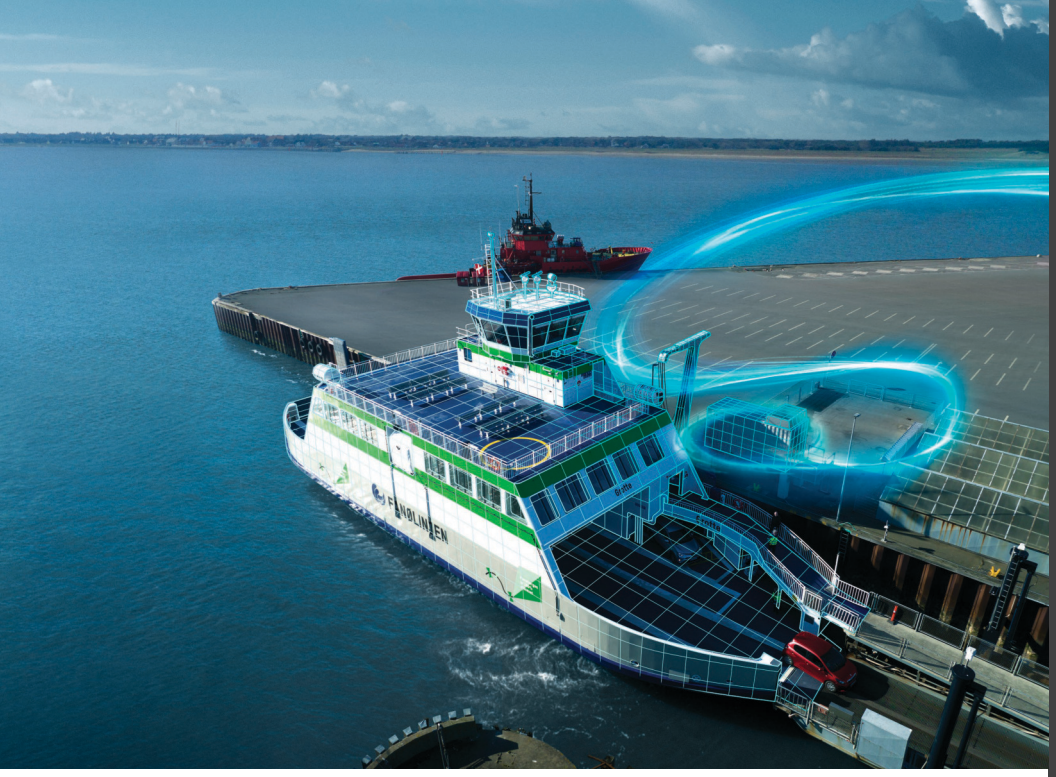


ENGINEERING TOMORROW

Fact sheet | iC7-Marine

Need **strong** and **secure performance**, with **flexible** integration?

iC7-Marine liquid-cooled system modules enable you to build ultra-compact configurations performing with powerful robustness in marine and offshore environments.

Choose application software to suit your purpose:

- Propulsion & Machinery
- Active Front-end

Feature	Benefit
Secure-by-design	Reduce risk of downtime due to unauthorized access
High power density	Save space and reduce cooling costs
Native integration of filters below the power units	Save space and reduce installation costs
Highly accurate motor control	Save costs and improve performance
Modular control architecture	Improve performance by adapting to your application's needs
Integrated Ethernet communication interfaces	Save costs and time in installation
Quick-connection of power unit cooling when using the integration units	Save costs and time in installation and servicing
High number of integrated sensors	Improve performance and control accuracy
Expandable, encrypted microSD card-based memory	Securely record operational data for offline analysis

HIGHLIGHTS

- Unrivalled power density
- Robust in harsh environments
- Modular, scalable and serviceable
- Designed for easy integration
- Superior control performance
- Digital twin simulation models reduce risk and get you to market faster
- Cybersecure by design

Unlock

competitive new marine performance levels, with unrivalled power density

Learn more about iC7-Marine

iC7.danfoss.com iC7

iC7-Marine Liquid-cooled System Modules – the **ultimate** in **power density**

iC7-Marine is available in 2 variants

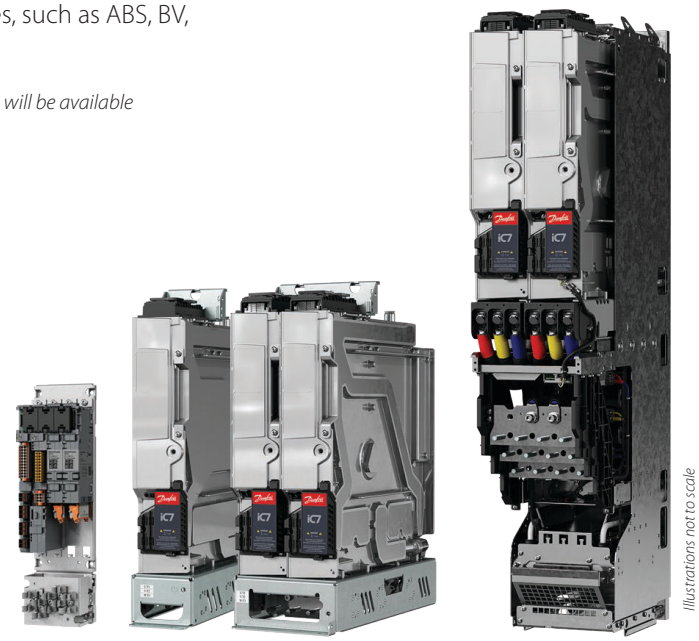
- System modules: Ideal for installations with low height clearance
- System modules with integration unit: integrated filters in a compact housing. Optimized power density for easy cabinet installation and serviceability

Pack in more power video

Type approvals [1]

Based on decades of experience across a wide range of Marine and Offshore applications, iC7-Marine drives fulfill type approvals of major classification societies, such as ABS, BV, CCS, DNV, and RINA.

[1] Additional type approvals will be available during 2024.



Illustrations not to scale

Voltage range	3 x 525-690 V AC 640-1100 V DC 3 x 380-500 V AC (B5) 465-800 V DC (B5)
Current range	AFE 236-5750 A INU 170-6400 A

For ratings and dimensions, refer to the iC7 Selection Guide

Key specifications [1]

Mains connection (AFE)	
Mains voltage U_{in}	– Voltage class 07: 3 x 525-690 V AC (-15% – +10%); 640-1100 V DC (-0% – +0%) – Voltage class B5: 3 x 380-500 V AC (-15%…+10%); 465-800 V DC (-0%…+0%)
Mains frequency	– 45-66 Hz
Supply network	– TN-S, TN-C, IT and TT – Supply voltage limited to 500 V AC for corner grounded networks
Power factor	– cosφ = 1 (fundamental)
Short circuit current	– Maximum short circuit current must be < 100 kA
Total harmonics distortion THDi	– < 5%: < 3% with dedicated transformer
Overvoltage category	– Class III according to IEC/EN 61800-5-1
Imbalance	– Nominal performance with voltage imbalance ≤ 3%. – Limited performance with >3% voltage imbalance
Connections to mains	– Once every 120 s

[1] Values subject to validation

Motor connection (INU)	
Output voltage	– 0-U_{in} 3-phase
Output frequency	– 0-599 Hz *(Limited performance with output filters above 70 Hz)*
Switching frequency	– 1.5-10 kHz (525-690 V AC) Default switching frequency 3 kHz
Motor control principles	– U/f control – Voltage Vector Control (VVC+) – Flux Vector Control (FVC+)
Motor and generator types supported	– Induction/asynchronous motor – Permanent magnet motor – Salient permanent magnet motor – Synchronous reluctance assisted permanent magnet motor
Cable length	– Up to 150 m [492 feet] with symmetrical 3-phase screened motor cable

DC connection	
DC bus voltage	– Voltage class 07: 640-1100 V DC (-0%..+0%) – Voltage class B5: 465-800 V DC (-0%..+0%)
DC source voltage	– 3%-100% of DC bus voltage – 3%-97% of DC bus voltage with full control performance
Source current ripple with iC7 DC/DC Filters	– DR10L < 1% RMS (typical) – DR12L < 0.5% RMS (typical)

EMC (IEC61800-3)	
Immunity	– Fulfils IEC/EN61800-3 (2018), 2nd environment
Emissions	– IEC/EN61800-3 (2018), category C4, default for the IP00/UL Open Type drive – IEC/EN61800-3 (2018), category C3, if the drive is installed according to the instructions of the manufacturer *(C3 not applicable for DC/DC Converter)*

Liquid cooling	
Temperature of cooling agent	– -10 to +45°C (I_N)(nominal), up to 60 C with derating – Temperature rise during circulation max 10 °C – Glycol to be used in cooling agent below 0 °C and ice formation not permitted
System max. working pressure	– Operating pressure 100-150 kPa (recommended) – Maximum pressure 500 kPa
Pressure drop	– 50-120 kPa at rated volumetric flow.
Allowed cooling agents	– Demineralized water or good pure quality water according to cooling liquid quality specification with inhibitor and propylene or ethylene glycol
Corrosion inhibitor	– Corrosion inhibitor recommended, for long lifetime
Allowed materials in the cooling system	– Aluminum – Stainless steel AISI 304/316 – Plastic (PVC not allowed) – Elastomers (EPDM, NBR, FDM)

Environmental conditions	
Protection rating drive modules	– IP00/UL Open Type
Ambient operating temperature	– -15 °C (no frost) to +60 °C (at I_N)
Storage/transportation temperature	– -40 °C to +70 °C; glycol to be used in liquid under 0°C and ice formation not permitted
Relative humidity	– 5 to 96% RH, no dripping water or condensation allowed
Pollution degree	– PD3
Altitude	– 0-3000 m above sea level: voltage class 07 without AFE supply – 0-2000 m: voltage class 07 with AFE supply – Above 1,000 m derating of maximum ambient operating temperature by 0.5 °C per each 100 m is required
Vibration (IEC60068-2-6)	– Displacement amplitude 1 mm (peak) at 2-13.2 Hz – Maximum acceleration amplitude 0.7 G at 13.2-100 Hz with maximum amplification of 5
Shock (IEC60068-2-27)	– Max 15G, 11 ms *(in package)*
Environmental operating conditions (IEC 60721-3-3	– Climatic conditions: Class 3K22 – Chemically active substances: IEC 60721-3-3 Edition 3.0/ISO 3223 Second Edition, class C4 – Biological conditions: Class 3B1 – Mechanically active substances: Class 3S6 – Special climatic conditions (heat radiation): Class 3Z1

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iC7

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iC7-Automation | iC7-Marine | iC7-Hybrid

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Some functionalities listed in this fact sheet are for future implementation