



TYPE APPROVAL CERTIFICATE

Certificate No:
TAE0000193
Revision No:
3

This is to certify:

That the Circuit Breaker

with type designation(s)
Tmax XT1, XT2, XT3, XT4, XT5, XT6 and XT7/XT7M

Issued to
ABB S.P.A. - ABB Sace Division
Bergamo BG, BG, Italy

is found to comply with
DNV GL rules for classification – Ships, offshore units, and high speed and light craft

Application :

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.

Rated voltage (V) 690
Rated current (A) 160 - 1600

Issued at **Hamburg** on **2021-06-10**

for **DNV**

This Certificate is valid until **2025-10-14**.

DNV local station: **Italy/Malta CMC**

Approval Engineer: **Harald Amberger**

.....
Arne Schaarmann
Head of Section

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.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.



Product description

Moulded –case circuit breaker

| Ratings | | | XT1 | | | | |
|--|--------------|----|-----------------|------|------|------|-----|
| Breaking capacity levels | | | B | C | N | S | H |
| Utilization category (IEC 60947-2) | | | A | | | | |
| Poles | No. | | 3/4 | | | | |
| Method of installation | | | Fixed / Plug in | | | | |
| Rated insulation voltage, U _i | V | | 1000 | | | | |
| Rated impulse withstand voltage, U _{imp} | kV | | 8 | | | | |
| Rated uninterrupted current I _u 40°C | A | | 160 | | | | |
| Rated service voltage, U _e | (AC) 50-60Hz | V | 690 | | | | |
| | (DC) | V | 500 | | | | |
| Rated ultimate short-circuit breaking capacity, I _{cu} | | | | | | | |
| | 440 V AC | kA | 15 | 25 | 36 | 50 | 65 |
| | 690 V AC | kA | 3 | 4 | 6 | 8 | 10 |
| Rated service short-circuit breaking capacity, I _{cs} (%I _{cu}) | | | | | | | |
| | 440 V AC | % | 75 | 50 | 50 | 50 | 50 |
| | 690 V AC | % | 100 | 100 | 75 | 50 | 50 |
| Rated short-circuit making capacity, I _{cm} | | | | | | | |
| | 440 V AC | kA | 30 | 52.5 | 75.6 | 105 | 143 |
| | 690 V AC | kA | 4.5 | 6 | 9 | 13.6 | 17 |

| Ratings | | | XT2 | | | | |
|--|--------------|----|--------------------------------|-----|-----|-----|-----|
| Breaking capacity levels | | | N | S | H | L | V |
| Utilization category (IEC 60947-2) | | | A | | | | |
| Poles | No. | | 3/4 | | | | |
| Method of installation | | | Fixed / Plug in / Withdrawable | | | | |
| Rated insulation voltage, U _i | V | | 1000 | | | | |
| Rated impulse withstand voltage, U _{imp} | kV | | 8 | | | | |
| Rated uninterrupted current I _u 40°C | A | | 160 | | | | |
| Rated service voltage, U _e | (AC) 50-60Hz | V | 690 | | | | |
| | (DC) | V | 500 | | | | |
| Rated ultimate short-circuit breaking capacity, I _{cu} | | | | | | | |
| | 440 V AC | kA | 36 | 50 | 65 | 100 | 150 |
| | 480 V AC | kA | -- | -- | -- | -- | 75* |
| | 690 V AC | kA | 10 | 12 | 15 | 18 | 20 |
| Rated service short-circuit breaking capacity, I _{cs} (%I _{cu}) | | | | | | | |
| | 440 V AC | % | 100 | 100 | 100 | 100 | 100 |
| | 690 V AC | % | 100 | 100 | 100 | 100 | 100 |
| Rated short-circuit making capacity, I _{cm} | | | | | | | |
| | 440 V AC | kA | 75.6 | 105 | 143 | 220 | 440 |
| | 480 V AC | kA | -- | -- | -- | -- | 165 |
| | 690 V AC | kA | 17 | 24 | 30 | 36 | 40 |

*The breaker type XT2V for 480 V is only applicable for use when the I_{cs} value is not relevant.

| Ratings | | | XT3 | |
|---|--------------|----|-----------------|----------|
| Breaking capacity levels | | | N | S |
| Utilization category (IEC 60947-2) | | | A | |
| Poles | No. | | 3/4 | |
| Method of installation | | | Fixed / Plug in | |
| Rated insulation voltage, Ui | V | | 800 | |
| Rated impulse withstand voltage, Uimp | kV | | 8 | |
| Rated uninterrupted current Iu 40°C | A | | 250 | |
| Rated service voltage, Ue | (AC) 50-60Hz | V | 690 | |
| | (DC) | V | 500 | |
| Rated ultimate short-circuit breaking capacity, Icu | | | | |
| | 440 V AC | kA | 25 | 40 |
| | 690 V AC | kA | 5 | 8 |
| Rated service short-circuit breaking capacity, Ics (%Icu) | | | | |
| | 440 V AC | % | 75 | 50 |
| | 690 V AC | % | 75 | 50 |
| Rated short-circuit making capacity, Icm | | | | |
| | 440 V AC | kA | 52.5 | 84 |
| | 690 V AC | kA | 8.5 | 13.6 |

| Ratings | | | XT4 | | | | | |
|---|--------------|----|--------------------------------|----------|----------|----------|----------|----------|
| Breaking capacity levels | | | N | S | H | L | V | X |
| Utilization category (IEC 60947-2) | | | A | | | | | |
| Poles | No. | | 3/4 | | | | | |
| Method of installation | | | Fixed / Plug in / Withdrawable | | | | | |
| Rated insulation voltage, Ui | V | | 1000 | | | | | |
| Rated impulse withstand voltage, Uimp | kV | | 8 | | | | | |
| Rated uninterrupted current Iu 40°C | A | | 160/250 | | | | | |
| Rated service voltage, Ue | (AC) 50-60Hz | V | 690 | | | | | |
| | (DC) | V | 750 | | | | | |
| Rated ultimate short-circuit breaking capacity, Icu | | | | | | | | |
| | 440 V AC | kA | 36 | 50 | 65 | 150 | 150 | 200 |
| | 690 V AC | kA | 10 | 12 | 15 | 25 | 50 | 100 |
| Rated service short-circuit breaking capacity, Ics (%Icu) | | | | | | | | |
| | 440 V AC | % | 100 | 100 | 100 | 100 | 100 | 100 |
| | 690 V AC | % | 100 | 100 | 100 | 100 | 100 | 100 |
| Rated short-circuit making capacity, Icm | | | | | | | | |
| | 440 V AC | kA | 75.6 | 105 | 143 | 330 | 330 | 440 |
| | 690 V AC | kA | 17 | 24 | 30 | 52.5 | 105 | 220 |

| Ratings | | | XT5 | | | | | |
|--|---------------------------------------|----|----------------------------------|----------|----------|----------|----------|----------|
| Breaking capacity levels | | | N | S | H | L | V | X |
| Utilization category (IEC 60947-2) | | | A (up to 630 A), B (up to 500 A) | | | | | |
| Poles | No. | | 3/4 | | | | | |
| Method of installation | | | Fixed / Plug in / Withdrawable | | | | | |
| Rated insulation voltage, U _i | | V | 1000 | | | | | |
| Rated impulse withstand voltage, U _{imp} | | kV | 8 | | | | | |
| Rated uninterrupted current I _u 40°C | | A | 400/630 | | | | | |
| Rated service voltage, U _e | (AC) 50-60Hz | V | 1000 | | | | | |
| | (DC) | V | 500 | | | | | |
| Rated ultimate short-circuit breaking capacity, I _{cu} | | | S400, S630 | | | X630 | | |
| | 440 V AC | kA | 36 | 50 | 65 | 90 | 180 | 200 |
| | 690 V AC | kA | 20 | 25 | 40 | 70 | 80 | 100 |
| Rated service short-circuit breaking capacity, I _{cs} (%I _{cu}) | | | | | | | | |
| | 440 V AC | % | 100 | 100 | 100 | 100 | 100 | 100 |
| | 690 V AC | % | 100 | 100 | 75 | 50 | 50 | 50 |
| | 690 V AC (I _n up to 500 A) | % | 100 | 100 | 100 | 100 | 100 | 100 |
| Rated short-circuit making capacity, I _{cm} | | | | | | | | |
| | 440 V AC | kA | 75.6 | 105 | 143 | 200 | 400 | 440 |
| | 690 V AC | kA | 40 | 52,5 | 84 | 154 | 176 | 220 |
| Rated short-time withstands current, I _{cw} | | | | | | | | |
| | 1s | kA | 6 for XT5 630 / 5 for XT5 400 | | | | | |

| Ratings | | | XT6 | | |
|--|--------------|----|---------------------------------|----------|----------|
| Breaking capacity levels | | | N | S | H |
| Utilization category (IEC 60947-2) | | | A (up to 1000A), B (up to 800A) | | |
| Poles | No. | | 3/4 | | |
| Method of installation | | | Fixed / Withdrawable | | |
| Rated insulation voltage, U _i | | V | 1000 | | |
| Rated impulse withstand voltage, U _{imp} | | kV | 8 | | |
| Rated uninterrupted current I _u 40°C | | A | 600 to 1000 | | |
| Rated service voltage, U _e | (AC) 50-60Hz | V | 1000 | | |
| | (DC) | V | 750 | | |
| Rated ultimate short-circuit breaking capacity, I _{cu} | | | | | |
| | 440 V AC | kA | 30 | 45 | 50 |
| | 690 V AC | kA | 20 | 22 | 25 |
| Rated service short-circuit breaking capacity, I _{cs} (%I _{cu}) | | | | | |
| | 440 V AC | % | 100 | 100 | 100 |
| | 690 V AC | % | 100 | 100 | 100 |
| Rated short-circuit making capacity, I _{cm} | | | | | |
| | 440 V AC | kA | 63 | 94,5 | 110 |
| | 690 V AC | kA | 40 | 46,2 | 52,5 |
| Rated short-time withstands current, I _{cw} | | | | | |
| | 1s | kA | 10 | | |

| Ratings | | | XT7 and XT7M | | |
|--|--------------|----|----------------------|----------|----------|
| Breaking capacity levels | | | S | H | L |
| Utilization category (IEC 60947-2) | | | B | | |
| Poles | No. | | 3/4 | | |
| Method of installation | | | Fixed / Withdrawable | | |
| Rated insulation voltage, U _i | V | | 1000 | | |
| Rated impulse withstand voltage, U _{imp} | kV | | 8 | | |
| Rated uninterrupted current I _u 40°C | A | | 400 to 1600 | | |
| Rated service voltage, U _e | (AC) 50-60Hz | V | 690 | | |
| | (DC) | V | 750 | | |
| Rated ultimate short-circuit breaking capacity, I _{cu} | | | | | |
| | 440 V AC | kA | 50 | 65 | 100 |
| | 690 V AC | kA | 30 | 42 | 50 |
| Rated service short-circuit breaking capacity, I _{cs} (%I _{cu}) | | | | | |
| | 440 V AC | % | 100 | 100 | 100 |
| | 690 V AC | % | 100 | 100 | 75 |
| Rated short-circuit making capacity, I _{cm} | | | | | |
| | 440 V AC | kA | 110 | 143 | 220 |
| | 690 V AC | kA | 66 | 92,4 | 110 |
| Rated short-time withstands current, I _{cw} | | | | | |
| | 1s | kA | 20 | | |

Further ratings acc. manufacturer documentation.

Application/Limitation

Location Classes:

Temperature: B, Humidity: B, Vibration: A, EMC: A

XT4X 250:

100kA at 690VAC (I_{cs}=25kA for I_n>200 A when equipped with terminals: Front, FCCu and FCCuAl).

XT4X 160:

100kA at 690VAC (suitable only for I_n≥32 A).

XT4V 250:

50kA at 690VAC (I_{cs}=25kA for I_n>200 A when equipped with terminals: Front, FCCu and FCCuAl).
 For I_n<32 A, I_{cu}=25kA, I_{cs}=20kA).

XT4V 160:

I_{cu}=I_{cs}=100kA at 690VAV (For I_n<32 A, I_{cu}=25kA, I_{cs}=20kA).

XT1 and XT3 only equipped with thermal-magnetic release, XT2, XT4, XT5 and XT6 are equipped with both Electronic and thermal-magnetic release. XT7, XT7M is equipped with electronic release.

Release data is given for 40°C. For ship application thermal magnetic releases to be derated in accordance with manufacturer document 1SDC210099D0206 (electronic releases need no deration).

Operating instruction of the manufacturer to be observed

Type Approval documentation

CD "TEST REPORTS ABB SACE Tmax XT – DNV APPROVAL"

SE-90444, SE-90445, SE-101368, SE-101370, SE-101371A1, SE-101369A1, CN50672

LBRP 11955/03 rev 01, LBRP 16568/00, LBRP 16569/00, LBRP 16917/00, LBRP 16917/01, LBRP 16918/00
LBRP 16918/01, LBRP 16920/00, LBRP 18334/00, LBRP 18335/00, LBRP 18336/00, LBRP 18337/00, LBRP 18338/00
LBRP 18338/01, LBRP 18339/00, LBRP 18339/01, LBRP 18340/00, LBRP 18340/01, LBRP 18341/00, LBRP 18341/01
LBRP 18334/00, LBRP 18342/00, LBRP 18343/00, LBRP 18344/00, LBRP 18749/00, LBRP 18750/00, LBRP 19037/01

200019647UDI-EMCb, 200019647UDI-EMCd

Rel19-4788844257-1-0-EMC, Rel19-4788923674-1-0-EMC, 200026776UDI-EMC

Tests carried out

Type tests according to IEC 60947-2 sequence I, II, III and Annex H. Vibration & shock, inclination, EMC, dry heat, damp heat and low temperature test.

UL 489 (ed.11, 2009) for breaker type XT2V for 480V /Icu.

Marking of product

ABB SACE – Type designation – Electrical data

Name and place of manufacturer

ABB SpA – ABB Sace Division
Frosinone, ITALY

Periodical assessment

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

The main elements of the assessment are:

- Inspection on factory samples, selected at random from the production line (where practicable)
- Results from Routine Tests (RT) checked (if not available tests according to 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.

Periodical assessment is to be performed after 2 years and after 3.5 years. A renewal assessment will be performed at renewal of the certificate.

END OF CERTIFICATE