C62.11a™

IEEE Standard for Metal-Oxide Surge Arresters for AC Power Circuits (>1 kV)

Amendment 1: Short-Circuit Tests for Station, Intermediate, and Distribution Arresters

IEEE Power Engineering Society

Sponsored by the
Surge Protective Devices Committee

IEEE
3 Park Avenue
New York, NY 10016-5997, USA

18 July 2008

IEEE Std C62.11a™-2008
(Amendment to C62.11™-2005)

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Approved 27 March 2008

IEEE-SA Standards Board

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Abstract: Metal-oxide surge arresters designed to repeatedly limit the voltage surges on 48 Hz to 62 Hz power circuits (>1000 V) by passing surge discharge current and automatically limiting the flow of system power current applies to this amendment. This amendment covers devices for separate mounting and to those supplied integrally with other equipment. The tests demonstrate that an arrester can survive the rigors of reasonable environmental conditions and system phenomena, while, at the same time, protect equipment and/or the system from damaging overvoltages caused by lightning, switching, or other undesirable surges.
Keywords: discharge current, discharge voltage, duty-cycle voltage rating, lightning protection, metal-oxide surge arrester (MOSA), surge arrester, valve arrester, maximum continuous operating voltage (MCOV), prospective (available) short-circuit current

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Introduction

This introduction is not part of IEEE Std C62.11a-2008, Standard for Metal-Oxide Surge Arresters for AC Power Circuits (> 1 kV) Amendment 1: Short-Circuit Tests for Station, Intermediate, and Distribution Arresters.

Metal-oxide surge arresters described in this amendment represent the most predominant surge arrester technology applied on ac power systems above 1 kV. This standard presents minimum criteria for the testing of such surge arresters. Matters of application of this type of surge arrester are covered in IEEE Std C62.22™. Testing and application of older technology silicon carbide surge arresters are covered in IEEE Std C62.1™ and IEEE Std C62.2™, respectively. For testing and application of surge protective devices for use in low-voltage circuits (1 kV and below), other standards in the C62™ series are available.

This amendment to IEEE Std C62.11-2005 contains the following significant changes:

- Modifications to Table 2 Arrester Design Tests
    - Replace Pressure-relief test for station and intermediate arresters, subclause 8.16, with new subclause 8.21.
    - Replace Short-circuit test for porcelain-housed distribution arresters, subclause 8.17, with new subclause 8.21.
    - Replace Short-circuit test for polymer-housed distribution arresters, subclause 8.18, with new subclause 8.21.
    - Renumbering existing subclauses 8.19, 8.20, 8.21, 8.22 and 8.23 to 8.16, 8.17, 8.18, 8.19, and 8.20 respectively.
- Addition of subclause 8.21 – Short Circuit Test for Station, Intermediate and Distribution Arresters.

The changes from the previous “Pressure Relief” test requirements to the new “Short-Circuit” test requirements are in large part an effort to harmonize more closely with the requirements of the IEC surge arrester standard 60099-4, Ed. 1.2 (2006). The new requirements of the IEC standard took into account field experience indicating that arresters tested at their “rated” short-circuit current level have failed violently in service at fault currents substantially below the “rated” current at which they were tested. Consequently, the new IEC procedure contains requirements for testing not only at “rated” current, but at two lower “intermediate” current levels, in addition to the “low” current test level that was already required. The IEC standard was also revised to add specific provisions for testing of newer technology polymer-housed arresters. Changes to IEEE C62.11-2005, contained in this amendment, have been made along similar lines.

IEEE Std C62.11-2005 does not contain short-circuit (pressure-relief) requirements for station and intermediate class polymer-housed arresters. This deficiency is remedied in this Amendment. At the same time, it was recognized that the document could be simplified by having one basic procedure for all outdoor arresters instead of having different procedures for station/intermediate, porcelain-housed distribution, and polymer-housed distribution arresters. There are some differences in the test requirements between porcelain-housed and polymer-housed arresters, and some differences in sample preparation between different types of construction of these arresters.

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