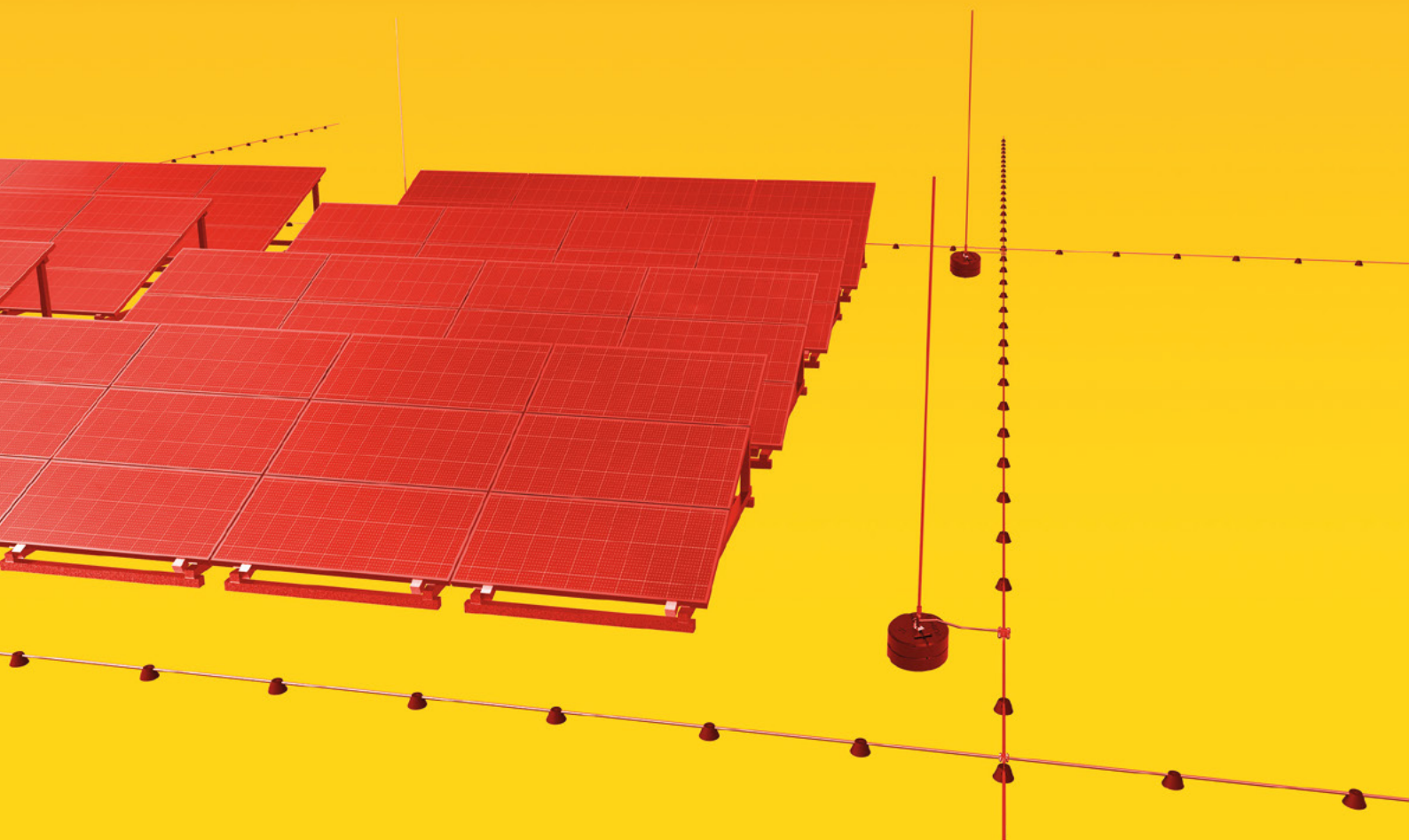


THE BEST SOLUTIONS SINCE 1998



# ELKO-BIS

SYSTEMY ODGROMOWE

**LIGHTNING PROTECTION  
OF PHOTOVOLTAIC PANELS**



[www.elkobis.com](http://www.elkobis.com)



MORE INFORMATION AVAILABLE  
ON OUR WEBSITE  
[www.elkobis.com](http://www.elkobis.com)







## Our future - solar energy

Facing decrease of fossil fuel resources and continuous global growth demand for energy, it is essential to seek alternative energy acquisition sources. Estimated demand for energy in 2040 will increase by 56 %. One of the ways to deal with this problem is to use renewable energy sources. Renewable sources technology is getting cheaper and cheaper, therefore its been growing dynamically. It is estimated that currently „green energy“ meets about 10% of world's energy demand.

Considering inexhaustibility of its sources and lack of waste treatment costs, this share will undoubtedly increase. In the ‚green energy‘ sector, it is the Sun that is indicated as the main source of energy acquisition. It mainly results from the universality and availability of this solution.

Theoretically, solar radiation with the total power of 89,000 terawatts (1 terawatt is  $10^{12}$  watt) reaches the Earth, whereby for comparison, humanity currently needs about 18 terawatts of energy. So it's almost 5,000 times more than we need. Considering the available fossil fuels, it can be stated that their amount allows to produce as much energy as reaches the Earth from the Sun within just 56 days.



# Lightning protection of photovoltaic panels

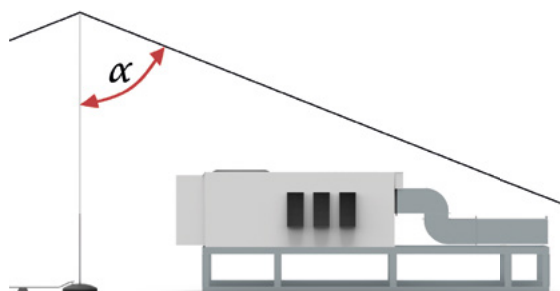
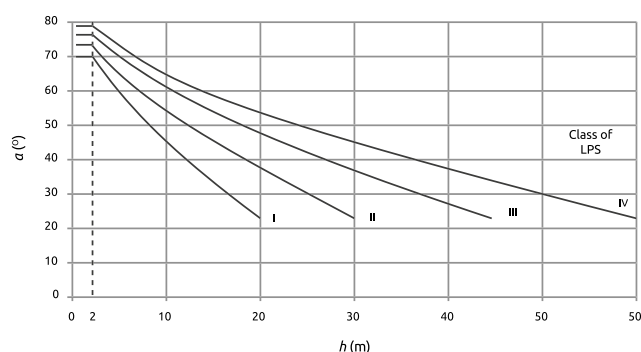
Photovoltaic panel devices containing photovoltaic cells responsible for the conversion of solar radiation energy into electricity. Used in outdoor places, with high intensity of solar radiation, such as roofs of construction facilities and the ground, forming so-called photovoltaic farms. Outdoor location, make them particularly vulnerable to direct atmospheric discharges and overvoltages induced in the event of a nearby lightning discharge.

Following applicable safety rules and generally accepted industry guidelines, there are two basic rules in determining the location of lightning rods (masts, air terminals):

- ▶ The arrangement of masts is considered as appropriate, when protected facility is entirely within the protection zone.
- ▶ Lightning masts, lightning rod and air terminal system are moved away from protected devices, creating minimum separation distance ( $s$ ).



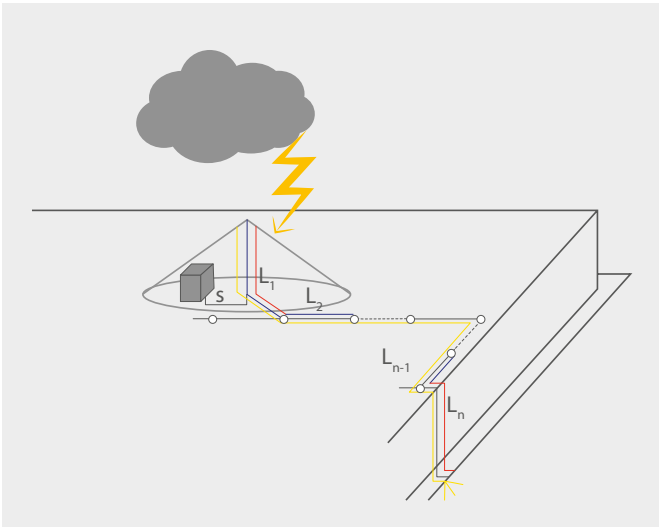
SPHERE RADIUS	LPS1	LPS2	LPS3	LPS4
$r$	140-500	55	54	26



The protection zone created by the system of lightning masts depends on the selected method of determination. The designer may use the rolling sphere method or the protective angle method.

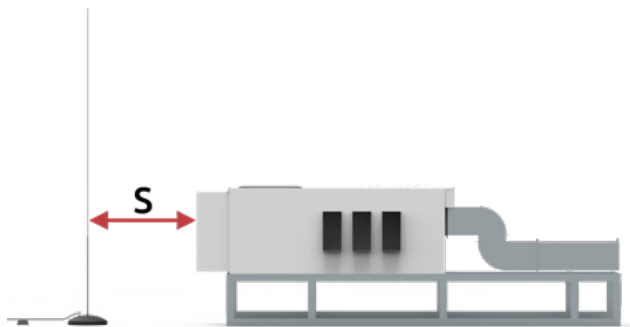
- ▶ The rolling sphere method consists in „rolling“ a sphere with a given radius  $r$  dependent on the LPS class, around the facility. The place where the sphere touches the facility is a place exposed to direct atmospheric discharge and lightning protection should be applied there. When the rolled sphere does not touch the protected devices, lightning protection is considered to be suitable.
- ▶ The protective angle method is a method determining protection zone, using lightning rods. A lightning mast creates a cone-shaped protective zone for electrical devices. This cone depends on the angle, determined on the basis of LPS class and mast height.



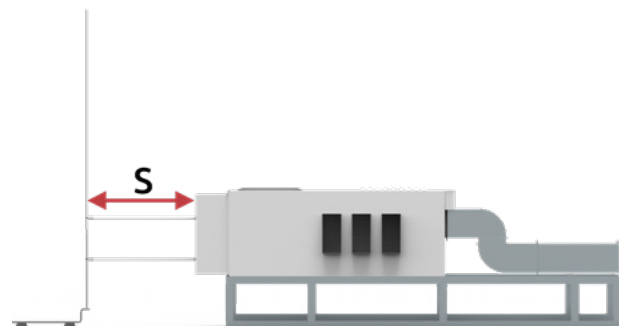


When designing or making an external lightning protection device, we should pay special attention to protection of devices located on protected roofs, both from the effects of direct lightning discharge, as well as from the charge transfer from the lightning protection system to the protected device. Multi-sheet standards PN-EN62305 state unequivocally that: „All roof devices made of insulating or conductive material, which contain electrical equipment and / or equipment processing information, should be located in the protective zone of the air termination system”.

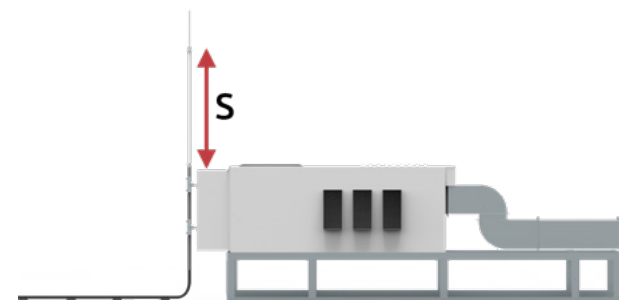
**Depending on the constraints with the insulation clearances that designers and contractors encounter during implementation of the investment, three Types of lightning protection are applied:**



- ◀ Maintaining the insulation clearance without interfering with the protected device - used in places where there are no problems with obtaining insulation clearances and there is enough space for lightning masts.



- ◀ Maintaining the insulation clearance on insulation bars - used in places where mounting to the device or shutter structure is possible. By using insulation bars made of non-conductive material, we keep the insulation clearance despite mechanical connection



- ◀ Keeping the insulation clearance using insulated high-voltage cable system - used in places where it is not possible to keep the insulation clearance due to the lack of space on the roof or the architectural point of view to keep aesthetics of the facility. High-voltage cable system compliant with the PN-EN 62305 standard provides us with an insulation clearance of 75 cm



## Threats and responsibility

ELKO-BIS is a Polish manufacturing leader within external lightning protection systems and products protecting building facilities, along with their electrical equipment, including photovoltaic systems. For over 20 years we have developed and implemented more than 1,000 widely used products in lightning protection technology, responding to all requirements and industry standards. That is why designers and contractors can be sure that products are complete and reliable.

Following Polish Insurance Association, main insurance obligation is to perform lightning protection system according to lightning protection standards PN-EN 62305, which strictly establish designing principles and standards for lightning protection systems, including particular tests performance for lightning protection components. It is designers and contractors obligation to apply appropriate products and solutions.

Effective and long-lasting operation of lightning protection system rely on tested and verified materials. Using ELKOBIS products, contractor gets 3 to 5 years warranty which only confirms high quality of our components.



## QUALITY IN THE FIRST PLACE!

- Our products have not only been thoroughly tested and provided with the necessary certificates, but also obtained numerous awards and distinctions! Owing to this, our customers can enjoy the highest quality lightning protection.



Decide with Confidence







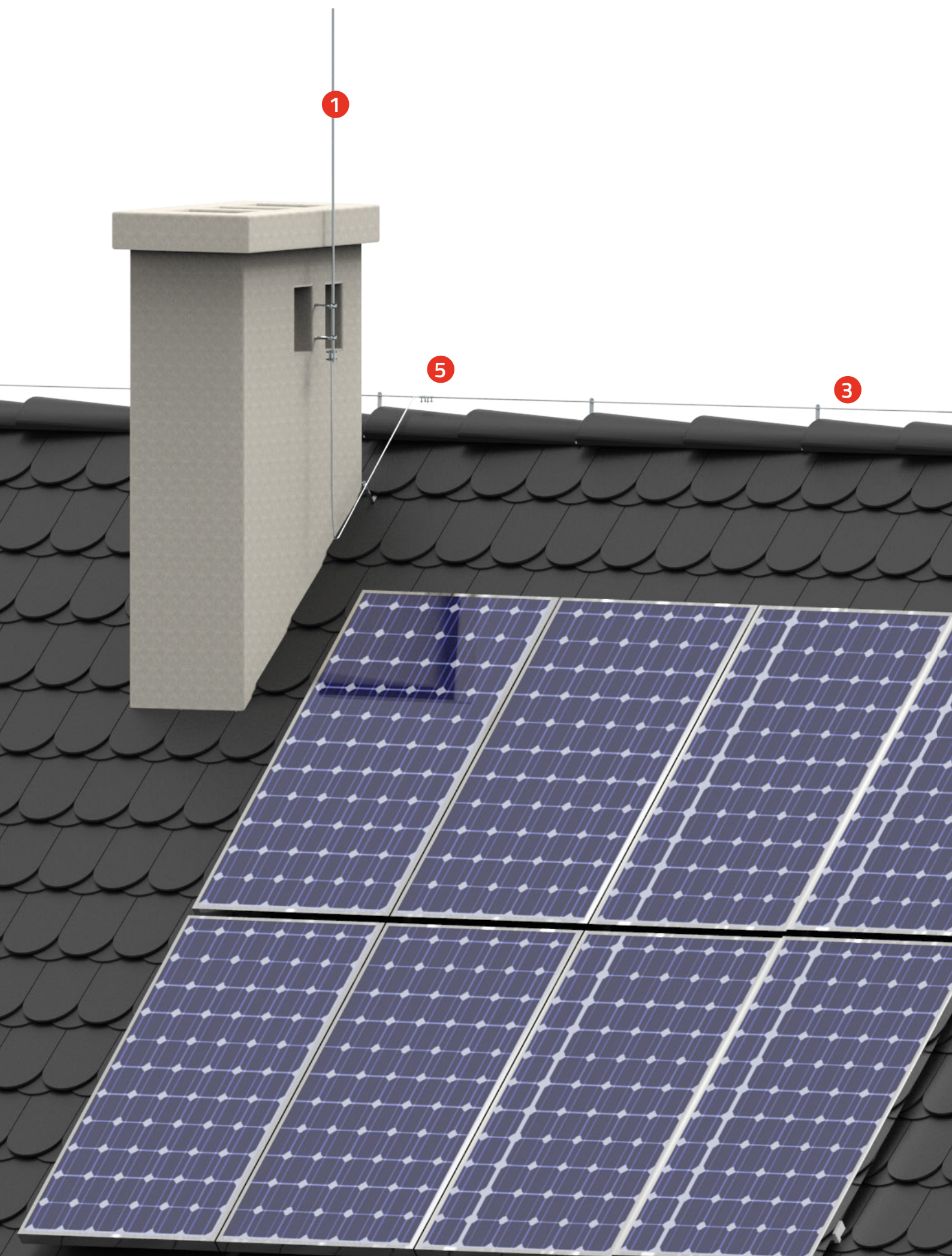
## Detached houses photovoltaic protection

Those days there are more photovoltaic panel systems installed on the roofs of detached houses. It is related to new panel production technologies, which are significantly cheaper than a few years ago, and also with many government funds for renewable energy investments. In case of photovoltaic lightning protection, it is important

to keep appropriate separation distance from air termination, which in many cases is associated with reduction of panel numbers used. The most common protection practices include use of chimney spires and gable spires on the facility.











CHECK OUT THE RELATED PRODUCTS  
on the next page





## 1 Chimney Spire



For chimneys protection. Spire set include 2 fix plug holders and wire connector. Can be use as a protection of attic and elements around it.

CAT. NUM.	TYPE	A	B	Bolt
97001009	70.10	1000	16	4 × M8 × 20
97001509	70.15	1500	16	4 × M8 × 20
97002009	70.20	2000	16	4 × M8 × 20
97002509	70.25	2500	16	4 × M8 × 20
97003009	70.30	3000	16	4 × M8 × 20

To order a specific material option, replace last two digits into material equivalent from Material Options specification.

CU	03	AL	09
----	----	----	----

## 2 Single Ridge Tile Spire



For Lightning Protection of roof elements and devices (skylights, air conditioners, air handling units, air handling channels) For tile roofs. Direct screw assembly to ridge tile. Complete set include horizontal wire connector.

CAT. NUM.	TYPE	A	B	C	D	E	F
97101009	71.10	ø 12	1000	30	150	2,5	350
97101509	71.15	ø 12	1500	30	150	2,5	350
97102009	71.20	ø 12	2000	30	150	2,5	350

To order a specific material option, replace last two digits into material equivalent from Material Options specification.

CU	03	AL	09
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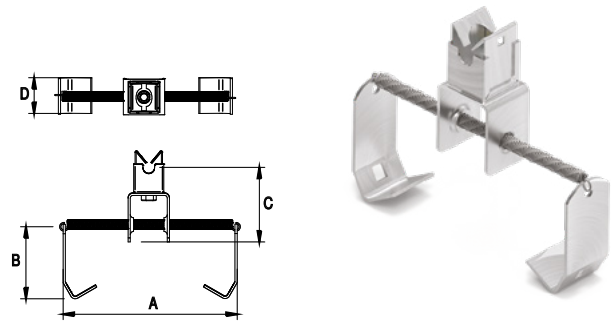


### 3 Universal Ridge Tail Holder

To lead wire conductor on a roof tops covered in ceramic or steel sheet roof tiles. Flexible spring mounting to ridge tile, fits with majority of ridge tile Types. To be used for Ø 8 wire conductor.

CAT. NUM.	TYPE	A	B	C	D
25910105	-	140-500	55	54	26

NI

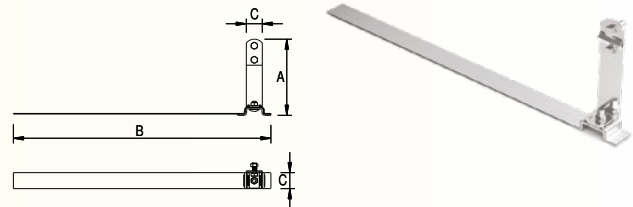


### 4 Tape Universal Under Tile Wire Holder

For fixing wire on the roof surface covered in roof tiles with lock. Tape is made of plastic aluminum, allowing easy adoption to each Type of roof tile. Steel fixing element Type OC, OG or LA. Holder allows to lead wire parallel and perpendicular to roof edge.

CAT. NUM.	TYPE	A	B	C
91004009	10.10/S AL	120	400	25

AL



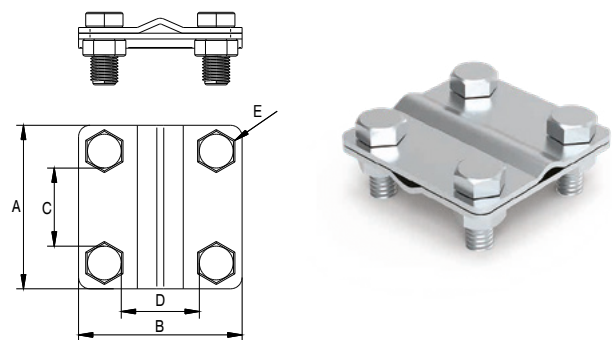
### 5 4 Screws Cross Connection Clamp

For cross wire connections. Two parts 2 mm thick, assembled with 4 screws M8. Option 90100101 suitable to connect wires up to Ø8mm, as option 90100201 suitable to connect wires up to Ø10mm

CAT. NUM.	TYPE	A	B	C	D	E
90100101	1.1	57	57	30	30	4 x M8 x 20
90100201	1.2	57	57	30	30	4 x M8 x 30

To order a specific material option, replace last two digits into material equivalent from Material Options specification.

OC	01	OG	02	CU	03	NI	05	CU/OC	06	MS	10
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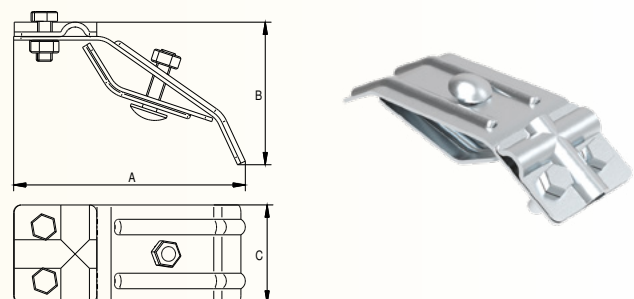
### 6 Gutter Wire Holder

To connect wire with all Types of gutters. Two parts 2mm thick, assembled with M6 screw. Option 90300201 allows to place wire along the gutter.

CAT. NUM.	TYPE	Clamped	A	B	C	Bolt
90300201	3.1/S	screw	40	103	40	M6 x 30

To order a specific material option, replace last two digits into material equivalent from Material Options specification.

OC	01	OG	02	CU	03	NI	05	MS	10	LA	16
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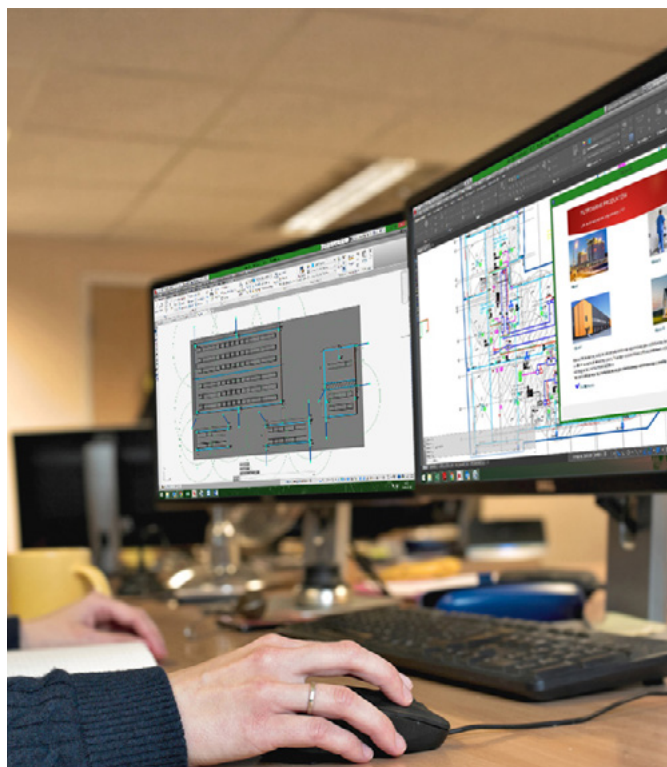


## Project support

Following lightning protection standards, it is designers duty to perform complete risk assessment, in order to determined appropriate lightning protection class (LPS). Only than and after, designer should proceed further with lightning protection of construction facilities and its devices. Unfortunately quite often project working pace and frequent conflicts, being an effect of project infliction from various industries being involved in the process, are leading to nonconformities and errors within lightning protection concept itself.

The most common are: lack of separation distance and insufficient protection zone as a result of wrong LPS elements selection. Therefore, to meet designers expectations, we have created a dedicated technical department, where designers can get answers to their questions on various lightning protection issues, standard requirements, also obtaining help and support within design process.

Our engineers have an access to Auto-CAD software, being able to check all documentation, provide corrections or prepare full design offer. Designers can be sure that project will follow current standards and modern lightning protection solution will be applied.



▲ Diploma INNOVATIONS 2014 during International Power Industry trade fair EXPOPOWER



▲ Golden Volt statuette for the best electrotechnical product of the trade fair ENERGETAB

Additionally, we have created free to download CAD software overlay, containing current library of products as best solutions for lightning protection. Overlay also contains many tools supporting design process, such as:

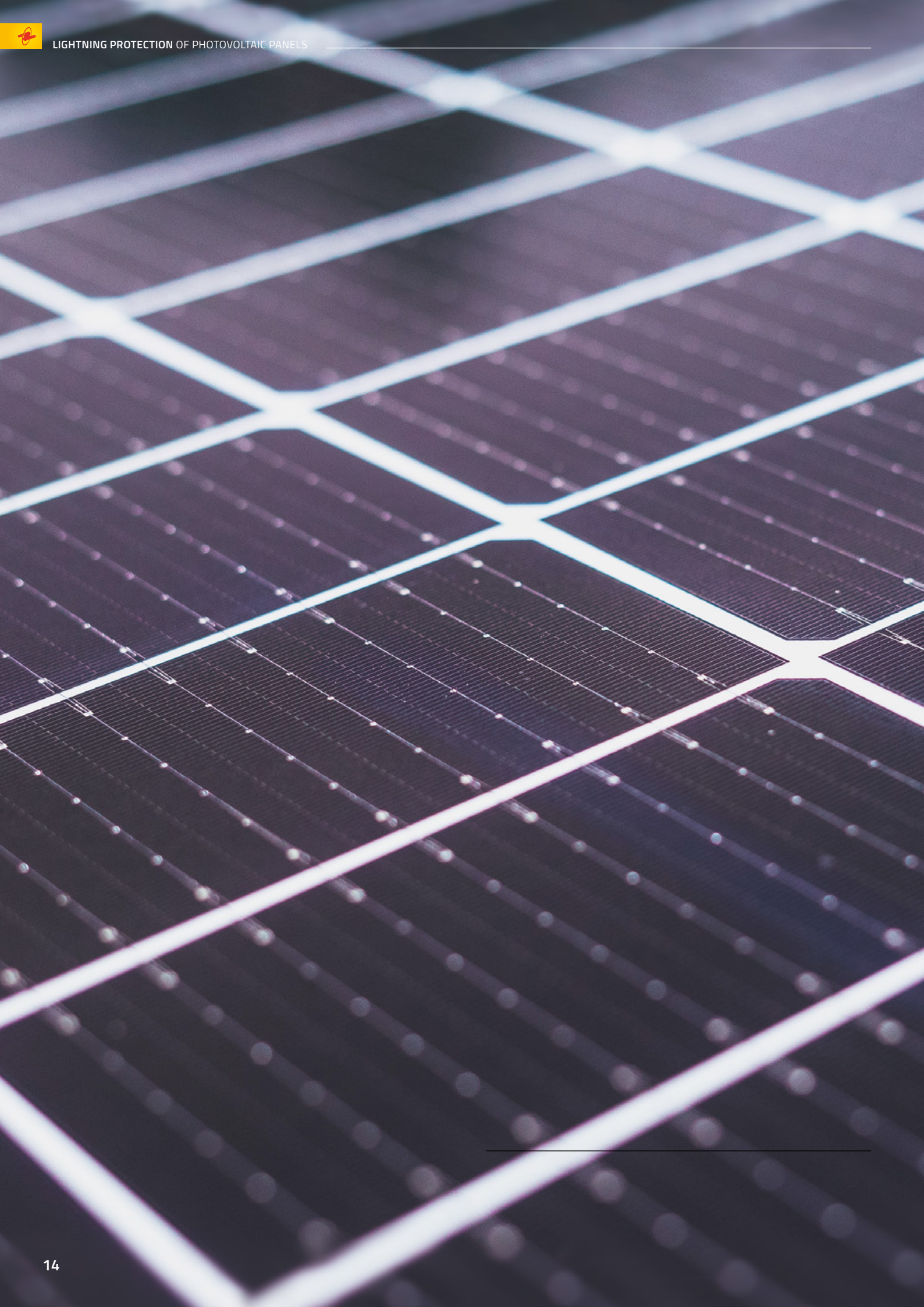
- ▶ Calculation of insulation clearances.
- ▶ Determination of protection zones of lightning rods.
- ▶ Spreadsheets dedicated to lightning protection of photovoltaic systems.
- ▶ Designer tool-kits containing basic information on lightning protection standards.
- ▶ Engineering graphics used in electrical projects.
- ▶ Counting module for applied elements.





CONTACT US!  
[export@elkobis.com.pl](mailto:export@elkobis.com.pl)



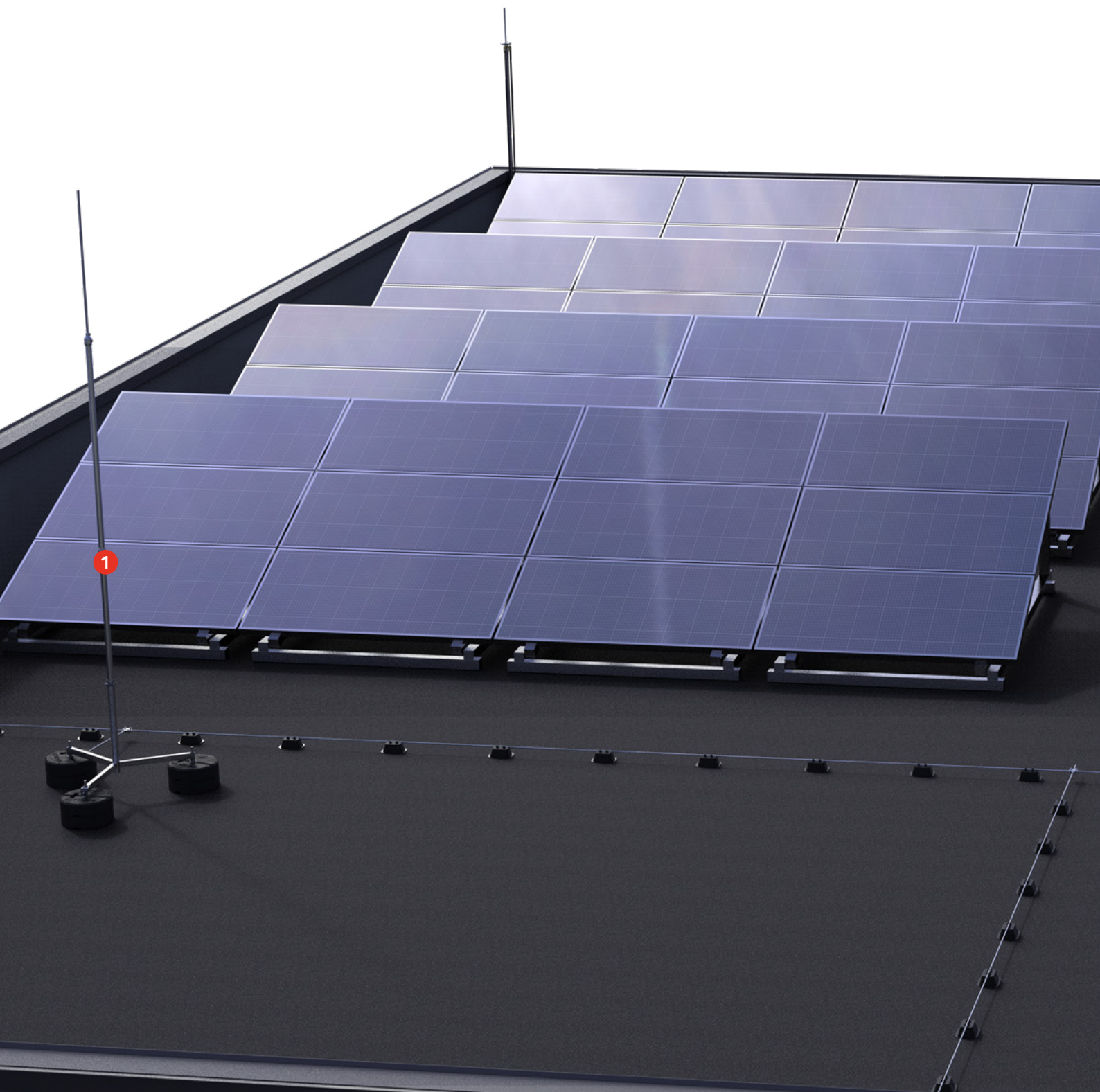






## Industrial roofs -photovoltaic protection

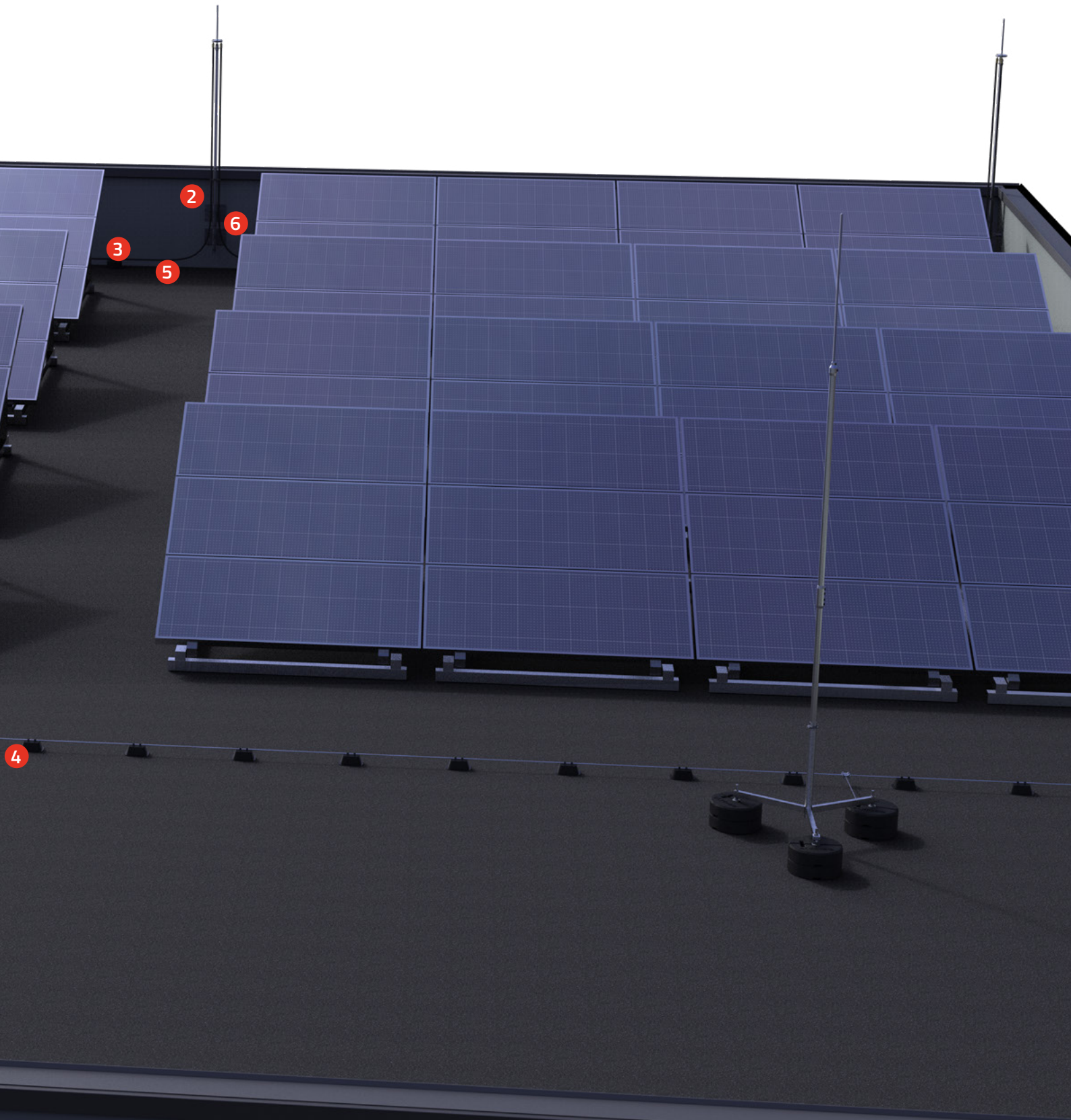
Industrial facilities are characterised by a large roof surface, which is used for refrigerating, ventilation appliances and devices to obtain energy, for example through photovoltaic panels. Designers of these devices strive for the most effective use of this surface, which creates problems with obtaining the insulation clearance of LPS elements. In such cases, it is necessary to use a high voltage cable system with masts, which allows to come directly to the devices. This solution combines optimal roof construction with the best lightning protection.







CHECK OUT THE RELATED PRODUCTS  
on the next page



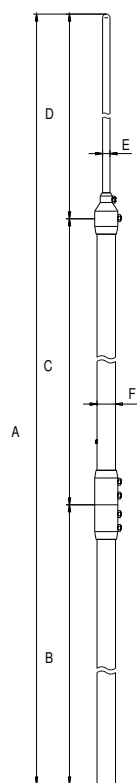


## 1 Lightning Protection Air Terminal

For lightning protection of roof elements and devices (skylights, air conditioners, air handling units, air handling channels). Depending on assembly location, appropriate holder need to be applied example 66000205 (wall holder) Air Terminal made of durable aluminium.

CAT. NUM.	TYPE	Wind resistance	A	B	C	D	E	F
62007009	62.7 AL	140 km/h	7000	3000	3000	1000	ø16	ø40
62006509	62.65 AL	140 km/h	6500	3000	3000	500	ø16	ø40
62006009	62.6 AL	149 km/h	6000	3000	2000	1000	ø16	ø40
62005509	62.55 AL	149 km/h	5500	3000	2000	500	ø16	ø40
62005009	62.5 AL	175 km/h	5000	2000	2000	1000	ø16	ø40
62004509	62.45 AL	175 km/h	4500	2000	2000	500	ø16	ø40
62004009	62.4 AL	192 km/h	4000	3000	----	1000	ø16	ø40
62003509	62.35 AL	192 km/h	3500	3000	----	500	ø16	ø40
62003009	62.3 AL	192 km/h	3000	2000	----	1000	ø16	ø40

AL



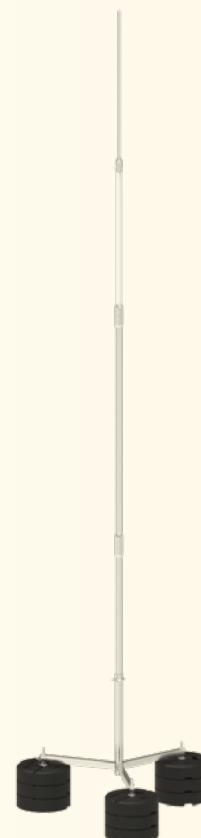
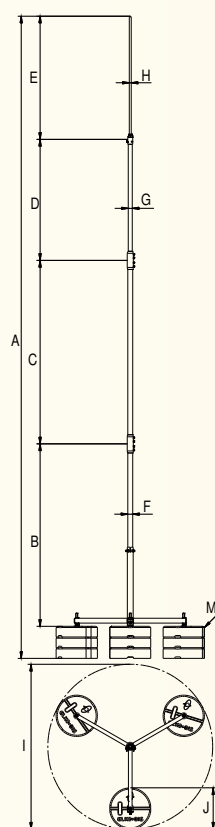
\*Pipes diameters may change.



## 2 Tripod High Voltage Interception Mast

For Lightning Protection of steel roof elements and devices (skylights, air conditioners, air handling units, air handling channels). Choose correct mast holders depending on assembly place e.g mast holder 96000201 for wall mounting. To be use at places with non possibility of keeping isolation distance from protected equipment. Made of stainless steel, insulation Bar with 1 meter aluminum spire.

- ▶ NOTICE: High Voltage Cable ordered separately. Tripod concrete base gives appropriate wind resistance.
- ▶ Free standing mast with total weight up to 142kg. It is recommended to use pads under concrete base. Option 94308222 for tar board roofs and option 94308221 for membrane roofs.
- ▶ Complete measurement table **available on page 23**





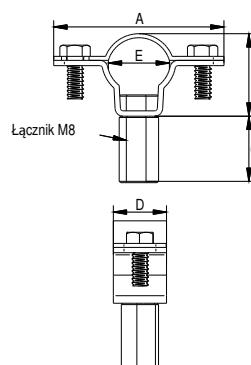


### 3 High Voltage Cable Holder

To lead high voltage cable conductor over walls and steel constructions. 2 types with and without connector to direct flat surface fixing.

CAT. NUM.	TYPE	A	B	C	D	E	Screw	Notes
31600105	316.1	64	31	-	20	23	2×M6×16	without connector
31600205	316.2	64	31	25	20	23	2×M6×16	with connector

NI

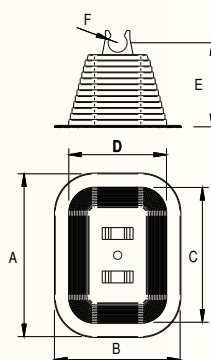


### 4 High Voltage Cable - PVC Coated Concrete Holder

To lead high voltage cable conductor over the flat roofs. Fixed to surface using ELKO-FIX adhesive 99300199 or membrane glue 11000599. Use only with high voltage conductor 30000199. Assembly details on [www.elkobis.com](http://www.elkobis.com)

CAT. NUM.	TYPE	A	B	C	D	E	F
31000111	-	208	160	165	125	106	ø24

PCV



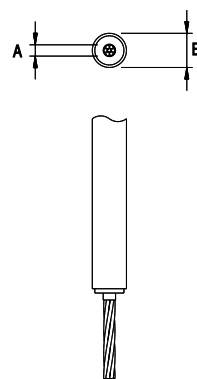
### 5 Insulated High Voltage Cable

To discharge strike electric stream. Use at places where appropriate insulation distance from protected elements can not be kept or close to communication strings. Cable construction guarantee insulation distance of 75cm. Can be directly lead on electric devices. Resistant to weather conditions. Copper wire.

Projects support on: [export@elkobis.com.pl](mailto:export@elkobis.com.pl)

Detailed technical features: [www.elkobis.com](http://www.elkobis.com)

CAT. NUM.	TYPE	A	B
30000199	300.1	35 mm <sup>2</sup>	23 mm



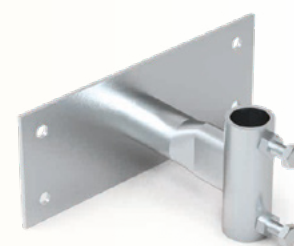
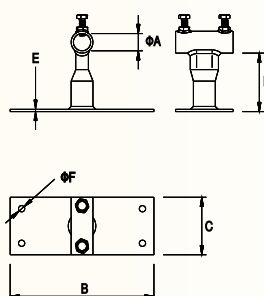
Product sizes can be changed

### 6 Interception Air Rod Holder

For wall and construction mounting of mast and spires. Use minimum 2 holders for one mast. Recommended distance between holders is 0,8m. NOTICE: We supply non typical holders, adjusted to roof construction. For size and price quotation mail contact: [export@elkobis.com.pl](mailto:export@elkobis.com.pl)

CAT. NUM.	TYPE	A	B	C	D	E	F	Bolt
96000101	60.1	31	250	100	100	4	11	2 × M10 × 30
96000201	60.2	42	250	200	100	4	11	2 × M10 × 30

OC 01 OG 02 LA 16 NI 05



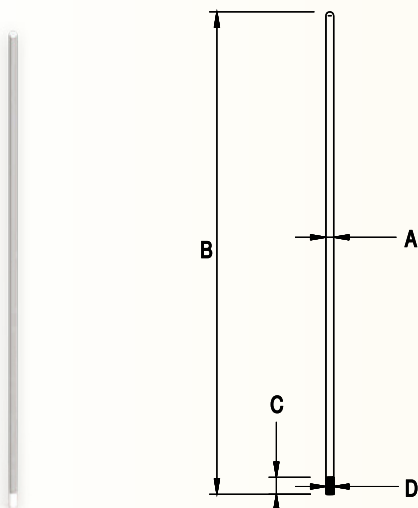


## Photovoltaic farm protection

The potential of the Sun’s energy undoubtedly inspires the greatest minds of the world. Continuous development and discoveries have made photovoltaic panel technology very effective and the price relatively low. This encourages investors to build large-surface photovoltaic farms.

Despite the low construction of these panels it should be remembered that the risk of discharge into the device or the surge occurrence is large, and the costs associated with the lightning protection system are only a fraction of the cost of the entire investment. Insulation bar system, simple to use, will allow to obtain effective lightning protection compatible with lightning protection standards and requirements set by insurers.

### Aluminium Interception Air Rod



For Lightning Protection of roof elements and devices (skylights, air conditioners, air handling units, air handling channels). Choose correct mast holders depending on assembly place. Mast holder 96000101 for wall mounting, wire clamp 94200201 and connector 94200401.

CAT. NUM.	TYPE	A	B	C	D
94301009	43.010	16	1000	35	M16
94301509	43.015	16	1500	35	M16
94302009	43.020	16	2000	35	M16
94302509	43.025	16	2500	35	M16
94303009	43.030	16	3000	35	M16
94303509	43.035	16	3500	35	M16
94304009	43.040	16	4000	35	M16

AL



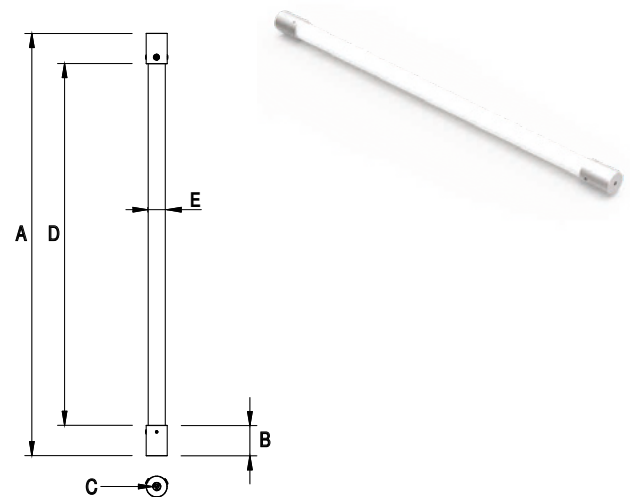


## Separation Bar

To get insulation distance from protected device. Bar can be fixed to device cover, blinds, masts, pipes or steel chimneys using dedicated holder or clamp. Guarantee electric insulation.

CAT. NUM.	TYPE	A	B	C	D	E
97900729	79. 075	750	51	M8	638	32
97900029	79. 100	1000	51	M8	888	32
97901529	79. 150	1500	51	M8	1388	32
97920029	79. 200	2000	51	M8	1888	32

PCV



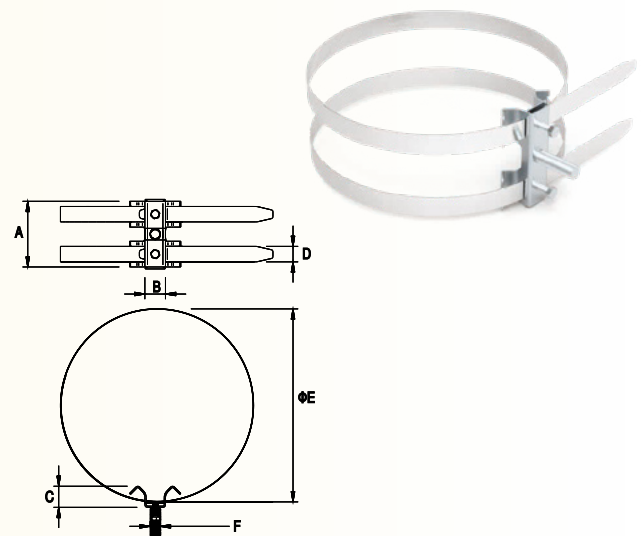
M16 threaded Separation Bars are available on request

## Double Universal Piping Clamp

For insulated bar, interception rod or high voltage cable mounting to pipe constructions. Flexible stainless tape conductor adjust to different shapes, allowing assemble of lightning protection at different shape constructions. Clamp should be directly fastened with insulation bar e.g 97900729 or high voltage cable e.g 30400101. or interception air rod 96000701

CAT. NUM.	TYPE	A	B	C	D	E	F	Bolt
96701105	67.1/M16	120	30	30	24 x 0,25	150-300	M16 x 50	2 x M8 x 20
96700105	67.1/M8	120	30	30	24 x 0,25	150-300	M8 x 25	2 x M8 x 20
96701205	67.2/M16	120	30	30	24 x 0,25	≤150	M16 x 50	2 x M8 x 20
96700205	67.2/M8	120	30	30	24 x 0,25	≤150	M8 x 25	2 x M8 x 20
96701305	67.3/M16	120	30	30	24 x 0,25	300-500	M16 x 50	2 x M8 x 20
96700305	67.3/M8	120	30	30	24 x 0,25	300-500	M8 x 25	2 x M8 x 20

NI

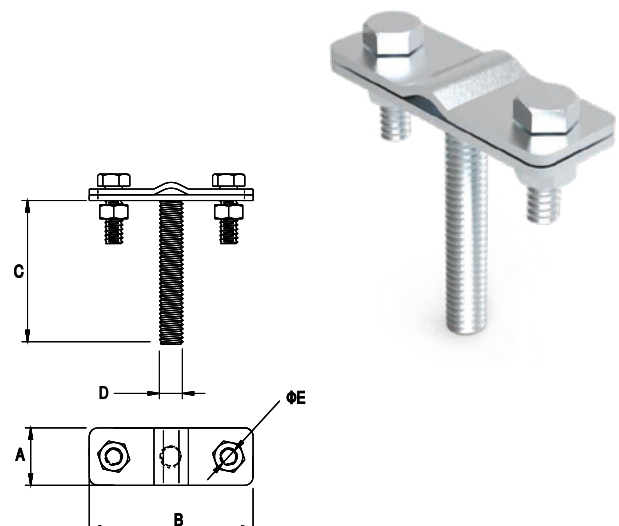


## Wire Conductor Holder

For insulated bars wire conductors leading. Insulated bars should be firstly mounted to steel construction, device cover or interception air rods.

CAT. NUM.	TYPE	A	B	C	D	E	Bolt
98400201	84.2	20	57	M8 x 45	M8	7	2 x M6 x 16
98401201	84.2.1	20	57	M8 x 45	M8	7	2 x M6 x 30

OC





# Overvoltage protection

Proper design and construction of the external lightning protection system of photovoltaic panels, with maintaining a safe insulation clearance (s), protect photovoltaic systems against direct atmospheric discharge and the effects of lightning current flowing through these devices. This allows to avoid the most dangerous effects of lightning discharges, that is the damage of photovoltaic panels and penetration of the whole lightning current into the internal electrical installation of the facility.

However, it should be remembered that the effects of discharges causing damaging or destroying electrical devices can be felt within a radius of up to 2 km from the place of lightning discharge due to the so-called lightning electromagnetic pulses that can cause voltage increase in the electrical installation of the construction facility, whose level may exceed the highest allowed

operating voltage. The effect of this voltage increase is professionally determined as a "surge".

Photovoltaic panels produce direct current and a device called an inverter transforms it into alternating current with network parameters. The inverter is, however, a device with complicated electronics, and therefore sensitive to all effects of lightning electromagnetic pulses.

Taking these two facts into consideration, external lightning protection of photovoltaic panels should also be completed by surge arresters dedicated to them and in compliance with the zone protection concept included in the PN-EN 62305-4 standard.

Coordinated external and internal (surge) lightning protection allows to fully protect photovoltaic panels and internal installation against any effects of lightning discharges.







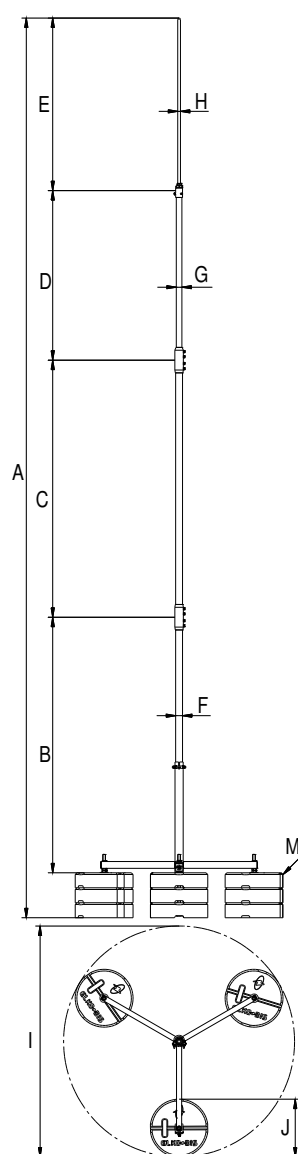
## Additional products

### Tripod High Voltage Interception Mast

For Lightning Protection of steel roof elements and devices (skylights, air conditioners, air handling units, air handling channels). Choose correct mast holders depending on assembly place e.g mast holder 96000201 for wall mounting.

To be use at places with non possibility of keeping isolation distance from protected equipment. Made of stainless steel, insulation Bar with 1 meter aluminum spire.

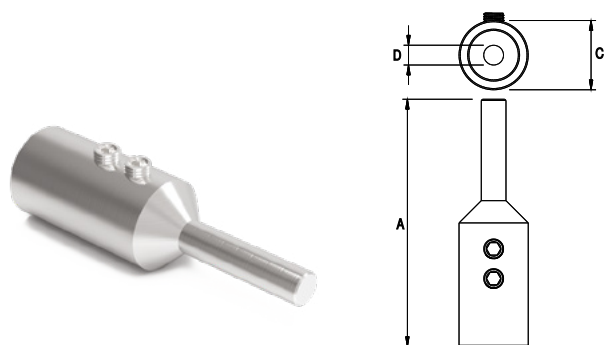
NOTICE: High Voltage Cable ordered separately. Tripod concrete base gives appropriate wind resistance. Free standing mast with total weight up to 142kg. It is recommended to use pads under concrete base. Option 94308222 for tar board roofs and option 94308221 for membrane roofs.



CAT. NUM.	TYPE	Height	Wind resistance	A	B	C	D	E	F	G	H	I	J	M
65747009	65.7 4p cz WVM	7	133 km/h	7340	3000	2000	1500	500	40	32	16	ø1350	ø340	12x16 kg
65737009	65.7 3p cz WVM		116 km/h	7255	3000	2000	1500	500	40	32	16	ø1350	ø340	9x16 kg
65727009	65.7 2p cz WVM		96 km/h	7170	3000	2000	1500	500	40	32	16	ø1350	ø340	6x16 kg
65746009	65.6 4p cz WVM	6	157 km/h	6340	2000	2000	1500	500	40	32	16	ø1350	ø340	12x16 kg
65736009	65.6 3p cz WVM		137 km/h	6255	2000	2000	1500	500	40	32	16	ø1350	ø340	9x16 kg
65726009	65.6 2p cz WVM		113 km/h	6170	2000	2000	1500	500	40	32	16	ø1350	ø340	6x16 kg
65745009	65.5 4p cz WVM	5	191 km/h	5340	3000	----	1500	500	40	32	16	ø1350	ø340	12x16 kg
65735009	65.5 3p cz WVM		166 km/h	5255	3000	----	1500	500	40	32	16	ø1350	ø340	9x16 kg
65725009	65.5 2p cz WVM		138 km/h	5170	3000	----	1500	500	40	32	16	ø1350	ø340	6x16 kg
65724009	65.4 2p cz WVM	4	175 km/h	4170	2000	----	1500	500	40	32	16	ø1350	ø340	6x16 kg
65714009	65.4 1p cz WVM		128 km/h	4085	2000	----	1500	500	40	32	16	ø1350	ø340	3x16 kg
65713009	65.3 1p cz WVM	3	175 km/h	3085	1000	----	1500	500	40	32	16	ø1350	ø340	3x16 kg



## High Voltage Cable End Tip



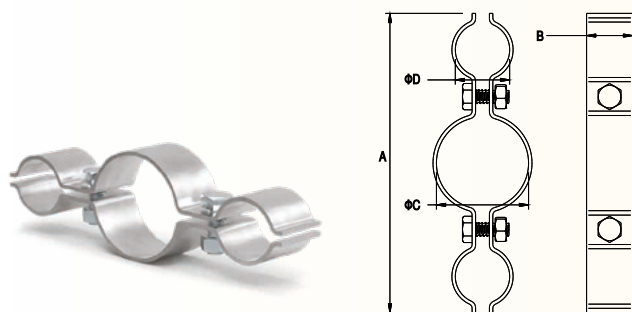
Product sizes can be changed.

For High Voltage Cable connections with horizontal conductor or directly with earthing electrode. Brass tip allows connection to copper or steel construction, being resistance to weather conditions. In a set with screw protection glue and heat shrink tubing. NOTE: End Tip assembly according to instruction.

CAT. NUM.	TYPE	A	C	D	Socket screws
30100105	301.1	100	28	10	2 × M8 × 12

NI

## High Voltage Interception Air Rod Holder



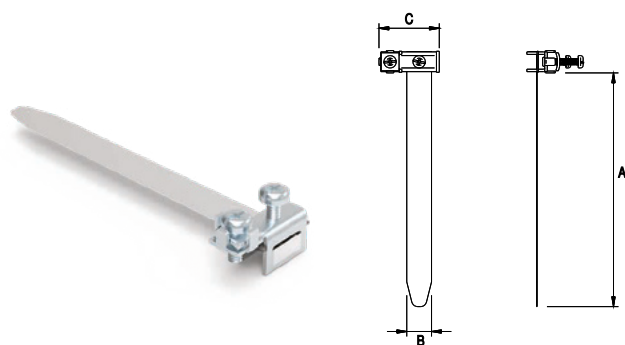
Wymiary produktu mogą ulec zmianie.

For leading 2 high voltage cables on the outer side of Interception Rod e.g 96575005. Distance between holders should not exceed 1 meter. Stainless steel holder.

CAT. NUM.	TYPE	A	B	C	D	Bolt
30900105	-	130	20	40	23,6	2 × M6 × 16

NI 05

## Earthing Tensioning Strap

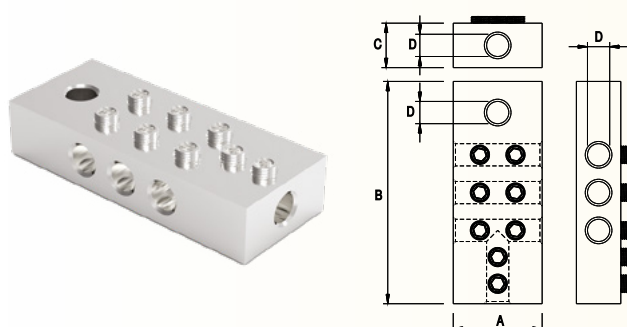


For equipotential connections at pipe constructions and installations. Pipe diameter scale in table form. Clamp sectional dimensions for conductor connection from 2,5 up to 16mm. Strap 96440101 also used for earthing semiconductive external coating of high voltage cable 30000199.

CAT. NUM.	TYPE	A	B	C	Pipe diameter
96440101	-	125	14	32	< 36
96440201	-	190	20	48	< 54
96440301	-	410	20	48	< 124
96440401	-	585	20	48	< 180

0C 01

## High Voltage Cables Connector



For High Voltage Cables connections. Connector arrangement allows 3-4 cable connection at the same time together with air termination installation. Consider connection point as non isolated installation, keeping demanded isolation distance.

CAT. NUM.	TYPE	A	B	C	D	Socket screws
31300105	313.1	40	100	20	10	8 × M8 × 12

NI 05 MS 10



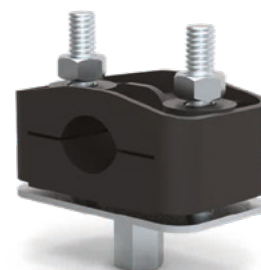
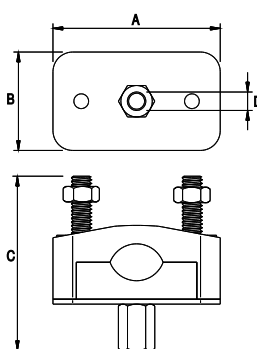


## High Voltage Cable Holder with Connector

For High Voltage Cable mounting. Used with other ELKO-BIS products, assembly on different type constructions e.g 31100110, 97701105, 96701105. Holder resistance to weather conditions and UV radiation.

CAT. NUM.	TYPE	A	B	C	D
30400101	304. 1	70	40	70	M8
30400201	304. 2	70	40	94	M16

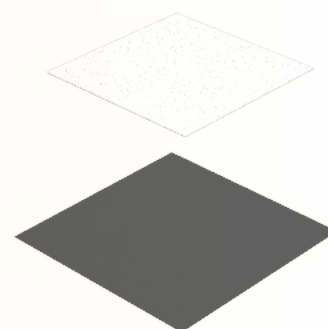
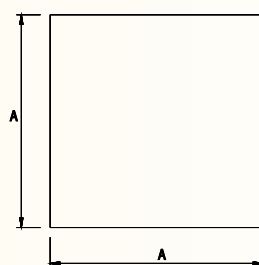
OC



## Concrete Base Pad

For mechanical damage protection of roof surface. To use under concrete base of mast. Depending on roof covering type use appropriate pad: tar board or membrane.

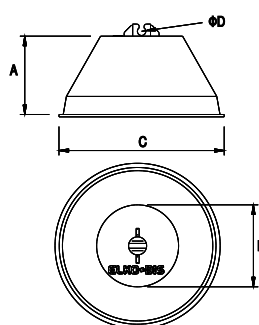
CAT. NUM.	TYPE	Rodzaj	A
94308222	43.82/P	do papy	500
94308221	43.82/M	do membrany	500



## PVC Covered Concrete Wire Holder

For fixing wire on the flash roofs. Can be glued to roof surface using glueing composition 99401099 (only option with concrete bottom) Glue assembly details, see: [www.elkobis.com](http://www.elkobis.com)

CAT. NUM.	TYPE	Description	A	B	C	D	Weight
93000111	30.1	concrete bottom	75	70	130	6-8	~1,1 kg
93020111	30.1D PL	plastic bottom	75	70	138	6-8	~1,1 kg
93010111	-	concrete bottom	75	70	130	8-10	~1,1 kg
93030111	-	plastic bottom	75	70	138	8-10	~1,1 kg

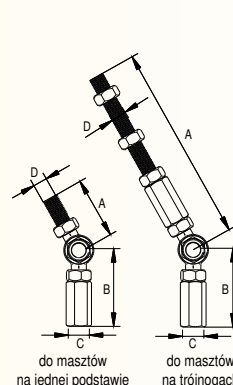


## Mast Regulating Set

For vertical-lining of masts including roof slope. It is recommended to use regulation sets above 5% slope. Set 96530001 dedicated to vertical-lining of tripod masts up to 15% roof slope.

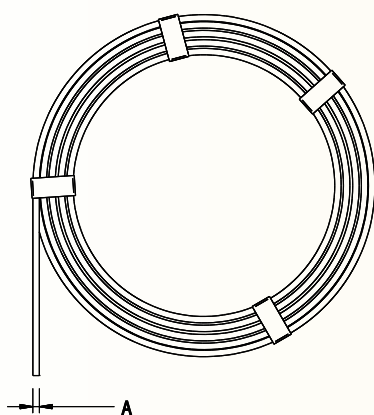
CAT. NUM.	TYPE	A	B	C	D	Notes
66598005	-	208	83	M16	M16	three-element for tripod masts
66599005	-	175	83	M16	16	single-element for one base masts

NI 05





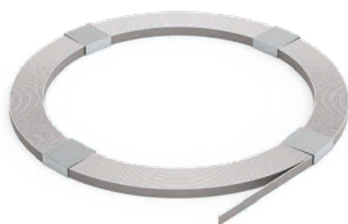
## Wire Conductor



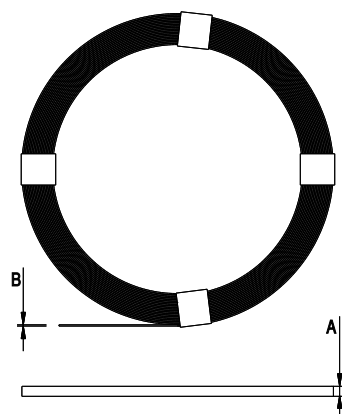
For earth-termination systems. Coating thickness comply with PN-EN 62561-2:2012 norm (zinc plated minimum 350g/m<sup>2</sup>, copper bonded minimum 70 µm) On offer 50 kg rollers (steel wire) 20 kg (aluminum wire). Confectioned sale also available.

CAT. NUM.	MATERIAL	TYPE	A	Weight 1 m.b. (kg)
80000602	Zinc plated	DR6	6	0,220
80000802	Zinc plated	DR8	8	0,395
80001002	Zinc plated	DR10	10	0,620
80000603	Copper	DR6	6	0,252
80000803	Copper	DR8	8	0,447
80001003	Copper	DR10	10	0,699
80000809	Aluminum	DR8	8	0,136
80010809	Aluminum	DR8 10kg	8	0,136
80020809	Aluminum	DR8 20kg	8	0,136
80001009	Aluminum	DR10	10	0,212
80000804	Copper bonded	DR8	8	0,410
80000805	Stainless GAT V4A	DR8	8	0,391
80001805	Stainless GAT V2A	DR8	8	0,391

## Tape Conductor



Before order check availability and leadtime.



Use for foundation earthing, lattice mats or ring earthing conductors and down conductors, equipotential installations. Zinc coating comply with norm. On offer 25 kg or 50 kg roller. Confectioned sale also available.

CAT. NUM.	MATERIAL	TYPE	A	B	Weight 1 m.b. (kg)
82503002	Zinc plated	25 × 3	25	3	0,589
82504002	Zinc plated	25 × 4	25	4	0,785
83003502	Zinc plated	30 × 3,5	30	3,2	0,823
83004002	Zinc plated	30 × 4	30	4	0,942
84004002	Zinc plated	40 × 4	40	4	1,256
85000402	Zinc plated	50 × 4	50	4	1,57
82503003	Copper	25 × 3	25	3	0,668
82504003	Copper	25 × 4	25	4	0,89
83004003	Copper	30 × 4	30	4	1,068
84004003	Copper	40 × 4	40	4	1,424
82504004	Copper bonded	25 × 4	25	4	0,820
83004004	Copper bonded	30 × 4	30	4	0,980
84004004	Copper bonded	40 × 4	40	4	1,285
83003505	Stainless Gat V4A	30 × 3,5	30	3,5	0,833
83013505	Stainless Gat V2A	30 × 3,5	30	3,5	0,833





## Meet the leader of the Polish lightning protection system market!

Since the beginning of our existence, that is since 1998, we have focused on quality, the highest production and service standards. We have built a team of excellent specialists working with full commitment and understanding the needs and expectations of the customer.

Owing to this, today the ELKO-BIS lightning protection equipment is known in the country and abroad, and our systems protect many prestigious construction facilities and thousands of residential houses.



## THIS IS AN OFFER!

The comprehensive ELKO-BIS offer includes lightning protection equipment and accessories for all buildings and facilities. We fulfil orders immediately and our products are covered by even a 5-year warranty. We specialise in

providing unusual solutions, we provide design services and select elements of the lightning protection system for a specific project. We also offer technical consulting and trainings.

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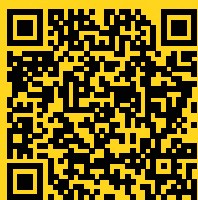
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