



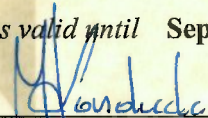
**TYPE APPROVAL CERTIFICATE**  
No. **ELE105223XP**

**This is to certify** that the product below is found to be in compliance with the applicable requirement of the RINA type approval system.

<i>Description</i>	<b>FREQUENCY CONVERTERS</b>
<i>Type</i>	<b>iC7-60</b>
<i>Applicant</i>	<b>VACON Ltd. RUNSORINTIE 7 65380 Vaasa FINLAND</b>
<i>Manufacturer</i>	<b>VACON Ltd.</b>
<i>Place of manufacture</i>	<b>RUNSORINTIE 7 65380 Vaasa FINLAND</b>
<i>Reference standards</i>	<b>Rules for the classification of ships.- Part C - Machinery, systems and fire protection. - Ch.3, Sect. 6, Table 1</b>

Issued in **GDAŃSK** on **September 7, 2023**. This Certificate is valid until **September 6, 2028**



  
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RINA Services S.p.A.  
**Jaroslaw Kondracki**

This certificate consists of this page and 1 enclosure



## TYPE APPROVAL CERTIFICATE

No. ELE105223XP

Enclosure - Page 1 of 2

iC7-60

### Product description:

Danfoss iC7-60 liquid cooled drive modules are used as building blocks for larger power systems. Modules consist of inverter units, front ends and other power handling building blocks.

Depending on a product functions system modules like (INU) inverter units, (AFE) active front end units, (BCU) brake chopper units, (GC) grid converter units and (DC) DC/DC converter units can be configured adequately.

All products use the same system module building block (NBU Neutral Base Unit) with AC/DC terminals, IGBTs (LV100/LINPAK - new module replacing SKIN module), DC capacitors and PCBAs. All the electronic components are placed inside IP55 enclosure, terminals are exposed therefore the IP rating is IP00. The product functions are defined by application software and options.

The product can be configured as basic system modules and loose filters or with integration units. Integration units improve serviceability and allow input and output filters to be integrated to the same mechanical construction.

iC7 system modules can be equipped with following options: L filter, LC filter, SIN filter, du/dt filter, common mode filter, DC filter, pre-charging circuit and cooling modules (heat exchanger)

### Technical data:

(In accordance with Danfoss design guide)

Power supply: 380-500 VAC / 525-690 VAC / 400-800 VDC / 640-1200 VDC

Voltage variation: AC +10%, -15%, DC +-0%

Input frequency: 45- 66 Hz

Output voltage: 0- U<sub>in</sub>, 3 phase

Output frequency: 0-599 Hz

Temperature class: B

Vibration class: A

Humidity class: B

EMC class: IEC 61800-3. To be used on EMC class A locations.

### Documents and drawings:

DANFOSS Drives diagrams: MIU+AR10L/3, MIU+AR12L/3, MIU+DR10L/3, MIU+IR10L/3, MIU+IR12L/3,

DANFOSS iC7 Series Liquid- cooled System Modules Operating Guide

DANFOSS Propulsion Application Software Guide for iC7- Marine, iC7-60 Series

### Test reports:

CB Test certificate no.: FI-51319 corresponding test report- HELES2102000122-1

CB Test certificate no.: FI-513220, corresponding test report- HELES2102000122-2

Adjustable speed electrical power drive systems- Part 5-1: Test Report HELES22000152-1

Mechanical Tests- LINPAK Module IM10L, INU 416 A report no.: EUFI29-21002279-T1

Test Report iC7-60 LCD P4050- IACS UR E-10

DANFOSS Vibration Simulation with ANSYS Mechanical- Frame: IM12L

DANFOSS Vibration Simulation with ANSYS Mechanical- LC-Filter 1000 A

Electromagnetic Compatibility EMC Test Report 299288-1, HELEM2204000174-1, HELEM2204000174-2

Mechanical Tests - Control unit for Viking system modules: EUFI29-19004866-T2

Mechanical Tests - iC7-60SL3A07-380AE00C : EUFI29-19006315-T2

Mechanical Tests - iC7-60SL3A08-750AE00C4 : EUFI29-19004589-T4

Mechanical Tests - iC7-60SL3A08-750AE00C4 : EUFI29-19004589-T6

Mechanical Tests - iC7-60SLIN08-820AE00C4 : EUFI29-19004589-T2

**TYPE APPROVAL CERTIFICATE**

**No. ELE105223XP**

**Enclosure - Page 2 of 2**

**iC7-60**

**Remarks:**

- The products fulfill EC-Code: EC21.
- All changes in software are to be recorded as long as the system is in use on board. Major changes in the software are to be approved before being installed in the converter.
- This approval is granted only on the basis of positive outcome of verifications on board to be carried out according to the all above mentioned remarks and to all other applicable RINA Rules.
- Any modification / upgrade of the firmware installed in the system is to be communicated; functional test and spot check are to be carried out and witnessed by a RINA Surveyor, to give evidence of the correct function of the system.

**GDAŃSK September 7, 2023**

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