

UNIVERSAL LAMPHOUSE



Kinoton GMBH
Filmtheater- und Studiotechnik



Kinoton GMBH
Filmtheater- und Studiotechnik

Lamphouse

Preface

Dear customer,

Thank you for purchasing the KINOTON Universal Lamphouse. We are confident that you will find it a valuable addition to your studio equipment.

This operating manual will help you to get the most out of your KINOTON Universal Lamphouse. It contains all the information you need to know about the operation and maintenance of the unit.

We have tried to make this manual as easy to read as possible. It is written in a simple, clear style. We hope you will find it helpful and that it will save you a lot of time and trouble.

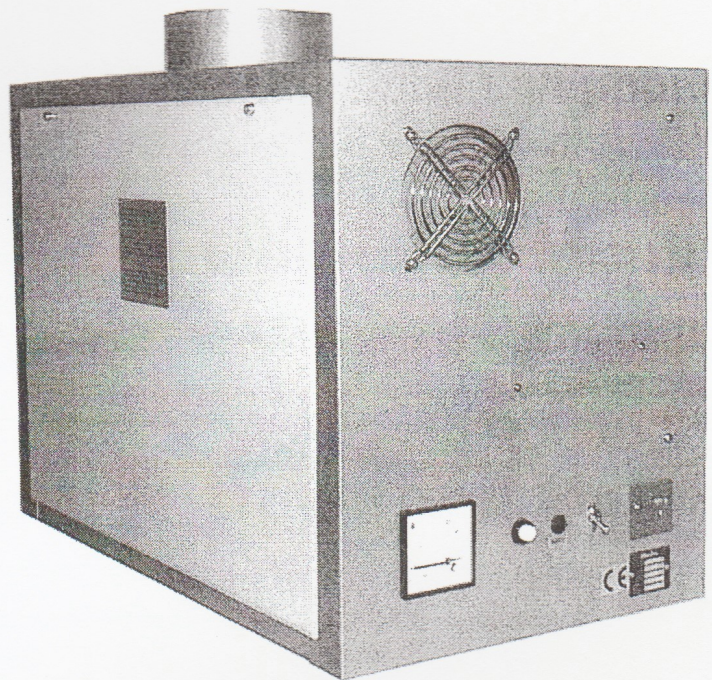
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All information in this manual is given by KINOTON. However, KINOTON accepts no liability for any damage or loss of data caused by the use of this manual.

Operating Manual

Universal Lamphouse

Subject to technical changes.



Imprint

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Preface

Dear customer,

Thank you for your decision to buy the lamphouse and for your confidence in our product.

This operating manual will help you get acquainted with the lamphouse and to make use of its possible applications in accordance with the requirements.

This operating manual includes important hints for a safe, proper, correct and economic operation.

It will also help you to avoid danger, to reduce failures and to increase life and reliability of the lamphouse.

This operating manual includes useful hints for proprietor and personnel obligations. It does not substitute, but supports, a thorough training period.

All information in this manual is given by best knowledge and has been checked carefully. However, KINOTON accepts no liability for the accuracy of this information.



Subject to technical changes.

Changes


Issue of this manual: August 1999


Changes, additions	Chapter, page	Date

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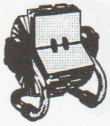
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1 Safety

1.1 Safety Notes

General Hints

- The operating manual is to be kept with the projector at all times.
- Precondition for the safe running and trouble-free operation of lamphouse is working knowledge of the basic safety regulations and agreed use.
- This operating manual contains the most important instructions for running the lamphouse safely.
- The operating manual must be read and absorbed by all persons working with the lamphouse, placing particular emphasis on all aspects regarding safety.
- In addition, all current and valid regulations and measures concerning accident prevention must be observed.

Proprietor Obligations

The proprietor is obliged to allow only those persons to work and / or operate the lamphouse that

- are familiar with safe working and accident prevention along with complete working knowledge of the projector and all additional machines and pieces of system
- read and understand the safety chapter and the warning instructions thereto in this operating manual.

The proprietor has to check the safe working of his personnel regularly.

Personnel Obligations

Those persons who work with the lamphouse are obliged

- to observe the regulations appertaining and prevention of accident
- to have read and understood the safety chapter and the warning instructions thereto in this operating manual.

Danger when Working with Xenon Lamps

Universal Lamphouses are constructed according to the latest engineering and state-of-the art safety standards. The lamphouse is only to be employed for its **intended purpose** and is only used when **functioning absolutely perfectly**.



Serious danger may result from improper use of the system causing injury to the user or a third person, or damage may be done to the system or other items in the vicinity.

Faults that could adversely affect safety must be rectified immediately.

The projector cannot be used before faults are rectified.

Intended Purpose

The lamphouse will be mounted on your projector and is suitable to illuminate the screen evenly.

Any other or further use is not classified as "intended purpose". KINOTON cannot be held liable for any damage resulting from different or extended operation.

Defined intended purpose also includes:

- the observance of all instructions contained in the manual
- adherence to the inspection
- implementation of maintenance and repair work.

Guarantee and Liability

On principle the "General Terms of Business" of KINOTON apply. They are available to the customer on conclusion of sale at the latest.

Guarantee and liability claims for damage to persons and property are invalid if due to one of the following causes:

- improper use of lamphouse
- improper assembly, commissioning, operating and maintenance of lamphouse
- operation the lamphouse with defective and / or non-functioning safety and protection devices
- non-observance of instructions in the manual regarding transportation, storage, assembly, commissioning, operation and maintenance
- modification of lamphouse without authorization from the manufacturer
- faulty monitoring of parts subject to wear and tear
- improperly effected repair work
- emergencies due to influence from outside bodies or force majeure.



1.2 Safety instructions

1.2.1 Symbols and Notes



DANGER

This symbol indicates an imminent threat of danger to life and personal health.

Disregard of this warning results in serious personal injuries to highly dangerous injuries.



ATTENTION

This symbol indicates a possibly dangerous situation.

Disregard of this warning can result in light personal injuries or damage of System.



NOTE

This symbol indicates where notes, user tips and useful information can be found.

They serve to use the lamphouse to its optimum.



1.2.2 Protective Devices

All existing safety devices must be checked regularly.

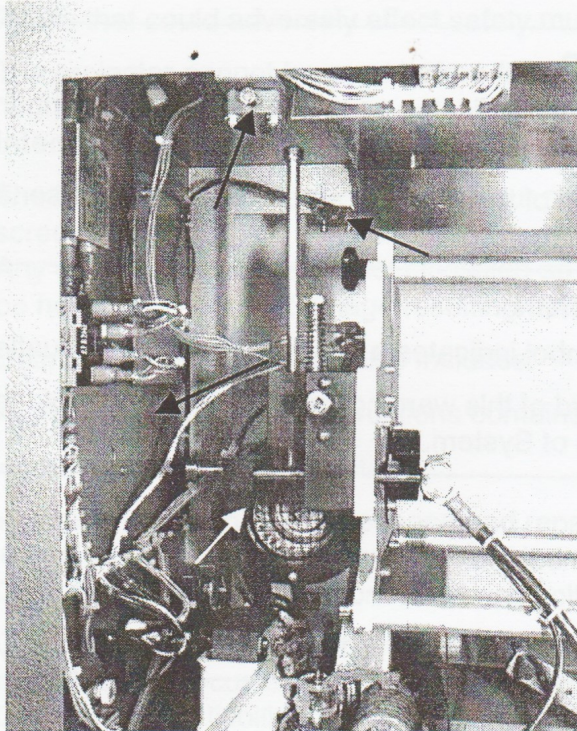


Figure 1-1 Protective devices in lamphouse

Door switch

On both sides door switches (arrows) are mounted in frame of lamphouse.

The xenon lamp ignites only when both side door of lamphouse is closed.

Airflow switch

As soon as projector is switched on, the radial blower (white arrow) is going in operation. It is reasonable to directly cool the xenon bulb.

If the air flow is interrupted, the xenon lamp will be switched off via airflow switch.

If projector and xenon lamp are switched off, the blower has to run after about ten minutes.

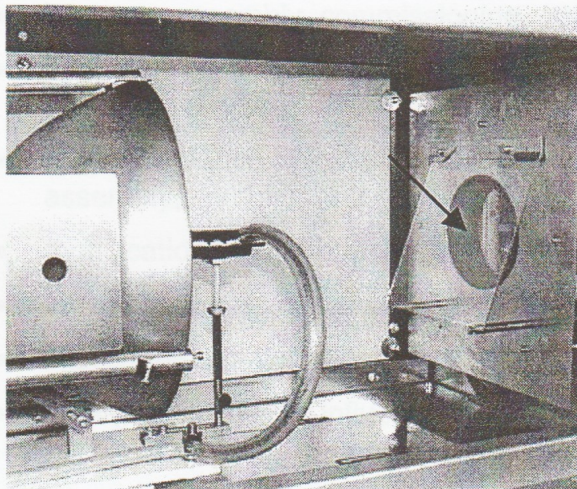


Figure 1-2 Heat filter

Heat filter

From a lamp capacity of 2500 W onwards a heat filter (arrow) has to be mounted to protect film gate.



1.2.3 Special Hazard Points

Mechanical danger by broken glass flying around:

- when operating the xenon lamp with open lamphouse
- when exchanging the xenon bulb



DANGER OF EXPLOSION

Never deactivate the door switch.



Only work on open lamphouse and with destruction of xenon bulb with face protection (shield), neck protection and safety clothes which reach to the elbow.



If the xenon lamp explodes you can suffer hurts in face, eyes and artery.



In cold condition the xenon lamp has an inner pressure of about 8 to 10 bar and in hot condition of about 30 bar.

Dispose xenon bulb: Before removing xenon lamp put protective cover around it, pack xenon bulb in original package and give it back to your supplier.

Insert the new xenon bulb in protective cover only. First remove it after mounting the xenon bulb.

Danger because of formation of ozone:

- when operating the xenon lamp



DANGER

Operate projector in a well ventilated room only.

Better method: Connect an outgoing air pipe with exhaust fan at the top of the projector and lead it to the outside of the building.

Danger because of ultraviolet radiation:

- when operating the xenon lamp with open lamphouse



DANGER

Operate projector with a closed lamphouse only.

If you do some adjustments in open lamphouse (look through visual hole), you have to use a visual protection which selects the ultraviolet radiation.

Never look into light of xenon lamp without protective glasses.

Danger because of high voltage:

- when igniting the xenon lamp



DANGER

Ignite xenon lamp in closed lamphouse only.



Danger because of errors and malfunction:

- unexpected ignition of xenon lamp
 - malfunction of protective device
-

**DANGER**

- Regularly check function of protective device.
 - Never operate with open lamphouse.
 - Make sure that nobody ignites the xenon lamp while somebody is working on it.
-

1.2.4 Electric Power Hazards

Allow work on the electrical supply to be carried out by competent electricians only. The projector electronics must be checked regularly. Loose connections must be restored immediately.

The access to the control cabinet must always be closed. Only authorized staff have access to the control cabinet.

When working on life parts, switch off main switch and put out the corresponding fuse.

1.2.5 Modification of Lamphouse Construction

No alterations, additions or modifications may be made to lamphouse without consent of KINOTON. This also includes welding of bearing parts.

Only use original spare and wear parts. Parts obtained from third party manufacturers cannot guarantee strain and security standards.

1.2.6 Cleaning and Disposal

Substances and materials used must be handled and disposed correctly, especially when cleaning with solvents.

1.2.7 Copyright

Copyright of this manual remains in possession of KINOTON.

This manual is intended for the user company and its staff only.

It contains regulations and operating notes that must not be copied, reproduced or otherwise transmitted, in whole or in part.

Infringement of copyright laws may lead to prosecution.

2 Transportation and Installation / Mounting

2.1 Transportation

Package

Delivery by lorry in Germany

- Lamphouse is delivered in a wooden box.
- The accessories are packed into the box too.

Storage

If lamphouse is stored for a longer time:

- Only store in dry rooms.
- Choose a suitable protective coating or leave lamphouse in the original coating.

2.2 Delivery or Equipment Variations

Lamphouse

- Xenon unit
 - 1000 to 2000 W
 - 2000 to 7000 W

Accessories

- Dichroic mirror
 - Xenon unit 700 to 2000 W at a focal length $f = 60/540$: $\varnothing 300$ mm
 - Xenon unit 2000 to 7000 W at a focal length $f = 55/825$: $\varnothing 340$ mm
- Xenon bulbs
 - 1000 W, 1600 W, 2000 W
 - 2500 W, 3000 W, 4000 W, 5000 W, 7000 W
- Operating manual



NOTE

For further information about accessories please contact your local dealer.



2.3 Installation



NOTE

The lamphouse will be delivered completely wired and factory-tested. You only have to assemble mirror, xenon bulb and heat filter (if necessary).

Place of Installation, Place of Operation

The Universal Lamphouse will be directly mounted on projector.

In figure 2-1 you see the requirements of lamphouse 1000 to 2000 W and 2000 to 7000 W (with localizer).

Unpacking

- Take accessories out of wooden box.



ATTENTION

Carefully take out mirror. Risk of fracture!

- Lift up lamphouse with a suitable hoisting machine and transport it to projector.

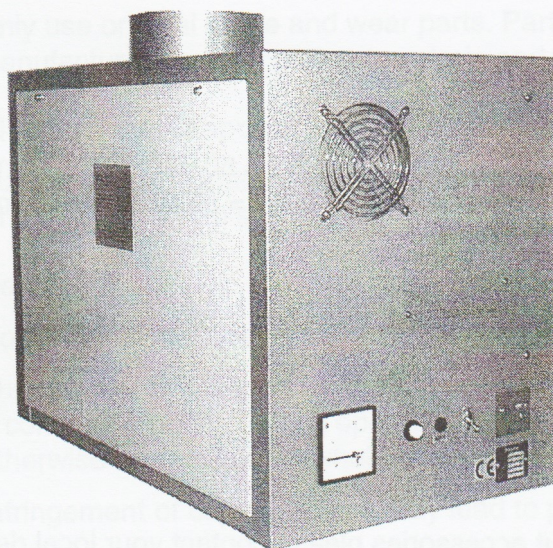
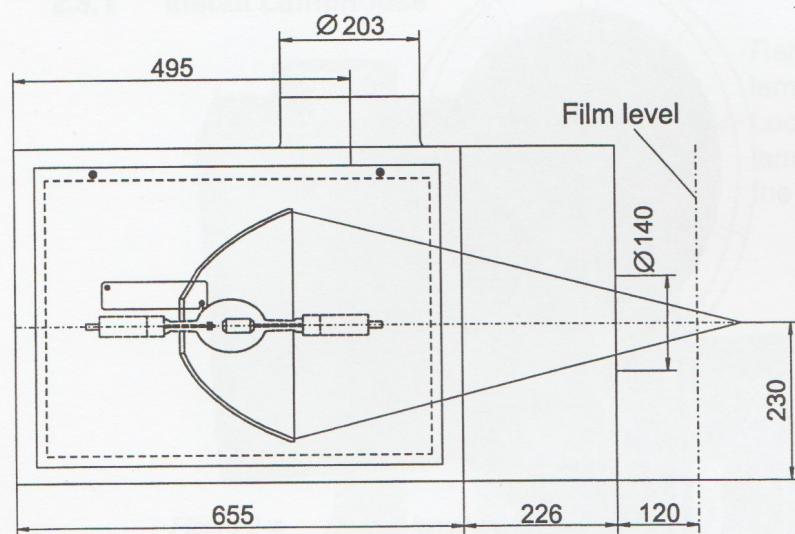


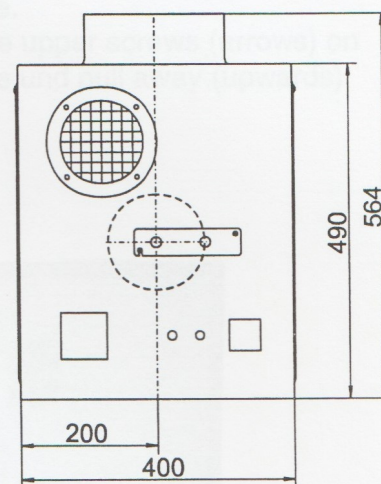
Figure 2-1 Universal Lamphouse



2000 to 7000 W



View from backside



1000 to 2000 W

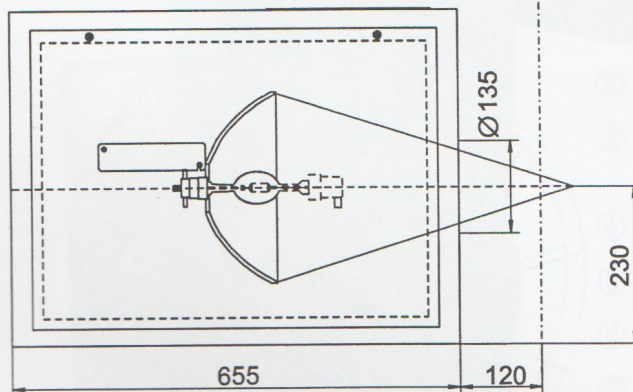


Figure 2-2 Requirement Universal Lamphouses

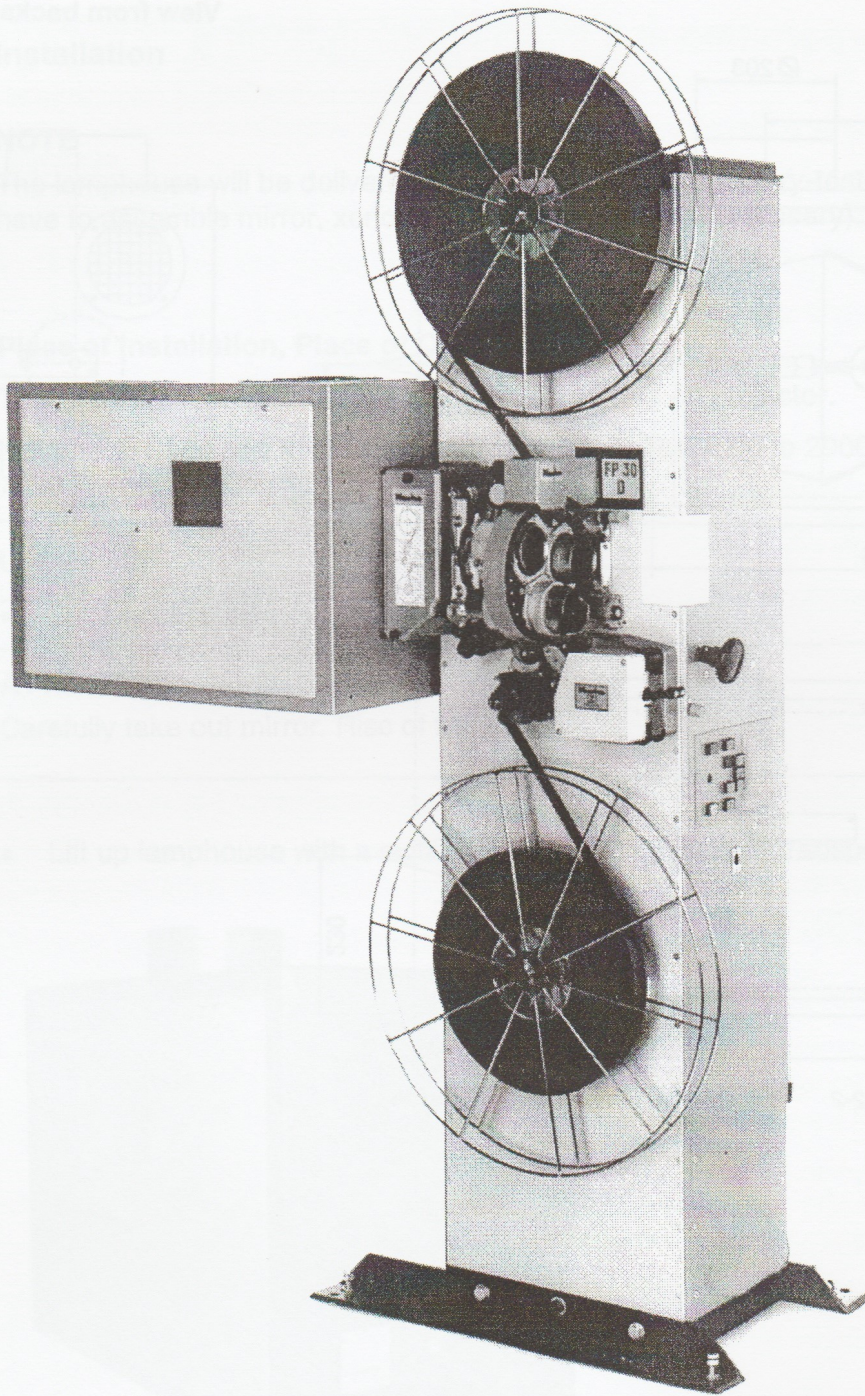
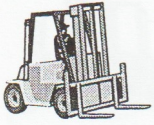


Figure 2-3 Universal Lamphouse (up to 2000 W) at projector FP 30 D



2.3.1 Install Lamphouse

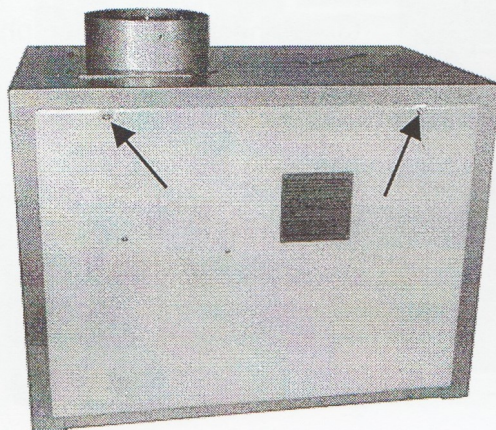


Figure 2-4 Door of lamphouse

Remove both lateral doors of lamphouse.

Loosen the upper screws (arrows) on lamphouse and pull away (upwards) the door.

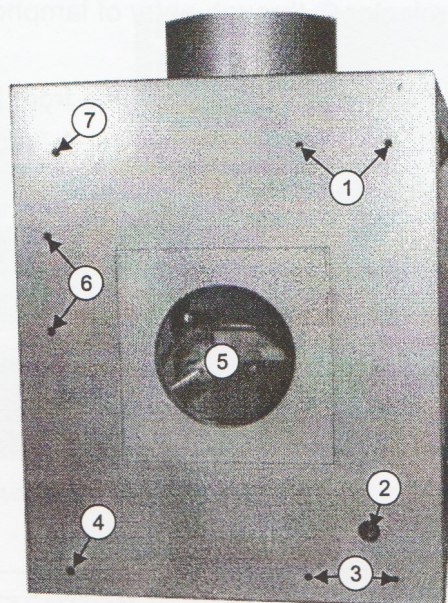


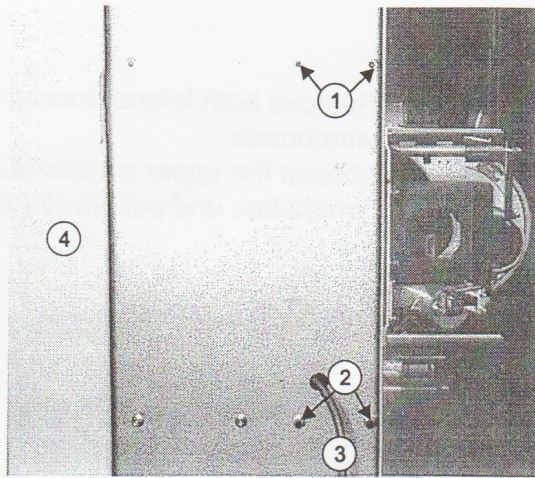
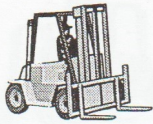
Figure 2-5 Drilled holes at mounting side

- ① upper holes to fasten on projector/localizer
- ② cable entry
- ③ lower holes to fasten on projector/localizer
- ④ lower hole to fasten localizer
- ⑤ opening to film gate
- ⑥ hole to fasten light shutter (option)
- ⑦ upper hole to fasten localizer



NOTE

Lamphouses with xenon lamps from 2000 W onwards are mounted with an according localizer. It has the drilled holes to fasten the lamphouse at projector.



- ① nuts/screws above
- ② nuts/screws below
- ③ connecting cable lamphouse
- ④ projector door

- Remove the four nuts on the screws in housing of projector.

Figure 2-6 Left side of projector

- Lift up lamphouse in a way that drilled holes of projector are opposite of lamphouse ones.
- Thread connecting cable from projector ③ through entry of lamphouse (② Figure 2-5).
- Put lamphouse onto the screws ①/② and fasten lamphouse from inside with the four nuts ①/②, you removed.

2.3.2 Connect Cable

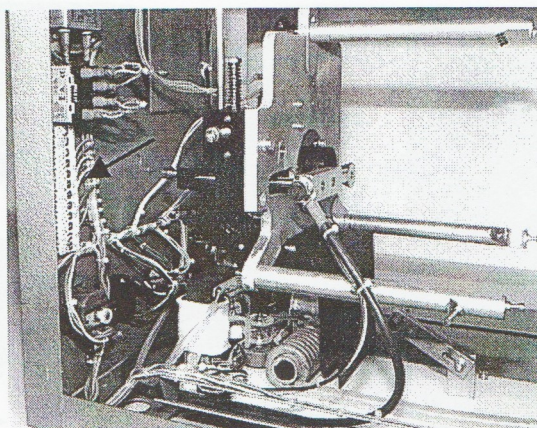
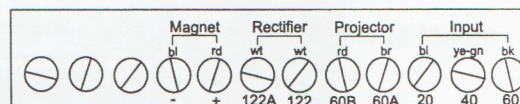


Figure 2-7 Terminal strip

Connect cable with terminal strip (arrow).

The wires in cable are signed corresponding to the terminals.



2.3.3 Connect DC Lines

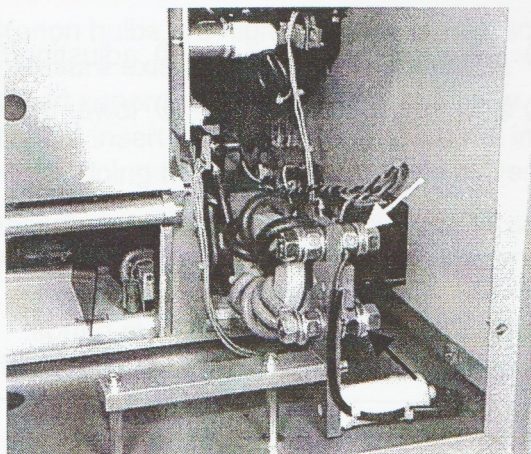


Figure 2-8 Connect DC lines

- Connect positive cable to the upper bolt of ferrit core (white arrow).
- Connect negative cable to the lower bolt of ferrit core (black arrow).
- Mark the ends (at ferrit core and rectifier) of the positive and negative cable with a blue and a red tape.



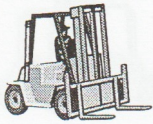
ATTENTION

- Connecting the cable is to be carried out by a competent electrician only.
- If you connect a **110 V lamphouse** with a **110 V projector** you must not connect mains current from projector to lamphouse. You have to connect mains current of projector and lamphouse separately.



NOTE

See also chapter 6.2.1, Wiring Scheme.



2.3.4 Insert the Mirror

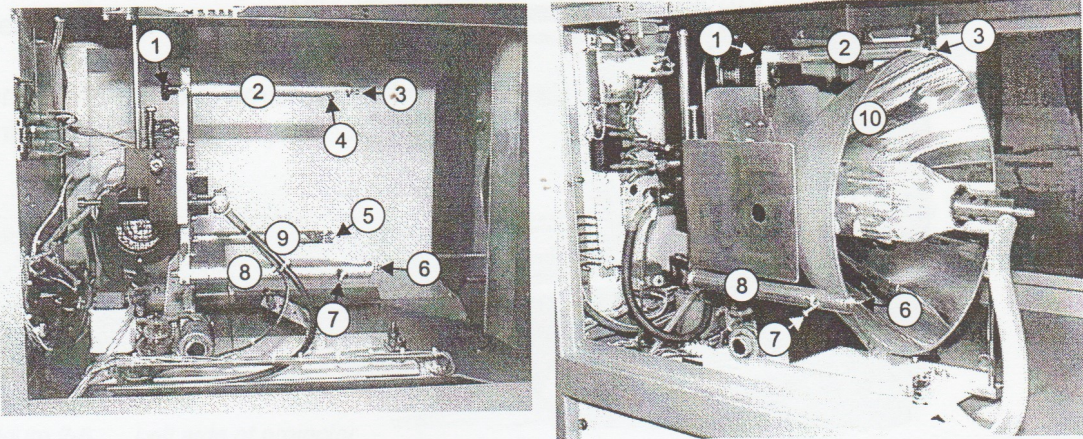


Figure 2-9 Insert mirror

- | | | |
|-----------------------------------|--------------------------|--------------------------|
| ① handle star upper mirror holder | ② mirror holder | ③ adjusting/fixing screw |
| ④ spring | ⑤ adjusting/fixing screw | ⑥ adjusting/fixing screw |
| ⑦ adjusting/fixing screw | ⑧ lower mirror holder | ⑨ lower mirror holder |
| ⑩ mirror | | |



ATTENTION

Do not touch the inside of the mirror (reflecting coat) with bare hands. If necessary carefully remove finger prints with a cloth wetted with alcohol.



NOTE

Before installing the mirror you have to check and if necessary adjust the optical axis. See chapter 5.3.3, Basic Adjustments.

1. Loosen handle star ① of the mirror holder on the top ② until it is moveable upwards.
2. Put down the mirror ⑩ on holders below ⑧/⑨. Move mirror holder on the top ② over the mirror and carefully put it down on the edge of the mirror.
3. Tighten handle star ① of mirror holder on the top.

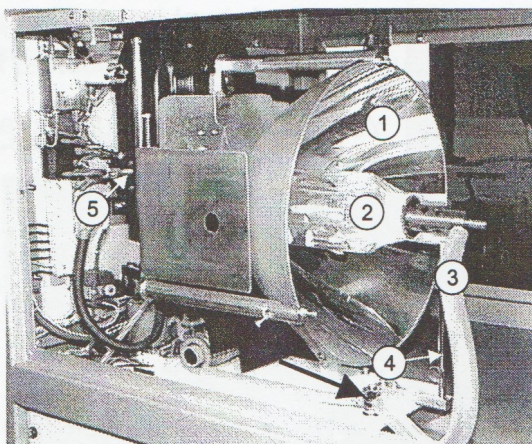


ATTENTION

Be careful that mirror will not be clamped too toughly. The mirror could brake because it expands while operating. The mirror should lay on the lower mirror holders ⑧/⑨ while the spring ④ of the upper holder ② is slightly pressing against edge of mirror.



2.3.5 Insert Xenon Bulb



- ① mirror
- ② xenon bulb in protective coat
- ③ anode cable (+)
- ④ bulb stay (adjustable)
- ⑤ hexagonal socket screw to fasten xenon bulb

Figure 2-10 Insert xenon bulb



DANGER

Xenon bulbs are high-pressure glow-discharge lamps in which a high interior pressure exists even if not in operation.

Insert xenon bulb in protective coat only.

Do not insert with any violence. Do not insert bulb by touching it at anode base. While doing this work, wear safety clothes, face protection and protective suit.

Inserting the 7000 W bulb you have to adjust the optical axis so far as possible in forward direction to have enough space.

1. Remove cap of protective coat (only with xenon bulbs up to 2000 W).
2. Insert xenon bulb in protective coat ② with cathode base first through central hole of mirror ①.
3. Hold bulb in position with right hand and tighten it with knob of threading bar (arrow) from the outside of projector with left hand.

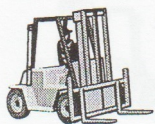


NOTE

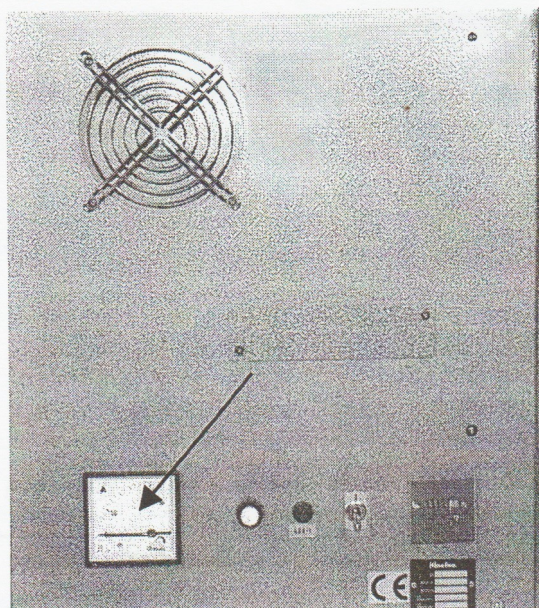
If you insert xenon bulbs up to 2000 W you can easily screw them in.

If you insert xenon bulbs from 2000 W onwards you need an adapter: Screw adapter on cathode base, insert bulb and tighten it in the described way (point 3).

4. Pull away (up to 2000 W) or unfold and remove the protective coat.
5. Fasten positive cable (anode) ③ of xenon bulb with connecting bolt (arrow).
6. Close lamphouse doors and fasten screws.



Adjust intensity of currents



Turn handwheel for rectifier control and set intensity of current in a way you see in the following table. You can read the values on ampere meter (arrow).

Figure 2-11 Adjust intensity of currents

Lamp capacity [W]	Setting value [A]	max. current [A]
700	37	45
1000	50	55
1600	65	70
2000	70	75
2500	90	100
3000	100	110
4000	130	140
5000	160	170
7000	160	170



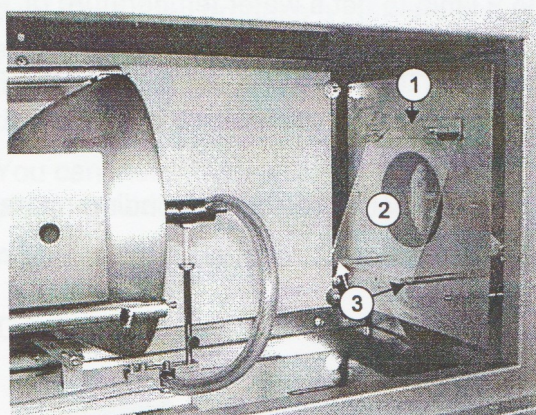
NOTE

- Adjust illumination of screen see chapter 5.3.1.
- Read the data sheet which is delivered with xenon bulb.

2.3.6 Insert Heat Filter

A heat filter is necessary from a lamp capacity of 2500 W onwards. It protects film gate from too much heat.

Lamphouse up to 2000 W



① clamping bar

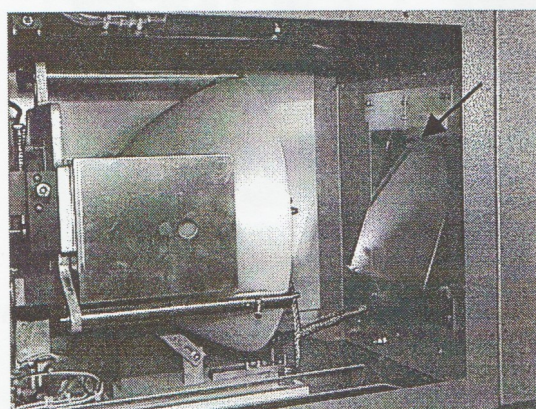
② heat filter

③ holders

1. Remove protective foil from filter!
2. Insert filter under clamping bar ① and put it on the lower holders ③.
3. Carefully fasten screws of clamping bar.

Figure 2-12 Heat filter

Lamphouse 2000 to 7000 W



1. Remove protective foil from filter!
2. Put heat filter on the lower holders and press the filter against the spring (arrow) until it arrests at the end of the spring (clamping).

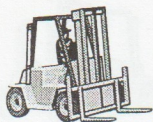
Figure 2-13 Heat filter



ATTENTION

The heat filter is a reflection filter, therefore you have to watch out for the **reflection side of filter to be directed to xenon lamp**.

- You can see the edge of reflection coating when you look at the small side of filter holding it against the light.
- The reflection side is slightly adhesive. Touch the filter on one edge with your fingers - On the adhesive side you will see a fingerprint.



2.3.7 Water Cooling



ATTENTION

- Xenon bulbs from 3000 W onwards need water cooling for film gate and front gate.
- You need a water flow of 2 to 3 l/min to get a water temperature of $18^{\circ}\text{C} \pm 2^{\circ}\text{C}$ ($64^{\circ}\text{F} \pm 10^{\circ}\text{F}$).



NOTE

The installation of water cooling is described in the corresponding operating manual.

3 Operating, Components and Operating Elements

3.1 Description / Function

The Universal Lamphouse will be mounted on projector. Depending on lamp capacity an according localizer is fastened on lamphouse.

Two electrodes produce a light arc in a surrounding of pure xenon gas between each other. The light arc will be reflected via the mirror and lights through film gate, the film and in result the screen. If xenon lamp is correctly adjusted an even light distribution across the screen is guaranteed.

You can insert horizontal xenon bulbs from 1000 to 7000 W capacity. Two versions of xenon units are available(1000 to 2000 W and 2000 to 7000 W).

A rectifier provides the xenon lamp with power.

3.2 Components

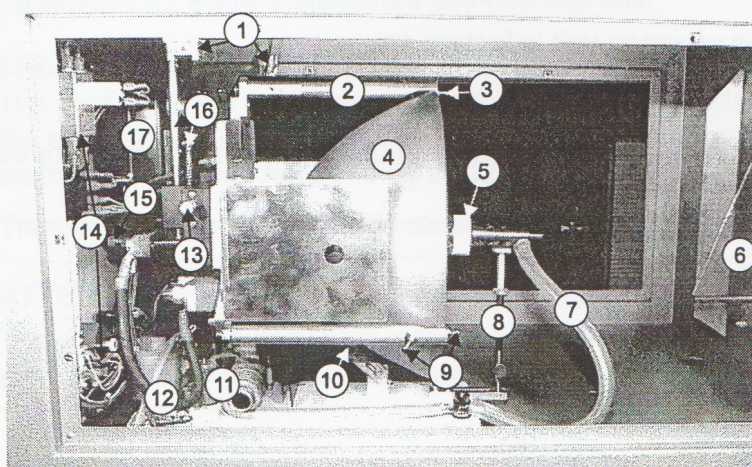


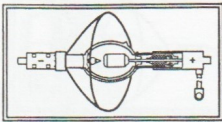
Figure 3-1 Projector FP 50 D (operating side)

- | | | |
|-------------------------------|------------------------------------|--------------------------|
| ① door switches | ② mirror holder | ③ adjusting/fixing screw |
| ④ mirror | ⑤ xenon bulb | ⑥ heat filter |
| ⑦ anode cable (+) | ⑧ bulb stay | |
| ⑨ adjusting/fixing screw | ⑩ stabilizing magnet | ⑪ ignition unit |
| ⑫ cathode cable (-) | ⑬ horizontal adjustment xenon bulb | ⑭ electrical equipment |
| ⑮ axial adjustment xenon bulb | ⑯ vertical adjustment xenon bulb | ⑰ fan |

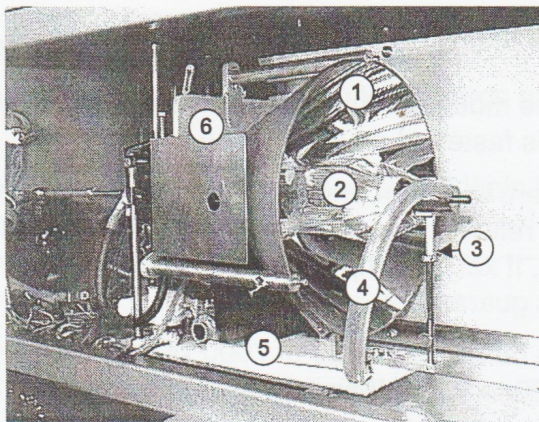


DANGER

- You can ignite xenon lamp only when door of lamphouse is closed. If you open the door during operation the door switch will be activated and the xenon lamp will immediately get off.
- You can suffer hurts when broken glass is flying around (xenon bulb has an inner pressure of 8 to 10 bar in cold condition and about 30 bar in hot condition). Because of that you have to wear protective suit, protective gloves and face/neck protection during all works at open lamphouse.



3.2.1 Xenon Unit



- ① mirror
- ② xenon bulb in protective coat
- ③ bulb stay
- ④ anode cable (+)
- ⑤ ignition base with ignition unit
- ⑥ mirror holder

Figure 3-2 Xenon unit



NOTE

The optical axis of xenon unit is factory-set.



ATTENTION

The adjustment of optical axis is carried out by authorized experts or service men of KINOTON only. See chapter 5.3.3.

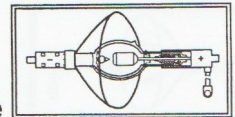
There are two different xenon units with xenon lamps:

- 1000 to 2000 W
- 2000 to 7000 W



NOTE

- In xenon unit 1000 to 2000 W you can screw in the xenon bulb easily.
- In xenon unit 2000 to 7000 W you have to put on an adaptor on cathode base of the bulb. With the aid of the hexagonal socket screw you can fasten the bulb with the adapter.



3.2.2 Xenon Bulb

Principle function of xenon lamp

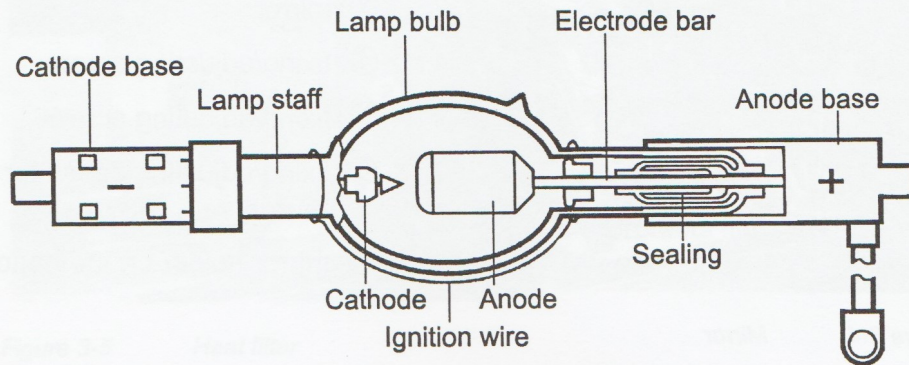


Figure 3-3 Principle function of a glow-discharge lamp

The lamp bulb out of quartz glass encloses the electrode system and the xenon gas. The discharge arc burns between anode (+) and cathode (-). The cathode delivers the electrons. The anode takes off the electrons. The resulting brake energy will be transformed into heat energy and then reflected.

The discharge arc (light arc) is stabilized through a magnet.



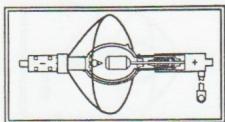
ATTENTION

The adjustment of stabilizing magnet is carried out by authorized experts or service men of KINOTON only. See chapter 5.3.2.

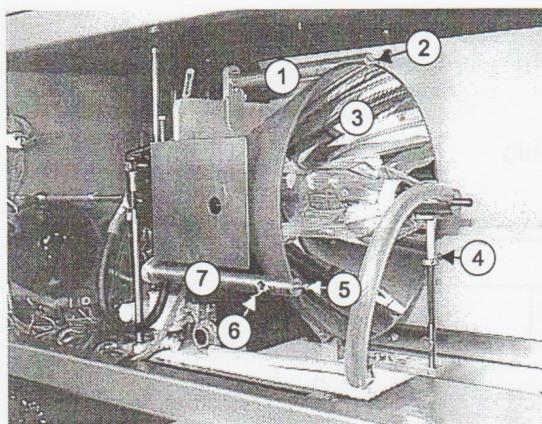


NOTE

Assembly and disposing of xenon bulb, see chapter 5.2.1.



3.2.3 Mirror



- ① mirror holder on the top
- ② fixing/adjusting screw
- ③ mirror
- ④ fixing/adjusting screw
- ⑤ fixing/adjusting screw
- ⑥ fixing/adjusting screw for other mirrors
- ⑦ mirror holder on the bottom

Figure 3-4 Mirror

Nowadays cold mirrors are mostly used. Because of their coating heat can diffuse the mirror – the film gate gets a less range of heat but the full range of light.

The following mirrors are available:

- Xenon unit 1000 to 2000 W at a focal length $f = 60/540$: $\varnothing 300$ mm
- Xenon unit 2000 to 7000 W at a focal length $f = 55/825$: $\varnothing 340$ mm



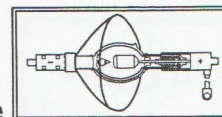
ATTENTION

Do not touch the inside of the mirror with bare hands. If necessary carefully remove fingerprints with an alcohol-soaked cloth.

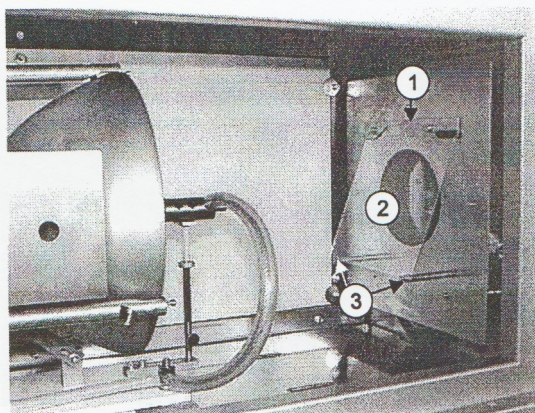


NOTE

Exchange mirror, see chapter 5.2.2.



3.2.4 Heat Filter



① fixing bar

② heat filter

③ holders

You need a heat filter from 2500 W onwards (from 2000 W onwards recommend, for projector FP 38 E necessary).

It protects film gate to get too much heat through xenon lamp.

Figure 3-5 Heat filter



ATTENTION

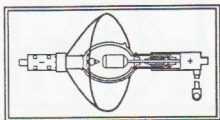
The heat filter is a reflection filter, therefore you have to watch out for the **reflection side of filter to be directed to xenon lamp**.

- You can see the edge of reflection coating when you look at the small side of filter holding it against the light.
- The reflection side is slightly adhesive. Touch the filter on one edge with your fingers - On the adhesive side you will see a fingerprint.
- Do not forget to remove protective foil before you use the filter.



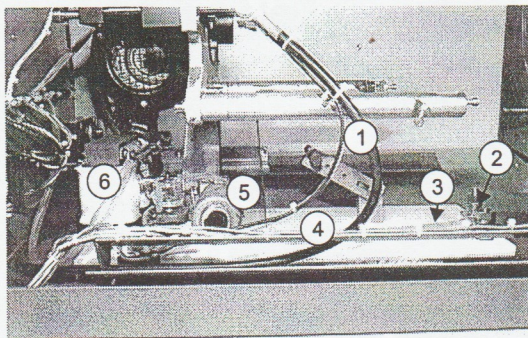
NOTE

Exchange of heat filter, see chapter 5.2.3.



3.2.5 Electrical Equipment

Ignition Unit



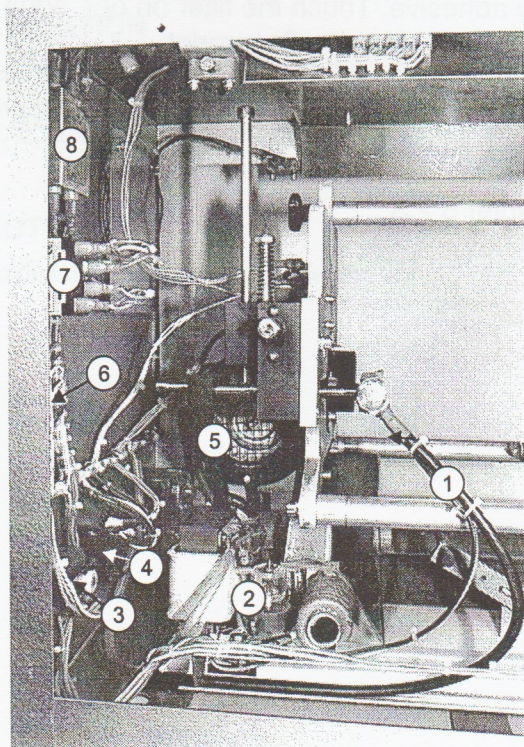
- ① cathode cable (-)
- ② connection anode cable (+)
- ③ ignition cable from ignition coil to connection anode cable
- ④ ignition base
- ⑤ ignition coil
- ⑥ ignition unit

Figure 3-6 Ignition unit



ATTENTION HIGH VOLTAGE

- You can ignite xenon lamp only when door of lamphouse is closed and fan is running.
- All works on ignition unit are to be carried out by competent electricians only.



- ① cathode cable (-)
- ② ignition unit
- ③ operating hour meter
- ④ reversible switch
- ⑤ fan
- ⑥ terminal strip
- ⑦ contactor
- ⑧ mains suppression filter

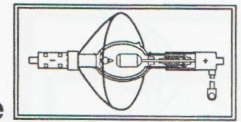


ATTENTION

All works on electrical equipment are to be carried out by competent electricians only.

All adjustments and programmings are to be carried out by authorized experts or from service men of KINOTON only.

Figure 3-7 Electrical equipment



3.2.6 Cooling

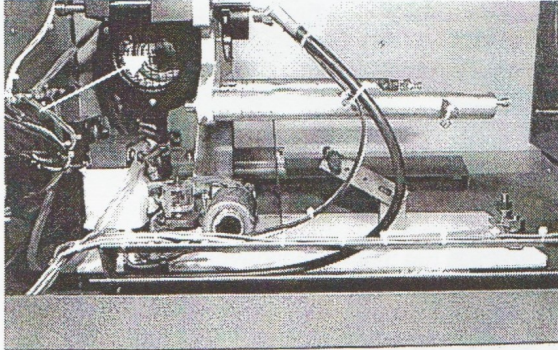


Figure 3-8 Additional air fan (radial)

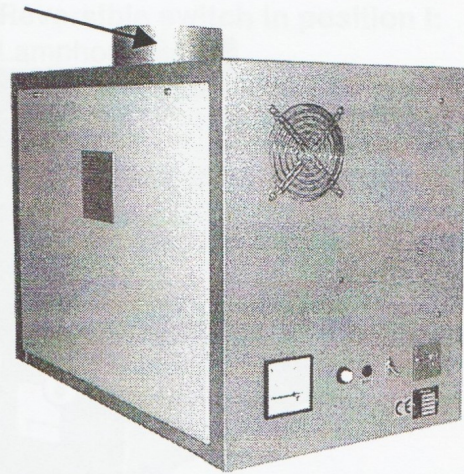


Figure 3-9 Exhaust ventilator (axial)

The xenon bulb and the housing are cooled via a additional air fan (Fig. 3-8, arrow), which leads airflow around the bulb. The exhaust ventilator (Fig. 3-9, arrow) leads warm air out of housing.



NOTE

The lamphouse has an exhaust ventilator cowl with lamp capacity from 2000 W onwards.

3.2.7 Rectifier

The rectifier supplies xenon lamp with regular current.

The intensity of currents of rectifier (type) depends on xenon unit (see chapter 2.3.5).

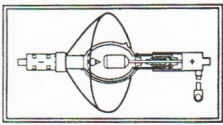
With the handwheel you can adjust intensity of current for xenon lamp (iron core will be moved).

You can read the adjusted intensity of current on ampere meter of lamphouse.

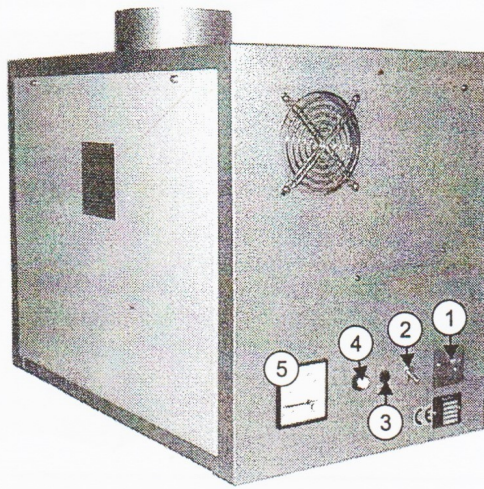


NOTE

- When using an electrical rectifier you have to adjust intensity of current with a potentiometer.
- You will find a more detailed discription of the rectifier in the corresponding operating manual.



3.3 Operating Elements



- ① operating hour meter
- ② switch lamphouse ON/OFF
- ③ fuse
- ④ press button IGNITE
- ⑤ ammeter

Figure 3-10 Operating xenon lamp

3.3.1 Ignition Button

The xenon lamp automatically ignites when pushing the button **PROJ. START** at operating panel.

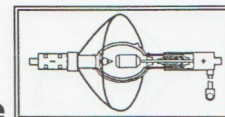
You can manually ignite xenon lamp by pushing the press button ④.



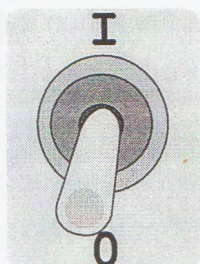
ATTENTION

Do not push this button for more than three seconds. The ignition unit will be damaged if you push for a longer time.

If xenon lamp does not ignite after you push button two to three times, the ignition unit or rectifier or xenon bulb probably have a defect.



3.3.2 Reversible Switch: Lamphouse ON/OFF



Reversible switch in position I:

Lamphouse is ON.

Ventilation runs after when xenon lamp lights off.

Reversible switch in position 0:

Lamphouse is OFF.

Figure 3-11 Reversible switch: fan ON / OFF

Switch-ON/OFF Lamphouse manually



Switch on reversible switch (position „I“) of xenon lamp. The fan is running.



Switch off reversible switch (position „0“) of xenon lamp. The fan is off.



NOTE

You can program ventilation in a way that the fan runs after (approx. 5 minutes) when projector and xenon lamp are switched off.

This thermal switch is operating with a temperature of 60°C. If the temperature is less than 45°C the switch resets.

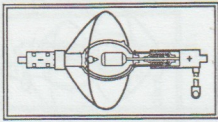
3.3.3 Fuse

If you screw out the fuse the lamphouse is all-pole separated from main current.



ATTENTION

You have to screw out fuse with all maintenance work and cleaning.



3.3.4 Operating Hour Counter

The operating hour counter shows the hours the xenon bulb is operating.

3.3.5 Ammeter

Turning the handwheel of rectifier you can move iron core in coils – intensity of currents changes.

You can read intensity of currents on ammeter.



NOTE

When using an electrical rectifier you have to adjust intensity of current with a potentiometer.

Lamphouse 1000 to 2000 W is equipped with an ammeter 100 A.

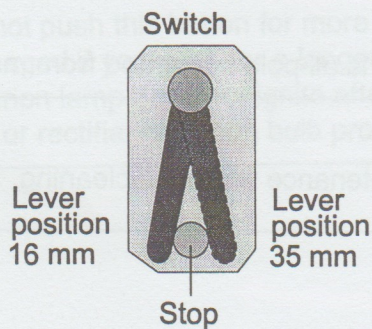
Lamphouse 2000 to 7000 W is equipped with an ammeter 200 A and an additional resistor.



NOTE

- You will find a more detailed description of the rectifier in the corresponding operating manual.
- Adjusting intensity of currents according to xenon lamp, see chapter 2.3.6, Insert Xenon Bulb.

3.3.6 Switch Lever 16mm-Film – 35mm-Film



With the switch lever you can choose between 16mm-Film and 35mm-Film – focal length will change.

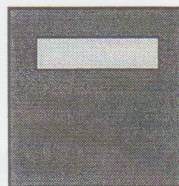
switch lever stop left:
16 mm is chosen

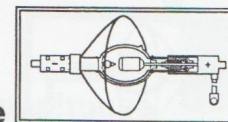
switch lever stop right:
35 mm is chosen.

Always move switch lever to its stop.



Hour Counter





3.4 Trouble Shooting




Currently technology and programming guarantee a perfect process of system, nevertheless there could be errors because of maloperation, wrong procedures and other things.

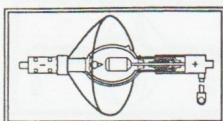
In this chapter you get information about possible errors and error messages and about possible clearing of these errors.




Basically the system distinguishes two types of errors:

error type 1: projector stops immediately

error type 2: errors which do not stop projector

 Error	 Reasons	 Clearing
xenon lamp does not ignite	<ul style="list-style-type: none"> no contact ignition unit is defect lamphouse is open – door not closed correct 	<ul style="list-style-type: none"> ignite manually exchange close lamphouse
lighting of screen is uneven	<ul style="list-style-type: none"> xenon unit is not in optical axis xenon bulb is not adjust correctly xenon bulb has too many operating hours 	<ul style="list-style-type: none"> adjust service adjust (chapter 5.3.1) exchange (chapter 5.2.1)
base cover (anode) discoloured	<p>overheating of base (over 230°C)</p> <ul style="list-style-type: none"> electrical connections are poored not enough cooling disadjusted optical axis intensity of currents too high 	<ul style="list-style-type: none"> fasten contacts or exchange check cooling adjust check, adjust
bulb gets black, is coloured dark	<ul style="list-style-type: none"> because of overheating the bulb will get fractures 	<ul style="list-style-type: none"> check, described in line above exchange bulb
slug on the top of cathode	<ul style="list-style-type: none"> wrong polarity, wrong connection wrong connection of lamphouse 	<ul style="list-style-type: none"> check, change poles check, anode (the bigger electrode) has to be connect above cathode



 Error	 Reasons	 Clearing
deformation of electrodes and blackening of lamp	restless arc <ul style="list-style-type: none"> • not in range of current control • alternating component is too high • bad or missing arc stabilization • bad or wrong cooling 	<ul style="list-style-type: none"> • adjust intensity of currents see table (chap. 2.3.5) • check rectifier • adjust stabilization magnet (chap. 5.3.2) • check cooling
bulb gets milky	<ul style="list-style-type: none"> • life of xenon bulb is reached • intensity of currents is too high 	<ul style="list-style-type: none"> • exchange lamp (chap. 5.2.1) • check and adjust intensity of currents remove fingerprints on xenon bulb before switching on
asymmetrical blackening of bulb	<ul style="list-style-type: none"> • bad or missing arc stabilization 	<ul style="list-style-type: none"> • adjust stabilization magnet (chap. 5.3.2)

4 Maintenance and Cleaning

4.1 General Hints



ATTENTION

- Allow work on electric supply to be carried out by competent electricians only.
- Make sure that nobody starts lamp while you are working on it.
With all maintenance and cleaning work you must separate lamphouse from power supply (switch off main switch of projector and screw out fuse).

Because of using maintenance-free elements, the consumption of material and the expenditure of time for maintenance work and repair are reduced to a minimum.

This maintenance and cleaning work which is necessary may be observed especially from operators. These works have to be carried out regularly and carefully. See the following lists of cleaning and maintenance regarding this.

4.2 Cleaning

Weekly

mirror	Remove dust and dirt with a soft brush. Remove adhere dirt under a slight press with a linen cloth which is lightly moistened with alcohol.
--------	--



ATTENTION

Do never use sharp objects to remove hard particles from mirror.



DANGER

- Open lamphouse ten minutes after switching off xenon lamp only.
- The power of xenon lamp and rectifier must be switched off all-polo. Therefore switch off main switch of projector.
- You can suffer hurts when broken glass is flying around (xenon bulb has a inner pressure of 8 to 10 bar in cold condition and about 30 bar in hot condition). Because of that you have to wear protective suit, protective gloves and face/neck protection with all works on open lamphouse.





4.3 Maintenance

Every three month

check illuminating of screen	Adjust permanent magnet (chapter 5.3.2). Adjust light point on screen, see chapter 5.3.1.
Check operating hours of xenon bulb	Exchange xenon bulb, see chapter 5.2.1.

5 Repair and Adjustments

5.1 General Hints

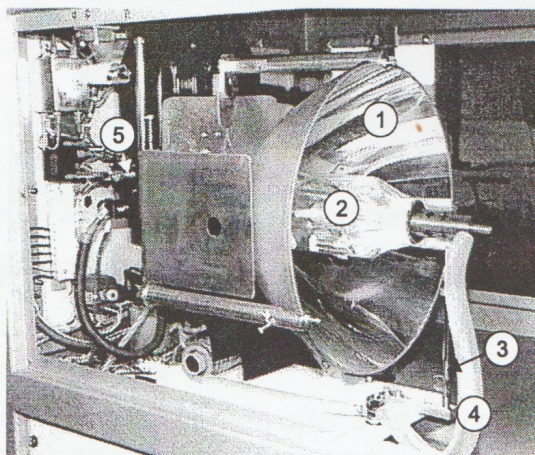


ATTENTION

- Allow work on electrical equipment to be carried out by competent electricians only.
- Make sure that nobody starts projector while you are working on it. With all maintenance and cleaning work you must separate projector from power supply (switch off main switch).
- All adjustments to be carried out by experts.

5.2 Repair

5.2.1 Exchange Xenon Bulb



- ① mirror
- ② xenon bulb in protective coat
- ③ bulb stay
- ④ anode cable (+)
- ⑤ hexagonal socket screw to fix the xenon bulb (not visible in figure)

Figure 5-1 Xenon unit



DANGER

- Wait ten minutes after switching off xenon lamp to open lamphouse.
- The power of xenon lamp and rectifier must be switched off all-pole. Therefore switch off main switch of projector and screw out fuse of lamphouse.
- You can suffer hurts when broken glass is flying around (xenon bulb has an inner pressure of 8 to 10 bar in cold condition and about 30 bar in hot condition). Because of that you have to wear protective suit, protective gloves and face/neck protection during all works on open lamphouse.





Disassembly

- Remove door of lamphouse.
- Put protective coat ② around bulb.
- Remove positive cable ④ from anode connecting bolt.
- Remove xenon bulb: Loosen hexagonal socket screw ⑤ behind xenon lamp. At the same time hold bulb with the other hand.
- Carefully pull bulb out of hole of mirror ①.



DANGER

Because of explosion danger the used xenon lamp **must not** lie in performance room.

If you want to use it again it is recommended to pack xenon bulb in original package and store it in a box. Give the packed xenon bulb back to your purveyor.

Assembly



DANGER

- Xenon bulbs are high-pressure glow-discharge lamps.
- Insert xenon bulb in protective coat only.
- Do not insert with violence. Do not insert by touching the anode base.
- Wear protective clothes, a face / neck protection and a protective suit.

- Remove cap of protective coat ② of xenon bulb (up to 2000 W).
- Thread xenon bulb in protective coat (7000 W bulb: before you insert the bulb, turn axial adjustment so far as possible in forward direction) with cathode base in front through central hole of mirror ①.
- Hold bulb with one hand and fasten it with your other hand. Tighten screw with an Allan key.



NOTE

Xenon lamps up to 2000 W are directly screwed in socket. With xenon lamps from 2000 W onwards you have to screw an adaptor on bulb, the hexagon socket screw will be screwed in adapter to fasten xenon bulb.

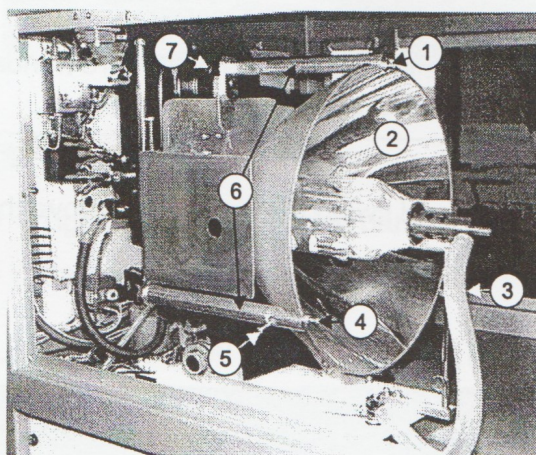
- Lay anode base on bulb stay ③. Adjust bulb stay in height so that xenon bulb is lying in a horizontal level.
- Remove protective coat.
- Fasten anode cable ④ at connecting bolt in lamphouse.
- Close door of lamphouse and tighten screws.



NOTE

Adjust intensity of currents, see chapter 2.3.5, Insert Xenon Bulb.

5.2.2 Exchange Mirror



- ① adjusting/fixing screw above
- ② mirror
- ③ adjusting/fixing screw below
- ④ adjusting/fixing screw below
- ⑤ adjusting/fixing screw other mirror
- ⑥ mirror holder
- ⑦ handle star

Figure 5-2 Mirror



ATTENTION

- Open lamphouse after a waiting period of 10 minutes only.
- The current of lamp and rectifier must be switched off all-pole. Switch-off main switch of projector and turn out fuse.
- Work at open lamphouse to be carried out has to be done with protective suit, gloves and face shield. You can seriously hurt yourself when xenon bulb explodes and broken glass is flying around.



Disassembly

- Remove door of lamphouse.
- Remove xenon bulb as described in chapter 5.2.1, Disassembly.
- Loosen fixing screw of mirror holder on the top ⑦.
- Take out mirror ② carefully.

Assembly



ATTENTION

Do not touch the inner side of mirror (reflecting surface) with bare hands. If necessary, remove fingerprints with alcohol-soaked cloth.

- Place mirror ② into lower holders and swing the upper one above the mirror and place it on the edge of the mirror.
- Tighten handle star ⑦.
- If necessary adjust screws ①, ③ and ④.



ATTENTION

Care must be taken that the mirror is not firmly clamped, otherwise when heated during operation it would not be able to expand and would brake. The mirror should lie on the two lower holders only while it is pressed by the spring ①, lightly against the front edge of the holder only.

- Insert xenon bulb (see chapter 5.2.1, Assembly).



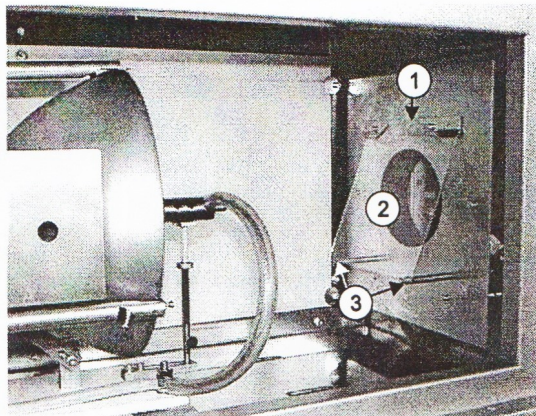
NOTE

The optical axis is factory-set. If adjustment is necessary, it is carried out by experts or service men of KINOTON only (see chapter 5.3.3).



5.2.3 Exchange Heat Filter

Lamphouse up to 2000 W



① fixing bar

② heat filter

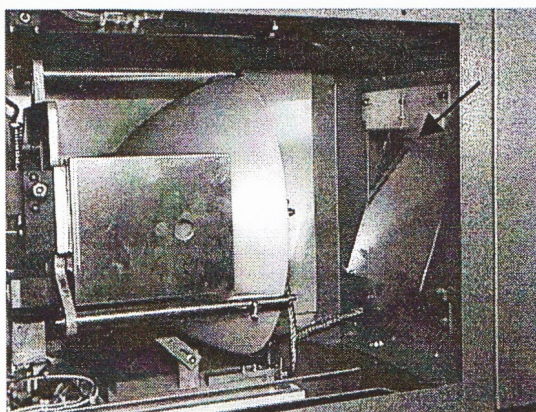
③ holders

- Loosen screws of fixing bar.
- Lift up heat filter a little bit and sidely pull it away.
- Place the new heat filter by sidely shoving it in fixing bar at the top and inserting it into the holders at the bottom.

Figure 5-3 Heat filter

- Tighten screws of fixing bar.
- Remove protective foil.

Lamphouse 2000 to 7000 W



- Pull out the old heat filter.
- Remove protective foil from the new filter!
- Put heat filter on the lower holders and press the filter against the spring (arrow) until it arrests at the end of the spring (clamping).

Figure 5-4 Heat filter



ATTENTION

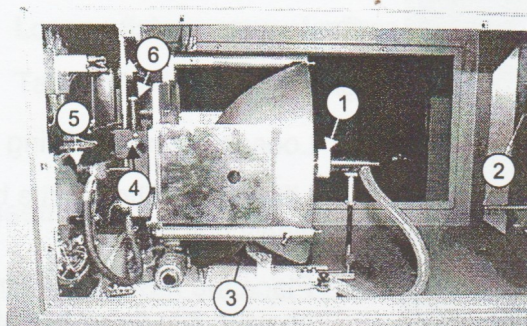
The heat filter is a reflection filter, therefore you have to watch out for the **reflection side of filter to be directed to xenon lamp**.

- You can see the edge of reflection coating when you look at the small side of filter holding it against the light.
- The reflection side is slightly adhesive. Touch the filter on one edge with your fingers - On the adhesive side you will see a fingerprint.



5.3 Adjustments

5.3.1 Illumination of Screen



- ① xenon bulb
- ② to film gate
- ③ stabilizing magnet
- ④ horizontal adjustment
- ⑤ axial adjustment
- ⑥ vertical adjustment

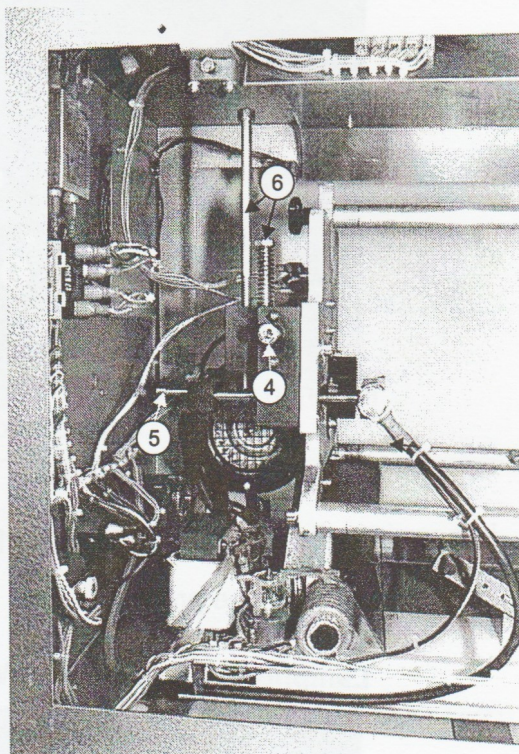


Figure 5-5 Adjustments of xenon bulb

- Start projector.
- You can adjust the xenon bulb against mirror in three levels (horizontal ④, vertical ⑥ und axial ⑤).

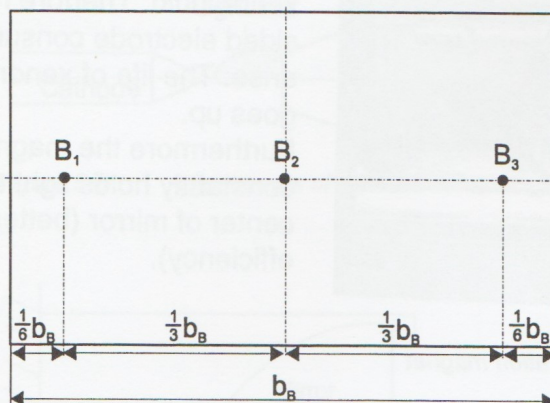


DANGER

- Open lamphouse after a waiting period of 10 minutes only.
- The current of lamp and rectifier must be switched off all-pole. Switch-off main switch of projector and turn out fuse of lamphouse.
- Work at open lamphouse to be carried out has be done with protective suit, cloves and face shield. You can seriously hurt yourself when xenon bulb explodes and broken glass is flying around.



- Turning hexagon socket screw ⑤, the xenon lamp is adjusted as much along the optical axis until only a reduced round illuminated spot can be seen on screen.
- By turning adjusting screws right – left (horizontally) ④ and up – down (vertically) ⑥ you have to bring this light spot precisely into the middle of the screen.



Luminance B in center of screen:
 $55 \text{ cd/m}^2 = 16 \text{ footlambert}$

The luminance of lateral measure points should not be less than 50%, better 68% of luminance of screen center.

This is an average value and depends on chosen lens.

Figure 5-6 Position of measure points

To determine the illuminance (Lux) you have to measure it. Multiplicate it with the degree of reflection or with the luminance factor (only with reflection screens):

$$\text{Luminance [cd/m}^2\text{]} = \frac{\text{Degree of Reflection}}{3,14} \times \text{Illuminance [LUX]}$$

$$\text{Luminance [apostilb]} = \text{Degree of Reflection} \times \text{Illuminance [LUX]}$$

Another and better method to measure illuminance with a spot meter:

$1^\circ/\text{cd}$ for a m^2 or footlambert is to be 50 - 65 cd/m^2 .

$1 \text{ cd (candela)} \times 0.292 = 1 \text{ footlambert}$



NOTE

Always measure with the biggest aperture (21.3 x 18.2).

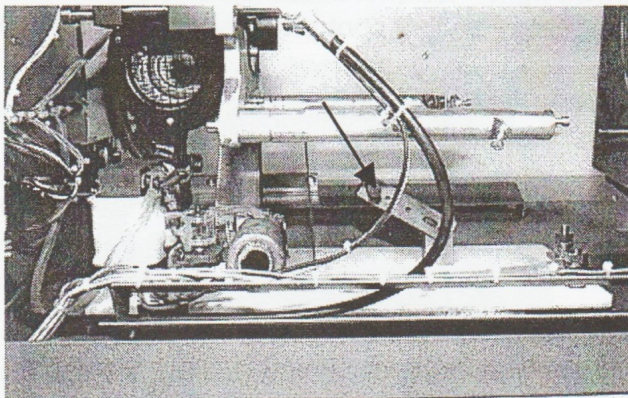


NOTE

- If the adjustment is not possible in the described way, you have to change the mirror position with the aid of the adjusting/fixing screws of mirror holders.
- Adjust light arc with moving the stabilization magnet. This adjustment is to be carried out by an expert only (see chapter 5.3.2).



5.3.2 Adjust Light Arc Stabilization Magnet



A magnet stabilizes the light arc between cathode and anode of xenon bulb. Therefore no one-sided electrode consumption can arise. The life of xenon lamp goes up.

Furthermore the magnet constantly holds light arc in the center of mirror (better optical efficiency).

Figure 5-7 Adjustments of stabilization magnet

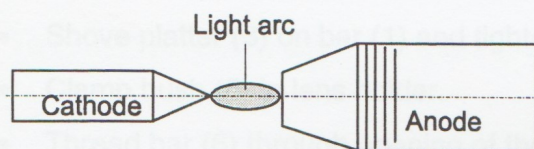


DANGER

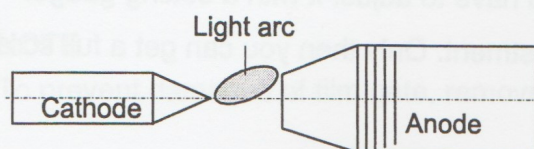


- This adjustment can only be done when lamphouse is open and xenon lamp is ignited. Therefore be especially careful.
- Use a face shield with UV protective glasses (weld protective glasses).
- All work at open lamphouse to be carried out has to be done with protective suit, gloves and face shield. You can seriously hurt yourself when xenon bulb explodes and broken glass is flying around.

- The mirror has a window. Insert mirror in a way you will horizontally see the light arc through this window.
- Insert xenon bulb.
- Ignite lamp and set the corresponding intensity of current at handwheel of rectifier.
- Look at light arc.



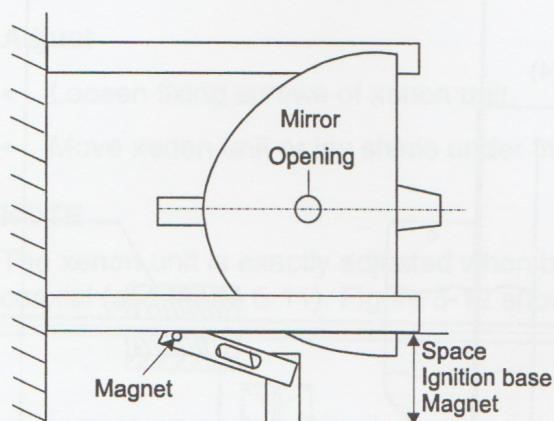
Light arc is adjusted correctly.



Light arc is not adjusted correctly.

A correct adjustment is necessary.

Figure 5-8 Adjustments of light arc



The stabilization magnet is lying in an aluminium holder which is fastened at ignition base

space ignition base - magnet
for 1000 to 2000 W xenon unit:
79 to 81 mm

space ignition base - magnet
for 2000 to 7000 W xenon unit:
92 to 94 mm

Figure 5-9 Stabilization magnet on mirror

- Adjust magnet by lifting and lowering aluminium holder until light arc has the correct position (see figure 5-8).
- Coat the screws after adjustment.



NOTE

Check position of light arc whenever you change xenon bulb.



5.3.3 Basically Adjust Xenon Unit



NOTE

- The xenon unit is factory-set. If basic adjustment is changed because of transport or modification, you have to adjust it with a setting gauge.
- Pay attention to an exact adjustment. Only then you can get a full screen illumination.

Insert setting gauge

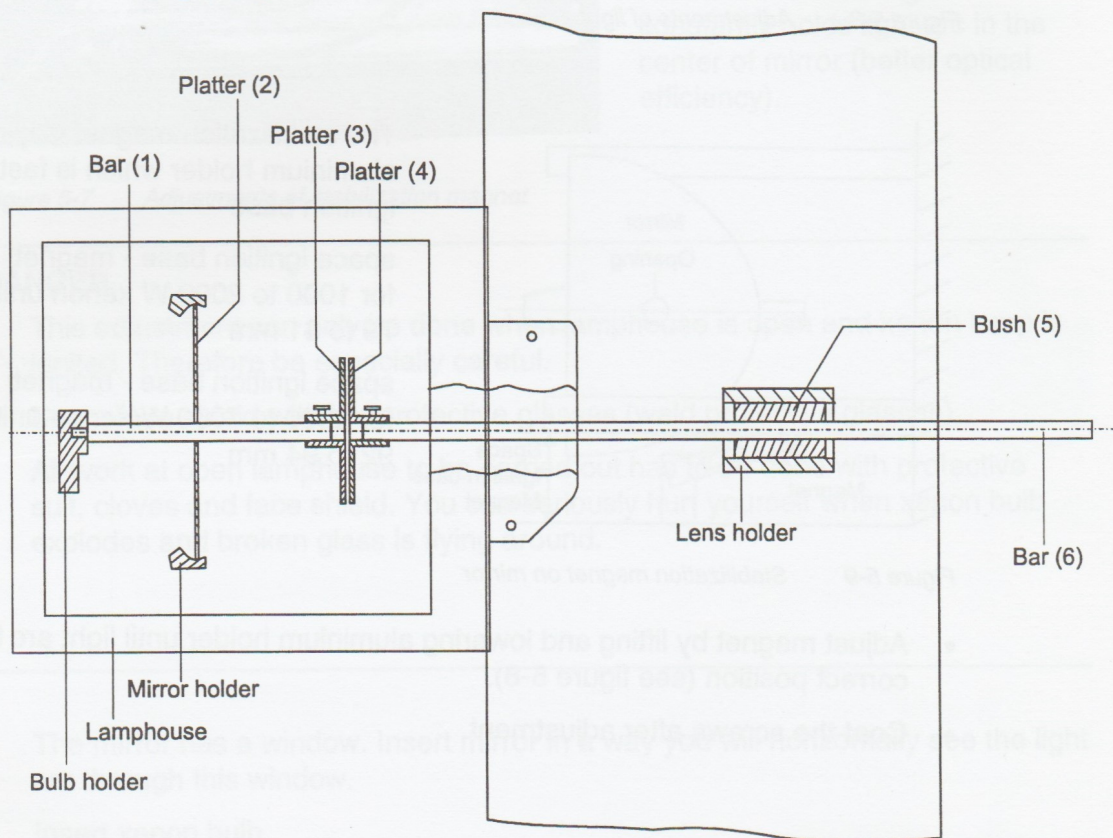


Figure 5-10 Inserting setting gauge

- Insert disc (2) instead of the mirror.
- Thread bar (1) through hole of disc and screw the bar in bulb socket.
- Adjust bar with horizontal and vertical adjusting screws in a way that the bar is exactly standing in the middle of the disc.



- Shove platter (3) on bar (1) and tighten it.
- Clamp bush (5) in lens holder.
- Thread bar (6) through opening of the bush, then through film gate to lamphouse (open gate shutter manually).



NOTE

To prevent damages of film gate, remove shutter housing.

- In lamphouse shove platter (4) on bar (6) and tighten it.
- Shove bar with platter until both platters touch each other.

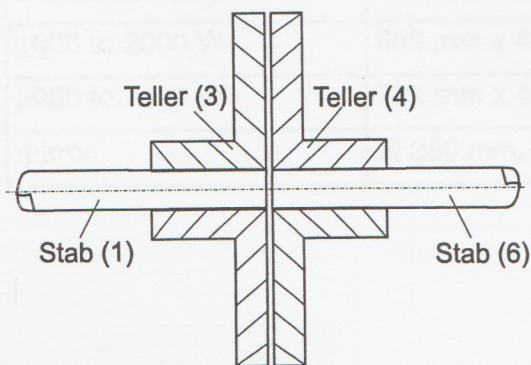
Adjust

- Loosen fixing screws of xenon unit.
- Move xenon unit or lay shims under frame of unit until the adjustment is correct.



NOTE

The xenon unit is exactly adjusted when both platters are standing parallel and coaxial (see figure 5-11). Figure 5-12 shows the incorrect adjustment.



Adjusted correctly: optical axis is parallel to setting gauge.

Figure 5-11 Setting gauge correct

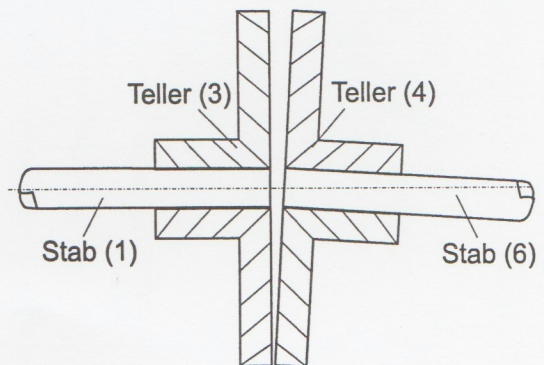
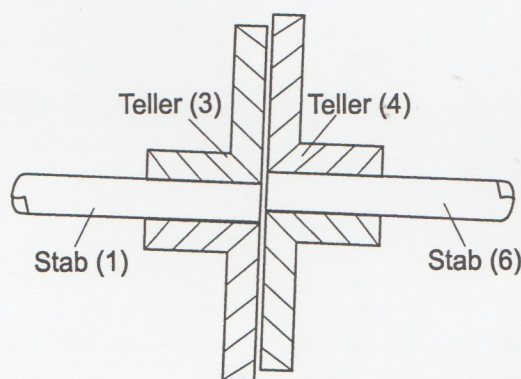
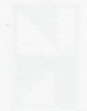


Figure 5-12 Setting gauge not correct

- Tighten fixing screws and remove setting gauge.



5.3.3

- Shove platter (3) on bar (1) and tighten it.
- Clamp push (6) in lens holder.

NOTE

Thread bar (6) through opening of the push, then through the hole of the holder and the holder.

- To prevent damages of film gate, remove shutter housing, otherwise it may not work.

Adjusting shutter frame

- In lamphouse shove platter (4) on bar (5) and tighten it.
- Shove bar with platter until both platters touch each other.

- Adjust
- Loosen fixing screws of xenon unit.
- Move xenon unit a few mm under frame of film and the shutter's corner.

The xenon unit is exactly adjusted when both platters are running parallel and coaxial (see Figure 5-11). Figure 5-12 shows the incorrect adjustment.



Figure 5-11: Setting gauge correct

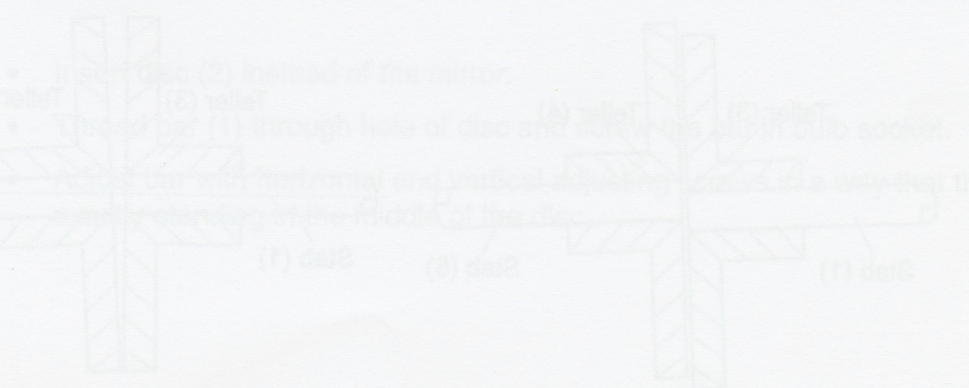


Figure 5-12: Setting gauge not correct

- Tighten fixing screws and remove setting gauge.



6 Technical Data and Circuit Diagrams

6.1 Data of Lamphouse

Name	Universal Lamphouse
Type	1000 - 2000 W / 2000 - 7000 W
Machine No.	See number plate at housing.

6.1.1 Connecting Data

Power supply	115/230 V
Frequency	50 or 60 Hz
Pre-fuse	6,3 A
Power max.	depends on equipment

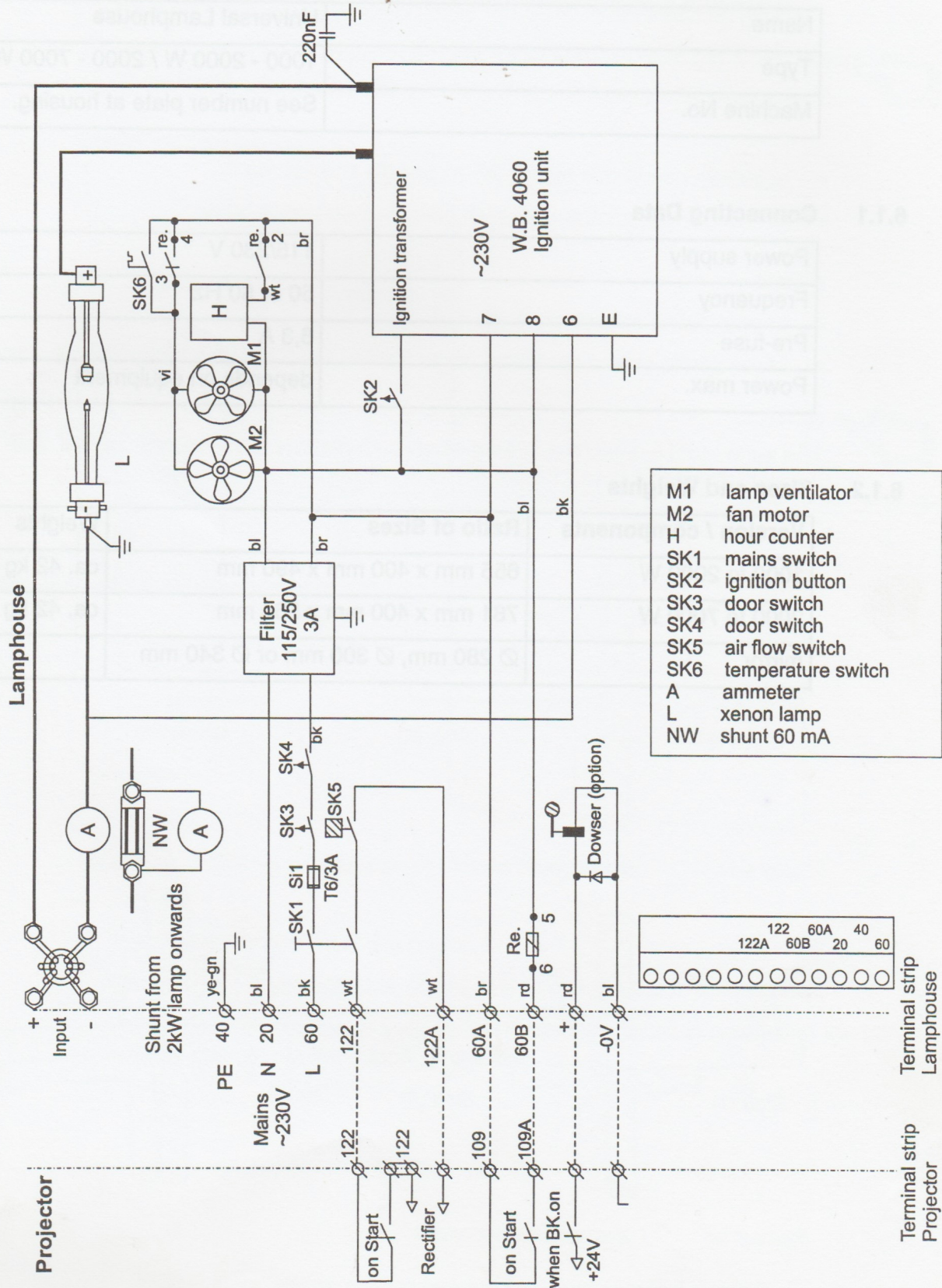
6.1.2 Sizes and Weights

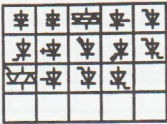
Version / components	Ratio of Sizes	Weights
1000 to 2000 W	655 mm x 400 mm x 490 mm	ca. 42 kg
2000 to 7000 W	781 mm x 400 mm x 564 mm	ca. 42 kg
mirror	Ø 280 mm, Ø 300 mm or Ø 340 mm	

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40

6.2 Circuit Diagrams

6.2.1 Wiring Scheme Lamphouse





6.2 Circuit Diagram

6.2.1 Wiring Scheme Ignition Unit

6.2.1.1 Wiring Scheme Ignition Unit





7 Lists of Parts and Wearing Parts

Part	Figure	Pos.	Piece	Item No.
Mirror dichroic	7-1	1		
Ø 300 mm f=60/540			01	0040 180 00156
Ø 340 mm f=55/825			01	0040 180 00155
Xenon bulbs	1-1	2		
700 W / HSC			01	0040 120 00101
1000 W / HSC			01	0040 120 00102
1600 W / HSC			01	0040 120 00103
2000 W / SHDC			01	0040 120 00104
2000 W / HTP			01	0040 120 00150
2000 W / H			01	0040 120 00094
2000 W / HS			01	0040 120 00098
2500 W / HS			01	0040 120 00095
3000 W / H			01	0040 120 00096
3000 W / HTP			01	0040 120 00154
3000 W / HS			01	0040 120 00155
4000 W / HTP			01	0040 120 00151
4000 W / HS			01	0040 120 00097
4200 W / CA			01	0040 120 00156
5000 W / H			01	0040 120 00157
5000 W HBM			01	0040 120 00170
7000 W / HS			01	0040 120 00152
7000 W / HSH			01	0040 120 00159
Adapter for 2000 W / H			01	1000 404 57017
Adapter for 2000 W / HS			01	1000 404 57018
Adapter for 3000 W / H			01	1000 404 57019
Adapter for 4000 W / HS			01	1000 404 57020



Part	Figure	Pos.	Piece	Item No.
heat filter 20 x 20	7-1	3	01	0025 760 70213
spring mirror holder	7-2	4	01	1000 492 37001
stabilizing magnet	7-2	5	01	1000 256 27001
ignition unit from 10/97 discharger HF	7-2	6	01 01	0040 240 00018 0040 240 00020
return spring axial adjustment	7-2	7	01	1000 492 37003
return spring horizontal adjustment	7-2	8	01	1000 492 37002
return spring vertical adjustment	7-2	9	01	1000 492 37004
door switch	7-2	10	01	1000 276 17001
air flow switch	7-2	11	01	1000 276 37005
ignition button	7-3	12	01	5322 276 10134
operating hour meter	7-3	13	01	0040 240 00060
ammeter 100 A	7-3	14	01	0040 240 00065
ammeter 200 A			01	1000 347 67001
additional resistor for ammeter 200 A			01	1000 115 87001

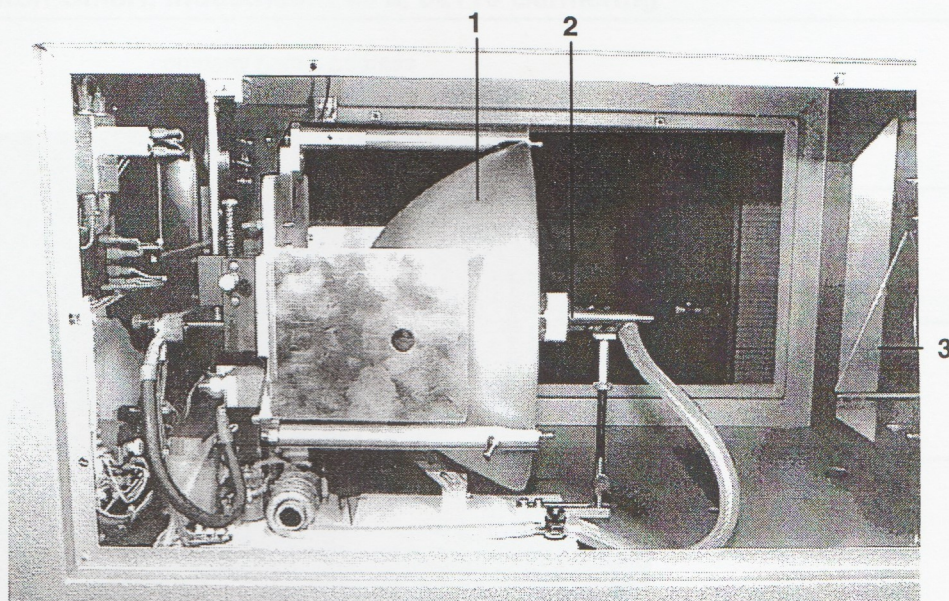


Figure 7-1

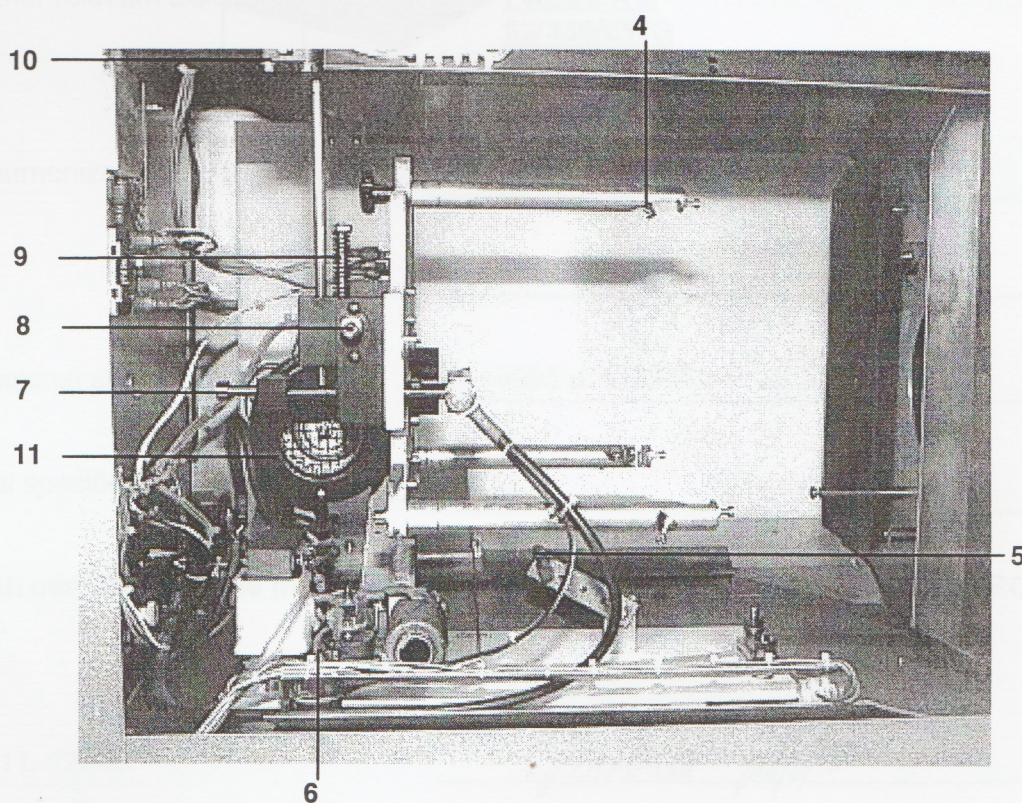


Figure 7-2

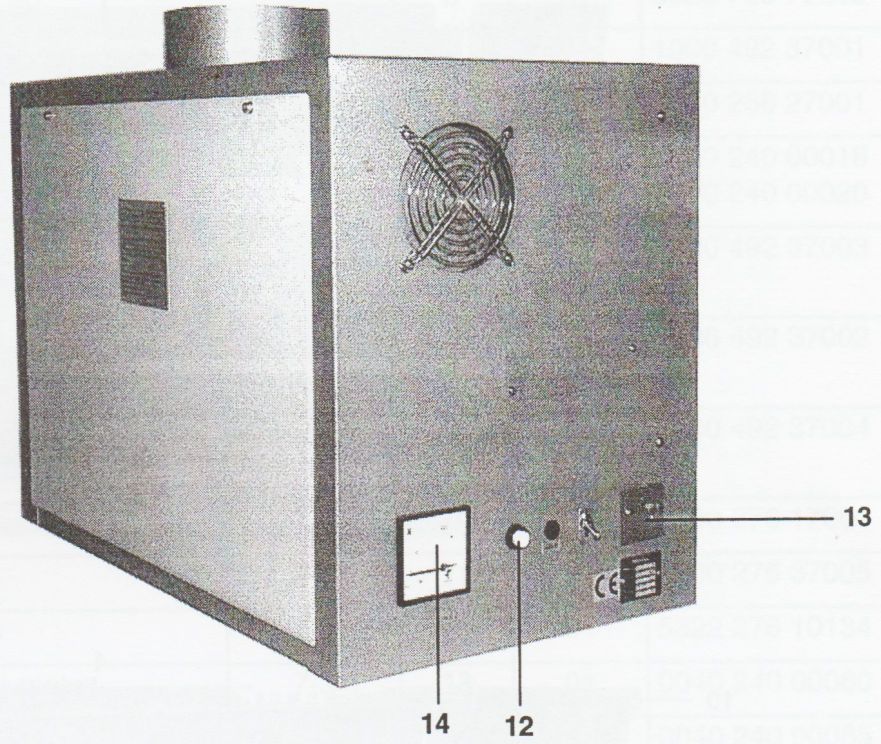


Figure 7-3

EC Declaration of Conformity

Messrs.: Kinoton GmbH, Industriestr. 20 a, 82110 Germering

company name, address

Machine: xenon lamphouse

designation

4000 / 7000 W

870

type

serial number

version

Relevant EC stipulations:

Machine regulation

if need be other relevant EC regulations

89/392/EWG

73/23/EWG

89/336/EWG

Standards:

if need be harmonized standards

if need be national standards

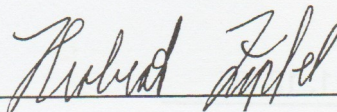
DIN 15995 u. VBG 80

and technical specifications

It is herewith certified that the machine specified above satisfies the above-listed EC regulations.

Germering, 11. 12. 95

place ,date



signature

Herbert Zipfel

prename, name

Production Manager

function

EC Declaration of Conformity

Messrs.: Kinoton GmbH, Industriestr. 20 a, 82110 Germering

company name, address

Machine: xenon lamphouse

designation

700 / 1000 W

358

type

serial number

version

Relevant EC stipulations:

Machine regulation

if need be other relevant EC regulations

89/392/EWG

73/23/EWG

89/336/EWG

Standards:

if need be harmonized standards

if need be national standards

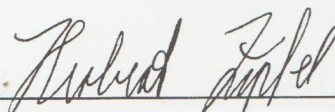
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prename, name

Production Manager

function



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