



**Marine & Offshore
Division**

Certificate number: 22030/B0 BV

File number: ACE 04/856/01

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

SOGA S.P.A

MONTECCHIO MAGGIORE (VI) - ITALY

for the type of product

ALTERNATING CURRENT GENERATORS (Power 100kW and over)

Synchronous Brushless Generators
SK series

Requirements:

Bureau Veritas Rules for the Classification of Steel Ships.
IEC 60034 (2010)

This certificate is issued to attest that BUREAU VERITAS 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: 06 Mar 2020

For BUREAU VERITAS,

At BV RIJEKA, on 06 Mar 2015,

Slaven Celic



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. 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 Division 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 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:

Three phase synchronous brushless generator - Type SK...

Single bearing or double bearing

Self excited with exciter and AVR powered by auxiliary winding: (AVR BL4-V analog and AVR DBL1 digital)

PMG with frames 400 and 450.

Frame material:	Steel
Number of poles:	4
Height of frame:	225, 250, 315, 355, 400 and 450
Voltage:	231/400 V 50 Hz – 260/450 V 60 Hz
Power factor:	0,8
Enclosure and cooling:	IP 23 – IC 01
Ambient temperature:	50°C
Duty type:	S1
Insulation class:	H
Temperature rise:	F

1.1 - Rated power at S1

Type	kVA 50 Hz	kVA 60 Hz
SK 225 LS	101	120
SK 225 LM	110	132
SK 250 SL	130	156
SK 250 MS	145	174
SK 250 MM	160	192
SK 250 ML	185	222
SK 250 LS	200	240
SK 250 LM	220	264
SK 250 LL	240	288
SK 315 SS	280	336
SK 315 SM	320	384
SK 315 SL	360	432
SK 355 MS	400	480
SK 355 MM	460	528
SK 355 LS	480	576
SK 355 LM	520	624
SK 355 WL	580	700
SK 400 SD	640	770
SK 400 SE	720	865
SK 400 SF	800	960
SK 450 SG	880	1055
SK 450 ME	1040	1250
SK 450 MF	1200	1440
SK 450 MG	1300	1560
SK 450 LE	1450	1740

Options:

Anti-condensation heaters

Thermal protection: PT100 or PTC or similar

Electronic device for parallel operation

2. DOCUMENTS AND DRAWINGS:

As per SINCRO technical description Z58975E Issue 1 dated Feb.2015.

3. TEST REPORTS:

N°s: 21580221104, 255049, 21572-03 Z/389, 84/568, SK 250 MS4-18.Dec.2008.

SK 225 LM tests report Ser.No. 29926, dated 28.Nov.2014.

4. APPLICATION / LIMITATION:

According to BV Rules for the Classification of Steel Ships and IEC 60092 series.

5. PRODUCTION SURVEY REQUIREMENTS:

- 5.1 - The above products are to be supplied by **SINCRO d.o.o., Rijeka** in compliance with the type and the requirements described in this certificate.
- 5.2 - This type of product is within the category IBV of Bureau Veritas Rule Note NR320.
- 5.3 - BV product certificate is required.

6. MARKING OF PRODUCT:

- 6.1 - Trade name.
- 6.2 - Date of manufacture and serial number.
- 6.3 - Equipment type or model identification under which it was type-tested
- 6.4 - @ or \ conformity marking, as relevant (I product only).

7. OTHERS:

- 7.1 - This approval is given on the understanding that the Society reserves the right to require check tests to be carried out on the units at any time and that the **SOGA S.P.A** will accept full responsibility for informing shipbuilders, ship-owners or their sub-contractors of the proper methods of use and general maintenance of the units and the conditions of this approval.
- 7.2 - This certificate supersedes the Type Approval Certificate N° 22030/A1 BV issued on 22.10.2013. by the Society.

*** END OF CERTIFICATE ***