

TYPE APPROVAL CERTIFICATE

Certificate No:
TAE00000YN
Revision No:
6

This is to certify:

That the Generator

with type designation(s)
LSAM, LL and LC

Issued to

Moteurs Leroy Somer
Angoulême Cedex 9, France

is found to comply with

DNV rules for classification – Ships, offshore units, and high speed and light craft
DNV class programme DNV-CP-0393 – Type approval – Rotating electrical machines

Application :

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

Degree of protection	IP23, IP44 (derating 10%)
Insulation class	H
Temp. class (°C)	B, F or H
Voltage (V)	220V - 690V
Power (kW)	9kVA to 2350kVA (50Hz) ; 10.5kVA to 2615kVA (60Hz)
Frequency (Hz)	50 or 60 Hz
Speed (RPM)	1500 rpm or 1800 rpm

Issued at **Høvik** on **2022-05-23**

for **DNV**

This Certificate is valid until **2027-03-22**.

DNV local station: **France NB**

Approval Engineer: **Nicolay Horn**

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Trond Sjøvåg
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.



Name and place of manufacturer

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 16915 Angoulême cedex 9
 France

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Nidec Leroy Somer EPG
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 United States of America

Product description

AC Synchronous Generators for marine environments Type LSAM, LL and LC

LSAM types: 40, 42,3, 44.3, 46.2, 46.3, 47.2, 47.3, 49.1, 49.3, 50.2, 52.3
 LL/LC types: 11, 15, 31, 50, 51, 61, 62, 70, 72 and LL82 and 93

Enclosure class:	IP23, IP44 (derating 10%)
Winding insulation:	Class H
Temperature rise limits:	Class B, Class F or Class H
Voltage class:	220V to 690V
Power class:	9kVA to 2350kVA (50Hz) ; 10,5kVA to 2615kVA (60Hz)
Frequency class:	50 or 60 Hz
Speed:	1500 or 1800 rpm
Duty type:	S1
Power factor:	0,8, 0.9
Ambient temperature	45°C, 50°C
AVR:	R220, R250, R438, R449, R450, AREP, AREP+, PMG, D350, D510C, D550 and D700

Application/Limitation

The generator must be regarded as a component. The voltage regulator is a part of this type approval. However, the end user / system responsible must ensure that the generator including the voltage regulator fulfills the DNV Rules Pt.4 Ch.8 Sec.5 2.2. The adjustment of the AVR (lexc max, droop, U/f, knee point) to be checked during commissioning on board.

This type approval certificate does not replace the requirement to DNV Product Certificate for units larger than 300kVA.

Type Approval documentation

Technical info:

Electrical data sheet T20H35 rev. C dated 2020-07-21.

Electrical and mechanical data documentation for each type of alternator

Catalogue Marine Table – LSAM range Low voltage Alternator – 4 pole 4715 en – 2021.06/i

Drawings:

LSA473-8-001 to 020, LSA473-7-005, LSA473-3-023 to 029.

Lsa443-7-024/025/026, LSA443-8-125/132/134/139/140/141/142/145/146/147/148/149

LSA443-9-016/017.

List of drawings File T20H029 Rev 0 dated 15.03.2011

Test reports :

Nidec Marine type test LSAM 473 L10 with AVR D350 and D550

202003T019, T28BP R240, R241, R242/29.11.2005 + T28.T005/15.03.2011

Reports: N14179G6-A0220995, N141433U-A0220995, A0220995, ACEO/TECH/90-001

Tests carried out

Tested according to IEC 60034-1 / 2010-01 and GL Guidelines for the Performance of Type Approvals, VI-7-6 part 4, ed. 1999.

Marking of product

Leroy Somer S.A, type designation, serial number, ingress protection (IP), ambient temperature, power factor, voltage, current, frequency, speed, output apparent power, winding insulation.

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 Production Sample Tests (PST) and Routines (RT) checked (if not available tests according to PST and 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.

Assessment to be performed at 2 and 3.5 year and at renewal.

END OF CERTIFICATE