



NIPPON KAIJI KYOKAI

TYPE APPROVAL CERTIFICATE FOR AUTOMATIC DEVICES AND EQUIPMENT

Certificate No. TA25019M

This is to certify that the undernoted product(s) has/have been approved in accordance with the requirements specified in Chapter 1, Part 7 of "Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use" and the relevant Society's Rules.

This certificate is issued to

Manufacturer:	Danfoss Power Electronics A/S
Place of Manufacturing:	4401 N Bell School Rd, Loves Park, IL 61111, USA Ulsnaes 1, DK-6300 Graasten, Denmark
Product description:	Frequency Converters
Model:	FC-102, FC-202, FC-301/302, FC-322 Frequency Converters
Approval No.:	15A003
Valid until:	12 January 2030

The details are described in the attached sheet(s).

Issued at Tokyo on 10 January 2025.



S. Oishi
General Manager
Machinery Department

Note: (1) This certificate has been issued due to delete of some models. of active filters.

(2) The manufacturer, if desired, is requested to apply to the Society for renewal prior to the expiration date.

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Attached sheet -1/7 to the Certificate No. TA25019M

Specification & documents:

1. Particulars: Power supply: 200-240V, 380-480/500V, 525-690V

2. Components and reference drawings:

VLT[®]HVAC Drive series FC-102;

200-240V (T2) : Power rating 1.1~45kW

380-480V (T4) : Power rating 1.1~90kW

525-690V (T7) : Power rating 1.1~90kW

380-480V (T4) : Power rating 110~1,000kW

525-690V (T7) : Power rating 75~1,400kW

380-480V (T4) : Power rating 315~1,000kW (12-pulse)

525-690V (T7) : Power rating 450~1,400kW (12-pulse)

VLT[®]AQUA Drive series FC-202;

200-240V (T2) : Power rating 0.25~45kW

380-480V (T4) : Power rating 0.37~90kW

525-690V (T7) : Power rating 1.1~90kW

380-480V (T4) : Power rating 110~1,000kW

380-480V (T7) : Power rating 75~1,400kW

380-480V (T4) : Power rating 315~1,000kW (12-pulse)

525-690V (T7) : Power rating 450~1,400kW (12-pulse)

VLT[®]Automation Drive FC-300 series FC-301/302;

200-240V (T2) : Power rating 0.25~37kW

380-480/500V (T4/T5) : Power rating 0.37~75kW

525-690V (T7) : Power rating 1.1~75kW

380-500V (T5) : Power rating 90~800kW

525-690V (T7) : Power rating 55~1,200kW

380-500V (T5) : Power rating 250~800kW (12-pulse)

525-690V (T7) : Power rating 355~1,200kW (12-pulse)

- To be continued -

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Attached sheet -2/7 to the Certificate No. TA25019M

Selection types for Type Codes for FC102, 202, 300 Series

----- (Character 24-39 software + options)

1 4 7 10 11 23

Basic string definitions:

Product Group (character 1-3)

FC- : Adjustable Frequency Converters

VLT series (character 4-6)

102 : VLT HVAC Drive - Advanced version

202 : VLT AQUA Drive - Advanced version

301 : VLT Automation Drive - Standard version

302 : VLT Automation Drive - Advanced version

Power size (character 7-10; representative examples - complete range not listed here)

PK25 : 0.25kW / 0.33HP

P75K : 75kW / 100HP

P90K : 90kW / 125HP

N75K : 75kW / 100HP D3h

N90K : 90kW / 125HP D3h

P110 : 110kW / 150HP

N110 : 110kW / 150HP

Voltage (character 11-12)

T2 : Three phase 200-240V AC

T4 : Three phase 380-480V AC

T5 : Three phase 380-500V AC

T7 : Three phase 525-690V AC

- To be continued -

Enclosure (character 13-15)

E00 : IP00 / Chassis
E20 : IP20 / Chassis
E2S : IP20 / Chassis (medium power D-Frame)
E21 : IP21 / Type 1
E2D : IP21 / Type 1 with heater
H21 : IP21 / Type 1 with heater
E54 : IP54 / Type 12
H54 : IP54 / Type 12
E5H : Hybrid IP54
E2M : IP20 / Type 1 with mains shield
E5M : IP54 / Type 12 with mains shield
E5D : IP54 / Type 12 (medium power D-Frame)
E55 : IP55 / Type 12
E66 : IP66 / Type 4X

Hardware (character 16-23)

Hardware, RFI filter (character 16-17)

H1; H2; H3; H4; H5; B2; B4;

Hardware, Brake & Stop (character 18)

Hardware, Display (character 19)

Hardware, Coating (Character 20)

C : Coated PCB

R : Coated PCB 3C3 + Ruggedized

Hardware, Mains options (character 21)

Hardware, adaptation A (character 22)

Hardware, adaptation B (character 23)

Software (character 24-28)

Options - A (character 29-30)

Options - B (character 31-32)

Options - C (character 33-37)

Options - D (character 38-39)

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Attached sheet -4/7 to the Certificate No. TA25019M

Basic string definitions for brand labeling and customer specific drives:

Product Group and VLT series (character 1-6)

TR-200	Equals to FC-102
ITT102	Equals to FC-102
AF-600	Equals to FC-102
AKD102	Equals to FC-102
FC-103	Equals to FC-102
ADS102	Equals to FC-102
IVS102	Equals to FC-102
TR-200	Equals to FC-102
ITT102	Equals to FC-102
FC-103	Equals to FC-102
CUE202	Equals to FC-202
WI-EFC	Equals to FC-202
FC-322	Equals to FC-202
LD-302	Equals to FC-302
IR-302	Equals to FC-302
IRV302	Equals to FC-302
CD-302	Equals to FC-302
MWU302	Equals to FC-302
CDS302	Equals to FC-302
DV-302	Equals to FC-302
3G3DV	Equals to FC-302
LB-302	Equals to FC-302
AFE302	Equals to FC-302
AF-650	Equals to FC-302
FCK302	Equals to FC-302
FC-312	Equals to FC-302
FC-311	Equals to FC-301

- To be continued -

3. Documentation and Test Reports:

Product overview complete Maine approval Note (Doc.ID: 00714813, Rev.Seq A.33, 2022-09-06)

CTR-11-0205, REVISION RELEASED

177R0339, 177R0340, 177R0374, 177R0375, 177R0490, 177R0491, 177R0492, 177R0493

DATASYST PROJECT: D15-14976, D15-14845

Operating Instructions, 90kW-315kW D-frame VLT® AutomationDrive FC 300

Operating Instructions, 110kW-400kW D-frame VLT® AQUA Drive FC 200

Operating Instructions, 110kW-400kW D-frame VLT® AQUA Drive FC 100

ENGINEERING TEST REPORT #: 312204, 312202, 312171 and 312172, 312169 and 312170,

312081B, 312081A, 312080B, 312080A

Radiometric Document RP-7154, RP-7120

EMC test results: 00708507, 00705781, 00708506, 00705683, 00702489

NTS Report: Danfoss Drives A10116 Report, A8366-500B0432, Danfoss Drives A11198 Report

Operating Guide, 355-800 kW, Enclosure Size E, VLT® HVAC Drive FC102 (MG16O202)

Operating Guide, 355-800 kW, Enclosure Size E, VLT® AQUA Drive FC202 (MG22A202)

Operating Guide, 315-710 kW, Enclosure Size E, VLT® Automation Drive FC302 (MG38A202)

Electromagnetic Compatibility Test Report (11494250A)

Electromagnetic Compatibility Test Report (11494250B)

Test Report (19645766 001_N560, 19645767 001_N710)

Visual inspection for Power Drive System (00734665)

VIBRATION TESTING OF E2 AND E4 DRIVES (D15-17445)

DAMP HEAT TESTING ON A D7h NEMA 12, IP54, VARIABLE FREQUENCY DRIVE
(D15-15766 REVISION A)

Danfoss Report Cold test (4786962025-S1-1)

EMC test results for FC-302N315T5 in E1h frame size (00734306)

EMC test results for FC302-N500T5 in E2h frame size (00734307)

EMC test results for FC302-N560T7 in E3h frame size (00734308)

EMC test results for FC302-N710T7 in E4h frame size (00734309)

Marine Certification Dry Heat Test Report (00735629)

P454 Damp Heat Test Report Class B Cyclic (00715502)

P4001 Immunity Test Simulations. Test Report

P4001_PTP_IACS10_no3_Intermittent_AC_Line_Loss_N400T5

P7020 Cold Test Report (00726256)

tr4001_PTP_4_Quadrant_Operation_N400T5

tr4001_PTP_LVD_Insulation_Resistance_Test

UL Testing (00733941)

- To be continued -

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DLS EMISSION TEST REPORT (Doc.No. 25952, 2021-03-01)

Danfoss Test Report (Doc.No. PEC-4640 Radiated emission, 2021-09-24)

Danfoss Test Report (Doc.No. PEC-4679 Radiated emission, 2021-09-28)

Danfoss Test Report (Doc.No. PEC-4680 Radiated emission, 2021-10-04)

Danfoss Test Report (Doc.No. PEC-6924 Radiated emission, 2023-06-22)

Danfoss Test Report (Doc.No. PEC-6925 Radiated emission, 2023-06-22)

DDTS Test Report (Doc.No. EMC-2022-002-RI-STO-D2, 2022-10-06)

DDTS Test Report (Doc.No. EMC-2022-002-RI-STO-E1, 2022-10-06)

Danfoss Test Report (Doc.No. PEC-4639 Radiated immunity, 2021-10-19)

Danfoss Test Report (Doc.No. PEC-4681 Radiated immunity, 2021-10-13)

Danfoss Test Report (Doc.No. PEC-4682 Radiated immunity, 2021-10-15)

Danfoss Test Report (Doc.No. PEC-6926 Radiated immunity, 2023-04-06)

Danfoss Test Report (Doc.No. PEC-6927 Radiated immunity, 2023-04-18)

LSR ENGINEERING TEST REPORT (Doc.No. TR 316365, 2017-02-17)

- To be continued -

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Test items & approval conditions:

1. Test items:

(Applied testing items are marked with X.)

ENVIRONMENTAL TESTS (IACS UR E10 Rev.9 basis)		Mark
External examination		X
Operation test and performance test		X
Electric power supply failure test		X
Power supply fluctuation test	Electric	X
	Pneumatic and Hydraulic	--
Insulation resistance test		X
High voltage test		X
Pressure test (Pneumatic and Hydraulic)		--
Dry heat test (Temperature $40^{\circ}\text{C} \times 1.5 \text{ h}$ & $50^{\circ}\text{C} \times 1.5 \text{ h}$ & $55^{\circ}\text{C} \times 16 \text{ h}$)		X
Damp heat test		X
Vibration test (Acceleration $\pm 0.7 \text{ g}$)		X
Inclination test		--
Cold test (Temperature $5^{\circ}\text{C} \times 2 \text{ h}$)		X
Salt mist test		--
Electrostatic discharge immunity test		X
Radiated radio frequency immunity test		X
Conducted low frequency immunity test		X
Conducted high frequency immunity test		X
Burst / Fast transient immunity test		X
Surge immunity test		X
Radiated emission test		X
Conducted emission test		X
Flame retardant test		--

2. Approval condition:

- (1) The product is not allowed to be installed in the bridge and on open deck.
- (2) The product is to be installed in special power distribution zone in accordance with IEC 60533 and manufacturer's EMC installation guideline.

- The End -