



Lloyd's Register

# Type Approval Certificate

This is to certify that the undernoted product(s) has/have been tested with satisfactory results in accordance with the relevant requirements of the Lloyd's Register Type Approval System.

This certificate supersedes certificate number 18/20010 issued on 06.04.2018 which is hereby cancelled.

This certificate is issued to:

**PRODUCER** Danfoss Power Electronics A/S  
Ulsnaes 1  
6300 Graasten  
Denmark

**DESCRIPTION** Adjustable frequency converters and standalone advanced active filter

**TYPE** VLT® Drives and VLT® Advanced Active Filter  
according following selection types for type codes

----- (character 24 – 39 software + options)  
1 4 7 11 13 16 23

Product group (character 1-3):  
FC-, AAF

VLT® series (character 4-6):  
102: VLT® HVAC Drive  
202: VLT® AQUA Drive  
302: VLT® Automation Drive  
006: Advanced Active Filter

**Certificate No.** 18/20010 (E1)

**Issue Date** 05 August 2019

**Expiry Date** 22 July 2024

**Sheet** 1 of 6

  
Thorsten Wolff  
Hamburg Technical Support Office  
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LR031.1.2016.06

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**TYPE (continued)**

Power size or current rating (character 7-10):

P\*\*\*: 0.25 - 1.4 MW

N\*\*\*: 55 - 800 kW

A\*\*\*: 190 - 400 A

\*\*\* to be selected according to Danfoss Design Guide

Voltage (character 11-12):

T2: 3x 200-240V AC

T4: 3x 380-480V AC

T5: 3x 380-500V AC

T7: 3x 525-690V AC

Protection degree (character 13-15):

C00: IP 00 Chassis

C20: IP 20 Chassis

C21: IP21

C2H: IP21 + Heater

C54: IP54

C5H: IP54 + Heater

C2M: IP21 + Mains shield

C2S: IP 20 Chassis

C5M: IP54 + Mains shield

E00: IP 00 Chassis

E20: IP 20 Chassis

E21: IP 21

E2D: IP 21 (only D-frame)

E2M: IP 21 + Mains shield

E2S: IP 20 Chassis stainless steel screws

E5D: IP54 (only D-frame)

E5M: IP 54 + Mains shield

E5S: IP 54 With stainless steel screws+ Heater

E54: IP 54

E55: IP 55

E66: IP 66

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2 of 6

  
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**TYPE (continued)**

Protection degree (character 13-15) continued:

H21: IP 21 + Heater

H54: IP 54 + Heater

Hardware (character 16-23):

RFI filter character 16-17: H1, B2, H2, H3, B4, H4, H5, L2, N2, N4, HX

Braking character 18: B, C, D, E, R, S, T, U, X

Display character 19: G, J, K, L, N, X

PCB coating character 20: C, R

Mains input character 21: E, J, X, 1, 2, 3, 4, 7

Hardware options character 22-23\*

\* to be selected according to Danfoss Design Guide

Software character 24-28

VLT® options (character 29-30):

Fieldbus options A

VLT® options (character 31-32):

I/O options B

VLT® options (character 33-34):

Motion control options C

VLT® options (character 35):

Application options

Character 36- 37 not used

VLT® options (character 38-39):

External control input: D0, DX

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3 of 6

  
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**TYPE (continued)**

Firmware versions:  
FC102 -4.xx and 5.xx  
FC202 -2.xx and 3.xx  
FC302 -7.xx and 8.xx  
AAF006-2.xx

**APPLICATION**

Marine, Offshore and Industry applications for use in environmental categories ENV1 and ENV2 (for radiated and conducted emission suitable for special power distribution zones acc. IEC 60533 only) as defined in Lloyd's Register Test Specification Number 1:2002

**STANDARD**

IEC 61800-3:2005 +A1:2012  
DS/EN 61800-5-1 (2007)

**RATINGS**

Power Size	Power Rating Normal Overload [kW]	AC Mains Voltage [V]
FC 102		
P1K1 -P45K	1.1 - 45	200 - 240
P1K1 - P1M0	1.1 - 1000	380 - 480
P1K1 - P1M4	1.1 - 1400	525 - 690
N110 - N560	110 - 560	380 - 480
N75K - N800	75 - 800	525 - 690
FC 202		
PK25 - P45K	0.25 - 45	200 - 240
PK37 - P1M0	0.37 - 1000	380 - 480
P1K1 - P1M4	1.1 - 1400	525 - 690
N110 - N560	110 - 560	380 - 480
N75K - N800	75 - 800	525 - 690

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4 of 6



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**RATINGS continued**

Power Size	Power Rating Normal Overload [kW]	AC Mains Voltage [V]
FC302		
PK25 - P37K	0.25 - 37	200 - 240
PK37 - P800	0.37 - 800	380 - 500
P1K1 - P1M2	1.1 - 1200	525 - 690
N90K - N560	90 - 560	380 - 500
N55K - N710	55 - 710	525 - 690

**OTHER CONDITIONS**

The complete installation and function is subject to separate plan appraisal according applicable Rules and Regulations, when installed on LR classed vessels. Screened cables between motor and converter to be installed on LR classed vessels. Converters used for essential services rated above 100kW to be manufactured and tested in compliance with LR Rules and Regulations. If used in marine and offshore applications the equipment is to be installed in special power distribution zones according IEC 60533 and Danfoss EMC Installation Guideline 00720010 revision sequence A8. Appropriate measures should be taken to attenuate EMC effects on the distribution system so that safe operation is assured. Planned EMC measures are matter of assessment prior to installation on board. The type selection has to be according Danfoss Design Guide. The installation requirements according Danfoss Installation Guide have to be fulfilled.

The temperature range in operation is up to 45 °C. For 46 - 55 °C with current derating of 1%/°C or 1.5%/°C as applicable according to Danfoss Design Guide.

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**PLACE OF PRODUCTION**

Danfoss Power Electronics A/S  
Ulsnaes 1  
6300 Graasten  
Denmark

Danfoss LLC\*  
4401 N Bell School Road  
IL 61111 Loves Park  
USA

\*E1h – E4h can be produced at Loves Park only

*The Type Approval does not eliminate the need for normal inspection and survey procedures required by the Rules and Regulations.*

*If the specified standards are amended during the validity of this certificate, the product is to be re-approved prior to it being supplied to vessels to which the amended standards apply.*

*The Design Appraisal Document No. HTS/ETS 38460-19 and its supplementary Type Approval Terms and Conditions form part of this Certificate.*

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