
Technical Commercial Information

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Title: **Update of SF₆ Primary Distribution Circuit-Breaker**

Index:

1. Introduction
 2. Product
 3. Price lists
 4. Availability and delivery times
 5. Sales support tools
-

1. Introduction

After about 20 years of successful sales and service on various fields of application, PPMV gas insulated MV indoor circuit-breaker series HD4 has been updated on the most sold ratings.

The following technical note is to inform about the update of types at 12/17.5 kV up to 1250 A and up to 31.5 kA.

The updated HD4 is still based on auto-puffer quenching technique and has been certified according to latest edition (ed.2.1-2012) of IEC 62271-100.



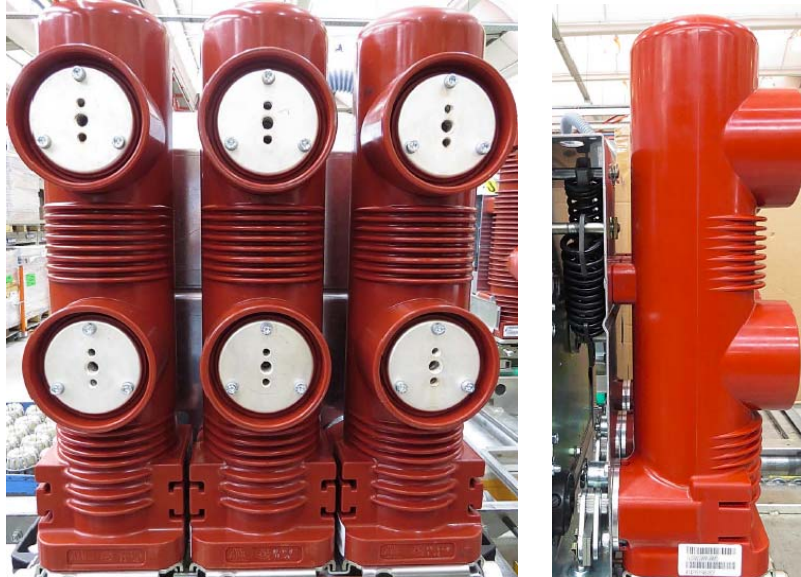
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The shape of cylinder in epoxy resin and the terminals have been improved. Particularly the upper terminal is now in rear side as the lower terminal; moreover respect to previous freestanding types there are no “L shape” connection so the bars/cables can be connected to terminal directly and easily. Please see next pictures.



Withdrawable types are fully interchangeable with previous types.

Freestanding types keep the same pole centre distance, the same position of the terminals, more/less same overall dimensions, then, even though not fully interchangeable, freestanding types can be easily adapted by OEMs into their interchangeable withdrawable versions.

Both freestanding and withdrawable construction are fully interchangeable as it concerns to electrical diagram of the previous types.

Mechanical and electrical accessories are common with previous types.

2. Product

The following technical note applies to the following series of M.V. Primary Distribution SF₆ indoor circuit-breakers:

a) SF₆ circuit breakers with mechanical operating mechanism, freestanding construction, 150 mm and 210 mm pole centre distance, type HD4 12 kV, 630..1250 A, up to **31.5 kA**; the type designations are the same ones respect to previous types while commercial codes are changed:

- 1VCF307111R0121 HD4 12.06.16 p.150 (supplied since 1st oct.2015 – see TCI 1VCD850134R001)
- 1VCF307111R0321 HD4 12.12.16 p.150 (supplied since 1st oct.2015 – see TCI 1VCD850134R001)
- 1VCF307111R0141 HD4 12.06.25 p.150 (supplied since 1st oct.2015 – see TCI 1VCD850134R001)
- 1VCF307111R0341 HD4 12.12.25 p.150 (supplied since 1st oct.2015 – see TCI 1VCD850134R001)
- 1VCF307111R0151 HD4 12.06.32 p.150
- 1VCF307111R0351 HD4 12.12.32 p.150
- 1VCF307111R0122 HD4 12.06.16 p.210
- 1VCF307111R0322 HD4 12.12.16 p.210
- 1VCF307111R0142 HD4 12.06.25 p.210
- 1VCF307111R0342 HD4 12.12.25 p.210
- 1VCF307111R0152 HD4 12.06.32 p.210

- 1VCF307111R0352 HD4 12.12.32 p.210
- 1VCF307113R0122 HD4 17.06.16 p.210
- 1VCF307113R0322 HD4 17.12.16 p.210
- 1VCF307113R0142 HD4 17.06.25 p.210
- 1VCF307113R0342 HD4 17.12.25 p.210
- 1VCF307113R0152 HD4 17.06.32 p.210
- 1VCF307113R0352 HD4 17.12.32 p.210

b) SF₆ circuit breakers with mechanical operating mechanism, withdrawable construction for both UniGear ZS1 panel and PowerCube PB1 enclosures, 150 mm pole centre distance, type HD4/P 12..17.5 kV, 630..1250 A, up to 31.5 kA; the type designations are the same ones for UniGear respect to the previous ones, while the type designation for PowerCube Enclosure PB1 becomes “HD4/P” respect to the previous “HD4/W”; these are the new commercial codes:

- 1VCF307121R0121 HD4/P 12.06.16 p.150 *(supplied since 1st oct.2015 – see TCI 1VCD850134R001)*
- 1VCF307121R0321 HD4/P 12.12.16 p.150 *(supplied since 1st oct.2015 – see TCI 1VCD850134R001)*
- 1VCF307121R0141 HD4/P 12.06.25 p.150 *(supplied since 1st oct.2015 – see TCI 1VCD850134R001)*
- 1VCF307121R0341 HD4/P 12.12.25 p.150 *(supplied since 1st oct.2015 – see TCI 1VCD850134R001)*
- 1VCF307121R0151 HD4/P 12.06.32 P.150
- 1VCF307121R0351 HD4/P 12.12.32 P.150
- 1VCF307123R0121 HD4/P 17.06.16 p.150 *(supplied since 1st oct.2015 – see TCI 1VCD850134R001)*
- 1VCF307123R0321 HD4/P 17.12.16 p.150 *(supplied since 1st oct.2015 – see TCI 1VCD850134R001)*
- 1VCF307123R0141 HD4/P 17.06.25 p.150 *(supplied since 1st oct.2015 – see TCI 1VCD850134R001)*
- 1VCF307123R0341 HD4/P 17.12.25 p.150 *(supplied since 1st oct.2015 – see TCI 1VCD850134R001)*
- 1VCF307123R0151 HD4/P 17.06.32 p.150
- 1VCF307123R0351 HD4/P 17.12.32 p.150

c) SF₆ circuit breakers with mechanical operating mechanism, withdrawable construction for PowerCube PB2 enclosures, 210 mm pole centre distance, type HD4/W 12..17.5 kV, 630..1250 A, up to 31.5 kA; the type designations are the same ones respect to previous types while commercial codes are changed:

- 1VCF307131R0122 HD4/W 12.06.16 p.210
- 1VCF307131R0322 HD4/W 12.12.16 p.210
- 1VCF307131R0142 HD4/W 12.06.25 p.210
- 1VCF307131R0342 HD4/W 12.12.25 p.210
- 1VCF307131R0152 HD4/W 12.06.32 p.210
- 1VCF307131R0352 HD4/W 12.12.32 p.210
- 1VCF307133R0122 HD4/W 17.06.16 p.210
- 1VCF307133R0322 HD4/W 17.12.16 p.210
- 1VCF307133R0142 HD4/W 17.06.25 p.210
- 1VCF307133R0342 HD4/W 17.12.25 p.210
- 1VCF307133R0152 HD4/W 17.06.32 p.210
- 1VCF307133R0352 HD4/W 17.12.32 p.210

The new types are going to be supplied as a default according to this planning:

- a) b) groups - since 15th of June 2016
- c) group - since 1st of September 2016

Shift from previous types is immediate; the old types will be supplied as an alternative for the transitory periods below listed, provided detailed reason is specified and with an extra price:

- a) b) groups until 15th of September 2016

- c) group until 1st of December 2016

All the mandatory type tests (temperature rise, withstand insulation at power frequency, withstand insulation at lightning impulse, short-time and peak withstand current, mechanical life, short-circuit current making and breaking capacity, cable-charging switching) have been performed both in UniGear switchgear and PowerCube enclosures. Moreover, capacitive current switching test has been performed in back-to-back capacitor banks application with 25 kA breaking capacity types.

Type tests applicability guidelines to OEMs own designed products have been defined according to type test results carried-out on ABB products; a summary of the applicability guidelines to OEMs own designed products is available in ANNEX 1; for further information please contact ABB. Please make sure that the applicability guidelines are communicated to active OEMs customers.

Until further notice, updated types of HD4 circuit breakers are not suitable, due to not yet carried out certification, in the following cases:

- Marine applications
- GOST applications
- Specific Utilities approvals (please contact ABB in case you need to apply for a specific Utility approval)

ANNEX 2 shows the applicability table.

Till further notice, for all these cases the old types shall be specified at order (selection available in Order Forms and soon on CCP configurators).

3. PRICE LISTS

There is no price difference between updated breakers and the previous corresponding types.

4. AVAILABILITY AND DELIVERY TIMES

The updated HD4 will be supplied as a default starting since 15th of June 2016 for freestanding construction p.150 - 210 mm and withdrawable construction p.150 mm and since 1st of September 2016 for withdrawable construction p.210 mm with the same delivery time which is currently confirmed.

5. SALES SUPPORT TOOLS

List of available documentation:

- Technical Catalogue
- Instruction manual
- Price List
- Electrical diagram
- Overall dimension table
- Order form

ANNEX 1: Type tests applicability guidelines to OEMs own designed products (Attachment)

ANNEX 2: Applicability table

Market or Application	Updated types Applicability
IEC Standard Market	Yes
Marine Applications	No
GOST Applications	No
ANSI/UL Market	No
Specific Utilities and Regional approval	Ask ABB
Any other specific approval	Ask ABB

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OEM Test Matrix – HD4 new design 12-17.5 kV up to 1250A and 31.5 kA

- **Dielectric Test**
 - Fixed version:
 - OEM needs to repeat the test
 - Withdrawable version:
 - OEM needs to repeat the test
 - Withdrawable version with PowerCube:
 - Test already performed by ABB so no need to repeat

- **Temperature rise test & measurement of the resistance of the main circuit**
 - Fixed version:
 - Replacing actual HD4 with new design HD4: due to the fact that the resistance of the new pole is equal to the actual pole, a temperature rise test valid for a breaker with the actual pole is still valid for the new pole. Needed are the type test with the new pole in UniGear together with the actual pole test in the OEM panel
 - Withdrawable version with OEM cassette/panel:
 - Replacing actual HD4 with new design HD4: due to the fact that the resistance of the new pole is equal to the actual pole, a temperature rise test valid for a breaker with the actual pole is still valid for the new pole. Needed are the type test with the new pole in UniGear together with the actual pole test in the OEM panel
 - Withdrawable version with PowerCube:
 - Replacing actual HD4 with new design HD4: due to the fact that the resistance of the new pole is equal to the actual pole, a temperature rise test valid for a breaker with the actual pole is still valid for the new pole. Needed are the type test with the new pole in UniGear together with the actual pole test in the OEM panel

- **STC test**
 - Fixed version:
 - Test for the pole to withstand the mechanical forces has been carried out on the breaker in UniGear. Furthermore, the panel has been able to withstand the test with new design pole, therefore does not need to be repeated
 - Withdrawable version:
 - Test for the pole to withstand the mechanical forces has been carried out on the breaker in UniGear. Furthermore, the panel has been able to withstand the test with new design pole, therefore does not need to be repeated
 - Withdrawable version with PowerCube:
 - Test for the pole to withstand the mechanical forces has been carried out on the breaker in UniGear. Furthermore, the panel has been able to withstand the test with new design pole, therefore does not need to be repeated



- **Making & Breaking test / single phase tests; double earth fault test**

- Fixed version:

- Test for HD4 has been carried out on the breaker in UniGear. Furthermore, the panel has been able to withstand the test with new design pole therefore does not need to be repeated

- Withdrawable version:

- Test for HD4 has been carried out on the breaker in UniGear. Furthermore, the panel has been able to withstand the test with new design pole therefore does not need to be repeated

- Withdrawable version with PowerCube:

- Test for HD4 has been carried out on the breaker in UniGear. Furthermore, the panel has been able to withstand the test with new design pole therefore does not need to be repeated

- **Mechanical Lifetime test**

- Fixed version:

- Independent from switchgear, therefore the already performed test from ABB can be used without declarations

- Withdrawable version:

- Independent from switchgear, therefore the already performed test from ABB can be used without declarations

- Withdrawable version with PowerCube:

- Independent from switchgear, therefore the already performed test from ABB can be used without declarations

- **Capacitive switching**

- Fixed version:

- Test only depends on the used new pole, its stroke and opening speed of the drive. Consequently, a test for the breaker can directly be applied to other panels. Concerning line charging: this test is not applicable. Concerning single bank switching: this test can be deducted from the carried out tests with cable charging and back-to-back switching

- Withdrawable version:

- Test only depends on the used new pole, its stroke and opening speed of the drive. Consequently, a test for the breaker can directly be applied to other panels. Concerning line charging: this test is not applicable. Concerning single bank switching: this test can be deducted from the carried out tests with cable charging and back-to-back switching

- Withdrawable version with PowerCube:

- Test only depends on the used new pole, its stroke and opening speed of the drive. Consequently, a test for the breaker can directly be applied to other panels. Concerning line charging: this test is not applicable. Concerning single bank switching: this test can be deducted from the carried out tests with cable charging and back-to-back switching



- **Mechanical compatibility / Rack In-Out Test**
 - Fixed version
 - Not Applicable
 - Withdrawable version
 - OEM needs to repeat the test
 - Withdrawable version with PowerCube:
 - Test already performed by ABB in UniGear panel so no need to repeat