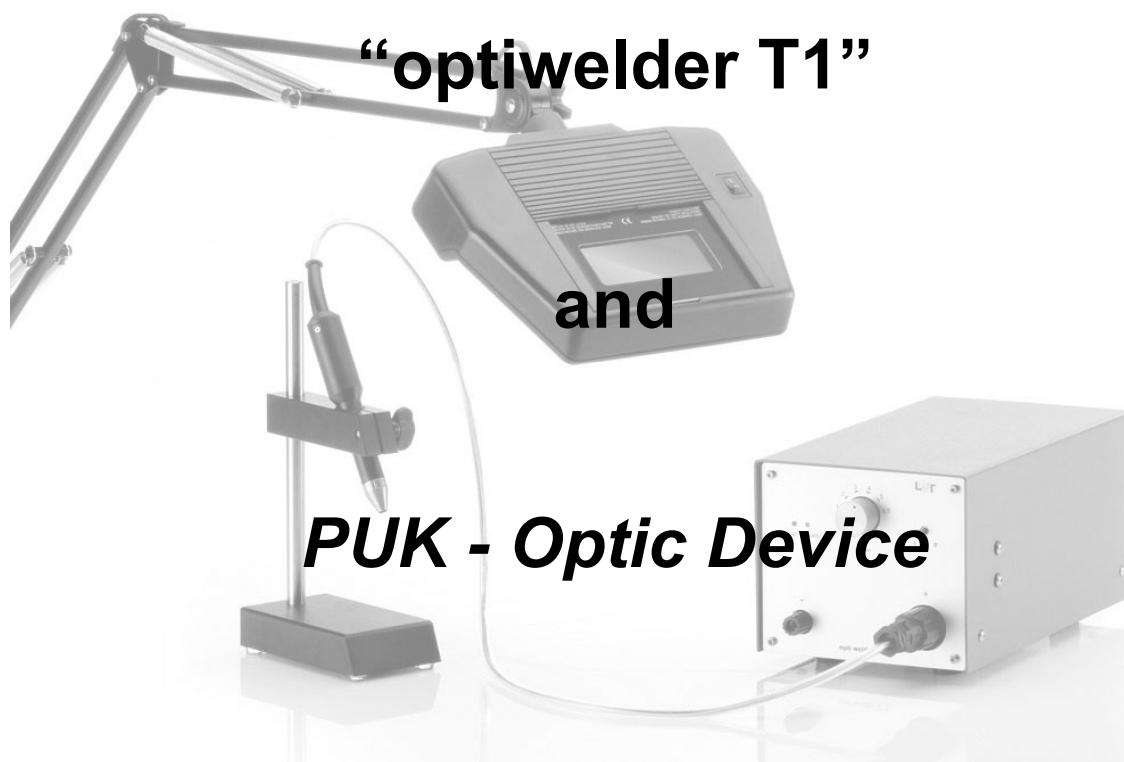


Operating Instructions

Precision Welding Device



opti-welder T1

OPERATIONS MANUAL



Dear Customer,

This manual is intended to assist you in operating and maintaining your „opti-welder T1“. It is in your best interest to read this manual thoroughly, and to follow the instructions conscientiously. You will avoid malfunctioning as a result of operating errors. The device will thank you with a continuous readiness for use for years to come.

This device may only be operated by trained professionals and within the range of intended use. The manufacturer will not be liable for any damages, which result from improper usage or treatment. Please read the sections „General Safety Rules“ and „Personal Body Protection“ carefully before you start up the device.

Please keep this manual handy and in a safe place.

Note

This device manufactured by „Lampert Werktechnik GmbH“ meets all conformity requirements of the CE emblem and are manufactured in accordance with the VDE – Guidelines.

Use original spare parts only for maintenance and overhaul. Our customer service department will gladly help you.

The device may be opened or altered by authorized personnel only, otherwise all warranty and liability claims become invalid!

**Lampert Werktechnik GMBH
January 2004**

TABLE OF CONTENTS

SECTION 1 – FIELD OF APPLICATION	2
SECTION 2 – INTRODUCTION	2
SECTION 3 – SAFETY RULES	3
3-1. General safety rules	3
3-2. Personal body protection and dangers	4
SECTION 4 – INSTALLATION	4
4-1. Set-up rules	4
4-2. Operations elements front side	4
4-3. Operations elements rear side	4
4-4. Starting up	5
SECTION 5 – INSTRUCTIONS	5
5-1. Welding instructions	5
5-2. In general and pointers	6
5-3. Sharpening the electrodes	6
5-4. Care and maintenance	6
SECTION 6 – TECHNICAL DATA	7
6-1. Technical data	7
6-2. Picture Symbols – Identification plate	7
SECTION 7 – TROUBLE SHOOTING	8
SECTION 8 – SPARE PARTS LIST	9
SECTION 9 – EG-CONFORMITY DECLARATION	9

SECTION 1 – FIELD OF APPLICATION OPTI-WELDER T1: **(Intended Use)**

- Point welding on steel and steel alloys as well as titanium and various NE metals and nickel alloys such as brass, German silver, monel or EVO. Also suitable for precious metals and precious metals alloys.
- **Not approved for welding dentures! (Dentistry)**
-

- Any usage other than herein specified is prohibited.
- Do not use outdoors! Use only in a dry environment!

We are not liable for the durability of the welding points. We recommend checking the welding points and if necessary re-do the welding.

SECTION 2 – INTRODUCTION

The opti-welder T1 is the long missed link between over elaborated welding techniques and laser techniques. This unique precision welding device was created combining intelligent coordination and precise mechanics. Smaller dimension, lightweight and low energy requirements are

advantageous and important facts. Outstanding ignition and welding qualities offer a broad range of application. A whole new world of production and repairing possibilities opens up for all fixating and welding techniques.

SECTION 3 – SAFETY RULES

3-1. GENERAL SAFETY RULES

- Only a professional may open the device. Remove the power plug and make certain that the device is completely unplugged. . Discharge the components in the device, which store electricity.
- If you have any doubts, please contact a professional. Of course, you may contact our customer service, which has the appropriate resources and means, as well as professionally trained personnel.
- Always use appropriate length cables and make sure the work piece clamp is properly attached.
- Hazards could be caused by the main current as well as by the welding current.
- The law prohibits the non-professional electrician to tamper with parts, which are connected with the main voltage, with the exception of the power plug or the main power switch.
- Remove the device from the power during repair or maintenance work on the power source. If you need to leave the workstation, even only for a moment, you must noticeably block the power plug.
- The highest and therefore the most dangerous voltage in the welding electrical circuit is the idling voltage. The maximum permission able idling voltage is determined in national and international requirements and depends on the type of welding power, the construction of the power source and the more or less electrical hazard of the work station.
- If a safe operation of the device seems doubtful, turn off the device and secure against unintentional use. Safe operation is no longer possible if
 - the device shows visible damage or,
 - the device malfunctions

- the device no longer can operate
- Please note the relevant safety precautions during handling of the gas bottles.

The Optiwelder is manufactured to be operated with 230V~ main voltage

Yellow-green conductor = protection conductor (PE). The remaining conductors L1 and N are connected to phase and neutral of the power plug. Since the introduction of the Euro Norm IEC 38 (effective since May 1987) the mains voltage in all Europe is defined by 230V.

The welding device is set by the manufacturer at 230V!

– this means, the device may, due to the tolerance of +/- 15%, also be operated on a 220V power. Devices that operate on a different power than 230V will be marked with a special sticker.

AUTHORIZED SERVICE PERSONNEL ONLY MAY OPEN THE DEVICE!

IF THE DEVICE HAS BEEN MADE FOR A SPECIAL VOLTAGE, THEN SEE THE TECHNICAL DATA INDICATED ON THE DEVICE! THE POWER SWITCH MUST CORRESPOND WITH THE MAIN VOLTAGE AND THE POWER RECEPTACLE OF THE WELDING DEVICE. (See the technical data!)

PLEASE ENSURE THAT THE MAIN POWER BOX CAN SUPPORT THE USE OF THIS DEVICE WITHOUT BLOWING A FUSE:

USE ONLY THE PROVIDED POWER CONNECTORS!

3-2. PERSONAL BODY PROTECTION AND DANGERS

- Wear protective gloves on both hands during welding, since sparks and splashes are unavoidable. The protection gloves may not contain a high portion of easy melting plastic fibers. Gloves will protect from harmful UV rays during welding.
- Wear appropriate clothes, with no synthetics.
Do not look into the welding arc with unprotected eyes; only use welding protection shield with correct protection lenses (min. Protection level 11)
- The arc emits besides light and heat rays, which could cause glares or burns, also UV rays. If insufficiently protected, these invisible ultra violet rays can cause a very painful conjunctivitis, which will become apparent several hours later.
- Persons or helpers whom are in the vicinity of this light arc must be made aware of the danger and must also wear protective gear, if necessary, install protection walls.
- Arrange for enough fresh air, especially in small rooms, since smoke and harmful gases may develop.
- Do not perform any welding on receptacles, in which gas, fuel, mineral oils or similar were stored, even if they have been empty for some time, because the residues could cause an explosion.
- Special rules apply to rooms of high risk of fire and explosion.

SECTION 4 – INSTALLATION

4-1. SET UP RULES

- Set up the device so that the cooling air can easily reach all surfaces of the casing.
- Do not cover the device in any way!
- Set the device onto a sturdy, hard to inflame and insulated surface!
- Do not let metal dust (i.e. during sanding) get into the device

4-2. DESCRIPTION OF THE OPERATING ELEMENTS FRONT SIDE

(Illus. 1)



CHARGE LIGHT (1)

Glow orange during charging

OPERATION LIGHT (2)

Glow yellow when ready for welding

WELD POWER DIAL (3)

6 level adjustable welding power

IMPULSE LENGTH SWITCH (4)

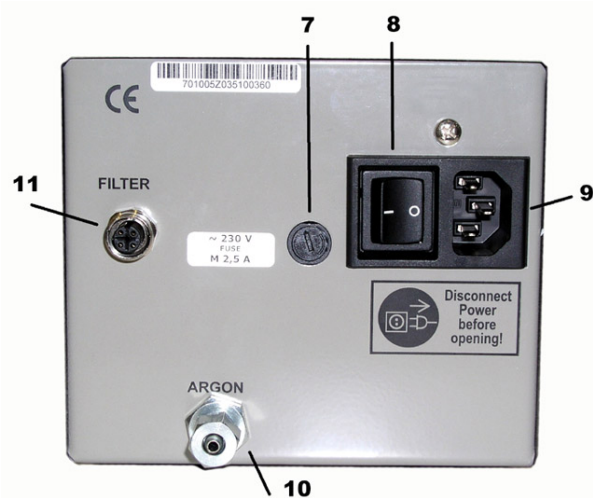
CONNECTOR JACK FOR HAND PIECE (5)

JACKS (6)

For connecting the contact elements such as welding table, clamps and holding pliers

4-3. DESCRIPTION OF THE OPERATIONS ELEMENTS BACK SIDE

(Illus. 2)



FUSEBOX (7)

Fuse box with space for spare fuses

MAINS POWER SWITCH (8)

RECEPTACLE (9)

For connecting the power cable

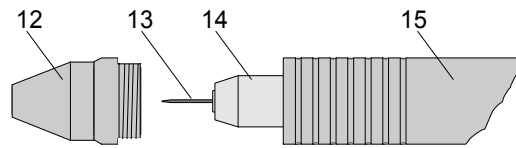
INERT GAS CONNECTOR (10)

For a Ø 6,0 mm pressure hose

CONNECTOR JACK FOR WELDING SHIELD(11)

To adjust level of eye protection of the welding safety shield

Illus. 3)



4-4. STARTING UP

- Set up the device on a level and stable as well as insulated surface, such as a workbench.
- Insert the hand piece connector as straight as possible into the jack (5) and carefully turn per hand towards the right to secure.
- Insert the connector of the clamp or pliers into one of the jacks (6).
- Unscrew the valve (12) of the hand piece (15)
- Loosen the electrode thread (14), insert the newly sharpened tungsten electrode (13) and screw on tightly (per hand - do not use a wrench) with the electrode projecting ca. 5 – 8 mm out of the valve (illus. 3). (Use original electrodes only)
- Screw the valve back on (per hand do not use a wrench)
- Fasten the welding shield with the provided table clamp onto the workbench.
- Insert the round connector of the shutter into the with „filter“ indicated connector jack (11) on the rear side of the device and secure with the grub screws.
- Attach the pressure gauge onto the inert gas bottle (if possible use Argon with min. 99.8%, i.e. „Argon 4.6“) according to the provided operations manual.
- Attach the pressure hose with help of the fast screws onto the pressure gauge as well as onto the gas connector (10) on the rear side of the device.
- Open the gas bottle valve and set the gas flow to ca. 3 – 6 liter per minute – **maximum operating pressure 10 bar!**
- Insert the power plug.
- Switch the mains power switch (8) to „ON“ – the device will perform an automatic test.
- The yellow control light (2) will glow when the device is ready for operation.
- Choose the power on the weld power deal with the level switch (3).
- The pulse length can be changed with the switch (4) i.e. to smooth out welding spots or to change the depth of penetration.
- **Always use appropriate eye protection.**

Follow the operations instructions of the attached eye protection devices such as welding shield or Microscope Shutter!

ATTENTION!

Clamps or pliers, which are attached to the OPTI-WELDER T1, could be conducting voltage, as soon as the power mains switch is turned on. Make sure that these components do not touch any electrical conducting parts such as the casing.

SECTION 5 – INSTRUCTIONS

5-1. WELDING INSTRUCTIONS

- Connect the clamp to piece to a blank metal location on the work piece.
- Make sure the clamp has sufficient contact.
- Touch the electrode tip to the spot to be welded until the welding is done --- **without, or with minimum pressure to the electrode tip!**
- The welding procedure is automatically done:
 - Safety gas encases the welding spot
 - A signal announces the arc
 - The light arc appears
 - Safety gas supply ceases
- The welding procedure may be stopped anytime by removing the electrode from the work piece.

5-2. IN GENERAL AND POINTERS

PLEASE NOTE!

- **Always work with sharpened electrodes!**
This is the best way to achieve maximum results.
- **Make sure the work piece has enough contact to the clamp. If contact problems occur, make certain the clamp is in contact with a metallic blank location.**
- **Never weld „hands free“, this means; support both hands i.e. on the workbench during welding. Shaking hands falsify the parameters of the device. .**
- **Apply only minimum pressure onto the electrode tip.**
- **Weld only with minimum gas pressure!**
3 to 4 l/min are often sufficient.

TIPS

- Take enough time to get to know your device.
- Try out various power levels of the device.
- Keep in mind that various materials react differently during welding.
- Consider the thickness of the material when you choose the power level.
- Try to touch the work piece to be welded as precisely as possible.
- With just a little experience you will discover how the angle in which you touch the needle to the work piece will effect the flow direction of the welding point.
Touching the work piece in an angle of 90° will give you the deepest welding point.
- A saw or file can serve well as a „welding addition“.
- For deeply located welding spots, the electrode should be longer.
- It may be helpful to use wire as a welding addition to close holes or as reinforcement.
- Only use welding wires as a welding addition, which are compatible with the used material.
- If ignition problems occur it is helpful to apply light pressure to the needle from the side, as if you were scratching the surface of the work piece.
With this technique you can steer the welding point into a certain direction.

5-3. SHARPENING THE ELECTRODES



The electrodes should be sharpened with a diamond grinder with fine or medium grain.
The angle should be ca. 25° (Illus. 4)

5-4. CARE AND MAINTENENCE

The Opti-Welder T1 needs, under ordinary working conditions, only minimal care and maintenance. Remembering a couple of points is crucial, though, to ensure proper functioning and a long life for your welding device.

- Regularly check the power plug and power cables, as well as welding cables for damage.
- Ensure that the hand piece parts are easy to operate.
- If necessary, clean the electrode thread of the hand piece to ensure an optimal contact with the electrode.

WARNING! IF FUSES NEED TO BE REPLACED, REPLACE ONLY WITH THE SAME VALUES. IF DAMAGES OCCUR AFTER INSTALLING INAPPROPRIATE FUSES (I.E. TOO STRONG) THE WARRANTY BECOMES INVALID.

AUTHORIZED PERSONNEL MAY ONLY OPEN THE DEVICE!








SECTION 6 – TECHNICAL DATA

6-1. TECHNICAL DATA

- Device is suitable for spot and precision welding in dry environments
- Main Voltage ~230 V / 50-60 Hz +/-15%
- Mains fuse T 2,5 A
- Power input 500 VA
- Operating voltage: 20 – 38 V
- No I- load voltage 38 V
- max. charging time 3 sec
- Inert gas: min. ARGON 99,9% (ARGON 4.6)
- Maximum gas pressure 10 bar
- Inert class I
- Insulation class B
- Weight 5,20 kg

6-2. Identification Plate

Symbol explanations:

A	Amperage	V	Voltage	IP	Protection Method
Hz	Hertz		Alternating Current (AC)		Tungsten-Inert Gas-Welding
	Direct Current	 1 ~ 50-60Hz	Power plug single phase / Alternating Current / 50-60Hz		Read the manual
U₀	Idling Voltage	U₁	Mains Voltage		Ground
U₂	Nominal Voltage	I₂	Nominal welding current		Single phase transformer
I_{1max}	Amperage input	I_{1eff}	Rated Amperage input	X	Duty cycle

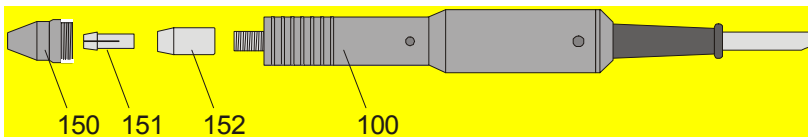
SECTION 7 – TROUBLE SHOOTING

ERROR	CAUSE	SOLUTION
1. No welding power Main power switch on, ready for operation lamp does not light up	Power connection interrupted	Check power connection and main voltage
2. No welding power Power main switch on. Ready for operation lamp lights up (yellow)	Welding cable connection interrupted Bad or no grounding	Check connectors Connect to work piece. Attach contact clamps directly to the work piece
3. No welding power Main power switch on ready for operation lamp is constantly lit up (orange)	Interruption due to power error	Press the reset button or turn device on and off If still error, take device to be serviced
4. Hard to ignite	Bad grounding contact Dirty electrode Burned down electrode tip	Connect to work piece Re-sharpen electrode Re-sharpen electrode
5. Power fuse and/or automatic safety blows	Not enough power protection Wrong automat Netzsicherung löst im Leerlauf aus	Install proper power protection Send device to be serviced
6. Welding unsatisfactory	Wrong safety gas, no inert gas	Use inert gas (Argon 4.6)
7. Oxidation and soot development	Gas pressure too high	Reduce flow to ca. 3 to 4 l/min
7 Heavy oxidation development on the welding spot	Wrong safety gas, no inert gas	Use inert gas (Argon 4.6)
8. Tungsten in basic material	Too much electrode pressure on the work piece	Lightly touch work piece so that it barely ignites enough
9. Tungsten electrode adheres to work piece	Too much electrode pressure on the work piece	Lightly touch work piece so that it barely ignites enough
10. Tungsten electrode melts off	Tip sharpened too much	Sharpen to the recommended angle (ca. 25°)
11. Static discharge over the device surface	Special location	Use special floor mat for the work area
12. Work piece adheres to the welding table	Bad connection to welding table	Use clamps or pliers

WARNING! Authorized personnel may only open the device!

Text and images correspond to the technical version during print of this manual. We reserve the right to change components.

SECTION 8 – REPLACEMENT PARTS LIST



Hand piece:

100 100	Complete Hand piece
100 150	Valve
100 151	Spread pliers
100 152	Nut

Electrodes:

284315	Electrodes 10 pcs. In display can (Thorium dioxide - free)
--------	---

Soldering Tweezer:

284310	Soldering Tweezer with 900 mm cable
--------	-------------------------------------

Clamp:

284317	Electric Clamp
--------	----------------

Grindinwheel:

284316	Diamandweel
--------	-------------

SECTION 9 – EG Conformity Declaration

- According to machine guidelines 98/37/EG, Appendix II A
- According to low voltage guidelines 73/23/EWG
- According to EMV (electro-magnetic compatibility) guidelines 89/336/EWG

The Manufacturer,

Lampert Werktechnik GmbH.....

Julius-Echter-Str. 4, 97440 Werneck, Germany,

declares that the product

“optiwelder T1” Spot Welding Device

conforms to the conditions set forth in the above-named guidelines, including any changes made up to the time of declaration.

The following harmonised standards were used:

Welding current sources for arc hand welding in limited operation: DIN VDE 0543 (VDE 0543)

Protective housing type (IP Code): DIN EN 60529 (VDE 0470-1)

Electro-magnetic compatibility (EMV): EN50199

Werneck, September 5th, 2002

Lampert Werktechnik GmbH

Andrea Bauer – Lampert (President and CEO)

PUK

OPTIC UNIT

OPERATIONS MANUAL



Dear Customer,

This manual is intended to help you operate your PUK – safety welding shield. It is in your best interest to read this manual thoroughly, and to follow the instructions conscientiously. You will avoid malfunction as a result of operating errors. The device will thank you with a continuous readiness for use and a long life span.

This device may only be operated by trained professionals and within the range of the intended use. The manufacturer will not be liable for any damages, which result from improper usage or treatment. Please read the sections „General Safety Rules“ and „Personal Body Protection“ carefully before you start up the device.

Note:

The devices manufactured by „Lampert Werktechnik GmbH“ meet all conformity demands of the CE emblem and are manufactured in accordance with the VDE -

Guidelines. The liquid crystal displays are DIN-CERTCO (DIN-association for eye protection) are tested and approved.

Only use original spare parts for maintenance and overhaul. Our customer service will gladly help you.

The device may be opened or altered by authorized personnel only, otherwise all warranty and liability claims are invalid!

LAMPERT WERKTECHNIK GMBH

January 2004

INDEX

Intended Use	2
Introduction	2
General Safety Rules	2
Personal Body Protection	3
Start Up and Instructions	3
Description of Operating Elements	3
Care and Maintenance	4
Technical Data	4

THE INTENDED USE FOR THE PUK-Welding Shield:

- Observation of welding procedures through the view window of the welding shield and illumination of the workstation.
- The PUK-Welding Shield may only be used together with the „Optiwelder“-Precision Welding Device.
- The PUK- Welding Shield may only be used if set up according to the instructions.
- Usages other than described are prohibited.
- Outdoor use is prohibited. Use only in a dry environment!

INTRODUCTION

Arc Welding without protective gear is dangerous and may result in a painful inflammation of the cornea as well as an irreversible cataracts. The PUK- Welding Shield with the integrated LCD-Weld view protection filter offers a reliable protection against these hazards and permanently **protects** against UV/IR-Rays, sparks and splashes in the light green and dark green level. The protection level of the filter is in such a manner

defined, that glares from the light arc are avoided. The PUK Welding Shield may only be used with a PUK-Welding Device. Shortly before ignition of the light arc, the electronic of the PUK Spot Welding Device activates the filter from level DIN 3 to the safe dark level DIN 11. The filter lightens up again immediately after the light arc has been switched off.

GENERAL SAFETY RULES

- A professional may only open the device. Remove the power plug and make sure the device is not under live power. Always contact your professional if you are uncertain.
- Before replacing the energy savings bulb remove the power plug and do not touch the bulb until it has sufficiently cooled off. Only use energy savings bulbs with maximal 9W.
- The law prohibits the non-professional any handling of parts, which could be under live power, with exception of the power plug or the main power switch.
- Unplug the device from the main power source during repairs and maintenance of main power. During tasks, which take more than a few grips, or you need to leave your workstation, even only for a couple of minutes, you must additionally block the power source.
- If it is assumed that a safe usage of the device is not guaranteed, turn off the device and secure it against unintentional use. You can assume that a safe operation is not guaranteed if
 - the device shows visible damage or
 - Malfunctions occur or the device ceases to operate

EYE PROTECTION DURING WELDING

- **Do not look into the light arc with unprotected eyes; use this welding protection shield with appropriate protective lenses or safety goggles for welding.**
The light arc emits, besides light and heat rays, which could cause glaring and/or burns, also UV rays. If not sufficiently protected, these invisible ultra violet rays could cause a very painful conjunctivitis, which will become apparent after a few hours.
- Persons or helpers, whom are in the vicinity of this light arc must be advised of the danger and must also wear protective gear, if necessary install protection walls.

START UP AND INSTRUCTIONS

- Insert the welding shield into the lamp holder (3)
- Install the illumination bulb (max. 9W) into the provided socket
- Plug in the lamp's connector plug (4) into the outlet (5) on the rear side of the welding device and fasten by carefully turning per hand towards the right.
- Plug in the welding shield's power plug (6) into an appropriate ~230 V (22V) / 50-60 Hz. power outlet.
- **Keep a minimum distance of 15 cm between the illumination and/or the work piece and welding table.**
- Turn the power switch (1) to „ON“
- The view protection filter (2) must switch from dark to bright shortly after turning on the device for a test. Perform this test every time before you begin working with this device to make sure it is in perfect working condition. If necessary, start the test over by turning off the device and turning it back on after a few moments.

ATTENTION!

Always test that the Welding Shield is in correct functioning order before you start welding. If the glare protection filter (Shutter) does not switch from bright to dark, it must immediately be replaced.

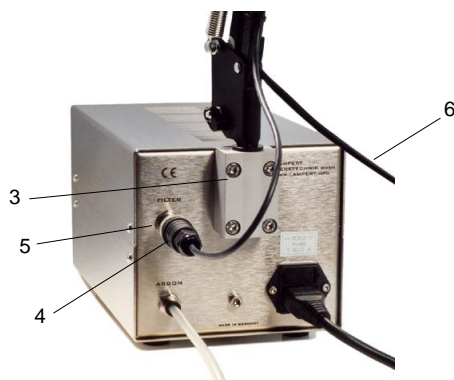
DESCRIPTION OF THE OPERATING ELEMENTS

(Fig. 1)



**MAIN POWER SWITCH (1)
GLARE PROTECTION FILTER (SHUTTER) (2)**

(Fig. 2)



**LAMP HOLDER (3)
CONNECTOR PLUG (4)
OUTLET (5)
POWER CABLE (6)**

CARE AND MAINTENANCE

The welding shield needs under ordinary circumstances a minimum of care and maintenance. It is essential though, you pay attention to a few points to guarantee proper function and to ensure you will have this device ready for operation for years to come.

- Regularly check the power plug, power cable and connector plug for damage.
- Occasionally clean the view window with a soft cloth

TECHNICAL DATA

- Optical view protection and illumination unit (welding shield) only to be operated with the „Opti-Welder-„ Precision welding device
- Use only in dry environments
- Operating temperature +5°C to +40°C
- Mains Voltage +/-15%
~230 V / 50-60 Hz
- Illumination=Energy savings lamp max. 9 W
- Protection class II
- Insulation class B
- Weight 1,75 Kg

TECHNICAL DATA LCD-SHUTTER

- Brightness level DIN 3
- Darkness level DIN 11
- Circuit time <50ms
- UV Protection >UV 15
- IR Protection >IR 14

WARNING:

Authorized service personnel may only open the device; otherwise the manufacturer warranty will become invalid!

Text and images correspond to the technical version during print of this manual. We reserve the right to change components.