



CERTIFICATE NUMBER 19-LD1851904-PDA

EFFECTIVE DATE 15-May-2019

EXPIRATION DATE 14-May-2024

ABS TECHNICAL OFFICE London Engineering Dpt

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 Frequency Converter

Model VACON 100 and 100X AC Drives

This Product Design Assessment (PDA) Certificate remains valid until 14-May-2024 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 Chatzigiakidas, 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)

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Web: www.drives.danfoss.com

Tier: 4 - Enrolled in PQA Program *TC*

Product: Frequency Converter
Model: VACON 100 and 100X AC Drives
Intended Service:

For use on ABS Classed Vessels and Offshore Facilities in accordance with the listed ABS Rules and International Standards.

Description:

VACON100 and 100X AC Drive are the drives for controlling various type of motors.

Rating:

VACON 100

Frame sizes MR4 to MR12

POWER: 0.37 kW to 800 kW

Supply Voltage: 3~AC,208-690V, 47-65 Hz.

Output Frequency: 0-320Hz (standard)

Continuous Current (Low overload): 3.4 to 1180 Amps

Input current ((Low overload): 3.2 to 1164 Amps

Continuous Current (high overload): 2.6 to 920 Amps

Input current (high overload): 2.4 to 908 Amps

Ambient temperature: IL : -10°C (-14°F) (no frost)... +40°C (104°F) and IH: -10C (-14°F)(no frost)... +50°C (122°F)

Degree of protection: IP54.

Option : IP21 drives for controlled environment, IP00 for frames MR8, MR9A/B, MR10, MR11 and MR12 are optional variant for system integrators which would like to use their own cabinet type.

Vacon 100 is ATEX certified. EC-Type Certificate Ref : VTT 06 ATEX 048X Issue 2, Marking : EX II (2) GD

VACON 100X

Frame sizes MM4 to MM6

POWER: 1.1 kW to 37 kW

Supply Voltage: 3~AC,208 to 240V (50/60Hz) or 380 to 480(500)V (47.5 - 66Hz).

Output Frequency: 0-320Hz (standard)

rated Continuous Current: 3.4 to 72 Amps.

Input current: 3.4 to 67.5 Amps.

Ambient temperature -10 c to +50 C degrees (the output current must be derated to 75% of In).

Degree of protection: IP66.

Service Restriction:

- Unit Certification is required for semiconductor converters used to control motor drives having a rated power of 100 kW(135 hp) or over that are intended for essential services as 4-8-3/1.5 of Marine Vessel Rules (2019). Detailed requirements for unit certification are in 4-8-3/8.7 of the ABS Rules for Building and Classing Marine Vessels 2016.
- Environmental tests and approval are for hardware only.
- 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 Marine Vessels Rules (2019) 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.
- If the manufacturer or purchaser request an ABS Certificate for compliance with a specification or standard, the specification or standard, including inspection standards and tolerances, must be clearly defined.

Comments:

- The Manufacturer has provided a declaration about the control of, or the lack of Asbestos in this product.
- Arrangements and details are required to be submitted and reviewed by ABS for compliance with all other applicable Rule requirements prior to each such installation on board an ABS classed vessel.
- Where used in machinery space (i.e. engine room, boiler room) the units are to have an ambient rating of 45°C.
- The units are to have the appropriate enclosure IP rating as per 4-8-3/Table 2 based on their installed location.

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- Details related to overload protection, running protection and motor starter disconnects are to be submitted for each installation.
- Each installation of the specific VACON100 & 100X AC Drive on board an ABS classed vessel is to be provided with main cables and fuses which sizes are as recommended by VACON (referenced in vacon 100 ac drives installation manual enclosed drives, Doc ID. DPD01666B).
- We note that MR8, MR9A/B, MR10, MR11 and MR12 are delivered as IP00 modules and they do not comply with EMC requirement as per 4-9-9/Table 1 of the Rules for Building and Classing Marine Vessels. Planned EMC measures are required to be submitted for review prior to installation of these models on board.
- Only Vacon 100 is ATEX certified. Vacon 100X is not ATEX certified as it is motor mountable.
- ATEX certified equipment is not to be installed in hazardous areas on U.S. Flagged Vessels, unless it can be proven to have been tested to the IEC 60079 series standards by an independent laboratory accepted by the U.S. Coast Guard. USCG MI Notice 01-12 (February 7, 2012).

Notes/Drawing/Documentation:

- Drawing No. 294638-1ab Attachment 1 photos, 294638-1ab Attachment 1 photos, Revision: -, Pages: 1
- Drawing No. 294638-1ab Attachment 2 technical documentation, 294638-1ab Attachment 2 technical documentation, Revision: -, Pages: 1
- Drawing No. FIMKO CB FI-40463 signed final, FIMKO CB FI-40463 signed final, Revision: -, Pages: 1
- Drawing No. FIMKO CB FI-40464 signed final r, FIMKO CB FI-40464 signed final r, Revision: -, Pages: 1
- Drawing No. Test Report 293589-1, Test Report 293589-1, Date: 03-Oct-2018, SGS, Revision: -, Pages: 1
- Drawing No. Test Report 293589-2, Test Report 293589-2, Date: 03-Oct-2018, SGS, Revision: -, Pages: 1
- Drawing No. Test Report 294638-1a, Test Report 294638-1a, Date: 13-Mar-2019, SGS Fimko Ltd, Revision: -, Pages: 1
- Drawing No. Test Report 294638-1b, Test Report 294638-1b, Date: 13-Mar-2019, SGS Fimko Ltd, Revision: -, Pages: 1
- Drawing No. VTT-S-00567-18, VTT-S-00567-18, Date: 06-Feb-2018, VTT Expert Services Ltd, Revision: -, Pages: 1
- Drawing No. VTT-S-01711-18, VTT-S-01711-18, Date: 10-Apr-2018, VTT Expert Services Ltd, Revision: -, Pages: 1

Terms of Validity:

This Product Design Assessment (PDA) Certificate 19-LD1851904-PDA, dated 15/May/2019 remains valid until 14/May/2024 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:

- Marine Vessels Rules (2019) 1-1-4/7.7, 1-1-A3, 1-1-A4, 4-8-3/5.7, 4-8-3/8.3, 4-8-3/8.5, 4-8-3/8.7, 4-9-3/5
- Steel Vessels for Service on Rivers and Intra-coastal Waterways (2019): 1-1-4/7.7, 1-1-A3, 1-1-A4
- Steel Barge Rules (2019): 1-1-4/7.9, 1-1-A3, 1-1-A4
- High Speed Crafts (2019): 1-1-4/11.9, 1-1-A2, 1-1-A3, 4-6-4/7.17, 4-6-4/10.3, 4-6-4/10.5, 4-6-4/10.7
- Mobile Offshore Units (2019): 1-1-4/9.7, 1-1-A2, 1-1-A3, 4-1-1/7.9, 4-3-1/11, 6-1-1/9, 6-1-1/13, 6-1-7/9.15, 6-1-

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7/12.3, 6-1-7/12.5, 6-1-7/12.7

- Facilities on Offshore Installations (2019): 1-1-4/9.7, 1-1-A2, 1-1-A3, 3-6/11.7

National:

NA

International:

IEC 61800-5-1 Ed 2.0: 2007 + AMD1:2016

IEC 61800-3 Ed 3.0: 2017

EN 61800-5-2:2017

EN 61800-5-1:2007+AMD1:2016

EN 61800-3: 2004+A1:2017

EN 62061:2005 +A2: 2015

EN 60204-1:2006+A1:2009+AC: 2010

ISO 13849-1:2008+AC: 2015

Government:

NA

EUMED:

NA

OTHERS:

NA

TC