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Programmable controllers – Part 2: Equipment requirements and tests

Withdrawing



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CONTENTS

FOREWORD.....	10
INTRODUCTION.....	12
1 General.....	13
1.1 Scope and object.....	13
1.2 Compliance with this standard.....	14
1.3 Normative references.....	14
2 Type tests.....	17
2.1 Equipment to be tested (equipment under test/EUT).....	17
2.2 Special features for immunity and EMC tests.....	18
2.3 Withstand test conditions.....	19
2.4 Verification procedure.....	19
2.5 Requirements for test programmes and proper functioning verification procedures (PFVPs) to be provided by the manufacturer.....	19
2.6 General conditions for tests.....	20
3 Terms and definitions.....	20
4 Normal service conditions and requirements.....	28
4.1 Climatic conditions and requirements.....	28
4.1.1 Operating ambient air temperature.....	28
4.1.2 Relative humidity.....	28
4.1.3 Altitude.....	28
4.1.4 Pollution degree.....	29
4.2 Mechanical service conditions and requirements.....	29
4.2.1 Vibrations.....	29
4.2.2 Shock.....	29
4.2.3 Free falls (portable and hand-held equipment).....	30
4.3 Transport and storage conditions and requirements.....	30
4.3.1 Temperature.....	30
4.3.2 Relative humidity.....	30
4.3.3 Altitude.....	30
4.3.4 Free falls (PLC units in manufacturer's original packaging).....	31
4.3.5 Other conditions.....	31
4.4 Electrical service conditions and requirements.....	31
4.4.1 AC and d.c. equipment power supply.....	31
4.4.2 Overvoltage category, control of transient overvoltages.....	31
4.4.3 Non-periodic overvoltages.....	31
4.5 Special conditions and requirements.....	31
5 Functional requirements.....	31
5.1 Functional power supply and memory back-up requirements.....	33
5.1.1 AC and d.c. power supply.....	33
5.1.2 Memory back-up.....	34
5.2 Digital I/Os.....	34
5.2.1 Digital inputs (current sinking).....	35
5.2.2 Digital outputs for alternating currents (current sourcing).....	37
5.2.3 Digital outputs for direct current (current sourcing).....	40

5.3	Analogue I/Os	41
5.3.1	Analogue inputs.....	41
5.3.2	Analogue outputs.....	41
5.4	Communication interface requirements.....	42
5.5	Main processing unit(s) and memory(ies) of the PLC-system requirements	42
5.6	Remote input/output stations (RIOSs) requirements	42
5.7	Peripherals (PADTs, TEs, HMIs) requirements	42
5.8	PLC-system self-tests and diagnostics requirements	43
5.9	Functional earthing.....	43
5.10	Mounting requirements	43
5.11	General marking requirements	44
5.11.1	Functional identifications	44
5.11.2	Module location and module identifications.....	44
5.11.3	Functional earth terminals markings	44
5.12	Requirements for normal service and functional type tests and verifications.....	44
5.13	Requirements for information on normal service and function.....	44
6	Normal service and functional type tests and verifications.....	44
6.1	Climatic tests	44
6.2	Dry-heat and cold withstand tests.....	45
6.2.1	Variation of temperature.....	46
6.2.2	Cyclic damp heat withstand test	47
6.3	Mechanical tests	48
6.3.1	Vibration (type test associated with normal service conditions).....	48
6.3.2	Shock (type test associated with normal service conditions).....	48
6.3.3	Free fall (type test associated with normal service conditions).....	49
6.3.4	Free fall (type test associated with transport and storage conditions)	49
6.3.5	Plugging/unplugging of removable units.....	49
6.4	Verification of special functional requirements for power ports and memory back-up – Special immunity limits for power ports	49
6.4.1	Verification of functional equipment power input port (a.c. or d.c.).....	50
6.4.2	External energy supply variation tests (immunity tests).....	51
6.4.3	Improper equipment power supply connection tests.....	54
6.4.4	Verification of memory back-up requirements	55
6.5	Verification of input/output requirements	55
6.5.1	General	55
6.5.2	Verification of digital inputs.....	56
6.5.3	Verification of digital outputs	56
6.5.4	Verification of analogue I/Os.....	57
6.6	Verification of communication interface requirements	58
6.7	Verification of MPU requirements	58
6.8	Verification of remote I/O stations	59
6.8.1	Response time test.....	59
6.8.2	Loss of communication test	59
6.8.3	Verification of other requirements	59
6.9	Verification of peripheral (PADTs, TEs, HMIs) requirements.....	59
6.10	Verification of PLC-system self-tests and diagnostics	59
6.11	Verification of markings and manufacturer's documentation.....	59
7	General information to be provided by the manufacturer.....	60
7.1	Information on type and content of documentation.....	60

7.1.1	Information on catalogues and datasheets.....	60
7.1.2	Information on user's manuals.....	60
7.1.3	Information on technical documentation.....	60
7.2	Information on compliance with this standard.....	60
7.3	Information on reliability.....	61
7.4	Information on other conditions.....	61
7.5	Information on shipping and storage.....	61
7.6	Information on a.c. and d.c. power supply.....	61
7.7	Information on digital inputs (current sinking).....	61
7.8	Information on digital outputs for alternating currents (current sourcing).....	62
7.9	Information on digital outputs for direct current (current sourcing).....	63
7.10	Information on analogue inputs.....	63
7.10.1	Information on analogue input static characteristics.....	63
7.10.2	Information on analogue input dynamic characteristics.....	63
7.10.3	Information on analogue input general characteristics.....	64
7.10.4	Information on analogue input miscellaneous characteristics.....	64
7.11	Information on analogue outputs.....	64
7.11.1	Information on analogue output static characteristics.....	64
7.11.2	Information on analogue output dynamic characteristics.....	64
7.11.3	Information on analogue output general characteristics.....	65
7.11.4	Information on analogue output miscellaneous characteristics.....	65
7.12	Information on communication interfaces.....	65
7.13	Information on main processing unit(s) and memory(ies) of the PLC-system.....	65
7.14	Information on remote input/output stations (RIOs).....	66
7.15	Information on peripherals (PADTs, TEs, HMIs).....	67
7.16	Information on self-tests and diagnostics.....	67
8	Electromagnetic compatibility (EMC) requirements.....	67
8.1	General.....	67
8.2	Emission requirements.....	68
8.2.1	General requirements for emission.....	68
8.2.2	Emission limits in the low-frequency range.....	68
8.2.3	Emission limits in the high-frequency range.....	68
8.3	EMC immunity requirements.....	68
8.3.1	General.....	69
8.3.2	Performance criteria.....	70
8.3.3	Immunity levels.....	71
8.3.4	Voltage dips and interruptions power ports.....	73
8.4	Requirements for EMC tests and verifications.....	74
8.5	Requirements for information on EMC.....	74
9	Electromagnetic compatibility (EMC) type tests and verifications.....	74
9.1	Electromagnetic compatibility-related tests.....	74
9.2	Test environment.....	75
9.3	Measurement of radiated interference.....	75
9.4	Measurement of conducted interference.....	75
9.5	Electrostatic discharge.....	76
9.6	Radiofrequency electromagnetic field – Amplitude modulated.....	76
9.7	Power-frequency magnetic fields.....	77
9.8	Fast transient bursts.....	77
9.9	High-energy surges.....	78

9.10	Conducted radiofrequency interference	78
9.11	Damped oscillatory wave (for zone C only)	79
9.12	Voltage dips and interruptions	79
10	Electromagnetic compatibility (EMC) information to be provided by the manufacturer	80
11	Safety requirements	80
11.1	Equipment types and protection	80
11.1.1	Open PLC-system equipment	80
11.1.2	Enclosed PLC-system equipment	80
11.2	Protection against electrical shock	82
11.2.1	Permissible limits for accessible parts	82
11.2.2	Dielectric strength	83
11.2.3	Ports requiring protection	83
11.2.4	Protection in normal condition	84
11.2.5	Protection in single-fault condition	85
11.2.6	Secondary circuits which do not pose a risk of electrical shock	86
11.3	Protection against the spread of fire	87
11.3.1	Limited power circuits	87
11.4	Clearance and creepage distances requirements	88
11.4.1	Clearances relating to overvoltage category II	89
11.4.2	Clearances for micro-environment where voltages are known and controlled	90
11.4.3	Creepage distances for basic and supplementary insulation	91
11.4.4	Creepage distances for double/reinforced insulation	94
11.4.5	Creepage for field-wiring terminals	94
11.5	Flame-retardant requirements for non-metallic materials	94
11.5.1	Non-metallic enclosure material	94
11.5.2	Non-metallic material supporting live parts	94
11.5.3	Non-metallic parts	95
11.5.4	Decorative and labelling materials	95
11.5.5	Internal wiring or interconnection cables	95
11.6	Temperature limits	95
11.7	Enclosures	95
11.7.1	Open equipment	96
11.7.2	Enclosed equipment	96
11.8	Operator-accessible hazardous live field-wiring terminal constructional requirements	96
11.9	Provisions for protective earthing	96
11.9.1	Protective earthing requirements for enclosed equipment	97
11.9.2	Protective earthing requirements for open equipment	97
11.10	Wiring	98
11.10.1	Internal wiring	98
11.10.2	Interconnection wiring	98
11.10.3	Equipment power input cord	98
11.11	Switching devices	99
11.12	Components related to safety requirements	99
11.13	Battery requirements	99
11.14	Maximum voltage and minimum voltage	99
11.15	Markings and identification	99
11.15.1	External wiring terminals identification	100

11.15.2	Live parts	100
11.15.3	Protective earth terminals markings.....	100
11.15.4	Enclosed Class II equipment	100
11.15.5	Equipment supplied by SELV/PELV.....	101
11.15.6	Rating information	101
11.16	Requirements for safety type tests and verifications	101
11.17	Requirements for safety routine tests and verifications	101
11.17.1	Requirement for dielectric strength verification	101
11.17.2	Requirement for protective earthing verification.....	101
11.18	Requirements for information on safety.....	101
12	Safety type tests and verifications	102
12.1	Safety-related mechanical tests and verifications	102
12.1.1	Impact withstand test.....	102
12.1.2	Operator accessibility tests.....	103
12.1.3	General examination of openings.....	103
12.1.4	Wire flexing test.....	104
12.1.5	Temperature test	104
12.1.6	Protective coating test	104
12.1.7	Rigidity test	104
12.1.8	Clearance and creepage verification.....	105
12.1.9	Field-wiring terminals constructional verification.....	105
12.2	Safety-related electrical tests	105
12.2.1	Dielectric withstand verification test.....	105
12.2.2	Protective earthing continuity test.....	107
12.2.3	Stored energy injury risk test	108
12.2.4	Overload test.....	108
12.2.5	Endurance test	108
12.3	Single-fault condition tests	109
12.3.1	Single-fault condition – General.....	109
12.3.2	Single-fault condition – Breakdown of components test	109
12.3.3	Single-fault condition – Protective impedance test.....	110
12.3.4	Single-fault condition – isolation transformers test.....	110
12.4	Limited power circuits test.....	110
13	Safety routine tests	110
13.1	Dielectric withstand test	110
13.2	Dielectric withstand verification test.....	111
13.3	Protective earthing test	111
14	Safety information to be provided by the manufacturer	111
14.1	Information on evaluation of enclosures for open equipment (power dissipation).....	112
14.2	Information on mechanical terminal connection	112
Annex A (informative) Illustration of PLC-system hardware definitions		113
Annex B (informative) Digital input standard operating range equations.....		114
Annex C (normative) Test tools.....		115
Annex D (informative) Zone C – EMC immunity levels		118
Annex E (informative) Overvoltage example.....		120
Bibliography.....		122

Figure 1 – EUT configurations	18
Figure 2 – Typical interface/port diagram of a PLC-system	32
Figure 3 – I/O Parameters.....	35
Figure 4 – U-I operation regions of current-sinking inputs	36
Figure 5 – Temporary overload waveform for digital a.c. outputs.....	38
Figure 6 – Temporary overload waveform for digital d.c. outputs.....	40
Figure 7 – Third harmonic immunity test	51
Figure 8 – Gradual shut-down/start-up test	52
Figure 9 – Fast supply voltage variation test	53
Figure 10 – Slow supply voltage variation test	54
Figure 11 – EMC immunity zones.....	69
Figure 12 – Impact withstand test procedure.....	102
Figure 13 – Dielectric withstand test procedures	107
Figure A.1 – Programmable controller system (PLC-system).....	113
Figure C.1 – Jointed test finger.....	115
Figure C.2 – 15 mm × 3 mm test pin	116
Figure C.3 – 100 mm × 4 mm test pin.....	116
Figure C.4 – 100 mm × 3 mm test pin	117
Figure E.1 – Creepage distances of circuits where recurring peak voltages are generated	120
Table 1 – General conditions for tests	20
Table 2 – Operating ambient air temperature of PLC-systems.....	28
Table 3 – Sinusoidal vibrations service conditions for PLC-systems.....	29
Table 4 – Free fall on concrete floor for portable and hand-held equipment	30
Table 5 – Free fall on concrete floor in manufacturer's original packaging	31
Table 6 – Rated values and operating ranges of incoming power supply.....	33
Table 7 – Voltage interruptions (functional requirements).....	34
Table 8 – Standard operating ranges for digital inputs (current sinking)	37
Table 9 – Rated values and operating ranges for current sourcing digital a.c. outputs	38
Table 10 – Rated values and operating ranges (d.c.) for current-sourcing digital d.c. outputs	40
Table 11 – Rated values and impedance limits for analogue inputs.....	41
Table 12 – Rated values and impedance limits for analogue outputs.....	41
Table 13 – Dry-heat and cold withstand tests.....	45
Table 14 – Change of temperature, withstand and immunity tests	46
Table 15 – Cyclic (12 + 12) damp-heat test.....	47
Table 16 – Immunity vibration test	48
Table 17 – Immunity shock test.....	48
Table 18 – Free-fall immunity/withstand tests (portable and hand-held equipment)	49
Table 19 – Free-fall withstand test (units within manufacturer's original packaging)	49
Table 20 – Insertion/withdrawal of removable units	49
Table 21 – Voltage ripple and frequency range immunity test.....	50

Table 22 – Third harmonic immunity test.....	50
Table 23 – Gradual shut-down/start-up test	52
Table 24 – Supply voltage variation tests	53
Table 25 – Voltage interruptions immunity test (Functional tests).....	54
Table 26 – Back-up duration withstand test.....	55
Table 27 – Change of energy source test.....	55
Table 28 – Overload and short-circuit tests for digital outputs	57
Table 29 – Emission limits	68
Table 30 – EMC immunity zones, example regarding surge	70
Table 31 – Criteria to prove the performance of a PLC-system against EMC disturbances	70
Table 32 – Enclosure port tests, Zones A and B.....	71
Table 33 – Conducted immunity tests, Zone B	72
Table 34 – Conducted immunity tests, zone A.....	73
Table 35 – Voltage dips and interruptions (EMC requirements).....	74
Table 36 – Radiated emission measurement.....	75
Table 37 – Conducted emission measurement.....	75
Table 38 – Electrostatic discharge immunity test.....	76
Table 39 – Radiated electromagnetic field immunity test.....	76
Table 40 – Power-frequency magnetic field immunity test.....	77
Table 41 – Fast transient burst immunity test.....	77
Table 42 – High-energy surge immunity test	78
Table 43 – Conducted r.f. immunity test.....	78
Table 44 – Damped oscillatory wave immunity test	79
Table 45 – Voltage dips and interruptions immunity test (EMC tests)	79
Table 46 – Shock protection requirements for open and enclosed equipment.....	84
Table 47 – Limits of output current and output power for inherently limited power sources.....	88
Table 48 – Limits of output current, output power and ratings for over-current protective devices for non-inherently limited power sources.....	88
Table 49 – Minimum clearances in air corresponding to overvoltage category II conditions (except for field wiring terminals) for basic/supplementary insulation.....	89
Table 50 – Minimum clearances in air corresponding to overvoltage category II conditions (except for field wiring terminals) for double /reinforced insulation	90
Table 51 – Minimum clearances in air at field-wiring terminals	90
Table 52 – Minimum clearances in air for micro-environment where the voltages are known and controlled	91
Table 53 – Classification of material group according to comparative tracking index (CTI).....	91
Table 54 – Minimum creepage distances for other than printed circuit boards (1).....	92
Table 55 – Minimum creepage distances for printed circuit boards (1), (6), (9) (basic and supplementary insulation)	93
Table 56 – Minimum creepage distances related to recurring peak voltages on printed wiring boards without protective coating (1) (pollution degrees 1 and 2).....	94
Table 57 – Temperature limits	95
Table 58 – Impact withstand test (1)	102

Table 59 – Operator accessibility tests (1)	103
Table 60 – Dielectric withstand voltages for impulse a.c. power-frequency and d.c. tests for basic/supplementary insulation (5)	106
Table 61 – Dielectric withstand voltages for impulse a.c. power frequency and d.c. tests for double/reinforced insulation (5)	107
Table 62 – Overload test circuit values	108
Table 63 – Endurance test circuit values.....	109
Table 64 – Routine dielectric withstand test (5).....	111
Table D.1 – Enclosure port tests, Zone C.....	118
Table D.2 – Conducted immunity tests, Zone C.....	119

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

PROGRAMMABLE CONTROLLERS –

Part 2: Equipment requirements and tests

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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- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 61131-2 has been prepared by subcommittee 65B: Devices, of IEC technical committee 65: Industrial-process measurement and control.

This third edition of IEC 61131-2 cancels and replaces the second edition published in 2003 and constitutes a technical revision.

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

- a) DC power port requirements have been moved from Clause 8 to Clause 5.
- b) Correction of the following tests of Clause 6:
 - voltage range test;
 - fast supply voltage variation test;
 - slow supply voltage variation test;
 - gradual shut-down/start-up test.
- c) Change of EMC requirements in Clause 8:

- requirements for radiofrequency interference in Table 33 changed from 3 V to 10 V for Zone B equipment;
 - reference to EMC basic standards with the last version;
 - reference to generic standards 61000-6-x;
 - cable length aligned to generic standards.
- d) Correction of the following tests in Clause 9:
- voltage dips and interruptions – power port type tests and verifications.
- e) New organization of Clause 11:
- equipment types and protection;
 - open PLC-system equipment;
 - enclosed PLC-system equipment:
 - Class I equipment;
 - Class II equipment;
 - Class III equipment;
 - protection against electric shock;
 - definition of secondary circuits which do not pose a risk of electric shock:
 - Class 2 circuit;
 - limited voltage/current circuit;
 - limited voltage circuit;
 - limited energy circuit ≤ 30 V a.c. or 42,2 V peak;
 - limited impedance circuit;
 - protection against the spread of fire within limited power circuits;
 - protective earthing requirements for enclosed equipment;
 - minor improvements in different subclauses;
 - impulse test only for verification of clearances.

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

FDIS	Report on voting
65B/623/FDIS	65B/636/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.

The list of all parts of the IEC 61131 series, under the general title *Programmable controllers*, can be found on the IEC website.

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.

A bilingual version of this publication may be issued at a later date.

INTRODUCTION

IEC 61131-2 is part of a series of standards on programmable controllers and the associated peripherals and should be read in conjunction with the other parts of the series.

Where a conflict exists between this and other IEC standards (except basic safety standards), the provisions of this standard should be considered to govern in the area of programmable controllers and their associated peripherals.

Compliance with IEC 61131-2 cannot be claimed unless the requirements of 7.2 are met.

Service and physical environment requirements are specified in Clause 4. Functional requirements are specified in Clause 5. Electromagnetic compatibility requirements are specified in Clause 8. Safety requirements are specified in Clause 11.

Terms of general use are defined in IEC 61131-1. More specific terms are defined in each part.

Withdrawn

PROGRAMMABLE CONTROLLERS –

Part 2: Equipment requirements and tests

1 General

1.1 Scope and object

This part of IEC 61131 specifies requirements and related tests for programmable controllers (PLCs) and their associated peripherals (for example, programming and debugging tools (PADTs), human-machine interfaces (HMIs), etc.) which have as their intended use the control and command of machines and industrial processes.

PLCs and their associated peripherals are intended to be used in an industrial environment and may be provided as open or enclosed equipment. If a PLC or its associated peripherals are intended for use in other environments (light industrial, commercial, residential), then the specific requirements, standards and installation practices for those other environments should be additionally applied to the PLC and its associated peripherals.

This standard also applies to any products performing the function of PLCs and/or their associated peripherals.

Equipment covered in this standard is intended for use in overvoltage category II (IEC 60664-1) in low-voltage installations, where the rated equipment supply voltage does not exceed a.c. 1 000 V r.m.s. (50/60 Hz), or d.c. 1 500 V. (If PLCs or their associated peripherals are applied in overvoltage category III installations, then additional analysis will be required to determine the suitability of the equipment for those applications.)

This standard does not deal with the functional safety or other aspects of the overall automated system. PLCs, their application programme and their associated peripherals are considered as components of a control system.

Since PLCs are component devices, safety considerations for the overall automated system including installation and application are beyond the scope of this standard. Refer to IEC 60364-1 or applicable national/local regulations for electrical installation and guidelines.

However, PLC safety as related to electric shock and fire hazards, electrical interference immunity and error detecting of the PLC-system operation (such as the use of parity checking, self-testing diagnostics, etc.), are addressed.

The object of this standard is

- to establish the definitions and identify the principal characteristics relevant to the selection and application of PLCs and their associated peripherals;
- to specify the minimum requirements for functional, electrical, mechanical, environmental and construction characteristics, service conditions, safety, EMC, user programming and tests applicable to PLCs and the associated peripherals.

This standard also specifies

- a) service, storage and transportation requirements for PLCs and their associated peripherals (Clause 4);
- b) functional requirements for PLCs and their associated peripherals (Clause 5);
- c) EMC requirements for PLCs and their associated peripherals (Clause 8);

- d) safety requirements for PLCs and their associated peripherals (Clause 11);
- e) information that the manufacturer is required to supply (Clauses 7, 10 and 14);
- f) test methods and procedures that are to be used for the verification of compliance of PLCs and their associated peripherals with the requirements (Clauses 6, 9 and 12).
- g) safety routine tests for PLCs and their peripherals (Clause 13).

The tests are type tests or production routine tests, and not tests related to the ways PLC systems are applied.

1.2 Compliance with this standard

When compliance with this standard is indicated without qualification, compliance with all clauses, including all tests and verifications required in this standard, should be verified. Moreover, the manufacturer's obligations expressed in this standard are not waived if no type test is required, or if the test conditions are restricted for practical reasons.

When compliance with some portion of this standard is indicated, it is only necessary to verify compliance with those clauses against which the compliance claim is made. The manufacturer's obligations as indicated above are still applicable. The smallest unit of this standard for compliance purposes should be a clause, such as Clauses 5, 8 or 11.

Compliance with a portion of this standard is provided to facilitate efforts with respect to particular conformity assessment requirements (for example, Clause 8, 9 and 10 as the compliance requirements for the EU electromagnetic compatibility directive or Clause 11, 12, 13 and 14 as the compliance requirements for the EU low-voltage directive).

Compliance with constructional requirements and with requirements for information to be provided by the manufacturer should be verified by suitable examination, visual inspection and/or measurement.

All requirements not tested according to the clauses on tests and verifications should be verifiable under a procedure to be agreed to by the manufacturer and the user.

The manufacturer shall provide, on request, compliance verification information for all requirements referenced in the claims of compliance with all or a portion of this standard.

It is the manufacturer's responsibility to ensure that delivered PLC equipment and associated peripherals are equivalent to the sample(s) which have been type-tested according to this standard and therefore that they comply with all requirements of this standard.

Significant modifications shall be indicated through the use of suitable revision level indexes and markings (see 5.11 and 11.15) and shall comply with this standard.

NOTE A new type test may be required to confirm compliance.

Where the manufacturer is allowed to select among several options, he shall clearly specify in his catalogues and/or datasheets those to which any portion of the PLC-system equipment complies. This applies to severity classes of voltage dips (i.e. PS1 or PS2) and types of digital inputs (i.e. Type 1 or Type 3).

1.3 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 60060-1:1992, *High-voltage test techniques – Part 1: General definitions and test requirements*

IEC 60068-2-1:2007, *Environmental testing – Part 2-1: Tests – Test A: Cold*

IEC 60068-2-2:1974, *Environmental testing – Part 2: Tests – Tests B: Dry heat*

IEC 60068-2-6:1995, *Environmental testing – Part 2: Tests – Test Fc: Vibration (sinusoidal)*

IEC 60068-2-14:1984, *Environmental testing – Part 2: Tests – Test N: Change of temperature*

IEC 60068-2-27:1987, *Environmental testing – Part 2: Tests – Test Ea and guidance: Shock*

IEC 60068-2-30:2005, *Environmental testing – Part 2: Tests – Test Db: Damp heat, cyclic (12 h + 12-hour cycle)*

IEC 60068-2-31:1969, *Environmental testing – Part 2: Tests – Test Ec: Drop and topple, primarily for equipment-type specimens*

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Withdrawn