Certificate No: LR2466674TA-02
Issue Date: 04/08/2025
Expiry Date: 08/07/2029

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.

Manufacturer	**Danfoss Power Electronics A/S**
Address	Ulsnæs 1, Graasten, 6300, Denmark
Place of Production	Danfoss Power Electronics A/S Ulsnæs 1, Graasten, 6300, Denmark
Place of Production	Danfoss Drives, LLC 4401 N. Bell School Road, Loves Park, IL, 61111, United States
Place of Production	Zhejiang Holip Electronic Technology Co., Ltd No. 339 North Xinqiao Road, Wuyun town,Haiyan County, Jiaxing, Zhejiang, China
Type	Electronic Frequency Convertor
Description	Adjustable frequency converters Refer to the Appendix for further details.
Trade Name	VLT ® Drives
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

Ashwinikumar Mhamal

Electrical & Control Technical Manager - Africa, Middle East & India to Lloyd's Register Marine and Offshore India LLP

Units 1702-1704, 17th Floor (Level-13), Building Q2, Aurum Q Parc; Gen 4/1 TTC, Thane-Belapur Road, Ghansoli, Navi Mumbai, 400710, India

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Type Approval Certificate

Test Specification Number 1:2002

Specified Standard

EN 61800-3:2004+A1:2012
DS/EN 61800-5-1 (2007)+A1:2017+A11:2021
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.

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Type Approval Certificate

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 Marine and Offshore India LLP of any modification or changes to the equipment in order to obtain a valid Certificate.

Previous Version: This certificate supersedes certificate number LR2466674TA issued on 09 July 2024 which is hereby cancelled.

The Design Appraisal Document TSO-25-038427 and its supplementary Type Approval Terms and Conditions form part of this Certificate.

Units 1702-1704, 17th Floor (Level-13), Building Q2, Aurum Q Parc; Gen 4/1 TTC, Thane-Belapur Road, Ghansoli, Navi Mumbai, 400710, India

Certificate No: LR2466674TA
Issue Date: 09.07.2024
Expiry Date: 08.07.2029

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