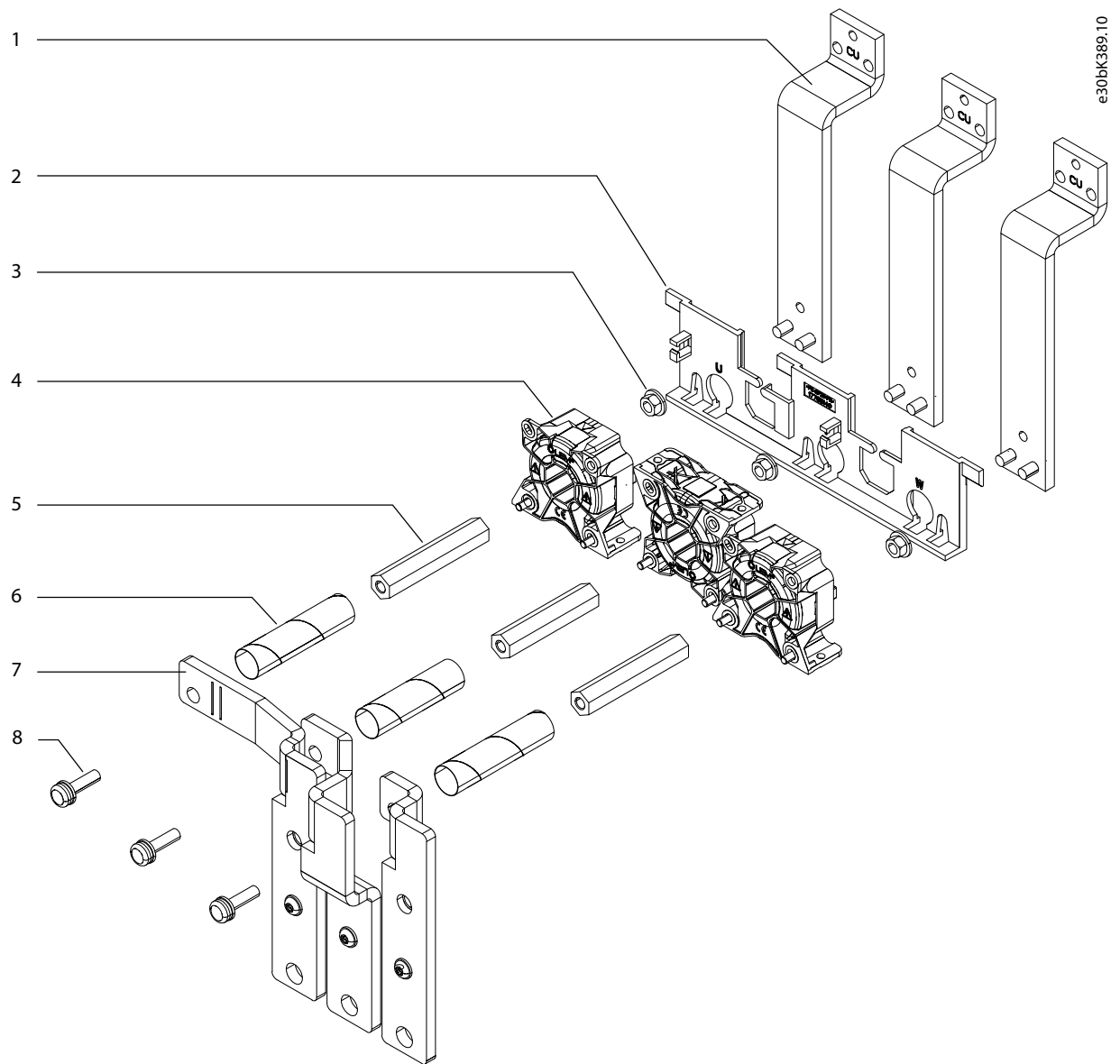


Illustration 1: Current Sensor Hex Busbar Assembly (D1h/D3h/D5h/D6h Drives)

1	IGBT output busbar	5	Hex busbar
2	Hex busbar support bracket	6	Nomex® tube
3	M6 nut	7	Motor busbar <sup>(1)</sup>
4	Current sensor <sup>(1)</sup>	8	M6x24 screw

<sup>1</sup> Current sensors and motor busbars are not included in kit 176F4181.

## 2.3 Assembling the Current Sensor Hex Busbars in D2h/D4h/D7h/D8h Drives

### ⚠ WARNING ⚠

#### NOMEX® TUBES REQUIRED

The heat-resistant Nomex® tubes are required to maintain proper electrical protection. Failure to install the Nomex® tubes can result in personal injury or equipment damage.

- Do not discard the Nomex® tubes.

Use the following steps to assemble the current sensor hex busbars in D2h/D4h/D7h/D8h drives. See [Illustration 2](#).

#### Procedure

1. Replace the existing IGBT output busbars with the 3 IGBT output busbars from the kit, and fasten the busbars to the IGBT modules.

See the service guide for detailed disassembly procedures.

2. Fasten the 3 hex busbars to the studs on the IGBT output busbars, 1 per busbar.

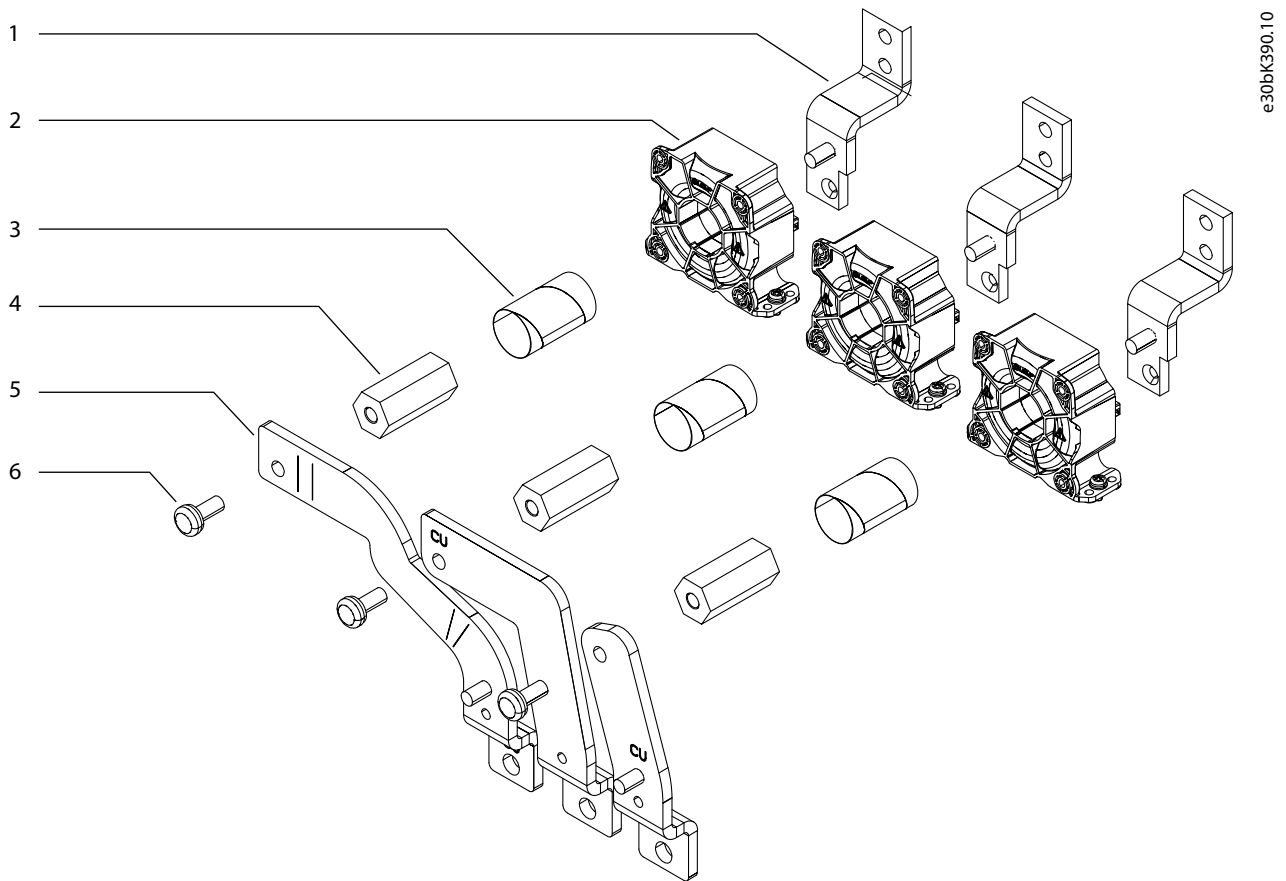
For kit 176F4182 (300 A), torque the hex busbars to 9.6 Nm (85 in-lb).  
For kit 176F4183 (500 A), torque the hex busbars to 19.1 Nm (169 in-lb).

3. Place the 3 heat-resistant Nomex® tubes over the hex busbars, 1 per busbar.

The hex busbars and Nomex® tubes are inserted through the centers of the current sensors when installing the current sensors in the drive.

4. Position the motor busbars (U/V/W) in the drive.
5. Fasten 3 M8x20 screws (T40) through the motor busbars and into the threads of the 3 hex busbars, 1 per busbar.

During installation in the drive, these 3 M8x20 screws (T40) fasten the motor busbars (U/V/W) to the 3 hex busbars.



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Illustration 2: Current Sensor Hex Busbar Assembly (D2h/D4h/D7h/D8h Drives)

1	IGBT output busbar	4	Hex busbar
2	Current sensor <sup>(1)</sup>	5	Motor busbar <sup>(1)</sup>
3	Nomex® tube	6	M8x20 screw

<sup>1</sup> Current sensors and motor busbars are not included in kits 176F4182 and 176F4183.

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