

TYPE APPROVAL CERTIFICATE**This is to certify:****That the Disconnection Switch**with type designation(s)
OTDC16 - 1600

Issued to

**ABB Oy, Smart Power
VAASA, Finland**

is found to comply with

**DNV GL rules for classification – Ships, offshore units, and high speed and light craft
IEC 60947****Application :****Products approved by this certificate are accepted for installation on all vessels classed by
DNV GL.**This Certificate is valid until **2024-03-14**.Issued at **Høvik** on **2020-07-20**DNV GL local station: **Finland CMC**Approval Engineer: **Nicolay Horn**for **DNV GL**

Digitally Signed By: Alonso Pontes, Marta

Location: DNV GL Høvik, Norway

**Marta Alonso Pontes
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.

Job Id: **262.1-029610-2**
 Certificate No: **TAE0000383**
 Revision No: **1**

Product description

DC Switch-disconnector OTDC16 - 1600,

Technical data:

| | | | OTDC16F | OTDC25F | OTDC32F |
|--|--------------------|--------------|-----------|-----------|-----------|
| Rated insulation voltage U_i (V) | Polution degree 3 | | 1000 | 1000 | 1000 |
| Rated imp.voltage U_{imp} (kV) | | | 8 | 8 | 8 |
| Rated thermal current I_{th} (A) | In open air | | 25 | 32 | 45 |
| | In enclosure 40 °C | | 25 | 32 | 45 |
| | In enclosure 60 °C | | 25 | 32 | 45 |
| Rated operation current / poles in series DC21B (A) | 500 V | One circuit | - | - | - |
| | 660 V | One circuit | 16/2 | 25/2 | 32/2 |
| | | Two circuits | - | 25/2 | 32/2 |
| | 1000 V | One circuit | 10/2,16/3 | 16/2,25/3 | 20/2,32/3 |
| | | Two circuits | 10/2 | 16/2 | 20/2 |
| Three circuits | | - | - | - | |
| 1500 V | One circuit | - | - | - | |
| Rated short circuit withstand current 1 kV, 1 sec. I_{cw} (kA) | | | 0.4 | 0.6 | 0.8 |
| Rated short circuit making capacity I_{cm} (kA) | | | 0.4 | 0.6 | 0.8 |
| Rated conditunal short circuit capacity I_p (kA) | Ip rms. | | - | - | - |
| | Max fuse size | | - | - | - |

| | | | OTDC16U | OTDC25U | OTDC32U |
|--|--------------------|--------------|---------|---------|---------|
| Rated insulation voltage U_i (V) | Polution degree 3 | | 1000 | 1000 | 1000 |
| Rated imp.voltage U_{imp} (kV) | | | 8 | 8 | 8 |
| Rated thermal current I_{th} (A) | In open air | | 40 | 50 | 63 |
| | In enclosure 40 °C | | 32 | 40 | 50 |
| | In enclosure 60 °C | | 25 | 32 | 40 |
| Rated operation current / poles in series DC21B (A) | 500 V | One circuit | - | - | - |
| | 660 V | One circuit | 16/2 | 25/2 | - |
| | | Two circuits | 16/2 | 25/2 | 32/2 |
| | 1000 V | One circuit | 10/2 | 16/2 | - |
| | | Two circuits | 10/2 | 16/2 | 20/2 |
| Three circuits | | 10/2 | - | - | |
| 1500 V | One circuit | - | - | - | |
| Rated short circuit withstand current 1 kV, 1 sec. I_{cw} (kA) | | | 1 | 1 | 1 |
| Rated short circuit making capacity I_{cm} (kA) | | | 1 | 1 | 1 |
| Rated conditunal short circuit capacity I_p (kA) | Ip rms. | | 10 | 10 | 10 |
| | Max fuse size | | 80 | 80 | 80 |

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| | | | OTDC100E | OTDC160E OTDC100U | OTDC200E |
|---|--------------------|----------------|----------|----------------------|----------|
| Rated insulation voltage Ui (V) | Polution degree 3 | | 1500 | 1500 | 1500 |
| Rated imp. voltage Uimp (kV) | | | 12 | 12 | 12 |
| Rated thermal current Ith (A) | In open air | | 100 | 160 | 200 |
| | In enclosure 40 °C | | 100 | 160 | 200 |
| | In enclosure 60 °C | | 100 | 160 | 200 |
| Rated operation current / poles in series DC21B (A) | 500 V | One circuit | 100/1 | 160/1 | 200/1 |
| | 660 V | One circuit | - | - | - |
| | | Two circuits | - | - | - |
| | 1000 V | One circuit | 100/2 | 160/2 | 200/2 |
| | | Two circuits | 100/2x2 | 160/2x2 | 200/2x2 |
| | | Three circuits | 100/3x2 | 160/3x2 | 200/3x2 |
| 1500 V | One circuit | 100/2x2 | 160/2x2 | 200/2x2 | |
| Rated short circuit withstand current 1 kV, 1 sec. Icw (kA) | | | 10 | 10 | 10 |
| Rated short circuit making capacity Icm (kA) | | | 10 | 10 | 10 |
| Rated conditunal short circuit capacity Ip (kA) | Ip rms. | | - | - | - |
| | Max fuse size | | - | - | - |

| | | | OTDC250E OTDC245U OTDC200U OTDC180U | OTDC315E OTDC250U | OTDC400E OTDC320U |
|---|--------------------|----------------|--|----------------------|----------------------|
| Rated insulation voltage Ui (V) | Polution degree 3 | | 1500 | 1500 | 1500 |
| Rated imp.voltage Uimp (kV) | | | 12 | 12 | 12 |
| Rated thermal current Ith(A) | In open air | | 250 | 315 | 400 |
| | In enclosure 40 °C | | 250 | 315 | 400 |
| | In enclosure 60 °C | | 200 | 315 | 400 |
| Rated operation current / poles in series DC21B (A) | 500 V | One circuit | 250/1 | - | - |
| | 1000 V | One circuit | 250/2 | 315/2 | 400/2 |
| | | Two circuits | 250/2x2 | 315/2 | 400/2 |
| | | Three circuits | - | 315/2 | 400/2 |
| | 1500 V | One circuit | - | 315/3 | 400/3 |
| | | Two circuits | - | 315/4 | 400/4 |
| Three circuits | | - | 315/3 | 400/3 | |
| Rated short circuit withstand current 1 kV, 1 sec. Icw (kA) | | | 10 | 10 | 10 |
| Rated short circuit making capacity Icm (kA) | | | - | - | - |
| Rated conditunal short circuit capacity Ip (kA) | Ip rms. | | - | - | - |
| | Max fuse size | | - | - | - |

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| | | | OTDC250E OTDC245U OTDC200U OTDC180U | OTDC315E OTDC250U | OTDC400E OTDC320U |
|--|--------------------|----------------|--|----------------------|----------------------|
| Rated insulation voltage U_i (V) | Polution degree 3 | | 1500 | 1500 | 1500 |
| Rated imp. voltage U_{imp} (kV) | | | 12 | 12 | 12 |
| Rated thermal current I_{th} (A) | In open air | | 250 | 315 | 400 |
| | In enclosure 40 °C | | 250 | 315 | 400 |
| | In enclosure 60 °C | | 200 | 315 | 400 |
| Rated operation current / poles in series DC21B (A) | 500 V | One circuit | 250/1 | - | - |
| | | Two circuits | 250/2 | 315/2 | 400/2 |
| | 1000 V | One circuit | 250/2x2 | 315/2 | 400/2 |
| | | Two circuits | - | 315/2 | 400/2 |
| | | Three circuits | - | 315/2 | 400/2 |
| | 1500 V | One circuit | - | 315/3 | 400/3 |
| | | Two circuits | - | 315/4 | 400/4 |
| Three circuits | | - | 315/3 | 400/3 | |
| Rated short circuit withstand current 1 kV, 1 sec. I_{cw} (kA) | | | 10 | 10 | 10 |
| Rated short circuit making capacity I_{cm} (kA) | | | - | - | - |
| Rated conditunal short circuit capacity I_p (kA) | I_p rms. | | - | - | - |
| | Max fuse size | | - | - | - |

| | | | OTDC315F OTDC250UF | OTDC400F OTDC320UF | OTDC500F OTDC400UF |
|--|---------------------------------|----------------|-----------------------|-----------------------|-----------------------|
| Rated insulation voltage U_i (V) | Polution degree 3 | | 1500 | 1500 | 1500 |
| Rated imp. voltage U_{imp} (kV) | | | 12 | 12 | 12 |
| Rated thermal current I_{th} (A) | In open air | | 315 | 400 | 500 |
| | In enclosure 40 °C | | 315 | 400 | 500 |
| | In enclosure 60 °C | | 315 | 400 | 500 |
| Rated operation current / poles in series DC21B (A) | 500 V | One circuit | - | - | - |
| | | Two circuits | 315/2 | 400/2 | 500/2 |
| | 660 V | One circuit | 315/2x2 | 400/2x2 | 500/2x2 |
| | | Two circuits | 315/2x3 | 400/2x3 | 500/2x3 |
| | | Three circuits | 315/2 | 400/2 | 500/2 |
| | 1000 V | One circuit | 315/2x2 | 400/2x2 | 500/2x2 |
| | | Two circuits | 315/2x3 | 400/2x3 | 500/2x3 |
| 1500 V | One circuit | 315/2x3 | 400/2x3 | 500/2x3 | |
| Rated short circuit withstand current 1 kV, 1 sec. I_{cw} (kA) | | | 10 | 10 | 10 |
| Rated short circuit making capacity I_{cm} (kA) | | | 10 | 10 | 10 |
| Rated conditunal short circuit capacity I_q (only -ESS types) | I_q rms. (kA) | | 30 | 30 | 30 |
| | Max. ETI fuse size, (gPV 3) (A) | L/R=3ms | 500 | 500 | 500 |

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| | | | OTDC500E OTDC400U | OTDC630E | OTDC800E OTDC600U |
|--|--------------------|----------------|----------------------|----------|----------------------|
| Rated insulation voltage U_i (V) | Polution degree 3 | | 1500 | 1500 | 1500 |
| Rated imp. voltage U_{imp} (kV) | | | 12 | 12 | 12 |
| Rated thermal current I_{th} (A) | In open air | | 630 | 630 | 800 |
| | In enclosure 40 °C | | 550 | 630 | 800 |
| | In enclosure 60 °C | | 440 | 630 | 680 |
| Rated operation current / poles in series DC21B (A) | 500 V | One circuit | - | - | - |
| | | Two circuits | - | - | - |
| | 660 V | One circuit | - | - | - |
| | | Two circuits | - | - | - |
| | | Three circuits | - | - | - |
| | 1000 V | One circuit | 500/2 | 630/2 | 800/2 |
| | | Two circuits | 500/2 | - | - |
| Three circuits | | 500/2 | - | - | |
| 1500 V | One circuit | 500/2 | - | - | |
| | One circuit | 500/4 | - | - | |
| | Two circuits | 500/3 | - | - | |
| Rated short circuit withstand current 1 kV, 1 sec. I_{cw} (kA) | | | 10 | 10 | 10 |
| Rated short circuit making capacity I_{cm} (kA) | | | - | - | - |
| Rated conditunal short circuit capacity I_p (kA) | Ip rms. | | - | - | - |
| | Max fuse size | | - | - | - |

| | | | OTDC630F OTDC600UF | OTDC800F |
|--|---------------------------------|----------------|-----------------------|----------|
| Rated insulation voltage U_i (V) | Polution degree 3 | | 1500 | 1500 |
| Rated imp. voltage U_{imp} (kV) | | | 12 | 12 |
| Rated thermal current I_{th} (A) | In open air | | 630 | 800 |
| | In enclosure 40 °C | | 630 | 630 |
| | In enclosure 60 °C | | 630 | |
| Rated operation current / poles in series DC21B (A) | 500 V | One circuit | - | - |
| | | Two circuits | - | - |
| | 660 V | One circuit | 630/2 | 800/2 |
| | | Two circuits | 630/2x2 | - |
| | | Three circuits | 630/2x2 | - |
| | 1000 V | One circuit | 630/2x3 | - |
| Two circuits | | 630/2 | 800/2 | |
| Three circuits | | 630/2x2 | - | |
| 1500 V | One circuit | 630/2x3 | - | |
| Rated short circuit withstand current 1 kV, 1 sec. I_{cw} (kA) | | | 10 | 10 |
| Rated short circuit making capacity I_{cm} (kA) | | | 10 | 10 |
| Rated conditunal short circuit capacity I_q (only -ESS types) | I_q rms. (kA) | | 30 | 30 |
| | Max. ETI fuse size, (gPV 3) (A) | L/R=3ms | 500 | 500 |

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| | | | OTDC800F_22_ OTDC800UF_22 | OTDC1000F_22_ OTDC1000UF_2 |
|--|---------------------------------|----------------|------------------------------|-------------------------------|
| Rated insulation voltage Ui (V) | Polution degree 3 | | 1500 | 1500 |
| Rated imp. voltage Uimp (kV) | | | 12 | 12 |
| Rated thermal current Ith (A) | In open air | | 800 | 1000 |
| | In enclosure 40 °C | | 800 | 1000 |
| | In enclosure 60 °C | | - | - |
| Rated operation current / poles in series DC21B (A) | 500 V | One circuit | - | - |
| | 660 V | One circuit | 800/2x2 | 1000/2x2 |
| | | Two circuits | - | - |
| | 1000 V | One circuit | - | - |
| | | Two circuits | 800/2x2 | 1000/2x2 |
| | | Three circuits | - | - |
| 1500 V | One circuit | - | - | |
| Rated short circuit withstand current 1 kV, 1 sec. Icw (kA) | | | 10 40 (only -ESS, 0,05s) | 10 40 (only -ESS, 0,05s) |
| Rated short circuit making capacity Icm (kA) | | | 10 40 (only -ESS) | 10 40 (only -ESS) |
| Rated conditunal short circuit capacity Iq (only -ESS types) | Iq rms. (kA) | | 30 | 30 |
| | Max. ETI fuse size, (gPV 3) (A) | L/R=3ms | 500 | 500 |

| | | | OTDC1000E | OTDC1250E OTDC800U | OTDC1600E OTDC1000U |
|---|--------------------|----------------|-----------|-----------------------|------------------------|
| Rated insulation voltage Ui (V) | Polution degree 3 | | 1500 | 1500 | 1500 |
| Rated imp. voltage Uimp (kV) | | | 12 | 12 | 12 |
| Rated thermal current Ith(A) | In open air | | 1000 | 1250 | 1600 |
| | In enclosure 40 °C | | 1000 | 1250 | 1250 |
| | In enclosure 60 °C | | 800 | 1000 | 1000 |
| Rated operation current / poles in series DC21B (A) | 500 V | One circuit | - | - | - |
| | 660 V | One circuit | - | - | - |
| | | Two circuits | - | - | - |
| | 1000 V | One circuit | 1000/4 | 1250/4 | 1600/4 |
| | | Two circuits | - | - | - |
| | | Three circuits | - | - | - |
| 1500 V | One circuit | - | - | - | |
| Rated short circuit withstand current 1 kV, 1 sec. Icw (kA) | | | 10 | 10 | 10 |
| Rated short circuit making capacity Icm (kA) | | | 10 | 10 | 10 |
| Rated conditunal short circuit capacity Ip (kA) | Ip rms. | | - | - | - |
| | Max fuse size | | - | - | - |

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Application/Limitation

Ingress protection IP20. To be installed inside switchboard / enclosures.
Installation procedures according to the manufacturer's instructions to be followed.

Environmental categories: Vibration A, Temperature D, Humidity B.

Type Approval documentation

Technical info:

ABB Oy catalogue "Protection and Connection- Switch-disconnectors OTDC and OTDCP (parts)

Test reports:

SGS test reports nos. 268531-1 dated 2012-09-24, 276842-2 dated 2014-10-01, 277635-1 dated 2014-10-10, 281632-1 dated 2015-11-12 and 286634-2 dated 2017-01-31.

Vaasa University of Applied Sciences test reports nos. TA2018-20 to 23 dated 2018-10-03 and TA2018-28 to 30 dated 2018-10-01.

Tests carried out

Type tests in accordance with IEC 60947-1 (Third Ed +A1:2012) and IEC 60947-3 (Fifth Ed + A1:2010).
Environmental tests in accordance with DNV GL-CG-0339.

Marking of product

ABB Oy – Disconnecting switch – Type designation

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 Type approval documentation
- Review of possible change in design, materials and performance
- Ensuring traceability between manufacturer's product type marking and Type Approval Certificate.

Assessment to be performed at 2, 3.5 year and at renewal.

END OF CERTIFICATE