

# lux & lummen

• NEWS • PRODUCTS • IDEAS 2023



The lighting installer's dream **8** • Light and IT; 1+1=3 **14**

Energy consumption reduced by 65% **22**

# lux lumen

## **News magazine and product guide 2023**

Published by Glamox

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Please refer to our website for information about our 5 year warranty.

# The Glamox Group

Glamox develops, manufactures and distributes professional lighting solutions for the global market.

## Quality brands and solutions

The Group owns a range of quality lighting brands. Glamox is committed to meeting customer needs and expectations by providing quality products and solutions, service and support.

## Technology and expertise

Our products and solutions are developed and tested by our engineers at our own research and testing facilities, and manufactured and certified in accordance with all relevant quality and environmental standards. They are based on the latest technology and expertise – and generations of experience.

## Our product brands for land based lighting



Glamox is a leading lighting brand for professional markets, onshore and offshore, established in 1947. The wide assortment of Glamox products is of superior technical quality, and available for a wide range of applications – including challenging environments.



For more than 80 years Luxo has designed mainly arm-based innovative, ergonomic lighting products. Luxo products improve lighting conditions, taking particular care of individual needs.



Küttel is a leading supplier of professional lighting solutions, based in Kriens in Switzerland. Products from Küttel combine quality, up-to-date technology and contemporary design.



Since 1986, Luxonic has excelled in the design and manufacture of energy efficient, aesthetically pleasing lighting products, for the education, health-care, commercial, retail and industrial sectors.



ES-SYSTEM's mission is to deliver energy-efficient, innovative and comprehensive lighting solutions while minimizing its negative impact on the natural environment and maximizing care for the users' comfort and health.

# lux Lumen

## Creating light for a better life

If 2022 was the year for recovering from the effects of the pandemic, 2023 will be a year for adapting – adapting to political insecurity, the European energy crisis, and to the EU legislation that will end the production of our most widely-used types of fluorescent lighting. The T5 and T8 light sources will as good as disappear from the European market in August 2023. Are you prepared?

Thankfully, there are solutions to these challenges. Nearly all existing buildings in Europe need to plan their transitions to LED lighting, but the solutions already exist, both for large and small projects. The energy crisis has led to spiralling costs, but by upgrading your light installation you can drastically reduce your lighting energy use, especially if you include smart energy controls that only light up the areas that need it. These are all things that Glamox can help you solve, and new wireless technology has made both the implementation and the commissioning of these systems surprisingly quick and easy. Other upgrades, like solar panels, heat pumps, and improved insulation can help you even further along the way to future-proofing your building.

It is, however, critical that you start planning your transition to LED today. This new legislation could lead to a shortage of light sources and luminaires in Europe, and you do not want to be caught unprepared. In a worst-case scenario, you might not be able to find replacements for your fluorescent tubes after August. The bright side? Not only will European commercial buildings become more sustainable, but transitioning to LED will also cut down on maintenance and energy costs.

When planning an upgrade to your light installation, keep in mind that light is more than EU directives, costs, and lumens per watt. The quality of light is of the utmost importance. The purpose of light is to help people see, to enable them to do their jobs, and to be comfortable and safe.

This is why our mission at Glamox is “Creating light for a better life”. In the end, it’s all about the people.

lumen (lm) is the unit of luminous flux; a measure of the total amount of visible light emitted by a light source.

lux (lx) is the unit of illuminance, measuring luminous flux per unit area; a measure of the intensity of light that hits a surface.



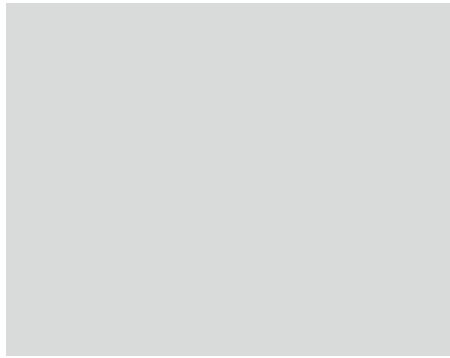
## Modern products and solutions

We offer a range of lighting brands, and provide our customers with expert advice and solutions. Our products are engineered for easy installation, with modern electronic components and light sources for the best energy efficiency and economy. Our lighting solutions help create the experience of comfortable, flexible and stimulating working environments – enhancing efficiency and performance, while taking care of individual needs.

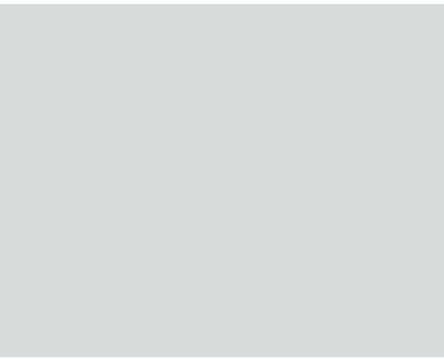
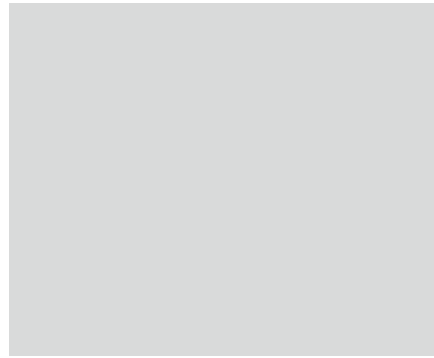
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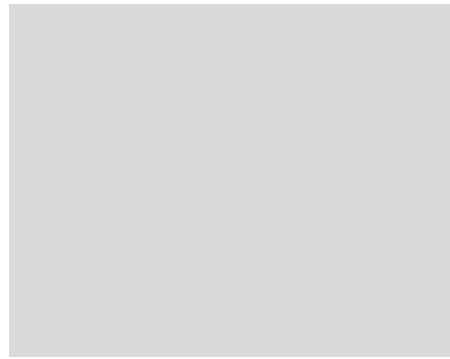
8



14



8



22

# CONTENTS

GLAMOX 2023

8

## The lighting installer's dream

LiteIP designs and manufactures wireless light management system from its base in Southampton, UK. The company's innovative light management system has evolved over a decade from a simple idea to become one of the most widely used control systems for commercial lighting in the UK.

14

## Light and IT; 1+1=3

Axians, the most versatile specialist in digital transformation and energy transition, has equipped its office in Capelle aan den IJssel in the Netherlands with sustainable lighting and a wireless light management system. During this refurbishment, they switched from the traditional fluorescent tube to modern LED lighting.

18

## Human centric campus lighting for students

The new Savilahti campus in Kuopio provides a modern learning environment for the 3,500 students at the Savo Vocational College. Human centric lighting helps to create comfortable and healthy spaces where learning is supported by lighting.

22

## Reduced energy consumption by more than 65%

The Mimers Hus upper secondary school, which opened in 2004, is located in central Kungälv, just north of Gothenburg, Sweden. The school is home to 2,000 upper secondary students and about 400 adult education students. The school also runs Nationally Approved Sports Education (NIU) combining the elite sports of bandy, rowing and handball with studies.

26

## Conveying a sense of calmness

The Clinic for Radiooncology and Radiotherapy at Hanau Hospital has state-of-the-art equipment that enables reliable and targeted radiation treatment of tumours and affected tissue.

### Product overview

Find your product by using our picture overview.



The lighting installer's dream

– Glamox Wireless Radio,

**a wireless light  
management system**

that is simple to  
install, set up and maintain

Acquired by Glamox in March 2021, LiteIP designs and manufactures wireless light management systems from its base in Southampton, UK. The company's innovative light management system has evolved over a decade from a simple idea to become one of the most widely used control systems for commercial lighting in the UK – in the Glamox-branded 'Glamox Wireless Radio'.



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ITH THE WORLD GOING THROUGH AN ENERGY CRISIS and with the cost of electricity rising sharply, it is now more important than ever for homes, commercial office buildings and industrial companies to look for more ways of saving energy. Lighting is an area where savings can be made, not only by replacing fluorescent light fittings with more energy efficient LED lighting, but also by improving how the LED lighting is controlled to make additional energy savings – and this is where the LiteIP wireless light management system can really make a difference.

With more than 1,300 clients and over 700,000 luminaires installed at more than 3,000 locations in the UK, LiteIP must be doing something very right for its customers. David Lippold is the founder and Managing Director of LiteIP. He comments: “When you’re trying to sell a commercial lighting solution, most of the time the key factor is the payback calculation. The end user wants to know how much money

it will save over time. Typically, our wireless light management system will save between 60% and 90% of energy costs, depending on the application. Any customer that can see payback in less than a year will invariably make a purchase. If payback is less than three years, they still might buy, but if payback is five years, they’re unlikely to buy. The key with the energy crisis is that if you double the cost of the energy, the payback period halves, it’s as simple as that. The energy crisis means that more light management system projects will pay for themselves in less time.”

David cites an example of a multi-story car park. “In a multi-story car park, the lighting tends to be on 24/7. When a car drives in, the lights will switch on to the end of that road or bay. A minute later they’ll probably dim down to 10% of full power. So most of the lights are running at 10% of their power, except when people are actually driving and walking around. At any one time during the day, you’ll





probably find 20% of the car park is at full power and 80% are at 10%. During the night, all the lights are either at 10% of full power or they are switched off completely. So in this application, you'd typically achieve 80-90% energy savings and a payback of less than a year. In open plan commercial offices, the energy savings would be less, probably more like 60-70%, but it's all significant percentages when energy costs are rising."

#### The path to success

David Lippold has been involved in light management systems for many years. He bought into a UK-based lighting company around 15 years ago. One of the things he wanted the company to have was its own light management system, so he set about trying to find a suitable supplier. He explains: "You'd think it would be easy to find a suitable system, but it wasn't. We couldn't find an easy way of having multiple PIRs [passive infrared sensor] controlling overlapping groups of lights within a room. You needed to install some sort of light management system module that is wired to the PIRs. But what about daylight coming into the room? You really need the lights to dim down at certain times of the day. So you'd also need a daylight sensor near the windows, which also has to be wired back to the control module. You then need to ask, 'does the daylight sensor have precedence over the PIRs?' Some kind of logic needs to be defined so that the lights know when to switch off and on, and when to dim. Although this example is not all that complex, it did mean that you started to require the help of a specialist in light management systems."

At that time, companies started to install single space light management system, whereby a control module would be fitted to control a certain space in an office or warehouse, with a number of PIRs connected to it, with some standard logic

applied. "As long as the electrician wired it all together correctly, it should all work straight out of the box. But it was over-complicated, which means mistakes can be made. At this point, I decided to work out how I could devise a control solution that would simplify it all," says David.

#### The steps to a solution

A 'corridor function' control system for lights then emerged onto the market, which meant you only had a single switchable live wire in, for example, a hotel corridor. Outside each room you would install a sensor. It connected the live wire to another switchable live wire. If anybody activated a sensor the whole corridor would light up. Then the lights would slowly dim down over the next 30 seconds or so to a kind of standby level. And then after, say, half an hour, if nobody had triggered a sensor in the corridor, the lights would switch off completely. "So you had a system here that only required one set of wiring and didn't need a central control unit. The intelligence was in the light fitting itself. So this gave me some more ideas on how to simplify light management systems," he adds.

#### Shopping centre success

David used the corridor function method for some lighting installations in commercial offices and corridors, but then did something similar for a shopping centre multi-story car park. The lighting refurbishment project was huge for his company at the time, with more than 6,000 dimming lights required and 2,000 sensors. He comments: "We installed microwave sensors in the car park and wired it all up. I spent weeks overseeing the project on site, ensuring the electricians were wiring everything up correctly and locating things in the right places. It all went



David Lippold, Managing Director of LiteIP.

very well and the shopping centre customer was very happy, in fact so happy that they gave us an order to replace all the lighting in eight of their other shopping centres across the UK.”

However, two things didn't go according to plan on these follow-up projects. The electrical contractor pulled wiring through conduits but damaged some of the existing wires. So it cost the contractor a fortune to repair the damaged wiring and the project went over-budget. They also pulled the wires to the wrong fittings in places and had to rework it. David wasn't able to be on site this time around to manage it all, so mistakes were made.

“So I now started to think of how we could remove the need for wiring altogether. It was around 2010 and the birth of the Internet of Things (IoT) – the first time there were more connected items in the world than PCs. This made me think ‘What if each sensor just broadcast a radio message?’ Wireless messaging wasn't exactly revolutionary technology, but it certainly wasn't in any lighting products at the time. If every sensor could broadcast that it was on, and what if all my relays opening and closing the contacts could hear that message. And what if I could then tune the system to how far you wanted to broadcast these messages. When you walk up to a sensor, it would transmit its message. All the lights that hear the message close their relays and the lights switch on. This means you don't need any wires between the light fittings. They could perform the corridor function through the driver in the light fitting.”

The big breakthrough here was that LiteIP could then tell the customer that no contractor would even be required on site as we would just replace your existing light fittings with LED equivalents and give you a custom gear tray for each fitting with a dimming control unit inside. A straight swap with no wiring or rewiring required.

### Wireless addressable lighting solution

But there was another key advantage. As David states: “Each sensor ended up having a unique identity and could broadcast a message to all of the surrounding lights with its identity. Lights that had subscribed to that sensor would activate, so we could control unlimited overlapping groups. At this time, we also had DALI [digital addressable lighting interface] controls. With DALI, you could set the exact brightness level rather than using a relay and relying on Corridor Function. Adding these together gave us an amazing wireless light management system with more flexibility than DALI systems and with much lower installation costs.

### Added benefits for emergency lighting

David then became involved in a lighting project for Ford Motor Company's European Parts Depot in Daventry, UK – the biggest single footprint building in Europe at the time. He comments: “They liked our control solution but said they also needed to convert half of the existing 10,000 lights to become emergency lights and wanted an addressable system to automatically test it.”

Legislation stated that Ford needed to test these emergency lights once every month to see whether they were working correctly. So each month, Ford would need to employ a team of people to come in, turn the power off, check if the 5,000 emergency lights went correctly into emergency mode. “By installing a light management system with DALI, Ford could then automatically test the lights. With emergency lighting, you have live, neutral and earth wiring, but you also need a permanent live wire. Ford hadn't got sufficient emergency lighting so we were going to have to add this extra unswitched live wire to convert half their lights into emergency lights to comply with the new legislation along with DALI cables to test it. It was becoming a huge project, to rewire the whole site,



and replace all the light fittings.”

Another lightbulb moment: because each LiteIP wireless light controls itself, it needs a permanent live, but does not need a switched live. If Ford simply made their lives permanent (by removing the switch), and we added testing and monitoring of the emergency lights into our controllers, they could have as many emergency lights as they needed without any rewiring! “So I could now give Ford reporting of emergency lighting, as well as provide them with all the energy savings and they didn’t have to rewire the site at all. The Daventry site now has the most sophisticated lighting system that money can buy with no rewiring required, and half their lights are now emergency lights!”

“I knew I wanted to sell LiteIP to all the lighting manufacturers. The first five years after we launched the product, nobody was competing with us. Although there are competitors now, they’re not really in our space, they tend to be suppliers of wireless lighting for domestic homes using Zigbee or Bluetooth, but these companies haven’t solved the tricky controls problems, nor do they have the emergency light testing function. Also, the range of their wireless systems are only around a tenth of the range of our system. So this is why we are strong in the industrial and commercial markets, where the spaces are typically much larger. Our solution can be

installed with thousands of lights over long distances.”

### Eliminate costly rewiring

If companies are thinking of changing their light fittings, most don’t see that as too problematic. But if the project requires rewiring of the building, this could involve tearing down walls, replastering, pulling the ceilings down, installing new conduits, and seeing electricians on scaffolding for months on end. Furthermore, with most lighting installations, the emergency lighting is out of date. “So when these companies come to upgrade their light fittings, their emergency lights have to meet more stringent standards. You can’t do this without rewiring. Therefore, one of the most significant reasons why you would use our system rather than a wired system is that you will not have to rewire the site, which would be costly, often inconvenient and sometimes impossible on older or listed buildings.”

As David puts it: “With our solution, the electrician simply replaces the existing light fitting with ours. He doesn’t need to know about the controls inside. It’s a straight swap over. There’s no commissioning, testing or set up for him. If the light switches on and glows, he’s done his job.”

If the end user needs presence detection, daylight linking, scene



controls in the boardroom, the LiteIP solution offers it all. “Users can decide when they move in to a building, what they desire for each room. So there is no risk to a project manager specifying our system. We even have a tablet app that allows the project manager to design and configure the light management system in detail. It’s a bit like creating an interactive drawing of the lighting installation. This includes the type of lights, which lights are linked with others, dimming settings, and so on. The end user maintenance technician or electrician can also use the app if they wish, but it’s mostly used at the commissioning stage.

#### Online dashboard access

If they wish, the end user can also log into the LiteIP website dashboard. The tablet app is synchronised with the dashboard, which means the maintenance technician or electrician can look at each light on the site and check its settings, how much energy it’s using, the energy usage over time, whether it’s an emergency light, its status, etc. It gathers real time live data from the lights. You can even tweak the settings online if the end user requirements change. You have complete flexibility, as well as the most complete energy saving solution available today.

### How Glamox Wireless Radio works at a glance

- Glamox supplies luminaires with Glamox wireless controllers.
- Glamox Wireless Radio can have integrated occupancy sensors, either PIR, microwave or third party devices.
- All luminaires, daylight and scene controllers require LNE connection only.
- All luminaires contain Glamox Wireless Radio controllers and occupancy sensors.
- Luminaires are linked together in occupancy groups.
- A remote daylight sensor links wirelessly to luminaires close to natural daylight.
- A scene controller links wirelessly to bring local control to groups of luminaires.
- Glamox Wireless Radio presence, daylight and scene controllers work in conjunction with each other to provide an integrated solution.
- Daylight takes precedence over presence detection to always maximise energy saving.
- With an online Glamox Wireless Radio system, luminaires are linked together and communicate directly with each other on 868MHz. Collators are located on site providing Internet access. Data is passed via the collator to the cloud. Clients use any Internet connected device to review settings, energy and emergency data on site.

# Licht and IT; 1 + 1 = 3

Axians, the most versatile specialist in digital transformation and energy transition, has equipped its office in Capelle aan den IJssel in the Netherlands with sustainable lighting and a wireless light management system. During this refurbishment, they switched from the traditional fluorescent tube to modern LED lighting. With the current energy prices and the phasing out of fluorescent light sources, this is a wise decision.





**A** COMPANY WHERE TECHNOLOGY is the backbone of the organization with a great interest in innovation and efficiency. ICT solutions and ingenuity are of paramount importance here, as is sustainability. Our contact arose with the simple question: “Can you help us replace lighting fixtures?” As the project developed the interest in our light management systems arose due to sustainability objectives.

### An outdated installation and a light management wish

Changes in older buildings where the technical installation is based on the existing lighting system require smart solutions. For example, the wiring is often 3-wire and difficult to expand to the 5-wire system, which is necessary to use the DALI standard for lighting. The solution to this situation is a reliable and easy to set up wireless system.

The Axians building was built in 1989 and is therefore an outdated building. Our Glamox Wireless Radio system brought the most efficient solution through significantly less work on the technical installation; no wiring adjustment, no adjustment in the groups and no need for light switches. Axians manages

IT networks and their customers’ data should be secured at all times. Glamox Wireless Radio communicates on the 868 mHz frequency and is the perfect solution for this, it functions independently of the company network.

### Energy-saving lighting solution

In collaboration with OOK architects, we realized a lighting design in which all LED lighting fixtures were fitted with a presence sensor. If this sensor registers the presence of people, the lighting reacts in scenarios that have been programmed in advance using a tablet. Scenarios in which the response time, lighting levels and follow-up time match the users and their tasks, these settings can easily be adjusted if, for example, rooms are given different purposes. If a control route is walked through the building outside working hours, only the lighting where the surveillance is located reacts briefly.

Lighting, which is only on when there is human activity, saves a lot of energy. The switch to LED luminaires alone entails savings of 50 percent on energy costs. With Glamox Wireless Radio this saving can amount upto 85 percent compared to the old situation.



Building on the possibilities that Glamox Wireless Radio already offers, it was decided to expand the system. Collators are currently being installed in the building. These units measure the exact energy consumption, burning hours, presence and status of the lighting. Insight into these parameters ensures greater efficiency; for example, you can determine which areas have been used and need to be cleaned and where cleaning is not necessary or where a different setting of luminaires is more effective.

#### Successful cooperation

Peter Booms - Procurement Manager at Axians says: "I have nothing but praise for the lighting and I am glad that it has been realized in this way. I had no worries about the lighting during the entire project, everything went smoothly and was supervised with great enthusiasm. In the beginning, the lighting was a closing point for me that was not realistic. Thanks to Glamox's input, I have a beautiful end result that meets all requirements both decoratively and functionally. Users are satisfied, we are more energy efficient and more sustainable, 1+1 has actually become 3. The cooperation between us, Glamox and installer Lugthart could not have been better."

## About Axians

Axians supports its customers — private-sector companies, public-sector entities, operators and service providers — in their digital infrastructures and solutions development. To this end, Axians offers a comprehensive range of ICT solutions and services spanning business applications and data analytics, enterprise networks and digital workspaces, datacenters and cloud services, telecommunications infrastructure and cybersecurity. Axians's specialized consulting, design, integration and service teams develop bespoke digital transformation solutions that contribute to successful business outcomes for its customers. Axians has offices in 27 countries and counts worldwide 13.500 employees.

#### A total of 800 installed luminaires:

C85-R  
 D70-R155  
 C95-P100x1200  
 C95-R600x600  
 A35-S400  
 SNO  
 SVA

#### What makes Glamox Wireless Radio unique:

- Luminaires do not need to be addressed or programmed.
- Luminaires can be grouped and be members of several groups.
- Luminaires can be allocated to zones.
- No limit on number of luminaires.
- Adjustments remain possible, they are easily implemented.
- The system can be expanded.
- The system is future-proof.
- Optional: monitor energy consumption, office occupancy, luminaires and emergency lighting.
- No connection to company network or interference with other systems.
- Glamox Wireless Radio operates on the 868 MHz frequency.





# Human centric campus lighting for students

The new Savilahti campus in Kuopio provides a modern learning environment for the 3,500 students at the Savo Vocational College. Human centric lighting helps to create comfortable and healthy spaces where learning is supported by lighting.



**T**HE CAMPUS CONSISTS OF THREE CONNECTED NEW BUILDS (called “Power”, “Electricity” and “Light”), which house various classrooms, including an electrical laboratory, hairdressing company, vehicle paint shop and training kitchen. A total of 3,500 students and 450 employees work over a total area of 26,000 m<sup>2</sup>.

Great importance was placed on the quality and design of the lighting on the campus. All teaching and working spaces, halls and corridors are equipped with human centric lighting.

“We wanted to create a healthy and high-quality environment for students and staff, including with respect to lighting. For humans, light is the most important factor for maintaining the day-night rhythm. Interior lighting supports this natural rhythm,” said Timo Kauppinen, electrical engineer at Savo’s inter-municipal education association.

A characteristic feature of human centric lighting (HCL) is that the colour temperature and intensity of the lighting vary throughout the day. Only the amount of light required to lower the melatonin level and regulate the internal clock is emitted in an energy-efficient manner. At the same time, cortisone and serotonin levels increase in the body. The timing of the light and the correct light quantity to help improve the well-being, sleep quality and performance of the students are crucial here.

Natural daylight also plays an important role on campus. The high glass façades and wall glazing inside the building allow daylight to enter the interior.

#### Warm or cold light depending on activity

Savo’s inter-municipal education association pursued a



sustainable development strategy in the planning and construction of the campus spaces.

“The focus areas for the lighting as part of the sustainable development approach have been the luminaire life cycle, the long service life of the light sources and the control of the lighting. With modern LED luminaires and DALI control, the lighting can be implemented extremely energy-efficiently and economically,” noted Kauppinen.

The light intensity in the communal areas is usually set to 80 percent of the capacity. However, during the current power saving period, the capacity has been reduced to 50 percent.

“The room lighting is controlled via the KNX bus of building automation system based on the measurement data from the motion sensors. The colour temperature and light intensity of human centric lighting are controlled according to Glamox’

recommendations,” said Pekka Ullgren, project manager at Sweco Finland Oy.

Teaching staff can change the lighting presets as needed, selecting strong and cool bright white light to boost concentration during examinations, for example. On the other hand, dimmed, warm lighting can be set to aid relaxation during rest periods and group discussions.

“Learning areas need to remain flexible. The balanced room lighting enables the facilities to be set up efficiently. The layout of the module lighting matches the ceiling grid, which means that the lighting can be moved if necessary,” says Kauppinen.



# New lighting in Mimershallen reduced energy consumption by more than 65%

The Mimers Hus upper secondary school, which opened in 2004, is located in central Kungälv, just north of Gothenburg, Sweden. The school is home to 2,000 upper secondary students and about 400 adult education students. The school also runs Nationally Approved Sports Education (NIU) combining the elite sports of bandy, rowing and handball with studies.



**I**n 2009, the Mimershallen sports hall was built next to the school. It is a 4,500 square metre sports facility containing two full-size handball pitches, a grandstand for 600 spectators, a cafeteria, a 60-metre running track and an indoor jumping pit.

Mimershallen is well-utilised, not only by upper secondary school student sports and NIU handball training, but also by Kungälv's Handball Club who conduct their activities here. The hall hosts a broad range of activities including junior and senior teams as well as elite-level men's and women's sports.

Both sides play in the upper divisions; the men in the second highest, Allsvenskan and the women in the highest division, SHE (Swedish Handball Elite), formerly the Elite series.

This level puts not only high demands on the players themselves, but also on the site, not least on lighting. Switching to a new energy-efficient lighting system had the added benefit of significantly improving the quality of TV broadcasts.

When the hall was built in 2009, luminaires with 80W T-5 fluorescent tubes were installed. These had started to fail and were beginning to require ever-increasing maintenance resources. By replacing all the lighting with modern, energy-efficient LED luminaires, the hall invested in a solution with a very long service life and minimal

maintenance requirements. Not least of all, it resulted in major energy savings. 160 luminaires of 4x80W T5 fluorescent tubes (53,440W in total) were switched out to 160 LED luminaires of 120W (19,200W in total). Replacing the luminaires alone resulted in a 65% energy savings. In addition, a modern control system was installed to further reduce energy consumption.

The new C52-S sports hall luminaire, with HD TV driver, was chosen for the sports halls. The C52 is ideal for multi-purpose sports halls. Its ball impact resistance has been tested in accordance with the German DIN 57 710-13 standard. This standard deals with how luminaires used in indoor sports facilities handle impact.

Lighting in sports facilities must be designed to meet a number of challenges not often encountered elsewhere. Varying ceiling heights, special needs for ensuring the visual comfort of sports enthusiasts in the bleachers, and easy access for cameras that broadcast sporting events require the mounting and angles of lighting to be versatile and that visibility is flawless and flicker-free. The C52-S's slogan – a player in the highest league – made it feel like the right choice of luminaire.

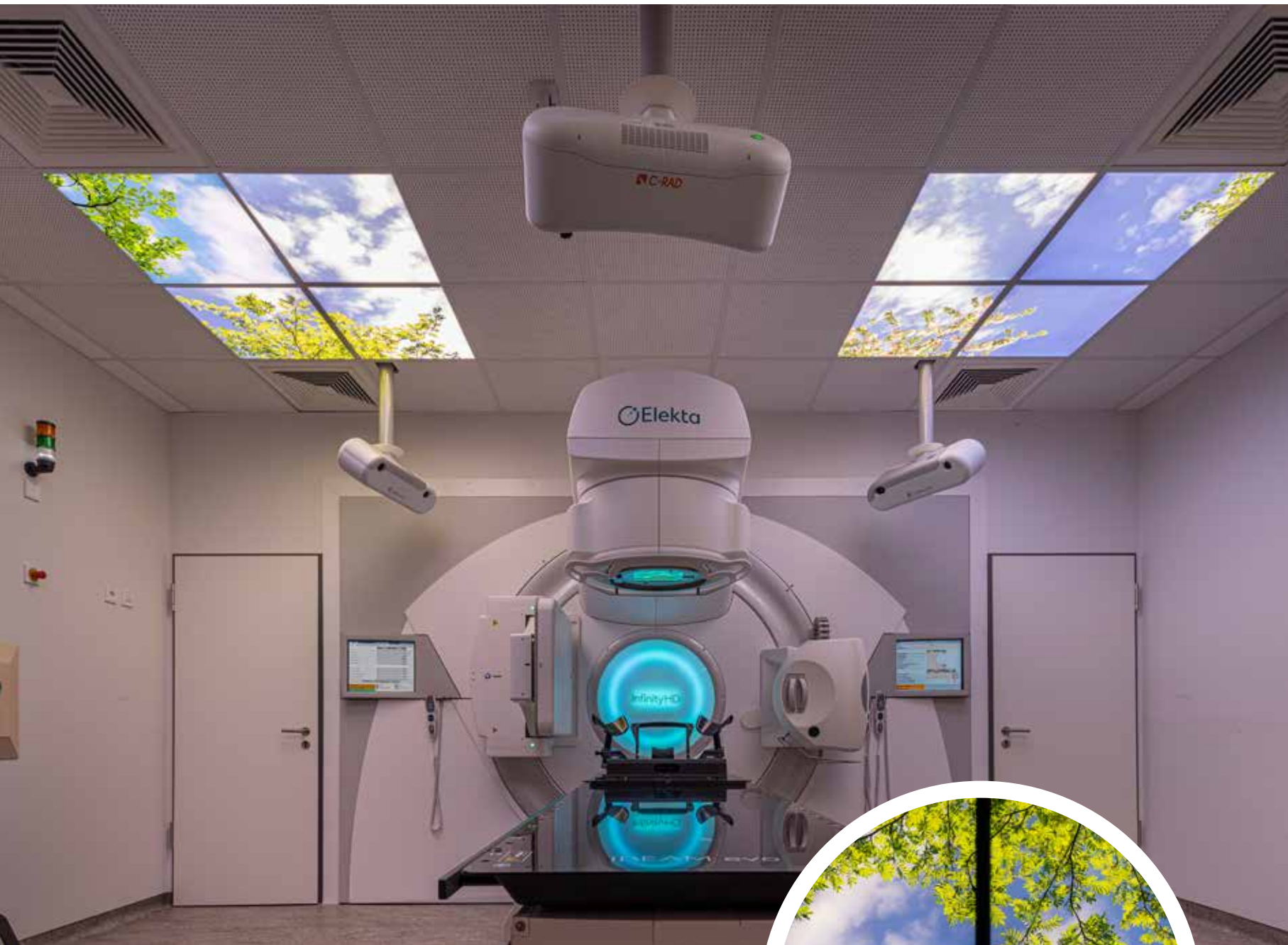
A great deal of the premises' other lighting was also replaced by modern LED luminaires, which resulted in lower energy costs and better lighting for spectators and guests to the cafeteria.

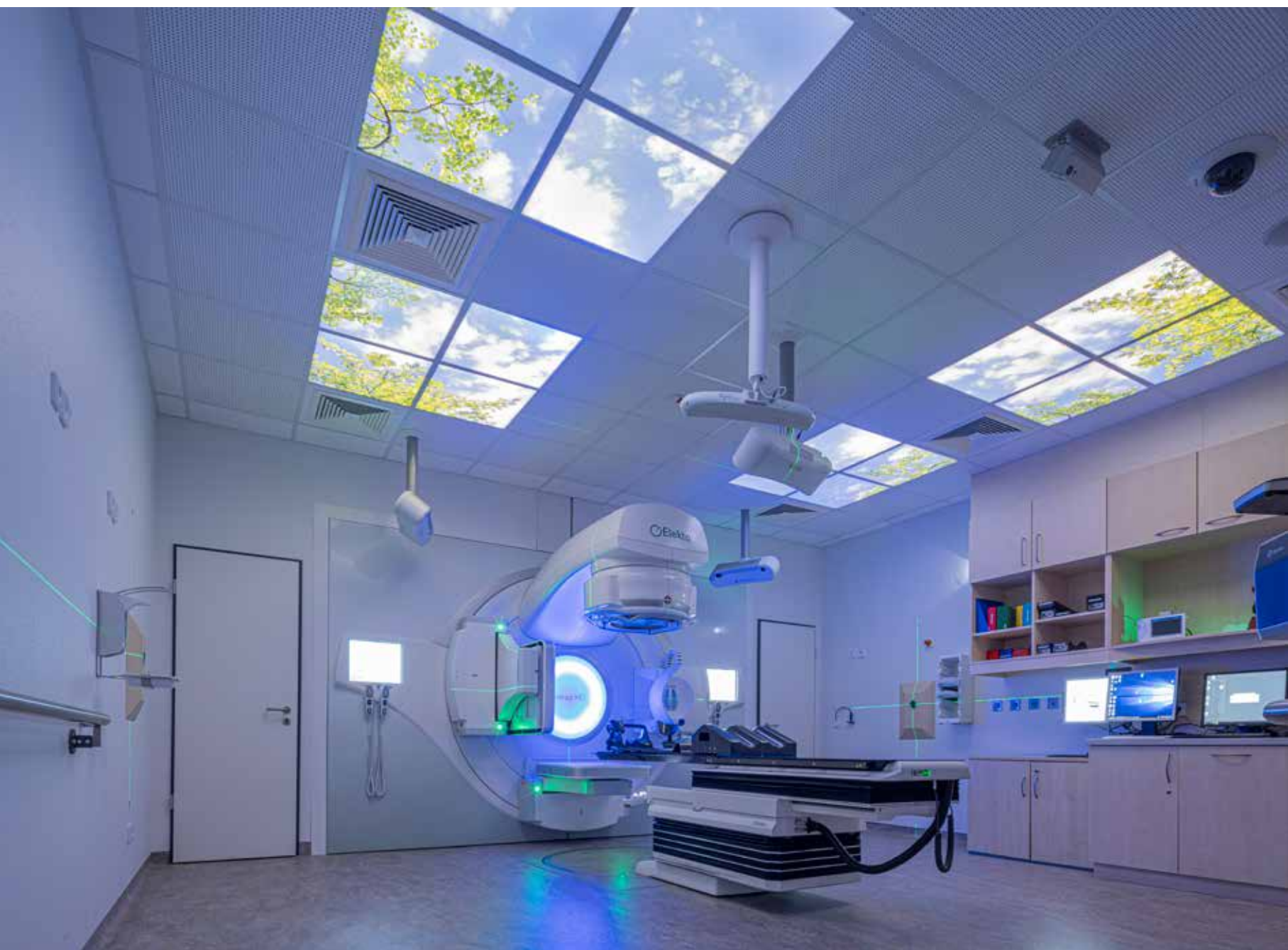




# Conveying a sense of calmness

The Clinic for Radiooncology and Radiotherapy at Hanau Hospital has state-of-the-art equipment that enables reliable and targeted radiation treatment of tumours and affected tissue.





A therapy session lasts around 7-10 minutes, the pure exposure time is around 1-2 minutes. Despite the short duration, this medical treatment can cause stress and anxiety for patients. In order to minimise these and other psychological impacts, four SkyPanels from Glamox were installed in a square in each radiation room of the clinic as part of the renovation. The high-grade LED panels give the impression of bright daylight in the windowless rooms and thus promote the well-being of patients before, during and after the radiotherapy. After extensive consultation with Glamox and the planning office Will, the hospital managers chose high-resolution motif layers with a 3D effect, which show a visually appealing daylight sky with protruding trees and also act as homogeneous general lighting in the room. The Human Centric Lighting Loop built into the luminaires mimics the light throughout the day and varies between

cool (6500K) and warm (2700K) light depending on the time of day. With this tunable white technology, the panels create a realistic link to the outside world and support the circadian rhythm of patients and clinical staff. Different light scenes with illuminance levels of up to 1000 lux are also saved for different treatment steps, such as setting the beam. This means that the radiation equipment and other work areas are optimally illuminated at all times. If required, the IP55-certified panels can also be controlled manually via DALI. No additional lights are required. The SkyPanels were installed by Beckhoff-Elektro GmbH. Programming and commissioning were carried out by the specialists from Glamox GmbH in close cooperation with the employees at the hospital. This cooperation is to be expanded in the near future. Further lighting projects at Hanau Hospital are already in the starting blocks.



## About Hanau Hospital

Hanau Hospital is publicly run by the city of Hanau and is an academic teaching hospital of the Goethe University Frankfurt with a certified training centre. In 30 highly specialised specialist departments, around 1,800 employees provide care for almost 100,000 patients every year in both outpatient and inpatient care. Hospital patients can rely on high quality and hygiene standards. The hospital delivers a high standard of diagnostics with a variety of accredited centres and focuses on the optimal treatment and care of patients.







# Abbreviations/Symbol explanation

Our product can be delivered with different types of optic, light distributions, sensors, emergency and light sources. Available choices are marked with different symbols (icons) or optic descriptions. Use of symbols or different optic description indicates an option within that product group and not that all products have that functionality.

## Louvre Optic

SA = Asymmetrical softlight  
SL/SU = Softlight  
DL/DU = Darklight  
ML = Micro lamella

## Diffuser

CL = Clear plastic diffuser  
OP = Opal diffuser  
OPA = Opal asymmetric diffuser  
OD = Opal Drop out diffuser  
MP = Microprismatic diffuser  
GL = Glass  
CI/MP = Circular steel frame and Microprismatic diffuser  
CI/OP = Circular steel frame and Opal diffuser  
TG = Tempered glass  
HTG = Heat soaked tempered glass

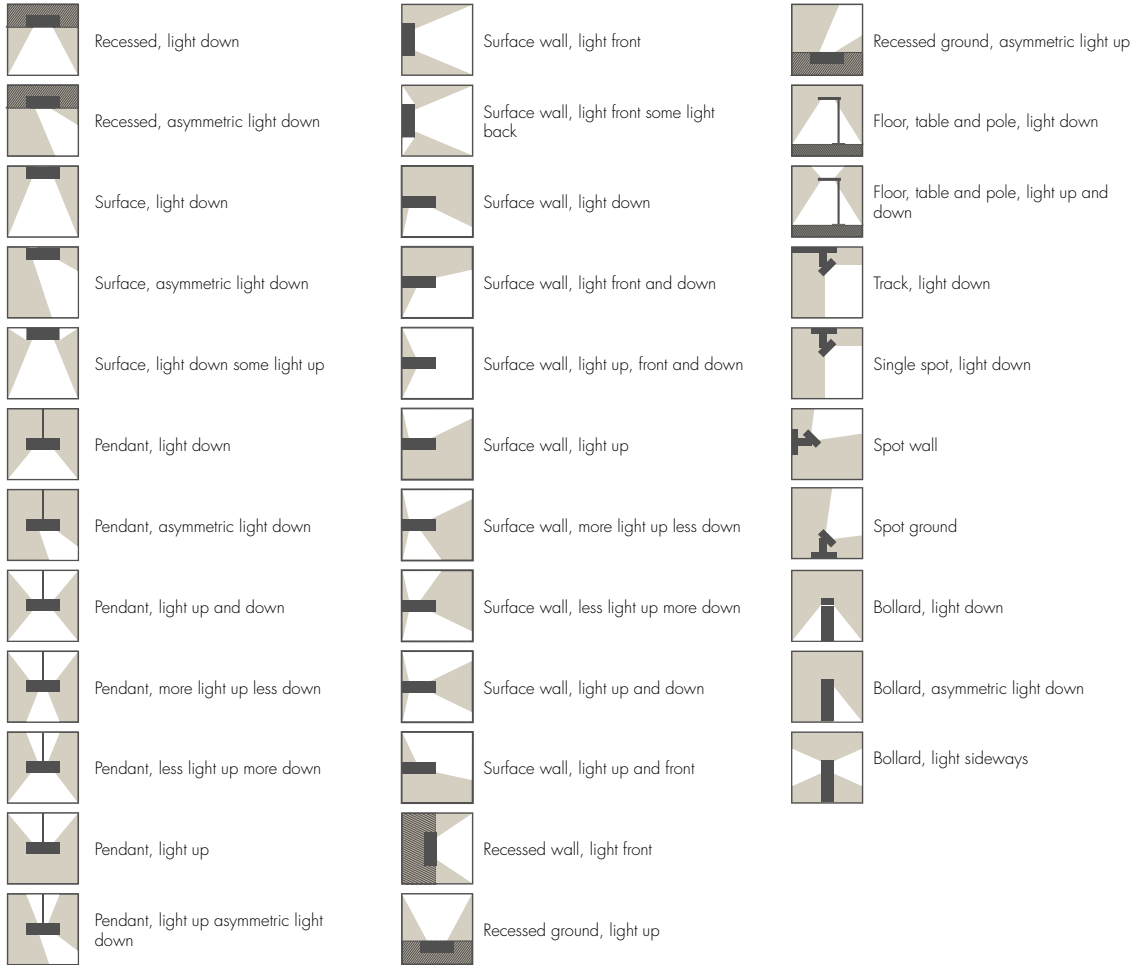
## Reflector finish downlight

SI = Silver reflector  
SM = Silver Matt reflector  
SF = Silver faceted reflector

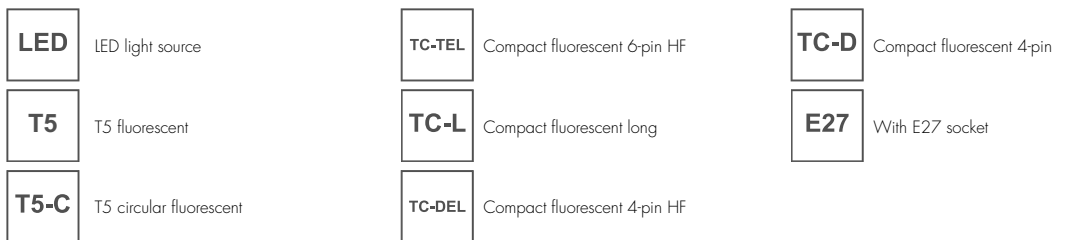
## Optic

NB = Narrow beam  
XNB = Extreme narrow beam  
MB = Medium beam  
WB = Wide beam  
WBA = Wide beam asymmetrical  
XWB = Extreme wide beam  
XA = Extreme asymmetric beam  
ASY = Asymmetric  
SYM = Symmetric  
SB = Shelf beam  
MBA = Medium beam asymmetrical  
ELB = Ellipsoid beam

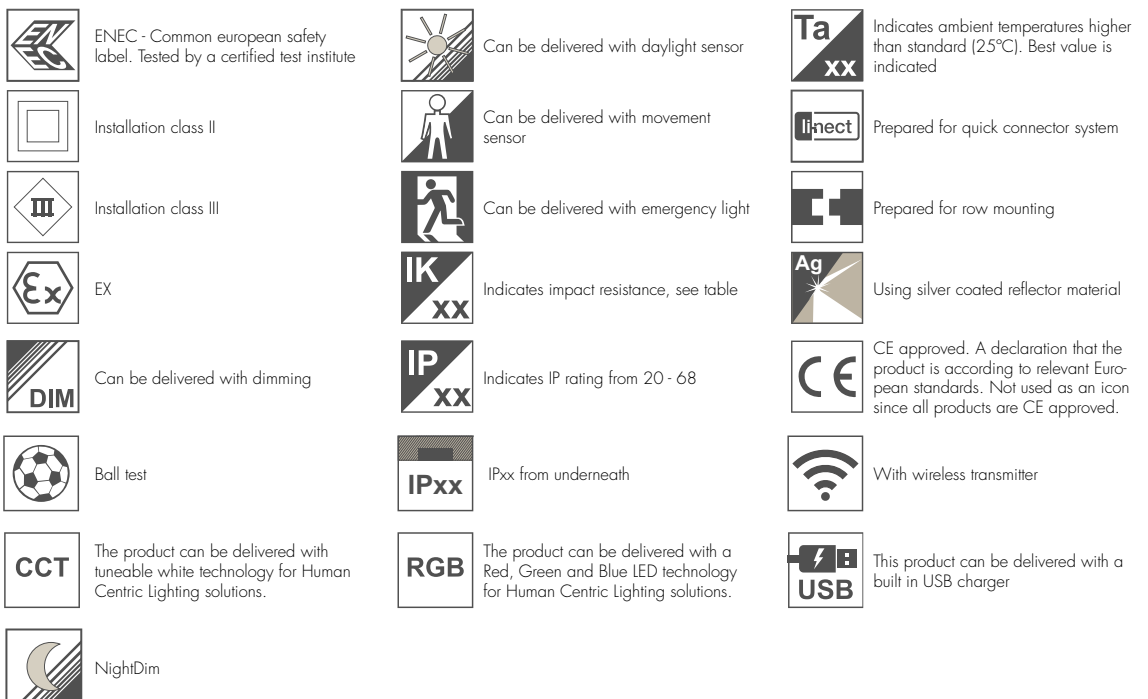
## Icons for mounting and light distribution



## Icons for light sources



## Other



## IP classification

### Protection against solid objects

IP2X	Protection against standard test finger
IP3X	Protection against 2.5mm steel wire
IP4X	Protection against 1.0mm steel wire
IP5X	Dust resistance
IP6X	Dust proof

### Protection against water

IPX0	No protection against water
IPX1	Drip proof
IPX3	Spray proof
IPX4	Splash proof
IPX5	Water jet proof
IPX6	Heavy sea water protected
IPX7	Water proof to 1metre/30 min)

## Impact classification in Joule (J)

IK00	0.00	IK06	1.00
IK01	0.15	IK07	2.00
IK02	0.20	IK08	5.00
IK03	0.35	IK09	10.00
IK04	0.40	IK10	20.00
IK05	0.70		



