INTERNATIONAL STANDARD

IEC 60254-2

Edition 3.1
2000-11

Edition 3:1997 consolidated with amendment 1:2000

Lead-acid traction batteries –

Part 2: Dimensions of cells and terminals and marking of polarity on cells

*This **English-language** version is derived from the original **bilingual** publication by leaving out all French-language pages. Missing page numbers correspond to the French-language pages.*

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International Electrotechnical Commission, 3, rue de Varembé, PO Box 131, CH-1211 Geneva 20, Switzerland
Telephone: +41 22 919 02 11 Telefax: +41 22 919 03 00 E-mail: inmail@iec.ch Web: www.iec.ch

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

LEAD-ACID TRACTION BATTERIES –

Part 2: Dimensions of cells and terminals and marking of polarity on cells

FOREWORD

1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
2) The formal decisions or agreements of the IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested National Committees.
3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, technical reports or guides and they are accepted by the National Committees in that sense.
4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 60254-2 has been prepared by IEC technical committee 21: Secondary cells and batteries.

This third edition cancels and replaces the second edition published in 1985 and constitutes a technical revision.

This consolidated version of IEC 60254-2 consists of the third edition (1997) [documents 21/406/FDIS and 21/423/RVD] and its amendment 1 (2000) [documents 21/488/FDIS and 21/505/RVD].

The technical content is therefore identical to the base edition and its amendment and has been prepared for user convenience.

It bears the edition number 3.1.

A vertical line in the margin shows where the base publication has been modified by amendment 1.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 3.

The committee has decided that the contents of the base publication and its amendments will remain unchanged until 2005. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

LEAD-ACID TRACTION BATTERIES –
Part 2: Dimensions of cells and terminals and marking of polarity on cells

1 General

1.1 Scope and object

This part of IEC 60254 is applicable to lead-acid traction batteries used as power sources for electric propulsion.

The object of the present standard is to specify

– the maximum external (overall) dimensions of traction battery cells, that is, the width, the height and the length;

– the form of the marking of traction battery cell polarity and dimensions of corresponding symbols;

– the basic dimensions of some commonly used traction battery terminals designed to connect output cables to the battery;

– the dimensions of cells commonly used in Asia and North America.

1.2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 60254. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of IEC 60254 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 60417-1:1998, *Graphical symbols for use on equipment – Part 1: Overview and application*

IEC 60417-2:1998, *Graphical symbols for use on equipment – Part 2: Symbol originals*

2 Main dimensions of traction battery cells

2.1 Standard series

Traction battery cells in accordance with this standard shall belong to one of the following two dimensional series determined by the width:

E (narrow) L (wide)

2.2 External dimensions

2.2.1 The external (overall) dimensions of traction battery cells are represented by the following symbols:

b width (dimension parallel to the surface of the plates);

h height (including lid, vent plugs and terminals, but without output cable);

l length (dimension perpendicular to the surface of the plates).

2.2.2 The dimensions of traction battery cells in accordance with this standard shall correspond to those of table 1.

2.3 Cell range prevalent in Asia [1)]

The dimensions of traction battery cells in this range are given in table 2.

2.4 Cell range prevalent in North America [2)]

The dimensions of traction battery cells in this range are given in table 3. Width and length only are specified.

3 Marking of polarity on traction battery cells and dimensions of corresponding symbols

3.1 General provisions for marking of cell polarity

To comply with this standard, traction battery cells shall carry the marking of polarity, at least of the positive terminal.

3.2 Form of marking

The marking shall take the form of the symbol +, indented or in relief, on the lid adjacent to the positive terminal.

If the negative terminal is also marked, the marking shall take the form of the symbol –, indented or in relief, on the lid adjacent to the negative terminal.

3.3 Symbols used for marking and their dimensions

Symbols used for the marking of the polarity shall be in accordance with future IEC 60417-1.

The marking of the positive terminal shall be in accordance with the symbol 5005-a: Plus, positive polarity.

The eventual marking of the negative terminal shall be in accordance with the symbol 5006-a: Minus, negative polarity.

The actual value of dimension "*a*" of these symbols shall be equal to or greater than 5 mm.

NOTE A dimension "*a*" of 5 mm corresponds to a total length of each arm of the symbol equal to 6 mm.

4 Basic dimensions of traction battery terminals

4.1 General provisions for dimensions of battery terminals

This standard gives only basic dimensions of standardized types of battery end terminals necessary to ensure interchangeability. The use of other forms of terminal is not precluded.

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1) See appropriate Japanese standard.

2) See appropriate USA standard.

4.2 Conical traction battery terminals

The traction battery terminals shall be chosen from the three types listed in figure 1, based upon the cross-sectional area of cable used.

4.3 Bolted traction battery terminals

The traction battery cable ends for bolted terminals shall be chosen from the four types listed in figure 2, based upon the cross-sectional area of cable used.

NOTE For smaller size connections, reference should be made to the dimensions of terminals shown in IEC 60095-2.

Table 1 – Main dimensions of traction battery cells

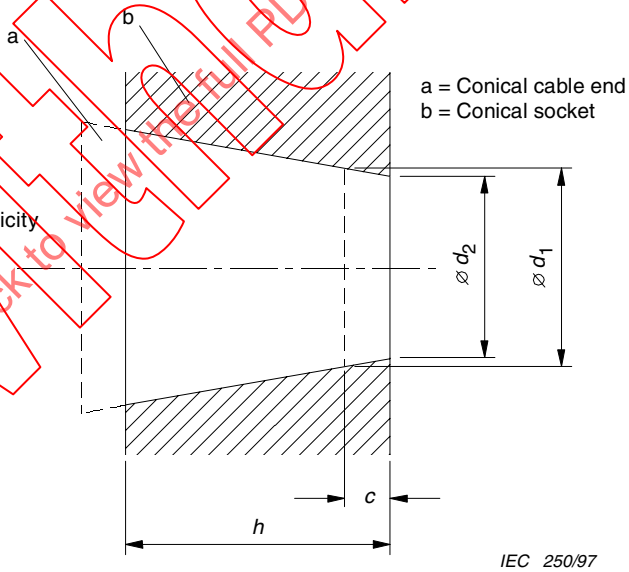
Series	Width *b* max. mm	Type	Height *h* max. mm	Length series *l* max. mm
E	160	A	300	47, 64, 79
		B	370	95, 111
		C	440	127, 145
		D	510	160, 176
		E	555	192, 208
		G	750	
L	198	B	370	47, 65
		C	440	83, 101
		D	510	119, 137
		E	555	155, 174
		F	605	192
		G	750	

Table 2 – Cell range prevalent in Asia – Main dimensions of traction battery cells

Width max. mm	Type	Height max. mm	Length max. mm		
160	a	360	62	80	92
	b	390	96	111	130
	c	435	146	163	179
	d	450	192	208	227
	e	530	246		
	f	560			
	g	740			

Table 3 – Cell range prevalent in North America – Main dimensions of traction battery cells (vented)

Plates	Cell footprint			
	Narrow		Wide	
	in	mm	in	mm
5	2,00 × 6,19	50,8 × 157,2		
7	2,75 × 6,19	69,9 × 157,2		
9	3,50 × 6,19	88,9 × 157,2	3,50 × 8,63	88,9 × 219,2
11	4,25 × 6,19	108,0 × 157,2	4,25 × 8,63	108,0 × 219,2
13	5,00 × 6,19	127,0 × 157,2	5,00 × 8,63	127,0 × 219,2
15	5,75 × 6,25	146,1 × 158,8	5,75 × 8,63	146,1 × 219,2
17	6,50 × 6,25	165,1 × 158,8	6,50 × 8,63	165,1 × 219,2
19	7,25 × 6,25	184,2 × 158,8	7,25 × 8,63	184,2 × 219,2
21	8,00 × 6,25	203,2 × 158,8	8,00 × 8,63	203,2 × 219,2
23	8,75 × 6,25	222,3 × 158,8		
25	9,50 × 6,25	241,3 × 158,8		
27	10,25 × 6,25	260,4 × 158,8		
29	11,00 × 6,25	279,4 × 158,8		
31	11,75 × 6,25	298,5 × 158,8		
33	12,50 × 6,25	317,5 × 158,8		



Type of terminal	Maximum cable area	Dimensions mm			
	mm^2	d_1	h	d_2	c_{max}
A	50	12,5	25,0	13,0	4,0
B	70	14,0	25,0	14,5	4,0
C	95	15,0	36,0	16,0	8,0

Figure 1 – Basic dimensions of conical traction battery terminals