



SLOVENSKI STANDARD
SIST EN 50181:1997

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Plug-in type bushings above 1 kV up to 36 kV and from 250 A to 1,25 kA for equipment other than liquid filled transformers

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Steckbare Durchführungen über 1 kV bis 36 kV und von 250 A bis 1,25 kA für Anlagen anders als flüssigkeitsgefüllte Transformatoren

Traversées embrochables de tensions supérieures à 1 kV jusqu'à 36 kV et de 250 A à 1,25 kA pour équipements autres que transformateurs à remplissage de liquide

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Ta slovenski standard je istoveten z: EN 50181:1997

ICS:

29.080.20 Skoznjiki Bushings

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 50181

May 1997

ICS 29.180

Descriptors: Plug-in type bushing, dimensions

English version

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for equipment other than liquid filled transformers**

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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

CONTENTS

	page
Foreword.....	3
Introduction.....	4
1 Scope.....	4
2 Normative references.....	4
3 Definitions.....	4
3.1 Plug-in type bushing.....	4
3.2 Separable connector.....	4
3.3 Interface type.....	4
3.4 Bail holder.....	4
4 Requirements.....	5
4.1 Application.....	5
4.2 Standard values of rated voltage U_r	5
4.3 Standard values of rated current I_r	5
4.4 Compliance.....	5
4.5 Bushing mounting distance.....	5
4.6 Detail dimensions of plug-in type bushings.....	5
4.6.1 Outside cone type.....	6
4.6.2 Inside cone type.....	8

Foreword

This European Standard was prepared by the Technical Committee CENELEC TC 36A, Insulated bushings.

The text of the draft was submitted to the formal vote and was approved by CENELEC as EN 50181 on 1996-10-01.

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) 1997-12-01
 - latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 1997-12-01
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Introduction

The object of this standard is to specify the requirements to ensure interchangeability of bushings for rated voltages above 1 kV up to 36 kV and rated currents from 250 A to 1 250 A for equipment other than insulating liquid filled transformers.

1 Scope

This standard is applicable to insulated bushings for rated voltages above 1 kV up to 36 kV, rated currents from 250 A up to 1 250 A and frequencies from 15 Hz up to 60 Hz for equipment other than liquid filled transformers.

This standard establishes essential dimensions, to ensure adequate mounting and interchangeability of mating plug-in separable connectors of equivalent ratings.

2 Normative references

This European standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 60137:1996 Bushings for alternating voltages above 1 000 V

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3 Definitions

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For the purposes of this standard, the following definitions apply :

- | | | |
|-----|------------------------------|--|
| 3.1 | Plug-in type bushing | A bushing one end of which is designed to receive a separable insulated cable connector, without which the bushing cannot function and the other end of which has customized dimensions according to insulation requirements for the specific application |
| 3.2 | Separable connector : | A fully insulated termination permitting the connection and disconnection of the cable to and from the mating plug-in type bushing. |
| 3.3 | Interface type : | Bushing dimensions that insure mechanical and electrical interchangeability of bushing and separable connector of similar rating and type.
Each interface type is designed by a letter or a number. |
| 3.4 | Bail holder : | A fixture which facilitates anchoring of an externally mounted device (called the bail) designed to prevent undesirable separation of a separable connector and a bushing. A bail holder may or may not be an integral part of a bushing and is an optional feature. |

4 Requirements

4.1 Application

Bushings covered by this standard shall be suitable for operation with one end connected to a separable connector and the other end having customized dimensions according to the insulation requirements for the specific application.

4.2 Standard values of rated voltage (U_r)

The value of U_r of a bushing shall be chosen from the standard values of the highest voltage for equipment U_m , as given below, in kilovolts:

12 - 24 - 36

4.3 Standard values of rated current (I_r)

The value I_r of a bushing shall be chosen from the standard values given below in amperes :

250 - 400 - 630 - 800 - 1 250

4.4 Compliance

Bushings which are supplied separately shall meet the requirements of EN 60137

Customized bushings which are integrated directly in the equipment shall comply with the test requirements specified in the standard(s) relevant to that type of equipment.

4.5 Bushing mounting distance:

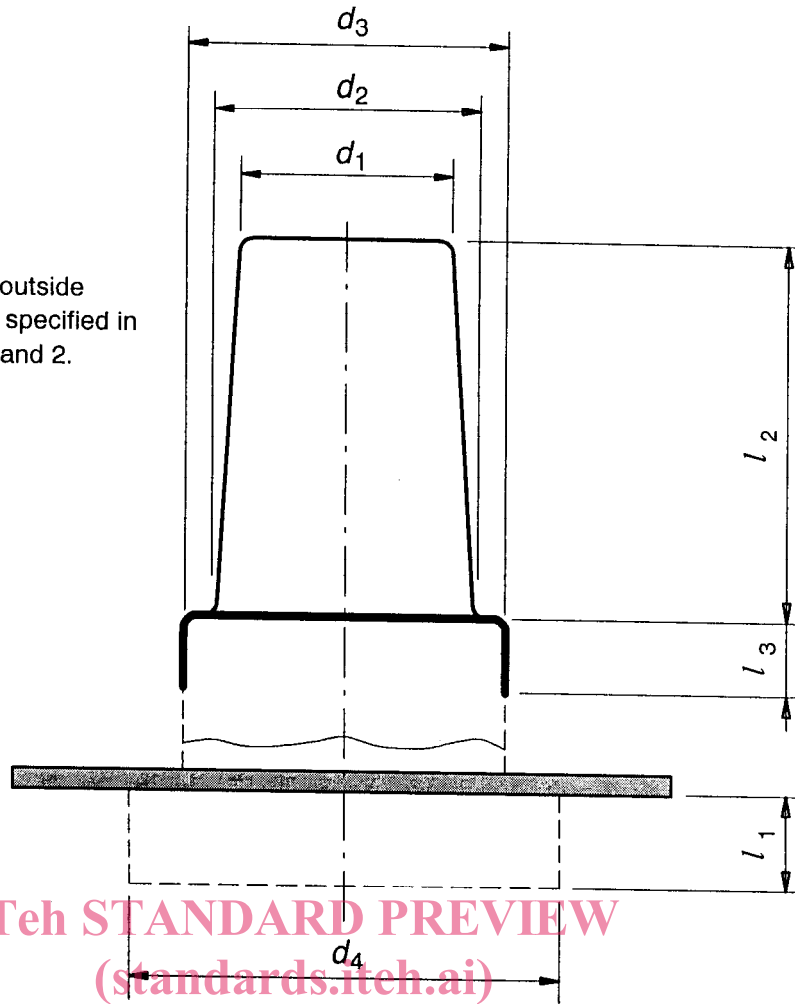
The minimum distance between bushings shall take into account the outer dimensions of separable connectors and the optional bail holders.

4.6 Detail dimensions of plug-in type bushings:

The dimensions necessary to ensure adequate mounting and interchangeability of mating plug-in separable connectors shall be as specified in the following Figures and Tables.

4.6.1 Outside Cone Type

The dimensions necessary for outside cone plug-in type bushings are specified in figures 1 and 2 and in tables 1 and 2.



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Figure 1: Outer dimensions of outside cone plug-in type bushings.

Table 1: Bushing dimensions

U_r (kV)	I_r (A)	d_1 (mm)	$d_2 \pm 0,2$ (mm)	$d_3 \pm 0,2$ (mm)	d_4 max. (mm)	l_1 max. (mm)	l_2 (mm)	l_3 min. (mm)	Contact type	Interface type
12-24	250	$31^{+0,1}_{-0,3}$	32,5	48,5	132	205	$48^0_{-0,2}$	9	Sliding	A
36		$46 \pm 0,2$	56	70	132	205	$90 \pm 0,2$	11	Sliding	B
12-24-36	400	$46 \pm 0,2$	56	70	137	205	$90 \pm 0,2$	11	Sliding	B
12-24-36	630	$46 \pm 0,2$	56	70	137	205	$90 \pm 0,2$	11	Bolted	C
12-24	800 / 1 250	$39,9 \pm 0,2$	52,1	76,2	137	205	$81 \pm 0,2$	14,8	Bolted	D
36		$39,9 \pm 0,2$	61,5	76,2	165	240	$103,7 \pm 0,2$	21	Bolted	E

Note:

The envelope $l_1 \times d_4$ represents the section of the plug-in type bushing inside the equipment. When bushings are an integral functional part of an equipment, the values l_1 and d_4 may differ from the table and shall be defined by the equipment manufacturer.

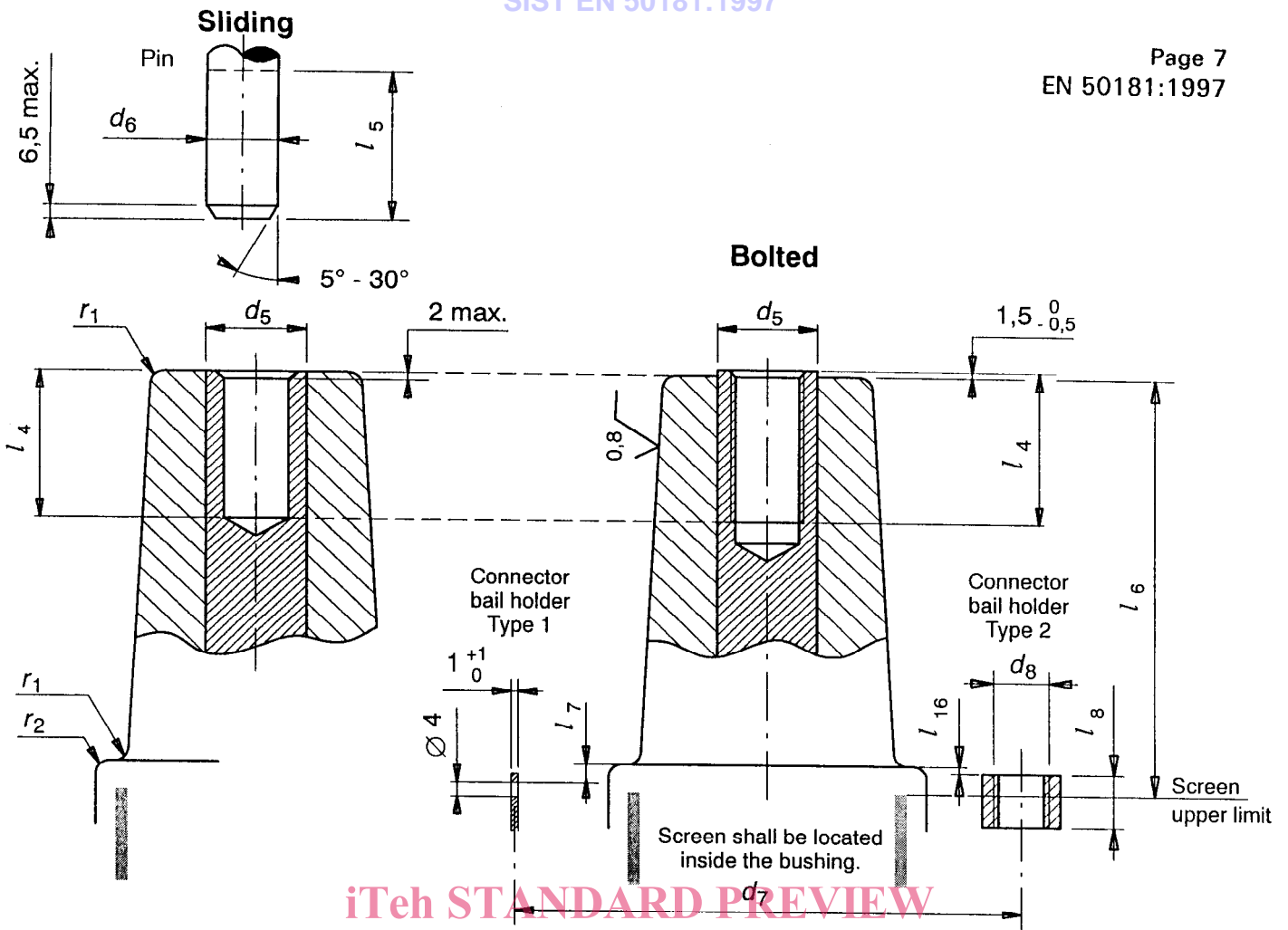


Figure 2: Interface details of outside cone plug-in type bushings

Table 2: Interface dimensions

U _r (kV)	I _r (A)	Bushing contact			Radius		Bail holder Type 1 or 2			l ₇ ±2 (mm)	l ₈ min. (mm)	l ₁₆ ±1 (mm)	Interface type					
		Type	Material *	d ₅ nominal (mm)	d ₆ (mm)	Thread	l ₄ min. (mm)	l ₅ (mm)	l ₆ max. (mm)					r ₁ max. (mm)	r ₂ max. (mm)	Location d ₇ ±0,5 (mm)	Required number min.	d ₈ Type 2
12-24	250	Sliding	Cu	-	7.9 ^{+0,02} _{-0,05}	-	32	30	54	1	2 X 45°	90	2	M6	3,5	8	2	A
36	250	Sliding	Cu	-	14 ⁺⁰ _{-0,04}	-	40	38	97	3	3	102	2	M8	5,5	10	2	B
12-24-36	400	Sliding	Cu	-	14 ⁺⁰ _{-0,04}	-	40	38	97	3	3	102	2	M8	5,5	10	2	B
12-24-36	630	Bolted	Cu	22 min.	-	M 16	29	-	97	3	3	** 102	** 2	** M8	-	10	-	C
12-24	800	Bolted	Cu or Al	32	-	M 16	29	-	88	3	3	** 102	** 2	** M8	-	10	-	D
36									111									E
12-24	1 250	Bolted	Cu	32	-	M 16	29	-	88	3	3	** 123	** 2	** M8	-	10	-	D
36									111									E

Notes: * In the connection of separable connectors to bushings, care must be taken in the matching of the materials of the cable conductors, the cable lugs and the bushing conductors. Where dissimilar metals are joined, appropriate precautions shall be taken.
Where aluminium bushing conductors are used and screw threads are required, a suitable grade of aluminium or aluminium alloy shall be used.
** Bail holder is optional.