NIPPON KAIJI KYOKAI

COPY

TYPE APPROVAL CERTIFICATE FOR AUTOMATIC DEVICES AND EQUIPMENT

Certificate No. TA25199M

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

Applicant:	**Danfoss Drives Oy**
Manufacturer 1:	**Danfoss Drives Oy**
Place of Manufacturing 1:	**Runsorintie 7 Vaasa 65380, FINLAND**
Manufacturer 2:	**Danfoss (China) Drives Co., Ltd.**
Place of Manufacturing 2:	**Block 6-7, No. 339 North Xinqiao Road, Wuyuan Street, Haiyan Country, JiaXing City, Zhejiang Province, China**
Product description:	**Frequency Converter**
Model:	**Vacon NX series**
Approval No.:	**20A014**
Valid until:	**6 April 2030**

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

Issued at Tokyo on 9 May 2025.

S. Oishi
General Manager
Machinery Department

Note: The manufacturer, if desired, is requested to apply to the Society for renewal prior to the expiration date.

General Specification:

Supply voltage range	208 - 690 V
Frequency	50/60 Hz
Voltage variation	Permanent ± 10 %, Transient± 20 %
Frequency variation	Permanent ± 5 %, Transient± 10 %
Output frequency	0 - 320 Hz
Number of phases	3
Temperature range in operation	Air cooled : 0 - 40 °C (40 - 50 °C when derated 1.5% / °C , 50 - 55 °C when derated 2.5% / °C) Liquid cooled : 0 - 50 °C (CH6x series 50 - 55 °C when derated 2.5% / °C)
Protection class	IP00, IP21, IP54

Product Description:

Air and liquid cooled.

CHxx = liquid cooled, FRxx = air cooled, FIxx = Inverter module, Air cooled.

Type designation	Frame size	Mains supply (V)	Motor shaft power (kW) [1) 2)]
NXP0004	FR4	208 - 240	0.55 / -
NXP0007	FR4	208 - 240	0.75 / -
NXP0008	FR4	208 - 240	1.1 / -
NXP0011	FR4	208 - 240	1.5 / -
NXP0012	FR4	208 - 240	2.2 / -
NXP0017	FR5	208 - 240	3 / -
NXP0025	FR5	208 - 240	4 / -
NXP0031	FR5	208 - 240	5.5 / -
NXP0048	FR6	208 - 240	7.5 / -
NXP0061	FR6	208 - 240	11 / -
NXP0075	FR7	208 - 240	15 / -
NXP0088	FR7	208 - 240	18.5 / -
NXP0114	FR7	208 - 240	22 / -
NXP0140	FR8	208 - 240	30 / -
NXP0170	FR8	208 - 240	37 / -
NXP0205	FR8	208 - 240	45 / -
NXP0261	FR9	208 - 240	55 / -
NXP0300	FR9	208 - 240	75 / -
NXP0003	FR4	380 - 500	1.1 / -
NXP0004	FR4	380 - 500	1.5 / -
NXP0005	FR4	380 - 500	2.2 / -
NXP0007	FR4	380 - 500	3 / -
NXP0009	FR4	380 - 500	4 / -
NXP0012	FR4	380 - 500	5.5 / -
NXP0016	FR5 / CH3	380 - 500	7.5 / 11
NXP0022	FR5 / CH3	380 - 500	11 / 15
NXP0031	FR5 / CH3	380 - 500	15 / 18,5
NXP0038	FR6 / CH3	380 - 500	18.5 / 22
NXP0045	FR6 / CH3	380 - 500	22 / 30
NXP0061	FR6 / CH3	380 - 500	30 / 37

- To be continued –

Type designation	Frame size	Mains supply (V)	Motor shaft power (kW) [1) 2)]
NXP0072	FR7 / CH4	380 - 500	37 / 45
NXP0087	FR7 / CH4	380 - 500	45 / 55
NXP0105	FR7 / CH4	380 - 500	55 / 75
NXP0140	FR8 / CH4	380 - 500	75 / 90
NXP0168	FR8 / FI9 / CH5	380 - 500	90 / 110
NXP0205	FR8 / FI9 / CH5	380 - 500	110 / 132
NXP0261	FR9 / FI9 / CH5	380 - 500	132 / 160
NXP0300	FR9 / FI9 / CH61	380 - 500	160 / 200
NXP0385	FR10 / FI10 / CH61	380 - 500	200 / 250
NXP0460	FR10 / FI10 / CH62/72	380 - 500	250 / 315
NXP0520	FR10 / FI10 / CH62/72	380 - 500	250 / 355
NXP0385	FR10 / FI12 / CH62/72	380 - 500	200 / 250
NXP0460	FR10 / FI12 / CH62/72	380 - 500	250 / 315
NXP0520	FR10 / FI12 / CH62/72	380 - 500	250 / 355
NXP0590	FR11 / FI12 / CH62/72	380 - 500	315 / 400
NXP0650	FR11 / FI12 / CH62/72	380 - 500	355 / 450
NXP0730	FR11 / FI12 / CH62/72	380 - 500	400 / 500
NXP0820	FR12 / FI12 / CH63	380 - 500	450 / 560
NXP0920	FR12 / FI12 / CH63	380 - 500	500 / 600
NXP1030	FR12 / FI12 / CH63	380 - 500	560 / 700
NXP1150	FR13 / FI13 / CH63	380 - 500	630 / 750
NXP1300	FR13 / FI13	380 - 500	710 / -
NXP1370	CH64/74	380 - 500	- / 900
NXP1450	FR13	380 - 500	800 / -
NXP1640	CH64/74	380 - 500	- / 1100
NXP1770	FR14 / FI14	380 - 500	900 / -
NXP2060	CH64/74	380 - 500	- / 1400
NXP2150	FR14 / FI14	380 - 500	1100 / -
NXP2300	CH64/74	380 - 500	- / 1500
NXP2470	2xCH64/74	380 - 500	- / 1600
NXP2700	FR14 / FI14	380 - 500	1400 / -
NXP2950	2xCH64/74	380 - 500	- / 1950
NXP3710	2xCH64/74	380 - 500	- / 2450
NXP4140	2xCH64/74	380 - 500	- / 2700
NXP0004	FR6	525 - 690	3 / -
NXP0005	FR6	525 - 690	4 / -
NXP0007	FR6	525 - 690	5.5 / -
NXP0010	FR6	525 - 690	7.5 / -
NXP0013	FR6	525 - 690	10 / -
NXP0018	FR6	525 - 690	15 / -
NXP0022	FR6	525 - 690	18.5 / -
NXP0027	FR6	525 - 690	22 / -
NXP0034	FR6	525 - 690	30 / -
NXP0041	FR7	525 - 690	37.5 / -
NXP0052	FR7	525 - 690	45 / -
NXP0062	FR8	525 - 690	55 / -
NXP0080	FR8	525 - 690	75 / -
NXP0100	FR8	525 - 690	90 / -
NXP0125	FR9 / FI9	525 - 690	110 / -
NXP0144	FR9 / FI9	525 - 690	132 / -
NXP0170	FR9 / FI9 / CH61	525 - 690	160
NXP0208	FR9 / FI9 / CH61	525 - 690	200
NXP0261	FR10 / FI10 / CH61	525 - 690	250

- To be continued –

Type designation	Frame size	Mains supply (V)	Motor shaft power (kW) [1) 2)]
NXP0325	FR10 / FI10 / CH62/72	525 - 690	315
NXP0385	FR10 / FI10 / CH62/72	525 - 690	355
NXP0416	FR10 / FI10 / CH62/72	525 - 690	450
NXP0460	FR10 / FI12 / CH62/72	525 - 690	450
NXP0502	FR10 / FI12 / CH62/72	525 - 690	500
NXP0590	FR11 / FI12 / CH63	525 - 690	560
NXP0650	FR11 / FI12 / CH63	525 - 690	630
NXP0750	FR11 / FI12 / CH63	525 - 690	710
NXP0815	CH63	525 - 690	750
NXP0820	FR12 / FI12 / CH74/74	525 - 690	800
NXP0920	FR13 / FI13 / CH64/74	525 - 690	900
NXP1030	FR13 / FI13 / CH64/74	525 - 690	1000
NXP1180	FR13 / FI13 / CH64/74	525 - 690	1150
NXP1300	CH64/74	525 - 690	1150
NXP1500	FR14 / FI14 / CH64/74	525 - 690	1500
NXP1700	CH64/74	525 - 690	- /1550
NXP1850	2x CH64/74	525 - 690	- /1650
NXP1900	FR14 / FI14	525 - 690	1800/ -
NXP2120	2x CH64/74	525 - 690	- /1900
NXP2250	FR14 / FI14	525 - 690	2000/ -
NXP2340	2x CH64/74	525 - 690	- /2100
NXP2700	2x CH64/74	525 - 690	- /2450
NXP3100	2x CH64/74	525 - 690	- /3100
2 x NXP2470	4 x CH64/74	400 - 500	3050
2 x NXP2950	4 x CH64/74	400 - 500	3600
2 x NXP3710	4 x CH64/74	400 - 500	4500
2 x NXP4140	4 x CH64/74	400 - 500	5150
2 x NXP1850	4 x CH74	525 - 690	3150
2 x NXP2120	4 x CH74	525 - 690	3600
2 x NXP2340	4 x CH74	525 - 690	3950
2 x NXP2700	4 x CH74	525 - 690	4600
2 x NXP3100	4 x CH74	525 - 690	5300
NXN2000	CH60	400 - 690	2200
NXS0004	FR4	208 - 240	0.55
NXS0007	FR4	208 - 240	0.75
NXS0008	FR4	208 - 240	1.1
NXS0011	FR4	208 - 240	1.5
NXS0012	FR4	208 - 240	2.2
NXS0017	FR5	208 - 240	3
NXS0025	FR5	208 - 240	4
NXS0031	FR5	208 - 240	5.5
NXS0048	FR6	208 - 240	7.5
NXS0061	FR6	208 - 240	11
NXS0075	FR7	208 - 240	15
NXS0088	FR7	208 - 240	18.5
NXS0114	FR7	208 - 240	22
NXS0140	FR8	208 - 240	30
NXS0170	FR8	208 - 240	37
NXS0205	FR8	208 - 240	45
NXS0261	FR9	208 - 240	55
NXS0300	FR9	208 - 240	75

- To be continued –

Type designation	Frame size	Mains supply (V)	Motor shaft power (kW) [1) 2)]
NXS0003	FR4	380 - 500	1.1
NXS0004	FR4	380 - 500	1.5
NXS0005	FR4	380 - 500	2.2
NXS0007	FR4	380 - 500	3
NXS0009	FR4	380 - 500	4
NXS0012	FR4	380 - 500	5.5
NXS0016	FR5	380 - 500	7.5
NXS0022	FR5	380 - 500	11
NXS0031	FR5	380 - 500	15
NXS0038	FR6	380 - 500	18.5
NXS0045	FR6	380 - 500	22
NXS0061	FR6	380 - 500	30
NXS0072	FR7	380 - 500	37
NXS0087	FR7	380 - 500	45
NXS0105	FR7	380 - 500	55
NXS0140	FR8	380 - 500	75
NXS0168	FR8	380 - 500	90
NXS0205	FR8	380 - 500	110
NXS0261	FR9	380 - 500	132
NXS0300	FR9	380 - 500	160
NXS0385	FR10	380 - 500	200
NXS0460	FR10	380 - 500	250
NXS0520	FR10	380 - 500	250
NXS0590	FR11	380 - 500	315
NXS0650	FR11	380 - 500	355
NXS0730	FR11	380 - 500	400
NXS0004	FR6	525 - 690	3
NXS0005	FR6	525 - 690	4
NXS0007	FR6	525 - 690	5.5
NXS0010	FR6	525 - 690	7.5
NXS0013	FR6	525 - 690	11
NXS0018	FR6	525 - 690	15
NXS0022	FR6	525 - 690	18.5
NXS0027	FR6	525 - 690	22
NXS0034	FR6	525 - 690	30
NXS0041	FR7	525 - 690	37.5
NXS0052	FR7	525 - 690	45
NXS0062	FR8	525 - 690	55
NXS0080	FR8	525 - 690	75
NXS0100	FR8	525 - 690	90
NXS0125	FR9	525 - 690	110
NXS0144	FR9	525 - 690	132
NXS0170	FR9	525 - 690	160
NXS0208	FR9	525 - 690	200
NXS0261	FR10	525 - 690	250
NXS0325	FR10	525 - 690	315
NXS0385	FR10	525 - 690	355
NXS0416	FR10	525 - 690	400
NXS0460	FR11	525 - 690	450
NXS0502	FR11	525 - 690	500
NXS0590	FR11	525 - 690	560

- To be continued –

1) Values applicable for 40 °C, 10 % overload and highest voltage in each voltage class. To be modified for ships application at 45 °C. See "General Specification".

2) Values applicable for 50 °C, 0 % overload and highest voltage in each voltage class.

3) Module is rectifier unit and does not run motor but feed DC power to the inverters. In addition NXP can be substituted by NXI, NXA, NXB, or NXN. NXI, NXA and NXB -units are exactly based on DC-fed Vacon NXP control and power electronics component platforms, excluding for rectifier units and charging circuitry, which are not used in these products. Variation is made by application selection. NXN is a building block of FR13-14 or independent rectifier unit.

NXS FR10-FR12, NXP FR10-FR14 and all CH units will include the following external chokes.

CHK0261	CHK0400	CHK0520	CHK0650	CHK0750	CHK0820	CHK1030	CHK1150

NXA units can also be accompanied with following L/LCL filters and NXF units with following L filters.

LCL 0261 5	LCL 0460 5	LCL 1300 5	LCL 0170 6	LCL 0325 6	LCL 1030 6
L 0300 5	L 0520 5	L 1450 5	L 0208 6	L 0416 6	L 1180 6

-NX_ Liquid cooled (CHxx) units can be accompanied with hoses attached to the modules.
-NX Liquid cooled (CHxx) units can be accompanied with following options:
Heat Exchangers, Air-cooled Regenerative LCL filters IP00 (Naturally convected) and Liquid-cooled Regenerative LCL filters IP00
-All drives can be accompanied with external components as follows:
Brake resistors, AC-chokes, SIN-, DUT-, RFI-, L-, LCL-filters and heat exchangers.

- To be continued -

Documentations:

-Product brochure :

DKDDPB905A102_NXP_NXC,
DKDDPB909A202_NXP_Liquid_Cooled_LR,
DKDDPB911A102_VACON_NXP_Common_DC_Bus_LR,
DKDDPB913A102_VACON_NXS_LR,
Vacon-NXP-Vacon-NXC-Brochure-BC00167H-EN

-User Manuals :

Liquid-cooled-NFE-User-Manual-DPD01795D-UK,
Vacon-NX-Inverters-FI4-8-User-Manual-DPD00908A-EN,
Vacon-NX-Inverters-FI9-14-User-Manual-DPD00909A-EN,
Vacon-NXP-IP00-Modules-Installation-Manual-DPD0088,
Vacon-NXP-Liquid-Cooled-Drives-User-Manual-DPD0088,
Vacon-NXP-Marine-APFIFF09-Application-Manual-DPD01667A_V010,
Vacon-NXS-NXP-User-Manual-DPD01241A-US

-Product Statements :

STC_EMC NX,
Vacon NX FR4-6 STR,
Vacon NX FR7-9 STR,
Vacon NX FR10-12 STR,
Vacon NX FR13-14_FI9-14 STR,
Vacon NX LC CH3_CH4 STR,
Vacon NX LC CH5 STR,
Vacon NX LC CH6x STR,
Vacon NX LC CH7x STR,
Vacon NXI FR4-8 STR M1

-Quality Certificates :

VaconLtd_ IATF 16949.pdf,
VaconLtd_ ISO 9001_2015.pdf,
VaconLtd_ ISO 14001_2015.pdf,
VaconLtd_ OHSAS 18001_2007.pdf

-Software document

NX SW Process and Quality Plan v7

-Main circuit diagram:

Ch3 500V main circuit,
Ch4 500V main circuit,
Ch5 FC dimensions,
Ch5 main circuit,
CH60 LC NFE Main Circuit Diagram Rev B,
CH60 LC NFE Type Circuit diagram,
CH61 500 690V main circuit power modules INU,
CH61 FC dimensions,
CH61 inu dimensions,

- To be continued -

CH62 500 690V main circuit power modules INU,
CH62 inu dimensions, CH 63 500 690V main circuit module 2,
CH63 500 690V main circuit module 2 INU,
CH63 FC dimensions, CH63 inu dimensions,
CH64 500 690V main circuit power modules INU,
CH64 inu dimensions, Ch72 HC dimensions,
Ch72 main circuit power module, Ch74 FC dimensions,
Ch74 main circuit power modules,
FI9 500 690V control circuit inu, FI9 500 690V control circuit,
FI9 500 690V Main circuit inu, Fi10 500 690V main circuit control inu,
FI10 500 690V main circuit power module inu,
FI12 500 690V main circuit control inu, FI12 500 690V main circuit power modulesl inu,
FI4 230 500V main circuit inu, FI4 230 500V main circuit,
FR4 500V main circuit, FI5 230 500V main circuit inu,
FR5 230 500V main circuit, FI6 230 500V main circuit inu,
FR6 230 500V main circuit, FR6 690V main circuit,
FI7 500 690V main circuit inu, FR7 230V main circuit,
FR7 500 690V main circuit, FI8 500 690V Main circuit inu,
FR8 230V Main circuit, FR8 500 690V Main circuit,
FR8 500V Main circuit REG, FR9 230V Main circuit,
FR9 500V main circuit, FR10 500 690V main circuit control,
FR10 500 690V main circuit cooling brake,
FR10 500 690V main circuit power module,
FR10 INU 500 690V main circuit, FR11 500 690V main circuit control,
FR11 control circuit 500 690V, FR11 cooling circuit 500 690V,
FR11 main circuit 500 690V phase module,
FR11 main circuit 500 690V, FR12 500 690V main circuit control,
FR12 500 690V main circuit motor control,
FR13 500 690V main circuit 1, FR13 500 690V main circuit 2,
FR13 500 690V main circuit control, FR13 500 690V main circuit cooling,
FR13 500 690V main circuit power modules,
FR13 500 690V main circuit principe, FI14 500 690V main circuit control inu,
FI14 500 690V main circuit power modules inu,
FR14 500 690V main circuit control, FR14 500 690V main circuit power modules

- To be continued -

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Attached sheet -8/9 to the Certificate No. TA25199M

Test reports:

Test_Reports_for_Marine_Type_Approval_NX.xlsx

[SGS Fimko Oy]

228338-1, 231330-1, 234713-1

[VTT Expert Services Ltd]

VTT-S-00992-09

[Witness report by DNV-GL]

FIN-65380 Vaas

[Flame retardant for polymeric enclosure materials]

File Number : E248280

[Centria test report]

Version 1.0.0 dated 9-13.10.2006

[SGS Fimko Ltd]

295115-1-1, 300477-2-1, 290708-1-2, 300620-1

- To be continued -

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 55℃×16 h)		X
Damp heat test		X
Vibration test (Acceleration ±0.7g)		X
Inclination test		--
Cold test (Temperature 5℃×2 hours)		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:

- The product is not allowed to be installed in the bridge and on open deck.
- Vacon NX_ must be regarded as a component. The actual installation shall be designed according to Vacon Installation & Operating lnstructions.
- In case when FI9/ FR10 and above drives are delivered as IP00 modules, evidences to ensure the compliance with EMC requirement are required to be submitted for review prior to installation of these models on board.

- The End -