BS EN IEC 60255-26:2025

BSI Standards Publication

Measuring relays and protection equipment

Part 26: Electromagnetic compatibility requirements

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National foreword

This British Standard is the UK implementation of EN IEC 60255-26:2025. It is identical to IEC 60255-26:2023. It supersedes BS EN 60255-26:2013, which will be withdrawn on 30 April 2028.

The UK participation in its preparation was entrusted to Technical Committee PEL/95, Measuring relays and protection systems.

A list of organizations represented on this committee can be obtained on request to its committee manager.

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This British Standard was published under the authority of the Standards Policy and Strategy Committee on 30 April 2025.

Amendments/corrigenda issued since publication

Date	Text affected

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN IEC 60255-26

April 2025

ICS 29.120.70

Supersedes EN 60255-26:2013; EN 60255-26:2013/AC:2013

English Version

Measuring relays and protection equipment - Part 26: Electromagnetic compatibility requirements (IEC 60255-26:2023)

Relais de mesure et dispositifs de protection - Partie 26: Exigences de compatibilité électromagnétique (IEC 60255-26:2023)

Messrelais und Schutzeinrichtungen - Teil 26: Anforderungen an die elektromagnetische Verträglichkeit (IEC 60255-26:2023)

This European Standard was approved by CENELEC on 2024-10-16. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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European foreword

The text of document 95/515/FDIS, future edition 4 of IEC 60255-26, prepared by TC 95 "Measuring relays and protection equipment" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 60255-26:2025.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2026-04-30
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2028-04-30

This document supersedes EN 60255-26:2013 and all of its amendments and corrigenda (if any).

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Any feedback and questions on this document should be directed to the users' national committee. A complete listing of these bodies can be found on the CENELEC website.

Endorsement notice

The text of the International Standard IEC 60255-26:2023 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following note has to be added for the standard indicated:

IEC 61000-4 series	NOTE	Approved as EN 61000-4 series

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Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cencenelec.eu.

Publication	Year	Title	EN/HD	Year
IEC 60255-1	2022	Measuring relays and protection equipment - Part 1: Common requirements	EN IEC 60255-1	2023
IEC 61000-4-2	2008	Electromagnetic compatibility (EMC) - Part 4-2: Testing and measurement techniques - Electrostatic discharge immunity test	EN 61000-4-2	2009
IEC 61000-4-3	2020	Electromagnetic compatibility (EMC) - Part 4-3 : Testing and measurement techniques - Radiated, radio-frequency, electromagnetic field immunity test	EN IEC 61000-4-3	2020
IEC 61000-4-4	2012	Electromagnetic compatibility (EMC) - Part 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test	EN 61000-4-4	2012
IEC 61000-4-5	2014	Electromagnetic compatibility (EMC) - Part 4-5: Testing and measurement techniques - Surge immunity test	EN 61000-4-5	2014
+ A1	2017		+ A1	2017
IEC 61000-4-6	2013	Electromagnetic compatibility (EMC) - Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields	EN 61000-4-6	2014
-	-		+ AC	2015
IEC 61000-4-8	2009	Electromagnetic compatibility (EMC) - Part 4-8: Testing and measurement techniques - Power frequency magnetic field immunity test	EN 61000-4-8	2010

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Publication	Year	Title	EN/HD	Year
IEC 61000-4-11	2020	Electromagnetic compatibility (EMC) - Part 4-11: Testing and measurement techniques - Voltage dips, short interruptions and voltage variations immunity tests for equipment with input current up to 16 A per phase	EN IEC 61000-4-11	2020
-	-		+ AC	2020
-	-		+ AC	2022
IEC 61000-4-16	2015	Electromagnetic compatibility (EMC) - Part 4-16: Testing and measurement techniques - Test for immunity to conducted, common mode disturbances in the frequency range 0 Hz to 150 kHz	EN 61000-4-16	2016
IEC 61000-4-17	1999	Electromagnetic compatibility (EMC) - Part 4-17: Testing and measurement techniques - Ripple on d.c. input power port immunity test	EN 61000-4-17	1999
+ A1	2001		+ A1	2004
+ A2	2008		+ A2	2009
IEC 61000-4-18	2019	Electromagnetic compatibility (EMC) - Part 4-18: Testing and measurement techniques - Damped oscillatory wave immunity test	EN IEC 61000-4-18	2019
IEC 61000-4-29	2000	Electromagnetic compatibility (EMC) - Part 4-29: Testing and measurement techniques - Voltage dips, short interruptions and voltage variations on d.c. input power port immunity tests	EN 61000-4-29	2000
CISPR 11 (mod)	2015	Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement	EN 55011	2016
+ A1	2016		+ A1	2017
-	-		+ A11	2020
+ A2	2019		+ A2	2021
CISPR 32	2015	Electromagnetic compatibility of multimedia equipment - Emission requirements	EN 55032	2015
-	-		+ AC	2016-07
+ A1	2019		+ A1	2020
-	-		+ A11	2020

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Document Sharing Hub

Full document details: BS EN IEC 60255-26:2025

CONTENTS

FOREWORD 5
1 Scope 7
1.1 General 7
1.2 Emission 7
1.3 Immunity 7
2 Normative references 7
3 Terms, definitions, and abbreviated terms 9
3.1 Terms and definitions 9
3.2 Abbreviated terms 12
4 Electromagnetic environmental levels 13
4.1 General 13
4.2 Zone A, severe electromagnetic environment 13
4.3 Zone B, typical electromagnetic environment 14
5 Emission 14
5.1 Radiated emission 14
5.2 Conducted emission 15
6 Immunity 16
6.1 Immunity of enclosure 16
6.2 Immunity of auxiliary power supply port 17
6.3 Immunity of signal/control port and wired network port 20
6.4 Immunity of input and output ports 21
6.5 Immunity of earth port 24
7 Test set-up and procedures 24
7.1 General 24
7.2 Emission 25
7.2.1 General 25
7.2.2 Radiated emission 26
7.2.3 Conducted emission 26
7.3 Immunity 26
7.3.1 General 26
7.3.2 Electrostatic discharge immunity test 28
7.3.3 Radiated electromagnetic field immunity test 29
7.3.4 Electrical fast transient/burst immunity test 31
7.3.5 Damped oscillatory wave immunity test 32
7.3.6 Surge immunity test 33
7.3.7 Conducted RF immunity test 35
7.3.8 Conducted power frequency immunity test on binary inputs 37
7.3.9 Power frequency magnetic field immunity test 38
7.3.10 Voltage dips and short interruptions test (AC or DC) 38
7.3.11 Ripple on DC input power port immunity test 39
7.3.12 Gradual shutdown / start-up tests 40
8 Criteria for acceptance 40
8.1 Emission 40
8.2 Immunity 41
9 Test report 42
Annex A (normative) Power frequency immunity tests on binary inputs 44

AVA Documents
Document Sharing Hub
Full document details: BS EN IEC 60255-26:2025

A.1 General 43
A.2 Test classes 43
A.3 Test equipment 43
A.3.1 General 43
A.3.2 Test generator 43
A.3.3 Verification of the test generator 44
A.3.4 Coupling networks 44
A.4 Test set-up 44
A.4.1 General 44
A.4.2 Earthing connections 44
A.4.3 Auxiliary equipment 44
Annex B (informative) Background information for power frequency tests 47
Annex C (informative) Background information about spot frequency tests 48
Annex D (informative) EMC risk assessment 50
D.1 EMC design risk assessment 50
D.2 Product platform risk assessment 52
Annex E (informative) Considerations regarding radio interfaces 54
Annex F (informative) Immunity test to be considered in future 55
Bibliography 56

Figure 1 – Gradual shutdown / start-up test 40
Figure A.1 – Example of Zone A differential mode tests 45
Figure A.2 – Example of Zone B differential mode tests 45
Figure A.3 – Example of Zone A and Zone B common mode tests 46

Table 1 – Radiated emission tests – Enclosure port 14
Table 2 – Required highest frequency for radiated measurement 15
Table 3 – Conducted emission tests – AC and DC auxiliary power supply port 15
Table 4 – Conducted emission tests – Wired network port 15
Table 5 – Immunity tests – Enclosure port 16
Table 6 – Immunity tests – Auxiliary power supply port 17
Table 7 – Immunity tests – signal/control port and wired network port 20
Table 8 – Immunity tests – Input and output port 21
Table 9 – Immunity tests – Earth port 24
Table 10 – Radiated emission test 26
Table 11 – Conducted emission test 26
Table 12 – Electrostatic discharge immunity test 28
Table 13 – Radiated electromagnetic field immunity test (frequency sweep) 29
Table 14 – Radiated electromagnetic field immunity test (spot frequencies) 30
Table 15 – Electrical fast transient/burst immunity test 31
Table 16 –Damped oscillatory wave immunity test 32
Table 17 – Surge immunity test 33
Table 18 – Conducted RF immunity test (frequency sweep) 35
Table 19 – Conducted RF immunity test (spot frequencies) 36
Table 20 – Conducted power frequency immunity test on binary inputs 37

AVA Documents Document Sharing Hub
Full document details: BS EN IEC 60255-26:2025

Table 21 – Power frequency magnetic field immunity test 38
Table 22 – Voltage dips and short interruptions test (AC or DC) 38
Table 23 – Ripple on DC input power port immunity test 39
Table 24 – Gradual shutdown and start-up test 40
Table 25 – Acceptance criteria for immunity tests 41
Table C.1 – Selection of spot frequencies 48
Table D.1 – Risk assessment based on a hardware design modification 51
Table D.2 – Risk assessment, selecting representative EUT configuration(s) 52
Table E.1 – Listed standard with relevance 54
Table F.1 – Immunity test to be considered in future 55

Documents
Document Sharing Hub
Full document details: BS EN IEC 60255-26:2025

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MEASURING RELAYS AND PROTECTION EQUIPMENT –

Part 26: Electromagnetic compatibility requirements

FOREWORD

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IEC 60255-26 has been prepared by IEC technical committee 95: Measuring relays and protection equipment. It is an International Standard.

This fourth edition cancels and replaces the third edition published in 2013. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) update of normative references
b) introduction of a wired network port and signal/control port in accordance with CISPR 32;
c) introduction of low-power instrument transformer (LPIT) and battery monitor port;
d) expansion of the frequency range on radiated radio-frequency immunity test up to 6 GHz;
e) updated requirements on electrostatic discharge tests;
f) introduction of fast damped oscillatory wave test for Zone A applications;
g) specification of higher immunity requirements on power frequency magnetic field tests;

AVA Documents
Document Sharing Hub

Full document details: BS EN IEC 60255-26:2025

h) update of the spot frequency test and addition of a new annex with background information;
i) addition of details and further guidance on the relay settings;
j) additional test condition for AC voltage dips and interruptions;
k) addition of an annex about EMC risk assessments;
l) addition of an annex on radio interfaces.

The text of this International Standard is based on the following documents:

Draft	Report on voting
95/515/FDIS	95/525/RVD

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

The language used for the development of this International Standard is English

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

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

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

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

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MEASURING RELAYS AND PROTECTION EQUIPMENT –

Part 26: Electromagnetic compatibility requirements

1 Scope

1.1 General

This part of IEC 60255 specifies the requirements for electromagnetic compatibility for measuring relays and protection equipment. It is applicable to measuring relays and protection equipment and combinations of devices to form schemes for power system protection including the control, monitoring, communication and process interface equipment used with those systems.

Tests specified in this document are not required for equipment not incorporating electronic circuits, for example electromechanical relays.

The requirements specified in this document are applicable to measuring relays and protection equipment in a condition representative of how new equipment is provided by the manufacturer. All tests specified are type tests only.

1.2 Emission

This document specifies limits and test methods, for measuring relays and protection equipment in relation to electromagnetic emissions which might cause interference in other equipment.

These emission limits represent electromagnetic compatibility requirements and have been selected to ensure that the disturbances generated by measuring relays and protection equipment, operated normally in substations and power plants, do not exceed a specified level which could prevent other equipment from operating as intended.

Test requirements are specified for the enclosure, auxiliary power supply ports, input/output ports, signal/control ports and wired network ports.

1.3 Immunity

This document specifies the immunity test requirements for measuring relays and protection equipment in relation to continuous and transient, conducted and radiated disturbances, including electrostatic discharges.

These test requirements represent the electromagnetic compatibility immunity requirements and have been selected so as to ensure an adequate level of immunity for measuring relays and protection equipment, operated normally in substations and power plants.

NOTE 1 Product safety considerations are not covered in this document.

NOTE 2 In special cases, situations will arise where the levels of disturbance could exceed the levels specified in this document, for example where a hand-held transmitter or a mobile telephone is used close to measuring relays and protection equipment. In these instances, special precautions and procedures could be needed.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies.

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For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60255-1:2022, *Measuring relays and protection equipment – Part 1: Common requirements*

IEC 61000-4-2:2008, *Electromagnetic compatibility (EMC) – Part 4-2: Testing and measurement techniques – Electrostatic discharge immunity test*

IEC 61000-4-3:2020, *Electromagnetic compatibility (EMC) – Part 4-3: Testing and measurement techniques – Radiated, radio-frequency, electromagnetic field immunity test*

IEC 61000-4-4:2012, *Electromagnetic compatibility (EMC) – Part 4-4: Testing and measurement techniques – Electrical fast transient/burst immunity test*

IEC 61000-4-5:2014, *Electromagnetic compatibility (EMC) – Part 4-5: Testing and measurement techniques – Surge immunity test*
IEC 61000-4-5:2014/AMD1:2017

IEC 61000-4-6:2013, *Electromagnetic compatibility (EMC) – Part 4-6: Testing and measurement techniques – Immunity to conducted disturbances, induced by radio-frequency fields*

IEC 61000-4-8:2009, *Electromagnetic compatibility (EMC) – Part 4-8: Testing and measurement techniques – Power frequency magnetic field immunity test*

IEC 61000-4-11:2020, *Electromagnetic compatibility (EMC) – Part 4-11: Testing and measurement techniques – Voltage dips, short interruptions and voltage variations immunity tests for equipment with input current up to 16 A per phase*

IEC 61000-4-16:2015, *Electromagnetic compatibility (EMC) – Part 4-16: Testing and measurement techniques – Test for immunity to conducted, common mode disturbances in the frequency range 0 Hz to 150 kHz*

IEC 61000-4-17:1999, *Electromagnetic compatibility (EMC) – Part 4-17: Testing and measurement techniques – Ripple on d.c. input power port immunity test*
IEC 61000-4-17:1999/AMD1:2001
IEC 61000-4-17:1999/AMD2:2008

IEC 61000-4-18:2019, *Electromagnetic compatibility (EMC) – Part 4-18: Testing and measurement techniques – Damped oscillatory wave immunity test*

IEC 61000-4-29:2000, *Electromagnetic compatibility (EMC) – Part 4-29: Testing and measurement techniques – Voltage dips, short interruptions and voltage variations on d.c. input power port immunity tests*

CISPR 11:2015, *Industrial, scientific and medical equipment – Radio-frequency disturbance characteristics – Limits and methods of measurement*
CISPR 11:2015/AMD1:2016
CISPR 11:2015/AMD2:2019

CISPR 32:2015, *Electromagnetic compatibility of multimedia equipment – Emission requirements*
CISPR 32:2015/AMD1:2019

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3 Terms, definitions, and abbreviated terms

3.1 Terms and definitions

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

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- IEC Electropedia: available at https://www.electropedia.org/
- ISO Online browsing platform: available at https://www.iso.org/obp

3.1.1
analogue output port
port that generates an analogue output signal to drive actuators, analogue panel meters, etc.

Note 1 to entry: Typically a current or voltage less than or equal to 20 mA or 10 V DC respectively.

[SOURCE: IEC 60255-1:2022, 3.1.3]

3.1.2
auxiliary equipment
AE
equipment necessary to provide the equipment under test (EUT) with the signals required for normal operation and to verify the performance of the EUT

3.1.3
auxiliary power supply port
AC or DC auxiliary energizing input

Note 1 to entry: Some modern relays have a single auxiliary power supply port that can be energized with both AC and/or DC.

3.1.4
battery monitor port
port intended for connection to the station battery for the purpose of battery voltage monitoring

[SOURCE: IEC 60255-1:2022, 3.1.6]

3.1.5
binary input port
port intended for inputs which have an on or off state given by direct connection to an energizing quantity without any communications protocol

[SOURCE: IEC 60255-1:2022, 3.1.7]

3.1.6
binary output port
port intended for outputs which have an on or off state given by direct connection to an energizing quantity without any communications protocol

[SOURCE: IEC 60255-1:2022, 3.1.8]

3.1.7
common mode
CM
mode between each active conductor and a specified reference, usually earth or ground reference plane

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3.1.8
cabinet
free-standing and self-supporting enclosure for housing electrical and/or electronic equipment

Note 1 to entry: A cabinet is usually fitted with doors and/or side panels, which may or may not be removable.

[SOURCE: IEC 60050-581:2008, 581-25-02]

3.1.9
coupling network
electrical circuit or device for the purpose of transferring energy from one circuit to another with a defined impedance

3.1.10
coupling/decoupling network
CDN
electrical circuit incorporating the functions of both the coupling and decoupling networks

3.1.11
decoupling network
electrical circuit for the purpose of preventing test voltages applied to the EUT from affecting other devices, equipment, or systems which are not under test

3.1.12
differential mode
DM
mode between any two of a specified set of active conductors

3.1.13
earth port
point where a cable intended for connection to earth for functional or safety purposes can be connected

3.1.14
enclosure port
physical boundary of the EUT through which electromagnetic fields can radiate or impinge

[SOURCE: IEC 60050-445:2010, 445-07-04, modified – The term "time relay" has been replaced by "EUT" and "can" has been replaced by "may".]

3.1.15
equipment under test
EUT
equipment submitted to a test, including any accessories such as communication modules, plug-in power supplies, etc. unless otherwise specified

[SOURCE: IEC 60255-1:2022, 3.1.15]

3.1.16
highest internal frequency
F_X
highest fundamental frequency generated or used within the EUT or highest frequency at which it operates

Note 1 to entry: This includes frequencies which are solely used within an integrated circuit.

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3.1.17
input port
port through which the EUT is energized or controlled in order to perform its function(s)

EXAMPLE 1 Analogue current transformer (LPCT/CT) input, analogue voltage transformer (LPVT or VT) input, binary input, battery monitor input, etc.

[SOURCE: IEC 60255-1:2022, 3.1.18]

3.1.18
low-power instrument transformer
LPIT
arrangement, consisting of one or more current or voltage transformer(s) which may be connected to transmitting systems and secondary converters, all intended to transmit a low-power analogue or digital output signal to measuring instruments, meters and protective or control devices or similar apparatus

EXAMPLE An arrangement consisting of three current sensors, three voltage sensors connected to one merging unit delivering one digital output is considered an LPIT.

Note 1 to entry: LPITs are commonly called non-conventional instrument transformers (NCIT).

Note 2 to entry: The output power produced by these devices is typically lower or equal to 1 VA.

[SOURCE: IEC 61869-6:2016, 3.1.601]

3.1.19
low-power current transformer
LPCT
low-power instrument transformer for current measurement

[SOURCE: IEC 61869-6:2016, 3.1.602]

3.1.20
low-power voltage transformer
LPVT
low-power instrument transformer for voltage measurement

[SOURCE: IEC 61869-6:2016, 3.1.603]

3.1.21
output contact
arrangement of contact members, with their insulation, which close or open their contact circuit by their relative movement

[SOURCE: IEC 60050-444:2002, 444-04-03, modified – The term "contact" has been replaced by "output contact", the domain "for elementary relays" and the figure have been omitted.]

3.1.22
output port
port through which the EUT produces predetermined changes

[SOURCE: IEC 60255-1:2022, 3.1.27]

3.1.23
port
particular interface of the specified EUT with the external electromagnetic environment

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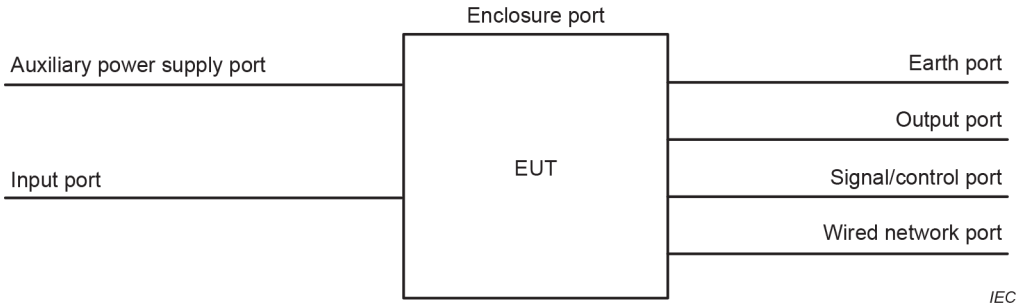

3.1.24
rated value
value of a quantity used for specification purposes, established for a specified set of operating conditions of a component, device, equipment, or system

[SOURCE: IEC 60050-447:2020, 447-03-11]

3.1.25
signal/control port
port intended for the interconnection of components of an EUT, or between an EUT and local AE and used in accordance with relevant functional specifications (for example, for the maximum length of cable connected to it)

Note 1 to entry: Examples include EIA-232, Universal Serial Bus (USB), High-Definition Multimedia Interface (HDMI®), IEEE Standard 1394 ("FireWire"), IRIG-B Interface.

3.1.26
small equipment
equipment, either positioned on a tabletop or standing on the floor which, including its cables, fits in a cylindrical test volume of 1,2 m in diameter and 1,5 m above the ground plane

Note 1 to entry: For small equipment, emission testing at distances under 10 m is accepted.

3.1.27
wired network port
port for the connection of voice, data and signalling transfers intended to interconnect widely dispersed systems by direct connection to a single-user or multi-user communication network

Note 1 to entry: Examples of these ports include CATV, PSTN, ISDN, xDSL, LAN, EIA-485 and similar networks.

Note 2 to entry: These ports may support screened or unscreened cables and may also carry AC or DC power (e.g. PoE) where this is an integral part of the telecommunication specification.

Note 3 to entry: A port generally intended for interconnection of components of a system under test (e.g. EIA-232, IEEE Standard 1284 (parallel printer), Universal Serial Bus (USB), IEEE Standard 1394 ("Fire Wire"), etc.) and used in accordance with its functional specifications (e.g. for the maximum length of cable connected to it), is not considered to be a wired network port.

3.2 Abbreviated terms

AAN Asymmetric artificial network
AE Auxiliary equipment
AMN Artificial mains network
CATV Communal (broadcasting) antenna/cable TV network
CDN Coupling/decoupling network
CCC Capacitive coupling clamp
CM Common mode
CVP Capacitive voltage probe
DM Differential mode

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EMC Electromagnetic compatibility
ESD Electrostatic discharge
EUT Equipment under test
FW Firmware
HW Hardware
IED Intelligent electronic device
ISDN Integrated services digital network
LAN Local area network
LPCT Low-power current transformer
LPIT Low-power instrument transformer
LPVT Low-power voltage transformer
PCBA Printed circuit board assembly
PCB Printed circuit board
PSTN Public switched telephone network
RF Radio frequency
RTD Resistance temperature detector
UFA Uniform field area
USB Universal serial bus
xDSL Generic term for all types of DSL (digital subscriber line) technology

4 Electromagnetic environmental levels

4.1 General

The environmental levels shall be selected in accordance with the most realistic installation and environmental conditions in which the EUT is expected to operate.

Based on common installation practices, the recommended selection of test levels is given in 4.2 and 4.3.

4.2 Zone A, severe electromagnetic environment

The installation is characterized by the following attributes:

- no suppression of electrical fast transients/bursts in the power supply and control and power circuits which are switched by relays and high-power contactors;
- no separation of the industrial circuits from other circuits associated with environments of higher severity levels;
- no separation between power supply, control, signal and communication cables;
- use of common multi-core cables for control and signal lines;
- interconnections that are running as outdoor cables along with power cables, even to the high voltage equipment; a special case of this environment is when the electronic equipment is connected to the telecommunication network within a densely populated area. There is no systematically constructed grounding network outside the electronic equipment, and the grounding system consists only of pipes, cables, etc.

The outdoor area of industrial process equipment, power stations, open-air HV substation switchyards and gas insulated switchgear may be representative of this environment.

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4.3 Zone B, typical electromagnetic environment

The installation is characterized by the following attributes:

- no suppression of electrical fast transients/bursts in the power supply and control circuits which are switched by relays;
- poor separation of the industrial circuits from other circuits associated with environments of higher severity levels;
- dedicated cables for power supply, control, signal and communication lines;
- poor separation between power supply, control, signal and communication cables;
- the interconnection cables can be partly outdoor cables, but close to the grounding network;
- availability of earthing system represented by conductive pipes, ground conductors in the cable trays (connected to the protective earth system) and by a ground mesh.

The area of industrial process equipment, power plants and the relay room of open-air HV substations may be representative of this environment.

Measuring relays and protection equipment shall meet Class A emission limits for both environmental conditions (Zone A and Zone B).

5 Emission

5.1 Radiated emission

Table 1 – Radiated emission tests – Enclosure port

Item	Environmental phenomena	Frequency range	Limits	Reference standard	Test procedure (reference to this document)
1.1	**Radiated emission (below 1 GHz)** [a]	30 MHz to 230 MHz	40 dB (µV/m) quasi-peak at 10 m 50 dB (µV/m) quasi-peak at 3 m	CISPR 11	See 7.2.2
		230 MHz to 1 000 MHz	47 dB (µV/m) quasi-peak at 10 m 57 dB (µV/m) quasi-peak at 3 m		
1.2	**Radiated emission (above 1 GHz)**	1 GHz to 3 GHz	56 dB (µV/m) average at 3 m 76 dB (µV/m) peak at 3 m	CISPR 32	See 7.2.2
		3 GHz to 6 GHz	60 dB (µV/m) average at 3 m 80 dB (µV/m) peak at 3 m		

[a] Measuring relays and protection equipment are apparatus which satisfy the class A limits. Limits can be measured at a nominal distance of 3 m or 10 m or 30 m. A measuring distance less than 10 m is allowed only for equipment which complies with the definition for "small equipment" given in 3.1.26. In the case of measurements at a separation distance of 30 m, an inverse proportionality factor of 20 dB per decade shall be used to normalize the measured data to the specified distance for determining compliance.

At the transition frequency, the more stringent limit shall apply.

Table 2 shows the highest frequency up to which radiated emission measurements shall be performed.

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