

Installation Instructions

VLT® Frequency Converter Internal Mains Fuse Replacement

FC 102/FC 103/FC 202/FC 301/FC 302

1.1 Introduction

The instructions provide information about the replacement of internal mains fuses for single-phase and 3-phase frequency converters in A, B, and C enclosures. This kit is designed and tested for the North American market.

	A2	A3	A5	B1	B2	C1	C2
Single-phase			X	X	X	X	X
3-phase	X	X	X	X	X	X	X

Table 1.1 Supported Enclosures

1.2 Safety Instructions

Only qualified, Danfoss-authorized 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 manual.

⚠ WARNING

DISCHARGE TIME

The frequency converter contains DC-link capacitors, which can remain charged even when the frequency converter is not powered. Failure to wait the specified time after power has been removed before performing service or repair work could result in death or serious injury.

1. Stop the motor.
2. Disconnect AC mains, permanent magnet type motors, and remote DC-link supplies, including battery back-ups, UPS, and DC-link connections to other frequency converters.
3. Wait for the capacitors to discharge fully before performing any service or repair work. The duration of waiting time is specified in *Table 1.2*.

Voltage [V]	Minimum waiting time (minutes)	
	4	15
208–230	0.25–3.7 kW (0.3–5 hp)	5.5–45 kW (7.5–60 hp)
460–480	0.25–7.5 kW (0.3–10 hp)	11–90 kW (15–125 hp)
575–600	0.75–7.5 kW (1.0–10 hp)	11–90 kW (15–125 hp)

High voltage can be present even when indicator lights are off!

Table 1.2 Discharge Time for FC 102 and FC 202

Voltage [V]	Minimum waiting time (minutes)	
	4	15
208–230	0.25–3.7 kW (0.3–5 hp)	5.5–37 kW (7.5–50 hp)
460–480	0.37–7.5 kW (0.5–10 hp)	11–75 kW (15–100 hp)
575–600	0.75–7.5 kW (1–10 hp)	11–75 kW (15–100 hp)

High voltage can be present even when indicator lights are off!

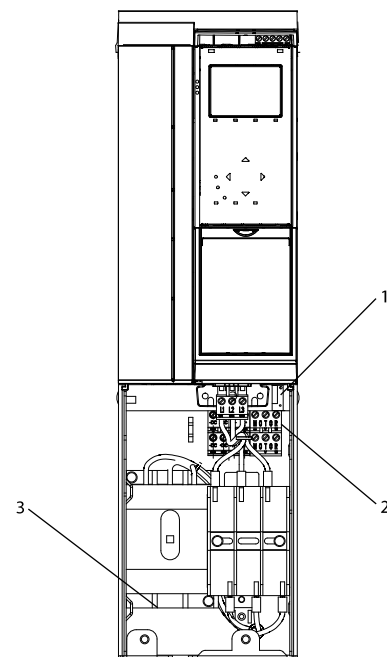
Table 1.3 Discharge Time for FC 300

1.3 Mains Fuse/Relay Locations

Enclosure size A

Illustration 1.1 and *Illustration 1.2* show the input power, motor, and relay locations for A2, A3, and A5 enclosures.

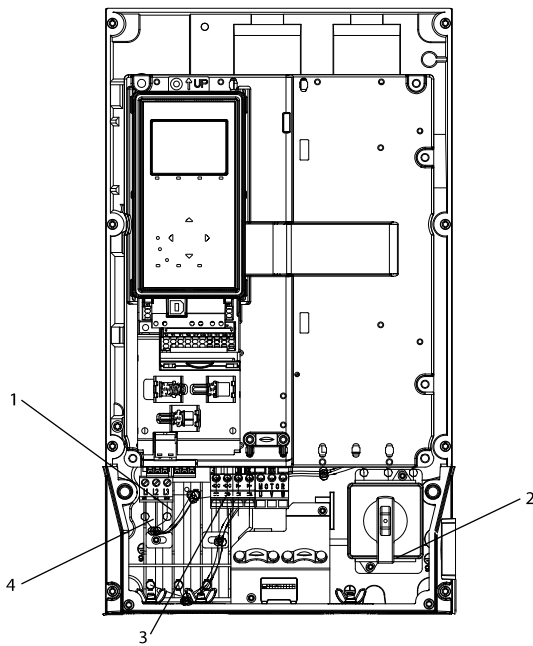
Illustration 1.2 identifies the mains fuse locations.



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1	Relays
2	Motor
3	Input power

Illustration 1.1 A2 and A3 Enclosures (3-phase Only)



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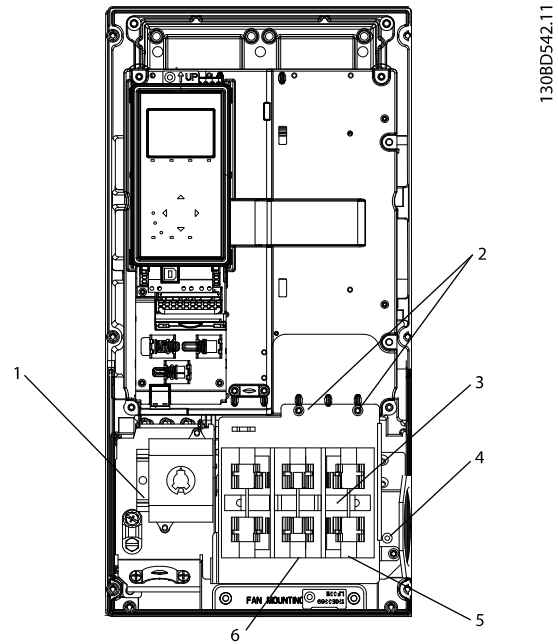
Enclosure size B

Illustration 1.3, Illustration 1.4, and Illustration 1.5 show the input power, motor, and relay locations for B1 and B2 enclosures.

Motor and relay connections are located under the mains fuse block. To access these connectors, loosen the three T20 screws and move the fuse block out of the way. Do not disassemble the mains fuse block.

1	Mains fuses
2	Input power
3	Motor
4	Relays

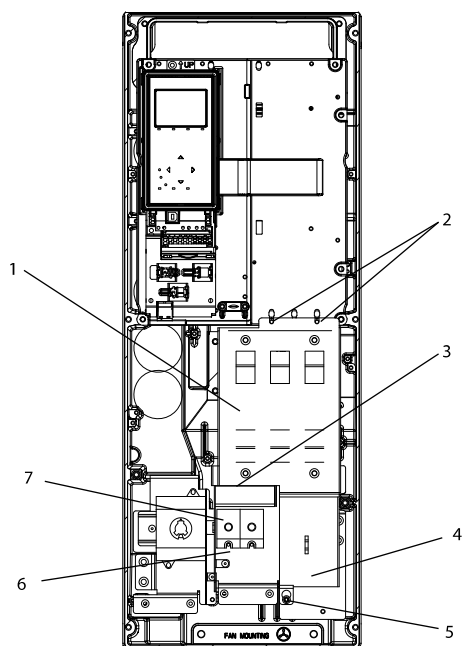
Illustration 1.2 A5 Enclosure (Single-phase and 3-phase)



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1	Input power
2	T20 screws
3	Mains fuses
4	T20 screw
5	Motor (beneath fuse plate)
6	Relays

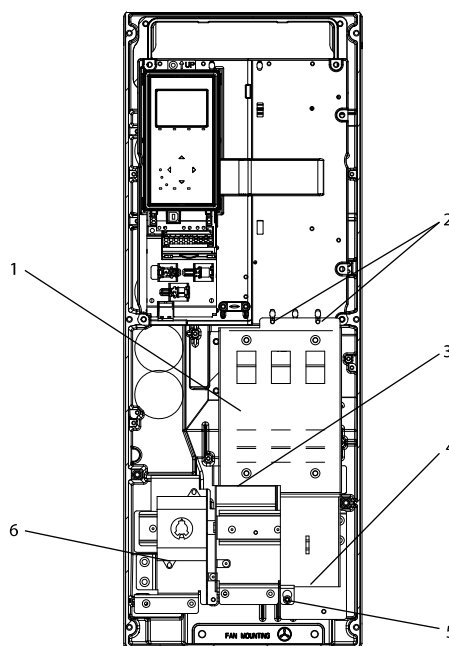
Illustration 1.3 B1 Enclosure (Single-phase and 3-phase)



130BE117.10

1	Mains fuses
2	T20 screws
3	Relays
4	Motor (beneath fuse plate)
5	T20 screw
6	Input power
7	Input terminal block

Illustration 1.4 B2 Enclosure (Single-phase)



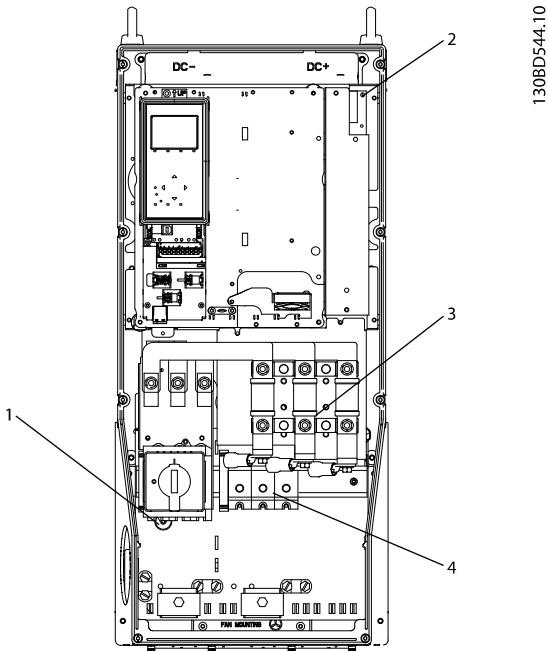
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1	Mains fuses
2	T20 screws
3	Relays
4	Motor (beneath fuse plate)
5	T20 screw
6	Input power

Illustration 1.5 B2 Enclosure (3-phase)

Enclosure size C

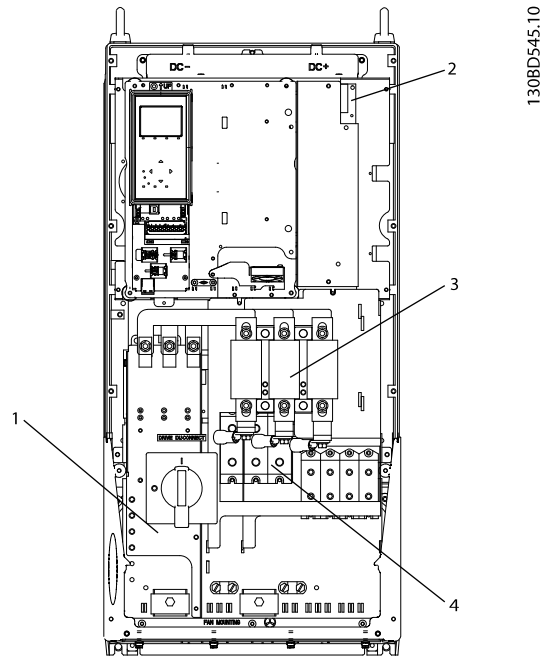
Illustration 1.6 and Illustration 1.7 show the input power, motor, and relay locations for C1 and C2 enclosures.



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1	Input power
2	Relays
3	Mains fuses
4	Motor

Illustration 1.6 C1 Enclosure



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1	Input power
2	Relays
3	Mains fuses
4	Motor

Illustration 1.7 C2 Enclosure

1.4 Mains Voltage Ratings

Single-phase frequency converters

	FC 102	FC 202	FC 301/FC 302 [NO]	FC 301/FC 302 [HO]
[V]	kW (hp)		kW (hp)	kW (hp)
208–230	1.1 (1.5)		—	—
460–480	—		—	—
575–600	—		—	—

Table 1.4 A5 Enclosure (Single-phase)

	FC 102	FC 202	FC 301/FC 302 [NO]	FC 301/FC 302 [HO]
[V]	kW (hp)		kW (hp)	kW (hp)
208–230	1.5–5.5 (2–7.5)		—	—
460–480	—		—	—
575–600	—		—	—

Table 1.5 B1 Enclosure (Single-phase)

	FC 102	FC 202	FC 301/FC 302 [NO]	FC 301/FC 302 [HO]
[V]	kW (hp)		kW (hp)	kW (hp)
208–230	7.5 (10)		—	—
460–480	—		—	—
575–600	—		—	—

Table 1.6 B2 Enclosure (Single-phase)

	FC 102	FC 202	FC 301/FC 302 [NO]	FC 301/FC 302 [HO]
[V]	kW (hp)		kW (hp)	kW (hp)
208–230	15 (20)		—	—
460–480	—		—	—
575–600	—		—	—

Table 1.7 C1 Enclosure (Single-phase)

	FC 102	FC 202	FC 301/FC 302 [NO]	FC 301/FC 302 [HO]
[V]	kW (hp)		kW (hp)	kW (hp)
208–230	22 (30)		—	—
460–480	—		—	—
575–600	—		—	—

Table 1.8 C2 Enclosure (Single-phase)

3-phase frequency converters

	FC 102/FC 103	FC 202	FC 301/FC 302 [NO]	FC 301/FC 302 [HO]
[V]	kW (hp)		kW (hp)	
208–230	1.1–3.7 (1.5–5)		0.25–3.7 (0.3–5)	
460–480	1.1–7.5 (1.5–10)		0.37–7.5 (0.5–10)	
575–600	1.1–7.5 (1.5–10)		0.75–7.5 (1–10)	

Table 1.9 A1–A2 Enclosures (3-phase)

	FC 102/FC 103	FC 202	FC 301/FC 302 [NO]	FC 301/FC 302 [HO]
[V]	kW (hp)		kW (hp)	
208–230	5.5–11 (7.5–15)		7.5–11 (10–15)	
460–480	11–18.5 (15–25)		15–18 (20–25)	
575–600	11–18.5 (15–25)		11–18 (15–25)	

Table 1.10 B1 Enclosure (3-phase)

	FC 102/FC 103	FC 202	FC 301/FC 302 [NO]	FC 301/FC 302 [HO]
[V]	kW (hp)		kW (hp)	
208–230	15 (20)		15 (20)	
460–480	22–30 (30–40)		22–30 (30–40)	
575–600	22–30 (30–40)		22–30 (30–40)	

Table 1.11 B2 Enclosure (3-phase)

	FC 102/FC 103	FC 202	FC 301/FC 302 [NO]	FC 301/FC 302 [HO]
[V]	kW (hp)		kW (hp)	
208–230	18.5–30 (25–40)		18.5–22 (25–30)	
460–480	37–55 (50–75)		37–55 (50–75)	
575–600	37–55 (50–75)		37–55 (50–75)	

Table 1.12 C1 Enclosure (3-phase)

	FC 102/FC 103	FC 202	FC 301/FC 302 [NO]	FC 301/FC 302 [HO]
[V]	kW (hp)		kW (hp)	
208–230	37–45 (50–60)		30–45 (40–60)	
460–480	75–90 (100–125)		75–90 (100–125)	
575–600	75–90 (100–125)		75–90 (100–125)	

Table 1.13 C2 Enclosure (3-phase)

1.5 Mains Fuse Replacement Table

Single-phase frequency converters

To replace the same type of mains fuse installed in the unit, refer to *Table 1.14*. For a list of maximum mains fuse sizes that can be installed in the unit, or for hp/kW sizes not shown in this chart, refer to the operating instructions.

Unit rating		FC 102/FC 103/FC 202			FC 301/FC 302		
[hp]	[kW]	208–230 V	460–480 V	575–600 V	208–230 V	460–480 V	575–600 V
0.5	0.37	—	—	—	—	—	—
0.75	0.55	—	—	—	—	—	—
1	0.75	—	—	—	—	—	—
1.5	1.1	LP-CC-15 15 A, 600 V, Class CC	—	—	—	—	—
2	1.5	JJN-20 20 A, 300 V, Class T	—	—	—	—	—
3	2.2	JJN-30 30 A, 300 V, Class T	—	—	—	—	—
4	3	JJN-35 35 A, 300 V, Class T	—	—	—	—	—
5	3.7/4	JJN-50 50 A, 300 V, Class T	—	—	—	—	—
7.5	5.5	JJN-60 60 A, 300 V, Class T	—	—	—	—	—
10	7.5	JJN-80 80 A, 300 V, Class T	—	—	—	—	—
15	11	—	—	—	—	—	—
20	15	FWX-150 150 A, 250 V	—	—	—	—	—
25	18.5	—	—	—	—	—	—
30	22	FWX-200 200 A, 250 V	—	—	—	—	—
40	30	—	—	—	—	—	—
50	37	—	—	—	—	—	—
60	45	—	—	—	—	—	—
75	55	—	—	—	—	—	—
100	75	—	—	—	—	—	—
125	90	—	—	—	—	—	—

Table 1.14 Mains Fuse Replacement (Single-phase)

3-phase frequency converters

To replace the same type of mains fuse installed in the unit, refer to *Table 1.15*. For a list of maximum mains fuse sizes that can be installed in the unit, or for hp/kW sizes not shown in this chart, refer to the operating instructions.

Unit rating		FC 102/FC 103/FC 202			FC 301/FC 302		
[Hp]	[kW]	208–230 V	460–480 V	575–600 V	208–230 V	460–480 V	575–600 V
0.5	0.37	—	—	—	LP-CC-5 5 A, 600 V, Class CC	LP-CC-6 6 A, 600 V, Class CC	—
0.75	0.55	—	—	—	LP-CC-10 10 A, 600 V, Class CC	LP-CC-6 6 A, 600 V, Class CC	—
1	0.75	—	—	—	LP-CC-10 10 A, 600 V, Class CC	LP-CC-6 6 A, 600 V, Class CC	LP-CC-5 5 A, 600 V, Class CC
1.5	1.1	LP-CC-10 10 A, 600 V, Class CC	LP-CC-6 6 A, 600 V, Class CC	LP-CC-5 5 A, 600 V, Class CC	LP-CC-10 10 A, 600 V, Class CC	LP-CC-6 6 A, 600 V, Class CC	LP-CC-5 5 A, 600 V, Class CC
2	1.5	LP-CC-15 15 A, 600 V, Class CC	LP-CC-10 10 A, 600 V, Class CC	LP-CC-10 10 A, 600 V, Class CC	LP-CC-15 15 A, 600 V, Class CC	LP-CC-10 10 A, 600 V, Class CC	LP-CC-10 10 A, 600 V, Class CC
3	2.2	LP-CC-20 20 A, 600 V, Class CC	LP-CC-10 10 A, 600 V, Class CC	LP-CC-10 10 A, 600 V, Class CC	LP-CC-20 20 A, 600 V, Class CC	LP-CC-10 10 A, 600 V, Class CC	LP-CC-10 10 A, 600 V, Class CC
4	3	LP-CC-25 25 A, 600 V, Class CC	LP-CC-15 15 A, 600 V, Class CC	LP-CC-15 15 A, 600 V, Class CC	LP-CC-25 25 A, 600 V, Class CC	LP-CC-15 15 A, 600 V, Class CC	LP-CC-15 15 A, 600 V, Class CC
5	3.7/4	LP-CC-30 30 A, 600 V, Class CC	LP-CC-20 20 A, 600 V, Class CC	LP-CC-20 20 A, 600 V, Class CC	LP-CC-30 30 A, 600 V, Class CC	LP-CC-20 20 A, 600 V, Class CC	LP-CC-20 20 A, 600 V, Class CC
7.5	5.5	JJN-50 50 A, 300 V, Class T	LP-CC-25 25 A, 600 V, Class CC	LP-CC-25 25 A, 600 V, Class CC	JJN-50 50 A, 600 V, Class CC	LP-CC-25 25 A, 600 V, Class CC	LP-CC-25 25 A, 600 V, Class CC
10	7.5	JJN-50 50 A, 300 V, Class T	LP-CC-30 30 A, 600 V, Class CC	LP-CC-30 30 A, 600 V, Class CC	JJN-60 60 A, 300 V, Class T	LP-CC-30 30 A, 600 V, Class CC	LP-CC-30 30 A, 600 V, Class CC
15	11	JJN-60 60 A, 300 V, Class T	JJS-40 40 A, 600 V, Class T	JJS-35 35 A, 600 V, Class T	JJN-80 80 A, 300 V, Class T	JJS-40 40 A, 600 V, Class T	JJS-35 35 A, 600 V, Class T
20	15	JJN-80 80 A, 300 V, Class T	JJS-40 40 A, 600 V, Class T	JJS-35 35 A, 600 V, Class T	JJN-125 125 A, 300 V, Class T	JJS-50 50 A, 600 V, Class T	JJS-45 45 A, 600 V, Class T
25	18.5	JJN-125 125 A, 300 V, Class T	JJS-50 50 A, 600 V, Class T	JJS-45 45 A, 600 V, Class T	JJN-125 125 A, 300 V, Class T	JJS-60 60 A, 600 V, Class T	JJS-50 50 A, 600 V, Class T
30	22	JJN-125 125 A, 300 V, Class T	JJS-60 60 A, 600 V, Class T	JJS-50 50 A, 600 V, Class T	FWX-150A 150 A, 250 V	JJS-80 80 A, 600 V, Class T	JJS-60 60 A, 600 V, Class T
40	30	FWX-150A 150 A, 250 V	JJS-80 80 A, 600 V, Class T	JJS-60 60 A, 600 V, Class T	FWX-200A 200 A, 250 V	JJS-100 100 A, 600 V, Class T	JJS-80 80 A, 600 V, Class T
50	37	FWX-200A 200 A, 250 V	JJS-100 100 A, 600 V, Class T	JJS-80 80 A, 600 V, Class T	FWX-250A 250 A, 250 V	JJS-125 125 A, 600 V, Class T	JJS-100 100 A, 600 V, Class T
60	45	FWX-250A 250 A, 250 V	JJS-125 125 A, 600 V, Class T	JJS-100 100 A, 600 V, Class T	—	JJS-150 150 A, 600 V, Class T	JJS-125 125 A, 600 V, Class T
75	55	—	JJS-150 150 A, 600 V, Class T	JJS-125 125 A, 600 V, Class T	—	FWH-200B 200 A, 500 V	JJS-150 150 A, 600 V, Class T
100	75	—	FWH-200B 200 A, 500 V	JJS-150 150 A, 600 V, Class T	—	FWH-250A 250 A, 500 V	JJS-175 175 A, 600 V, Class T
125	90	—	FWH-250A 250 A, 500 V	JJS-175 175 A, 600 V, Class T	—	—	—

Table 1.15 Mains Fuse Replacement (3-phase)

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