

Solid-state relays

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EESTI STANDARDI EESSÕNA**NATIONAL FOREWORD**

<p>Käesolev Eesti standard EVS-EN 62314:2008 sisaldab Euroopa standardi EN 62314:2006 ingliskeelset teksti.</p>	<p>This Estonian standard EVS-EN 62314:2008 consists of the English text of the European standard EN 62314:2006.</p>
<p>Standard on kinnitatud Eesti Standardikeskuse 20.02.2008 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas.</p>	<p>This standard is ratified with the order of Estonian Centre for Standardisation dated 20.02.2008 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation.</p>
<p>Euroopa standardimisorganisatsioonide poolt rahvuslikele liikmetele Euroopa standardi teksti kättesaadavaks tegemise kuupäev on 08.08.2006.</p>	<p>Date of Availability of the European standard text 08.08.2006.</p>
<p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>The standard is available from Estonian standardisation organisation.</p>

ICS 29.120.70

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Solid-state relays
(IEC 62314:2006)

Relais statiques
(CEI 62314:2006)

Halbleiterrelais
(IEC 62314:2006)

This European Standard was approved by CENELEC on 2006-07-01. 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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CENELEC

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

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

The text of document 94/232/FDIS, future edition 1 of IEC 62314, prepared by IEC TC 94, All-or-nothing electrical relays, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 62314 on 2006-07-01.

The following dates were fixed:

- | | | |
|--|-------|------------|
| – latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement | (dop) | 2007-04-01 |
| – latest date by which the national standards conflicting with the EN have to be withdrawn | (dow) | 2009-07-01 |

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 62314:2006 was approved by CENELEC as a European Standard without any modification.

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

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.

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

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60038 (mod)	1983	IEC standard voltages ¹⁾	HD 472 S1	1989
-			+ corr. February	2002
-			A1	1995
A1	1994		-	-
A2	1997		-	-
IEC 60050-195	1998	International Electrotechnical Vocabulary (IEV) Chapter 195: Earthing and protection against electric shock	-	-
IEC 60050-444	2002	International Electrotechnical Vocabulary Part 444: Elementary relays	-	-
IEC 60068-2-1	1990	Environmental testing Part 2: Tests - Tests A: Cold	EN 60068-2-1	1993
IEC 60068-2-2	1974	Environmental testing Part 2: Tests - Tests B: Dry heat	EN 60068-2-2 ²⁾	1993
IEC 60068-2-14 + A1	1984 1986	Environmental testing Part 2: Tests - Test N: Change of temperature	EN 60068-2-14	1999
IEC 60068-2-20 + A2	1979 1987	Environmental testing Part 2: Tests - Test T: Soldering	HD 323.2.20 S3	1988
IEC 60068-2-78	2001	Environmental testing Part 2-78: Tests - Test Cab: Damp heat, steady state	EN 60068-2-78	2001
IEC 60112	2003	Method for the determination of the proof and the comparative tracking indices of solid insulating materials	EN 60112	2003
IEC 60529	- ³⁾	Degrees of protection provided by enclosures (IP Code)	EN 60529 + corr. May	1991 ⁴⁾ 1993

¹⁾ The title of HD 472 S1 is: Nominal voltages for low-voltage public electricity supply systems.

²⁾ EN 60068-2-2 includes supplement A:1976 to IEC 60068-2-2.

³⁾ Undated reference.

⁴⁾ Valid edition at date of issue.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60664-1 (mod)	- ³⁾	Insulation coordination for equipment within low-voltage systems Part 1: Principles, requirements and tests	EN 60664-1	2003 ⁴⁾
IEC 60664-3	2003	Insulation coordination for equipment within low-voltage systems Part 3: Use of coating, potting or moulding for protection against pollution	EN 60664-3	2003
IEC 60695-2-10	2000	Fire hazard testing Part 2-10: Glowing/hot-wire based test methods - Glow-wire apparatus and common test procedure	EN 60695-2-10	2001
IEC 60695-10-2	2003	Fire hazard testing Part 10-2: Abnormal heat - Ball pressure test	EN 60695-10-2	2003
IEC 60695-11-10 A1	1999 2003	Fire hazard testing Part 11-10: Test flames - 50 W horizontal and vertical flame test methods	EN 60695-11-10 A1	1999 2003
IEC 60999-1	1999	Connecting devices - Electrical copper conductors - Safety requirements for screw-type and screwless-type clamping units Part 1: General requirements and particular requirements for clamping units for conductors from 0,2 mm ² up to 35 mm ² (included)	EN 60999-1	2000
IEC 61210 (mod)	1993	Connecting devices - Flat quick-connect terminations for electrical copper conductors - Safety requirements	EN 61210	1995
IEC 61760-1	1998	Surface mounting technology Part 1: Standard method for the specification of surface mounting components (SMDs)	EN 61760-1 ⁵⁾	1998

⁵⁾ EN 61760-1 is superseded by EN 61760-1:2006, which is based on IEC 61760-1:2006.

CONTENTS

FOREWORD.....	4
1 Scope and object.....	6
2 Normative references	7
3 Terms and definitions	8
4 Characteristics of solid-state relays	12
4.1 Summary of characteristics	12
4.2 Type of solid-state relay	12
4.3 Rated and limiting values for load circuits.....	12
4.4 Load category	13
4.5 Rated and limiting values for control circuits.....	14
5 Marking and documentation.....	14
5.1 Marking	14
5.2 Data	15
5.3 Instructions for installation, operation and maintenance	15
6 Normal conditions.....	15
6.1 Normal service, transport and storage conditions	15
6.2 Normal mounting conditions	16
7 Constructional requirements	16
7.1 Materials	16
7.2 Clearances and creepage distances	16
7.3 Heat and fire resistance	16
7.4 Terminals	16
8 Performance requirements	17
8.1 Temperature-rise.....	17
8.2 Overload test.....	18
8.3 Endurance test	20
8.4 Insulation tests	21
8.5 Impact test	21
8.6 Ball pressure test	21
8.7 OFF-state leakage current measurement.....	21
8.8 ON-state voltage drop measurement	21
9 Type test	22
Annex A (normative) Insulation coordination	23
Annex B (normative) Glow-wire test	34
Annex C (normative) Quick-connect terminations	37
Figure B.1 – Glow-wire and position of the thermocouple.....	35
Figure B.2 – Glow-wire test apparatus (example).....	36

Table 1 – Load categories.....	13
Table 2 – Required data	15
Table 3 – Test conditions for test Tb	17
Table 4 – Minimum requirements for overload capability test conditions	19
Table 5 – Endurance test.....	20
Table A.1 – Rated impulse withstand voltages (waveform: 1,2/50 μ s) for solid-state relays connected directly to the mains	24
Table A.2 – Minimum clearances	26
Table A.3 – Minimum creepage distances for solid-state relays	27
Table A.4 – Preconditioning	29
Table C.1 – Cross-sectional areas for conductors depending on the resistive current carried by the terminal	38

SOLID-STATE RELAYS

1 Scope and object

This International Standard applies to particular all-or-nothing electrical relays denominated solid-state relays intended for performing electrical operations by single step function changes to the state of electric circuits between the OFF-state and the ON-state and vice versa. It is applicable to solid-state relays with rated voltages up to 750 V and with a.c. output current up to 160 A.

NOTE Requirements for solid-state relays with d.c. output circuits are under consideration.

This standard deals with solid-state relays which are intended for incorporation in other products or equipment. As such, solid state relays are considered to be components and this standard defines the basic safety-related and functional requirements for solid-state relays as stand-alone components.

Such solid-state relays are incorporated in products or equipment which themselves have to comply with the relevant product and/or application standard(s) to meet their intended application. The following are examples of such applications:

- general industrial equipment;
- electrical facilities;
- electrical machines;
- electrical appliances;
- office communications;
- building automation and environmental control;
- automation and process control;
- electrical installation engineering;
- medical engineering;
- telecommunications;
- vehicle engineering;
- transportation engineering;
- lighting control.

Solid state relays are components (not stand alone devices) and as such do not perform a direct function. Therefore, no EMC requirements are included in this standard.

NOTE This is in line with the European EMC Directive.

Where the application of a solid-state relay determines additional requirements such as EMC and overcurrent protection, the solid-state relay shall be assessed in accordance with the relevant IEC standard(s).

Solid-state switching devices with monolithic structures fall within the scope of IEC subcommittee 47E and are not covered in this standard.

Semiconductor controllers and contactors fall within the scope of the IEC 60947 series of standards – *Low-voltage switchgear and controlgear* – developed by IEC subcommittee 17B and are not covered in this standard.

Compliance with the requirements of this standard is verified by the type tests indicated.

The object of this standard is to state:

- the characteristics of solid-state relays;
- the requirements which solid-state relays shall comply with reference to
 - a) their operation and behaviour;
 - b) their dielectric properties;
 - c) the degrees of protection provided by their enclosures, where applicable;
- the tests verifying that the requirements have been met, and the test methods to be adopted;
- the information to be given with the solid-state relay or in the manufacturer's documentation.

2 Normative references

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

IEC 60038:1983, *IEC standard voltages*
Amendment 1 (1994)
Amendment 2 (1997)

IEC 60050-195:1998, *International Electrotechnical Vocabulary (IEV) – Part 195: Earthing and protection against electric shock*

IEC 60050-444:2002, *International Electrotechnical Vocabulary (IEV) – Part 444: Elementary relays*

IEC 60068-2-1:1990, *Environmental testing – Part 2: Tests. Tests A: Cold*

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

IEC 60068-2-14:1984, *Environmental testing – Part 2: Tests. Test N: Change of temperature*
Amendment 1 (1986)

IEC 60068-2-20:1979, *Environmental testing – Part 2: Tests. Test T: Soldering*
Amendment 2 (1987)

IEC 60068-2-78:2001, *Environmental testing – Part 2-78: Tests – Test Cab: Damp heat, steady state*

IEC 60112:2003, *Method for the determination of the proof and the comparative tracking indices of solid insulating materials*

IEC 60529, *Degrees of protection provided by enclosures (IP Code)*

IEC 60664-1, *Insulation coordination for equipment within low-voltage systems – Part 1: Principles, requirements and tests*

IEC 60664-3:2003, *Insulation coordination for equipment within low-voltage systems – Part 3: Use of coating, potting or moulding for protection against pollution*

IEC 60695-2-10:2000, *Fire hazard testing – Part 2-10: Glowing/hot-wire based test methods – Glow-wire apparatus and common test procedure*

IEC 60695-10-2:2003, *Fire hazard testing – Part 10-2: Abnormal heat – Ball pressure test*

IEC 60695-11-10:2003, *Fire hazard testing – Part 11-10: Test flames – 50 W horizontal and vertical flame test methods*

IEC 60999-1:1999, *Connecting devices – Electrical copper conductors – Safety requirements for screw-type and screwless-type clamping units – Part 1: General requirements and particular requirements for clamping units for conductors from 0,2 mm² up to 35 mm² (included)*

IEC 61210:1993, *Connecting devices – Flat quick-connect terminations for electrical copper conductors – Safety requirements*

IEC 61760-1:1998, *Surface mounting technology – Part 1: Standard method for the specification of surface mounting components (SMDs)*

3 Terms and definitions

For the purposes of this document the terms and definitions given in IEC 60050(444) and the following apply. .

3.1 Terms and definitions related to relays

3.1.1

solid-state relay

electrical relay in which the intended response is produced by electronic, magnetic, optical or other components without mechanical motion

[IEV 444-01-06]

3.1.2

electrical relay

device designed to produce sudden and predetermined changes in one or more output circuits when certain conditions are fulfilled in the electrical input circuits controlling the device

[IEV 444-01-01]

3.1.3

rated operational voltage

U_e

value of voltage which determines the application of the solid-state relay and to which the relevant tests and the load categories are referred

3.1.4

rated insulation voltage

U_i

value of voltage to which dielectric tests and creepage distances are referred

3.1.5

rated impulse withstand voltage

U_{imp}

peak value of an impulse voltage of prescribed form and polarity which the solid-state relay is capable of withstanding without failure under specified conditions of test and to which the values of the clearances are referred