



Marine & Offshore

Certificate number: 16598/D0 BV

File number: ACE 04/440/04

Product code: 2572I

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

Nidec Leroy Somer EPG Angoulême
ANGOULEME cedex 9 - FRANCE

for the type of product

ALTERNATING CURRENT GENERATORS (Power 100kW and over)
LSAM series.

Requirements:

Bureau Veritas Rules for the Classification of Steel Ships, offshore units, naval ships and yachts.
IEC 60034-1 (2010), IEC 60092-301 (1995).

This certificate is issued to attest that Bureau Veritas Marine & Offshore 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 Jun 2026

For Bureau Veritas Marine & Offshore,

At BV BORDEAUX, on 28 Jun 2021,

Gabriel ZIMMER



This certificate remains valid until the date stated above, unless cancelled or revoked, provided the conditions indicated in the subsequent page(s) are complied with and the product remains satisfactory in service. This certificate will not be valid if the applicant makes any changes or modifications to the approved product, which have not been notified to, and agreed in writing with Bureau Veritas Marine & Offshore. Should the specified regulations or standards be amended during the validity of this certificate, the product(s) is/are to be re-approved prior to it/they being placed on board vessels to which the amended regulations or standards apply. This certificate is issued within the scope of the General Conditions of Bureau Veritas Marine & Offshore available on the internet site www.veristar.com. Any Person not a party to the contract pursuant to which this document is delivered may not assert a claim against Bureau Veritas Marine & Offshore for any liability arising out of errors or omissions which may be contained in said document, or for errors of judgement, fault or negligence committed by personnel of the Society or of its Agents in establishment or issuance of this document, and in connection with any activities for which it may provide.

THE SCHEDULE OF APPROVAL

1. PRODUCT DESCRIPTION:

Series LSAM ...Low voltage alternator for generator set – 4 poles

Cooling	Air
Degree of protection	IP 23 and IP 44
Ambient temperature	40°C to 50°C
Frequency	50 Hz and 60 Hz
Speed	1500 RPM and 1800 RPM
Excitation system	AREP with AVR type R... AREP+ with AVR type R... or PMG with AVR type R...or, AVR D510C, D350, D550 or D700
Winding	3 phase winding 6 wires or 12 wires 2/3 pitch
Voltage 50 Hz	220 V to 690 V
Voltage 60 Hz	208 V to 690 V
Insulation class	H
Thermal class	B or F or H
Duty	S1 and S2
Power factor	0,8
Mounting	Single bearing or two bearing arrangement
Prime mover	Diesel or gas engine or turbine

Rated power at S1 with degree of protection IP 23 and ambient temperature 45°C *

*The power indicated in these tables can be modified according to ambient temperature and duty type

1.1 Type LSAM 44.3

TYPE	POWER at 50 Hz Thermal class F/H kVA 380/400/415V	POWER at 60 Hz Thermal class F/H kVA 440/450/480	POWER at 50Hz Thermal class F/H kVA 690V	Power at 60Hz Thermal class F/H kVA 690V
LSAM 44.3S3	/	100	/	/
LSAM 44.3S4	/	102/113	/	100
LSAM 44.3S5	100	114/125	/	110
LSAM 44.3M6	113/123	135/147	/	105/124
LSAM 44.3M8	123/135	150/164	101/111	115/129
LSAM 44.3L10	137/150	169/184	117/128	140/155
LSAM 44.3VL13	145/160	175/190	125/140	145/165
LSAM 44.3VL14	155/170	180/200	135/150	155/175

1.2 Type LSAM 46.2

TYPE	POWER at 50 Hz Thermal class F kVA 380/400/415V	POWER at 50 Hz Thermal class H kVA 380/400/415V	POWER at 60 Hz Thermal class F kVA 440/450V	POWER at 60 Hz Thermal class H kVA 440/450V	POWER at 50 Hz Thermal class F/H kVA 690V	POWER at 60 Hz Thermal class F/H kVA 690V
LSAM 46.2 M3	166	180	200	208	142 / 152	165 / 185
LSAM 46.2 M5	180	195	210	230	160 / 170	180 / 200
LSAM 46.2 L6	217	240	265	290	200 / 210	225 / 250
LSAM 46.2 L9	250	270	300	327	225 / 240	255 / 285
LSAM 46.2VL12	276	308	340	372	250 / 270	270 / 305

1.3 Type LSAM 47.2

TYPE	POWER at 50 Hz Thermal class F kVA 380/400/415V	POWER at 50 Hz Thermal class H kVA 380/400/415V	POWER at 60 Hz Thermal class F kVA 440/450V	POWER at 60 Hz Thermal class H kVA 440/450V	POWER at 50 Hz Thermal class F/H kVA 690V	POWER at 60 Hz Thermal class F/H kVA 690V	POWER at 60Hz Thermal class B kVA 450V
LSAM 47.2 VS2	330	365	410	430	320 / 345	402 / 443	/
LSAM 47.2 S4	360	390	445	500	350 / 380	415 / 456	375
LSAM 47.2 S5	390	425	485	531	370 / 400	437 / 480	/
LSAM 47.2 M7	450	500	570	625	435 / 465	520 / 580	/
LSAM 47.2 L9	510	556	594	660	480 / 515	540 / 605	/

1.4 Type LSAM 49.1

TYPE	POWER at 50 Hz Thermal class F/H kVA 380/400/415V	POWER at 60 Hz Thermal class F/H kVA 440/450V	POWER at 50 Hz Thermal class F/H kVA 690V	POWER at 60 Hz Thermal class F/H kVA 690V
LSAM 49.1 S4	560 / 610	710 / 780	520/565	620 / 690
LSAM 49.1M5	600 / 650	760 / 830	/	660 / 732
LSAM 49.1 M6	615 / 680	775 / 820	580 / 630	710/786
LSAM 49.1M75	675 / 730	845 / 890	625 / 680	760 / 840
LSAM 49.1L8	/	/	/	830 / 934
LSAM 49.1 L9	740 / 810	930 / 1000	/	/
LSAM 49.1 L10	/	/	750 / 800	/
LSAM 49 L11	900 / 980	1070 / 1170	760 / 830	/

1.5 Type LSAM 50.2

TYPE	POWER at 50 Hz Thermal class F/H kVA 380/400/415V	POWER at 60 Hz Thermal class F/H kVA 440/450V	POWER at 50 Hz Thermal class F/H kVA 690V	POWER at 60 Hz Thermal class F/H kVA 690V
LSAM 50.2 M6	1080 / 1195	1300 / 1420	960 / 1030	1090 / 1220
LSAM 50.2 L7	1175 / 1290	1390 / 1550	1030 / 1100	/
LSAM 50.2 L8	1270 / 1400	1520 / 1685	1125 / 1215	1290 / 1440
LSAM 50.2 VL10	1390 / 1540	1670 / 1840	1290 / 1385	1450 / 1625

1.6 Type LSAM46.3

TYPE	POWER at 50 Hz Thermal class F/H kVA 380/415V	POWER at 60 Hz Thermal class F/H kVA 440/480V	POWER at 50 Hz Thermal class F/H kVA 690V	POWER at 60 Hz Thermal class F/H kVA 690V
LSAM46.3S2	163/180	191/210	145/160	165/185
LSAM46.3S3	180/195	210/230	160/170	185/206
LSAM46.3S4	202/220	237/261	180/200	213/240
LSAM46.3S5	215/231	250/275	190/210	225/250
LSAM46.3M7	240/261	280/307	216/240	240/270
LSAM46.3M8	253/275	295/324	230/253	255/287
LSAM46.3L10	276/300	314/345	240/270	270/300
LSAM46.3L11	303/332	353/388	256/282	295/330

1.7 Type LSAM49.3

TYPE	POWER at 50 Hz Thermal class F/H kVA 380/415V	POWER at 60 Hz Thermal class F/H kVA 440/480V	POWER at 50 Hz Thermal class F/H kVA 690V	POWER at 60 Hz Thermal class F/H kVA 690V
LSAM49.3S4	590/610	681/755	550/615	625/700
LSAM49.3M6	660/730	760/840	600/680	750/800
LSAM49.3M8	760/820	850/940	650/700	800/860
LSAM49.3L9	820/910	940/1045	725/800	850/900
LSAM49.3L10	892/971	1031/1146	775/850	900/950

1.8 Type LSAM52.3

TYPE	POWER at 50 Hz Thermal class F/H kVA 380/415V	POWER at 60 Hz Thermal class F/H kVA 440/480V	POWER at 50 Hz Thermal class F/H kVA 690V	POWER at 60 Hz Thermal class F/H kVA 690V
LSAM52.3S6	1640/1795	1965/2155	1510/1670	-
LSAM52.3S7	1925/2110	2310/2535	1680/1855	2070/2285
LSAM52.3L9	2085/2305	2505/2770	1965/2170	2150/2375
LSAM52.3L12	2210/2445	2655/2930	2140/2365	2550/2815

Options:

Filters on air inlet and air outlet (IP 44).

Winding protections for harsh environments and relative humidity greater than 95%.

Space heaters.

Thermal protection for winding.

Possible inclusion of accessories for paralleling, protection and measurement.

2. DOCUMENTS AND DRAWINGS:

List of drawing N°T20H39, rev. A, dated 04 Feb 2020.

Catalogues references:

Marine	4715, rev. i	dated Dec 2018
LSAM 44.3	5028, rev. m	dated Sep 2020
LSAM 46.2	3790, rev. i	dated Apr 2015
LSAM 46.3	5273, rev. j	dated Sep 2020
LSAM 47.2	3782, rev. p	dated Sep 2020
LSAM 49.1	3867, rev. h	dated May 2014
LSAM 49.3	5279, rev. j	dated Sep 2020
LSAM 50.2	4098, rev. m	dated Sep 2020
LSAM 52.3	5199, rev. i	dated Jul 2020

Specification Ref: T20H035, Rev. C, dated 21 Jul 2020.

Drawing Ref. LSA443-8-132, Rev.B, dated 12 Oct 2017.

3. TEST REPORTS:

3.1 - Type tests carried out according to BV Rules Pt C, Ch 2, Sec 4 table 1.

Result of type tests in electrical data sheet

Data sheet references

LSAM 44.3	T20H035, rev. C	dated 21 Jul 2020
LSAM 46.2	T20H006, rev. D	dated 02 Oct 2020
LSAM 46.3	T20H036, rev. C	dated 21 Aug 2020
LSAM 47.2	T20H007, rev. E	dated 21 Aug 2020
LSAM 49.1	T20H003, rev. G	dated 18 Aug 2014
LSAM 49.3	T20H037, rev. C	dated 21 Aug 2020
LSAM 50.2	T20H026, rev. D	dated 30 Sep 2020
LSAM 52.3	TECH/SCO./0132, rev. A	dated 26 Aug 2015

3.2 - Degree of protection carried out according to EN 60034 Part 5

LCIE N°124095 - 649339A for IP23.

LCIE N°124095 - 649339B for IP44.

3.3 - Tests reports dated 22.05.2014., witnessed by BV's Surveyor.

3.4 - Tests report dated 17.Dec.2015.

3.5 - Tests report dated 07.Jul.2015.

3.6 - Tests report dated 18.Dec.2015.

3.7 - Tests report, dated 09 Aug 2019.

3.8 - Tests report N° 202003T018, dated 03 Mar 2020.

4. APPLICATION / LIMITATION:

4.1 Application / limit of use

According to BV Rules for the classification of steel ships, offshore units, naval ships and yachts.

- Power decrease of 10% from table in item I when degree of protection IP 44.

- Power decrease of 5% from table in item I when degree of protection IP 23 with air inlet filter.

4.2 - On board installation & Maintenance requirements:

According to BV Rules for the classification of steel ships, offshore units, naval ships and yachts.

5. PRODUCTION SURVEY REQUIREMENTS:

5.1 - The **generators series LSAM** are to be supplied by **Nidec Leroy Somer EPG Angoulême** in accordance with the type described in this certificate and Bureau Veritas Rules for the Classification of Steel Ships.

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 - For information, **Nidec Leroy Somer EPG Angoulême** has declared to Bureau Veritas the following production sites:

<p>Leroy Somer 669 Natchez Trace Drive Lexington, TN UNITED STATES OF AMERICA</p>	<p>Leroy Somer Electro Technology (Fuzhou) Co.Ltd No.1 Aimosheng Road, Gaishan Town Cangshan District Fuzhou, Fujian Province 350026 Fuzhou CHINA</p>	<p>Nidec Leroy Somer EPG Angoulême Boulevard Marcellin Leroy CS 10015 16915 ANGOULEME cedex 9 FRANCE</p>
<p>Nidec Moteurs Leroy Somer OLO1 HOLICE SPOL. S.R.O SLADKOVSKÉHO 43 779 00 OLOMOUC CZECH REPUBLIC</p>	<p>NIDEC MOTEURS LEROY SOMER OLO2 & 3 M.L.S. HOLICE SPOL S R.O. PRUMYSLOVA 5/740 779 00 OLOMOUC CZECH REPUBLIC</p>	<p>NIDEC Leroy Somer EPG Orléans ACO 1 rue de la Buelle 45800 SAINT JEAN DE BRAYE FRANCE</p>
<p>Leroy-Somer Reynosa Maquinaria y Herramienta, S. de R.L. de C.V. Reynosa Industrial Center Ave. Industrial Reynosa Lote-6 88780 Reynosa, Tamaulipas MEXICO</p>		

6. MARKING OF PRODUCT:

6.1 - Name plate according to IEC 60034-1.

6.2 - Stamp  on frame when BV Mode I survey

6.3 - Stamp  on frame when individual inspection

7. OTHERS:

7.1 - It is **Nidec Leroy Somer EPG Angoulême** 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 Certificates n° 16598/C5 BV issue on 27 Nov 2020 by Bureau Veritas.

*** END OF CERTIFICATE ***