INTERNATIONAL STANDARD

ISO 8820-6

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Road vehicles — Fuse-links —

Part 6: Single-bolt fuse-links

Véhicules routiers — Liaisons fusibles —

Partie 6: Liaisons fusibles à poste singulier

Reference number
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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 8820-6 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 3, *Electrical and electronic equipment*.

ISO 8820 consists of the following parts, under the general title *Road vehicles — Fuse-links*:

— *Part 1: Definitions and general test requirements*

— *Part 2: User's guide*

— *Part 3: Fuse-links with tabs (blade type)*

— *Part 4: Fuse-links with female contacts (type A) and bolt-in contacts (type B) and their test fixtures*

— *Part 5: Fuse-links with axial terminals (Strip fuse-links) Types SF 30 and SF 51 and test fixtures*

— *Part 6: Single-bolt fuse-links*

— *Part 7: Fuse-links with tabs (Type G) with rated voltage of 450 V*

Road vehicles — Fuse-links —

Part 6: Single-bolt fuse-links

1 Scope

This part of ISO 8820 specifies single-bolt fuse-links in road vehicles. It establishes, for this fuse-link type, the rated current, test procedures, performance requirements and dimensions.

This part of ISO 8820 is applicable to fuse-links with a rated voltage of 58 V, a current rating of $\leqslant$ 300 A and a breaking capacity of 2 000 A intended for use in road vehicles at a nominal voltage of 12 V, 24 V and/or 42 V.

This part of ISO 8820 is intended to be used in conjunction with ISO 8820-1 and with ISO 8820-2. The numbering of its clauses corresponds to that of ISO 8820-1, whose requirements are applicable, except where modified by requirements particular to this part of ISO 8820.

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.

ISO 4017, *Hexagon head screws — Product grades A and B*

ISO 8820-1, *Road vehicles — Fuse-links — Part 1: Definitions and general test requirements*

ISO 8820-2, *Road vehicles — Fuse-links — Part 2: User's guide*

ISO 6722, *Road vehicles — 60 V and 600 V single-core cables — Dimensions, test methods and requirements*

3 Terms and definitions

For the purposes of this Part of ISO 8820, the terms and definitions given in ISO 8820-1 and the following apply.

3.1
insulating nut
electrically insulated device used to assemble a single-bolt fuse

4 Marking and labelling

The requirements given in ISO 8820-1 and Table 1 of this part of ISO 8820 apply.

Table 1 — Fuse-link colour coding

Fuse-link rating A	Colour
50	red
75	brown
100	yellow
125	green
150	orange
175	white
200	blue
250	pink
300	grey

5 Tests and requirements

5.1 General

5.1.1 General test conditions

In addition to carrying out the test procedures in accordance with ISO 8820-1, the following criteria shall apply:

— Tests shall be performed following the test sequences in Table 2.

— The test fixtures for electrical tests shall be designed in accordance with Figure 4. The connection resistance shall be 0,35 mΩ max. to ensure the proper function of the test fixture.

— Terminals shall have a suitable finish which will assure corrosion protection, and shall have satisfactory mechanical and electrical properties.

— The mounting torque shall be (12 ± 1) Nm.

— The insulation resistance of the insulating nut measured with 100 V d.c. shall be > 10 MΩ.

5.1.2 Test sequence

Table 2 — Test sequences

No.	Requirement/Test		Clause	Sample groups [a]						
				1	2	3	4	5	6	7
1	Dimensions		6	X	X	X				
2	Marking and labelling		4	X	X	X	X	X	X	X
3	Strength of insulating body		5.9	X	X	X	X	X	X	X
4	Voltage drop		5.2	X	X	X				
5	Accelerated ageing		5.4				X			
6	Fluid compatibility		5.4					X		
7	Mechanical load		5.4						X	
8	Transient current cycling		5.3							X
9	Voltage drop		5.2				X	X	X	X
10	Current steps		5.6			X				
11	Breaking capacity		5.7	X						
12	Operating time rating	1,00 I_R	5.5		X		X	X	X	X
		1,35 I_R			Y[b]		Y	Y	Y	Y
		1,50 I_R			Y		Y	Y	Y	Y
		2,00 I_R			Y		Y	Y	Y	Y
		3,50 I_R			Y		Y	Y	Y	Y
		6,00 I_R			Y		Y	Y	Y	Y
13	Strength of insulating body		5.9	X	X	X	X	X	X	X

[a] Each sample group shall contain a minimum of 10 fuse links.

[b] For these operating time tests noted with a Y, the sample groups 2, 4, 5, 6 and 7 for each current rating shall be divided equally. These fuses are intended to be subjected to a single operating time test only.

5.1.3 Test cable sizes

Test cable sizes shall be as given in Table 3. All tests for a particular fuse-link rating shall be performed using the same cable size.

Test cable sizes are specified to allow comparative fuse-link tests to be carried out. The cable size specified does not necessarily indicate the size of cable to be used in the vehicle application.

Table 3 — Test cable sizes

Fuse-link rating A	Conductor cross-sectional area[a] mm²
50	10
75	
100	16
125	
150	25
175	
200	35
250	50
300	70
[a] Conductor material according to ISO 6722.	

5.2 Voltage drop

5.2.1 Tests

The test given in ISO 8820-1 and Figure 3 of this part of ISO 8820 shall apply.

5.2.2 Requirements

The requirements given in Table 4 shall apply.

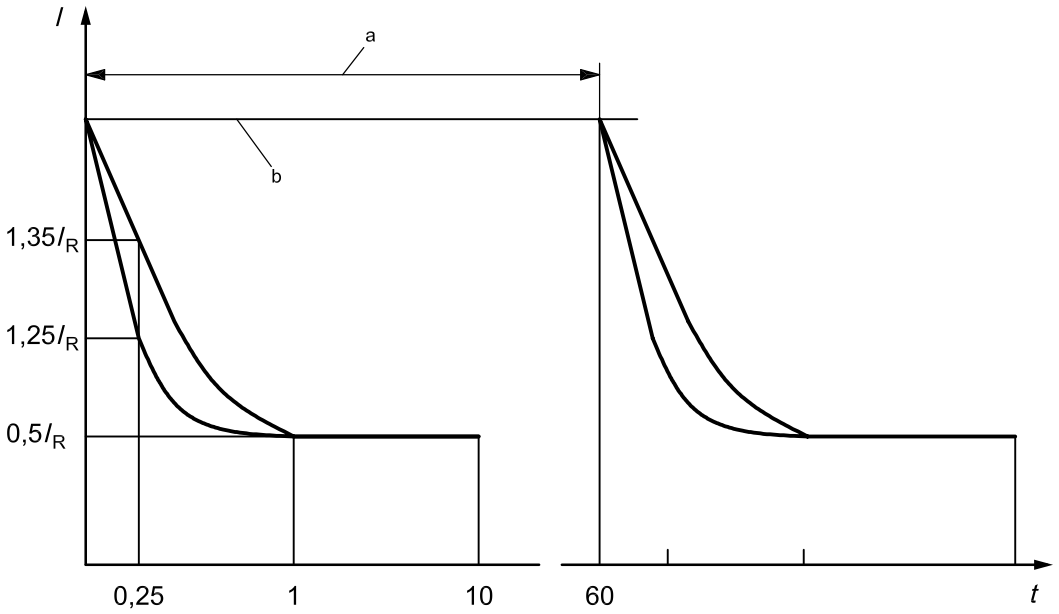
Table 4 — Voltage drop

Fuse-link rating A	Max. fuse-link voltage drop mV
50	110
75	105
100	100
125	95
150	90
175	85
200	80
250	75
300	70

5.3 Transient current cycling

5.3.1 Test

Figure 1 and the test given in ISO 8820-1 shall apply. This test shall be performed at an environmental temperature of (90 ± 5) °C. At an elapsed time of 0,25 s on-time, the current shall fall to a value between 1,25 I_R and 1,35 I_R. At no time shall the steady state current fall below 0,50 I_R.



Key

I current in A
t time in s
a one cycle
b 4 I_R

Figure 1 — Transient current cycling

5.3.2 Requirement

The requirements given in ISO 8820-1 shall apply.

5.4 Environmental conditions

The tests and requirements given in ISO 8820-1 shall apply.

5.5 Operating time rating

5.5.1 Test

The test given in ISO 8820-1 shall apply.

5.5.2 Requirement

The requirements given in Table 5 shall apply.

After activation, the current through the fuse-link shall not exceed 0,5 mA at the rated voltage of the fuse-link.

Table 5 — Operating times

Test current A	Operating time s	
	min.	max.
1,0 I_R	360 000	∞
1,35 I_R	5	1 800
1,5 I_R	1	600
2,0 I_R	0,2	60
3,5 I_R	0,03	1,0
6,0 I_R	0,01	0,2

5.6 Current steps

5.6.1 Test

The test given in ISO 8820-1 shall apply.

5.6.2 Requirement

The requirement given in ISO 8820-1 shall apply. After activation, the current through the fuse-link shall not exceed 0,5 mA at the rated voltage of the fuse-link.

5.7 Breaking capacity

5.7.1 Test

The test given in ISO 8820-1 shall apply.

Test at 2 000 A with cable sizes as shown in Table 3.

5.7.2 Requirement

The requirement given in ISO 8820-1 shall apply

After activation, the current through the rated voltage of the fuse-link shall not exceed 0,5 mA at U_R = 58 V.

5.8 Strength of terminals

Not applicable.

5.9 Strength of insulating body of the fuse-link and insulating nut

5.9.1 Purpose

The purpose for this test given in ISO 8820-1 shall apply.

5.9.2 Test

Install the fuse-links in the test fixture with the mounting torque of (12 ± 1) Nm.

NOTE Test number 13 in Table 2 “test sequence” is just a removal from the test fixture.

5.9.3 Requirement

Fuse-links and insulating nuts shall remain physically intact.

6 Dimensions

6.1 Single-bolt fuse-link

Dimensions in millimetres

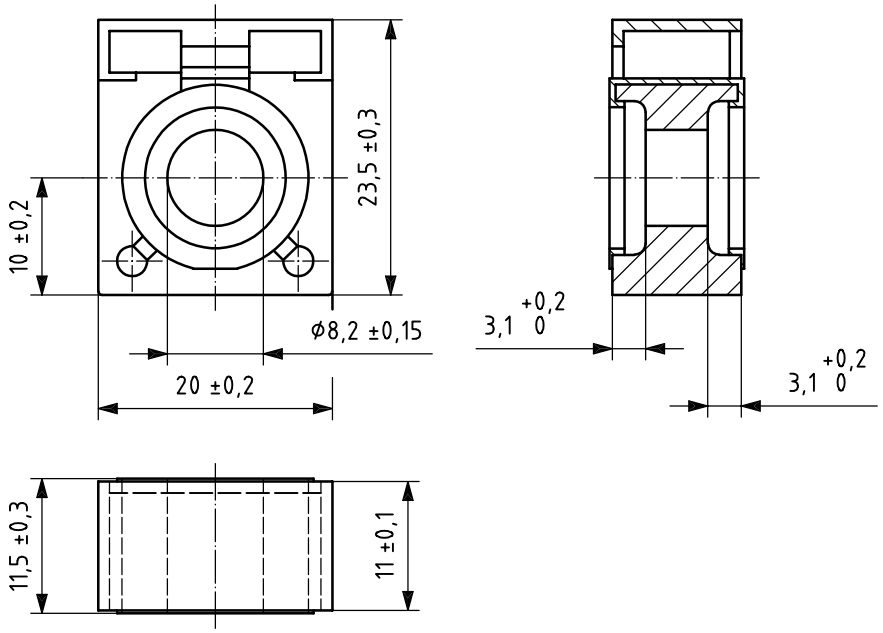
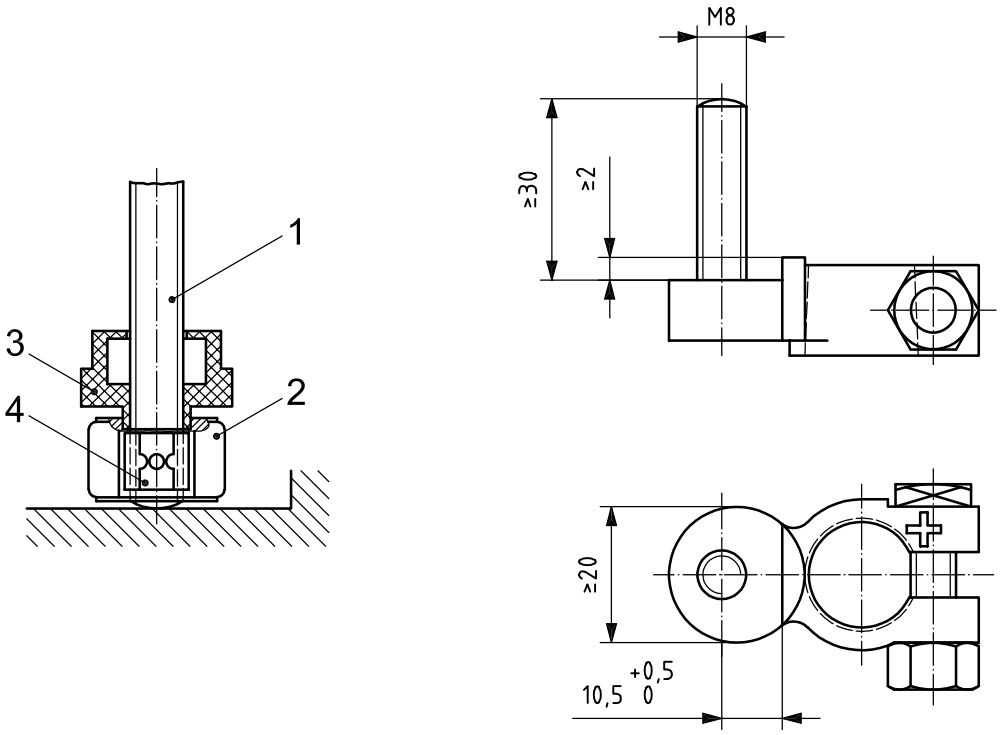


Figure 2 — Single-bolt fuse-link

6.2 Mounting example

Dimensions in millimetres



Key

1, 2 measuring points for voltage drop
3 insulating nut
4 bolt

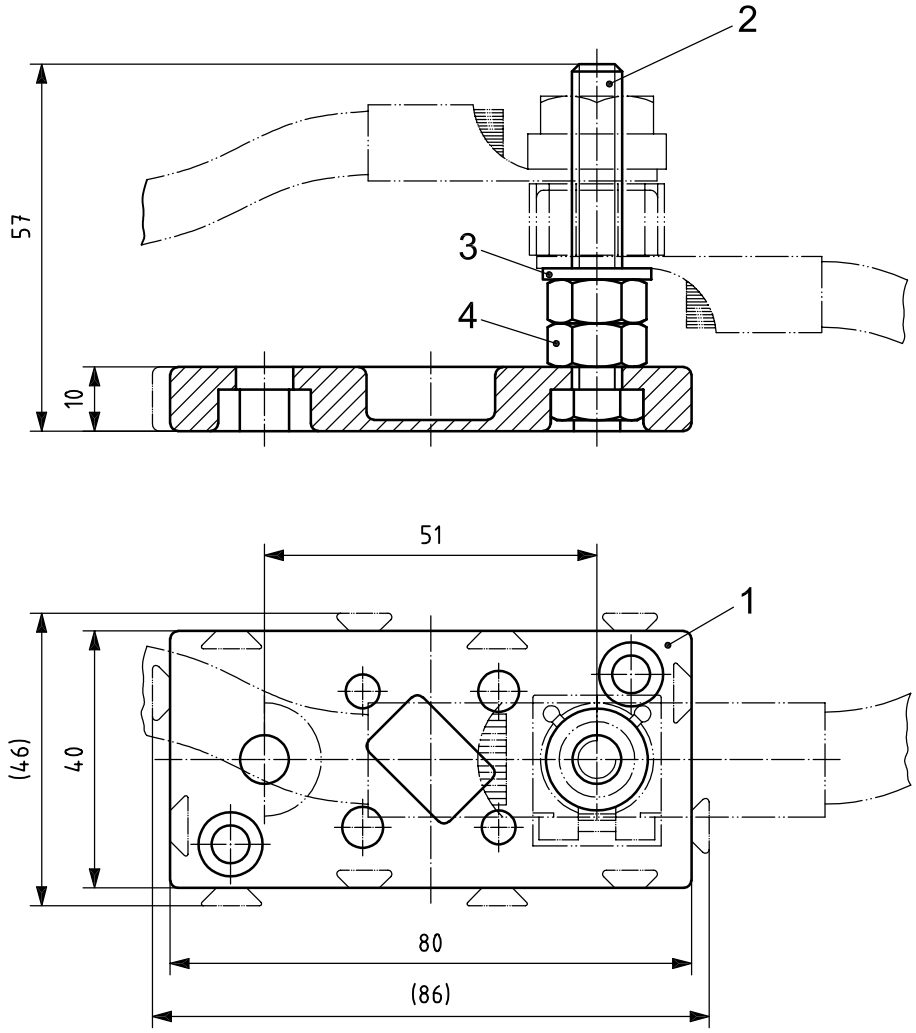
Figure 3 — Mounting example

7 Test fixture

Table 6 — Parts list and material specifications

Reference No. in Figure 4	Description	Dimensions see figure	Material specifications, finish and coating	Quantity
1	Test fixture insulating body	2	Thermoset plastic	1
2	Bolt: ISO 4017-M8×50-8.8		Steel, gal. Zn	1
3	Washer: DIN 125-A8,4		Steel, gal. Zn	1
4	Nut: ISO 40323-M8-8		Steel, gal. Zn	2

Dimensions in millimetres
Tolerances: ISO 2768

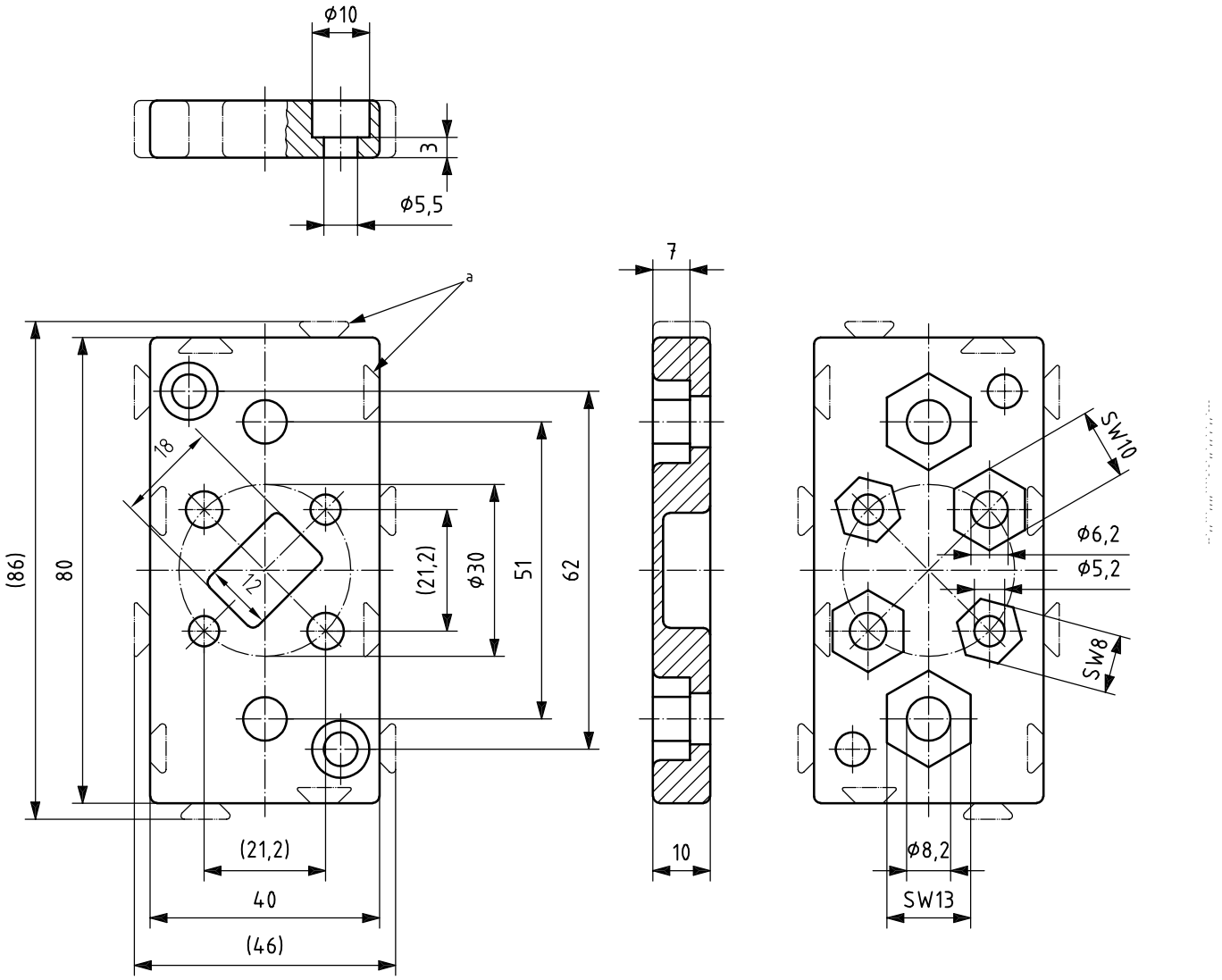


Key

1, 2, 3, 4 see Table 6

Figure 4 — Test fixture

Dimensions in millimetres
Tolerances: ISO 2768



Key

SW width across flats

[a] Optionally dove-tailing.

All corners and edges shall be rounded R1.

Figure 5 — Test fixture insulating body

ICS 43.040.10

Price based on 10 pages