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**Electrical equipment for measurement, control and laboratory use – EMC requirements –
Part 3-1: Immunity requirements for safety-related systems and for equipment intended to perform safety-related functions (functional safety) – General industrial applications**

INTERNATIONAL
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COMMISSION

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CONTENTS

FOREWORD	4
INTRODUCTION	2
1 Scope	8
2 Normative references	8
3 Terms, definitions and abbreviations	10
3.1 Terms and definitions	10
3.2 Abbreviations	10
4 General	13
5 EMC test plan	14
5.1 General	14
5.2 Instruction for testing	14
5.3 Configuration of EUT during testing	15
5.3.1 General	15
5.3.2 Composition of EUT	15
5.3.3 Assembly of EUT	15
5.3.4 I/O ports	15
5.3.5 Auxiliary equipment (AE)	15
5.3.6 Cabling and earthing (grounding)	15
5.4 Operation conditions of EUT during testing	16
5.4.1 Operation modes	16
5.4.2 Environmental conditions	16
5.4.3 EUT software during test	16
5.5 Specification of performance criteria	16
5.6 Test description	16
6 Performance criteria	16
6.1 Performance criterion FS DS	16
6.2 Application of the performance criterion FS DS	16
6.3 Aspects to be considered during application of performance criterion DS	17
7 Immunity requirements	18
8 Test set-up and test philosophy for EUTs with functions intended for safety applications	26
8.1 Testing of safety-related systems and equipment intended to be used in safety-related systems	26
8.2 Test philosophy for equipment intended for use in safety-related systems	26
8.3 Test philosophy for safety-related systems	27
8.4 Test configuration and test performance	27
8.5 Monitoring	27
9 Test results and test report	29
Annex A (informative) Approaches on how to apply IEC 61326-3 series	35
Annex B (informative) Evaluation of electromagnetic phenomena	37
Annex C (informative) Allowed effects during immunity tests	41
Bibliography	46
Figure 1 – Typical test set-up for equipment intended for use in safety-related system, tested as stand-alone equipment or entire system	30

Figure 2 – Typical test set-up for equipment intended for use in a safety-related system integrated into a representative safety-related system during test	32
Figure 3 – Typical test set-up for equipment intended for use in safety-related system tested stand-alone	32
Figure 4 – Typical test set-up for a safety-related system	32
Figure A.1 – Correlation between the standards IEC 61326-1, IEC 61326-2-x, IEC 61326-3-1 and IEC 61326-3-2	36
Figure B.1 – Emission/immunity levels and compatibility level, with an example of emission/immunity levels for a single emitter and susceptor, as a function of some independent variables (see IEC TR 61000-1-1).....	38
Table 1 – Reaction of EUT during test	18
Table 2 – Selected frequencies for electromagnetic field tests	18
Table 2 – Immunity test requirements for equipment intended for use in industrial – Enclosure port	19
Table 3 – Immunity test requirements for equipment intended for use in industrial – Input and output AC power ports	20
Table 4 – Immunity test requirements for equipment intended for use in industrial – Input and output DC power ports	21
Table 5 – Immunity test requirements for equipment intended for use in industrial – I/O signal/control ports	22
Table 6 – Immunity test requirements for equipment intended for use in industrial – I/O signal/control ports connected direct to power supply networks.....	23
Table 7 – Immunity test requirements for equipment intended for use in industrial – Functional earth port.....	23
Table 8 – Frequency ranges of mobile transmitters and ISM equipment for tests with electromagnetic fields	25
Table 9 – Selected Frequency ranges of mobile transmitters and ISM equipment for the conducted RF tests	26
Table 10 – Applicable performance criteria and observed behaviour during test for equipment intended for use in safety-related systems	27
Table B.1 – Exemplary considerations on electromagnetic phenomena and test levels with regard to functional safety in industrial applications	40
Table C.1 – Allowed effects during immunity tests on functions of equipment (1 of 2)	42
Table C.2 – Allowed effects during immunity tests on functions of a system (1 of 2).....	44

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**ELECTRICAL EQUIPMENT FOR MEASUREMENT, CONTROL
AND LABORATORY USE – EMC REQUIREMENTS –****Part 3-1: Immunity requirements for safety-related systems and
for equipment intended to perform safety-related functions
(functional safety) – General industrial applications****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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This redline version of the official IEC Standard allows the user to identify the changes made to the previous edition. A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text.

International Standard IEC 61326-3-1 has been prepared by subcommittee 65A: System aspects, of IEC technical committee 65: Industrial-process measurement, control and automation.

This second edition cancels and replaces the first edition published in 2008. This edition constitutes a technical revision. This edition includes the following significant technical changes with respect to the previous edition:

- extension of the frequency range up to 6 GHz for the radio-frequency electromagnetic field test according to IEC 61000-4-3,
- replacement of the performance criterion FS with DS according to the generic standard IEC 61000-6-7,
- adding Table 1 – Aspects to be considered during application of performance criterion DS,
- including immunity tests for devices with current consumption > 16 A according to IEC 61000-4-34,
- updating Table 8 – Frequency ranges of mobile transmitters and ISM equipment,
- updating Figure A.1 and Figure 1 for better readability.

IEC 61326-3-1 is to be read in conjunction with IEC 61326-1.

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

FDIS	Report on voting
65A/819/FDIS	65A/825/RVD

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

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

A list of all the parts of the IEC 61326 series, under the general title *Electrical equipment for measurement, control and laboratory use – EMC requirements*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website 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.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

Functional safety is that part of the overall safety relating to the equipment under control (EUC) and the EUC control system which depends on the correct functioning of the electrical safety-related systems. To achieve this, all items of equipment of the safety-related system which are involved in the performance of the safety functions must behave in a specified manner under all relevant conditions.

The IEC basic safety publication for functional safety of electrical/electronic/programmable electronic safety-related systems is IEC 61508. It sets the overall requirements to achieve functional safety. Sufficient immunity to electromagnetic disturbances is one of those requirements.

The concept of IEC 61508 distinguishes between the consideration of the application and the design of safety-related electrical and electronic systems. ~~The interface between both is~~ The overall safety requirements specification ~~(SRS)~~. It specifies all relevant requirements of the intended application, as follows:

- a) definition of the safety functions, based on a risk assessment of the intended application (which functions are intended to reduce risk);
- b) appropriate safety integrity level (SIL) for each safety-function based on a risk assessment of the intended application;
- c) definition of the environment in which the system is intended to work including the electromagnetic environment as required by IEC 61508-2.

The requirements for each safety function are then specified in one or more system safety requirements specifications (SSRS). Hence, with regard to immunity against electromagnetic phenomena, the essential starting point is that the electromagnetic environment and its phenomena are considered in the SSRS, as required by IEC 61508. The safety-related system intended to implement the specified safety function has to fulfil the SSRS, and, from it, corresponding immunity requirements have to be derived for the items of equipment, which results in an equipment requirement specification. With respect to the electromagnetic environment, the SSRS and the equipment requirement specification should be based on a competent assessment of the foreseeable electromagnetic threats in the real environment over the whole operational life of the equipment. Hence, immunity requirements for the equipment depend on the characteristics of the electromagnetic environment in which the equipment is intended to be used.

The equipment manufacturer, therefore, has to prove that the equipment fulfils the equipment requirement specification and the system integrator must prove that the system fulfils the SSRS. Evidence has to be produced by application of appropriate methods. They do not need to consider any other aspects of the application, for example, risk of the application associated to any failure of the safety-related system. The objective is for all equipment in the system to comply with particular performance criteria taking into account functional safety aspects (for example, the performance criterion ~~FS~~ DS) up to levels specified in the SSRS independent of the required safety integrity level (SIL).

For approaches on how to apply IEC 61326-3 series, see Annex A.

There exists meanwhile the generic EMC standard IEC 61000-6-7 dealing with functional safety aspects in industrial environments. Generic EMC standards are designed to apply for a defined electromagnetic environment, to products for which no dedicated product family EMC/product EMC standards exist. However, for the equipment in the scope of this document, the information given in the generic EMC standard was considered not to be sufficient. More detailed information and specifications were needed, for example specific test set-ups, consideration of the functional earth port or the deliberate differentiation between types of electromagnetic environments relevant for the equipment in the scope of this document.

Though historically this product standard was developed several years before the generic EMC standard, this 2nd edition considers the information given in the generic EMC standard and applies it where appropriate.

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

Part 3-1: Immunity requirements for safety-related systems and for equipment intended to perform safety-related functions (functional safety) – General industrial applications

1 Scope

This part of IEC 61326 covers all equipment within the scope of IEC 61326-1 ~~applies to this part of IEC 61326~~, but is limited to systems and equipment for industrial applications intended to perform safety functions as defined in IEC 61508 with SIL 1-3.

The electromagnetic environments encompassed by this product family standard are industrial, both indoor and outdoor, as described for industrial locations in IEC 61000-6-2 or defined in 3.8 of IEC 61326-1. Equipment and systems intended for use in other electromagnetic environments, for example, in the process industry or in environments with potentially explosive atmospheres, are excluded from the scope of this document.

Equipment and systems considered as “proven-in-use” according to IEC 61508 or “prior use” according to IEC 61511 are excluded from the scope of this document.

Fire alarm systems and security alarm systems intended for protection of buildings are excluded from the scope of this document.

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

IEC 60050-161, *International Electrotechnical Vocabulary – Part 161: Electromagnetic compatibility* (available at <<http://www.electropedia.org/>>)

IEC 61000-4-2:2004 2008, *Electromagnetic compatibility (EMC) – Part 4-2: Testing and measurement techniques – Electrostatic discharge immunity test*

IEC 61000-4-3:2006, *Electromagnetic compatibility (EMC) – Part 4-3: Testing and measurement techniques – Radiated, radio-frequency, electromagnetic field immunity test*

IEC 61000-4-3:2006/AMD1:2007

IEC 61000-4-3:2006/AMD2:2010

IEC 61000-4-4:2004 2012, *Electromagnetic compatibility (EMC) – Part 4-4: Testing and measurement techniques – Electrical fast transient/burst immunity test*

IEC 61000-4-5:2005 2014, *Electromagnetic compatibility (EMC) – Part 4-5: Testing and measurement techniques – Surge immunity test*

IEC 61000-4-6:2004 2013, *Electromagnetic compatibility (EMC) – Part 4-6: Testing and measurement techniques – Immunity to conducted disturbances, induced by radio-frequency fields*

IEC 61000-4-8:~~1993~~ 2009, *Electromagnetic compatibility (EMC) – Part 4-8: Testing and measurement techniques – Power frequency magnetic field immunity test*¹
~~Amendment 1 (2000)~~

IEC 61000-4-11:2004, *Electromagnetic compatibility (EMC) – Part 4-11: Testing and measurement techniques – Voltage dips, short interruptions and voltage variations immunity tests*

IEC 61000-4-16:~~1998~~ 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*
~~Amendment 1 (2001)~~

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*

IEC 61000-4-34:2005, *Electromagnetic compatibility (EMC) – Part 4-34: Testing and measurement techniques – Voltage dips, short interruptions and voltage variations immunity tests for equipment with input current more than 16 A per phase*
IEC 61000-4-34:2005/AMD1:2009

IEC 61000-6-2:~~2005~~ 2016, *Electromagnetic compatibility (EMC) – Part 6-2: Generic standards – Immunity for industrial environments*

IEC 61326-1:~~2005~~ 2012, *Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 1: General requirements*

~~IEC 61326-2-1:2005, *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 61326-2-2:2005, *Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 2-2: Particular requirements – Test configurations, operational conditions and performance criteria for portable test, measuring and monitoring equipment used in low-voltage distribution systems*~~

~~IEC 61326-2-3:2006, *Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 2-3: Particular requirements – Test configurations, operational conditions and performance criteria for transducers with integrated or remote signal conditioning*~~

~~IEC 61326-2-4:2006, *Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 2-4: Particular requirements – Test configurations, operational conditions and performance criteria for insulation monitoring devices according to IEC 61557-8 and for equipment for insulation fault location according to IEC 61557-9*~~

~~IEC 61326-2-5:2006, *Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 2-5: Particular requirements – Test configurations, operational conditions and performance criteria for field devices with interfaces according to IEC 61784-1, CP 3/2*~~

IEC 61326-3-2:~~2008~~ ², *Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 3-2: Immunity requirements for safety-related systems and for*

¹ There exists a consolidated edition 1.1 (2001) that includes edition 1.0 and its amendment.

equipment intended to perform safety-related functions (functional safety) – Industrial applications with specified ~~EM~~ electromagnetic environment

IEC 61508-2:2000 2010, Functional safety of electrical/electronic/programmable electronic safety-related systems – Part 2: Requirements for electrical/electronic/programmable electronic safety-related systems

~~ISO/IEC Guide 51:1999, Safety aspects – Guidelines for their inclusion in standards~~

INTERNATIONAL STANDARD

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Electrical equipment for measurement, control and laboratory use – EMC requirements –

Part 3-1: Immunity requirements for safety-related systems and for equipment intended to perform safety-related functions (functional safety) – General industrial applications

Matériel électrique de mesure, de commande et de laboratoire – Exigences relatives à la CEM –

Partie 3-1: Exigences d'immunité pour les systèmes relatifs à la sécurité et pour les matériels destinés à réaliser des fonctions relatives à la sécurité (sécurité fonctionnelle) – Applications industrielles générales

CONTENTS

FOREWORD	4
INTRODUCTION	6
1 Scope	8
2 Normative references	8
3 Terms, definitions and abbreviations	9
3.1 Terms and definitions	9
3.2 Abbreviations	12
4 General	13
5 EMC test plan	13
5.1 General	13
5.2 Instruction for testing	13
5.3 Configuration of EUT during testing	14
5.3.1 General	14
5.3.2 Composition of EUT	14
5.3.3 Assembly of EUT	14
5.3.4 I/O ports	14
5.3.5 Auxiliary equipment (AE)	14
5.3.6 Cabling and earthing (grounding)	14
5.4 Operation conditions of EUT during testing	14
5.4.1 Operation modes	14
5.4.2 Environmental conditions	15
5.4.3 EUT software during test	15
5.5 Specification of performance criteria	15
5.6 Test description	15
6 Performance criteria	15
6.1 Performance criterion DS	15
6.2 Application of the performance criterion DS	16
6.3 Aspects to be considered during application of performance criterion DS	16
7 Immunity requirements	17
8 Test set-up and test philosophy for EUTs with functions intended for safety applications	22
8.1 Testing of safety-related systems and equipment intended to be used in safety-related systems	22
8.2 Test philosophy for equipment intended for use in safety-related systems	22
8.3 Test philosophy for safety-related systems	23
8.4 Test configuration and test performance	23
8.5 Monitoring	24
9 Test results and test report	24
Annex A (informative) Approaches on how to apply IEC 61326-3 series	27
Annex B (informative) Evaluation of electromagnetic phenomena	30
Annex C (informative) Allowed effects during immunity tests	34
Bibliography	39
Figure 1 – Typical test set-up for equipment intended for use in safety-related system, tested as stand-alone equipment or entire system	25

Figure 2 – Typical test set-up for equipment intended for use in a safety-related system integrated into a representative safety-related system during test	26
Figure A.1 – Correlation between the standards IEC 61326-1, IEC 61326-2-x, IEC 61326-3-1 and IEC 61326-3-2	29
Figure B.1 – Emission/immunity levels and compatibility level, with an example of emission/immunity levels for a single emitter and susceptor, as a function of some independent variables (see IEC TR 61000-1-1).....	31
Table 1 – Reaction of EUT during test	16
Table 2 – Immunity test requirements – Enclosure port.....	17
Table 3 – Immunity test requirements – Input and output AC power ports	18
Table 4 – Immunity test requirements – Input and output DC power ports	19
Table 5 – Immunity test requirements – I/O signal/control ports	19
Table 6 – Immunity test requirements – I/O signal/control ports connected direct to power supply networks.....	20
Table 7 – Immunity test requirements – Functional earth port	20
Table 8 – Frequency ranges of mobile transmitters and ISM equipment for tests with electromagnetic fields	21
Table 9 – Frequency ranges of mobile transmitters and ISM equipment for the conducted RF tests	22
Table 10 – Applicable performance criteria and observed behaviour during test for equipment intended for use in safety-related systems	23
Table B.1 – Exemplary considerations on electromagnetic phenomena and test levels with regard to functional safety in industrial applications	33
Table C.1 – Allowed effects during immunity tests on functions of equipment	35
Table C.2 – Allowed effects during immunity tests on functions of a system	37

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FOREWORD

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INTRODUCTION

Functional safety is that part of the overall safety relating to the equipment under control (EUC) and the EUC control system which depends on the correct functioning of the electrical safety-related systems. To achieve this, all items of equipment of the safety-related system which are involved in the performance of the safety functions must behave in a specified manner under all relevant conditions.

The IEC basic safety publication for functional safety of electrical/electronic/programmable electronic safety-related systems is IEC 61508. It sets the overall requirements to achieve functional safety. Sufficient immunity to electromagnetic disturbances is one of those requirements.

The concept of IEC 61508 distinguishes between the consideration of the application and the design of safety-related electrical and electronic systems. The overall safety requirements specification specifies all relevant requirements of the intended application, as follows:

- a) definition of the safety functions, based on a risk assessment of the intended application (which functions are intended to reduce risk);
- b) appropriate safety integrity level (SIL) for each safety-function based on a risk assessment of the intended application;
- c) definition of the environment in which the system is intended to work including the electromagnetic environment as required by IEC 61508-2.

The requirements for each safety function are then specified in one or more system safety requirements specifications (SSRS). Hence, with regard to immunity against electromagnetic phenomena, the essential starting point is that the electromagnetic environment and its phenomena are considered in the SSRS, as required by IEC 61508. The safety-related system intended to implement the specified safety function has to fulfil the SSRS, and, from it, corresponding immunity requirements have to be derived for the items of equipment, which results in an equipment requirement specification. With respect to the electromagnetic environment, the SSRS and the equipment requirement specification should be based on a competent assessment of the foreseeable electromagnetic threats in the real environment over the whole operational life of the equipment. Hence, immunity requirements for the equipment depend on the characteristics of the electromagnetic environment in which the equipment is intended to be used.

The equipment manufacturer, therefore, has to prove that the equipment fulfils the equipment requirement specification and the system integrator must prove that the system fulfils the SSRS. Evidence has to be produced by application of appropriate methods. They do not need to consider any other aspects of the application, for example, risk of the application associated to any failure of the safety-related system. The objective is for all equipment in the system to comply with particular performance criteria taking into account functional safety aspects (for example, the performance criterion DS) up to levels specified in the SSRS independent of the required safety integrity level (SIL).

For approaches on how to apply IEC 61326-3 series, see Annex A.

There exists meanwhile the generic EMC standard IEC 61000-6-7 dealing with functional safety aspects in industrial environments. Generic EMC standards are designed to apply for a defined electromagnetic environment, to products for which no dedicated product family EMC/product EMC standards exist. However, for the equipment in the scope of this document, the information given in the generic EMC standard was considered not to be sufficient. More detailed information and specifications were needed, for example specific test set-ups, consideration of the functional earth port or the deliberate differentiation between types of electromagnetic environments relevant for the equipment in the scope of this document.

Though historically this product standard was developed several years before the generic EMC standard, this 2nd edition considers the information given in the generic EMC standard and applies it where appropriate.

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

Part 3-1: Immunity requirements for safety-related systems and for equipment intended to perform safety-related functions (functional safety) – General industrial applications

1 Scope

This part of IEC 61326 covers all equipment within the scope of IEC 61326-1, but is limited to systems and equipment for industrial applications intended to perform safety functions as defined in IEC 61508 with SIL 1-3.

The electromagnetic environments encompassed by this product family standard are industrial, both indoor and outdoor, as described for industrial locations in IEC 61000-6-2 or defined in 3.8 of IEC 61326-1. Equipment and systems intended for use in other electromagnetic environments, for example, in the process industry or in environments with potentially explosive atmospheres, are excluded from the scope of this document.

Equipment and systems considered as “proven-in-use” according to IEC 61508 or “prior use” according to IEC 61511 are excluded from the scope of this document.

Fire alarm systems and security alarm systems intended for protection of buildings are excluded from the scope of this document.

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

IEC 60050-161, *International Electrotechnical Vocabulary – Part 161: Electromagnetic compatibility* (available at <<http://www.electropedia.org/>>)

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

IEC 61000-4-3:2006, *Electromagnetic compatibility (EMC) – Part 4-3: Testing and measurement techniques – Radiated, radio-frequency, electromagnetic field immunity test*
IEC 61000-4-3:2006/AMD1:2007
IEC 61000-4-3:2006/AMD2:2010

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 61000-4-6:2013, *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 61000-4-11:2004, *Electromagnetic compatibility (EMC) – Part 4-11: Testing and measurement techniques – Voltage dips, short interruptions and voltage variations immunity tests*

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 61000-4-29:2000, *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*

IEC 61000-4-34:2005, *Electromagnetic compatibility (EMC) – Part 4-34: Testing and measurement techniques – Voltage dips, short interruptions and voltage variations immunity tests for equipment with input current more than 16 A per phase*
IEC 61000-4-34:2005/AMD1:2009

IEC 61000-6-2:2016, *Electromagnetic compatibility (EMC) – Part 6-2: Generic standards – Immunity for industrial environments*

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

IEC 61326-3-2:____¹, *Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 3-2: Immunity requirements for safety-related systems and for equipment intended to perform safety-related functions (functional safety) – Industrial applications with specified electromagnetic environment*

IEC 61508-2:2010, *Functional safety of electrical/electronic/programmable electronic safety-related systems – Part 2: Requirements for electrical/electronic/programmable electronic safety-related systems*

¹ Under preparation. Stage at the time of publication: IEC/DIS 61326-3-2:2016.

SOMMAIRE

AVANT-PROPOS	44
INTRODUCTION.....	46
1 Domaine d'application	48
2 Références normatives	48
3 Termes, définitions et abréviations	49
3.1 Termes et définitions	49
3.2 Abréviations	53
4 Généralités	53
5 Plan d'essai de CEM	54
5.1 Généralités	54
5.2 Instructions relatives aux essais	54
5.3 Configuration de l'EUT lors des essais	54
5.3.1 Généralités	54
5.3.2 Composition de l'EUT	55
5.3.3 Assemblage de l'EUT	55
5.3.4 Accès d'entrée/sortie	55
5.3.5 Matériel auxiliaire (AE)	55
5.3.6 Câblage et mise à la terre	55
5.4 Conditions de fonctionnement de l'EUT lors des essais	55
5.4.1 Modes de fonctionnement	55
5.4.2 Conditions d'environnement	55
5.4.3 Logiciel de l'EUT durant l'essai	56
5.5 Spécification des critères de performance	56
5.6 Description de l'essai	56
6 Critères de performance	56
6.1 Critère de performance DS	56
6.2 Application du critère de performance DS	56
6.3 Aspects à prendre en considération lors de l'application du critère de performance DS	57
7 Exigences d'immunité	57
8 Montage d'essai et philosophie des essais pour les EUT possédant des fonctions destinées à des applications de sécurité	64
8.1 Essais pour les systèmes relatifs à la sécurité et le matériel destiné à une utilisation dans des systèmes relatifs à la sécurité	64
8.2 Philosophie des essais pour le matériel utilisé dans des systèmes relatifs à la sécurité	64
8.3 Philosophie des essais pour les systèmes relatifs à la sécurité	65
8.4 Configuration d'essai et réalisation de l'essai	65
8.5 Surveillance	66
9 Résultats d'essai et rapport d'essai	67
Annexe A (informative) Approches relatives à la manière d'appliquer la série IEC 61326-3 ..	69
Annexe B (informative) Évaluation des phénomènes électromagnétiques	72
Annexe C (informative) Effets admis pendant les essais d'immunité	77
Bibliographie	82

Figure 1 – Montage d'essai type pour un matériel destiné à une utilisation dans un système relatif à la sécurité, soumis à l'essai comme matériel autonome ou système complet.....	67
Figure 2 – Montage d'essai type pour un matériel destiné à une utilisation dans un système relatif à la sécurité et intégré dans un système relatif à la sécurité représentatif en cours d'essai	68
Figure A.1 – Corrélation entre les normes IEC 61326-1, IEC 61326-2-x, IEC 61326-3-1 et IEC 61326-3-2	71
Figure B.1 – Niveaux d'émission/immunité et niveau de compatibilité, avec un exemple de niveaux d'émission/immunité pour un émetteur et susceptible unique, en fonction de certaines variables indépendantes (voir IEC TR 61000-1-1).....	73
Tableau 1 – Réaction de l'EUT au cours de l'essai	57
Tableau 2 – Exigences des essais d'immunité – Accès par l'enveloppe	58
Tableau 3 – Exigences des essais d'immunité – Accès par les bornes d'alimentation en courant alternatif.....	59
Tableau 4 – Exigences des essais d'immunité – Accès par les bornes d'alimentation en courant continu	60
Tableau 5 – Exigences des essais d'immunité – Accès par les bornes d'entrée/sortie signal/commande.....	61
Tableau 6 – Exigences des essais d'immunité – Accès par les bornes d'entrée/sortie signal/commande connectées directement aux réseaux d'alimentation électrique	62
Tableau 7 – Exigences des essais d'immunité – Mise à la terre fonctionnelle	62
Tableau 8 – Plages de fréquences des émetteurs mobiles et des matériels ISM pour les essais avec des champs électromagnétiques	63
Tableau 9 – Plages de fréquences des émetteurs mobiles et des matériels ISM pour les essais de perturbations RF conduites	64
Tableau 10 – Critères de performance applicables et comportement observé pendant l'essai pour un matériel destiné à une utilisation dans des systèmes relatifs à la sécurité.....	65
Tableau B.1 – Considérations ayant valeur d'exemple sur les phénomènes électromagnétiques et les niveaux d'essai par rapport à la sécurité fonctionnelle dans des applications industrielles	75
Tableau C.1 – Effets admis pendant les essais d'immunité sur des fonctions d'un matériel	78
Tableau C.2 – Effets admis pendant les essais d'immunité sur les fonctions d'un système	80

COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

MATÉRIEL ÉLECTRIQUE DE MESURE, DE COMMANDE ET DE LABORATOIRE – EXIGENCES RELATIVES À LA CEM –

Partie 3-1: Exigences d'immunité pour les systèmes relatifs à la sécurité et pour les matériels destinés à réaliser des fonctions relatives à la sécurité (sécurité fonctionnelle) – Applications industrielles générales

AVANT-PROPOS

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La norme internationale IEC 61326-3-1 a été établie par le sous-comité 65A: Aspects systèmes, du comité d'études 65 de l'IEC: Mesure, commande et automation dans les processus industriels.

Cette deuxième édition annule et remplace la première édition parue en 2008. Cette édition constitue une révision technique. Cette édition inclut les modifications techniques majeures suivantes par rapport à l'édition précédente:

- extension de la plage de fréquences jusqu'à 6 GHz pour l'essai de champ électromagnétique à fréquences radioélectriques, conformément à l'IEC 61000-4-3,
- remplacement du critère de performance FS par DS, conformément à la norme générique IEC 61000-6-7,
- ajout du Tableau 1 – aspects à prendre en considération lors de l'application du critère de performance DS,
- intégration d'essais d'immunité pour les dispositifs ayant une consommation de courant > 16 A, conformément à l'IEC 61000-4-34,
- mise à jour du Tableau 8 – Plages de fréquences des émetteurs mobiles et des matériels ISM,
- mise à jour de la Figure A.1 et de la Figure 1 pour une meilleure lisibilité.

L'IEC 61326-3-1 doit être lue conjointement avec l'IEC 61236-1.

Le texte de cette norme est issu des documents suivants:

FDIS	Rapport de vote
65A/819/FDIS	65A/825/RVD

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à l'approbation de cette norme.

Cette publication a été rédigée selon les Directives ISO/IEC, Partie 2.

Une liste de toutes les parties de la série IEC 61326, sous le titre général *Matériel électrique de mesure, de commande et de laboratoire – Exigences relatives à la CEM*, peut être consultée sur le site web de l'IEC.

Le comité a décidé que le contenu de cette publication ne sera pas modifié avant la date de stabilité indiquée sur le site web de l'IEC sous "<http://webstore.iec.ch>" dans les données relatives à la publication recherchée. À cette date, la publication sera

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INTRODUCTION

La sécurité fonctionnelle est la partie de la sécurité du matériel commandé (EUC) et de son système de commande qui dépend du fonctionnement correct des systèmes électriques relatifs à la sécurité. Pour l'atteindre, toutes les entités du matériel du système relatif à la sécurité impliquées dans les performances des fonctions de sécurité doivent se comporter d'une manière spécifiée dans toutes les conditions pertinentes.

La publication IEC fondamentale pour la sécurité fonctionnelle des systèmes électriques/électroniques/électroniques programmables relatifs à la sécurité est l'IEC 61508. Elle établit les exigences globales pour l'atteinte de la sécurité fonctionnelle. L'immunité suffisante aux perturbations électromagnétiques est l'une de ces exigences.

Dans son concept, l'IEC 61508 distingue l'application et la conception des systèmes électriques et électroniques relatifs à la sécurité. La spécification globale des exigences de sécurité spécifie toutes les exigences pertinentes pour l'application prévue, comme suit:

- a) définition des fonctions de sécurité, basée sur une appréciation du risque pour l'application prévue (quelles fonctions sont prévues pour réduire les risques);
- b) niveau d'intégrité de sécurité (SIL) approprié pour chaque fonction de sécurité basée sur une appréciation du risque pour l'application prévue;
- c) définition de l'environnement dans lequel le système est destiné à fonctionner, y compris l'environnement électromagnétique, tel qu'exigé par l'IEC 61508-2.

Les exigences relatives à chaque fonction de sécurité sont alors spécifiées dans une ou plusieurs spécifications des exigences de sécurité concernant les systèmes (SSRS). Ainsi, en ce qui concerne l'immunité aux phénomènes électromagnétiques, le point de départ essentiel est le fait que l'environnement électromagnétique et ses phénomènes sont pris en compte dans la SSRS, tel qu'exigé dans l'IEC 61508. Le système relatif à la sécurité destiné à mettre en œuvre la fonction de sécurité spécifiée doit être conforme à la SSRS et les exigences d'immunité correspondantes doivent en découler pour les entités du matériel, ce qui se traduit par une spécification des exigences pour le matériel. Pour ce qui concerne l'environnement électromagnétique, il convient que la SSRS et la spécification des exigences pour le matériel soient fondées sur une évaluation pertinente des menaces électromagnétiques prévisibles dans l'environnement réel sur la totalité de la durée d'exploitation du matériel. Ainsi, les exigences d'immunité pour le matériel dépendent des caractéristiques de l'environnement électromagnétique dans lequel le matériel est destiné à fonctionner.

Le fabricant de matériel doit donc prouver que le matériel est conforme aux exigences qui lui sont applicables et l'intégrateur du système doit prouver que le système est conforme à la SSRS. Des preuves doivent être apportées en appliquant des méthodes appropriées. Il n'est pas nécessaire de tenir compte des autres aspects de l'application, par exemple, les risques associés à toute défaillance du système relatif à la sécurité. L'objectif est que tout matériel du système soit conforme aux critères particuliers de performance, par la prise en compte des aspects de sécurité fonctionnelle (par exemple, le critère de performance DS) jusqu'aux niveaux spécifiés dans la SSRS indépendamment du niveau d'intégrité de sécurité (SIL) exigé.

Pour des approches sur la manière d'appliquer la série IEC 61326-3, voir l'Annexe A.

Il existe également la norme CEM générique IEC 61000-6-7, qui traite des aspects de la sécurité fonctionnelle dans les environnements industriels. Les normes CEM génériques sont conçues pour s'appliquer dans un environnement électromagnétique défini à des produits pour lesquels il n'existe aucune norme CEM de produit/de famille de produits dédiée. Cependant, concernant les matériels qui relèvent du domaine d'application du présent document, il a été jugé que les informations fournies dans la norme CEM générique ne sont pas suffisantes. Des informations et des spécifications plus détaillées se sont avérées nécessaires, par exemple, des montages d'essai spécifiques, la prise en considération d'accès par la borne de terre fonctionnelle ou la différenciation délibérée entre les types

d'environnements électromagnétiques applicables aux matériels qui relèvent du domaine d'application du présent document.

Même si, historiquement, la présente norme de produit a été élaborée quelques années avant la publication de la norme CEM générique, cette deuxième édition tient compte des informations fournies dans la norme CEM générique et les applique selon le cas.

MATÉRIEL ÉLECTRIQUE DE MESURE, DE COMMANDE ET DE LABORATOIRE – EXIGENCES RELATIVES À LA CEM –

Partie 3-1: Exigences d'immunité pour les systèmes relatifs à la sécurité et pour les matériels destinés à réaliser des fonctions relatives à la sécurité (sécurité fonctionnelle) – Applications industrielles générales

1 Domaine d'application

La présente partie de l'IEC 61326 couvre tous les matériels qui relèvent du domaine d'application de l'IEC 61326-1, mais est limitée aux systèmes et matériels pour applications industrielles destinés à réaliser des fonctions de sécurité telles que définies dans l'IEC 61508, avec un niveau d'intégrité de sécurité (SIL) 1-3.

Les environnements électromagnétiques couverts par la présente norme de famille de produits sont des environnements industriels, à la fois à l'intérieur et à l'extérieur, tels que décrits pour les sites industriels dans l'IEC 61000-6-2 ou définis en 3.8 de l'IEC 61326-1. Les matériels et les systèmes pour une utilisation dans d'autres environnements électromagnétiques, par exemple dans l'industrie de processus ou dans des environnements avec des atmosphères potentiellement explosives, sont exclus du domaine d'application du présent document.

Les matériels et systèmes considérés comme «éprouvés par une utilisation antérieure», conformément à l'IEC 61508, ou «utilisation préalable», conformément à l'IEC 61511, sont exclus du domaine d'application du présent document.

Les systèmes d'alarme incendie et les systèmes d'alarme de sécurité destinés à la protection des bâtiments sont exclus du domaine d'application du présent document.

2 Références normatives

Les documents suivants cités dans le texte constituent, pour tout ou partie de leur contenu, des exigences du présent document. Pour les références datées, seule l'édition citée s'applique. Pour les références non datées, la dernière édition du document de référence s'applique (y compris les éventuels amendements).

IEC 60050-161, *Vocabulaire Électrotechnique International – Partie 161: Compatibilité électromagnétique* (disponible sur <<http://www.electropedia.org/>>)

IEC 61000-4-2:2008, *Compatibilité électromagnétique (CEM) – Partie 4-2: Techniques d'essai et de mesure – Essai d'immunité aux décharges électrostatiques*

IEC 61000-4-3:2006, *Compatibilité électromagnétique (CEM) – Partie 4-3: Techniques d'essai et de mesure – Essai d'immunité aux champs électromagnétiques rayonnés aux fréquences radioélectriques*

IEC 61000-4-3:2006/AMD1:2007

IEC 61000-4-3:2006/AMD2:2010

IEC 61000-4-4:2012, *Compatibilité électromagnétique (CEM) – Partie 4-4: Techniques d'essai et de mesure – Essais d'immunité aux transitoires électriques rapides en salves*

IEC 61000-4-5:2014, *Compatibilité électromagnétique (CEM) – Partie 4-5: Techniques d'essai et de mesure – Essai d'immunité aux ondes de choc*

IEC 61000-4-6:2013, *Compatibilité électromagnétique (CEM) – Partie 4-6: Techniques d'essai et de mesure – Immunité aux perturbations conduites, induites par les champs radioélectriques*

IEC 61000-4-8:2009, *Compatibilité électromagnétique (CEM) – Partie 4-8: Techniques d'essai et de mesure – Essai d'immunité au champ magnétique à la fréquence du réseau*

IEC 61000-4-11:2004, *Compatibilité électromagnétique (CEM) – Partie 4-11: Techniques d'essai et de mesure – Essais d'immunité aux creux de tension, coupures brèves et variations de tension*

IEC 61000-4-16:2015, *Compatibilité électromagnétique (CEM) – Partie 4-16: Techniques d'essai et de mesure – Essai d'immunité aux perturbations conduites en mode commun dans la plage de fréquences de 0 Hz à 150 kHz*

IEC 61000-4-29:2000, *Compatibilité électromagnétique (CEM) – Partie 4-29: Techniques d'essai et de mesure – Essais d'immunité aux creux de tension, coupures brèves et variations de tension sur les accès d'alimentation en courant continu*

IEC 61000-4-34:2005, *Compatibilité électromagnétique (CEM) – Partie 4-34: Techniques d'essai et de mesure – Essais d'immunité aux creux de tension, coupures brèves et variations de tension pour matériel ayant un courant appelé de plus de 16 A par phase*
IEC 61000-4-34:2005/AMD1:2009

IEC 61000-6-2:2016, *Compatibilité électromagnétique (CEM) – Partie 6-2: Normes génériques – Norme d'immunité pour les environnements industriels*

IEC 61326-1:2012, *Matériel électrique de mesure, de commande et de laboratoire – Exigences relatives à la CEM – Partie 1: Exigences générales*

IEC 61326-3-2:___¹, *Matériel électrique de mesure, de commande et de laboratoire – Exigences relatives à la CEM – Partie 3-2: Exigences d'immunité pour les systèmes relatifs à la sécurité et pour les matériels destinés à réaliser des fonctions relatives à la sécurité (sécurité fonctionnelle) – Applications industrielles dont l'environnement électromagnétique est spécifié*

IEC 61508-2:2010, *Sécurité fonctionnelle des systèmes électriques/électroniques/électroniques programmables relatifs à la sécurité – Partie 2: Exigences pour les systèmes électriques/électroniques/électroniques programmables relatifs à la sécurité*

¹ En préparation. Stade au moment de la publication: IEC/DIS 61326-3-2:2016.