

Low-voltage switchgear and controlgear —

Part 7-1: Ancillary equipment — Terminal blocks for copper conductors

The European Standard EN 60947-7-1:2002 has the status of a
British Standard

ICS 29.130.20

National foreword

This British Standard is the official English language version of EN 60947-7-1:2002. It is identical with IEC 60947-7-1:2002, including Corrigendum March 2003. It supersedes BS EN 60947-7-1:1992 which is withdrawn.

The UK participation in its preparation was entrusted by Technical Committee PEL/17, Switchgear, controlgear and HV-LV co-ordination, to Subcommittee PEL/17/2, Low-voltage switchgear and controlgear, which has the responsibility to:

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- monitor related international and European developments and promulgate them in the UK.

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Cross-references

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English version

**Low-voltage switchgear and controlgear
Part 7-1: Ancillary equipment -
Terminal blocks for copper conductors
(IEC 60947-7-1:2002)**

Appareillage à basse tension
Partie 7-1: Matériels accessoires -
Blocs de jonction pour conducteurs
en cuivre
(CEI 60947-7-1:2002)

Niederspannungsschaltgeräte
Teil 7-1: Hilfseinrichtungen -
Reihenklempen für Kupferleiter
(IEC 60947-7-1:2002)

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CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
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Foreword

The text of document 17B/1187/FDIS, future edition 2 of IEC 60947-7-1, prepared by SC 17B, Low-voltage switchgear and controlgear, of IEC TC 17, Switchgear and controlgear, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60947-7-1 on 2002-10-01.

This European Standard supersedes EN 60947-7-1:1991 + corrigendum June 1997 + A1:1999.

This Part 7-1 shall be read in conjunction with EN 60947-1. The provisions of the general rules dealt with in EN 60947-1 are applicable to this standard, where specifically called for. Clauses and subclauses, tables, figures and annexes thus applicable are identified by reference to "IEC 60947-1", e.g. 1.2 of IEC 60947-1, table 4 of IEC 60947-1 or annex A of IEC 60947-1.

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) 2003-07-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2005-10-01

Annexes designated "normative" are part of the body of the standard.

Annexes designated "informative" are given for information only.

In this standard, annexes C and ZA are normative and annexes A and B are informative.

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 60947-7-1:2002 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 60715	NOTE	Harmonized as EN 60715:2001 (not modified).
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CONTENTS

1	General	4
1.1	Scope.....	4
1.2	Normative references	4
2	Definitions	5
3	Classification	5
4	Characteristics	5
4.1	Summary of characteristics	5
4.2	Type of terminal block	5
4.3	Rated and limiting values	6
5	Product information	7
5.1	Marking	7
5.2	Additional information.....	7
6	Normal service, mounting and transport conditions.....	8
7	Constructional and performance requirements.....	8
7.1	Constructional requirements	8
7.2	Performance requirements	9
7.3	Electromagnetic compatibility (EMC)	10
8	Tests	10
8.1	Kinds of test	10
8.2	General	10
8.3	Verification of mechanical characteristics	10
8.4	Verification of electrical characteristics.....	13
8.5	Verification of thermal characteristics	18
8.6	Verification of EMC characteristics	19
	Annex A (informative) Clearances and creepage distances	20
	Annex B (informative) Items subject to agreement between manufacturer and user	21
	Annex C (normative) Tightening torques for the verification of the mechanical strength of screw-type clamping units.....	22
	Annex ZA (normative) Normative references to international publications with their corresponding European publications	23
	Bibliography.....	24

LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR –

Part 7-1: Ancillary equipment – Terminal blocks for copper conductors

1 General

1.1 Scope

This part of IEC 60947 specifies requirements for terminal blocks with screw-type or screw-less-type clamping units primarily intended for industrial or similar use and to be fixed to a support to provide electrical and mechanical connection between copper conductors. It applies to terminal blocks intended to connect round copper conductors, with or without special preparation, having a cross-section between 0,2 mm² and 300 mm² (AWG 24/600 kcmil), intended to be used in circuits of a rated voltage not exceeding 1 000 V a.c. up to 1 000 Hz or 1 500 V d.c.

NOTE AWG is the abbreviation of “American Wire Gage” (Gage (US) = Gauge (UK))

kcmil = 1000 cmil;

1 cmil = 1 circular mil = surface of a circle having a diameter of 1 mil

1 mil = 1/1000 inch

This standard may be used as a guide for

- terminal blocks requiring the fixing of special devices to the conductors, for example quick connect terminations or wrapped connections, etc.;
- terminal blocks providing direct contact to the conductors by means of edges or points penetrating the insulation, for example insulation displacement connections, etc.;
- special types of terminal blocks, for example disconnect terminal blocks, etc.

Where applicable in this standard, the term “clamping unit” has been used instead of the term “terminal”. This is taken into account in case of reference to IEC 60947-1.

1.2 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 60695-2-2:1991, *Fire hazard testing – Part 2: Test methods – Section 2: Needle-flame test*

Amendment 1 (1994)

IEC 60947-1:1999, *Low-voltage switchgear and controlgear – Part 1: General rules*

Amendment 1 (2000)

Amendment 2 (2001)

ISO 4046:1978, *Paper, board, pulp and related terms – Vocabulary*

2 Definitions

For the purposes of this part of IEC 60947, the definitions given in IEC 60947-1, together with the following definitions, apply.

2.1

terminal block

insulating part carrying one or more mutually insulated terminal assemblies and intended to be fixed to a support

2.2

rated cross-section

value of the maximum cross-section of all connectable types of conductors, rigid (solid and stranded) and flexible, stated by the manufacturer, and to which certain thermal, mechanical and electrical requirements are referred

2.3

rated connecting capacity

range of cross-sections and, if applicable, the number of connectable conductors, for which the terminal block is designed

2.4

terminal assembly

two or more clamping units fixed to the same conductive part

3 Classification

Distinction is made between various types of terminal blocks as follows:

- method of fixing the terminal block to the support;
- number of poles;
- type of clamping units: screw-type clamping units or screwless-type clamping units;
- ability to receive prepared conductors (see 2.3.27 of IEC 60947-1);
- terminal assemblies with identical or dissimilar clamping units;
- number of clamping units on each terminal assembly;
- service conditions.

4 Characteristics

4.1 Summary of characteristics

The characteristics of a terminal block are as follows:

- type of terminal block (see 4.2);
- rated and limiting values (see 4.3).

4.2 Type of terminal block

The following shall be stated:

- type of clamping units (e.g. screw-type, screwless-type);
- number of clamping units.

4.3 Rated and limiting values

4.3.1 Rated voltages

Subclauses 4.3.1.2 and 4.3.1.3 of IEC 60947-1 apply.

4.3.2 Short-time withstand current

A specified r.m.s. value of current which a terminal block shall be able to withstand during a specified short-time under prescribed conditions of use and behaviour (see 7.2.3 and 8.4.6).

4.3.3 Standard cross-sections

The standard values of cross-sections of round copper conductors to be used are contained in table 1.

Table 1 – Standard cross-sections of round copper conductors

Metric size ISO mm ²	Comparison between AWG/kcmil and metric sizes	
	Size AWG/kcmil	Equivalent metric area mm ²
0,2	24	0,205
0,34	22	0,324
0,5	20	0,519
0,75	18	0,82
1	–	–
1,5	16	1,3
2,5	14	2,1
4	12	3,3
6	10	5,3
10	8	8,4
16	6	13,3
25	4	21,2
35	2	33,6
50	0	53,5
70	00	67,4
95	000	85
–	0000	107,2
120	250 kcmil	127
150	300 kcmil	152
185	350 kcmil	177
240	500 kcmil	253
300	600 kcmil	304

4.3.4 Rated cross-section

The rated cross-section shall be selected from the standard cross-sections given in table 1.

4.3.5 Rated connecting capacity

For terminal blocks with a rated cross-section between 0,2 mm² and 35 mm² inclusive, the minimum range contained in table 2 applies. The conductors may be rigid (solid or stranded) or flexible. The manufacturer shall state the types and the maximum and minimum cross-sections of conductors that can be connected and, if applicable, the number of conductors simultaneously connectable to each clamping unit. The manufacturer shall also state any necessary preparation of the end of the conductor.

Table 2 – Relationship between rated cross-section and rated connecting capacity of terminal blocks

Rated cross-section		Rated connecting capacity	
mm ²	AWG	mm ²	AWG
0,2	24	0,2	24
0,34	22	0,2 – 0,34	24 – 22
0,5	20	0,2 – 0,34 – 0,5	24 – 22 – 20
0,75	18	0,34 – 0,5 – 0,75	22 – 20 – 18
1	–	0,5 – 0,75 – 1	–
1,5	16	0,75 – 1 – 1,5	20 – 18 – 16
2,5	14	1 – 1,5 – 2,5	18 – 16 – 14
4	12	1,5 – 2,5 – 4	16 – 14 – 12
6	10	2,5 – 4 – 6	14 – 12 – 10
10	8	4 – 6 – 10	12 – 10 – 8
16	6	6 – 10 – 16	10 – 8 – 6
25	4	10 – 16 – 25	8 – 6 – 4
35	2	16 – 25 – 35	6 – 4 – 2

5 Product information

5.1 Marking

A terminal block shall be marked in a durable and legible manner with the following:

- the name of the manufacturer or a trade mark by which the manufacturer can be readily identified;
- a type reference permitting its identification in order to obtain relevant information from the manufacturer or his catalogue.

5.2 Additional information

The following information shall be stated by the manufacturer, if applicable, e.g. in the manufacturer's data sheet or his catalogue or on the packing unit:

- IEC 60947-7-1, if the manufacturer claims compliance with this standard;
- the rated cross-section;
- the rated connecting capacity, if different from table 2, including the number of conductors simultaneously connectable;
- the rated insulation voltage;
- the rated impulse withstand voltage, when determined;
- service conditions, if different from those of clause 6.