# SLOVENSKI STANDARD
# SIST EN 61439-3:2012

**01-julij-2012**

**Nadomešča:**
**SIST EN 60439-3:1998**
**SIST EN 60439-3:1998/A1:1998**
**SIST EN 60439-3:1998/A2:2002**

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**Sestavi nizkonapetostnih stikalnih in krmilnih naprav - 3. del: Električni razdelilniki, s katerimi lahko ravnajo nestrokovnjaki (DBO) (IEC 61439-3:2012)**

Low-voltage switchgear and controlgear assemblies - Part 3: Distribution boards intended to be operated by ordinary persons (DBO) (IEC 61439-3:2012)



Niederspannungs-Schaltgerätekombinationen - Teil 3: Installationsverteiler für die Bedienung durch Laien (IVL) (IEC 61439-3:2012)



Ensembles d'appareillage à basse tension - Partie 3: Tableaux de répartition destinés à être utilisés par des personnes ordinaires (DBO) (CEI 61439-3:2012)

**Ta slovenski standard je istoveten z:** **EN 61439-3:2012**

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**ICS:**

| | | |
|---|---|---|
| 29.130.20 | Nizkonapetostne stikalne in krmilne naprave | Low voltage switchgear and controlgear |

**SIST EN 61439-3:2012** **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

# EN 61439-3

April 2012

ICS 29.130.20

Supersedes EN 60439-3:1991 + A1:1994 + A2:2001

English version

# Low-voltage switchgear and controlgear assemblies - Part 3: Distribution boards intended to be operated by ordinary persons (DBO)

(IEC 61439-3:2012)

Ensembles d'appareillage à basse tension - Partie 3: Tableaux de répartition destinés à être utilisés par des personnes ordinaires (DBO)
(CEI 61439-3:2012)

Niederspannungs-Schaltgerätekombinationen - Teil 3: Installationsverteiler für die Bedienung durch Laien (IVL)
(IEC 61439-3:2012)



This European Standard was approved by CENELEC on 2012-03-22. 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.



Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

CENELEC

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

**Management Centre: Avenue Marnix 17, B - 1000 Brussels**



Ref. No. EN 61439-3:2012 E

## Foreword

The text of document 17D/448/FDIS, future edition 1 of IEC 61439-3, prepared by SC 17D, "Low-voltage switchgear and controlgear assemblies", of IEC/TC 17, "Switchgear and controlgear" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61439-3:2012.

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) | 2012-12-22 |
| • latest date by which the national standards conflicting with the document have to be withdrawn | (dow) | 2015-03-22 |

This document supersedes EN 60439-3:1991 + A1:1994 + A2:2001 + corrigendum November 2009.

EN 61439-3:2012 includes the following significant technical changes with respect to EN 60439-3:1991:

– alignment with EN 61439-1:2011.

This standard is to be read in conjunction with EN 61439-1. The provisions of the general rules dealt with in EN 61439-1 (hereinafter referred to as Part 1) are applicable to this standard where they are specifically cited. When this standard states “addition” “modification” or “replacement”, the relevant text in Part 1 is to be adapted accordingly.



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 standard covers the Principle Elements of the Safety Objectives for Electrical Equipment Designed for Use within Certain Voltage Limits (LVD - 2006/95/EC)

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 61439-3:2012 was approved by CENELEC as a European Standard without any modification.

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

| | | |
|---|---|---|
| IEC 60947-2 | NOTE | Harmonized as EN 60947-2. |

# Annex ZA
(normative)

## Normative references to international publications with their corresponding European publications

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.

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

| Publication | Year | Title | EN/HD | Year |
|---|---|---|---|---|
| ***Addition*** *to Annex ZA of EN 61439-1:2011:* | | | | |
| IEC 60068-2-75 | - | Environmental testing -<br>Part 2-75: Tests - Test Eh: Hammer tests | EN 60068-2-75 | - |
| IEC 60269-3 | - | Low-voltage fuses -<br>Part 3: Supplementary requirements for fuses for use by unskilled persons (fuses mainly for household or similar applications) - Examples of standardized systems of fuses A to F | HD 60269-3 | - |
| IEC 60898-1 (mod) | 2002 | Electrical accessories - Circuit breakers for overcurrent protection for household and similar installations -<br>Part 1: Circuit-breakers for a.c. operation | EN 60898-1<br>+ corr. February<br>+ A11<br>+ A12 | 2003<br>2004<br>2005<br>2008 |
| IEC 61008 | Series | Residual current operated circuit-breakers without integral overcurrent protection for household and similar uses (RCCB's) | EN 61008 | Series |
| IEC 61009 | Series | Residual current operated circuit-breakers with integral overcurrent protection for household and similar uses (RCBOs) | EN 61009 | Series |
| IEC 61439-1 | 2011 | Low-voltage switchgear and controlgear assemblies -<br>Part 1: General rules | EN 61439-1 | 2011 |
| IEC 62423 (mod)<br>+ corr. December | 2009<br>2011 | Type F and type B residual current operated circuit-breakers with and without integral overcurrent protection for household and similar uses | FprEN 62423 | 201X[1)] |



[1)] At draft stage.

# Annex ZB
(informative)

## A-deviations

**A-deviation**: National deviation due to regulations, the alteration of which is for the time being outside the competence of the CENELEC member.

This European Standard falls under Directive 2004/108/EC.

NOTE (from CEN/CENELEC IR Part 2:2011 , 2.17) Where standards fall under EC Directives, it is the view of the Commission of the European Communities (OJ No C 59, 1982-03-09) that the effect of the decision of the Court of Justice in case 815/79 Cremonini/Vrankovich (European Court Reports 1980, p. 3583) is that compliance with A-deviations is no longer mandatory and that the free movement of products complying with such a standard should not be restricted except under the safeguard procedure provided for in the relevant Directive.

A-deviations in an EFTA-country are valid instead of the relevant provisions of the European Standard in that country until they have been removed.

Clause Deviation

**United Kingdom**

UK Electricity, Safety and Quality Regulations S.I. 2002 No. 2965 require electricity suppliers to state the maximum prospective short circuit current at the supply terminals.
This information is given in Electricity Association publication P25. To meet this condition the following requirements are to be incorporated:



**3.1** Additional definition



3.1.104 Customer distribution board, CDB:

An integrated assembly, for the control and distribution of electrical energy, principally in a household or similar premise, incorporating manual means of double-pole isolation on the incoming circuit(s), with polarity observed throughout. They are designed for use exclusively with specific protective devices on the outgoing circuits, and type-tested for use when energized through the specified 100 amp fuse.

NOTE Generally known in the UK as a Consumer unit.

**10.11.5** Additional test

10.11.5.7 Verification of the capability of the CDB to withstand a 16 kA fault.

The following test is applied to CDB's as covered by the definition in 3.1.104.

10.11.5.7.1 Test arrangements

The CDB shall be set up as in normal use. It will be sufficient to test a single functional unit if the remaining functional units are constructed in the same way and cannot affect the test result.

10.11.5.7.2 Short-circuit test procedure

The following test procedure is intended to verify the performance of the

incoming device and its connections, and any other item in the CDB not separately rated in excess of 16 kA, when the complete CDB is protected by a fuse-link complying with BS 88.3 (formerly BS 1361). This type test shall be deemed to cover the use of any other short-circuit protective device having a Joule integral ($I^2t$) and cut-off current not exceeding values given in item b) below, at the rated voltage, prospective current and power factor.

a) It shall be verified that the representative samples of the final circuit protective devices used for the test comply with Table ZB.1 and Table ZB.2 where applicable.

b) The reference fuse shall be a 100 A fuse-link complying with type II of BS 88.3. Details of the fuse-links used for the test, i.e. manufacturer's name, reference, rated current, rated voltage and pre-arcing (I2 t), shall be given in the test report.
Where BS 1361 type II fuse-links are available for test / certification purposes, they may be used in place of BS 88-3 fuse-links as key performance characteristics are identical.

c) The final circuit protective device shall be mounted as in service in the manufacturer's smallest recommended enclosure (metal if offered in the catalogue). The connection on the load side of the protective device under test shall be in accordance with Table ZB.3 and 0,6 m ± 0,05 m in length.

d) The test circuit shall be connected as shown in Figure ZB.1 The relative positions of the closing switch, inductive reactor and resistor are not obligatory, but the resistor shall be in series with the master circuit-breaker.

e) The impedance used for limiting the prospective short-circuit fault current to the required value shall be inserted on the supply side of the circuit.



Resistors shall be connected between line and neutral, after the impedances for adjusting the prospective current, so as to draw current of 10 A per phase at rated voltage from the supply.
If an air-cored inductor is used, a resistor taking approximately 1 % of the current through the inductor shall be connected in parallel with it.

A lower value of shunt current may be used with the consent of the manufacturer.

**Table ZB.1 – Requirements for final circuit protective devices: Circuit-breakers complying with BS EN 60898 and RCBOs complying with BS EN 61009**

| Circuit-breaker or RCBO type | Time h | Test current in multiples of rated current ($I_n$) | Result |
|---|---|---|---|
| B, C, D | 1 | 1,13 | No trip |
| | 1[a] | 1,45 | Trip |
| NOTE Test to be conducted at specified reference ambient temperature. | | | |
| [a] This test shall commence within 5 seconds of the end of the test at 1,13 $I_n$. | | | |

**Table ZB.2 – Requirements for final circuit protective devices: Semi-enclosed fuses complying with BS 3036 and cartridge fuses complying with BS 88.3.**

| Test Current A | Time h | Test current in multiples of rated current ($I_n$) | Result |
|---|---|---|---|
| 5(6) | 0,75 | 1,0 | Fuse intact |
| 15(16) | 1 | | |
| 20 | 1 | | |
| 30(32) | 1,25 | | |
| 45 | 1,5 | | |
| | | | |
| 5(6) | 0,75 | 2,0 | Fuse melted |
| 15(16) | 1 | | |
| 20 | 1 | | |
| 30(32) | 1,25 | | |
| 45 | 1,5 | | |
| Where BS 1361 fuse-links are available for test / certification purposes, they may be used in place of BS 88-3 fuse-links as key performance characteristics are identical | | | |

**Table ZB.3 – Cross sections of copper conductors on load side of protective device under test**



| Device Rating A | | Conductor $mm^2$ |
|---|---|---|
| | <6 | 1,0 |
| < 6 | ≤ 10 | 1,5 |
| < 10 | ≤ 20 | 2,5 |
| < 20 | ≤ 32 | 6,0 |
| <32 | ≤ 40 | 10,0 |



10.11.5.7.3 Circuit conditions

The applied voltage shall be not less than 100 % and not more than 110 % of the rated single phase voltage of the final circuit protective device. The recovery voltage measured two cycles after operation shall be not less than 95 % nor more than 105 % of the rated single phase voltage of the final circuit protective device, and shall be maintained for at least 30 s after the interruption of the short-circuit current. The higher limit of 105 % may be exceeded with the consent of the manufacturer.

The value of the prospective short-circuit current shall be 16 kA -0% +5 % at a power factor of 0,6 ± 0,05 determined from a calibration oscillogram taken with a link of negligible impedance positioned as shown in Figure ZB.1. All parts of the equipment normally earthed in service, including its enclosure, shall be insulated from earth, but shall be connected to the neutral of the supply or to a substantially inductive artificial neutral, permitting a prospective fault current of at least 100 A.

This connection shall include a reliable device, such as a fuse consisting of a copper wire of 0,1 mm diameter and not less than 50 mm in length for the detection of the fault current and, if necessary, a resistor to limit the value of the prospective fault current to approximately 100 A.

10.11.5.7.4 Test sequence

The CDB shall be subject to the following two tests A and B with the outgoing way fitted with a final circuit protective device of the maximum thermal current rating.

If the final circuit protective devices have a short-circuit rating less than 16 kA, two further tests A and B shall be carried out with a device of the minimum thermal rating fitted. In addition, if the CDB is designed to accept different types or ranges of outgoing devices, each type shall be further tested separately.

The two tests are as follows:

a) Test A. With the circuit connected as described above, with all fuses in place and all circuit-breakers closed, the test voltage is applied with the point-on-wave controlled to provide initiation of the fault at between 0° and 20° (electrical) on the rising voltage.

b) Test B. A further short-circuit operation shall be applied after suitable preparation as indicated in Table ZB.4 dependent on which of the alternative results of test A is achieved.
If circuit-breakers are included in the customer distribution board, the test shall be applied by reclosing a circuit-breaker with the test circuit energized. If fuses are used, the test shall be as in Test A.

During the tests cheesecloth shall be placed on the outside of the enclosure at all openings, e.g. arc vents and handles. There shall be no ignition of the cheesecloth.
The cheesecloth shall be clean and dry bleached plain cotton of approximately 30 g to 40 g per square metre. When placed into position the cheesecloth shall be folded loosely in such a manner that cut and torn edges will not be exposed directly to the arc or flash. Ignition of the cheesecloth is considered to have occurred when a flame is visible. Smouldering is not considered to be evidence of ignition. The cheesecloth may be changed following each test B.
Details of the $I^2t$ let through by the combination of devices during the test shall be given in the test report. A new CDB of the same design may be used for each of the two test sequences.



**Table ZB.4 – Preparation for test B**

| | | Result of test A | | |
|---|---|---|---|---|
| Reference fuse complying with BS 88.3 (formerly BS 1361) | | Intact | Blown | |
| Protective device | | Operated | | Not operated |
| Final circuit preparation for test B | Circuit-breaker complying with BS EN 60898 or RCBO complying with BS EN 61009 | No action | Replace reference fuse | Replace reference fuse, open circuit breaker or RCBO |
| | Fuse complying with BS 3036 | Rewire test fuse | Replace reference fuse. Rewire test fuse | Replace reference fuse |
| | Fuse complying with BS 88.3 (formerly BS 1361) | Replace test fuse | No action | No action |

10.11.5.7.5 Conditions after test

Where the incoming switch is a protective device, the test report shall state which of the protective devices operated during the test, i.e. the incoming and/or outgoing devices.

The earth fault indicating device shall be intact and the degree of protection of the enclosure shall not be impaired.
The insulation resistance a) shall be measured within 3 min of the conclusion of the series of tests. The insulation resistance for b) and c) shall be measured as soon as practical after measurement of a), the times of measurement of b) and c) being recorded in the test report. The values shall be measured at 500 V d.c. and shall not be less than the following:

a) 0,10 MΩ between the final circuit protective device incoming terminal and the corresponding outgoing terminal, with the isolating device open and with the blown fuse in position or the circuit-breaker or RCBO opened, whichever is applicable.
b) 0,25 MΩ between the final circuit protective device terminals and earth, with the final circuit fuse rewired, the final circuit cartridge fuse replaced, or the circuit-breaker or RCBO reclosed, whichever is applicable, and with the incoming isolating device open.
c) 0,25 MΩ between the final circuit protective device incoming terminals and any other metal parts which are unearthed and exposed in service.

The condition of the incoming isolating device shall comply with its product specification with regard to isolating properties. The conductors shall not be deformed such that the clearance and creepage distances specified in 8.3 are impaired. There shall be no loosening of parts used for the connection of the conductors.
Where an RCD is included in CDB its operation shall be checked. With the RCD closed and connected to a supply at 0,85 times rated voltage ± 5 % the test device shall be operated The RCD shall open.

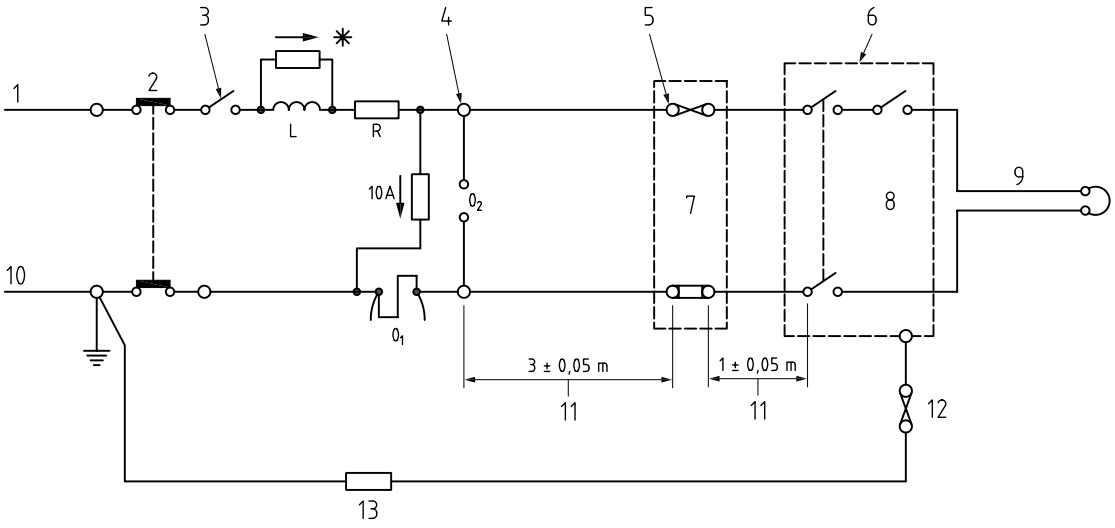


**Figure ZB.1 – Test circuit to prove co-ordination of characteristics**

**Key**

| | |
|---|---|
| 1 | line Conductor |
| 2 | circuit breaker |
| 3 | closing Switch |
| 4 | calibration point |
| 5 | 100 A Fuse-link complying with type II of BS 88.3 (see ZB.1 Cl. 10.11.5.7.2) |
| 6 | consumer unit (metalclad, if applicable) (see ZB.1 Cl. 10.11.5.7.2) |
| 7 | house service cut-out |
| 8 | device under test |
| 9 | 0,6 M of twin cable (see Table ZB.3) |
| 10 | neural Conductor |
| 11 | 16 sqmm copper cable |
| 12 | finewire fuse 0,1 mm Dia 50 mm long tinned copper wire |
| 13 | resistor to limit earth fault current to 100 A |
| * | resistor to take approx 1 % of the current through the inductor |
| $o_1$,$o_2$ | oscillograph connections |

## Annex ZZ
(informative)

## Coverage of Essential Requirements of EU Directive 2004/108/EC

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 all relevant essential requirements as given in Article 1 of Annex I of the EU Directive 2004/108/EC.

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

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