



## General Information about metal-arc lamps

We at THEIMER are especially proud of the fact that we are worldwide the only manufacturer of Graphic Arts Machinery, who really develops and manufactures **ALL** components under one roof.

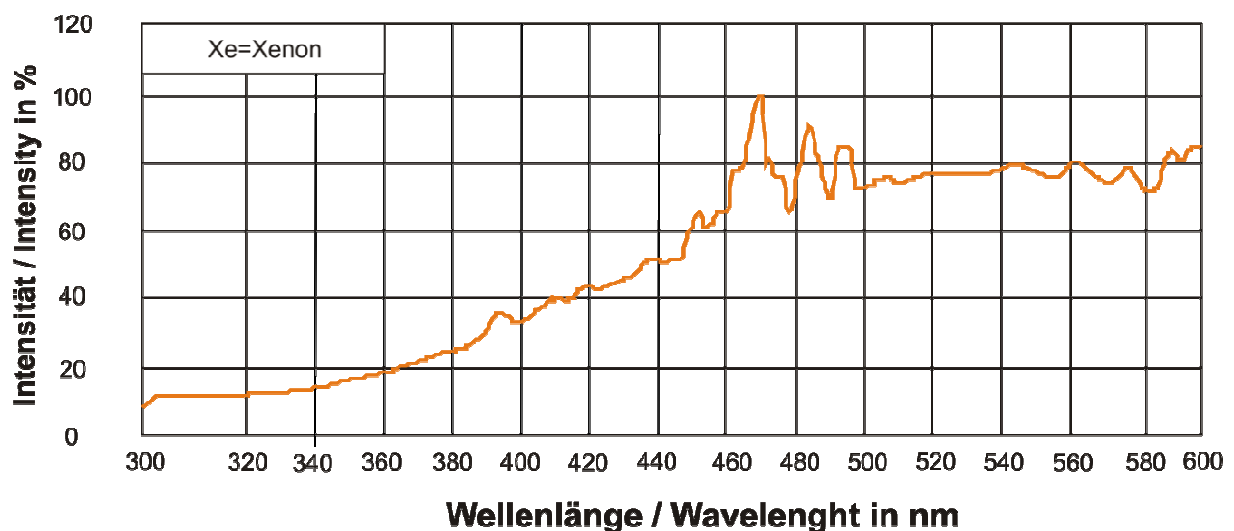
This results in optimum adoption to the demands of the customer's applications. For you as a user of this kind of equipment this guaranties a reliable piece of equipment which will be usable in future as well.

For manufacturing THEIMER lamps only the purest raw material are used which are available only from very few suppliers worldwide. The manufacturing is mainly done manually in steps matching the individual type's requirement. Each lamp is carefully checked after completion to meet the optical and electrical specifications and released for shipment after a period of in-burning dependent on the type. Most of the THEIMER lamps are checked and run in the original units they are designed for.

## We distinguish between different basic types of lamps:

### • Pulse Xenon lamps

Are lamps, which are used mainly for reprographic cameras, where the high and stable colour temperature of 6000° K is required. The lamps are relatively long and thin in diameter. They are filled with the rare gas Xenon at relatively low pressure. They produce light immediately after applying power and need no warm-up time. The wattage can be anywhere between 200 and 12,000 Watts dependent on the length. The emission spectrum is similar to daylight and reaches from UV to IR. Therefore these lamps are not ideal for applications where concentration on one area of the spectrum is required.



#### Energieaufteilung: power balance:

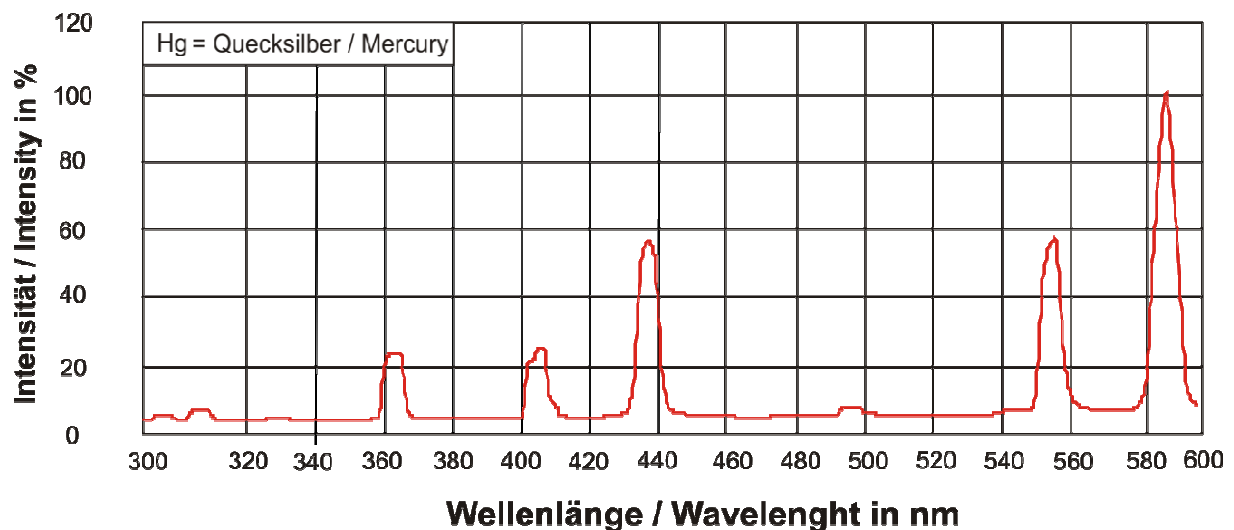
20% UV-Strahlung / UV-Light  
30% sichtbares Licht / visible Light  
50% Infrarot wärme / infrared heat

#### ungefähre Energieverteilung: power distribution:

2% ~190 - 290nm = UV-C  
5% 290 - 315nm = UV-B  
8% 315 - 380nm = UV-A  
28% 380 - 400nm = UV-VIS  
57% >400nm = VIS

## • Undoped Mercury High Pressure lamps

These lamps are mainly used for ink curing in or at printing presses. There is this part of the emission spectrum used which lies in the shorter wavelength part of the UV region. These lamps are relatively long as well, because they need to radiate the full width of the sheet plus some reserve. The power of the single lamp reaches from about 1000 up to 15,000 Watts, where multiple lamp arrangements are needed for higher speed presses. The filling consists of the rare gas Argon at low pressure for ignition and a small amount of Mercury which is evaporated, to build up the final pressure, during the run-up time after start. Only after this time, which may be as long as several minutes, the full intensity is available. After switching off there is another cool down time needed until the pressure is low enough to allow successful re-ignition. The emission spectrum consists of few but strong lines at very distinct points of the spectrum. Therefore this type can only be used where the process exactly requires one or more of these lines.



### Energieaufteilung: power balance:

30% UV-Strahlung / UV-Light  
15% sichtbares Licht / visible Light  
55% Infrarot wärme / infrared heat

### ungefähre Energieverteilung: power distribution:

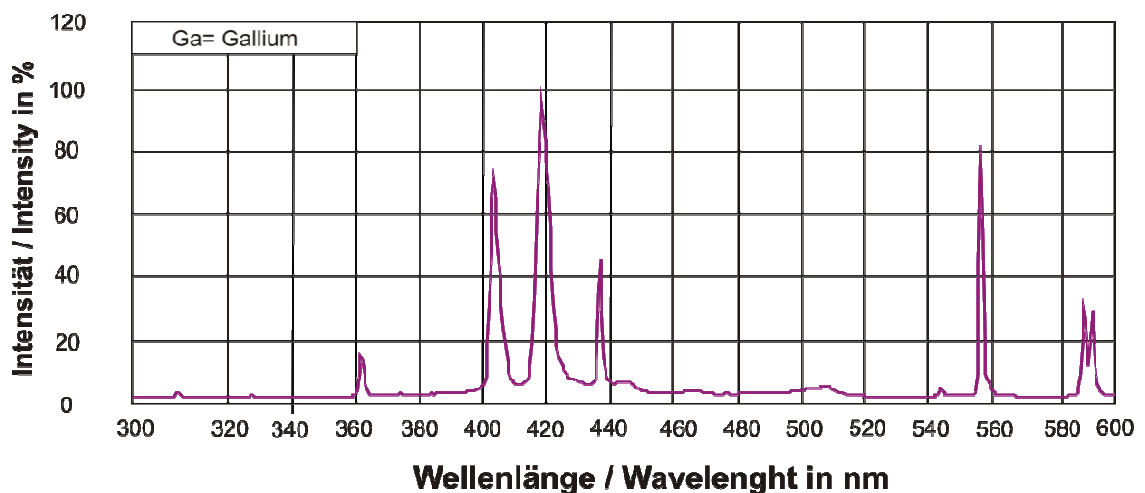
15% ~190 - 290nm = UV-C  
8% 290 - 315nm = UV-B  
7% 315 - 380nm = UV-A  
5% 380 - 400nm = UV-VIS  
15% >400nm = VIS

- **Doped High Pressure Mercury lamps.**

Are lamps used for applications where photosensitive material is used. We differentiate

between the two groups of film and plates. The lamps are used in machines which are used to copy films or "burn" plates. To get a sharp image the lamps need to be relatively short in length despite the high power of up to 8,000 Watts. The filling consists of the rare gas Argon for ignition and a small amount of Mercury to carry the discharge. In addition to this there is a minor amount of metal halides to generate the specific emission spectrum, dependent of the application where it is designed.

- The Gallium type is doped with Gallium to get the emission peak at about 410 nm. This type is used for applications on Diazo basis like positive plates and blueprints.



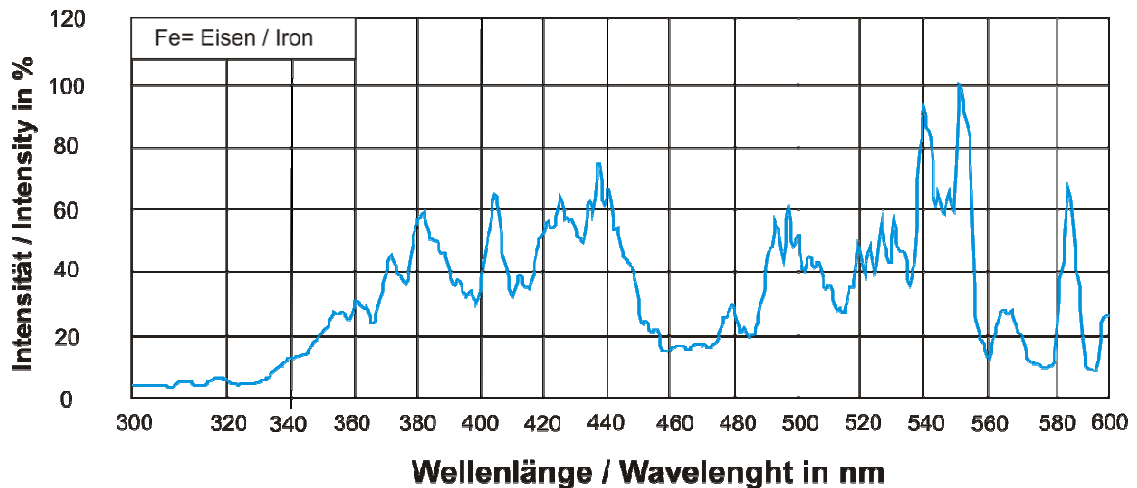
**Energieaufteilung:  
power balance:**

30% UV-Strahlung / UV-Light  
15% sichtbares Licht / visible Light  
55% Infrarot wärme / infrared heat

**ungefähre Energieverteilung:  
power distribution:**

7% ~190 - 290nm = UV-C  
8% 290 - 315nm = UV-B  
5% 315 - 380nm = UV-A  
17% 380 - 400nm = UV-VIS  
24% >400nm = VIS

- The Iron type has Iron, Cobalt and Nickel instead as additive and emits a wider spectrum between 350 and 450 nm. This is very well suited for exposure of polymer plates and Daylight film. It can also be used for applications where Diazo together with other material is used.



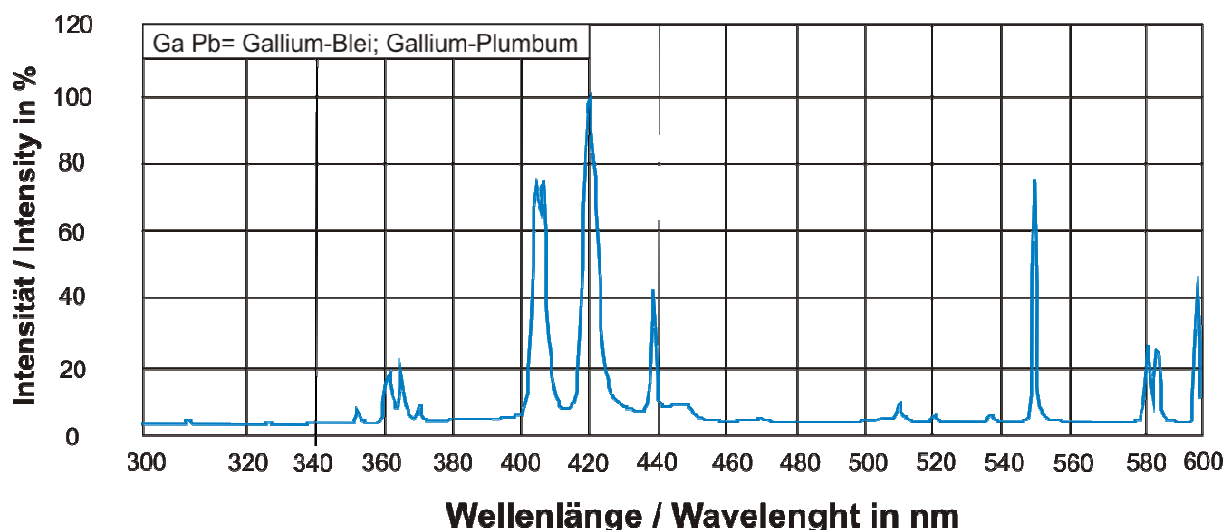
**Energieaufteilung:  
power balance:**

30% UV-Strahlung / UV-Light  
15% sichtbares Licht / visible Light  
55% Infrarot wärme / infrared heat

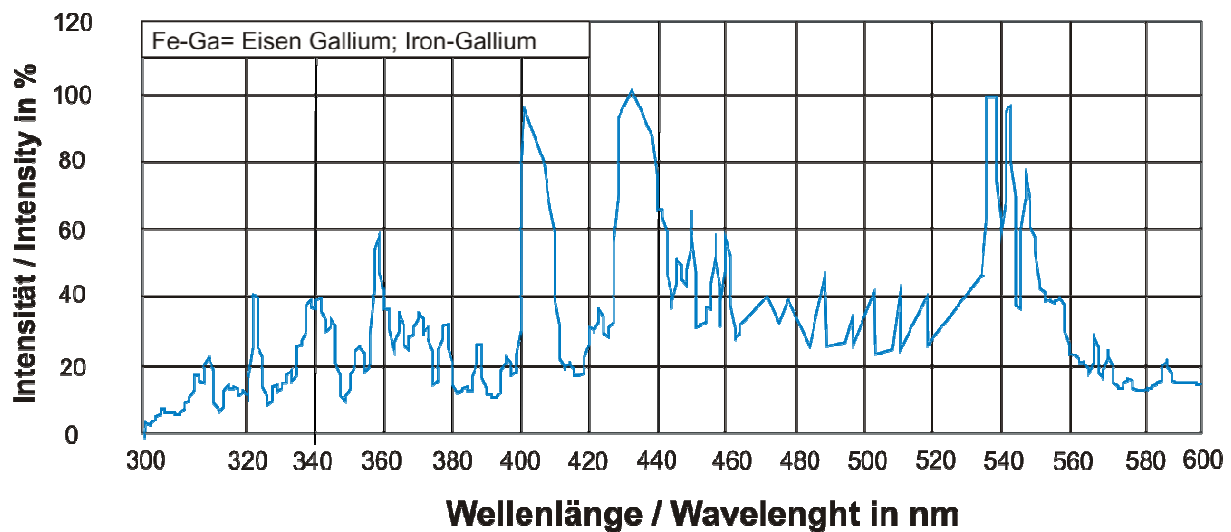
**ungefähre Energieverteilung:  
power distribution:**

7% ~190 - 290nm = UV-C  
5% 290 - 315nm = UV-B  
17% 315 - 380nm = UV-A  
6% 380 - 400nm = UV-VIS  
16% >400nm = VIS

- Sometimes there is a so-called "Dual" spectrum used, which is generated by addition of Lead to a basic Gallium type. But the power is not stronger in any area than that of the Iron type.



- In opposition to the above the Fe-Ga type is definitely stronger in the area around 400nm, where positive plates are sensitive. But stability over time is by far not as good as with the other types. Especially negative is the fact that the equilibrium of the doping material shifts and thus the emission spectrum as well. This behaviour cannot be compensated by light integration and the resulting exposure times vary as well. If the advantage of the higher speed is really needed for the process the shift can partially be avoided by early change of the lamp. (<<500h)



## Important!

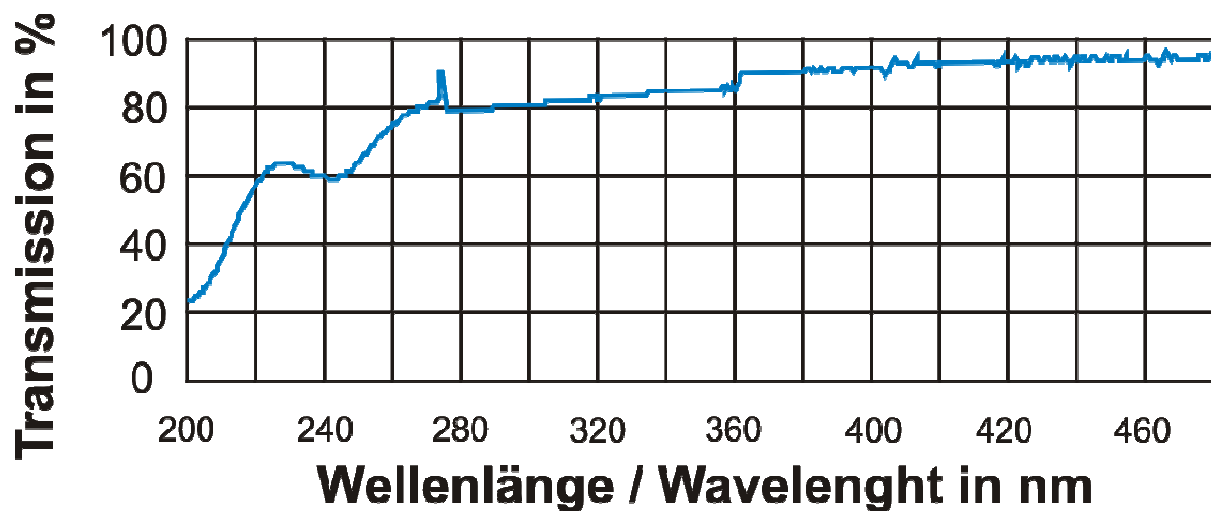
To save energy all THEIMER units should be switched off if they are not needed for the next 30 Minutes. The wear due to the new starting procedure is so low in modern designs that there is no noticeable shortening of life expectancy.

## Ozone Free Lamps

Are so called because the material of the lamp body does contain additions which absorb short wavelength UV radiation. This radiation can generate Ozone O<sub>3</sub> from Oxygen of the air. In fact this is not very likely to be the case if the lamp is operated in a unit where cooling and power supply is in good working order. If however strong odors and occasionally a white deposit are observed, then there is a different mechanism in effect which has nothing to do with Ozone. The reason then is a reaction of Chlorine with other components of the ambient air. This Chlorine is generated from the UV radiation onto chlorinated hydrocarbons present in the air. These solvents though very effective are no longer allowed in working environment because of the health hazard. They used to be the main component of washing solvents for printing presses and film cleaner. In most countries all members of this family are not in use any more. If this white deposit is present and needs to be cleaned off this is best done with just clear water. In these cases the use of an ozone free lamp greatly reduces the generation of these odors, but this means that the vapours remain present in the air with all the potential hazard to the human health. In a certain way a not ozone free lamp acts as an air cleaner in destroying the chlorinated hydrocarbons into less dangerous substances. Another aspect of the ozone free lamp is that it runs hotter and thus reaching a shorter life due to the absorbed radiation in wall material. This leads to the recommendation to use standard lamps especially as the ozone level generated by these lamps is hardly measurable and not at all dangerous to the people working in this environment. All these high-pressure lamps need a warm-up time to allow vaporisation of the mercury and doping material. Dependent on the type this may take up to 5 Minutes. Because it is not easy to restrike a hot lamp which has just been switched off it is necessary to wait again about 5 Minutes until it can be lit again, there is shutter in front of the lamp which closes off the light when not needed for the exposure. During this time the lamp idles at low power to reduce consumption and heat loading to the environment.

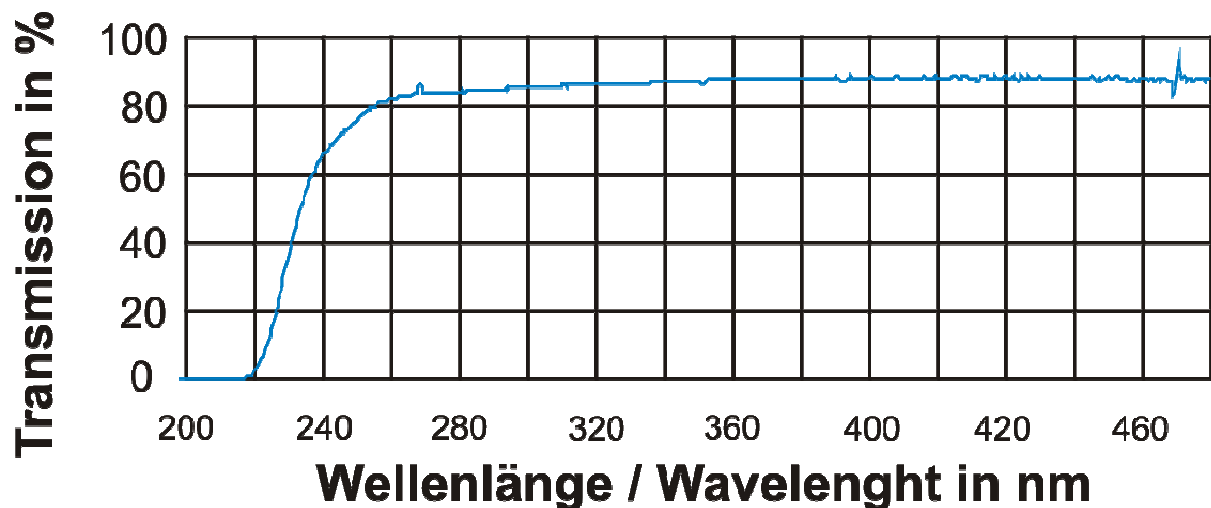
For the actual exposure this shutter is opened and the full intensity is reached again immediately.

### Ozone generating Quartz



transmits down to below 200nm and thus allows generation of Ozone from Oxygen in the air.

### Ozone free Quartz



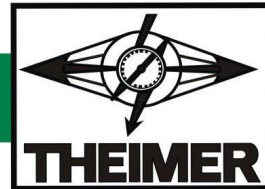
blocks off all radiation below 240 nm and thus prevents generation of Ozone from the air. At the same time curing speed in UV curing units is significantly reduced due to the lack of this radiation. To reach a tack free surface this short wavelength radiation is absolutely necessary.



## Safety instructions:

All high-pressure lamps contain Mercury and need to be disposed off properly at the end of the useful life. THEIMER offers this service to its customers free of charge, if the lamps are sent back in the original packing postage prepaid.

UV radiation can cause damage to skin and eyes. Consequently, the UV emitters should be operated in accordance with safety guidelines. When working with UV emitters please use proper safety equipment like eyeglasses and keep all body parts covered. UV radiation at 185 nm and 265 nm can be insulated by standard glass, transparent plastic, and practically all intransparent materials. When using ozone-producing emitters ensure that MAK limits (limiting values of ozone concentration) are met.



## Ihre Firmendaten/ Your Company details:

Firma /Company: \_\_\_\_\_  
 Name/Name: \_\_\_\_\_  
 Adresse/Adress: \_\_\_\_\_  
 E-Mail: \_\_\_\_\_

## Ihr Lampentyp / your lamp:

OEM Strahlerhersteller/OEM manufacturer: \_\_\_\_\_

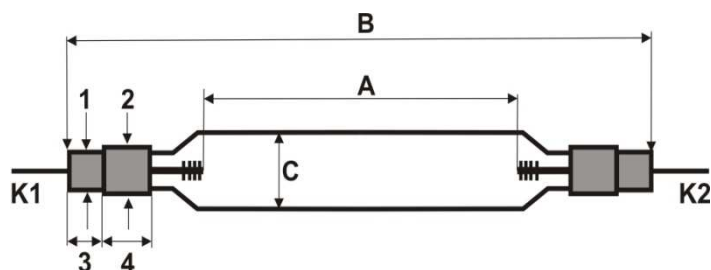
OEM Lampenbezeichnung/ OEM lamp type: \_\_\_\_\_

Brennspannung / Voltage: \_\_\_\_\_ V Brennstrom /lamp current: \_\_\_\_\_ A

Leistung/power: \_\_\_\_\_ W spez.-Leistung/specific power: \_\_\_\_\_ W/cm

Spektrum/ spectrum: Quecksilber /mercury Eisen/iron Gallium/gallium

Anderes/other: ☐ ☐ ☐



### Abmessungen:

A= \_\_\_\_\_ mm

B= \_\_\_\_\_ mm

C= \_\_\_\_\_ Ømm

### Quarzart/ Glass Type:

Standard ☐

Ozonfrei /ozonfree ☐

Synthetisch/synthetic ☐

## Anschluss / connection

Kabellänge/ lenght of cabel: K1= \_\_\_\_\_ mm

K2= \_\_\_\_\_ mm

Anschlusstyp/Type of connector: ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Anschlussrichtung/direction of connection: Radial/radial ☐

Axial/axial ☐

Sockelmaterial/Socketmaterial: Metall/metal ☐

Keramik/ceramic ☐

Sockeldimensionen/Socketdimensions: 1= \_\_\_\_\_ mm 2= \_\_\_\_\_ mm 3= \_\_\_\_\_ mm 4= \_\_\_\_\_ mm

Bemerkungen/Annotations: \_\_\_\_\_

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_