Marine & Offshore Division

Certificate number: 43073/A2 BV
File number: ACE6/842/2
Product code: 2592I

This certificate is not valid when presented without the full attached schedule composed of 7 sections

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TYPE APPROVAL CERTIFICATE

This certificate is issued to

Vacon Ltd

VAASA - FINLAND

for the type of product

FREQUENCY CONVERTERS (Power 50kW and over)

VACON 100 series.

Requirements:
Bureau Veritas Rules for the Classification of Steel Ships.

EC Code: 31.

This certificate is issued to attest that BUREAU VERITAS did undertake the relevant approval procedures for the product identified above which was found to comply with the relevant requirements mentioned above.

This certificate will expire on: 28 Jan 2021

For BUREAU VERITAS,
At BV HELSINKI, on 18 Nov 2016,
Tommy Andersson

THE SCHEDULE OF APPROVAL

1. PRODUCT DESCRIPTION :

The **VACON100** are frequency converters for Marine applications.

1.1 - VACON100 approval range:

1.1.1 - Mains voltage 208-240 V, 50-60 Hz

			Low overload			High overload				
			Loadability	Motor shaft power		Loadbility	Motor shaft power			
Frequency converter type	Module drive	Enclosed drive -ED (IP21, IP54)	40°C continuous current ILout (A)	230V 40°C LO (kW)	NEC 230V 40°C LO (HP)	50°C continuous current IHout (A)	230V 50°C HO (kW)	NEC 230V 50°C HO (HP)	45°C continuous current	Max current Is (2s) (A)
0100-3L-0205-2-xxxx	IP00, IP21,IP54	-	205	55	75	170	45	60	187.5	340
0100-3L-0261-2-xxxx	IP00, IP21,IP54	-	261	75	100	211	55	75	236	410
0100-3L-0310-2-xxxx	IP00, IP21,IP54	-	310	90	125	251	75	100	280.5	502

1.1.2 - Mains voltage 380-500 V, 50-60 Hz

			Low overload			High overload				
			Loadability	Motor shaft power		Loadability	Motor shaft power			
Frequency converter type	Module drive	Enclosed drive -ED (IP21, IP54)	40°C continuous current ILout (A)	400V 40°C LO (kW)	480V NEMA / NEC 40°C LO (HP)	50°C continuous current IHout (A)	400V 50°C HO (kW)	480V NEMA / NEC 50°C HO (HP)	45°C continuous current	Max current Is (2s) (A)
0100-3L-0105-5-xxxx	IP21, IP54	-	105	55	75	87	45	60	96	174
0100-3L-0140-5-xxxx	IP00, IP21,IP54	-ED	140	75	100	105	55	75	122.5	210
0100-3L-0170-5-xxxx	IP00, IP21,IP54	-ED	170	90	125	140	75	100	155	280
0100-3L-0205-5-xxxx	IP00, IP21,IP54	-ED	205	110	150	170	90	125	187.5	340
0100-3L-0261-5-xxxx	IP00, IP21,IP54	-ED	261	132	200	205	110	150	233	410
0100-3L-0310-5-xxxx	IP00, IP21,IP54	-ED	310	160	250	251	132	200	280.5	502
0100-3L-0385-5-xxxx	IP00	-ED	385	200	300	310	160	250	347.5	620
0100-3L-0460-5-xxxx	IP00	-ED	460	250	350	385	200	300	422.5	770
0100-3L-0520-5-xxxx	IP00	-ED	520	250	450	460	250	350	490	920
0100-3L-0590-5-xxxx	IP00	-ED	590	315	500	520	250	450	555	1040
0100-3L-0650-5-xxxx	IP00	-ED	650	355	500	590	315	500	620	1180
0100-3L-0730-5-xxxx	IP00	-ED	730	400	600	650	355	500	690	1300
0100-3L-0820-5-xxxx	IP00	-ED	820	450	700	730	400	600	775	1460
0100-3L-0920-5-xxxx	IP00	-ED	920	500	800	820	450	700	870	1640
0100-3L-1040-5-xxxx	IP00	-ED	1040	560	900	920	500	800	980	1840
0100-3L-1180-5-xxxx	IP00	-ED	1180	630	1000	920	500	800	1050	1840

1.1.3 - Mains voltage 525-600V, 50-60 Hz

			Low overload		High overload			
			Loadability	Motor shaft power	Loadability	Motor shaft power		
Frequency converter type	Module drive	Enclosed drive -ED (IP21, IP54)	40°C continuous current ILout (A)	600V 40)C LO (HP)	50°C continuous current IHout (A)	600V 50°C HO (HP)	45°C continuous current	Max current Is (2s) (A)
0100-3L-0080-6-xxxx	IP00, IP21,IP54	-ED	80	75	62	60	71	124
0100-3L-0100-6-xxxx	IP00, IP21,IP54	-ED	100	100	80	75	90	160
0100-3L-0125-6-xxxx	IP00, IP21,IP54	-ED	125	125	100	100	112.5	200
0100-3L-0144-6-xxxx	IP00, IP21,IP54	-ED	144	150	125	125	134.5	250
0100-3L-0208-6-xxxx	IP00, IP21,IP54	-ED	208	200	170	150	189	340
0100-3L-0261-6-xxxx	IP00	-ED	261	250	208	200	234.5	416
0100-3L-0325-6-xxxx	IP00	-ED	325	300	261	250	293	522
0100-3L-0385-6-xxxx	IP00	-ED	385	400	325	300	355	650
0100-3L-0416-6-xxxx	IP00	-ED	416	450	385	300	400.5	770
0100-3L-0460-6-xxxx	IP00	-ED	460	450	416	400	438	832
0100-3L-0520-6-xxxx	IP00	-ED	520	500	460	450	490	920
0100-3L-0590-6-xxxx	IP00	-ED	590	600	520	500	555	1040
0100-3L-0650-6-xxxx	IP00	-ED	650	650	590	600	620	1180
0100-3L-0750-6-xxxx	IP00	-ED	750	700	650	650	700	1300
0100-3L-0820-6-xxxx	IP00	-ED	820	800	650	650	735	1300

1.1.4 - Mains voltage 525-690 V, 50-60 Hz

			Low overload			High overload				
			Loadability	Motor shaft power		Loadability	Motor shaft power			
Frequency converter type	Module drive	Enclosed drive -ED (IP21, IP54)	40°C continuous current ILout (A)	690V 40°C LO (kW)	600V 40°C LO (HP)	50°C continuous current IHout (A)	690V 50°C HO (kW)	600V 50°C HO (HP)	45°C continuos current	Max current Is (2s) (A)
0100-3L-0062-7-xxxx	IP21, IP54	-	62	55	60	52	45	50	57	104
0100-3L-0080-7-xxxx	IP00, IP21,IP54	-ED	80	75	75	62	55	60	71	124
0100-3L-0100-7-xxxx	IP00, IP21,IP54	-ED	100	90	100	80	75	75	90	160
0100-3L-0125-7-xxxx	IP00, IP21,IP54	-ED	125	110	125	100	90	100	112.5	200
0100-3L-0144-7-xxxx	IP00, IP21,IP54	-ED	144	132	150	125	110	125	134.5	250
0100-3L-0170-7-xxxx	IP00, IP21,IP54	-ED	170	160	150	144	132	150	157	288
0100-3L-0208-7-xxxx	IP00, IP21,IP54	-ED	208	200	200	170	160	150	189	340
0100-3L-0261-7-xxxx	IP00	-ED	261	250	250	208	200	200	234.5	416
0100-3L-0325-7-xxxx	IP00	-ED	325	315	300	261	250	250	293	522
0100-3L-0385-7-xxxx	IP00	-ED	385	355	400	325	315	300	355	650
0100-3L-0416-7-xxxx	IP00	-ED	416	400	450	385	355	300	400.5	770
0100-3L-0460-7-xxxx	IP00	-ED	460	450	450	416	400	400	438	832
0100-3L-0520-7-xxxx	IP00	-ED	520	500	500	460	450	450	490	920
0100-3L-0590-7-xxxx	IP00	-ED	590	560	600	520	500	500	555	1040
0100-3L-0650-7-xxxx	IP00	-ED	650	630	650	590	560	600	620	1180
0100-3L-0750-7-xxxx	IP00	-ED	750	710	700	650	630	650	700	1300
0100-3L-0820-7-xxxx	IP00	-ED	820	800	800	650	630	650	735	1300

2. DOCUMENTS AND DRAWINGS :

VACON100 installation manual for wall mounted drives, ref. DPD01711F, dated 20.Feb.2015.
VACON100 installation manual for IP00 drives, ref. DPD01665B, dated 15.Jun.2015.
VACON100 marine installation guide, ref. DPD01773A Rev. A, dated 11.Aug.2015.
VACON100 installation manual for enclosed drives, ref. DPD01666B, dated 25.Jun.2015.
VACON100 installation instruction for drive supply switch, ref. DPD01421 Rev. A, dated 13.Jan.2014.
VACON100 data sheet, ref. BC00446A.
VACON100 X installation manual, ref. DPD00534H Rev. H, dated 10.Jul.2015.
VACON100 X Mains switch manual, ref. DPD00978B.
VACON100 X Control keypad manual, ref. DPD00979A.
VACON100 X optional heater manual, ref. DPD01097A.
VACON100 X data sheet, ref. DPD01194B.
Drawings refs. Binder#1 & Binder#2 dated 11.Dec.2015.

3. TEST REPORTS :

VACON:

- Test report No. TED10720 & TED10721, dated 03.Jul.2015.
- Test report No. TED10724, dated 17.Jul.2015.
- Test report No. TED10728, dated 08.Jul.2015.
- Test report No. TED10757 & TED10758, dated 17.Jul.2015.

VTT:

- Test report No. VTT-S-02593-15, dated 17.Jun.2015.

SGS:

- Tests report No. 269776-1/2, dated 02.Jan.2013.

4. APPLICATION / LIMITATION :

4.1 - BUREAU VERITAS Rules and Regulations for the Classification of Steel Ships.
4.2 - Approval valid for ships intended to be granted with the following additional class notations: **AUT-UMS, AUT-CCS, AUT-PORT and AUT-IMS.**
4.3 - BUREAU VERITAS Environmental Category, EC Code: **31.**
4.4 - The equipment fulfils the EMC requirements for installation in General Power Distribution Zones.
4.5 - The installation shall comply with the Manufacturer's recommendation described in the above-referenced documentation.
4.6 - The VACON 100 & 100X series use a derating factor as follows:

Models	Maximum temperature	Derating possible
VACON 100	40°C	40-50°C derate 1.5%/°C, 50-55°C derate 2.5%/°C

Note: Frequency converters with safety-related options have a maximum ambient tremperature of 40°C.

5. PRODUCTION SURVEY REQUIREMENTS :

5.1 - The **VACON 100 & 100X series** are to be supplied by **Vacon Ltd** in compliance with the type and the requirements described in this certificate.
5.2 - This type of product is within the category IBV of Bureau Veritas Rule Note NR320.
5.3 - BV product certificate is required.
5.4 - **Vacon Ltd** has declared to Bureau Veritas that the type of product described in this certificate are manufactured at the following production sites:

Vacon 100
Vacon Ltd
Runsorintie 7
65380 Vaasa
Finland

6. MARKING OF PRODUCT :

6.1 - Trade name.
6.2 - Date of manufacture and serial number.
6.3 - Equipment type or model identification under which it was type-tested
6.4 - \ or @conformity marking, as relevant

7. OTHERS :

7.1 - It is **Vacon Ltd** responsibility to inform shipbuilders or their sub-contractors of the proper methods of fitting, use and general maintenance of the approved equipment and the conditions of this approval.
7.2 - This certificate supersedes the Type Approval Certificate No. 43073/A1 BV issued on 18.May.2016. by the Society.

***** END OF CERTIFICATE *****