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STANDARDIZATION SECTOR
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K.77

Amendment 1

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SERIES K: PROTECTION AGAINST INTERFERENCE

Characteristics of metal oxide varistors for the protection of telecommunication installations

Amendment 1: New Appendix III – Characterizing thermally protected MOVs using a.c. step stress testing

Recommendation ITU-T K.77 (2009) – Amendment 1

Recommendation ITU-T K.77

Characteristics of metal oxide varistors for the protection of telecommunication installations

Amendment 1

New Appendix III – Characterizing thermally protected MOVs using a.c. step stress testing

Summary

Amendment 1 to Recommendation ITU-T K.77 adds a new appendix that describes a general procedure for characterizing the performance of the thermal disconnect of thermally protected metal oxide varistors.

History

Edition	Recommendation	Approval	Study Group	Unique ID*
1.0	ITU-T K.77	2009-01-13	5	11.1002/1000/9659-en
1.1	ITU-T K.77 (2009) Cor.1	2011-05-05	5	11.1002/1000/11350-en
1.2	ITU-T K.77 (2009) Amd. 1	2013-12-13	5	11.1002/1000/12116-en

* To access the Recommendation, type the URL http://handle.itu.int/ in the address field of your web browser, followed by the Recommendation's unique ID. For example, http://handle.itu.int/11.1002/1000/11830-en.

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Recommendation ITU-T K.77

Characteristics of metal oxide varistors for the protection of telecommunication installations

Amendment 1

New Appendix III – Characterizing thermally protected MOVs using a.c. step stress testing

Appendix III

Characterizing thermally protected MOVs using a.c. step stress testing

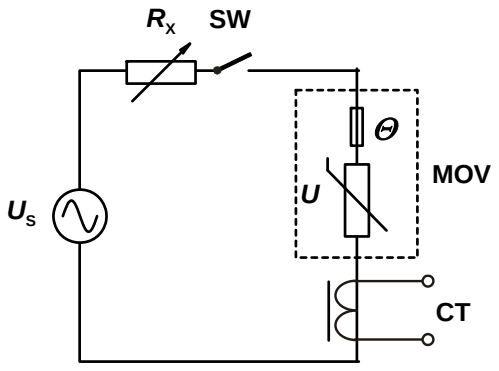
(This appendix does not form an integral part of this Recommendation.)

III.1 Introduction

This appendix gives details of a general procedure which characterizes the performance of the thermal disconnect of a thermally protected MOV using a.c. step stress testing.

III.2 Procedure

Figure III.1 shows the characterization circuit. An a.c. voltage source, U_S, of 1.6 times the MOV maximum continuous operating voltage (MCOV), U_C, is applied to the MOV via resistor R_X. Resistor R_X defines the prospective short-circuit current. The prospective short-circuit currents used double with each step. The first test is at 0.125 A and the subsequent six steps, using a new sample for each test, are 0.25 A, 0.5 A, 1 A, 2 A, 4 A and 8 A. For step number 1, resistor R_X is $R_1 = 8U_C$ and for the subsequent six steps half the resistance value i.e., $R_2 = 4U_C$, $R_3 = 2U_C$, $R_4 = U_C$, $R_5 = 0.5U_C$, $R_6 = 0.25U_C$, $R_7 = 0.125U_C$. Each test current shall be applied for a 15-minute period or if the monitored current falls to zero during that time, the test is terminated.



KEY

$U_S = 1.6U_C$	MOV = Composite symbol of an MOV (resistance dependent on applied voltage, U) and series disconnect (operated by temperature, Θ)
$R_X = 8U_C/(2^{x-1})$	CT = Current Transformer for monitoring MOV current
SW = Switch to apply U_S	

Figure III.1 – Disconnect characterization circuit

The test atmospheric conditions used are given in clause 7 'Test methods'. The thermally protected MOV should be mounted in accordance with the manufactures' recommendations. When mounted the MOV should be surrounded with a cheese cloth tent spaced 10 mm from the MOV body.

III.3 Results

For each test record the prospective current and the time for disconnection if it occurs. At the end of each test where disconnection occurs the cheese cloth should be examined for any damage. Cheese cloth damage would indicate a possible hazardous situation. The test results of prospective current and disconnect time can be plotted in the format shown in Figure III.2.

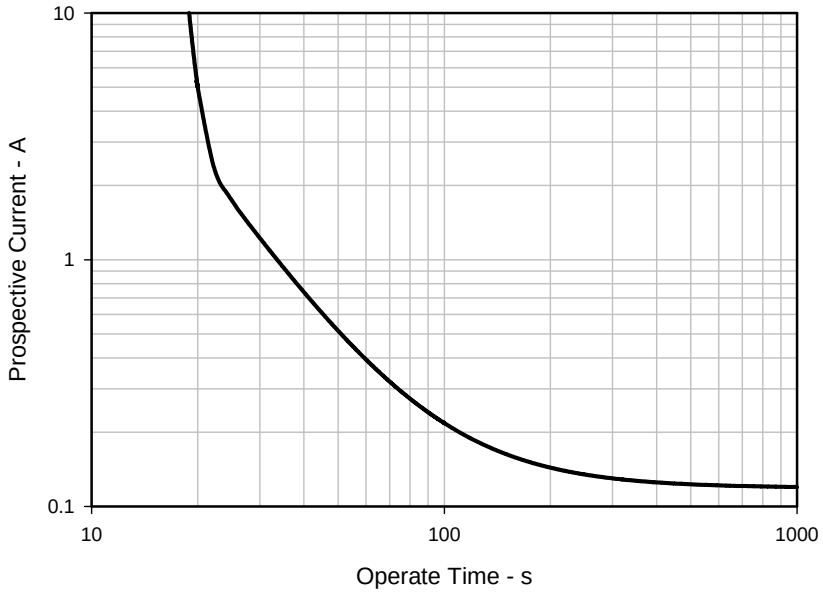


Figure III.2 – Example of disconnect prospective current versus time characteristic

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