




Aba-Szer Fémbútor Kft.

Outdoor LIGHTING

2014/2015



reddot award 2014
winner



Cities, roads, facilities... all the elements of the space in which humans live need light. To feel safe, to be able to function, but also enjoy the beauty and aesthetics of the world around us. Our experience has allowed us to complete an offer dedicated just to these spaces...

PRODUCTION OF ALUMINIUM CONES

○ MATERIAL

Conical columns are rolled from EN AW-6060 aluminium alloy tube. Aluminium column base plates are pressed from EN AW 5754 aluminium alloy sheet. The use of aluminium alloy ensures the correct mechanical strength and chemical welding process, polishing and creation of anodised oxide on items produced.

○ TECHNOLOGY OF CONE PRODUCTION

Extruded aluminium alloy tube is mechanically rolled on specially designed digitally controlled machines. By using a rotational squeezing method, the cylindrical tube is being transformed into conical tube with a greater durability parameters. Conical columns are then brushed. This production technology and conical forming machines are protected by patent registration, patent no PAT-194795.

○ BASE PLATE WELDING

The aluminium base plate and conical column section are welded by automatic robot. This ensures high quality and aesthetic repetition within required parameters.



Welded connection of base plate with the column

○ WIRING CHAMBER

Each aluminium lighting column has a wiring chamber where the connection boxes are mounted. The wiring chamber door is cut by laser or on a specially designed automatic saw. The door is fastened with screws. The closure of the wiring chamber is equipped with grip clips (locks) welded to the door and to the wiring chamber. The ROSA door locking system adds to the integral strength of the column but subsequent wind calculations are not dependent on it being in place.

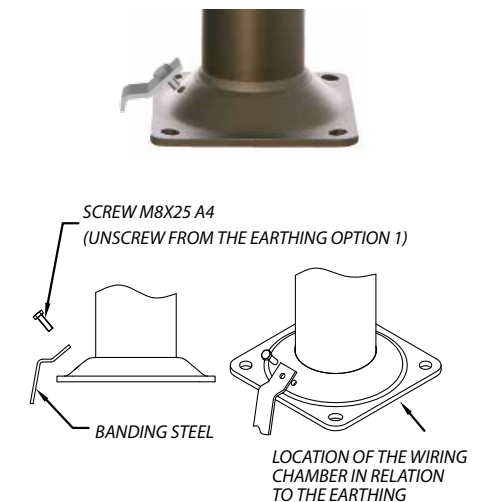
○ EARTHING SYSTEM

A slot is provided in the lower locking bar for a supplied M8 earthing bolt to which the earthing cable is attached. This location allows easy access to earthing bolt, thus allows for quick maintenance and assembly.



Wiring chamber in the aluminium columns

Alternative, for the earthing used in the wiring chamber as a standard is the additional earthing which is made on the base of the column. It can therefore be an optional, stainless steel screw M8 can be mounted on earth connection box in the wiring chamber, or can be screwed in the base plate. This solution can be used especially in the case of application of the earthing by banding steel.

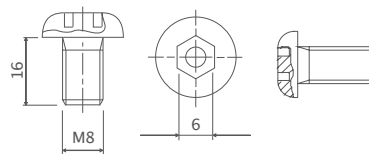


○ WIRING CHAMBER DOOR SCREWS

Doors are secured with two stainless steel M8 screws of a special security allen socket shape which prevents opening of the wiring chamber by unauthorised persons. Retaining o-ring type washers are fitted to each screw protecting it from falling out when loosening. The column can be equipped with triangular screws/keys which are available on request.



Allen key



Screw for closing wiring chamber door
M8x16 A2 (security allen screw with bolt)

○ COLUMN REINFORCEMENT

Columns marked with index "wzm" are reinforced. Reinforcement of the column within the base and wiring chamber by an additional tube or a thicker wall allows the use of a number of luminaires or extension arms, or their installations in areas exposed to high wind speeds.

○ CONNECTION OF TWO-PIECE ALUMINIUM COLUMNS

Permanent connection of two-piece columns is assured by using specially designed stainless steel coronet connection clamp.

Connecting element is secured by using:

- 3 screws M10 – for two-piece SAL columns,
- 4 screws M10 – for two-piece MAL masts.



Connecting clamp for two-piece
column type SAL



Connecting clamp for two-piece
column type MAL

○ RESISTANCE CALCULATIONS

Column resistance calculations are made in resistance program in accordance with standards EN 40 and EN 1991-1-4. Column resistance is calculated for columns with detached wiring chamber door.

Permissible column loads.

Designing of aluminium lighting columns is based on the group of standards EN 40.

1. EN 40-1 – Lighting columns – Terms and definitions.
2. EN 40-2 – Lighting columns – General requirements and dimensions.
3. EN 40-3-1 – Lighting columns – Designing and verification – Specification of characteristic loading and recalled EN 1991-1-4. Designing bases and influencing on construction. 2-4 Wind loads.
4. EN 40-3-2 – Lighting columns – Designing and verification – Verification by testing.
5. EN 40-3-3 – Lighting columns – Designing and verification – Verification by calculations.
6. EN 40-6 – Aluminium lighting columns – Requirements.

The above listed standards also specify methods of determining the permissible load in column construction. When determining permissible column loads, the following characteristic specific parameters were taken into consideration: average wind speed, location category, analytical load, horizontal deviation, shape factor.



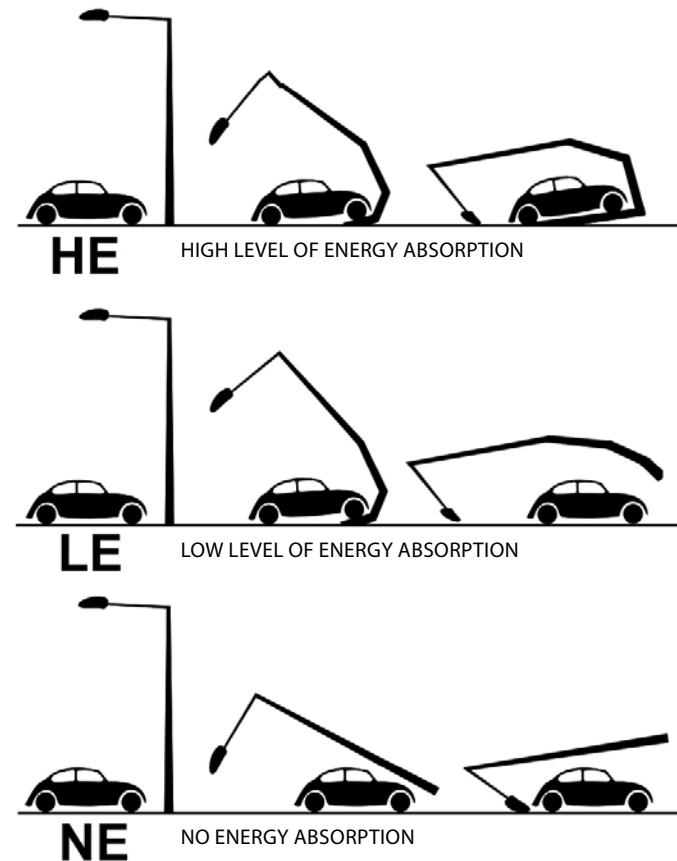
PASSIVE SAFETY

Aware of the safety requirements expected from the producers of lighting columns in minimizing the danger resulting from road accidents we have carried out passive safety tests on its products according to standard EN 12767 "Passive safety of support structures for road equipment. Requirements and test methods."

Due to the test results, we have received the passive safety certificate for rooted aluminium columns up to 12 m and diameter up to Ø225 mm and for flanged aluminium columns up to 12 m and diameter up to Ø180 mm:

100 NE 2
 100 – test impact speed
 NE – non-energy absorption construction
 2 – vehicle passenger safety degree

Aluminium lighting columns with the passive safety class 100NE2 may be used in a road infrastructure, where the non-energy absorption factor is required for road constructions, e.g. motor ways, express ways, country roads. In this case, the vehicle, having crashed against the column, will continue driving at a reduced speed, protecting the passengers of vehicle against the effects of collision.



Levels of energy absorption according to EN 12767

Categories and parameters

Determination of standards:

1. Construction categories in respect of the energy absorption degree:
 - HE – high level of energy absorption
 - LE – low level of energy absorption
 - NE – no energy absorption
 - Class „0” – passive safety requirements are not met
2. The degrees of passenger safety:
 - 1, 2, 3 – supporting structures to provide increased security
 - 4 – harmless supporting constructions.

ANODISING PROCESS

○ ROSA ANODISING PLANT

Anodising plant of aluminium products is part of ROSA GROUP. It has been operating since 2009 and it is today the largest of this kind facility in Central – Eastern Europe. ROSA anodising plant specializes in services such as anodising with electrochemical or interference colouring of aluminium materials (including sheet metal, pipes, profiles or other structural elements). Modern interference technology of colouring provides richer from the traditional colour palette, resistant to external factors, including UV radiation. ROSA anodising plant anodises the elements up to 10 m, simple or complex shapes, in 10 unique anodising colours, each with the possibility of brightening.

○ ANODISING PROCESS

Raw and unsecured aluminium is susceptible to dirt, and it corrodes in the polluted and aggressive environment. We offer to our clients the highest quality products, that's why all of our aluminium columns are anodised.

Anodising is a surface treatment of aluminium and its alloys consisting of a controlled electrolytic formation of a protective layer of aluminium oxide. Depending on product destination and terms of use, anodised coatings are made in several thickness classes. The thickness of the anodic coating lighting columns is 20 µm. This ensures safe use in moderate to harsh conditions. For exceptionally harsh conditions a coat of 25 microns is recommended. There is the possibility to anodise products up to 10 m length.

The porous structure of the oxide coating allows to permanent colouring of metal with an electrochemical or interference method. In these technologies, metallic fraction is permanently associated with the structure of an anode layer and the corresponding geometry and orientation of the pores determines the perceived colour.

Anodising is used for the following purposes:

- the anti-corrosion and mechanical protection of the metal surface, with particular emphasis on atmospheric corrosion, especially against aggressive environmental factors such as sea water, acid rain, etc.,
- decorative - anodised surfaces achieve a smooth, satin finish, and additional colouring provides exceptional aesthetic surface finish.

○ QUALITY GUARANTEE!

We conducted in our R&D laboratory test of resistance of anodic oxide coatings to UV rays. The test was performed in accordance with the recommendation of EN ISO 6581 «Anodising of aluminium and its alloys – Determination of relative resistance to ultraviolet light and heat of coloured anodic oxide coatings.»

During 11500 h of the exposure of the samples in the device Q-Sun Xe-3 during 11500 h, there was no change in colour of the oxide coating. Such exposure period as equivalent to 16 years of operation in Polish climatic conditions.

At the same time, the samples of anodised aluminium lighting columns are systematically tested in a salt spray chamber to determine the corrosion resistance. So far, during 16000 h of exposure time, there was no signs of corrosion (exposure time recommended by EN ISO 9227 is 1000 h).

The company received technical approval of the European Association of Surface Treatment Aluminium QUALANOD with the right to use the Quality Label QUALANOD of Anode Coatings, which confirms the highest quality of services provided by ROSA anodising plant.



○ VALUE OF ANODISED ALUMINIUM

- anodised coatings are integrally connected with the ground, so there is no possibility of peeling, spalling or delamination,
- long service life, with the possibility of receiving the guarantee up to 20 years,
- high aesthetics of the column for a long time of use,
- high resistance to UV radiation,
- high resistance to abrasion due to the greater hardness of the coating,
- corrosion free,
- the availability of a wide range of colours,
- decorative surface.

○ ANODISING PROCESS

The process of anodising is carried out on an automated technological line equipped with 27 tanks. This process can be divided into three stages. Between the different essential processes the operations of washing the product are carried out.

Anodising process stages:

1. Surface preparation:

- surface pre-treatment phase – removal of grease and other contaminants of various origin from the surface of the aluminium,
- alkaline bath phase – removal of thin oxide layer from the surface of the product and creating an uniform matt and decorative appearance, and removal possible defects,
- pickling (lightening) phase – removal residual alloy impurities and thin oxide layers and sediments that may remain after the etching process, their removal is necessary to create the optimal adherence of the oxide coating to the matrix.

2. Anodising and colouring:

- anodising is controlled formation of aluminium oxide layer on the aluminium surface during electrochemical process. Anodised coating is formed by electrolysis, in sulfuric acid solution with the participation of a certain current density. The anodic film grows with 2/3 of its thickness below the original metal surface and 1/3 above it. It is considerably thicker than the natural oxide layer so that it effectively protects the aluminium surface from further oxidation, that is corrosion. Its porous structure allows for durable colouring of the product by chemical, electrochemical and interference method.



- electrochemical colouring is treating an anodised product in the electrolyte containing tin ions. Reduced metal in cycle cathode is deposited on the bottom of the pores of the oxide coating and can durable colouring the aluminium surface. This method produces a range of colours from pale to dark brown and black.
- Interference colouring operation is preceded by shapes modification of the pores of the anodic layer. Tin is then deposited in such modified pores and provides durable colouring of aluminium surface, expanding the palette of colours obtainable in electrochemical colouring of new colours. This method uses the interference phenomena of the reflected light waves which increases or decreases the amplitude of the resultant wavelengths. Modifying the amplitude by controlled changing the shape of the pores of the anode layer allows to create new colours.

3. Sealing

Sealing aim to seal the closure of the porous oxide layer, which ensures proper corrosion resistance. This is the last process of anodising, run in a dematerialized hot water containing accelerating additives, which comes to fill the pores in the oxide coating with boehmite and aluminium hydroxide. After sealing the anodised aluminium surface is hard, smooth, resistant to dirt and corrosion.

○ BRIGHTENING

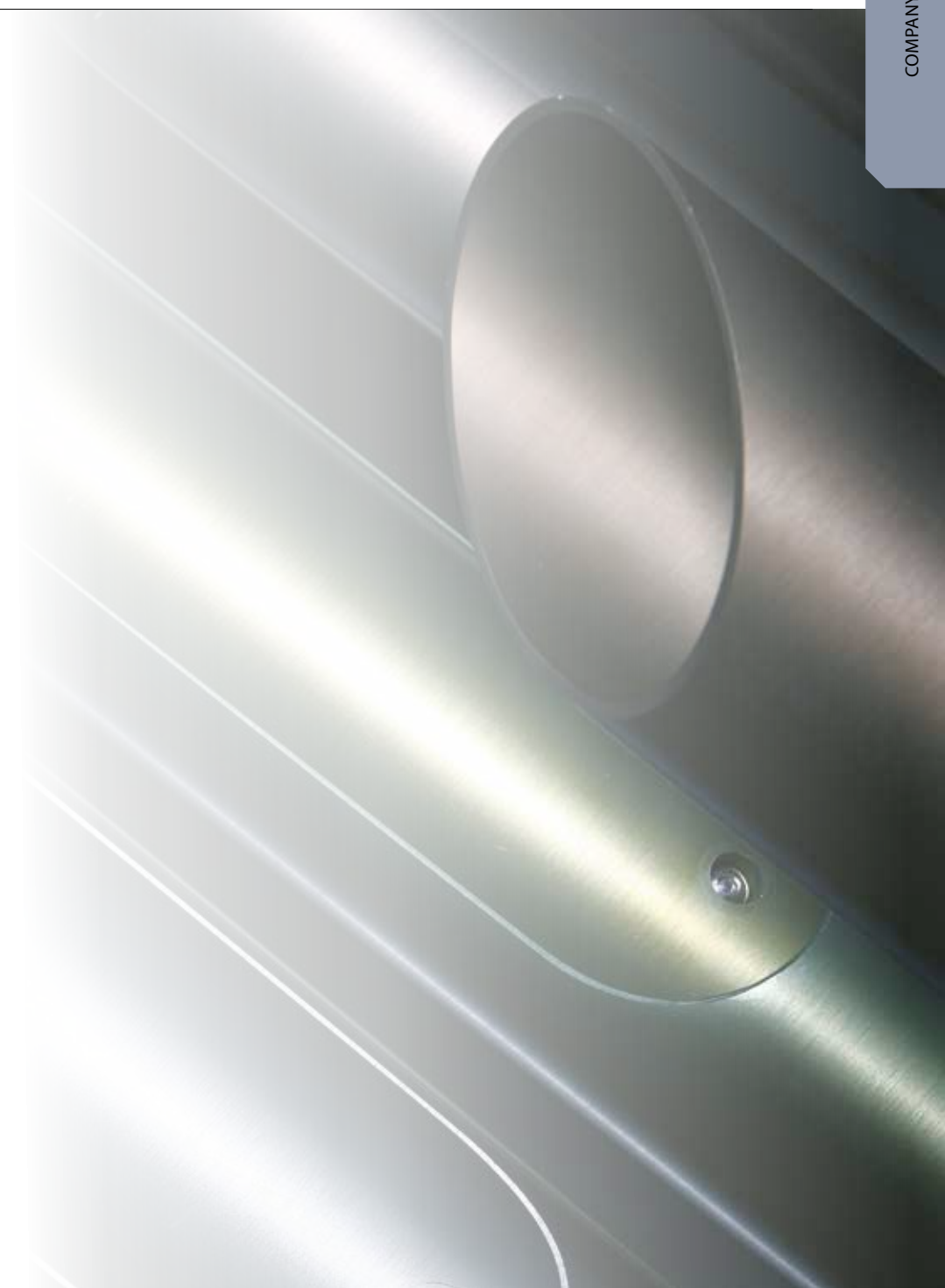
Brightening is accomplished by chemical etching of glossy surface structure prior to anodising of the aluminium. The process is based on smoothing the chemical structure of the surface, which results in a reduction in fogging and lightens the metal surface, which in turn can effect the final gloss.



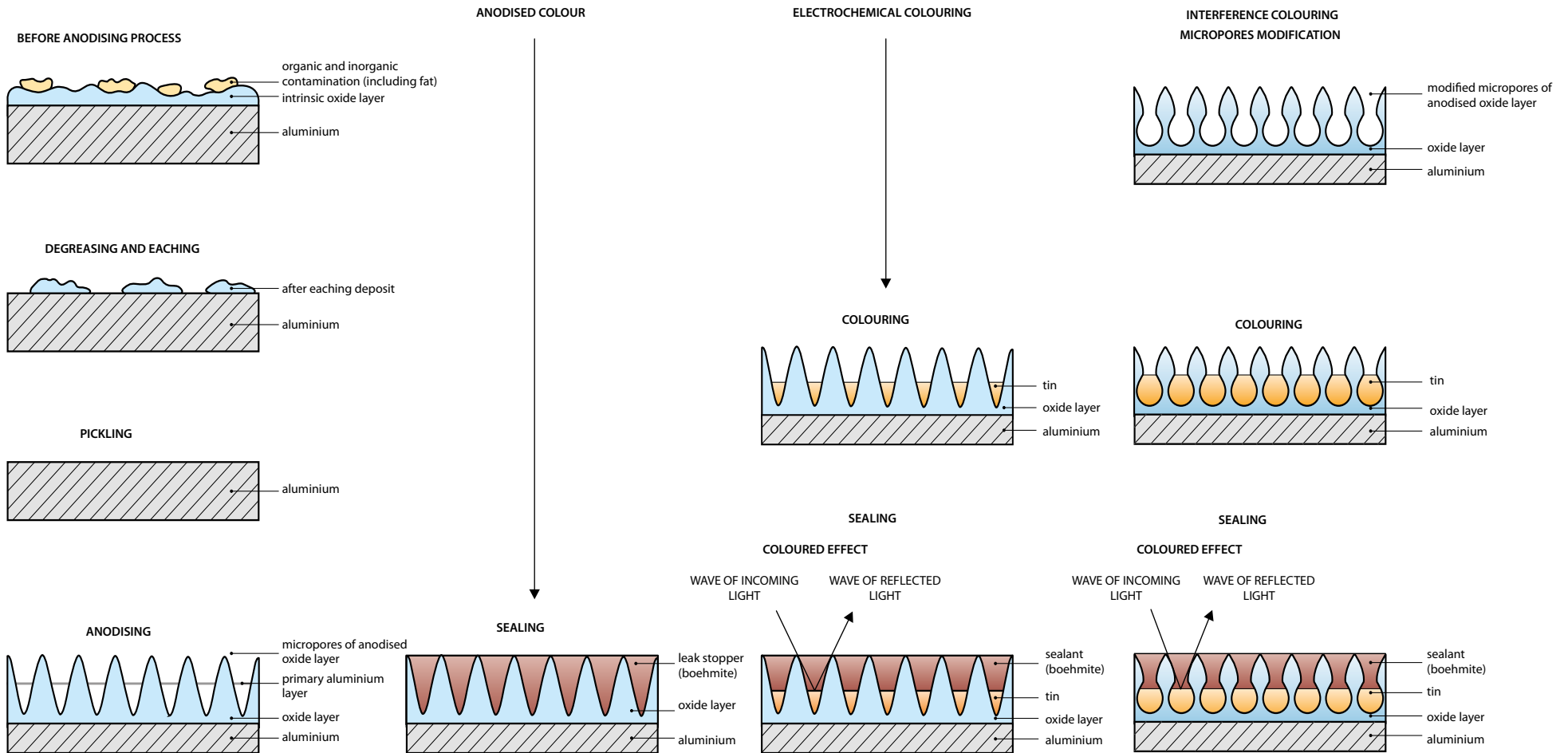
THE ANODISING COLOUR PALETTE



Real anodising colour can differ from presented colour sample.
 "W" means brightening.



ANODISING PROCESS OF ALUMINIUM PRODUCTS



○ ELASTOMER

Anticorrosive base protection of the column and its rooted section. Due to negative effects of salts and ammonia compounds and to prevent mechanical damage in compliance with EN-40 European requirements concerning aluminium columns, it is recommended to protect the lower part of the column.

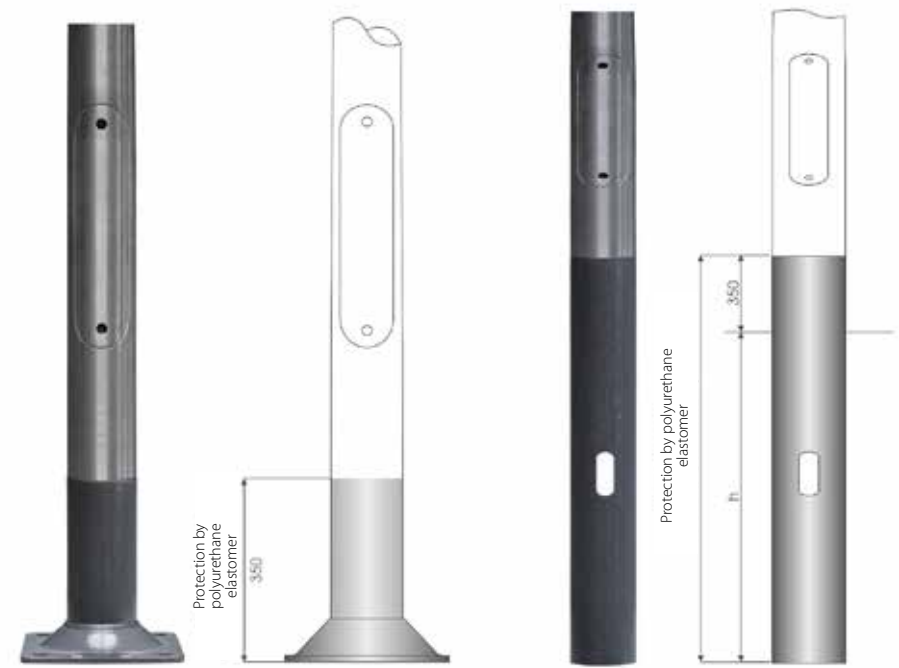
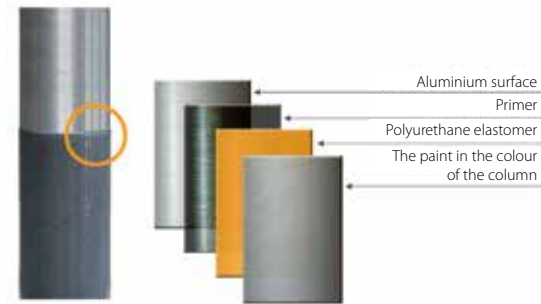
The thickness protection layer is from 0,7 mm to 1 mm and its hardness is 90°sh. Elastomer surface is painted by UV resistant paint into colour matching the colour of anodised column.

For this purpose, ROSA proposes to cover the column base together with fixing holes and also the rolled part of the column up to 350 mm with polyurethane elastomer.

Rooted columns type SAL dz are protected with polyurethane elastomer as a standard. Material and production technology are environmentally friendly.



ELASTOMER COLUMN PROTECTION



Protection of the columns with base plate by polyurethane elastomer

Protection of the rooted columns by polyurethane elastomer

PRODUCTION OF PLASTIC COATED POLES

○ POLE CONSTRUCTION

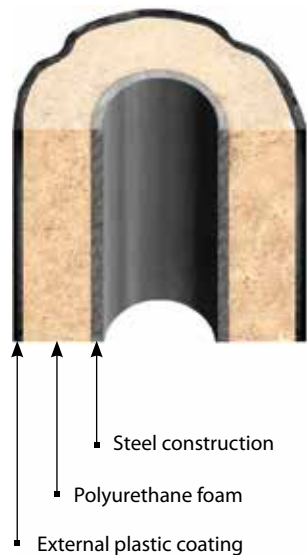
Plastic coated poles consist of three interconnected materials:

- supporting structure made of steel tubes of hybrid construction welded to the steel base which is reinforced with angle braces,
- external components made of special composition of plastics by thermoforming and injection molding method,
- self-extinguishing, rigid polyurethane foam that fills the space between the structure and the plastic coating of the pole.

The pole steel construction was specially designed to absorb the load created mostly by wind pressure.

Plastic coating is made in two versions:

- standard thermal resistance – poles used in countries where air temperature varies between -30°C to $+40^{\circ}\text{C}$,
- high thermal resistance – poles used in countries where air temperature is less than -30°C and exceeds $+40^{\circ}\text{C}$. It concerns poles in black colours. This type of pole is additionally marked with letter "F".



Wiring chamber in SP poles



Wiring chamber in S and SM poles



○ NICHE CHAMBER

Poles with niche chamber are additionally marked with letter "W". The niche chamber is located in the first, lower section of the lighting pole. It is designed to connection box mounting on the aluminium rail located on the back of the steel structure of the pole. The rail fixing clamp can be used as a protective one.

The niche chamber is protected by decorative plastic cover in identical colour and texture to the pole.

Plastic coated poles are characterized by:

- corrosion resistance,
- light weight facilitates transport and mounting,
- aesthetic appearance,
- adverse weather conditions resistance,
- resistant to salt, ammonia and other caustic substance,
- UV resistant,
- high mechanical qualities,
- suitable for every climatic zone,
- low cost of maintenance.

○ TYPES OF PLASTIC COATED POLES

Plastic coated poles are produced in three versions:

- S – traditional,
- SP – straight,
- SM – composite.

○ TYPES OF SPIGOT ENDING

Three types of spigot ending are used depending on type of plastic coated pole:

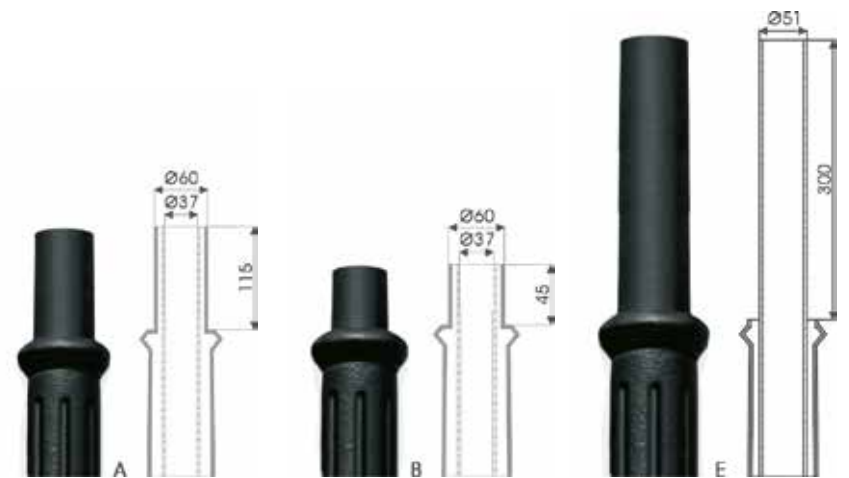
- type „A” – designed for mounting arm systems in poles type S and SP and extension arms WT in poles type SP,
- type „B” – designed for using luminaires with spigot ending $\varnothing 60$ mm (OP, OPA-1, OS-1, OS-1 LED, OS-11 LED),
- type „E” – designed for mounting extension arms WTM.

Spigot ending is integral and non-modified part of the pole.



An example of the construction of the pole S-40W

An example of the construction of the pole SM-1W



Section endings of plastic coated poles

LIGHTING LUMINAIRES

○ VARIETY OF SOLUTIONS

ROSA offers a wide range of products based on LED technology and solutions using high-pressure light sources. Types of ROSA luminaires:

- park luminaires designed to illuminate urban areas for example, parks, routes, parkings,
- street luminaires designed to illuminate highways, roads, parkings and industrial areas,
- floodlights for architectural lighting, sports facilities and large areas.

○ LUMINAIRES FOR DISCHARGE LAMPS

We offer modern, aesthetic and functional luminaires which use high-pressure light source. Among them are park and street luminaires and floodlights which are used to illuminate large areas. This enables the comprehensive use of lighting luminaires – they can be mounted either directly on the column and on the extension arm or wall bracket. Additionally, a handle is integrated with the luminaire, what allows to adjust the inclination angle. A wide range of lamp diffusers for park luminaires provides a choice in shape, colour, material and size. For luminaires with transparent lamp diffusers, stainless steel louvre reflector may also be installed. It reduces glare and directs the luminous flux towards the ground.

Luminaires are made from high quality materials. Anodised aluminium is used for the structure, and a new generation of plastic which is resistant to aging and the conditions of industrial atmosphere that guarantees long-term trouble-free operation. It is possible to use different light sources and power, so they can be adapted to existing conditions and needs.

According to the recommendations of the European Directive No 2005/32/EC concerning most of all, the sky pollution by street lighting, construction of ROSA luminaires limit upward light emission. Whereas, according to environmental policy of the company, the luminaires are made from environmentally friendly materials and fully utilized.



○ LED LUMINAIRES

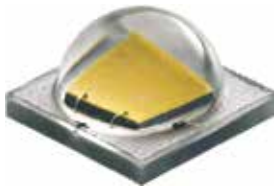
ROSA LED luminaires combine anodised aluminium technology with innovative LED sources what makes them not only economic, ecological and durable, but also highly aesthetic. In the group of ROSA LED luminaires are park, street luminaires and floodlights.

The advantages of using LED luminaires:

- reduction of energy consumption,
- possibility of using power reduction,
- quantity reduction of lighting sets,
- maintenance costs savings.

○ LIGHT SOURCES

ROSA products equipped with LED use light source CREE:



LED CREE XM-L2



LED CREE XT-E



XM-L2 – one of the most efficient single-structure diodes on the market which assures unprecedented savings in energy consumption:

- high efficiency – allows to achieve up to 120 lm/W of entire luminaire efficiency,
- low thermal resistance 2,5°C/W – which translates into low diode working temperatures with consequently longer luminaire lifespan.

XT-E – a diode characterized by good ratio of price to performance:

- uniformity of light colour in the whole angle of the lighting beam (columns KARIN LED, CORONA LED)

LMH2 – replaceable LED module used in traditional luminaires retrofitted with LED source (ATLANTIS LED, ELBA LED, OS-11 LED)

- pleasant warm colour temperature (3500 K) and very high CRI>90

○ COLOUR TEMPERATURE OF LIGHT, COLOUR RENDERING INDEX

Light sources in ROSA luminaires and lighting sets are available in the variants of the light colour temperature: 3500 K or 5000 K.

Light colour	Colour temperature of light (CCT)	Colour rendering index (CRI)
Warm white	3500 K	80
		>90*
Neutral white	5000 K	75

* ATLANTIS LED, ELBA LED, OS-11

Warm white colour (3500 K) is preferred in lighting of urban spaces, parks. In contrast, neutral white colour (5000 K) works in street lighting due to the higher efficiency of light.

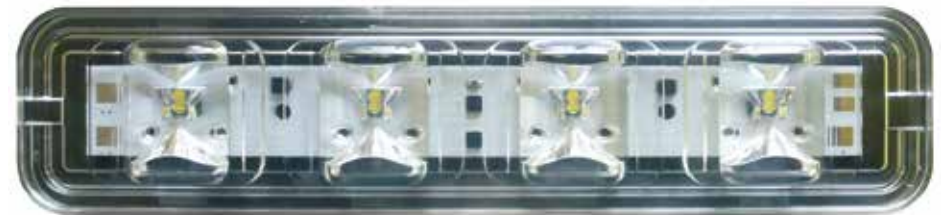
These variants are marked in the product code by number „3” for the temperature 3500 K and by number „6” for the 5000 K. The choice of one of these options makes no difference to the luminaire cost but depends on customer preference.

There is a possibility of ordering the luminaires with light sources with a colour temperature other than the standard, from range 2600-5000 K on request.

○ OPTICS

ROSA LED luminaires use only optics made of PMMA (polymethyl methacrylate) with increased resistance to temperature. It is used in collective lens and lamp diffusers/light diffusing plates (ELBA LED, ATLANTIS LED, CORONA LED, KARIN LED, OS-11 LED).

Standard LED module has a temperature sensor and protection of circuit interruption due to damage of a single diode.



Standard module LED – used in most of the park luminaires, also in lighting sets DROP LED and FLEXI LED

○ REPLACEABLE LED MODULE

Replaceable LED module contains 12 diodes XM-L2 or XT-E and is used in 5 unique optics. The housing and the connectors are waterproof – IP67. The module has a temperature sensor and protection against circuit interruption. At the bottom of the module is mounted a graphite thermal pad which provides heat transfer to the heat sink of the luminaire or column.



The module can be replaced using simple tools.

○ LUMINAIRE CONSTRUCTION

Luminaires body, with the exception of luminaires OS-1 LED, ELBA LED, ATLANTIS LED, MAGNOLIA LED and LED lighting sets, are made entirely from profiles and aluminium sheets. Aluminium alloy is known for its excellent thermal properties and high thermal conductivity (> 200W/mK).

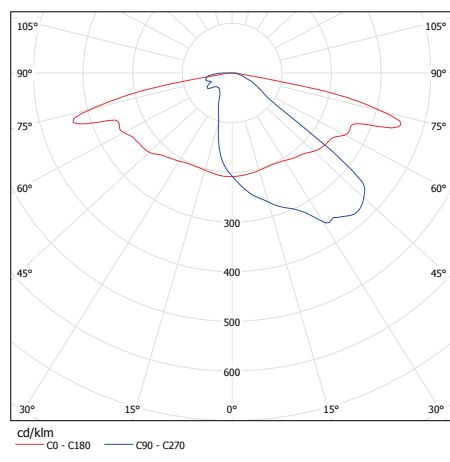
Maintaining low critical temperature of diodes ensure their durability over the years. Luminaire housing is anodised, which further increases the dissipation of heat by radiation. Using of anodised aluminium, beyond aesthetic values, provides further proper heat dissipation, allowing the luminaire long light efficiency at the highest level.

The standard LED luminaires are offered in configurations of colours inox/graphite or inox/black.



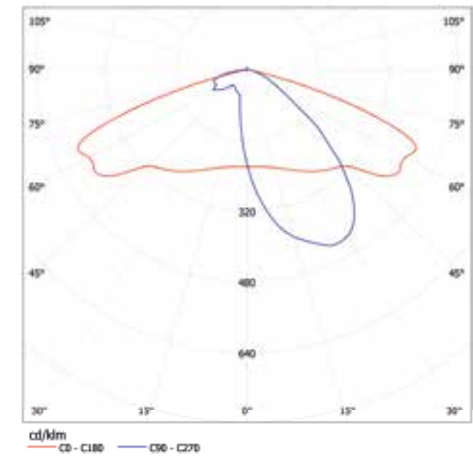
AVAILABLE OPTICS FOR REPLACEABLE LED MODULE

ME



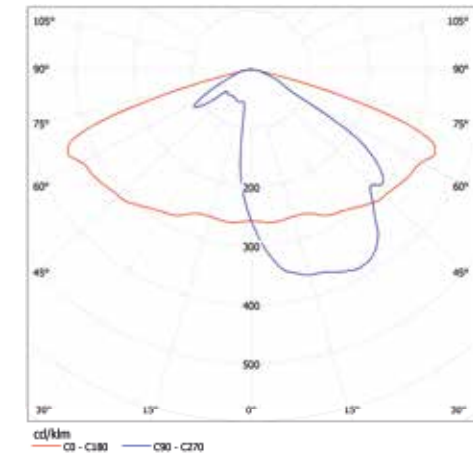
- ME lighting classes
- high rate of surrounding lighting $SR > 0.6$

T2



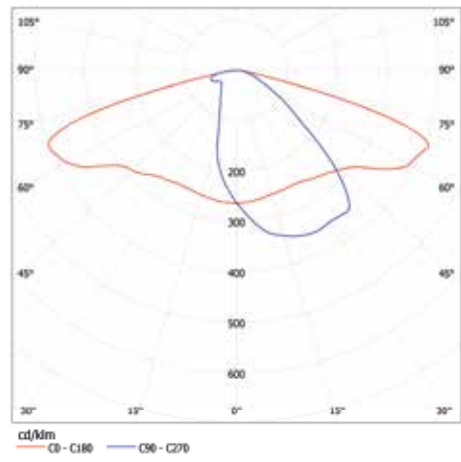
- ME2 lighting classes
- particularly effective in double row configurations (opposing arrangement or on median)

T3



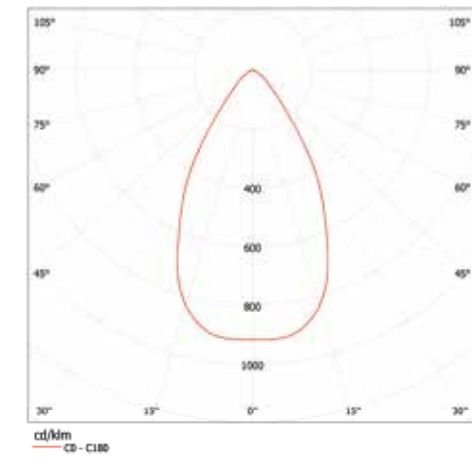
- ME3 lighting classes
- installation height up to 10 m
- high longitudinal uniformity of the luminance UI

DW



- ME road classes, pedestrian ways
- installation height up to 8 m
- very high longitudinal uniformity of the luminance UI

HB



- illumination of warehouses
- illumination of buildings

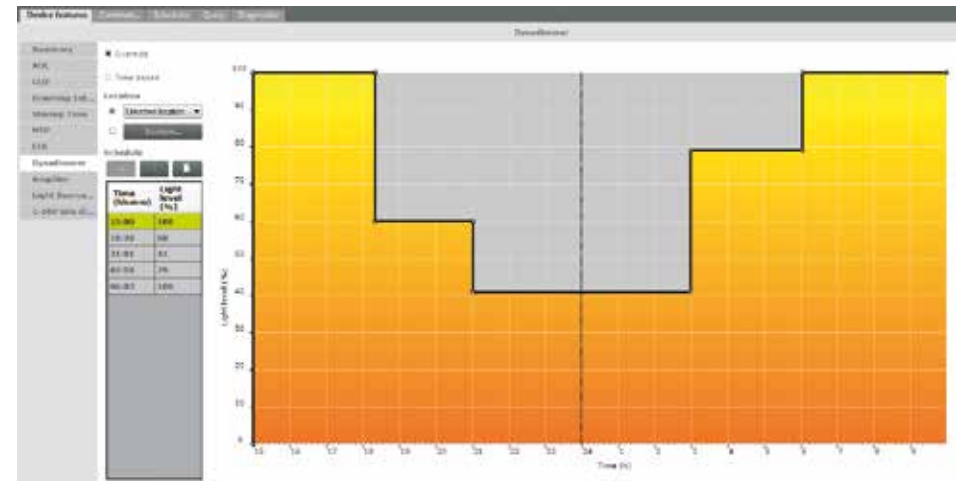
○ DRIVER – PHILIPS

The LED luminaires use highly efficient constant current programmable drivers: Philips Xitanium. Drivers series Xitanium are designed to power outdoor lighting with LED light source. Philips Xitanium drivers offer considerable flexibility through a large number of programmable options that can be set according to different requirements of customers. At the user's disposal is available a number of parameters such as: adjustable output current, interfaces Dali and 1-10V, built-in programmer time profiles. In addition, the driver has an option to control the temperature of LED modules, which reduces power if it detects a temperature higher than programmed, allowing to protect the diodes from overheating, and hence faster wear.

The driver is housed in an enclosure with routed connectors, making its replacement without or with simple tools.



Programmable time profiles allow to boost savings resulting from the use of lighting based on LED technology. Additional economic benefits result from possibility of reducing power luminaire during the cycle, where the maximum luminous flux is not particularly required. For the customer's convenience, it is possible to set 5 power threshold in the range from 10 to 100% of rated power at any interval cycle of luminaire. The user indicates the power level which is expected at specific hours across a day, then the driver performs a given profile, regardless of the time on/off lighting. The use of such a solution can reduce the power consumption of luminaires, which translates into economic savings.



Parameters used in Philips Xitanium drivers

Model	Output power range	Output voltage range	Current output range	Voltage	Insulation class	Ingress protection IP
Xitanium 75 W 0.1-1.05A Prog+sXt	25-75 W	36-75 V	100-1050 mA	120-277 V	II	IP66
Xitanium 150 W 0.1-1.05A Prog+sXt	75-150 W	70-148 V				

○ EXTERNAL CONTROL SYSTEM

ROSA luminaires have interface DALI or 1-10V, which allows to control the illuminance of luminaire. The best way of control is the connection of luminaires in a lighting control system. Such a system provides steering and control of LED luminaires.

ROSA recommends, the APANET Green System which allows dimming and the exclusion of individual luminaires or groups of luminaires and control of their parameters (active, reactive, $\cos\phi$, THD, etc.).



This system operates in a global standard LonWorks, which uses the protocol LonTalk for communication (ISO/IEC14908) that allows to use devices from different manufacturers in a single installation.

Additionally, there is the possibility of installing sensors in the system, mostly twilight and traffic, weather station through which it is possible to control the weather conditions in the place of luminaires installation. In case of failure of the luminaire, system sends a SMS or an e-mail with information about the damage of the luminaire.

Control over such luminaires takes place via devices with internet connection (desktop computers, laptops, tablets). This allows luminaire control from almost every place on Earth.

The use of an external control system can significantly affect the reduction of energy costs (e.g., installing a motion sensor on the rarely frequented stretch of road) and maintenance (reporting failure).

○ ECONOMY

The main advantage of the LED lighting is its energy – efficiency in comparison to traditional light sources. At the same luminous flux, the LEDs consume less energy than traditional lamps – for example, the new park luminaire MIRA LED 36W achieves higher light efficiency than used luminaire OPA-1 S-70W. With ROSA products, power consumption per year can be reduced up to 73% while reducing the cost of investment.

The durability of LEDs used in our housings characterized by a parameter L90 for 50 000 hours which allows for about 12 years of operation with decrease of luminous flux up to 90% of the initial value. Thereby significantly reducing the costs associated with maintenance of ROSA LED luminaires and get additional savings.

Another argument is improving the quality of lighting and ecological perception compared to conventional light sources.

○ ECOLOGY

Care for the environment and safety has created a huge demand for environmentally-friendly solutions.

- LEDs do not emit UV or infrared radiation. ROSA LED products use less energy, causing reduction of carbon dioxide emissions in electricity production.
- Light sources used in luminaires meet the requirements for Standard EN 62471 “Photo biological safety of lamps and lamp systems” and do not cause damage to eyes in normal use.
- Luminaires are made from renewable materials, mainly aluminium, which can easily be recycled.
- ROSA LED products are compatible with the RoHS Directive, which restricts the use of hazardous materials in electronics.
- In accordance with the policy of prevention “sky light pollution” light from the luminaires is directed only downward.

ROSA LED PRODUCTS CARRY A 5 YEAR GUARANTEE WHICH CAN BE EXTENDED UP TO 10 YEARS.

○ PARK LIGHTING

Create the perfect lighting of park, square or district. Wide range of ROSA products will allow you to choose ideal solution for the given environment. We offer modern lighting luminaires based on LED technology or using high-pressure light source. We also offer a wide selection of decorative columns, extension arms and wall brackets made of anodised aluminium or durable plastic. In addition to the standard product range we also make a special designs according to customer requirements.

PARK LIGHTING / ALUMINIUM COLUMNS

STRAIGHT COLUMNS Ø114

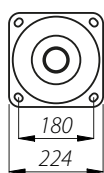
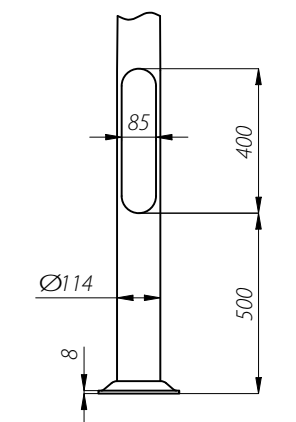
Columns with base plate

SAL-3/B60 code: 42120/C..
SAL-3,5/B60 code: 42101/C..
SAL-4/B60 code: 42102/C..
SAL-4,5/B60 code: 42103/C..

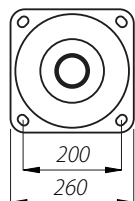
SAL-3/D60 code: 42122/C..
SAL-3,5/D60 code: 42114/C..
SAL-4/D60 code: 42115/C..
SAL-4,5/D60 code: 42116/C..

Rooted columns

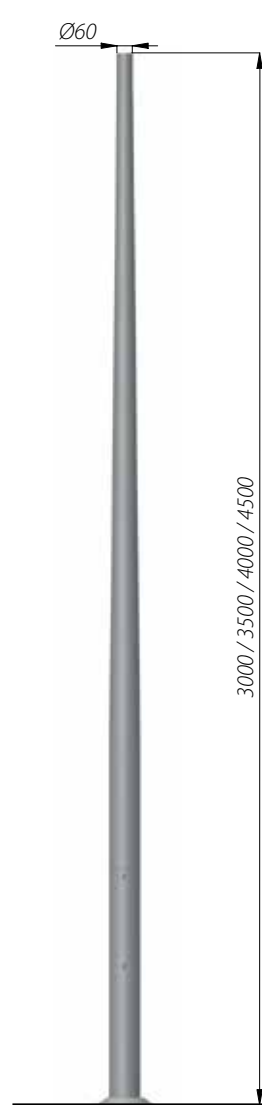
SAL-3/B60 dz code: 42124/C..
SAL-3,5/B60 dz code: 42108/C..
SAL-4/B60 dz code: 42111/C..
SAL-4,5/B60 dz code: 42107/C..



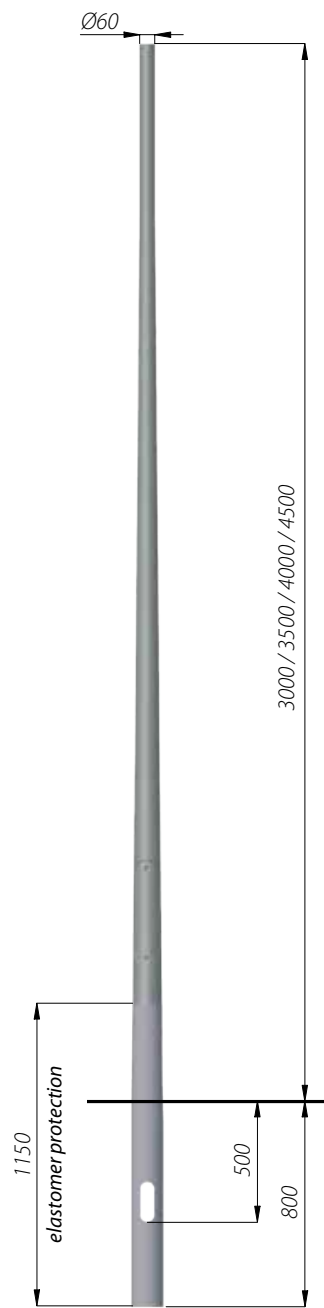
SAL-.../B60
B-50/Z-50



SAL-.../D60
B-51/Z-51



Column with base plate



Rooted column



Ostrava / Czech Republic

STRAIGHT COLUMNS Ø120

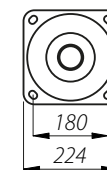
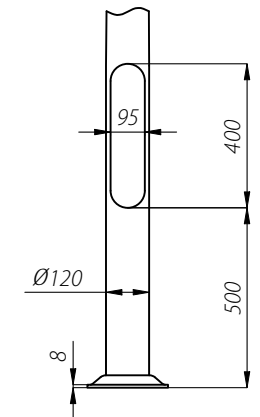
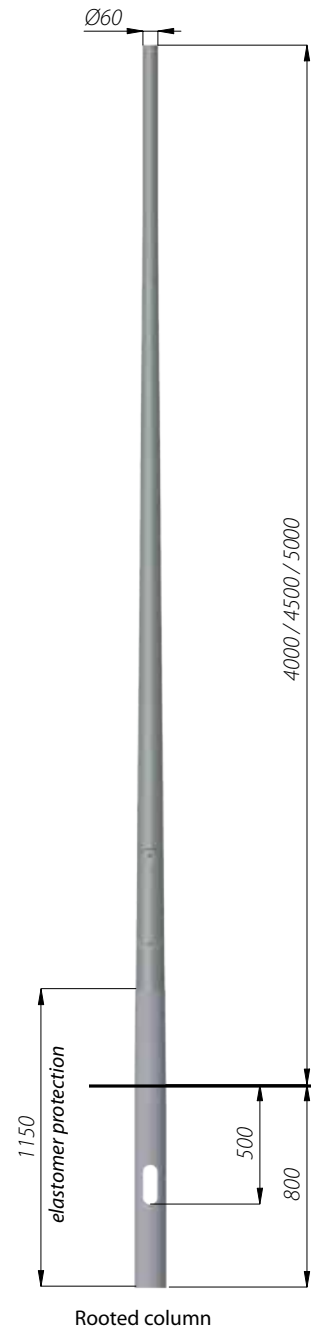
Columns with base plate

SAL-4	code: 42201/C..
SAL-4,5	code: 42202/C..
SAL-5	code: 42203/C..
SAL-5,5	code: 42205/C..
SAL-6	code: 42207/C..

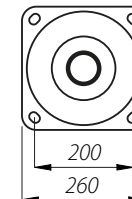
SAL-4E	code: 42217/C..
SAL-4,5E	code: 42218/C..
SAL-5E	code: 42219/C..
SAL-6E	code: 42223/C..

Rooted columns

SAL-4 dz	code: 42231/C..
SAL-4,5 dz	code: 42232/C..
SAL-5 dz	code: 42233/C..



SAL-...
B-50/Z-50



SAL-...E
B-51/Z-51



PARK LIGHTING / ALUMINIUM COLUMNS

STRAIGHT COLUMNS Ø146

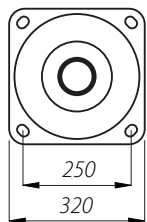
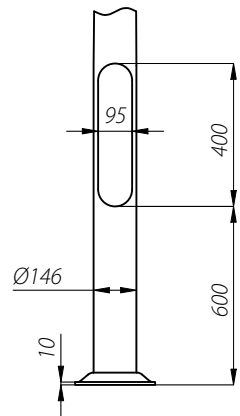
Columns with base plate

SAL-60 code: 42313/C..

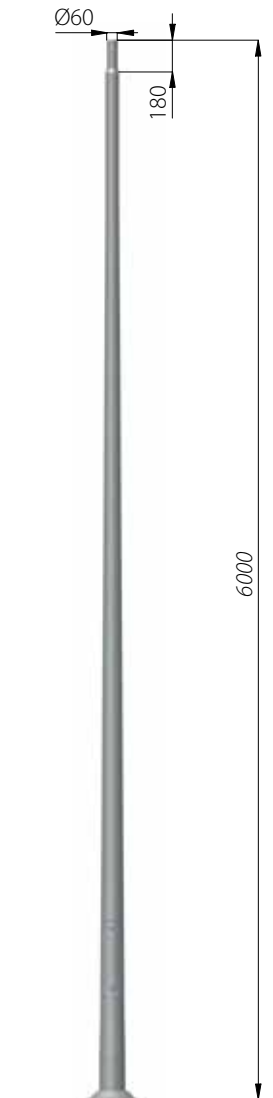
Rooted column

SAL-55 dz code: 42322/C..

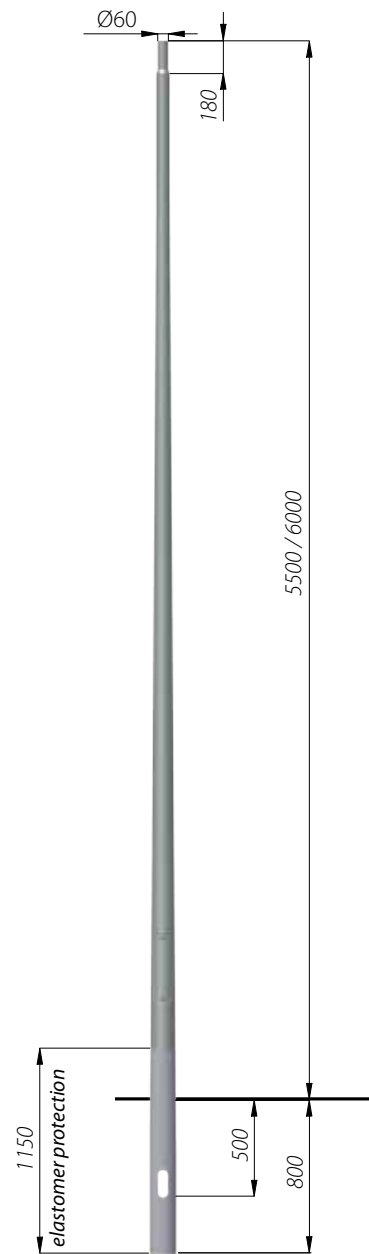
SAL-60 dz code: 42323/C..



B-60/Z-60



Column with base plate



Rooted column



DECORATIVE COLUMNS



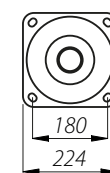
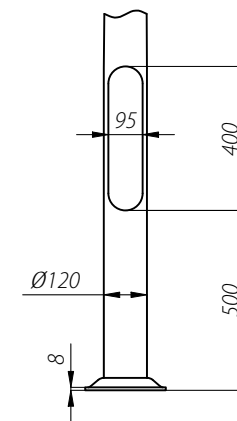
Nowe Brzesko / Poland



SAL DP-31
code: 42910/C..



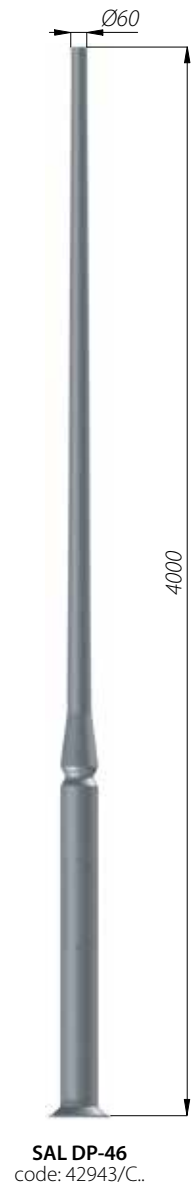
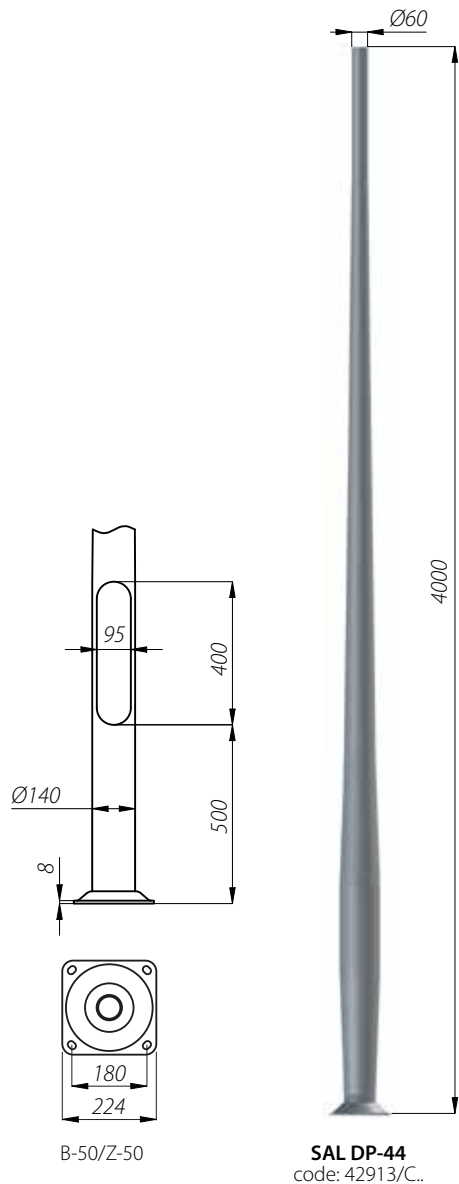
SAL DP-42
code: 42911/C..



B-50/Z-50

PARK LIGHTING

DECORATIVE COLUMNS

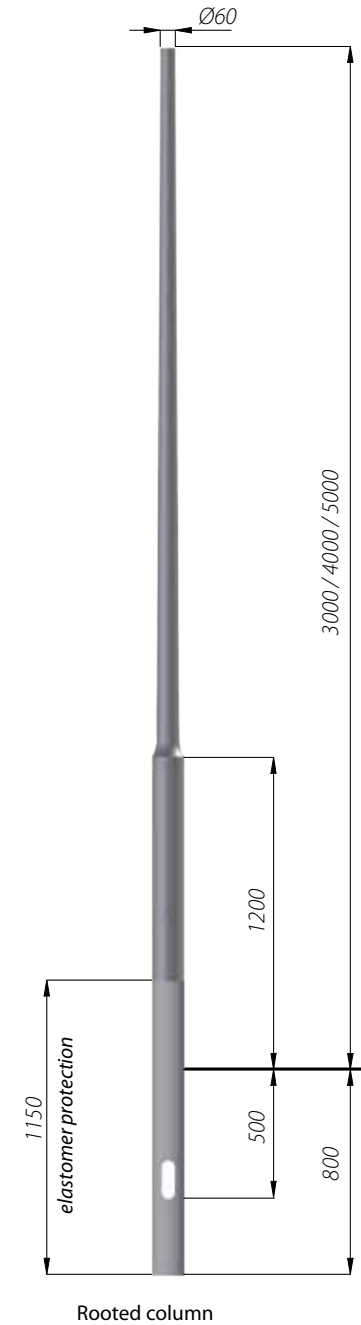
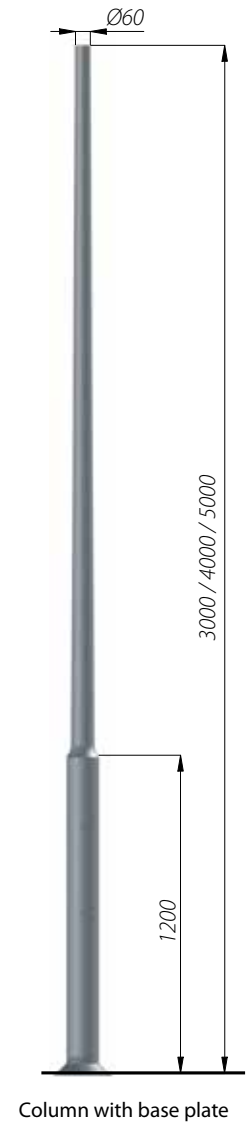
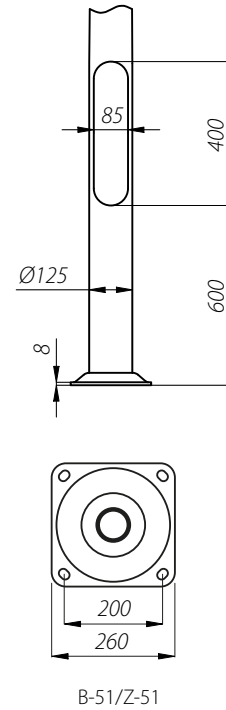


Columns with base plate

- SAL DP-38** code: 42945/C..
- SAL DP-48** code: 42946/C..
- SAL DP-58** code: 42947/C..

Rooted columns

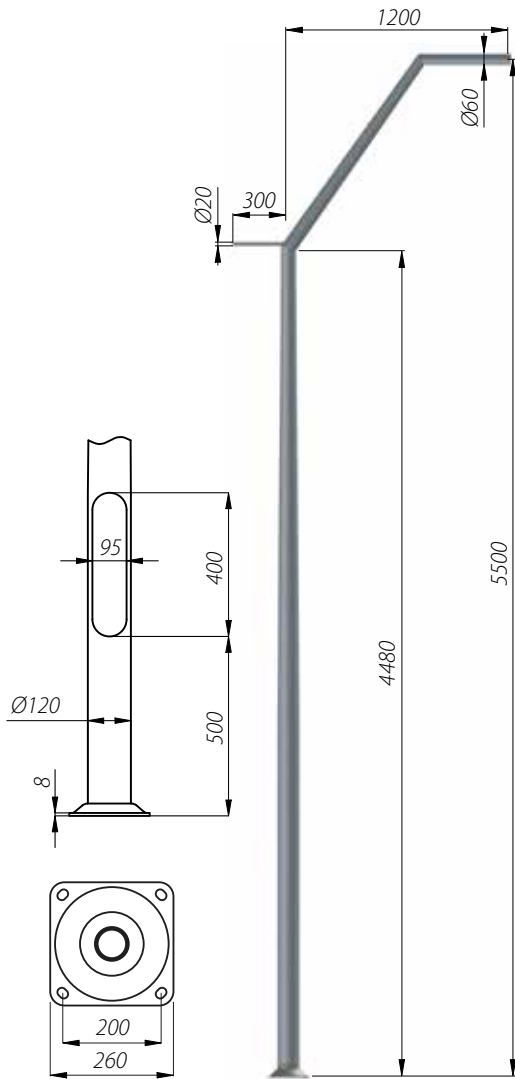
- SAL DP-38 dz** code: 42965/C..
- SAL DP-48 dz** code: 42966/C..
- SAL DP-58 dz** code: 42967/C..



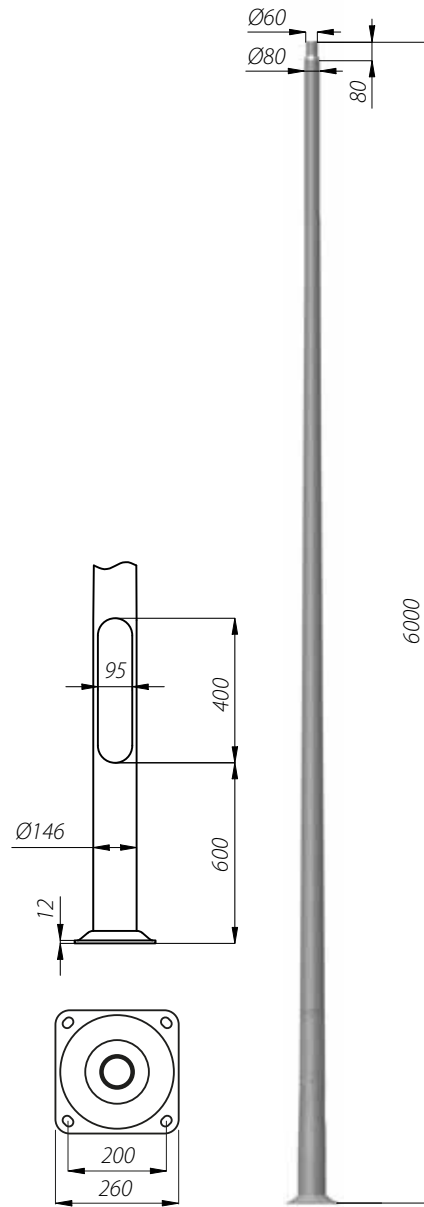


PARK LIGHTING

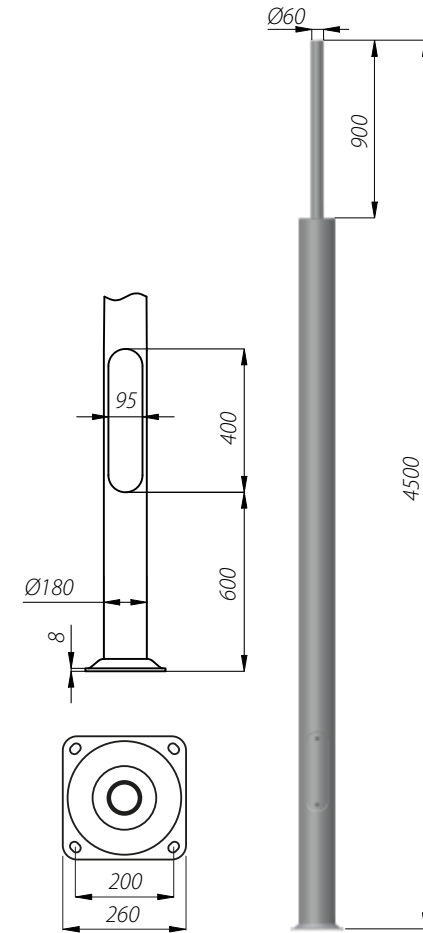
DECORATIVE COLUMNS



SAL DL-2
code: 42994/C...

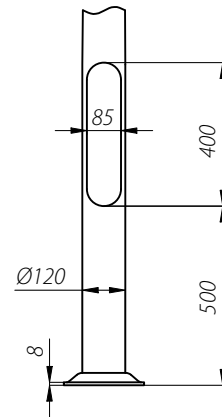


SAL DL-3
code: 42995/C...



SAL DL-5
code: 42997/C...

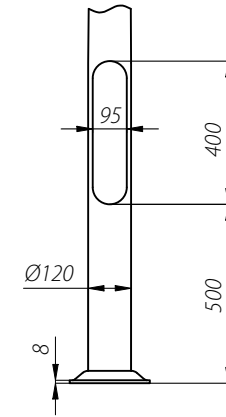
DECORATIVE COLUMNS



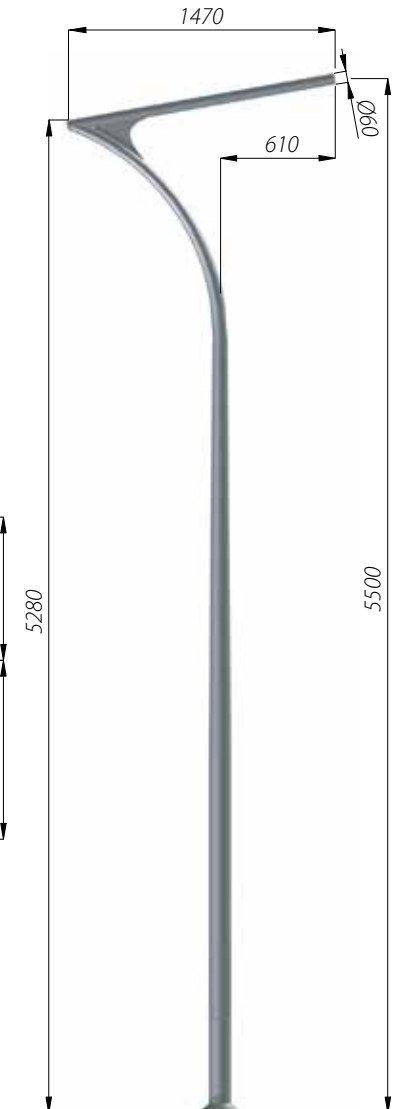
B-51/Z-51



SAL DS-51
code: 42224/C..



B-51/Z-51

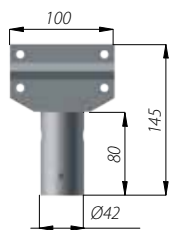


SAL DS-52
code: 42225/C..

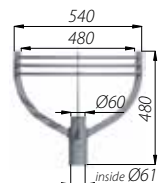
PARK LIGHTING

EXTENSION ARMS WA

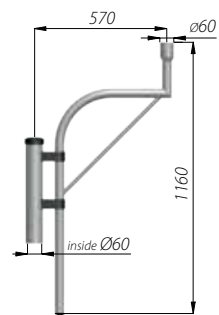
Application: columns SAL with spigot ending $\varnothing 60$ mm
(WA-0 is mounted on load-bearing catenary wires)



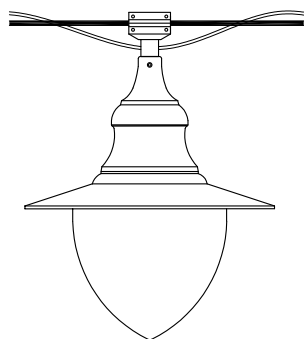
WA-0
code: 40270/C..
luminaire: OW



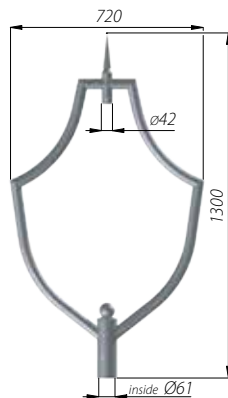
WA-1
code: 471011/C..
luminaire: OP 400



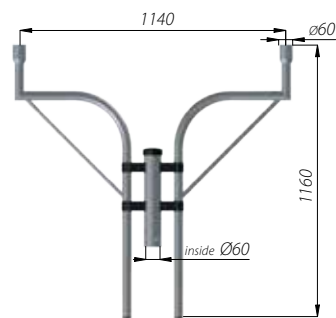
WA-5/1
code: 471051/C..
luminaires: OPA-1, OP



Mounting example of WA-0
with OW luminaire, Cone lamp diffuser



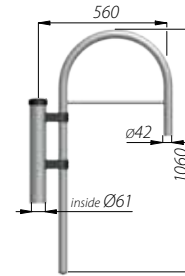
WA-4
code: 471040/C..
luminaire: OW



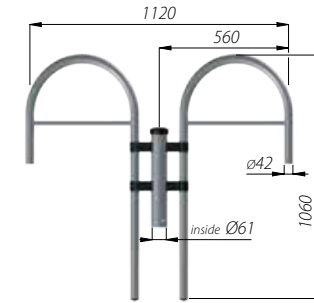
WA-5/2
code: 471052/C..
luminaires: OPA-1, OP



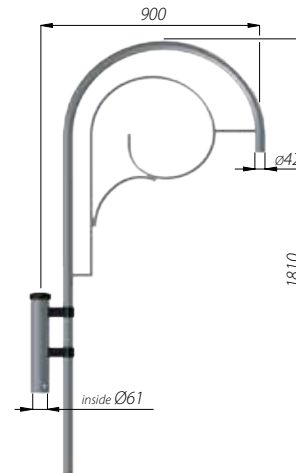
EXTENSION ARMS WA



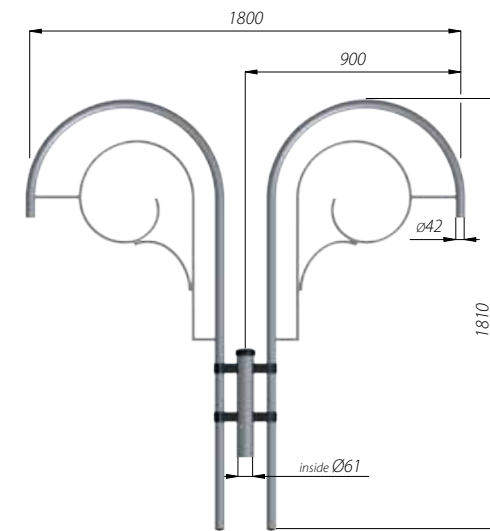
WA-14/1
code: 471141/C..
luminaires: OW, DROP



WA-14/2
code: 471142/C..
luminaires: OW, DROP

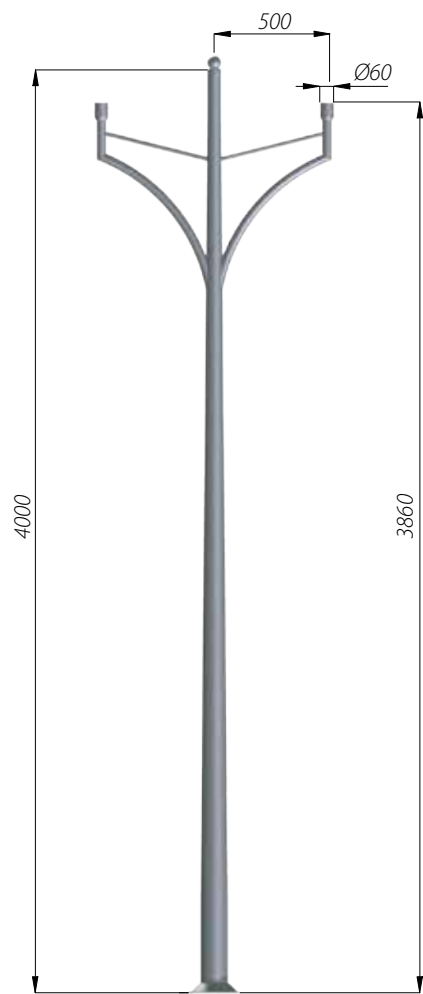


WA-20/1
code: 471201/C..
luminaires: OW, DROP

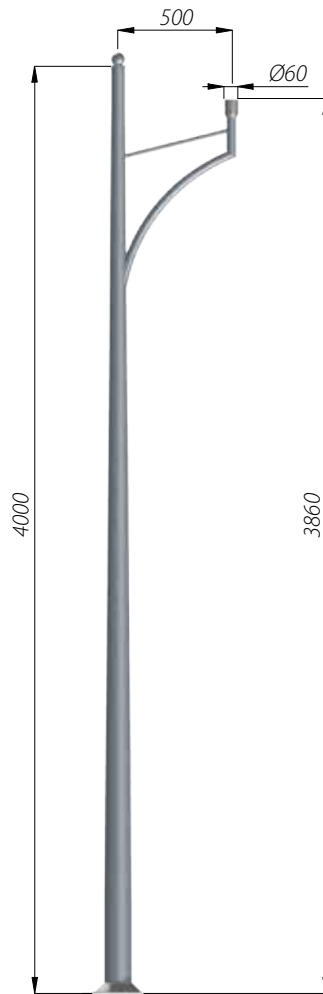


WA-20/2
code: 471202/C..
luminaires: OW, DROP

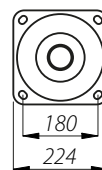
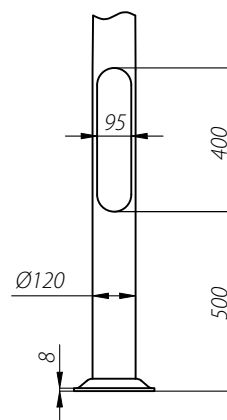
COLUMNS WITH WELDED EXTENSION ARMS



SAL-A2
code: 42209/C...



SAL-A1
code: 42210/C...



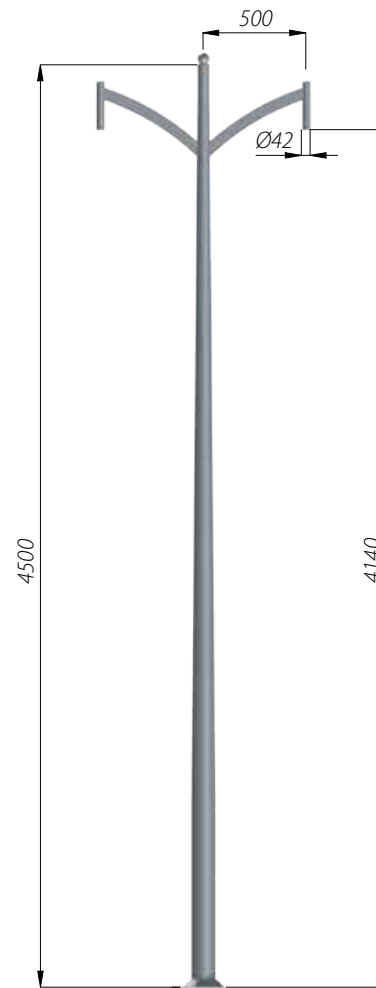
B-50/Z-50



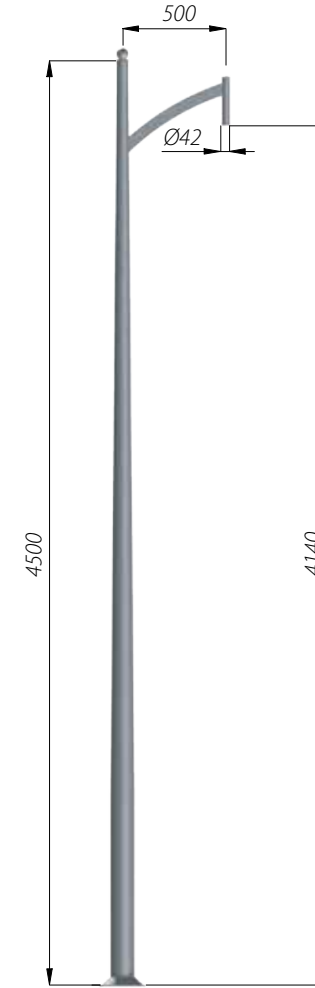
COLUMNS WITH WELDED EXTENSION ARMS



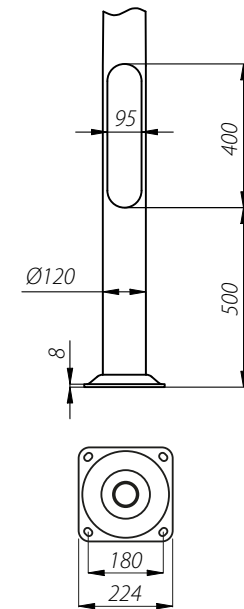
Tychy / Poland



SAL-C2
code: 42214/C...

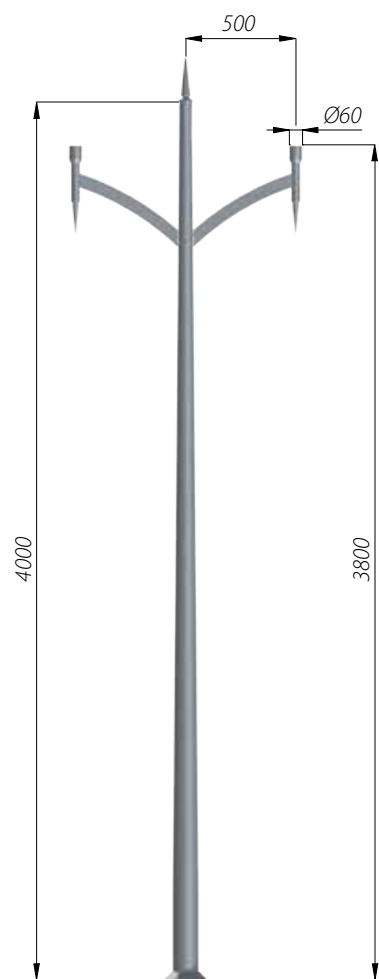


SAL-C1
code: 42213/C...

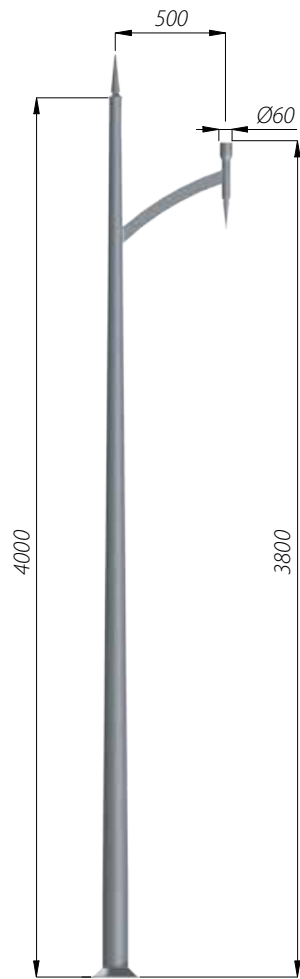


B-50/Z-50

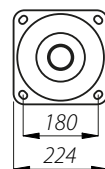
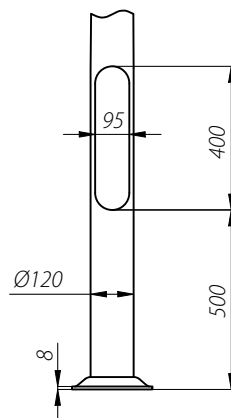
COLUMNS WITH WELDED EXTENSION ARMS



SAL-D2
code: 42216/C..



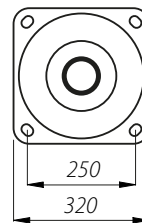
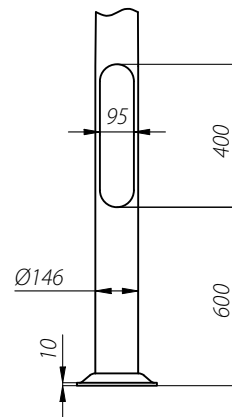
SAL-D1
code: 42215/C..



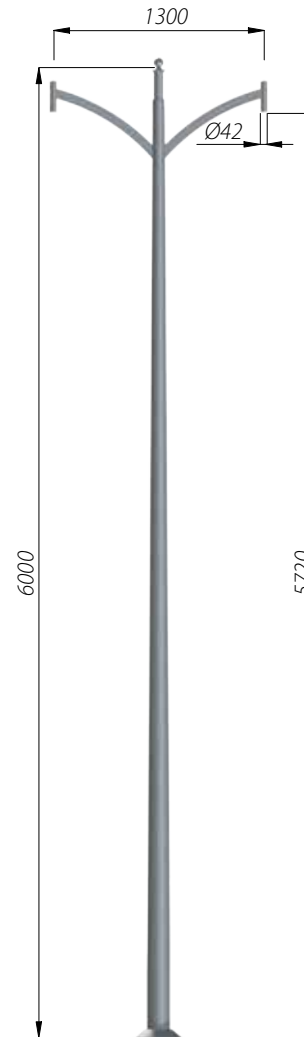
B-50/Z-50



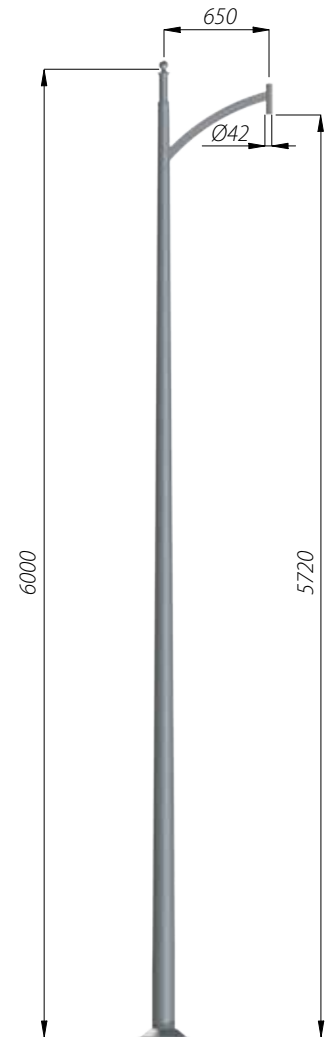
COLUMNS WITH WELDED EXTENSION ARMS



B-60/Z-60

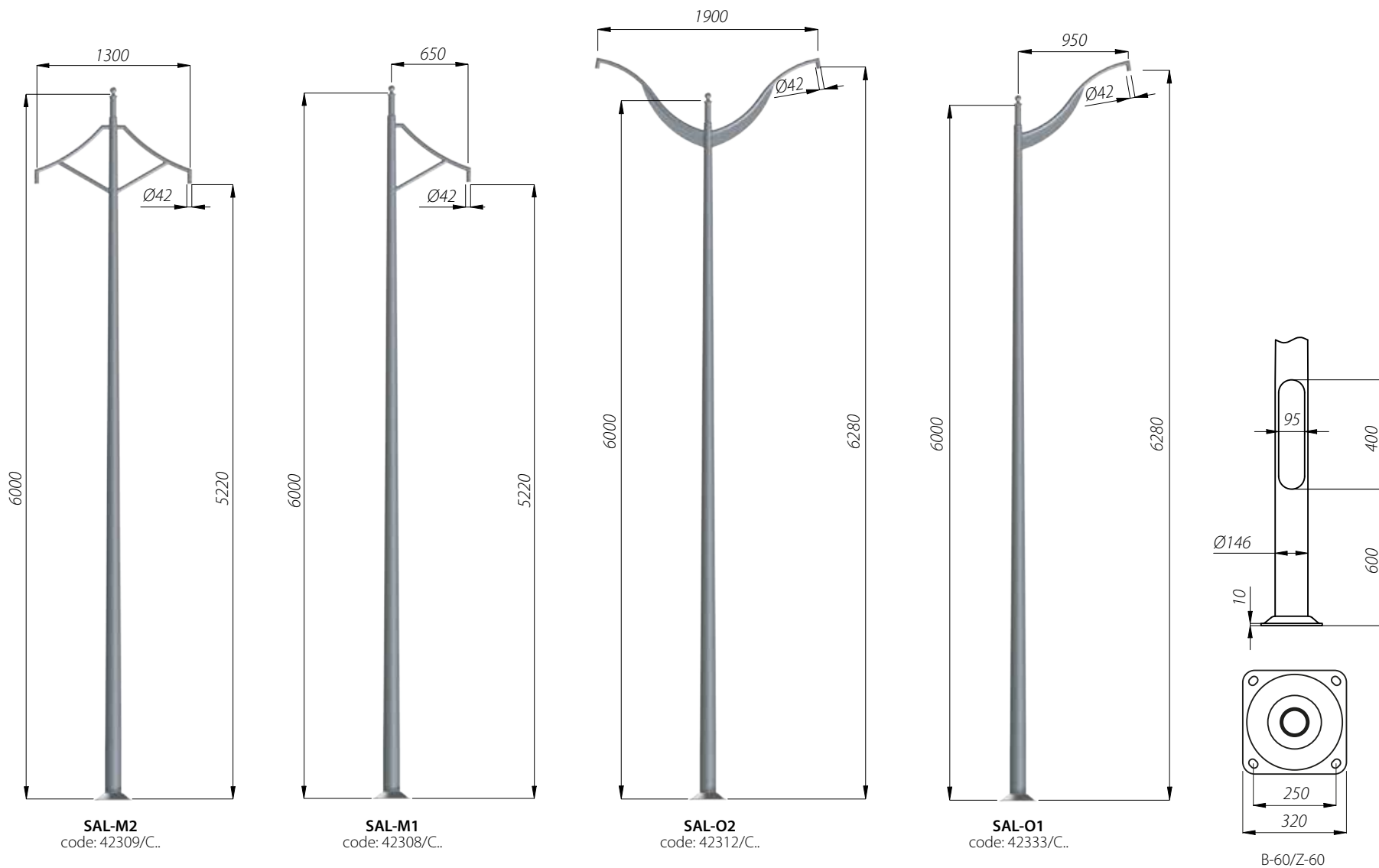


SAL-K2
code: 42306/C..

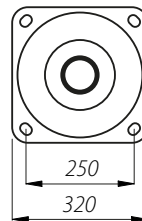
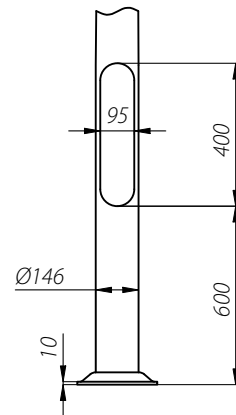


SAL-K1
code: 42330/C..

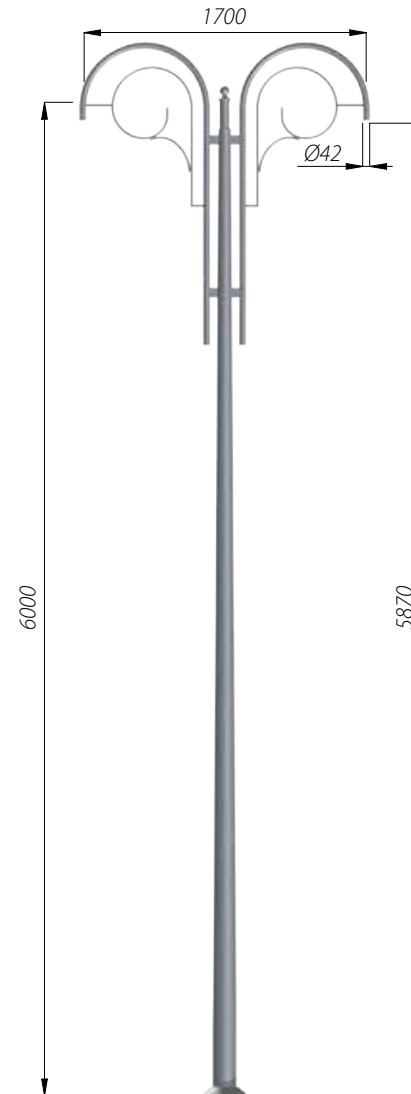
COLUMNS WITH WELDED EXTENSION ARMS



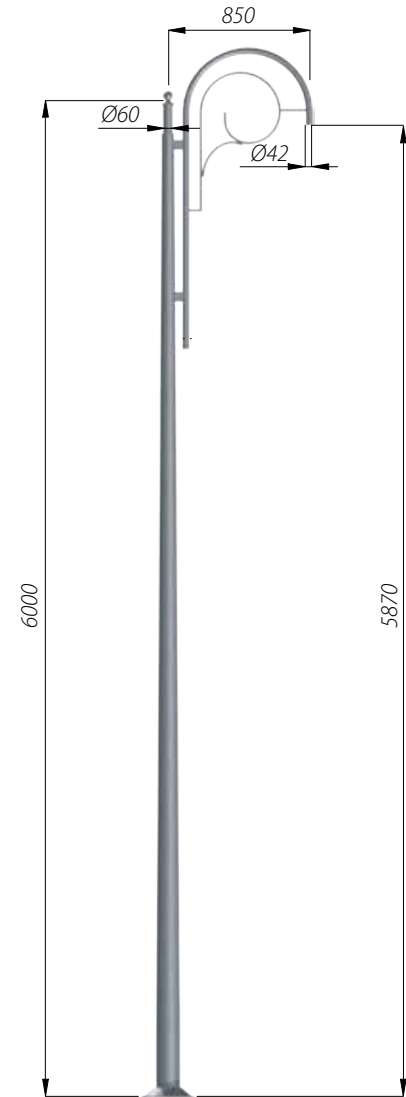
COLUMNS WITH WELDED EXTENSION ARMS



B-60/Z-60



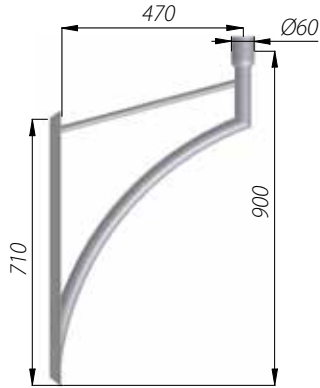
SAL-R2
code: 42311/C..



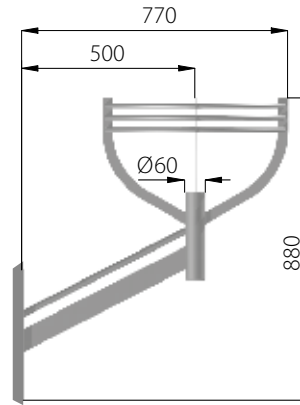
SAL-R1
code: 42334/C..

WALL BRACKETS KA

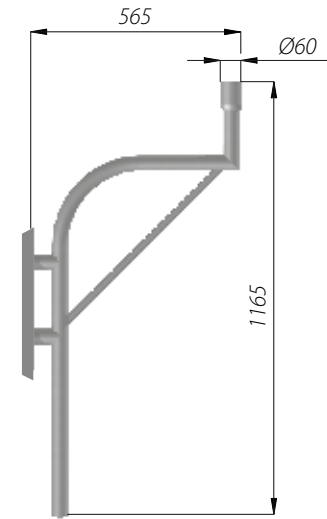
- application: aluminium wall brackets for wall mounting



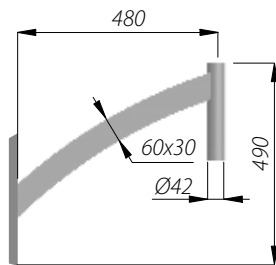
KA-A1
code: 478100/C..
luminaire: OP, OPA-1, OS-1, OS-1 LED, OS-11 LED



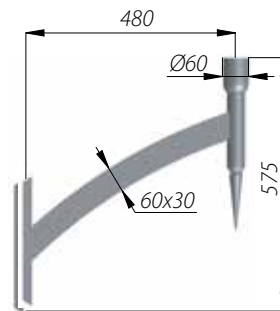
KA-1
code: 478010/C..
luminaire: OP



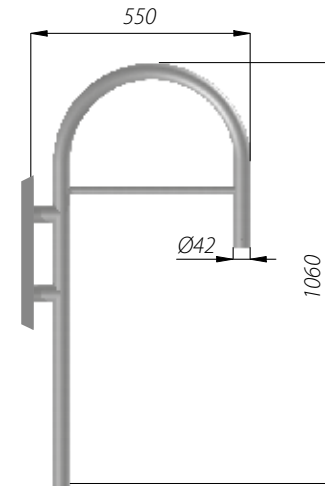
KA-5
code: 478050/C..
luminaire: OP, OPA-1



KA-C1
code: 478102/C..
luminaire: OW, DROP

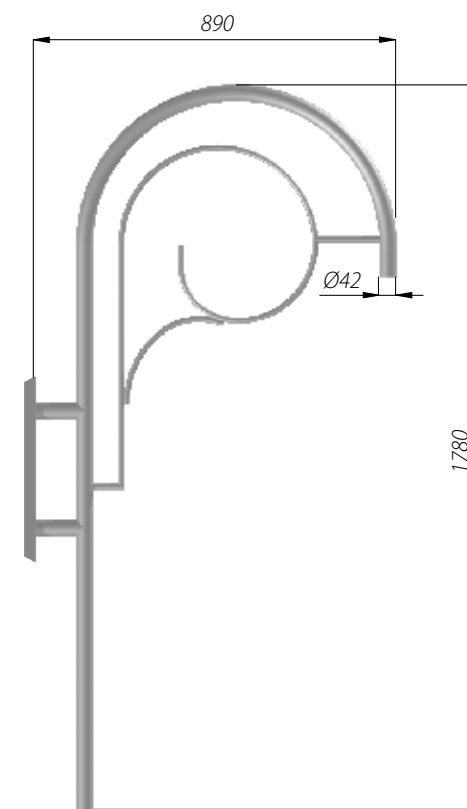


KA-D1
code: 478103/C..
luminaire: OP, OPA-1, OS-1, OS-1 LED, OS-11 LED



KA-14
code: 478140/C..
luminaire: OW, DROP

WALL BRACKETS KA

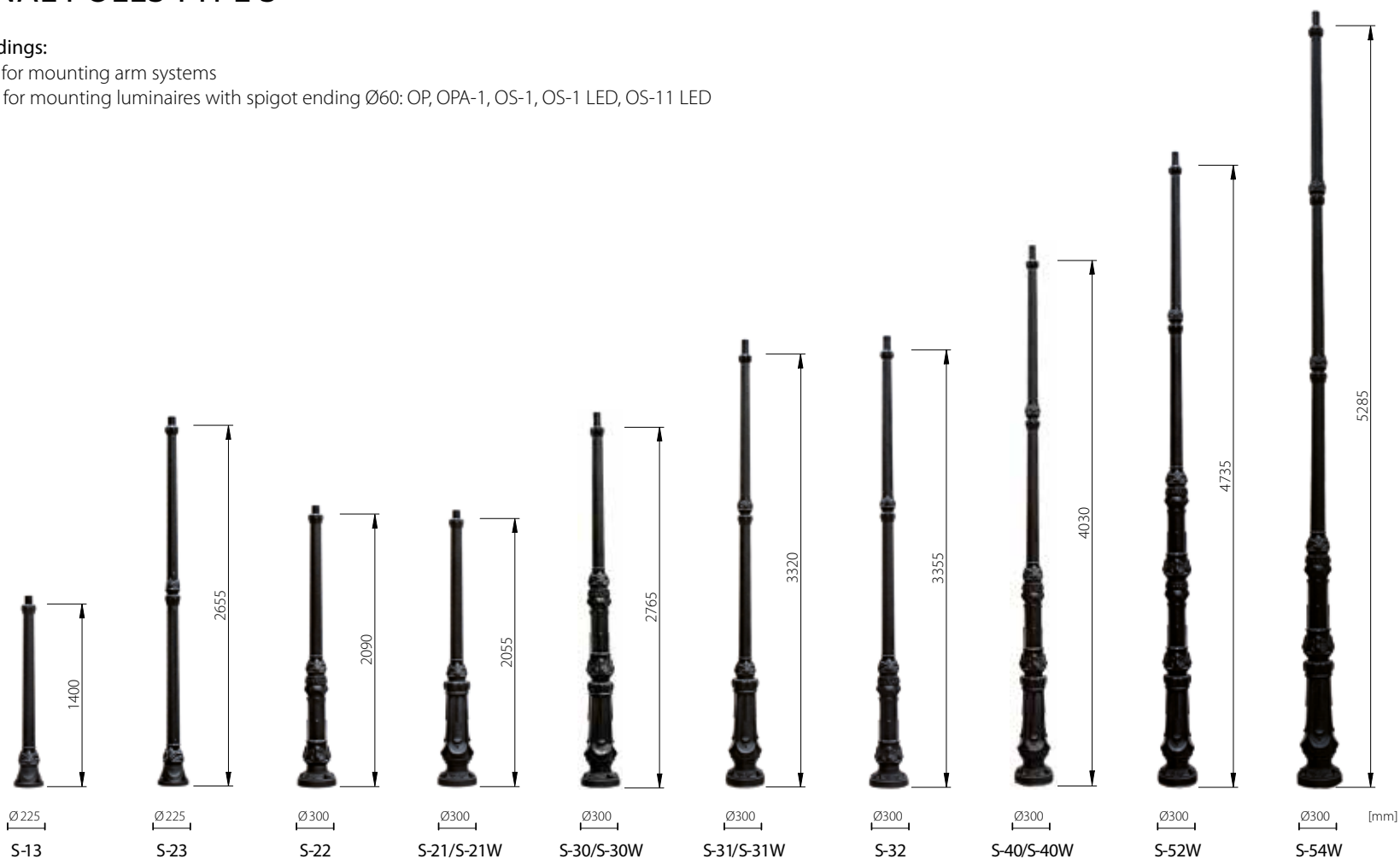


KA-20
code: 478200/C..
luminaires: OW, DROP

TRADITIONAL POLES TYPE S

Types of spigot endings:

- ending type "A" – for mounting arm systems
- ending type "B" – for mounting luminaires with spigot ending Ø60: OP, OPA-1, OS-1, OS-1 LED, OS-11 LED
- colour: black



Name	S-13	S-23	S-22	S-21/S-21W	S-30/S-30W	S-31/S-31W	S-32	S-40/S-40W	S-52W	S-54W
Ending "A"	–	12310	12210	12110/12111	13010/13011	13110/13111	13210	14010/14011	15211	15411
Ending "B"	13320	12320	12220	12120/12121	13020/13021	13120/13121	13220	–/14021	15221	15421

At ordering poles with increased thermal resistance the mark „F” must be added in the product code.

W – pole with niche chamber

TRADITIONAL POLES TYPE S



Example of the pole construction S-40W

TRADITIONAL POLES TYPE S



Pole S-13/B
luminaire OP
diffusers Klio
white

Pole S-21W/B
luminaire OS-1
frosted diffusers

Pole S-22/B
luminaire OP
diffusers Klio
smoked with cap

Pole S-23/B
luminaire OS-1
frosted diffusers

Pole S-30/A
arm system 2+1
downwards
luminaires OP, diffusers
Sphere transparent Ø400
stainless steel louvre
reflectors

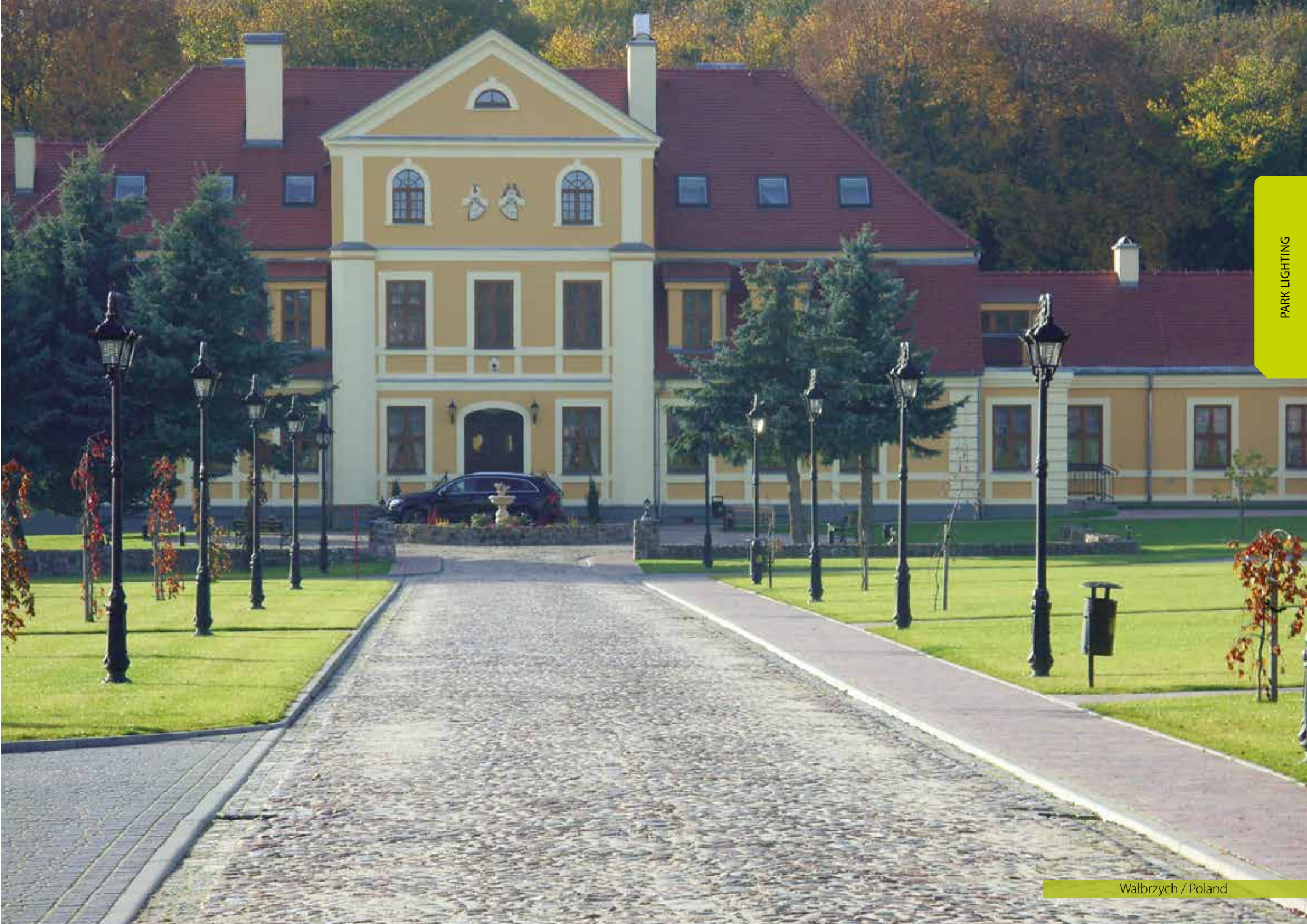
Pole S-31W/A
arm system 3 upwards,
luminaires OS-1
diffusers transparent
stainless steel louvre
reflectors

Pole S-32/A
arm system 2
downwards,
luminaires OS-1,
frosted diffusers

Pole S-40W/A
arm system 3+1
downwards,
luminaires OP,
diffusers Sphere
transparent Ø400
stainless steel louvre
reflectors

Pole S-52W/A
arm system 3
downwards,
luminaires OP,
diffusers Sphere
transparent Ø400,
stainless steel louvre
reflectors

Pole S-54W/A
arm system 2
downwards,
luminaires OP,
diffusers Sphere
transparent Ø450,
stainless steel louvre
reflectors

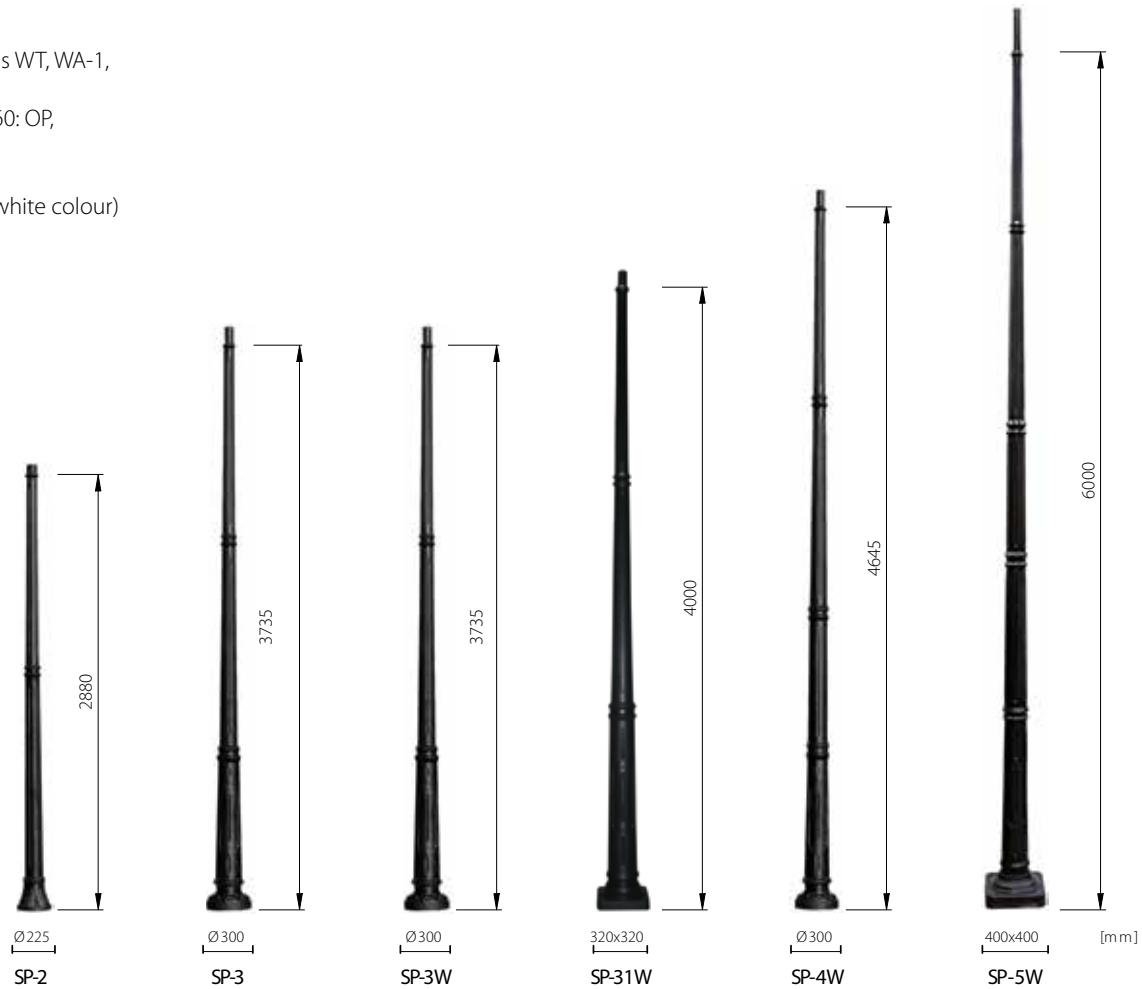


PARK LIGHTING

STRAIGHT POLES TYPE SP

Types of spigot endings:

- ending type "A" – for mounting arm system type P, extension arms WT, WA-1, WA-01, WA-4
- ending type "B" – for mounting luminaires with spigot ending $\varnothing 60$: OP, OPA-1, OS-1, OS-1 LED, OS-11 LED
- ending type "E" – for mounting extension arms WTM
- colour: black (there is also the possibility to make the column in white colour)



Name	SP-2	SP-3	SP-3W	SP-31W	SP-4W	SP-5W
Ending "A"	17210	17310	17311	173111	17411	–
Ending "B"	17220	–	17321	173211	17421	–
Ending "E"	–	–	17351	173511	17451	17551

At ordering poles with increased thermal resistance the mark „F” must be added in the product code.

W – pole with niche chamber

STRAIGHT POLES TYPE SP



Tychy / Poland



Example of the pole construction SP-4W

PARK LIGHTING / PLASTIC COATED POLES

STRAIGHT POLES TYPE SP



Pole SP-2/A
extension arm WT-2
luminaire OP
diffusers Sphere smoked Ø400
stainless steel louvre reflectors



Pole SP-3W/A
extension arm WT-5/2
luminaires OPA-1
diffusers Auris with black cap



Pole SP-4W/E
extension arm WTM-11/2
luminaires OP
diffusers Sphere transparent Ø400
stainless steel louvre reflectors



Pole SP-5W/E
extension arm WTM-20/2
luminaires OW
diffusers Cone white Ø400





PARK LIGHTING

PARK LIGHTING / PLASTIC COATED POLES

COMPOSITE POLES TYPE SM

Types of spigot endings:

- ending type "E" – for mounting extension arms WTM
- colour: black



Name	SM-1W	SM-2W	SM-3W
Ending "E"	15551	15651	15751

At ordering poles with increased thermal resistance the designation „F” must be added in the product code.
W – pole with niche chamber



COMPOSITE POLES TYPE SM



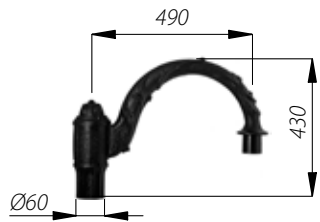
Aleksandrów Łódzki / Poland



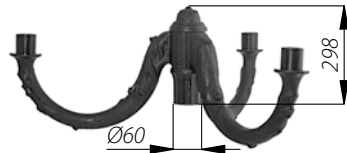
Example of the pole construction SM-1W/E

ARM SYSTEMS

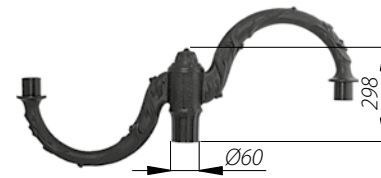
- **application:** for mounting on traditional plastic coated poles type S with spigot ending "A"
- **material:** arm – polypropylene reinforced with steel tube, head and extension of the head – polyamide
- **construction:** arm connected to head with a connecting socket
- **optional arm configuration:** upwards or downwards
- **luminaires:** OP, OS-1, OS-1 LED, OS-11 LED – max. weight 7 kg
- **colour:** black



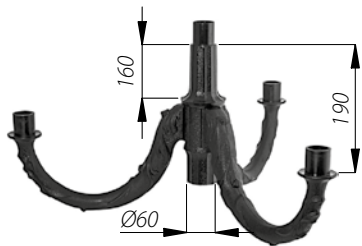
arm system 1 – downwards
code: 331000



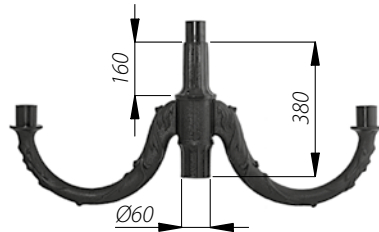
arm system 3 – upwards
code: 333000



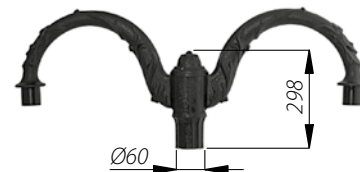
arm system 2 – upwards and downwards
code: 332000



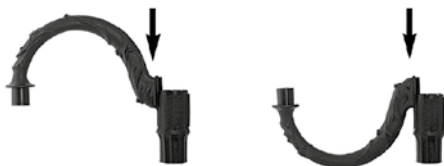
arm system 3+1 – upwards
code: 333100



arm system 2+1 – upwards
code: 332100



arm system 2 – downwards
code: 332000



The way of assembling arm system in a head



Spigot ending of the arm

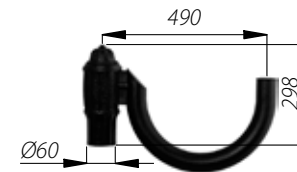


Gulbene / Latvia

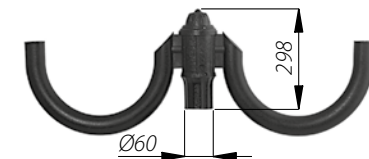


ARM SYSTEMS P

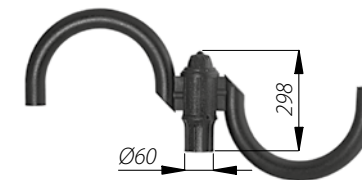
- **application:** for mounting on traditional plastic coated poles type SP with spigot ending "A"
- **material:** arm – polypropylene reinforced with steel tube, head – polyamide
- **construction:** arm connected to head with a connecting socket
- **optional arm configuration:** upwards or downwards
- **luminaires:** OP, OPA-1, OS-1, OS-1 LED, OS-11 LED – max. weight 7 kg
- **colour:** black



arm system P 1 – upwards
code: 341000



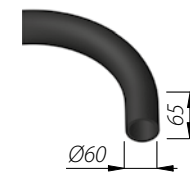
arm system P 2 – upwards
code: 342000



arm system P 2 – upwards and downwards
code: 342000



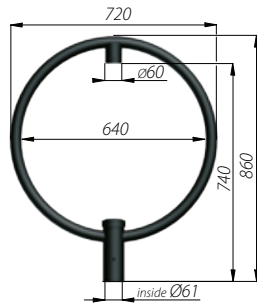
The way of assembling an arm system in a head



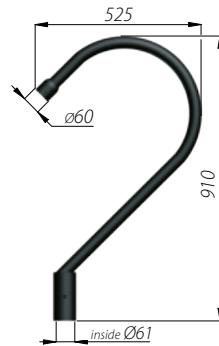
Spigot ending of the arm

EXTENSION ARMS WT

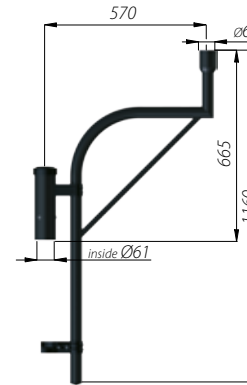
- **application:** for mounting on poles type S and SP with spigot ending "A"
- **material:** aluminium alloy anodised in black, there is also the possibility of anodising in other colours



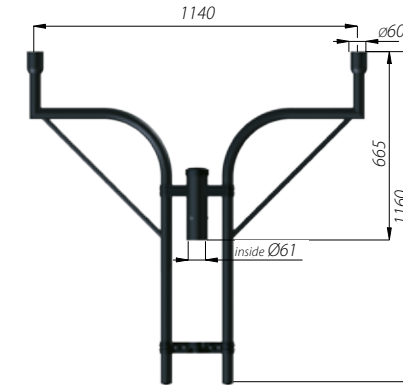
WT-2
code: 477020/C35
luminaire: OP 400



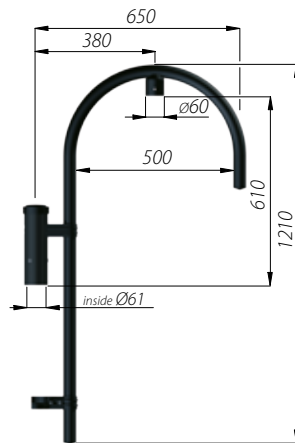
WT-3
code: 477030/C35
luminaires: OP 400, OP 450



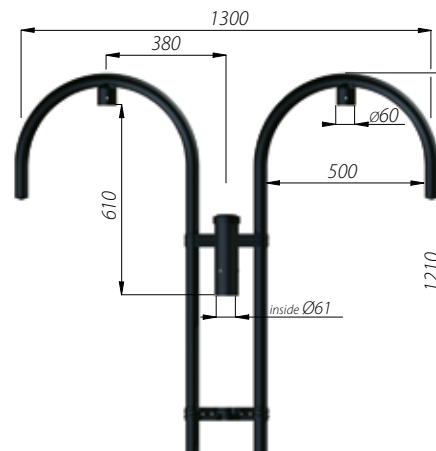
WT-5/1
code: 477051/C35
luminaire: OPA-1



WT-5/2
code: 477052/C35
luminaire: OPA-1



WT-8/1
code: 477081/C35
luminaire: OP 400

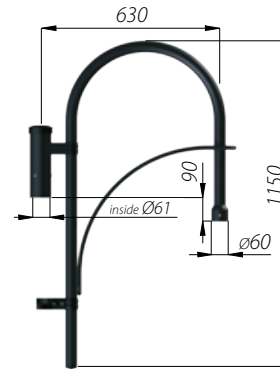


WT-8/2
code: 477082/C35
luminaire: OP 400

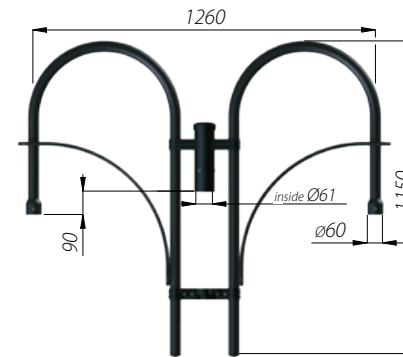


Tychy / Poland

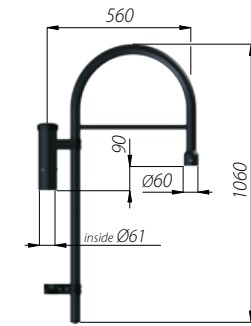
EXTENSION ARMS WT



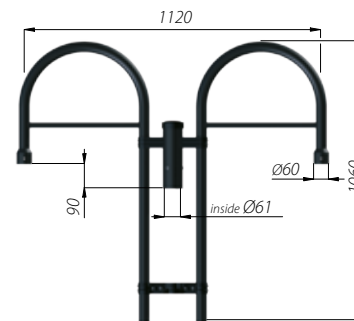
WT-11/1
code: 477111/C35
luminaires: OP 400, OP 450



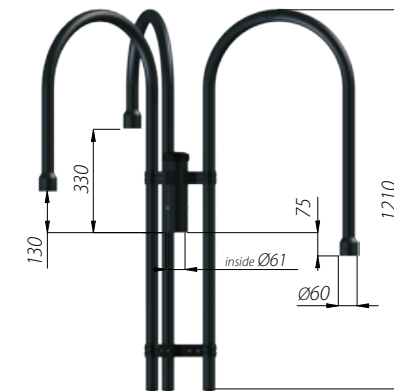
WT-11/2
code: 477112/C35
luminaires: OP 400, OP 450



WT-14/1
code: 477141/C35
luminaires: OP 400, OP 450



WT-14/2
code: 477142/C35
luminaires: OP 400, OP 450



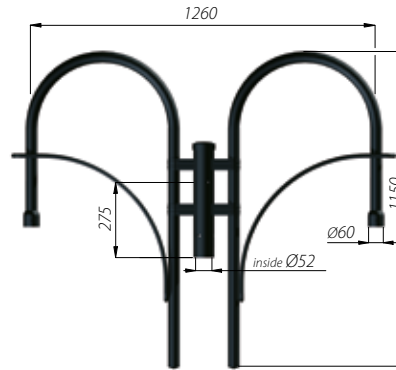
WT-12/3
code: 477123/C35
luminaires: OP 400, OP 450

EXTENSION ARMS WTM

- **application:** for mounting on poles type SM and SP with spigot ending "E"
- **material:** aluminium alloy anodised in black, there is also the possibility of anodising in other colours



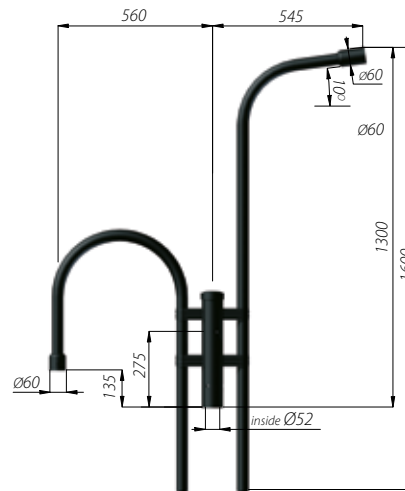
WTM-11/1
code: 476111/C35
luminaires: OP 400, OP 450



WTM-11/2
code: 476112/C35
luminaires: OP 400, OP 450



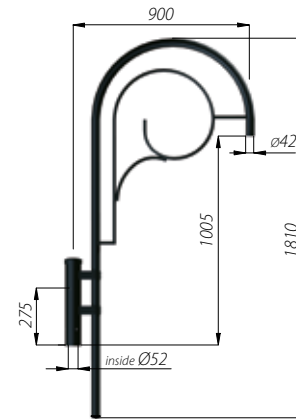
WTM-15/1P
code: 476151/C35
luminaires: OP 400, OP 450



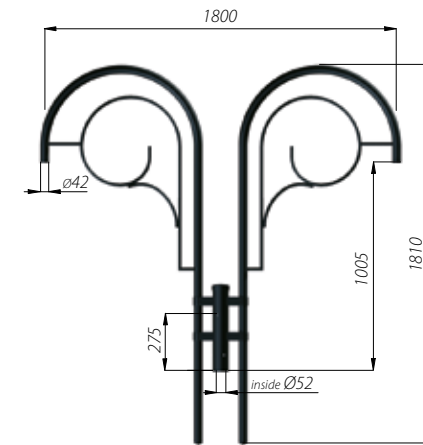
WTM-15/2
code: 476152/C35
luminaires: OP 400, OP 450, street



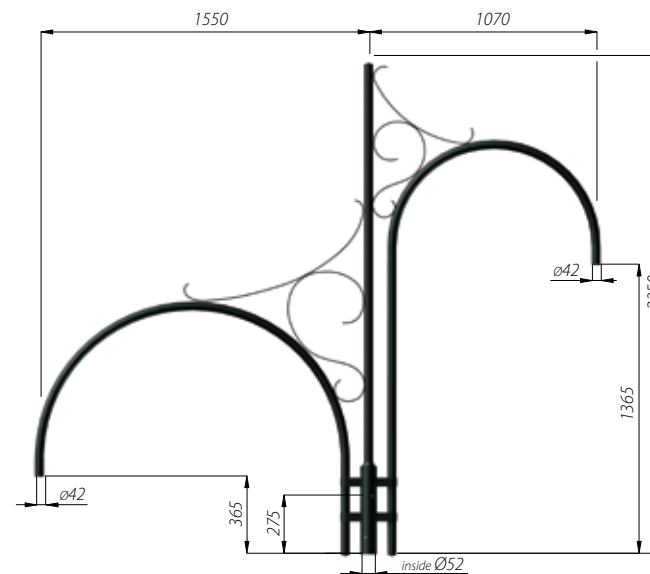
EXTENSION ARMS WTM



WTM-20/1
code: 476201/C35
luminaires: OW, DROP



WTM-20/2
code: 476202/C35
luminaires: OW, DROP



WTM-16/2
code: 476162/C35
luminaires: OW, DROP

PARK LIGHTING

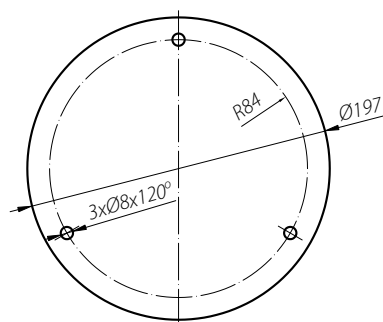
PARK LIGHTING / PLASTIC WALL BRACKETS

WALL BRACKET KR

- **application:** for mounting directly on the wall
- **mounting:** upwards or downwards
- **material:** arm – polypropylene, holder – polyamide
- **diameter of the mounting luminaire:** $\text{Ø}60$ mm
- **luminaires:** OS-1, OS-1 LED, OS-11 LED, OP



Wall bracket KR, luminaire OS-1, frosted lamp diffuser



Scheme of wall bracket holder

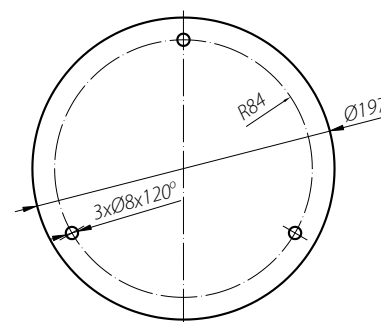


Wall bracket KR
code: 330100

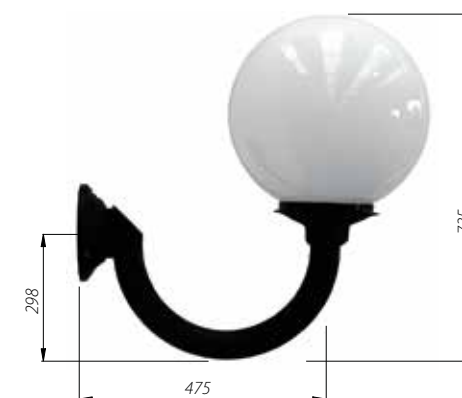


WALL BRACKET KP

- **application:** for mounting directly on the wall
- **mounting:** upwards or downwards
- **material:** arm – polypropylene, holder – polyamide
- **diameter of the mounting luminaire:** $\varnothing 60$ mm
- **luminaires:** OS-1, OS-1 LED, OS-11 LED, OP, OPA-1 (upwards only)



Scheme of wall bracket holder



Wall bracket KP
code: 340200
luminaire OP, lamp diffuser Sphere white $\varnothing 400$



Wall bracket KP
code: 340200

OS-1

- **protection degree:** IP54
- **insulation class:** I
- **material:** UV resistant polypropylene with glass fibre
- **colour:** black
- **mounting:** upwards or downwards
- **assembly:** on poles type S, SP with spigot ending "B", on arm systems, wall brackets KR, KP, columns, extension arms, aluminium wall brackets with spigot ending Ø60 mm and length 60 mm

Assembling
on arm system



Assembling on pole
or arm system

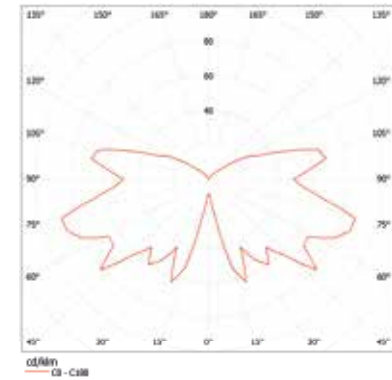
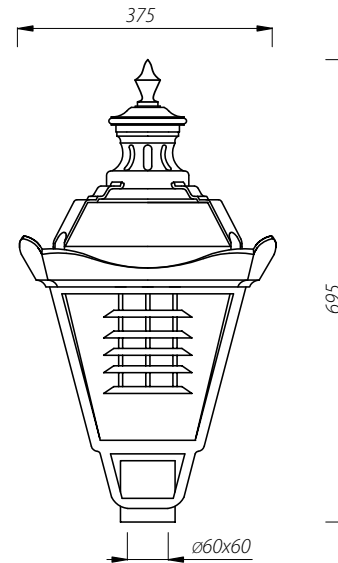
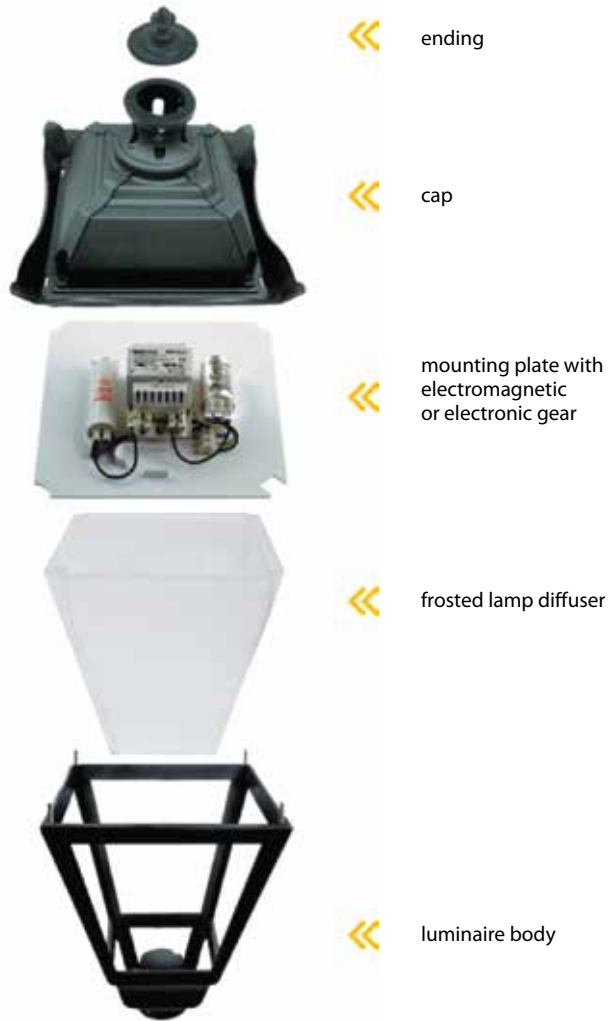


Luminaire OS-1,
frosted lamp diffuser

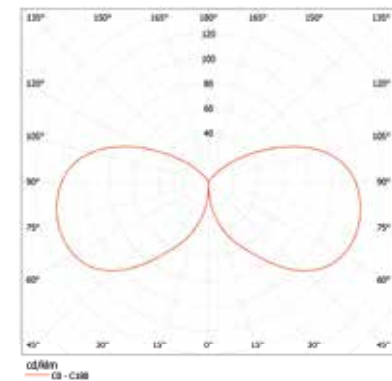
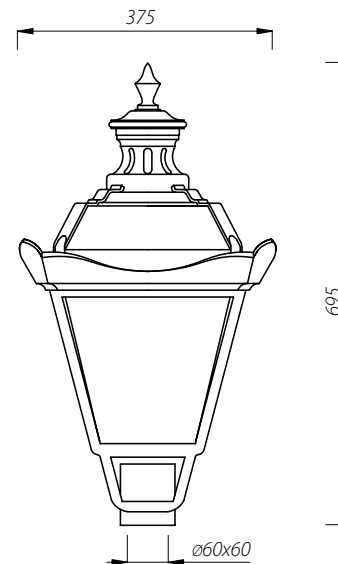
Name	Code/lamp diffuser			Light source	Power [W]	Weight [kg]
	Frosted	Transparent				
	PMMA	PC	PMMA			
OS-1 S-50W	2110001	211301	211201	Sodium E-27	50	4,9
OS-1 S-70W	2110002	211302	211202	Sodium E-27	70	5,2
OS-1 MH-70W	2110007	211307	211207	Metal halide E-27	70	5,2
OS-1 MH-100W	–	211308	–	Metal halide E-27	100	5,4
OS-1 R-125W	2110013	211313	211213	Mercury E-27	125	5,0
OS-1 E/Z	2110015	211315	211215	Compact fluorescent lamp E-27	23	3,9



OS-1



Distribution curve for luminaire OS-1
MH-100W transparent lamp diffuser with
stainless steel louvre reflector



Distribution curve for luminaire OS-1
S-70W Frosted lamp diffuser

Luminaire OS-1

PARK LIGHTING

OP LUMINAIRE

- **protection degree:** IP54
- **insulation class:** II
- **material:** base – polyamide, electrical gear cover – polycarbonate
- **colour:** black
- **mounting:** upwards or downwards
- **assembly:** on columns, aluminium and steel extension arms and arms systems with spigot ending Ø60 mm and length 45 mm and on poles type S and SP with spigot ending type "B".
- **type of luminaires:**
 OP 400 – diameter of lamp diffuser neck Ø180 mm
 OP 450 – diameter of lamp diffuser neck Ø200 mm



Luminaire OP


 Luminaire OP, diffusers Sphere
 transparent Ø400
 small stainless steel louvre reflector upwards

Name	Code / lamp diffuser diameter		Light source	Power [W]	Weight [kg]		Type of lamp diffuser	
	OP 400	OP 450			OP 400	OP 450	OP 400	OP 450
OP S-50W	210101	–	Sodium E-27	50	2,1	–	Atlanta Ø400, Sphere Ø400, Klio Ø400	
OP S-70W	210102	210202		70	2,4	2,7		
OP S-100W	210103	210203	Sodium E-40	100	2,6	2,9	Sphere Ø400	
OP S-150W	–	210204		150	–	3,5	–	
OP MH-70W	210107	210207	Metal halide E-27	70	2,4	2,7	Atlanta Ø400, Sphere Ø400, Klio Ø400	
OP MH-100W	210108	210208		100	2,6	2,8	Sphere Ø400	
OP MH-150W	–	210209		150	–	3,5	–	
OP R-125W	210113	210213	Mercury E-27	125	2,1	2,4	Sphere Ø400	
OP E/Z	210115	210215	Compact fluorescent lamp E-27	23	1,0	1,3	Atlanta Ø400, Kula Ø400, Klio Ø400	

Sphere Ø450



LUMINAIRE OP



stainless steel
louvre reflector



lamp



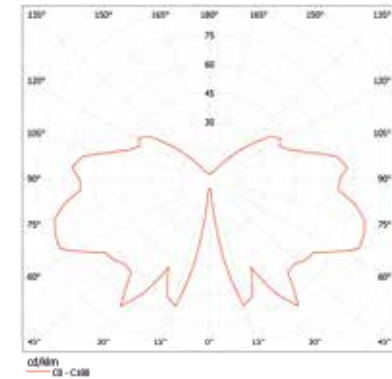
cover (PC)



universal mounting frame with
electromagnetic or electronic gear



luminaire base (PA)



Distribution curve for luminaire OP S-70W/400
transparent diffusers Sphere with small stainless
steel louvre reflector downwards

PARK LIGHTING

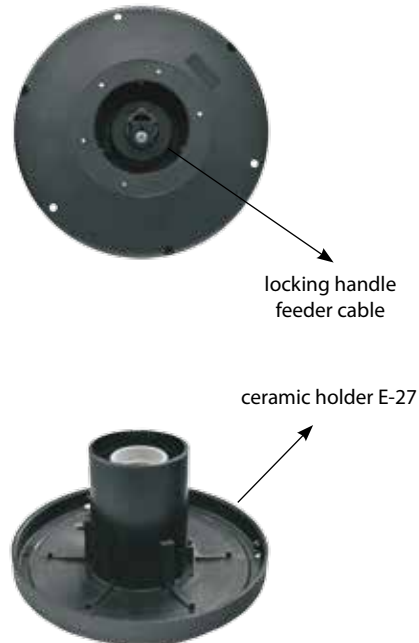
PARK LIGHTING / PARK LUMINAIRES

LUMINAIRE OZ

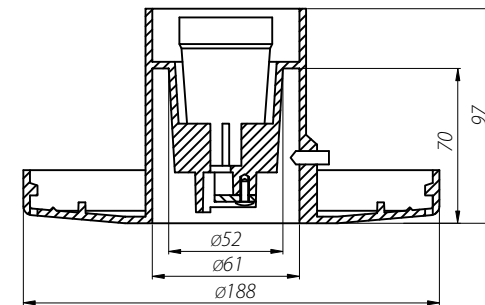
- protection degree: IP44
- insulation class: II
- material: polyamide with glass fibre
- colour: black
- mounting: only upwards
- assembly: on columns, extension arms, aluminium and steel wall brackets with spigot ending Ø60 mm and length 70 mm (OZ 400) and on poles type S and SP with ending specially adapted for OZ luminaire
- diameter of lamp diffuser neck Ø180 mm



Luminaire OZ 400



Luminaire OZ 400, diffusers Klio white Ø400



Luminaire OZ-400



Luminaire OZ 400, diffusers Sphere white Ø400

Name	Code	Light source	Power [W]	Weight [kg]	Type of lamp diffuser
OZ 400	211415	Compact fluorescent lamp	23	0,35	Sphere Ø400, Atlanta Ø400, Klio Ø400



PARK LIGHTING

LAMP DIFFUSERS WITH NECK Ø180 AND Ø200 MM

- available in many various sizes, colours and material
- diameter of lamp diffuser neck Ø180 mm and Ø200 mm



Sphere white



Sphere transparent



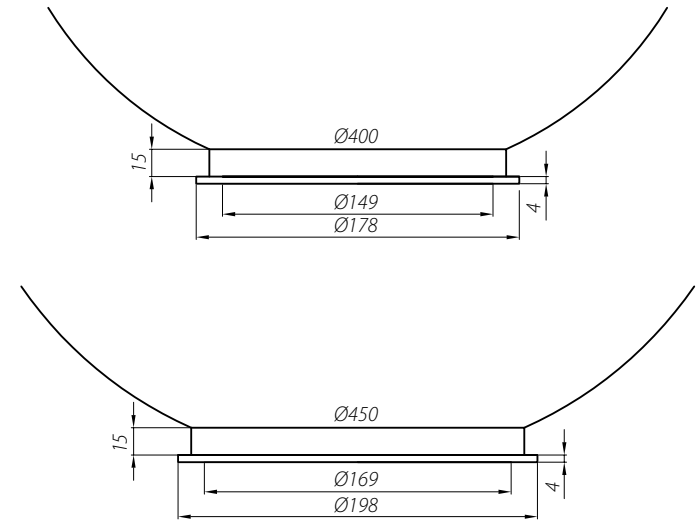
Sphere prismatic



Sphere painted upwards



Sphere painted downwards



Name	Type of material	Code			Type of luminaire Code
		White	Transparent	Smoked	
Sphere 400 k-180	PC-UV	651168	–	–	OP 400, OZ 400 (upwards only)
	PC	651170	651172	651174	
	PMMA	651171	651173	651175	
Sphere 400 k-180 painted upwards	PC	669170	669172	669174	OP 400
	PMMA	669171	669173	669175	
Sphere 400 k-180 painted downwards	PC	670170	670172	670174	OP 400
	PMMA	670171	670173	670175	
Sphere 400 k-180 prismatic	PMMA	–	652173	652175	OP 400, OZ 400 (upwards only)

Name	Type of material	Code			Type of luminaire Code
		White	Transparent	Smoked	
Sphere 450 k-200	PC-UV	651268	–	–	OP 450 (upwards only)
	PMMA	651281	651283	651285	
Sphere 450 k-200 painted upwards	PMMA	669281	669283	669285	OP 450
Sphere 450 k-200 painted downwards	PMMA	670281	670283	670285	

LAMP DIFFUSERS WITH NECK Ø180 AND Ø200 MM

ATLANTA

- diameter of lamp diffuser neck Ø180 mm



Atlanta painted



Atlanta prismatic painted

Name	Type of material	Code		Type of luminaire
		White	Transparent	
Atlanta painted 400	PMMA	676181	–	OP 400 OZ 400
Atlanta prismatic painted 400	PMMA	–	677181	

KLIO

- diameter of luminaire neck Ø180 mm
- additional element – cap



Klio



Klio with cap

Name	Type of material	Code		Type of luminaire	Cap of polyamide with glass fibre in black colour
		White	Smoked		
Klio 400	PMMA	675171	675175	OP 400 OZ 400	923710



Stepankovice / Czech Republic



Sochi / Russia

LUMINAIRE OPA-1

- **protection degree:** IP65
- **insulation class:** II
- **material:** base – die cast aluminium alloy, electrical gear cover – polycarbonate,
- **colour:** black (possibility to paint in other colours – polyester powder paint)
- **mounting:** only upwards
- **assembly:** on columns, extension arms, aluminium and steel wall brackets with spigot ending Ø60 mm, length 50 mm
- **diameter of lamp diffuser neck:** Ø150 mm



Luminaire OPA-1


 Luminaire OPA-1
diffusers Sphere painted Ø400 upwards

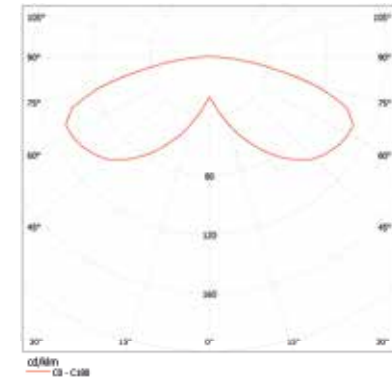
Name	Code	Light source	Power [W]	Weight [kg]	Type of lamp diffuser
OPA-1 S-50W	211801	Sodium E-27	50	2,6	Auris, Auris Maxi, Auris I, Auris Maxi I, Atlanta Ø500, Sphere Ø400-500
OPA-1 S-70W	211802		70	2,9	
OPA-1 S-100W	211803		100	3,1	
OPA-1 S-150W	211804	Sodium E-40	150	3,8	Auris Maxi, Atlantis Ø500, Sphere Ø450-500
OPA-1 MH-70W	211807	Metal halide E-27	70	2,9	Auris, Auris Maxi, Auris I, Auris Maxi I, Atlanta Ø500, Sphere Ø400-500
OPA-1 MH-100W	211808		100	3,1	
OPA-1 MH-150W	211809		150	3,7	
OPA-1 R-125W	211813	Mercury E-27	125	2,6	Auris, Auris Maxi, Auris I, Auris Maxi I, Atlanta Ø500, Sphere Ø400-500
OPA-1 E/Z	211815	Compact fluorescent lamp E-27	23	1,3	



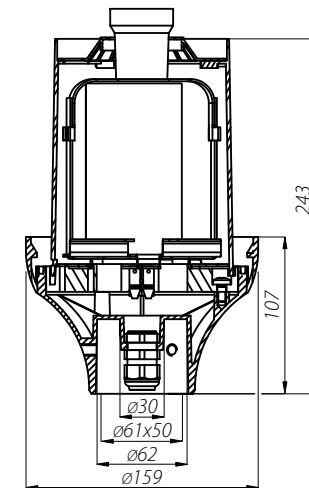
LUMINAIRE OPA-1



Sucha Beskidzka / Poland



Light distribution curve for luminaire OPA-1
S-70W lamp diffuser Sphere painted Ø400



Luminaire OPA-1

PARK LIGHTING

LAMP DIFFUSERS WITH NECK Ø150 MM



Auris



Auris Maxi



Atlantis



Auris I



Auris Maxi I

Name	Type of material	Code	Type of luminaire	Cap of shaped aluminium sheet – code black/other
		Transparent		
Auris without a cap	PC	660162	OPA-1	923602/923603
	PMMA	660163		
Auris I without a cap	PC	671162		
	PMMA	671163		
Auris Maxi without a cap	PC	660362		923662/923663
Auris Maxi I without a cap	PC	671362		
Atlantis frosted with a cap painted in black	PMMA	662368	OPA-1	-
Atlantis frosted with a cap painted in other colour	PMMA	670368		



LAMP DIFFUSERS WITH NECK Ø150 MM



Cone


 Transparent Sphere
400-500


Sphere painted upwards

Name	Plastic type	Code			Luminaires
		White	Transparent	Gold	
Cone 400 k-150	PC-UV	–	655168	–	OW, OP
	PC	655160	655162	655166	
Sphere 400 k-150	PC	–	651162	–	OPA-1, OW
Sphere 400 k-150 painted upwards	PC	–	669162	–	OPA-1
Sphere 450 k-150	PC	–	651262	–	OPA-1, OW
Sphere 450 k-150 painted upwards	PC	–	669262	–	OPA-1
Sphere 500 k-150	PC	–	651362	–	OPA-1

LUMINAIRE OW

- **protection degree:** IP65
- **insulation class:** II
- **material:** base – high-pressure die-cast aluminium, casing – polyamide, cap – shaped aluminium sheet, electrical gear cover – polycarbonate
- **colour:** black (possibility to paint in other colours – polyester powder paints)
- **mounting:** only downwards
- **assembly:** on columns, extension arms, aluminium and steel wall brackets with spigot ending $\varnothing 42$ mm, length 40 mm
- diameter of lamp diffuser neck: $\varnothing 150$ mm



Luminaire OW



Luminaire OW,
diffusers Cone white $\varnothing 400$

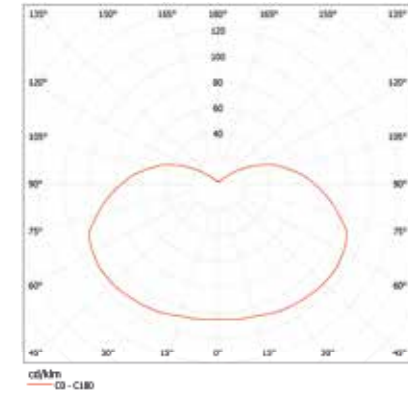
Name	Code	Light source	Power [W]	Weight [kg]	Type of lamp diffuser
OW S-50W	210901	Sodium E-27	50	4,3	Sphere $\varnothing 400-450$, Cone $\varnothing 300-400$
OW S-70W	210902		70	4,6	
OW S-100W	210903	Sodium E-40	100	4,9	Sphere $\varnothing 400-450$, Cone $\varnothing 400$
OW S-150W	210904		150	5,5	
OW MH-70W	210907	Metal halide E-27	70	4,6	Sphere $\varnothing 400-450$, Cone $\varnothing 300-400$
OW MH-100W	210908		100	4,8	
OW MH-150W	210909		150	5,4	
OW R-125W	210913	Mercury E-27	125	4,4	Sphere $\varnothing 400-450$, Cone $\varnothing 400$
OW E/Z	210915	Compact fluorescent lamp E-27	23	3,2	Sphere $\varnothing 400-450$, Cone $\varnothing 300-400$



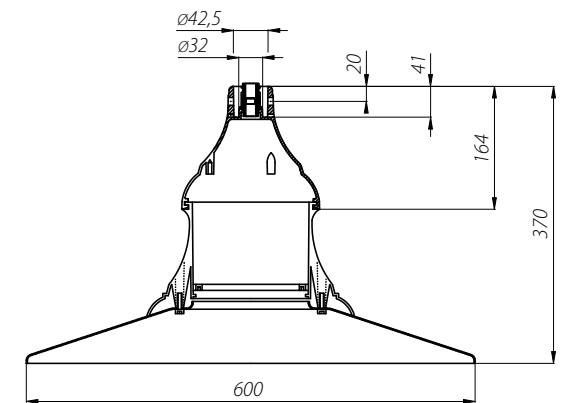
LUMINAIRE OW



Mikołów / Poland



Light distribution curve for luminaire OW S-100W diffusers Cone white Ø400



Luminaire OW

PARK LIGHTING / PARK LUMINAIRES

LUMINAIRE ELBA

- **protection degree:** IP65
- **insulation class:** II
- **material:** casing – high-pressure die-cast aluminium, electrical gear cover – polycarbonate, lamp-diffuser – UV stabilized polycarbonate in white and transparent version, cylindrical Ø200 mm, cap – shaped aluminium sheet
- **colour:** black (possibility to paint in other colours – polyester powder paints)
- **mounting:** only upwards
- **assembly:** on columns, extension arms, aluminium and steel wall brackets with spigot ending Ø60 mm, length 50 mm



Luminaire ELBA
with white lamp diffuser



Luminaire ELBA
with transparent lamp diffuser



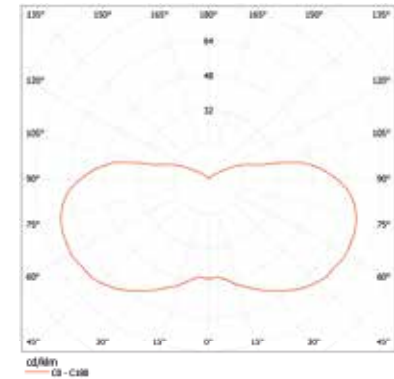
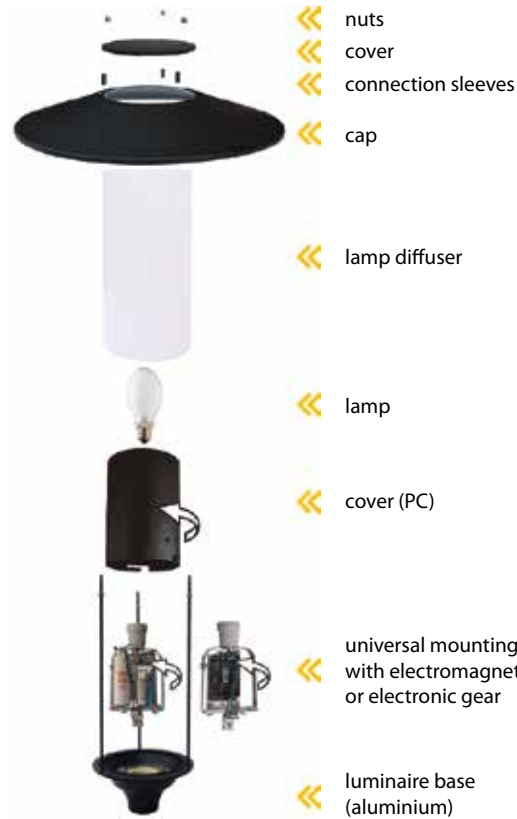
Kielce / Poland

Name	Lamp diffuser	Code	Light source	Power [W]	Weight [kg]
ELBA S-70W	white	213402	Sodium E-27	70	6,3
	transparent	213602			6,5
ELBA S-100W	white	213403	Sodium E-40	100	6,7
	transparent	213603			6,9
ELBA MH-70W	white	213407	Metal halide E-27	70	6,3
	transparent	213607			6,5
ELBA MH-100W	white	213408		100	6,7
	transparent	213608			6,9
ELBA E/Z	white	213415	Compact fluorescent lamp E-27	23	5,0
	transparent	213615			5,2

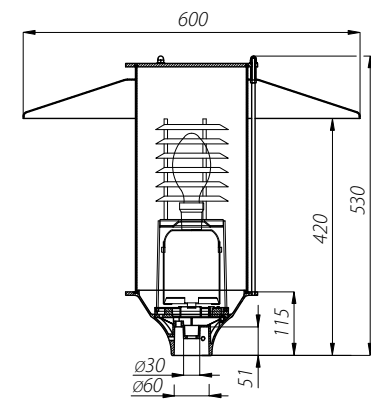
LUMINAIRE ELBA



Gorzów Wielkopolski / Poland



Light distribution curve for luminaire ELBA S-100 W white lamp diffuser



Luminaire ELBA

PARK LIGHTING

STAINLESS STEEL LOUVRE REFLECTORS

- **application:** for installation in park luminaires
- **material:** stainless steel
- **assembly:** by screwing into the luminaire casing with no tools needed, in case of luminaire OS-1 it is assembled directly to the luminaires' mounting plate
- **functions:** control of light distribution, glare reduction, decoration



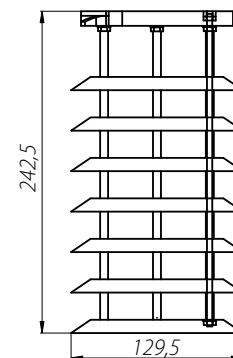
Big stainless steel louvre reflector mounted upwards



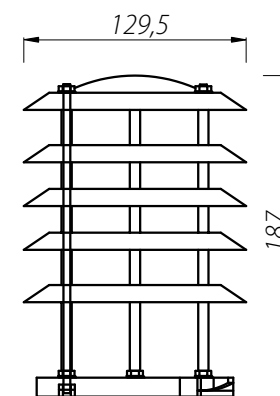
Small stainless steel louvre reflector mounted upwards



Small stainless steel louvre reflector for luminaire OS-1



Big stainless steel louvre reflector mounted downwards



Small stainless steel louvre reflector mounted upwards

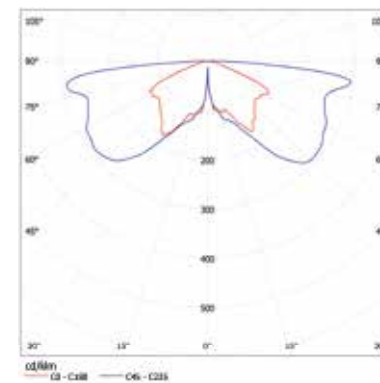
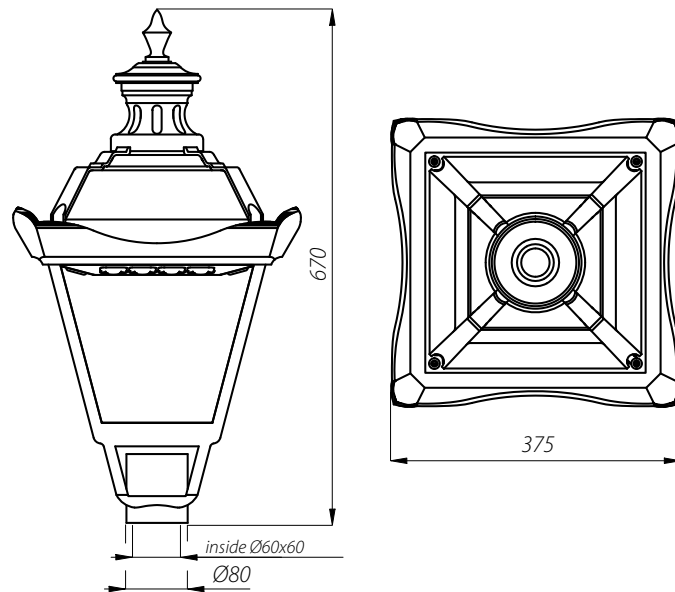
Name	Code	Luminaire type	Lamp-holder type
Big louvre reflector upwards	911116	OP, OPA-1	E-40
Big louvre reflector downwards	911117	OP, OW	
Small louvre reflector mounted upwards	911126	OP, OPA-1	E-27
Small louvre reflector mounted downwards	911127	OP, OW	
Stainless reflector for luminaire OS-1	911307	OS-1	



PARK LIGHTING

OS-1 LED

- protection degree: IP66
- insulation class: II
- supply voltage: 120-277 V AC, 50/60 Hz
- light source: CREE XT-E
- material: polypropylene with UV resistant glass fibre
- colour: black
- mounting: upwards or downwards
- assembly: on poles type S, SP with spigot ending "B", on arms system, wall brackets KR, KP, extension arms, aluminium and steel wall brackets with spigot $\varnothing 60$ and length 60 mm
- recommended mounting height: 4-5 m
- luminaire is adapted to work in temperatures between -40°C and $+40^{\circ}\text{C}$



Light distribution curve for luminaire OS-1 LED



Luminaire OS-1 LED
on pole S-31W with height of 3,32 m

Name	Temperature [K]	Code	Power / Number of LEDs [W/pcs]	Total power [W]	Luminous flux [lm]*	Lighting efficiency [lm/W]	Weight [kg]
OS-1 LED	5 000	211331/6	32/16	39	2 850	73	5,2
	3 500	211331/3			2 650	68	

* Due to the LED precision class the tolerance value is +/- 3%

OS-1 LED



<< ending



<< cap



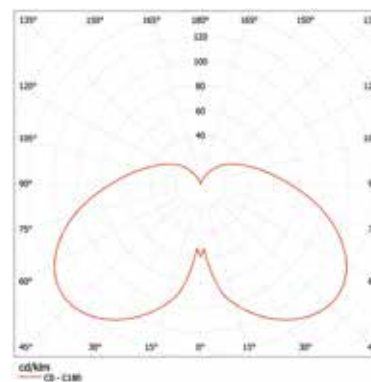
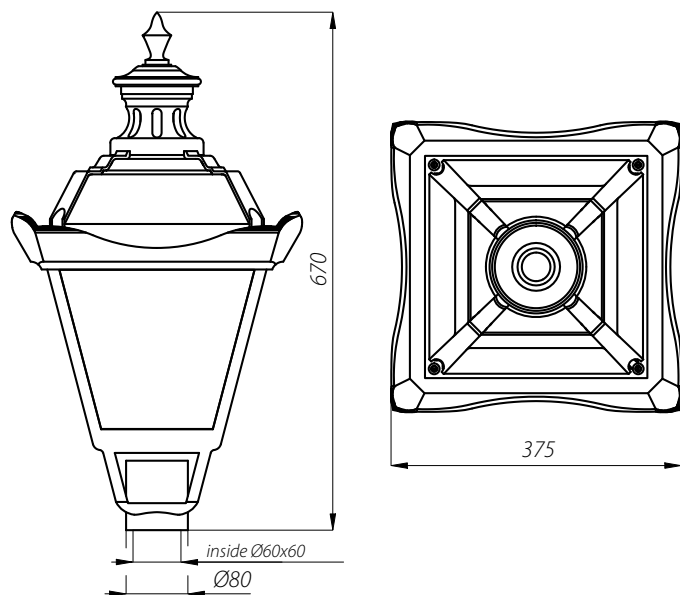
<< support plate with
LED modules and
driver



<< luminaire body

OS-11 LED

- **protection degree:** IP54
- **insulation class:** II
- **supply voltage:** 120-277 V AC, 50/60 Hz
- **light source:** CREE LMH2
- **material:**
body – polypropylene with UV resistant glass fibre
diffuser – frosted PMMA (polymethyl methacrylate)
- **colour:** black
- **mounting:** upwards or downwards
- **assembly:** on poles type S with spigot ending "B", on arms systems, wall brackets KR, KP, extension arms, aluminium and steel wall brackets with spigot Ø60
- **recommended mounting height:** 4-5 m
- luminaire is adapted to work in temperatures between -40°C and +40°C



Light distribution curve for luminaire OS-11 LED



Luminaire OS-11 LED on pole S-31W with height of 3,32 m

Name	Temperature [K]	Code	Power / Number of LEDs [W/pcs]	Total power [W]	Luminous flux [lm]*	Lighting efficiency [lm/W]	Weight [kg]
OS- 11 LED	3 500	2110050/3	38/1	43	4 000	64	5,3

* Due to the LED precision class the tolerance value is +/- 7%

OS-11 LED



<< ending

<< cap

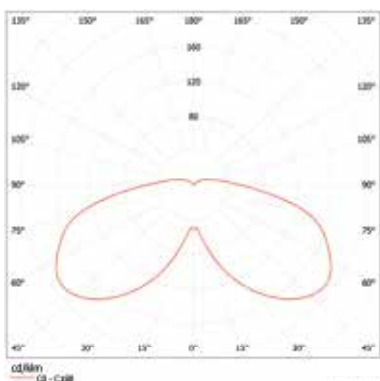
<< support plate with LED modules and driver

<< lamp diffuser

<< luminaire body

ELBA LED

- **protection degree:** IP65
- **insulation class:** II
- **supply voltage:** 120-277 V AC, 50/60 Hz
- **light source:** CREE LMH2
- **material:**
 - casing – high-pressure die-cast aluminium
 - diffuser – frosted cylindrical Ø200 mm (PMMA)
 - cap – shaped aluminium sheet
- **colour:** black (possibility to paint in other colours – polyester powder paints)
- **mounting:** only upwards
- **assembly:** on columns, extension arms, aluminium and steel wall brackets with spigot ending Ø60, length 50 mm
- **recommended mounting height:** 4-6 m
- luminaire is adapted to work in temperatures between -40°C and +55°C



Light distribution curve for luminaire ELBA LED



Name	The colour temperature of light [K]	code colour black / other	Power / Number of LEDs [W/pcs]	Total power [W]	Luminous flux [lm]*	Lighting efficiency [lm/W]	Weight [kg]
ELBA LED	3 500	213050/3 213150/3	38/1	43	3 200	74	5

* Due to the LED precision class the tolerance value is +/- 7%

PARK LIGHTING / PARK LUMINAIRES

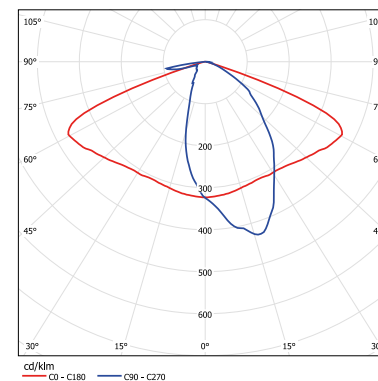
ELBA LED



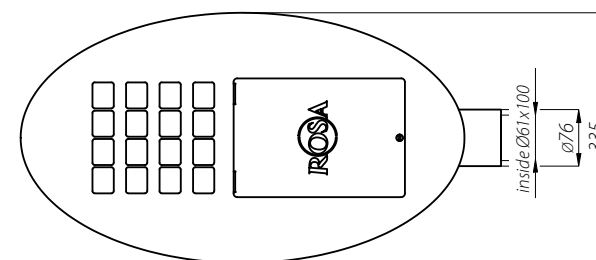
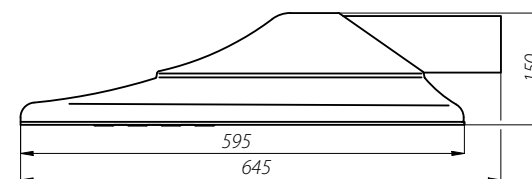
- << nuts
- << cover with LED module
- << connection sleeves
- << cap
- << diffuser
- << aluminium luminaire base with the power supply unit

GEMINI LED

- protection degree: IP66
- insulation class: II
- supply voltage: 120-277 V AC, 50/60 Hz
- light source: CREE XM-L2
- material: anodised aluminium alloy
- colour: inox/black
- assembly: on extension arms with spigot ending $\varnothing 60$, length 100 mm
- recommended mounting height: 5-6 m
- luminaire is adapted to work in temperatures between -40°C and $+40^{\circ}\text{C}$



Light distribution curve for a luminaire GEMINI LED



Luminaire GEMINI LED
on the column SAL DS-52
with height of 5,5 m

Name	The colour temperature of light [K]	Code	Power / Number of LEDs [W/pcs]	Total power [W]	Luminous flux [lm]*	Lighting efficiency [lm/W]	Weight [kg]
GEMINI LED 36	5 000	214332/6	36/12	42	5 000	119	9,5
	3 500	214332/3			3 850	92	
GEMINI LED 48	5 000	214333/6	48/16	55	6 650	121	
	3 500	214333/3			5 200	95	

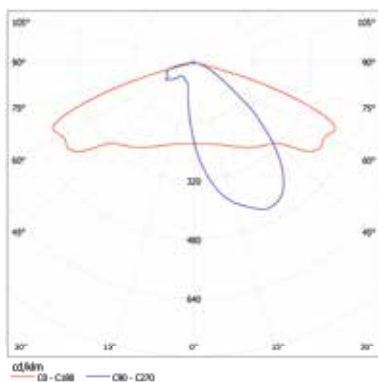
* Due to the LED precision class the tolerance value is +/- 3%



PARK LIGHTING

ISKRA LED

- **protection degree:** IP66
- **insulation class:** II
- **supply voltage:** 100-240 V AC, 50/60 Hz
- **light source:**
 - ISKRA LED ALFA 24 – CREE XT-E
 - ISKRA LED 24 – CREE XT-E
 - ISKRA LED ALFA 36 – CREE XM-L2
 - ISKRA LED 36 – CREE XM-L2
- **material:** anodised aluminium alloy
- **colour:** inox / black
- **assembly:** ISKRA LED ALFA – directly on the column with spigot ending Ø60 mm, length 80 mm
ISKRA LED – on extension arm with spigot ending Ø60 mm, length 90 mm
- **recommended mounting height:** 4-5 m
- luminaire is adapted to work in temperatures between -40°C and +55°C



Light distribution curve for a luminaire ISKRA LED

Name	The colour temperature of light [K]	Code	Power / Number of LEDs [W/pcs]	Total power [W]	Luminous flux [lm]*	Lighting efficiency [lm/W]	Weight [kg]
ISKRA LED ALFA 24	5 000	213330/6	24/12	28	2 500	89	2,2
	3 500	213330/3			1 950	70	
ISKRA LED ALFA 36	5 000	213332/6	36/12	42	5 000	119	
	3 500	213332/3			3 850	92	
ISKRA LED 24	5 000	213230/6	24/12	28	2 500	89	
	3 500	213230/3			1 950	70	
ISKRA LED 36	5 000	213232/6	36/12	42	5 000	119	
	3 500	213232/3			3 850	92	

* Due to the LED precision class the tolerance value is +/- 3%

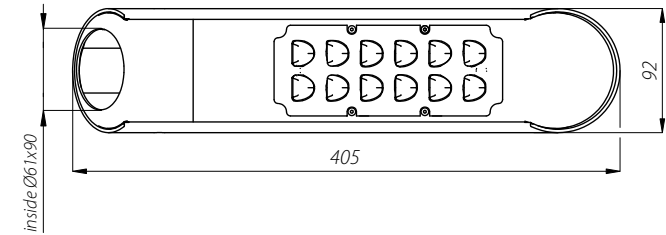


ISKRA LED

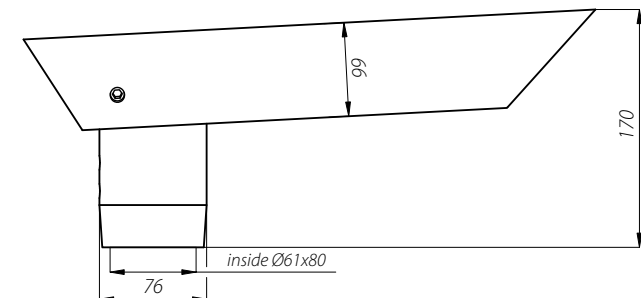
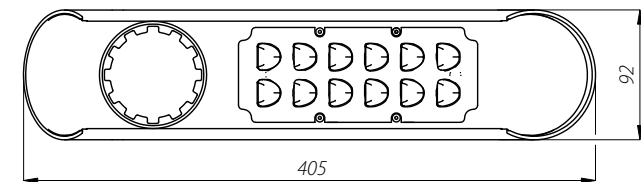
ISKRA LED ALFA

 Luminaire ISKRA LED ALFA
on column SAL-4 with a height of 4 m

ISKRA LED



ISKRA LED

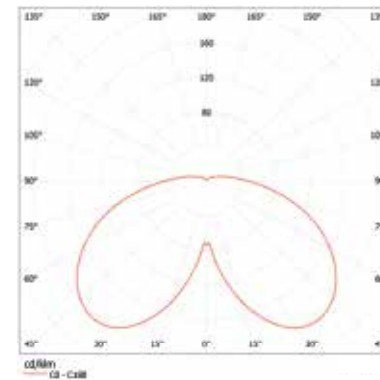
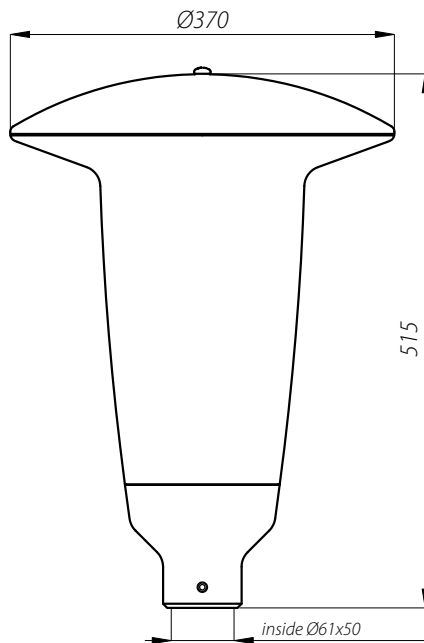


ISKRA LED ALFA

PARK LIGHTING / PARK LUMINAIRES

ATLANTIS LED

- protection degree: IP66
- insulation class: II
- supply voltage: 120-277 V AC, 50/60 Hz
- light source: CREE LMH2
- material:
 - cap and base – anodised aluminium alloy
 - diffuser – frosted PMMA
- colour: inox
- assembly: on columns with spigot ending $\varnothing 60$ mm, length 50 mm
- recommended assembly height: 4-6 m
- luminaire is adapted to work in temperatures between -40°C and $+55^{\circ}\text{C}$



Light distribution curve for ATLANTIS LED luminaire



Luminaire ATLANTIS LED on column SAL-4 (4 m high)

Name	The colour temperature of light [K]	Code	Power / Number of LEDs [W/pcs]	Total power [W]	Luminous flux [lm]*	Lighting efficiency [lm/W]	Weight [kg]
ATLANTIS LED	3 500	214650/3	38/1	43	3 500	81	4,6

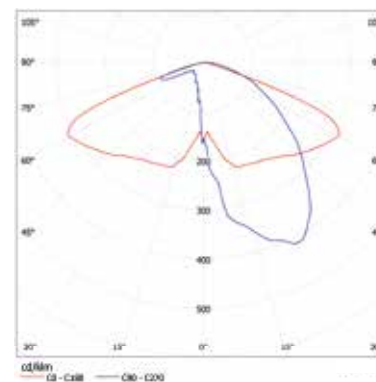
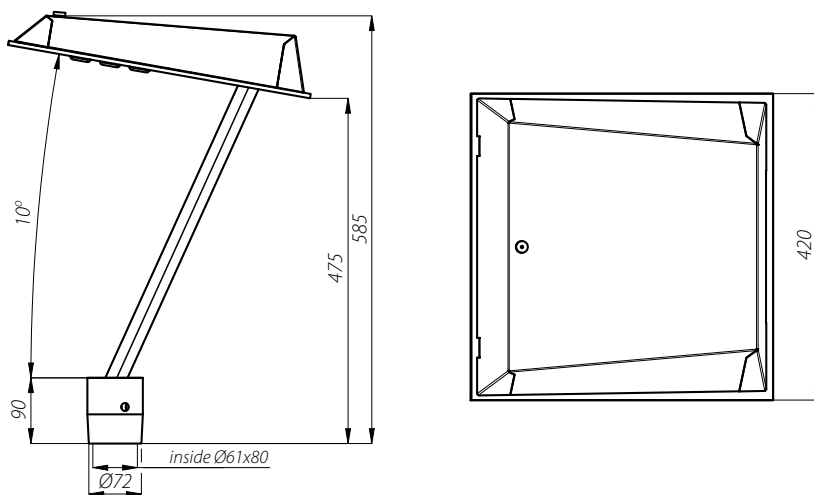
* Due to LED precision class, the value tolerance is $\pm 7\%$



PARK LIGHTING

MIRA LED

- protection degree: IP66
- insulation class: II
- supply voltage: 120-277 V AC, 50/60 Hz
- light source: CREE XM-L2
- material: anodised aluminium alloy
- colour: inox/graphite
- assembly: on columns with spigot ending $\varnothing 60$ mm, length 50 mm
- recommended assembly height: 4-5 m
- luminaire is adapted to work in temperatures between -40°C and $+40^{\circ}\text{C}$



Light distribution curve for MIRA LED luminaire



Luminaire MIRA LED on column SAL-4/B60 (4 m high)

Name	The colour temperature of light [K]	Code	Power / Number of LEDs [W/pcs]	Total power [W]	Luminous flux [lm]*	Lighting efficiency [lm/W]	Weight [kg]
MIRA LED	5 000	214532/6	36/12	42	5 000	119	6,1
	3 500	214532/3			3 850	92	

* Due to LED precision class, the value tolerance is +/-3%

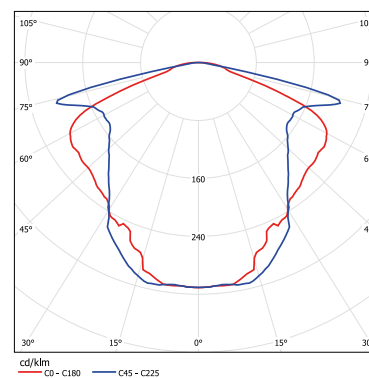
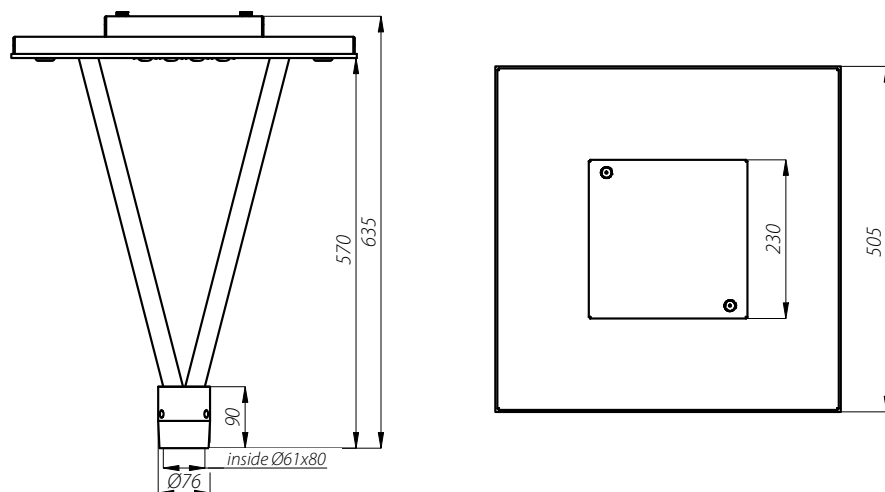


PARK LIGHTING

PARK LIGHTING / PARK LUMINAIRES

MIZAR LED

- protection degree: IP66
- insulation class: II
- supply voltage: 120-277 V AC, 50/60 Hz
- light source: CREE XM-L2
- material: anodised aluminium alloy
- colour: inox/graphite
- assembly: on columns with spigot ending $\varnothing 60$ mm, length 80 mm
- recommended assembly height: 5-6 m
- luminaire is adapted to work in temperatures between -40°C and $+55^{\circ}\text{C}$



Light distribution curve for MIZAR LED luminaire

Name	The colour temperature of light [K]	Code	Power / Number of LEDs [W/pcs]	Total power [W]	Luminous flux [lm]*	Lighting efficiency [lm/W]	Weight [kg]
MIZAR LED	5 000	214433/6	48/16	55	6 650	121	9,2
	3 500	214433/3			5 200	95	

* due to LED precision class, the value tolerance is +/-3%

 Luminaire MIZAR LED on column
SAL-4/B60 (4 m high)



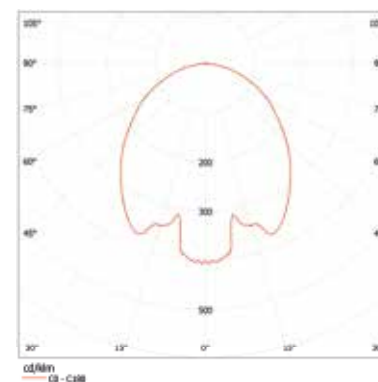
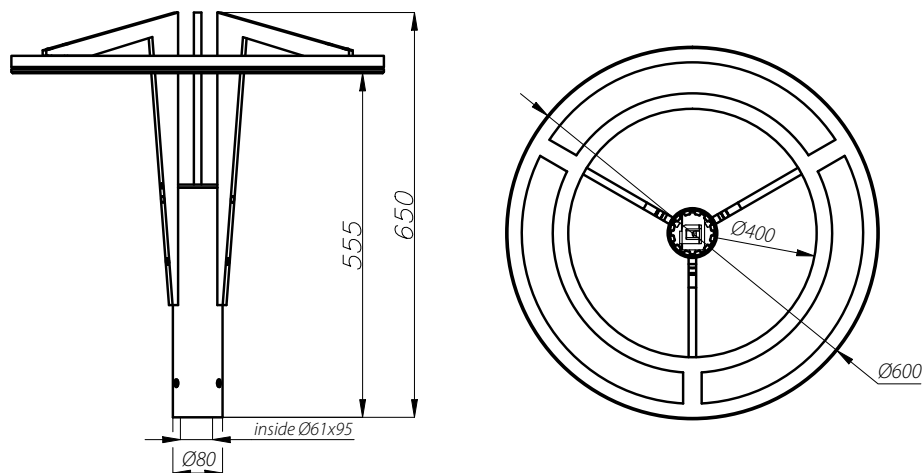
Promenady Wrocławskie / Poland



PARK LIGHTING / PARK LUMINAIRES

CORONA LED

- protection degree: IP66
- insulation class: II
- supply voltage: 120-277V, AC, 50/60 Hz
- light source: CREE XT-E
- material: anodised aluminium alloy
- colour: inox/graphite
- assembly: on columns with spigot ending $\varnothing 60$ mm, length 95 mm
- recommended assembly height: 5-7 m
- luminaire is adapted to work in temperatures between -40°C and $+55^{\circ}\text{C}$



Light distribution curve for CORONA LED luminaire


 Luminaire CORONA LED
on column SAL DL-3 (6 m high)

Name	The colour temperature of light [K]	Code	Power / Number of LEDs [W/pcs]	Total power [W]	Luminous flux [lm]*	Lighting efficiency [lm/W]	Weight [kg]
CORONA LED	5 000	214735/6	72/36	80	5 000	63	13

* due to LED precision class, the value tolerance is +/-3%

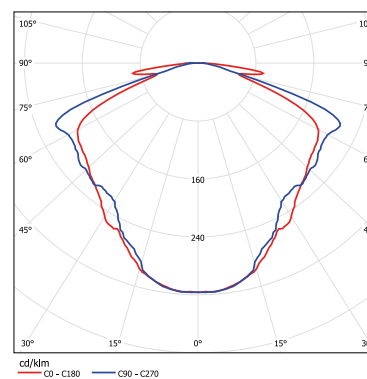
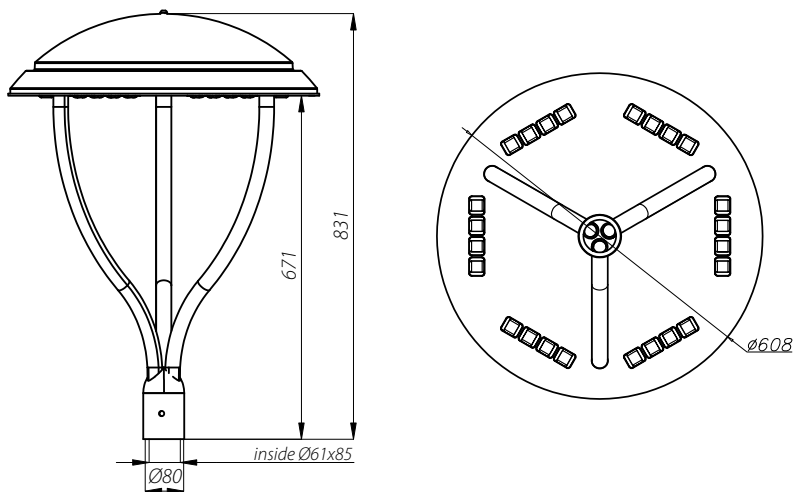


PARK LIGHTING

PARK LIGHTING / PARK LUMINAIRES

COSMO DELTA LED

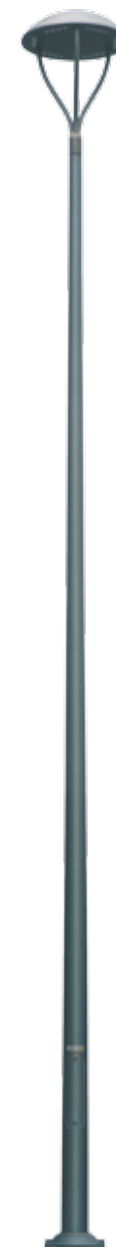
- protection degree: IP66
- insulation class: II
- supply voltage: 120-277 V AC, 50/60 Hz
- light source: CREE XM-L2
- material: anodised aluminium alloy
- colour: inox/black
- assembly: on columns with spigot ending $\varnothing 60$ mm, length 85 mm
- recommended assembly height: 6-8 m
- luminaire is adapted to work in temperatures between -40°C and $+55^{\circ}\text{C}$



Light distribution curve for COSMO DELTA LED luminaire

Name	The colour temperature of light [K]	Code	Power / Number of LEDs [W/pcs]	Total power [W]	Luminous flux [lm]*	Lighting efficiency [lm/W]	Weight [kg]
COSMO DELTA LED	5 000	214835/6	72/24	80	10 000	125	11
	3 500	214835/3			7 750	97	

* due to LED precision class, the value tolerance is +/-3%



Luminaire COSMO DELTA LED on column SAL DL-3 (6 m high)



PARK LIGHTING

PARK LIGHTING / PARK LUMINAIRES

VEGA LED

- **protection degree:** IP66
- **insulation class:** II
- **supply voltage:** 120-277 V AC, 50/60 Hz
- **light source:** CREE XM-L2
- **material:** anodised aluminium alloy
- **colour:** inox/graphite
- **mounting:**
 - VEGA LED – on extension arms with spigot ending $\varnothing 60$ mm, length 100 mm
 - VEGA LED ALFA – on columns with spigot ending $\varnothing 60$ mm, length 100 mm
 - VEGA LED BETA – on columns with spigot ending $\varnothing 60$ mm, length 95 mm, in a centric way
- **recommended assembly height:** 4,5-8 m
- luminaire is adapted to work in temperatures between -40°C and $+55^{\circ}\text{C}$



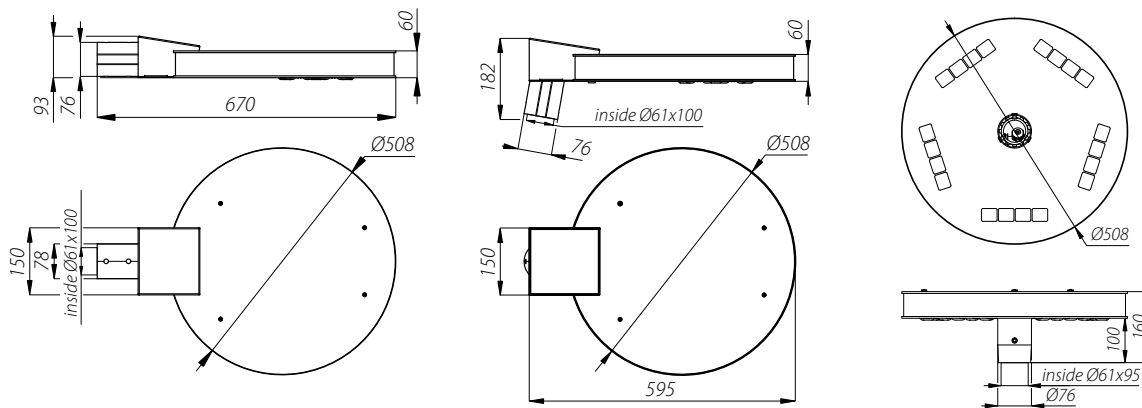
VEGA LED



VEGA LED ALFA



VEGA LED BETA



VEGA LED

VEGA LED ALFA

VEGA LED BETA

Name	The colour temperature of light [K]	Code	Power / Number of LEDs [W/pcs]	Total power [W]	Luminous flux [lm]*	Lighting efficiency [lm/W]	Weight [kg]	
VEGA LED 60	5 000	214134/6	60/20	68	8 300	122	10,5	
	3 500	214134/3			6 450	95		
VEGA LED ALFA 60	5 000	214234/6			8 300	122		9,5
	3 500	214234/3			6 450	95		
VEGA LED BETA 60	5 000	214034/6			8 300	122	9,5	
	3 500	214034/3			6 450	95		

* due to LED precision class, the value tolerance is +/-3%

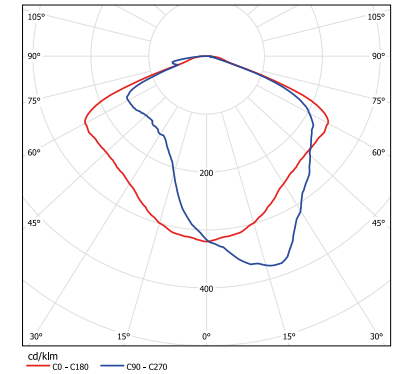
VEGA LED



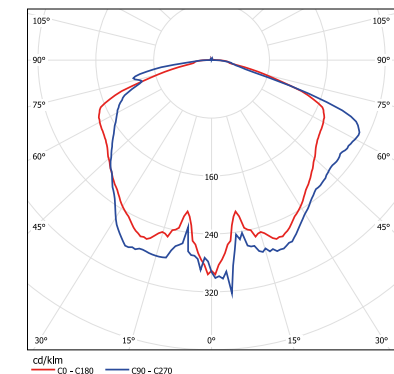
Tychy / Poland



1. Luminaire VEGA LED on column SAL DL-2 (5,5 m high)
 2. Luminaire VEGA LED BETA on column SAL DL-5 (4,5 m high)



Light distribution curve for VEGA LED ALFA luminaire



Light distribution curve for VEGA LED BETA luminaire

PARK LIGHTING