SLOVENSKI STANDARD
SIST R020-001:2002

01-september-2002

Compression and mechanical connectors for power cables with copper or aluminium conductors - Compression terminal lugs for power cables to fit equipment up to and including 1 kV - Overall dimensions

Compression and mechanical connectors for power cables with copper or aluminium conductors - Compression terminal lugs for power cables to fit equipment up to and including 1 kV - Overall dimensions

Ta slovenski standard je istoveten z: **R020-001:2001**

ICS:

29.120.20 Spojni elementi Connecting devices

SIST R020-001:2002 **en**

CENELEC **R020-001**

REPORT November 2001

English version

Compression and mechanical connectors for power cables with copper or aluminium conductors – Compression terminal lugs for power cables to fit equipment up to and including 1 kV – Overall dimensions

This CENELEC Report has been prepared by TC 20, Electric cables. It was approved by TC 20 on 2001-05-11 and endorsed by the CENELEC Technical Board on 2001-07-03.

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

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Ref. No. R020-001:2001 E

Foreword

This CENELEC Report was prepared by the CENELEC Technical Committee TC 20, Electric cables.

It was approved by TC 20 on 2001-05-11 and endorsed by the CENELEC Technical Board on 2001-07-03.

Contents

Introduction

When using apparatus and switchgear for low voltage, the space needed for installation of a cable is always a problem. The manufacturer wants to make the apparatus as small as possible to save space and material to get a lower cost. The user wants to have an easy installation of the cable and sometimes also wants to install a larger cable size than necessary to decrease power losses in the cable.

The connection of terminal lugs on the cable is also a special problem. The user may want to install any terminal lug found on the market, which he is at liberty to do, providing there is appropriate installation tooling available. The manufacturer of equipment should in this case design his apparatus so that the largest terminal lug on the market can be installed. On the other hand, the apparatus can be designed for the smallest lug available on the market forcing the user to buy this for the installation, perhaps using a special tool.

This Report specifies overall installed maximum dimensions to serve mainly as a guide for dimensioning of cable termination enclosures. The reasons for not giving all dimensions of the lug are:

a) an apparatus manufacturer must know the overall dimensions needed in the apparatus for a certain cable size and application. There is no real use for all dimensions specified for a lug;

b) to specify all dimensions is to develop a new terminal lug or compression system, which is not the purpose of this Report. Further technical development of terminal lugs will also be difficult with too many dimensional restrictions;

c) there is a wide range of mounting holes of the palm on the market, but only one mounting hole is given for each conductor size. The given mounting holes are chosen small, because for the same tightening torque, the force from a small size of bolt is higher than the force from a larger one. The ability to apply a large torque on a terminal lug is limited in switchgear due to the limited space. The mechanical strength for the apparatus can also be a limiting factor.

Information about the tables

Table 1 gives the maximum overall installed dimensions for cables with aluminium conductors fitted with aluminium or bimetallic lugs. Preferred mounting bolts are listed. Other hole sizes can be used as long as they fulfil the other requirements of this Report.

Table 2 gives the maximum overall installed dimensions for cables with copper conductors fitted with copper lugs. Preferred mounting bolts are listed. Other hole sizes can be used as long as they fulfil the other requirements of this Report.

Sources of information

IEC have published a Technical Report 61238-2:1996 which has been used to define some basic dimensions. However, the report gives dimensions for different classes of installation based on the space requirement. The reason this paper does not follow the IEC format is that other technical committees do not accept the IEC dimensions for confined space. They require even smaller dimensions, particularly for the width of the palm. The design of the lugs will then deviate from what is usually used on power cables and they may not be tested according to IEC 61238-1. It must be the responsibility of the manufacturer to show that the connection fulfils the test requirements for the actual application, which in most cases should be those according to IEC 61238-1.

Dimensions for mechanical lugs are not included, as such connectors are still under development.

1 Scope

This Report specifies the overall installed dimensions for compression lugs for power cables to fit equipment up to and including 1 kV. Overall installed dimensions are given in separate tables for terminal lugs installed on aluminium or copper conductors.

This Report applies to terminal lugs for the conductors of power cables, which conform to the requirements of HD 383, with cross-sections of 10 mm² to 500 mm² for copper and 16 mm² to 500 mm² for aluminium conductors.

This Report is applicable to terminal lugs with one hole in the palm.

2 Normative references

This Report 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 these publications apply to this Report only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

HD 383, *Conductors of insulated cables (Endorsing IEC 60228 and 60228A)*

IEC 60050(461):1993, *International Electrotechnical Vocabulary (IEV) - Chapter 461: Electric cables*

IEC 61238-1:1993, *Compression and mechanical connectors for power cables with copper or aluminium conductors – Part 1: Test methods and requirements*

3 Definitions

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

3.1
conductor (of a cable)
a part of a cable which has the specific function of carrying current (IEV 461-01-01)

3.2
(**terminal) lug**
a metallic device to connect a cable conductor to other electrical equipment (IEV 461-17-07)

3.3
compression lug
a lug which is attached to a conductor by pressure forming or reshaping the barrel of the terminal lug

3.4
mechanical lug
a lug which is attached to a conductor by mechanical means, e.g. a screw or bolt

3.5
palm (of a terminal lug)
the part of a terminal lug used to make the connection to electrical equipment (IEV 461-17-07)

3.6
barrel (of terminal lug)
the part of a lug into which the conductor to be connected is introduced (IEV 461-17-06)

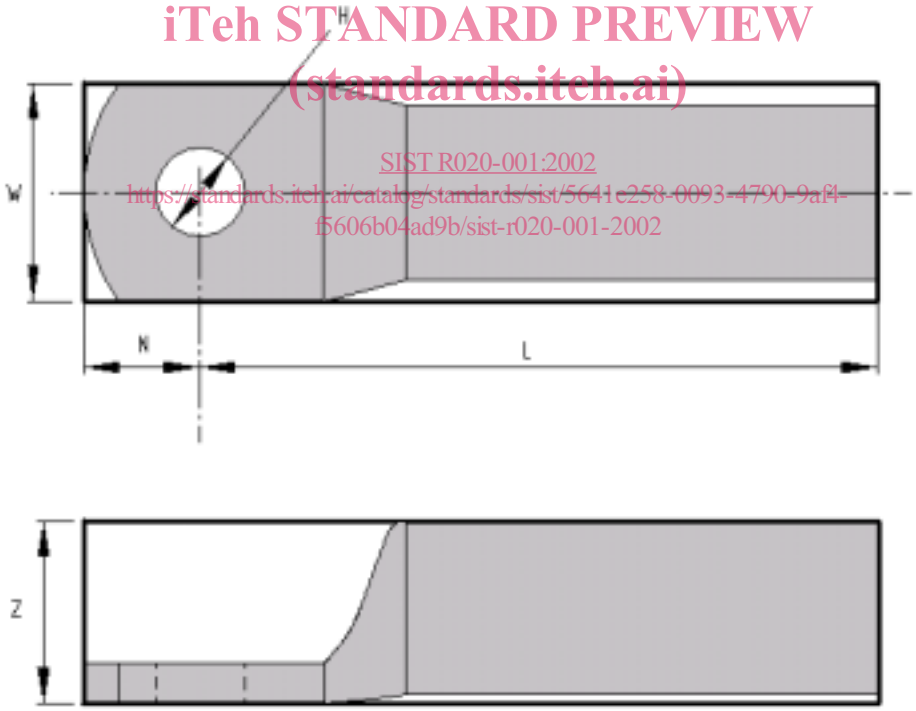
4 Requirements

4.1 Performance

The terminal lugs shall conform to the requirements of IEC 61238-1 for class A or class B connectors.

4.2 Dimensions

The terminal lug shall conform to either table 1 or table 2. For an identification of each dimension see figure 1.



(Dimensions W, (N+L) and Z indicate the envelope required for a terminal lug)

Figure 1 – Space requirement of terminal lug

Table 1 - Overall dimensions of installed aluminium/bimetallic compression terminal lug

Conductor cross-section area mm^2	Dimensions after installation mm				H Stud or bolt size
	L max.	N max.	W max.	Z max.	
16	80	12	25	20	M8
25	80	13	25	20	M8
35	80	13	25	25	M8
50	86	13	32.5	25	M8
70	100	16	32.5	25	M10
95	100	16	32.5	31	M10
120	106	18.5	38	31	M12
150	110	18.5	38	39	M12
185	110	18.5	45	39	M12
240	120	20	54	39	M12
300	160	20	54	50	M12
400	160	25	60	50	M16
500	160	25	72	53	M16

Table 2 - Overall dimensions of installed copper compression terminal lug

Conductor cross-section area mm^2	Dimensions after installation mm				H Stud or bolt size
	L max.	N max.	W max.	Z max.	
10	36	10,5	16	9,5	M6
16	40	13	20	10,5	M8
25	42	13	20	12,5	M8
35	47	13	21	14,5	M8
50	57,5	13	25	16,5	M8
70	62	15	25	19	M10
95	71,5	16	32	21,5	M10
120	77	18,5	38	23,5	M12
150	86	18,5	38	26,5	M12
185	90,5	18,5	38	28,5	M12
240	101,5	19	44	31,5	M12
300	112	21	50	34,5	M12
400	140	25	56	42	M16
500	145	25	61	45,5	M16