OPERATING INSTRUCTIONS

“DENTA PUK”

Dear customer!

The manual that you hold in your hands is designed to acquaint you with the operating principles and correct maintenance of your “DENTA PUK”.
Please read this manual carefully and clearly observe the guidelines it describes; this way malfunctions and operating errors can be avoided. Adhering to the guidelines will promote the working life of the machine and assure that it remains in constant operational readiness during this time; it will also ensure your personal safety.

This device may only be operated by qualified personnel, and then only for its designated use and in accordance with the guidelines contained in this manual. The manufacturer accepts no responsibility, and is in no way liable for damage caused by improper use or operation of the machine.
Before first using your “DENTA PUK”, please be sure to carefully read the manual sections “General Safety Requirements” and “Personal safety”.

Please retain these instructions for future reference.

A note on conformity marks

The equipment made by “Lampert Werktechnik GmbH”, fulfils the conformity requirements of CE certification and is manufactured according to VDE guidelines.

The DENTA PUK is certified as “BG-PRÜFZERT” by the German federation of statutory accident insurance institutions for the industrial sector, and carries the “GS” safety standards certification mark.

When overhauling or reconditioning our devices, we strongly advise to use original parts only. Our customer service team is at your disposal, and will gladly assist in any way they can.

The device may only be opened, or alterations carried out, by authorised customer service technicians. Noncompliance will result in all warrantees and liability claims becoming void.

LAMPERT WERKTECHNIK GMBH

October 2009

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A SAFETY NOTICES AND TERMINOLOGY USED

Warning!

"*Warning*!" Denotes a potentially dangerous situation. Failure to comply with these notices can result in serious injury or even death.

Caution!

"*Caution*!" These notices show a situation that can result in minor injury or damage to property if not complied with.

Please note!

"*Please note*!" Points out situations where ignoring the safety notice can negatively affect the result of work being carried out and damage the equipment.

Important!

"*Important*!" Notices are helpful hints and other particularly useful pieces of information. They do not indicate a potentially dangerous or harmful situation.

1 DESIGNATED USE

Applying welds to all common dental alloys and titanium, for work associated with the repairing or manufacturing of dental appliances for patients. It is prohibited to use this apparatus to carry out welds in or on the body.

Any other application of the appliance other than the above stated is prohibited.

It is prohibited to use this apparatus out of doors. Use only in dry surroundings!

No liability of any kind will be assumed for the durability of welds. We recommend that welds are always inspected.

2 INTRODUCTION

The DENTA PUK is as an excellent way of bringing the technique of welding to a broad band of users in the dental industry, whilst at the same time keeping running costs and the initial outlay to a minimum.

Thanks to a clever combination of high performance electronics and precision mechanics, we've been able to create a unique micro-welding device.

The DENTA PUK is small in size, low in weight and consumes only a minimum of energy. These are not just important facts, but also very beneficial attributes. Its excellent ignition and welding characteristics permit a broad spectrum of applications and a wide range of uses.

By bringing new possibilities to the world of welding engineering, entirely new dimensions are available to those producing or repairing dental appliances.

3 SAFETY INSTRUCTIONS

3-1 GENERAL SAFETY INSTRUCTIONS

The device may only be opened by a trained and qualified technician or electrician. Before opening the device, remove the mains plug from the wall socket, and make sure that the machine is not receiving any electrical current. Discharge any of the machines components which contain and store an electrical charge.

Should any questions arise, please always consult a trained professional.
Our customer service team is naturally also always at your service; staffed with a competent, professionally trained workforce, they have the necessary resources and equipment at their disposal and would be pleased to assist you further wherever necessary.

Always use original cables of sufficient length and make sure that the clamp holding the work piece is properly and securely attached.

The risk of hazards may arise from welding current as well as from mains electricity.

When carrying out repair or servicing work, the machine must always be disconnected from the power supply. Throughout any work of longer duration, that requires the qualified person to leave (even if only briefly) the place where work is being carried out, the wall socket must also be securely closed off.

The highest, and therefore most dangerous voltage in the welding circuit, is the open circuit voltage. The maximum permissible open circuit voltage is laid down by national and international regulations. This differs depending on the type of welding current, the type of power source, and the potential for electrical hazard of the workplace.

If it can be assumed that a safe operation of the device is no longer possible, the machine must be shut down and removed from the power supply; it must also be secured against accidental re-operation or activation.

It is likely, and can be expected, that a safe operation of the device is no longer possible when:

- The machine shows visible signs of damage.

- Malfunctions or faults occur.

- The machine will not operate.

Please observe the appropriate safety measures when handling gas bottles and the safety rules in dealing with gases.

In its standard serialised form, the DENTA PUK must be run on a mains voltage of 230V~.

The wiring of the mains power supply plug is as follows: yellow-green lead = equipment grounding conductor (PE). The other two leads L1 and N, are connected to the Phase und Neutral terminals of the plug.

Since the launch of the Euro Norm IEC 38 (valid from May 1987), the mains voltage is defined Europe-wide as 230V.

The welding device is set ex works, to run on 230V!

This means that the equipment can, because of the tolerance range of +/-15%, also be run on a mains power of 220V~. Machines that have been “factory set” to run on a voltage other than 230V are specially labelled with an appropriate sticker.
THE DEVICE MAY ONLY BE OPENED BY AUTHORIZED PERSONNEL!
IF THE DEVICE HAS BEEN MADE FOR A VOLTAGE OTHER THAN THE STANDARD VOLTAGE OF 230V~, THEN THE TECHNICAL DATA INDICATED ON THE IDENTIFICATION PLATE IS APPLICABLE! MAINS PLUGS MUST CORRESPOND WITH THE MAINS VOLTAGE AND THE CURRENT CONSUMPTION OF THE WELDING DEVICE. (See the technical data!)
ALWAYS USE FUSE THAT IS APROPRIATE AND SUITABLE FOR THE MACHINES CURRENT CONSUMPTION.
USE ONLY THE POWER CORDS PROVIDED!

3-2 PERSONAL SAFETY AND POTENTIAL RISKS

When welding it is preferable to wear protective gloves on both hands, as it cannot be completely ruled out that sparks and splashes occur during welding. The protective gloves may not contain high proportions of quickly melting synthetic fibres. Protective gloves also guard against UV-rays which are harmful during prolonged periods of intensive welding.

Wear appropriate clothing with no synthetics.

The work piece and electrode tip can become extremely hot during welding, bringing a possible risk of burns.

The point of the electrode, when clamped into the hand piece, signifies a risk of injury. (Wounds caused by piercing or scratching of the hand, face, eyes, etc….).

Do not look into the arc without adequate eye protection. Only use a welders' protective glare shield that contains a protective glass which conforms to regulations (protection class 11, minimum).

The electric arc radiates rays of heat and light that can cause the user to be burned or dazzled. In Addition to this, the arc also gives off UV-radiation. If the eyes are not adequately protected, these invisible ultraviolet rays can cause a very painful conjunctivitis, the effects of which are only noticeable several hours after exposure.

Those lingering or working in close proximity to the electric arc, must be made aware of the risks, and supplied with the appropriate protective equipment. Wherever necessary, a protective screen should be erected.

When welding, especially in confined spaces, always make sure that there is enough fresh air, as smoke and harmful gases are produced.

Because of the danger of explosions, no welding may be carried out on any containers that have previously held gasses, fuels, petroleum, mineral oils or similar; even if these have been standing empty for a prolonged period.

Specific regulations apply in high fire-risk and explosion-risk rooms or areas.

DANGER FROM SHIELDING-GAS CYLINDERS

When handling gas cylinders, always abide by the appropriate safety regulations.

In particular, gas bottles are to be safeguarded and secured so that they can neither topple over nor fall off anything. In addition they are to be protected against thermal shock so that they cannot heat up to above 50℃ or are subjected to severe frost. A prolonged contact to the suns rays is also to be avoided.

4 INSTALLATION

4-1 SET-UP GUIDELINES

The device is to be placed so that cooling air can freely circulate and reach all surfaces of the machine.

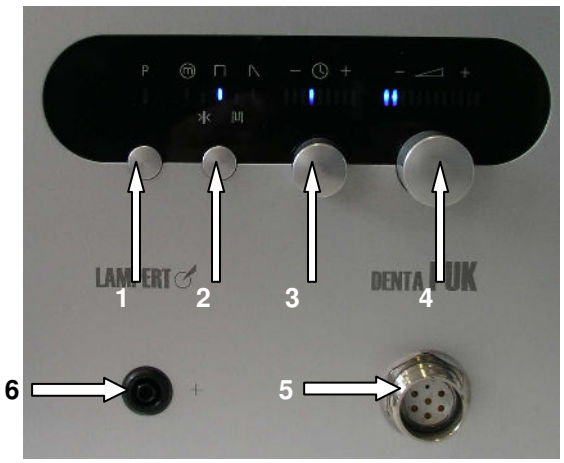
The device must not be covered!

Always place the machine on a hard, insulating and non-combustible base material.

No metal dust, that may occur or accumulate (e.g. during abrasion work), may be allowed to enter the machine.

4-2 CONTROLS, FUNCTIONS AND FEATURES - FRONT

(Fig. 1)



(1) BUTTON-PROGRAM MEMORY

(2) BUTTON-SWITCHING MODES

(3) ROTARY KNOB-IMPULSE LENGTH / WELDING TIME

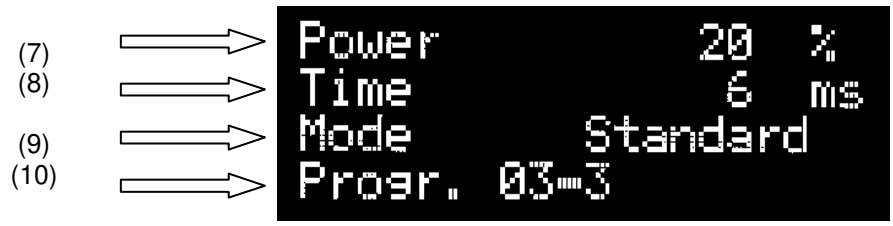
(4) ROTARY KNOB-WELDING POWER

(5) SOCKET FOR THE HANDPIECE (-pole)

(6) SOCKET (+ pole)

For connecting accessories designed to complete the electrical circuit (i.e. crocodile clip, or other connecting cables)

LCD-DISPLAY



(7) Power in percent (%)

(8) Impulse length (welding time) in Milliseconds (ms)

(9) Current mode setting: Standard mode / Pulse welding mode / Soft welding mode / Pin welding mode / Micro mode

(10) Program indicator P1-P10 (P1-P5 are pre-programmed at the factory)

The foot switch function can be recognised by this symbol ↓**.** The foot switch itself is an optional accessory.

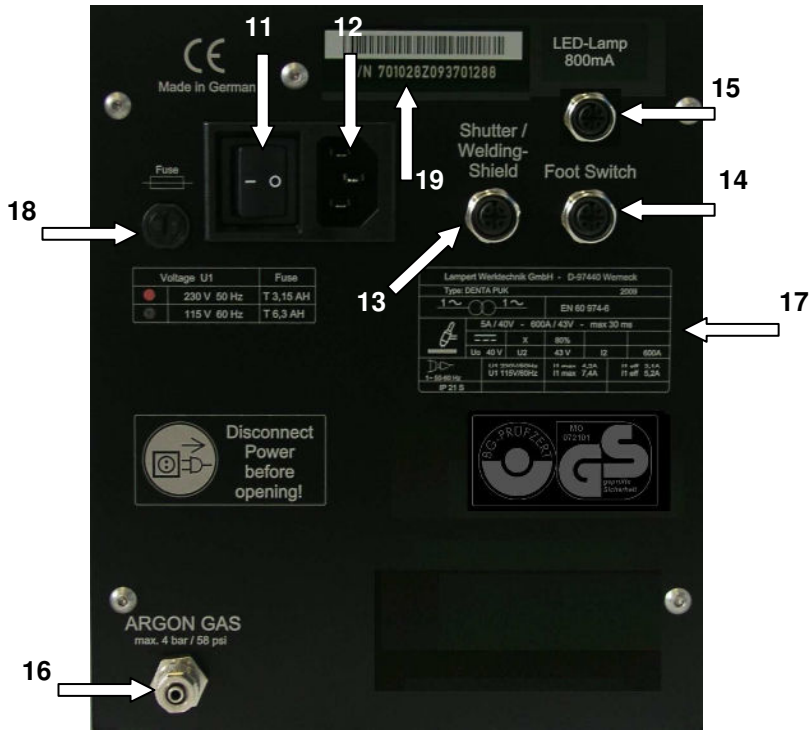
Please note: In the following cases the machine will switch automatically to its standby setting after 2 minutes:

- If no weld has taken place during this time.
- If the machine has not been otherwise operated or the parameters changed during this time.

Whilst on standby, only 1 of the blue “Power” LEDs will light.
To switch the machine again to its operational mode, activate any one of the controls, or complete the electrical circuit (contact the electrode with a work piece that is connected via the crocodile clip). Once done, the machine is then instantly usable again and is ready to work.

4-3 CONTROLS, FUNCTIONS AND FEATURES - BACK

(Fig. 2)



(11) MAINS POWER SWITCH

(12) I.E.C. POWER CONNECTOR

For connecting the mains power cable

(13) CONNECTION SOCKET FOR GLARE PROTECTION SYSTEM (“Shutter / Welding Shield”)

(14) CONNECTION SOCKET FOR FOOT SWITCH (“Foot Switch”)

(15) CONNECTION SOCKET FOR LED MICROSCOPE LIGHTING (“LED-Lamp 800 mA”)

Please note: The connection sockets for the foot switch, the glare protection system and the LED microscope lighting are identical!

(16) CONNECTOR FOR INERT GAS HOOKUP (“ARGON GAS”)

For pressure hose Ø 6 mm

(17) IDENTIFICATION PLATE

(18) FUSE TRAY (“Fuse”)

(19) SERIAL NUMBER

4-4 SETUP INSTRUCTIONS AND COMMENCING WORK

Setup:

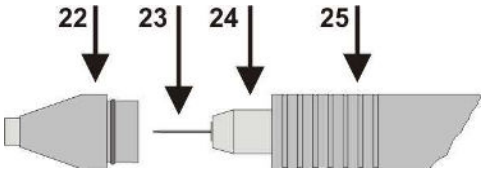
The machine is always to be placed on a hard, insulating and non-combustible base material, ideally on a work bench.

Push the connector plug of the hand-piece as straight as possible into the socket (5) and by turning it to the right, carefully tighten the plug. (**Hand tight only**).

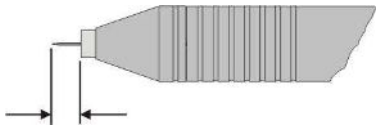
Insert the connector of the terminal clamp being used (i.e. crocodile clip) into its socket (6).

Inserting the electrode:

Before changing the electrode, please check and make sure that the machine is switched off. The uncontrolled triggering of a welding impulse can hereby be avoided.



(Fig. 3)



(Fig. 4)

Remove the argon nozzle (22) from the hand-piece (25) by twisting it in opposite (alternate) directions, and gently pulling.

Unscrew the clamping nut (24), and insert a freshly sharpened tungsten electrode (23), then tighten the clamping nut. (**Hand tight only**).
UNDER NO CIRCUMSTANCES IS A SPANNER TO BE USED TO TIGHTEN THE CLAMPING NUT.
Ideally, the electrode should protrude 4 - 6mm out of the nozzle (when replaced). (Fig. 4)

(Only use original, Thorium oxide free, electrodes).

Now replace the argon nozzle again.

Please note!

Argon nozzle (22), clamping nut (24), collet and electrodes (23) are all wear parts (spare parts), and are therefore not covered by our warranty.

Connecting the glare protection system:

The round plug for the shutter (glare protection system “welding microscope SMD”) is inserted into the socket marked “Shutter / Welding Shield” (13) on the back of the machine, and with aid of the nut, tightened. (**Hand tight only**).

Caution!

Only the Lampert-glare protection system “welding microscope SMD” may be connected to the DENTA PUK.

Other glare protection systems are not permitted and can result in permanent health damage or lead to the damaging of the machine.

Please note!

Before starting to weld, always check to make sure that the eye-protecting filter (Shutter) is functioning correctly.

By pressing in the rotary knob power (4), the eye protecting filter will change from its clear setting (Luminescence DIN3) to its dark setting (Obscurity DIN11) and back again when released.

Should the eye protecting filter (shutter) not change from its light to dark setting, then it must be immediately replaced before any further work is carried out.

Connecting the gas supply:

Mount the flowmeter regulator to the bottle of inert gas, observing hereby the enclosed instruction manual. (Wherever possible, use Argon with a purity of 99,99% i.e. “Argon 4,6“.

Mount the pressure hose to the quick coupling pieces on the flowmeter regulator, and the connector for inert gas on the back of the machine (16); fasten these (**Hand tight only**).

Only use original pressure hose – supplied.

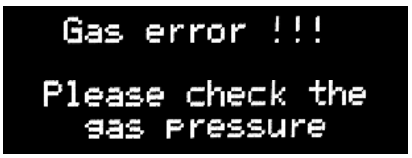
Check all the pressure hose connections to ensure that they are all secure and there are no gas leaks.

When all is correctly connected, open the valve on the gas bottle, and set the pressure on the flowmeter regulator to ca. **2** litres per minute.

To fine tune the flow rate to the correct amount **2** litres per minute, please see part 5 of these instructions below.

The maximum operating pressure is 4 bar!

Please note!

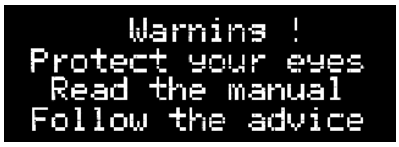


The DENTA PUK will only work when hooked up to a supply of inert gas and only when the machine is receiving enough pressure (ca. 2 litres/min).

If inert gas is not hooked up, not flowing or if the pressure is too low, the display will show the following reading: "Gas error!! Please check the gas pressure".

Connecting the power supply:

Insert the mains power cable into I.E.C power connector (12), and insert the plug into the mains power socket.



Switch the mains power switch (11) to "ON". The display will show the following **important safety warning "Warning! Protect your eyes! Read the manual! Follow the advice!"**
Confirm the compliance with these safety instructions, by pressing any button. Following this, the machine will run a self-test.

Please note!

Please also follow the guidelines given in the operating instructions of the attached welding microscope "SMD"!

Caution!

As soon as the mains power switch is switched to "ON", the terminal clamp (i.e. crocodile clip) and cables receive electrical current. Please see to it that these items cannot come into contact with any electrically conducting or earthed materials. For the user / operator there is no danger, but unwanted operating errors can occur.

4-5 CHANGING LANGUAGE DISPLAYED:

Languages available: ENGLISH – ITALIAN – SPANISH – FRENCH – GERMAN

The machine can be changed from English to run in any of the 4 other languages mentioned above.

Switch the machine on and confirm the safety notice displayed, so that the device starts and is ready for work.

Now press both the "Mode" button (2) and the rotary-knob "Power" (4), holding them pressed for 2 seconds.

The language setting has now been changed to the next language in sequence.
By repeating this process, the various languages available can be selected one after the other.

5 OPERATING PRINCIPLES AND SETTING THE PARAMETERS

After being switched on and running the self-test, the machine will start from its initial settings:

Standard mode, 7 ms impulse length/welding time, and a low power setting.

The initial settings for mode, welding time and power, correspond to the blue LEDs in the display. The display also has blue LEDs to mark the entire parameter range.

Important !

At the outset, until a basic proficiency is reached, we recommend to only change the parameter welding power, leaving the welding time constant. After a short time, when you have become more confident with the technique and have gained more experience, then you can naturally also change the welding time to suit your needs.

The machine automatically saves the last three sets of welding parameters that have been used.

By pressing in the rotary knob “Impulse length / welding time” (3), these previous settings can be recalled one after another.

Even when the machine is switched on, or after accidentally changing the parameters, the settings that were last used are there to be recalled again.

Please note !

Please remember that only when the gas flow rate has been correctly set up and adjusted, can good welding results be achieved.

To adjust the gas flow to the correct amount, press in and hold the rotary knob – welding power (4). (The gas valve in the machine will now be open and the gas flowing freely). Without letting go of the rotary knob welding power (4), adjust the flowmeter regulator to the correct flow rate ca. **2** litres per minute.

5-1 SETTING THE WELDING PARAMETERS

Power:

The welding power (potency of the welding energy), can be set by adjusting the rotary knob – welding power (4)

The size and intensity of the welding spot can thus be governed.

Welding time:

Using the rotary knob – Impulse length / welding time (3), the user can regulate for how many milliseconds the welding energy impacts upon the work piece.

Depending on the angle at which the electrode is held in relation to the work piece, the penetration depth and direction of flow (of molten metals), can be influenced.

The penetration depth is at its greatest when the electrode is held vertically to the work piece.

A description of the welding modes:

Standard mode

Welding time 4-30ms, Power 20-100%
Our all-round program for many different applications.

Pulse welding mode

Welding time 4-30ms, Power 20-100%
Possible uses: grooves or joints, the inner surface of crowns, joints in tight angles on model cast dilatations, small cavities.

Soft mode

Welding time 4-30ms, Power 20-100%
Especially well adapted to adding metal with welding wires, (the impulse form is, in this case, even "softer on the electrode" than the standard impulse).

Pin welding mode

Welding on retentions on resin saddles, or pins.

Micro mode

Welding time 4-12ms, Power 5-32%
This modes parameters have lower output levels that can be set in finer increments, making it ideal for very small cross-sections of material, for wires or orthodontics.
Especially important to note: always use a sharp electrode!

5-2 USING THE PROGRAMMABLE MEMORY

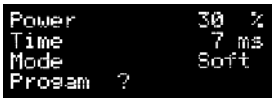
RECALLING STORED SETTINGS (Program slot 1 – 10)

Apart from the 5 pre-programmed memory slots, this feature brings the possibility to personalise and store the users own welding parameter settings, into 5 additionally available memory slots. These settings can then be recalled at a moments notice.

Please note!
The parameter settings of the pre-programmed memory slots, represent recommended guideline values for "normal" material thicknesses. Especially when working with thin or delicate constructions, it is advisable to start with lower output levels, so that the work piece doesn't become damaged; if necessary, the settings can be re-adjusted at any time.

By pressing (short) the button – program memory (1) and then releasing it, the individual memory slots can be accessed.

STORING SETTINGS INTO THE MEMORY (Program slot 6 – 10).



Press the button – program memory (1) **(long – ca. 1 sec.)** and then releasing it, the process for storing the current user settings is initiated.

Press the button – program memory (1) **(short)** and then releasing it, the memory slot can be selected in which the settings are to be saved. (Program slot 6 – 10)

Press the button – program memory (1) **(long – ca. 3 sec.)** and then releasing it, the settings are saved into the selected slot. The display will show the notice **"Settings stored. Please enter the name of the program".**

Now the memory slot can be given a name (up to 10 characters).

By **turning** the rotary knob – welding power (4), the icon (number, letter), in the selected character, can be changed.

To select the next character in the row, **press and release** the rotary knob – welding power (4)

Finally, to store the settings and name into the selected memory slot, **press and release** the rotary knob – Impulse length / welding time (3). The display will show the notice **"Your text was stored"** the programming process is now completed.

Please note!
If the user tries to save a set of parameters that is identical to one that is already stored (or identical to one of the pre-programmed settings), the display will show the following error notice. **"Settings identical to program – X Settings not stored!".** This is to avoid the "blocking" of a memory slot with a duplication of already stored information.

In this case the memory slot, where the original setting is stored, will blink. The process can then be cancelled by pressing the rotary knob – welding power (4).

6 INSTRUCTIONS FOR USE

6-1 WELDING INSTRUCTIONS (Standard- / Pulse- / Soft- / Micro-mode)

(For instructions regarding the foot switch, please refer to chapter 6-2 where this subject is handled separately).

Attach one of the terminal clamps (i.e. crocodile clip) to a part of the work piece where the bare metal is exposed.

Gently touch the area (or item) to be welded with the tip of the electrode.
Maintain the contact until the weld has been produced.

Please note !
Do not apply force when the electrode tip touches the work piece; work using no pressure, or only the slightest of pressure !

The welding process runs automatically:

- Inert gas circulates around and encases the welding area.
- A signal tone indicates that the arc is about to be fired.
- The arc is released.
- The flow of inert gas stops.

By withdrawing the work piece from the electrode, the welding process can be interrupted.

WELDING INSTRUCTIONS (Pin welding mode)

(For instructions regarding the foot switch, please refer to chapter 6-2 where this subject is handled separately).

Please note !
The pin welding mode is designed solely for the purpose of welding on pins (Ø 1,3 mm) using the provided pin welding adapter.

Please switch the machine off before changing the electrode or changing to or from the pin welding adapter. This is a safety precaution which will safeguard against the uncontrolled triggering of a weld.

When changing to the pin welding mode, remove the electrode, clamping nut and collet, and replace this with the pin welding adapter.

In the pin welding mode, always work without clamping nut and argon nozzle.

Attach one of the terminal clamps (i.e. crocodile clip) to a part of the work piece where the bare metal is exposed.

Insert a pin (Ø 1,3 mm) into the pin welding adapter.

The welding process runs automatically:

1. When the pin is gently connected with the work piece, the pin welding adapter will retract, and a signal tone will sound for 3 seconds.

2. By gently contacting the work piece a second time with the adapter, the welding process is triggered. (This second contacting, must occur during the 3 seconds of the signal tone, otherwise the welding process is automatically stopped).

We recommend using the pre-programmed memory slot no. 5 as the standard setting for this mode.

Please note!
No gas is released during the entire pin welding process.

6-2 WELDING WITH THE FOOT SWITCH (optional accessory)

Make sure that the DENTA PUK is switched off. Attach the foot switch cable to the socket “Foot Switch” on the back of the machine.

Next switch the machine back on,
The display will show the following **important safety warning: “Warning! Protect your eyes! Read the manual! Follow the advice!”**
Confirm the compliance with these safety instructions, by pressing any button. Following this, the machine will run a self-test.

The machine is now ready for use.

The foot switch can be activated, by pressing and holding it for ca. 1 second. The display will show the symbol ↓.

In Standard-/ Pulse-/ Soft-/ Micro-mode:

Attach one of the terminal clamps (i.e. crocodile clip) to a part of the work piece where the bare metal is exposed.

If the work piece is brought into contact with the electrode, the glare protection system (shutter) inside the microscope SMD will flicker in a clearly visible manner.

Whilst in this operating status, if the foot switch is pressed, the welding process will run automatically, just as described in chapter 6-1.

In Pin welding mode:

Please note!
The pin welding mode is designed solely for the purpose of welding on pins (Ø 1,3mm) using the provided pin welding adapter.
Please switch the machine off before changing the electrode or changing to or from the pin welding adapter. This is a safety precaution which will safeguard against the uncontrolled triggering of a weld.

When changing to the pin welding mode, remove the electrode, clamping nut and collet, and replace this with the pin welding adapter.
In the pin welding mode, always work without clamping nut and argon nozzle.

Attach one of the terminal clamps (i.e. crocodile clip) to a part of the work piece where the bare metal is exposed.

Insert a pin (Ø 1,3 mm) into the pin welding adapter.

1. When the pin is gently connected with the work piece, the pin welding adapter will retract.

2. By gently contacting the work piece a second time with the adapter, the glare protection system (shutter) inside the microscope SMD will visibly flicker.

If then the foot switch is pressed, the welding process will be triggered.
Please note! No gas is released during the entire pin welding process.

Please note!
During step "2." Above (whilst the shutter is flickering), if the foot switch is not pressed within 5 seconds, a constant signal tone will commence. This is a warning, and is designed to protect the hand-piece solenoid from overloading in the case of unintentional contact.

By again holding the footswitch pressed for ca. 1 second, (without contacting the work piece) the footswitch function can be deactivated. The symbol ↓ will disappear from the display.

6-3 WORKING WITH THE ADAPTER CABLE FOR WELDING PINS (Ø1,3mm)

The pin welding mode gives the user the possibility weld on pins (Ø 1,3 mm). Here the provided adapter cable is utilised, to enable a better contact to the work piece.

After the pin is welded on to the work piece, the cable can simply be slotted on to the pin, thus providing the optimum contact with the DENTA PUK, so that further welding work can be carried out. (This is especially advantageous for all work where contacting the work piece with the other provided tools (i.e. crocodile clip), proves difficult.
The pin is only a "temporary aid" that must not withstand high levels of mechanical stress. As it will be removed again after the welding work is completed, it is important to remember to use a low power setting when welding it on. This will ensure that the pin can be easily removed and polished afterwards.

This can be a very useful method, i.e. when wanting to carry out a weld on a model cast denture that is already mounted to a model.

It is best to choose a place on the work piece that is sufficient in size and is not prone warping or distortion; also important, is that the chosen spot for the pin is easy to finish and polish afterwards.

After the work is finished, the pin can be easily removed again, and the welding area cleaned with the rest of the work piece after all welding is completed.

6-4 TIPS AND GENERAL POINTERS

!

Important !

Always work with a well sharpened electrode !

This is the only way to achieve optimum results.

Always make sure that the work piece has a good contact to the connecting terminal (i.e. crocodile clip).
In case of problems that arise as a result of poor electrical contact, attach the connecting terminal to a part of the work piece where the bare metal is exposed.

Never weld "freehand", meaning: always lay both hands on the hand-rests; this will aid in steadying the hands. If the hands shake, the parameters of the device can be falsified and the welding result affected.

Do not apply force when the electrode tip touches the work piece; work using no pressure, or only the slightest of pressure !

Weld using only a low gas pressure !
In most cases about 2 l/min is enough.

TIPS

Take the time to get to know the machine its modes and operating techniques.

Try out the various output levels that the machine has to offer.

Bear in mind that every material reacts differently when welded, according to its heat-conductivity.

When choosing the output levels of parameters, make allowances for the thickness of the material which is to be welded and adjust settings accordingly.

Work with as much precision as possible: contact the electrode tip as precisely as you can to the area where the weld is needed.

With experience you will observe that, the angle at which the electrode contacts the work piece, has an impact on the “direction of flow” of the welding spot.

The deepest penetration into the material is achieved when the electrode is held at a 90° angle to the work piece.

When working on “deep laying” or recessed welds, the electrode can be allowed to protrude slightly further out of the nozzle. In this case, the gas-flow rate should be slightly increased.

If holes or pores are to be closed, or existing joints and parts strengthened, extra material will be needed. Here, it can be helpful use an appropriate welding wire.

6-5 SHARPENING THE ELECTRODES

Please switch the machine off before changing the electrode; this is a safety precaution which will safeguard against the uncontrolled triggering of a weld.

The electrode should be sharpened using a diamond grinding wheel, preferably one that has a fine or middle grain.

The grinding angle should be 15°, (see the diag ram above).

6-6 CARE AND MAINTENANCE

Under normal working conditions, the DENTA PUK needs only a minimum of maintenance and care. However, it is necessary to observe a few vital points, to ensure that the device remains operable, and gives lasting service in the years to come.

Regularly check all cables and plugs to make sure that they are not damaged.

Check the moving parts of the hand-piece to ensure ease of mobility.

Whenever necessary, clean the thread under the clamping nut of the hand-piece (see Fig. 3 no. 24 on page 8), to ensure that the electrode has a perfect contact with the hand-piece.

Warning !

IF FUSES NEED TO BE EXCHANGED; THESE ARE ONLY TO BE REPLACED WITH FUSES OF THE SAME SPECIFICATION. USING FUSES OF A HIGHER VALUE WILL INVALIDATE ANY WARRNTY CLAIMS !

The DENTA PUK may only be opened by an electrician, electrical technician or other qualified personnel who are familiarised with these products.

7 TECHNICAL DATA

7-1 TECHNICAL DATA

- Device suitable solely for indoor-welding in dry surroundings!

■ Humidity	Max. 80 % up to 31℃, Max. 50 % 31℃-40℃
■ Elevation	Not over 2000m NN
■ Mains voltage	~230 V / 50-60 Hz +/- 15%
■ Fuse	T 3,15 A
■ Power input	400 VA
■ Closed-circuit voltage	20 – 43 V
■ Open-circuit voltage	43 V
■ Duty cycle X	80%
■ Max. charging time	0,8 s
■ Inert gas	min. ARGON 99,8%
■ Maximum Gas pressure	4 bar
■ Protection category	I
■ Insulation class	B
■ Degree of protection	IP 21S
■ Weight “DENTA PUK”	8,8 kg

7-2 Identification plate

Explanation of picture symbols

A	Amperage	V	Voltage	IP	Degree of protection
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	Rated no-load voltage	U_1	Rated supply voltage		Protective earth
U_2	Conventional load voltage	I_2	Rated welding current		Single phase transformer
I_{1max}	Rated max. supply current	I_{1eff}	Max. effective supply current	X	Duty cycle

8 TROUBLE SHOOTING

	FAULT	CAUSE	SOLUTION
1	**No power**		
	Mains power switch is switched on, but the display does not light up.	The power supply (feeder) to the machine is interrupted or machine's internal fuse defective	Check the mains power cable and mains voltage or replace fuse with a suitable fuse of the same type and value.
2	**No welding current**		
	Mains power switch is switched on, but the machine does not weld.	The power supply (feeder), from the machine to the hand-piece is interrupted.	Check the connections (connector and socket).
	Mains power switch is switched on, but the machine does not weld.	Bad, or no connection to protective ground	Create a connection between the machine and the work piece. Attach one of the terminal clamps (i.e. crocodile clip) securely to a part of the work piece.
3	**No welding current**		
	Mains power switch is switched on	Problem caused by fault current (abnormal current in an electric circuit due to a fault, usually a short circuit or abnormally low impedance path).	Switch the machine off and then on again via the mains power switch. If the problem persists, the machine will need servicing, please contact your dealer.
4	**Circuit breaker is triggered, or mains fuse blows**	The mains fusing is too weak or the wrong circuit breaker is being used.	Correctly fuse the mains power supply.
		Mains fuse blows as soon as the machine is switched on.	The machine will need servicing, please contact your dealer.
5	**Bad welding result / bad welding characteristics**	The wrong inert gas is being used.	Use Argon inert gas. Wherever possible, use Argon with a purity of 99,996% i.e. "Argon 4,6".
6	**Oxidation and the forming of soot**	The gas pressure is set too high.	Reduce the flow rate-ca. 2 L/min. is sufficient.
7	**Welding spots are heavily oxidised.**	The wrong inert gas is being used.	Use Argon inert gas. Wherever possible, use "Argon 4,6".
8	**Tungsten inclusions in the work-piece**	The electrode is being pressed too hard onto the work piece.	Work using no pressure, or only the slightest of pressure; do not apply force!
9	**Tungsten electrode "sticks" to the work piece when welding**	The electrode is being pressed too hard onto the work piece.	Work using no pressure, or only the slightest of pressure; do not apply force!
10	**Tip of tungsten electrode melts off as soon as welding starts.**	The angle, at which the electrode is sharpened, is too acute.	Recommended grinding angle is ca. 15°.
11	**Discharge of static electricity across the surface of the machine.**	Due to special local conditions	Use a special antistatic mat for the working area.
12	**Glare protection system (Shutter) in not working**	The plug of the glare protection system is not correctly connected.	Insert the plug of the glare protection system into the socket marked "Shutter/Welding Shield" (Fig 2 no.13 page 7).

13	**The machine welds immediately after the electrode contacts the work piece (no delay for gas to flow, prior to the welding process)**	Technical malfunction	Immediately take machine out of operation. It must be shut down and removed from the power supply; it must also be secured against accidental re-operation or activation. The machine will need servicing, please contact your dealer.

Warning !

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Text and images correspond to, and represent the current technological state at the time of publication and are subject to change without notice.

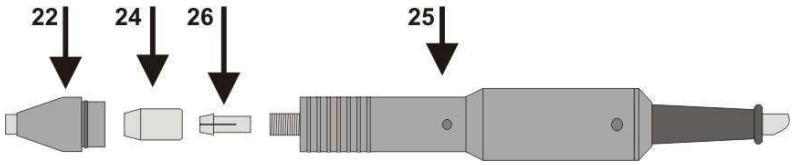
Our products are manufactured to exacting standards. Produced with care, they undergo meticulous testing processes to ensure high quality and length of product life.
Nevertheless should the welding device malfunction, you are assured of our support and a competent service.
Should reconditioning, maintenance or repairs be necessary at any time, this may be carried out solely by Lampert Company, its staff or from Lampert authorised service points. Please always have the Serial number of the machine ready when responding to, or making any enquiries.

Service address and contact details:

LWT-Service Centre
Ettlebener Strasse 27b
D-97440 Werneck

service@lampert.info

9 SPARE PARTS LIST



- **Hand-piece:**

25	Hand-piece complete	DP100 100
22	Argon nozzle	DP100 150 K
26	Collet	DP100 151
24	Clamping nut	DP100 152

- **Electrodes:**

Electrodes (Thorium oxide free), 10 pcs. in display box, including 1 diamond grinding wheel	DP100 401

- **Diamond grinding wheel:**

Diamond grinding wheel	DP100 701

- **Gas hose:**

3m gas hose 6x4mm (max. 10bar)	DP100 153

10 DISPOSAL INFORMATION:

Devices that are no longer in use (waste), can be made unserviceable by removing the mains power cable.

For EU countries only:

As specified in European directive 2002/96/ EG on waste electrical and electronic equipment, used electrical appliances must be collected and stored separately and introduced into an environmentally compatible disposal system.

11 EG-CONFORMITY DECLARATION

The Manufacturer,

Lampert Werktechnik GmbH

Ettlebener Str. 27, D-97440 Werneck

Declares herewith that the following product:

Precision welding device

"DENTA PUK"

Complies with the provisions of the below mentioned directive, including any amendments hereof, that were valid at the time of declaration.

Relevant EC guidelines:

According to low voltage guidelines 2006/95/EG

According to EMV (electro-magnetic compatibility) guidelines 2004/108/EG

The following harmonised standards were used:

EN 60974-6

EN ISO 12100-1

EN ISO 12100-2

Person duly authorised to carry out technical documentation: N. Hammer

Werneck, 30.10.2009

Lampert Werktechnik GmbH

Andrea Bauer-Lampert (Managing Director)