Certificate No:
TAE00004BH

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Electric Machine

with type designation(s)
EM-PMI375-T800/ T1100, EM-PMI540-T1500/ T2000

Issued to
Danfoss Editron Oy
Lappeenranta, **Finland**

is found to comply with
DNV rules for classification – Ships, offshore units, and high speed and light craft

Application :

Products approved by this certificate are accepted for installation on all vessels classed by DNV.

Type	Degree of protection	Insulation class	Temp. class (°C)	Voltage (V)	Power (kW)	Frequency (Hz)	Speed (RPM)
EM-PMI375-T800/ T1100	IP65	H	155	500	86 - 303	90 - 380	900 - 3800
EM-PMI540-T1500/ T2000	IP65	H	155	500	133 - 473	93.3 - 320	700 - 2400

Issued at **Høvik** on **2021-12-13**
This Certificate is valid until **2026-12-12**.
DNV local station: **Helsinki FIS**

Approval Engineer: **Georgy Abramenko**

for **DNV**

Trond Sjåvåg
Head of Section

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid.
The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.

Product description

3-phase synchronous liquid cooled motor with permanent-magnet excitation controlled by frequency converter:

General Data	
Duty type:	S1
IP Rating	65
Ambient air temp.:	45 °C
Insulation class:	H
Nominal voltage:	500V AC

Type	**Motors**			**Generators**		
	In [A]	Pn [kW]	Rated speed [rpm]	In [A]	Apparent power [kVA]	Rated speed [rpm]
EM-PMI375-T800-900	116	86	900	119	105	1000
EM-PMI375-T800-1300	161	122	1300	160	141	1400
EM-PMI375-T800-1600	202	151	1600	201	175	1700
EM-PMI375-T800-1900	224	170	1900	222	193	2000
EM-PMI375-T800-2300	251	192	2300	247	212	2400
EM-PMI375-T800-2800	283	215	2800	279	242	2900
EM-PMI375-T800-3200	306	229	3200	301	258	3300
EM-PMI375-T800-3800	325	250	3800	318	273	3900
EM-PMI375-T1100-1200	221	176	1200	219	193	1300
EM-PMI375-T1100-1500	292	206	1500	288	251	1700
EM-PMI375-T1100-1800	310	231	1800	305	266	1900
EM-PMI375-T1100-2100	343	259	2100	338	293	2200
EM-PMI375-T1100-2400	358	266	2400	351	302	2500
EM-PMI375-T1100-2900	409	303	2900	401	344	3000
EM-PMI540-T1500-700	176	133	700	175	155	800
EM-PMI540-T1500-1200	293	216	1200	291	254	1400
EM-PMI540-T1500-1400	358	253	1400	356	308	1600
EM-PMI540-T1500-1600	391	278	1600	358	336	1800
EM-PMI540-T1500-1800	413	303	1800	409	354	2000
EM-PMI540-T1500-2100	454	339	2100	450	388	2300
EM-PMI540-T1500-2400	522	380	2400	516	443	2600
EMI-PMI540-T2000-700	267	199	700	266	233	800
EMI-PMI540-T2000-1300	431	325	1300	428	372	1400
EMI-PMI540-T2000-1700	543	405	1700	538	466	1900
EMI-PMI540-T2000-2100	633	473	2100	666	573	2300

Application/Limitation

1. When integrated in propulsion line, the documentation according to DNV Rules must be submitted for approval within product certification, as guided by additional Class notations requirements.
2. Product certification shall be carried out for motors of 300kW and above, as required by DNV rules Pt.4 Ch.8 Sec.1 Table 3. Excess torque- and current capabilities of the permanent-magnet motor as per makers technical data sheet. Motor characteristics and load requirements to be coordinated in the project application.
3. Products are not suitable for installation/ operation on open decks applications where IP56 equipment is required, unless optionally provided with IP67 rating.
4. Electrical machines are not rated to be used in redundancy type 3 design concept according to DNV Rules Pt.4 Ch.8 Sec.5.

Type Approval documentation

Tests carried out

Visual inspection, Temperature rise test at full load, IP rating, Overspeed, HV test (dielectric strength), Insulation resistance measurement, windings resistance measurement, Overload test, No load test, Over torque test.

Marking of product

Type designation - technical data including rated voltage - RPM, rated power - ambient temperature - rated current - rated frequency - insulation class - IP class

Periodical assessment

The scope of the periodical assessment is to verify that the conditions stipulated for the Type approval are complied with and that no alterations are made to the product design or choice of materials.
The main elements of the assessment are:

- Inspection on factory samples, selected at random from the production line (where practicable)
- Results from Routine Tests (RT) checked (if not available tests according to RT to be carried out)
- Review of type approval documentation
- Review of possible change in design, materials and performance
- Ensuring traceability between manufacturer's product type marking and Type Approval Certificate.

Periodical assessment is to be performed after 2 years and after 3.5 years. A renewal assessment will be performed at renewal of the certificate.

END OF CERTIFICATE