



TEST REPORT

EN IEC 60974-1:2022/A12:2023

Arc welding equipment - Part 1: Welding power sources

EN 60974-4:2016

Arc welding equipment - Part 4: Periodic inspection and testing

EN 60974-6:2016

Arc welding equipment - Part 6: Limited duty equipment

EN IEC 60974-14:2018/AC:2022-02

Arc welding equipment - Part 14: Calibration, validation and consistency testing

For

Guangzhou Auctech Automation Technology Ltd

Room 903, Building E1, Design City, No. 7, Hexian North Street, Helong Street,
Baiyun District, Guangzhou City, CHINA

Model:

MIG-630MR、MIG-630XR、MIG-500R、MIG-500IXRR、MIG-500IXR、MIG-500MR、
MIG-500XR、MIG-350XR、MIG-350MR、MIG-350IXR、MIG-350IIR、MIG-350R

2025-05-15

This Report Concerns: ☒ Original Report	Equipment Type: MIG WELDING MACHINE
Test By:	Engine Chen/
Report Number:	TH2505147-C01-R01
Test Date:	2025-05-11 to 2025-05-15
Reviewed By:	Prince Huang /
Approved By:	Prince Huang /
Prepared By:	Shenzhen Tian Hai Test Technology Co., Ltd. 401-501, Building A5, The Silicon Valley Power Intelligent Terminal Industrial Park, No. 20, Dafu Industrial Zone, Dafu Community, Guanlan Street, Longhua District, Shenzhen City Tel : 86-755-86615100 Fax: 86-755-86615105

Note: This test report is limited to the above client company and the product model only. It may not be duplicated without prior written consent of Shenzhen Tian Hai Test Technology Co., Ltd.



TEST REPORT

EN IEC 60974-1:2022/A12:2023

EN 60974-4:2016

EN 60974-6:2016

EN IEC 60974-14:2018/AC:2022-02

Report Reference No...... TH2505147-C01-R01

Tested by (signature)..... Engine Chen

Reviewed by (signature)..... Prince Huang

Approved by (signature)..... Prince Huang

Date of issue..... 2025-05-15

Testing Laboratory Name..... **Shenzhen Tian Hai Test Technology Co., Ltd.**

Address..... 401-501, Building A5, The Silicon Valley Power Intelligent Terminal Industrial Park, No. 20, Dafu Industrial Zone, Dafu Community, Guanlan Street, Longhua District, Shenzhen City

Testing location..... Same as above

Applicant's Name..... **Guangzhou Aucotech Automation Technology Ltd**

Address..... Room 903, Building E1, Design City, No. 7, Hexian North Street, Helong Street, Baiyun District, Guangzhou City, CHINA

Manufacturer..... **Guangzhou Aucotech Automation Technology Ltd**

Address..... Room 903, Building E1, Design City, No. 7, Hexian North Street, Helong Street, Baiyun District, Guangzhou City, CHINA

Test specification

Standard(s)..... EN IEC 60974-1:2022/A12:2023、EN 60974-4:2016、EN 60974-6:2016
EN IEC 60974-14:2018/AC:2022-02

Test procedure CE mark

Non-standard test method..... N/A

Test item description..... **MIG WELDING MACHINE**

Model and/or type reference..... MIG-630MR、MIG-630XR、MIG-500R、MIG-500IXRR、MIG-500IXR、
MIG-500MR、MIG-500XR、MIG-350XR、MIG-350MR、MIG-350IXR、
MIG-350IIR、MIG-350R

Model Difference and Rating..... See next Page.

Note..... All test perform on model:MIG-500IXR.



Model Difference

Model No.	Working voltage	Duty Cycle	Maximum output current
MIG-630MR	220V/380V	X=100%	630A
MIG-630XR	220V/380V	X=100%	630A
MIG-500R	220V/380V	X=100%	500A
MIG-500IIR	220V/380V	X=100%	500A
MIG-500IXR	220V/380V	X=100%	500A
MIG-500MR	220V/380V	X=100%	500A
MIG-500XR	220V/380V	X=100%	500A
MIG-350XR	220V/380V	X=100%	350A
MIG-350MR	220V/380V	X=100%	350A
MIG-350IXR	220V/380V	X=100%	350A
MIG-350IIR	220V/380V	X=100%	350A
MIG-350R	220V/380V	X=100%	350A



Test case verdicts

Test case does not apply to the test object : N/A (Not apply)
Test item does meet the requirement : P(Pass)
Test item does not meet the requirement : F(Fail)

General remarks:

""See remark #)""refers to a remark appended to the report.
""See appended table)""refers to a table appended to the report.
Throughout this report a comma is used as the decimal separator.
The test results presented in this report relate only to the object tested.
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Attachment include:

Appendix for photo

Remarks:

Copy of the marking plate

Product: MIG WELDING MACHINE

Model: MIG-500IXR



Guangzhou Auctech Automation Technology Ltd

Room 903, Building E1, Design City, No. 7, Hexian North Street, Helong Street,
Baiyun District, Guangzhou City, CHINA

EN IEC 60974-1:2022/A12:2023、EN 60974-4:2016、EN 60974-6:2016、EN IEC 60974-14:2018/AC:2022-02



Clause	Requirement Test	Result	Verdict
4	Environmental conditions		P
	WELDING POWER SOURCES shall be capable of delivering RATED OUTPUTS at rated DUTY CYCLES when the following environmental conditions prevail:		P
	a. range of ambient air temperature:		P
	during operation:-10°C to +40°C	Complied	P
	b. relative humidity of the air:		P
	up to 50 % at 40°C;	Complied	P
	up to 90 % at 20°C;	Complied	P
	c. ambient air, free from abnormal amounts of dust, acids, corrosive gases or substances, etc.other than those generated by the welding process;	Complied	P
	d. altitude above sea level up to 1000 m;	Complied	P
	e. base of the WELDING POWER SOURCE inclined up to 10°	Complied	P
	WELDING POWER SOURCES shall withstand storage and transport at an ambient air temperature of -20°C to +55°C without any damage to function and performance.	Complied	P
6	Protection against electric shock		P
6.1	Insulation	Complied	P
6.1.1	General		P
	The majority of WELDING POWER SOURCES fall within the overvoltage category II in accordance with IEC 60664-1; mechanically powered WELDING POWER SOURCES fall within overvoltage category II.All WELDING POWER SOURCES shall be designed for use in environmental conditions of POLLUTION DEGREE 3 as a minimum.	Class III	P
	Components or subassemblies with CLEARANCES Or CREEPAGE DISTANCES corresponding to POLLUTION DEGREE 2 are permitted if the MICRO-ENVIRONMENT of the component or subassembly is improved (by means such as filtering, coating, potting, moulding) so that only non-conductive pollution or occasional temporary conductivity caused by condensation occurs.	Complied	P
	Components or subassemblies with CLEARANCES Or CREEPAGE DISTANCES corresponding to POLLUTION DEGREE 1 are permitted, if they are completely coated, potted or moulded in accordance with IEC 60664-3.	Complied	P
	See Table 3 for printed wiring material CREEPAGE DISTANCES.	Complied	P
	CLASS I EQUIPMENT intended to be connected to an earthed three-phase three-wire system shall be designed with insulation based on line to line voltage values. CLASS I EQUIPMENT designed with insulation based on line to neutral voltage values shall be provided with a caution that such equipment shall only be used on a supply network that is either a three-phase, four-wire system with an earthed neutral or a single-phase, three-wire, system with an earthed neutral.	Complied	P
	The application of insulation in many configurations is illustrated in Figure 2, but other configurations and solutions are possible. If a particular configuration is not represented in Figure 2, the required insulation shall be determined by considering the effect of a single fault.	Complied	P
6.1.2	CLEARANCES		P



EN IEC 60974-1:2022/A12:2023、EN 60974-4:2016、EN 60974-6:2016、EN IEC 60974-14:2018/AC:2022-02			
Clause	Requirement Test	Result	Verdict
	For circuits directly connected to the mains supply the voltage line-to-neutral shall be derived from Table A.1. For BASIC or SUPPLEMENTARY INSULATION, and REINFORCED INSULATION, minimum CLEARANCES shall be in accordance with Table 2 for overvoltage category III. For other overvoltage categories, minimum CLEARANCES shall be in accordance with IEC 60664-1.	Complied	P
	The values of Table 2 shall also apply to the WELDING CIRCUIT within the WELDING POWER SOURCE and to CONTROL CIRCUITS when separated from the SUPPLY CIRCUIT, for example by a transformer.	Complied	P
6.1.3	CREEPAGE DISTANCES		P
	The basis for the determination of a CREEPAGE DISTANCE is the long-term RMS value of the voltage existing across it. This voltage is the highest value of the steady-state WORKING VOLTAGE as specified in IEC 60664-1:2020, 4.2.5), the rated insulation voltage or the rated voltage. For the determination of the rated insulation voltages Table A.2 and Table A.3 can be used.	Complied	P
6.1.4	Insulation resistance		P
	The insulation resistance shall be not less than the values given in Table 4.	Complied	P
6.1.5	Dielectric strength		P
	The insulation shall withstand the following test voltages without any flashover or breakdown:		P
	a. first test of a WELDING POWER SOURCE: test voltages given in Table 5;	Complied	P
	b. repetition of the test of the same WELDING POWER SOURCE: test voltage 80 % of the values given in Table 5		N/A
6.2	Protection against electric shock in normal service (direct contact)		P
6.2.1	Protection provided by the enclosure		P
	WELDING POWER SOURCES specifically designed for indoor use shall have a minimum degree of protection of IP21S using IEC 60529 test procedures and conditions.		N/A
	WELDING POWER SOURCES specifically designed for outdoor use shall have a minimum degree of protection of IP23S using IEC 60529 test procedures and conditions.	IP23S	P
	WELDING POWER SOURCES with degree of protection IP23S can be stored, but are not intended to be used outside during precipitation unless sheltered.	Complied	P
	Adequate drainage shall be provided by the enclosure. Retained water shall not interfere with the operation of the equipment or impair safety. The quantity of water that may enter the enclosure is not limited.	Complied	P
	WELDING CIRCUIT connections shall be protected as specified in 11.4.1.	Complied	P
	REMOTE CONTROLS for WELDING POWER SOURCES shall have a minimum degree of protection of IP2X using IEC 60529 test procedures and conditions.	Complied	P
	A WELDING POWER SOURCE shall be subjected to the appropriate water test without being energized. Immediately after the test, the WELDING POWER SOURCE shall be moved to a safe environment and subjected to the insulation resistance test, listed in 5.4 g) and dielectric strength test, listed in 5.4 h)	Complied	P
6.2.2	Capacitors		N/A



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Clause	Requirement Test	Result	Verdict
	Each capacitor provided as part of a WELDING POWER SOURCE and connected either across a SUPPLY CIRCUIT or across a winding of a transformer providing WELDING CURRENT shall		N/A
	a. not contain more than 1 l of flammable liquid;		N/A
	b. be designed not to leak during normal service;		N/A
	c. be contained within the WELDING POWER SOURCE enclosure or other enclosure which conforms to the relevant requirements of this document.		N/A
	For capacitor short circuit test, see 9.5.		N/A
6.2.3	Automatic discharge of SUPPLY CIRCUIT capacitors		N/A
	Each capacitor shall be provided with a means of automatic discharge which shall reduce the voltage across the capacitor to 60 V or less within the time necessary to give access to any current carrying part connected to the capacitor or an appropriate warning label shall be used. For any plug which has a voltage due to a capacitor, the access time is considered to be 1 s.		N/A
	Capacitors having a rated capacitance not exceeding 0,1 pF are not considered to present a risk of electric shock.		N/A
	Conformity shall be checked by VISUAL INSPECTION and by the following test.		N/A
	The WELDING POWER SOURCE is operated at the highest RATED SUPPLY VOLTAGE. The WELDING POWER SOURCE is then disconnected from the supply network and the voltages are measured with instruments that do not significantly affect the values being measured.		N/A
6.2.4	Isolation of the WELDING CIRCUIT		N/A
	The WELDING CIRCUIT shall be isolated from the SUPPLY CIRCUIT and from all other circuits having a voltage higher than the allowable NO-LOAD VOLTAGE in accordance with 11.1.1 (for example auxiliary power SUPPLY CIRCUITS) by reinforced or DOUBLE INSULATION or equivalent means that meet the requirements of 6.1. If another circuit is connected to the WELDING CIRCUIT, the power of the other circuit shall be supplied by an isolating transformer or equivalent means.		N/A
	The WELDING CIRCUIT shall not be connected internally to the connecting means for the external protective conductor, the enclosure, frame or core of the WELDING POWER SOURCE, except, if necessary, by an interference suppression network or protection capacitor.		N/A
	Conformity shall be checked by tests given in 6.1.		N/A
6.2.5	WELDING CIRCUIT TOUCH CURRENT		N/A
	The TOUCH CURRENT between the WELDING CIRCUIT connections and the protective conductor terminal shall not exceed 14,1 mA peak.		N/A
	Conformity shall be checked by VISUAL INSPECTION and measurement of the TOUCH CURRENT with a circuit as shown in Figure 3 at the RATED SUPPLY VOLTAGE(S) and no-load condition.		N/A
	The measuring network specified in Figure N.2 shall be connected as shown in Figure 3.		N/A
6.2.6	TOUCH CURRENT in normal condition	Complied	P
	The TOUCH CURRENT for accessible conductive surfaces, not connected to the PROTECTIVE CIRCUIT, shall not exceed 0,7mA peak under normal conditions.	0.57mA	P



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Clause	Requirement Test	Result	Verdict
	Conformity shall be checked by measurement of the TOUCH CURRENT with a circuit as shown in Figure 4 and the measurement network of Figure N.1, without simulating any fault and under the following conditions:		P
	a. the WELDING POWER SOURCE is:		P
	--- isolated from the ground plane;	Complied	P
	--- supplied by the highest RATED SUPPLY VOLTAGE plus an appropriate working tolerance as specified by the manufacturer, at least +10 % for any supply, except +6 % for supply systems with 600 V or greater;	Complied	P
	b. the WELDING CIRCUIT is in the no-load condition;	Complied	P
	c. interference suppression capacitors are not disconnected.		N/A
6.3	Protection against electric shock in case of a fault condition (indirect contact)	Complied	P
6.3.1	Protective provisions		P
	WELDING POWER SOURCES shall be CLASS I or CLASS II EQUIPMENT in accordance with IEC 61140,with the exception of the WELDING CIRCUIT.	CLASS I	P
6.3.2	Isolation between windings of the SUPPLY CIRCUIT and the WELDING CIRCUIT		P
	Windings of the SUPPLY CIRCUIT and the WELDING CIRCUIT shall be isolated by		P
	a. reinforced or DOUBLEINSULATION	reinforced	P
	or		P
	b. BASIC INSULATION to a metal screen between them which is connected to the protective conductor.		N/A
	Between the windings of the SUPPLY CIRCUIT and the WELDING CIRCUIT, there shall be insulation which conforms to the values given in Table 6. Alternatively, other means specified in IEC 61558-1 may be used provided that the complete requirements of IEC 61558-1 are satisfied.	Complied	P
6.3.3	Internal conductors and connections		p
	Internal conductors and connections shall be secured or positioned to prevent accidental loosening,which could cause electrical connection between		P
	a. the SUPPLY CIRCUIT or any other circuit and the WELDING CIRCUIT so that the output voltage could become higher than the allowable NO-LOAD VOLTAGE;	reinforced	P
	b. the protective conductor, enclosure, frame or core and the WELDING CIRCUIT.		N/A
	Where insulated conductors pass through metallic parts, they shall be provided with bushings of insulating material or the openings shall be smoothly rounded with a radius of at least1,5 mm.		N/A
	Bare conductors shall be so fixed that the CLEARANCE and CREEPAGE DISTANCE from each other and from conductive parts is maintained (see 6.1.2 and 6.3.2).		N/A
	Conductors of different circuits may be laid side by side, may occupy the same duct (for example conduit, cable trunking system), or may be in the same multiconductor cable provided that the arrangement does not impair the proper functioning of the respective circuits. Where those circuits operate at different voltages, the conductors shall be separated by suitable barriers or shall be insulated for the highest voltage to which any conductor within the same duct can be subjected.		N/A
6.3.4	Additional requirements for PLASMA CUTTING SYSTEMS	Complied	P



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Clause	Requirement Test	Result	Verdict
	The plasma cutting torch, parts (e.g. parts typically replaced due to wear) and PLASMA CUTTING POWER SOURCE, recommended by the manufacturer, shall form a safe system.		P
	Plasma tips, which for technical reasons cannot be protected against direct contact, shall be considered sufficiently protected for normal use and SINGLE-FAULT CONDITION if the following requirements are fulfilled:		P
	a. when no arc current is present:		P
	the voltage between the plasma tip and the workpiece and/or earth is not higher than the values given in 11.1.1,	Complied	P
	or		--
	the PLASMA CUTTING POWER SOURCE is fitted with a HAZARD REDUCING DEVICE in accordance with Clause 13	Complied	P
	and		--
	b. for manual systems, when an arc current is present:		P
	the sides of a plasma tip cannot be touched by the standard test finger in accordance with IEC 60529 when it is placed on a flat surface with its centre line perpendicular to it,	Complied	P
	or		--
	the DC LOAD VOLTAGE between the plasma tip and the workpiece and/or earth is not higher than values given in 11.1.1.	Complied	P
6.3.5	Movable coils and cores		N/A
	If movable coils or cores are used to adjust the WELDING CURRENT, the construction shall be such that the prescribed CLEARANCES and CREEPAGE DISTANCES are maintained, taking into account electrical and mechanical stresses.		N/A
	Conformity shall be checked by operating the mechanism 500 times over its complete movement between minimum and maximum at the rate specified by the manufacturer and by VISUAL INSPECTION.		N/A
6.3.6	TOUCH CURRENT in fault condition		P
	For CLASS I EQUIPMENT, the weighted TOUCH CURRENT in the case of an external protective conductor failure or disconnection shall not exceed 14,1 mA peak except for equipment with permanent connection by a reinforced protective conductor in accordance with IEC 61140.	Complied	P
	Equipment for permanent connection with a reinforced protective conductor may have a leakage current up to 5 % of the RATED SUPPLY CURRENT per phase.	Complied	P
	Conformity shall be checked using the configurations as shown in Annex N with measurement network of Figure N.2 under the following conditions:	Complied	P
	1) the WELDING POWER SOURCE is:		P
	--- isolated from the ground plane;	Complied	P
	--- fully assembled and ready for use in the maximum configuration;	Complied	P
	--- supplied by the highest RATED SUPPLY VOLTAGE plus an appropriate working tolerance as specified by the manufacturer, at least +10 % for any supply, except +6 % for supply systems with 600 V or greater;	Complied	P
	--- not connected to the protective earth except through measurement components;	Complied	P
	2) the WELDING CIRCUIT is in the no-load condition;	Complied	P
	3) interference suppression capacitors shall not be disconnected.		N/A
7	Thermal requirements		P
7.1	Heating test	Complied	P



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Clause	Requirement Test	Result	Verdict
7.1.1	Test conditions		P
	When placing the measuring devices, the only access permitted shall be through openings with cover plates, inspection doors or easily removable panels provided by the manufacturer. The ventilation in the test area and the measuring devices used shall not interfere with the normal ventilation of the WELDING POWER SOURCE or cause abnormal transfer of heat to or from it.		P
	The WELDING POWER SOURCE is operated at RATED SUPPLY VOLTAGE, with constant current, at a cycle time of (10±0,2) min:		P
	a. with the rated WELDING CURRENT (I ₂) at 60 % and/or 100 % DUTY CYCLE as appropriate;	Complied	P
	b. with the RATED MAXIMUM WELDING CURRENT (/2max) at the corresponding DUTY CYCLE.		P
	If it is known that neither a) nor b) gives maximum heating, then a test shall be made at the setting within the rated range which gives the maximum heating.	Complied	P
	In the case of a WELDING POWER SOURCE rated for AC tungsten inert-gas welding, an unbalanced load could cause maximum heating. In this case, a test shall be carried out as given in Annex C.	Complied	P
	The ambient temperature condition of 5.1 shall be fulfilled.		P
7.1.2	Tolerances of the test parameters		P
	During the last 60 min of the heating test in accordance with 7.1.3, the following tolerances shall be met:		P
	a. LOAD VOLTAGE: $\begin{matrix} +10 \\ -2 \end{matrix}$ % of the appropriate CONVENTIONAL LOAD VOLTAGE	Complied	P
	b. WELDING CURRENT: $\begin{matrix} +10 \\ -2 \end{matrix}$ % of the appropriate CONVENTIONAL WELDING CURRENT	Complied	P
	c. supply voltage: ±5 % of the appropriate RATED SUPPLY VOLTAGE;	Complied	P
	d. engine speed: ±5 % of the appropriate rated speed;	Complied	P
	e. temperature: $\begin{matrix} +10 \\ -2 \end{matrix}$ K of the ambient temperature.	Complied	P
7.1.3	Duration of test		P
	The heating test shall be carried out until the rate of the TEMPERATURE RISE does not exceed 2 K/h on any component for a period not less than 60 min.	Complied	P
7.2	Temperature measurement		P
7.2.1	Measurement conditions		P
	The temperature shall be determined at the midpoint of the load time of the last cycle as follows:		P
	a. for windings, by measurement of the resistance, or by surface or embedded temperature sensors;	Complied	P
	b. for other parts, by surface temperature sensors.	Complied	P
7.2.2	Surface temperature sensor		P
	The temperature is measured by a temperature sensor applied to accessible surfaces of windings or other parts in accordance with the conditions stipulated below.	Complied	P
	Bulb thermometers shall not be used for measuring temperatures of windings and surfaces.	Complied	P



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Clause	Requirement Test	Result	Verdict
	Temperature sensors are placed at accessible spots where the maximum temperature is likely to occur. It is advisable to locate the predictable hot spots by means of a preliminary check.	Complied	P
	Efficient heat transmission between the point of measurement and the temperature sensor shall be ensured, and protection shall be provided for the temperature sensor against the effect of air currents and radiation.	Complied	P
7.2.3	Resistance		P
	The TEMPERATURE RISE of windings is determined by the increase in their resistance and is obtained for copper by the following formula:	Complied	P
7.2.4	Embedded temperature sensor		N/A
	The temperature is measured by thermocouples or other suitable temperature measuring instruments of comparable size embedded at the hottest parts.		N/A
	Thermocouples shall be applied directly to windings and coils. Any integrally applied insulation on the conductors themselves is not required to be removed.		N/A
	A thermocouple applied to the hottest point of a single layer winding is considered as embedded.		N/A
7.2.5	Determination of the ambient air temperature		P
	The ambient air temperature is determined by at least three measuring devices. These are spaced uniformly around the WELDING POWER SOURCE, at approximately one-half of its height and 1 m to 2 m from its surface. They are protected from draughts and abnormal heating. The mean value of the temperature readings is adopted as the temperature of the ambient air.	Complied	P
	in the case of forced air-cooled WELDING POWER SOURCES, a single measuring device is placed where the air enters the cooling system. The mean of the readings taken at equal intervals of time during the last quarter of the duration of the test is adopted as the ambient air temperature.	Complied	P
7.2.6	Recording of temperatures		P
	Where possible. temperatures are recorded while the equipment is in operation and after shutdown. On those parts where the recording of temperature is not possible while the equipment is in operation, temperatures are taken after shutdown as described below.	Complied	P
	Whenever a sufficient time has elapsed between the instant of shutdown and the time of final temperature measurement to permit the temperature to fall, suitable corrections are applied to obtain as nearly as practicable the temperature at the instant of shutdown. This can be done by plotting a curve in accordance with Annex D. A minimum of four temperature readings is taken within 5 min from shutdown, in cases where successive measurements show an increasing temperature after shutdown, the highest value is taken.	Complied	P
	To maintain the temperature during the stopping period, precautions shall be taken to shorten the stopping period of an engine-driven WELDING POWER SOURCE.	Complied	P
7.3	Limits of TEMPERATURE RISE		P
7.3.1	Windings, commutators and slip-rings		P
	The TEMPERATURE RISE for windings, commutators and slip-rings shall not exceed the values given in Table 7, regardless of the method of temperature measurement used.	Complied	P
	No part shall be allowed to reach any temperature that will damage another part even though that part might conform to the requirements in Table 7.	Complied	P



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Clause	Requirement Test	Result	Verdict
	Furthermore, for tests at other than 100 % DUTY CYCLE, the temperature occurring during any full cycle shall not exceed the maximum temperatures given in Table 7.	Complied	P
	Conformity shall be checked by measurement in accordance with 7.2.	Complied	P
7.3.2	External surfaces		P
	The TEMPERATURE RISE for external surfaces shall not exceed the values given in Table 8. Limits of TEMPERATURE RISE are given for:		P
	--- an unintentional contact period of 1 s for enclosures	Complied	P
	--- a contact period of 4 s for buttons and	Complied	P
	--- a contact period of 60 s for handles.	Complied	P
	For engine-driven WELDING POWER SOURCES, the limits of Table 8 can be exceeded for surfaces that are:		N/A
	a. recognizable by appearance or function;or		N/A
	b. marked with the symbol IEC 60417-5041:2002-10;or		N/A
	c. located or guarded to prevent unintentional contact during normal operation.		N/A
	Conformity shall be checked by measurement in accordance with 7.2 and VISUAL INSPECTION		N/A
7.3.3	Other components		P
	The maximum temperature of other components shall not exceed their rated maximum temperature,in accordance with the relevant standard.	Complied	P
7.4	Loading test		P
	WELDING POWER SOURCES shall withstand repeated load cycles without damage or functional failure. This test can be conducted on any WELDING POWER SOURCE that functions correctly.	Complied	P
	Conformity shall be checked by the following tests and by establishing that no damage or functional failure to the WELDING POWER SOURCE occur during the tests.	Complied	P
	Starting from the cold state, the WELDING POWER SOURCE s loaded at the RATED MAXIMUM WELDING CURRENT until one of the following occurs:	Complied	P
	a. the THERMAL PROTECTION is actuated;		N/A
	b. the maximum temperature limit of the windings is reached;		N/A
	c. period of 10 min is reached.		P
	Immediately after reset of the THERMAL PROTECTION in a), or after b) or c), one of the following tests is carried out.		P
	1) In the case of a DROOPING CHARACTERISTIC WELDING POWER SOURCE, the controls are set to provide RATED MAXIMUM WELDING CURRENT. It is then loaded 60 times with a short circuit having an external resistance between 8 m and 10 m Ω for 2 s, followed by a pause of 3 s.	Complied	P
	2) In the case of a FLAT CHARACTERISTIC WELDING POWER SOURCE, it is loaded once with 1.5 times the RATED MAXIMUM WELDING CURRENT at maximum available LOAD VOLTAGE for 15 s. For WELDING POWER SOURCES fitted with a protection device, which limits the WELDING CURRENT to a value lower than 1.5 times the RATED MAXIMUM WELDING CURRENT, the test is carried out at the maximum WELDING CURRENT available at corresponding LOAD VOLTAGE.	Complied	P



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Clause	Requirement Test	Result	Verdict
	Immediately after test 1) or 2) is carried out, while equipment is still hot, the equipment shall be checked in accordance with 6.1.5.	Complied	P
7.5	Commutators and slip-rings		N/A
	Commutators, slip-rings and their brushes shall show no evidence of injurious sparking or damage throughout the range of the engine-driven WELDING POWER SOURCE.		N/A
	Conformity shall be checked by VISUAL INSPECTION during		N/A
	a. the heating test in accordance with 7.1		N/A
	and		N/A
	b. the loading test in accordance with item 1) or 2) of 7.4		N/A
8	THERMAL PROTECTION		P
8.1	General requirements		P
	An electrically powered WELDING POWER SOURCE shall be fitted with THERMAL PROTECTION if the DUTY CYCLE at RATED MAXIMUM WELDING CURRENT is lower than	Complied	P
	a. 35 % in the case of a DROOPING CHARACTERISTIC;	Complied	P
	or		--
	b. 60 %in the case of a FLAT CHARACTERISTIC		P
	If a WELDING POWER SOURCE is fitted with THERMAL PROTECTION, the THERMAL PROTECTION shall meet the requirements of 8.2 to 8.7.	Complied	P
8.2	Construction		P
	The THERMAL PROTECTION shall be designed to prevent alteration of the temperature setting or operation.	Complied	P
8.3	Location		P
	The THERMAL PROTECTION shall be permanently located within the WELDING POWER SOURCE to ensure that the heat transfer is reliable.	Complied	P
8.4	Operating capacity		P
	The THERMAL PROTECTION shall be able to operate, when the WELDING POWER SOURCE delivers its RATED MAXIMUM WELDING CURRENT:	Complied	P
	a. 100 times,in the case of a DUTY CYCLE of 35 % or higher		N/A
	or		N/A
	b. 200 times,in the case of a DUTY CYCLE lower than 35 %		N/A
	Conformity shall be checked with a suitable overload producing the required number of consecutive interruptions of a circuit having the same electrical characteristics, especially current and reactance, as the circuit in which the THERMAL PROTECTION is used.		N/A
	After this test, the requirements of 8.5 and 8.6 shall be met.		N/A
8.5	Operation		N/A
	The THERMAL PROTECTION shall prevent the WELDING POWER SOURCE windings from exceeding the maximum temperature limits given in Table 7.		N/A
	The THERMAL PROTECTION shall not operate when the WELDING POWER SOURCE is loaded with the RATED MAXIMUM WELDING CURRENT at the corresponding rated DUTY CYCLE indicated on the RATING PLATE.		N/A



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Clause	Requirement Test	Result	Verdict
	Conformity shall be checked during operation in accordance with 7.1, at RATED MAXIMUM WELDING CURRENT, at ambient temperature condition of 5.1 and without operation of the THERMAL PROTECTION. After that, the WELDING POWER SOURCE is overloaded in accordance with 9.4. Additionally, if the temperature condition of 5.1 does not give the maximum heating of windings the test shall be carried out at ambient temperature that gives the maximum heating of windings.		N/A
8.6	Resetting		N/A
	The THERMAL PROTECTION shall not reset automatically or manually until the temperature has dropped below that of the CLASS OF INSULATION given in Table 7.		N/A
8.7	Indication		N/A
	WELDING POWER SOURCES fitted with THERMAL PROTECTION shall indicate that the THERMAL PROTECTION has reduced or disconnected the WELDING POWER SOURCE output. When the THERMAL PROTECTION has an automatic reset the indicator shall be either a yellow light (or yellow flag within an aperture), or an alphanumeric display on the WELDING POWER SOURCE, wire feeder or ancillary equipment showing symbols or words whose meanings are given in the instruction manual.		N/A
9	Abnormal operation		P
9.1	General requirements		P
	A WELDING POWER SOURCE shall not breakdown and increases the risk of electric shock or fire, under the conditions of operation of 9.2 to 9.5. These tests are conducted without regard to temperature attained on any part, or the continued proper functioning of the WELDING POWER SOURCE. The only criterion is that the WELDING POWER SOURCE does not become unsafe. These tests may be conducted on any WELDING POWER SOURCES that function correctly.	Complied	P
	WELDING POWER SOURCES, protected internally by, for example, circuit-breaker or THERMAL PROTECTION, meet this requirement if the protection device operates before an unsafe condition occurs.	Complied	P
	Conformity shall be checked by the following tests.		P
	a. A layer of dry absorbent surgical type cotton is placed under the WELDING POWER SOURCE extending beyond each side for a distance of 150 mm.	Complied	P
	b. Starting from the cold state, the WELDING POWER SOURCE is operated in accordance with 9.2 to 9.4.	Complied	P
	c. During the test, the WELDING POWER SOURCE shall not emit flames, molten metal or other materials that ignite the cotton indicator.	Complied	P
	d. Following the test and not more than 5 min after the test, the WELDING POWER SOURCE shall be capable of withstanding a dielectric test in accordance with 6.1.5 b).	Complied	P
9.2	Stalled fan test		P
	A WELDING POWER SOURCE, which relies on motor-driven fan(s) for conformity with the tests of Clause 7, is operated at RATED SUPPLY VOLTAGE Or RATED LOAD SPEED for a period of 4 h while the fan motor(s) is(are) mechanically stalled and the WELDING POWER SOURCE operated at the output condition of 7.1.	Complied	P
9.3	Short circuit test		P



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Clause	Requirement Test	Result	Verdict
	The WELDING POWER SOURCE is short circuited with the torch and the welding cables normally supplied by the manufacturer, or, if none are supplied, by a conductor 1,2 m in length and of the cross-section given in Table 9.	Complied	P
	The WELDING POWER SOURCE at the maximum output setting is connected to that RATED SUPPLY VOLTAGE that produces the highest RATED SUPPLY CURRENT at RATED MAXIMUM WELDING CURRENT. The SUPPLY CIRCUIT is protected by external fuses or a circuit-breaker with the rating and type as specified by the manufacturer.	Complied	P
	The WELDING POWER SOURCE shall not clear the supply fuse or circuit-breaker when short circuited:		P
	a. for 15 s in the case of a DROOPING CHARACTERISTIC;	Complied	P
	b. three times for 1 s, within a period of 1 min, in the case of a FLAT CHARACTERISTIC.		P
	The short circuit is then applied for 2 min or until the supply fuse or circuit-breaker clears	Complied	P
	The supply voltage shall not decrease by more than 10 % during this test.	Complied	P
	Mechanically driven WELDING POWER SOURCES are short circuited for 2 min at maximum output setting and set for operation at RATED LOAD SPEED.	Complied	P
9.4	Overload test		N/A
	The WELDING POWER SOURCE is operated for 4 h in accordance with 7.1.1 b) at 1,5 times the corresponding DUTY CYCLE.		N/A
	If the WELDING POWER SOURCE is rated for more than 67 % DUTY CYCLE, this test is conducted at 100% DUTY CYCLE		N/A
	If the WELDING POWER SOURCE is provided with output regulating taps, those taps producing the highest supply current shall be used.		N/A
	if the DUTY CYCLE at the RATED MAXIMUM WELDING CURRENT is 100 %, the WELDING POWER SOURCE shall not be tested.		N/A
9.5	Capacitors short circuit		N/A
	Each capacitor provided as part of a WELDING POWER SOURCE and connected either across a SUPPLY CIRCUIT or across a winding of a transformer providing WELDING CURRENT shall not cause the WELDING POWER SOURCE to exhibit hazardous electrical breakdown or present risk of fire in event of a failure.		N/A
	Conformity shall be checked by the following test:		N/A
	The WELDING POWER SOURCE is operated at no-load at its RATED SUPPLY VOLTAGE and with a supply fuse or circuit-breaker rated up to but not more than 200 % of the RATED MAXIMUM SUPPLY CURRENT with all or any of the capacitors shorted until:		N/A
	1) any fuse or over-current device in the WELDING POWER SOURCE has operated; or		N/A
	2) the SUPPLY CIRCUIT fuse or circuit-breaker has cleared; or		N/A
	3) the SUPPLY CIRCUIT components of the WELDING POWER SOURCE reach a steady state temperature, not higher than that allowed in 7.3.		N/A
	If any undue heating or melting becomes apparent, the WELDING POWER SOURCE shall conform to the requirements of items a), c) and d) of 9.1.		N/A
	There shall be no leakage of liquid during any of the TYPE TESTS required by this document.		N/A



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Clause	Requirement Test	Result	Verdict
	For interference suppression capacitor class X and class Y, or capacitors having internal fusing or a circuit-breaker, this test is not required.		N/A
10	Connection to the supply network		P
10.1	Supply voltage		P
	WELDING POWER SOURCES shall be capable of operating at the RATED SUPPLY VOLTAGE 10 %.This can give deviations from the RATED VALUES.	Complied	P
	Conformity shall be checked by the following test:		N/A
	The WELDING POWER SOURCE is connected to a CONVENTIONAL LOAD and adjusted to minimum and maximum output. Each setting is tested at RATED SUPPLY VOLTAGE 10 %. Verify presence of stable current flow in the WELDING CIRCUIT under these four conditions.		N/A
10.2	Multi-supply voltage		P
	WELDING POWER SOURCES which are designed to operate from different supply voltages shall be fitted with one of the following:		P
	a. an internal voltage selection panel where the adjustment for the supply voltage is made by links. A marking shall indicate the arrangement of links for each supply voltage;		N/A
	b. an internal terminal box or panel in which the terminals are clearly marked with the supply voltages;		N/A
	c. a switch for tap selection which shall be fitted with an interlocking system which prevents the switch being moved to an incorrect position. The interlocking system shall be adjusted only by the use of a tool;		N/A
	d. two supply cables, each fitted with a different plug, and a selector switch which ensures that the pins of the plug not in use cannot become live;		N/A
	e. a system to automatically configure the WELDING POWER SOURCE in accordance with the supply voltage.	Complied	P
	Conformity shall be checked by VISUAL INSPECTION and the following tests.		P
	In the case d), a selector switch is additionally tested in accordance with 10.8.		P
10.3	Means of connection to the SUPPLY CIRCUIT		P
	Acceptable means of connection to the SUPPLY CIRCUIT are one of the following:		P
	a. terminals intended for the permanent connection of flexible supply cables;	Complied	P
	b. terminals intended for the connection of supply cables to a permanent installation;		N/A
	c. appliance inlets fitted to the WELDING POWER SOURCE		N/A
10.4	Marking of terminals		P
	The terminal for the external protective conductor shall be marked with the symbol  (IEC60417-5019:2006-08)	Complied	P
10.5	PROTECTIVE CIRCUIT		P
10.5.1	Continuity requirement		P
	The internal PROTECTIVE CIRCUIT shall be capable of withstanding currents likely to be encountered in the case of a fault.		N/A



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Clause	Requirement Test	Result	Verdict
	CLASS I WELDING POWER SOURCES shall have a suitable terminal, adjacent to the phase-conductor terminals, dimensioned in accordance with Annex E and Table E.1, for the connection of the external protective conductor, This terminal shall not be used for any other purpose (such as for clamping two parts of the casing together).	Complied	P
	On and inside the WELDING POWER SOURCE, if there is a neutral-conductor terminal, this shall not be in electrical contact with the terminal for the connection of the protective conductor.	Complied	P
	Both inside and outside the WELDING POWER SOURCE, insulated protective conductors shall have the twin colours green and yellow. If the WELDING POWER SOURCE is supplied with a flexible multi-conductor supply cable, this shall have the protective conductor with the twin colours green and yellow.	Complied	P
	In some countries, the single colour green is also used to identify the protective conductor and the protective conductor terminal.	Complied	P
	If the WELDING POWER SOURCE is fitted with a protective conductor, it shall be connected in such a way that if the cable is pulled away from the terminals, the phase conductors break before the protective conductor.		N/A
	The method of securing conductive parts to the PROTECTIVE CIRCUITS, for example paint-piercing washers, paint-piercing screws or non-painted surfaces shall be considered during VISUAINSPECTION.		N/A
10.5.2	TYPE TEST		P
	A current of 200 % of the MAXIMUM EFFECTIVE SUPPLY CURRENT as given on the RATING PLATE is applied from an enclosure part, that is likely to become live, through the external protective conductor terminal for period of time given in Table 10, using the smallest external protective conductor size given in Table 11.	Complied	P
10.5.3	ROUTINE TEST		P
	The test is to verify the continuity of the PROTECTIVE CIRCUIT by injecting a current of at least 10 A at 50 Hz or 60 Hz derived from a SELV source. The tests are to be made between the PE terminal and relevant points that are part of the PROTECTIVE CIRCUIT. The test time is 1 s.	Complied	P
	The measured voltage between the PE terminal and the points of test shall not exceed the values given in Table 12:	Complied	P
10.6	Cable anchorage		P
	WELDING POWER SOURCES fitted with terminals for the connection of flexible supply cables shall be provided with a cable anchorage that relieves the electrical connection from strain.	Complied	P
	The cable anchorage shall be so constructed that		P
	a. it is dimensioned for flexible cables having the range of cross-sectional area of conductor as specified in Table E1:	Complied	P
	b. the method of anchorage can be easily recognized	Complied	P
	c. the cable can be easily replaced	Complied	P
	d. the cable cannot come into contact with conductive clamping screws of the cable anchorage if these screws are accessible or in electrical contact with exposed conductive parts;	Complied	P
	e. the cable is not retained by a metal screw which bears directly on it;	Complied	P
	f. at least one part of the cable anchorage is securely fixed to the WELDING POWER SOURCE	Complied	P



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Clause	Requirement Test	Result	Verdict
	g. any screws that shall be loosened or tightened during cable replacement do not serve to fix any other component;	Complied	P
	h. when fitted to a CLASS I WELDING POWER SOURCE, it shall be made of insulating material or so insulated that, if there is a cable insulation fault, no exposed conductive parts shall become live.		N/A
	A flexible supply cable, which has the minimum cross-sectional area of the conductor specified is connected at the point of connection to the equipment. The cable anchorage is fitted to the cable and tightened.	Complied	P
	it shall then not be possible to push the cable so far into the WELDING POWER SOURCE that either the cable itself or internal parts of the WELDING POWER SOURCE are likely to be damaged.	Complied	P
	The cable anchorage is then loosened and retightened 10 times.	Complied	P
	The cable is then subjected for 1 min to a pull as specified in Table 13 without jerking	Complied	P
	At the end of the test, the cable shall not have been displaced by more than 2 mm and the ends of the conductors shall not have been noticeably displaced in the terminals. To measure the displacement, prior to the test, a mark is provided at a distance of 20 mm from the cable anchorage on the cable with the cable in the stressed condition.	1.3mm	P
	After the test, the displacement of this mark in relation to the cable anchorage is measured,with the cable in the stressed condition.	Complied	P
	During the test, no visible damage (for example nicks, cuts or tears in the sheath) shall be caused to the cable.	Complied	P
	The test is then repeated with the maximum cross-sectional area of the conductor specified.	Complied	P
10.7	Inlet openings		N/A
	Where the supply cable passes through metallic parts, it shall be provided with a bushing of insulating material, or the openings shall be smoothly rounded with a radius of at least 1,5 mm.		N/A
10.8	SUPPLY CIRCUIT on/off switching device		P
	Where a built-in SUPPLY CIRCUIT n/ff switching device (for example switch, contactor or circuit-breaker) is provided,this shall:		P
	a. switch all ungrounded mains conductors, and	Complied	P
	b. plainly indicate whether the circuit is open or closed, and either	Complied	P
	c. be rated as follows:		P
	--- voltage: not less than the values given on the RATING PLATE	Complied	P
	--- current: not less than the highest effective supply current as given on the RATING PLATE, or	Complied	P
	d. be suitable for this application.		P
	Conformity shall be checked by VISUAL INSPECTION: for c) in accordance with other relevant standards,and for d) by the following tests.	Complied	P
10.9	Supply cables		P
	When supply cables are attached to the WELDING POWER SOURCE, they shall:		P
	a. be suitable for the application and meet national and local regulations;	Complied	P
	b. be dimensioned in accordance with the MAXIMUM EFFECTIVE SUPPLY CURRENT I_{leff} ;	Complied	P
	or		--
	c. have a length of at least 2 m as measured from the exit point of the enclosure.	Complied	P



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Clause	Requirement Test	Result	Verdict
10.10	Supply coupling device (attachment plug)		P
	If a supply coupling device is provided as a part of the arc welding equipment, its RATED VALUES shall be not less than:		P
	a. the rated current of the fuse required to comply with the tests specified in 9.3 regardless of whether or not a SUPPLY CIRCUIT switch is incorporated;	Complied	P
	b. the MAXIMUM EFFECTIVE SUPPLY CURRENT I_{eff} .	No more than 16A	P
	For supply networks up to 125 V, the rated current shall, additionally, not be less than either c) or d):		P
	c. 70 % of the RATED MAXIMUM SUPPLY CURRENT for equipment incorporating a supply switch;	Complied	P
	d. 70 % of the supply current measured with the output short-circuited at maximum setting for equipment not incorporating a supply switch.		N/A
	Furthermore, the coupling device shall be suitable for industrial purposes		N/A
11	Output		P
11.1	RATED NO-LOAD VOLTAGE		P
11.1.1	RATED NO-LOAD VOLTAGE for use in environments with increased risk of electric shock		N/A
	if the WELDING POWER SOURCE is not fitted with a HAZARD REDUCING DEVICE in accordance with Clause 13, the RATED NO-LOAD VOLTAGE shall not exceed:		N/A
	a. DC 113 V peak;		N/A
	b. AC 68 V peak and 48 V RMS		N/A
11.1.2	RATED NO-LOAD VOLTAGE for use in environments without increased risk of electric shock		P
	If the WELDING POWER SOURCE is not fitted with a HAZARD REDUCING DEVICE in accordance with Clause 13, the RATED NO-LOAD VOLTAGE shall not exceed		P
	a. DC 113 V peak;	Complied	P
	b. AC 113 V peak and 80 V RMS		N/A
11.1.3	RATED NO-LOAD VOLTAGE for the use with mechanically held torches with increased protection for the operator		N/A
	The RATED NO-LOAD VOLTAGE shall not exceed		N/A
	a. DC 141 V peak;		N/A
	b. AC 141 V peak and 100 V RMS		N/A
	These values may only be used if the following requirements are fulfilled:		N/A
	1) the torch shall not be hand-held;		N/A
	2) the NO-LOAD VOLTAGE shall be switched off automatically when the welding is stopped; and		N/A
	3) the protection against direct contact with live parts shall be given by:		N/A
	--- a minimum degree of protection of IP2X, or		N/A
	--- a HAZARD REDUCING DEVICE (see Clause 13)		N/A
11.1.4	RATED NO-LOAD VOLTAGE for special processes for example plasma cutting		N/A
	The RATED NO-LOAD VOLTAGE shall not exceed 500 V peak DC.		N/A
	Conformity shall be checked by measurement in accordance with 11.1.5, by operation and by VISUAL INSPECTION, except that the series combination of the 200 fixed and 5 kΩ variable resistors can be replaced by a fixed resistance of 5 kΩ.		N/A



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Clause	Requirement Test	Result	Verdict
	A RATED NO-LOAD VOLTAGE exceeding 113 V peak DC can only be used if the following requirements are fulfilled		N/A
	a. These PLASMA CUTTING POWER SOURCES with their corresponding torches shall prevent the output of NO-LOAD VOLTAGE if the torch is disassembled or disconnected from the PLASMACUTTING POWER SOURCE.		N/A
	b. The NO-LOAD VOLTAGE shall be less than 68 V peak not later than 2 s after the CONTROL CIRCUIT (for example start switch) is opened		N/A
	c. The voltage between the tip of the torch and the workpiece or earth shall be less than 68 V peak not later than 2 s after both pilot and main arcs are extinguished.		N/A
	The conditions for complying with these requirements shall be given in the instructions		N/A
	Such PLASMA CUTTING POWER SOURCES may be marked with the symbol 84 of Annex L.		N/A
11.1.5	Additional requirements		P
	The RATED NO-LOAD VOLTAGE at all possible output settings shall not exceed the values given in 11.1.1 to 11.1.4, summarized in Table 14.		P
	During measurement, the actual supply voltage shall not vary from the RATED SUPPLY VOLTAGE by greater than 6 %. If the NO-LOAD VOLTAGE varies with supply voltage, then for a variation of supply voltage greater than $\pm 1\%$, the NO-LOAD VOLTAGE shall be linearly corrected in accordance with the actual supply voltage.	Complied	P
	WELDING POWER SOURCES shall be		N/A
	a. designed to ensure that the output voltages given in Table 14 are not exceeded in the event of failure of any component (for example, open circuit or short circuit failure) , or		N/A
	b. fitted with a protection system, which switches off the voltage at the output terminals within 0,3 s and shall not be reset automatically.		N/A
	These values are not applicable to voltages for arc striking or arc stabilizing that could be superimposed.		N/A
11.1.6	Measuring circuits		N/A
	For measuring RMS values, a true RMS meter shall be used together with a resistor of $(5 \pm 0,25)$ k Ω , connected across the WELDING CIRCUIT terminals as shown in Figure 5.		N/A
11.2	TYPE TEST values of the CONVENTIONAL LOAD VOLTAGE		P
11.2.1	Manual metal arc welding with covered electrodes		P
	I_2 up to 600 A: $U_2 = (20 + 0,04 I_2)$ V	Complied	P
	I_2 over 600 A: $U_2 = 44$ V	Complied	P
11.2.2	Tungsten inert gas		N/A
	I_2 up to 600 A: $U_2 = (10 + 0,04 I_2)$ V		N/A
	I_2 over 600 A: $U_2 = 34$ V		N/A
11.2.3	Metal inert/active gas and flux cored arc welding		N/A
	I_2 up to 600 A: $U_2 = (14 + 0,05 I_2)$ V		N/A
	I_2 over 600 A: $U_2 = 44$ V		N/A
11.2.4	Submerged arc welding		N/A
	I_2 up to 600 A: $U_2 = (20 + 0,04 I_2)$ V		N/A
	I_2 over 600 A: $U_2 = 44$ V		N/A
11.2.5	Plasma cutting		N/A



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Clause	Requirement Test	Result	Verdict
	I_2 up to 170 A: $U_2 = (80 + 0,4 I_2)$ V		N/A
	I_2 between 170A and 500 A: $U_2 = (131 + 0,1 I_2)$ V		N/A
	I_2 above 500 A: $U_2 = 191$ V		N/A
	For plasma cutting, the manufacturer can specify additional LOAD VOLTAGES as determined under typical cutting conditions.		N/A
11.2.6	Plasma welding		N/A
	I_2 up to 600 A: $U_2 = (25 + 0,04 I_2)$ V		N/A
	I_2 over 600 A: $U_2 = 49$ V		N/A
11.2.7	Plasma gouging		N/A
	I_2 up to 300 A: $U_2 = (100 + 0,4 I_2)$ V		N/A
	I_2 over 300 A: $U_2 = 22$ V		N/A
	For plasma gouging, the manufacturer can specify additional LOAD VOLTAGES as determined under typical gouging conditions.		N/A
11.2.8	Additional requirements		P
	Throughout its range of adjustment, the electrically powered WELDING POWER SOURCES shall be capable of delivering CONVENTIONAL WELDING CURRENTS (I_2) at CONVENTIONAL LOAD VOLTAGES(U_2) in accordance with 11.2.1 to 11.2.7.	Complied	P
11.3	Mechanical switching devices used to adjust output		P
	A switch, contactor, circuit-breaker or other control device used to adjust or control the level of output from the WELDING POWER SOURCE shall have an endurance suitable for the application.	Complied	P
	The device is installed in a test WELDING POWER SOURCE and subjected to 6 000 cycles of operation over the complete range of mechanical movement with the output at the no-load condition.If the device is in the SUPPLY CIRCUIT, the WELDING POWER SOURCE is operated at the highest RATED SUPPLY VOLTAGE. Check that no electrical or mechanical failure of the device or damage to the WELDING POWER SOURCE occurs.	Complied	P
11.4	WELDING CIRCUIT connections		P
11.4.1	Protection against unintentional contact		P
	WELDING CIRCUIT connections, with or without welding cables connected, shall be protected against unintentional contact by persons or by metal objects, for example vehicles. crane hooks,etc.	Complied	P
	Examples of how such protection can be afforded.		P
	a. Any live part of a coupling device is recessed behind the plane of the access opening.Devices complying with IEC 60974-12 meet the requirement		N/A
	b. A hinged cover or a protective guard is provided.	Complied	P
11.4.2	Location of coupling devices		N/A
	Uncovered coupling devices shall be located so that their openings are not tilted upwards		N/A
11.4.3	Outlet openings		P
	Where welding cables pass through metallic parts, the edges of the opening shall be smoothly rounded with a radius of at least 1.5 mm.	Complied	P
11.4.4	Three-phase multi-operator welding transformer		N/A
	All welding output connections intended to be connected to the workpiece shall have a common interconnection within the WELDING POWER SOURCE.		N/A



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Clause	Requirement Test	Result	Verdict
	Welding output connections of the same phase shall all be marked in the same way as each other.		N/A
11.4.5	Marking		P
	Connections designed specifically for attachment to the workpiece or to the electrode shall be so identified.		N/A
	For DC WELDING POWER SOURCES, the polarity shall be clearly marked, either on the welding output connections or on the polarity selector, This requirement is not relevant for PLASMA CUTTING POWER SOURCES	Complied	P
11.4.6	Connections for plasma cutting torches		N/A
	The torch shall be connected to and disconnected from the PLASMA CUTTING POWER SOURCE:		N/A
	a. within the PLASMA CUTTING POWER SOURCE, by use of a tool, by screws or coupling devices;or		N/A
	b. on the PLASMA CUTTING POWER SOURCE,by a coupling device which is:		N/A
	1) designed to avoid connection of incompatible torches,or		N/A
	2) operated by use of a tool.		N/A
	When the coupling device is disconnected, no voltage higher than the limits of SELV accessible to the operator shall be present.		N/A
11.5	Power supply to external devices connected to the WELDING CIRCUIT		P
	When a WELDING POWER SOURCE supplies electrical power to an external device including a connection to the WELDING CIRCUIT, such power shall be supplied by one of the following:	Complied	P
	the WELDING CIRCUIT;		N/A
	a safety isolating transformer in accordance with IEC 61558-2-6 or equivalent means incorporated in the WELDING POWER SOURCE;	Complied	P
	an isolating transformer in accordance with IEC 61558-2-4 with a rated secondary voltage up to 120 V RMS if all exposed conductive parts of the external device, as recommended by the manufacturer, are connected to the protective earth conductor that is protected against the WELDING CURRENT, for example by a current sensing relay or by insulation of the relevant metal parts,for example by an enclosure.		N/A
	External devices include wire feed units, arc striking and stabilizing devices, torches, seam trackers or other devices containing a connection to the WELDING CIRCUIT.	Complied	P
11.6	Auxiliary power supply		P
	in the case of WELDING POWER SOURCES designed to supply electrical power to external devices which are not a part of the WELDING CIRCUIT (for example for lighting, external cooling system or electric tools), these auxiliary circuits and accessories shall comply with the standards and regulations relating to the use of these external devices.	Complied	P
	The WELDING CIRCUIT shall be isolated from such SUPPLY CIRCUITS in accordance with 6.2.4 and6.3.2.	Complied	P
	Near the socket-outlet of the auxiliary power supply, the available current, voltage, DUTY CYCLE if less than 100 %, AC or DC and the status of the neutral (for example earthed or unearthed)as appropriate, shall be clearly and indelibly marked.	Complied	P
11.7	Welding cables		P
	If a WELDING POWER SOURCE is supplied with welding cables, they shall meet the requirements of IEC 60245-6 or meet national and local regulations.	Complied	P



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Clause	Requirement Test	Result	Verdict
	If a PLASMA CUTTING POWER SOURCE is supplied with welding cables, they shall meet the current and NO-LOAD VOLTAGE ratings suitable for the application and meet national and local regulations.	Complied	P
12	CONTROL CIRCUITS		P
12.1	General requirement		P
	All inputs and outputs of CONTROL CIRCUITS shall be tested at the maximum load as specified by the manufacturer. REMOTE CONTROL CIRCUITS can be tested without connection to the power source. provided that the power source can be simulated.	Complied	P
12.2	Isolation of CONTROL CIRCUITS		P
	A CONTROL CIRCUIT that leaves the enclosure that has a voltage lower than the allowable NO-LOAD VOLTAGE in accordance with 11.1.1, and that is separated from the WELDING CIRCUIT and SUPPLY CIRCUIT shall be:		P
	a. insulated from the SUPPLY CIRCUIT by double or REINFORCED INSULATION,	Complied	P
	b. insulated from all other circuits having a voltage higher than the allowable NO-LOAD VOLTAGE in accordance with 11.1.1 (e.g. auxiliary power SUPPLY CIRCUITS, plasma cutting circuit) by double or REINFORCED INSULATION, and	Complied	P
	c. insulated from the WELDING CIRCUIT having a voltage lower than the allowable NO-LOAD VOLTAGE in accordance with 11.1.1 by BASIC INSULATION.	Complied	P
12.3	WORKING VOLTAGES of remote CONTROL CIRCUITS		N/A
	The WORKING VOLTAGES in REMOTE CONTROL CIRCUITS that are designed to be handheld shall not exceed 50 V AC or 120 V ripple free DC between conductors, or between any conductor and PROTECTIVE CIRCUIT, under normal operating conditions and after a single fault.		N/A
13	HAZARD REDUCING DEVICE		P
13.1	General requirements		P
	A HAZARD REDUCING DEVICE shall reduce the severity of the electric shock that can originate from NO-LOAD VOLTAGES exceeding the allowable RATED NO-LOAD VOLTAGE for a given environment.Types of HAZARD REDUCING DEVICES are given in 13.2.	Complied	P
13.2	Types of HAZARD REDUCING DEVICES		P
13.2.1	Voltage reducing device		P
	A voltage reducing device shall have automatically reduced the RATED NO-LOAD VOLTAGE to a level not exceeding the values of 11.1.1 at the moment the resistance of the external WELDINGCIRCUIT exceeds 200 . The operating time is specified in Table 15.	Complied	P
	Such WELDING POWER SOURCES may be marked with the symbol 84 of Annex L.	Complied	P
13.2.2	Switching device for AC to DC		P
	A switching device for AC to DC shall have automatically switched the rated AC NO-LOAD VOLTAGE to a rated DC NO-LOAD VOLTAGE not exceeding the values given in 11.1.1 at the moment the resistance of the external WELDING CIRCUIT exceeds 200 2. The operating time is specified in Table 15.	Complied	P
	Such WELDING POWER SOURCES can be marked with the symbol 84 of Annex L.	Complied	P
13.3	Requirements for HAZARD REDUCING DEVICES		N/A



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Clause	Requirement Test	Result	Verdict
13.3.1	Disabling the HAZARD REDUCING DEVICE		N/A
	The design shall be such that the operator cannot disable or by-pass the HAZARD REDUCING DEVICE without the use of a tool.		N/A
13.3.2	Interference with operation of a HAZARD REDUCING DEVICE		N/A
	REMOTE CONTROLS, as specified by the manufacturer, and arc striking or arc stabilizing devices of the WELDING POWER SOURCE shall not interfere with the proper functioning of the HAZARD REDUCING DEVICE, i.e. NO-LOAD VOLTAGE limits shall not be exceeded.		N/A
13.3.3	Indication of satisfactory operation		N/A
	A reliable device, for example a signal lamp, shall be provided which indicates that the HAZARD REDUCING DEVICE is operating satisfactorily. Where a signal lamp is used, it shall light when the voltage has been reduced or changed to DC		N/A
13.3.4	Fail to a safe condition		P
	If the HAZARD REDUCING DEVICE fails to operate in accordance with 13.1, the voltage at the output terminals shall be reduced to a level not exceeding 11.1.1 in accordance with Table 15 and shall not be reset automatically.		P
14	Mechanical provisions		P
14.1	General requirements		P
	Equipment shall be constructed and assembled so that it has the strength and rigidity necessary to withstand the normal service to which it is likely to be subjected, without increasing the risk of electric shock or other hazards whilst maintaining the minimum CLEARANCES required. Equipment shall be provided with a case or cabinet that encloses all live and hazardous moving parts (such as pulleys, belts, fans, gears etc.) except that the following shall not be fully enclosed:	Complied	P
	a. supply, control and welding cables;		P
	b. output terminals for the connection of welding cables		P
14.2	Enclosure		P
14.2.1	Enclosure materials		P
	Non-metallic materials intended to protect from contact with live parts, except welding and SELV circuits, shall have a flammability classification of V-1 or better in accordance with IEC 60695-1110.	Metal	P
14.2.2	Enclosure strength		P
	The enclosure, including air louvers, shall withstand an impact energy of 10 Nm in accordance with Annex I.	Complied	P
	Handles, push buttons, adjustment dials etc. shall not be tested with the pendulum hammer.	Complied	P
	Alternatively, the enclosure can be constructed of sheet metal with a minimum thickness in accordance with Annex J.	Complied	P
14.3	Handling means		P
14.3.1	Mechanised handling		N/A
	If means for mechanical handling are provided (for example eyelet or lug) for the purpose of lifting an assembled equipment, these shall be capable of withstanding the mechanical stress of a static pull with a force calculated from the mass of the assembled equipment as follows.		N/A
	a. For equipment with a mass of up to 150 kg, a force calculated from 10 times the mass shall be used.		N/A



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Clause	Requirement Test	Result	Verdict
	b. For equipment with a mass of greater than 150 kg, a force calculated from four times the mass or at least 15 kN shall be used.		N/A
14.3.2	Manual handling		P
	If means for manual handling are provided for lifting or carrying (for example handles, straps).these shall be capable of withstanding the mechanical stress of a static pull with a force calculated from the mass of the assembled equipment as follows.	Complied	P
	A force calculated from four times the mass or at least 600 N shall be used	2246.2N	P
14.4	Drop withstand		P
	Equipment shall be capable of withstanding a drop test. For this test, the equipment shall be equipped with all the associated attachments, cooling liquid and filler wire (excluding gas cylinders, separate trailers, carts and wheel undercarriages, unless these items are standard equipment and permanently affixed) that are recommended to be installed.	Complied	P
	The heights for the drop test shall be as follows:		P
	a. equipment with a mass of up to 25 kg shall withstand a drop of 250^{+10}_0 mm		N/A
	b. equipment with a mass of greater than 25 kg shall withstand a drop of 100^{+10}_0 mm	100mm	P
	Engine-driven WELDING POWER SOURCES shall be filled up and be ready for immediate use		N/A
14.5	Tilting stability		P
	Equipment in its most unstable position shall not topple over when tilted up to 10°, Auxiliary items as specified by the manufacturer in accordance with the type of the equipment such as gas cylinders, wire feed unit or cooling device could affect the stability, and these shall be taken into account.	Complied	P
	If the manufacturer specifies other auxiliary items, so that the requirement of this subclause cannot be met,then instructions shall be provided for anchorage or other means as necessary.		N/A
15	RATING PLATE		P
15.1	General requirements		P
	A clearly and indelibly marked RATING PLATE shall be fixed securely to or printed on each WELDING POWER SOURCE.	Complied	P
	After this test, the marking shall be easily legible. It shall not be easy to remove the RATINGPLATE and it shall show no curling.	Complied	P
15.2	Description		P
	The RATING PLATE shall be divided into sections containing information and data for the		P
	a. identification;	Complied	P
	b. welding output;	Complied	P
	c. energy supply.	Complied	P
	The arrangement and sequence of the data shall comply with the principle shown in Figure 7(for examples.see Annex K).		N/A
	it is permissible to separate the above sections from each other and affix them at locations more accessible or convenient for the user.		N/A
	For WELDING POWER SOURCES to be used for several welding processes or for rotating WELDING POWER SOURCES, either one combined or several separate RATING PLATE(S) can be used		N/A



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Clause	Requirement Test	Result	Verdict
15.3	Contents		P
	The following explanations refer to the numbered boxes shown in Figure 7		P
	a) Identification		P
	1) Name and address of the manufacturer or distributor or importer and, optionally, a trademark and the country of origin, if required.	Complied	P
	2) Type (identification) as given by the manufacturer.	Complied	P
	3) Traceability of design and manufacturing data, for example serial number	Complied	P
	4) WELDING POWER SOURCE symbol (optional)	Complied	P
	5) Reference to the standards confirming that the WELDING POWER SOURCE complies with their requirements.	Complied	P
	b) Welding output	Complied	P
	6) Welding process symbol	Complied	P
	7) ☐ Mark for WELDING POWER SOURCES which are suitable for supplying power to welding operations carried out in an ENVIRONMENT WITH INCREASED RISK OF ELECTRIC SHOCK (if applicable).		N/A
	8) WELDING CURRENT symbol	Complied	P
	9) U _o ... V RATED NO-LOAD VOLTAGE (see 11.1)		P
	① peak value in case of direct current	Complied	P
	② RMS value in case of alternating current.		N/A
	If several NO-LOAD VOLTAGES are adjustable, their range shall be given by the rated minimum and maximum NO-LOAD VOLTAGE.		N/A
	Additionally, the following shall be given.		N/A
	③ U _r ... V reduced RATED NO-LOAD VOLTAGE in case of a voltage reducing device;	Complied	P
	④ U _s ... V switched RATED NO-LOAD VOLTAGE in case of an AC to DC switching device.		N/A
	10) ... A/... V to ... A/... V Range of output, minimum WELDING CURRENT and its corresponding CONVENTIONAL LOAD VOLTAGE or less, maximum WELDING CURRENT and its corresponding CONVENTIONAL LOAD VOLTAGE or greater.	Complied	P
	11) X DUTY CYCLE symbol.	Complied	P
	12) I ₂ Rated WELDING CURRENT symbol.	Complied	P
	13) U ₂ CONVENTIONAL LOAD VOLTAGE Symbol	Complied	P
	11a, 11b, 11c ...% Values of the DUTY CYCLE at an ambient temperature of 40°C.		P
	12a, 12b, 12c ... A Values of the rated WELDING CURRENT.		P
	13a, 13b, 13c ... V Values of the CONVENTIONAL LOAD VOLTAGE		P
	These boxes form a table with corresponding values of the three settings:		P
	① ...% DUTY CYCLE at the RATED MAXIMUM WELDING CURRENT:		P
	② ...60% DUTY CYCLE:		P
	③ ...100% DUTY CYCLE as far as relevant		P
	c) Energy supply		P
	14) Energy supply symbol	Complied	P
	15) U ₁ ...V RATED SUPPLY VOLTAGE	Complied	P
	16) I _{1max} ...A RATED MAXIMUM SUPPLY CURRENT	Complied	P
	17) I _{1eff} ...A MAXIMUM EFFECTIVE SUPPLY CURRENT	Complied	P
	18) n... min ⁻¹ RATED LOAD SPEED		N/A



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Clause	Requirement Test	Result	Verdict
	19) $n_0 \dots \text{min}^{-1}$ RATED NO-LOAD SPEED		N/A
	20) $n_i \dots \text{min}^{-1}$ RATED IDLE SPEED,if applicable		N/A
	21) $P_{1\max} \dots \text{kW}$ Maximum power consumption,if applicable		N/A
	22) IP... Degree of protection,	IP23S	P
	23)  Symbol for CLASS II EQUIPMENT,if applicable		N/A
15.4	Tolerances		P
	Manufacturers shall meet RATING PLATE values within the following tolerances by controlling component and manufacturing tolerances:	(220V/380V)	P
	a. U_0 RATED NO-LOAD VOLTAGE in V +5 % measured in accordance with 11.1, but in nocase shall the values summarized in Table 14 be exceeded;	+2.8%/-1.1%	P
	b. $I_{2\min}$ RATED MINIMUM WELDING CURRENT inA $U_{2\min}$ minimum CONVENTIONAL LOAD VOLTAGE inV The values of b) shall be no greater than 102 % of those stated on the RATING PLATE.	10.5/5.0 14.5/20.2	P
	c. $I_{2\max}$ RATED MAXIMUM WELDING CURRENT inA $U_{2\max}$ maximum CONVENTIONAL LOAD VOLTAGE inV The values of c) shall be no greater than 98 % of those stated on the RATING PLATE.	500.2/500.7 39.0/40.0	P
	d. n_0 RATED NO-LOAD SPEED of rotation in $\text{min}^{-1} \pm 5 \%$;	-	N/A
	e. $P_{1\max}$ maximum power consumption in kW $^{+10}_{-0} \%$	-	N/A
	f. $I_{1\max}$ RATED MAXIMUM SUPPLY CURRENT in A $\pm 10 \%$	-7.3%/-0.4%	P
	g. The efficiency measured on any equipment connected to the supply network shall not be less than the reported value. The IDLE STATE power consumption shall not be greater than the reported value.		P
15.5	Direction of rotation		N/A
	If necessary, the direction of rotation shall be indicated on rotating WELDING POWER SOURCES.		N/A
16	Adjustment of the output		P
16.1	Type of adjustment		P
	If the WELDING POWER SOURCE has a means to adjust the output current, output voltage or both.the adjustment can be continuous,step-by-step,or both.	Complied	P
	In the case of a continuous adjustment with several ranges, there shall be no gap between the ranges.	Complied	P
16.2	Marking of the adjusting device		P
	The output of the WELDING POWER SOURCE corresponding to different control settings shall be clearly and indelibly marked either on or by the controls, or displayed digitally.	Digital display	P
	With the exception of WELDING POWER SOURCES that are set or adjusted with or by means of a digital read-out the following shall apply.		N/A
	a. The setting indications on the scales or control tables shall take into account the relationship between the CONVENTIONAL LOAD VOLTAGE and the CONVENTIONAL WELDING CURRENT		N/A
	b. Each position in the case of a step-by-step adjustment or each major graduation in the case of a continuous adjustment shall be clearly marked with		N/A
	1) a numerical indication of the controllable parameters		N/A
	or, where this is not possible		N/A



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	2) an alphanumeric marking.		N/A
	In case 2), a table on the apparatus or in the instructions shall indicate, for each control position, the nominal value of the (control) parameter.		N/A
	c. In the case of multiple range adjustment, maximum and minimum values for each range shall be given.		N/A
	d. WELDING POWER SOURCES designed for use with more than one process, for which the CONVENTIONAL LOAD VOLTAGE differs, shall be marked with a separate control scale for each process. If this is not possible, alphanumeric marks as given in b) shall be used.		N/A
	e. Where the WELDING POWER SOURCE is designed so that it can be supplied at several RATED SUPPLY VOLTAGES and where, for the same control position, the numerical values of the welding parameters are not the same, separate scales or a separate series of alphanumeric markings shall be fitted		N/A
16.3	Indication of current or voltage control		P
16.3.1	General		P
	Where there is a voltage or current control, the output setting shall be indicated in volts, amperes or an arbitrary reference scale.	Complied	P
16.3.2	Set value		P
	The accuracy of voltage or current indication shall be		P
	a. between 100 % and 25 % of the maximum setting ± 10 % of the true value;	MMA/MIG -1.4%~-0.5% /-5.5%~-2.1%	P
	b. below 25 % of the maximum setting $\pm 2,5$ % of the maximum setting	-0.2%/-	P
16.3	Displayed value		N/A
	If the manufacturer provides an analog ammeter or voltmeter on the equipment, this shall be of class 2,5 and be properly damped.		N/A
17	Instructions and markings		P
17.1	Instructions		P
	Each WELDING POWER SOURCE shall be delivered with instructions which shall include the following (as applicable):		P
	a. general description	Complied	P
	b. mass of the WELDING POWER SOURCE and its various parts and correct methods of handling them, for example by fork-lift or crane, and precautions to be taken with gas cylinders, wire feeders, etc.;	Complied	P
	c. the meaning of indications, markings and graphical symbols;	Complied	P
	d. information for selection and connection to the supply network (for example suitable supply cables, connection devices or attachment plugs, including the type and RATED VALUES for RCD, fuse or circuit-breaker, see also caution of 6.1.1) by qualified personnel in accordance with relevant national and local regulations;	Complied	P
	e. correct operational use relating to the WELDING POWER SOURCES (for example cooling requirements, location, control device, indicators, fuel type);	Complied	P
	f. welding capability, STATIC CHARACTERISTIC (drooping and/or flat), DUTY CYCLE (DUTY FACTOR) limitations and explanation of THERMAL PROTECTION if relevant;	Complied	P
	g. imitations of use relating to the degree of protection provided, for example WELDING POWER SOURCES are not suitable for use in rain or snow;	Complied	P



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Clause	Requirement Test	Result	Verdict
	h. basic guidelines regarding protection against personal hazards for operators and persons in the work area (for example electric shock, fumes, gases, arc rays, hot metal, sparks, noise, back injury during manual handling);	Complied	P
	i. conditions under which extra precautions are to be observed when welding or cutting (for example ENVIRONMENT WITH INCREASED RISK OF ELECTRIC SHOCK, flammable surroundings, flammable products, closed containers, elevated working positions, etc.);	Complied	P
	j. how to maintain the WELDING POWER SOURCE, such as recommended cycles for partial and complete test and other operation (for example cleaning);	Complied	P
	k. a list of parts typically replaced due to wear;	Complied	P
	l. information on supply of electrical power to external devices, for example for lighting or electric tools;		N/A
	m. precautions against toppling over, if the WELDING POWER SOURCE shall be placed on tilted plane;	Complied	P
	n. warning against the use of a WELDING POWER SOURCE for pipe thawing;	Complied	P
	o. type (identification) of plasma cutting torches that are specified for use with the PLASMA CUTTING POWER SOURCE;		N/A
	p. pressure, flow rate and type of plasma gas and if relevant, of cooling gas or cooling liquid;		N/A
	q. steps or range of the output current and the corresponding plasma gas as a set of values;		N/A
	r. EMC classification in accordance with IEC 60974-10;	Complied	P
	s. for an engine-driven WELDING POWER SOURCE, warning against the carbon monoxide component of engine exhaust (example of National Labelling Regulation is given in US Code of Federal Regulations. Title 16. Parts 1407).		N/A
	Other useful information can also be given, for example CLASS OF INSULATION, POLLUTION DEGREE, efficiency (see Annex M), etc.	Complied	P
17.2	Markings		P
	Each WELDING POWER SOURCE shall be clearly and indelibly marked on or near the front panel or near the ON/OFF switching device with the following combination of symbols to signify "Caution! Read instruction manual":	Complied	P
	This marking shall also be used near the torch connector of PLASMA CUTTING POWER SOURCES indicating that the operator should read the instruction manual before selecting and connecting a torch. A single marking readily visible within operator line of sight to the front panel, ON/OFF switching device and torch connector is permitted.		N/A
	The following equivalent wording can be used:		P
	Warning: Read instruction manuals before operating and servicing this equipment.	Complied	P
	For other additional markings, see Annex L	Complied	P



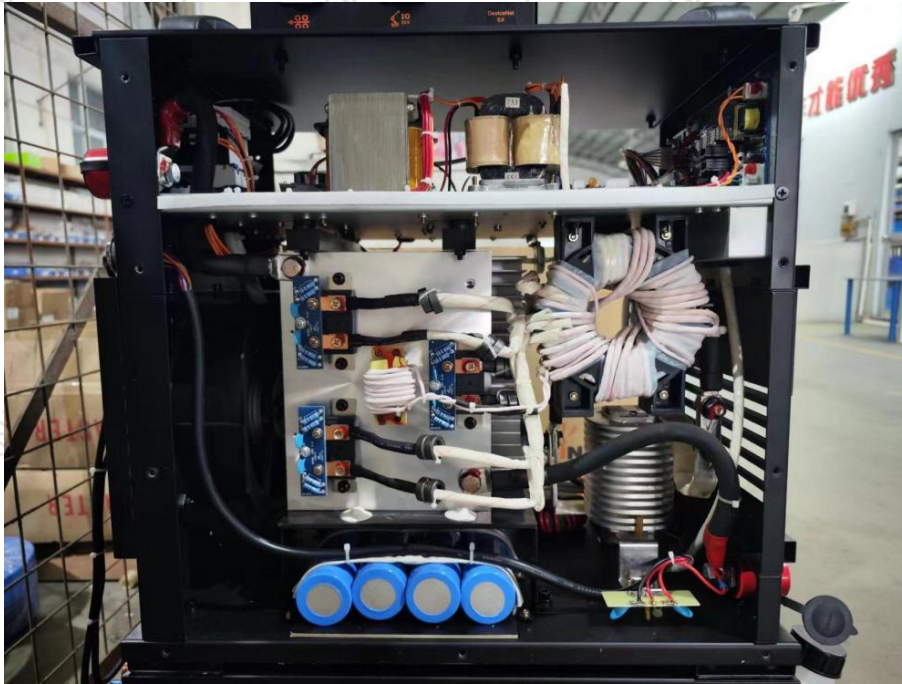
Appendix for product photos



Front



Side



Internal view



Grounding protection terminal

***** END OF REPORT *****