

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Arc welding equipment –
Part 1: Welding power sources**

**Matériel de soudage à l'arc –
Partie 1: Sources de courant de soudage**



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IEC Central Office
3, rue de Varembe
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
Fax: +41 22 919 03 00
info@iec.ch
www.iec.ch

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COMMISSION

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CONTENTS

FOREWORD.....	7
1 Scope.....	9
2 Normative references.....	9
3 Terms and definitions	10
4 Environmental conditions	18
5 Tests	19
5.1 Test conditions	19
5.2 Measuring instruments.....	19
5.3 Conformity of components	19
5.4 Type tests	20
5.5 Routine tests	20
6 Protection against electric shock.....	21
6.1 Insulation.....	21
6.1.1 General	21
6.1.2 Clearances	22
6.1.3 Creepage distances	23
6.1.4 Insulation resistance	25
6.1.5 Dielectric strength.....	25
6.2 Protection against electric shock in normal service (direct contact).....	26
6.2.1 Protection provided by the enclosure.....	26
6.2.2 Capacitors	27
6.2.3 Automatic discharge of supply circuit capacitors.....	27
6.2.4 Isolation of the welding circuit	28
6.2.5 Welding circuit touch current.....	28
6.2.6 Touch current in normal condition	29
6.3 Protection against electric shock in case of a fault condition (indirect contact).....	29
6.3.1 Protective provisions.....	29
6.3.2 Isolation between windings of the supply circuit and the welding circuit.....	29
6.3.3 Internal conductors and connections	29
6.3.4 Additional requirements for plasma cutting systems	30
6.3.5 Movable coils and cores.....	30
6.3.6 Touch current in fault condition	31
7 Thermal requirements.....	31
7.1 Heating test	31
7.1.1 Test conditions	31
7.1.2 Tolerances of the test parameters.....	32
7.1.3 Duration of test	32
7.2 Temperature measurement.....	32
7.2.1 Measurement conditions	32
7.2.2 Surface temperature sensor.....	32
7.2.3 Resistance.....	33
7.2.4 Embedded temperature sensor	33
7.2.5 Determination of the ambient air temperature.....	33
7.2.6 Recording of temperatures.....	33
7.3 Limits of temperature rise	34

7.3.1	Windings, commutators and slip-rings	34
7.3.2	External surfaces	34
7.3.3	Other components	35
7.4	Loading test	35
7.5	Commutators and slip-rings	36
8	Thermal protection	36
8.1	General requirements	36
8.2	Construction	36
8.3	Location	36
8.4	Operating capacity	36
8.5	Operation	37
8.6	Resetting	37
8.7	Indication	37
9	Abnormal operation	37
9.1	General requirements	37
9.2	Stalled fan test	38
9.3	Short circuit test	38
9.4	Overload test	38
10	Connection to the supply network	39
10.1	Supply voltage	39
10.2	Multi-supply voltage	39
10.3	Means of connection to the supply circuit	39
10.4	Marking of terminals	40
10.5	Protective circuit	40
10.5.1	Continuity requirement	40
10.5.2	Type test	41
10.5.3	Routine test	41
10.6	Cable anchorage	42
10.7	Inlet openings	43
10.8	Supply circuit on/off switching device	43
10.9	Supply cables	44
10.10	Supply coupling device (attachment plug)	44
11	Output	45
11.1	Rated no-load voltage	45
11.1.1	Rated no-load voltage for use in environments with increased risk of electric shock	45
11.1.2	Rated no-load voltage for use in environments without increased risk of electric shock	45
11.1.3	Rated no-load voltage for the use with mechanically held torches with increased protection for the operator	45
11.1.4	Rated no-load voltage for special processes for example plasma cutting	45
11.1.5	Additional requirements	46
11.1.6	Measuring circuits	47
11.2	Type test values of the conventional load voltage	48
11.2.1	Manual metal arc welding with covered electrodes	48
11.2.2	Tungsten inert gas	48
11.2.3	Metal inert/active gas and flux cored arc welding	48
11.2.4	Submerged arc welding	48

11.2.5	Plasma cutting	48
11.2.6	Plasma welding	48
11.2.7	Plasma gouging	48
11.2.8	Additional requirements	48
11.3	Mechanical switching devices used to adjust output	48
11.4	Welding circuit connections	49
11.4.1	Protection against unintentional contact	49
11.4.2	Location of coupling devices	49
11.4.3	Outlet openings	49
11.4.4	Three-phase multi-operator welding transformer	49
11.4.5	Marking	49
11.4.6	Connections for plasma cutting torches	50
11.5	Power supply to external devices connected to the welding circuit	50
11.6	Auxiliary power supply	50
11.7	Welding cables	51
12	Control circuits	51
12.1	General requirement	51
12.2	Isolation of control circuits	51
12.3	Working voltages of remote control circuits	51
13	Hazard reducing device	51
13.1	General requirements	51
13.2	Types of hazard reducing devices	52
13.2.1	Voltage reducing device	52
13.2.2	Switching device for a.c. to d.c.	52
13.3	Requirements for hazard reducing devices	52
13.3.1	Disabling the hazard reducing device	52
13.3.2	Interference with operation of a hazard reducing device	52
13.3.3	Indication of satisfactory operation	53
13.3.4	Fail to a safe condition	53
14	Mechanical provisions	53
14.1	General requirements	53
14.2	Enclosure	53
14.2.1	Enclosure materials	53
14.2.2	Enclosure strength	53
14.3	Handling means	54
14.3.1	Mechanised handling	54
14.3.2	Manual handling	54
14.4	Drop withstand	55
14.5	Tilting stability	55
15	Rotating plate	55
15.1	General requirements	55
15.2	Description	55
15.3	Contents	56
15.4	Tolerances	59
15.5	Direction of rotation	60
16	Adjustment of the output	60
16.1	Type of adjustment	60
16.2	Marking of the adjusting device	60

16.3	Indication of current or voltage control	60
17	Instructions and markings	61
17.1	Instructions	61
17.2	Markings	62
Annex A (informative)	Nominal voltages of supply networks	63
Annex B (informative)	Example of a combined dielectric test	64
Annex C (normative)	Unbalanced load in case of a.c. tungsten inert-gas welding power sources	65
Annex D (informative)	Extrapolation of temperature to time of shutdown	67
Annex E (normative)	Construction of supply circuit terminals	68
Annex F (informative)	Cross-reference to non-SI units	70
Annex G (informative)	Suitability of supply network for the measurement of the true r.m.s. value of the supply current	71
Annex H (informative)	Plotting of static characteristics	72
Annex I (normative)	Test methods for a 10 Nm impact	73
Annex J (normative)	Thickness of sheet metal for enclosures	74
Annex K (informative)	Examples of rating plates	76
Annex L (informative)	Graphical symbols for arc welding equipment	81
Annex M (informative)	Efficiency	104
Annex N (normative)	Touch current measurement in fault condition	105
	Bibliography	109
	Figure 1 – Example of insulation configuration for Class I equipment	21
	Figure 2 – Measurement of welding circuit touch current	28
	Figure 3 – Measurement of r.m.s. values	47
	Figure 4 – Measurement of peak values	47
	Figure 5 – Principle of the rating plate	56
	Figure B.1 – Combined high-voltage transformers	64
	Figure C.1 – Voltage and current during a.c. tungsten inert-gas welding	65
	Figure C.2 – Unbalanced voltage during a.c. tungsten inert-gas welding	66
	Figure C.3 – AC welding power source with unbalanced load	66
	Figure I.1 – Test set-up	73
	Figure K.1 – Single-phase transformer	76
	Figure K.2 – Three-phase rotating frequency converter	77
	Figure K.3 – Subdivided rating plate: single-/three-phase transformer rectifier	78
	Figure K.4 – Engine-generator-rectifier	79
	Figure K.5 – Single-/three-phase inverter type	80
	Figure L.1 – Input voltage power switch	101
	Figure L.2 – Arc force control potentiometer	101
	Figure L.3 – Remote receptacle and selector switches	102
	Figure L.4 – Terminals with inductance selector for MIG/MAG welding	102
	Figure L.5 – Process switch (MMA, TIG, MIG)	102
	Figure L.6 – Selector switch on AC/DC equipment	102
	Figure L.7 – Panel indicator lights (overheat, fault, arc striking, output voltage)	103

Figure L.8 – Setting pulsing parameters using digital display.....	103
Figure N.1 – Measuring network for weighted touch current	105
Figure N.2 – Diagram for touch current measurement on fault condition at operating temperature for single-phase connection of appliances other than those of class II	107
Figure N.3 – Diagram for touch current measurement on fault condition for three-phase four-wire system connection of appliances other than those of class II	108
Table 1 – Minimum clearances for overvoltage category III	22
Table 2 – Minimum creepage distances	24
Table 3 – Insulation resistance	25
Table 4 – Dielectric test voltages	25
Table 5 – Minimum distance through insulation.....	29
Table 6 – Temperature limits for windings, commutators and slip-rings	34
Table 7 – Temperature limits for external surfaces	35
Table 8 – Cross-section of the output short-circuit conductor	38
Table 9 – Current and time requirements for protective circuits	41
Table 10 – Minimum cross-sectional area of the external protective copper conductor	41
Table 11 – Verification of continuity of the protective circuit	42
Table 12 – Pull.....	43
Table 13 – Summary of allowable rated no-load voltages	46
Table 14 – Hazard reducing device requirements.....	52
Table E.1 – Range of conductor dimensions to be accepted by the supply circuit terminals.....	68
Table F.1 – Cross-reference for mm ² to American wire gauge (AWG)	70
Table I.1 – Angle of rotation θ to obtain 10 J/m impact	73
Table I.2 – Mass of the free fall weight and height of the free fall	73
Table J.1 – Minimum thickness of sheet metal for steel enclosures.....	74
Table J.2 – Minimum thickness of sheet metal for enclosures of aluminium, brass or copper	75
Table L.1 – Letters used as symbols	82

INTERNATIONAL ELECTROTECHNICAL COMMISSION

ARC WELDING EQUIPMENT –

Part 1: Welding power sources

FOREWORD

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International Standard IEC 60974-1 has been prepared by IEC technical committee 26: Electric welding.

This fourth edition cancels and replaces the third edition published in 2005 and constitutes a technical revision.

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

- the heating test shall be carried out at ambient temperature of 40 °C (see 5.1);
- new Figure 1 summarizes example of insulation requirements;
- creepage distances for pollution degree 4 are no longer valid (see Table 2);
- insulation requirements for Class II equipment are defined (see Table 3);
- dielectric test voltage interpolation restriction lower limit is changed to 220 V and interpolation for control and welding circuit is clarified (see Table 4);
- water test is clarified by suppression of visual inspection (see 6.2.1);

- isolation requirements of the supply circuit and the welding circuit are moved in protection against electric shock in normal service (see 6.2.4);
- touch current in normal service and in single fault condition requirements are changed (see 6.2.5, 6.2.6 and 6.3.6);
- maximum temperature for insulation systems are reviewed in accordance with current edition of IEC 60085 (see Table 6);
- limits of temperature rise for external surfaces are updated depending of unintentional contact period as defined in ISO 13732-1 (see Table 7);
- loading test is completed by a dielectric test (see 7.4);
- conformity test for tolerance to supply voltage fluctuation is clarified (see 10.1);
- marking of terminals is limited to external protective conductor and three-phase equipment terminals (see 10.4);
- usage of hazard reducing device is clarified (see 11.1);
- requirements for control circuits are changed (see Clause 12);
- impact test is clarified (see 14.2.2);
- environmental parameters are completed (see Annex M).

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

FDIS	Report on voting
26/472/FDIS	26/479/Rv

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.

In this standard, the following print types are used:

- *conformity statements*: in italic type

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

ARC WELDING EQUIPMENT –

Part 1: Welding power sources

1 Scope

This part of IEC 60974 is applicable to power sources for arc welding and allied processes designed for industrial and professional use, and supplied by a voltage not exceeding 1 000 V, or driven by mechanical means.

This part of IEC 60974 specifies safety and performance requirements of welding power sources and plasma cutting systems.

This part of IEC 60974 is not applicable to welding power sources for manual metal arc welding with limited duty operation which are designed mainly for use by laymen and designed in accordance with IEC 60974-6.

This part of IEC 60974 is not applicable to testing of power sources during periodic maintenance or after repair.

NOTE 1 Typical allied processes are electric arc cutting and arc spraying.

NOTE 2 AC systems having a nominal voltage between 100 V and 1 000 V are given in Table 1 of IEC 60038:2009.

NOTE 3 This part of IEC 60974 does not include electromagnetic compatibility (EMC) requirements.

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 60050-151:2001, *International Electrotechnical Vocabulary (IEV) – Part 151: Electrical and magnetic devices*

IEC 60050-851:2008, *International Electrotechnical Vocabulary (IEV) – Part 851: Electric welding*

IEC 60245-6, *Rubber insulated cables – Rated voltages up to and including 450/750 V – Part 6: Arc welding electrode cables*

IEC 60417-DB:20111, *Graphical symbols for use on equipment*

IEC 60445, *Basic and safety principles for man-machine interface, marking and identification – Identification of equipment terminals, conductor terminations and conductors*

IEC 60529, *Degrees of protection provided by enclosures (IP Code)*

¹ “DB” refers to the IEC on-line database.