



DET NORSKE VERITAS

TYPE APPROVAL CERTIFICATE

CERTIFICATE NO. E-10522

This Certificate consists of 4 pages

This is to certify that the

Circuit Breaker

with type designation(s)

Tmax T4 N/S/H/L/V, TMax T5 N/S/H/L/V and T6 N/S/H/L/V

Holder of certificate

ABB S.P.A. - ABB Sace Division

Bergamo BG, Italy

is found to comply with

Det Norske Veritas' Rules for Classification of Ships, High Speed & Light Craft and Det Norske Veritas' Offshore Standards

IEC 60947-2 (2009-05)

IEC 60439-1 (1999-09)

Application

Rated Voltage (V)	690 (AC)
Rated Current (A)	250 - 800
Frequency (Hz)	50-60

Place and date

Høvik, 2010-10-20

for DET NORSKE VERITAS AS

This Certificate is valid until

2012-12-31

Marit Laumann
Head of Section

Local Office
DNV Milan

Nicolay Horn
Surveyor

Notice: This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid. The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

If any person suffers loss or damage which is proved to have been caused by any negligent act or omission of Det Norske Veritas, then Det Norske Veritas shall pay compensation to such person for his proved direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question, provided that the maximum compensation shall never exceed USD 2 million. In this provision "Det Norske Veritas" shall mean the Foundation Det Norske Veritas as well as all its subsidiaries, directors, officers, employees, agents and any other acting on behalf of Det Norske Veritas.

Name and place of manufacturer

ABB SpA – ABB Sace Division
 Frosinone, ITALY

Product description

Circuit breakers type Tmax including adapter for 60 mm busbar (for Tmax T4 & Tmax T5 only). Can be delivered with both thermomagnetic and electronic trip units. Technical data:

	Tmax T4				
	N	S	H	L	V
Rated insulation voltage U_i (V)	1000	1000	1000	1000	1000
Rated impulse withstand voltage U_{imp} (kV)	8	8	8	8	8
Rated current I_n (A) at 40 °C (See application/limitation)	250/320	250/320	250/320	250/320	250/320
Rated service voltage U_e (V)	690 AC	690 AC	690 AC	690 AC	690 AC
Rated frequency AC (Hz)	50-60	50-60	50-60	50-60	50-60
Rated ultimate short-circuit breaking capacity (kA) I_{CU}					
230 V AC (kA)	70	85	100	200	200
440 V AC (kA)	30	40	65	100	180
500 V AC (kA)	25	30	50	85	150
690 V AC (kA)	20	25	40	70	80
Rated service short-circuit breaking capacity I_{CS} (% I_{cu})	100 %	100 %	100 %	100 %	100 %
Utilisation category	A	A	A	A	A
Rated short-circuit making capacity I_{cm}					
230 V AC	154	187	220	440	660
440 V AC (kA)	63	84	143	220	396
500 V AC (kA)	52.5	63	105	187	330
690 V AC (kA)	40	52.5	84	154	176

	Tmax T5				
	N	S	H	L	V
Rated insulation voltage U_i (V)	1000	1000	1000	1000	1000
Rated impulse withstand voltage U_{imp} (kV)	8	8	8	8	8
Rated current I_n (A) at 40 °C (See application/limitation)	400/630	400/630	400/630	400/630	400/630
Rated service voltage U_e (V)	690 AC	690 AC	690 AC	690 AC	690 AC
Rated frequency AC (Hz)	50-60	50-60	50-60	50-60	50-60
Rated ultimate short-circuit breaking capacity (kA) I_{CU}					
230 V AC (kA)	70	85	100	200	200
440 V AC (kA)	30	40	65	100	180
500 V AC (kA)	25	30	50	85	150
690 V AC (kA)	20	25	40	70	80
Rated service short-circuit breaking capacity I_{CS} (% I_{cu})	100 %	100 %	100 % ¹⁾	100 % ¹⁾²⁾	100 % ³⁾
Utilisation category	A/B ⁴⁾	A/B ⁴⁾	A/B ⁴⁾	A/B ⁴⁾	A/B ⁴⁾
Rated short-circuit making capacity I_{cm}					
230 V AC (kA)	154	187	220	440	660
440 V AC (kA)	63	84	143	220	396
500 V AC (kA)	52.5	63	105	187	330
690 V AC (kA)	40	52.5	84	154	176

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	Tmax T6				
	N	S	H	L	V
Rated insulation voltage Ui (V)	1000	1000	1000	1000	1000
Rated impulse withstand voltage Uimp (kV)	8	8	8	8	8
Rated current Iu (A) at 40 °C (See application/ limit.)	630/800/ 1000	630/800/ 1000	630/800/ 1000	630/800/ 1000	800
Rated service voltage Ue (V)	690 AC	690 AC	690 AC	690 AC	690 AC
Rated frequency AC (Hz)	50-60	50-60	50-60	50-60	50-60
Rated ultimate short-circuit breaking capacity (kA) Icu					
230 V AC (kA)	70	85	100	200	200
440 V AC (kA)	30	45	50	80	120
500 V AC (kA)	25	35	50	65	85
690 V AC (kA)	20	22	25	30	40
Rated service short-circuit breaking capacity Ics (% Icu)	100 % ⁵⁾	100 % ⁵⁾	100 % ⁵⁾	100 % ⁵⁾	75 % ⁷⁾
Utilisation category	A/B ⁶⁾	A/B ⁶⁾	A/B ⁶⁾	A/B ⁶⁾	B
Rated short-circuit making capacity Icm					
230 V AC (kA)	154	187	220	440	440
440 V AC (kA)	63	94.5	105	176	264
500 V AC (kA)	52.5	73.5	105	143	187
690 V AC (kA)	40	46	52.5	63	66

- 1) 75% for T5 630 at 500V and 690V 2) 50% for T5 630 at 690V 3) 50% for T5 630 at 500 V & 690V
 4) B for 400 A: Icw = 5 kA 75 % for 690 V and version L 5) B for 400 A: Icw = 7.6 kA (630 A) - 10 kA (800 A)
 6) B for 400 A: Icw = 7.6 kA (630 A) - 10 kA (800 A) 7) Ics=150kA at 230Vac, 100kA at 440Vac, 30kA at 690Vac

Technical data for the adapter:

Rated voltage Ue (V):	415	440	690
Rated peak withstand current Ipk (A):	440	396	176
Rated conditional short-circuit current Isc (A):	200	180	80

Application/Limitation

Release data is given for 40 °C. For ship application thermal magnetic releases to be derated in accordance with following table (electronic releases need no deration):

T4		T5		T6	
40 °C	45 °C	40 °C	45 °C	40 °C	45 °C
In max	In max	In max	In max	In max	In max
20	19	320	311	630	609
32	30	400	386	800	774
50	48	500	482		
80	77				
100	97				
125	121				
160	154				
200	195				
250	243				

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For more details regarding derating, see ABB SACE catalogue 1SDC210015D0202.
Suitable for use in an IT-net with a capacity of 1.2 times the maximum trip current at 690 V AC.

Type Approval documentation

Tests carried out

Type tests according to IEC 60947-2 sequence I, II, III & IV (only T5 400) and Annex H (T6 only). Vibration, inclination, EMC, dry heat, damp heat and low temperature test.
Adapter tested in accordance with IEC 60439-1.

Marking of product

ABB SACE – Type designation – Electrical data

Certificate retention survey

The scope of the retention/renewal survey is to verify that the conditions stipulated for the Type approval is complied with and that no alterations are made to the product design or choice of materials.

The main elements of the survey are:

- Inspection on factory samples, selected at random from the production line (where practicable)
- Results from Production Sample Tests (PST) and Routines (RT) checked (if not available tests according to PST and RT to be carried out)
- Review of type approval documentation
- Review of possible change in design, materials and performance
- Ensuring traceability between manufacturer's product type marking and Type Approval Certificate.

Survey to be performed at least every second year.

END OF CERTIFICATE