TYPE APPROVAL CERTIFICATE

Certificate no.:
TAE000008B
Revision No:
5

This is to certify:

that the Frequency Converter

with type designation(s)
FC-202 series

issued to
Danfoss Power Electronics A/S
Gråsten, **Denmark**

is found to comply with
DNV rules for classification – Ships, offshore units, and high speed and light craft

Application:

Products approved by this certificate are accepted for installation on all vessels classed by DNV.

Issued at **Hamburg** on **2026-02-18**
This Certificate is valid until **2027-06-30**.
DNV local unit: **Denmark CMC**

Approval Engineer: **Torsten Dzillak**

for **DNV**

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This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid.
The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

Name and place of manufacturer

Danfoss Drives A/S GRAASTEN Denmark	Danfoss LLC LOVES PARK IL, United States
Zhejiang Holip Electronic Technology Co., Ltd Haiyan county, Jiaxing city, Zhejiang province, China	Danfoss Drives OY Runsorintie 7, 65380 Vaasa, Finland

Product description

Product: Frequency converter for asynchronous motors for use in various marine applications.

Model: VLT® AQUA Drive series FC-202

FC-202 power rating vs. enclosure type and IP rating

FC-202: 200-240V				
Power rating [kW]	**Enclosure type**			
FC-202	**IP20** (*1)	**IP21** (*2)	**IP55** (*3)	**IP66** (*4)
0,25	A2	A2 (*5)	A4+A5	A4+A5
0,37				
0,55				
0,75				
1,1				
1,5				
2,2				
3,0	A3	A3 (*5)	A5	A5
3,7				
5,5	B3	B1	B1	B1
7,5				
11				
15	B4	B2	B2	B2
18.5		C1	C1	C1
22	C3			
30				
37	C4	C2	C2	C2
45				

FC-202: 380-480/500V				
Power rating [kW]	**Enclosure type**			
FC-202	**IP20** (*1)	**IP21** (*2)	**IP55** (*3)	**IP66** (*4)
0,37	A2	A2 (*5)	A4+A5	A4+A5
0,55				
0,75				
1,1				
1,5				
2,2				
3,0				
4,0				
5,5	A3	A3 (*5)	A5	A5
7,5				
11	B3	B1	B1	B1
15				

FC-202: 380-480/500V				
Power rating [kW]	**Enclosure type**			
FC-202	**IP20** (*1)	**IP21** (*2)	**IP55** (*3)	**IP66** (*4)
18.52				
22	B4	B2	B2	B2
30				
37		C1	C1	C1
45	C3			
55				
75	C4	C2	C2	C2
90				

FC-202: 525-690V				
Power rating [kW]	**Enclosure type**			
FC-202	**IP20** (*1)	**IP21** (*2)	**IP55** (*3)	**IP66** (*4)
1,1	A3	N/A	N/A	N/A
1,5				
2,2				
3,0				
4,0				
5,5				
7,5				
11	B4	B2	B2	B2
15				
18				
22				
30				
37		C2	C2	C2
45	C3			
55				
75	D3h			
90				

FC-202: 380-480/500V					
Power rating [kW]	**Enclosure type**				
	6-pulse			**12-pulse**	**Low Harmonic Drive (LHD)**
FC-202	**IP20 (*1)**	**IP00** (*1)	**IP21/IP54** (*2)		
110	D3h	N/A	D1h/D5h/D6h	N/A	N/A
132					
160					D1n
200	D4h		D2h/D7h/D8h		D2n
250					
315				F8/F9	E9
355	E3h	E2/E3h	E1/E1h		
400					
450					
500	E4h	E4h	F1/F3/E2h	F10/F11	F18
560	E4h	E4h	F1/F3/E2h		

630	N/A	N/A	F1/F3		
710	N/A	N/A	F1/F3		
800	N/A	N/A	F2/F4	F12/F13	N/A
1M0					

FC-202: 525-690V				
Power rating [kW]	**Enclosure type**			
	6-pulse			**12-pulse**
FC-202	**IP20 (*1)**	**IP00** (*1)	**IP21/IP54** (*2)	
75	D3h	N/A	D1h/D5h/D6h	N/A
90				
110				
132				
160				
200	D4h	N/A	D2h/D7h/D8h	N/A
250				
315				
400				
450	E3h	E2/ E3h	E1/E1h	F8/F9
500				
560				
630				
710	E4h	E4h	F1/F3/E2h	F10/F11
800	E4h	E4h	F1/F3/E2h	
900	N/A	N/A	F1/F3	
1M0	N/A	N/A	F2/F4	F12/F13
1M2				
1M4				

(*1) IP20/Panel mount. All IP20 versions can be upgraded to IP21 with optional kit
(*2) IP21/NEMA Type 1
(*3) IP55/NEMA Type 12
(*4) IP66/NEMA Type 4X
(*5) IP20/Panel with IP21 upgrade kit
For more detailed information: See Product Overview Document ID 00714813 version A33.

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Application/Limitation

Supply voltage range:	200 - 240 V / 380 - 480 V / 525 - 690 V, 50/60 Hz
Voltage variation:	± 10 %, -15% with reduced power rating
Frequency variation:	A, B and C frames: ± 10%, -15% for maintaining functions after start up. D, E and F frames: ± 5% In accordance with Danfoss design guide
Output frequency:	A, B and C frames: 0 – 590 Hz D, E and F frames: 0 – 590 Hz In accordance with Danfoss design guide
Temperature range in operation:	In accordance with Danfoss design guide
Temperature range in operation:	0 - 45°C, 46-55 °C with current derating in according to relevant design guide.
Temperature class:	A
Vibration class:	A
Humidity class:	B*
EMC class:	A**
Protection class:	IP00 / 20 / 21 / 54 / 55 / 66 & E4X***

The FC-202 shall be regarded as a component. The actual installation is to be designed according to Danfoss design guide MG11BC02, MG22B202 & MG20Z302 and according to the applicable DNV Rules for the actual application.

Frequency converters rated equal or larger than 100 kW serving essential or important functions as defined in DNV rules Pt.4 Ch.8 shall have a product certificate according to DNV Pt.4 Ch.8 Sec.1 Table 3 for each delivery to DNV classed vessels.

For product certification / plan approval, the following documents of the semiconductor assembly should be submitted for approval, Ref. to DNV Pt.4 Ch.8 Sec.1 Table 2 by the end user / final product integrator:

- Reference to this Type Approval Certificate
- (E180) A drawing showing external location of instruments and devices for operation (panel layout)
- (E240) Functional description for the intended use, configuration and interface (e.g. alarms, monitoring and auxiliary power supplies)
- (Z252) Test program at manufacturer for routine tests and functional tests as per DNV Pt.4 Ch.8 Sec.7, 2.1.1
- Single line diagram (only applicable for multi drive configuration)
- If additional components to the type approved frequency converter are delivered, documentation according to DNV rules Pt.4 Ch.8 Sec.1 table 2 shall be submitted for review.

* Relative humidity 5 to 95%, no condensation allowed.

** Converters EMC classed C3 according to IEC 61800-3 can be installed in "special distribution zone" and "general power distribution zone" in accordance with IEC 60533 provided precautions are taken to attenuate these effects on the distribution system, so the safe operation is assured.

*** To be installed in an enclosure with an IP degree in accordance with DNV Rules w.r.t. location.

The Type Approval covers hardware and software for the basic controller.

Clause for software control:

All changes in software are to be recorded as long as the system is in use on board. The records of all changes are to be forwarded to DNV for evaluation and approval. Major changes in the software are to be approved before being installed in the converter.

Type Approval documentation

Tests carried out

Visual inspection, Performance, Power supply failure, Power supply variations, Voltage/frequency variation, Vibration/shock, Dry heat, Damp heat, Insulation resistance, High voltage.
EMC: Electrical fast transient (Burst), electrical slow transient (Surge), RF-common mode Voltage, radiated RF-electromagnetic fields, electric discharge (ESD), radiated and conducted emission.

Marking of product

Danfoss – Type designation – Power – Voltage

Periodical assessment

The scope of the periodical assessment is to verify that the conditions stipulated for the Type approval are complied with and that no alterations are made to the product design or choice of materials.

The main elements of the assessment are:

- Inspection on factory samples, selected at random from the production line (where practicable)
- Results from Routine tests (RT) checked (if not available tests RT to be carried out)
- Review of type approval documentation
- Review of possible change in design, materials and performance
- Ensuring traceability between manufacturer's product type marking and Type Approval Certificate.

Assessment to be performed at 2, 3.5 year and at renewal.

END OF CERTIFICATE