



Confirmation of Product Type Approval

Company Name: DANFOSS DRIVES OY

Address: RUNSORINTIE 7 VAASA FI 65380 Finland

Product: Frequency Converter

Model(s): VACON 100 and 100X AC Drives

Endorsements:

Certificate Type	Certificate Number	Issue Date	Expiry Date
Product Design Assessment (PDA)	24-00T2545449-PDA	17-MAY-2024	16-MAY-2029
Manufacturing Assessment (MA)	19-TU3753184	08-NOV-2019	13-DEC-2024
Product Quality Assurance (PQA)	19-3753184-PQA	08-NOV-2019	13-DEC-2024

Tier

4 - Enrolled in PQA Program

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.

Ratings

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 Restrictions

- 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 (2024). Detailed requirements for unit certification are in 4-8-3/8.1 of the ABS Rules for Building and Classing Marine Vessels 2024.

- 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 of the ABS Marine Vessels Rules (2024) the documentation detailed in 4-9-3/15 Table 3, Table 4 & Table 5 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.

- Evidence of EM Immunity and EM Testing must be submitted to ABS for review if requested by the customer

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.

- 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.
- This PDA does not cover the ATEX certifications, as such the applicable ATEX certification is to be submitted for each review, in accordance with the applicable ruleset.
- 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.

Notes, Drawings and Documentation

Drawing No. No changes declaration, Manufacturer declaration ABS V100&V100X no changes_Signed, Revision: -, Pages: 1

Drawing No. AQ298036140958, Vacon100 Operating Guide, Revision: 001, Pages: 148

Drawing No. VACON100 Marine Test (version 1), VACON100 Marine Test, Revision: -, Pages: -

Drawing No. Type Tests, VACON 100 Type Tests, Revision: -, Pages: 281

Drawings from past PDA Projects:

Drawing No. FI 8747, CB TEST CERTIFICATE, Revision: -, Pages: 2

Drawing No. FI 7021, CB TEST CERTIFICATE, Revision: -, Pages: 2

Drawing No. FI 8652 M1, CB TEST CERTIFICATE, Revision: -, Pages: 2

Drawing No. 028-713010338-000, TECHNICAL REPORT, Revision: -, Pages: 5

Drawing No. FI 7019, CB TEST CERTIFICATE, Revision: -, Pages: 2

Drawing No. FI 8744, CB TEST CERTIFICATE, Revision: -, Pages: 2

Drawing No. FI 7108, CB TEST CERTIFICATE, Revision: -, Pages: 2

Drawing No. FI 8646, CB TEST CERTIFICATE, Revision: -, Pages: 2

Drawing No. FI 7020, CB TEST CERTIFICATE, Revision: -, Pages: 2

Drawing No. FI 8745, CB TEST CERTIFICATE, Revision: -, Pages: 2

Drawing No. 028-71395934-000, TECHNICAL REPORT, Revision: -, Pages: 4

Drawing No. 028-71397706-000, TECHNICAL REPORT, Revision: -, Pages: 5

Drawing No. FI 8746, CB TEST CERTIFICATE, Revision: -, Pages: 2

Drawing No. 01/205/5216/12, TYPE EXAMINATION CERTIFICATE, Revision: -, Pages: 1

Drawing No. FI 6983, CB TEST CERTIFICATE, Revision: -, Pages: 2

Drawing No. FI 8748, CB TEST CERTIFICATE, Revision: -, Pages: 2

Drawing No. FI 8653 M1, CB TEST CERTIFICATE, Revision: -, Pages: 2

Drawing No. 265797-1 TR MR4, 265797-1 TR MR4, Revision: -, Pages: 38

Drawing No. Test Report 278414-5, Test Report 278414-5, Revision: -, Pages: 56

Drawing No. Test Report 278414-4, Test Report 278414-4, Revision: -, Pages: 54

Drawing No. FI 404063, CB TEST CERTIFICATE, Revision: -, Pages: 2

Drawing No. FI 404064, CB TEST CERTIFICATE, Revision: -, Pages: 3

Drawing No. Test Report 294638-1b, Test Report 294638-1b, Revision: -, Pages: 46

Drawing No. Test Report 294638-1a, Test Report 294638-1a, Revision: -, Pages: 65

Drawing No. Test Report 278414-1, Test Report 278414-1, Revision: -, Pages: 41

Drawing No. Test Report 278414-2, Test Report 278414-2, Revision: -, Pages: 43

Drawing No. Test Report 278414-3, Test Report 278414-3, Revision: -, Pages: 51

Drawing No. Test Report 276122-3 Amendment 1, Test Report 276122-3 Amendment 1, Revision: -, Pages: 29

Drawing No. Test Report 276122-4 Amendment 1, Test Report 276122-4 Amendment 1, Revision: -, Pages: 30

Drawing No. MR8ED 690 V, STATEMENT OF TEST RESULTS, Revision: -, Pages: 1

Drawing No. MR9ED 690 V, STATEMENT OF TEST RESULTS, Revision: -, Pages: 1

Drawing No. MR10ED 500 V, STATEMENT OF TEST RESULTS, Revision: -, Pages: 1

Drawing No. MR10ED 690 V, STATEMENT OF TEST RESULTS, Revision: -, Pages: 1

Drawing No. MR12ED 500 V, STATEMENT OF TEST RESULTS, Revision: -, Pages: 1

Drawing No. MR12ED 690 V, STATEMENT OF TEST RESULTS, Revision: -, Pages: 1

Term of Validity

This Product Design Assessment (PDA) Certificate remains valid until 16/May/2029 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.

ABS Rules

- ABS RULES FOR BUILDING AND CLASSING MARINE VESSELS (2024) 1A-1-4/7.7, 1A-1-A3, 1A-1-A4, 4-8-3/8.1, 4-8-3/8.3, 4-8-3/8.5

- ABS RULES FOR BUILDING AND CLASSING LIGHT AND HIGH-SPEED CRAFT (2024): 1C-1-4/11.9, 1C-1-A2, 1C-1-A3, 4-6-4/10.3, 4-6-4/10.5

- ABS RULES FOR BUILDING AND CLASSING MOBILE OFFSHORE UNITS (2024): 1B-1-4/9.7, 1B-1-A2, 1B-1-A3, 6-1-1/9, 6-1-1/13, 6-1-7/12.1, 6-1-7/12.3, 6-1-7/12.7

International Standards

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

IEC 61800-3 Ed 3.0: 2017

EN 61800-5-2:2017

EN 61000-6-2:2005

IACS E10 Rev. 8 (2021)

EU-MED Standards

NA

National Standards

NA

Government Standards

NA

Other Standards

NA



A handwritten signature in blue ink, appearing to read 'Joseph W. ...', is positioned above the printed name and title.

Corporate ABS Programs
American Bureau of Shipping
Print Date and Time: 31-Jul-2024 2:12

ABS has used due diligence in the preparation of this certificate, and it represents the information on the product in the ABS Records as of the date and time the certificate is printed.

If the Rules and/or standards used in the PDA evaluation are revised or if there is a design modification (whichever occurs first), a PDA revalidation may be necessary.

The continued validity of the MA is dependent on completion of satisfactory audits as required by the ABS Rules. The validity of both PDA and MA entitles the product to receive a **Confirmation of Product Type Approval**.

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 prior to the effective date of the ABS Rules and standards applied at the time of PDA issuance. ABS makes no representations regarding Type Approval of the Product for use on vessels, MODUs or facilities built after the date of the ABS Rules used for this evaluation.

Type Approval requires Drawing Assessment, Prototype Testing and assessment of the manufacturer's quality assurance and quality control arrangements. The manufacturer is responsible to maintain compliance with all specifications applicable to the product design assessment. Unless specifically indicated in the description of the product, certification under type approval does not waive requirements for witnessed inspection or additional survey for product use on a vessel, MODU or facility intended to be ABS classed or that is presently in class with ABS.

Due to wide variety of specifications used in the products ABS has evaluated for Type Approval, it is part of our contract that; whether the standard is an ABS Rule or a non-ABS Rule, the Client has full responsibility for continued compliance with the standard.

Questions regarding the validity of ABS Rules or the need for supplemental testing or inspection of such products should, in all cases, be addressed to ABS.