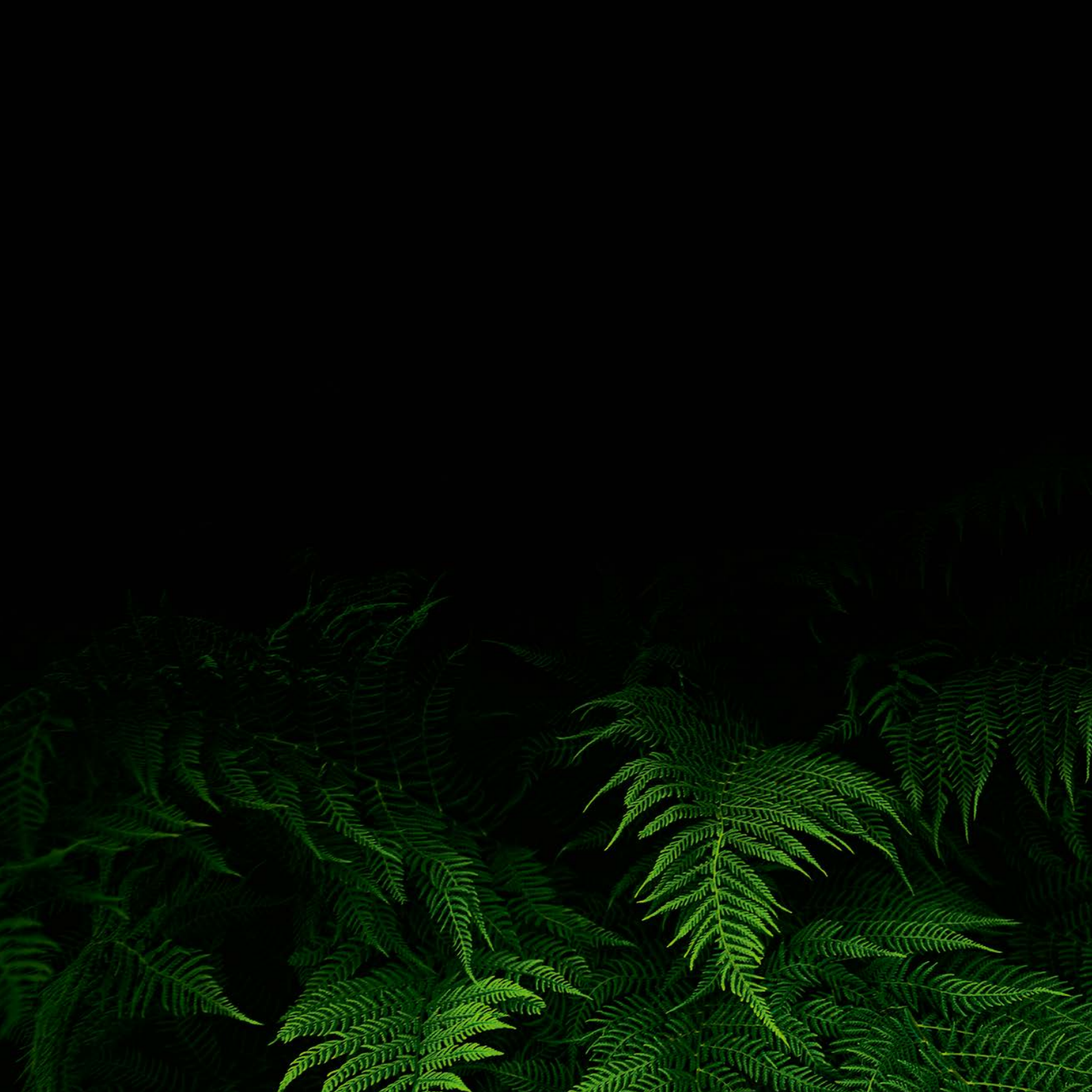
# Responsible outdoor lighting

Environmentally friendly light

BEGA



# The effect and significance of artificial light

Natural sources of light like the sun and the moon have a significant impact on the biological activity of plants and microorganisms as well as on the instincts of people and animals. Moonlight helps animals – and specifically insects, of which there are by far the most species on Earth – navigate in the dark. Other factors that determine the life of all living things are light-dark changes, the direction of the light and its rhythm, meaning the number of daylight hours each day.

Artificial light – especially light with high blue light content – attracts animals, especially insects and birds. It can severely disrupt life's natural rhythms. And there are consequences: reproductive and foraging activities are impaired, and some may even die in the vicinity of artificial light sources.
The negative impact on the ecosystem as a whole can only be minimised if we avoid any harm caused by light.

Our focus must be on responsible outdoor lighting that addresses the fundamental relevance of illumination to ensure safety and create identity. It brightens our living spaces, but must at the same time avoid adverse effects on animals as much as possible – in nature as well as in urban environments.

# Principles of efficient ecological illumination

The guidance described below plays a key role and forms the basis for planning ecologically and economically balanced, responsible outdoor lighting that protects the night sky. Specific local requirements and regulations must be taken into account as early as the planning phase:

- Each light source should have **a clear purpose** and be compatible with **the requirements of its surroundings** (nature or residential, urban or industrial areas)
- Light should only be **directed** to where it is needed – taking into account all relevant regulations
- The illumination should be **no brighter than necessary** and should be integrated into a **demand-based control system**
- Glare, stray light and **light emission** to the sides and above the luminaires should be avoided
- In natural surroundings in particular, planning and implementation should include preferably **shielded** light points **close to the ground** wherever possible
- If possible, **warm light colours** should be used, i.e. colour temperatures of 3000 Kelvin or less due to their **reduced blue light content**
- The **colour spectrum** must be adapted to the respective **season** and **other requirements specific to the environment**
- The **higher the protection class** of the luminaires, the better they will be protected against the ingress and subsequent death of insects
- A low **surface temperature** of the luminaires prevents unnecessary heat emission and protects animals in their vicinity

# Ecologically efficient lighting solutions for the scenic illumination of living spaces

As a general rule, all unnecessary light emission should be avoided when creating ecologically efficient lighting solutions. At the same time, it is also crucial to maintain important illuminated living spaces. Additionally, architecture and its design usually have an intrinsic cultural, historical or creative importance. These features should be presented as identifiable and visually evocative focal points in the dark – or at least during early evening hours.

DarkSky

# Dark Sky – returns darkness to the night

The luminaires from our “Dark Sky” selection feature highly efficient light that is directed onto the surface to be illuminated, emitting less than 1% of their luminaire luminous flux into the upper half-space of the luminaire.

The exact data regarding luminaire luminous flux in the upper half-space as well as information on the BUG rating according to IES TM-15-07 and the CEN Flux Code according to EN 13032-2 can be found in the **product data sheets** for the individual luminaires on the BEGA website and must be checked against the respective regionally applicable regulations.

**BUG rating according to IES TM-15-07**

The system for testing luminaires with photometric data refers to measurements of light incidence:

**B**acklight – The light behind the luminaire
**U**plight – The light above the luminaire
**G**lare – Glare factor

The lumen ratings measured are classified on a scale from 0 (low) to 5 (high). They must be checked against applicable regional regulations.


P0944


P0544


P0607

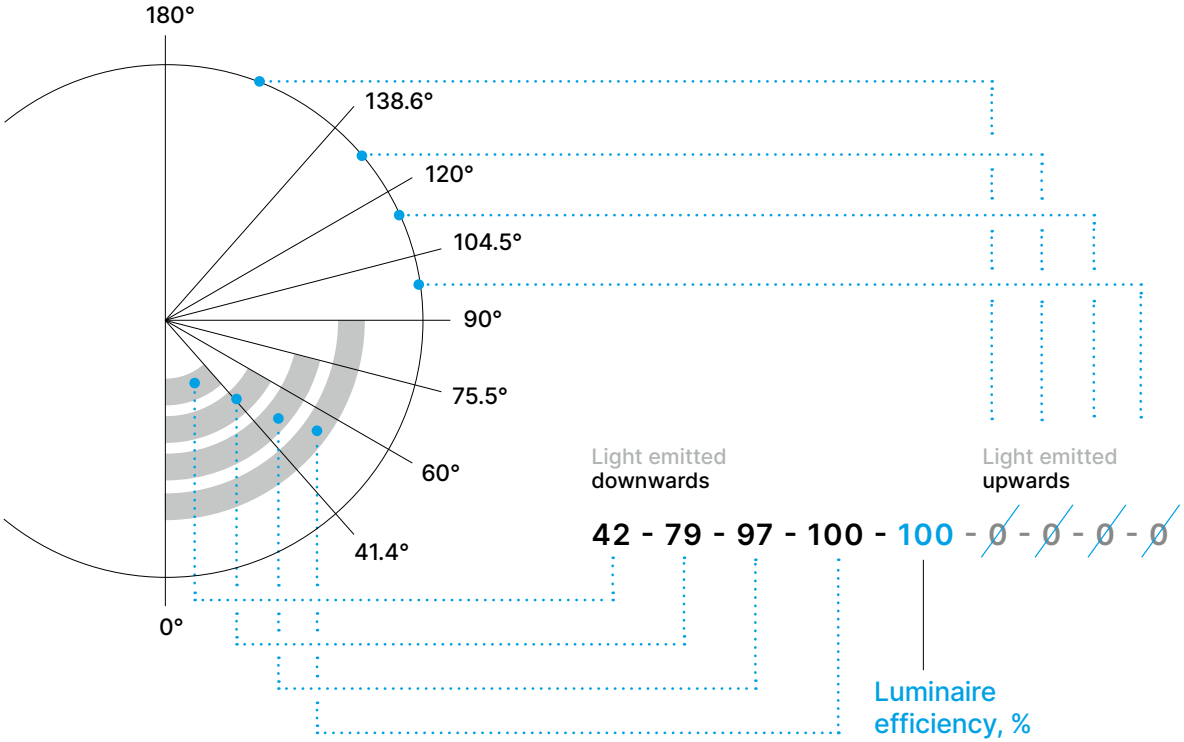

P0625


P0492


P0385


P0832

You can find all luminaires here:
→ bega.com/darksky




DarkSky

**CEN Flux Code according to EN 13032-2**

Percentage of the luminous flux of the luminaire emitted upward and downward in defined solid angles. Each segment has an assigned number.

DarkSky

# BEGA photometric measurements

The BEGA measurement findings are **true results**, which show the **exact** proportion of the luminous flux emitted into the upper half-space **including all reflections**.

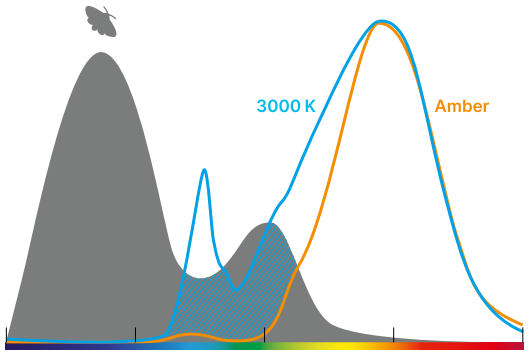
- Our measurement laboratory is VDE-certified (TDAP ID number 40039235)
- The measurements are carried out according to DIN EN 13032-4 and LM79
- The light distribution measurement includes **all components** that are integral parts of **the luminaire** and could **reflect** the light directed downwards into the upper half-space of the luminaire
- Reliable procedure: The product is measured **'as is', taken straight from its BEGA packaging**

  In terms of our product groups, that means:
  - Bollards with permanently mounted vertical tube
  - System bollard head without system bollard tube
  - Pole-top luminaire without the pole
  - Light building element with vertical tube at a length of one metre

# The influence of blue light component on insects and humans

**Reducing the blue light component** decreases the attraction of light to animals, and specifically insects.
BEGA luminaires come with a colour temperature of **3000 Kelvin** as standard.

Additionally, many BEGA luminaires are offered in series **with a colour temperature of 2700 or 2200 Kelvin**. Almost any luminaire in our range can also be supplied with other colour temperatures and in phosphor-converted amber with reduced blue light on request.




Light wavelength visibility for nocturnal insects

Reduced blue light by using an amber hue

# BEGA BugSaver® technology: designed to meet the needs of people and animals

We have developed luminaires with BEGA BugSaver® technology for efficient illumination in urban and natural environments. This technology enhances the sense of security for people, while protecting nocturnal animals. Their flexibility in terms of colour temperature and light output is designed to integrate the shielded light into the environment without affecting the ecological balance.

The light colour can be switched from **3000 Kelvin** to a special **amber spectrum** to protect the nocturnal animals.

An additional **reduction of the light output** during night-time hours reinforces the positive effect.

The result: significantly less impact on nocturnal **animal life**.

The use of **amber colour** for the protection of nocturnal animals **is compliant with the standards** for street and footpath illumination according to DIN EN 13201:2015.

**Spatial orientation** is not impacted due to the reduced colour rendering index.

P0294

P0444

P0475

P0675

P0385

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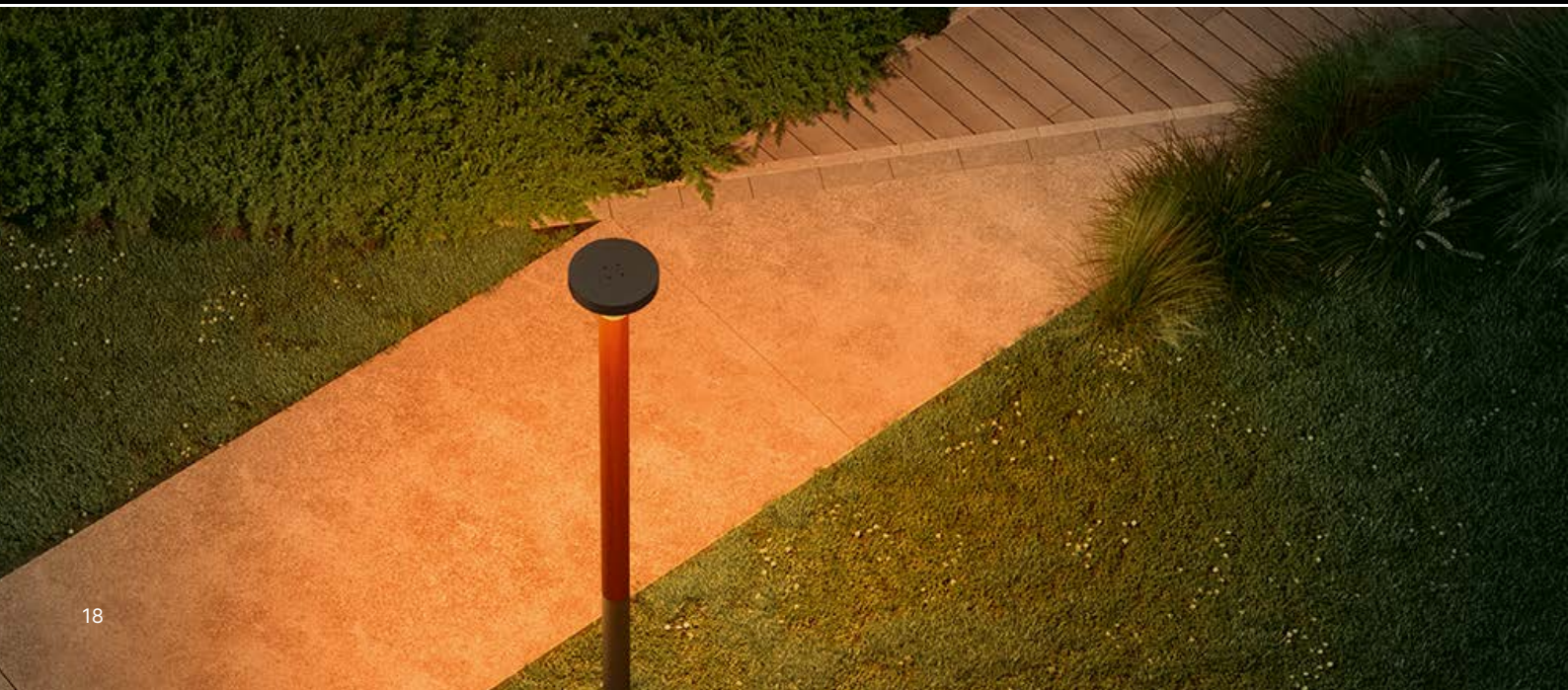
You can find all luminaires here:
→ bega.com/bugsaver

3000 Kelvin

Amber (similar to 1800 Kelvin)

Amber (similar to 1800 Kelvin)
with simultaneous output reduction



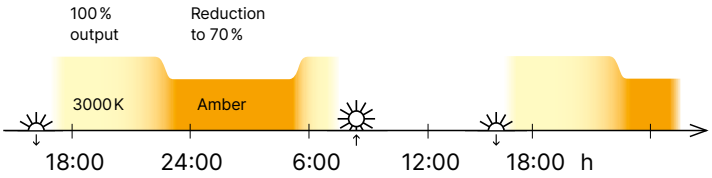
# Change the colour temperature to create light for people and the environment

Luminaires with BEGA BugSaver® technology can be switched from **3000 Kelvin to amber light**. That is where our designated BEGA BugSaver® control devices or a conventional DALI light control come into play.

You can choose from three **BEGA BugSaver® control devices** for switching the colour temperature with simultaneous output reduction. Control can be effected via control phase or with the help of virtual midnight calculation for up to nine connected luminaires. No other components will be needed.

Luminaires with our BEGA BugSaver® technology can be controlled via DALI Device Type 8 (DT8) and can therefore be easily integrated into **intelligent control systems**. These ensure a needs-oriented and eco-friendly use of lighting systems:

- Output reduction or switch-off at night
- Use of motion and/or dusk sensors

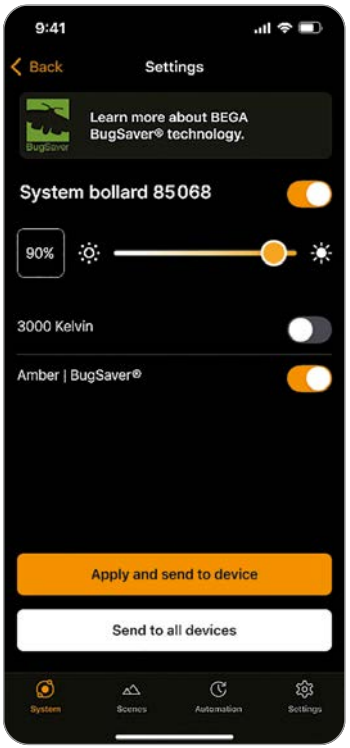


# Use BEGA Connect for intelligent light control

Intelligent light control ensures an environmentally friendly and needs-based use of lighting systems. Light is employed only where and when it is needed. In addition to output reduction or switch-off at night, the inclusion of sensor technology and automation creates even more valuable ecological benefits.

BEGA Connect is the perfect tool for implementing efficient control. It also allows you to make the most of the flexibility offered by our BEGA BugSaver® technology. That includes the option of adapting **switching and output reduction options** to meet the highly variable protection requirements during different times of the night and even seasons.

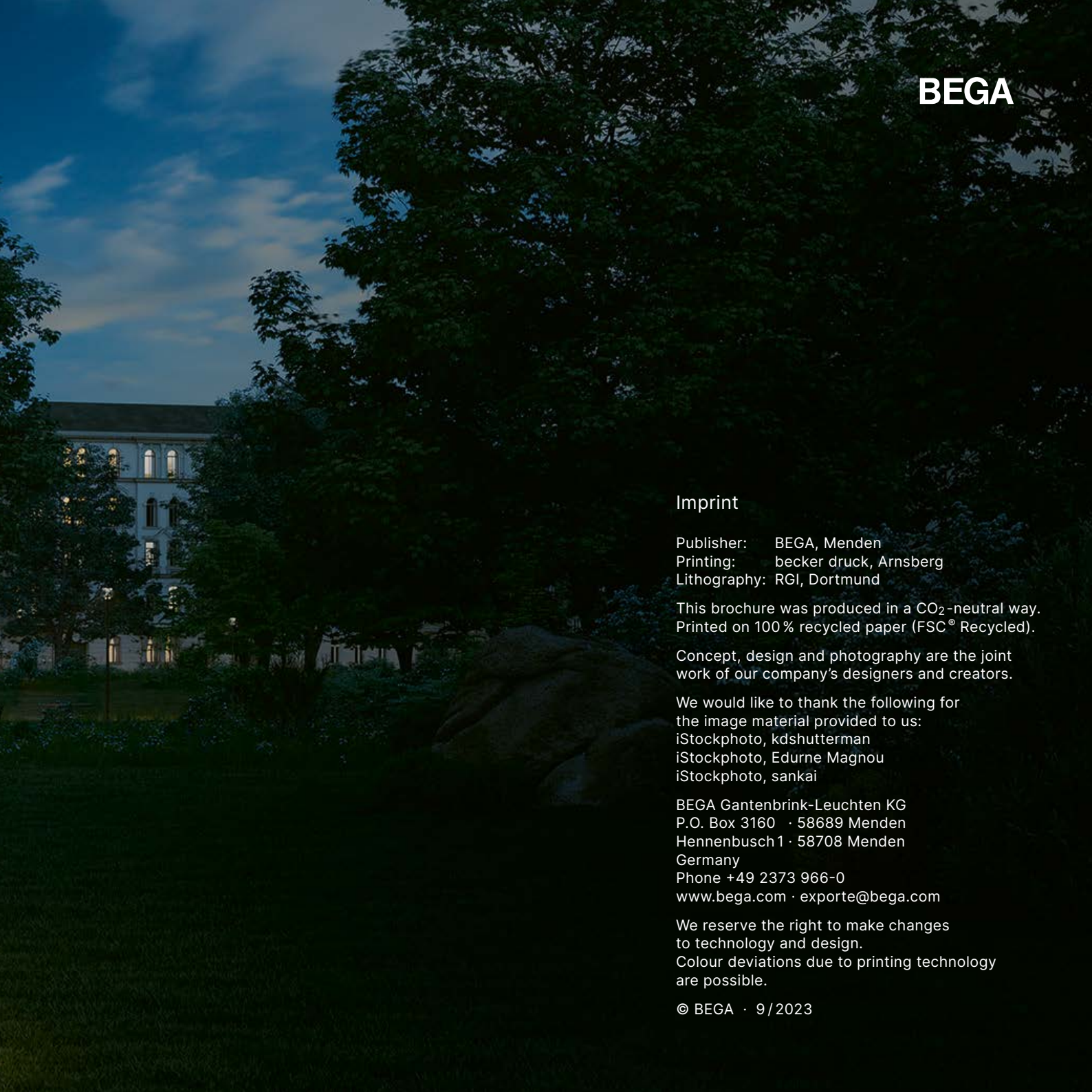
Our **cloud-based BEGA Connect system** allows you to control the light from absolutely anywhere. And due to its optional Internet connectivity integration via narrowband IoT, it is also completely independent of any existing IP infrastructure.




More advantages of BEGA Connect:

- Easy installation and configuration via app
- Location-independent configuration and control
- Guaranteed data security
- Joint management of geographically separate systems

→ connect.bega.com



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## Imprint


Publisher: BEGA, Menden
Printing: becker druck, Arnsberg
Lithography: RGI, Dortmund

This brochure was produced in a $CO_2$-neutral way.
Printed on 100 % recycled paper (FSC® Recycled).

Concept, design and photography are the joint work of our company's designers and creators.

We would like to thank the following for the image material provided to us:
iStockphoto, kdshutterman
iStockphoto, Edurne Magnou
iStockphoto, sankai



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