



Confirmation of Product Type Approval

Please refer to the "Service Restrictions" shown below to determine if Unit Certification is required for this product.

This certificate reflects the information on the product in the ABS Records as of the date and time the certificate is printed.

Pursuant to the Rules of the American Bureau of Shipping (ABS), the manufacturer of the below listed product held a valid Manufacturing Assessment (MA) with expiration date of 13/DEC/2019. The continued validity of the Manufacturing Assessment is dependent on completion of satisfactory audits as required by the ABS Rules.

And; a Product Design Assessment (PDA) valid until 19/JAN/2021 subject to continued compliance with the Rules or standards used in the evaluation of the product.

The above entitle the product to be called Product Type Approved.

The Product Design Assessment is valid for products intended for use on ABS classed vessels, MODUs or facilities which are in existence or under contract for construction on the date of the ABS Rules used to evaluate the Product.

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.

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.

Product Name: Frequency Converter
Model Name(s): VACON 100 and 100X AC Drives

Presented to:
VACON LTD
P.O. BOX 25
RUNSORINTIE 7
Finland

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, 50/60Hz Output Put Frequency: 0-320Hz (standard) Continuous Current IHout : 2.4 to 1180 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, MR9, MR10 and MR12 are optional variant for system integrators which would like to use their own cabinet type. Only 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,230 to 500V, 50/60Hz Output Put Frequency: 0-320Hz (standard) Continuous Current IHout : 3.4 to 72A Ambient temperature of 50 C degrees the output current must be derated to 75% of In

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 Steel Vessels Rules (2016). Detailed requirements for unit certification are in 4-8-3/8.7 of the ABS Rules for Building and

Classing Steel 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 Rules for Building and Classing Steel Vessels 2015 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. Details related to overload protection, running protection and motor starter disconnects are to be submitted for each installation. Each installation of the specific VACON100 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, MR9, MR10 and MR12 are delivered as IP00 modules and they do not comply with EMC requirement as per 4-9-7/Table 9 of the Rules for Building and Classing Steel 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.

Notes / Documentation:

Drawing No. 01/205/5216/12, TYPE EXAMINATION CERTIFICATE, Revision: -, Pages: 1 Drawing No. 028-713010338-000, TECHNICAL REPORT, Revision: 00, Pages: 1 Drawing No. 028-71395934-000, TECHNICAL REPORT, Revision: 00, Pages: 1 Drawing No. 028-71397706-000, TECHNICAL REPORT, Revision: 00, Pages: 1 Drawing No. 18690, INVESTIGATION REPORT, Revision: -, Pages: 1 Drawing No. 18701, INVESTIGATION REPORT, Revision: -, Pages: 1 Drawing No. D8 12 02 76674 005, COMPLIANCE DOCUMENT, Revision: -, Pages: 1 Drawing No. D8 12 02 76674 006, COMPLIANCE DOCUMENT, Revision: -, Pages: 1 Drawing No. E8N 13 02 76674 009, ATTESTATION OF COMPLIANCE, Revision: -, Pages: 1 Drawing No. EC DECLARATION OF CONFORMITY, EC DECLARATION OF CONFORMITY, Revision: -, Pages: 1 Drawing No. FI 6982, CB TEST CERTIFICATE, Revision: -, Pages: 1 Drawing No. FI 6983, CB TEST CERTIFICATE, Revision: -, Pages: 1 Drawing No. FI 6984, CB TEST CERTIFICATE, Revision: -, Pages: 1 Drawing No. FI 7019, CB TEST CERTIFICATE, Revision: -, Pages: 1 Drawing No. FI 7020, CB TEST CERTIFICATE, Revision: -, Pages: 1 Drawing No. FI 7021, CB TEST CERTIFICATE, Revision: -, Pages: 1 Drawing No. FI 7108, CB TEST CERTIFICATE, Revision: -, Pages: 1 Drawing No. FI 8646 M1, CB TEST CERTIFICATE, Revision: -, Pages: 1 Drawing No. FI 8652 M1, CB TEST CERTIFICATE, Revision: -, Pages: 1 Drawing No. FI 8653 M1, CB TEST CERTIFICATE, Revision: -, Pages: 1 Drawing No. FI 8744, CB TEST CERTIFICATE, Revision: -, Pages: 1 Drawing No. FI 8745, CB TEST CERTIFICATE, Revision: -, Pages: 1 Drawing No. FI 8746, CB TEST CERTIFICATE, Revision: -, Pages: 1 Drawing No. FI 8747, CB TEST CERTIFICATE, Revision: -, Pages: 1 Drawing No. FI 8748, CB TEST CERTIFICATE, Revision: -, Pages: 1 Drawing No. FI12/0025, SYSTEM CERTIFICATION, Revision: -, Pages: 1 Drawing No. FI12/1010, SYSTEM CERTIFICATION, Revision: -, Pages: 1 Drawing No. FI12/2004, SYSTEM CERTIFICATION, Revision: -, Pages: 1 Drawing No. MM4 MAIN BLOCK DIAGRAM, VACON 100X MM4 208 - 500V MAIN BLOCK DIAGRAM, Revision: A, Pages: 1 Drawing No. MM4 STANDARD LEVEL MAIN CIRCUIT DIAGRAM, VACON 100X MM4 208-500V STANDARD LEVEL MAIN CIRCUIT DIAGRAM, Revision: A, Pages: 1 Drawing No. MM5 MAIN BLOCK DIAGRAM, VACON 100X MM5 208-500V STANDARD LEVEL MAIN CIRCUIT DIAGRAM, Revision: A, Pages: 1 Drawing No. MM5 STANDARD LEVEL MAIN CIRCUIT DIAGRAM, VACON 100X MM5 208-500V STANDARD LEVEL MAIN CIRCUIT DIAGRAM, Revision: A, Pages: 1 Drawing No. MM6 MAIN BLOCK DIAGRAM, VACON 100X MM6 208 - 500V MAIN BLOK DIAGRAM, Revision: A, Pages: 1 Drawing No. MM6 STANDARD LEVEL MAIN CIRCUIT DIAGRAM, VACON 100X MM6 - 208 - 500V

STANDARD LEVEL MAIN CIRCUIT DIAGRAM, Revision: A, 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 Drawing No. MR4 DESIGN LEVEL MAIN CIRCUIT DIAGRAM, VACON 100 MR04 208-500 V DESIGN LEVEL MAIN CIRCUIT DIAGRAM, Revision: B, Pages: 1 Drawing No. MR4 Main Block Diagram, VACON 100 MR04 208-500 V DESIGN LEVEL MAIN CIRCUIT DIAGRAM, Revision: B, Pages: 1 Drawing No. MR5 6 DESIGN LEVEL, MR5 525-600V DESIGN LEVEL, Revision: B, Pages: 1 Drawing No. MR5 6 STANDARD LEVEL, MR5 525-600V STANDARD LEVEL, Revision: B, Pages: 1 Drawing No. MR5 Design Level Main Circuit Diagram, VACON 100 M505 208-500V DESIGN LEVEL MAIN CIRCUIT DIAGRAM, Revision: B, Pages: 1 Drawing No. MR5 Main Block Diagram, VACON 100 MR05 208-500V MAIN BLOCK DAIGRAM, Revision: B, Pages: 1 Drawing No. MR6 6 7 DESIGN LEVEL, MR6 525-690V DESIGN LEVEL, Revision: B, Pages: 1 Drawing No. MR6 6 7 MAIN LEVEL, MR6 525-690V MAIN LEVEL, Revision: B, Pages: 1 Drawing No. MR6 Design Level Main Circuit Diagram, VACON 100 MR06 208-500V DESIGN LEVEL MAIN CIRCUIT DIAGRAM, Revision: B, Pages: 1 Drawing No. MR6 Main Block Diagram, VACON 100 MR06 208-500V MAIN BLOCK DIAGRAM, Revision: B, Pages: 1 Drawing No. MR7 6 7 DESIGN LEVEL, MR7 525-690V DESIGN LEVEL, Revision: B, Pages: 1 Drawing No. MR7 6 7 STANDARD LEVEL, MR7 525-690V STANDARD LEVEL, Revision: B, Pages: 1 Drawing No. MR7 Standard Level Main Circuit Diagram, VACON 100 MR7 208-500V STANDARD LEVEL MAIN CIRCUIT DIAGRAM, Revision: B, Pages: 1 Drawing No. MR7 design level, VACON 100 MR7 208-500 V DESIGN LEVEL MAIN CIRCUIT DIAGRAM, Revision: C, Pages: 1 Drawing No. MR8 6 7 DESIGN LEVEL, 525-690V DESIGN LEVEL, Revision: B, Pages: 1 Drawing No. MR8 6 7 STANDARD LEVEL, 525-690V STANDARD LEVEL, Revision: B, Pages: 1 Drawing No. MR8 Standard Level Main Circuit Diagram, VACON 100 MR8 208-500 V STANDARD LEVEL MAIN CIRCUIT DIAGRAM, Revision: B , Pages: 1 Drawing No. MR8 design level, VACON 100 MR8 208-500 V DESIGN LEVEL MAIN CIRCUIT DIAGRAM, Revision: C, Pages: 1 Drawing No. MR8ED 690 V, STATEMENT OF TEST REPORT, Revision: -, Pages: 1 Drawing No. MR9 6 7 STANDARD LEVEL, 525-690V STANDARD LEVEL, Revision: B, Pages: 1 Drawing No. MR9 7 DESIGN LEVEL, 525-690V DESIGN LEVEL, Revision: B, Pages: 1 Drawing No. MR9 Standard Level Main Circuit Diagram, vacon 100 mr9 208-500v standard level main circuit diagram, Revision: C, Pages: 1 Drawing No. MR9 design level, VACON 100 MR9 208-500V DESIGN LEVEL MAIN CIRCUIT DIAGRAM, Revision: D, Pages: 1 Drawing No. MR9ED 690 V, STATEMENT OF TEST REPORT, Revision: -, Pages: 1 Drawing No.

Master_list_for_Type_Approval_Vacon100_series[1],
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No. Vacon-100-X-Mains-Switch-Installation-Manual-DPD00,
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 Drawing No. Vacon-100-X-Optional-Heater-Arctic-Option-Installa,
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 No. Vacon100, Vacon100, Revision: -, Pages: 1 Drawing No.
 vacon-100-x-20-x-brochure-DPD01196B, vacon-100-x-20-x-brochure-DPD01196B,
 Revision: -, Pages: 1

Term of Validity:

This Product Design Assessment (PDA) Certificate 15-LD1432892-PDA, dated 20/Jan/2016 remains valid until 19/Jan/2021 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.

ABS Rules:

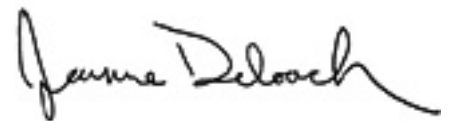
-Steel Vessels (2016): 1-1-4/7.7, 1-1-Appendix 3 & 4, 4-8-3/8, 4-9-8/Table 1 -Steel Vessels Under 90 Meters (295 Feet) in Length (2016): 1-1-4/7.7, 1-1-Appendix 3 & 4, 4-6-4/10, 4-7-2/Table 1 - Facilities on Offshore Installations (2016): 1-1-4/9.7, 1-1- Appendix 2 & 3 -Offshore Support Vessels (2016): 1-1-4/7.7, 1-1-Appendix 3 & 4, 4-8-3/8, 4-9-8/Table 1 -Mobile Offshore Drilling Units (2016): 1-1-4/9.7, 1-1-Appendix 3 & 4, 6-1-1/9, 6-1-1/13; 6-1-7/12, 13.5 -High-Speed Craft (2016): 1-1-4/11.9, 1-1-Appendix 2 & 3, 4-6-4/10, 4-7-9/Table 9 - Steel Vessels for Service on Rivers and Intracoastal Waterways (2016): 1-1-4/7.7, 1-1-A3&A4; 4-5-4/10 - High Speed Crafts (2016): 1-1-4/11.9, 1-1-A2&A3; 4-6-4/10, 4-7-9 Table 9 - Steel Barge Rules (2016): 1-1-4/7.9, 1-1-A3&A4

**National Standards:
 International Standards:**

IEC 61800-5-1 Ed 2.0: 2007, IEC 61800-3 Ed 2.0: 2004 EN 61800-5-2:2007, EN 61800-5-1:2007, EN 61800-3: 2004+A1:2012, EN 61000-6-2:2005, EN 62061:2005 +AC: 2010, EN 60204-1:2006+A1:2009+AC: 2010, EN ISO13849-1:2008+AC: 2009

**Government Authority:
 EUMED:
 Others:**

Model Certificate	Model Certificate No	Issue Date	Expiry Date
PDA	15-LD1432892-PDA	20/JAN/2016	19/JAN/2021



ABS Programs

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 was printed. Type Approval requires Drawing Assessment, Prototype Testing and assessment of the manufacturer's quality assurance and quality control arrangements. Limited circumstances may allow only Prototype Testing to satisfy Type Approval. The approvals of Drawings and Products remain valid as long as the ABS Rule, to which they were assessed, remains valid. ABS cautions manufacturers to review and maintain compliance with all other specifications to which the product may have been assessed. Further, unless it is specifically indicated in the description of the product; Type Approval does not necessarily waive witnessed inspection or survey procedures (where otherwise required) for products to be used in a vessel, MODU or facility intended to be ABS classed or that is presently in class with ABS. 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.