IEC 60127-2

Edition 3.0 2014-09

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Miniature fuses –
Part 2: Cartridge fuse-links

Coupe-circuit miniatures –
Partie 2: Cartouches

IEC 60127-2:2014-09(en-fr)

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

PRICE CODE
CODE PRIX X

ICS 29.120.50

ISBN 978-2-8322-1844-0

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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MINIATURE FUSES –

Part 2: Cartridge fuse-links

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of 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, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). 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. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard IEC 60127-2 has been prepared by subcommittee 32C: Miniature fuses, of IEC technical committee 32: Fuses.

This third edition of IEC 60127-2 cancels and replaces the second edition published in 2003, amendment 1 (2003) and amendment 2 (2010). This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) add 4 new standard sheets 7 up to 10.

This International Standard is to be used in conjunction with IEC 60127-1:2006.

The text of this standard is based on the following documents:

FDIS	Report on voting
32C/493/FDIS	32C/498/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The clauses of this standard supplement, modify or replace the corresponding clauses in IEC 60127-1.

Where there is no corresponding clause or subclause in this standard, the clause or subclause of IEC 60127-1 applies without modification as far as is reasonable. When this standard states “addition”, “modification” or “replacement”, the relevant text in IEC 60127-1 is to be adapted accordingly.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

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

INTRODUCTION

According to the wish expressed by the users of miniature fuses, all standards, recommendations and other documents relating to miniature fuses should have the same publication number in order to facilitate reference to fuses in other specifications, for example, equipment specifications.

Furthermore, a single publication number and subdivision into parts would facilitate the establishment of new standards, because clauses and subclauses containing general requirements need not be repeated.

The new IEC 60127 series is thus subdivided as follows:

IEC 60127, *Miniature fuses* (general title).

IEC 60127-1, *Miniature fuses – Part 1: Definitions for miniature fuses and general requirements for miniature fuse-links*

IEC 60127-2, *Miniature fuses – Part 2: Cartridge fuse-links*

IEC 60127-3, *Miniature fuses – Part 3: Sub-miniature fuse-links*

IEC 60127-4, *Miniature fuses – Part 4: Universal modular fuse-links (UMF) – Through-hole and surface mount types*

IEC 60127-5, *Miniature fuses – Part 5: Guidelines for quality assessment of miniature fuse-links*

IEC 60127-6, *Miniature fuses – Part 6: Fuse-holders for miniature fuse-links*

IEC 60127-7, *Miniature fuses – Part 7: Miniature fuse-links for special applications*

IEC 60127-8, (Free for further documents)

IEC 60127-9, (Free for further documents)

IEC 60127-10, *Miniature fuses – Part 10: User guide for miniature fuses*

This Part of IEC 60127 covers additional requirements, test equipment and standard sheets.

The SI system of units is used throughout this standard.

MINIATURE FUSES –

Part 2: Cartridge fuse-links

1 Scope and object

This part of IEC 60127 relates to special requirements applicable to cartridge fuse-links for miniature fuses with dimensions measuring 5 mm × 20 mm and 6,3 mm × 32 mm for the protection of electric appliances, electronic equipment and component parts thereof, normally intended for use indoors.

It does not apply to cartridge fuse-links for appliances intended to be used under special conditions, such as in corrosive or explosive atmospheres.

This standard applies in addition to the requirements of IEC 60127-1.

The object of this standard is to define special and additional test methods for cartridge fuse-links applying in addition to the requirements of IEC 60127-1.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60068-2-20, *Environmental testing – Part 2-20: Tests – Test T: Test methods for solderability and resistance to soldering heat of devices with leads*

IEC 60068-2-21:2006, *Environmental testing – Part 2-21: Tests – Test U: Robustness of terminations and integral mounting devices*

IEC 60127-1:2006, *Miniature fuses – Part 1: Definitions for miniature fuses and general requirements for miniature fuse-links*
Amendment 1:2011

ISO 3, *Preferred numbers – Series of preferred numbers*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60127-1:2006, Clause 3, apply.

4 General requirements

Clause 4 of IEC 60127-1:2006 applies.

5 Standard ratings

Clause 5 of IEC 60127-1:2006 applies.

6 Marking

Clause 6 of IEC 60127-1:2006 applies except as follows:

6.1 *Addition:*

e) A symbol denoting the rated breaking capacity. This symbol shall be placed between the marking for the rated current and the marking for the rated voltage.

These symbols are

H denoting high breaking capacity,

L denoting low breaking capacity,

E denoting enhanced breaking capacity.

EXAMPLES of marking:

T	3	1	5	L	2	5	0	V

		F	4	H	2	5	0	V

T	3	1	5	E	2	5	0	V

6.4 *Add the following paragraph after the first paragraph:*

The values for “d” and “s” shall be 0,8 mm ± 0,2 mm.

7 General notes on tests

Clause 7 of IEC 60127-1:2006 applies except as follows:

7.2.1 *Addition:*

For testing individual fuse ratings, the number of fuse-links required is 48, of which 12 are kept as spares. The testing schedule is shown in Table 1.

For the maximum ampere rating of a homogeneous series, the number of fuse-links required is 48, of which 22 are kept as spares. The testing schedule is shown in Table 2.

For the minimum ampere rating of a homogeneous series the number of fuse-links required is 33, of which 16 are kept as spares. The testing schedule is shown in Table 3.

Table 1 – Testing schedule for individual ampere ratings

Sub-clause	Description		Fuse-link no.													
			1-6	7 9 11	8 10 13	12 14 15	16 17 18	19 20 21	22 24 26	23 25 27	28 29 30	31 32 33	34 36 38	35 37 39	40 41 42	43 44 45	46 47 48
9.4 [a]	Endurance test		X														
9.2.2 [a]	Test at elevated temperature [b]						X										
9.2.1 [a]	Time/current characteristics	10 I_N		X													
		4 I_N							X								
		2,75 I_N											X				
		2,0 I_N or 2,1 I_N														X	
9.3	Breaking capacity test: Rated breaking capacity					X											
	5 times the rated current							X									
	10 times the rated current										X						
	50 times the rated current											X					
	250 times the rated current														X		
8.3	Terminations (end cap test)			X					X				X			X	
8.5 [a]	Soldered joints		X	X			X		X				X			X	
6.2 [a]	Legibility and indelibility of marking			X					X				X			X	

[a] These subclauses are to be found in IEC 60127-1.

[b] Applicable only when specified on the standard sheet.

Table 2 – Testing schedule for maximum ampere rating of a homogeneous series

Sub-clause	Description		Fuse-link numbers in decreasing value of voltage drop												
			1-6	7 8 9	10 11 12	13-17	18-27	28 29 30	31 32 33	34 35 36	37 38 39	40 41 42	43 44 45	46 47 48
9.4 [a]	Endurance test		X											
9.2.2 [a]	Test at elevated temperature [b]							X						
9.2.1 [a]	Time/current characteristics	10 I_N		X										
		4 I_N							X					
		2,75 I_N									X			
		2,0 I_N or 2,1 I_N											X	
9.3	Rated breaking capacity					X								
8.3	Terminations (end cap test)			X					X		X		X	
8.5 [a]	Soldered joints		X	X				X	X		X		X	
6.2 [a]	Legibility and indelibility of marking			X					X		X		X	

[a] These subclauses are to be found in IEC 60127-1.

[b] Applicable only when specified on the standard sheet.

Table 3 – Testing schedule for minimum ampere rating of a homogeneous series

Sub-clause	Description		Fuse-link numbers in decreasing value of voltage drop						
			1-6	7 8 9	10 11 12	13-17	18-27	28 29 30	31 32 33
9.4 [a]		Endurance test	X						
9.2.1 [a]	Time/current characteristics	10 I_N		X					
		2,0 I_N or 2,1 I_N						X	
9.3		Rated breaking capacity				X			
[a] These subclauses are to be found in IEC 60127-1.									

Replacement:

7.3 Fuse-bases for tests

For tests that require a fuse-base for mounting the fuse-links, bases according to Figures 1, 2 or 3, shall be used as appropriate.

The contact resistance between each contact and a silvered brass piece having the same nominal dimensions and shape as the fuse-link to be tested shall not exceed 3 mΩ and is measured under the following conditions:

a) in order to prevent the breakdown of thin insulating layers on the contacts, the e.m.f. of the circuit shall not exceed 20 mV (d.c. or a.c. peak);

b) in order to prevent undue heating of the contacts, the current flowing shall not exceed 1 A.

Metal parts of the fuse-base, except the spring and connections, shall be made of brass. Brass parts of the fuse-base and of the gauge for measuring contact resistance shall have a copper content of between 58 % and 70 %. Contacts shall be silver-plated.

For fuse-links with rated currents up to and including 6,3 A, a fuse-base according to Figure 1 shall be used. The contact force shall be between 4 N and 6 N. The flexible lead and terminal wires shall be of copper and shall have a cross-sectional area of 1 mm^2; the length of each of the terminal wires being approximately 500 mm.

For fuse-links with rated currents exceeding 6,3 A, a fuse-base according to Figure 2 shall be used. The contact force shall be between 8 N and 12 N. The flexible lead and terminal wires shall be of copper and shall have a cross-sectional area of 6 mm^2; the length of each of the terminal wires being approximately 500 mm.

For breaking capacity tests, a fuse-base according to Figure 3, with the same contact force and conductor cross-sectional area as for the base in Figure 2, shall be used.

Dimensions in millimetres with tolerance of 0,1 mm

Fuse-links	***a*** mm	***b*** mm
5 mm × 20 mm	20	48
6,3 mm × 32 mm	32	60

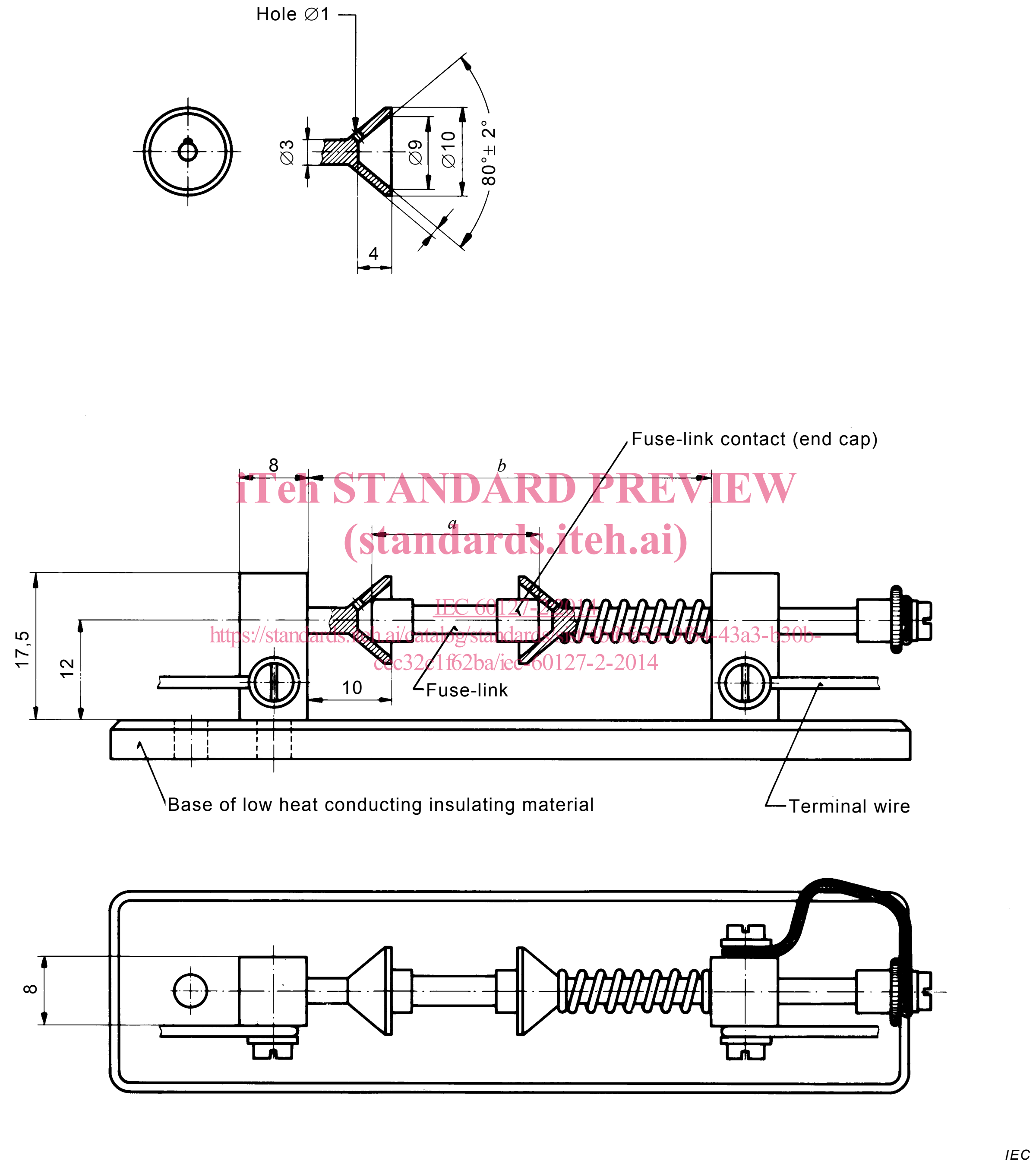

Figure 1 – Test fuse-base for 5 mm × 20 mm and 6,3 mm × 32 mm fuse-links – Rated currents up to and including 6,3 A (see 7.3)

Dimensions in millimetres with tolerances of 0,1 mm

Fuse-links	*a* mm	*b* mm
5 mm × 20 mm	20	48
6,3 mm × 32 mm	32	60

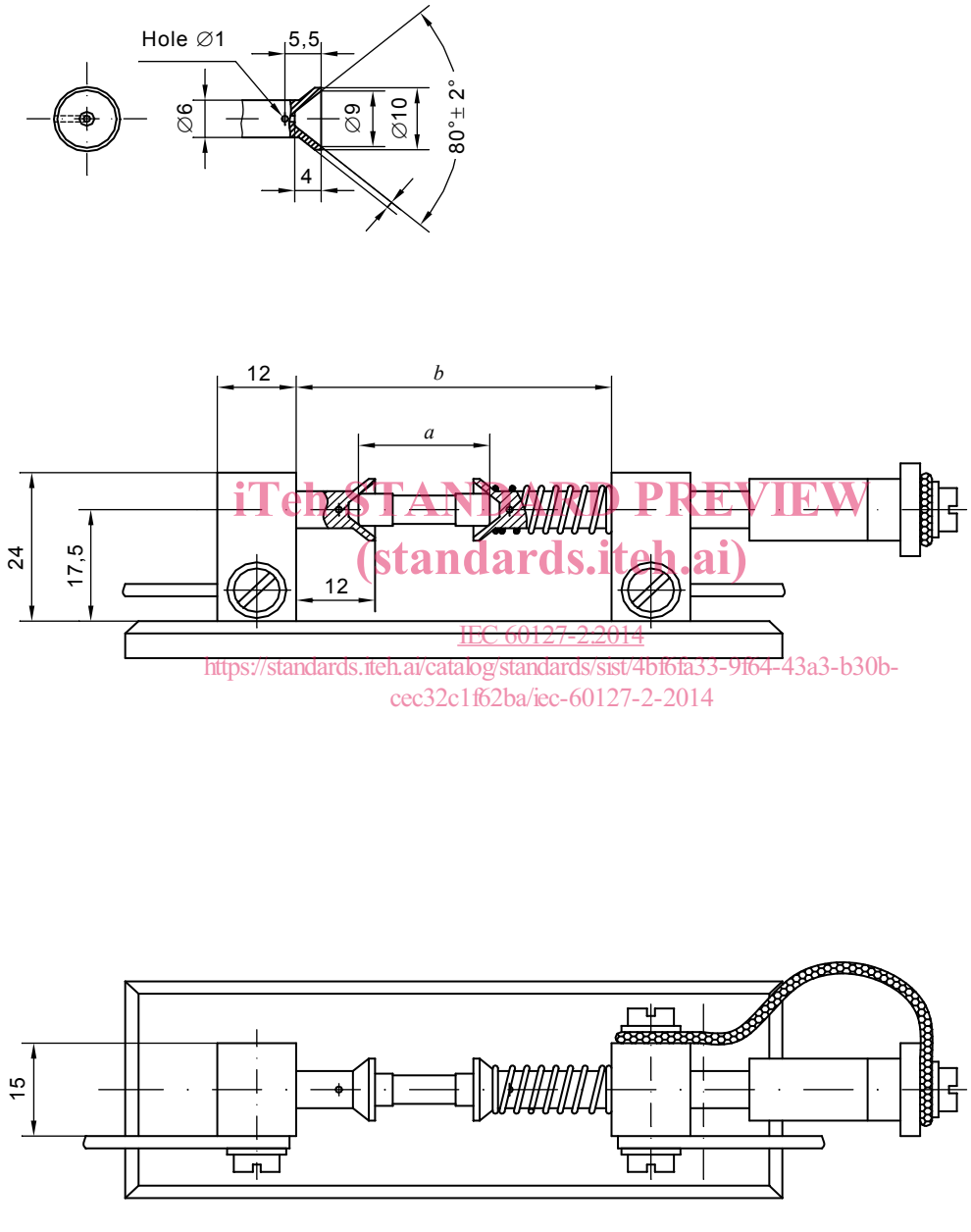

Figure 2 – Test fuse-base for 5 mm × 20 mm and 6,3 mm × 32 mm fuse-links – Rated currents exceeding 6,3 A (see 7.3)

Dimensions in millimetres with tolerance of 0,1 mm

Fuse-links	*a* mm	*b* mm
5 mm × 20 mm	20	67
6,3 mm × 32 mm	32	79

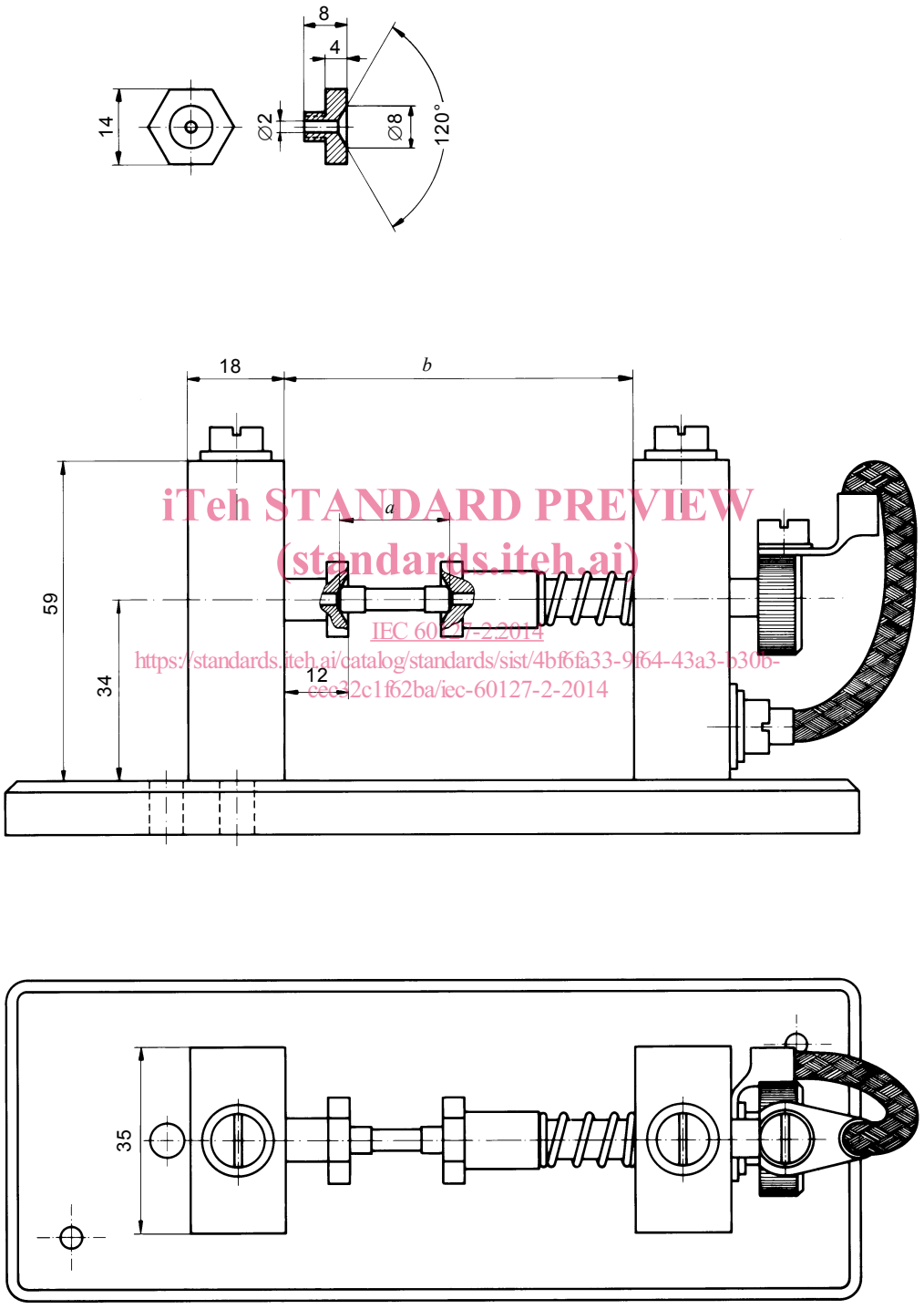

Figure 3 – Test fuse-base for breaking capacity tests (see 7.3)