



## 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.

<b>Manufacturer</b>	<b>Danfoss Power Electronics A/S</b>
<b>Address</b>	Ulsnæs 1, Graasten, 6300, Denmark
<b>Place of Production</b>	Danfoss Power Electronics A/S Ulsnæs 1, Graasten, 6300, Denmark
<b>Place of Production</b>	Danfoss Drives, LLC 4401 N. Bell School Road, Loves Park, IL, 61111, United States
<b>Type</b>	Electronic Frequency Convertor
<b>Description</b>	Adjustable frequency converters Refer to the Appendix for further details.
<b>Trade Name</b>	VLT <sup>®</sup> Drives
<b>Application</b>	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
<b>Specified Standard</b>	EN 61800-3:2004+A1:2012 DS/EN 61800-5-1 (2007)+A1:2017+A11:2021

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EN 61800-5-2:2017

### Ratings

Refer to the Appendix for further details.

### 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.

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.

This certificate is not valid for equipment, the design, ratings or operating parameters of which have been varied from the specimen tested. The manufacturer should notify Lloyd's Register EMEA of any modification or changes to the equipment in order to obtain a valid Certificate.

### Previous Version:

This certificate supersedes certificate number 18/20010 (E1) issued on 05 August 2019 which is hereby cancelled.

The Design Appraisal Document TSO-24-012921/TW and its supplementary Type Approval Terms and Conditions form part of this Certificate.

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## Appendix

### TYPE

VLT® Drives  
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-

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

Power size or current rating (character 7-10):  
P\*\*\*: 0.25 - 1.4 MW  
N\*\*\*: 55 - 800 kW  
\*\*\* 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

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



Firmware versions:

FC102 -7.xx

FC202 -5.xx

FC302 -9.xx

**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
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