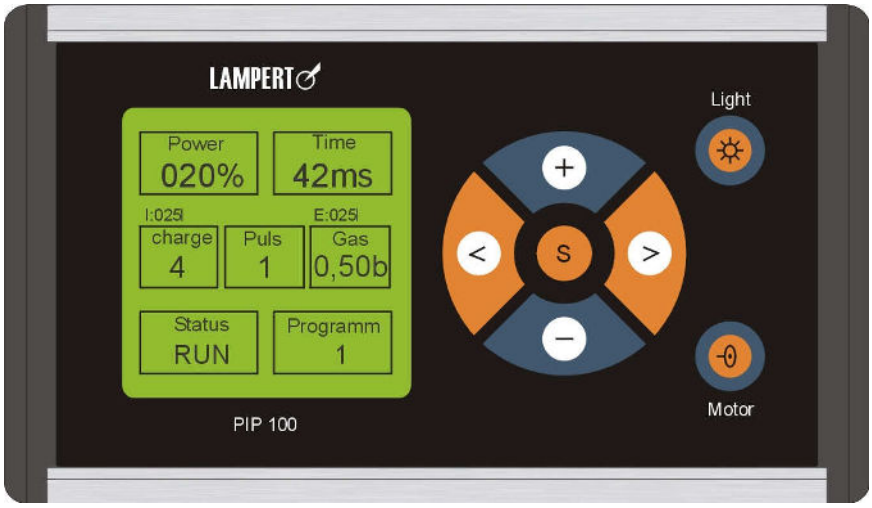
PIP 100

Operating Instructions

230V



Dear Customer

This handbook is intended to help you with the operation of your PIP 100. 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", "Personal Protection" and the Safety Precautions.

Please retain these instructions for reference.

Note on Symbol

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

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 WERKTECHNIK GMBH

May 2007

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SECTION 1 – GENERAL APPLICATION OF THE WELDING DEVICE PIP 100:
(intended use)

- 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 – GENERAL SAFETY INSTRUCTIONS - READ BEFORE USING

2-1. 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
    - when functional errors occur, or
    - if it no longer functions properly.

- Please follow relevant safety measures when handling gas bottles.

PIP 100 can be operated in series using a mains voltage of 230V~

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 230 V ex works! This means that it also may be operated using 220 volts due to its tolerance of +/- 15%. Devices set to a different voltage than 230 V will be marked with a special sticker.
If the PIP 100 is switched for a voltage other than 230V, 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.

2-2. 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 fibres.

- **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 conjunct vital 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.

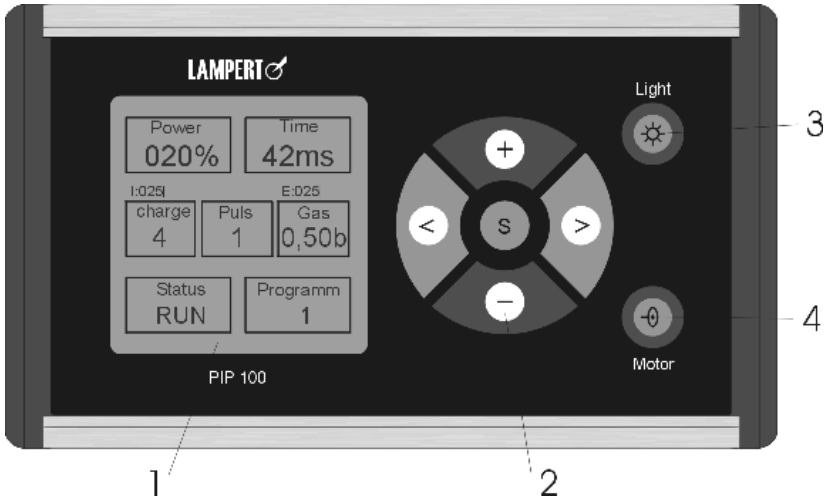
SECTION 3 – SETTING UP

3-1. SETTING UP REGULATIONS

- 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.

3-2. DESCRIPTION OF THE CONTROL ELEMENTS CONTROLLER

(Fig. 1)



INDICATION AREA (1)

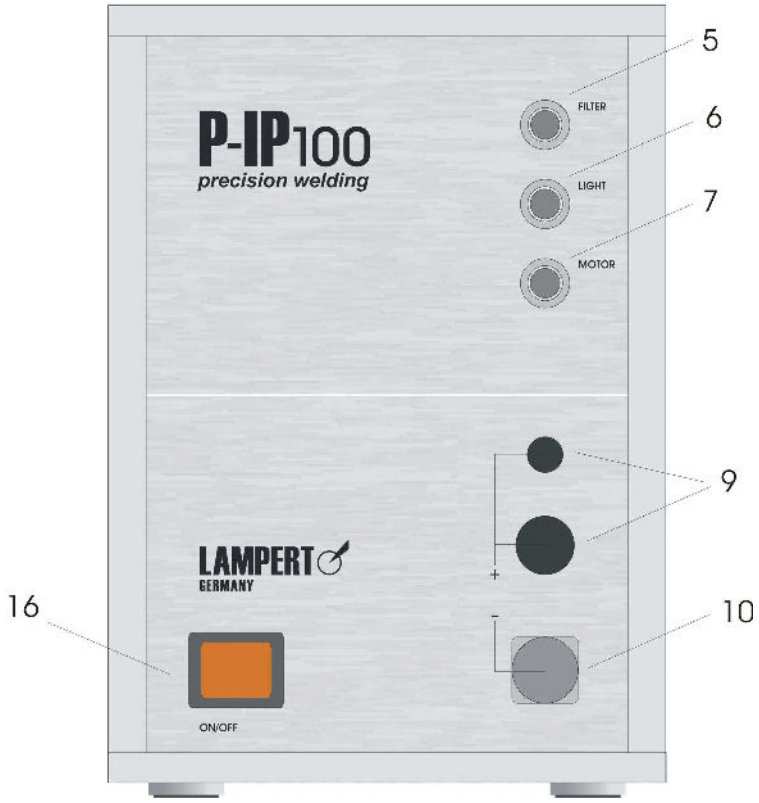
CONTROL- AND MEMORY KEYS (2)

ACTIVATOR FOR AUXILIARY LIGHTING (3)

ACTIVATOR ELECTRODE SHARPENING ENGINE (4)

3-3. DESCRIPTION OF THE CONTROL ELEMENTS SERVICE SECTION

(FIG. 2)



CONNECTING SOCKET FOR EYE PROTECTION SYSTEM (5)

CONNECTING SOCKET FOR AUXILIARY LIGHTING (6)

CONNECTING SOCKET FOR GRINDING ENGINE (7)

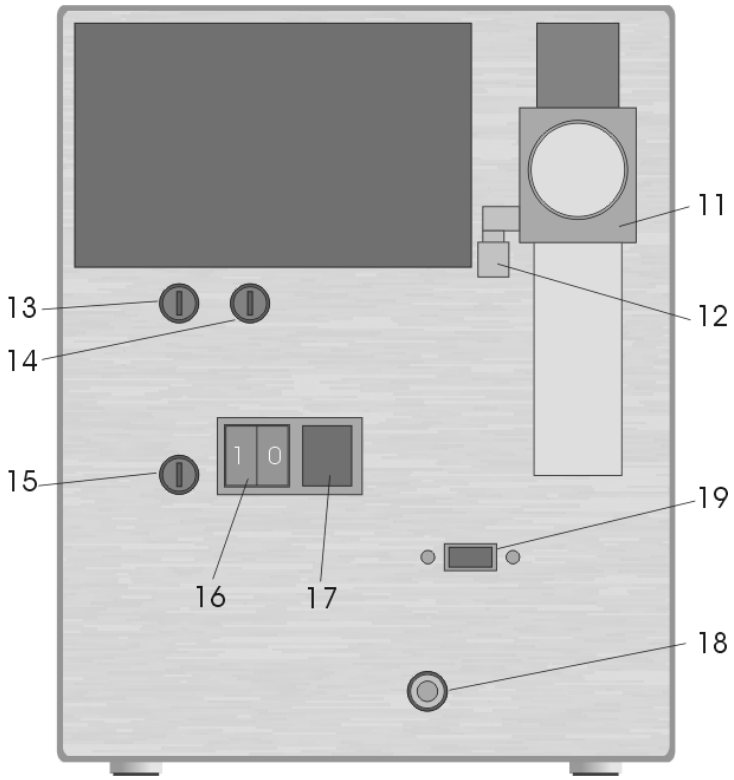
CONNECTING SOCKET FOR HANDPIECE (10)

CONNECTING SOCKETS FOR CONTACT ELEMENTS (9) such as welding table, welding clamp, holding plier

Safety patch cord! In order to plug off an insert plug it is essential to first press this plug into the socket to detach the locking

3-4. DESCRIPTION OF OPERATING COMPONENTS BACKSIDE CONTROLLER

(Fig. 3)



PRESSURE REDUCING-VALVE WITH WATER TRAP (11)
CONNECTION FOR COMPRESSED AIR (12)
for ∅ 6.0mm pressure tube (min. 3 bar (43psi) – max. 10 bar(145psi) oil free)
FUSEBOX (13)
Welding current T10AH (5x20mm)
FUSEBOX (14)
Auxiliary lighting T2,5AH (5x20mm)
FUSEBOX (15)
Power Fuse T4AH (5x20mm)
MAIN SWITCH (16)
APPLIANCE COUPLERS (17)
Connection of the mains cable
SHIELDING GAS CONNECTOR (18)
for ∅ 6.0mm pressure tube (max. 4 bar (58psi))
PC - CONNECTION (19)

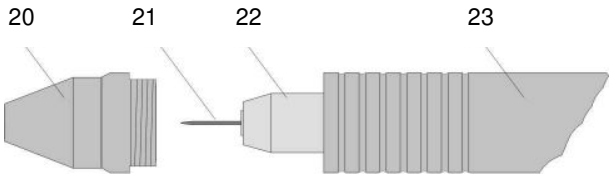
3-5. STARTING THE WELDING PROCESS:

The device must be set up on a flat and stable surface; a work table is best suitable.

- Connect the control Panel (fig. 1) with the main device (fig. 2), by using the connecting cable.
- Insert the hand piece connector as straight as possible into the socket (9) and by turn to the right carefully bolt on (do it manually!)
- Insert the connector of the clamp or pliers into one of the sockets (10)
- Remove the nozzle (20) of the hand piece (23) (by pulling)
- Loosen the electrode thread (22), insert the newly sharpened tungsten electrode (21) and screw on tightly (per hand - do not use a wrench) with the electrode projecting approx. 5 – 8 mm out of the nozzle (Only use original electrodes)
- mount the nozzle
- Plug the round plug for the eye protection system; such as “Optic unit” or “Microscope” into the connection socket (5) marked “Filter” located on the front side of the device and secure it with the nut.
- Attach the pressure controller to the protective gas container after carefully reading the instructions (if possible, use argon gas with a minimum of 99.9%, e.g. “Argon 4.6” or an inert gas mixture suitable for your application)
- Connect pressure tube, by using the quick connectors, to the pressure controller and to the gas connection (18) of housing backside
- Open gas bottle valve and set the gas flow to 8 litres per minute
- Plug in main plug
- Switch “on” mains plug (16) - equipment accomplishes self check

CAUTION: **maximum operating pressure should be 4 bars / 58psi!**

(Fig. 4)



IMPORTANT!
Consider also the operating instructions of the attached eye protective systems!

ATTENTION!
When welding with PIP 100, 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 4 – OPERATION

4-1. CONTROL KEYS AND FUNCTIONS

Menu to the right and down

Menu to the left and up

Increase current value (cancel memory procedure)

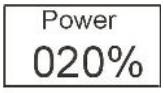
Decrease current value (cancel memory procedure)

Save, store current parameters

Auxiliary lighting on/off

Grinding engine on/off

4-2. DISPLAY



Achievement in the per cent of 15% - 100% in 5% stages

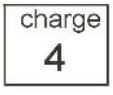
Welding time in ms of 3ms - 52ms

I:025

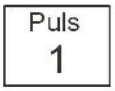
Devices interior temperature

E:025

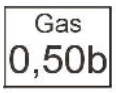
Hand piece temperature



Charge/welding tension 1 - 5



Welding Impulse shape 1 – 6



Gas pressure in bar

Status and/or error display

Selected programme number

4-3. ADJUST THE PARAMETER

OPERATION OF MENU AND KEYS

Keep the keys pressed until a beep signal confirms the input. If a key is pressed continuously this is to rate as renewed key/input.

With the keys < and > the individual menu points (program fields) can be selected.

Using the + and - key the desired programme can be selected if the programme field is activated.

NOTE: To reach the most quickly possible welding sequence no menu option may be selected!
I.e. keep the keys < / > pressed until no menu option is active anymore or store you the selected setting.

PROGRAMME STORING

Through pressing the „S" - key the memory procedure is activated.
Now a program place of 1 - 20 can be selected by using the + and - key
Using the < or > key the memory procedure can be discontinued.
The „S"– Key needs to be pressed again for 2 seconds to close the memory procedure.
With release the S - key the current parameters are stored into the selected program place.

SELECTION OF WELDING TENSION

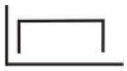
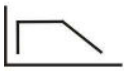
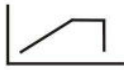
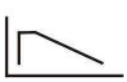
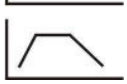
Different welding tensions can be selected in the menu „charge".

Charge	Welding Tension in V
1	38
2	39,5
3	40,5
4	41,5
5	43

The welding tension affects the ignition behaviour and the amount of energy.

SELECTION OF IMPULSE SHAPE

The current welding process can be affected in the menu "pulse".

Current process	Pulse shape	
	1	Standard impulse
	2	Rise and descent flattened
	3	Descent flattened (2/5 of the welding time)
	4	Rise flattened (3/5 of the welding time)
	5	Descent flattened (4/5 of the welding time)
	6	Rise (1/5)and descent (2/5) flattened

NOTE: If a pulse length is selected smaller than 7ms, always the plus form 1 is active!

STATUS INDICATION AND ERROR MESSAGES

Run	Devices ready for use
Wait	Indication during the welding procedure
Store	Memory procedure activated
Save	Storage of the current parameter in the selected memory
S-Fail	Faulty shutter (eye protection filter incorrectly)
G-Fail	Gas fault: Gas pressure under 0,10 bar / 1,45 psi during the welding procedure Solve error and weld again
H-Fail	Hand piece not connected Control hand piece connection
T-Fail	Temperature error, hand piece temperature over 52°C Compressed air cooling is switched on

HAND PIECE COOLING

The function "hand piece cooling" presupposes a compressor air bleed port.
If no compressor air bleed port is available the "hand piece cooling" is deactivated.

Starting from a hand piece temperature of 40°C the hand piece cooling is activated.
If compressed air is connected the compressed air valve is opened and the hand piece is cooled after 10 seconds of work break.
If the hand piece temperature sinks under 35°C the compressed air valve is closed and the hand piece cooling is deactivated.
Also by starting a welding procedure the compressed air valve is closed.

If the hand piece temperature reaches 53° the cooli ng is obligation-switched on.
If the hand piece temperature falls under 53° the c ooling can be stopped by starting a new welding procedure.

GAS PRESSURE SETTING

Adjust the pressure reducing valve to a flow rate of 3-5l/min.

Note: The maximum pressure amounts to 4 bar / 58psi.
If the gas pressure is adjusted higher, the internal gas regulation can be damaged.

4-4. WELDING GUIDELINES

- Use a clamp though the work piece can be connected to the ground connection
- Make sure there is good contact between work piece and 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 signal tone indicates the arc
  - the arc sets off
  - protective gas supply stops
- The welding procedure can be interrupted at any time by taking off the electrode from the work piece

4-5. BASIC INFORMATION AND TIPS:

Important!

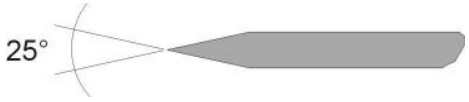
- **Always work with a sharp edge electrode to get optimal results.**
- **Always make sure that there is enough contact between work piece and welding table. In case of problems use a clamp and/or pliers.**
- **Never weld "free hand". That is, always support both hands on the base (work table). Trembling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

TIPS

- Take the time to familiarize yourself with our device
- Test the different adjustment possibilities of the equipment.
- Remember that materials may react differently
- When choosing the performance level and welding time consider the material thickness
- Touch the work piece exactly at the point to weld.
- 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 burr can serve well as a „welding addition".
- Allow the needle to clamp in longer for deep-lying welding spots.
- If you work with adding material, use only suitable welding wires.
- If you have 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.

4-6. GRINDING THE ELECTRODES

Figure 4



The electrodes must be ground on a fine or medium Diamond wheel.
The angle should be about 15 - 25°. (Fig. 4)

SECTION 5 – MAINTENANCE

PIP 100 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.

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- 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!

SECTION 6 – TECHNICAL DATA

6-1. TECHNICAL DATA

- Device suitable for welding in dry rooms.
- Temperature range 5-40℃
- Altitude indication: Not over 2000 m NN
- Air humidity: Max one. 80 % to 31℃ max. 50 % of 31 -40℃
- Mains voltage ~230 V/50-60 cycles per second of +/-15%
- Net security T 4 AH
- Capacity 1200 VA
- Normal voltage 38 - 43 V
- Open circuit voltage 3 V
- max. load time 1.7 sec
- Inert gas: recommended ARGON 99.9% (ARGON 4,6)
- maximum gas pressure 4 bar (58psi)
- Compressed air max. 10 bar (145psi)
- Cyclic duration X: 80 %
- Protection class system I
- Insulation category B
- Protection type IP21S
- Weight 16 kg

6-2. IDENTIFICATION PLATE

Description of symbols:

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
U_0	Idling Voltage	U_1	Mains Voltage		Ground
U_2	Nominal Voltage	I_2	Nominal welding current		Single phase transformer
I_{1max}	Amperage input	I_{1eff}	Rated Amperage input	X	Duty cycle

SECTION 7 - 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	Welding cable connection interrupted. Bad contact or no contact	Check connections Connect work piece Fasten contact clamp directly to work piece
3. No welding power Mains switch turned on	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 amount
8. Strong oxidation of welding spots	wrong protective gas no protective gas	Use inert protective gas (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. Work piece sticks to welding table	Bad contact to welding table	Use clamp or pliers
14. Equipment stops on status "WAIT"	Electrode was not separated from the work piece after the welding procedure	Separate electrode from the work piece
15. Equipment indicates status "WAIT" after switching on the device		Check charging fuse and replace if necessary

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

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

EC-DECLARATION OF CONFORMITY

- 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
Ettlebener Str. 27, 97440 Werneck, Germany,

Declares that the product

Precision Welding Device ……
"PIP 100""……..

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, May 1th, 2007

Lampert Werktechnik GmbH

Andrea Bauer – Lampert (President and CEO)