

## Type Approval Certificate

*This is to certify that the undernoted products have been tested with satisfactory results in accordance with the relevant requirements of the Lloyd's Register Type Approval System.*

This certificate is issued to:

**PRODUCER**

ABB SpA - ABB Sace Division  
Via Baioni, 35  
Bergamo, 24123  
Italy

**PLACE OF  
PRODUCTION**

Via Enrico Fermi 14  
Frosinone 03100  
ITALY

**DESCRIPTION**

Low voltage air circuit breakers and electronic release units for Direct Current applications

**TYPE**

Circuit breakers: Emax E2 and Emax E3  
Electronic release units: PR122/DC and PR123/DC

**APPLICATION**

Marine and offshore applications in Category ENV1, ENV2, ENV3 as defined in LR Type Approval System Test Specification No. 1 2002

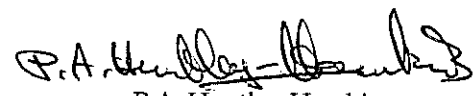
**STANDARD**

IEC 60947-2:2006

**RATINGS**

Rated voltage (V): 500 – 750 – 1000 DC  
Rated current (A): 800 – 2500

Certificate No. 11/00055  
Issue Date 13 October 2011  
Expiry Date 12 October 2016  
Sheet 1 of 3

  
P.A. Huntley-Hawkins  
London Design Support Office  
Lloyd's Register EMEA

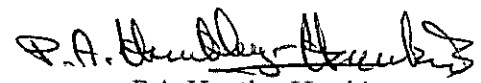
*Lloyd's Register EMEA  
71 Fenchurch Street, London EC3M 4BS*

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## RATINGS (Continued)

	E2	
	B	N
Insulation voltage $U_i$ (V)	1000	1000
Impulse withstand voltage $U_{imp}$ (kV)	12	12
Current $I_u$ (A) at 40 °C	800 - 1600	1600
Ultimate breaking capacity $I_{cu}$		
500 V DC (kA) (III)	35	50
750 V DC (kA) (III)	25	25
1000 V DC (kA) (IV)	25	25
Service breaking capacity $I_{cs}$ (% $I_{cu}$ )	100	100
Short-time withstand current $I_{cw}$ (0.5sec)		
500 V DC (kA) (III)	35	50
750 V DC (kA) (III)	25	25
1000 V DC (kA) (IV)	25	25
Making capacity $I_{cm}$ (% $I_{cu}$ )	100	100
Utilisation category	B	B
Electronic trip unit	PR122/DC PR123/DC	PR122/DC PR123/DC

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## RATINGS (Continued)

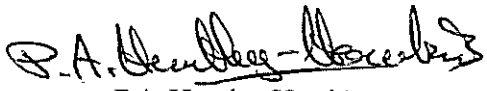
	E3	
	N	H
Insulation voltage $U_i$ (V)	1000	1000
Impulse withstand voltage $U_{imp}$ (kV)	12	12
Current $I_u$ (A) at 40 °C	800 - 2500	1600 - 2500
Ultimate breaking capacity $I_{cu}$		
500 V DC (kA) (III)	60	65 <sup>*)</sup>
750 V DC (kA) (III)	40	40
1000 V DC (kA) (IV)	35	40
Service breaking capacity $I_{cs}$ (% $I_{cu}$ )	100	100
Short-time withstand current $I_{cw}$ (0.5sec)		
500 V DC (kA) (III)	60	65
750 V DC (kA) (III)	40	40
1000 V DC (kA) (IV)	35	40
Making capacity $I_{cm}$ (% $I_{cu}$ )	100	100
Utilisation category	B	B
Electronic trip unit	PR122/DC PR123/DC	PR122/DC PR123/DC

\*)  $I_{cu}$  = 85kA if supplied from bottom of breaker.

*"This Certificate is not valid for equipment, the design, ratings or operating parameters of which have been varied from the specimen tested. The manufacturer should notify Lloyd's Register EMEA of any modification or changes to the equipment in order to obtain a valid certificate."*

*The Design Appraisal Document No.11/00055 and its supplementary Type Approval Terms and Conditions form part of this Certificate.*

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**DESIGN APPRAISAL DOCUMENT**

Date	Quote this reference on all future communications
13 October 2011	LDSO/ETS/ WO1919134 /TTP/PAHH/WP4126018

**TEST REPORTS (Continued)**

Test certificate 10087649	25 February 2011
Test report LBRP 8566/00	08 October 2009
Test report LBRP 8567/00	07 October 2009
Test report A8031253	14 October 2008
Test report A8031254	14 October 2008
ABB Test report 21714	19 May 2009
Test report LBRP 8776/00	08 June 2009
Test report LBRP 8777/00	08 June 2009
Test report LBRS 10918/00	Received 01 June 2011
Certificate of conformity NO. IT 09.079	22 October 2009
Test report 09.101	22 October 2009

Supplementary Type Approval Terms and Conditions

Type Approval certifies that a representative sample of the product(s) referred to herein has/have been found to meet the applicable design criteria for the use specified herein. It does not mean or imply approval for any other use, nor approval of any product(s) designed or manufactured otherwise than in strict conformity with the said representative sample.

Type Approval is based on the understanding that the manufacturer's recommendations and instructions and any relevant requirements of the Rules and Regulations are complied with.

Type Approval does not eliminate the need for normal inspection and survey procedures required by the Rules and Regulations.

Lloyd's Register EMEA reserves the right to cancel or withdraw this Type Approval Certificate in accordance with the Lloyd's Register Type Approval System Procedure.



Peter Huntley-Hawkins  
Lead Specialist  
Electrotechnical Systems  
London Design Support Office

Part 2  
Circuit Breakers (ENV Tested) (Part 2)

Producer/ Licence No.	Type	Standard	Rating				Short Circuit	Category/ Additional Tests	Remarks	Cert. No.				
			Normal Current Amperes	A.C.		D.C.								
				Voltage	Power Factor	Voltage					Time Constant Seconds			
ABB SpA - ABB Sace Division, Via Baioni, 35, Bergamo, 24123, Italy.	Emax E2 & E3 Impulse withstand voltage Uimp = 12kV Utilisation category B E2B E2N E3N E3H	60947-2:2006	800 - 1600			Rated ultimate breaking capacity Icu (kA)	ENV 1 ENV 2 ENV 3 (2002)	Expires: 12 October 2016 Including electronic trip units PR122/DC and PR123/DC	11/00055					
											500(III)		15.8 ms	35
											750(III)		15.9 ms	25
											1000(IV)		15.5 ms	25
										1600	500(III)		15.8 ms	50
											750(III)		15.9 ms	25
											1000(IV)		15.5 ms	25
										800 - 2500	500(III)		16.5 ms	60
											750(III)		15.2 ms	40
											1000(IV)		15 ms	35
1600 - 2500	500(III)		16.5 ms	65										
	750(III)		15.2 ms	40										
	1000(IV)		15 ms	40										
	500(III)		15 ms	85'										

*R.A. Breda*

13th October 2011