

INTERNATIONAL STANDARD

**IEC
60095-2**

Third edition
1984-09

Lead-acid starter batteries –

Part 2: Dimensions of batteries and dimensions and marking of terminals

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International Electrotechnical Commission, 3, rue de Varembe, 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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CONTENTS

FOREWORD	Page 5
PREFACE TO THE THIRD EDITION	5

SECTION ONE — GENERAL

Clause	
1. Scope	9
2. Object	9

SECTION TWO — MAIN DIMENSIONS OF BATTERIES

3. General	9
4. Location of terminals	11
5. Handles, if any.	11
6. Standard fastening	11
7. Main dimensions of batteries	11
8. Dimensions and arrangement of ledges and notches	13

SECTION THREE — SUPPLEMENTARY DIMENSIONS OF BATTERIES WITH PERMISSIBLE ALTERNATIVE FASTENING

9. General concerning permissible alternative fastening	13
10. Fastening by lugs	13
11. Fastening by upper part of the case	15

SECTION FOUR — DIMENSIONS OF BATTERY TERMINALS

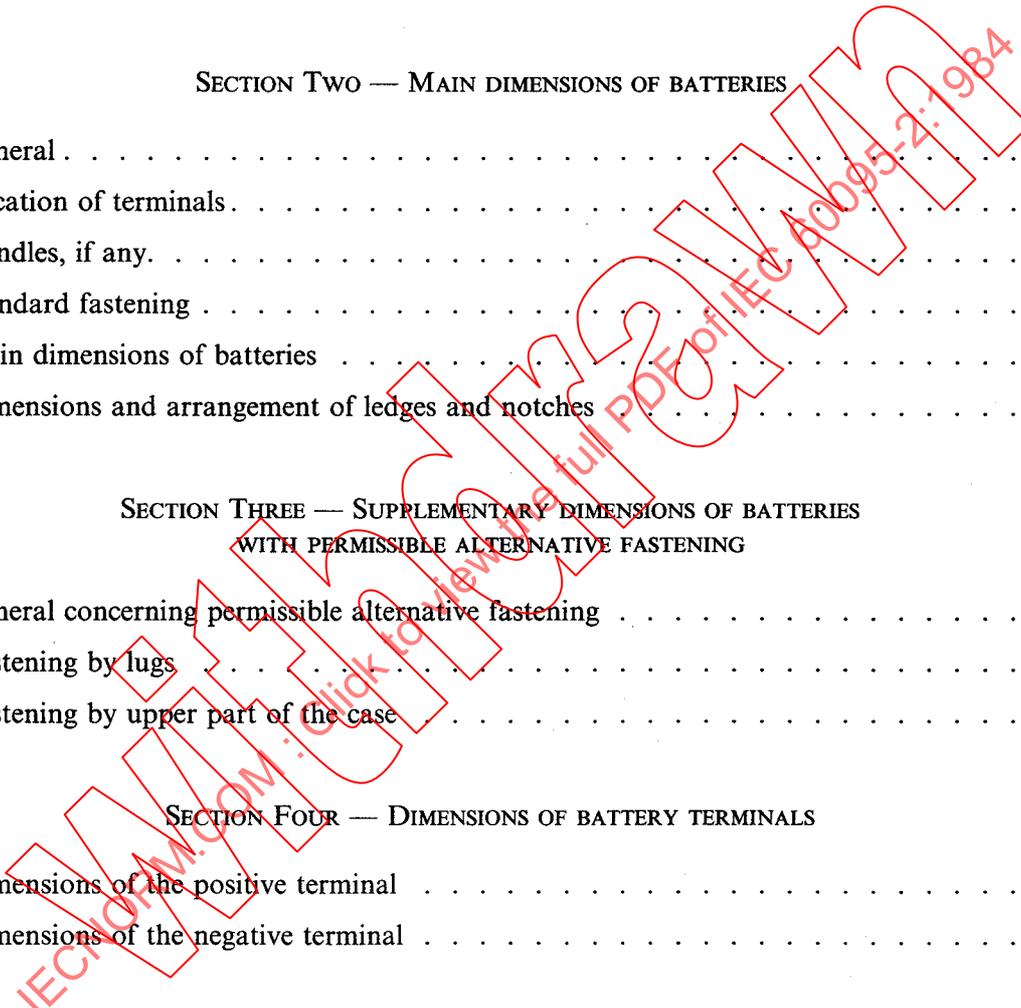
12. Dimensions of the positive terminal	15
13. Dimensions of the negative terminal	15

SECTION FIVE — MARKING OF THE POLARITY OF BATTERIES AND DIMENSIONS OF CORRESPONDING SYMBOLS

14. Marking of the polarity of terminals	17
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FIGURES	18-21
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TABLES	22-23
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INTERNATIONAL ELECTROTECHNICAL COMMISSION

LEAD-ACID STARTER BATTERIES**Part 2: Dimensions of batteries and dimensions and marking of terminals**

FOREWORD

- 1) The formal decisions or agreements of the IEC on technical matters, prepared by Technical Committees on which all the National Committees having a special interest therein are represented, express, as nearly as possible, an international consensus of opinion on the subjects dealt with.
- 2) They have the form of recommendations for international use and they are accepted by the National Committees in that sense.
- 3) In order to promote international unification, the IEC expresses the wish that all National Committees should adopt the text of the IEC recommendation for their national rules in so far as national conditions will permit. Any divergence between the IEC recommendation and the corresponding national rules should, as far as possible, be clearly indicated in the latter.
- 4) The IEC has not laid down any procedure concerning marking as an indication of approval and has no responsibility when an item of equipment is declared to comply with one of its recommendations.

PREFACE TO THE THIRD EDITION — 1984

This standard has been prepared by IEC Technical Committee No. 21, Secondary Cells and Batteries.

This third edition of IEC Publication 95-2 replaces the second edition (1965) which was withdrawn from sale in 1978. It also replaces IEC Publication 95-3: Lead-acid Starter Batteries, Part 3: Dimensions and Marking of Terminals, and Amendment No. 1 (1977).

The principles for a progressive revision of Publication 95-2 were drawn up at the meeting held in Prague in 1969. A first draft on the dimensional standardization of a system for fastening batteries to vehicles was discussed at the meeting held in Stockholm in 1970. As a result of this meeting, a draft, Document 21(Central Office)144, was submitted to the National Committees for approval under the Six Months' Rule in November 1971. Subsequently, twelve documents were approved by the National Committees under the Six Months' Rule or the Two Months' Procedure. Once the fastening system had been adopted, work was started on the standardization of the heights and widths and then of the lengths for batteries designated as wide (175 mm) of standard height (190 mm) fastened by means of bottom hold-down ledges on the long sides of the battery cases. It is this series of starter batteries, comprising five types, which was to become the international standard series, the only series standardized by the IEC.

However, it proved impossible to remain limited to a single series of batteries and, gradually, the standardization field was extended to wide batteries of low configuration (175 mm) and then to narrow batteries (135 mm) of standard height (225 mm) and low configuration (205 mm). The standard fastening system by means of bottom hold-down ledges on the long sides of the battery case also proved insufficient and permissible alternative fastening providing for fastening by the bottom of the case on the short sides and possibly by means of a device resting on the upper part of the battery were proposed. The standard series was extended by the addition of a low configuration type. Furthermore, the marking of the polarity was revised.

Following the various drafts successively approved, Document 21(Central Office)263, comprising the complete text of this standard, was submitted to the National Committees for approval under the Two Months' Procedure in August 1982.

The National Committees of the following countries voted explicitly in favour of publication:

Australia	German Democratic Republic	New Zealand
Belgium	Germany	South Africa (Republic of)
Canada	Israel	Spain
Czechoslovakia	Italy	Sweden
Denmark	Japan	Switzerland
Egypt	Korea (Republic of)	Union of Soviet
France	Netherlands	Socialist Republics

Other IEC publication quoted in this standard:

Publication No. 417: Graphical Symbols for Use on Equipment. Index, Survey and Compilation of the Single Sheets.

Note:

Lead acid batteries for starting, lighting and ignition (SLI) of vehicles with internal combustion engines are made in a wide variety of dimensional configurations and with different modes of fastening the batteries to the vehicles. It appears reasonable from the point of view of both user and manufacturer to identify certain preferred series of such batteries together with recommended means for secure fastening and electrical connection to the vehicles.

In different parts of the world and in various countries, there exist well-established systems of SLI batteries which are defined in national or trade standards. It is realized that these cannot be replaced in the short term by an international standard. Also there remains a large demand for special SLI batteries which cannot be covered by a very restricted number of recommended types. This accounts for the character of the present publication. It is envisaged to deal with the preferred series of SLI batteries in use in North America in the near future.

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Withdrawn

LEAD-ACID STARTER BATTERIES

Part 2: Dimensions of batteries and dimensions and marking of terminals

SECTION ONE — GENERAL

1. Scope

- 1.1 This standard is applicable to lead-acid batteries used for starting, lighting and ignition of passenger automobiles and light commercial vehicles with a nominal voltage of 12 V fastened to the vehicles by means of ledges on the long sides of the battery case (standard fastening).
- 1.2 Since other methods of fastening the batteries are at present in use, two alternative admissible means are specified in Section Three.

2. Object

The object of the present standard is to specify:

- the main dimensions of starter batteries of four standard series;
- the location of the positive and negative terminals with respect to the fastening system;
- the dimensions of tapered terminals of starter batteries;
- the marking of the polarity.

SECTION TWO — MAIN DIMENSIONS OF BATTERIES

3. General

3.1 *Standard series*

Starter batteries in accordance with this standard shall belong to one of the following four series:

L, LB, E, EB

3.2 *Wide series*

The first two series have the same width (L=large) but different height:

L = standard height
LB = low configuration

3.3 *Narrow series*

The last two series have also the same width (E = narrow) but different height:

E = standard height
EB = low configuration

3.4 *Preferred series*

Of these four series, the series L (large, standard height) shall be considered as the preferred series.

4. **Location of terminals**

The arrangement of positive and negative terminals with respect to the position of the notches (see Sub-clause 6.2) shall be in accordance with Figure 1, page 18.

5. **Handles, if any**

Batteries in accordance with this standard may have handles. The projection "c" of handles (see Figure 1) shall not exceed the values in Table I, page 22. The handles shall be capable of being folded or removed so as not to interfere with the other dimensions.

6. **Standard fastening**

6.1 *Ledges on long sides*

All batteries in accordance with this standard (series L, LB, E and EB) shall have, on the lower part, ledges (or recesses forming ledges) for fastening over the full length of the long sides, forming an integral part of the battery case and allowing the battery to be fixed by means of the bottom of the case.

6.2 *Notches*

To secure correct positioning of the battery on the support, the ledge on the side of the terminals shall have one notch, the ledge on the opposite side shall have two notches.

The hold-down clamps of the support shall match with the ledges and the notches to provide secure fastening in either direction.

7. **Main dimensions of batteries**

The main dimensions of the batteries are represented by symbols as indicated on the drawing in Figure 1, page 18.

This schematic drawing does not represent any design details of the top of the battery.

The dimensions corresponding to the symbols below shall be in accordance with Table I, page 22.

Symbols used:

- b = overall width above ledges
 h = overall height including lid, plugs and terminals, but without handles
 l = overall length without handles
 b_1 = width across ledges
 l_1 = length at battery base
 c = maximum projection of handles, if any

8. Dimensions and arrangement of ledges and notches

The shape and dimensions of ledges and of notches shall be in accordance with Figures 3a and 3b, page 20 (details X and Y of Figure 1, page 18).

The positions of ledges and notches are indicated in Figure 1 and Sub-clause 6.2.

**SECTION THREE — SUPPLEMENTARY DIMENSIONS OF BATTERIES
WITH PERMISSIBLE ALTERNATIVE FASTENING****9. General concerning permissible alternative fastening**

Starter batteries having the main dimensions of the standard series L, E and EB may, as alternatives to the standard fastening, be fixed to the vehicles either:

- by additional lugs at the short sides (letter S added to the designation of the standard series: LS, ES, EBS), see Clause 10;
- by means of a hold-down device engaging with the upper part of the battery (for example, a metal frame), connected to the support platform (letter T added to the designation of the standard series: LT, ET, EBT), see Clause 11.

In either case, such batteries shall have on the long side ledges in accordance with Clause 6.

10. Fastening by lugs**10.1 Lugs**

Batteries for fastening at the short sides (see Clause 9) series LS, ES, EBS, shall have lugs at the bottom of the short sides, forming an integral part of the battery case. The shape and dimensions of the lugs shall correspond to Figures 2 and 3b.

10.2 Positioning of the battery

To secure correct positioning of the battery on the support, notches shall be provided in the lugs; the lug on the side of the negative terminal shall have one notch at the centre, the lug on the side of the positive terminal shall have two notches, the positions of which are indicated in Figure 2, page 19.

The shape and dimensions of the notches shall correspond to Figures 3a and 3b, page 20.

The hold-down clamps of the support shall match with the lugs and the notches to provide secure fastening in either direction.

10.3 *Supplementary dimension of battery with fastening by lugs*

The total length across the lugs l_2 , see Figure 2, page 19, to batteries of series LS, ES and EBS shall be in accordance with the values in Table II, page 23.

11. **Fastening by upper part of the case**

11.1 *Arrangement of the upper part of the case*

Batteries for fastening by the upper part of the case in accordance with Clause 9, series LT, ET and EBT, shall be designed so that the cover provides appropriate support for the hold-down device, for instance a metal frame.

11.2 *Supplementary dimension of batteries with fastening by upper part of the case*

The height of the upper surface h_1 , supporting the hold-down device, of series LT, ET and EBT above the bottom of the case (see Figure 2) shall be in accordance with the values in Table III, page 23.

SECTION FOUR — DIMENSIONS OF BATTERY TERMINALS

12. **Dimensions of the positive terminal**

The tapered positive terminal shall be in accordance with Figure 4, page 21.

13. **Dimensions of the negative terminal**

The tapered negative terminal shall be in accordance with Figure 5, page 21.

SECTION FIVE — MARKING OF THE POLARITY OF BATTERIES
AND DIMENSIONS OF CORRESPONDING SYMBOLS

14. Marking of the polarity of terminals

Batteries shall carry the marking of polarity, at least of the positive terminal.

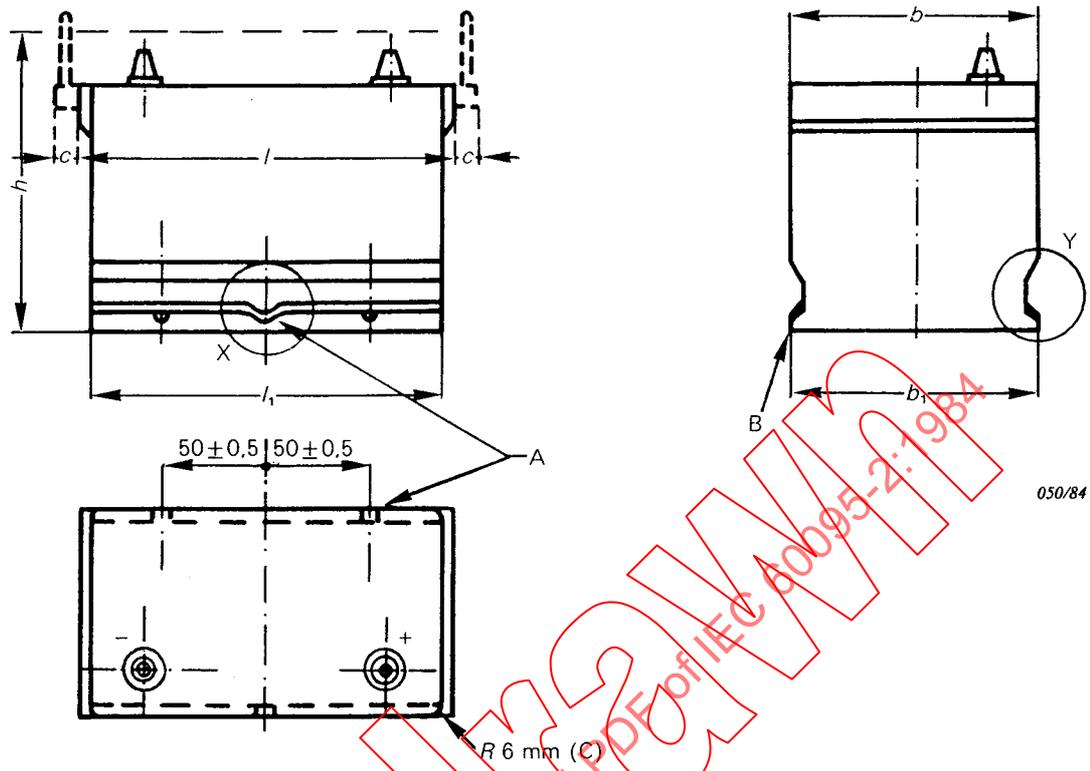
- 14.1 This marking shall take the form of the symbol +, indented or in relief, either on the upper surface of the positive terminal or on the lid adjacent to the positive terminal.

The symbol used for marking the positive terminal shall be in accordance with symbol 5005-a: Plus; positive polarity of IEC Publication 417: Graphical Symbols for Use on Equipment. Index, Survey and Compilation of the Single Sheets. The actual value of the dimensions "a" should be equal to or greater than 5 mm.*

- 14.2 If the negative terminal is also marked, the symbol used shall be in accordance with symbol 5006-a: Minus; negative polarity of IEC Publication 417; this marking shall also be placed, either on the upper surface of the negative terminal or on the lid adjacent to the negative terminal. The size of the negative marking shall correspond to that of the positive marking.

* A dimension "a" of 5 mm corresponds to a total length of each arm of the symbol equal to 5.6 mm.

Dimensions en millimètres — Dimensions in millimetres



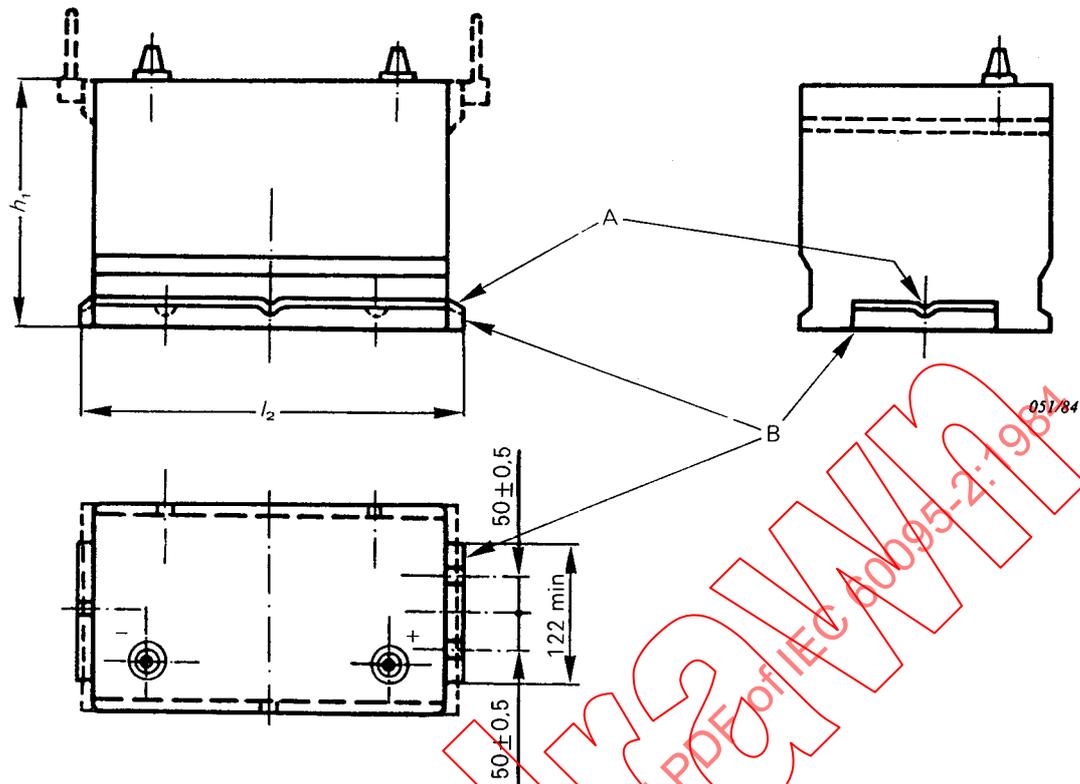
050/84

- A = encoches sur listeaux (voir détail X sur figure 3a, page 20)
notches on ledges (see detail X in Figure 3a, page 20)
- B = listeaux (voir détail Y sur figure 3b, page 20)
ledges (see detail Y in Figure 3b, page 20)
- C = sur listeaux seulement
on ledges only

FIG. 1. — Dimensions principales des batteries et disposition du système de fixation standard (listeaux, encoches) et des bornes.

Main dimensions of batteries and arrangement of the standard fastening system (ledges, notches) and of the terminals.

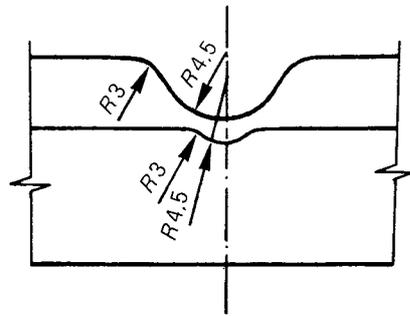
Dimensions en millimètres — Dimensions in millimetres



- A = encoches sur talons (voir détail X sur figure 3a, page 20)
 notches on lugs (see detail X on Figure 3a, page 20)
- B = talons (voir détail Y sur figure 3b, page 20)
 lugs (see detail Y on Figure 3b, page 20)

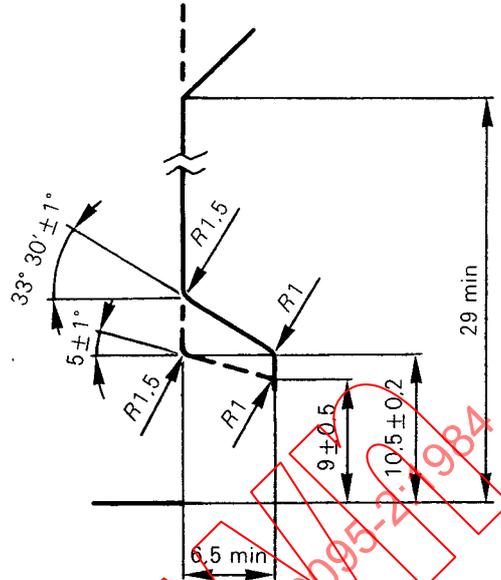
FIG. 2. — Dimensions supplémentaires des batteries présentant des variantes de fixation admissibles, disposition des talons, des encoches et des bornes.
 Supplementary dimensions of batteries with permissible alternative fastening, arrangement of lugs, notches and terminals.

Dimensions en millimètres — Dimensions in millimetres



052/84

FIG. 3a. — Détail X — encoche.
Detail X — notch.



053/84

FIG. 3b. — Détail X — listeau ou talon.
Detail Y — ledge or lug.

Notes:

- Sur tous les rayons, tolérance $\pm 0,5$ mm.
- Trait gras — exécution obligatoire.
- Trait maigre — exécution facultative.

- Tolerance of all radii ± 0.5 mm.
- Heavy lines — mandatory.
- Light lines — optional.

FIG. 3. — Dimensions des listeaux, des talons et des encoches.
Dimensions of ledges, lugs and notches.