

INTERNATIONAL STANDARD

ISO 7284

Second edition
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Resistance welding equipment — Particular specifications applicable to transformers with two separate secondary windings for multi-spot welding, as used in the automobile industry

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Matériel de soudage par résistance — Spécifications particulières applicables aux transformateurs à deux enroulements secondaires séparés pour soudage multipoints, utilisés dans l'industrie automobile



Reference number
ISO 7284:1993(E)

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.

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.

International Standard ISO 7284 was prepared by Technical Committee ISO/TC 44, *Welding and allied processes*, Sub-Committee SC 6, *Resistance welding*.

<https://standards.iteh.ai/catalog/standards/sist/fe27fccd-67d0-4cfd-9d3b-0c76d09ba05/iso-7284-1993>

This second edition cancels and replaces the first edition (ISO 7284:1984), table 3 of which has been technically revised so as to be in alignment with IEC values.

Annex A forms an integral part of this International Standard.

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Resistance welding equipment — Particular specifications applicable to transformers with two separate secondary windings for multi-spot welding, as used in the automobile industry

1 Scope

This International Standard gives specifications relating to the particular types of transformers specified in clause 3. It complements ISO 5826 which gives general specifications applicable to all transformers.

This International Standard applies to transformers with two separate secondary windings for electric resistance welding machines for multi-spot welding, as used in the automobile industry.

NOTE 1 By agreement between the manufacturer and the user, this International Standard may also be applied to those transformers for multi-spot welding used in other industries or for other types of welding machines where possible. ISO 5826 is applicable in all cases.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 669:1981, *Rating of resistance welding equipment*.

ISO 5826:1983, *Transformers for resistance welding*

machines — General specifications applicable to all transformers.

IEC 423:1973, *Outside diameters of conduits for electrical installations and threads for conduits and fittings.*

3 Types of transformer

This International Standard covers the types of transformer given in table 1 characterized by the secondary no-load voltage U_{20} , the secondary permanent current I_{2p} and, for information, by the continuous output S_p and/or the rated power at a duty factor of 50 % (S_{50}).

Transformers may optionally have a rotary switch for the secondary no-load voltage U_{20} .

The power on which the definition of the transformer type is based is the primary power, i.e. the sum of the powers of both the secondary windings.

4 General requirements

Unless otherwise specified, those requirements of ISO 5826 not modified by this International Standard shall be met.

5 Positions of the rotary switch

The rotary switch shall be either on the transformer in one of the five positions shown in figure 1 or separate from the transformer (position 6).

Table 1 — Types of transformer, electrical characteristics

U_{20} without rotary switch V	U_{20} with rotary switch		I_{2p} kA	S_p kVA	S_{50} kVA
	Position	V			
5,0	1	3,0	5,6	28	40
	2	3,6			
	3	4,2			
	4	5,0			
7,1	1	5,0	6,3	45	63
	2	5,6			
	3	6,3			
	4	7,1			
10,0	1	7,1	7,1	71	100
	2	8,0			
	3	9,0			
	4	10,0			

NOTES

1 The selection of the secondary voltage is made on the primary side by means of a rotary switch or a set of connectors. In the following clauses, only rotary switch assemblies are shown.

2 For requirements concerning the secondary permanent current I_{2p} and the secondary no-load voltage U_{20} see ISO 5826.

6 Dimensions

6.1 Transformers

The dimensions of the transformers shall be as shown in figure 2 and as given in table 2.

Table 2 — Dimensions l_1 , l_2 and l_3 as a function of the secondary permanent current

Dimensions in millimetres

I_{2p} kA	Dimension		
	l_1	l_2	l_3
5,6	500	224	408
6,3	550	280	458
7,1	660	400	568

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6.2 Rotary switch

The dimensions of the rotary switch when it is separate from the transformer shall be as shown in figure 3.

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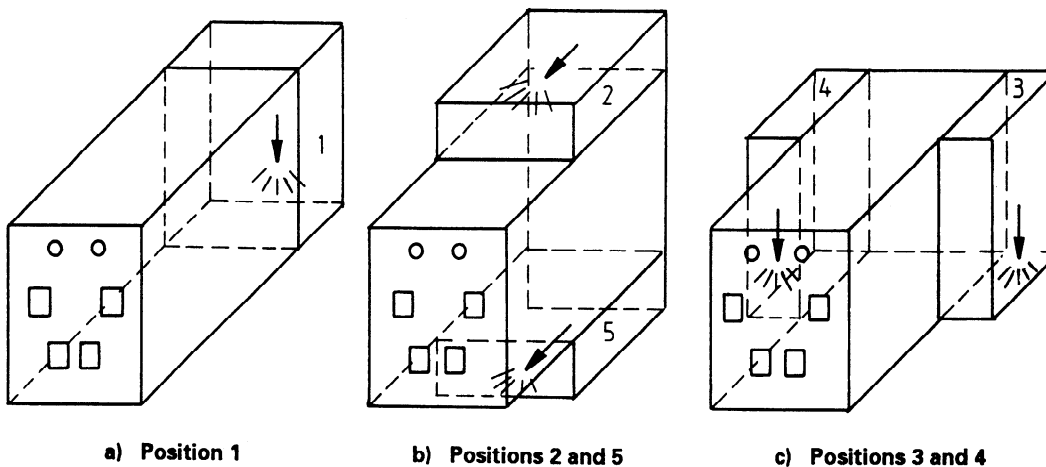


Figure 1 — Positions of the rotary switch

Dimensions in millimetres
Roughness values in micrometres

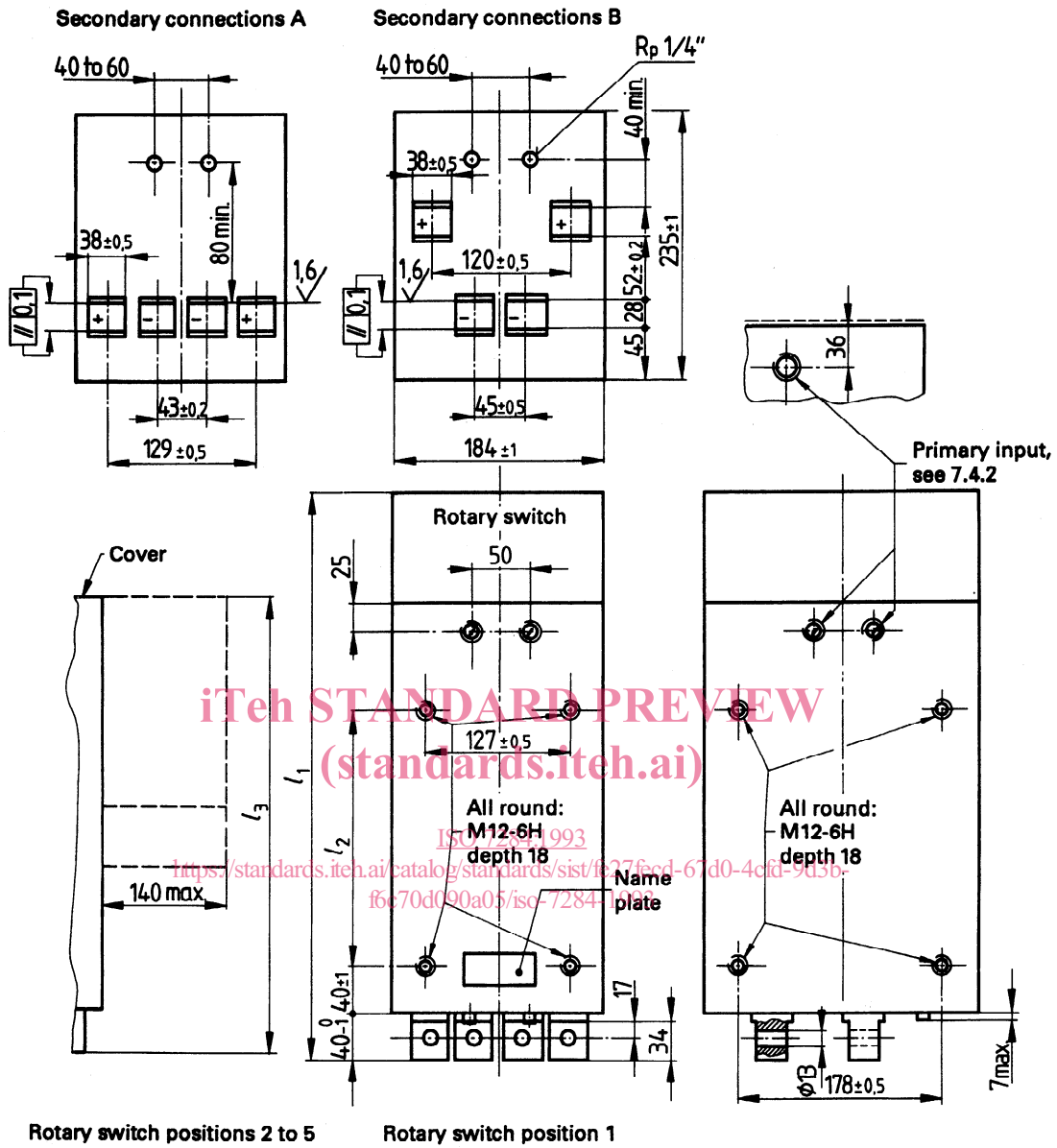
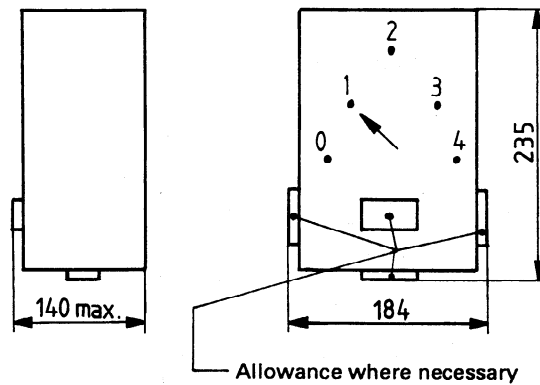


Figure 2 — Dimensions and arrangement of secondary connections



NOTE — All sizes are overall, including any allowance necessary for primary inputs, see 7.4.2.

Figure 3 — Dimensions of the separate rotary switch (position 6) — Position of the handle

7 Construction

7.1 Secondary connections

The arrangement and dimensions of the secondary connections shall be as shown in figure 2 and as given in table 2.

7.2 Cooling water circuit

The cooling water circuit shall ensure effective cooling of the transformer for a nominal water flow of 4 l/min and the incoming cooling water shall be at a maximum temperature of 30 °C¹⁾.

It shall be leakproof at a pressure of 10 bar²⁾.

For the said water flow, the pressure drop shall be not more than 0,6 bar.

7.3 Rotary switch

7.3.1 The rotary switch has five steps of which four are active and one is a zero step.

The rotary switch shall be designed so as to

- allow rapid transition from one step to another;
- allow positive positioning at each step;
- block direct transition from step 4 to step 0.

7.3.2 The direction of rotation for voltage increase shall be clockwise.

1) Value in accordance with ISO 5826.

2) 1 bar = 100 kPa; 1 Pa = 1 N/m²

7.3.3 The torque necessary for switch rotation shall not be greater than 6 N·m. The length of the lever shall be approximately 80 mm.

7.3.4 The cover of the switch shall be so designed that the control lever is protected and so that an accumulation of liquid which could leak into the transformer is avoided.

7.3.5 The rotary switch shall hold any position indicated in clause 5 equally well.

7.4 Primary connections

7.4.1 Cables and terminals

Cables used for primary connections and terminals shall be appropriate to the primary current which can flow and shall be in accordance with the requirements of the relevant IEC Publications.

7.4.2 Cable input

For the transformers, the cable input into the transformer and the rotary switch shall be planned in accordance with one of the methods given in annex A. The position of the threaded holes for the cable input into the transformer shall be as shown in figure 2.

7.5 No-load current

The value of the no-load current shall not be greater than the values given in table 3.

8 Tests

Transformers covered by this International Standard shall be tested in accordance with the requirements of ISO 5826.

9 Designation

Transformers covered by this International Standard are designated by noting in order:

- a reference to this International Standard;
- the arrangement of the secondary connections (see figure 2);

- the position of the rotary switch (see clause 5). If there is no rotary switch, 0 shall be noted for transformers without controls and 7 for transformers with control of the secondary voltage by means of a set of connectors;

- the secondary no-load voltage U_{20} (see table 1);

- the continuous output S_p (see table 1);

- the primary voltage.

EXAMPLE

Transformer ISO 7284 - B - 1 - 7,1 - 45 - 380

Table 3 — Limit values of the no-load current, I_0

I_{2p} kA	U_1 V						S_p kVA	S_{50} kVA	S_0 kVA
	230	400	415	500	550	690			
	I_0 A								
5,6	24,5	14	13,5	11,2	10,2	8,1	28	40	5,60
6,3	36	20,5	19,7	16,4	14,9	12	45	63	8,20
7,1	43,5	25	24,1	20	18,2	14,5	71	100	10,00

Annex A (normative)

Cable input for the primary connection

A.1 Transformers

Two alternatives are possible for the cable input for the primary connection to the transformer.

A.1.1 One or two threaded holes shall be made on each of the four sides of the transformer, as indicated in figure 2.

The holes that are used shall be fitted with a conduit for the cable; the others shall be blocked by means of a special screw. The dimensions of the conduit and screw are given in table A.1.

A.1.2 An opening shall be made on all four sides of the transformer. Each of these openings shall be covered by a plate one or more of which has a hole for the passage of a cable conduit. The other shall be without holes.

Dimensions of such plates are shown in figure A.1. The openings shall be made so that the hole is positioned as indicated in figure 2. Conduit sizes are given in table A.1.

A.2 Rotary switch

Three alternatives are possible for the cable input for the primary connection to the rotary switch.

A.2.1 Four openings shall be made in the cover of the switch, as shown in figure A.1. These openings shall be covered by plates with or without a cable conduit, as indicated in A.1.1.

The sizes of the plates are shown in figure A.2; the conduit size shall be 40 mm in accordance with IEC 423.

A.2.2 A threaded hole shall be drilled into the surface of the switch with the lever. The opposite side of the switch shall be formed by a detachable plate.

A.2.3 Connection shall be made on the lever surface of the switch by means of a plug and socket device, the dimensions of which are shown in figure A.3. This alternative is only possible where the current is less than or equal to 200 A.

Table A.1 — Dimensions of the conduits

I_{2p} kA	Thread of steel conduit and screw in accordance with IEC 423	
	Conductors	
	1	3
	Nominal size mm	
5,6	32	50
6,3	40	50
7,1	40	50

Dimensions in millimetres

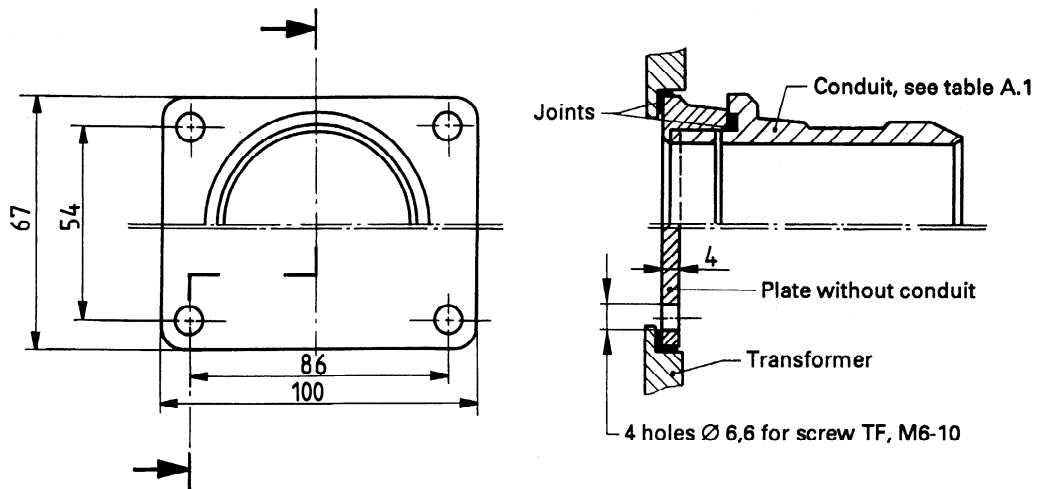


Figure A.1 — Dimensions of the plate for transformers

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Dimensions in millimetres

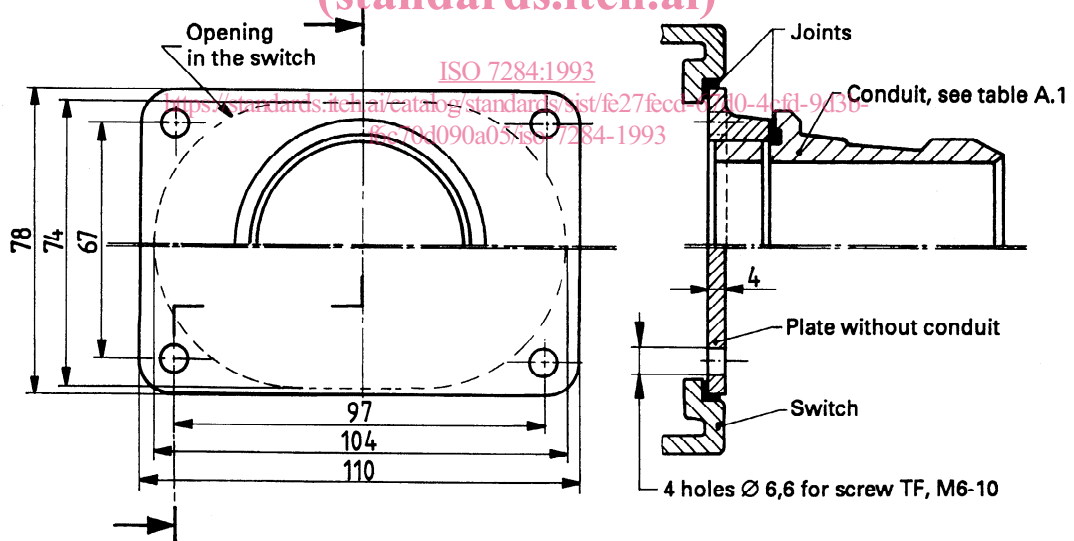


Figure A.2 — Dimensions of the plate for rotary switch