



MARINE DIVISION

Certificate number: 32147/A1 BV

File number: ACE4/484/5

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

MECC ALTE SPA

Creazzo (VI) - ITALY

for the type of product

ALTERNATING CURRENT GENERATORS

ECO/ECP series.

Requirements:

Bureau Veritas Rules for the Classification of Steel Ships

IEC 60034 series, IEC 60092 - 301

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: 30 Jan 2018

For BUREAU VERITAS,

At BV VENEZIA, on 11 Mar 2013,

Sandro BRUSEGAN



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 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:

Trifases Synchronous A.C Generators Type ECO & ECP.

Enclosure class :	IP 23 (IP45)
Winding Insulation :	Class H
Temperature rise limits :	Class B, F or H
Voltage class	Up to 480 V
Power class	Up to 2880 kVA
Frequency class	50 or 60 Hz
Speed	1500 or 1800 rpm

Rating class H : [kVA] Amb 45°C

Type	50 Hz			60 Hz			
	380 V	400 V	415 V	440 V	450 V	460 V	480 V
ECO 32 2S/4	33.6	33.6	33.6	40.3	40.3	40.3	40.3
ECO 32 3S/4	38.4	38.4	38.4	46.1	46.1	46.1	46.1
ECO 32 1L/4	48.0	48.0	48.0	57.6	57.6	57.6	57.6
ECO 32 2L/4	57.6	57.6	57.6	65.3	67.2	69.1	69.1
ECO 32 3L/4	67.2	67.2	67.2	76.8	78.7	80.6	80.6
ECP 34 1S/4	81.6	81.6	81.6	97.9	97.9	97.9	97.9
ECP 34 2S/4	101	101	101	121	121	121	121
ECP 34 1L/4	125	125	125	139	144	150	150
ECP 34 2L/4	144	144	144	163	168	173	173
ECO 38 1SN/4	173	173	173	211	211	211	211
ECO 38 2SN/4	192	192	192	230	230	230	230
ECO 38 3SN/4	216	216	216	259	259	259	259
ECO 38 1LN/4	230	240	230	288	288	288	288
ECO 38 2LN/4	278	288	288	326	336	346	346
ECO 38 3LN/4	336	336	336	403	403	403	403
ECO 40 1S/4	384	384	384	432	446	461	461
ECO 40 2S/4	432	432	432	490	504	518	518
ECO 40 3S/4	480	480	480	557	566	576	576
ECO 40 1L/4	528	528	518	605	619	634	634
ECO 40 1.5L/4	595	595	595	672	693	714	714
ECO 40 2L/4	653	653	653	749	766	783	783
ECO 43 1SN/4	768	768	768	922	922	922	922
ECO 43 2SN/4	893	893	893	1018	1044	1071	1071
ECO 43 1LN/4	1056	1056	1056	1210	1238	1267	1267
ECO 43 2LN/4	1248	1248	1248	1423	1460	1498	1498

Rating class F : [kVA] Amb 45°C

Type	50 Hz			60 Hz			
	380 V	400 V	415 V	440 V	450 V	460 V	480 V
ECO 32 2S/4	30.8	30.8	30.8	37.0	37.0	37.0	37.0
ECO 32 3S/4	35.2	35.2	35.2	42.2	42.2	42.2	42.2
ECO 32 1L/4	44.0	44.0	44.0	52.8	52.8	52.8	52.8
ECO 32 2L/4	52.8	52.8	52.8	59.8	61.6	63.4	63.4
ECO 32 3L/4	61.6	61.6	61.6	70.4	72.2	73.9	73.9
ECP 34 1S/4	74.8	74.8	74.8	89.8	89.8	89.8	89.8
ECP 34 2S/4	92.4	92.4	92.4	111	111	111	111
ECP 34 1L/4	114	114	114	128	132	137	137
ECP 34 2L/4	132	132	132	150	154	158	158
ECO 38 1SN/4	158	158	158	194	194	194	194
ECO 38 2SN/4	176	176	176	211	211	211	211
ECO 38 3SN/4	198	198	198	238	238	238	238
ECO 38 1LN/4	211	220	211	264	264	264	264
ECO 38 2LN/4	255	264	264	299	308	317	317
ECO 38 3LN/4	308	308	308	370	370	370	370
ECO 40 1S/4	352	352	352	396	409	422	422
ECO 40 2S/4	396	396	396	449	462	475	475
ECO 40 3S/4	440	440	440	510	519	528	528
ECO 40 1L/4	484	484	475	554	568	581	581
ECO 40 1.5L/4	546	546	546	616	635	655	655
ECO 40 2L/4	598	598	598	686	702	718	718
ECO 43 1SN/4	704	704	704	845	845	845	845
ECO 43 2SN/4	818	818	818	933	957	982	982
ECO 43 1LN/4	968	968	968	1109	1135	1162	1162
ECO 43 2LN/4	1144	1144	1144	1304	1338	1373	1373

Rating class H : [kVA] Amb 45°C

Type	50 Hz			60 Hz			
	380 V	400 V	415 V	440 V	450 V	460 V	480 V
ECO 46 1S/4	1440	1440	1440	1650	1690	1730	1730
ECO 46 2S/4	1730	1730	1730	1970	2020	2080	2080
ECO 46 1L/4	2016	2016	2016	2300	2360	2420	2420
ECO 46 2L/4	2400	2400	2400	2730	2800	2880	2880

Rating class F : [kVA] Amb 45°C

Type	50 Hz			60 Hz			
	380 V	400 V	415 V	440 V	450 V	460 V	480 V
ECO 46 1S/4	1300	1300	1300	1470	1520	1560	1560
ECO 46 2S/4	1540	1540	1540	1750	1800	1850	1850
ECO 46 1L/4	1825	1825	1825	2070	2130	2200	2200
ECO 46 2L/4	2160	2160	2160	2450	2520	2600	2600

For Class B rating temperatures rises, multiply class H rating by 0.792.

For degree of protection IP45 (fitting and air inlet filter and air outlet filter), multiply class H rating by 0.74.

2. DOCUMENTS AND DRAWINGS:**Mecc Alte:**

- MCH-2010-005, dated 29/01/2010.
- MCH-2011-100, dated 08/10/2012.
- MCH-2009-007, dated 10/02/2009.
- CLP 054, dated 28/04/2008.
- MCH-2009-117, dated 17/12/2009.
- MCH-2012-010, dated 14/02/2012.

3. TEST REPORTS:**Mecc Alte:**

- All tests witnessed by BV's Surveyor, dated : 08/02/2011, 18/09/2012, 24/09/2009, 24/09/2012, 30/03/2011.
- Tests reports N°1139989/1139983/1139992/1139985/1138872/1139993, stamped Accepted and Reviewed on 16/01/2013.
- Tests reports N°1142998/1131793/1350615/1139996/1139990, stamped Accepted and Reviewed on 16/01/2013.

4. APPLICATION / LIMITATION:

BUREAU VERITAS Rules and Regulations for the Classification of Steel Ships.

5. PRODUCTION SURVEY REQUIREMENTS:

- 5.1 - The generators are to be supplied by **MECC ALTE SPA** 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:

- Name plate according to IEC 60034-1
- Society's brand as relevant

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 by **MECC ALTE**, will accept full responsibility for informing shipbuilders, shipowners 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° 32147/A0 BV issued on 30/01/2013 by the Society.

*** END OF CERTIFICATE ***