MARINE DIVISION

17 bis Place des Reflets - La Défense 2
92400 Courbevoie - France

Tel. 33 1 42 91 52 91
Fax. 33 1 42 91 28 94
www.veristar.com

Certificate number: 07471/C0 BV

File number : ACE 02/010/10

Product code : 2633H

This certificate is not valid when presented without the full attached schedule composed of 7 sections

TYPE APPROVAL CERTIFICATE

as per Bureau Veritas Classification Rules

This certificate is issued to

ABB SACE S.p.A.

Bergamo - ITALY

for the type of product

CIRCUIT BREAKERS (LOW VOLTAGE)

Type: EMAX E1B, E1N, E2B, E2N, E2S, E3N, E3S, E3H, E3V, E4S, E4H, E4V, E6H, E6V.

Regulations and standards :
BV Rules for the Classification of Steel Ships.
IEC 60947-2.

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 of the Regulations and standards mentioned above.

This certificate is valid until : 09 Jul 2012

At Paris la Défense, on : 09 Jul 2007

For BUREAU VERITAS,
By order of the Secretary

L.COURREGELONGUE

Approval office

Local office : BV GENOA
Surveyor : G. Pirovano

THE SCHEDULE OF APPROVAL

1. PRODUCT DESCRIPTION :

Product Type	Number of poles	Rated service voltage Ue [V AC]	Icu [kA]	Ics [kA]	Rated insulation voltage Ui [V]	Remarks
Circuit breakers Type E1B: 800 A 1250 A	**3 - 4**	**690**	**42** (220/230/380/ 400/415/440/ 500/525/660/ 690 V AC)	**42** (220/230/380/ 400/415/440/ 500/525/660/ 690 V AC)	**1000**	see note 1)
Circuit breakers Type E1N: 800 A 1000 A 1250 A 1600 A	**3 - 4**	**690**	**50** (220/230/380/ 400/415/440/ 500/525/660/ 690 V AC)	**50** (220/230/380/ 400/415/440/ 500/525/660/ 690 V AC)	**1000**	see note 1)
Circuit breakers Type E2B: 1600 A 2000 A	**3 - 4**	**690**	**42** (220/230/380/ 400/415/440/ 500/525/660/ 690 V AC)	**42** (220/230/380/ 400/415/440/ 500/525/660/ 690 V AC)	**1000**	see note 1)
Circuit breakers Type E2N: 1250 A 1600 A 2000 A	**3 - 4**	**690**	**65** (220/230/380/ 400/415/440 V AC) **55** (500/525/660/ 690 V AC)	**65** (220/230/380/ 400/415/440 V AC) **55** (500/525/660/ 690 V AC)	**1000**	see note 1)
Circuit breakers Type E2S: 800 A 1000 A 1250 A 1600 A 2000 A	**3 - 4**	**690**	**85** (220/230/380/ 400/415/440 V AC) **65** (500/525/660/ 690 V AC)	**85** (220/230/380/ 400/415/440 V AC) **65** (500/525/660/ 690 V AC)	**1000**	see note 1)
Circuit breakers Type E3N: 2500 A 3200 A	**3 - 4**	**690**	**65** (220/230/380/ 400/415/440/ 500/525/660/ 690 V AC)	**65** (220/230/380/ 400/415/440/ 500/525/660/ 690 V AC)	**1000**	see note 1)
Circuit breakers Type E3S: 1250 A 1600 A 2000 A 2500 A 3200 A	**3 - 4**	**690**	**75** (220/230/380/ 400/415/440/ 500/525/660/ 690 V AC)	**75** (220/230/380/ 400/415/440/ 500/525/660/ 690 V AC)	**1000**	see note 1)
Circuit breakers Type E3H: 1250 A 1600 A 2000 A 2500 A 3200 A	**3 - 4**	**690**	**100** (220/230/380/ 400/415/440/ 500/525 VC) **85*** (660/690 V AC)	**85** (220/230/380/ 400/415/440/ 500/525/660/ 690 V AC)	**1000**	see note 1) (*) The performance at 600V is 100 kA
Circuit breakers Type E3V: 800 A 1250 A 1600 A 2000 A 2500 A 3200 A	**3 - 4**	**690**	**130** (220/230/380/ 400/415/440 V AC) **100** (500/525/660/ 690 V AC)	**100** (220/230/380/ 400/415/440 V AC) **85** (500/525/660/ 690 V AC)	**1000**	see note 1)

Circuit breakers Type E4S: 4000 A	**3 - 4**	**690**	**75** (220/230/380/ 400/415/440/ 500/525/660/ 690 V AC)	**75** (220/230/380/ 400/415/440/ 500/525/660/ 690 V AC)	**1000**	see note 1)
Circuit breakers Type E4H: 3200 4000 A	**3 - 4**	**690**	**100** (220/230/380/ 400/415/440/ 500/525 V AC) **85*** (660/690 V AC)	**100** (220/230/380/ 400/415/440/ 500/525 V AC) **85** (660/690 V AC)	**1000**	see note 1) (*) The performance at 600V is 100 kA
Circuit breakers Type E4V: 3200 4000 A	**3 - 4**	**690**	**150** (220/230/380/ 400/415/440 V AC) **130** (500/525 V AC) **100** (660/690 V AC)	**125** (220/230/380/ 400/415/440 V AC) **130** (500/525 V AC) **100** (660/690 V AC)	**1000**	see note 1)
Circuit breakers Type E6H: 4000 A 5000 A 6300 A	**3 - 4**	**690**	**100** (220/230/380/ 400/415/440/ 500/525/660/ 690 V AC)	**100** (220/230/380/ 400/415/440/ 500/525/660/ 690 V AC)	**1000**	see note 1)
Circuit breakers Type E6V: 3200 A 4000 A 5000 A 6300 A	**3 - 4**	**690**	**150** (220/230/380/ 400/415/440 V AC) **130** (500/525 V AC) **100** (660/690 V AC)	**125** (220/230/380/ 400/415/440 V AC) **100** (500/525/660/ 690 V AC)	**1000**	see note 1)

Note: 1) All above circuit breakers are equipped with the microprocessor - based releases type:
PR 111, PR 112, PR 113, PR 121, PR 122 and PR 123.

2. DOCUMENTS AND DRAWINGS :

Technical catalogue - Preliminary - 1SDC200006D0202.

3. TEST REPORTS :

ACEA Laboratory test reports: 96.232 dated 1996.09.30 ; 96.307 dated 1996.10.10 ; 96.306 dated 1996.10.10 ; 96.232/1 dated 1996.09.30 ; 96.249 dated 1996.07.02 ; 20847 dated 2000.03.14 (for association with PR112).

- Test report ABB SACE n° LBRP 5145 dated 31.08.2001.
- Test report ABB SACE TMS n° 20995 dated 13.11.2000 & 23.11.2000.
- Test report ABB SACE Ref.: modR020/lab-edB dated 12.11.2001.

ACEA Laboratory test reports: 96.302, 96.303, 96.304, 96.305 dated 1996.10.10 ; 96.234, 96.234/1 dated 1996.09.30 ; 96.233 dated 1996.07.02 ; 96.365 dated 1996.10.1 ; 96.366, 96.367, 96.308, 96.309, 96.310 dated 1996.10.10 ; 10 420 dated 2000.02.25 (for association with PR 112).

- Test report ABB SACE n° LBRP 5145 dated 31.08.2001.
- Test report ABB SACE TMS n° 20995 dated 13.11.2000 & 23.11.2000.
- Test report ABB SACE Ref.: modR020/lab-edB dated 12.11.2001.

ACEA Laboratory test reports: 96.524, 96.525, 96.523 dated 1997.01.30 ; 97.035 dated 1997.05.06 ; 96.499, 96.500 dated 1997.01.20 ; 96.501 dated 1997.01.30 ; 96.502 dated 1997.01.20 ; 96.503, 96.504 dated 1996.12.11 ; 96.505 dated 1997.01.30 ; 96.368 dated 1996.10.10 ; 96.427 dated 1996.12.16 ; 96.370 dated 1996.10.10 ; 96.369 dated 1996.10.10 ; 96.421, 96.422, 96.423, 96.424 dated 1996.12.02; 96.425, 96.426, 96.428 96.429 dated 1996.12.09; 96.371, 96.372, 96. 373 dated 1996.10.10; 96.497, 96.496 dated 1996.12.11, 96.498 dated 1997.01.30 ; 97.034, 97.036 dated 1997.05.06.

- Test report ABB SACE n° LBRP 5145 dated 31.08.2001.
- Test report ABB SACE TMS n° 20995 dated 13.11.2000 & 23.11.2000.
- Test report ABB SACE Ref.: modR020/lab-edB dated 12.11.2001.

ACEA Laboratory test reports: 97.040, 97.041 dated 1997.05.06 ; 97.114, 97.115, 97.125 dated 1997.05.20 ; 97.037, 97.038, 97.039 dated 1997.05.06 ; 97.116 dated 1997.05.20 ; 97.037 dated 1997.05.06.

- Test report ABB SACE n° LBRP 5145 dated 31.08.2001.
- Test report ABB SACE TMS n° 20995 dated 13.11.2000 & 23.11.2000.
- Test report ABB SACE ref.: N° modR020/lab-edB dated 12.11.2001.

ACEA Laboratory test reports: 97.182 dated 1997.06.18 ; 97.152 dated 1997.06.17 ; 97.117, 97.118 dated 1997.05.20 ; 97.303 dated 1997.07.28 ; 97.225 dated 1997.06.25 ; 9467 dated 1997 (for association with PR 112).

- Test report ABB SACE n° LBRP 5145 dated 31.08.2001.
- Test report ABB SACE TMS n° 20995 dated 13.11.2000 & 23.11.2000.
- Test report ABB SACE ref.: modR020/lab-edB dated 12.11.2001.

LOVAG test reports: 05.071 dated 2005.11.04 ; 05.072 dated 2005.11.08 ; 05.067 dated 2005.10.24 ; 05.068 dated 2005.10.19 ; 04.163 dated 2004.12.17 ; 04.164 dated 2005.03.02 ; 04.165 dated 2005.03.11 ; 04.166 dated 2005.03.07 ; 04.167 dated 2005.03.22 ; 04.168 dated 2004.12.16.
Intertek ETL SEMKO test reports: E133S2105G1_07 dated 2005.05.03 ; E133S2105G2_08 dated 2005.05.02 ; E133S2105G2_09 dated 2005.05.02 ; E133S2105G3_06 dated 2005.05.02.
ACAE test reports: 05.033 and 05.034 dated 2005.05.18.

4. APPLICATION / LIMITATION :

To be used with PR 111, PR 112, PR 113, PR121, PR 122 and PR 123 units.

5. PRODUCTION SURVEY REQUIREMENTS :

5.1 - The Circuit Breakers, types: EMAX E1B, E1N, E2B, E2N, E2S, E3N, E3S, E3H, E3V, E4S, E4H, E4V, E6H, E6V, are to be manufactured, examined and tested by **ABB SACE S.p.A**., in accordance with the type described in this certificate and Bureau Veritas Rules for the Classification of Steel Ships.

5.2 - Production sites are to be recognized by Bureau Veritas as per NR320 for HBV products. To this end **ABB SACE S.p.A.** has to make the necessary arrangements for a Society's Surveyor to perform visits and product audits at the production sites.

5.3 - Each equipment is to be supplied with Manual(s) for installation, use & maintenance.

6. MARKING OF PRODUCT :

According to IEC 60947 Specification.

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 **ABB SACE S.p.A.,** 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 Certificates N°s: 07472/B0 BV, 07473/B0 BV, 07474/B0 BV and 07475/B0 BV issued on 23/04/2002 and 07471/B1issued on 13/02/2007 BVby the Society.

***** END OF CERTIFICATE *****