

# OPERATING INSTRUCTIONS

## Welding microscope for the PUK U3

### USM



Dear customer!

This manual will explain the operating principles and correct maintenance of your "USM".

The "USM" is a microscope that has been specially modified to suit the here described applications and uses.

Lamperts stereo microscopes are precision instruments that undergo intensive testing prior to delivery, to ensure that they reach you in perfect condition. The design allows simple handling, needs only a minimum of maintenance and at the same time offers outstanding functionality.

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 here within. 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 "USM", 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 LCD-shutters used for this microscope have been tested and authorised, and carry the DIN-CERTCO certification from the DIN authority for eye protection.

When overhauling or reconditioning our devices, we strongly advise only to use original parts. 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 warranties and liability claims becoming void.**

**LAMPERT WERKTECHNIK GMBH**

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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

- The viewing or examining under the microscope of objects by looking through the eyeglass.
- The illuminating of the working area.

The USM may only be used with a PUK U3 – precision welding device.



### **The USM may only be used when it is correctly connected.**

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!

## 2 INTRODUCTION

Arc welding without protective equipment is dangerous and can lead to a painful inflammation of the cornea. It can also lead to an irreversible clouding of the eye lenses (cataract).

The USM with its integrated LCD glare protection filter offers a reliable safeguard against these dangers. It provides continuous protection against UV/IR-rays, as well as sparks and splashes, both in the filters clear setting (Luminescence DIN3) as well as in its dark setting (Obscurity DIN11).

The filter is constructed so that a dazzling from the glare of the electric arc is avoided. Shortly before an electric arc is fired, the PUK U3's electronic circuitry, switches the filter automatically from its clear setting (Luminescence DIN3) to its dark setting (Obscurity DIN11). The filter then returns to the clear setting again immediately after the electric arc is extinguished.

The USM may only be used in conjunction with a PUK U3 precision welding device.

### 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. If you are unsure, or have any questions, always consult a trained and qualified technician or electrician.

Before exchanging the LED module, remove the power supply plug. Only use original replacement LED modules from Lampert.

Non qualified persons are prohibited by law from tampering with any electrical devices that are connected to the mains power supply, or otherwise receiving current. Non qualified persons may only operate the mains plug, power adapter or the main on/off switch.

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.

If it can be assumed that a safe operation of the device is no longer possible, then 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 will not operate.
- When malfunctions occur.
- The machine will operate, but shows visible signs of damage.



#### 3-2 PERSONAL SAFETY AND POTENTIAL RISKS

##### EYE PROTECTION DURING WELDING

**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.

##### EYE PROTECTION WHILST OPERATING THE LED LAMP

**Do not look into the LED Lamp, or into the reflection of the LED light, without eye protection. Always use a welders' protective glare shield with a minimum protection class of 3.**

## 4 INSTALLATION

### 4-1 UNPACKING

All the parts of the “USM” stereo-microscope have been carefully packed so that they reach you in perfect condition. We recommend that you retain the original packaging as this will be needed if ever the device needs to be sent in, if you intend to store the item for a longer period, or if it needs to be transported to a technical service centre for servicing or repair.

The packaging of the USM comprises the following items:

- Microscope head with mount and LCD glare protection filter (4.2 Fig.1 - 10).
- Supporting arm (for holding the welding hand-piece), with integrated LED light (4.2 Fig.12).
- Bearing rod (4.2 Fig.1 -11).
- Rod for pitch adjustment (4.2 Fig.1 -18).
- Base plate, for attaching the bearing rod (4.2 Fig.1 -13).
- Hand rests (4.2 Fig.1 -14).
- Protective cover.
- Tools for adjusting the focus and for assembling the microscope.

#### **Remove and handle all microscope components with great care!**

Avoid touching the lenses and optical elements. Also avoid contact with dust, water or any other substances that could soil or damage the surface of the lenses and impair the quality of the image.

### 4-2 SETUP INSTRUCTIONS AND COMENCING WORK

#### **All stages of the microscope assembly must be carried out with great care. The individual parts must not be put together using excessive force.**

Mount the bearing rod (11) to the base plate (13), using the bolt that is included; tighten it with an open-ended spanner. Place upright, on a clean, flat, and stable surface.

Slide the rod for pitch adjustment (18) into the underside of the bearing rod. Secure it using the retaining screw for pitch adjustment (15), which is screwed into the side of the bearing rod and gently tightened.

Slide the supporting arm (12) over the bearing rod (11) and secure it slightly above the middle of the rod, tightening hand tight.

Slide the microscope head (8) and its mount with retaining screw (9) over the bearing rod (11), and secure it at about 5cm above the supporting arm for the hand-piece (12).

Insert the eyepieces (1) with eyepiece covers, and secure them with the locking screw (4).

Attach the “control lead for LCD glare protection filter (Shutter)” (17), to the back of the welding device. (Observe the guidelines in the instruction manual of the welding device).

Connect the LED light with the PUK U3.

Insert the mains cable (16) into the connection socket marked “LED-Lamp 800 mA”, on the back of the welding device.



#### **Please note!**

**Always test that the LCD glare protection filter (Shutter) (6) is working correctly before you start welding.**

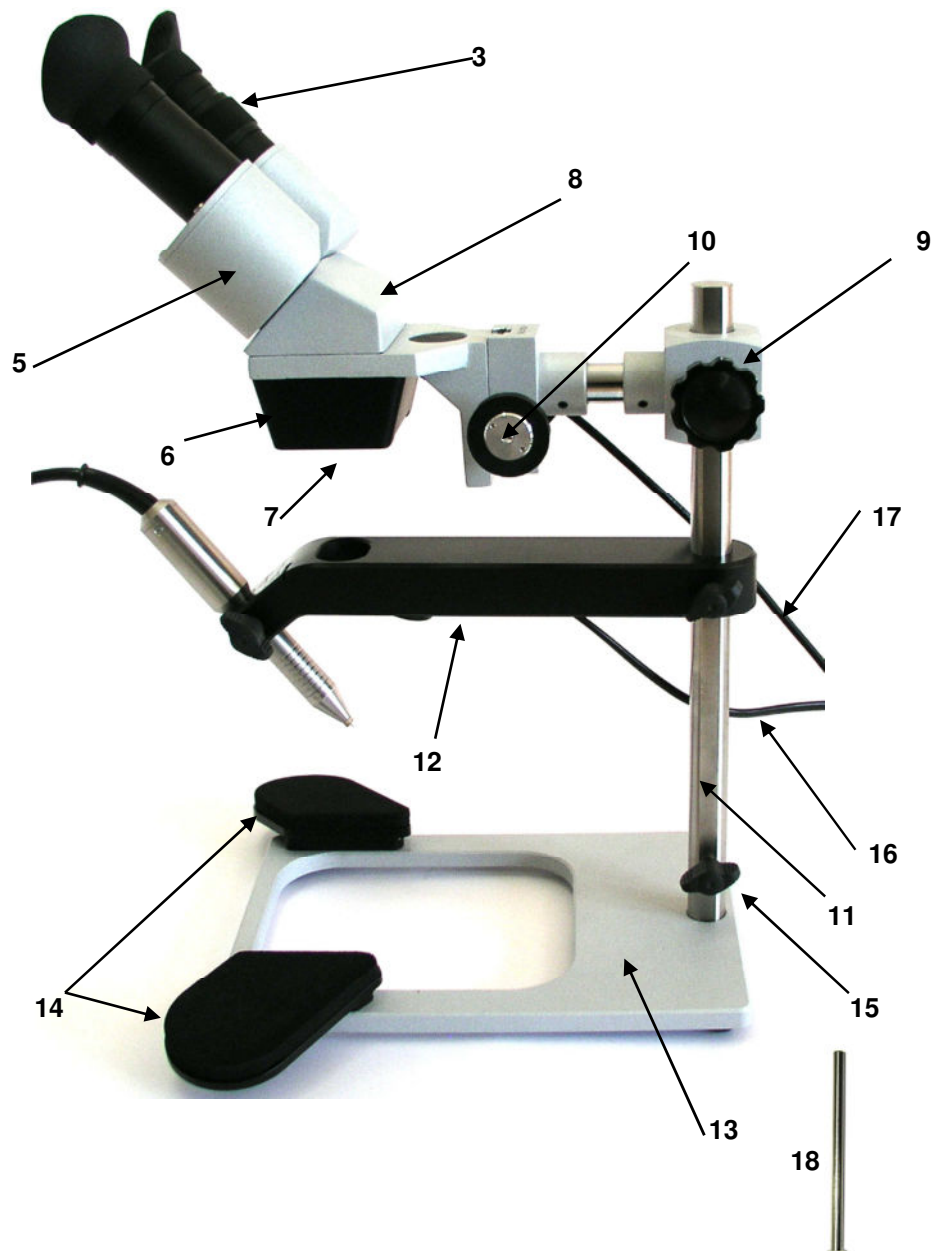
**By pressing in the rotary knob – Power, of the “PUK U3” welding device, the shutter can be tested. During this process, It will change from its clear setting to its dark setting, and back again.**

If the LCD glare protection filter (Shutter) doesn't change from its clear to dark setting, then it must be exchanged straight away. No welding may be done unless the microscope has a fully functioning shutter.

Shortly after the machine is switched on, the welding device will run a self-test. During the self-test, the LCD glare protection filter (Shutter) (6), will change from its clear setting to its dark setting, and back again. Each time the machine is used, make sure that the shutter is operating correctly, if necessary start the self-test again. To do this, switch the machine off, wait several seconds, and then switch it on again.

#### 4-3 DESCRIPTION OF PARTS

(Fig. 1)





- (1) Eyepiece
- (2) Dioptic adjustment
- (3) Eyepiece tubes
- (4) Locking screw
- (5) Prism casing
- (6) LCD glare protection filter (Shutter)
- (7) Protective glass
- (8) Microscope head
- (9) Retaining screw for microscope head mount
- (10) Rotary knob - Focus
- (11) Bearing rod
- (12) Supporting arm (for holding the hand-piece) with integrated LED light
- (13) Base plate
- (14) Hand rests
- (15) Retaining screw for pitch adjustment
- (16) Mains cable with plug and switch
- (17) Control lead for LCD glare protection filter (Shutter)
- (18) Rod for pitch adjustment

## **5 INSTRUCTIONS FOR USE**

### **5-1 FIRST STEPS**

Adjust the height and position of the supporting arm (12) so that, when both hands are resting on the hand rests (14), the work piece can easily be guided to the tip of the electrode. Here remember to first correctly position the hand-piece in the supporting arm.

Switch the LED light on using the mains cable switch (16).

### **5-2 SETTING THE VIEWING DISTANCE**

Look through the eye-pieces (1). By holding the prism casings (5), and moving them inwards or outwards, the eye-piece tubes (3) can be adjusted to the correct viewing distance for the user's eyes.

The viewing distance is correct when the complete visual field can be seen through both eyepieces and both views combine to produce the effect of a single field of vision.

The viewing distance should be individually set for each user.

### 5-3 FOCUSING

Mount the welding hand-piece in the supporting arm. Make sure that the hand-piece has an electrode inserted and is correctly positioned.

Turn the rotary knob - focus (10) until a focus setting is achieved, which is midway between the min. and max. focus setting.

Adjusting the height of the microscope head mount:

Hold the microscope head (8) in one hand, (avoid touching the microscope lens). With the other hand loosen the retaining screw of the microscope head mount (9). The microscope head can now be freely adjusted in height.

Look through the eyepieces and slide the microscope head up or down on the bearing rod until the object is in focus.

Tighten the retaining screw of the microscope head mount again.

Ensure a sharp image by adjusting the rotary knob - focus (10).

### 5-4 DIOPTER SETTINGS

The ring for dioptic adjustment (2) is located on the left eye-piece tube (3). In the normal position, the lower part of the sleeve is aligned with the marking on the eye-piece tube.

When a user's eyes have differing strengths of vision:

With only the right eye open, look through the right eye-piece (1) and set the focus using the rotary knob - focus (10).

Now, with only the left eye open, look through the left eye-piece and adjust the focus by turning the dioptic adjustment (2) on the left eye-piece tube (3) until the viewed object is in focus.

## **6 CARE AND MAINTENANCE**

Under normal working conditions, the stereo microscope "USM" needs only a minimum of maintenance and care. However there are a few vital points, which when observed will ensure that the device gives lasting service in the years to come.

After finishing working with the "USM", always cover it with its dust protection cover.

Every so often please check all cables and plugs to make sure that they are not damaged.

Every now and then, clean the device with a soft cloth.

SHOULD ANY MAINTENANCE OR REPAIRS BE NECESSARY THAT ARE NOT DESCRIBED IN THIS MANUAL, PLEASE CONTACT YOUR LOCAL DEALER.

### 6-1 MAINTANENCE OF THE OPTICAL COMPONENTS

Do not try to dismantle the optical components. For repairs that are not described in this manual, please consult your local dealer or the Lampert Service Centre.



Before cleaning the lens surface, remove any dust particles with a special brush. The respective accessories can be found in every photo shop.

Cleaning the eye-pieces:

Do not remove the eye-pieces (1) from the eye-piece tubes (3).

Clean the outer surfaces and breathe on them while doing so.

Subsequently, dry the eye-piece lens using an appropriate paper or cloth. Dry the lens with circular movements, starting in the centre and working your way outwards. Avoid wiping a lens that is already dry, as it might easily be scratched.

Cleaning and replacing the protective glass (7) of the LCD glare protection filter (Shutter):



**Never dismount / detach, the LCD glare protection filter (Shutter)!**

Clean only the surface. Use a soft cotton cloth dampened with window cleaning fluid. Next, dry the lens also using a soft cotton cloth.

If the protective glass (7) needs to be replaced, slide the old glass forwards out of its retaining fixture, and replace the glass in the same manner.

## 6-2 MAINTANENCE OF THE ELECTRICAL COMPONENTS



**Warning! Danger of glare, never look directly into the LED light or its reflections!**

**Caution! Only operate the LED light when the LED module is mounted in the supporting arm of the hand-piece.**

Changing the LED light module:

Switch the PUK U3 off, and remove its power cable.

Loosen the retaining screws that hold the LED module, and remove the module.

Only use replacement LED modules from Lampert Company.

Mount the new LED module in the supporting arm of the hand-piece. Remember that the module should fit flush with the underside of the supporting arm.

## 7 TROUBLE SHOOTING

	PROBLEM	CAUSE	SOLUTION
7-1	<u>PROBLEMS WITH ELECTRICAL COMPONENTS</u>		
A	<b>The LED light doesn't work</b>	Main socket not in operation	Have it repaired by a qualified technician.
		Cable is not attached	Insert the mains cable (16) into the connection socket marked "LED-Lamp 800 mA", on the back of the welding device
		Cord switch is not switched on	Switch on the cord switch
		PUK U3 is off	Switch on the PUK U3
		LED defective	Change the LED module (Chapter 6.2)
B	<b>Shutter doesn't switch to its dark setting</b>	Control lead is not attached	Attach the control lead for the Shutter (17) to the back of the welding device
		Shutter defective	Exchange the shutter

7-2	<u>IMAGE QUALITY</u>		
<b>D</b>	<b>Bad image magnification</b>	Eye-pieces soiled	Clean the eye-pieces
<b>E</b>	<b>Blotches or dirt in the field of vision</b>	Eye-pieces soiled	Clean the eye-pieces
		Protective glass soiled	Clean the protective glass
		Please note: Blotches in the field of vision can also be caused by dust or dirt on the inside of the eye-pieces. We therefore recommend to always have the lenses cleaned by an authorised service technician	
7-3	<u>PROBLEMS WITH MECHANICAL COMPONENTS</u>		
<b>F</b>	Focus doesn't remain in the position it has been set to	The microscope head (8) slides down	Adjust the tension of the rotary knob – focus (10)

#### 7-4 Customer service

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 microscope 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 through service points authorised by Lampert. 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](mailto:service@lampert.info)

#### 7-5 CARRYING THE MICROSCOPE

When moving and handling the stereo microscope, carry it with both hands. Thereby holding the bearing rod (11) with one hand, and the base plate with the other (13).

Always hold the microscope upright.

## **8 TECHNICAL DATA**

### 8-1 TECHNICAL INFORMATION - MICROSCOPE

- LCD glare protection filter and LED light module. For use only in conjunction with PUK U3 precision welding devices.
- Device suitable solely for indoor-welding in dry surroundings!
- Humidity Max. 80 % up to 31°C,  
Max. 50 % 31°C - 40°C
- Elevation Not over 2000m NN
- Operating temperature +5°C to +40°C
- Bulb "LED-module" 2,5W / 800mA
- Protection category III
- Insulation class B

■ Degree of protection	IP 20
■ Weight	3,6 kg
<b>8-2 <u>OPTICAL INFORMATION - MICROSCOPE</u></b>	
■ Lens	1,0
■ Eye-piece lenses	10x
■ Working distance	variable
■ Degree of magnification	10x
■ Size of "field of vision" in mm	20 mm
<b>8-3 <u>TECHNICAL INFORMATION - LCD SHUTTER</u></b>	
■ Degree of luminescence	DIN 3
■ Degree of Obscurity	DIN 11
■ Switching time	<50ms
■ UV protection	>UV 15
■ IR protection	>IR 14



### **Warning!**

**The device may only be opened by a trained and qualified technician!**

Text, pictures and illustrations represent the technical stand at the time of printing; we reserve the right to make changes as necessary.

## **9 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.

## 10 **EG-CONFORMITY DECLARATION**

According to machine guidelines 98/37/EG, Appendix II A

**The Manufacturer,**

**Lampert Werktechnik GmbH**

**Ettlebener Str. 27, D-97440 Werneck**

**declares herewith that the following product:**

Welding microscope with integrated LCD glare protection filter

“USM”

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

**Relevant EC guidelines:**

According to low-voltage directive 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

DIN EN 169

DIN EN 379

Person duly responsible for technical documentation: Hammer N.

Werneck, 1.10.2009

Lampert Werktechnik GmbH

Andrea Bauer – Lampert (Managing Director)

