



NIPPON KAIJI KYOKAI

**TYPE APPROVAL CERTIFICATE
FOR AUTOMATIC DEVICES AND EQUIPMENT**

Certificate No. TA20165M

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

Manufacturer: **Vacon Ltd**
Place of Manufacturing: **Runsorintie 7 Vaasa 65380, FINLAND**
Product description: **Frequency Converter**
Model: **Vacon 100 series, Vacon 100X series**

Approval No.: **20A015**
Valid until: **6 April 2025**

This certificate is subject to the conditions specified in the attached sheet(s).

Issued at Tokyo on 7 April 2020.



T. Shimada
General Manager
Machinery Department

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

NIPPON KAIJI KYOKAI

Attached sheet -1/8 to the Certificate No. TA20165M

General Specification (Vacon 100):

Supply voltage range:	200-240 V / 380-480 (500) V / 525-690 V
Frequency:	50/60 Hz
Voltage variation:	Permanent $\pm 10\%$, Transient $\pm 20\%$
Frequency variation:	Permanent $\pm 5\%$, Transient $\pm 10\%$
Output frequency:	0 - 320 Hz
Temperature range in operation:	40 - 50 °C derate 1.5% /°C, 50 – 55 °C derate 2.5% /°C

-The Vacon 100_ must be regarded as a component. The actual installation shall be designed according to Vacon Installation & Operating Instructions.

-We note that MR8, MR9, MR10, MR11 and MR12 can be delivered as IP00 modules and they do not comply with EMC requirement. Evidences to ensure the compliance with EMC requirement are required to be submitted for review prior to installation of these models on board.

Product Description (Vacon 100):

Mains voltage 208-240V, 50/60Hz			
Frequency Converter type	Current rating 45 degC continuous current $I_{L,out}$ (A)	Frame size	Enclosure Protection**
0100-3L-0003-2-xxxx	3,15	MR4	IP21, IP54
0100-3L-0004-2-xxxx	4,25	MR4	IP21, IP54
0100-3L-0007-2-xxxx	5,7	MR4	IP21, IP54
0100-3L-0008-2-xxxx	7,3	MR4	IP21, IP54
0100-3L-0011-2-xxxx	9,5	MR4	IP21, IP54
0100-3L-0012-2-xxxx	11,05	MR4	IP21, IP54
0100-3L-0018-2-xxxx	15,25	MR5	IP21, IP54
0100-3L-0024-2-xxxx	21	MR5	IP21, IP54
0100-3L-0031-2-xxxx	28	MR5	IP21, IP54
0100-3L-0048-2-xxxx	39,5	MR6	IP21, IP54
0100-3L-0062-2-xxxx	55	MR6	IP21, IP54
0100-3L-0075-2-xxxx	68,5	MR7	IP21, IP54
0100-3L-0088-2-xxxx	81,5	MR7	IP21, IP54
0100-3L-0105-2-xxxx	96,5	MR7	IP21, IP54
0100-3L-0140-2-xxxx	127	MR8	IP00 / IP21, IP54
0100-3L-0170-2-xxxx	155	MR8	IP00 / IP21, IP54
0100-3L-0205-2-xxxx	187,5	MR8	IP00 / IP21, IP54
0100-3L-0261-2-xxxx	236	MR9	IP00 / IP21, IP54
0100-3L-0310-2-xxxx	280,5	MR9	IP00 / IP21, IP54

- To be continued -

Product Description (Vacon 100):

Mains voltage 380-480V (500V), 50/60Hz			
Frequency Converter type	Current rating 45degC continuous current I_{Lout} (A)	Frame size	Enclosure Protection**
0100-3L-0003-5-xxxx	3	MR4	IP21, IP54
0100-3L-0004-5-xxxx	4,1	MR4	IP21, IP54
0100-3L-0005-5-xxxx	4,95	MR4	IP21, IP54
0100-3L-0008-5-xxxx	6,8	MR4	IP21, IP54
0100-3L-0009-5-xxxx	8,8	MR4	IP21, IP54
0100-3L-0012-5-xxxx	10,8	MR4	IP21, IP54
0100-3L-0016-5-xxxx	14	MR5	IP21, IP54
0100-3L-0023-5-xxxx	19,5	MR5	IP21, IP54
0100-3L-0031-5-xxxx	27	MR5	IP21, IP54
0100-3L-0038-5-xxxx	34,5	MR6	IP21, IP54
0100-3L-0046-5-xxxx	42	MR6	IP21, IP54
0100-3L-0061-5-xxxx	53,5	MR6	IP21, IP54
0100-3L-0072-5-xxxx	66,5	MR7	IP21, IP54
0100-3L-0087-5-xxxx	79,5	MR7	IP21, IP54
0100-3L-0105-5-xxxx	96	MR7	IP21, IP54
0100-3L-0140-5-xxxx	122,5	MR8	IP00, IP21,IP54
0100-3L-0170-5-xxxx	155	MR8	IP00, IP21,IP54
0100-3L-0205-5-xxxx	187,5	MR8	IP00, IP21,IP54
0100-3L-0261-5-xxxx	233	MR9A	IP00, IP21,IP54
0100-3L-0310-5-xxxx	280,5	MR9A	IP00, IP21,IP54
0100-3L-0386-5-xxxx	347,5	MR9B	IP00, IP21,IP54
0100-3L-0385-5-xxxx	347,5	MR10	IP00
0100-3L-0460-5-xxxx	422,5	MR10	IP00
0100-3L-0520-5-xxxx	490	MR10	IP00
0100-3L-0590-5-xxxx	555	MR10	IP00
0100-3L-0650-5-xxxx	620	MR12	IP00
0100-3L-0730-5-xxxx	690	MR12	IP00
0100-3L-0820-5-xxxx	775	MR12	IP00
0100-3L-0920-5-xxxx	870	MR12	IP00
0100-3L-1040-5-xxxx	980	MR12	IP00
0100-3L-1180-5-xxxx	1050	MR12	IP00

- To be continued -

Product Description (Vacon 100):

Mains voltage 525-600V, 50/60Hz			
Frequency Converter type	Current rating 45degC continuous current I_{Lout} (A)	Frame size	Enclosure Protection**
0100-3L-0004-6-xxxx	3,3	MR5	IP21, IP54
0100-3L-0006-6-xxxx	5	MR5	IP21, IP54
0100-3L-0009-6-xxxx	7,55	MR5	IP21, IP54
0100-3L-0011-6-xxxx	10	MR5	IP21, IP54
0100-3L-0018-6-xxxx	15,75	MR6	IP21, IP54
0100-3L-0022-6-xxxx	20	MR6	IP21, IP54
0100-3L-0027-6-xxxx	24,5	MR6	IP21, IP54
0100-3L-0034-6-xxxx	30,5	MR6	IP21, IP54
0100-3L-0041-6-xxxx	37,5	MR7	IP21, IP54
0100-3L-0052-6-xxxx	46,5	MR7	IP21, IP54
0100-3L-0062-6-xxxx	57	MR7	IP21, IP54
0100-3L-0080-6-xxxx	71	MR8	IP00, IP21, IP54
0100-3L-0100-6-xxxx	90	MR8	IP00, IP21, IP54
0100-3L-0125-6-xxxx	112,5	MR8	IP00, IP21, IP54
0100-3L-0144-6-xxxx	134,5	MR9A	IP00, IP21, IP54
0100-3L-0208-6-xxxx	189	MR9A	IP00, IP21, IP54
0100-3L-0262-6-xxxx	234,5	MR9B	IP00, IP21, IP54
0100-3L-0261-6-xxxx	234,5	MR10	IP00
0100-3L-0325-6-xxxx	293	MR10	IP00
0100-3L-0385-6-xxxx	355	MR10	IP00
0100-3L-0416-6-xxxx	400,5	MR10	IP00
0100-3L-0460-6-xxxx	438	MR12	IP00
0100-3L-0520-6-xxxx	490	MR12	IP00
0100-3L-0590-6-xxxx	555	MR12	IP00
0100-3L-0650-6-xxxx	620	MR12	IP00
0100-3L-0750-6-xxxx	700	MR12	IP00
0100-3L-0820-6-xxxx	735	MR12	IP00

- To be continued -

Product Description (Vacon 100):

Mains voltage 525-690V, 50/60Hz			
Frequency Converter type	Current rating 45degC continuous current I_{L,out} (A)	Frame size	Enclosure Protection**
0100-3L-0007-7-xxxx	6,5	MR6	IP21, IP54
0100-3L-0010-7-xxxx	8,75	MR6	IP21, IP54
0100-3L-0013-7-xxxx	11,75	MR6	IP21, IP54
0100-3L-0018-7-xxxx	15,75	MR6	IP21, IP54
0100-3L-0022-7-xxxx	20	MR6	IP21, IP54
0100-3L-0027-7-xxxx	24,5	MR6	IP21, IP54
0100-3L-0034-7-xxxx	30,5	MR6	IP21, IP54
0100-3L-0041-7-xxxx	37,5	MR7	IP21, IP54
0100-3L-0052-7-xxxx	46,5	MR7	IP21, IP54
0100-3L-0062-7-xxxx	57	MR7	IP21, IP54
0100-3L-0080-7-xxxx	71	MR8	IP00, IP21,IP54
0100-3L-0100-7-xxxx	90	MR8	IP00, IP21,IP54
0100-3L-0125-7-xxxx	112,5	MR8	IP00, IP21,IP54
0100-3L-0144-7-xxxx	134,5	MR9A	IP00, IP21,IP54
0100-3L-0170-7-xxxx	157	MR9A	IP00, IP21,IP54
0100-3L-0208-7-xxxx	189	MR9A	IP00, IP21,IP54
0100-3L-0262-7-xxxx	234,5	MR9B	IP00, IP21,IP54
0100-3L-0261-7-xxxx	234,5	MR10	IP00
0100-3L-0325-7-xxxx	293	MR10	IP00
0100-3L-0385-7-xxxx	355	MR10	IP00
0100-3L-0416-7-xxxx	400,5	MR10	IP00
0100-3L-0460-7-xxxx	438	MR12	IP00
0100-3L-0520-7-xxxx	490	MR12	IP00
0100-3L-0590-7-xxxx	555	MR12	IP00
0100-3L-0650-7-xxxx	620	MR12	IP00
0100-3L-0750-7-xxxx	700	MR12	IP00
0100-3L-0820-7-xxxx	735	MR12	IP00

- To be continued -

General Specification (Vacon 100X)

Supply voltage range:	200-240 V / 380-480V / 380-500V, 50/60 Hz
Voltage variation:	-15 % +10 % continuously
Frequency variation:	47.5 - 66 Hz
Output frequency:	0 - 320 Hz
Temperature range in operation:	0 - 40 °C (40 - 60 °C when derated 2,5% /°C) Note: Frequency converters with safety-related options have a maximum ambient temperature of 40°C.

Product Description (Vacon 100X):

Mains voltage 208-240V, 50/60Hz, 3~			
Frequency Converter type	Current rating 40 degC continuous current I_{Lout} (A)	Frame size	Enclosure Protection
0007-2-X	6,6	MM4	IP66
0008-2-X	8	MM4	IP66
0011-2-X	11	MM4	IP66
0012-2-X	12,5	MM4	IP66
0018-2-X	18	MM5	IP66
0024-2-X	24,2	MM5	IP66
0031-2-X	31	MM5	IP66
0048-2-X	48	MM6	IP66
0062-2-X	62	MM6	IP66

Mains voltage 380-480V / 380V-500V, 50/60Hz, 3~			
Frequency Converter type	Current rating 40degC continuous current I_{Lout} (A)	Frame size	Enclosure Protection
0003-4-X	3,4	MM4	IP66
0004-4-X	4,8	MM4	IP66
0005-4-X	5,6	MM4	IP66
0008-4-X	8	MM4	IP66
0009-4-X	9,6	MM4	IP66
0012-4-X	12	MM4	IP66
0016-4-X	16	MM5	IP66
0023-4-X	23	MM5	IP66
0031-4-X	31	MM5	IP66
0038-4-X	38	MM6	IP66
0046-4-X	46	MM6	IP66
0061-4-X	61	MM6	IP66
0072-4-X	72	MM6	IP66

- To be continued -

NIPPON KAIJI KYOKAI

Attached sheet -6/8 to the Certificate No. TA20165M

Documentations:

-Product brochure : Vacon100_presentation_Aug.ppt, Vacon100.pdf,
vacon-100-x-20-x-brochure-DPD01196Benglish.pdf

-User Manuals : Vacon-100-Wall-Mounted-Drives-Installation-Manual-DPD01711FUK.pdf,
Vacon-100-100-FLOW-Drive-Switch-Installation-instr.pdf,
Vacon-100-Enclosed-Drives-Installation-Manual-DPD01666B-UK.pdf,
Vacon-100-IP00-Drives-Installation-Manual-DPD01665B-UK.pdf,
Vacon-100-Marine-Installation-Guide-DPD01773A-UK_11.8.pdf,
Vacon-100-X-Optional-Heater-Arctic-Option-Installa.pdf,
Vacon-100-X-Graphical-Keypad-Installation-Manual-D.pdf,
Vacon-100-X-Installation-Manual-DPD00534H-UK.pdf,
Vacon-100-X-Mains-Switch-Installation-Manual-DPD00.pdf

-Product Statements : MR12ED 690 V.pdf, CB Certificate Safety MR4.pdf,
CB Certificate Safety MR5.pdf, CB Certificate Safety MR6.pdf, CB Certificate Safety MR7.pdf,
CB Certificate Safety MR8.pdf, CB Certificate Safety MR8ED.pdf,
CB Certificate Safety MR9.pdf, CB Certificate Safety MR9ED.pdf,
CB Certificate Safety MR10-12-ED.pdf, CB-EMC Certificate MR4.pdf,
CB-EMC Certificate MR5.pdf, CB-EMC Certificate MR6.pdf, CB-EMC Certificate MR7.pdf,
CB-EMC Certificate MR8.pdf, CB-EMC Certificate MR9.pdf,
EC Type-Examination Certificate for Vacon100.pdf, MR8ED 500 V.pdf,
MR8ED 690 V.pdf MR9ED 500 V.pdf, MR9ED 690 V.pdf, MR10ED 500 V.pdf,
MR10ED 690 V.pdf, MR12ED 500 V.pdf, Vacon-VTT-ATEX-048X-EN.pdf,
MM4_028-71397706-000_Rev.00_tr.pdf, MM5_028-71395934-000_Rev.00_tr.pdf,
MM6_028-713010338-000_Rev.00_tr.pdf, Vacon_100X_MM4 EMC.pdf,
Vacon_100X_MM5 EMC.pdf, V100X_EC_Declaration_of_Conformity.pdf

-Quality Certificates : VaconLtd_IATF 16949.pdf, VaconLtd_ISO 9001_2015.pdf,
VaconLtd_ISO 14001_2015.pdf, VaconLtd_OHSAS 18001_2007.pdf

- To be continued -

NIPPON KAIJI KYOKAI

Attached sheet -7/8 to the Certificate No. TA20165M

Documentations:

-Main circuit : MR4 Main Block Diagram revB.pdf,
MR4 Design Level Main Circuit Diagram revB.pdf,
MR5_6_STANDARD_LEVEL_revB.pdf, MR5 Design Level Main Circuit Diagram revB.pdf,
MR5 Main Block Diagram revB.pdf, MR5_6_DESIGN_LEVEL_revB.pdf,
MR6_6_7_MAIN_LEVEL_revB.pdf, MR6 Design Level Main Circuit Diagram revB.pdf,
MR6 Main Block Diagram revB.pdf, MR6_6_7_DESIGN_LEVEL_revB.pdf,
MR7_design_level_RevC.pdf, MR7 Standard Level Main Circuit Diagram revB.pdf,
MR7_6_7_DESIGN_LEVEL_revB.pdf, MR7_6_7_STANDARD_LEVEL_revB.pdf,
MR8_design_level_RevC.pdf, MR8 Standard Level Main Circuit Diagram revB.pdf,
MR8_6_7_DESIGN_LEVEL_revB.pdf, MR8_6_7_STANDARD_LEVEL_revB.pdf,
MR9_design_level_RevD.pdf, MR9 Standard Level Main Circuit Diagram revC.pdf,
MR9_6_7_DESIGN_LEVEL_revB.pdf, MR9_6_7_STANDARD_LEVEL_revB.pdf,
MR10_7_IP00_STANDARD_LEVEL_revA.pdf, MR10_5_IP00_DESIGN_LEVEL_revB.pdf,
MR10_5_IP00_STANDARD_LEVEL_revB.pdf, MR10_7_IP00_DESIGN_LEVEL_revA.pdf,
MR12_5_(6)7_IP00_revA.pdf, MM6 standard level main circuit diagram.pdf,
MM4 main block diagram.pdf, MM4 standard level main circuit diagram.pdf,
MM5 main block diagram.pdf, MM5 standard level main circuit diagram.pdf,
MM6 main block diagram.pdf

-Test reports

Test_Reports_for_Marine_Type_Approval.xlsx,
[SGS Fimko Oy]
269776-1, 269776-2
[VTT Expert Services Ltd]
VTT-S-02593-15, VTT-S-02611-15, VTT-S-01015-15, VTT-S-01016-15
[Witness report by DNV-GL]
TED10720, TED10721, TED10723, TED10724
[Flame retardant for polymeric enclosure materials]
File Number : E248280

- To be continued -

NIPPON KAIJI KYOKAI

Attached sheet -8/8 to the Certificate No. TA20165M

Test items & approval conditions:

1. Test items:

(Applied testing items are marked with X.)

ENVIRONMENTAL TESTS		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°C × 16 h)		X
Damp heat test		X
Vibration test (Acceleration ±0.7g)		X
Inclination test		--
Cold test (Temperature 5°C × 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.

- The End -