Easy life solutions

FAQ sheet dimmable LED lamps

What is LED?
LED is the acronym for light emitting diode. In the 1920s, a Russian scientist named Oleg Losev discovered light emission in diodes when an electric current passes through them. He published his theories in a Russian magazine and applied for a patent. His work, however, remained unnoticed and it wasn't until 1962 that the evolution of LED really picked up; Nick Holoyak developed a working LED that year.

A LED is a semiconductor which emits light if an electric current is being run through it in the right direction. It is therefore an electronic component which directly emits light. The light colour depends on the semiconductor material. A LED consists of a chip of light emitting material, a wire frame with room for the chip and a protective housing. LEDs are small (2 - 5 mm) but if they are combined, they have an excellent light output. Another great advantage is that LEDs are up to 80% more energy saving than incandescent and halogen lamps, which is good for the environment and for your wallet.

Do I need another dimmer if I'm going to use LED lamps?
LED requires less power (wattage), dimming also requires less power. As an effect, the minimum power (wattage) of a dimmer has to be extremely low, starting at 1 or 5 watt.
Most dimmers that are already installed in your home probably start at 20 or 40 watt. If you would connect dimmable LED lamps to these kind of dimmers, it will result in flickering lights, lights failing to dim or unstable light. In the end, an incompatible dimmer will also shorten the lifespan of both lamp and dimmer.
In that case, it is necessary to buy an electronic (wall) dimmer with a low minimum power level.
HQ dimmers offer the best choice. HQ dimmers start at 1 or 5 watt and are specifically designed and tested to meet the requirements of HQ LED lamps.

Which dimmers are suitable for LED?
Electronic wall dimmers, which are based on the so-called trailing edge principle, are compatible with dimmable LED lamps. Electronic wall dimmers are marked with the letters RC. Please see the example below of the HQ wall dimmer.

It is crucial to realise that only trailing edge dimmers are suitable for dimmable LED lamps. Trailing edge dimmers are electronic dimmers, which are marked with RC or RLC.

Leading edge dimmers (marked with R or R,L) on the other hand, are completely incompatible with dimmable LED lamps. At first, they seem to be working fine but, passing enormous peak currents onto the LED lamp, they will eventually shorten the lifespan of both lamp and dimmer. Electronic dimmers are more expensive since they incorporate a technique which is more advanced.

Conclusion:
- Trailing edge dimmers / electronic dimmers (marked with RC or RLC) are suitable for dimming (filament) LED, CFL, halogen and incandescent lamps.
- Leading edge dimmers / traditional dimmers (marked with R or RL) are only suitable for dimming CFL, halogen and incandescent lamps. They are completely incompatible with dimmable (filament) LED lamps.

Which dimmers are compatible with HQ lamps?
To make things easier for you, we selected a dimmer series. These dimmers guarantee an excellent compatibility with HQ dimmable LED lamps. Visit our webshop for a complete overview of our LED dimmer assortment.

Which LED lamps are dimmable?
You can recognise dimmable LED lamps by the text and/or symbol on the packaging. Please see examples of HQ and Sylvania below.

My lamps emit a flickering light. Why is that?
There are various reasons why your lamps are flickering:

- You are trying to dim non-dimmable LED lamps. These lamps are not suitable for dimming which causes a flickering light.
- The lamps are connected to a dimmer which has a minimum wattage that is too high.
- The dimmer, for example, displays 40 - 300 W. Most LED lamps, however, have a wattage of 10 W or less. In that case, the dimmer fails to dim the lamp, because the LED lamps has a wattage which is too low. This results in flickering light.
- The dimmer is only compatible with incandescent lamps and halogen lamps and is based on the leading edge principle (these dimmers are marked with an R or R,L). This causes the lamp to flicker.

The dimmer displays 5 - 150 watt. Is 150 W the maximum load for LED?
If you use incandescent or halogen lamps you could put a maximum load of 80% on the dimmer, whereas with LED lamps we advise a maximum load of 30 - 40% of the indicated power. In this specific case, you could connect lamps of up to 40% of 150 W = 60 W to the dimmer to ensure a smooth operation of the lamps and to prevent an overload of the dimmer. However, do not forget to take into account the power factor of the connected LED lamp(s). With regard to the maximum wattage, a distinction is made between incandescent/halogen lamps and LED lamps. This has to do with the so-called power factor (Pf) of LED lamps.

It works as follows: the more efficient a LED lamp is able to convert current into light, the higher the Pf. A lot of lamps in the market have a low Pf, however. This means that a lamp with a wattage of 10 W and a Pf of 0.5, actually requires 20 W.

If you would plan to connect lamps with a poor Pf of 0.3 to a 150 W dimmer, you should only charge the dimmer with a maximum load of 50 W. Besides, dimming requires you to also take into account another +/- 20%.

This power factor does not apply to incandescent lamps, which is why an incandescent lamp of 150 W would be allowed. However, we advise to charge dimmers and transformers up to a maximum of 80%. In this case, we would advise to use incandescent or halogen lamps of up to 120 W.

To be able to come up with proper advise, you should therefore always ask for the power factor of the (HQ) lamp which is going to be used.

Power factor (Pf) per lamp	Number of lamps in luminaire	Watt (W) per lamp	Watt (W) total	Total required power (W)
			No. of lamps x watt per lamp	*Total W / power factor*
0,3	1	10	10	33,33
0,3	3	10	30	100
0,5	1	10	10	20
0,5	3	10	30	60
0,8	1	10	10	12,5
0,8	3	10	30	37,5