IEC 60255-22-1

Edition 3.0 2007-10

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Measuring relays and protection equipment – Part 22-1: Electrical disturbance tests – 1 MHz burst immunity tests

Relais de mesure et dispositifs de protection – Partie 22-1: Essais d'influence électrique – Essais d'immunité à l'onde oscillatoire amortie 1 MHz

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INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

PRICE CODE
CODE PRIX

M

ICS 29.120.70

ISBN 2-8318-9331-3

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

MEASURING RELAYS AND PROTECTION EQUIPMENT –

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FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard IEC 60255-22-1 has been prepared by IEC technical committee 95: Measuring relays and protection equipment.

This third edition cancels and replaces the second edition published in 2005. This standard constitutes a technical revision. The main differences with respect to the previous edition are:

– this document is based on IEC 61000-4-18;
– a capacitor was added for testing shielded communication lines when earthed at one end only;
– the test procedure for communication ports is clarified;
– the length of the communication cable for testing is fixed at 10 m;
– connection to earth removed in Figure 4 for test generator terminal.

The text of this standard is based on the following documents:

CDV	Report on voting
95/204/CDV	95/218/RVC

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

A list of all parts of the IEC 60255 series, under the general title *Measuring relays and protection equipment*, can be found on the IEC website.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

MEASURING RELAYS AND PROTECTION EQUIPMENT –

Part 22-1: Electrical disturbance tests – 1 MHz burst immunity tests

1 Scope and object

This part of IEC 60255 is based on IEC 61000-4-18, referring to that publication where applicable, and specifies the general requirements for 1 MHz oscillatory wave immunity tests for measuring relays and protection equipment for power system protection, including the control, monitoring and process interface equipment used with the relays and protection equipment.

The objective of the tests is to confirm that the equipment under test will operate correctly when energised and subjected to repetitive damped oscillatory waves such as those originating from closing or opening circuit breakers or disconnectors in high voltage substations or power plants.

The requirements specified in this standard are applicable to measuring relays and protection equipment in a new condition and all tests specified are type tests only.

The object of this standard is to state:

– definition of terms used;
– test severity levels;
– test equipment;
– test set-up;
– test procedure;
– criteria for acceptance;
– test report.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60255-6, *Electrical relays – Part 6: Measuring relays and protection equipment*

IEC 61000-4-18:2006, *Electromagnetic Compatibility (EMC) – Part 4-18: Testing and measurement techniques – Damped oscillatory wave immunity test*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
auxiliary equipment
equipment necessary to provide the EUT with the signals required for normal operation and equipment to verify the performance of the EUT

3.2
auxiliary power supply port
AC or DC auxiliary energising input of the EUT

3.3
burst
a sequence of a limited number of distinct pulses or an oscillation of limited duration.

[IEV 161-02-07]

3.4
communication port
interface with a communication and/or control system, using low energy signals, permanently connected to the EUT

3.5
EUT
Equipment Under Test, which may be either a measuring relay or a protection equipment

3.6
functional earth port
a port on the EUT which is connected to earth for purposes other than electrical safety

3.7
input port
port through which the EUT is energised or controlled in order to perform its function(s), e.g. current and voltage transformer, status (binary) inputs, etc.

[IEV 131-12-61, modified]

3.8
output port
port through which the EUT produces predetermined changes, e.g. contact, optocoupler, analogue outputs, etc.

[IEV 131-12-62, modified]

3.9
port
particular interface of the EUT with the external electromagnetic environment (see Figure 1)

[IEC 61000-4-18, 3.10]

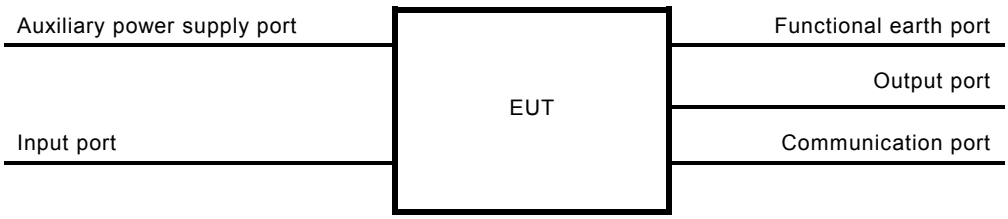


Figure 1 – Ports for measuring relays and protection equipment

4 Test severity levels

The test voltages for the appropriate ports of the EUT are shown in Table 1.

Table 1 – Test voltages for the EUT ports

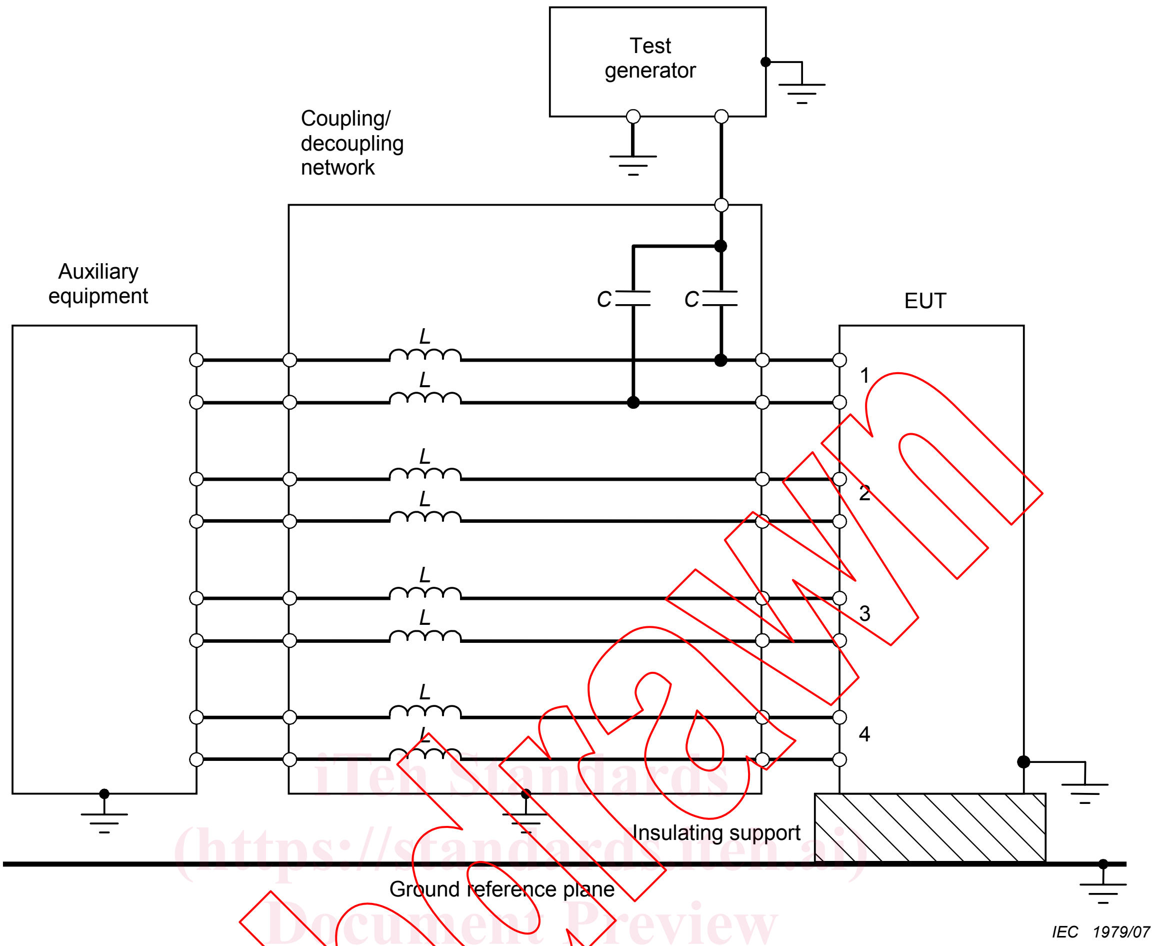
	Test voltage (kV peak ± 10 %) Oscillation frequency 1 MHz	
Port under test	**Common mode test**	**Differential mode test**
Auxiliary power supply	2,5	1
Input and output (see note)	2,5	1
Communication	1	0
NOTE In more severe environments a differential test voltage of 2,5 kV may be required for current and voltage transformer inputs.		

The 1 MHz test is not applicable to functional earth port.

The 1 MHz test is not applicable to the communications port if interfacing with cables which are not permanently connected, or whose total length according to the manufacturers functional specification is always less than 3 m.

5 Test equipment

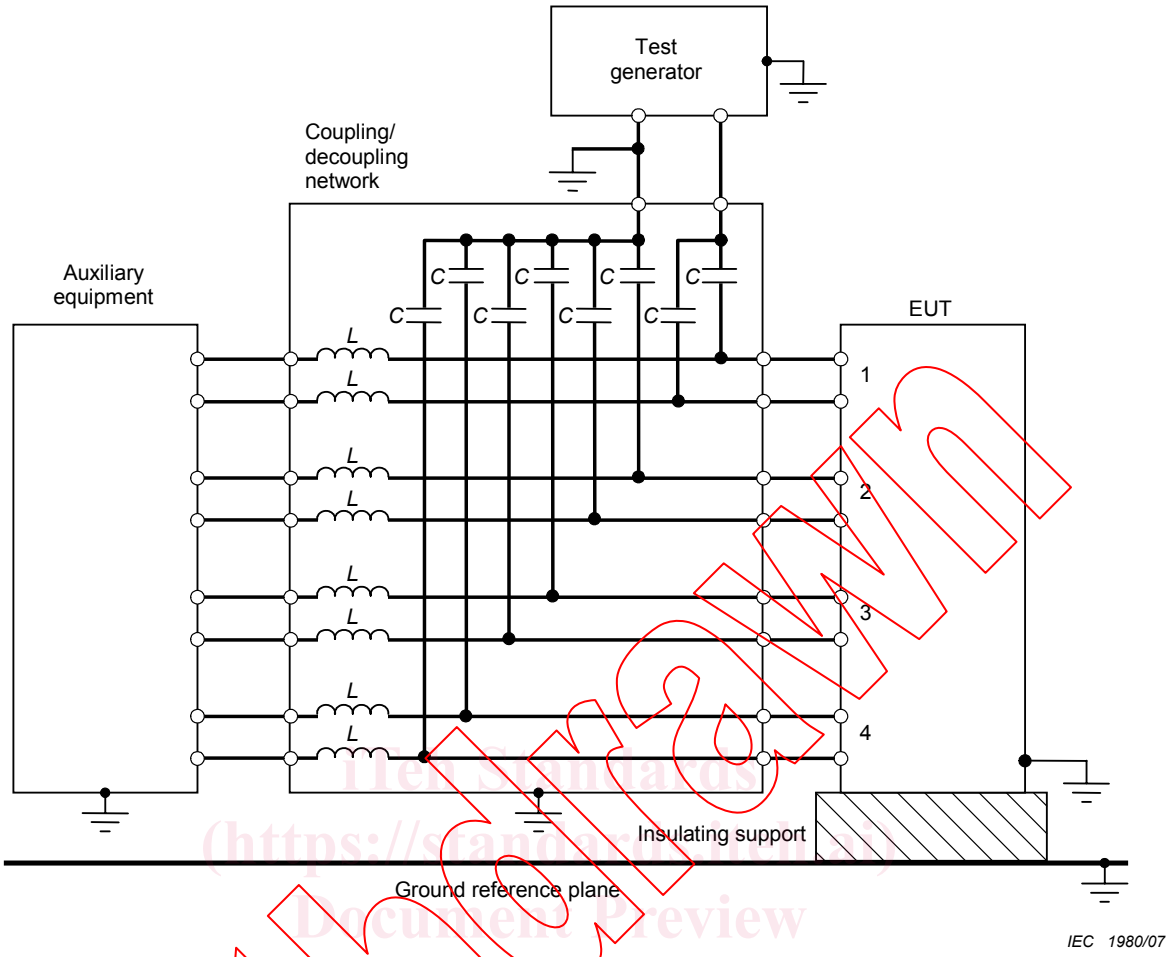
The test generator, characteristics and performance are specified in IEC 61000-4-18. The coupling and decoupling networks shall be in accordance with the arrangements in Figures 2, 3 and 4 of this part of IEC 60255.



Key

L	high-frequency blocking inductor, 1,5 mH
C	high-frequency coupling capacitor, 0,5 µF
1, 2, 3, 4	EUT input and output ports

Figure 2 – Common mode test between each independent port and earth



Key

L	high-frequency blocking inductor, 1,5 mH
C	high-frequency coupling capacitor, 0,5 µF
1, 2, 3, 4	EUT input and output ports

Figure 3 – Common mode test between each independent port and all other independent ports coupled to earth