



CERTIFICATE NUMBER 14-LD451536-5-PDA
EFFECTIVE DATE 06-Sep-2018
EXPIRATION DATE 02-Jun-2019
ABS TECHNICAL OFFICE London

CERTIFICATE OF Product Design Assessment

This is to certify that a representative of this Bureau did, at the request of

VACON LTD

located at

P.O. BOX 25, RUNSORINTIE 7, VAASA, Finland, FIN-65381

assess design plans and data for the below listed product. This assessment is a representation by the Bureau as to the degree of compliance the design exhibits with applicable sections of the Rules. This assessment does not waive unit certification or classification procedures required by ABS Rules for products to be installed in ABS classed vessels or facilities. This certificate, by itself, does not reflect that the product is Type Approved. The scope and limitations of this assessment are detailed on the pages attached to this certificate.

Product Motor Controller, Variable Speed Drives

Model VACON NX Series

This Product Design Assessment (PDA) Certificate remains valid until 02-Jun-2019 or until the Rules and/or Standards used in the assessment are revised or until there is a design modification warranting design reassessment (whichever occurs first).

Acceptance of product is limited to the "Intended Service" details prescribed in the certificate and as per applicable Rules and Standards.

This Certificate is valid for installation of the listed product on ABS units which exist or are under contract for construction on or previous to the effective date of the ABS Rules and standards applied at the time of PDA issuance. Use of the Product for non-ABS units is subject to agreement between the manufacturer and intended client.

American Bureau of Shipping

Theodoros Chatzigiakaidas, Senior Engineer

NOTE: This certificate evidences compliance with one or more of the Rules, Guides, standards or other criteria of ABS or a statutory, industrial or manufacturer's standards. It is issued solely for the use of ABS, its committees, its clients or other authorized entities. Any significant changes to the aforementioned product without approval from ABS will result in this certificate becoming null and void. This certificate is governed by ABS Rules 1-1-A3/5.9 Terms and Conditions of the Request for Product Type Approval and Agreement (2010)

VACON LTD

P.O. BOX 25

RUNSORINTIE 7

VAASA

Finland FIN-65381

Telephone: +358 201 21 21

Fax: +358 201 212 207

Email: drives@danfoss.com

Web: www.drives.danfoss.com

Tier: 4 - Enrolled in PQA Program TC**Product:** Motor Controller, Variable Speed Drives**Model:** VACON NX_Series**Intended Service:**

Motor Controller for use in propulsion, thrusters, pumps, cranes etc. for ships and offshore installations.

Description:

Following drive models and their configurations are listed in the attached sheets.

NXL Compact Drives: MF2 to MF6, 208V to 500V, Continuous load current rating from 1.3Aac to 61Aac. Enclosure IP20, IP21 and IP54.

NXS Standard Drives: FR4 to FR14, 208V to 690V, Continuous load current rating from 2.2Aac to 730Aac, Enclosure IP21 and IP54.

NXP High Performance Drives: FR4 to FR14, 208V to 690V, Continuous load current rating from I low 3.7Aac / I high 2.4Aac to I low 2365Aac / I high 1940Aac, Enclosure IP00, IP21 and IP54, Up to max of 8987A is possible by paralleling 4 modules (4x2365x0,95).

NXI common DC drives: FR4, FR6 to FR8 and FI9 to FI14, 465Vdc - 1100Vdc, Continuous load current rating from I low 4.1Aac / I high 2.4Aac to I low 2700Aac / I high 2300Aac, Up to max of 10260A is possible by paralleling 4 modules (4x2700x0,95). Enclosure IP00, with NXA, NXB & NXF software applications

NXN non-regenerative front-end, FI9, Continuous load current rating I low 650Aac / I high 507Aac, Enclosure IP00 (External AC Choke to be used in all IP00 Frequency drives and rectifiers)

DC Bus Tie Breaker Functionality

VACON DC Guard: DCGuard consist of a VACON® NXP inverter and application software ADFIF102.

Following drive models and their configuration are also possible as per the attached sheets.

NXL Drives: MF2 to MF6

NXS Drives: FR4 to FR14

NXP Drives: FR4 to FR14 NXI Drives: FR4, FR6 to FR8 and FI9 to FI14, with NXA, NXB & NXF software applications

NXN Drives: FI9.

Rating:

IP00, IP20, IP21 & IP54, 208V to 690V AC.

Enclosures IP00, IP20, IP21 and IP54, voltage and current ratings as per the manufacturer's manuals.

Enclosures IP00, IP20, IP21 and IP54, voltage ratings from 208 VAC to 690 VAC and 465 VDC to 1100 VDC, current ratings from 1.3 A to 2700 A and with paralleling up to max 10260 A (4x2700x0.95) as per the manufacturer's manuals.

Service Restriction:

Unit Certification is required as detailed in 4-8-3/8.7 of the ABS Steel Vessels Rules (2014).

Comments:

1) Tests and approval are for the basic components. Each configuration and external connection is to be specifically approved for propulsion and DP applications.

2) When incorporated in a system of Category I, II or III in accordance with 4-9-3/7.1 and 4-9-3/Table 1 of the ABS Steel Vessels Rules 2014 the documentation detailed in 4-9-3/Table 2 is to be submitted to ABS or to be available for review by ABS as applicable.

3) We note that FI9, frame 10 and above drives are delivered as IP00 modules and they do not comply with EMC requirement as per 4-9-7/Table 9 of the ABS Steel Vessels Rules. Planned EMC measures are required to be submitted for review prior to installation of these models on board.

VACON LTD

P.O. BOX 25

RUNSORINTIE 7

VAASA

Finland FIN-65381

Telephone: +358 201 21 21

Fax: +358 201 212 207

Email: drives@danfoss.com

Web: www.drives.danfoss.com

Tier: 4 - Enrolled in PQA Program TC

4) The Manufacturer has provided a declaration about the control of, or the lack of Asbestos in this product.

Notes/Drawing/Documentation:

Drawing No. DCGuard - Application presentation - HW_Marine approval, DCGuard - Application presentation - HW_Marine approval, Revision: -, Pages: 1
Drawing No. ISO9001-2008-2017, ISO9001-2008-2017, Revision: -, Pages: 1
Drawing No. ISO9001-2008_CnEn_201606, ISO9001-2008_CnEn_201606, Revision: -, Pages: 1
Drawing No. TAE00002G2, DNVGL TA Cert, Revision: 1F, Pages: 1
Drawing No. VACON abs certificate of design assessment -china-, VACON abs certificate of design assessment -china-, Revision: -, Pages: 1
Drawing No. VACON abs certificate of design assessment -finland-, VACON abs certificate of design assessment -finland-, Revision: -, Pages: 1
Drawing No. VACON abs type approval in finland 7_1_2015, VACON abs type approval in finland 7_1_2015, Revision: -, Pages: 1
Drawing No. VACON confirmation of product type approva china 18_8_20, VACON confirmation of product type approva china 18_8_20, Revision: -, Pages: 1
Drawing No. VACON DCGuard-Application software and interface test plan-Rev0_0, VACON DCGuard-Application software and interface test plan-Rev0_0, Revision: -, Pages: 1
Drawing No. VACON DCGuard-DNV-GL Type Approval Tests-00738584, VACON DCGuard-DNV-GL Type Approval Tests-00738584, Revision: -, Pages: 1
Drawing No. VACON DCGuard-Functional description-00738711, VACON DCGuard-Functional description-00738711, Revision: -, Pages: 1
Drawing No. VACON DCGuard-Technical data-00738653, VACON DCGuard-Technical data-00738653, Revision: -, Pages: 1
Drawing No. VACON DCGuard-Test plan, VACON DCGuard-Test plan, Revision: -, Pages: 1
Drawing No. Vacon-NXP-DCGuard-ADFIF102-Manual-DPD01971A-V004, Vacon-NXP-DCGuard-ADFIF102-Manual-DPD01971A-V004, Revision: -, Pages: 1
Drawing No. VaconLtd_Finland_ISO9001_2008, VaconLtd_Finland_ISO9001_2008, Revision: -, Pages: 1

Terms of Validity:

This Product Design Assessment (PDA) Certificate 14-LD451536-5-PDA, dated 06/Sep/2018 remains valid until 02/Jun/2019 or until the Rules or specifications used in the assessment are revised (whichever occurs first).

This PDA is intended for a product to be installed on an ABS classed vessel, MODU or facility which is in existence or under contract for construction on the date of the ABS Rules or specifications used to evaluate the Product.

Use of the Product on an ABS classed vessel, MODU or facility which is contracted after the validity date of the ABS Rules and specifications used to evaluate the Product, will require re-evaluation of the PDA.

Use of the Product for non ABS classed vessels, MODUs or facilities is to be to an agreement between the manufacturer and intended client.

STANDARDS**ABS Rules:**

The Rules applicable to this assessment are:

- Steel Vessel Rules (2014) 1-1-4/7.7, 1-1-A 3; 4-8-3/5.7; 4-8-3/8.3; 4-8-3/8.5, 4-8-3/8.7 4-9-8/Table 1.
- Steel Vessels Under 90 Meters (295 Feet) in Length (2014) 1-1-4/7.7, 1-1-A 3 and 4; 4-6-3/3.13
- Facilities on Offshore Installations (2014) 1-1-4/9.7, 1-1-A 2 and 3

VACON LTD

P.O. BOX 25

RUNSORINTIE 7

VAASA

Finland FIN-65381

Telephone: +358 201 21 21

Fax: +358 201 212 207

Email: drives@danfoss.com

Web: www.drives.danfoss.com

Tier: 4 - Enrolled in PQA Program

- Offshore Support Vessels (2014) 1-1-4/7.7, 1-1-A 3 and 4; 4-8-3/5.7; 4-8-3/8.3; 4-8-3/8.5; 4-9-8/Table 1.
- Mobile Offshore Drilling Units Rules (2014) 1-1-4/9.7, 1-1-A 2 and 3; ; 6-1-7/12.3 & 5; 6-1-7/9.15.
- Steel Vessels for Service on Rivers and Intracoastal Waterways (2014) 1-1-4/7.7, 1-1-A 3 and 4; 4-5-3/3.13
- High Speed Craft (2014): 1-1-4/11.9, 1-1-A 2 and 3; 4-6-3/3.13

National:

NA

International:

EN 50178, EN 60068-2-6, EN 60204-1, EN61800, IEC60092, IEC61000, IEC60068, IEC60947, IEC60529, IEC60533.

Government:

NA

EUMED:

NA

OTHERS:

IACS UR E22

