

Philips Digital Projection Lighting

Important information to know when you buy a projection replacement module

You are highly recommended to buy a projection replacement module (= cage/housing with a bulb inside) instead of a bare bulb. Once you buy such a replacement module, please make sure that the replacement lamp (which is inside the cage/housing) is 100% the same as the original lamp installed in the projector. Only once the bulb is 100% identical, you can be guaranteed the replacement module will match the projector performance and design. In that case you can avoid unnecessary quality or safety problems caused by wrong lamp usage.

We listed 10 possible problems in below article to help you understand what quality or safety problems could happen in case non-identical replacement lamps are used inside the cage/housing. We hope this background information helps you to better understand the importance of having a 100% identical lamp in your replacement module.

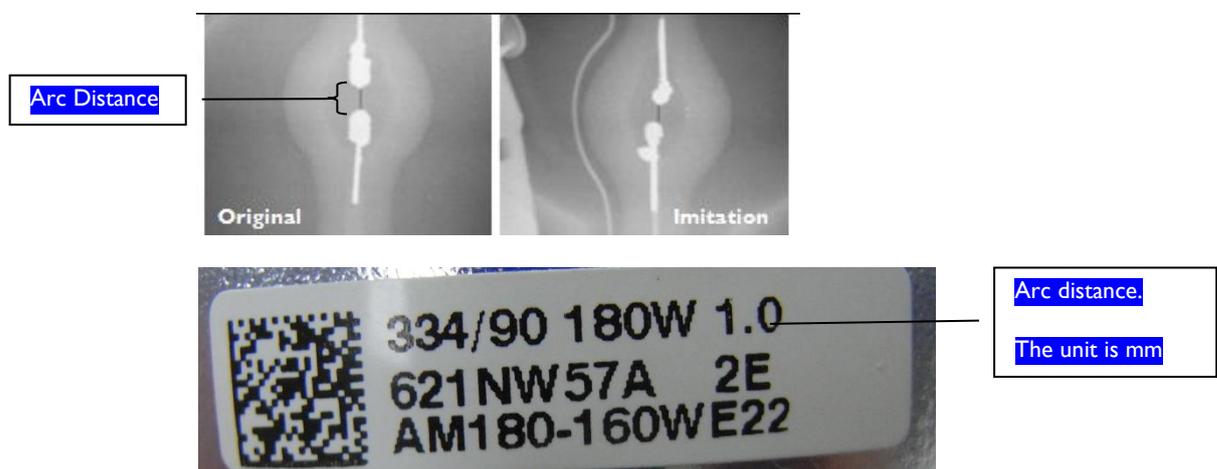
Lamps that are originally installed in a projector are based on co-development activities between the lamp/driver manufacturer and the projector manufacturer. This co-development is necessary to secure optimal brightness and contrast performance including lifetime of the lamp, guarantee solid lamp dimming without risk of lamp failure, optimal cooling of the lamp and solid lamp ignition.

When installing a replacement lamp which is not identical to the originally installed lamp, problems could occur during operation of the projector. Each deviation from the original lamp could lead to:

- i. Bad performance of the lamp / projector in light output and life time
- ii. Non-ignition of the lamp
- iii. Short circuit or even failure of the lamp
- iv. Visible image flicker could happen on the screen, which is not good for the human eye.

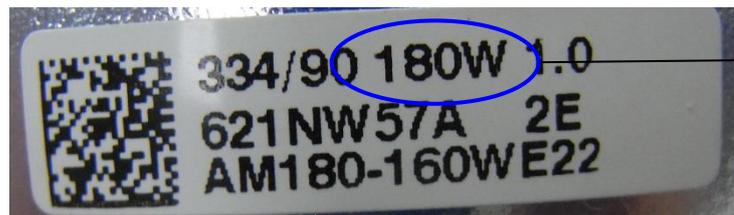
Below are the 10 possibilities of deviation that could cause problems when using non-identical replacement lamps.

- 1) **The replacement lamp has a different arc distance over the original lamp used in the projector. The nominal arc distance can mostly be found in the label of the lamp.**
 - a. This arc distance deviation can lead to:
 - i. Light output differences (brightness)
 - ii. Bad coupling of light into optics (loss of contrast, light, brilliance etc.)
 - iii. Damage to optical components due to UV- and IR-light
 - iv. Decrease of life time of the projector, optics and/or lamp



2) The replacement lamp has a different **wattage** over the original lamp used in the projector (lamp power).

- a. The following situations can occur:
 - i. When using a higher wattage lamp in combination with a lower wattage ballast/driver: this might lead to ignition failures of the lamp and flicker
 - ii. When using a lower wattage lamp in combination with a higher wattage ballast/driver: this might lead to damage of the lamp (electrodes might well be destroyed)
 - iii. In general, when the replacement lamp produces more light as the original lamp, the optical elements in the projector might face serious damage due to heat and overpowered, uncontrolled light exposure
 - iv. In general, when the replacement lamp produces less light as the original lamp, the projector itself provides low light output



Wattage

3) The replacement lamp has a different **reflector** size over the original lamp used in the projector.

- a. Each deviation of reflector size of the replacement lamp can lead to:
 - i. No perfect fit in lamp housing, causing the lamp not to fit in the projector well, which will cause hampering of the projector
 - ii. Bad positioning of the lamp in its lamp housing. A wrong positioned lamp might well cause optical damage of the optical elements of the projector as light will not go straight through the optical elements
 - iii. Loss of light
 - iv. Possible short circuit of electrical parts in the projector



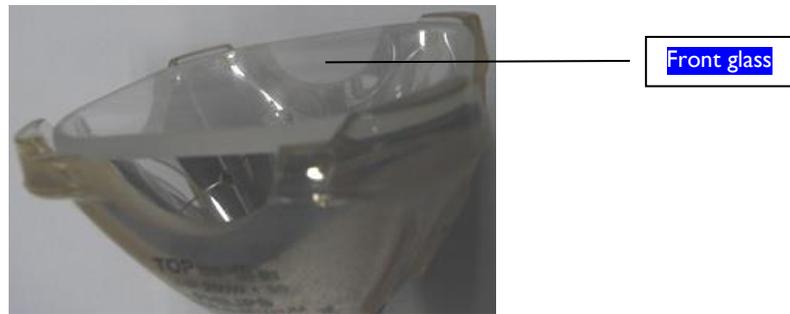
E19.4 reflector
50 x 50 x 56 mm

E20.9 Reflector
51 x 51 x 58 mm

4) The replacement lamp has a non-identical **front glass** or even no front glass at all over the original lamp used in the projector.

- a. In most cases the front glass of an original lamp carries a well defined, invisible coating. This coating filters out UV- and IR light. Each deviation of the front glass of the replacement lamp can lead to:
 - i. Damage of optical components inside the projector because replacement lamps with no or wrong coating do not filter out UV-and IR light correctly

- ii. In case original lamps for the projector are designed without such a front filtering front glass, then this is done in close co-development with the projector manufacturer. In case the replacement lamp would then carry such a front glass, it could well have a negative effect on the optical elements and overall performance of the projector



5) The replacement lamp has non-identical **air gaps or even no air gaps at all over the original lamp used in the projector.**

- a. Air gaps are used for specific and very detailed spot cooling of the lamp. Air gaps are needed to operate the lamp in the correct environment.

Each deviation of these air gaps can lead to:

- i. Damage of the lamp and/or the projector. Different air gaps will lead to a change of the cooling air flow in the projector. This will immediately effect the life time and light performance of the projector
- ii. If the projector holds an original lamp without air gaps and the replacement lamps carries air gaps, then this deviates from basic projector design and normal operation of the projector cannot be guaranteed for 100%



6) The replacement lamps has non-identical **materials and non-identical **coatings** over the original lamp used in the projector.**

- b. Each deviation in material and coating can lead to:
 - i. Loss in light and lifetime performance, short circuit and even failure. Original lamps in the projector are co-designed between lamp manufacturer and the projector manufacturer. This secures the optimal conditions to make maximum use of the used materials (glass, filters, metal parts, plastic parts etc.). This ideal material combination is chosen to realize the best possible performance of the projector



7) The replacement lamp has a different **ignition voltage** over the original lamp used in the projector. Lamps with metal “antenna” in the tube are 5 kV lamps. For some lamps, the antenna is in the front, for some lamps the antenna is in the rear.

c. Each deviation of ignition voltage can lead to:

i. No ignition of the lamp, short circuit or even failure of the lamp.

There are different ignition voltages for lamps (sometimes the ignition voltage goes up to 20 kV!). This high ignition voltage is required to ignite the projection lamp. The electronics, the lamp, the connecting cables and the connectors are all designed to handle such kinds of high voltages



8) The replacement lamp has different **connection methods** over the original lamp used in the projector.

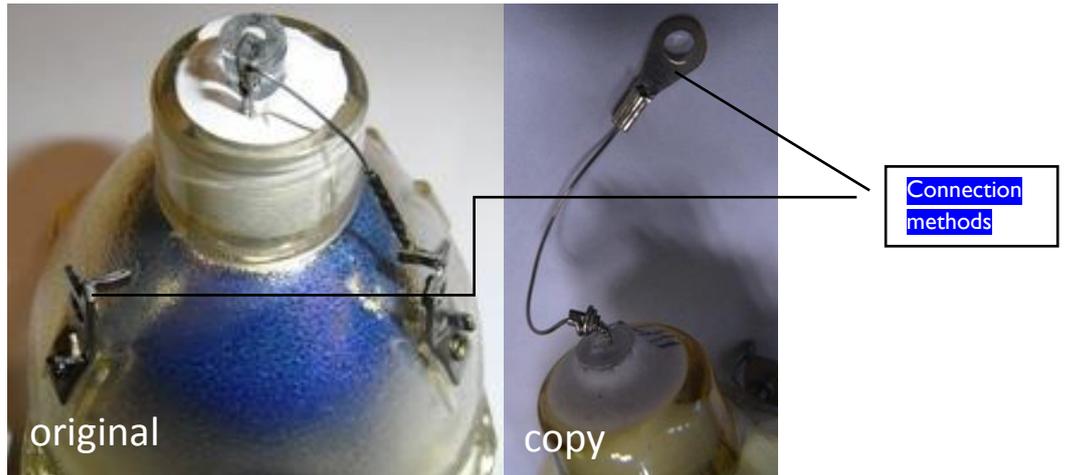
d. Each deviation in connection methods can lead to:

i. The replacement lamp that will not fit into the lamp housing.

ii. The replacement lamp will not ignite.

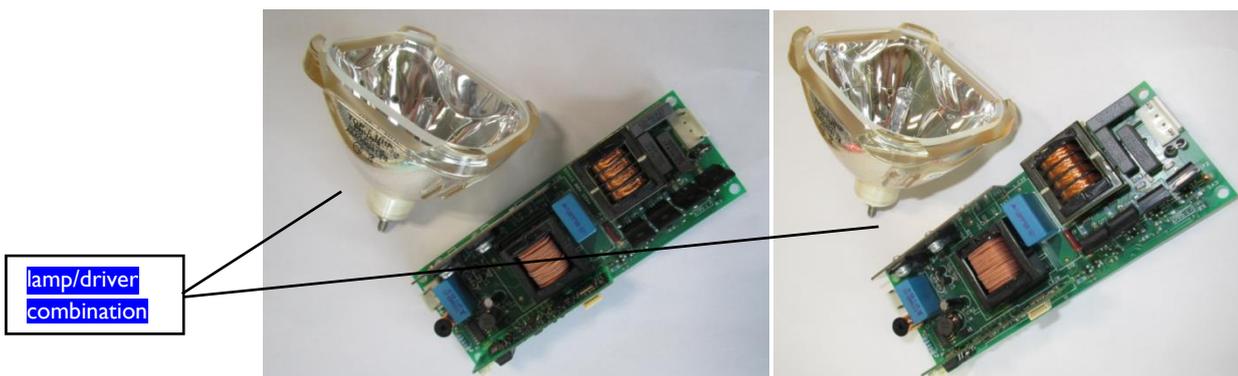
iii. Short circuit and safety risks as connecting wires sometimes process 20kV.

iv. Melting/burning of critical parts of the replacement lamp, such as cables and connectors.



9) The replacement lamp has a different **lamp/driver combination** over the original lamp used in the projector.

- e. The combination of lamp and drive is unique to every projector model. Each deviation of original lamp/driver combination can lead to:
 - i. Unbalanced electrical power towards the replacement lamp can have many side effects such as: too low light output, lower life time performance, non ignition of the lamp, melting/burning of parts in the projector and even short circuit.



10) The replacement lamp has different **inner shape** over the original lamp used in the projector.

- a. The lamp have almost the same outer shape, but inter shape is total different. Each deviation of inter shape can lead to:
 - i. Difference light output distribution from the lamps, cause the lower brightness from projector
 - ii. Different cooling position, cause the temperature spec can't reach target
 - iii. Different working distance, cause optical engine broken



In the end, only by using original lamp can ensure the best performance of the projector, protection of user eyes, and safe and stable operation of projector. Another important thing to know is, you are supposed to replace modules instead of bare bulbs. It is then to be able to conduct the replacement in a safe, correct and convenient way. Nowadays you can buy replacement modules from the market through various channels. And it is hard to tell if they are really original ones or not. To guarantee you to get the good quality replacement modules, we only recommend you to get them from the projector manufacturers or Philips authorized premium partners. And for your information, you can find Philips partners:

If you are in **Asia**, please contact:
APO International Co., Ltd.
www.apolamps.com

If you are in **Europe**, please contact:
Diamond Lamps Pte Ltd
www.diamondlamps.net

If you are in **United States**, please contact:
MI Technologies, Inc.
www.mitechnologiesinc.com

Glossary

Air gaps

Open areas in the outer surface of the reflector of the lamp, needed to cool the lamp in a very controlled way.

Arc

A very hot plasma gas cloud, jumping between the electrodes inside the lamp.

Arc distance (and how to recognize)

Distance (open area) between the electrodes inside the lamp.

Ballast

See Driver.

Brilliance

This is the experience of the viewer when he/she is looks at a projected image. A kind of “crispy” image, not dull.

Bulb

Bulb and lamp are both identical names commonly used.

Burner

Small quartz tube with some gas inside. This is the center element of the projection lamp and generates the very concentrated white light when ignited (see Ignition).

Coating

This is mostly a silver colored “paint” inside the lamp. This coating is used to reflect light as good and as much as possible.

Driver

Electrical power supply which controls the ignition of the lamp and needed to supply the power to operate the lamp.

Electrodes

The two metal pins inside the lamp with a certain small distance from each other (see arc distance). These pins are used to generate the light (see arc), when electrical power from the driver is applied.

Front glass

This is a special coated glass assembled on the front of the lamp, which filters Ultra Violet (UV) and Infra Red (IR) light.

Ignition

This is the phase after you switch on the lamp of the projector. A very high voltage is used to ignite the lamp. The gasses inside the burner of the lamp will “light up”, generating the concentrated white light.

Ignition failure

Problem with ignition of the lamp, causing no light.

Ignition voltage (and how to recognize)

This is a high voltage (between 2.5 kV and 20 kV) needed to ignite the projection lamp

IR light

Infra Red light. Invisible red light, which is generated when the lamp ignites. This light is filtered out by the front glass of the bulb and/ or by the optics inside the projector.

Lamp power

See wattage

Optics

This is a general name for all optical parts (mirrors, lenses, filters) inside a projector or beamer.

Reflector

This is the outer part of the lamp. This is the part with the coating inside, without the burner.

Reflector size (and how to recognize)

The size of the reflector. There are different reflector sizes and shapes, all depending on the projector where it is used for.

UV light

Ultra Violet light. Invisible blue light, which is automatically generated when the lamp ignites. This light is filtered out by the front glass of the lamp and/ or by the optics inside the projector. Reason for this filtering is that UV light has a negative effect on optical components.

Wattage(and how to recognize)

Currently projection lamps operate between 100W to 400W. Most of the time this wattage is printed directly on the bulb or on the sticker/label on the lamp.