



Type test report no. VV 5E 001e

Mechanical tests

Product Approval
CTTP/LLD
11.01.2018

- Type test for type:** Selector switches VACUTAP® VV with
- single-phase design or three-phase design,
- maximum rated through-current: 250 A, 400 A or 600 A,
- reversing change-over selector, coarse change-over selector
or without change-over selector.
- Test specification:** IEC 60214-1:2014, sub-clause 5.2.6: "Mechanical tests".
- Test samples:** 1: VACUTAP® VV III 400 D – 145 – 12 23 1W, serial no. 1556633
2: VACUTAP® VV III 600 D – 40 – 12 23 3W, serial no. 1237049
- Manufacturer:** Maschinenfabrik Reinhausen GmbH, Regensburg, Germany.
- Date of test:** October 2013 to April 2015
- Place of test:** Maschinenfabrik Reinhausen GmbH, Regensburg, Germany.
- Tests performed:** Simulation of the transformer drying procedure.
- Mechanical endurance test with sequence tests: 500,000 operations were performed at a temperature of 80°C. The switching sequence was measured at the beginning and at the end of the mechanical endurance test.
100 operations were performed at a temperature of 115 °C. The switching sequence was measured at each operation.
100 operations were performed at a temperature of -25 °C. The switching sequence was measured at each operation.
- Operation under maximum allowable static pressure: 100 operations were performed at a temperature of 40°C and under maximum allowable static pressure of 1 bar. The switching sequence was measured at each operation.
- Pressure and vacuum test: Performed on the oil compartment of the test sample to confirm the pressure and vacuum withstand values stated in the technical data of VACUTAP® VV.
- Test results:** The requirements of IEC 60214-1:2014 were met, i.e.:
- The mechanical endurance test with sequence test and the operation test at maximum allowable static pressure were passed successfully.
- The pressure and vacuum test was passed successfully.

This report contains 39 sheets.

i. V. Dr. Thomas Strof
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Maschinenfabrik Reinhausen GmbH
- PRODUCT APPROVAL -

1. Test specification

The type test was performed in accordance with IEC 60214-1:2014 "Tap-changers - Part 1: Performance requirements and test methods", sub-clause 5.2.6: "Mechanical tests".

2. Data of test samples

Test sample no.	1
Selector switch:	VACUTAP® VV III 400 D – 145 – 12 23 1W
Serial no.:	1556633
IBASE:	468728544
Year of manufacture:	2014

Test sample no.	2
Selector switch:	VACUTAP® VV III 600 D – 40 – 12 23 3W
Serial no.:	1237049
IBASE:	377582958
Year of manufacture:	2011

3. Scope of application

Three phase selector switches type VACUTAP® VV with highest voltage for equipment $U_m = 145$ kV have the maximum axial dimensions and are representative for the highest mechanical stress among all selector switches of type VACUTAP® VV.

Depending on the number of pitches of the selector switch, the mechanism for opening and closing the vacuum interrupters works with following different angles per operation:

- 36° between each contact at type VACUTAP® VV with 10 pitch design and
- 36° between contacts 11 to 12 and 1 to 12 resp. 29° between the other contacts at type VACUTAP® VV with 12 pitch design.

Due to the 12 pitch selector switch operates with both angles per operation, the test of a 12 pitch selector switch is also representative for 10 pitch selector switches.

Due to the biggest volume of the oil compartment of selector switches type VACUTAP® VV with $U_m = 145$ kV and the same design of all relevant seals, the performed pressure and vacuum test is applicable to all selector switches of type VACUTAP® VV.

Because of above mentioned facts this type test report is valid for all selector switches type VACUTAP® VV.

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