SVENSK STANDARD SS-EN 61230

Fastställd	Utgåva	Sida	Ansvarig kommitté
2009-04-27	2	1 (1+61)	SEK TK 78

Arbete med spänning – Bärbar utrustning för jordning och för jordning och kortslutning

Live working –
Portable equipment for earthing or earthing and short-circuiting

Som svensk standard gäller europastandarden EN 61230:2008. Den svenska standarden innehåller den officiella engelska språkversionen av EN 61230:2008.

Nationellt förord

Europastandarden EN 61230:2008

består av:

– **europastandardens ikraftsättningsdokument,** utarbetat inom CENELEC
– **IEC 61230, Second edition, 2008 - Live working - Portable equipment for earthing or earthing and short-circuiting**

utarbetad inom International Electrotechnical Commission, IEC.

Tidigare fastställd svensk standard SS-EN 61230, utgåva 1, 1996 och SS-EN 61230/A11, utgåva 1, 2000, gäller ej fr o m 2011-10-01.

ICS 13.260; 29.240.20; 29.260.99

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 61230

November 2008

ICS 13.260; 29.240.20; 29.260.99

Supersedes EN 61230:1995 + A11:1999

English version

Live working - Portable equipment for earthing or earthing and short-circuiting

(IEC 61230:2008)

Travaux sous tension - Equipements portables de mise à la terre ou de mise à la terre et en court-circuit (CEI 61230:2008)

Arbeiten unter Spannung - Ortsveränderliche Geräte zum Erden oder Erden und Kurzschließen (IEC 61230:2008)

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

Ref. No. EN 61230:2008 E

SEK Svensk Elstandard

Foreword

The text of document 78/741/FDIS, future edition 2 of IEC 61230, prepared by IEC TC 78, Live working, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61230 on 2008-10-01.

This European Standard supersedes EN 61230:1995 + A11:1999.

The major changes are:

– extension of the scope to cover the use of equipment on d.c. installations;
– extension of the use of aluminium to all conductive parts of the device;
– extension of the application to silicone rubber cables made by the revision of TC 20 document EN 61138;
– possibility of using this standard for separate components of the equipment;
– general revision of requirements and tests;
– deletion of the marking requirement of the double triangle to clarify that the products covered by the standard are not appropriate for performing live working;
– clarification and modification to the procedure for short-circuit test:
  - change of the number of devices submitted to test,
  - change of the pre-conditioning time to 48 h,
  - clarification of the test procedure for separate components;
– application of conformity assessment for products having completed the production phase, according to EN 61318:2008;
– revision of existing annexes;
– change of normative Annexes A and C into informative Annexes C and B with a reviewed wording;
– deletion of Annex B, not applicable according to EN 61318:2008;
– deletion of Annex D, its requirements and tests being now included in the body of the standard;
– introduction of a new informative Annex A on railway application;
– introduction of a new informative Annex D giving guidelines for determination of the equivalent r.m.s. value of a short-circuit current;
– revision of the list of type tests, which now appears in normative Annex E;
– introduction of a new normative Annex F on classification of defects.

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)	2009-07-01
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2011-10-01

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 61230:2008 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60071-1	NOTE	Harmonized as EN 60071-1:2006 (not modified).
IEC 60071-2	NOTE	Harmonized as EN 60071-2:1997 (not modified).
IEC 60228	NOTE	Harmonized as EN 60228:2005 (not modified).
IEC 60743 + A1	NOTE	Harmonized as EN 60743:2001 + A1:2008 (not modified).
IEC 60832	NOTE	Harmonized as EN 60832:1996 (modified).
IEC 60855	NOTE	Harmonized as EN 60855:1996 (modified).
IEC 60865-1	NOTE	Harmonized as EN 60865-1:1993 (not modified).
IEC 60909-0	NOTE	Harmonized as EN 60909-0:2001 (not modified).
IEC 61235	NOTE	Harmonized as EN 61235:1995 (modified).
IEC 61472	NOTE	Harmonized as EN 61472:2004 (not modified).
ISO 9000	NOTE	Harmonized as EN ISO 9000:2005 (not modified).

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.

Publication	Year	Title	EN/HD	Year
IEC 60060-1	1989	High-voltage test techniques - Part 1: General definitions and test requirements	HD 588.1 S1	1991
IEC 60068-2-11	1981	Environmental testing - Part 2: Tests - Test Ka: Salt mist	EN 60068-2-11	1999
IEC 60068-2-42	2003	Environmental testing - Part 2-42: Tests - Test Kc: Sulphur dioxide test for contacts and connections	EN 60068-2-42	2003
IEC 60811-1-4 + corr. May + A1 A2	1985 1986 1993 2001	Common test methods for insulating and sheathing materials of electric cables - Part 1: Methods for general application - Section 4: Tests at low temperature	EN 60811-1-4 A2	1995 2001
IEC 60811-2-1 A1	1998 2001	Insulating and sheathing materials of electric and optical cables - Common test methods - Part 2-1: Methods specific to elastomeric compounds - Ozone resistance, hot set and mineral oil immersion tests	EN 60811-2-1 A1	1998 2001
IEC 60811-3-1 A1 A2	1985 1994 2001	Common test methods for insulating and sheathing materials of electric cables - Part 3: Methods specific to PVC compounds - Section 1: Pressure test at high temperature - Tests for resistance to cracking	EN 60811-3-1 A1 A2	1995 1996 2001
IEC 61138 (mod)	2007	Cables for portable earthing and short-circuiting equipment	EN 61138	2007
IEC 61318	2007	Live working - Conformity assessment applicable to tools, devices and equipment	EN 61318	2008
IEC 61477 A1 A2 (mod)	2001 2002 2004	Live working - Minimum requirements for the utilization of tools, devices and equipment	EN 61477 A1 A2	2002 2002 2005

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LIVE WORKING – PORTABLE EQUIPMENT FOR EARTHING OR EARTHING AND SHORT-CIRCUITING

1 Scope

This International Standard is applicable to portable equipment, with or without matching connection points, for temporary earthing or earthing and short-circuiting of electrically isolated or de-energized a.c. and d.c. installations, distribution and transmission networks, whether they are overhead or underground or of low or high voltage.

NOTE Annex A provides guidance for application to railway systems.

This standard covers equipment comprising an earthing or a short-circuiting or an earthing and short-circuiting device and insulating component. An example is given in Figure 1a and Figure 1b.

It also covers:

– earthing or short-circuiting or earthing and short-circuiting devices intended to be installed with insulating means. An example of an earthing device is given in Figure 1c;
– separate components, such as conductive extension (see Figure 1b) or clamp or cable with end fittings.

The performance of equipment, devices and components covered by this standard is based on electro-dynamic and electro-thermal effects acting during short-circuit. The withstand capability of the devices and equipment is expressed by their rated values of current, time and peak factor. No rated voltage is given, but the geometrical dimensions of the equipment are also linked to the voltage of the installation.

Examples of connection diagrams of earthing and short-circuiting devices are given in Figures 2 and 3. Associated usual lengths of cables are given in Table 1.

Not covered in this standard are:

– insulating means, such as insulating sticks, telescopic sticks, insulating handles, insulating gloves, aerial devices with insulating booms, insulating ropes to be used to install the earthing and short-circuiting device;
– insulating components, except for basic safety requirements for the insulating element;

  NOTE Basic safety recommendations for earthing sticks are given in Annex B.

– devices meant only for the draining of induced currents;
– relevant working procedures for using portable equipment for earthing or earthing and short-circuiting.

NOTE The equipment complying with this standard should be used according to safe working procedures and according to local or national regulation, such as live working or dead working procedures.

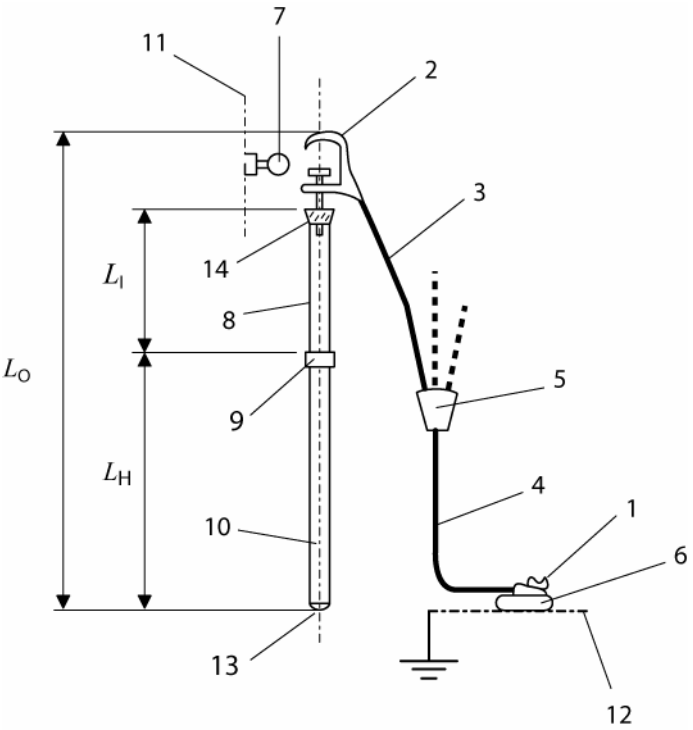


Figure 1a – Multi-phase equipment

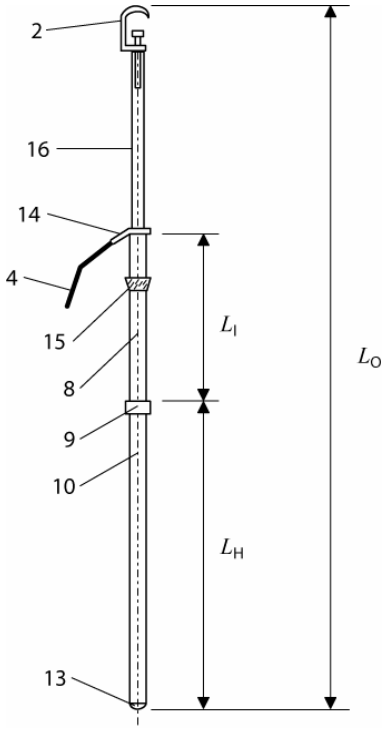
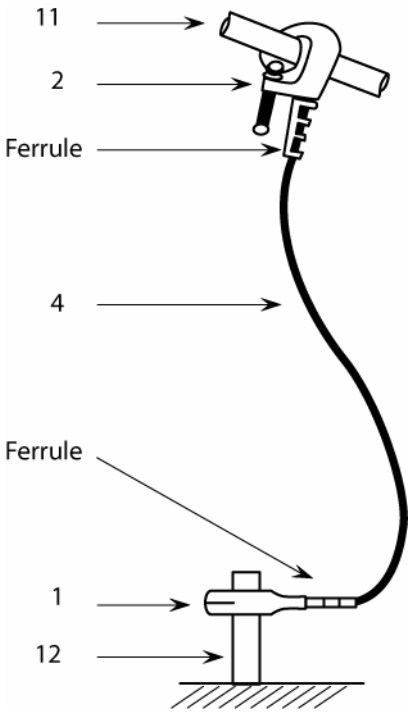


Figure 1b – Single-phase equipment with extension



NOTE The same device can also be used for short-circuiting.

Figure 1c – Earthing device

Key

1 Earth clamp or rail clamp
2 Line clamp or contact line clamp
3 Short-circuiting cable(s)
4 Earthing cable(s)
5 Connecting cluster
6 Earth permanent connection point or rail
7 Line permanent connection point or overhead contact line profile
8 Insulating element
9 Handle limit mark
10 Handle of earthing stick
11 Installation conductor or bar
12 Earthing system
13 End cap of stick
14 End fitting, permanent or detachable
15 Stick coupling, detachable for transport reasons
16 Conductive extension
L_I Length of insulating element
L_H Length of handle
L_O Overall length of earthing stick and conductive extension component

NOTE 1 The earthing and short-circuiting device comprises components 1, 2, 3, 4, 5 and 16.

NOTE 2 The earthing stick comprises components 8, 9, 10, 13, 14 and 15.

NOTE 3 The earthing device comprises components 1, 2 and 4.

Figure 1 – Examples of portable equipment and device for installations, network and railway systems application

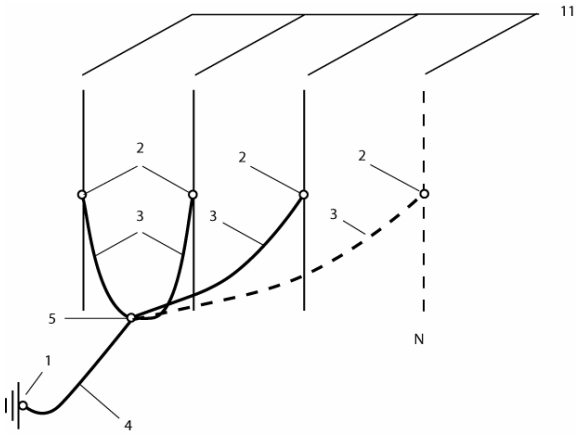


Figure 2a

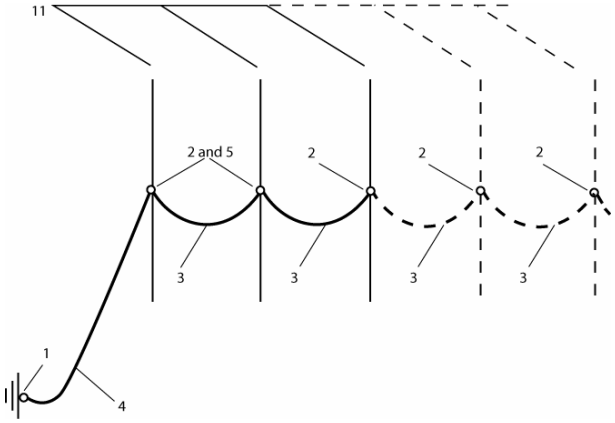


Figure 2b

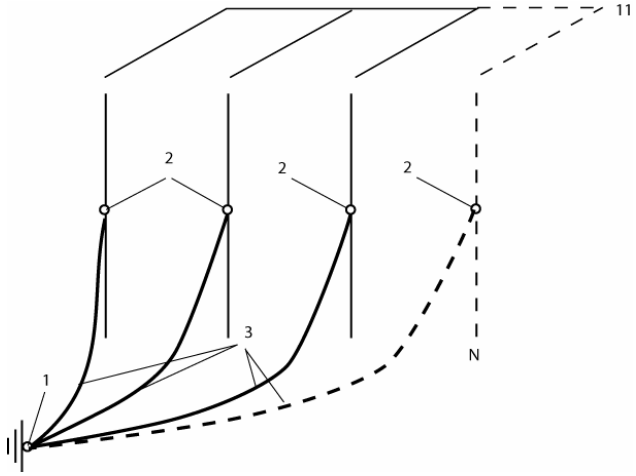


Figure 2c

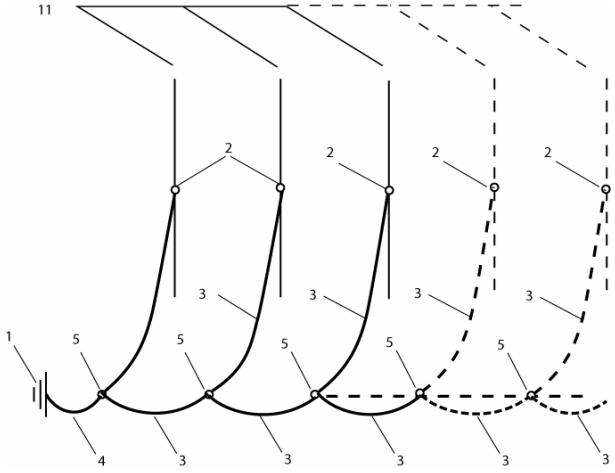
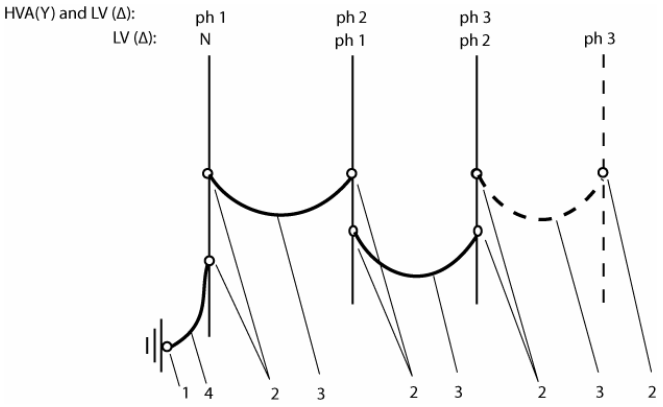


Figure 2d



HVA (Y) = High voltage distribution , Y Neutral system

LV (Δ) = Low voltage, Δ Neutral system

Figure 2e

Key

1	Earth clamp
2	Line clamp
3	Short-circuiting cable(s)
4	Earthing cable(s)
5	Connecting cluster
11	Installation conductor or bar
16	Conductive extension

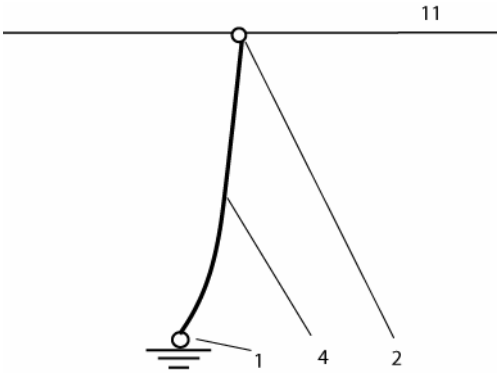


Figure 2f

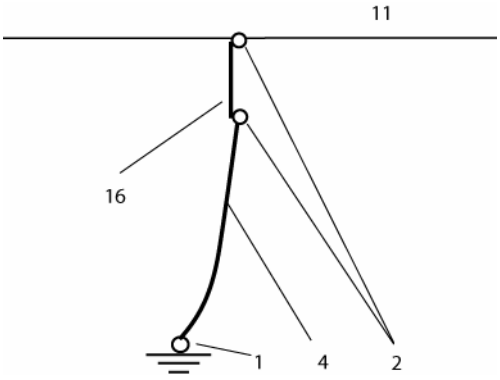


Figure 2g

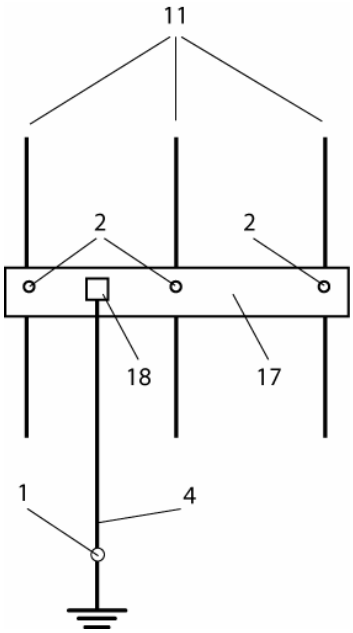
Figure 2 – Connection diagrams of single and multi-phase earthing and short-circuiting devices for network application

NOTE Figure 2 shows examples only of connection arrangements. Not all are suitable for all situations. It is the responsibility of the user to consider movement of connecting cables from magnetic forces. This has to be considered prior to a final connection.

Table 1 – Usual lengths of earthing and short-circuiting cables for different types of installations and different voltage levels

Classes of operating voltages	Overhead line	Open air substation	Metal enclosed or indoor substation
Low voltage [a]	Multi-phase Figures 2a, 2b, 2c, 2d key 3 = 0,5 m key 4 = 12 m to 16 m	Multi-phase Figure 2c ; key 3 = 0,5 m Figure 2a ; key 3 = 0,5 m and key 4 = 1 m to 10 m	Specific
	Single-phase Figure 2f key 4 = 0,5 m to 10 m		
Distribution [a]	Multi-phase Figures 2a, 2b, 2c, 2d key 3 = 2 m to 2,5 m key 4 = 8 m to 10 m	Multi-phase Figures 2a, 2b, 2c key 3 = 7,5m to 10 m key 4 = 2,5 m to 3 m	Multi-phase Figure 2a key 3 = 0,7 m key 4 = 2 m
	Multi-phase + 5 m extension Figure 2g key 4 = 8 m to 10 m		
	Single-phase Figure 2f key 4 = 8 m to 10 m	Single-phase Figure 2f key 4 = 10 m to 12 m	
Transmission [a]	Single-phase Figure 2f key 4 = 8 m	Single-phase Figure 2f key 4 = 10 m to 12 m	Multi-phase Figure 2a key 3 = 3 m key 4 = 3 m
		Single-phase + 2 m to 5 m extension Figure 2g key 4 = 7 m to 8 m	Single-phase Figure 2f key 4 = 3 m to 4 m

[a] The voltage limits for the different classes of operating voltage are conventional values and could be modified by national regulations or national practice.



Key

1	Earth clamp
2	Line clamp
4	Earthing cable(s)
11	Installation conductor
17	Short-circuiting bar
18	Earthing cable connection

Figure 3 – Illustration of a three-phase earthing and short-circuiting device with short-circuiting bar and earthing cable(s) for installation and network application

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 60060-1:1989 *High voltage test techniques – Part 1: General definitions and test requirements* [1)]

IEC 60068-2-11:1981, *Environmental testing – Part 2: Tests – Test Ka: Salt mist*

IEC 60068-2-42:2003, *Environmental testing – Part 2-42: Tests – Test Kc: Sulphur dioxide test for contacts and connections*

IEC 60811-1-4:1985, *Common test methods for insulating and sheathing materials of electric cables – Part 1: Methods for general application – Section Four: Tests at low temperature*
Amendment 1 (1993)
Amendment 2 (2001)

1) Under revision.