



# SLOVENSKI STANDARD

## SIST EN 50180-2:2016

01-januar-2016

Nadomešča:  
SIST EN 50180:2010

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**Skoznjiki za napetosti nad 1 kV do 52 kV in tokove od 250 A do 3,15 kA za transformatorje, polnjene s tekočinami - 2. del: Zahteve za komponente skoznjikov**

Bushings above 1 kV up to 52 kV and from 250 A to 3,15 kA for liquid filled transformers  
- Part 2: Requirement for bushing components

Durchführungen über 1 kV bis 52 kV und von 250 A bis 3,15 kA für flüssigkeitsgefüllte Transformatoren - Teil 2: Anforderungen an Einzelteile der Durchführungen  
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Traversées de tensions supérieures à 1 kV jusqu'à 52 kV et de 250 A à 3,15 kA pour transformateurs immergés dans un liquide - Partie 2: Exigences relatives aux composants de traversée  
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**Ta slovenski standard je istoveten z: EN 50180-2:2015**

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**ICS:**

29.080.20	Skoznjiki	Bushings
29.180	Transformatorji. Dušilke	Transformers. Reactors

**SIST EN 50180-2:2016**

**en,fr,de**

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EUROPEAN STANDARD

**EN 50180-2**

NORME EUROPÉENNE

EUROPÄISCHE NORM

October 2015

ICS 29.080.20

English Version

## Bushings above 1 kV up to 52 kV and from 250 A to 3,15 kA for liquid filled transformers - Part 2: Requirement for bushing components

Traversées de tensions supérieures à 1 kV jusqu'à 52 kV et de 250 A à 3,15 kA pour transformateurs immergés dans un liquide - Partie 2: Exigences relatives aux composants de traversée

Durchführungen über 1 kV bis 52 kV und von 250 A bis 3,15 kA für flüssigkeitsgefüllte Transformatoren - Teil 2: Anforderungen an Einzelteile der Durchführungen

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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.

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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

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## European foreword

This document (EN 50180-2:2015) has been prepared by CLC/TC 36A "Insulated Bushings".

The following dates are fixed:

- latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2016-08-10
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) 2018-08-10

This document supplements EN 50180-1:2015 by design details for components, described in the withdrawn standards DIN 42531, DIN 42532 and DIN 42533 and it is important for utilities to manage interchangeability. This document should document major additional information of the withdrawn standards.

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.

EN 50180 "*Bushings above 1 kV up to 52 kV and from 250 A to 3,15 kA for liquid filled transformers*" consists of the following parts:

- *Part 1: General requirements for bushings;*
- *Part 2: Requirement for bushing components;*
- *Part 3: Requirements for bushing fixations.*

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## 1 Scope

This European Standard should be considered in factual context with EN 50180-1 only. The dimensional supplements are related to figures and tables of EN 50180-1. To enable a better understanding of additional information some tables from EN 50180-1 are used and extended.

This European Standard may now be used also for bushings with a highest voltage of 52 kV. Figures for the details of the components and the related tables are added according to the extended range of voltage.

## 2 Normative references

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

EN 1652, *Copper and copper alloys — Plate, sheet, strip and circles for general purposes*

EN 12164, *Copper and copper alloys — Rod for free machining purposes*

EN 13599, *Copper and copper alloys — Copper plate, sheet and strip for electrical purposes*

EN 13601, *Copper and copper alloys — Copper rod, bar and wire for general electrical purposes*

EN 22768 (all parts), *General tolerances (ISO 2768-1, all parts)*

EN 27434, *Slotted set screws with cone point (ISO 7434)*

EN 50180-1:2015, *Bushings above 1 kV up to 52 kV and from 250 A to 3,15 kA for liquid filled transformers — Part 1: General requirements for bushings*

EN 50180-3, *Bushings above 1 kV up to 52 kV and from 250 A to 3,15 kA for liquid filled transformers — Part 3: Requirements for bushing fixations*

EN ISO 868, *Plastics and ebonite — Determination of indentation hardness by means of a durometer (shore hardness) (ISO 868)*

EN ISO 1302, *Geometrical Product Specifications (GPS) — Indication of surface texture in technical product documentation (ISO 1302)*

EN ISO 4032, *Hexagon regular nuts (style 1) — Product grades A and B (ISO 4032)*

EN ISO 4753, *Fasteners – Ends of parts with external ISO metric thread (ISO 4753)*

EN ISO 7089, *Plain washers — Normal series — Product grade A (ISO 7089)*

EN ISO 8673, *Hexagon regular nuts (style 1) with metric fine pitch thread — Product grades A and B (ISO 8673)*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 50180-1:2015 apply.

### 4 Dimensions and designations

#### 4.1 General

Permissible deviations for tolerances without specified limits: EN 22768 (series).

The following tables refer to the respective tables in EN 50180-1:2015, additional data are added.

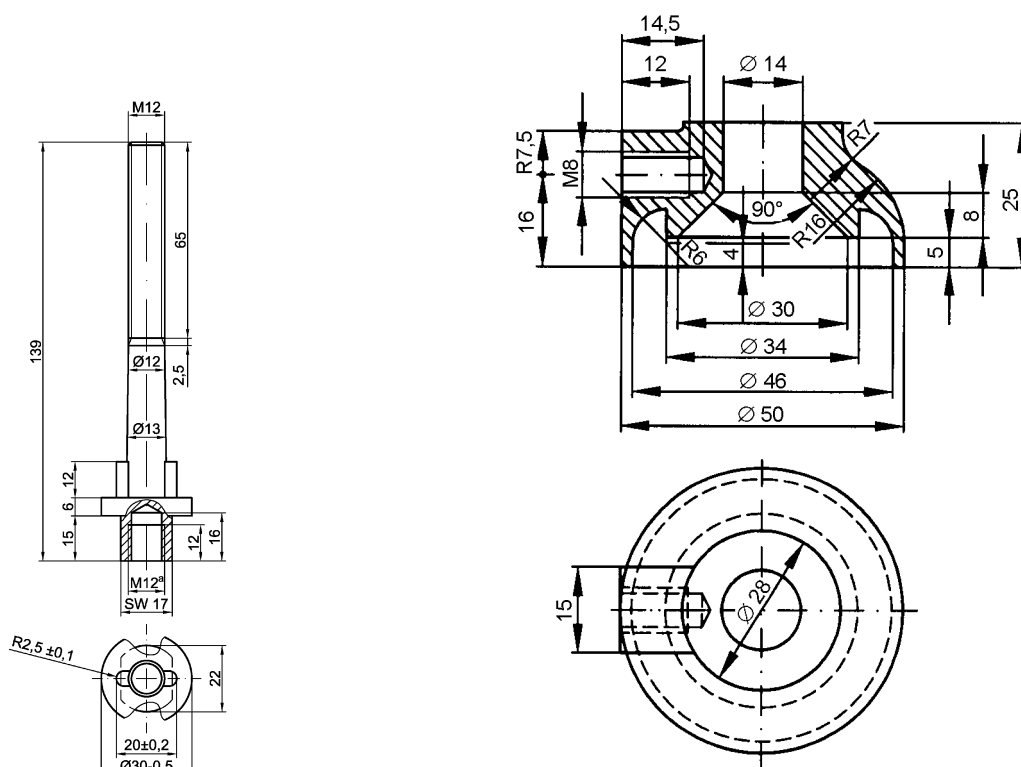
#### 4.2 Components for open-type bushings for 250 A, 12 kV to 36 kV

Table 1 – List of components, 250 A, 12 kV to 36 kV (see EN 50180-1:2015, Table 3)

Item	Quantity	Designation	Brief description	Remark
2	1	Terminal stud	D 250	Brass
3	1	Cap	E 250	Brass
4	1	Gasket	J 250	Insulating liquid resistant material
5	1	Spacer	O 250	
6	1	Packing <sup>a</sup>	N 250	Insulating liquid resistant material
7	3	Nut	EN ISO 4032 – M12	Brass
8	2	Washer	EN ISO 7089 – 12	Brass
9	4	Nut	EN ISO 4032 – M10	Corrosion-resistant steel
10	4	Washer	EN ISO 7089 – 12	Corrosion-resistant steel
11	1	Spring washer <sup>b</sup>		Corrosion-resistant steel
Version A: By means of a Clamping piece				
12	4	Clamping piece		Corrosion-resistant
Version B: By means of a Clamping ring				
13	1	Clamping ring	EN 50180-3	Corrosion-resistant
14	4	Clamping paw	EN 50180-3	Corrosion-resistant
<sup>a</sup> O-Ring according to individual agreement alternatively. <sup>b</sup> Conical spring washer according to individual agreement alternatively.				



Dimensions in mm



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Designation: **Terminal stud D 250**

Material: CW617N or equivalent acc. to EN 12164

<sup>a</sup> Thread M12 or drilling according to the applied lead or bolt.

**Figure 1 – Terminal stud (Item 2)**

Designation: **Cap E 250**

Material: CW614N or equivalent acc. to EN 12164

The external shape of the cap is not compulsory.

**Figure 2 – Cap (Item 3)**

Dimensions in mm

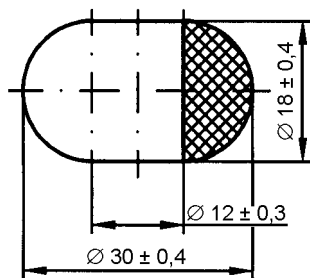
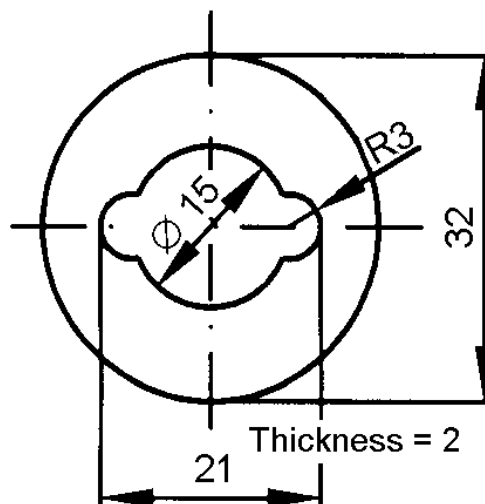
Designation: **Gasket J 250**Material: Insulating liquid resistant material,  
Shore hardness A/65 to A/70  
EN ISO 868Designation: **Spacer O 250**Material: Gasket material for high pressure,  
based on synthetic fibers

Figure 3 – Gasket (Item 4)

Figure 4 – Spacer (Item 5)

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Designation: **Packing N 250**Material: Insulating liquid resistant material  
Shore hardness A/65 to A/70  
EN ISO 868

Figure 5 – Packing (Item 6)

### 4.3 Components for open-type bushings for 630 A, 12 kV to 36 kV

Table 2 – List of components, 630 A, 12 kV to 36 kV (see EN 50180-1:2015, Table 5)

Item	Quantity	Designation	Brief description	Remark
2	1	Terminal stud	D 630	Brass <sup>a</sup>
3	1	Cap	E 630	Brass
4	1	Gasket	J 630	Insulating liquid resistant material
5	1	Spacer	O 630	
6	1	Packing <sup>b</sup>	N 630	Insulating liquid resistant material
7	3	Nut	EN ISO 4032 – M20	Brass
8	2	Washer	EN ISO 7089 – 20	Brass
9	6	Nut	EN ISO 4032 – M10	Corrosion-resistant steel
10	6	Washer	EN ISO 7089 – 10	Corrosion-resistant steel
11	1	Spring washer <sup>c</sup>		Corrosion-resistant steel
Version A: By means of a Clamping piece				
12	6	Clamping piece		Corrosion-resistant
Version B: By means of a Clamping ring				
13	1	Clamping ring	EN 50180-3	Corrosion-resistant
14	6	Clamping paw	EN 50180-3	Corrosion-resistant
<sup>a</sup>	Copper according to individual agreement alternatively.			
<sup>b</sup>	O-Ring according to individual agreement alternatively.			
<sup>c</sup>	Conical spring washer according to individual agreement alternatively.			