



BSI Standards Publication

# Electrical equipment for measurement, control and laboratory use — EMC requirements

Part 2-1: Particular requirements —  
Test configurations, operational  
conditions and performance criteria  
for sensitive test and measurement  
equipment for EMC unprotected  
applications (IEC 61326-2-1:2012)

### National foreword

This British Standard is the UK implementation of EN 61326-2-1:2013. It is identical to IEC 61326-2-1:2012. It supersedes BS EN 61326-2-1:2006, which will be withdrawn on 6 November 2015.

The UK participation in its preparation was entrusted by Technical Committee GEL/65, Measurement and control, to Subcommittee GEL/65/1, System considerations.

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

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English version

**Electrical equipment for measurement, control and laboratory use -  
 EMC requirements -  
 Part 2-1: Particular requirements -  
 Test configurations, operational conditions and performance criteria for  
 sensitive test and measurement equipment for EMC unprotected  
 applications  
 (IEC 61326-2-1:2012)**

Matériel électrique de mesure, de  
 commande et de laboratoire -  
 Exigences relatives à la CEM -  
 Partie 2-1: Exigences particulières -  
 Configurations d'essai, conditions  
 fonctionnelles et critères de performance  
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Elektrische Mess-, Steuer-, Regel- und  
 Laborgeräte – EMV-Anforderungen – Teil  
 2-1: Besondere Anforderungen –  
 Prüfanordnung, Betriebsbedingungen und  
 Leistungsmerkmale für empfindliche Prüf-  
 und Messgeräte für Anwendungen ohne  
 EMV-Schutzmaßnahmen  
 (IEC 61326-2-1:2012)

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## Foreword

The text of document 65A/641/FDIS, future edition 2 of IEC 61326-2-1, prepared by SC 65A, "System aspects", of IEC TC 65, "Industrial-process measurement, control and automation" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61326-2-1:2013.

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) 2013-08-06
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2015-11-06

This document supersedes EN 61326-2-1:2006.

EN 61326-2-1:2013 includes the following significant technical changes with respect to EN 61326-2-1:2006:

– Update with respect to EN 61326-1:2013.

EN 61326-2-1:2013 is to be used in conjunction with EN 61326-1:2013 and follows the same numbering of clauses, subclauses, tables and figures.

When a particular subclause of EN 61326-1 is not mentioned in this part, that subclause applies as far as is reasonable. When this standard states "addition", "modification" or "replacement", the relevant text in EN 61326-1 is to be adapted accordingly.

NOTE The following numbering system is used:

- subclauses, tables and figures that are numbered starting from 101 are additional to those in EN 61326-1;
- unless notes are in a new subclause or involve notes in EN 61326-1, they are numbered starting from 101 including those in a replaced clause or subclause;
- additional annexes are lettered AA, BB, etc.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For the relationship with EU Directive(s) see informative Annex ZZ, which is an integral part of this document.

## Endorsement notice

The text of the International Standard IEC 61326-2-1:2012 was approved by CENELEC as a European Standard without any modification.

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

*Annex ZA of EN 61326-1:2013 applies, except as follows:*

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 61326-1	2012	Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements	EN 61326-1	2013

**Annex ZZ**  
(informative)

**Coverage of Essential Requirements of EU Directives**

This European Standard has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association and within its scope the standard covers protection requirements of Annex I, Article 1 of the EC Directive 2004/108/EC.

Compliance with this standard provides one means of conformity with the specified essential requirements of the Directive[s] concerned.

NOTE Other requirements and other EU Directives may be applicable to the products falling within the scope of this standard.

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# **ELECTRICAL EQUIPMENT FOR MEASUREMENT, CONTROL AND LABORATORY USE – EMC REQUIREMENTS –**

## **Part 2-1: Particular requirements – Test configurations, operational conditions and performance criteria for sensitive test and measurement equipment for EMC unprotected applications**

### **1 Scope**

In addition to the scope of IEC 61326-1, this part of IEC 61326 specifies more detailed test configurations, operational conditions and performance criteria for equipment with test and measurement circuits (both internal and/or external to the equipment) that are not EMC protected for operational and/or functional reasons, as specified by the manufacturer.

The manufacturer specifies the environment for which the product is intended to be used and selects the appropriate test level specifications of IEC 61326-1.

NOTE Examples of equipment include, but are not limited to, oscilloscopes, logic analysers, spectrum analysers, network analysers, analogue instruments, digital multimeters (DMM) and board test systems.

### **2 Normative references**

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

Clause 2 of IEC 61326-1 applies, except as follows:

*Addition:*

IEC 61326-1: 2012, *Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 1: General requirements*

### **3 Terms and definitions**

For the purposes of this document, the terms and definitions given in IEC 61326-1 and IEC 60050-161 apply.

### **4 General**

Clause 4 of IEC 61326-1 applies.

### **5 EMC test plan**

#### **5.1 General**

Subclause 5.1 of IEC 61326-1 applies.



## 5.2 Configuration of EUT during testing

Subclause 5.2 of IEC 61326-1 applies, except as follows:

*Addition:*

### 5.2.4.101 I/O ports for test and measurement purposes

Test and measurement input ports shall be capped and shorted unless this leads to an operating condition unsuitable for measuring the emission and immunity performance of the product. If an input signal is needed, an appropriate input signal shall be applied using test leads or probes as specified by the manufacturer.

Test and measurement output ports not needed to evaluate the essential functions of the EUT shall be capped and/or terminated.

Electrostatic discharges shall be applied to the housing shield, but not to the inner pins of shielded port or cable connectors. Examples include: BNC, D-subminiature, IEEE 488 (IEC 60488), RS232 and IEEE 1284-B (parallel printer port), etc.

NOTE 1 Probes and/or test leads not used to apply an input signal during test to the test and measurement ports do not need to be connected. Such test leads can vary substantially from one application to another and are often connected to equipment that has the covers removed and may be in various stages of disassembly to provide access to test points inside. Connected test leads may increase emissions and/or reduce immunity in certain applications.

NOTE 2 Capped means locally covered with a screen or shield.

## 5.3 Operation conditions of EUT during testing

Subclause 5.3 of IEC 61326-1 applies, except as follows:

*Addition:*

### 5.3.101 Operational conditions

When both battery and a.c. options are available, both modes of operation shall comply.

### 5.3.102 Oscilloscopes

The oscilloscope ports shall be set for maximum sweep speed, maximum sensitivity and continuous acquisition mode unless other modes are known to provide worst-case emission or immunity results within normal applications.

### 5.3.103 Logic analysers

The logic analyser shall be set for data analysis modes during emission measurement and continuous data acquisition mode during immunity testing unless other modes are known to provide worst-case emission or immunity results within normal applications.

### 5.3.104 Digital multimeters (DMM)

Typical set-ups include: peak detect, maximum sensitivity (usually auto-range, if available, will suffice) and continuous acquisition mode.

### 5.3.105 Other equipment

For equipment not mentioned in 5.3.102 to 5.3.104, the following philosophy shall apply.

A selection of representative operation modes shall be made, taking into account that not all functions, but only the most typical functions of the equipment can be tested. The estimated worst-case operating modes for normal application shall be selected

#### **5.4 Specification of functional performance**

Subclause 5.4 of IEC 61326-1 applies.

#### **5.5 Test description**

Subclause 5.5 of IEC 61326-1 applies.

### **6 Immunity requirements**

#### **6.1 Conditions during the tests**

Subclause 6.1 of IEC 61326-1 applies.

#### **6.2 Immunity test requirements**

Subclause 6.2 of IEC 61326-1 applies.

#### **6.3 Random aspects**

Subclause 6.3 of IEC 61326-1 applies.

#### **6.4 Performance criteria**

Subclause 6.4 of IEC 61326-1 applies, except as follows:

*Addition:*

##### **6.4.101 Tests with transient electromagnetic phenomenon**

During testing with transient electromagnetic phenomena that are assigned to performance criteria B in Table 1, 2 or 3 of IEC 61326-1, the EUT may have temporary degradation or loss of function or performance which is self-recovering. Self-recovery times greater than 10 s shall be specified by the manufacturer in the equipment documentation for the user. Trigger functions need not be evaluated. No change in actual operating state or loss of stored data is allowed.

### **7 Emission requirements**

Clause 7 of IEC 61326-1 applies.

### **8 Test results and test report**

Clause 8 of IEC 61326-1 applies.

### **9 Instructions for use**

Clause 9 of IEC 61326-1 applies, except as follows:

*Addition:*

### **9.101 Additional instructions**

The manufacturer shall give information that the equipment may not meet the immunity requirements of this standard when test leads and/or test probes are connected and shall give guidance how to use test leads and/or test probes to minimize the impact of disturbances.

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