



SLOVENSKI STANDARD

SIST EN 60974-6:2011

01-marec-2011

Nadomešča:
SIST EN 60974-6:2003

Oprema za obločno varjenje - 6. del: Oprema za omejeno uporabo (IEC 60974-6:2010)

Arc welding equipment - Part 6: Limited duty equipment (IEC 60974-6:2010)

Lichtbogenschweißeinrichtungen - Teil 6: Schweißstromquellen mit begrenzter Einschaltdauer (IEC 60974-6:2010)

(standards.iteh.ai)

Matériel de soudage à l'arc - Partie 6: Matériel à service limité (CEI 60974-6:2010)

[SIST EN 60974-6:2011](https://standards.iteh.ai/catalog/standards/sist/c1340b2c-bb24-42ae-b34f-42e5/sist-en-60974-6:2011)

<https://standards.iteh.ai/catalog/standards/sist/c1340b2c-bb24-42ae-b34f-42e5/sist-en-60974-6:2011>

Ta slovenski standard je istoveten z: EN 60974-6:2011

ICS:

25.160.30 Varilna oprema Welding equipment

SIST EN 60974-6:2011 en

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 60974-6:2011

<https://standards.iteh.ai/catalog/standards/sist/c1340b2c-bb24-42ae-b34f-7193bb9f42e5/sist-en-60974-6-2011>

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 60974-6

January 2011

ICS 25.160.30

Supersedes EN 60974-6:2003 + corr. May.2005

English version

**Arc welding equipment -
Part 6: Limited duty equipment
(IEC 60974-6:2010)**

Matériel de soudage à l'arc -
Partie 6: Matériel à service limité
(CEI 60974-6:2010)

Lichtbogenschweißeinrichtungen -
Teil 6: Schweißstromquellen mit
begrenzter Einschaltdauer
(IEC 60974-6:2010)

This European Standard was approved by CENELEC on 2011-01-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Management Centre: Avenue Marnix 17, B - 1000 Brussels

Foreword

The text of document 26/429/FDIS, future edition 2 of IEC 60974-6, prepared by IEC TC 26, Electric welding, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60974-6 on 2011-01-01.

This European Standard supersedes EN 60974-6:2003 + corr. May.2005.

The main significant technical changes with respect to EN 60974-6:2003 + corr. May.2005 are the following:

- extension of the scope;
- amendment of the title;
- touch current at fault condition (see 6.3.7);
- new definition of thermal requirements based two independent devices, one for thermal protection and one for thermal control (see 7.1);
- new definition for thermal performances at 20 °C (see 7.2);
- thermal safety requirements are based on operating temperature for normal condition and maximum temperature in overload condition (see 7.4);
- addition of abnormal operation test for thermal control device (see 10.4);
- new requirement for auxiliaries (see Clause 16);
- new rating plate definition (see Clause 17);
- introduction of new mandatory warning symbols (see 12.1.117.3, Box 17b) and 19.2);
- induced changes due to publication of EN 60974-1:2005

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

The following dates were fixed:

- | | | |
|--|-------|------------|
| – latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement | (dop) | 2011-10-01 |
| – latest date by which the national standards conflicting with the EN have to be withdrawn | (dow) | 2014-01-01 |

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 60974-6:2010 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60127-1	NOTE	Harmonized as EN 60127-1.
IEC 60269-1	NOTE	Harmonized as EN 60269-1.
IEC 61558-1:2009	NOTE	Harmonized as EN 61558-1:2009 (not modified).

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

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.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60529	-	Degrees of protection provided by enclosures (IP Code)	EN 60529	-
IEC 60974-1	2005	Arc welding equipment - Part 1: Welding power sources	EN 60974-1	2005
IEC 60974-5	-	Arc welding equipment - Part 5: Wire feeders	EN 60974-5	-
IEC 60974-7	-	Arc welding equipment - Part 7: Torches	EN 60974-7	-
IEC 60974-10	-	Arc welding equipment - Part 10: Electromagnetic compatibility (EMC) requirements	EN 60974-10	-
IEC 60974-11	-	Arc welding equipment - Part 11: Electrode holders	EN 60974-11	-
IEC 61032	1997	Protection of persons and equipment by enclosures - Probes for verification	EN 61032	1998
ISO 2503	-	Gas welding equipment - Pressure regulators - and pressure regulators with flow-metering devices for gas cylinders used in welding, cutting and allied processes up to 300 bar (30 MPa)	-	-

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 60974-6:2011

<https://standards.iteh.ai/catalog/standards/sist/c1340b2c-bb24-42ae-b34f-7193bb9f42e5/sist-en-60974-6-2011>



IEC 60974-6

Edition 2.0 2010-11

INTERNATIONAL STANDARD

NORME INTERNATIONALE



**Arc welding equipment –
Part 6: Limited duty equipment**

STANDARD PREVIEW
(standards.iteh.ai)

**Matériel de soudage à l'arc –
Partie 6: Matériel à service limité**

[SIST EN 60974-6:2011](https://standards.iteh.ai/catalog/standards/sist/c1340b2c-bb24-42ae-b34f-7193bb9f42e5/sist-en-60974-6-2011)

<https://standards.iteh.ai/catalog/standards/sist/c1340b2c-bb24-42ae-b34f-7193bb9f42e5/sist-en-60974-6-2011>

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

PRICE CODE
CODE PRIX

W

ICS 25.160.30

ISBN 978-2-88912-265-3

CONTENTS

FOREWORD.....	6
1 Scope.....	8
2 Normative references.....	8
3 Terms and definitions.....	9
4 Environmental conditions.....	10
5 Tests.....	10
5.1 Test conditions	10
5.2 Measuring instruments.....	10
5.3 Conformity of components.....	10
5.4 Type tests	10
5.5 Routine tests	11
6 Protection against electric shock	11
6.1 Insulation	11
6.1.1 General.....	11
6.1.2 Clearances.....	11
6.1.3 Creepage distances.....	11
6.1.4 Insulation resistance.....	12
6.1.5 Dielectric strength.....	12
6.2 Protection against electric shock in normal service (direct contact).....	12
6.2.1 Protection provided by the enclosure.....	12
6.2.2 Capacitors.....	12
6.2.3 Automatic discharge of input capacitors.....	13
6.3 Protection against electric shock in case of a fault condition (indirect contact).....	13
6.3.1 Protective provisions	13
6.3.2 Isolation of the supply circuit and the welding circuit.....	13
6.3.3 Insulation between windings of the supply circuit and the welding circuit.....	13
6.3.4 Internal conductors and connections	13
6.3.5 Additional requirements for plasma cutting systems	13
6.3.6 Movable coils and cores.....	13
6.3.7 Touch current in fault condition.....	13
7 Thermal requirements	15
7.1 Devices for thermal protection and thermal control	15
7.2 Heating test.....	15
7.2.1 Test conditions	15
7.2.2 Tolerances of the test parameters.....	15
7.2.3 Rated maximum welding current	15
7.2.4 Calculation	16
7.3 Temperature measurement	16
7.3.1 Measurement condition.....	16
7.3.2 Surface temperature sensor	16
7.3.3 Resistance	16
7.3.4 Embedded temperature sensor	16
7.3.5 Determination of the ambient air temperature.....	16
7.3.6 Recording of temperatures	16
7.4 Limits of temperature.....	16

7.4.1	Windings, commutators and slip-rings	16
7.4.2	External surfaces	17
7.4.3	Other components	17
7.5	Loading test	17
7.6	Commutators and slip-rings	17
8	Thermal control device	18
8.1	Construction	18
8.2	Location	18
8.3	Operation	18
8.4	Resetting	18
8.5	Operating capacity	18
8.6	Indication	18
9	Thermal protection	19
9.1	Construction	19
9.2	Location	19
9.3	Operation	19
10	Abnormal operation	19
10.1	General requirements	19
10.2	Stalled fan test	20
10.3	Short circuit test	20
10.4	Overload test	20
11	Connection to the input supply network	20
11.1	Input supply	20
11.1.1	Supply voltage	20
11.1.2	Supply current	20
11.1.3	Engine driven welding power source	20
11.2	Multi supply voltage	21
11.3	Means of connection to the supply circuit	21
11.4	Supply circuit terminals	21
11.5	Cable anchorage	21
11.6	Inlet openings	21
11.7	Supply circuit on/off switching device	21
11.8	Supply cables	21
11.9	Supply coupling device (attachment plug)	21
12	Output	22
12.1	Rated no-load voltage	22
12.1.1	Rated no-load voltage for arc welding power source	22
12.1.2	Rated no-load voltage for plasma cutting power source	22
12.1.3	Additional requirements	23
12.1.4	Measuring circuit	23
12.2	Type test values of the conventional load voltage	25
12.2.1	Manual metal arc welding with covered electrodes	25
12.2.2	Tungsten inert gas	25
12.2.3	Metal inert/active gas and flux cored arc welding	25
12.2.4	Plasma cutting	25
12.2.5	Additional requirements	25
12.3	Mechanical switching devices used to adjust output	25
12.4	Welding circuit connections	25

12.4.1	Protection against unintentional contact	25
12.4.2	Location of coupling devices	25
12.4.3	Outlet openings.....	25
12.4.4	Marking.....	25
12.4.5	Connections for plasma cutting torches	25
12.5	Power supply to external devices.....	25
12.6	Auxiliary power output	26
12.7	Welding cables	26
13	Control circuits	26
14	Hazard reducing device.....	26
15	Mechanical provisions.....	27
15.1	General requirements	27
15.2	Enclosure.....	27
15.2.1	Enclosure materials.....	27
15.2.2	Enclosure strength	27
15.3	Handling means	27
15.4	Drop withstand.....	27
15.5	Tilting stability	27
16	Auxiliaries.....	27
16.1	General.....	27
16.2	Wire feeder.....	27
16.2.1	General.....	27
16.2.2	Test conditions	27
16.2.3	Thermal requirements.....	27
16.2.4	Protection against unintentional contact	27
16.3	Torch.....	28
16.3.1	General.....	28
16.3.2	Test conditions	28
16.3.3	Thermal requirements.....	28
16.4	Electrode holder.....	28
16.5	Pressure regulator	28
17	Rating plate	28
17.1	General requirements	28
17.2	Description.....	28
17.3	Contents	29
17.4	Tolerances	31
18	Adjustment of the output	31
19	Instructions and markings.....	31
19.1	Instructions	31
19.1.1	General.....	31
19.1.2	Instruction manual.....	32
19.1.3	Safety instructions.....	32
19.2	Markings	33
Annex A (informative)	Test probes	34
Annex B (informative)	Examples of rating plates	35
Annex C (informative)	Symbols-only precautionary label.....	36
Bibliography.....		37

Figure 1 – Measurement of touch current in fault condition	14
Figure 2 – Measuring network for weighted touch current	14
Figure 3 – Measurement of r.m.s values	24
Figure 4 – Measurement of peak values.....	24
Figure 5 – Principle of the rating plate	29
Figure A.1 – Test probe 12 of IEC 61032	34
Figure A.2 – Test probe 13 of IEC 61032	34
Figure B.1 – Rating plate.....	35
Figure C.1 – Example of precautionary label for engine driven manual metal arc welding power sourceBibliography	36
Table 1 – Temperature limits according to the class of insulation.....	17
Table 2 – Summary of rated no-load voltages.....	23
Table 3 – Hazard reducing device requirements for plasma cutting power source.....	26

iTeh STANDARD PREVIEW (standards.iteh.ai)

SIST EN 60974-6:2011

<https://standards.iteh.ai/catalog/standards/sist/c1340b2c-bb24-42ae-b34f-7193bb9f42e5/sist-en-60974-6-2011>

INTERNATIONAL ELECTROTECHNICAL COMMISSION

ARC WELDING EQUIPMENT –**Part 6: Limited duty equipment**

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.
- 2) The formal decisions or agreements of 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 IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 60974-6 has been prepared by IEC technical committee 26: Electric welding.

This second edition cancels and replaces the first edition published in 2003. It constitutes a technical revision.

The main significant technical changes with respect to the previous edition are the following:

- extension of the scope;
- amendment of the title;
- touch current at fault condition (see 6.3.7);
- new definition of thermal requirements based two independent devices, one for thermal protection and one for thermal control (see 7.1);
- new definition for thermal performances at 20 °C (see 7.2);
- thermal safety requirements are based on operating temperature for normal condition and maximum temperature in overload condition (see 7.4);

- addition of abnormal operation test for thermal control device (see 10.4);
- new requirement for auxiliaries (see Clause 16);
- new rating plate definition (see Clause 17);
- introduction of new mandatory warning symbols (see 12.1.117.3, Box 17b) and 19.2);
- induced changes due to publication of IEC 60974-1:2005.

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

FDIS	Report on voting
26/429/FDIS	26/437/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.

This standard is to be used in conjunction with IEC 60974-1:2005.

In this standard, the following print types are used:

- *conformity statements: in italic type.*

A list of all the parts in the IEC 60974 series, published under the general title *Arc welding equipment*, can be found on the IEC website.

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.

IMPORTANT – The “colour inside” logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this publication using a colour printer.