

Draft Standard Requirements for Tap Changers

C57.131

Comments (submitted by Jorge González):

For de-energized tap changers used in small distribution transformers (under 500 kVA), the contact temperature rise limit (when tested at 1.2 times the maximum rated current) does not correspond with the short circuit testing requirements.

Tap changers with 11 °C contact temperature rise can easily withstand 20 times the rated symmetrical current during 2 seconds, but fail when the initial peak current is 2.5 times the r.m.s. value.

To withstand the asymmetry stated in the standard, the contacts must be oversized causing a dimension problem due to the available space inside the small distribution transformers.

We propose to add the highlighted paragraph:

7.2.3 Short-circuit current test for DETCs

All contacts of different design carrying current continuously shall be subject to short-circuit currents, each of 2 s ($\pm 10\%$) duration. In the case of liquid-immersed deenergized tap changers, the test shall be performed in transformer liquid.

In the case of three-phase deenergized tap changers, it is sufficient to test the contacts of one phase only unless otherwise specified.

Three applications shall be made with an initial peak current of 2.5 ($\pm 5\%$) times the r.m.s. value of the rated short-circuit test current. The contacts shall not be moved between these applications.

For the case of tap changers with the hand wheel directly mounted, and rated for 34.5 kV and 150 A or below, three applications shall be made with an initial peak equal to the value of the rated short-circuit test current.

When there are no facilities for point-on-wave switching and it is not possible to obtain three short-circuit applications with initial peak current 2.5 times the r.m.s. value, the following test may be used.

The r.m.s. value of the short-circuit test current may be increased so that the rated peak current is obtained for the three applications and the test duration reduced. When using this method, the product of the square of the increased r.m.s. current and the shorter test duration shall not be less than the product of the square of the rated short-circuit r.m.s. current and the two second duration.

The values of the short-circuit test current to be applied shall be as given in Figure 3.