



NIPPON KAIJI KYOKAI

TYPE APPROVAL CERTIFICATE FOR AUTOMATIC DEVICES AND EQUIPMENT

Certificate No. TA19676M

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 and Filter**
Model: **FC-102, FC-202, FC-301/302, FC-322 Frequency Converters;**
AAF006 Active Filter

Approval No.: **15A003**
Valid until: **12 January 2025**

This certificate is subject to the conditions specified in the attached sheet(s).

Issued at Tokyo on 4 December 2019.


T. Shimada
General Manager
Machinery Department



Note: 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. TA19676M

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)

380-480V (T4): Power rating 160~710kW: (Low Harmonic Drive)

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)

380-480V (T4): Power rating 160~710kW: (Low Harmonic Drive)

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)

380-500V (T5): Power rating 132~630kW: (Low Harmonic Drive)

VLT®Active Filter AAF006

380-480V (T4): Current rating 190~400 Amps

- To be continued -

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Attached sheet -3/7 to the Certificate No. TA19676M

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; N2; N4; HX

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)

- To be continued -

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Attached sheet -4/7 to the Certificate No. TA19676M

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 -

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Attached sheet -5/7 to the Certificate No. TA19676M

3. Documentation and Test Reports:

VLT® Low Harmonic Drive for AAF006 Operating Instructions

TR424_PTP_THD_LHD120_P200_Series_6 Test Report

VLT® Laboratory test report

CTR-11-0205, REVISION RELEASED

P424, PTP, EMC results, AAF006A190T4 Test Report

CTR-11-0155, REVISION RELEASED

P424, PTP, EMC results, LHD330 series 006 Test Report

P424, PTP, EMC results, AAF006A190T4 Test Report

CTR-11-0125, REVISION B

P424, PTP, EMC results, LHD120 series 006 Test Report

CTR-11-0127, REVISION RELEASED

CTR-11-0145, REVISION DRAFT 2

P424, PTP, EMC results, LHD210 series 006 Test Report

CTR-11-0185, REVISION DRAFT 4

177R0339, 177R0340, 177R0349, 177R0350, 177R0351, 177R0352, 177R0354, 177R0374,

177R0375, 177R0490, 177R0491, 177R0492, 177R0493,

DATASYST PROJECT: D15-14976, D15-14845

Operating Instructions, 90kW-315kW D-frame VLT® Automation Drive 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

P424, vibration testing – Danfoss Specs, Document ID: 00706801, 00596396, 00596396, 00702667

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

Product overview complete Maine approval Note (Document ID: 00714813, Rev. A,32)

Operating Guide, 355-800 kW, Enclosure Size E, VLT® HVAC Drive FC102 (MG160202)

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)

- To be continued -

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Attached sheet -6/7 to the Certificate No. TA19676M

**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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Attached sheet -7/7 to the Certificate No. TA19676M

Test items & approval conditions:

1. Test items:

(Applied testing items are marked with X.)

ENVIRONMENTAL TESTS		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°C × 1.5 h & 50°C × 1.5 h & 55°C × 16 h)		X
Damp heat test		X
Vibration test (Acceleration ±0.7g)		X
Inclination test		--
Cold test (Temperature 5°C × 2 hours)		X
Salt mist test		--
Electrostatic discharge immunity test		X
Radiated radio frequency immunity test (80MHz - 2.7GHz) Note (1)		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		--

Note (1) The frequency range is in accordance with IEC 61800-3.

2. Approval condition:

The product is not allowed to be installed in the bridge and on open deck.

- The End -