

ARISTOTIG 250 AC/DC

DTD 250 AC/DC

Instruction Manual
Betriebsanweisung
Manual d'instruction
Bruksanvisning
Käyttöohjeet
Istruzioni per l'uso
Instrucciones de uso
Manual de instruccoes
Gebruiksaanwijzing

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!WARNING!

ARC WELDING AND CUTTING CAN BE INJURIOUS TO YOURSELF AND OTHERS. TAKE PRECAUTIONS WHEN WELDING. ASK FOR YOUR EMPLOYER'S SAFETY PRACTICES WHICH SHOULD BE BASED ON MANUFACTURER'S HAZARD DATA .

!ELECTRIC SHOCK - CAN KILL!

- * Install and earth the welding or cutting equipment in accordance with applicable standards.
- * Do not touch live electrical parts or electrodes with bare skin, wet gloves or wet clothing.
- * Insulate yourself from earth and workpiece.
- * Ensure that your working place is safe.

!FUMES AND GASES - CAN BE DANGEROUS TO HEALTH!

- * Keep your head out of the fumes.
- * Use ventilation, extraction of fumes at the arc or both to keep fumes and gases out of your breathing zone and the general area.

!ARC RAYS - CAN INJURE EYES AND BURN SKIN!

- * Protect your eyes and body. Use the correct welding screen and filter lens and wear protective, insulating and non-flammable clothing.
- * Protect bystanders with suitable screens or curtains.

!FIRE HAZARD!

- * Sparks and spatters can cause fire. Make sure, that there is no inflammable material in the surrounding of welding and cutting works.

!MALFUNCTION!

- * Call for expert assistance in the event of malfunction.

**Read and understand the instruction manual before installation and operation
!Protect yourself and others!**

TECHNICAL DESCRIPTION

ARISTOTIG 250 AC/DC is a most compact double current power supply for TIG-welding and Manual Metal Arc-welding (MMA).

"State of the art" IGBT-inverter technology, intelligent control, fastest response speed and a consequent modular way of construction leads to a unique relation between power and weight at a high duty cycle, highest precision in TIG-welding and best arc-characteristics in MMA-welding of all types of electrodes.

Due to the high switching frequency of 40 kHz of the DC-module (base-module) fastest reaction speed is achieved and leads to highest precision and arc-stability over the whole current range.

The AC-module, connected in series to the DC-module, is creating the alternating current in that way, that polarity change is done in such a short time that reignition of the arc is achieved without HF-support in the whole current range.

The cooperation of DC- and AC-module allows different wave forms on AC such as true square wave to sinus wave without loosing the fast polarity change and reignition without HF-support.

The clearly arranged control, by symboles easily to understand, allows a fast grip to the manifold functions of control and setup.

DTD 250 AC/DC Technical Data

	Mains voltage	(V) 3-phase	400 +/- 10% 50/60 Hz
M	Permanent power	(kVA)	7,3
A	Max. power	(kVA)	10
	Permanent current	(A)	10,5
I	Max. current	(A)	14,5
	Power factor cos phi		0,9
N	Efficiency		0,80
S	Frequency	(Hz)	50/60
	Fuses, slow blow	(A)	16
W	Current range	DC	3-250 A
		AC	10-250 A
E	Duty cycle	TIG	60% at 250 A
	(10 min cycle)		100% at 200 A
L		MMA	35% at 250 A
		MMA	60% at 200 A
D			100% at 190 A
I	Open circuit voltage	AC and DC	90V DC
N			
G			
C	Dimensions	(mm) L/W/H	470/270/520
O		Water cooled	470/270/730
N	Weight	(kg)	30
S		Water cooled	40
T	Protection class		IP 23
R	Cooling		F
U	Insulation class		F
C	Standards		EN 60974-1
T			VDE 0544-1
I			EN 50199
O	S-Mark		Yes
N	CE-mark		Yes

INSTALLATION

ARISTOTIG 250 AC/DC is supplied connected for 400 V 50/60 Hz. Mains voltage tolerances are accepted from + 10% to - 10%. greater tolerances will lead to a fault indication.

The mains plug must comply to country regulations and must be connected by an electrician. Check the mains voltage before the machine is switched on.

The welding cable for MMA and the work return lead for TIG and MMA should have a cross section of at least 35 mm². Check that all cables and connections are correctly fitted.

Secure a gas bottle on the gas-shelf always with the chain.

The welding equipment creates a noise level of < 70 dB(A) at idle.
An emission level related to the work-place cannot be stated, because this value is depending on the method and the surroundings. It is conditioned by a variety of parameters e.g. the welding or cutting process, the kind of current, the power, the kind of material, resonances of the workpiece, the surroundings and more.

WARNING

This product is intended for industrial use (Class A). In a domestic environment this product may cause radio interference. It is the users responsibility to take adequate precautions.

OPERATION

All controls and connections are located with easy access on the front of the machine.(see pages 50,51)

A: Control functions

- | | | | |
|----|-----------------------|-----|--|
| 1. | Green LED's | 1a: | Shows the mains voltage, when the machine is switched on. |
| | | 1b: | Lights up, when OCV or welding voltage is supplied to the outlets. |
| 2. | Mode switch | 2: | To change the welding mode:
MMA
TIG 2-stroke
TIG 4-stroke
TIG 4-stroke with pilot function (manual pulsing). |
| 3. | Ignition switch | 3: | To change the kind of ignition:
HF-Ignition
Lift-Arc Ignition. |
| 4. | Current mode switch | 4: | To change the current mode:
Non pulsed welding in AC and DC; TIG and MMA
Pulsed welding with straight pulses; AC and DC; TIG and MMA
Pulsed welding with soft pulses; AC and DC; TIG and MMA. |
| 5. | Potentiometer | 5: | To set the up-slope time from 0 to 10 seconds. |
| 6. | Current potentiometer | 6: | To set the welding current for non-pulsed welding or the pulse-current for pulsed welding |
| 7. | Current potentiometer | 7: | To set the base-current for pulsed welding or the pilot current in percentage (10-90%) of the pulse- or welding current. |
| 8. | Potentiometer | 8: | To set the down-slope time from 0 to 10 seconds. |
| 9. | Potentiometer | 9: | To set the gas-post-flow time from 0 to 30 seconds. |

- | | | | |
|-----|-------------------------|-----|---|
| 10. | Polarity switch | 10: | <p>5 position switch to select at the electrode:</p> <ul style="list-style-type: none"> * AC with approximated sine wave current * AC with square wave current * DC with straight polarity * DC with reverse polarity * DC with straight polarity, but with reverse ignition polarity <p>This function only should be used on MMA or on TIG-welding with big tungsten diameters and high currents.</p> |
| 11. | Frequency control | 11: | <p>This potentiometer fulfills a double function:</p> <ul style="list-style-type: none"> a) To set the pulse frequency from 0,3 to 300 Hz during pulsing; b) To set the AC-frequency from 30 to 300 Hz during non-pulsed AC-welding. <p>Note: When pulsed AC is selected, the AC-frequency is automatically fixed to 100 Hz! The highest selectable pulse-frequency is 100 Hz in this case!</p> |
| 12. | Balance control | 12: | <p>This potentiometer also fulfills a double function:</p> <ul style="list-style-type: none"> a) To set the time balance between pulse- and base-current during pulse welding; b) To set the AC-balance of positive or negative half wave to achieve either optimized cleaning or penetration. <p>Note: When pulsed AC is selected, the AC-balance is automatically fixed to 50/50%.</p> |
| 13. | Potentiometer Hot-Start | 13: | To set and to optimize the Hot-Start function in TIG and MMA. |
| 14. | Potentiometer Arc.Force | 14: | To set and optimize the Arc-Force function only in MMA. |
| 15. | Fault indication | 15: | <p>Shows faults as:</p> <ul style="list-style-type: none"> Overtemperature of the power supply, Exceeding the mains voltage tolerances, No water flow in the torch-cooling |

B: Connections

16. Main switch	16:	To switch the mains supply on or off. In position I the fans are started with reduced rotation speed and the machine is ready for operation.
17. OKC-connector Plus	17:	For the connection of the work-return lead or the electrode holder.
18. OKC-connector Minus	18:	For the connection of the electrode-holder.
19. TIG central connector	19:	Quick connector for current, gas and control cable.
20. Socket control cable	20:	To connect the torch control cable
21. Remote control socket	21:	To connect a remote control
22. Gas nipple	22:	To connect shielding gas
23. Mains cable input 23:	23	

WELDING

Attention: During stand by, speed of fans is reduced. When igniting an arc, rotation speed is automatically increased. This results in increased noise level during welding. When welding is stopped, and the machine has cooled down, rotation speed is again reduced automatically.
--

TIG-welding with DC output

- * Check that TIG-torch and work return lead are connected correctly.
- * Check that the right alloyed tungsten electrodes is used and that the electrode is ground at an included angle of 40°.
- * **Check that there is free air flow through the machine.**

Set main switch to position I. LED 1a is illuminated, cooling fans are started with reduced rotation speed. Meanwhile the temperature control diode and the control diode for under- and overvoltage are lighted. This indicates an internal check of the whole machine control. The yellow LED cuts out after app. 5 seconds; the red one after app. 30 seconds. The machine is ready for operation when the yellow control LED is disilluminated.

On TIG-welding three operation modes are possible:

1. 2-stroke mode.
2. 4-stroke mode.
3. 4-stroke mode with manual pulsing (pilot function), which means, that with short touching of the torch switch a change between two adjustable currents is possible. A torch with a double switch is not a must.

ATTENTION: The choice of automatic pulsing always overrides the choice of manual pulsing.

Set switch 2 to one of the desired positions TIG and the polarity switch 10 to position DC with negative polarity.

Set switch 3 to the desired ignition mode.

Set switch pulsing 4 to the desired position. You may weld as well non-pulsed, as pulsed with "hard" pulses as pulsed with "soft" pulses.

The welding current is set by potentiometer 6. Using one of the pulse welding modes this value is the pulse-current, whilst the base current is set by potentiometer 7 in percent of the pulse-current.

If a pulsed process has been set, you can now adjust by potentiometer 11 the pulse frequency and the time balance between pulse and base current by potentiometer 12.

By potentiometers 5, 8 and 9 you can set up-slope time, down- slope time and gas post flow time.

Using a foot remote control, it is plugged into socket 21 and switch 2 is set to position 2-stroke. Now you may control welding completely by the remote control.

Using a foot remote control, up- and down slope time have to be set to 0!

A hand remote control can be used for current control both in 2-stroke or 4-stroke mode.

TIG-welding with AC output

* Check that TIG torch and work return lead are connected correctly.

* Check that the correct alloyed tungsten electrode is used and that the electrode is ground at an included angle of 90°.

* **Check that there is free air flow through the machine.**

The setting procedure for torch switch function and the mode of ignition is the same as for DC-welding.

Please note, that, if you are setting the switch Pulsing 4 to one of the pulsing modes, the possibility of setting the AC-frequency and the balance control is out of function. Potentiometer 11 is now used to set the pulse frequency and potentiometer 12 to set the time balance between pulse time and background time.

If you are choosing the non-pulsed AC-welding by switch 4, potentiometer 11 may be used to set the AC-frequency and potentiometer 12 to set the balance between positive and negative half-wave.

An increased AC-frequency results in a most stable arc in low currents for welding extreme thin material.

The variation of the balance gives an increased cleaning in the positive direction and increased penetration in the negative direction.

By polarity switch 10 two different types of AC can be set:

1. A kind of sinus half waves, resulting in a soft arc and a reduced emission of noise.
2. A square wave AC, resulting in an arc, which is hard and stable but giving more noise emission.

Please note, that the arc is always ignited by a low DC-current, which is automatically switched to AC by the AC-module.

Safety cut out

When the torch trigger or the foot remote control is depressed without striking an arc, HF and open circuit voltage is switched off automatically after 2 seconds.

This safety cut out is also effective when arc interruptions occur.

- Benefits:
- * no uncontrolled arc-striking
 - * no material damage
 - * no dissipation of shielding gas
 - * reduced risk of accidents

MMA-Welding

Stick electrodes can be welded as well with DC as AC, with pulsed current or straight current.

Electrode holder and work return lead are connected to the OKC sockets 17 and 18 marked accordingly.

The switch TIG/MMA 2 must be brought into position MMA. The LED 1 b for the open circuit voltage is illuminated to show, that there is OCV at the outlets.

By potentiometer 6 the desired amperage can be set.

Potentiometer 15 for setting the Hot-start and potentiometer 16 for setting the Arc-force are now in function.

According to the electrode type to be welded, either DC straight polarity or DC reverse polarity or AC can be selected by polarity switch 10 without any reconnection of cables.

Attention: **Never lay down the electrode holder uninsulated or with a stick clamped!**

Disconnect electrode holder during TIG-welding!

Disconnect TIG-torch during MMA-welding!

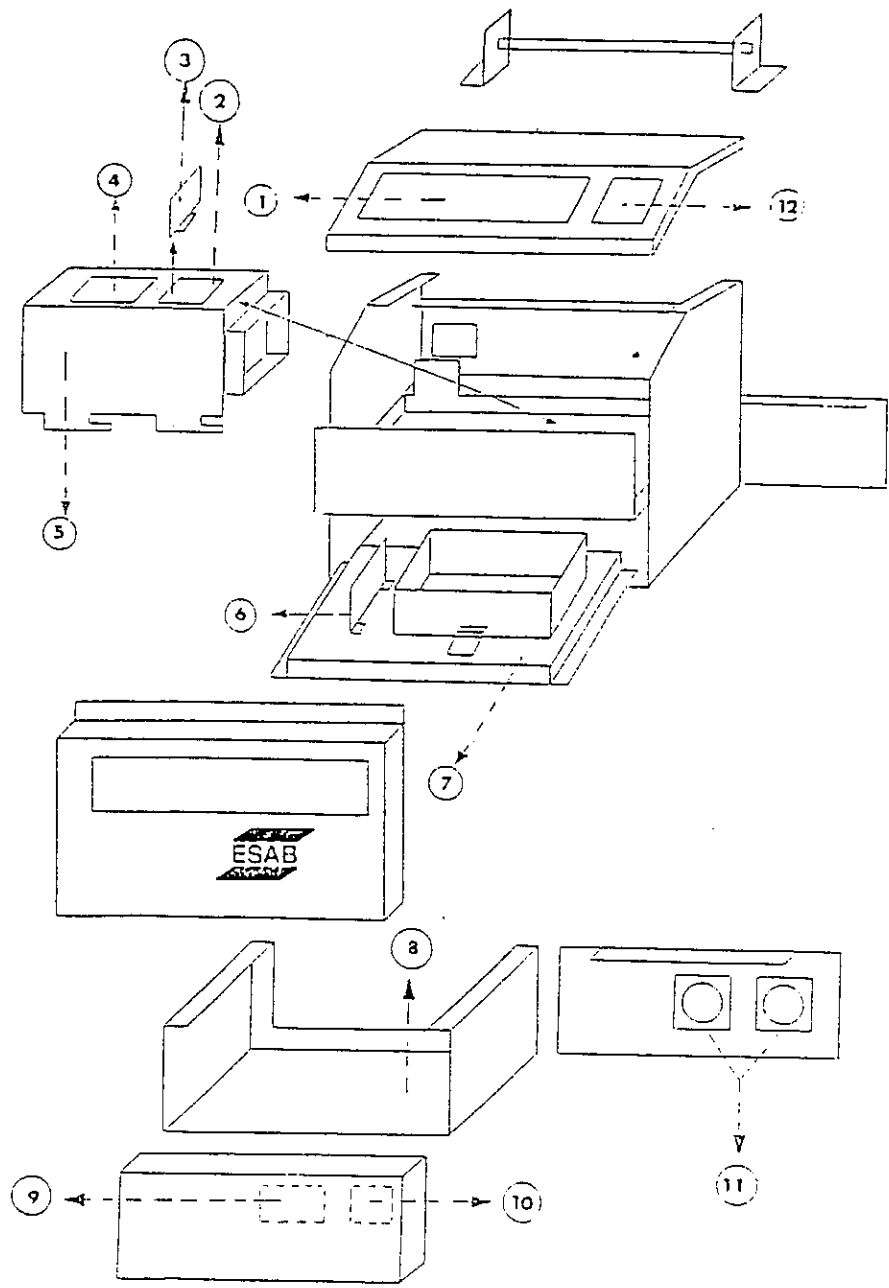
Maintenance

This welding equipment has been designed, manufactured and tested to the highest quality standards to ensure long and trouble free life. However, regular maintenance is an essential part of keeping the machine operating in a reliable and safe manner. Your attention is drawn to any maintenance instruction in this manual.

In general, all welding equipment should be thoroughly inspected, cleaned, tested and serviced at least annually. More frequent checking will be required, when the machine is heavily used.

Wear and tear, particularly in electro-mechanical and moving components, are gradual processes. Caught in time, repair costs are low and the benefits in performance, reliability and safety are significant. Left alone, they can put the equipment and you at risk.

Have this equipment regularly inspected and maintained by an approved service center.



DTD 250 AC/DC

recspare.doc

A: Recommended exchange parts list

Denomination Bezeichnung	GIN-No.:	1 year use		
		Number of machines		
		1	5	10
		Number of parts:		
1. Adjust PCB Einstelleinheit	0301 005 090	0	1	2
2. Controller PCB PREW Prozeßsteuerung PREW	0301 005 153	0	1	2
3. Control PCB PMST Platine PMST	0301 005 151	0	1	2
4. DC-power block DC-Leistungsteil Includes # 2 and 3	0301 005 138	0	0	1
5. Control PCB KOMM Platine KOMM	0301 005 152	0	1	2
6. HF-Unit HFZP HF-Gerät HFZP	0301 005 155	1	1	2
7. AC-power block AC-Leistungsteil includes # 5	0301 005 139	0	0	1
8. Water cooler see sep. spare parts list water cooler	0301 005 140	0	0	0

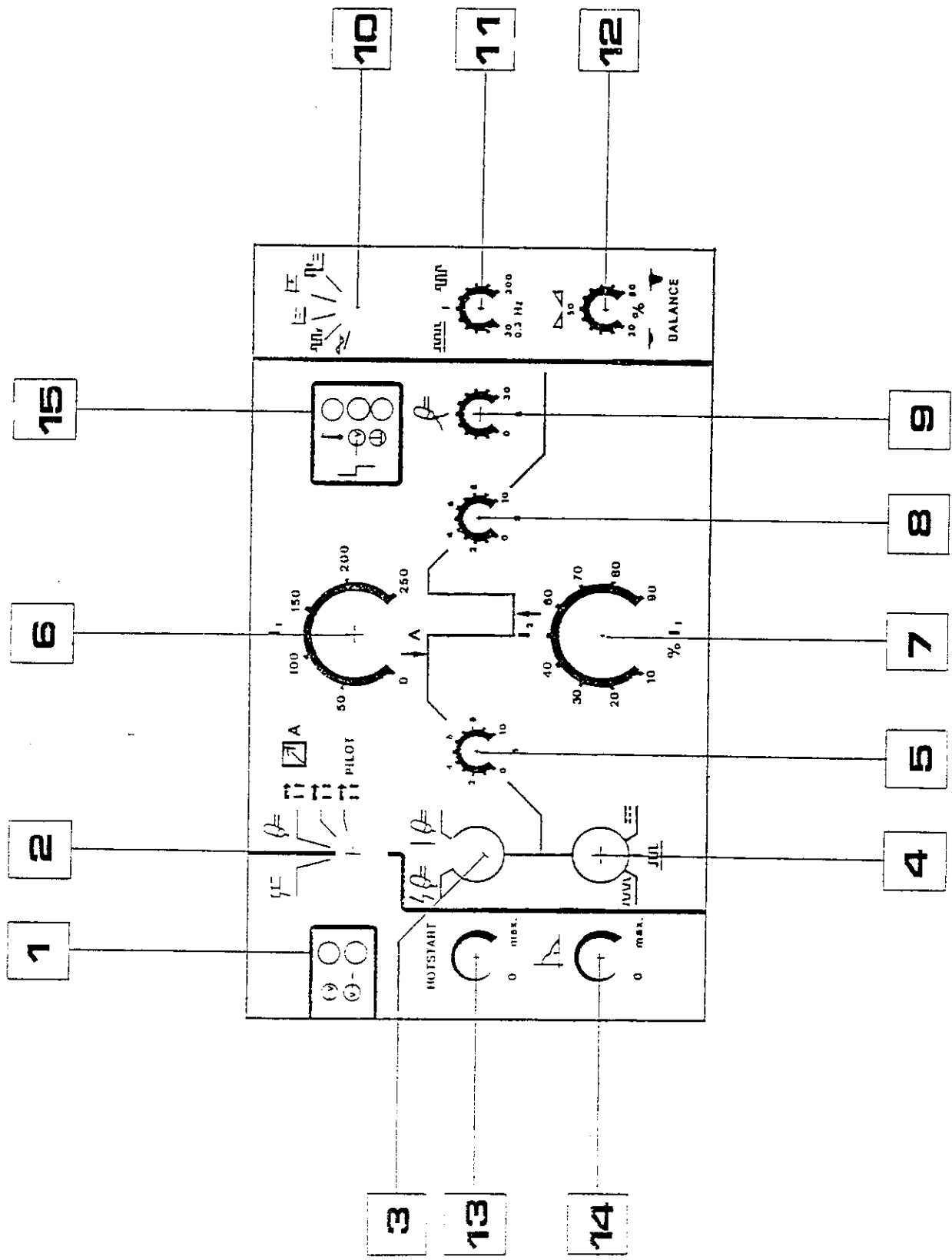
B: Recommended Spare parts list

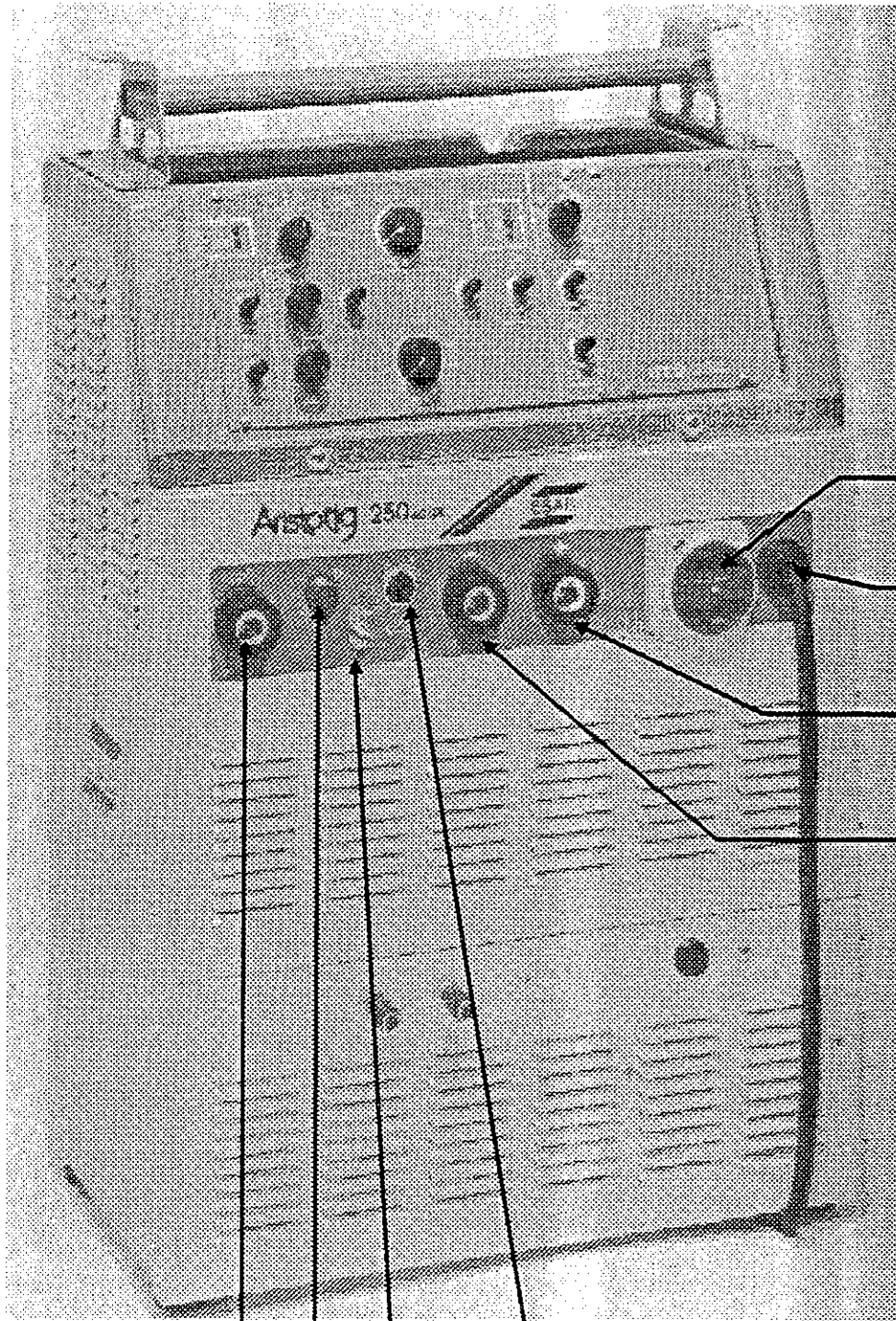
= Main switch Hauptschalter	0468 634 001	0	0	1
= Gas valve Magnetventil	0301 005 142	0	1	2
= Remote control PCB Platine Fernregleranschluß	0301 005 091	0	0	1
= Fan DC-block Lüfter DC-Block	0301 005 021	0	0	1

# Fan AC-block Lüfter AC-Block	0467 621 001	0	1	2
# Handling knob 'small' 'kleiner' Drehknopf	0301 005 143	1	3	5
# Handling knob 'middle' 'mittlerer' Drehknopf	0467 622 001	1	3	5
# Handling knob 'big' 'großer' Drehknopf	0468 587 001	1	3	5

C: Spare parts list water cooler

# Water cooler complete Wasserkühler komplett	0301 005 140	0	0	0
# Pump 230V 50/60 Hz Pumpe 230V 50/60 Hz	0301 005 106	0	0	1
# Flow switch Strömungswächter	0468 618 001	0	1	2
# Water cooler PCB Platine Wasserkühler	0301 005 101	0	0	1
# Water tank 3,5 l Wassertank 3,5 l	0301 005 141	0	0	0
# Heat exchanger Wärmertauscher	0301 005 107	0	0	1
# Fan Lüfter	0467 621 001	0	1	2
# Filling pipe Einfüllstutzen	1431 756 00	0	0	1
# Cover filling pipe Deckel Einfüllstutzen	0369 241 001	0	1	2
# Quick release conn. red Schnellkupplung rot	1260 984 00	0	1	2
# Quick release conn. blue Schnellkupplung	1260 983 00	0	1	2
# Fuse 2 A slow blow 5x30 Sicherung 2AT 5x30	0301 005 069	1	2	4





19 20 22 21

16
23
17
18

EG - Konformitätserklärung

EU - Declaration of conformity

UE - Déclaration de conformité

Hersteller: L-TEC
Manufacturer:
Fabricant:

Anschrift: Köttinger Weg 118
Address: D-57537 Wissen
Adresse:

Produktbezeichnung: **Lichtbogenschweißgerät**
Product denomination: Electric arc welding machine
Désignation du produit: Poste de soudage à l'arc électrique

Typ: **DTD 250 AC DC G ZA**
Type:
Type:

Artikel-Nr.: **1 010 198 00 / GIN-NO. 301-005-133**
Article-No.:
Numéro d'article:

Das bezeichnete Produkt stimmt mit den Vorschriften folgender Europäischer Richtlinien überein:

The product described above conforms to the rules of the following European Directives:
Le produit décrit ci-devant correspond avec les règles des Directives de UE suivant:

EU - Niederspannungsrichtlinie (73/23/EWG)

EU - Low voltage directive

UE - Directive pour tensions basses

EU - Richtlinie Elektromagnetische Verträglichkeit (89/336/EWG)

EU - Directive electromagnetic compatibility (EMC)

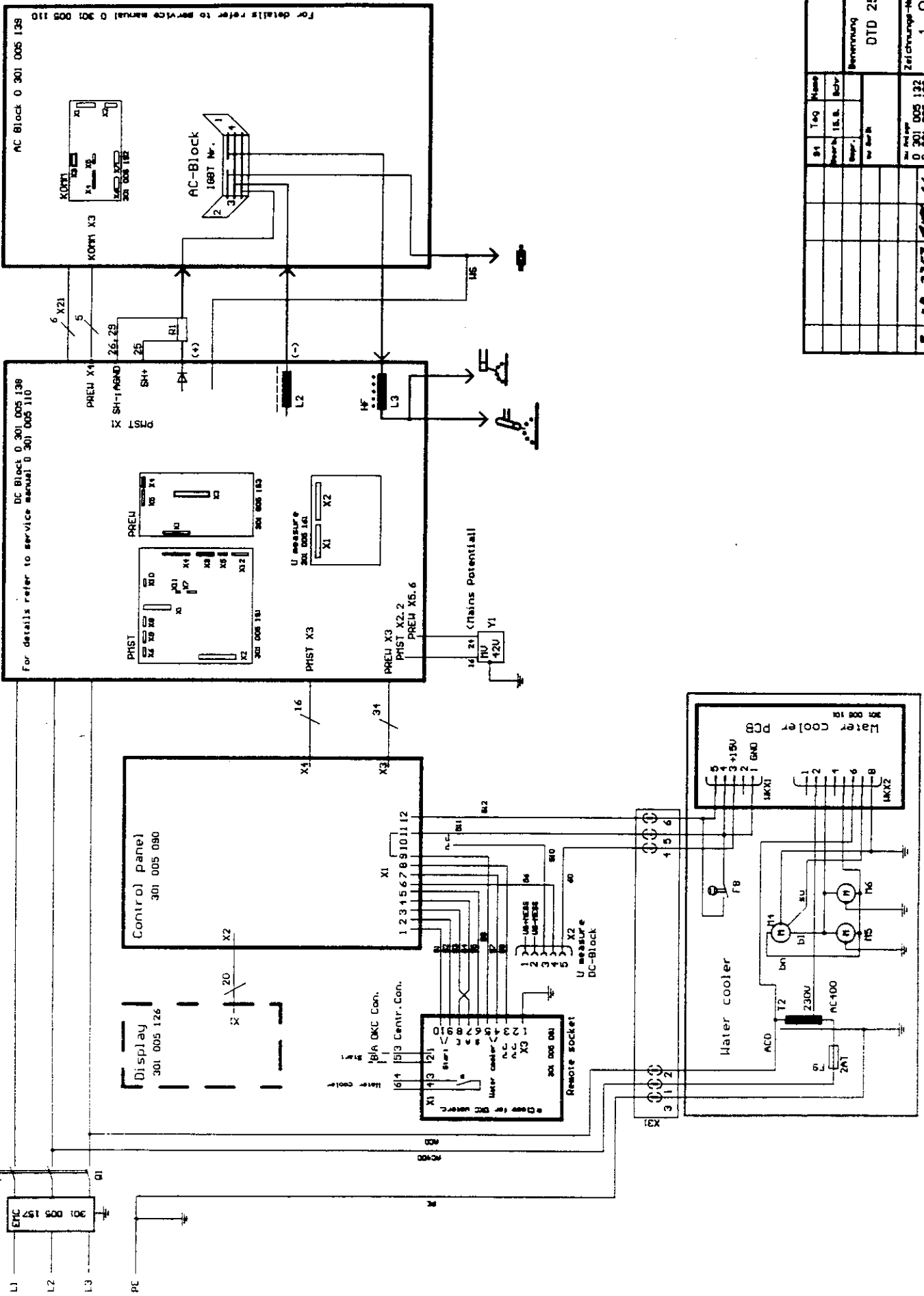
UE - Directive compatibilité électromagnétique (CEM)

Angewendete harmonisierte Normen: EN 60974-1 / IEC 974-1 / VDE 0544 Teil 1
Used harmonized standards: EN 60204-1 / IEC 204-1 / VDE 0113 Teil 1
Normes harmonisées appliquées: EN 50199

Unterschrift des Herstellers: 02.01.1996
Signature of manufacturer:
Signature du fabricant:



Dr.-Ing. J. Remmel
Technischer Leiter
Technical director
Chef ingénieur



Rev.	Änderungs-Nr.	Tag	Name
B	1 P-2357	17/85	Ma
A	10 - 2720	08/78	Bch

Rev.	Änderungs-Nr.	Tag	Name
0 301 005 132			
0 301 005 133			
0 301 005 134			
0 301 005 135			

Rev.	Änderungs-Nr.	Tag	Name
			1910551A

Rev.	Änderungs-Nr.	Tag	Name
			DTD 250 AC/DC

Rev.	Änderungs-Nr.	Tag	Name
			Zeilenummer
			1 910 951

Rev.	Änderungs-Nr.	Tag	Name
			Blatt Nr. 18.11.1986 13.02.20

ANNEX A

ANHEMVE.doc

(informative)

Installation and use under the aspect of electromagnetic compatibility (EMC)

The user is responsible for installing and using the welding or cutting equipment according to the manufacturers instructions. If electromagnetic disturbances are detected, then it shall be the responsibility of the user of the welding or cutting equipment to resolve the situation with the technical assistance of the manufacturer. In some cases this remedial action may be as simple as earthing the welding circuit (see Note). In other cases it could involve constructing an electromagnetic screen enclosing the power source and the work complete with associated input filters. In all cases electromagnetic disturbances must be reduced to the point, where they are no longer troublesome.

NOTE: The welding circuit may or may not be earthed for safety reasons. Changing the earthing arrangements should only be authorized by a person who is competent to assess whether the changes will increase the risk of injury, e.g. by allowing parallel welding or cutting current return paths which may damage the earth circuits of other equipment. Further guidance is given in IEC TC26(sec)94, Arc welding equipment installation and use.

A.1 Assessment of area

Before installing welding or cutting equipment the user shall make an assessment of potential electromagnetic problems in the surrounding area. The following shall be taken into account:

- a) Other supply cables, control cables, signalling and telephone cables above, below and adjacent to the welding or cutting equipment.
- b) Radio and television transmitters and receivers.
- c) Computer and other control equipment.
- d) Safety critical equipment, e.g. guarding of industrial equipment.
- e) The health of people around, e.g. the use of pacemakers and hearing aids.
- f) Equipment used for calibration and measurement.
- g) The immunity of other equipment in the environment. The user shall ensure, that other equipment being used in the environment is compatible. This may require additional protection measures.
- h) The time of day that welding/cutting or other activities are to be carried out.

The size of the surrounding area to be considered will depend on the structure of the building and other activities that are taking place. The surrounding area may extend beyond the boundaries of the premises.

A.2 Methods of reducing emission

A.2.2 Mains supply

Welding equipment should be connected to the mains supply according to the manufacturers recommendations. If interference occurs, it may be necessary to take additional precautions such as filtering of the mains supply. Consideration should be given to shielding the supply cable of permanently installed welding or cutting equipment in metallic conduit or equivalent. Shielding should be electrically continuous throughout its length. The shielding should be connected to the welding power source so that good electrical contact is maintained between the conduit and the power source enclosure.

A.2.2 Maintenance of the welding and cutting equipment

The welding and cutting equipment should be routinely maintained according to the manufacturers recommendations. All access and service doors and covers should be closed and properly fastened when the equipment is in operation. The welding or cutting equipment should not be modified in any way except for those changes and adjustments covered in the manufacturers instructions. In particular, the spark gaps of arc striking and stabilizing devices should be adjusted and maintained according to the manufacturers recommendations.

A.2.3 Welding and cutting cables

The welding and cutting cables should be kept as short as possible and should be positioned close together, running at or close to the floor level.

A.2.4 Equipotential bonding

Bonding of all metallic components in the welding or cutting installation and adjacent to it should be considered. However, metallic components bonded to the workpiece will increase the risk that the operator could receive an electrical shock by touching these metallic components and the electrode at the same time. The operator should be insulated from all such bonded metallic components.

A.2.5 Earthing of the workpiece

Where the workpiece is not bonded to earth for electrical safety, nor connected to earth because of its size and position e.g. ships hull or building steelwork, a connection bonding the workpiece to earth may reduce emissions in some, but not all instances. Care should be taken to prevent the earthing of the workpiece increasing the risk of injury to users, or damage to other electrical equipment. Where necessary, the connection of the workpiece to earth should be made by a direct connection to the workpiece, but in some countries where direct connection is not permitted, the bonding should be achieved by suitable capacitance, selected according to National regulations.

A.2.6 Screening and shielding

Selective screening and shielding of other cables and equipment in the surrounding area may alleviate problems of interference. Screening of the entire welding or cutting installation may be considered for special applications.