

Sammode lights the cooking extractor hoods of a central kitchen, the smoking cabinets of an industrial cooked meat producer, the drying plant of a paper mill, the kiln of a maltings, the steam generators of a nuclear power plant, the cooking areas of an industrial fried food producer, the continuous hot process of a steelworks, the production lines of a glass manufacturer...

# Lighting for high temperatures



Sammode

Industry  
Food processing

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## **Sammode Lighting for high temperatures**

Functional, durable, efficient and dependable, Sammode luminaires are made to last. Optimised down to the smallest detail, they offer users an exceptionally long and robust working life at minimal operating cost.

## Values and expertise

### Durability and dependability

For four generations, we have developed a unique level of experience in bringing light into the most critical locations and most severe environments under the most demanding conditions. Established in 1927, Sammode is now synonymous with high-durability, high-dependability technical lighting. Our expertise covers every link in the lighting chain, from design to manufacture, which means that we can guarantee to provide the best quality of lighting in all environments between -60°C and +200°C.

### Experience and local presence

Our strength is built on almost 90 years of service to lighting. We are also an independent family business on the human scale. Combined with our proud history, this structure makes us efficient and responsive, and gives us the capability to take onboard the real-life needs of our customers and interpret them immediately to design and manufacture precisely the right product for the job.

### Robustness and adaptability

We design and manufacture functional lighting that has always been appreciated for its performance, quality and low operating cost. We continually refine all our products by improving their design, selecting the best-possible materials and incorporating new technologies validated by our own laboratory. The key characteristics of our luminaires are robustness, longevity, dependability and adaptability.

### 100% French design and manufacture

Based in the Vosges region throughout our history, we manufacture 100% French luminaires. We control every link in the production chain, and are committed to a rolling programme of investment in upgrading our facilities. We source only components manufactured in Europe, and work closely with our partners to refine our luminaires, reduce their environmental footprint and limit transport distances.

### Attentiveness and commitment

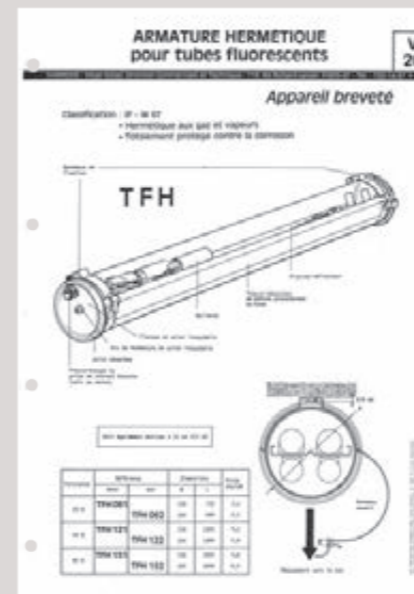
As a family business on the human scale, we place great value on individual commitment. Listening attentively to customer requirements, analysing their needs, ensuring that our customers make the right choices and minimising cost of ownership: our teams are dedicated to serving customers, advising them and finding the most appropriate solutions for their problems within their precise technical and budgetary constraints.



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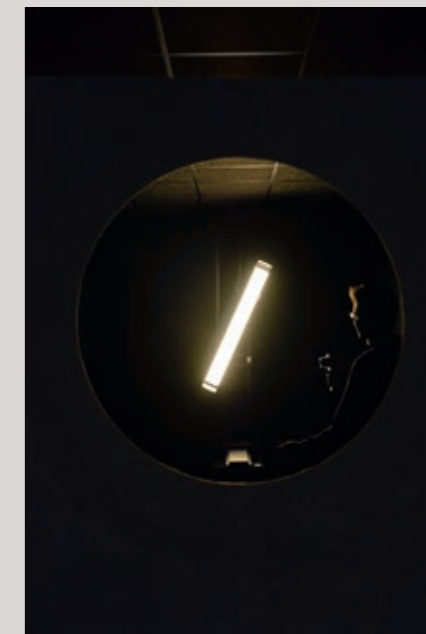
1. L'éclairage de qualité (High-quality lighting) general catalogue No. 1 (1927).
2. Lighting for damp environments from the 1938 catalogue.
3. A page from the 1968 Sammode catalogue.



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4. Sealing of Darwin lamp tubes. The Sammode production plant at Châtillon-sur-Saône in the Vosges region of France.

6. Photometric measurement.
7. Seal testing. The Sammode test laboratory in Paris.

# Sustainable lighting

<b>Respect for the environment</b>	Our environmental policy has always been clear and simple: we reject the idea of throwaway products and planned obsolescence, we select recyclable materials, prefer maintenance and component-by-component renovation, and reduce waste to the minimum. We understand that by designing efficient, dependable products, we limit production and reduce the need for maintenance. For every project we undertake, we help our customers to limit their energy consumption and use of natural resources.	
<b>Innovation</b>	Our continual commitment to research and the creation of new lighting solutions is motivated by technological progress and solving the individual problems specific to each customer. A demanding approach to technical issues is central to this commitment, as is minute attention to detail in design and manufacture, both of which contribute to meeting an exacting set of product functionality and durability criteria. Often invisible to the naked eye, these innovations always deliver improved performance.	
<b>LED technologies</b>	The development of light-emitting diodes (LEDs) is both a major technological revolution and a significant challenge for lighting manufacturers. Our Research & Innovation Department has been working for a decade on these new lighting systems. They offer enormous opportunities in terms of functionality, lighting precision and light control, as well as the promise of even greater energy savings.	
<b>Quality</b>	Our luminaires are created from the highest quality materials and incorporate electrical and electronic components selected in our laboratories for their ability to meet the most demanding specifications. The exacting quality and inspection processes developed over many years and applied to our products for ATEX environments and NF AEAS emergency lighting are also applied to our luminaires for the food processing industry: assembled with enormous attention to detail in our Châtillon-sur-Saône production plant, they are individually inspected and tested. Each then has its own individual serial number to guarantee full unit and component traceability.	
<b>5-year guarantee</b>	We design, manufacture and install lighting that is built to last: the absolute opposite of the throwaway mentality and programmed obsolescence. From the light source itself to the electronic circuits that control it and its mechanical structure, every component is designed to stand the test of time and be replaceable. This commitment to luminaire quality and durability is backed by our 5-year guarantee of 24/7 operation, which applies to all our ranges.	

# Our 6 key strengths

Six key strengths that guarantee the dependability of a long-term investment.

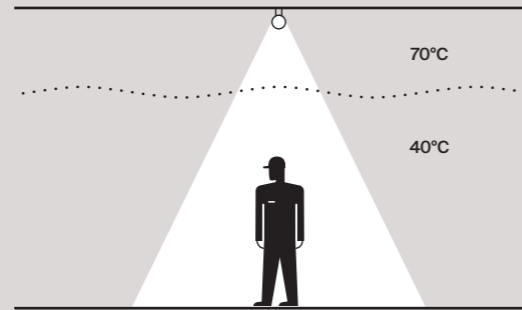
<b>Robustness</b>	Our luminaires are designed to withstand temperatures of up to 200°C. Special mechanical construction principles and high-quality materials, light sources and gear... each component is selected for its ability to maintain full strength at these high temperatures.	
<b>Ingress protection</b>	Our luminaires carry the IP68 ingress protection rating (hermetically sealed against dust, vapours and liquids) and the IP69K high-pressure water protection rating. The absence of internal dirt build-up guarantees maximum long-term light flow. Their tubular shape reduces external dirt accumulation and makes cleaning simpler.	
<b>Resistance</b>	Our luminaires are resistant to chemical attack (from cleaning products, greases and hydrocarbons) and corrosion, thanks to the use of resistant materials, such as stainless steel and co-extruded polycarbonate/PMMA.	
<b>Maintenance</b>	Our luminaires are supplied with rapid fixing systems to facilitate installation, removal and off-site maintenance. Production downtime and the risk of falling objects are therefore reduced, at the same time as making maintenance simpler and faster.	
<b>Durability</b>	Light source, power supplies and mechanical structure: every component is designed to last and be replaceable.	
<b>Performance</b>	Installation scheduling, selection of the right components for each application, light source positioning and layout, and overall energy consumption: our solutions optimise space lighting performance in accordance with individual requirements and budgets.	

# The different types of lighting

Whether the application is general lighting or task lighting, it is important to use the right luminaire with the right specifications for the required installation. For each of these applications, Sammode offers luminaires for high-temperature environments to meet the full spectrum of regulatory and functional requirements.

## Temperature-related selection criteria

Selecting the right luminaire also depends on the temperature of the environment in which it will be installed. To guarantee the characteristic long working life and strength integral to Sammode luminaires, it will be important to select a luminaire whose maximum operating temperature is higher than the area to be lit. For example, in particularly high spaces, rising heat tends to accumulate at ceiling level. So it is the temperature at this level that must govern the choice of luminaire.

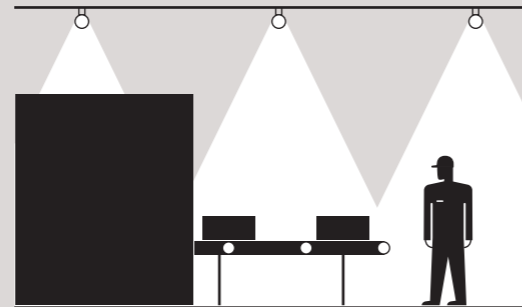


## General lighting

For industrial process environments:

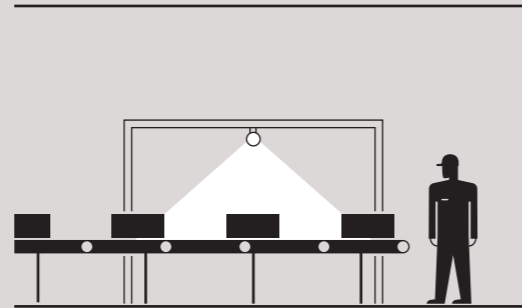
- with a floor area in excess of 20 m<sup>2</sup>
- less than 7 metres high
- with a lighting level above 150 lx

Appropriate general lighting, compliant with all current quality standards and requirements (HACCP, IFS, etc.), contributes to production team wellbeing, reduces fatigue and contributes to efficiency.



## Task lighting

Task lighting is appropriate for spaces less than 20 m<sup>2</sup> in floor area and less than 3 metres in height. In the majority of cases, it complements general lighting in smaller or confined spaces. These luminaires are subject to frequent on/off cycles involving a large number of switching operations, and achieve optimum lighting efficiency quickly. Our LED lighting solutions deliver the perfect response to these requirements.



# Materials

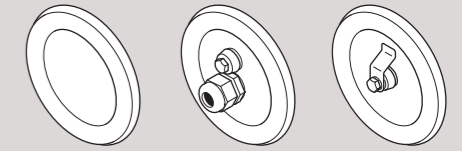
Our luminaires meet high technical and quality standards, and are manufactured exclusively from materials that make them particularly resistant to areas where ambient temperatures are high. These choices guarantee the exceptionally long working life of our products and their ability to deliver high levels of technical performance under extreme conditions of use.

## External metal components

### Stainless steel

We offer two grades of food grade stainless steel for all external components (end caps, mounting straps, etc.):

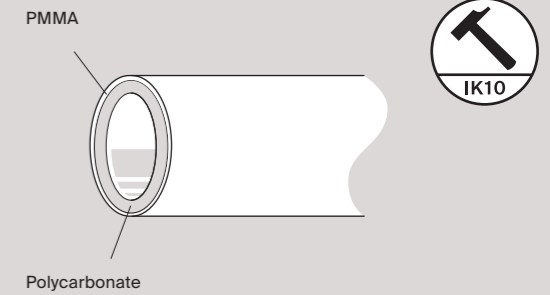
- 304 L stainless steel, suitable for most manufacturing and food processing applications.
- 316 L marine-grade stainless steel to resolve the issues raised by use in extreme conditions, and especially corrosive conditions like those found in marine environments.



## Materials for high temperatures

### Coextruded polycarbonate/PMMA diffuser

This composite diffuser comprises a polycarbonate diffuser with an integral coextruded polymethyl methacrylate (PMMA) layer to offer a unique level of resistance to cleaning materials, and provide full compliance with regulations regarding plastic materials and objects coming into contact with foodstuffs. Since PMMA resists chemical attack and polycarbonate offers excellent mechanical strength, our diffuser is recommended for demanding applications requiring a high level of mechanical impact resistance (IK10) or food processing industry environments (European directives 2002/72/EC, 2004/19/EC, 2005/79/EC and 2007/19/EC). Coextruded polycarbonate/PMMA diffusers are recommended for use in temperatures up to 70 °C.



Ambient temperature	Diffusers	Seals
< 70 °C	Coextruded polycarbonate/PMMA	EPDM

### Borosilicate glass diffuser

Sammode luminaires for use in temperatures above 70 °C are fitted with borosilicate glass diffusers. This material is inherently suited to applications where ambient temperatures are high. It offers exceptional levels of resistance to chemical attack (acid atmospheres, hydrocarbons, etc.) and abrasion (from coal dust, cement dust, etc.).



Ambient temperature	Diffusers	Seals
> 70 °C	Borosilicate glass	Silicone

### EPDM seal

Sammode luminaires for use in temperatures up to 70 °C are fitted with EPDM seals. The inherent elasticity of this material ensures the highest quality of seal for tubular casings. It is exceptionally resistant to UV and heat.

### Silicone seal

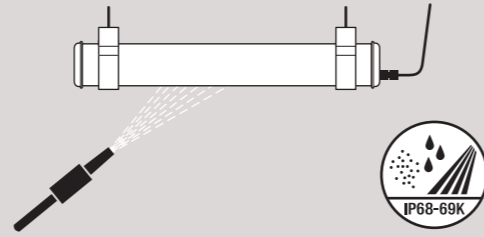
Sammode luminaires for use in temperatures above 70 °C are fitted with silicone seals. The high thermal inertia of this material ensures longer luminaire working life at very high temperatures.

# The strength of a tubular system

It was in 1967 that Sammode perfected the iconic TFH, Hermetic Fluorescent Tube luminaire, that would rapidly establish the reputation of the company. The design appears simple: a tube closed at both ends by a stainless steel cap. Continually improved and perfected, this concept is in reality a distillation of high technology and expertise.

## Ingress protection

A number of fundamental principles lie behind the ingress protection designed into our tubular luminaires, as a result of which they comply with IP68 and IP69K in terms of high-pressure water protection.



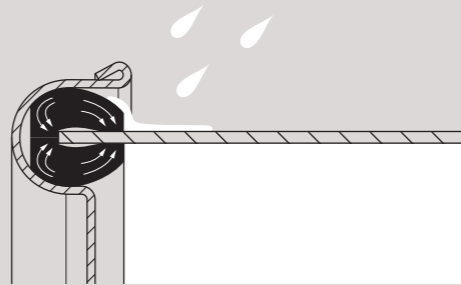
## Minimum length

The longer the seal, the greater the risk of infiltration: our tubular luminaires are sealed at each end of the tube, thereby minimising the sealing area.



## Even sealing

The entire surface of the seal must be evenly compressed, and that compression must remain constant over time: the use of a single central stainless steel screw ensures even distribution of effort across the full seal seating surface. The special shape of the press-formed 1/2 ring seal housing creates a triple seal.



## Constant sealing performance

Elastic deformation of the stainless steel end cap absorbs the expansion and mechanical stresses imposed on the casing of the luminaire throughout its working life. The materials used for our seals (sulphur-free EPDM, silicone, etc.) have been selected for their high level of resistance to chemical attack, and ensure that the ingress protection seal is maintained long term regardless of external conditions in terms of thermal shock or mechanical impact.

## Mechanical strength

The tubular body improves the mechanical strength of its basic materials by distributing mechanical stresses more effectively to create a heavy-duty level of rigidity. The absence of any longitudinal seal plane also ensures the consistent cohesion of the material and increases its impact resistance. These factors combine to ensure that the composite body versions of our luminaires achieve an exceptional level of impact resistance (IK10–20 Joules) that guarantees their continued performance over time.



## The limitations of traditional sealed luminaires

Originally designed for storage area or project site lighting, the traditional products offered by other manufacturers reveal their limitations in the demanding environments created by manufacturing and food processing industries. They comprise two sections produced using different materials: a ceiling-mounted casing containing the gear tray, and a transparent diffuser. This configuration makes them sensitive to heat fluctuations and mechanical impacts, which can cause relative distortion, resulting in compromised seal performance and the loss of closing clips. The long length of seal and its uneven compression as a result of using clips make it impossible to guarantee a long-term seal, and lead to electrical malfunctions due to the ingress of water or damp atmospheres.



Traditional luminaire seal measuring approx. 2.7 metres



Sammode tubular seal

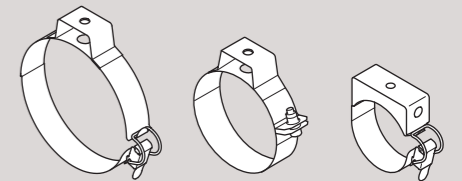
## Wiring

The heat emitted by the lamps and their associated gear, combined with high external temperatures, cause accelerated ageing of insulation, which may in turn result in random triggering of earth protection trips. This is the reason why the internal wiring used in our luminaires has silicon insulation woven with glass fibre (for applications up to 180 °C) or silicon rubber insulation (for applications up to 250 °C). With its ability to withstand constant exposure to high temperatures, the silicone ensures a long working life for the installation, while the glass fibre ensures that the wiring retains its mechanical integrity.

## Fixings

### Practical issues

All our luminaires use wraparound strap fixings to facilitate rapid fixing and removal.



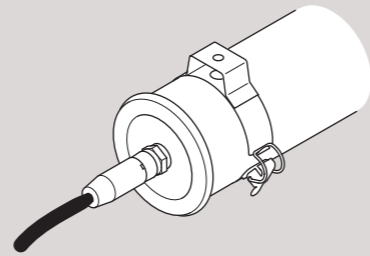
### Technical issues

Tubes are at risk of radial mechanical and shear stresses, which may lead to cracking over time. This is why component geometry, wraparound strap elasticity, strap thickness and weld location have all been optimised to eliminate any risk to the diffuser. Elastic deformation of the mounting straps therefore absorbs the dimensional variances produced by the thermal shocks and mechanical impacts to which the body of the luminaire is subject throughout its working life.

**Pluggable connector** Our tubular luminaires are fitted with an IP68/IP69K plug-in connector for rapid disconnection.

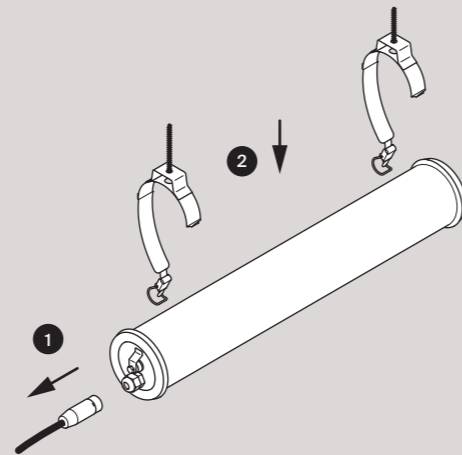
**Heavy duty**

Manufactured from ultra-strong and durable materials (polyamide body, nickel plated brass base and locking ring, etc.), this connector has been specially developed to match our housings in terms of quality. It therefore withstands the most aggressive chemical environments and mechanical impacts, and operates within a very wide temperature range (-40°C to +70°C).



**Convenient**

This connector is extremely easy to install, thanks to its screw ring locking system and screwed connector terminals. Fitted to an LED luminaire, it avoids the need to open the unit by using "plug and play" installation. Together with the toggle clamp mounting that enables the luminaire to be removed without tools, the pluggable connector makes it very simple to carry out maintenance operations outside the process area. It therefore removes the "glass risk", despite the use of standard fluorescent tubes.



**Plug-in power cord** Given the challenging conditions created by these high temperatures, luminaire installation and maintenance must be simple and fast. So our tubular luminaires can also be fitted with an optional IP68/IP69K plug-in power cord for fast disconnection in ambient temperatures up to 100°C.

**Vibrations** Vibration resistance compliant with IEC 60068-2-6. Our ranges of industrial tubular luminaires have successfully completed the vibration resistance tests conducted by the external L2EC laboratory and defined in the extreme conditions of use section of the EN 60598-1 standard: the luminaire is secured to a vibration generator in the most unfavourable normal installation position, and is then subject to calibrated vibrations for a period of 30 minutes (amplitude 0.35 mm, frequency levels 10 Hz, 55 Hz and 10 Hz, and scan speed of one octave per minute). On completion of this test, no luminaire component capable of compromising safety should have been loosened.



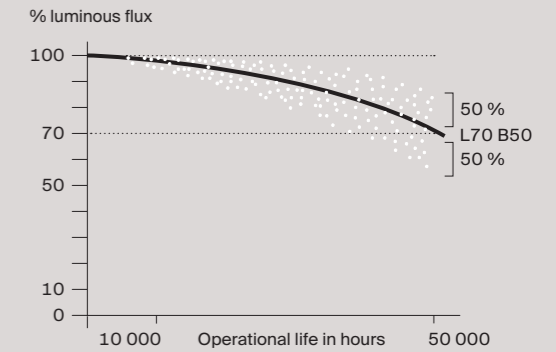
# LED working life

The working life of a traditional lighting system extends to the failure of a certain percentage of its sources. There is no reason why a well-designed LED system should cease to function, even if it leads eventually to the loss of luminous flux. Rather than give a strict lifespan for an LED system, it is more useful to describe its behaviour over time.

**Operational life**

This is expressed as follows: Operational life (in thousands of hours, or Kh) Lx By, where x = remaining luminous flux as a percentage of initial flux y = percentage of LEDs unlikely to maintain this value.

LED system performance is usually described on the basis of 50 Kh of operation: 50 Kh L70 B50 therefore means that after 50,000 operating hours, at least 50% of the LEDs in the system will maintain at least 70% of their original flux.



**Influencing factors**

The behaviour over time of an LED, and therefore that of the system in which it is fitted, is influenced by multiple factors, the most important of which are:

- Temperature: LEDs produce not only light, but also a large amount of heat. It is essential that this heat is dissipated within the lighting system using the basic principle that says "the colder the LED, the more effective and brighter it is and the longer its life will be".

- The power supply: the amount of heat emitted by an LED module may be reduced by minimising its power supply current. The use of a current level specifically recommended for LEDs is therefore essential.

- Chemical pollution: some chemical compounds (chlorine-based, sulphur-based, saline atmospheres, etc.) and humidity are incompatible with the electronic circuits, connections and components used in LED systems. These are therefore protected from exposure using a high-IP housing system designed to cope with such environments.

**The Sammode commitment**

Our extensive expertise in LED technology and installation has been amassed over many years. Which is why we are committed to delivering an operating life of 50 kh L80 B50 across all our ranges, regardless of recommended operating temperature range. We therefore offer lighting solutions to meet this level of requirement in ambient temperatures up to 70°C. This commitment sets one of the highest standards in the market, and imposes an uncompromising level of detailed technical expertise during the design of our luminaires. This means that we systematically opt for:

- robust components and suitable power supply solutions
- the most appropriate materials and efficient heat dissipation methods that are proven to be effective at the highest operating temperatures,

- a high level of protection by using a proven, fully-sealed housing appropriate for the environment concerned
- temperature testing of all luminaires.

Our principle is simple: the right components properly installed in the right housing.

The resulting techniques and processes are what substantiate the excellent reputation we have built over many years of serving the lighting market in the food processing industry. So today, our 5-Year Warranty applies to every one of our products, regardless of their application or light source technology.



# LED technology

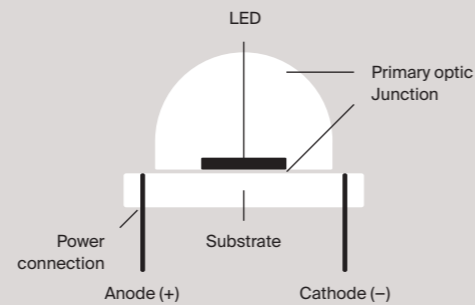
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## Thermal management

Managing the heat emitted by a luminaire has a significant effect on the performance of the light source and the control of its drivers.

### Phenomena

A LED is a semiconductor that emits blue light when a direct current is passed through the active layer—or junction—in the forward bias direction. This blue light is converted by a photoluminescent powder. Depending on the performance of the LED, 35-40% of the energy is converted into visible light containing no infra-red, and 60-65% into heat within the component. This heat must be dissipated. Excessive junction temperature can considerably reduce semiconductor lifespan (by up to 50% for a 10 °C variation), significant loss of luminous flux and a colorimetric shift.

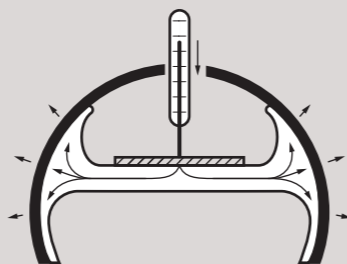


### Our strategy

The gear trays used for our LED modules contain passive aluminium heat sinks to provide direct and even conduction of heat. We create thermal barriers between LED modules and power supplies in order to limit their reciprocal heating effect. The offset mounting of our luminaires by using wraparound strap fixings to stand them slightly off from the surface to which they are fitted creates an airflow that helps to dissipate the heat generated. Lastly, we use only superior quality LED modules powered by precisely the right level of current to ensure maximum lifespan under specified conditions.

### Special high-temperature modules

These modules contain a ceramic LED housing that improves heat dissipation direct from the junction, and also use a PCB material that conducts heat more effectively. At like-for-like length and the same level of luminous flux, these modules contain more LEDs than standard modules: the individual LEDs are therefore driven at a lower level, thereby increasing their resistance to temperature.



### Validation testing

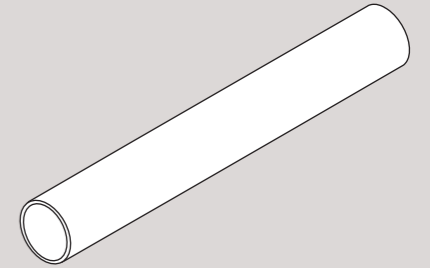
We conduct many tests and thermal simulations in our laboratory in order to ensure temperature qualification for all our luminaires. Our controlled climate facility uses thermal sensors to measure the most critical points of our luminaires.

## Optical management

Compared with standard fluorescent lamps, LEDs require a different approach to optical management, given their small size and high luminance (around 1 million cd/m<sup>2</sup>).

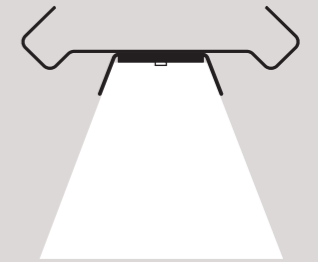
### Diffuse extensive optics

This light distribution pattern is suitable for the majority of general process lighting applications. As a result, careful optical design, light diffusion, avoiding direct eye exposure and reducing the glare of these bright on-demand sources becomes essential. Our diffuse optical systems disperse the light emitted by the source in such a way that the source itself is not visible to the user: the result is an increase in the visible area of lighting in combination with reduced luminance. We have developed satin-finish diffusers that achieve exactly the right balance between performance and comfort. The distance between source and diffuser is a key optical parameter, so the degree of diffuser opalescence varies with product diameter.



### Light mixing chamber

LEDs emit monochromatic (blue) light, so it is necessary to convert a part of this wavelength to cover the full visible spectrum. To achieve this, a photoluminescent powder is applied to a substrate, such as glass or silicon, located a fixed distance from the LED. But this process can create a number of defects (edge effects) at the base level that are perceived as variations in colour temperature. All our LED luminaires are fitted with a light mixing chamber that eliminates these effects by creating multiple reflections. The light mixing chamber also has two other functions that improve overall photometric efficiency: reducing shadows cast by connectors or wiring inside the luminaire, and limiting indirect luminous flux.



**Key characteristics of LEDs**

In a fast-changing market, it is important to have the ability to choose LED luminaires on the basis of clear, objective and comparable criteria. Especially since performance criteria will be included in future international standards now in preparation.

**Obsolete benchmarks**

The NF EN 13032 standard specifies that the performance of a fluorescent luminaire is determined by its luminous flux compared with that of the bare lamp at an ambient temperature of 25°C for both. It indicates the efficiency of the luminaire for a given quantity of light as a percentage. However, the complexity of the LED market makes this concept obsolete, since each manufacturer uses either LEDs only, standard modules or its own modules, and the resulting “luminaire optical system” varies considerably depending on the level of LED integration. Promoting 100% efficiency on the photometric curves for LED luminaires is clearly meaningless, as is any comparison between fluorescent luminaires and LED luminaires. Furthermore, the PR NF EN 13032-4 standard requires only measurements for luminaires, making no distinction between light sources.

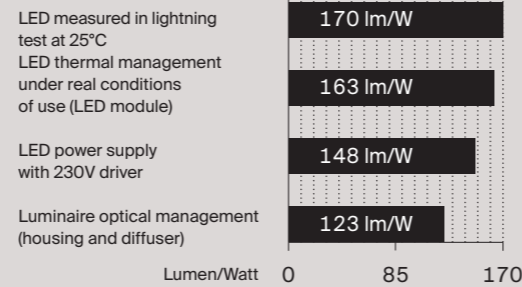
**System efficiency**

Correct sizing therefore relies only on system (or total) efficiency of the luminaire, as defined by the relationship between the luminaire output flux (in lumens) and its power consumption (in watts). It represents the quantity of energy to be injected into a luminaire in order to obtain a given level of luminous flux. This concept therefore takes account of the entire system: the LED used, its integration into the module, its power supply, the impact of thermal and optical management, etc.

**Total luminous flux and data transparency**

The luminous flux value is essential for comparing the LED luminaires offered by different suppliers. Some LED luminous flux and efficiency values at a temperature of 25°C may become meaningless in real-life, because the performance delivered by an LED solution depends on many factors (cooling, power supply, optical system, etc.). Our technical datasheets clearly indicate the total luminous flux of our luminaires expressed in lumens, together with their actual power consumption in watts. These values are measured completely transparently using the most demanding configuration within the operating temperature range.

Illustration for a Bunsen



**Comparison and limitations**

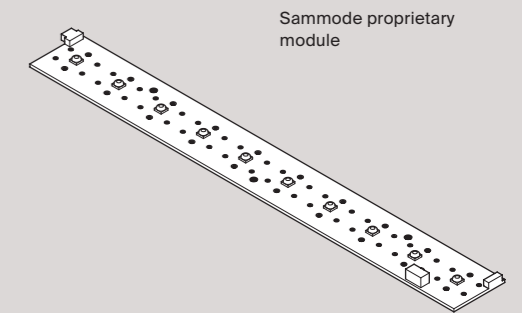
Relevant for comparing luminaires that use different technologies, total efficiency is, however, useful only for luminaires that are very similar in terms of their function and light distribution. The best practical approach is to conduct a lighting study that takes account of the photometric aspects of the products and the characteristics of the rooms in which they are used (dimensions, volumes, light reflection ratios, etc.) to produce a given level of lighting, and compare the total amount of power consumed.

**LED modules**

Our business culture is based on a rejection of throwaway products: we have always designed luminaires that have an exceptionally long working life, and are easily removable for future maintenance. Given the rapid advances in LED technology and our commitment to maintaining these values that our customers so appreciate, we have implemented a twin strategy.

**Proprietary LED modules**

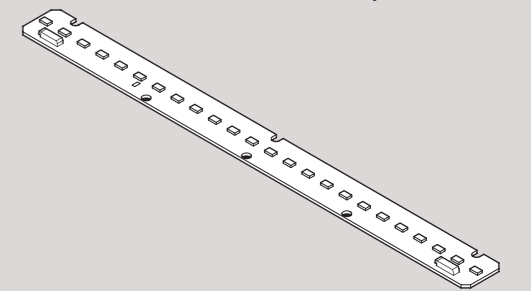
We use this type of module in niche applications where the market offers no suitable or sufficiently robust solution. We then create a special module containing the appropriate LED electronics for the application concerned. As a pioneer in LED solutions for industrial environments, it was in 2009 that we developed lighting modules capable of operation at temperatures as low as -60°C. Our central light source and machine lighting luminaires are also fitted with special modules. Our manufacturing expertise allows us to guarantee our customers a rolling programme of platform upgrades with long-term availability of new, higher performance components.



Sammode proprietary module

**Community (Zhaga compatible) LED modules**

These standard format modules are selected for their high level of quality. They are built in accordance with a shared specification to guarantee the interchangeability of modules from different manufacturers. Being able to draw on different suppliers of interchangeable LED modules allows us to ensure the availability of our lighting solutions and their long-term maintenance. And since these products are standard, their high-volume manufacture makes our solutions more affordable, at the same time as enabling their forward development to take advantage of the increased performance delivered by the latest generation of LED modules.

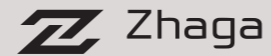


Community module

# Photobiological safety

## Zhaga

Zhaga is an international consortium of lighting and electronics companies formed in February 2010, which prepares industry standard specifications to ensure the interchangeability of LED light sources from different manufacturers. The resulting standards define the factors governing interface compatibility in terms of LED module dimensions, mechanical properties and photometric, thermal and electrical characteristics. Its aim is ultimately to transfer to the International Electrotechnical Commission (IEC) the process of managing the international standardisation of these specifications. They do not address LED module performance, quality or design, which remain specific to each manufacturer to ensure a full range of product options, from range entry to premium.



## Our partners

Our approach to quality has always been uncompromising, and we use only superior quality modules supplied by leading manufacturers or partners, all of which are European companies. Our in-depth knowledge of our own products and their heat dissipation capabilities, and a decade of experience in designing LED modules for use in challenging environments, make us highly critical and selective when it comes to suppliers. Our Research & Innovation department selects only those companies prepared to provide us with transparent technical data, and we never introduce new components until they have passed a battery of qualification and endurance tests conducted in our own laboratory.

## The EN 62471 standard

For each type of light source used, this standard defines the specifications to be complied with in order to avoid health risks that apply predominantly to the eyes and skin. Nevertheless, they contain a high intensity of blue light that poses a potential Blue Light Hazard, which can cause irreversible damage to the retina if viewed directly for prolonged periods. The likelihood of this risk becoming a reality depends on multiple factors, including the power of the LED, its colour temperature, its light distribution pattern and distance from the luminaire. To help users evaluate these risks clearly, EN 62471 subdivides lamps and casings into four risk groups.

Group 0 No risk	No photobiological hazard, even when viewed continually
Group 1 Low risk	Direct vision of the source limited to 10,000 sec. maximum (approx. 3 hr.)
Group 2 Moderate risk	Direct vision of the source limited to 100 sec. maximum
Group 3 High risk	Direct vision of the source limited to 0.25 sec; maximum, i.e. less than the natural eye protection reflex

## Obligations

From risk level 2 onwards, the CE marking must show the level of photobiological safety, but only level 3 imposes the need for user protection measures, since correct use of the luminaires concerned suffices at the other levels. Although a user does not generally look at a light source for long periods, a technician must be able to check light sources for correct operation in complete safety.

## Our products

The LED modules used in our products pose a level of photobiological hazard risk that falls either into Risk Group 0 or 1. They therefore pose no risk under normal conditions of use. Since these LED sources are also protected by a lens or diffuser, their luminance is clipped.

# Fluorescent sources

Given their good performance in terms of lifespan and light efficiency, good range of colours and reasonable price, fluorescent sources have for decades provided the lighting of choice for general industrial use.

## Linear tubes

### T8 Tubes

Providing the ultimate light source for industrial applications, this proven technology offers the best compromise between robustness, efficiency and lifespan. Compatible with ferromagnetic gear, these 26 mm diameter tubes create lighting solutions that can cope with ambient temperatures of up to 100 °C.



## Compact fluorescent lamps

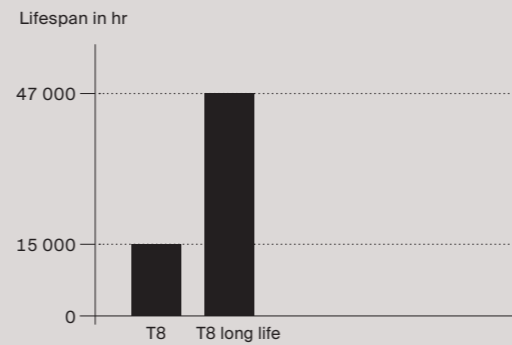
These 2G11 4-pin lamps offer high-density luminous flux at a shorter length, resulting in powerful, but extremely compact, lamps. They are most frequently used for task lighting solutions. However, this high-density flux creates a higher level of glare and a more restricted operating temperature range (up to 50 °C).



## Special lamps

### Long-life lamps

Equivalent in terms of luminous flux, these lamps have lifespans comparable to those offered by LED solutions, and are therefore longer than those offered by standard lamps. They offer the advantage of lower maintenance costs and waste generation as a direct result of the longer replacement intervals. They are ideal where relamping is costly (at extreme height, difficult access, etc.) or disruptive to the production process (tunnels, production lines, etc.).

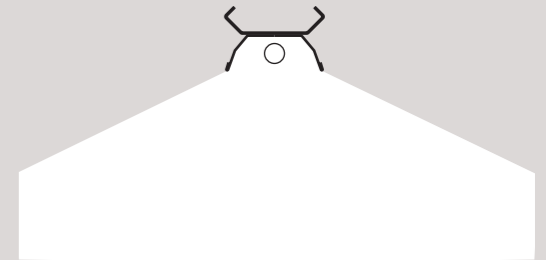


## Reflectors

We offer a broad range of technical reflectors in mirror-finish aluminium sheet to cover the majority of industrial lighting challenges.

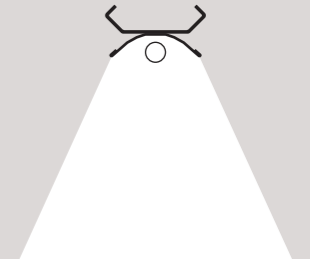
### Extensive reflectors

These high-efficiency specular aluminium reflectors have an unusually wide angle of spread. They are perfectly suited to providing an even spread of general lighting for installation below 5 m in height.



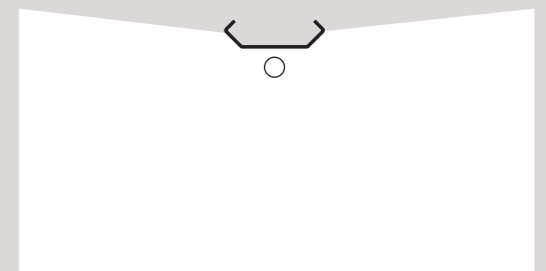
### Intensive reflectors

These mirror finish aluminium reflectors have a narrow angle of spread to concentrate the luminous flux. This type of directional lighting is indicated for corridors, public areas, specific areas or shelving.



### Diffuse optics

Our white powder-coated gear trays are particularly effective reflectors for creating a diffuse light. They are recommended for use in rooms with white ceilings below 3 m in height, where they boost the perceived light level and increase visual comfort by minimising luminance contrast between the ceiling and walls. Less dazzling than traditional mirror finish reflectors because they are non-directional, they are ideal for vertically mounted luminaires.



# Power supplies

Essential luminaire components, power supplies can optimise unit life when they are carefully selected to suit their operating environment.

## Mains electrical interference

The faults and fluctuations that can occur in industrial mains power supplies can damage luminaire gear not specifically designed to withstand them. Such faults and fluctuations take a number of different forms.



### Transient voltage surges

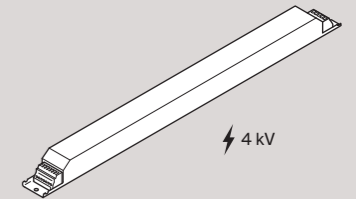
Although the recommendation is to distribute loads over all its phases, a 3-phase supply can be sensitive to operational factors: an imbalance due to the temporary shut-down of a powerful machine on one of the phases (up to 320 V), incorrect voltage regulation by the power supply company, which occurs frequently where the energy source is intermittent (wind power, tidal power, etc.: in countries engaged in a process of energy transition, such as the UK and Germany, the voltage regulation systems originally designed for constant energy generating systems are not 100% compatible with renewables), etc. Voltage surges can also be triggered by fluctuating high power loads (welding machines, motor startup, etc.).

### Voltage peaks

In a steady-state power supply network, the sudden stoppage of a powerful machine can trigger a voltage peak: the absence of current is then compensated for by an abrupt increase in voltage (of up to 4 kV) in that phase, which can feed back to the network. Other causes of voltage peaks include the switching from an AC supply to a DC supply, the use of a generator set and the indirect effects of electric arcing elsewhere in the industrial facility, etc. Lightning striking an installation directly or indirectly can also inject a voltage peak into the protective earth common to all parts of the building.

## Special LED drivers for industrial applications

For high-temperature applications, we use robust electronic drivers designed to operate in environments that are challenging in terms of permissible ambient temperature range, vibration, etc. These robust electronic drivers can be installed on the same power line as ferromagnetic gear.



### Special light engines

These so-called 'constant current drivers' generate the current characteristics required to operate LEDs. These drivers offer high-efficiency AC/DC conversion and good power factors to ensure energy-efficient (lm/W) LED/driver combinations. However, it is essential to use the right power supply for the LEDs concerned to avoid damaging the various components: the resulting assembly is referred to as an LED light engine. In practical terms, an LED module can be powered by a range of different currents, but variations will modify its characteristics: the lower the current, the less luminous flux it generates, but the higher its efficiency; conversely, the higher the current, the more luminous flux it generates, but the lower its efficiency and the shorter its lifespan. This power supply strategy is central to our expertise.

### Power supply network resilience

The components used in these power supplies are subject to a stringent selection process. They use exceptionally robust input filters to protect them against transient voltage peaks of up to 4 kV. They can also withstand voltage surges of 320 V AC up to 48 hours.

### Optimum thermal management

Thermal management is optimised to enable use at high ambient temperatures. The larger format of these power supplies compared with standard power supplies effectively reduces component temperature by 50%. Added to which, the critical components are separated as far as possible from internal heat sources.

**Vibration resilience**

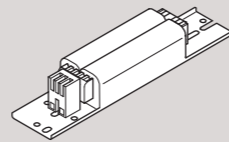
Particular care is taken to component positioning and fixing to obtain an exceptional level of resistance to vibration and permanent mechanical loadings.

**Limits**

Used in conjunction with special modules and appropriate thermal management, these power supplies can operate at temperatures up to +70 °C with no effect on their lifespan.

**Ferromagnetic power supplies**

Some extreme conditions are too challenging even for the most robust electronic power supplies. Extremely high temperatures increase the failure rate of electronic components. In ambient temperatures above 70 °C, ferromagnetic ballasts are the only possibility.

**Heavy duty**

Available only for T8 fluorescent tubes, ferromagnetic power supplies benefit from a particularly simple and robust design which allows them to cope with high temperatures, mains power supply interference (at the risk of damaging the lamp) and high amplitude vibrations. The main component of a so-called “inductive” electromagnetic ballast is a winding.

**Limits**

A starter is essential to lighting fluorescent lamps, and its power is boosted by the use of a condenser. Tubes powered by a 50 Hz supply flicker at a frequency of 100 Hz, which although invisible to the eye, has a perceptible stroboscopic effect that can cause dizziness and fatigue. The “duo” mounting used in our luminaires attenuates this effect, and also enables our luminaires to operate at ambient temperatures of 80 °C. We use only “very low loss” B1 class ballasts. In its separate power supply version, this technology allows us to offer lighting solutions that can cope with ambient temperatures of up to 100 °C (the Pauli HT 100 range).

**Commission Regulation (EC) No. 245/2009 Part 3**

Regulation EC 245/2009 (as modified by EC 347/2010) refers to implementation of Directive 2005/32/EC—the EuP (Energy using Products) directive—with regard to eco-design requirements for lighting products used in industry. It imposes a tiered series of efficiency and performance criteria, as well as obligations governing information and marking.

**Permitted use for special purposes**

Contrary to what is frequently reported, the third stage, which will come into effect in April 2017, will not prohibit the use of ferromagnetic power supplies, but will limit that use to very specific applications. However, given the efficiency of ferromagnetic technology, a number of exemptions are planned. As a result, (EU) regulation 1194/2012 contains exemptions for “special purpose products” that “have to withstand extreme physical conditions (such as vibrations or temperatures below -20 °C or above 50 °C)”. Directive 2006/42/EC permits the use of ferromagnetic ballast products for applications in the nuclear industry. This is consistent with technical choices made by ourselves a long time ago.

**Assured continuity of supply**

The special partnerships we maintain with our suppliers mean that we can give a commitment to supply ferromagnetic ballast luminaires that comply fully with current regulations after 2017 and in future decades. Our sales teams are there to help our customers in selecting appropriate equipment in accordance with this regulation.

# Incandescent lamps

Incandescent tungsten filament lamps are still the technology of choice for special applications. Requiring no ancillary gear, special incandescent lamps can provide lighting at very high temperatures.

## High-temperature incandescent lamps

These filament lamps use a special material to seal the fitting and glass bulb, allowing them to stand up robustly to very high temperatures. Properly installed, these sources can provide lighting in ambient temperatures of up to 200 °C.

E27  
200 °C



1

1. Continuous steel rolling mills  
ArcelorMittal  
Dunkirk  
France



2



3





4



5

5. EDF  
Nuclear power plant  
Golfech  
France



1



3



2



4

1. Poultry production line  
Gastronome  
Le Bignon  
France

2. Bread roll bakery  
Brioche Pasquier  
Étoile-sur-Rhône  
France

3. Shopping centre kitchen  
Ultra Lade  
Trondheim  
Norway

4. Restaurant kitchen  
Mercado di Ribeira  
Lisbon  
Portugal



1



2

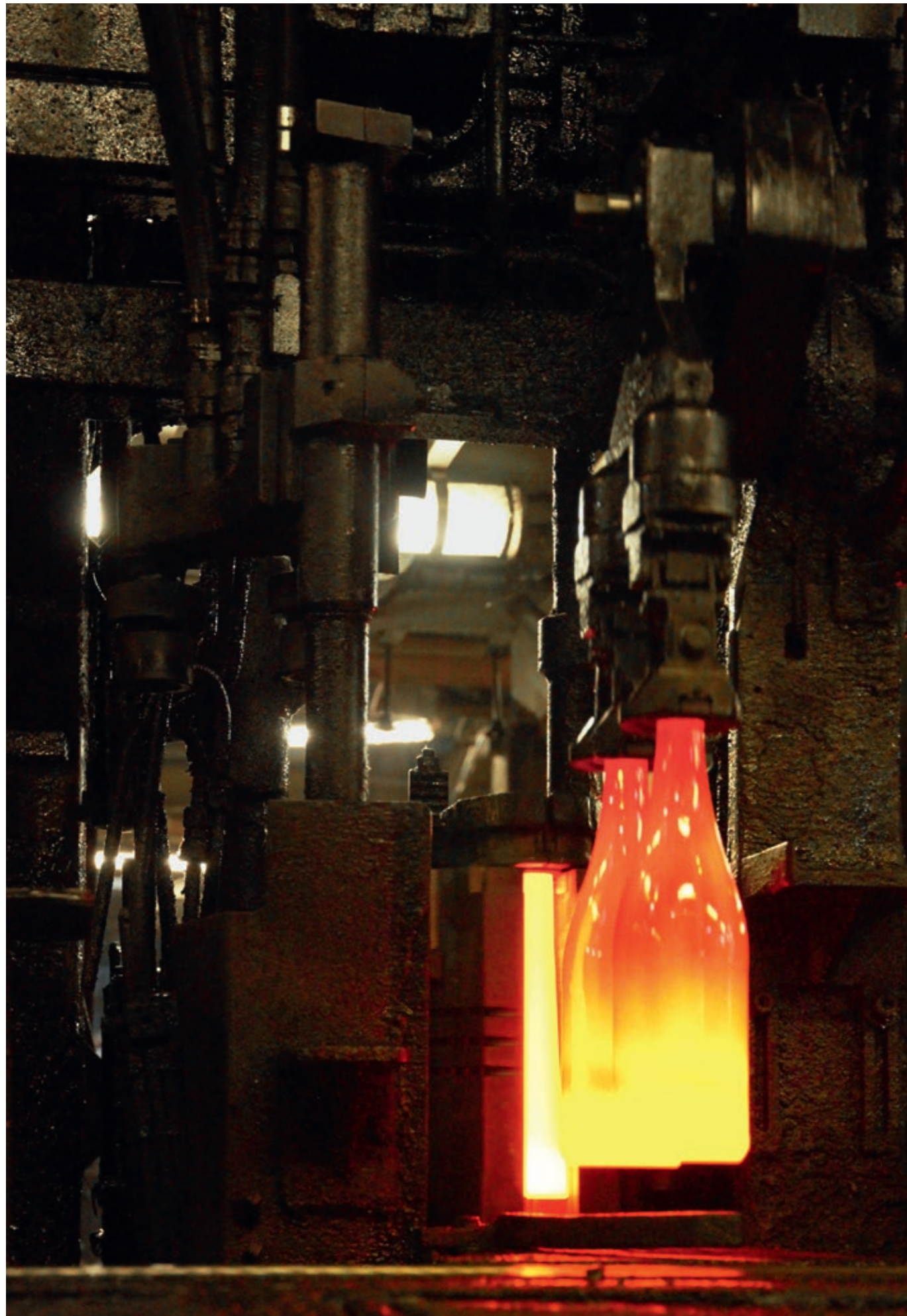


3

1. Gas burner  
E.ON  
Rotterdam  
Netherlands

2. Ready-prepared dishes  
production  
Nestlé  
Beauvais  
France

3. Enamelling dryer  
Villeroy & Boch  
Valence d'Agen  
France



1



2



3

1-2. Glass bottle production  
Verallia  
Cognac  
France

3. Paper pulp production  
International Paper  
Saillat-sur-Vienne  
France



1

# General lighting

These particularly powerful products are used to provide high levels of lighting for large spaces in order to carry out everyday industrial activities with maximum comfort and efficiency. These lighting solutions are designed for:

- floor area greater than 20 m<sup>2</sup>
- ceiling heights below 7 m

Tmax	Ranges	Tmax	Sources	Energy performance	Page
<b>High temperatures (coextruded polycarbonate/PMMA diffusers)</b>					
<70 °C	Bunsen 100	55 °C	LED	●●●●	42
	Bunsen 133	55 °C	LED	●●●●	43
	Einstein 100 HT	70 °C	T8	●●	44
	Einstein 133 HT	60 °C	T8	●●	45
	Joule 133	70 °C	LED	●●●●	46
<b>Very high temperatures (borosilicate glass diffusers)</b>					
<100 °C	Pauli 100 HT 80	80 °C	T8	●●	47
	Pauli 133 HT 80	80 °C	T8	●●	48
	Pauli 100 HT 100	100 °C	T8	●●	49
	Pauli 133 HT 100	100 °C	T8	●●	50
<200 °C	Pauli 133 HT 200	200 °C	Incandescent	●	51

# Lighting for high temperatures

Our lighting solutions deliver exceptionally long working life in extreme temperatures conditions, thanks to their housing system and specially designed components.

## Heat and light

Used in many industrial processes, from steel mills and iron foundries to paper mills, glass factories and food processing plants, heat has a major impact on the performance of traditional luminaires. It affects not only the quality of light, but also damages the electrical components and diffusers of traditional luminaires. That is why it is important to use special products to ensure comfortable, safe working conditions for operations teams and the process itself.

## Installation sizing

For correct lighting installation sizing, it is important to select luminaires whose maximum operating temperature is higher than the ambient temperature of the area to be lit. And since heat is concentrated in the highest parts of the building, the temperature to be taken into account for this calculation is the temperature nearest the ceiling.

## Resistance

Designed to provide efficient lighting at high temperatures, our luminaires are also resistant to:

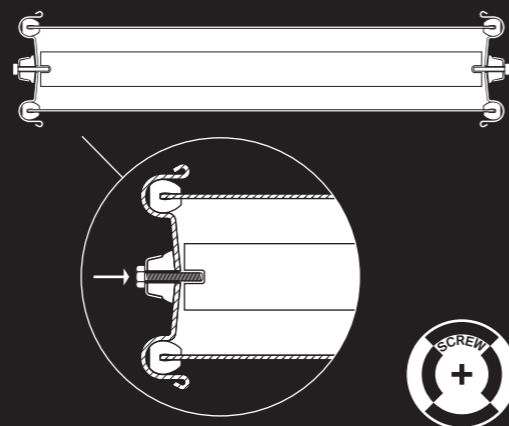
- wide variations in temperature
- high levels of continual vibration
- environments polluted by hydrocarbons
- particularly corrosive bactericidal agents
- abrasion

These stresses can cause premature damage to materials, followed by the spontaneous failure of standard equipment. Other factors, such as availability, bulk and accessibility, also require luminaire maintenance to be reduced to the minimum level achievable.

## The SCREW system

### A single-piece housing

A simple mechanical assembly of ultra-strong materials, the SCREW construction principle makes our products true single-piece housings offering high mechanical strength and chemical resistance. The diffuser and gear tray are held in compression by stainless steel end caps that make the system immune to impacts (IK10) and vibration. The luminaire is closed by the axial tightening of two stainless steel screws that apply a consistent pressure to the entire surface of the seal to guarantee a perfect hermetic seal (IP68/IP69 K). Throughout their life, the elastic deformation of the stainless steel end caps absorbs the expansion and mechanical stresses imposed on the casing of the luminaire. This ensures that it remains sealed long-term in the event of thermal shock or mechanical impact, independently of external conditions.



## The right diffuser for every application

At temperatures up to 70 °C, our luminaires are fitted with a composite coextruded polycarbonate/PMMA diffuser, which combines exceptional resistance to hydrocarbons and cleaning materials with high impact resistance (IK10). Luminaires for use in temperatures above this level are fitted with a borosilicate glass diffuser. This material is naturally suitable for applications in high ambient temperatures, and also offers exceptional resistance to chemical or abrasive aggression.

## LED

LED technology offers the highest level of energy efficiency. It is therefore recommended for luminaires that must reach the required luminous flux rapidly and tolerate a high number of on/off switching operations. We offer lighting solutions that operate at temperatures of up to +70 °C without compromising their lifespan.

LED

## Fluorescent lamps

### T8 lamps

These are the most commonly used light sources, and offer the best compromise between robustness, efficiency and lifespan. They make it possible to create lighting solutions for ambient temperatures of up to 100 °C.

T8

## High-temperature incandescent lamps

These filament lamps use a special material to seal the fitting and glass bulb, allowing them to stand up robustly to very high temperatures. Properly installed, these sources can provide lighting in ambient temperatures of up to 200 °C.

E27  
200 °C

## Mains electrical interference

The faults and fluctuations that can occur in industrial mains power supplies (3-phase imbalance, frequent voltage fluctuations, etc.) can damage luminaire gear not specifically designed to withstand them. Our products for LED luminaires contain robust electronic power supplies that are specifically protected against mains electrical interference and withstand voltage peaks of up to 4 kV and voltage surges of up to 320 V. They can also coexist in the same electrical system with ferromagnetic products, which are not sensitive to this type of interference.



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**Temperatures**

Our LED luminaires are fitted with robust electronic power supplies and high-temperature modules designed using special thermal management solutions to operate at temperatures up to 70 °C with no effect on their lifespan. Fluorescent luminaires using ferromagnetic gear make it possible to provide lighting solutions with the ability to resist ambient temperatures up to 100 °C.



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**Vibration resistance**

All our luminaires offer a high level of vibration resistance, thanks to their heavy-duty casings and specially-designed robust power supplies.

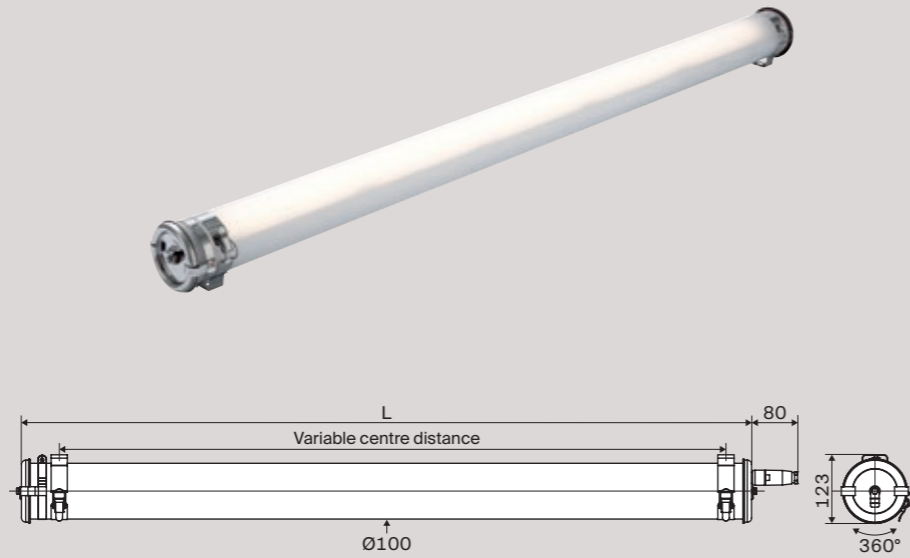
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# Bunsen 100

Max. temp.	55 °C
Technology	LED
Light output	2775 to 5550 lm
Control Gear	"Industry" rated

AG0213



## Key features

Suitable for high temperatures
Plug&Play-installation by disconnectable Plug
Very high resistance to corrosion
Long maintenance intervals
Durable and maintainable luminaire



## Options

<b>Finishings</b>	
End caps and fixing straps in Stainless Steel 316 L	MR

<b>Housing</b>	
Housing in Polycarbonate	PO

<b>Cable entries (black polyamide)</b>	
1 cable gland-Ø cable: 5 to 12 mm	113
1 cable gland-Ø cable: 7 to 14 mm	116
2 cable glands-Ø cable: 5 to 12 mm	213
2 cable glands-Ø cable: 7 to 14 mm	216

<b>Cable entries (nickel-coated brass)</b>	
1 cable gland-Ø cable: 5 to 14 mm	113 LN
2 cable glands-Ø cable: 5 to 54 mm	213 LN

<b>Disconnectable output cords with Plug (length 0,80 m)</b>	
High-temperature output cord fitted with a 3 pole WIELAND plug	CHT3

<b>Accessories</b>	
Protective roof	
Fixings for columns	
Spacer kit (5 or 20 cm) for fire safety standards	
4-outlet IP68 junction box	

## Principal part numbers

Lumens*	Designation	Part No.	Cons. (W)	Optic	T (K)	L (mm)
<b>Versions for new installations</b>						
3700	BUN100 14H830 POME PS3 SA BRS	3105 0050	33	☐	3000	1307
	BUN100 14H840 POME PS3 SA BRS	3105 0060			4000	
5550	BUN100 16H830 POME PS3 SA BRS	3105 0090	50	☐	3000	1850
	BUN100 16H840 POME PS3 SA BRS	3105 0100			4000	
<b>Retrofit versions: Like-for-like replacement</b>						
Equivalent to 1 × 36 W T8						
2775	BUN100 13H830 POME PS3 SA BRS	3105 0030	25	☐	3000	1007
	BUN100 13H840 POME PS3 SA BRS	3105 0040			4000	
Equivalent to 1 × 58 W T8						
4625	BUN100 15H830 POME PS3 SA BRS	3105 0070	43	☐	3000	1607
	BUN100 15H840 POME PS3 SA BRS	3105 0080			4000	

\* Light output of the luminaire

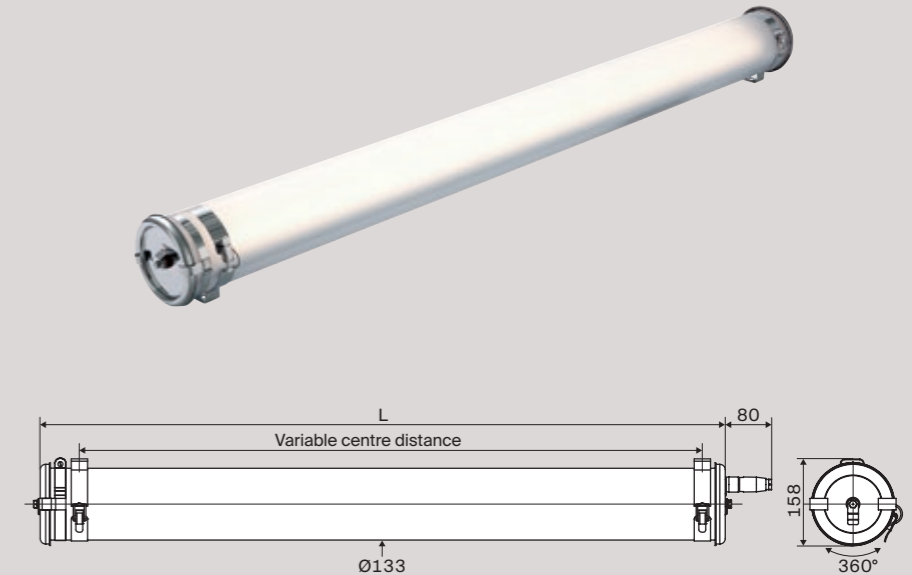
## Specifications

<b>Technical data</b>	
Light source	<ul style="list-style-type: none"> <li>High efficiency LED modules (155 lm/W)</li> <li>Special high-temperature LED modules</li> <li>50 000 h L80/B50 at max. operating temperature</li> <li>Replaceable LED modules</li> <li>CRI &gt; 80</li> </ul>
Optic	<ul style="list-style-type: none"> <li>Light mixing chamber</li> <li>Satin Diffuser to minimise glare</li> </ul>
Heat management	Heatsink in aluminium
Control Gear	<ul style="list-style-type: none"> <li>Special high-temperature electronic driver (non-dimmable)</li> <li>Resistance to voltage surge: 320 V AC, 48 h</li> <li>Supports voltage peaks &lt; 4 kV</li> </ul>
Power supply	220-240 V 50/60 Hz
Electrical class	Class I
Operating temperature	-20 °C to +55 °C
Connection	Disconnectable Plug Ø cable 8-10 mm (3 × 1,5 mm <sup>2</sup> )
Fixing	2 reinforced Stainless Steel fixing straps
Method of Construction	<ul style="list-style-type: none"> <li>Housing in one piece with high mechanical and chemical resistance</li> <li>Long-lasting imperviousness by axial screw fitting</li> </ul>
<b>Materials</b>	
Housing	Polycarbonate protected by a coextruded layer of PMMA
End caps, fixing straps...	Stainless Steel 304 L
Gaskets	EPDM
<b>Standards</b>	
Imperviousness	IP66, IP68 and IP69 K
Shock resistance	IK10
Fire resistance	650 °C
Vibration resistance	Meets the standard EN 60598-1 (tested according to CEI 60068-2-6)

# Bunsen 133

Max. temp.	55 °C
Technology	LED
Light output	5550 to 11100 lm
Control Gear	"Industry" rated

AG0213



## Key features

Suitable for high temperatures
Plug&Play-installation by disconnectable Plug
Very high resistance to corrosion
Long maintenance intervals
Durable and maintainable luminaire



## Options

<b>Finishings</b>	
End caps and fixing straps in Stainless Steel 316 L	MR

<b>Housing</b>	
Housing in Polycarbonate	PO

<b>Cable entries (black polyamide)</b>	
1 cable gland-Ø cable: 5 to 12 mm	113
1 cable gland-Ø cable: 7 to 14 mm	116
2 cable glands-Ø cable: 5 to 12 mm	213
2 cable glands-Ø cable: 7 to 14 mm	216

<b>Cable entries (nickel-coated brass)</b>	
1 cable gland-Ø cable: 5 to 14 mm	113 LN
2 cable glands-Ø cable: 5 to 54 mm	213 LN

<b>Disconnectable output cords with Plug (length 0,80 m)</b>	
High-temperature output cord fitted with a 3 pole WIELAND plug	CHT3

<b>Accessories</b>	
Protective roof	
Fixings for columns	
Spacer kit (5 or 20 cm) for fire safety standards	
4-outlet IP68 junction box	

## Principal part numbers

Lumens*	Designation	Part No.	Cons. (W)	Optic	T (K)	L (mm)
<b>Versions for new installations</b>						
7400	BUN133 24H830 POME PS3 SA BRS	3205 0030	66	☐	3000	1287
	BUN133 24H840 POME PS3 SA BRS	3205 0040			4000	
11100	BUN133 26H830 POME PS3 SA BRS	3205 0070	96	☐	3000	1850
	BUN133 26H840 POME PS3 SA BRS	3205 0080			4000	
<b>Retrofit versions: Like-for-like replacement</b>						
Equivalent to 2 × 36 W T8						
5550	BUN133 23H830 POME PS3 SA BRS	3205 0010	50	☐	3000	987
	BUN133 23H840 POME PS3 SA BRS	3205 0020			4000	
Equivalent to 2 × 58 W T8						
9250	BUN133 25H830 POME PS3 SA BRS	3205 0050	80	☐	3000	1587
	BUN133 25H840 POME PS3 SA BRS	3205 0060			4000	

\* Light output of the luminaire

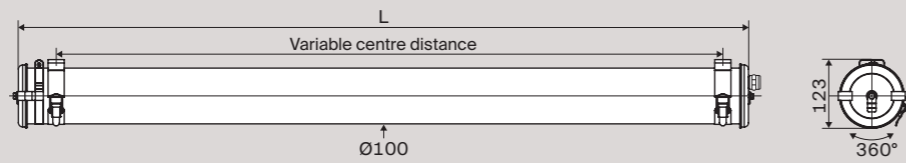
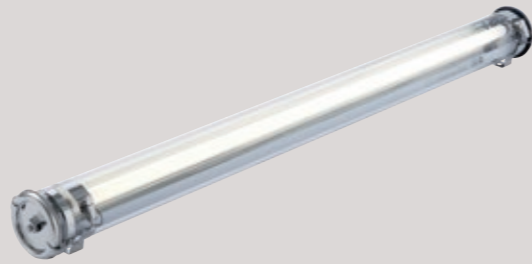
## Specifications

<b>Technical data</b>	
Light source	<ul style="list-style-type: none"> <li>High efficiency LED modules (155 lm/W)</li> <li>Special high-temperature LED modules</li> <li>50 000 h L80/B50 at max. operating temperature</li> <li>Replaceable LED modules</li> <li>CRI &gt; 80</li> </ul>
Optic	<ul style="list-style-type: none"> <li>Light mixing chamber</li> <li>Satin Diffuser to minimise glare</li> </ul>
Heat management	Heatsink in aluminium
Control Gear	<ul style="list-style-type: none"> <li>Special high-temperature electronic driver (non-dimmable)</li> <li>Resistance to voltage surge: 320 V AC, 48 h</li> <li>Supports voltage peaks &lt; 4 kV</li> </ul>
Power supply	220-240 V 50/60 Hz
Electrical class	Class I
Operating temperature	-20 °C to +55 °C
Connection	Disconnectable Plug Ø cable 8-10 mm (3 × 1,5 mm <sup>2</sup> )
Fixing	2 reinforced Stainless Steel fixing straps
Method of Construction	<ul style="list-style-type: none"> <li>Housing in one piece with high mechanical and chemical resistance</li> <li>Long-lasting imperviousness by axial screw fitting</li> </ul>
<b>Materials</b>	
Housing	Polycarbonate protected by a coextruded layer of PMMA
End caps, fixing straps...	Stainless Steel 304 L
Gaskets	EPDM
<b>Standards</b>	
Imperviousness	IP66, IP68 and IP69 K
Shock resistance	IK10
Fire resistance	650 °C
Vibration resistance	Meets the standard EN 60598-1 (tested according to CEI 60068-2-6)

# Einstein 100 HT

Max. temp.	70 °C
Technology	T8
Power	1 × 36 W and 1 × 58 W

AG0213



## Key features

Suitable for high temperatures
Impervious luminaire
Very high resistance to vibrations
Very high resistance to corrosion
Durable and maintainable luminaire



## Options

<b>Finishings</b>	
End caps and fixing straps in Stainless Steel 316 L	MR
<b>Housing</b>	
Housing in Polycarbonate	PO
<b>Cable entries (black polyamide)</b>	
1 cable gland–Ø cable: 7 to 14 mm	116
2 cable glands–Ø cable: 5 to 12 mm	213
2 cable glands–Ø cable: 7 to 14 mm	216
<b>Cable entries (nickel-coated brass)</b>	
1 cable gland–Ø cable: 5 to 14 mm	113 LN
2 cable glands–Ø cable: 5 to 54 mm	213 LN
<b>Disconnectable Plug</b>	
3 pole disconnectable Plug, lockable with a threaded ring	PS3
<b>Disconnectable output cords with Plug (length 0,80 m)</b>	
High-temperature output cord fitted with a 3 pole WIELAND plug	CHT3
<b>Accessories</b>	
Protective roof	
Fixings for columns	
Spacer kit (5 or 20 cm) for fire safety standards	
4-outlet IP68 junction box	

## Principal part numbers

Power	Designation	Part No.	Optic	L (mm)
<b>Versions without reflector</b>				
1 × 36 W	EIN100 136C G13 POME 113 BRS	1501 5022		1307
1 × 58 W	EIN100 158C G13 POME 113 BRS	1501 5050		1607
<b>Versions with extensive reflector</b>				
1 × 36 W	EIN100 136C G13 POME 113 RE BRS	1501 5048		1307
1 × 58 W	EIN100 158C G13 POME 113 RE BRS	1501 5051		1607
<b>Versions with intensive reflector</b>				
1 × 36 W	EIN100 136C G13 POME 113 RI BRS	1501 5049		1307
1 × 58 W	EIN100 158C G13 POME 113 RI BRS	1501 5052		1607

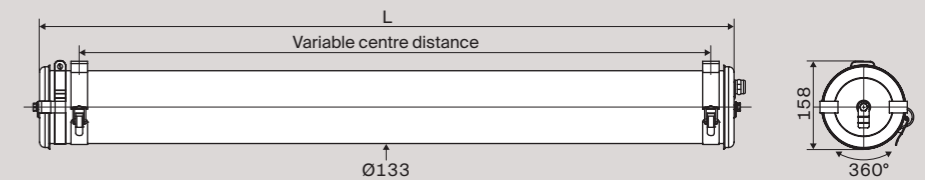
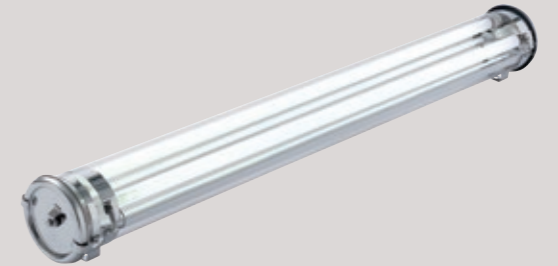
## Specifications

<b>Technical data</b>	
Light source	1 x T8 lamp, not included
Optic	<ul style="list-style-type: none"> <li>White powder coated gear tray serving as reflector for diffuse general lighting</li> <li>Extensive reflector (wide beam) in anodised aluminum sheet</li> <li>Intensive reflector (narrow beam) in anodised aluminium sheet</li> </ul>
Control Gear	Ferromagnetic Control Gear with very low losses (EEI B1)
Power supply	230 V 50 Hz
Electrical class	Class I
Operating temperature	-20 °C to +70 °C
Connection	Cable gland in black polyamid for Ø cable 5–12 mm (3 × 2,5 mm <sup>2</sup> )
Fixing	2 reinforced Stainless Steel fixing straps
Method of Construction	<ul style="list-style-type: none"> <li>Housing in one piece with high mechanical and chemical resistance</li> <li>Long-lasting imperviousness by axial screw fitting</li> </ul>
<b>Materials</b>	
Housing	Polycarbonate protected by a coextruded layer of PMMA
End caps, fixing straps...	Stainless Steel 304 L
Gaskets	EPDM
<b>Standards</b>	
Imperviousness	IP66, IP68 and IP69 K
Shock resistance	IK10
Fire resistance	650 °C
Vibration resistance	Meets the standard EN 60598-1 (tested according to CEI 60068-2-6)

# Einstein 133 HT

Max. temp.	60 °C
Technology	T8
Power	2 × 36 W and 2 × 58 W

AG0213



## Key features

Suitable for high temperatures
Impervious luminaire
Very high resistance to vibrations
Very high resistance to corrosion
Durable and maintainable luminaire



## Options

<b>Finishings</b>	
End caps and fixing straps in Stainless Steel 316 L	MR
<b>Housing</b>	
Housing in Polycarbonate	PO
<b>Cable entries (black polyamide)</b>	
1 cable gland–Ø cable: 7 to 14 mm	116
2 cable glands–Ø cable: 5 to 12 mm	213
2 cable glands–Ø cable: 7 to 14 mm	216
<b>Cable entries (nickel-coated brass)</b>	
1 cable gland–Ø cable: 5 to 14 mm	113 LN
2 cable glands–Ø cable: 5 to 54 mm	213 LN
<b>Disconnectable Plug</b>	
3 pole disconnectable Plug, lockable with a threaded ring	PS3
<b>Disconnectable output cords with Plug (length 0,80 m)</b>	
High-temperature output cord fitted with a 3 pole WIELAND plug	CHT3
<b>Accessories</b>	
Protective roof	
Fixings for columns	
Spacer kit (5 or 20 cm) for fire safety standards	
4-outlet IP68 junction box	

## Principal part numbers

Power	Designation	Part No.	Optic	L (mm)
<b>Versions without reflector</b>				
2 × 36 W	EIN133 236C G13 POME 113 BRS	1601 5061		1287
2 × 58 W	EIN133 258C G13 POME 113 BRS	1601 5037		1587
<b>Versions with extensive reflector</b>				
2 × 36 W	EIN133 236C G13 POME 113 RE BRS	1601 5062		1287
2 × 58 W	EIN133 258C G13 POME 113 RE BRS	1601 5045		1587

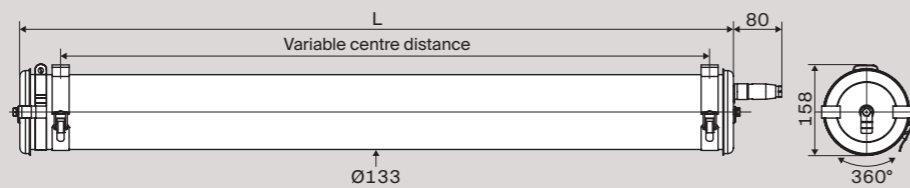
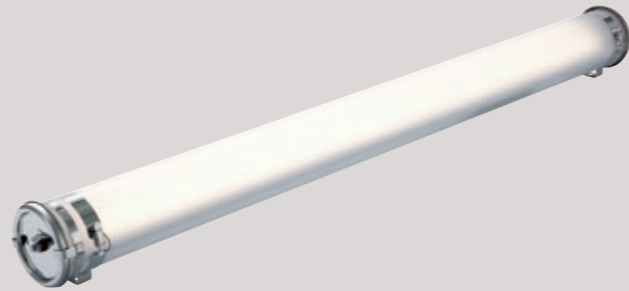
## Specifications

<b>Technical data</b>	
Light source	2 x T8 lamps, not included
Optic	<ul style="list-style-type: none"> <li>White powder coated gear tray serving as reflector for diffuse general lighting</li> <li>Extensive reflector (wide beam) in anodised aluminum sheet</li> </ul>
Control Gear	Ferromagnetic Control Gear with very low losses (EEI B1)
Power supply	230 V 50 Hz
Electrical class	Class I
Operating temperature	-20 °C to +60 °C
Connection	Cable gland in black polyamid for Ø cable 5–12 mm (3 × 2,5 mm <sup>2</sup> )
Fixing	2 reinforced Stainless Steel fixing straps
Method of Construction	<ul style="list-style-type: none"> <li>Housing in one piece with high mechanical and chemical resistance</li> <li>Long-lasting imperviousness by axial screw fitting</li> </ul>
<b>Materials</b>	
Housing	Polycarbonate protected by a coextruded layer of PMMA
End caps, fixing straps...	Stainless Steel 304 L
Gaskets	EPDM
<b>Standards</b>	
Imperviousness	IP66, IP68 and IP69 K
Shock resistance	IK10
Fire resistance	650 °C
Vibration resistance	Meets the standard EN 60598-1 (tested according to CEI 60068-2-6)

# Joule 133

Max. temp.	70 °C
Technology	LED
Light output	2475 to 4125 lm
Control Gear	"Industry" rated

AG0213



## Key features

Suitable for high temperatures
Plug&Play-installation by disconnectable Plug
Suitable for repeated switching on and off
Long maintenance intervals
Durable and maintainable luminaire



## Options

<b>Finishings</b>	
End caps and fixing straps in Stainless Steel 316 L	MR
<b>Housing</b>	
Housing in Polycarbonate	PO
<b>Cable entries (black polyamide)</b>	
1 cable gland-Ø cable: 5 to 12 mm	113
1 cable gland-Ø cable: 7 to 14 mm	116
2 cable glands-Ø cable: 5 to 12 mm	213
2 cable glands-Ø cable: 7 to 14 mm	216
<b>Cable entries (nickel-coated brass)</b>	
1 cable gland-Ø cable: 5 to 14 mm	113 LN
2 cable glands-Ø cable: 5 to 54 mm	213 LN
<b>Disconnectable output cords with Plug (length 0,80 m)</b>	
High-temperature output cord fitted with a 3 pole WIELAND plug	CHT3
<b>Accessories</b>	
Protective roof	
Fixings for columns	
Spacer kit (5 or 20 cm) for fire safety standards	
4-outlet IP68 junction box	

## Principal part numbers

Lumens*	Designation	Part No.	Cons. (W)	Optic	T (K)	L (mm)
<b>Versions for new installations</b>						
2475	JOU133 13H830 POME PS3 SA BRS	3212 0030	23		3000	987
	JOU133 13H840 POME PS3 SA BRS	3212 0040			4000	
4125	JOU133 15H830 POME PS3 SA BRS	3212 0050	38		3000	1587
	JOU133 15H840 POME PS3 SA BRS	3212 0060			4000	

\* Light output of the luminaire

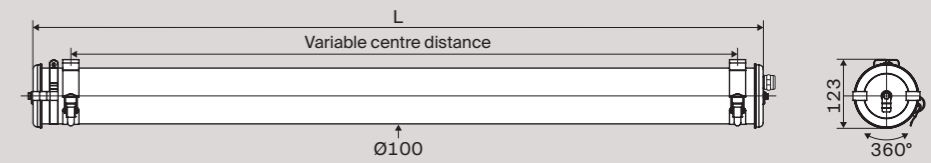
## Specifications

Technical data	
Light source	<ul style="list-style-type: none"> <li>High efficiency LED modules (160 lm/W)</li> <li>Special high-temperature LED modules</li> <li>50 000 h L80/B50 at max. operating temperature</li> <li>Replaceable LED modules</li> <li>CRI &gt; 80</li> </ul>
Optic	<ul style="list-style-type: none"> <li>Light mixing chamber</li> <li>Satin Diffuser to minimise glare</li> </ul>
Heat management	Heatsink in aluminium
Control Gear	<ul style="list-style-type: none"> <li>Special high-temperature electronic driver (non-dimmable)</li> <li>Resistance to voltage surge: 320 V AC, 48 h</li> <li>Supports voltage peaks &lt; 4 kV</li> </ul>
Power supply	220-240 V 50/60 Hz
Electrical class	Class I
Operating temperature	-20 °C to +70 °C
Connection	Disconnectable Plug Ø cable 8-10 mm (3 × 1,5 mm <sup>2</sup> )
Fixing	2 reinforced Stainless Steel fixing straps
Method of Construction	<ul style="list-style-type: none"> <li>Housing in one piece with high mechanical and chemical resistance</li> <li>Long-lasting imperviousness by axial screw fitting</li> </ul>
<b>Materials</b>	
Housing	Polycarbonate protected by a coextruded layer of PMMA
End caps, fixing straps...	Stainless Steel 304 L
Gaskets	EPDM
<b>Standards</b>	
Imperviousness	IP66, IP68 and IP69 K
Shock resistance	IK10
Fire resistance	650 °C
Vibration resistance	Meets the standard EN 60598-1 (tested according to CEI 60068-2-6)

# Pauli 100 HT 80

Max. temp.	80 °C
Technology	T8
Power	1 × 36 W and 1 × 58 W
Housing	Borosilicate glass

AG0213



## Key features

Suitable for very high temperatures
Impervious luminaire
Suitable for industrial environments
Resistant to aggressive chemical environments
Durable and maintainable luminaire



## Options

<b>Finishings</b>	
End caps and fixing straps in Stainless Steel 316 L	MR
<b>Fixings</b>	
Reinforced fixing straps with HSHC screw	BRV
Shock-resistant fixing straps with HSHC screw	BAC
<b>Cable entries (black polyamide)</b>	
1 cable gland-Ø cable: 7 to 14 mm	116
2 cable glands-Ø cable: 5 to 12 mm	213
2 cable glands-Ø cable: 7 to 14 mm	216
<b>Cable entries (nickel-coated brass)</b>	
1 cable gland-Ø cable: 5 to 14 mm	113 LN
2 cable glands-Ø cable: 5 to 54 mm	213 LN
<b>Disconnectable output cords with Plug (length 0,80 m)</b>	
High-temperature output cord fitted with a 3 pole WIELAND plug	CHT3
<b>Accessories</b>	
Protective roof	
Fixings for columns	
4-outlet IP68 junction box	

## Principal part numbers

Power	Designation	Part No.	Optic	L (mm)
<b>Versions without reflector</b>				
1 × 36 W	PAU100 HT80 136C G13 PY 113 BRS	3510 0021		1307
1 × 58 W	PAU100 HT80 158C G13 PY 113 BRS	3510 0031		1607
<b>Versions with extensive reflector</b>				
1 × 36 W	PAU100 HT80 136C G13 PY 113 RE BRS	3510 0161		1307
1 × 58 W	PAU100 HT80 158C G13 PY 113 RE BRS	3510 5015		1607
<b>Versions with intensive reflector</b>				
1 × 36 W	PAU100 HT80 136C G13 PY 113 RI BRS	3510 5008		1307
1 × 58 W	PAU100 HT80 158C G13 PY 113 RI BRS	3510 5004		1607

## Specifications

Technical data	
Light source	1 × T8 lamp, not included
Optic	<ul style="list-style-type: none"> <li>White powder coated gear tray serving as reflector for diffuse general lighting</li> <li>Extensive reflector (wide beam) in anodised aluminum sheet</li> <li>Intensive reflector (narrow beam) in anodised aluminium sheet</li> </ul>
Control Gear	Ferromagnetic Control Gear with very low losses (EEI B1)
Power supply	230 V 50 Hz
Electrical class	Class I
Operating temperature	-20 °C to +80 °C
Connection	Cable gland in black polyamid for Ø cable 5-12 mm (3 × 2,5 mm <sup>2</sup> )
Fixing	2 reinforced Stainless Steel fixing straps
Method of Construction	<ul style="list-style-type: none"> <li>Housing in one piece with high mechanical and chemical resistance</li> <li>Long-lasting imperviousness by axial screw fitting</li> </ul>
<b>Materials</b>	
Housing	Borosilicate glass
End caps, fixing straps...	Stainless Steel 304 L
Gaskets	Silicone
<b>Standards</b>	
Imperviousness	IP66, IP68 and IP69 K
Shock resistance	IK07
Fire resistance	Non-flammable
Vibration resistance	Meets the standard EN 60598-1 (tested according to CEI 60068-2-6)

# Pauli 133 HT 80

Max. temp.	80 °C
Technology	T8
Power	2 × 36 W and 2 × 58 W
Housing	Borosilicate glass

AG0213



## Key features

Suitable for very high temperatures
Impervious luminaire
Suitable for industrial environments
Resistant to aggressive chemical environments
Durable and maintainable luminaire



## Options

<b>Finishings</b>	
End caps and fixing straps in Stainless Steel 316 L	MR
<b>Fixings</b>	
Reinforced fixing straps with HSHC screw	BRV
Shock-resistant fixing straps with HSHC screw	BAC
<b>Cable entries (black polyamide)</b>	
1 cable gland-Ø cable: 7 to 14 mm	116
2 cable glands-Ø cable: 5 to 12 mm	213
2 cable glands-Ø cable: 7 to 14 mm	216
<b>Cable entries (nickel-coated brass)</b>	
1 cable gland-Ø cable: 5 to 14 mm	113 LN
2 cable glands-Ø cable: 5 to 54 mm	213 LN
<b>Disconnectable output cords with Plug (length 0,80 m)</b>	
High-temperature output cord fitted with a 3 pole WIELAND plug	CHT3
<b>Accessories</b>	
Protective roof	
Fixings for columns	
4-outlet IP68 junction box	

## Principal part numbers

Power	Designation	Part No.	Optic	L (mm)
<b>Versions without reflector</b>				
2 × 36 W	PAU133 HT80 236C G13 PY 113 BRS	3610 0021		1287
2 × 58 W	PAU133 HT80 258C G13 PY 113 BRS	3610 0031		1587
<b>Versions with extensive reflector</b>				
2 × 36 W	PAU133 HT80 236C G13 PY 113 RE BRS	3610 0421		1287
2 × 58 W	PAU133 HT80 258C G13 PY 113 RE BRS	3610 0411		1587

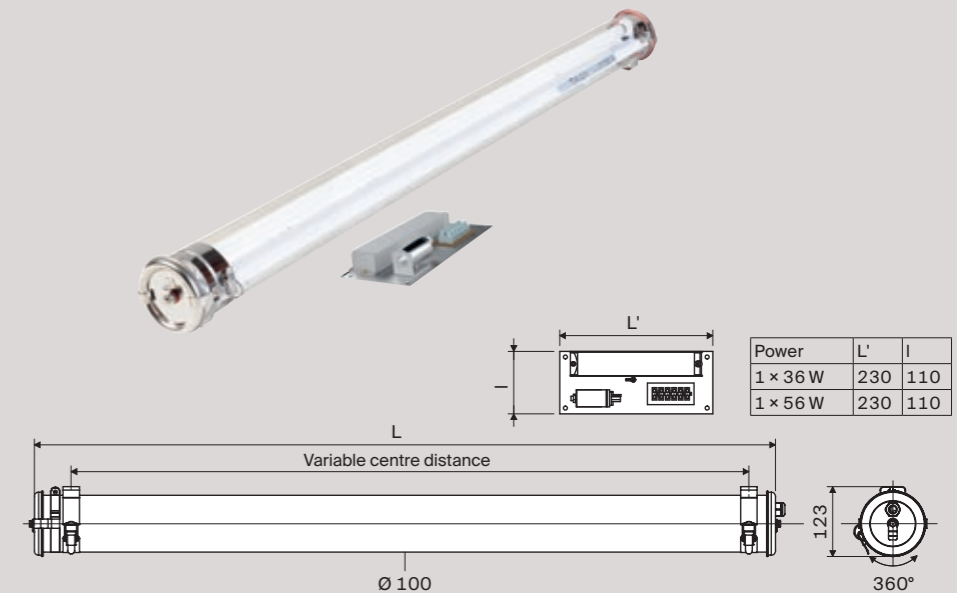
## Specifications

<b>Technical data</b>	
Light source	2 × T8 lamps, not included
Optic	<ul style="list-style-type: none"> <li>White powder coated gear tray serving as reflector for diffuse general lighting</li> <li>Extensive reflector (wide beam) in anodised aluminum sheet</li> </ul>
Control Gear	Ferromagnetic Control Gear with very low losses (EEI B1)
Power supply	230 V 50 Hz
Electrical class	Class I
Operating temperature	-20 °C to +80 °C
Connection	Cable gland in black polyamid for Ø cable 5-12 mm (3 × 2,5 mm <sup>2</sup> )
Fixing	2 reinforced Stainless Steel fixing straps
Method of Construction	<ul style="list-style-type: none"> <li>Housing in one piece with high mechanical and chemical resistance</li> <li>Long-lasting imperviousness by axial screw fitting</li> </ul>
<b>Materials</b>	
Housing	Borosilicate glass
End caps, fixing straps...	Stainless Steel 304 L
Gaskets	Silicone
<b>Standards</b>	
Imperviousness	IP66, IP68 and IP69 K
Shock resistance	IK07
Fire resistance	Non-flammable
Vibration resistance	Meets the standard EN 60598-1 (tested according to CEI 60068-2-6)

# Pauli 100 HT 100

Max. temp.	100 °C
Technology	T8
Power	1 × 36 W and 1 × 58 W
Housing	Borosilicate glass

AG0213



## Key features

Suitable for very high temperatures
Impervious luminaire
Suitable for industrial environments
Resistant to aggressive chemical environments
Durable and maintainable luminaire



## Options

<b>Finishings</b>	
End caps and fixing straps in Stainless Steel 316 L	MR
<b>Fixings</b>	
Reinforced fixing straps with HSHC screw	BRV
Shock-resistant fixing straps with HSHC screw	BAC
<b>Cable entries (black polyamide)</b>	
1 cable gland-Ø cable: 7 to 14 mm	116
<b>Cable entries (nickel-coated brass)</b>	
1 cable gland-Ø cable: 5 to 14 mm	113 LN
<b>Disconnectable output cords with Plug (length 0,80 m)</b>	
High-temperature output cord fitted with a 3 pole WIELAND plug	CHT3
<b>Accessories</b>	
Protective roof	
Fixings for columns	
4-outlet IP68 junction box	

## Principal part numbers

Power	Designation	Part No.	Optic	L (mm)
<b>Versions without reflector</b>				
1 × 36 W	PAU100 HT100 136CS G13 PY 113 BRS	3513 0021		1307
1 × 58 W	PAU100 HT100 158CS G13 PY 113 BRS	3513 0031		1607
<b>Versions with extensive reflector</b>				
1 × 36 W	PAU100 HT100 136CS G13 PY 113 RE BRS	3513 5011		1307
1 × 58 W	PAU100 HT100 158CS G13 PY 113 RE BRS	3513 5005		1607
<b>Versions with intensive reflector</b>				
1 × 36 W	PAU100 HT100 136CS G13 PY 113 RI BRS	3513 5012		1307
1 × 58 W	PAU100 HT100 158CS G13 PY 113 RI BRS	3513 5001		1607

Maximum distance between luminaire and gear tray: 50 m

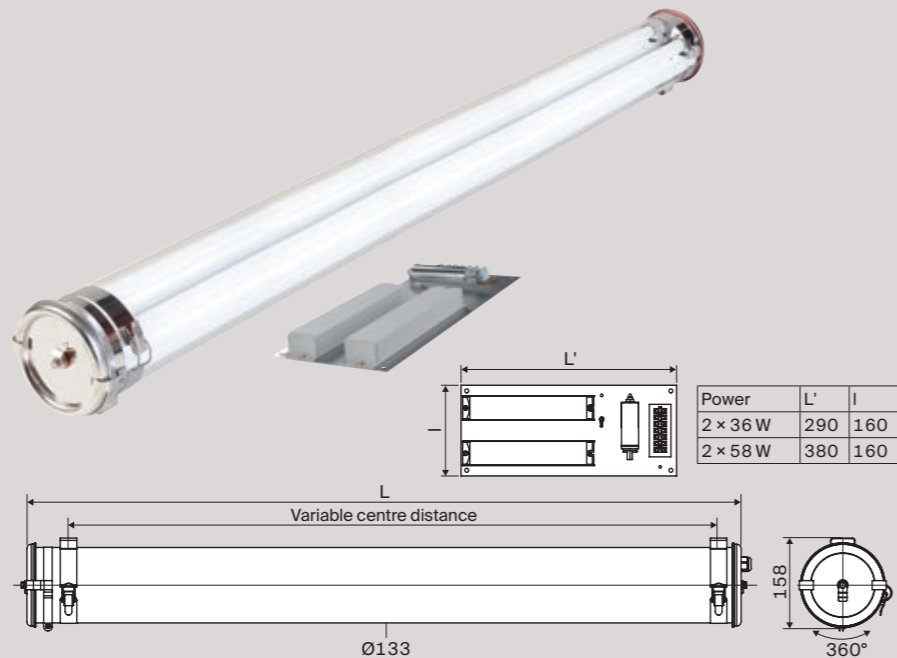
## Specifications

<b>Technical data</b>	
Light source	1 × T8 lamp, not included
Optic	<ul style="list-style-type: none"> <li>White powder coated gear tray serving as reflector for diffuse general lighting</li> <li>Extensive reflector (wide beam) in anodised aluminum sheet</li> <li>Intensive reflector (narrow beam) in anodised aluminium sheet</li> </ul>
Control Gear	<ul style="list-style-type: none"> <li>Ferromagnetic Control Gear with very low losses (EEI B1)</li> <li>Separate gear tray included in delivery</li> </ul>
Power supply	230 V 50 Hz
Electrical class	Class I
Operating temperature	-20 °C to +100 °C
Connection	<ul style="list-style-type: none"> <li>Cable gland in black polyamid for Ø cable 5-12 mm (3 × 2,5 mm<sup>2</sup>)</li> <li>Separate gear tray (6 × 2,5 mm<sup>2</sup>)</li> </ul>
Fixing	2 reinforced Stainless Steel fixing straps
Method of Construction	<ul style="list-style-type: none"> <li>Housing in one piece with high mechanical and chemical resistance</li> <li>Long-lasting imperviousness by axial screw fitting</li> </ul>
<b>Materials</b>	
Housing	Borosilicate glass
End caps, fixing straps...	Stainless Steel 304 L
Gaskets	Silicone
<b>Standards</b>	
Imperviousness	IP66, IP68 and IP69 K
Shock resistance	IK07
Fire resistance	Non-flammable
Vibration resistance	Meets the standard EN 60598-1 (tested according to CEI 60068-2-6)

# Pauli 133 HT 100

Max. temp.	100 °C
Technology	T8
Power	2 × 36 W and 2 × 58 W
Housing	Borosilicate glass

AG0213



## Key features

Suitable for very high temperatures
Impervious luminaire
Suitable for industrial environments
Resistant to aggressive chemical environments
Durable and maintainable luminaire



## Options

<b>Finishings</b>	
End caps and fixing straps in Stainless Steel 316 L	MR
<b>Fixings</b>	
Reinforced fixing straps with HSHC screw	BRV
Shock-resistant fixing straps with HSHC screw	BAC
<b>Cable entries (black polyamide)</b>	
1 cable gland-Ø cable: 7 to 14 mm	116
<b>Cable entries (nickel-coated brass)</b>	
1 cable gland-Ø cable: 5 to 14 mm	113 LN
<b>Disconnectable output cords with Plug (length 0,80 m)</b>	
High-temperature cord outlet fitted with a WIELAND 4-pin socket	CHT4
<b>Accessories</b>	
Protective roof	
Fixings for columns	
4-outlet IP68 junction box	

## Principal part numbers

Power	Designation	Part No.	Optic	L (mm)
<b>Versions without reflector</b>				
2 × 36 W	PAU133 HT100 236CS G13 PY 113 BRS	3613 0021		1287
2 × 58 W	PAU133 HT100 258CS G13 PY 113 BRS	3613 0031		1587
<b>Versions with extensive reflector</b>				
2 × 36 W	PAU133 HT100 236CS G13 PY 113 RE BRS	3613 5001		1287
2 × 58 W	PAU133 HT100 258CS G13 PY 113 RE BRS	3613 0161		1587

Maximum distance between luminaire and gear tray: 50 m

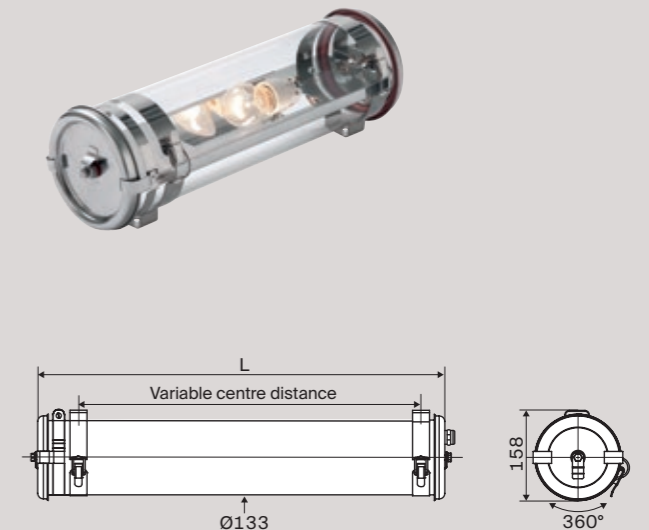
## Specifications

<b>Technical data</b>	
Light source	2 × T8 lamps, not included
Optic	<ul style="list-style-type: none"> <li>White powder coated gear tray serving as reflector for diffuse general lighting</li> <li>Extensive reflector (wide beam) in anodised aluminum sheet</li> </ul>
Control Gear	<ul style="list-style-type: none"> <li>Ferromagnetic Control Gear with very low losses (EEI B1)</li> <li>Separate gear tray included in delivery</li> </ul>
Power supply	230 V 50 Hz
Electrical class	Class I
Operating temperature	-20 °C to +100 °C
Connection	<ul style="list-style-type: none"> <li>Cable gland in black polyamid for Ø cable 5-12 mm (3 × 2,5 mm<sup>2</sup>)</li> <li>Separate gear tray (7 × 2,5 mm<sup>2</sup>)</li> </ul>
Fixing	2 reinforced Stainless Steel fixing straps
Method of Construction	<ul style="list-style-type: none"> <li>Housing in one piece with high mechanical and chemical resistance</li> <li>Long-lasting imperviousness by axial screw fitting</li> </ul>
<b>Materials</b>	
Housing	Borosilicate glass
End caps, fixing straps...	Stainless Steel 304 L
Gaskets	Silicone
<b>Standards</b>	
Imperviousness	IP66, IP68 and IP69 K
Shock resistance	IK07
Fire resistance	Non-flammable
Vibration resistance	Meets the standard EN 60598-1 (tested according to CEI 60068-2-6)

# Pauli 133 HT 200

Max. temp.	200 °C
Technology	E27 incandescence lamp *
Power	1 × 60 W and 2 × 60 W
Housing	Borosilicate glass

AG0213



## Key features

Suitable for very high temperatures
Impervious luminaire
Suitable for industrial environments
Resistant to aggressive chemical environments
Durable and maintainable luminaire



## Options

<b>Finishings</b>	
End caps and fixing straps in Stainless Steel 316 L	MR
<b>Fixings</b>	
Reinforced fixing straps with HSHC screw	BRV
<b>Cable entries (nickel-coated brass)</b>	
2 cable glands-Ø cable: 5 to 8 mm	213 LN
<b>Accessories</b>	
Fixings for columns	

## Principal part numbers

Power	Designation	Part No.	Optic	L (mm)
<b>1-lamp version</b>				
1 × 60 W	PAU133 HT200 1 × 60W E27 PY 113 LN BRS	3617 0011		464
<b>2-lamp version</b>				
2 × 60 W	PAU133 HT200 2 × 60W E27 PY 113 LN BRS	3617 0021		677

\* Special high-temperature lamp to be ordered separately Part No.: L-60-INC-HT

## Specifications

<b>Technical data</b>	
Light source	1 or 2 special incandescent oven lamps E27 (to be ordered separately)
Optic	<ul style="list-style-type: none"> <li>Stainless steel tray</li> <li>Reflector in anodised aluminum</li> </ul>
Power supply	230 V 50 Hz
Electrical class	Class I
Operating temperature	-20 °C to +200 °C
Connection	Cable gland in nickel-coated brass for Ø cable 5-8 mm (3 × 2,5 mm <sup>2</sup> )
Fixing	2 reinforced Stainless Steel fixing straps
Method of Construction	<ul style="list-style-type: none"> <li>Housing in one piece with high mechanical and chemical resistance</li> <li>Long-lasting imperviousness by axial screw fitting</li> </ul>
<b>Materials</b>	
Housing	Borosilicate glass
End caps, fixing straps...	Stainless Steel 304 L
Gaskets	Silicone
<b>Standards</b>	
Imperviousness	IP66, IP68 and IP69 K
Shock resistance	IK07
Fire resistance	Non-flammable
Vibration resistance	Meets the standard EN 60598-1 (tested according to CEI 60068-2-6)

# Task lighting

The reduced size of these products means that they can be installed in confined spaces and easily directed towards the area to be lit. These lighting solutions are designed for:

- small production areas (floor areas smaller than 20 m<sup>2</sup>),
- additional lighting for working areas

Tmax	Ranges	Tmax	Sources	Quantity of light	Compactness	Energy performance	Page
<b>High temperatures (coextruded polycarbonate/PMMA diffusers)</b>							
<70 °C	Bunsen 100	55 °C	LED	●●	●●	●●●●	58
	Hooke 100 HT	50 °C	2G11	●●●	●●●	●●	59
	Einstein 100 HT	70 °C	T8	●	●●	●●	60
	Einstein 133 HT	60 °C	T8	●●	●	●●	61
	Rankine 70	70 °C	LED	●●	●●●	●●●●	62
	Joule 133	70 °C	LED	●●	●	●●●●	63
<b>Very high temperatures (borosilicate glass diffusers)</b>							
<100 °C	Pauli 100 HT 80	80 °C	T8	●	●●	●●	64
	Pauli 133 HT 80	80 °C	T8	●●	●	●●	65
	Pauli 100 HT 100	100 °C	T8	●	●●	●●	66
	Pauli 133 HT 100	100 °C	T8	●●	●	●●	67
<200 °C	Pauli 133 HT 200	200 °C	Incandescent	●	●	●	68

# Lighting for high temperatures

Our lighting solutions deliver exceptionally long working life in extreme temperatures conditions, thanks to their housing system and specially designed components.

## Heat and light

Used in many industrial processes, from steel mills and iron foundries to paper mills, glass factories and food processing plants, heat has a major impact on the performance of traditional luminaires. It affects not only the quality of light, but also damages the electrical components and diffusers of traditional luminaires. That is why it is important to use special products to ensure comfortable, safe working conditions for operations teams and the process itself.

## Resistance

Designed to provide efficient lighting at high temperatures, our luminaires are also resistant to:

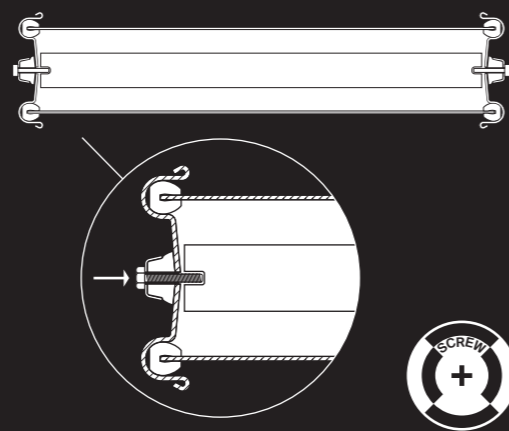
- wide variations in temperature
- high levels of continual vibration
- environments polluted by hydrocarbons
- particularly corrosive bactericidal agents
- abrasion

These stresses can cause premature damage to materials, followed by the spontaneous failure of standard equipment. Other factors, such as availability, bulk and accessibility, also require luminaire maintenance to be reduced to the minimum level achievable.

## The SCREW system

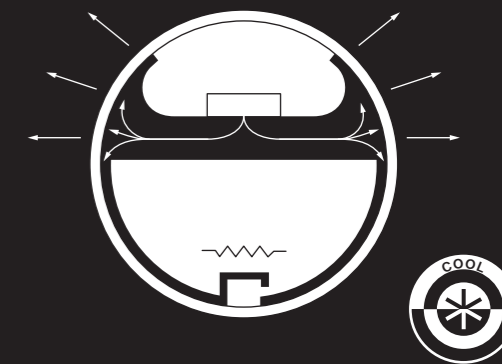
### A single-piece housing

A simple mechanical assembly of ultra-strong materials, the SCREW construction principle makes our products true single-piece housings offering high mechanical strength and chemical resistance. The diffuser and gear tray are held in compression by stainless steel end caps that make the system immune to impacts (IK10) and vibration. The luminaire is closed by the axial tightening of two stainless steel screws that apply a consistent pressure to the entire surface of the seal to guarantee a perfect hermetic seal (IP68/IP69K). Throughout their life, the elastic deformation of the stainless steel end caps absorbs the expansion and mechanical stresses imposed on the casing of the luminaire. This ensures that it remains sealed long term in the event of thermal shock or mechanical impact, independently of external conditions.



## The COOL system

Designed around LED technology, the COOL construction principle ensures the best balance between optimal heat management and compact size. The LED modules are mounted on a tray fabricated from extruded aluminium—a material known for its effective passive heat dissipation—to provide a direct and even spread of heat. The tray is sprung against the internal surface of the luminaire diffuser to optimise heat dissipation. The central slide that carries the power supply fulfils two functions: ensuring easier maintenance, and providing thermal compartmentalisation between the LED modules and the driver to limit heat transfer between them. The luminaire is closed by tightening the screw beneath the cable gland to ensure consistent radial expansion over the surface of the seal to provide a perfect IP68/IP69K compliant hermetic seal.



## The right diffuser for every application

At temperatures up to 70°C, our luminaires are fitted with a composite coextruded polycarbonate/PMMA diffuser, which combines exceptional resistance to hydrocarbons and cleaning materials with high impact resistance (IK10). Luminaires for use in temperatures above this level are fitted with a borosilicate glass diffuser. This material is naturally suitable for applications in high ambient temperatures, and also offers exceptional resistance to chemical or abrasive aggression.



## LED

LED technology offers the highest level of energy efficiency. It is therefore recommended for luminaires that must reach the required luminous flux rapidly and tolerate a high number of on/off switching operations. We offer lighting solutions that operate at temperatures of up to +70°C without compromising their lifespan.



## Fluorescent lamps

### T8 lamps




These are the most commonly used light sources, and offer the best compromise between robustness, efficiency and lifespan. They make it possible to create lighting solutions for ambient temperatures of up to 100°C.



## Compact fluorescent lamps

These lamps offer the highest density of luminous flux at a shorter length, and the luminaires that use them are the most compact of all. These sources can provide lighting in ambient temperatures of up to 50°C.



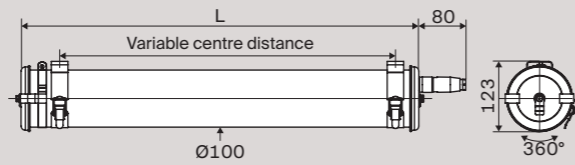
<b>High-temperature incandescent lamps</b>	These filament lamps use a special material to seal the fitting and glass bulb, allowing them to stand up robustly to very high temperatures. Properly installed, these sources can provide lighting in ambient temperatures up to 200 °C.	
<b>Electrical interference</b>	The faults and fluctuations that can occur in industrial mains power supplies (3-phase imbalance, frequent voltage fluctuations, etc.) can damage luminaire gear not specifically designed to withstand them. Our products for LED luminaires contain robust electronic power supplies that are specifically protected against mains electrical interference and withstand voltage peaks of up to 4 kV and voltage surges of up to 320 V. They can also coexist in the same electrical system with ferromagnetic products, which are not sensitive to this type of interference.	
<b>Temperatures</b>	Our LED luminaires are fitted with robust electronic power supplies and high-temperature modules designed using special thermal management solutions to operate at temperatures up to 70 °C with no effect on their lifespan. Fluorescent luminaires using ferromagnetic gear make it possible to provide lighting solutions with the ability to resist ambient temperatures of up to 100 °C.	
<b>Vibration resilience</b>	All our luminaires offer a high level of vibration resistance, thanks to their heavy-duty casings and specially-designed robust power supplies.	



# Bunsen 100

Max. temp.	55 °C
Technology	LED
Light output	1850 lm
Control Gear	"Industry" rated

AG0213



## Key features

Suitable for high temperatures
Plug&Play-installation by disconnectable Plug
Very high resistance to corrosion
Long maintenance intervals
Durable and maintainable luminaire



## Options

<b>Finishings</b>	
End caps and fixing straps in Stainless Steel 316 L	MR
<b>Housing</b>	
Housing in Polycarbonate	PO
<b>Cable entries (black polyamide)</b>	
1 cable gland-Ø cable: 5 to 12 mm	113
1 cable gland-Ø cable: 7 to 14 mm	116
2 cable glands-Ø cable: 5 to 12 mm	213
2 cable glands-Ø cable: 7 to 14 mm	216
<b>Cable entries (nickel-coated brass)</b>	
1 cable gland-Ø cable: 5 to 14 mm	113 LN
2 cable glands-Ø cable: 5 to 54 mm	213 LN
<b>Disconnectable output cords with Plug (length 0,80 m)</b>	
High-temperature output cord fitted with a 3 pole WIELAND plug	CHT3
<b>Accessories</b>	
Protective roof	
Fixings for columns	
Spacer kit (5 or 20 cm) for fire safety standards	
4-outlet IP68 junction box	

## Principal part numbers

Lumens*	Designation	Part No.	Cons. (W)	Optic	T (K)	L (mm)
1850	BUN100 12H830 POME PS3 SA BRS	3105 0010	17		3000	697
	BUN100 12H840 POME PS3 SA BRS	3105 0020			4000	

\* Light output of the luminaire

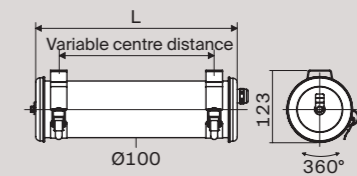
## Specifications

Technical data	
Light source	<ul style="list-style-type: none"> <li>High efficiency LED modules (155 lm/W)</li> <li>Special high-temperature LED modules</li> <li>50 000 h L80/B50 at max. operating temperature</li> <li>Replaceable LED modules</li> <li>CRI &gt; 80</li> </ul>
Optic	<ul style="list-style-type: none"> <li>Light mixing chamber</li> <li>Satin Diffuser to minimise glare</li> </ul>
Heat management	Heatsink in aluminium
Control Gear	<ul style="list-style-type: none"> <li>Special high-temperature electronic driver (non-dimmable)</li> <li>Resistance to voltage surge: 320 V AC, 48 h</li> <li>Supports voltage peaks &lt; 4 kV</li> </ul>
Power supply	220-240 V 50/60 Hz
Electrical class	Class I
Operating temperature	-20 °C to +55 °C
Connection	Disconnectable Plug Ø cable 8-10 mm (3 x 1,5 mm <sup>2</sup> )
Fixing	2 reinforced Stainless Steel fixing straps
Method of Construction	<ul style="list-style-type: none"> <li>Housing in one piece with high mechanical and chemical resistance</li> <li>Long-lasting imperviousness by axial screw fitting</li> </ul>
<b>Materials</b>	
Housing	Polycarbonate protected by a coextruded layer of PMMA
End caps, fixing straps...	Stainless Steel 304 L
Gaskets	EPDM
<b>Standards</b>	
Imperviousness	IP66, IP68 and IP69 K
Shock resistance	IK10
Fire resistance	650 °C
Vibration resistance	Meets the standard EN 60598-1 (tested according to CEI 60068-2-6)

# Hooke 100 HT

Max. temp.	50 °C
Technology	2G11 fluorescent lamp
Power	1 x 18 W and 1 x 36 W

AG0213



## Key features

Suitable for high temperatures
Small luminaire
Very high resistance to vibrations
Very high resistance to corrosion
Durable and maintainable luminaire



## Options

<b>Finishings</b>	
End caps and fixing straps in Stainless Steel 316 L	MR
<b>Housing</b>	
Housing in Polycarbonate	PO
<b>Cable entries (black polyamide)</b>	
1 cable gland-Ø cable: 7 to 14 mm	116
2 cable glands-Ø cable: 5 to 12 mm	213
2 cable glands-Ø cable: 7 to 14 mm	216
<b>Cable entries (nickel-coated brass)</b>	
1 cable gland-Ø cable: 5 to 14 mm	113 LN
2 cable glands-Ø cable: 5 to 54 mm	213 LN
<b>Disconnectable Plug</b>	
3 pole disconnectable Plug, lockable with a threaded ring	PS3
<b>Accessories</b>	
High-temperature output cord fitted with a 3 pole WIELAND plug	CHT3
<b>Accessories</b>	
Fixings for columns	
Spacer kit (5 or 20 cm) for fire safety standards	
4-outlet IP68 junction box	

## Principal part numbers

Power	Designation	Part No.	Optic	L (mm)
<b>Versions without reflector</b>				
1 x 18 W	HOO100 118C 2G11 POME 113 BRS	1561 0010		357
1 x 36 W	HOO100 136C 2G11 POME 113 BRS	1561 0020		519
<b>Versions with extensive reflector</b>				
1 x 18 W	HOO100 118C 2G11 POME 113 RE BRS	1561 0030		357
1 x 36 W	HOO100 136C 2G11 POME 113 RE BRS	1561 0040		519
<b>Satinised versions for diffuse lighting</b>				
1 x 18 W	HOO100 118C 2G11 POME 113 SA BRS	1561 0050		357
1 x 36 W	HOO100 136C 2G11 POME 113 SA BRS	1561 0060		519

When used vertically, the lamp cap must be on the bottom

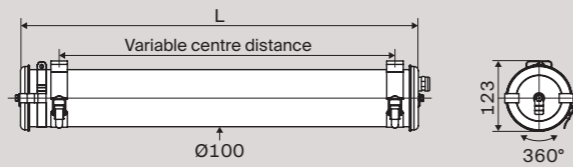
## Specifications

Technical data	
Light source	1 x 2G11compact fluorescent lamp, not included
Optic	<ul style="list-style-type: none"> <li>White powder coated gear tray serving as reflector for diffuse general lighting</li> <li>Extensive reflector (wide beam) in anodised aluminum sheet</li> <li>Satin-finish housing for diffuse lighting</li> </ul>
Control Gear	Ferromagnetic Control Gear with very low losses (EEI B1)
Power supply	230 V 50 Hz
Electrical class	Class I
Operating temperature	-20 °C to +50 °C
Connection	Cable gland in black polyamid for Ø cable 5-12 mm (3 x 2,5 mm <sup>2</sup> )
Fixing	2 reinforced Stainless Steel fixing straps
Method of Construction	<ul style="list-style-type: none"> <li>Housing in one piece with high mechanical and chemical resistance</li> <li>Long-lasting imperviousness by axial screw fitting</li> </ul>
<b>Materials</b>	
Housing	Polycarbonate protected by a coextruded layer of PMMA
End caps, fixing straps...	Stainless Steel 304 L
Gaskets	EPDM
<b>Standards</b>	
Imperviousness	IP66, IP68 and IP69 K
Shock resistance	IK10
Fire resistance	650 °C
Vibration resistance	Meets the standard EN 60598-1 (tested according to CEI 60068-2-6)

# Einstein 100 HT

Max. temp.	70 °C
Technology	T8
Power	1 × 18 W

AG0213



## Key features

Suitable for high temperatures
Impervious luminaire
Very high resistance to vibrations
Very high resistance to corrosion
Durable and maintainable luminaire



## Options

<b>Finishings</b>	
End caps and fixing straps in Stainless Steel 316 L	MR
<b>Housing</b>	
Housing in Polycarbonate	PO
<b>Cable entries (black polyamide)</b>	
1 cable gland-Ø cable: 7 to 14 mm	116
2 cable glands-Ø cable: 5 to 12 mm	213
2 cable glands-Ø cable: 7 to 14 mm	216
<b>Cable entries (nickel-coated brass)</b>	
1 cable gland-Ø cable: 5 to 14 mm	113 LN
2 cable glands-Ø cable: 5 to 54 mm	213 LN
<b>Disconnectable Plug</b>	
3 pole disconnectable Plug, lockable with a threaded ring	PS3
<b>Disconnectable output cords with Plug (length 0,80 m)</b>	
High-temperature output cord fitted with a 3 pole WIELAND plug	CHT3
<b>Accessories</b>	
Protective roof	
Fixings for columns	
Spacer kit (5 or 20 cm) for fire safety standards	
4-outlet IP68 junction box	

## Principal part numbers

Power	Designation	Part No.	Optic	L (mm)
<b>Versions without reflector</b>				
1 × 18 W	EIN100 118C G13 POME 113 BRS	1501 5021		697
<b>Versions with extensive reflector</b>				
1 × 18 W	EIN100 118C G13 POME 113 RE BRS	1501 5046		697
<b>Versions with intensive reflector</b>				
1 × 18 W	EIN100 118C G13 POME 113 RI BRS	1501 5047		697

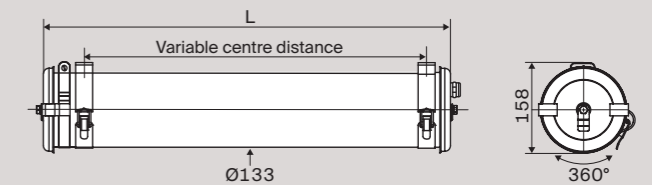
## Specifications

<b>Technical data</b>	
Light source	1 x T8 lamp, not included
Optic	<ul style="list-style-type: none"> <li>White powder coated gear tray serving as reflector for diffuse general lighting</li> <li>Extensive reflector (wide beam) in anodised aluminum sheet</li> <li>Intensive reflector (narrow beam) in anodised aluminium sheet</li> </ul>
Control Gear	Ferromagnetic Control Gear with very low losses (EEI B1)
Power supply	230 V 50 Hz
Electrical class	Class I
Operating temperature	-20 °C to +70 °C
Connection	Cable gland in black polyamid for Ø cable 5-12 mm (3 × 2,5 mm <sup>2</sup> )
Fixing	2 reinforced Stainless Steel fixing straps
Method of Construction	<ul style="list-style-type: none"> <li>Housing in one piece with high mechanical and chemical resistance</li> <li>Long-lasting imperviousness by axial screw fitting</li> </ul>
<b>Materials</b>	
Housing	Polycarbonate protected by a coextruded layer of PMMA
End caps, fixing straps...	Stainless Steel 304 L
Gaskets	EPDM
<b>Standards</b>	
Imperviousness	IP66, IP68 and IP69 K
Shock resistance	IK10
Fire resistance	650 °C
Vibration resistance	Meets the standard EN 60598-1 (tested according to CEI 60068-2-6)

# Einstein 133 HT

Max. temp.	60 °C
Technology	T8
Power	2 × 18 W

AG0213



## Key features

Suitable for high temperatures
Impervious luminaire
Very high resistance to vibrations
Very high resistance to corrosion
Durable and maintainable luminaire



## Options

<b>Finishings</b>	
End caps and fixing straps in Stainless Steel 316 L	MR
<b>Housing</b>	
Housing in Polycarbonate	PO
<b>Cable entries (black polyamide)</b>	
1 cable gland-Ø cable: 7 to 14 mm	116
2 cable glands-Ø cable: 5 to 12 mm	213
2 cable glands-Ø cable: 7 to 14 mm	216
<b>Cable entries (nickel-coated brass)</b>	
1 cable gland-Ø cable: 5 to 14 mm	113 LN
2 cable glands-Ø cable: 5 to 54 mm	213 LN
<b>Disconnectable Plug</b>	
3 pole disconnectable Plug, lockable with a threaded ring	PS3
<b>Disconnectable output cords with Plug (length 0,80 m)</b>	
High-temperature output cord fitted with a 3 pole WIELAND plug	CHT3
<b>Accessories</b>	
Protective roof	
Fixings for columns	
Spacer kit (5 or 20 cm) for fire safety standards	
4-outlet IP68 junction box	

## Principal part numbers

Power	Designation	Part No.	Optic	L (mm)
<b>Versions without reflector</b>				
2 × 18 W	EIN133 218C G13 POME 113 BRS	1601 5059		677
<b>Versions with extensive reflector</b>				
2 × 18 W	EIN133 218C G13 POME 113 RE BRS	1601 5060		677

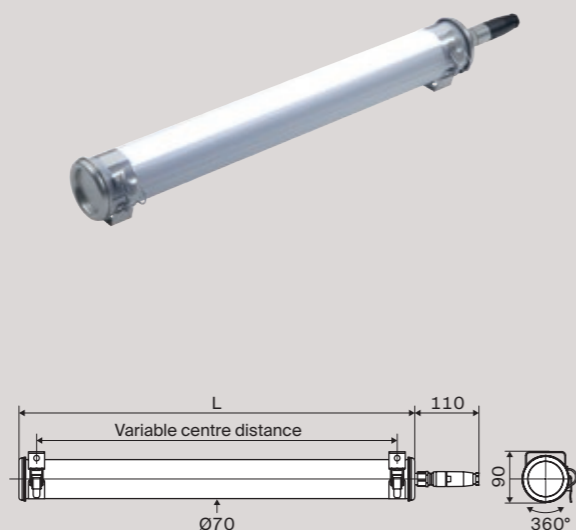
## Specifications

<b>Technical data</b>	
Light source	2 x T8 lamps, not included
Optic	<ul style="list-style-type: none"> <li>White powder coated gear tray serving as reflector for diffuse general lighting</li> <li>Extensive reflector (wide beam) in anodised aluminum sheet</li> </ul>
Control Gear	Ferromagnetic Control Gear with very low losses (EEI B1)
Power supply	230 V 50 Hz
Electrical class	Class I
Operating temperature	-20 °C to +60 °C
Connection	Cable gland in black polyamid for Ø cable 5-12 mm (3 × 2,5 mm <sup>2</sup> )
Fixing	2 reinforced Stainless Steel fixing straps
Method of Construction	<ul style="list-style-type: none"> <li>Housing in one piece with high mechanical and chemical resistance</li> <li>Long-lasting imperviousness by axial screw fitting</li> </ul>
<b>Materials</b>	
Housing	Polycarbonate protected by a coextruded layer of PMMA
End caps, fixing straps...	Stainless Steel 304 L
Gaskets	EPDM
<b>Standards</b>	
Imperviousness	IP66, IP68 and IP69 K
Shock resistance	IK10
Fire resistance	650 °C
Vibration resistance	Meets the standard EN 60598-1 (tested according to CEI 60068-2-6)

# Rankine 70

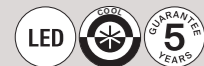
Max. temp.	70 °C
Technology	LED
Light output	1650 lm to 2475 lm
Control Gear	"Industry" rated

AG0213



## Key features

Suitable for high temperatures
Small luminaire
Plug&Play-installation by disconnectable Plug
Suitable for repeated switching on and off
Long maintenance intervals



## Options

<b>Finishings</b>	
End caps and fixing straps in Stainless Steel 316 L	MR
<b>Housing</b>	
Housing in Polycarbonate	PO
<b>Disconnectable output cords with Plug (length 0,80 m)</b>	
High-temperature output cord fitted with a 3 pole WIELAND plug	CHT3
<b>Accessories</b>	
Fixings for columns	
Spacer kit (5 or 20 cm) for fire safety standards	
4-outlet IP68 junction box	

## Principal part numbers

Lumens*	Designation	Part No.	Cons. (W)	Optic	T (K)	L (mm)
<b>Versions for new installations</b>						
1650	RAN70 12H830 POME PS3 SA	3404 0010	15	☐	3000	650
	RAN70 12H840 POME PS3 SA	3404 0020			4000	
2475	RAN70 13H830 POME PS3 SA	3404 0030	23	☐	3000	930
	RAN70 13H840 POME PS3 SA	3404 0040			4000	

\* Light output of the luminaire

## Specifications

<b>Technical data</b>	
Light source	<ul style="list-style-type: none"> <li>High efficiency LED modules (160 lm/W)</li> <li>Special high-temperature LED modules</li> <li>50 000 h L80/B50 at max. operating temperature</li> <li>Replaceable LED modules</li> <li>CRI &gt; 80</li> </ul>
Optic	<ul style="list-style-type: none"> <li>Light mixing chamber</li> <li>Satin Diffuser to minimise glare</li> </ul>
Heat management	Heatsink in aluminium
Control Gear	<ul style="list-style-type: none"> <li>Special high-temperature electronic driver (non-dimmable)</li> <li>Resistance to voltage surge: 320 V AC, 48 h</li> <li>Supports voltage peaks &lt; 4 kV</li> </ul>
Power supply	220-240 V 50/60 Hz
Electrical class	Class I
Operating temperature	-20 °C to +70 °C
Connection	Disconnectable Plug Ø cable 8-10 mm (3 x 1,5 mm <sup>2</sup> )
Fixing	2 reinforced Stainless Steel fixing straps
Method of Construction	<ul style="list-style-type: none"> <li>Housing in one piece with reinforced imperviousness by radial expansion of the sealing</li> <li>Closing by tightening the nut on the cable gland</li> </ul>
<b>Materials</b>	
Housing	Polycarbonate protected by a coextruded layer of PMMA
End caps, fixing straps...	Stainless Steel 304 L
Gaskets	EPDM
<b>Standards</b>	
Imperviousness	IP66, IP68 and IP69 K
Shock resistance	IK10
Fire resistance	650 °C
Vibration resistance	Meets the standard EN 60598-1 (tested according to CEI 60068-2-6)

# Joule 133

Max. temp.	70 °C
Technology	LED
Light output	1650 lm
Control Gear	"Industry" rated

AG0213



## Key features

Suitable for high temperatures
Plug&Play-installation by disconnectable Plug
Suitable for repeated switching on and off
Long maintenance intervals
Durable and maintainable luminaire



## Options

<b>Finishings</b>	
End caps and fixing straps in Stainless Steel 316 L	MR
<b>Housing</b>	
Housing in Polycarbonate	PO
<b>Cable entries (black polyamide)</b>	
1 cable gland-Ø cable: 5 to 12 mm	113
1 cable gland-Ø cable: 7 to 14 mm	116
2 cable glands-Ø cable: 5 to 12 mm	213
2 cable glands-Ø cable: 7 to 14 mm	216
<b>Cable entries (nickel-coated brass)</b>	
1 cable gland-Ø cable: 5 to 14 mm	113 LN
2 cable glands-Ø cable: 5 to 54 mm	213 LN
<b>Disconnectable output cords with Plug (length 0,80 m)</b>	
High-temperature output cord fitted with a 3 pole WIELAND plug	CHT3
<b>Accessories</b>	
Protective roof	
Fixings for columns	
Spacer kit (5 or 20 cm) for fire safety standards	
4-outlet IP68 junction box	

## Principal part numbers

Lumens*	Designation	Part No.	Cons. (W)	Optic	T (K)	L (mm)
<b>Versions for new installations</b>						
1650	JOU133 12H830 POME PS3 SA BRS	3212 0010	15	☐	3000	677
	JOU133 12H840 POME PS3 SA BRS	3212 0020			4000	

\* Light output of the luminaire

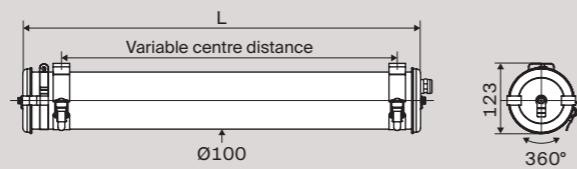
## Specifications

<b>Technical data</b>	
Light source	<ul style="list-style-type: none"> <li>High efficiency LED modules (160 lm/W)</li> <li>Special high-temperature LED modules</li> <li>50 000 h L80/B50 at max. operating temperature</li> <li>Replaceable LED modules</li> <li>CRI &gt; 80</li> </ul>
Optic	<ul style="list-style-type: none"> <li>Light mixing chamber</li> <li>Satin Diffuser to minimise glare</li> </ul>
Heat management	Heatsink in aluminium
Control Gear	<ul style="list-style-type: none"> <li>Special high-temperature electronic driver (non-dimmable)</li> <li>Resistance to voltage surge: 320 V AC, 48 h</li> <li>Supports voltage peaks &lt; 4 kV</li> </ul>
Power supply	220-240 V 50/60 Hz
Electrical class	Class I
Operating temperature	-20 °C to +70 °C
Connection	Disconnectable Plug Ø cable 8-10 mm (3 x 1,5 mm <sup>2</sup> )
Fixing	2 reinforced Stainless Steel fixing straps
Method of Construction	<ul style="list-style-type: none"> <li>Housing in one piece with high mechanical and chemical resistance</li> <li>Long-lasting imperviousness by axial screw fitting</li> </ul>
<b>Materials</b>	
Housing	Polycarbonate protected by a coextruded layer of PMMA
End caps, fixing straps...	Stainless Steel 304 L
Gaskets	EPDM
<b>Standards</b>	
Imperviousness	IP66, IP68 and IP69 K
Shock resistance	IK10
Fire resistance	650 °C
Vibration resistance	Meets the standard EN 60598-1 (tested according to CEI 60068-2-6)

# Pauli 100 HT 80

Max. temp.	80 °C
Technology	T8
Power	1 × 18 W
Housing	Borosilicate glass

AG0213



## Key features

Suitable for very high temperatures
Impervious luminaire
Suitable for industrial environments
Resistant to aggressive chemical environments
Durable and maintainable luminaire



## Options

<b>Finishings</b>	
End caps and fixing straps in Stainless Steel 316 L	MR
<b>Fixings</b>	
Reinforced fixing straps with HSHC screw	BRV
Shock-resistant fixing straps with HSHC screw	BAC
<b>Cable entries (black polyamide)</b>	
1 cable gland-Ø cable: 7 to 14 mm	116
2 cable glands-Ø cable: 5 to 12 mm	213
2 cable glands-Ø cable: 7 to 14 mm	216
<b>Cable entries (nickel-coated brass)</b>	
1 cable gland-Ø cable: 5 to 14 mm	113 LN
2 cable glands-Ø cable: 5 to 54 mm	213 LN
<b>Disconnectable output cords with Plug (length 0,80 m)</b>	
High-temperature output cord fitted with a 3 pole WIELAND plug	CHT3
<b>Accessories</b>	
Protective roof	
Fixings for columns	
4-outlet IP68 junction box	

## Principal part numbers

Power	Designation	Part No.	Optic	L (mm)
<b>Versions without reflector</b>				
1 × 18 W	PAU100 HT80 118C G13 PY 113 BRS	3510 0011		697
<b>Versions with extensive reflector</b>				
1 × 18 W	PAU100 HT80 118C G13 PY 113 RE BRS	3510 5006		697
<b>Versions with intensive reflector</b>				
1 × 18 W	PAU100 HT80 118C G13 PY 113 RI BRS	3510 5014		697

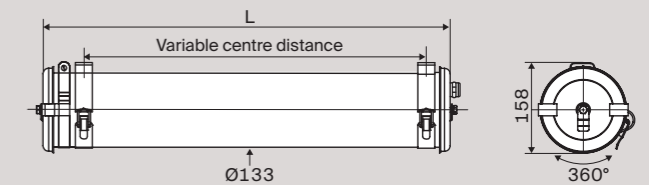
## Specifications

<b>Technical data</b>	
Light source	1 x T8 lamp, not included
Optic	<ul style="list-style-type: none"> <li>White powder coated gear tray serving as reflector for diffuse general lighting</li> <li>Extensive reflector (wide beam) in anodised aluminum sheet</li> <li>Intensive reflector (narrow beam) in anodised aluminium sheet</li> </ul>
Control Gear	Ferromagnetic Control Gear with very low losses (EEI B1)
Power supply	230 V 50 Hz
Electrical class	Class I
Operating temperature	-20 °C to +80 °C
Connection	Cable gland in black polyamid for Ø cable 5-12 mm (3 × 2,5 mm <sup>2</sup> )
Fixing	2 reinforced Stainless Steel fixing straps
Method of Construction	<ul style="list-style-type: none"> <li>Housing in one piece with high mechanical and chemical resistance</li> <li>Long-lasting imperviousness by axial screw fitting</li> </ul>
<b>Materials</b>	
Housing	Borosilicate glass
End caps, fixing straps...	Stainless Steel 304 L
Gaskets	Silicone
<b>Standards</b>	
Imperviousness	IP66, IP68 and IP69 K
Shock resistance	IK07
Fire resistance	Non-flammable
Vibration resistance	Meets the standard EN 60598-1 (tested according to CEI 60068-2-6)

# Pauli 133 HT 80

Max. temp.	80 °C
Technology	T8
Power	2 × 18 W
Housing	Borosilicate glass

AG0213



## Key features

Suitable for very high temperatures
Impervious luminaire
Suitable for industrial environments
Resistant to aggressive chemical environments
Durable and maintainable luminaire



## Options

<b>Finishings</b>	
End caps and fixing straps in Stainless Steel 316 L	MR
<b>Fixings</b>	
Reinforced fixing straps with HSHC screw	BRV
Shock-resistant fixing straps with HSHC screw	BAC
<b>Cable entries (black polyamide)</b>	
1 cable gland-Ø cable: 7 to 14 mm	116
2 cable glands-Ø cable: 5 to 12 mm	213
2 cable glands-Ø cable: 7 to 14 mm	216
<b>Cable entries (nickel-coated brass)</b>	
1 cable gland-Ø cable: 5 to 14 mm	113 LN
2 cable glands-Ø cable: 5 to 54 mm	213 LN
<b>Disconnectable output cords with Plug (length 0,80 m)</b>	
High-temperature output cord fitted with a 3 pole WIELAND plug	CHT3
<b>Accessories</b>	
Protective roof	
Fixings for columns	
4-outlet IP68 junction box	

## Principal part numbers

Power	Designation	Part No.	Optic	L (mm)
<b>Versions without reflector</b>				
2 × 18 W	PAU133 HT80 218C G13 PY 113 BRS	3610 0011		677
<b>Versions with extensive reflector</b>				
2 × 18 W	PAU133 HT80 218C G13 PY 113 RE BRS	3610 5017		677

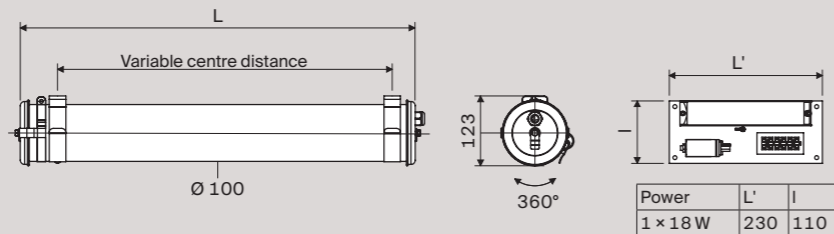
## Specifications

<b>Technical data</b>	
Light source	2 x T8 lamps, not included
Optic	<ul style="list-style-type: none"> <li>White powder coated gear tray serving as reflector for diffuse general lighting</li> <li>Extensive reflector (wide beam) in anodised aluminum sheet</li> </ul>
Control Gear	Ferromagnetic Control Gear with very low losses (EEI B1)
Power supply	230 V 50 Hz
Electrical class	Class I
Operating temperature	-20 °C to +80 °C
Connection	Cable gland in black polyamid for Ø cable 5-12 mm (3 × 2,5 mm <sup>2</sup> )
Fixing	2 reinforced Stainless Steel fixing straps
Method of Construction	<ul style="list-style-type: none"> <li>Housing in one piece with high mechanical and chemical resistance</li> <li>Long-lasting imperviousness by axial screw fitting</li> </ul>
<b>Materials</b>	
Housing	Borosilicate glass
End caps, fixing straps...	Stainless Steel 304 L
Gaskets	Silicone
<b>Standards</b>	
Imperviousness	IP66, IP68 and IP69 K
Shock resistance	IK07
Fire resistance	Non-flammable
Vibration resistance	Meets the standard EN 60598-1 (tested according to CEI 60068-2-6)

# Pauli 100 HT 100

Max. temp.	100 °C
Technology	T8
Power	1 × 18 W
Housing	Borosilicate glass

AG0213



## Key features

Suitable for very high temperatures
Impervious luminaire
Suitable for industrial environments
Resistant to aggressive chemical environments
Durable and maintainable luminaire



## Options

<b>Finishings</b>	
End caps and fixing straps in Stainless Steel 316 L	MR
<b>Fixings</b>	
Reinforced fixing straps with HSHC screw	BRV
Shock-resistant fixing straps with HSHC screw	BAC
<b>Cable entries (black polyamide)</b>	
1 cable gland-Ø cable: 7 to 14 mm	116
<b>Cable entries (nickel-coated brass)</b>	
1 cable gland-Ø cable: 5 to 14 mm	113 LN
<b>Disconnectable output cords with Plug (length 0,80 m)</b>	
High-temperature output cord fitted with a 3 pole WIELAND plug	CHT3
<b>Accessories</b>	
Protective roof	
Fixings for columns	
4-outlet IP68 junction box	

## Principal part numbers

Power	Designation	Part No.	Optic	L (mm)
<b>Versions without reflector</b>				
1 × 18 W	PAU100 HT100 118CS G13 PY 113 BRS	3513 0011		697
<b>Versions with extensive reflector</b>				
1 × 18 W	PAU100 HT100 118CS G13 PY 113 RE BRS	3513 5009		697
<b>Versions with intensive reflector</b>				
1 × 18 W	PAU100 HT100 118CS G13 PY 113 RI BRS	3513 5010		697

Maximum distance between luminaire and gear tray: 50 m

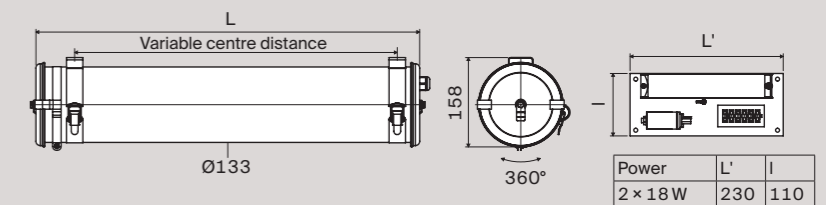
## Specifications

Technical data	
Light source	1 x T8 lamp, not included
Optic	<ul style="list-style-type: none"> <li>White powder coated gear tray serving as reflector for diffuse general lighting</li> <li>Extensive reflector (wide beam) in anodised aluminum sheet</li> <li>Intensive reflector (narrow beam) in anodised aluminium sheet</li> </ul>
Control Gear	<ul style="list-style-type: none"> <li>Ferromagnetic Control Gear with very low losses (EEI B1)</li> <li>Separate gear tray included in delivery</li> </ul>
Power supply	230 V 50 Hz
Electrical class	Class I
Operating temperature	-20 °C to +100 °C
Connection	<ul style="list-style-type: none"> <li>Cable gland in black polyamid for Ø cable 5-12 mm (3 x 2,5 mm<sup>2</sup>)</li> <li>Separate gear tray (6 x 2,5 mm<sup>2</sup>)</li> </ul>
Fixing	2 reinforced Stainless Steel fixing straps
Method of Construction	<ul style="list-style-type: none"> <li>Housing in one piece with high mechanical and chemical resistance</li> <li>Long-lasting imperviousness by axial screw fitting</li> </ul>
Materials	
Housing	Borosilicate glass
End caps, fixing straps...	Stainless Steel 304 L
Gaskets	Silicone
Standards	
Imperviousness	IP66, IP68 and IP69 K
Shock resistance	IK07
Fire resistance	Non-flammable
Vibration resistance	Meets the standard EN 60598-1 (tested according to CEI 60068-2-6)

# Pauli 133 HT 100

Max. temp.	100 °C
Technology	T8
Power	2 × 18 W
Housing	Borosilicate glass

AG0213



## Key features

Suitable for very high temperatures
Impervious luminaire
Suitable for industrial environments
Resistant to aggressive chemical environments
Durable and maintainable luminaire



## Options

<b>Finishings</b>	
End caps and fixing straps in Stainless Steel 316 L	MR
<b>Fixings</b>	
Reinforced fixing straps with HSHC screw	BRV
Shock-resistant fixing straps with HSHC screw	BAC
<b>Cable entries (black polyamide)</b>	
1 cable gland-Ø cable: 7 to 14 mm	116
<b>Cable entries (nickel-coated brass)</b>	
1 cable gland-Ø cable: 5 to 14 mm	113 LN
<b>Disconnectable output cords with Plug (length 0,80 m)</b>	
High-temperature output cord fitted with a 3 pole WIELAND plug	CHT3
<b>Accessories</b>	
Protective roof	
Fixings for columns	
4-outlet IP68 junction box	

## Principal part numbers

Power	Designation	Part No.	Optic	L (mm)
<b>Versions without reflector</b>				
2 × 18 W	PAU133 HT100 218CS G13 PY 113 BRS	3613 0011		677
<b>Versions with extensive reflector</b>				
2 × 18 W	PAU133 HT100 218CS G13 PY 113 RE BRS	3613 5006		677

Maximum distance between luminaire and gear tray: 50 m

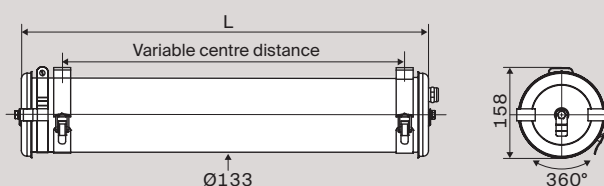
## Specifications

Technical data	
Light source	2 x T8 lamps, not included
Optic	<ul style="list-style-type: none"> <li>White powder coated gear tray serving as reflector for diffuse general lighting</li> <li>Extensive reflector (wide beam) in anodised aluminum sheet</li> </ul>
Control Gear	<ul style="list-style-type: none"> <li>Ferromagnetic Control Gear with very low losses (EEI B1)</li> <li>Separate gear tray included in delivery</li> </ul>
Power supply	230 V 50 Hz
Electrical class	Class I
Operating temperature	-20 °C to +100 °C
Connection	<ul style="list-style-type: none"> <li>Cable gland in black polyamid for Ø cable 5-12 mm (3 x 2,5 mm<sup>2</sup>)</li> <li>Separate gear tray (7 x 2,5 mm<sup>2</sup>)</li> </ul>
Fixing	2 reinforced Stainless Steel fixing straps
Method of Construction	<ul style="list-style-type: none"> <li>Housing in one piece with high mechanical and chemical resistance</li> <li>Long-lasting imperviousness by axial screw fitting</li> </ul>
Materials	
Housing	Borosilicate glass
End caps, fixing straps...	Stainless Steel 304 L
Gaskets	Silicone
Standards	
Imperviousness	IP66, IP68 and IP69 K
Shock resistance	IK07
Fire resistance	Non-flammable
Vibration resistance	Meets the standard EN 60598-1 (tested according to CEI 60068-2-6)

# Pauli 133 HT 200

Max. temp.	200°C
Technology	E27 incandescence lamp *
Power	1 × 60 W and 2 × 60 W
Housing	Borosilicate glass

AG0213



## Key features

Suitable for very high temperatures
Impervious luminaire
Suitable for industrial environments
Resistant to aggressive chemical environments
Durable and maintainable luminaire



## Options

<b>Finishings</b>	
End caps and fixing straps in Stainless Steel 316 L	MR
<b>Fixings</b>	
Reinforced fixing straps with HSHC screw	BRV
<b>Cable entries (nickel-coated brass)</b>	
2 cable glands-Ø cable: 5 to 8 mm	213 LN
<b>Accessories</b>	
Fixings for columns	

## Principal part numbers

Power	Designation	Part No.	Optic	L (mm)
<b>1-lamp version</b>				
1 × 60 W	PAU133 HT200 1 × 60 W E27 PY 113 LN BRS	3617 0011		464
<b>2-lamp version</b>				
2 × 60 W	PAU133 HT200 2 × 60 W E27 PY 113 LN BRS	3617 0021		677

\* Special high-temperature lamp to be ordered separately Part No.: L-60-INC-HT

## Specifications

<b>Technical data</b>	
Light source	1 or 2 special incandescent oven lamps E27 (to be ordered separately)
Optic	<ul style="list-style-type: none"> <li>Stainless steel tray</li> <li>Reflector in anodised aluminum</li> </ul>
Power supply	230 V 50 Hz
Electrical class	Class I
Operating temperature	-20°C to +200°C
Connection	Cable gland in nickel-coated brass for Ø cable 5-8 mm (3 × 2,5 mm <sup>2</sup> )
Fixing	2 reinforced Stainless Steel fixing straps
Method of Construction	<ul style="list-style-type: none"> <li>Housing in one piece with high mechanical and chemical resistance</li> <li>Long-lasting imperviousness by axial screw fitting</li> </ul>
<b>Materials</b>	
Housing	Borosilicate glass
End caps, fixing straps...	Stainless Steel 304 L
Gaskets	Silicone
<b>Standards</b>	
Imperviousness	IP66, IP68 and IP69 K
Shock resistance	IK07
Fire resistance	Non-flammable
Vibration resistance	Meets the standard EN 60598-1 (tested according to CEI 60068-2-6)

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# Options and accessories

To simplify fitting, adaptation and installation safety, Sammode offers all the options and accessories needed to install the right luminaire for your needs.

## Fixings

CHC screw reinforced fixing straps	Compatibility	Code
<ul style="list-style-type: none"> <li>Set of two reinforced screw-clamped stainless steel fixing straps</li> <li>This screw closure ensures secure luminaire mounting</li> <li>Recommended for surface-mounted luminaires</li> <li>Recommended where the luminaire is subject to mechanical stress (vibration, etc.)</li> <li>For even greater security, we recommend Torx Tamper-Proof screws that require the use of a suitable tool (code: BRVT)</li> </ul>	Pauli HT 80, Pauli HT 100 and Pauli HT 200 ranges only	BRV



Shock-resistant CHC screw fixing straps	Compatibility	Code
<ul style="list-style-type: none"> <li>Set of two reinforced screw-clamped stainless steel fixing straps with bracing legs</li> <li>Recommended for surface-mounted luminaires</li> <li>Recommended where the luminaire will be subject to severe mechanical stresses</li> <li>For even greater security, we recommend Torx Tamper-Proof screws that require the use of a suitable tool (code: BACT)</li> </ul>	Pauli HT 80, Pauli HT 100 and Pauli HT 200 ranges only	BAC



## Finishings

316 L marine grade stainless steel	Compatibility	Code
<ul style="list-style-type: none"> <li>Luminaire external metal components in 316 L stainless steel and screws in A4 stainless steel (in the basic option, these are 304 L stainless steel, with screws in A2 stainless steel)</li> <li>Excellent resistance to corrosion by pitting, and specifically recommended for marine applications</li> </ul>	All tubular ranges	MR



## Cable entries

1 cable gland in black polyamide for cable Ø: 5 to 12 mm	Compatibility	Code
<ul style="list-style-type: none"> <li>Luminaires supplied with a cable gland fitted to the end caps</li> <li>Capacities: <ul style="list-style-type: none"> <li>Cable Ø: 5 to 12 mm</li> <li>Terminal: screw connection, 3 x 2.5 mm<sup>2</sup></li> </ul> </li> <li>Ingress protection: IP66/IP68/IP69 K</li> <li>Materials: black polyamide 6</li> <li>Recommended for luminaires in contact with acids in sprayed or gaseous form</li> </ul>	All Ø 100 and Ø 133 tubular ranges, except the Pauli HT 200 range	113



2 cable glands in black polyamide for cable Ø: 5 to 12 mm	Compatibility	Code
<ul style="list-style-type: none"> <li>Luminaires supplied with 2 cable glands fitted to the end caps and a 3 x 2.5 mm<sup>2</sup> two-stage plug-in terminal to enable looped cabling.</li> <li>Capacities: <ul style="list-style-type: none"> <li>Cable Ø: 5 to 12 mm</li> <li>Terminal: screw connection, 3 x 2.5 mm<sup>2</sup></li> </ul> </li> <li>Ingress protection: IP66/IP68/IP69 K</li> <li>Materials: black polyamide 6</li> <li>Recommended for luminaires in contact with acids in sprayed or gaseous form</li> </ul>	All Ø 100 and Ø 133 tubular ranges, except the Pauli HT 100 and the Pauli HT 200 range	213



1 cable gland in black polyamide for cable Ø: 7 to 14 mm	Compatibility	Code
<ul style="list-style-type: none"> <li>Luminaires supplied with a polyamide cable gland</li> <li>Capacities: <ul style="list-style-type: none"> <li>Cable Ø: 7 to 14 mm</li> <li>Terminal: screw connection, 3 x 2.5 mm<sup>2</sup></li> </ul> </li> <li>Ingress protection: IP66/IP68/IP69 K</li> <li>Materials: black polyamide 6</li> <li>Recommended for luminaires in contact with acids in sprayed or gaseous form</li> </ul>	All Ø 100 and Ø 133 tubular ranges, except the Pauli HT 200 range	116



Spare parts are available for all our luminaires. For orders or additional information, please contact us by phone on +33 (0) 1 43 14 84 90 or e-mail us at enquiry@sammode.com.

## Cable entries (cont)

2 cable glands in black polyamide for cable Ø: 7 to 14 mm	Compatibility	Code
<ul style="list-style-type: none"> <li>Luminaires supplied with 2 cable glands fitted to the end caps and a 3 x 2.5 mm<sup>2</sup> two-stage plug-in terminal to enable looped cabling</li> <li>Capacities: <ul style="list-style-type: none"> <li>Cable Ø: 7 to 14 mm</li> <li>Terminal: screw connection, 3 x 2.5 mm<sup>2</sup></li> </ul> </li> <li>Ingress protection: IP66/IP68/IP69 K</li> <li>Materials: black polyamide 6</li> <li>Recommended for luminaires in contact with acids in sprayed or gaseous form</li> </ul>	All Ø 100 and Ø 133 tubular ranges, except the Pauli HT 100 and the Pauli HT 200	216



1 cable gland in nickel plated brass	Compatibility	Code
<ul style="list-style-type: none"> <li>Luminaires supplied with a double capacity nickel plated brass cable gland</li> <li>Capacities: <ul style="list-style-type: none"> <li>Cable Ø: 5 to 14 mm</li> <li>Terminal: screw connection, 3 x 2.5 mm<sup>2</sup></li> </ul> </li> <li>Ingress protection: IP66/IP68/IP69 K</li> <li>Materials: nickel plated brass</li> <li>Recommended for luminaires used in the presence of mineral oils and/or hydrocarbons</li> </ul>	All Ø 100 and Ø 133 tubular ranges	113 LN



2 cable glands in nickel plated brass	Compatibility	Code
<ul style="list-style-type: none"> <li>Luminaires supplied with 2 nickel plated cable glands fitted to the end caps and a 3 x 2.5 mm<sup>2</sup> two-stage plug-in terminal to enable looped cabling</li> <li>Capacities: <ul style="list-style-type: none"> <li>Cable Ø: 5 to 14 mm</li> <li>Terminal: screw connection, 3 x 2.5 mm<sup>2</sup></li> </ul> </li> <li>Ingress protection: IP66/IP68/IP69 K</li> <li>Materials: nickel plated brass</li> <li>Recommended for luminaires used in the presence of mineral oils and/or hydrocarbons</li> </ul>	All Ø 100 and Ø 133 tubular ranges, except the Pauli HT 100 range	213 LN



IP68/IP69 K plug-in connector for class I luminaires	Compatibility	Code
<ul style="list-style-type: none"> <li>Luminaires supplied with a straight plug-in connector with locking ring</li> <li>The base is end-cap mounted for Ø 100 and Ø 133 luminaires, and mounted to the cable gland body using an adapter for Ø 70 luminaires.</li> <li>Female socket supplied non-cabled</li> <li>Capacities: <ul style="list-style-type: none"> <li>Cable Ø: 8 to 10 mm</li> <li>Terminal: screwed, 3 x 1.5 mm<sup>2</sup></li> </ul> </li> <li>Ingress protection: IP66/IP68/IP69 K</li> <li>Materials: <ul style="list-style-type: none"> <li>Nickel plated brass base and adapter</li> <li>Polyamide 6 body</li> <li>Nickel plated brass locking ring</li> </ul> </li> <li>Recommended for off-site maintenance of luminaires and for Plug &amp; Play installations</li> </ul>	All Ø 100 and Ø 133 tubular ranges, except the Pauli HT 80, the Pauli HT 100 and the Pauli HT 200 range	PS3



IP68/IP69 K high-temperature plug-in cord for class I luminaires	Compatibility	Code
<ul style="list-style-type: none"> <li>Luminaires fitted with a 80 cm Wieland RST male plug on a special high-temperature 80 cm silicone cord and a non-cabled female socket</li> <li>Capacities: <ul style="list-style-type: none"> <li>Cable Ø 6 to 10 mm</li> <li>Female and male sockets: screw connection, 3 x 4 mm<sup>2</sup></li> </ul> </li> <li>Ingress protection: IP66/IP68/IP69 K</li> <li>Material: <ul style="list-style-type: none"> <li>Contact: Surface treated brass</li> <li>Insulating components: PA66</li> </ul> </li> <li>Recommended for off-site maintenance of luminaires and for Plug &amp; Play installations</li> </ul>	All Ø 100 and Ø 133 tubular ranges, except the Pauli 133 HT 100, and the Pauli 133 HT 200 range	CHT3










<b>IP68/IP69K high-temperature plug-in cord for class I luminaires</b>		<b>Compatibility</b>	<b>Code</b>
<i>Cable entries (cont.)</i>	<ul style="list-style-type: none"> <li>Luminaires fitted with a 80 cm Wieland RST male plug on a special high-temperature 80 cm silicone cord and a non-cabled female socket</li> <li>Capacities:               <ul style="list-style-type: none"> <li>Cable Ø 6 to 10 mm</li> <li>Female and male sockets: screw connection, 5 × 4 mm<sup>2</sup></li> </ul> </li> <li>Ingress protection: IP66/IP68/IP69K</li> <li>Material:               <ul style="list-style-type: none"> <li>Contact: Surface treated brass</li> <li>Insulating components: PA66</li> </ul> </li> <li>Recommended for off-site maintenance of luminaires and for Plug &amp; Play installations</li> </ul>	Pauli 133 HT 100 2 × 36 W and 2 × 58 W range only	CHT4



## Accessories

<b>Folded 304 L stainless steel protective cover</b>		<b>Compatibility</b>	<b>Code</b>
304 L stainless steel protective cover for installation on the fixing straps of Ø 100 and 133 ranges of luminaires. The fixing holes are to be drilled on site to suit the space between fixing straps		All tubular Ø 100 and Ø 133 ranges	
Folded 304 L stainless steel protective cover L 800 mm	12H LED 18 W T8		PU6362
Folded 304 L stainless steel protective cover L 1100 mm	13H/23H LED		CP00595
Folded 304 L stainless steel protective cover L 1400 mm	14H/24H LED		PU6286
	36 W T8		
Folded 304 L stainless steel protective cover L 1700 mm	15H/25H LED		PU6363
	58 W T8		
Folded 304 L stainless steel protective cover L 1950 mm	16H/26H LED		CP00597
<b>Folded 316 L stainless steel protective cover</b>		<b>Compatibility</b>	<b>Code</b>
316 L stainless steel protective cover for installation on the fixing straps of Ø 100 and 133 ranges of luminaires. The fixing holes are to be drilled on site to suit the space between fixing straps		All tubular Ø 100 and Ø 133 ranges	
Folded 316 L stainless steel protective cover L 800 mm	12H LED		CP00565
	18 W T8		
Folded 316 L stainless steel protective cover L 1100 mm	13H/23H LED		CP00596
Folded 316 L stainless steel protective cover L 1400 mm	14H/24H LED		CP00566
	36 W T8		
Folded 316 L stainless steel protective cover L 1700 mm	15H/25H LED		CP00567
	58 W T8		
<b>304 L column mounting fixing straps</b>		<b>Compatibility</b>	<b>Code</b>
Kit of two 304 L stainless steel column mounting fixing straps to carry standard Sammode luminaire fixing straps		All tubular ranges	
Kit of two 304 L stainless steel 1 ¼" (42 mm) column strap mountings			CP00568
Kit of two 304 L stainless steel 1 ½" (49 mm) column strap mountings			CP00569
Kit of two 304 L stainless steel 2" (60 mm) column strap mountings			CP00570
<b>316 L column mounting fixing straps</b>		<b>Compatibility</b>	<b>Code</b>
Kit of two 316 L stainless steel column mounting fixing straps to carry standard Sammode luminaire fixing straps		All tubular ranges	
Kit of two 316 L stainless steel 1 ¼" (42 mm) column strap mountings			CP00571
Kit of two 316 L stainless steel 1 ½" (49 mm) column strap mountings			CP00572
Kit of two 316 L stainless steel 2" (60 mm) column strap mountings			CP00573



<b>Raised 304 L stainless steel strap fixings for ceiling mounting</b>		<b>Compatibility</b>	<b>Code</b>
<ul style="list-style-type: none"> <li>Kit of 2 raised 304 L stainless steel strap fixings to ceiling-mount luminaires in accordance with the rules set out in technical document APSAD D14-A, i.e. a minimum distance of 20 cm between the equipment and the face of the sandwich panel</li> <li>Strap fixing screws included</li> </ul>	All tubular ranges, except the Pauli HT 80, the Pauli HT 100 and the Pauli HT 200 range		PU44277
			
<b>Raised 316 L stainless steel strap fixings for ceiling mounting</b>		<b>Compatibility</b>	<b>Code</b>
<ul style="list-style-type: none"> <li>Kit of 2 raised 316 L stainless steel strap fixings to ceiling-mount luminaires in accordance with the rules set out in technical document APSAD D14-A, i.e. a minimum distance of 20 cm between the equipment and the face of the sandwich panel</li> <li>Strap fixing screws included</li> </ul>	All tubular ranges, except the Pauli HT 80, the Pauli HT 100 and the Pauli HT 200 range		PU47378
			
<b>Raised 304 L stainless steel strap fixings for wall mounting</b>		<b>Compatibility</b>	<b>Code</b>
<ul style="list-style-type: none"> <li>Kit of 2 raised 304 L stainless steel strap fixings to wall-mount luminaires in accordance with the rules set out in technical document APSAD D14-A, i.e. a minimum distance of 5 cm between the equipment and the face of the sandwich panel</li> <li>Strap fixing screws included</li> </ul>	All tubular ranges, except the Pauli HT 80, the Pauli HT 100 and the Pauli HT 200 range		PU44278
			
<b>Raised 316 L stainless steel strap fixings for wall mounting</b>		<b>Compatibility</b>	<b>Code</b>
<ul style="list-style-type: none"> <li>Kit of 2 raised 316 L stainless steel strap fixings to wall-mount luminaires in accordance with the rules set out in technical document APSAD D14-A, i.e. a minimum distance of 5 cm between the equipment and the face of the sandwich panel</li> <li>Strap fixing screws included</li> </ul>	All tubular ranges, except the Pauli HT 80, the Pauli HT 100 and the Pauli HT 200 range		PU45880
			
<b>4-outlet IP68 junction box</b>		<b>Compatibility</b>	<b>Code</b>
<ul style="list-style-type: none"> <li>High-protection junction box for the connection of between 1 and 3 luminaires</li> <li>Capacities:               <ul style="list-style-type: none"> <li>Cable diam. 7 to 14 mm</li> </ul> </li> <li>Ingress protection: IP66/IP68</li> <li>Materials:               <ul style="list-style-type: none"> <li>Casing: PA 66</li> <li>Cover trim: SEBS</li> <li>Seals: TPE</li> </ul> </li> <li>Service temperature: -40 °C to +125 °C</li> <li>Supplied with blanking plugs for unused outlets</li> <li>Connection terminal not included</li> </ul>	All tubular ranges, except the Pauli HT 200 range		CP00674
			

# Materials

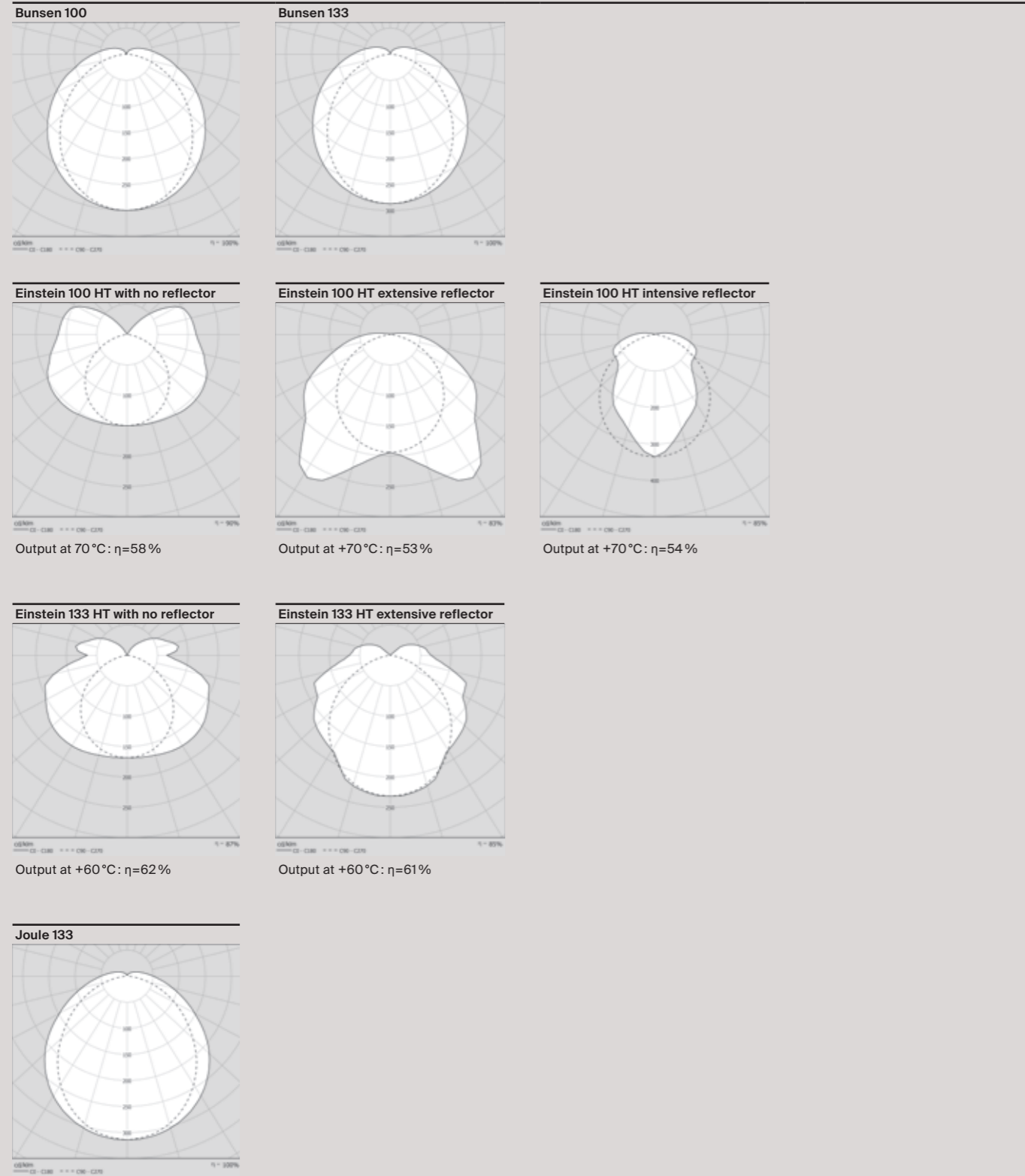
Our 50+ years of experience in the design and use of tubular luminaires have led us to select only the most appropriate materials for use in your industrial environments.

Materials	Features	Special benefits	Precautions and limitations on use
<b>304 L stainless steel</b>		<ul style="list-style-type: none"> <li>• Low-carbon chrome-nickel Austenitic stainless steel</li> <li>• Good corrosion resistance, superior to that offered by 304 stainless steel</li> <li>• Good crack resistance</li> <li>• Good mechanical properties</li> </ul>	<ul style="list-style-type: none"> <li>• Corrosion by pitting in acid or chlorinated environments</li> </ul>
<b>316 L stainless steel (MR option)</b>	This grade of stainless steel is particularly resistant to corrosion, and is recommended for marine environments	<ul style="list-style-type: none"> <li>• Low-carbon chrome-nickel-molybdenum Austenitic stainless steel</li> <li>• Very good corrosion resistance, especially in acid or chlorinated (marine) environments</li> <li>• Excellent resistance to intergranular corrosion (pitting)</li> <li>• Good crack resistance</li> <li>• Good mechanical properties</li> </ul>	
<b>Coextruded polycarbonate/ PMMA (POME option)</b>	This composite diffuser has been specially developed to exploit the mechanical impact protection of polycarbonate (IK10-20 Joules) in combination with the chemical and UV resistance of polymethyl methacrylate. Its use is recommended for outdoor lighting applications	<ul style="list-style-type: none"> <li>• Excellent mechanical properties: crack resistance, strength and impact resistance</li> <li>• Consistency of key characteristics over a broad temperature range</li> <li>• Dimensional stability</li> <li>• Water vapour impermeability</li> <li>• Good scratch resistance</li> <li>• Good chemical resistance</li> <li>• Good UV resistance</li> </ul>	<ul style="list-style-type: none"> <li>• Combustible (650 °C in the glow wire test)</li> <li>• Temperature limited to 70 °C</li> </ul>
<b>Polycarbonate (PO option)</b>	The polycarbonate we use for our tubular diffusers offers the best compromise between mechanical resistance (IK10-20 Joules) and fire resistance for industrial applications	<ul style="list-style-type: none"> <li>• Consistency of key characteristics over a broad temperature range</li> <li>• Dimensional stability</li> <li>• Water vapour impermeability</li> <li>• Good fire resistance (960 °C in the glow wire test)</li> </ul>	<ul style="list-style-type: none"> <li>• Attacked by certain detergents and bactericides</li> <li>• Poor resistance to hydrocarbons (oils, solvents, etc.)</li> <li>• Yellowing in outdoor applications</li> <li>• Poor scratch resistance</li> <li>• Temperature limited to 70 °C</li> </ul>
<b>Borosilicate glass (PY option)</b>	The borosilicate glass diffuser has been developed for our very high-temperature range of luminaires. It is also recommended for use in applications requiring exceptional resistance to chemical attack (acid atmospheres, hydrocarbons, etc.) and abrasion (from coal dust, cement dust, etc.).	<ul style="list-style-type: none"> <li>• Very high heat resistance</li> <li>• Thermal shock resistance</li> <li>• Excellent resistance to chemicals (except fluorinated products)</li> <li>• Good scratch resistance</li> <li>• Good mechanical strength</li> <li>• Non-combustible</li> </ul>	<ul style="list-style-type: none"> <li>• Relative fragility (IK07)</li> <li>• Weight</li> </ul>

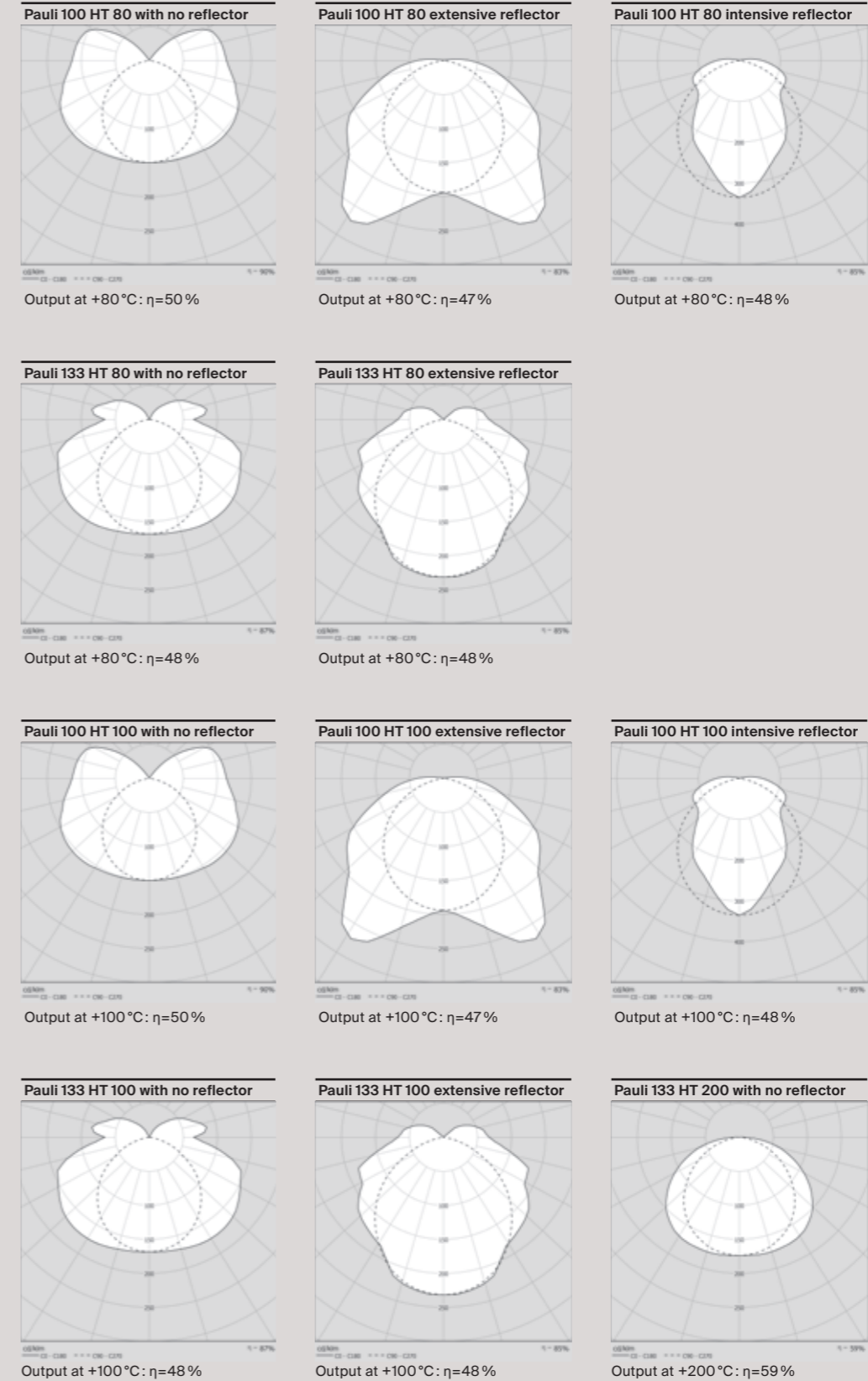
# Photometric polar diagrams

Correct sizing of your installation can make a considerable contribution to energy savings. We are available to help you plan the layout of your installation. Please e-mail us at [enquiry@sammode.com](mailto:enquiry@sammode.com)

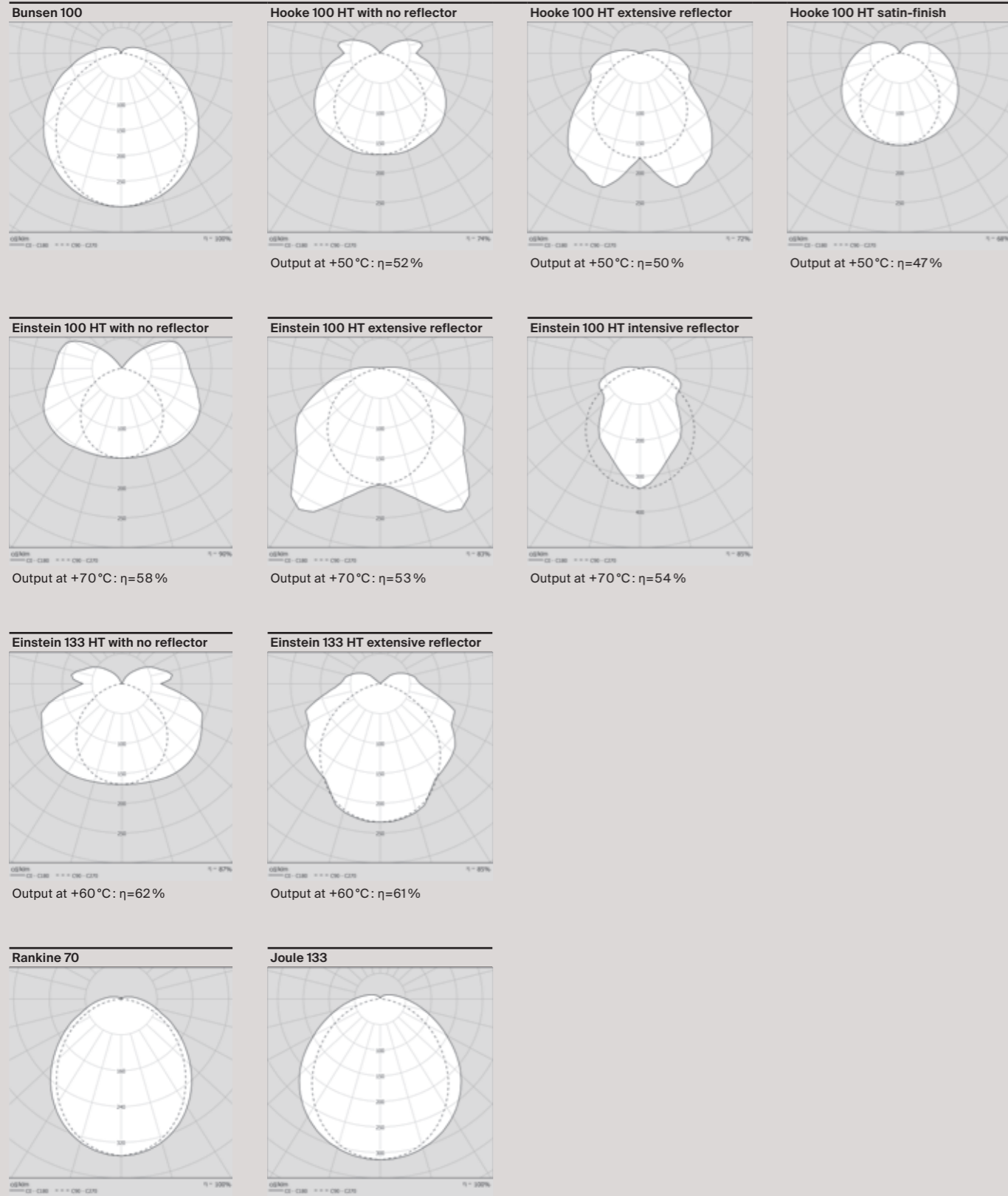
## General lighting



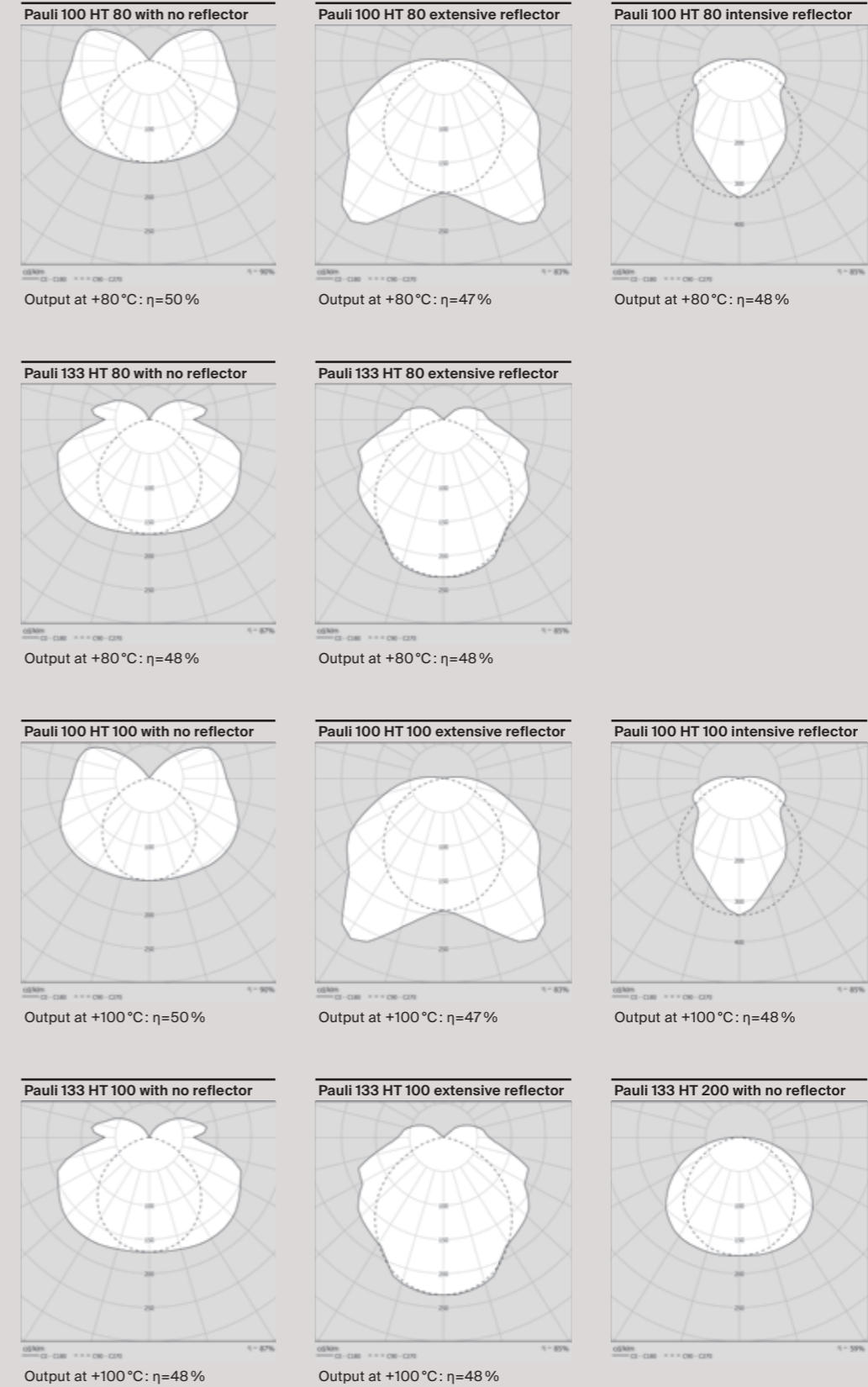
## General lighting (cont.)



**Task lighting**



*Task lighting (cont.)*



# Lighting levels

This guide sets out the average recommended lighting level for each application. The lighting requirement must be calculated at the location where the task is performed and at the level of the work surface, which is usually 80 cm above the floor (except where indicated otherwise).

## Indoor lighting

EN 12464-1 standard of 2011: Indoor workplaces

Common spaces	Type	Type of use	Lighting level	
	<b>Circulation areas</b>	Circulation areas and corridors	100 lux at floor	
		Circulation with vehicles on the route	150 lux at floor	
		Stairs	100 lux at floor	
		Passenger and goods lifts	100 lux	
		In front of goods lifts	200 lux	
		Loading bays	150 lux	
	<b>Restaurants and hotels</b>	Reception, cash desk, porter's desk	300 lux	
		Kitchens	500 lux	
		Restaurants, dining rooms, function rooms [1]	-	
		Buffet	300 lux	
		Self-service restaurants	200 lux	
		Conference rooms [2]	500 lux	
		Corridors [3]	100 lux at floor	
	1. Design the lighting to create the appropriate atmosphere 2. Plan for adjustable lighting 3. The lowest levels are acceptable during the night			
	<b>Industrial activities and crafts</b>	<b>Bakeries</b>	Preparation and baking	300 lux
Finishing, icing and decoration			500 lux	
<b>Cement, cement goods, concrete, bricks</b>		Drying	50 lux	
		Preparation of materials: work on kilns and mixers	200 lux	
		General machine work	300 lux	
		Rough forms	300 lux	
<b>Ceramics, tiles, glass, glassware</b>		Drying	50 lux	
		Preparation, general machine work	300 lux	
		Enameling, lamination, moulding, shaping simple pieces, satin-finishing, glass blowing	300 lux	
		Grinding, engraving, glass polishing, shaping precision parts, manufacturer of glass instruments	750 lux	
		Grinding of optical glass, crystal, hand grinding and engraving	750 lux	
		Precision work, e.g. decorative grinding, hand painting	1000 lux	
		Manufacture of synthetic precious stones	1500 lux	
		<b>Leather and leather goods</b>	Working areas above tanks, casks and pits	200 lux
Fleshing, milling, drawing and rubbing of hides			300 lux	
Saddlery, shoemaking: stitching, sewing, polishing, shaping, cutting and punching			500 lux	
Sorting			500 lux	
Machine leather dying			500 lux	
Quality control			1000 lux	
Colour inspection			1000 lux	
Shoemaking			500 lux	
Glove making			500 lux	
<b>Paper and paper goods</b>			Edge runners, pulp mills	200 lux
		Paper manufacture and processing, paper and corrugated machines, cardboard manufacture	300 lux	
		Standard bookbinding work, e.g. folding, sorting, gluing, cutting, embossing, sewing	500 lux	
<b>Power stations</b>		Fuel supply plant	50 lux	
		Boiler house	100 lux	
		Machine halls	200 lux	
		Side rooms, e.g. pump rooms, condenser rooms, etc., switchboards (inside buildings)	200 lux	
		Control rooms [1]	500 lux	
1. Dimming may be required				
<b>Printers</b>	Cutting, gilding, embossing, block engraving, work on stones and platens, printing machines, matrix making	500 lux		
	Paper sorting and hand printing	500 lux		
	Typesetting, retouching, lithography	1000 lux		
	Colour print inspection	1500 lux		
	Steel and copper engraving	2000 lux		

<i>Industrial activities and crafts (suite)</i>				
	<b>Rolling mills, iron and steelworks</b>	Production plants without manual operation	50 lux	
		Production plants with continuous manual operation	200 lux	
		Slab store	50 lux	
		Furnaces	200 lux	
		Mill train, coiler, shear line	300 lux	
		Control platforms; control panels	300 lux	
		Test, measurement and inspection	500 lux	
		Underfloor man-sized tunnels, belt sections, cellars, etc.	50 lux	
		<b>Wood working and processing</b>	Automated processing, e.g. drying, plywood manufacture	50 lux
			Steam pits	150 lux
	Saw frame		300 lux	
	Work at joiners bench, gluing, assembly		300 lux	
	Polishing, painting, fancy joinery		750 lux	
	Work on wood working machines, e.g. turning, fluting, dressing, rebating, grooving, cutting, sawing, sinking		500 lux	
	Selection of the near woods		750 lux	
	Marquetry, inlay work		750 lux	
	Quality control, inspection		1000 lux	
	<b>Foodstuffs and luxury food industries</b>	Workstations and working areas in breweries and maltings, cask washing and filling, screening, peeling and cooking in canning and chocolate production plants, workstations and working areas in sugar refineries, the drying and working of raw tobacco and the cellar-maturing of wine	200 lux	
		Product sorting and washing, crushing, mixing and packaging	300 lux	
		Fruit and vegetable cutting and sorting	300 lux	
		Workstations and critical working areas in abattoirs, butchers, dairies, flour mills and the filtering facilities of sugar refineries	500 lux	
		Ready meal production, kitchen work, and cigar/cigarette production	500 lux	
		Glass and bottle checking, product inspection, trimming, sorting and decoration	500 lux	
		Laboratories	500 lux	
		Colour inspection	1000 lux	
		<b>Chemicals, plastics and rubber industry</b>	Remote-operated processing installations	50 lux
			Processing installations with limited manual intervention	150 lux
Constantly manned workplaces in processing installations	300 lux			
Precision measuring rooms, laboratories	500 lux			
Pharmaceutical production	500 lux			
Tyre production	500 lux			
Colour inspection	1000 lux			
<b>Electrical and electronics industries</b>	Cutting, finishing, inspection	750 lux		
	Cable and wire manufacture	300 lux		
	Winding (large coils)	300 lux		
	Winding (medium-sized coils)	500 lux		
	Winding (small coils)	750 lux		
	Coil impregnating	300 lux		
	Galvanising	300 lux		
	Large-scale assembly work (e.g. large transformers)	300 lux		
	Medium-scale assembly work (e.g. switchboards)	500 lux		
	Small-scale assembly work (e.g. telephones, radios, IT hardware, computers)	750 lux		
Precision assembly work (e.g. measuring equipment, printed circuit boards)	1000 lux			
<b>Foundries and metal casting</b>	Electronic workshops, testing, adjusting	1500 lux		
	Man-size underfloor tunnels, cellars, etc.	50 lux		
	Platforms	100 lux		
	Send preparation	200 lux		
	Dressing rooms	200 lux		
	Work places at cupola and mixer	200 lux		
	Casting bay	200 lux		
	Shake out areas	200 lux		
	Machine moulding	200 lux		
	Hand and core moulding	300 lux		
	Die casting	300 lux		
	Model building	500 lux		

# Fluorescent lamps\*

\* Data sourced from leading lamp manufacturers, and subject to change.

The following tables give the maximum power consumption data for our luminaires fitted with fluorescent light sources. CELMA (Federation of National Manufacturers Associations for Luminaires and Electrotechnical components in the European Union) provides a classification of ballasts (or EELs) based on the combined power consumption values of the lamp system + ballast.

**Standard lamps** These are the most commonly used lamps

	P (W)	L (mm)	Flux <sup>1</sup> (lm)	Colour temp (K)	IRC	Class B1 ferromagnetic ballast	
						Conso. <sup>2</sup> (W)	Lifespan <sup>3</sup> (h)
<i>T8 tubes, 26 mm diameter, G13 fitting</i>							
	18	590	1350	3000 / 4000	85	≤ 24	15 000
	36	1200	3350			≤ 41	
	58	1500	5200			≤ 64	



*Compact fluorescent lamps, 2G11 fitting*

	18	217	1200	3000 / 4000	85	≤ 24	15 000
	36	411	2900			≤ 41	



## Long-life lamps

These lamps offer a longer lifespan than standard lamps, which is comparable to that of LED solutions, but with no effect on lighting performance (identical luminous flux).

### Benefits:

- Lower maintenance costs as a direct result of the longer replacement intervals
- Ideal where lamp replacement is costly (at

extreme height, difficult access, etc.) or disruptive to the production

- Reduced waste
- Low early failure rate

	P (W)	L (mm)	Colour temp (K)	IRC	Class B1 ballast	
					Conso. <sup>2</sup> (W)	Lifespan <sup>3</sup> (h)
<i>Tubes T8, 26 mm diameter, G13 fitting</i>						
	18	590	3000 / 4000	85	≤ 24	47 000
	36	1200			≤ 41	
	58	1500			≤ 64	



*Compact fluorescent lamps, 2G11 fitting*

	18	217	3000 / 4000	85	≤ 19	21 000
	36	411			≤ 36	



## Nota

1. Lamp luminous flux data refer to a temperature of 25°C to enable efficiency calculation in accordance with EN13032.

2. The consumption figures shown are standardised maximum values. For precise consumption data, please contact us.

3. The average lifespan of a lamp refers to a mortality rate of 50% (with continued luminous flux greater than 90% for surviving lamps). It refers to a 3-hour cycle (2 hours, 45 minutes on/15 minutes off).

# High-temperature incandescent lamps

\* Data sourced from leading lamp manufacturers, and subject to change

The following table gives the technical data for special incandescent lamps for high-temperature applications, as used in our Pauli 133 HT 200 luminaires.

	P (W)	Flux (lm)	Colour temp (K)	IRC	Conso. (W)	Lifespan (h)
<i>Incandescent lamp, E27 fitting</i>	60	660	2800	100	60	1000



# Calculating the luminous flux of a luminaire

The luminous flux of a luminaire (in lumens) is obtained by multiplying the flux of the lamp (s) by the efficiency of the luminaire (available in the photometric polar diagram chapter):  $\Phi_{\text{luminaire}} = \Phi_{\text{lamp}}(s) \times \eta$

## Example:

Luminous flux of a Pauli HT 80 with extensive reflector at 80°C and T8 58W lamp:

$$\Phi_{\text{luminaire}} = 5200 \text{ lm} \times 47\% = 2444 \text{ lm}$$

Luminous flux is a simple criterion that enables a first level of comparison between luminaires, particularly comparison of fluorescent products with LED products. However, it is important to bear in mind that luminous flux does not always equate to high light levels in the working area.

So efficient lighting is not just about the quantity of light, but how well the luminous flux is directed. This is referred to as 'useful flux', and photometric polar diagrams (charting the spatial distribution of light intensity) remain the most relevant criterion.

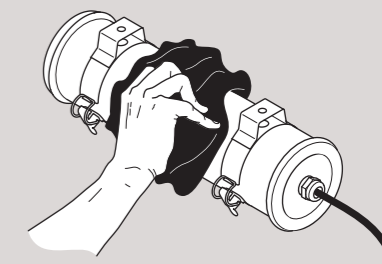
Our sales and technical teams are available to assist you in selecting the correct product for your needs.

# Maintenance

Throughout our history, we have always maintained a culture of uncompromising quality and design our luminaires for exceptionally long life in the most aggressive environments. Nevertheless, maintaining their characteristics and performance in these environments also relies on the quality of luminaire installation and maintenance.

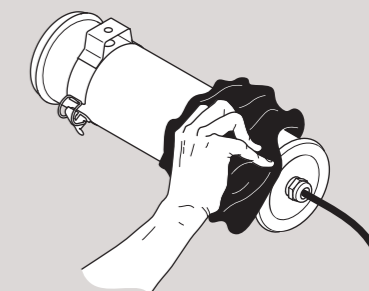
## Diffusers

Regular cleaning of the luminaire avoids the accumulation of surface deposits, and ensures that it retains its original appearance and specifications. The best cleaning method is to use a little soap in warm water with the optional addition of a gentle domestic detergent, and wipe the luminaire using a soft fabric or non-abrasive sponge. The surfaces should then be rinsed with cold water and dried immediately with a soft cloth to avoid residual water marks. Never use abrasive cleaning or highly alkaline materials, and never scrape luminaires using scrapers, razor blades or other sharp tools.



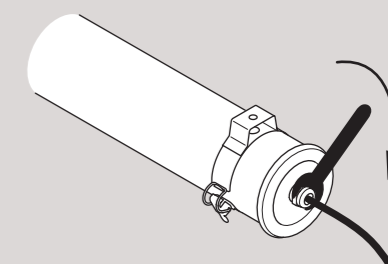
## Stainless steel components

Regular washing of stainless steel components (end caps, fixings, etc.) with clean water improves their resistance and avoids the accumulation of the conductive deposits that result in pitting (galvanic corrosion). It is also preferable to use stainless steel fixings (A2 for use with 304 L, and A4 for use with 316 L) when mounting luminaires and to protect them against molten metal spatter (from arc welding, etc.) and contamination as a result of an unprotected mounting (rust streaking, etc.).



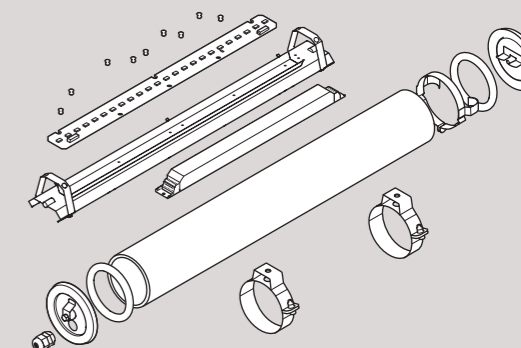
## Ingress protection

The best-possible long-term seal is maintained by following the installation instructions available in our online publications ([www.sammode.com](http://www.sammode.com)). Particular care should be taken to tighten cable glands and their suitability for the type of cable used.



## Spare parts

The simple assembly methods (nuts and bolts, rivets, etc.) used in our luminaires ensure that they can be easily dismantled to facilitate maintenance. From light source (LED modules, etc.) to electronic power supplies, mechanical structure (strap mountings, diffusers, etc.) and consumables (lamps, starters, condensers, sockets, batteries, etc.), every part of the luminaire is designed to last and be replaceable. Spare parts are available for all our luminaires. For orders or additional information, please call us on +33 (0) 1 43 14 84 90 or e-mail us at [enquiry@sammode.com](mailto:enquiry@sammode.com).



# Specifications

## Ingress Protection (IP)

The IP rating refers to the degree of protection provided by electrical equipment enclosures against the ingress of solid objects and moisture in accordance with EN 60529.

IP X Y

X	Protection against the ingress of solid objects	Y	Protection against the ingress of moisture
0	No protection	0	No protection
1	Objects ≥ 50 mm diameter	1	Vertically falling drops of water
2	Objects ≥ 12.5 mm diameter	2	Direct sprays of water up to 15° from vertical
3	Objects ≥ 2.5 mm diameter	3	Direct sprays of water up to 15° from vertical (rain)
4	Objects ≥ 1.0 mm diameter	4	Water splashed from all directions
5	Protected against dust (no harmful deposit)	5	Low-pressure water jets from all directions
6	Totally protected against dust	6	High-pressure water jets or heavy seas
		7	Temporary immersion
		8	Prolonged immersion at a depth specified by the manufacturer
		9	K* High-pressure steam/water jet cleaning

Sammode tubular luminaires are rated IP 66, 68 and 69 K. The following tests have been conducted under laboratory conditions in accordance with ISO 20653. Materials and design choices are optimised to maintain this level of ingress protection throughout the life of the luminaire.

Rating	Use	Test procedure
IP65	Indoor	Spraying the enclosure from all practicable directions with a stream of water from a standard-compliant test nozzle. <ul style="list-style-type: none"> <li>• Test duration: 3 minutes</li> <li>• Flow rate: 12.5 l/min</li> <li>• Distance between the nozzle and enclosure surface: 2.5 m–3 m</li> <li>• Pressure: 30 kPa</li> </ul>
IP66	Outdoor	Spraying the enclosure from all practicable directions with a stream of water from a standard-compliant test nozzle. <ul style="list-style-type: none"> <li>• Test duration: 3 minutes</li> <li>• Flow rate: 100 l/min</li> <li>• Distance between the nozzle and enclosure surface: 2.5 m–3 m</li> <li>• Pressure: 100 kPa</li> </ul>
IP68	Outdoor	<ul style="list-style-type: none"> <li>• Immersion of the luminaire in cold water</li> <li>• Immersion of the luminaire at a depth of 4 m (0.4 Bar)</li> <li>• The luminaire is switched on for 1 hour before commencement of the test</li> <li>• the luminaire is switched off during the test</li> <li>• Immersion duration: 1 hour</li> </ul>
IP69 K	Pressure washing	Spraying the enclosure with a high-pressure jet of hot water to reproduce food industry cleaning conditions. <ul style="list-style-type: none"> <li>• Test duration: 2,5 minutes</li> <li>• Flow rate: 15 l/min</li> <li>• Distance between the nozzle and enclosure surface: 100 and 150 mm</li> <li>• Pressure: 10000 kPa</li> <li>• Water temperature: 80 °C</li> </ul>

Up to, and including, the second figure 6, the rating implies compliance with the requirements of all lower numbers.

## Impact Resistance (IK)

Sammode luminaires with borosilicate glass bodies are IK07 rated; all others are IK10 rated. The following tests have been conducted under laboratory conditions in accordance with EN 62 262. Materials and design choices are optimised to maintain this level of impact

resistance throughout the life of the luminaire. The ingress protection levels of our luminaires remain intact following mechanical impact, as long as this remains below the impact energy guaranteed by the IK rating.


IK XX

XX	Protection against the ingress of solid objects
00	No protection
01	Impacts of 0.14 Joule impact energy (the energy of a 14 g weight falling 1m)
02	Impacts of 0.2 Joule impact energy (the energy of a 20 g weight falling 1m)
03	Impacts of 0.35 Joule impact energy (the energy of a 35 g weight falling 1m)
04	Impacts of 0.5 Joule impact energy (the energy of a 50 g weight falling 1m)
05	Impacts of 0.7 Joule impact energy (the energy of a 70 g weight falling 1m)
06	Impacts of 1 Joule impact energy (the energy of a 100 g weight falling 1m)
07	Impacts of 2 Joules impact energy (the energy of a 200 g weight falling 1m)
08	Impacts of 5 Joules impact energy (the energy of a 500 g weight falling 1m)
09	Impacts of 10 Joules impact energy (the energy of a 1 kg weight falling 1m)
10	Impacts of 20 Joules impact energy (the energy of a 2 kg weight falling 1m)

## Electrical safety classification

The electrical safety classification defines a level of electrical protection for the user as the basis for measuring the potential risk of a person coming into contact with mains voltage (230 V AC)

or any other voltage hazardous to humans (above 50 V in dry surroundings). Sammode luminaires comply with electrical safety classe I in accordance with EN 60598-1.

Class	Protection	Symbol
Class I	Equipment that is electrically insulated and provided with a connection to earth to protect exposed metal parts that could become live accidentally	

## Fire resistance

The glow wire test is governed by the IEC 60695-2-10 standard and is applied to determine whether the luminaire installed in a building could potentially burn and, more importantly, could contribute to the spread of fire. Sammode luminaire diffusers pass the glow wire test at a temperature of 650 °C for the coextruded polycarbonate/polymethyl methacrylate versions, and 960 °C for the polycarbonate versions.

The borosilicate glass diffuser and metal luminaire components are deemed non-flammable. All our emergency lighting luminaires pass the glow wire test at 960 °C. The test consists of applying a wire heated to a fixed temperature (650 °C, 850 °C, 960 °C, etc.) for a fixed period (5 or 30 seconds, for example) and examining the behaviour of the luminaire housing, especially if it catches fire.



# Our products are trusted by all these companies and organisations

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Fonderies du Poitou  
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WA75  
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Presses du Louvre, Paris

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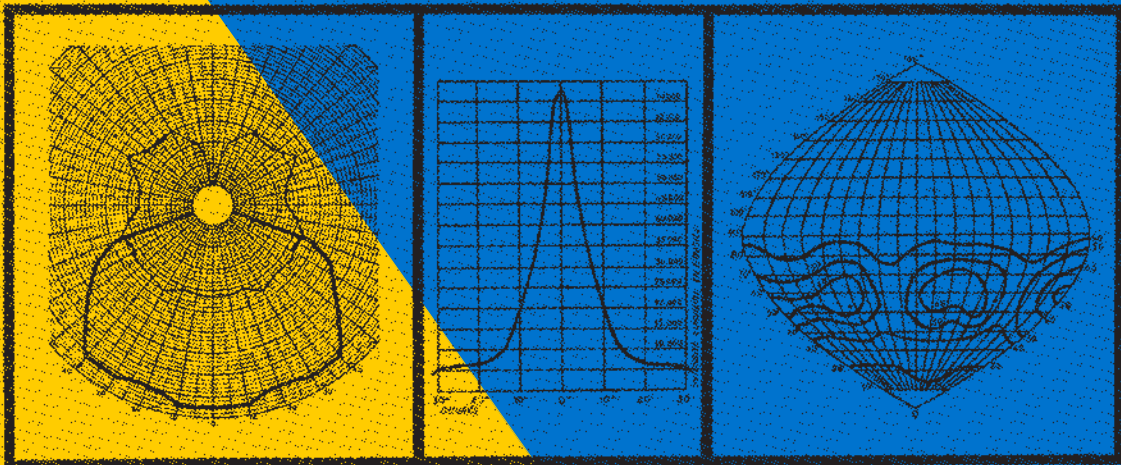
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## Products

	General lighting	Task lighting	LED
Bunsen 100	42	58	●
Bunsen 133	43		●
Einstein 100 HT	44	60	
Einstein 133 HT	45	61	
Hooke 100 HT		59	
Joule 133	46	63	●
Pauli 100 HT 80	47	64	
Pauli 133 HT 80	48	65	
Pauli 100 HT 100	49	66	
Pauli 133 HT 100	50	67	
Pauli 133 HT 200	51	68	
Rankine 70		62	●



Courbe Polaire

Courbe en coordonnées cartésiennes

Courbes Isobaugies

Extract  
of the 1930  
catalogue



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