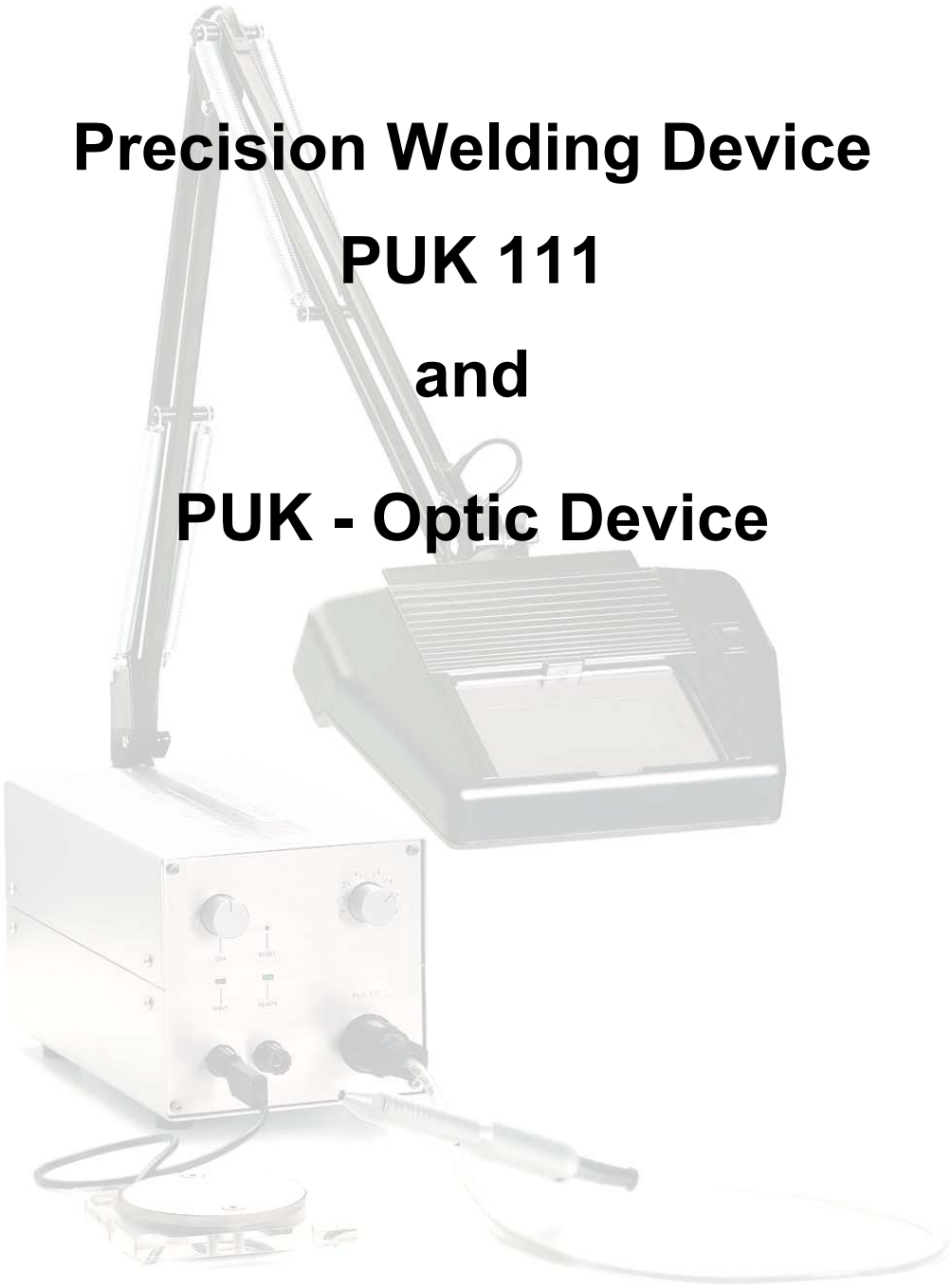
Operating Instructions

Precision Welding Device

PUK 111

and

PUK - Optic Device



Lampert Tools USA, Inc

115 V

PUK 111

Operating Instructions

115V

Dear Customer

This handbook is intended to help you with the operation of your PUK 111. It is important to read the instructions carefully and to follow the directions closely in order to avoid disruptions due to operating errors. By following instructions properly, your equipment will always be ready for use and serve you over a long lifespan.

Operation of the device should only be done by trained professionals and be operated according to the intended purpose of use. The manufacturer is in no way liable for any damage caused by improper use and operation. Before use please be sure to read the manual sections "General Safety Requirements" and "Personal Protection".

Please retain these instructions for reference.

Note on Symbol
The equipment manufactured by "Lampert TOOLS GmbH" fulfil the standard requirements of CE certification and are manufactured according to VDE guidelines.

The PUK is certified as "BG-PRÜFZERT" by the Central Professional Association and carries the "GS Sign" (No. MO 022101)

Use original parts only for maintenance and updating. Our customer service department with expertly trained staff, suitable resources and equipment would be pleased to help you further.

The device should only be opened or modified by authorized customer service technicians, otherwise all warrantees and liability claims will be void.

LAMPERT TOOLS GmbH

August 2003

TABLE OF CONTENTS

SECTION 1 – GENERAL APPLICATION

- fixing or fastening work pieces prior to soldering or other additional processing
- the placement of spot welding on precious metal and precious metal alloys, on steel and steel alloys as well as titanium and various NE-metals such as
  aluminium and brass
- not authorized for welding teeth fittings (dental techniques)
- Operation in outdoor areas is prohibited. Use in dry room areas only.

No liability of any kind will be assumed for the durability of welding spots. We recommend that you always check the spots and to solder them in case of doubt.

SECTION 2 – INTRODUCTION

PUK111 provides a long-awaited missing link between difficult joining techniques and laser welding devices. With the help of an intelligent combination of high performance electronics and precision mechanics, we've been able to create a unique spot welding device. It's small size, low weight and minimum energy use are important factors leading to your advantage. Excellent ignition and welding characteristics allow a broad range of use. With our welding device, you're able to gain access to new dimensions of welding techniques in the area of production and repair.

SECTION 3 – GENERAL SAFETY INSTRUCTIONS - READ BEFORE USING

3-1. SAFETY INSTRUCTIONS

- Opening the device is permitted only by trained experts. Remove the plug before opening the device and make sure that the device is without electrical power. Discharge all device components that may store electricity.
- Please consult an expert should any questions arise. Our customer service team with expertly trained staff, necessary resources and equipment would be pleased to assist you further at any time.
- Always use original cables that are long enough and make sure that the clamp holding the work piece is fastened properly.
- Hazard conditions may be caused by electricity as well as by welding current.
- It is illegal for non-professional electricians to handle parts that are directly connected to the mains power supply, except in cases of pulling the mains plug and/or operating the main power switch.
- The device must be disconnected from the mains as soon as repair or service works is needed. When leaving the place of work even for a short time, make sure that the electrical outlet is blocked clearly.
- Open circuit voltage is the highest and most dangerous voltage for welding current. The highest permitted open circuit voltages are contained in your national and international regulations according to the type of welding current, type of electrical source and the high or low hazard levels at the workplace.
- If you believe that operating the device is not possible without creating hazardous conditions, then shut off the device and secure it against unauthorised use. It is clear that a hazardous conditions are present when:
  - the device shows visible damage,or
  - or when functional errors occur
  - if it no longer functions properly.
- Please follow relevant safety measures when handling gas bottles

PUK111 can be operated in series using a mains voltage of 115V~

Yellow/green electric conductor = grounded terminal (PE)
Other conductors L1 and N are connected to phase and neutral of plug.

The welding device is set for 115 V ex works!
This means that it also may be operated using 115 volts due to its tolerance of +/- 15%. Devices set to a different voltage than 115 V will be marked with a special sticker.
If the PUK111 is switched for a voltage other than 115V, it will have a sticker with the corresponding voltage.

the device should only be opened by authorized customer service, otherwise the manufacturer`s warrantee is invalid.

if the device is setup for a special voltage, technical data contained on the output sticker are valid! Main plugs must correspond to the supply voltage and the current consumption of the welding device (see technical data)

The fuse protection must be set to the same voltage as the current consumption of the welding device.
Only use the Mains connection delivered with the device.

3-2. PERSONAL PROTECTION AND DANGER

- Always wear insulated protective gloves during the welding process to protect yourself from electrical strokes (open circuit voltage) from dangerous rays (heat and UV) and from hot metal and slags.

- Wear strong and insulated footwear. Footwear also must insulate under wet conditions. Low shoes are not suitable, since falling hot slags may cause burns.

- Wear suitable clothing - no synthetic fibers.

- **Do not look into arc without protecting your eyes. Use only a welders' face protection shield with protecting glass that conforms to regulation (minimum protection level 11).**
  The arc releases not only light and heat causing blindness or burning but also emits UV rays. If insufficient protection is used, the UV beams can cause very painful conjunctivital inflammation only noticeable after several hours.

- Bystanders close to the arcs also should be made aware of possible dangerous conditions and should wear protective equipment. If necessary protective walls should be set up.

- If welding in small rooms, ensure that there is sufficient ventilation since smoke and dangerous gases can be generated.

  It is prohibited by law to weld containers that have been used for the storage of gas, fuel, mineral oil etc., even if containers have been standing empty for a long period of time. Explosions may occur during the welding process due to residue.

- Note any special regulations for rooms with high fire or explosion hazards.

SECTION 4 – SAFETY PRECAUTIONS - READ BEFORE USING

4-1. Arc Welding Hazards

- ► **The symbols shown below are used throughout this manual to call attention to and identify possible hazards. When you see the symbol, watch out, and follow the related instructions to avoid the hazard. The safety information given below is only a summary of the more complete safety information found in the Safety Standards listed in Section 1-4. Read and follow all Safety Standards.**
- ► **Only qualified persons should install, operate, maintain, and repair this unit.**
- ► **During operation, keep everybody, especially children, away.**

ELECTRIC SHOCK can kill.

Touching live electrical parts can cause fatal shocks or severe burns. The electrode and work circuit is electrically live whenever the output is on. The input power circuit and machine internal circuits are also live when power is on. In semiautomatic or automatic wire welding, the wire, wire reel, drive roll housing, and all metal parts touching the welding wire are electrically live. Incorrectly installed or improperly grounded equipment is a hazard.

- _ Do not touch live electrical parts.
- _ Wear dry, hole-free insulating gloves and body protection.
- _ Insulate yourself from work and ground using dry insulating mats or covers big enough to prevent any physical contact with the work or ground.
- _ Do not use AC output in damp areas, if movement is confined, or if there is a danger of falling.
- _ Use AC output ONLY if required for the welding process.
- _ If AC output is required, use remote output control if present on unit.
- _ Disconnect input power or stop engine before installing or servicing this equipment. Lockout/tagout input power according to OSHA 29 CFR 1910.147 (see Safety Standards).
- _ Properly install and ground this equipment according to its Owner's Manual and national, state, and local codes.
- _ Always verify the supply ground – check and be sure that input power cord ground wire is properly connected to ground terminal in disconnect box or that cord plug is connected to a properly grounded receptacle outlet.
- _ When making input connections, attach proper grounding conduc-tor first – double-check connections.
- _ Frequently inspect input power cord for damage or bare wiring –replace cord immediately if damaged – bare wiring can kill.
- _ Turn off all equipment when not in use.
- _ Do not use worn, damaged, undersized, or poorly spliced cables.
- _ Do not drape cables over your body.
- _ If earth grounding of the workpiece is required, ground it directly with a separate cable.
- _ Do not touch electrode if you are in contact with the work, ground, or another electrode from a different machine.
- _ Use only well-maintained equipment. Repair or replace damaged parts at once. Maintain unit according to manual.
- _ Wear a safety harness if working above floor level.
- _ Keep all panels and covers securely in place.
- _ Clamp work cable with good metal-to-metal contact to workpiece or worktable as near the weld as practical.
- _ Insulate work clamp when not connected to workpiece to prevent contact with any metal object.
- _ Do not connect more than one electrode or work cable to any single weld output terminal.

SIGNIFICANT DC VOLTAGE exists after removal of input power on inverters.

- – Turn Off inverter, disconnect input power, and discharge input capacitors according to instructions in Maintenance Section before touching any parts.

FUMES AND GASES can be hazardous.

Welding produces fumes and gases. Breathing these fumes and gases can be hazardous to your health.

- _ Keep your head out of the fumes. Do not breathe the fumes.
- _ If inside, ventilate the area and/or use exhaust at the arc to remove welding fumes and gases.
- _ If ventilation is poor, use an approved air-supplied respirator.
- _ Read the Material Safety Data Sheets (MSDSs) and the manufacturer's instructions for metals, consumables, coatings, cleaners, and degreasers.
- _ Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator. Always have a trained watch-person nearby. Welding fumes and gases can displace air and lower the oxygen level causing injury or death. Be sure the breath-ing air is safe.
- _ Do not weld in locations near degreasing, cleaning, or spraying op-erations. The heat and rays of the arc can react with vapors to form highly toxic and irritating gases.
- _ Do not weld on coated metals, such as galvanized, lead, or cadmium plated steel, unless the coating is removed from the weld area, the area is well ventilated, and if necessary, while wearing an air-supplied respirator. The coatings and any metals containing these elements can give off toxic fumes if welded.

ARC RAYS can burn eyes and skin.

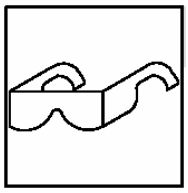
Arc rays from the welding process produce intense visible and invisible (ultraviolet and infrared) rays that can burn eyes and skin. Sparks fly off from the weld.

- _ Wear a welding helmet fitted with a proper shade of filter to protect your face and eyes when welding or watching (see ANSI Z49.1 and Z87.1 listed in Safety Standards).
- _ Wear approved safety glasses with side shields under your helmet.
- _ Use protective screens or barriers to protect others from flash and glare; warn others not to watch the arc.
- _ Wear protective clothing made from durable, flame-resistant material (leather and wool) and foot protection.

WELDING can cause fire or explosion.

Welding on closed containers, such as tanks, drums, or pipes, can cause them to blow up. Sparks can fly off from the welding arc. The flying sparks, hot workpiece, and hot equipment can cause fires and burns. Accidental contact of electrode to metal objects can cause sparks, explosion, overheating, or fire. Check and be sure the area is safe before doing any welding.

_ Protect yourself and others from flying sparks and hot metal.
_ Do not weld where flying sparks can strike flammable material.
_ Remove all flammables within 35 ft (10.7 m) of the welding arc. If this is not possible, tightly cover them with approved covers.
_ Be alert that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas.
_ Watch for fire, and keep a fire extinguisher nearby.
_ Be aware that welding on a ceiling, floor, bulkhead, or partition can cause fire on the hidden side.
_ Do not weld on closed containers such as tanks, drums, or pipes, unless they are properly prepared according to AWS F4.1 (see Safety Standards).
_ Connect work cable to the work as close to the welding area as practical to prevent welding current from traveling long, possibly unknown paths and causing electric shock and fire hazards.
_ Do not use welder to thaw frozen pipes.
_ Remove stick electrode from holder or cut off welding wire at contact tip when not in use.
_ Wear oil-free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes, and a cap.
_ Remove any combustibles, such as a butane lighter or matches, from your person before doing any welding.



FLYING METAL can injure eyes.

_ Welding, chipping, wire brushing, and grinding cause sparks and flying metal. As welds cool, they can throw off slag.
_ Wear approved safety glasses with side shields even under your welding helmet.

BUILDUP OF GAS can injure or kill.

_ Shut off shielding gas supply when not in use.
_ Always ventilate confined spaces or use approved air-supplied respirator.

HOT PARTS can cause severe burns.

_ Do not touch hot parts bare handed.
_ Allow cooling period before working on gun or torch.

MAGNETIC FIELDS can affect pacemakers.

_ Pacemaker wearers keep away.
_ Wearers should consult their doctor before going near arc welding, gouging, or spot welding operations.

NOISE can damage hearing.

Noise from some processes or equipment can damage hearing.
_ Wear approved ear protection if noise level is high.

CYLINDERS can explode if damaged.

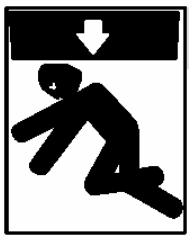
Shielding gas cylinders contain gas under high pressure. If damaged, a cylinder can explode. Since gas cylinders are normally part of the welding process, be sure to treat them carefully.

_ Protect compressed gas cylinders from excessive heat, mechani-cal shocks, slag, open flames, sparks, and arcs.
_ Install cylinders in an upright position by securing to a stationary support or cylinder rack to prevent falling or tipping.
_ Keep cylinders away from any welding or other electrical circuits.
_ Never drape a welding torch over a gas cylinder.
_ Never allow a welding electrode to touch any cylinder.
_ Never weld on a pressurized cylinder – explosion will result.
_ Use only correct shielding gas cylinders, regulators, hoses, and fit-tings designed for the specific application; maintain them and associated parts in good condition.
_ Turn face away from valve outlet when opening cylinder valve.
_ Keep protective cap in place over valve except when cylinder is in use or connected for use.
_ Read and follow instructions on compressed gas cylinders, associated equipment, and CGA publication P-1 listed in Safety Standards.

4-2. Additional Symbols For Installation, Operation, And Maintenance

FIRE OR EXPLOSION hazard.

_ Do not install or place unit on, over, or near combustible surfaces.
_ Do not install unit near flammables.
_ Do not overload building wiring – be sure power supply system is properly sized, rated, and protected to handle this unit.

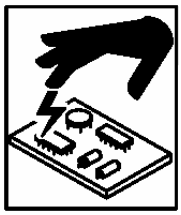


FALLING UNIT can cause injury.

_ Use lifting eye to lift unit only, NOT running gear, gas cylinders, or any other accessories.
_ Use equipment of adequate capacity to lift and support unit.
_ If using lift forks to move unit, be sure forks are long enough to extend beyond opposite side of unit.

OVERUSE can cause OVER-HEATING

_ Allow cooling period; follow rated duty cycle.
_ Reduce current or reduce duty cycle before starting to weld again.
_ Do not block or filter airflow to unit.



STATIC (ESD) can damage PC boards.

_ Put on grounded wrist strap BEFORE handling boards or parts.
_ Use proper static-proof bags and boxes to store, move, or ship PC boards.

MOVING PARTS can cause injury.

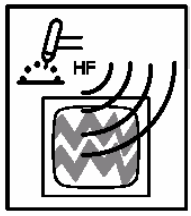
_ Keep away from moving parts.
_ Keep away from pinch points such as drive rolls.

WELDING WIRE can cause injury.

_ Do not press gun trigger until instructed to do so.
_ Do not point gun toward any part of the body, other people, or any metal when threading welding wire.

MOVING PARTS can cause injury.

_ Keep away from moving parts such as fans.
_ Keep all doors, panels, covers, and guards closed and securely in place.



H.F. RADIATION can cause interference.

_ High-frequency (H.F.) can interfere with radio navigation, safety services, computers, and communications equipment.
_ Have only qualified persons familiar with electronic equipment perform this installation.
_ The user is responsible for having a qualified electrician prompt-ly correct any interference problem resulting from the installation.
_ If notified by the FCC about interference, stop using the equipment at once.
_ Have the installation regularly checked and maintained.
_ Keep high-frequency source doors and panels tightly shut, keep spark gaps at correct setting, and use grounding and shielding to minimize the possibility of interference

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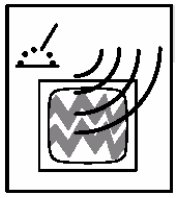


ARC WELDING can cause interference.

_ Electromagnetic energy can interfere with sensitive electronic equipment such as computers and computer-driven equipment such as robots.
_ Be sure all equipment in the welding area is electromagnetically compatible.
_ To reduce possible interference, keep weld cables as short as possible, close together, and down low, such as on the floor.
_ Locate welding operation 100 meters from any sensitive elec-tronic equipment.
_ Be sure this welding machine is installed and grounded according to this manual.
_ If interference still occurs, the user must take extra measures such as moving the welding machine, using shielded cables, using line filters, or shielding the work area.

4-3. Principal Safety Standards

Safety in Welding, Cutting, and Allied Processes, ANSI Standard Z49.1, from American Welding Society, 550 N.W. LeJeune Rd, Miami FL 33126 (phone: 305-443-9353, website: www.aws.org).

Recommended Safe Practices for the Preparation for Welding and Cut-ting of Containers and Piping, American Welding Society Standard AWS F4.1, from American Welding Society, 550 N.W. LeJeune Rd, Miami, FL 33126 (phone: 305-443-9353, website: www.aws.org).

National Electrical Code, NFPA Standard 70, from National Fire Protec-tion Association, P.O. Box 9101, 1 Battery March Park, Quincy, MA 02269–9101 (phone: 617–770–3000, website: www.nfpa.org and www. sparky.org).

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, from Compressed Gas Association, 1735 Jefferson Davis Highway, Suite 1004, Arlington, VA 22202–4102 (phone: 703–412–0900, web-site: www.cganet.com).

Code for Safety in Welding and Cutting, CSA Standard W117.2, from Canadian Standards Association, Standards Sales, 178 Rexdale Boulevard, Rexdale, Ontario, Canada M9W 1R3 (phone: 800–463–6727 or in Toronto 416–747–4044, website: www.csa–in-ternational.org).

Practice For Occupational And Educational Eye And Face Protection,

ANSI Standard Z87.1, from American National Standards Institute, 11 West 42nd Street, New York, NY 10036–8002 (phone: 212–642–4900, website: www.ansi.org).

Standard for Fire Prevention During Welding, Cutting, and Other Hot Work, NFPA Standard 51B, from National Fire Protection Association, P.O. Box 9101, 1 Battery March Park, Quincy, MA 02269–9101 (phone: 617–770–3000, website: www.nfpa.org and www. sparky.org).

OSHA, Occupational Safety and Health Standards for General Indus-try, Title 29, Code of Federal Regulations (CFR), Part 1910, Subpart Q, and Part 1926, Subpart J, from U.S. Government Printing Office, Super-intendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250 (there are 10 Regional Offices—phone for Region 5, Chicago, is 312–353–2220, website: www.osha.gov).

4-4. EMF Information

Considerations About Welding And The Effects Of Low Frequency Electric And Magnetic Fields Welding current, as it flows through welding cables, will cause electro-magnetic fields. There has been and still is some concern about such fields. However, after examining more than 500 studies spanning 17 years of research, a special blue ribbon committee of the National Research Council concluded that: “The body of evidence, in the committee’s judgment, has not demonstrated that exposure to power-frequency electric and magnetic fields is a human-health hazard.” However, studies are still going forth and evidence continues to be examined. Until the final conclusions of the research are reached, you may wish to minimize your exposure to electromagnetic fields when welding or cutting.

To reduce magnetic fields in the workplace, use the following procedures:

1. Keep cables close together by twisting or taping them.
2. Arrange cables to one side and away from the operator.
3. Do not coil or drape cables around your body.
4. Keep welding power source and cables as far away from operator as practical.
5. Connect work clamp to workpiece as close to the weld as possi-ble.

About Pacemakers:

Pacemaker wearers consult your doctor first. If cleared by your doctor, then following the above procedures is recommend.

SECTION 5 – INSTALLATION

5-1. TECHNICAL DATA:

- o Device suitable for welding in dry rooms.
- o Mains voltage ~ 115 V / 50-60 Hz +/- 15%
- o Mains fuse T4,0 A
- o Power input 500VA
- o Operating voltage 20-38 V
- o Open circuit voltage 38V
- o Max. loading time 3 seconds
- o Protective gas min. Argon 99.9 % "Argon grade 5" (ARGON 4.6)
- o max. gas pressure 10 bar
- o Protection class I
- o Insulation category B
- o Protection type IP20
- o Weight 5.25 kg

5-2. TYPE LABEL CHART

Description of symbols:

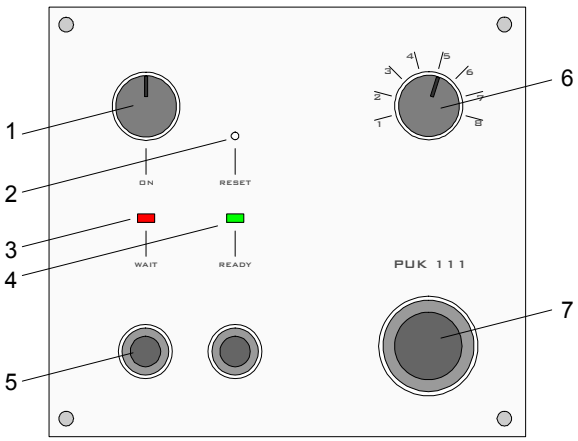
A	Amperes	V	Volts
Hz	Hertz		Alternating Current
	Direct Current	 1 ~ 50-60Hz	Line Connection 1 Phase / Alternating Current / 50-60Hz
U_0	Rated No Load Voltage (Average)	U_1	Primary Voltage
U_2	Conventional Load Voltage	I_2	Rated Welding Current
I_{1max}	Rated Maximum Supply Current	I_{1eff}	Maximum Effective Supply Current
IP	Degree Of Protection		Protective Earth (Ground)
	Gas Tungsten Arc Welding		One phase transformer
	Note Manual	X	Duty Cycle

5-3. SETTING UP

- Place the device so that cool air can reach the entire outside surface without difficulty
- Do not cover the device!
- Always place the device on a hard non-combustible, insulated material base.
- Do not allow metal dust (e.g. during abrasion work) to directly enter the device.

5-4.DESCRIPTION OF THE OPERATING COMPONENTS FRONT SIDE

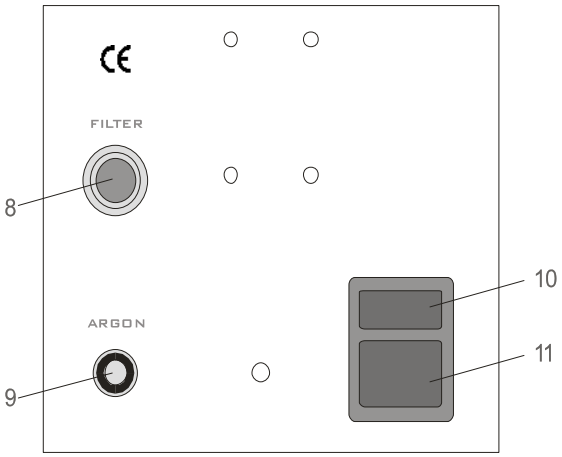
(Figure 1)



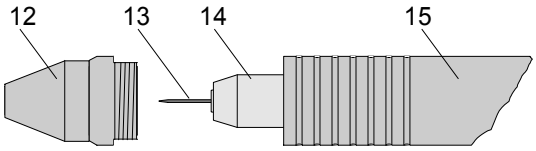
Main switch (1)
Reset button (2)
Charger signal (3) (red when charging)
Ready for use signal (4) (green when device is ready for welding)
Sockets (5) for connection of contact elements such as welding table, welding clamp, holding pliers.
Output regulator (6) . Power regulated in 8 steps
Connecting socket for tool piece (7)

DESCRIPTION OF OPERATING COMPONENTS BACK SIDE

(Figure 2)



Connection of optical unit (8) for filter control
Connection for inert gas (9) for ∅ 6.0mm pressure tube
Fuse box (10)
Plug (11) to connect to power supply



5-5. STARTING THE WELDING PROCESS:

The device must be set up on a flat and stable surface, a work table is best suitable.
Attention: Do not plug the power plug into the power outlet until you have completed installation!

- Insert cable of tool right straight into socket (7) turn tightly and carefully by hand to the right to fasten
- Insert plug of welding table and/or clamp or pliers into socket (5)
- Unscrew extruder die (12) from tool (15)
- Loosen electrode (14), insert newly grinded wolfram electrode (13) and fasten it (do it manually, do not use a tool) Let electrodes extend past the extruder die by about 5 mm (Fig. 3) (Only use original electrodes)
- Screw on extruder die (do it manually, not with a tool)
- Plug the optic unit into the fastening block located on the device, or alternatively fasten it to the work table using the accompanying table clamp
- Plug the round plug for the shutter into the connection socket marked “Filter” located on the back of the device and secure it with the screw.

.

- To connect the microscope, plug in the round plug and fasten it as like the optic unit above.
- Attach the pressure controller to the protective gas container after carefully reading the instructions (if possible, use argon gas with a minimum of 99.8%, e.g. “Argon grade 5” or “Argon 4.6”)
- Connect pressure tube, by using the quick connectors, to the pressure controller and to the gas connection (12) of housing backside
- Open gas bottle valve and set the gas flow to between 3-5 liters (.014 cubic feet) per minute - **maximum operating pressure should be 10 bar!**
- Plug in main plug to grounded outlet 115V (20amps)
- Set main switch (1) to ON – the device will perform a self-test.
- The green control light (4) will indicate that the device is in operational status.
- Use output regulator (6) to choose energy needed.
- Start welding process.
- **Use eye protection**

Please read the instructions on the connected eye protection devices such as the optic unit or microscope shutter!

ATTENTION!

When welding with PUK111, the welding base, the clamps and/or the pliers are live as soon as the mains master switch is turned on. Make sure that these parts do not touch any electrically conductive or earthed parts such as housing etc.

SECTION 6 – OPERATION

6-1. WELDING GUIDELINES

- Place the work piece on the welding table
- Make sure there is good contact between work piece and table
- Use a clamp or pliers if the work piece only has small contact with the table
- Use the electrode tip to touch the area you want to weld until the welding is complete. **"without pressure or only with slight pressure!"**
- The welding process takes place automatically:
  - protective gas floats around welding spot
  - A short beep indicates the arc
  - the arc sets off
  - protective gas supply stops
- The welding process can be interrupted at any given time by lifting the electrode away from the workpiece.

6-2. BASIC INFORMATION AND TIPS:

Important!

- **Always work with a sharp edge electrode to get optimal results.**
- **Always make sure that there is enough contact between work piece and welding table. In case of problems use a clamp and/or pliers.**
- **Never weld "free hand". That is, always support both hands on the base (work table). Trembling hands will distort the parameter of the device.**
- **Use only very light pressure on the electrode tip.**
- **Weld only using low gas pressure! 3 to 4 litres (.014 cubic feet) per minute is often enough.**

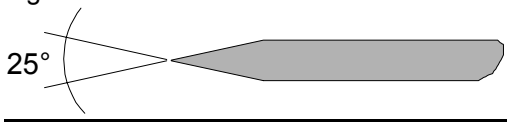
Tips

- Take the time to familiarize yourself with our device
- Test the various energy steps of the device.
- Remember that materials may react differently
- When choosing the energy step pay attention to the thickness of the material.
- Touch the work piece exactly at the point to welded.
- Once you are more familiar with the device you will notice that angle you use to touch the needle to the work piece will influence the "flow direction" of the welding spot. An angle of touch of 90° will result in the deepest welding spot possible.
- A saw or file with serrated edges is also very suitable as additional welding material
- Allow the needle to clamp in longer for deep-lying welding spots.
- It may be helpful to punch out material by chisel and weld them on.
- With a little experience you will be able to use wire to close holes or to add support.
- If you problems igniting, it may be helpful to **lightly press the needle sideways**. Using this technique you will be able to push welding spot in a certain direction.

6-3. GRINDING THE ELECTRODES

The electrodes must be ground on a fine or medium diamond wheel.
The angle should be about 25°. (Figure 4)

Figure 4



SECTION 7 – MAINTENANCE AND TROUBLESHOOTING

7-1. ROUTINE MAINTENANCE

PUK111 requires a minimum amount of care and maintenance when used under normal operating conditions. Please take note of some important points that will ensure a smooth functioning of your device and guarantee good service in the years to come.

- Occasionally check mains plug and cables and welding cable for damage.
- Check the movable parts of the hand piece for easy movement.
- Occasionally clean the electrode screw connection on the hand piece to guarantee good contact with the electrode.

Attention

If fuses have to be replaced, Only replace them with fuses of the same kind. if overly powerful fuses are used, the warranty against any possible damage will no longer be Valid.

The device should only be opened by trained personnel!

7-2. TROUBLESHOOTING CHECK LIST

ERROR	CAUSE	SOLUTION
1. No welding power Mains switch turned on Operation signal does not light up	Interrupted cable	Check cable and Mains
2. No welding power Mains switch turned on Operation signal green	Welding cable connection interrupted. Bad mass or no mass	Check connections Connect work piece Fasten contact clamp directly to work piece.
3. No welding power Mains switch turned on Operation signal constant (red)	Error by fault current	Press reset button or switch device off and on If malfunction continues, send device to be serviced
4. Poor ignition	poor contact with mass dirty electrode Tip of electrode burnt off	Connect work piece Grind electrode Grind electrode
5. Mains Fuse and/or safety cut-out has tripped	Mains fuse too weak, Incorrect safety cut out Mains fuse is tripped under no-load conditions	Insert correct fuse Send device to service
6. Poor welding characteristics	wrong protective gas no protective gas	Use inert protective gas (ARGON 4.6)
7.Oxidation and rust formation	Heavy gas pressure sufficient	Reduce flow through amount – 3-4 l/min.are
8. Strong oxidation of welding spots	wrong protective gas no protective gas	Use inert protective gas “Argon grade 5” (ARGON 4.6)
9. Tungsten contamination in basic material	Electrode with too high pressure onto work piece	Touch work piece with very slight pressure so that it manages to ignite
10. Tungsten Electrode sticks to work piece	Electrode with too high pressure onto work piece	Touch work piece with very slight pressure so that it manages to ignite
11. Tungsten Electrode fuses immediately	Grinding too sharp	Grind in recommended angle (25°)
12. Static discharge onto the device surface	Special situation at your location	Use special foot mat for the work area
13. Workpiece sticks to welding table	Bad contact to welding table	Use clamp or pliers

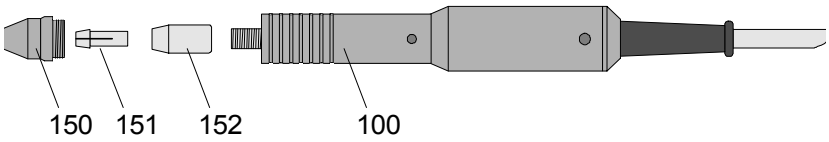
ATTENTION: The device should be opened by trained personnel only!

Text and figures at the time of printing. Subject to change.

SECTION 8 – LIST OF SPARE PARTS

LIST OF SPARE PARTS

Hand piece



100 100	complete hand piece
100 150	extrusion die
100 151	pliers
100 152	tension nut

Welding table

100 300	Welding table complete with 500mm cable

Electrodes

100 400	10 electrodes in display box (thoriumoxide-free)

Solder Cross Tweezers

100 750	Solder cross tweezers with 900mm cable

Pliers

100 500	Flat-point pliers with 900mm cable

Clamp

100 702	Electro clamp

Cable

100 306	Cable with 2 plugs 4mm, 500mm
100 307	Cable with 2 plugs 4mm, 1000mm

Grinding wheel

100 701	Diamond grinding wheel

SECTION 9 – CONTACT

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PUK

OPTIC DEVICE 115V

Operating Instructions

Dear Customer,

This handbook is intended to help you with the operation of your PUK Optic Device. It is important to read the instructions carefully and to follow the directions closely in order to avoid disruptions due to operating errors. By following instructions properly, your equipment will always be ready for use and serve you over a long lifespan.

Operation of the device should only be done by trained professionals and be operated according to the intended purpose of use. The manufacturer is in no way responsible for any damage caused by improper use and operation. Please be sure to read the chapters "General Safety Requirements" and "Personal Protection" before use.

Note on Symbols
The equipment manufactured by "Lampert Tools GmbH" fulfil the standard requirements of CE certification and are manufactured according to VDE guidelines.
The arc welding filter is in conformity with the "Practice For Occupational And Educational Eye And Face Protection" standard ANSI Z87.1-1989 (R1998)

Use original parts only for maintenance and updating. Our customer service department with expertly trained staff, suitable resources and equipment would be pleased to help you further.

The device <u>should only</u> be opened or modified by authorized customer service technicians, otherwise all warrantees and liability claims will be void.

LAMPERT TOOLS GMBH
August 2003

TABLE OF CONTENTS

SECTION 1 – GENERAL APPLICATION

Proper Use of the PUK OPTIC DEVICE includes:

- Observation of welding processes through the optic device's viewing window and workspace lighting.
- The PUK Optic Device may only be used in combination with PUK precision welding machine
- The PUK Optic Device may only be used when properly connected.
- Use for other than the proper purpose describe is not permitted.
- Use in outdoor areas is not permitted. Use only in dry room areas!

SECTION 2 – INTRODUCTION

Arc welding without protective equipment is dangerous and can lead to painful inflammation of the cornea and to irreversible clouding of the eye lens (cataracts). The PUK Optic Device with its integrated LCD – welder view protection filter offers reliable protection against these dangers and **permanently protects** against UV/IR rays, sparks and splashes at both light and dark levels. The filter's protection levels are defined to avoid blinding by the arc welding. The PUK Optic Device should only be used in combination with a PUK spot welding device. Shortly prior to lighting an arc, the electronic component of the PUK spot welding device switches the filter from the DIN 3 level to the safer DIN 11 dark level. As soon as the arc is turned off, the filter is switched back to the light setting.

SECTION 3 – GENERAL SAFETY INSTRUCTIONS - READ BEFORE USING

3-1. SAFETY INSTRUCTIONS

- Opening the device is permitted only by trained experts. Before opening the device, remove the plug and make sure that there is no electrical current in the device. If you are uncertain, always first ask an expert.
- Remove the plug before exchanging the energy saving light and only touch the light when it has cooled down sufficiently. Only use energy saving lights with a maximum output of 9 W.
- It is illegal for non-electrical professionals to handle parts which are directly connected to the mains voltage, except in cases of using the mains plug or the mains central switch.
- During maintenance or repair work of the electrical source, first separate the device from the mains. In the case of more complex activity where you must leave the work area – even for a short time – you are also required to clearly block the plug outlet.
- If it is clear that there is some danger involved in your activities, you must take the device out of operation and also prevent unintentional operation. It is clear that a dangerous situation is at hand when:
  - the device shows visible damage, or
  - or when functional errors occur
  - the device no longer works properly.

3-2. EYE PROTECTION WHILE WELDING

- **Do not look into the arc without eye protection; only use welding protection visors which are made from regulation-approved protective glass.**
  In addition to light and heat rays causing blinding or burning, the arc also emits UV rays. Without sufficient protection, these invisible ultraviolet rays cause very painful conjunctivital inflammation noticable after several hours.
- Any persons or helpers who are working near the arc should also be made aware of the dangers and be equipped with the proper required protection. If necessary, protective walls should be set up.

SECTION 4 – SAFETY PRECAUTIONS - READ BEFORE USING

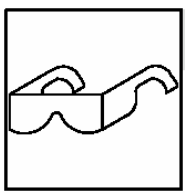
4-1. Arc Welding Hazards

► **The symbols shown below are used throughout this manual to call attention to and identify possible hazards. When you see the symbol, watch out, and follow the related instructions to avoid the hazard. The safety information given below is only a summary of the more complete safety information found in the Safety Standards listed in Section 4.2 Read and follow all Safety Standards.**
► **Only qualified persons should install, operate, maintain, and repair this unit.**
► **During operation, keep everybody, especially children, away.**

_ Wear a welding helmet fitted with a proper shade of filter to protect your face and eyes when welding or watching (see ANSI Z49.1 and Z87.1 listed in Safety Standards).
_ Wear approved safety glasses with side shields under your helmet.
_ Use protective screens or barriers to protect others from flash and glare; warn others not to watch the arc.
_ Wear protective clothing made from durable, flame-resistant material (leather and wool) and foot protection.

ARC RAYS can burn eyes and skin.

Arc rays from the welding process produce intense visible and invisible (ultraviolet and infrared) rays that can burn eyes and skin. Sparks fly off from the weld.



FLYING METAL can injure eyes.

_ Welding, chipping, wire brushing, and grinding cause sparks and flying metal. As welds cool, they can throw off slag.
_ Wear approved safety glasses with side shields even under your welding helmet.

4-2. Principal Safety Standards

Safety in Welding, Cutting, and Allied Processes, ANSI Standard Z49.1, from American Welding Society, 550 N.W. LeJeune Rd, Miami FL 33126 (phone: 305-443-9353, website: www.aws.org).

Recommended Safe Practices for the Preparation for Welding and Cut-ting of Containers and Piping, American Welding Society Standard AWS F4.1, from American Welding Society, 550 N.W. LeJeune Rd, Miami, FL 33126 (phone: 305-443-9353, website: www.aws.org).

National Electrical Code, NFPA Standard 70, from National Fire Protec-tion Association, P.O. Box 9101, 1 Battery March Park, Quincy, MA 02269–9101 (phone: 617–770–3000, website: www.nfpa.org and www. sparky.org).

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, from Compressed Gas Association, 1735 Jefferson Davis Highway, Suite 1004, Arlington, VA 22202–4102 (phone: 703–412–0900, web-site: www.cganet.com).

Code for Safety in Welding and Cutting, CSA Standard W117.2, from Canadian Standards Association, Standards Sales, 178 Rexdale

Boulevard, Rexdale, Ontario, Canada M9W 1R3 (phone: 800–463–6727 or in Toronto 416–747–4044, website: www.csa–in-ternational.org).

Practice For Occupational And Educational Eye And Face Protection,

ANSI Standard Z87.1, from American National Standards Institute, 11 West 42nd Street, New York, NY 10036–8002 (phone: 212–642–4900, website: www.ansi.org).

Standard for Fire Prevention During Welding, Cutting, and Other Hot Work, NFPA Standard 51B, from National Fire Protection Association, P.O. Box 9101, 1 Battery March Park, Quincy, MA 02269–9101 (phone: 617–770–3000, website: www.nfpa.org and www. sparky.org).

OSHA, Occupational Safety and Health Standards for General Indus-try, Title 29, Code of Federal Regulations (CFR), Part 1910, Subpart Q, and Part 1926, Subpart J, from U.S. Government Printing Office, Super-intendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250 (there are 10 Regional Offices—phone for Region 5, Chicago, is 312–353–2220, website: www.osha.gov).

SECTION 5 – OPERATION AND INSTRUCTIONS

5-1. SETTING UP

- Plug the optic device into the holder **(3)**
- Insert lights into the holder with a maximum of 9W
- Insert the lamp's connective plug **(4)** into the socket **(5)** on the back of the welding device and screw it tightly by carefully turning to the right. (as tight as possible by hand)
- Plug the optic device's mains plug **(6)** into the correct mains plug socket with ~115V (110V) / 50-60 Hz .
- **Keep a minimum 15 cm distance between the light and the workpiece and/or the welding table.**
- Turn the mains switch **(1)** to "ON"
- During a self-test right after switching on the welding device, the view protection filter **(2)** will quickly turn dark and then light. Test the device in this manner each time prior to beginning your work, to ensure that the view protection filter functions perfectly. If necessary, start the self-test gain by switching off the device; switch it on again after several seconds of waiting.

WARNING!

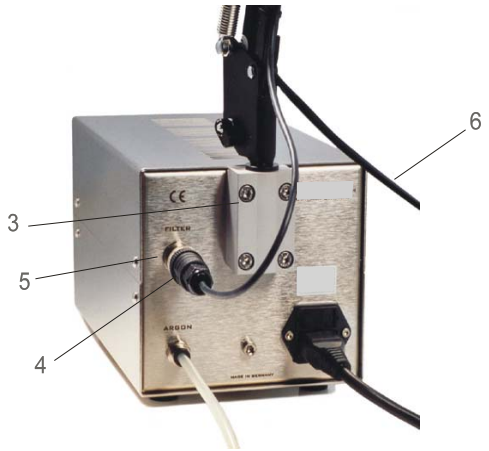
Before welding, always check that the PUK Optic Device functions properly. If the arc welding filter does not switch from light to dark, it must be changed immediately.

5-2. DESCRIPTION OF THE OPERATING ELEMENTS

(Fig. 1)

MAINS CENTRAL SWITCH (1)
ARC WELDING FILTER (2)

(Fig . 2)



LAMP HOLDER (3)
CONNECTIVE PLUG (4)
SOCKET (5)
MAINS CABLE (6)

5-3. TECHNICAL DATA

- Optical view protection and lighting unit for the exclusive use with PUK precision devices
- Use only in dry indoor areas
- Operating temperature +5°C to +40°C
- Mains voltage +/-15%
  ~115 V / 50-60 Hz
- Lighting material = energy saving lamps with max. 9 W
- Protective class II
- Isolations class B
- Type of protection IP 20
- Weight 1.75 Kg

5-4. TECHNICAL DATA – ARC WELDING FILTER

- Light state DIN 3
- Dark state DIN 11
- Switching time <50ms
- UV protection >UV 15
- IR protection >IR 14

SECTION 6 - CARE AND MAINTENANCE

6-1. ROUTINE MAINTENANCE

The PUK Optic Device does not require much care or maintenance when used at normal levels. However, several points must be observed in order to guarantee functioning and to keep the device working properly for many years to come.

- Regularly check the mains plug, mains cable and connective plug and cable for the welding device for damage
- Occasionally clean the view window with a soft cloth

WARNING: The device should only be opened by authorized customer service, otherwise the manufacturer´s warrantee is invalid.

SECTION 7 – CONTACT

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