

TYPE APPROVAL CERTIFICATE

Certificate No:

TA000001
DNV GL

This is to certify:

That the Circuit Breaker

with type designation(s)
HD4

Issued to

ABB SPA
Milano MI, Italy

is found to comply with

DNV GL rules for classification – Ships and offshore units

Application :

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

Rated Voltage (V) 12 kV
Rated Current (A) 630 - 3200
Frequency (Hz) 50-60

This Certificate is valid until **2020-12-20**.

Issued at **Hamburg** on **2015-12-21**

DNV GL local station: **Milan**

Approval Engineer: **Harald Amberger**

for **DNV GL**

Duy Nam Le
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.

Name and place of manufacturer

ABB S.p.A. Power Products Division – Unità Operativa SACE MV, Dalmine, via Fiuli, 4 (BG) Italy

Product description

Medium voltage SF6 circuit breakers.

HD4/P: Withdrawable version designed to be connected with the compartments of ABB UniSafe and UniGear switchboard

Types: HD4/P	12.06.32	12.12.32	12.16.32	12.20.32	12.25.32	12.16.50	12.25.50
Rated insulation voltage (kV):	12	12	12	12	12	12	12
Rated operational voltage (kV):	12	12	12	12	12	12	12
Withstand voltage (kV):	28	28	28	28	28	28	28
Impulse withstand voltage (kV):	75	75	75	75	75	75	75
Rated current (A):	630	1250	1600	2000	2500	1600	2500
Rated frequency (Hz):	50-60	50-60	50-60	50-60	50-60	50-60	50-60
Rated service short circuit breaking capacity I _{sc} (kA):	31.5	31.5	31,5	31,5	31,5	50	50
Rated admissible short time current (3 s) I _k (kA):	31.5	31.5	31.5	31.5	31.5	50	50
Rated making capacity I _p (kA):	80	80	80	80	80	125	125

HD4/C: Withdrawable version designed to be connected with CBE enclosure and CBF fixed parts

Types: HD4/C	12.06.32	12.12.32	12.16.32	12.25.32	12.16.50	12.25.50
Rated insulation voltage (kV):	12	12	12	12	12	12
Rated operational voltage (kV):	12	12	12	12	12	12
Withstand voltage (kV):	28	28	28	28	28	28
Impulse withstand voltage (kV):	75	75	75	75	75	75
Rated current (A):	630	2500	1600	2500	1600	2500
Rated frequency (Hz):	50-60	50-60	50-60	50-60	50-60	50-60
Rated service short circuit breaking capacity I _{sc} (kA):	31.5	31.5	31.5	31,5	50	50
Rated admissible short time current (3 s) I _k (kA):	31.5	31.5	31.5	31.5	50	50
Rated making capacity I _p (kA):	80	80	80	80	125	125

HD4/W: Withdrawable version designed to be connected with PowerCube units

Types: HD4/W	12.06.32	12.12.32	12.16.32	12.20.32	12.25.32
Rated insulation voltage (kV):	12	12	12	12	12
Rated operational voltage (kV):	12	12	12	12	12
Withstand voltage (kV):	28	28	28	28	28
Impulse withstand voltage (kV):	75	75	75	75	75
Rated current (A):	630	1250	1600	2000	2500
Rated frequency (Hz):	50-60	50-60	50-60	50-60	50-60
Rated service short circuit breaking capacity I _{sc} (kA):	31.5	31.5	31,5	31,5	31,5
Rated admissible short time current (3 s) I _k (kA):	31.5	31.5	31.5	31.5	31.5
Rated making capacity I _p (kA):	80	80	80	80	80

Application/Limitation

The medium voltage circuit breakers are to be installed according to DNV GL Rules for Ships and offshore units.

Type Approval documentation

Tests carried out

Type tests in accordance with IEC 60056 (replaced by IEC 62271-100), IEC 60298 (replaced by IEC 62271-100) & IEC 60694 (replaced by IEC 62271-1): Dielectric performances, temperatur-rise, operation performances, mechanical endurance, and shorts-circuit making and breaking.

Environmental tests in accordance with DNV "Standard for Certification No. 2.4": Power supply variation, vibration, inclination, damp heat, dry heat, low/cold temperature and high voltage.

Marking of product

ABB S.p.A. Power Product Division – Unità Operativa SACE MV, Dalmine
Medium voltage gas insulated circuit- breakers HD4/P, Rated Voltage 12000 V
Rated Current 630 - 3200A, Frequency 50-60Hz

Periodical assessment

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

Assessment to be performed at least every second year.

END OF CERTIFICATE