

Schröder EKINOX Powered by Sunna – FAQ

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Solar in general

What are the benefits of a solar lighting solution?

Solar luminaires rely on renewable energy to reduce the carbon footprint of street lighting operators. There is no need to build new electricity networks, thus avoiding civil works. This is particularly beneficial in areas where civil works would cause long-term damage to the surrounding area, such as parks, recreation areas and nature reserves. It is also attractive where the electricity grid is not available.

Why is it so expensive compared to a simple luminaire?

The solution is not just a luminaire. It has multiple components that manage energy from production to final consumption. Solar luminaires are generally used in areas where there is no electricity, such as bike paths, rural bus stops, junctions, pedestrian walkways, etc. Installing a power grid in these areas would be much more expensive than the solar solution.

Does this really reduce CO2 emissions?

Due to the long lifetime of street lighting luminaires, more than 80% of CO2 emissions are generated by the production of the electrical energy needed to operate the luminaire during its service life. The use of solar energy can significantly reduce CO2 emissions.

Solar construction

Why are the solar panel and the luminaire separate?

The function of the two units is quite different. With the solar panel, the aim is to harvest as much solar energy as possible during the day. The ideal mounting orientation is facing south in the northern hemisphere, and north in the southern hemisphere. In this way, the solar panel always faces the sun. In some cases, for example in parks, the panel should be placed above the tree canopy to avoid shading. The function of the luminaire on the other hand is to provide the right light distribution on the ground during the night. It should be aligned with the road to be illuminated and not with the sun. Also it should be mounted at a conventional mounting height, usually around 4m for the light distribution to be effective.

The solution of combining solar power and luminaires in one unit has limitations. For example, on a road where the luminaires face south (in Europe), the solar panel on top would face north and never receive enough sunlight during the day to recharge the batteries. Separating the luminaire and the solar system maximises energy harvesting and optimises the use of this through ideal light distribution.

Why is the inclination angle of the solar panel important?

As you move north or south away from the equator, the sunlight hits the earth's surface at a decreasing angle of less than 90°. In order to make the most of the sun's energy, solar panels should be orientated according to the latitude as far as possible. As these panels are not adjusted during the year, the best compromise must be found. Note that the angle also changes with the seasons - in winter the sun does not rise as high in the sky. The ideal compromise depends on the location. In Europe, an angle of 30 to 50 degrees is usually the ideal setting.

What type of battery is commonly used?

The battery is responsible for storing energy. These are chemical energy storage units. As battery technologies evolve, new chemistries appear on the market. Today, the two main chemistries are NiMH and LiFePO4.

What are the benefits of NiMH batteries?

NiMH is an older technology than LiFePO4 but still has some advantages over its newer counterpart:

- Better operation at lower temperatures
- Easier to manage charging
- Li-free - less risk of fire
- Well-known chemistry - well optimised. Self-discharge, memory effect and other defects have been eliminated over the long history of these batteries.

What are the benefits of LiFePO4 batteries?

LiFePO4 is a newer chemistry. It is based on well-known lithium, but it is not the same as that found in mobile phones, which usually have Li-polymer batteries. These are also based on lithium, but also contain iron phosphate. This reduces the well-known fire risk of lithium batteries. Lithium is a highly reactive material that can generate hydrogen from water, which is highly explosive. With LiFePO4 chemistry, this risk is considerably reduced.

- Lighter than NiMH for the same capacity
- Better discharge management than NiMH
- Lower self-discharge

What is monocrystalline / polycrystalline?

These are both solar cell technologies. They both have advantages and disadvantages. In the past, the difference was much more significant than today. Optimisation of the system itself is more important than the solar panel technology. As long as you have the power you need, the technology has no influence on the efficiency and lifetime of the system.

What is SunnaCore?

The SunnaCore is the combined management unit for solar energy harvesting, the battery and LED luminaire control. It is the heart of the solar energy system. The three features are different and have an impact on the other features. In order to achieve optimal system operation, these functions must be managed centrally. The combination of these three functions in one unit ensures optimal control of the whole system.

What does battery management do?

Batteries are sensitive equipment. In order to ensure a long service life for batteries, their charge level must be continuously monitored. Overcharging and deep discharging of batteries will considerably deteriorate their life span. The charging process must also be monitored to avoid overheating the batteries, which would also shorten their life. All of this is achieved through battery management. This is the most important part of the system.

With the Schröder EKINOX Powered by Sunna solution, battery management and LED control are managed by the same unit. The advantage is that, when the battery charge level is expected to become critically low at the end of the night, the system can modify the dimming profile of the luminaire to avoid both blackout and deep battery discharge. This single unit monitors and optimises the total operation of the system.

What is the average lifespan of a battery?

The lifespan of the battery depends on how it is used. If the installation is planned correctly and the battery is well managed, the life expectancy is over 10 years.

Due to the uncertainties, Schröder offers a standard 6-year warranty on the entire system. This does not mean that the system will fail after 6 years.

What are the requirements for poles?

As the solar equipment represents a large wind-bearing surface and weight, the solar system requires the use of reinforced poles. The dimensioning of the poles must be agreed with the pole manufacturers. All necessary information can be found in the system installation manual. Note that pole dimensioning and design are the expertise of the pole manufacturers; always consult them before ordering poles.

Why do we need to use dimming profiles?

The energy available in a solar powered luminaire is limited and should be used with care. Depending on local requirements - light levels, days of autonomy, traffic density, etc. - the right panel and battery size should be chosen. Choosing an oversized system will increase the cost or may even be physically unfeasible, while full light output is not always necessary. This is why a dimming profile is always used with solar powered luminaires. We offer a choice of several pre-programmed profiles at the time of ordering which can be changed later on site using an application on a mobile phone.

How does the PIR sensor work with the dimming profiles?

The PIR sensors detect the presence of people around the luminaire and override the dimming profile by increasing the light level to a user-defined value for additional safety. Due to the limited amount of energy available in the battery, the PIR feature will only work while there is sufficient energy left in the batteries. Avoiding total darkness at the end of the night remains the priority. The system therefore saves energy in order to be able to light up throughout the night.

How can these dimming profiles be changed on site?

A mobile phone application is available for professionals. It is intended for Schröder FAEs who work on commissioning/troubleshooting.

Luminaire construction

What is inside the luminaire if everything is in the solar panel?

The luminaire contains only the photometric engine (PCBA + lens) and, optionally, the PIR sensor. The reason for this is that the light must be directed towards the road at the usual luminaire heights, while the solar panel must potentially be above the tree canopy and facing the sun.

In this way, the light distributions of LensoFlex®4 work perfectly and the detection area of the PIR sensor is also in the right place, without depending on the location of the solar panel.

This layout allows a lighting study to be carried out in the same way as with normal luminaires. As the luminaires can be mounted at a lower height than the solar panel, lower lumen packages can be used, thus reducing the cost of the whole scheme.

What light distributions are available with the solar solution?

Luminaires compatible with the Schröder EKINOX powered by Sunna Design are available with LensoFlex®4 distributions and all the optional accessories that exist for the luminaire in question.

How do I know which panel is compatible with which luminaire?

A compatibility table is available on ProductSPOT. Solar panels have a separate configurator where the luminaire information is mandatory and this will check whether the system will be compatible. It will not allow an order to be placed on an incompatible combination.

How do I configure the solution? Is it available as standard?

Two configurators will need to be used. There is a separate CC for the solar version of the supported luminaire. The usual luminaire-related parameters can be selected there - distributions, CCT, cable length, PIR sensor, etc. This must be completed first.

Next, the luminaire code must be entered into the solar panel CC and the appropriate solar properties selected. This CC will check the compatibility between the configured luminaire and the solar panel.

Do we need an SPD in the luminaire with the Schröder EKINOX solution?

This solution is not connected to the mains, nor is it earthed, so no surge voltage can come from external wiring. Therefore, there is no need for an additional SPD. In fact, as the luminaire is Class III, no connection point to an SPD is required.

Communication

Is there any software available for this solution?

Yes, there is a commissioning mobile application that we make available to FAEs. With this application, it is possible to modify dimming profiles, run diagnostics, etc.

What is the communication protocol of this system?

Communication between the application and the mobile device is via Bluetooth™. It is not necessary to physically access the luminaire to change the dimming program or perform diagnostics, but it is necessary to be in the immediate proximity to do so.

Why is it only available for our FAEs?

The application allows the modification of parameters such as the dimming profile, which have a significant impact on the performance of the solution. Unlike traditional luminaires, in the case of solar lighting, changing a simple parameter such as the dimming profile has important implications because the electrical energy is limited. Choosing the wrong profile can lead to service interruptions and shorten the life of the product. For this reason, we only give access to this application to people trained in this solution.

Is the application available on Google Play or AppStore?

No. It is only distributed internally to Schröder FAEs.

Can solar-powered luminaires be connected to a remote management system via a Zhaga or NEMA socket?

At this stage, the solution is not compatible with Zhaga and does not have a NEMA socket. There is no possibility of connecting OWLET IV or third-party control nodes.

Is it compatible with Schröder EXEDRA?

Not at this stage. The solution does not provide remote management capability. Only Bluetooth™ communication is available for the commissioning and diagnostic mobile application.

We are looking into the possibility of including long-range communication for Schröder EXEDRA, but we are only at the feasibility study stage.