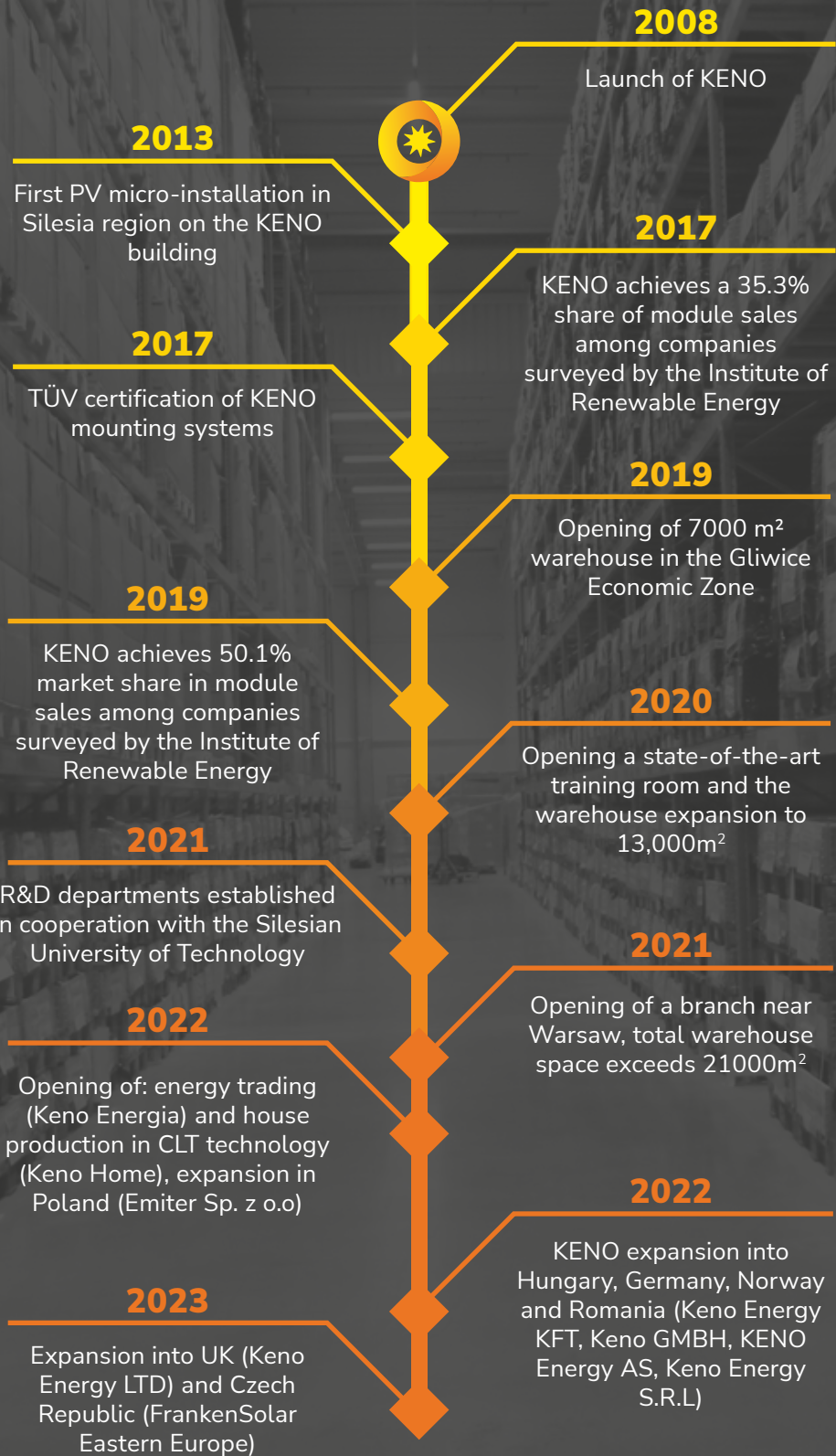




ELECTRICAL COMBINER BOXES

FOR PV INSTALLATIONS



CONFIDENCE BUILT ON THE COMMITMENT

KENO specialises in providing comprehensive, reliable solutions for professionals. Years of operation in the Renewable Energy industry have given us the experience to build a strong Group and gain a high position in the industry. **We have branches in 6 European countries** – Germany, United Kingdom, Norway, Poland, Romania and Hungary.

The newly opened branches were established as a result of the company's rapid growth and search for investment. Diversification into foreign markets is first and foremost a **pillar of financial stability for the KENO Group's business partners**. Thanks to this, we are able to even better forecast demand on the European market, thus ensuring the **best possible terms of cooperation and the highest possible availability of goods**, securing adequate stock levels.

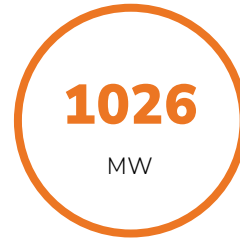
Our modernized in-house production line allows us to produce over 1,000 combiner box units per day, and our modern 48000m² logistics center allows us to maintain **fluidity of the supply chain**.

We influence the development of the RES market in Europe. We cooperate with a number of industry associations, and since 2021 we have been conducting product research in cooperation with Silesian University of Technology.

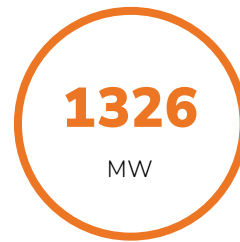
Our position, experience and solutions will enable your company to grow in the direction you want.



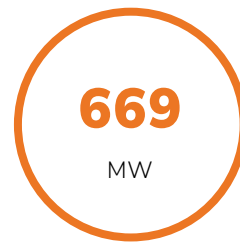
TURNOVER FOR 2022



PV MODULES DELIVERED in 2022



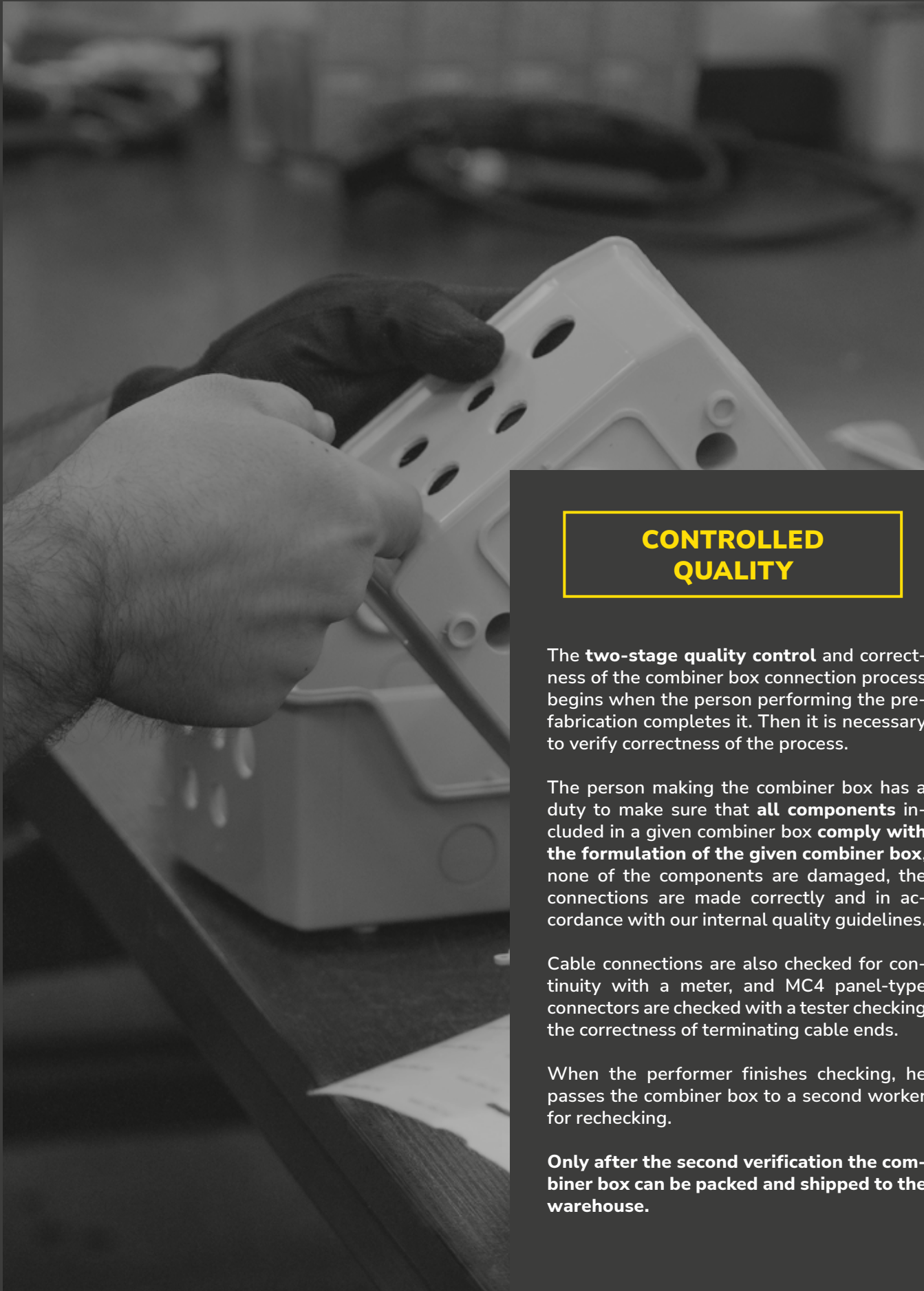
INVERTERS DELIVERED in 2022



MOUNTING SYSTEMS DELIVERED
IN 2022



WAREHOUSE SPACE



CONTROLLED QUALITY

The **two-stage quality control** and correctness of the combiner box connection process begins when the person performing the pre-fabrication completes it. Then it is necessary to verify correctness of the process.

The person making the combiner box has a duty to make sure that **all components** included in a given combiner box **comply with the formulation of the given combiner box**, none of the components are damaged, the connections are made correctly and in accordance with our internal quality guidelines.

Cable connections are also checked for continuity with a meter, and MC4 panel-type connectors are checked with a tester checking the correctness of terminating cable ends.

When the performer finishes checking, he passes the combiner box to a second worker for rechecking.

Only after the second verification the combiner box can be packed and shipped to the warehouse.

OWN PRODUCTION

We offer ready-made models of standard combiner box as well as those made to the customer's specifications, giving the possibility to configure components and protections according to individual design.

Our products are distinguished by:

- ➔ **Polish production** thanks to which we ensure constant availability and possibility of prefabrication of combiner box **according to customer specifications** (base of more than 1000 manufactured models)
- ➔ Up to **5 years** product warranty on selected models of combiner box
- ➔ Production **according to the standards** IEC 61439-1, 61439-2
- ➔ UV resistance **confirmed by relevant certifications**
- ➔ Protection Class **IP65** for STANDARD series and **IP66** for SECURE series
- ➔ **Technical service** and a dedicated research and development department based in Poland
- ➔ Production capacity of 1,000 units per day, annually up to **240,000 pieces**.
- ➔ **Shorter lead time** thanks to automated production line
- ➔ **Two-stage quality control** of each combiner box
- ➔ Unique nameplate with a QR code for up-to-date documentation of each combiner box
- ➔ KENO B2B purchasing platform with advanced configurators for both automatic and manual selection of combiner boxes

The full range of combiner boxes, along with their configuration options, is available on our B2B platform.

WWW.B2B.KENO-ENERGY.COM



CONVENIENCE OF SELECTION

Do you need quick selection of the best solutions or perhaps ordering combiner box for the specific conditions of your project? With two combiner box configurators **on our B2B platform, you choose what you need.**

Automatic selection in a few clicks will match for the selected inverter the ready-made combiner box suggested by our experts.

If you need specific solutions for your project, ordering the right combiner box will enable the manual selection configurator.

ONLINE MATERIALS

To make things easier for our business partners, we have made our catalogues available in all languages in a digital format. Simply scan the QR code to access the download.



COMPLIANCE WITH STANDARDS

From the point of view of safety, one of the most important elements in the combiner box, in addition to properly selected apparatuses, is properly made connections, which mainly translates into the correctness of prefabrication of the entire combiner box.

Taking care of the safety and security of the combiner boxes, they are manufactured in accordance with standards and comply with the provisions of European Union directives.

ELECTRICAL COMBINER BOXES HAVE BEEN MADE IN ACCORDANCE WITH THE STANDARDS DESCRIBED BY THE FOLLOWING STANDARDS:

IEC 61439-1 Low-voltage combiner box and controlgear, Part 1: General provisions

IEC 61439-2 Low-voltage combiner box and controlgear, Part 2: Combiner box and control panels for power distribution

LVD Low Voltage Directive 2014/35/UE On the harmonization of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits. It is applicable to equipment operating in the voltage range of 50 – 1000V AC and 75 – 1500V DC.

Directive 2014/30/UE – EMC Applies to each finished device or combination of finished devices, Taking care to limit and maintain the levels of electromagnetic emissions of the devices so that they allow trouble-free cooperation.

RoHS Directive 2011/65/UE Defines and imposes restrictions on the use of hazardous substances in electrical and electronic equipment (EEE). The directive’s provisions aim to improve the protection of human health and the environment at all stages of a product’s life, including for the environmentally sound recovery and disposal of waste EEE.

The combiner boxes have a declaration of conformity and are CE marked.

IP SYSTEM

I P 6 6

DEGREE OF PROTECTION AGAINST SOLIDS

DEGREE OF PROTECTION AGAINST WATER

CERTIFIED IP PROTECTION

IP is a system developed by the International Electrotechnical Commission (IEC) to define the levels of foreign body tightness of electrical equipment enclosures. The IP designation indicates how water – and dust-tight an electrical device is.

IP 65 – completely dust-tight, protection against low-pressure water jets from all sides – all KENO combiner boxes meet IP 65

IP 66 – completely dust-tight, protection against high-pressure water jets from all sides – due to its dimensions, the combiner box is equipped with a different casing, intended use – larger installations from 40kW

The protection measurement system is defined according to the standard EN 60529 (British BS EN 60529:1992, European IEC 60509:1989), describing how foreign bodies can enter electrical equipment.



TWO-STAGE QUALITY CONTROL AT THE PRODUCTION STAGE



NAMEPLATE WITH QR CODE FOR DOCUMENTATION



EXCLUSIVELY BRANDED COMPONENTS



SPECIAL MARKINGS OF WIRES OF ATSE COMBINER BOXES



ELECTRIC KENO COMBINER BOXES

- On offer **DC, AC combiner boxes** as well as DCAC
- Compliance with IEC 61439-1, 61439-2 standards, certified UV resistance
- Protection classes IP65 to IP66, certified for 1500V DC and 400V AC
- Using only original MC4 (Stäubli) connectors **reduces the risk of fire** due to overheating of the connectors or the occurrence of arcing
- **Each connector is tested** for the correctness of manufacture
- Unique, ultra-flexible tinned cable, tested to 6000V, with an expected **service life of at least 25 years**
- **5 year warranty** on the entire combiner box with Phoenix or Noark components
- **Fewer cables** thanks to mounting of components on a special Noark rail
- **Error-proof and simpler installation** thanks to installation of AC side components on so-called comb strips
- Door with option to change direction of opening
- Each combiner box has a nameplate with the most important information and a QR code for full, up-to-date documentation
- Each combiner box is made **under close supervision** with a two-step verification process and has an individual serial number



QUICK AND EASY SELECTION



DOOR
WITH THE OPTION OF
CHANGING THE
OPENING DIRECTION



WARRANTY UP TO 5
YEARS



A WIDE RANGE OF SOLUTIONS
(MORE THAN 1,000 MADE
MODELS)

PRACTICAL SOLUTION FOR INSTALLER AND WHOLESALER

- + **Time saving** – use of ready-made distributor reduces installation time
- + Prefabricated combiner box **eliminate the problem of incorrect selection** and execution of protection on the investment
- + The high quality of security at each investment ensures **security of the installer and the investor** in case of random events related to the PV installation
- + KENO's declaration of conformity certifies **the highest quality of workmanship** and **compliance** of use with the requirements and standards required by the country in question
- + Stickers included for marking the installation
- + Components from leading manufacturers such as **Phoenix Contact, Noark, Stäubli, Dehn**
- + Expansion of the product range to include an integral part of the installation – **the comprehensiveness of the offer**
- + Possibility to label the combiner boxes with your own logo
- + **Easy selection and fast ordering**, thanks to advanced configurators on the KENO B2B platform

STANDARD SERIES



STANDARD connection combiner boxes are successfully used in **small and medium household and industrial installations**. A wide range of applications of the combiner box is ensured by, among others **protection class IP65**, thanks to which the combiner box can be installed not only in closed rooms, but also in open spaces.

- Standard, proven housing
- The most popular type of combiner box in the KENO portfolio
- Option to install a key lock
- Transparent door



Type	4T	8T	12T	24T	36T	48T
Dimensions (without connectors) (WxHxD)	201x128x120	201x202x120	259x319x144	384x319x144	508x319x144	664x319x144
Number of fields in a row	4	8	12	12	12	12
Number of rows	1	1	1	2	3	4
Expandability	No					
Key lock	Optional					
Mounting method	Surface mounting					
Degree of protection	IP 65					
Protection class	II					
Rated insulation voltage Ui	400 V AC, 1500 V DC					
Design in accordance with	EN 60670, EN 62208					
UV resistance	Yes					
Impact resistance	IK 08					
Glow rod test	650°C					
Operating temperature	-25°C – +60°C					
Recyclable plastics	Halogen-free					

SUGGESTED SOLUTIONS

Installations with lightning protection			Installations without lightning protection		
DC	DCAC	AC	DC	DCAC	AC
3F inverter			3F inverter		
Installation up to 5kW (inverter power)					
Single-string installation		SH-47 AC, SH-446 AC SH-163 AC	Single-string installation		SH-19 AC, SH-296 AC, SH-194 AC
SH-5 DC	SH-28 DCAC, SH-78 DCAC, SH-632 DCAC		SH-1 DC	SH-27 DCAC, SH-75 DCAC, SH-714 DCAC	
Two-string installation			Two-string installation		
SH-6 DC	SH-53 DCAC, SH-235 DCAC, SH-386 DCAC		SH-2 DC	SH-30 DCAC, SH-98 DCAC, SH-183 DCAC	

Installations with lightning protection				Installations without lightning protection			
Installation up to 8kW (inverter power)							
Single-string installation		SH-232 AC, SH-269 AC, SH-195 AC	Single-string installation		SH-55 AC, SH-268 AC		
SH-5 DC	SH-52 DCAC, SH-90 DCAC, SH-719 DCAC		SH-1 DC	SH-35 DCAC, SH-40 DCAC, SH-297 DCAC			
Two-string installation			Two-string installation				
SH-6 DC	SH-18 DCAC, SH-92 DCAC, SH-283 DCAC		SH-2 DC	SH-45 DCAC, SH-117 DCAC, SH-528 DCAC, SH-175 DCAC			
Installation up to 10kW (inverter power)							
Single-string installation		SH-353 AC, SH-307 AC	Single-string installation		SH-86 AC, SH-285 AC, SH-131 AC		
SH-5 DC	SH-204 DCAC, SH-154 DCAC		SH-1 DC	SH-205 DCAC, SH-41 DCAC, SH-899 DCAC			
Two-string installation			Two-string installation				
SH-6 DC	SH-116 DCAC, SH-214 DCAC, SH-618 DCAC		SH-2 DC	SH-102 DCAC, SH-176 DCAC, SH-588 DCAC			
Installation up to 12kW (inverter power)							
Single-string installation		SH-171 AC, SH-308 AC	Single-string installation		SH-99 AC, SH-276 AC		
SH-5 DC			SH-1 DC				
Two-string installation			Two-string installation				
SH-6 DC			SH-2 DC				
Installation up to 15kW (inverter power)							
Single-string installation		SH-357 AC, SH-49 AC	Single-string installation		SH-111 AC, SH-299 AC		
SH-5 DC			SH-1 DC				
Two-string installation			Two-string installation				
SH-6 DC			SH-2 DC				
Installation with four strings			Installation with four strings				
SH-426 DC			SH-103 DC				

LARGER INSTALLATIONS (DC ONLY)

	Installations with lightning protection	Installations without lightning protection
Three-string installation	SH-181 DC	SH-81 DC
Four-string installation	SH-426 DC	SH-103 DC
Five-string installation	SH-317 DC	SH-206 DC
Six-string installation	SH-654 DC	SH-450 DC
Seven-string installation	SH-849 DC	SH-848 DC
Installations with parallel connections		
Installation 2 strings, 1 MPPT	SH-810 DC	SH-774 DC
Installation 4 strings, 2 MPPT	SH-438 DC	SH-239 DC
Installation 6 strings, 3 MPPT	SH-586 DC	SH-585 DC
Installation 8 strings, 4 MPPT	SH-630 DC	SH-217 DC

SH-1 DC



Connection combiner box surge arrester DC 1000V type 2, 1x PV string, 1x MPPT

Number of PV strings	1
Number of surge arresters	1
Surge arrester	Phoenix T2
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes
Standard warranty	5 years

SH-2 DC



Connection combiner box surge arrester DC 1000V type 2, 2x PV string, 2x MPPT

Number of PV strings	2
Number of surge arresters	2
Surge arrester	Phoenix T2
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes
Standard warranty	5 years

SH-81 DC



Connection combiner box surge arrester DC 1000V type 2, 3x PV string, 3x MPPT

Number of PV strings	3
Number of surge arresters	3
Surge arrester	Phoenix T2
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes
Standard warranty	5 years

SH-5 DC



Connection combiner box surge arrester DC 1000V type 1+2, 1x PV string, 1x MPPT

Number of PV strings	1
Number of surge arresters	1
Surge arrester	Phoenix T1/T2
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes
Standard warranty	5 years

SH-6 DC**Connection combiner box surge arrester DC 1000V type 1+2, 2x PV string, 2x MPPT**

Number of PV strings	2
Number of surge arresters	2
Surge arrester	Phoenix T1/T2
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes
Standard warranty	5 years

SH-181 DC**Connection combiner box surge arrester DC 1000V type 1+2, 3x PV string, 3x MPPT**

Number of PV strings	3
Number of surge arresters	3
Surge arrester	Phoenix T1/T2
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes
Standard warranty	5 years

AC 5 KW**SH-47 AC****Connection combiner box with AC surge arrester type 1+2, 10A 3-F**

Surge arrester	Noark T1/T2
Overcurrent circuit breaker 1	Noark B 10A 3F
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes
Standard warranty	5 years

SH-446 AC**Connection combiner box with AC surge arrester type 1+2, 10A 3-F, RCD type A 40A 300mA**

Surge arrester	Noark T1/T2
Overcurrent circuit breaker 1	Noark B 10A 3F
Residual current circuit breaker	1 x 300mA type A
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes
Standard warranty	5 years

SH-163 AC**Connection combiner box with AC surge arrester type 1+2, 10A 3-F, RCD type A 100mA**

Surge arrester	Noark T1/T2
Overcurrent circuit breaker 1	Noark B 10A 3F
Residual current circuit breaker	1 x 100mA type A
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes
Standard warranty	5 years

SH-19 AC**Connection combiner box with AC surge arrester type 2, 10A 3-F**

Surge arrester	Noark T2
Overcurrent circuit breaker 1	Noark B 10A 3F
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes
Standard warranty	5 years

SH-296 AC**Connection combiner box with AC surge arrester type 2, 10A 3-F, RCD type A 40A 300mA**

Surge arrester	Noark T2
Overcurrent circuit breaker 1	Noark B 10A 3F
Residual current circuit breaker	1 x 300mA type A
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes

SH-194 AC**Connection combiner box with AC surge arrester type 2, 10A 3-F, RCD type A 40A 100mA**

Surge arrester	Noark T2
Overcurrent circuit breaker 1	Noark B 10A 3F
Residual current circuit breaker	1 x 100mA type A
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes
Standard warranty	5 years

AC 8KW

SH-232 AC



Connection combiner box with AC surge arrester type 1+2, 16A 3-F

Surge arrester	Noark T1/T2
Overcurrent circuit breaker 1	Noark B 16A 3F
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes
Standard warranty	5 years

SH-195 AC



Connection combiner box with AC surge arrester type 1+2, 16A 3-F, RCD type 40A 100mA

Surge arrester	Noark T1/T2
Overcurrent circuit breaker 1	Noark B 16A 3F
Residual current circuit breaker	1 x 100mA type A
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes
Standard warranty	5 years

SH-269 AC



Connection combiner box with AC surge arrester type 1+2, 16A 3-F, RCD type A 40A 300mA

Surge arrester	Noark T1/T2
Overcurrent circuit breaker 1	Noark B 16A 3F
Residual current circuit breaker	1 x 300mA type A
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes

SH-55 AC



Connection combiner box with AC surge arrester type 2, 16A 3-F

Surge arrester	Noark T2
Overcurrent circuit breaker 1	Noark B 16A 3F
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes
Standard warranty	5 years

SH-812 AC**Connection combiner box with AC surge arrester type 2, 16A 3-F, RCD type 40A 100mA**

Surge arrester	Noark T2
Overcurrent circuit breaker 1	Noark B 16A 3F
Residual current circuit breaker	1 x 100mA type A
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes
Standard warranty	5 years

SH-268 AC**Connection combiner box with AC surge arrester type 2, 16A 3-F, RCD type A 40A 300mA**

Surge arrester	Noark T2
Overcurrent circuit breaker 1	Noark B 16A 3F
Residual current circuit breaker	1 x 300mA type A
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes

AC 10KW **SH-353 AC****Connection combiner box with AC surge arrester type 1+2, 20A 3-F**

Surge arrester	Noark T1/T2
Overcurrent circuit breaker 1	Noark B 20A 3F
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes
Standard warranty	5 years

SH-307 AC**Connection combiner box with AC surge arrester type 1+2, 20A 3-F, RCD type A 40A 300mA**

Surge arrester	Noark T1/T2
Overcurrent circuit breaker 1	Noark B 20A 3F
Residual current circuit breaker	1 x 300mA type A
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes

SH-86 AC**Connection combiner box with AC surge arrester type 2, 20A 3-F**

Surge arrester	Noark T2
Overcurrent circuit breaker 1	Noark B 20A 3F
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes
Standard warranty	5 years

SH-285 AC**Connection combiner box with AC surge arrester type 2, 20A 3-F, RCD type A 40A 300mA**

Surge arrester	Noark T2
Overcurrent circuit breaker 1	Noark B 20A 3F
Residual current circuit breaker	1 x 300mA type A
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes

AC 12KW**SH-171 AC****Connection combiner box with AC surge arrester type 1+2, 40A 3-F**

Surge arrester	Noark T1/T2
Overcurrent circuit breaker 1	Noark B 40A 3F
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes
Standard warranty	5 years

SH-308 AC**Connection combiner box with AC surge arrester type 1+2, 40A 3-F, RCD type A 40A 300mA**

Surge arrester	Noark T1/T2
Overcurrent circuit breaker 1	Noark B 40A 3F
Residual current circuit breaker	1 x 300mA type A
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes

SH-99 AC**Connection combiner box with AC surge arrester type 2, 40A 3-F**

Surge arrester	Noark T2
Overcurrent circuit breaker 1	Noark B 40A 3F
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes
Standard warranty	5 years

SH-276 AC**Connection combiner box with AC surge arrester type 2, 40A 3-F, RCD type A 40A 300mA**

Surge arrester	Noark T2
Overcurrent circuit breaker 1	Noark B 40A 3F
Residual current circuit breaker	1 x 300mA type A
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes

AC 15KW **SH-49 AC****Connection combiner box with AC surge arrester type 1+2, 32A 3-F**

Surge arrester	Noark T1/T2
Overcurrent circuit breaker 1	Noark B 32A 3F
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes
Standard warranty	5 years

SH-357 AC**Connection combiner box with AC surge arrester type 1+2, 32A 3-F, RCD type A 40A 300mA**

Surge arrester	Noark T1/T2
Overcurrent circuit breaker 1	Noark B 32A 3F
Residual current circuit breaker	1 x 300mA type A
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes
Standard warranty	5 years

SH-111 AC**Connection combiner box with AC surge arrester type 2, 32A 3-F**

Surge arrester	Noark T2
Overcurrent circuit breaker 1	Noark B 32A 3F
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes
Standard warranty	5 years

SH-299 AC**Connection combiner box with AC surge arrester type 2, 32A 3-F, RCD type A 40A 300mA**

Surge arrester	Noark T2
Overcurrent circuit breaker 1	Noark B 32A 3F
Residual current circuit breaker	1 x 300mA type A
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes

DCAC 5KW**SH-78 DCAC****DC+AC connection combiner box with 1000V surge arrester type 1+2, 1 x PV string, 1 x MPPT // Surge arrester AC type 1+2, 10A 3-F**

Number of PV strings	1
Number of surge arresters	1
Surge arrester DC	Phoenix T1/T2
Surge arrester AC	Noark T1/T2
Overcurrent circuit breaker	Noark B 10A 3F
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes
Standard warranty	5 years

SH-632 DCAC

DC+AC connection combiner box with 1000V surge arrester type 1+2, 1 x PV string, 1 x MPPT // surge arrester AC type 1+2, 10A 3-F, RCD type A 100mA 40A

Number of PV strings	1
Number of surge arresters	1
Surge arrester DC	Phoenix T1/T2
Surge arrester AC	Noark T1/T2
Overcurrent circuit breaker	Noark B 10A 3F
Residual current circuit breaker	1 x 100mA type A
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes

SH-1101 DCAC

DC+AC connection combiner box with 1000V surge arrester type 1+2, 1 x PV string, 1 x MPPT // surge arrester AC type 1+2, 10A 3-F, RCD type A 40A 300mA

Number of PV strings	1
Number of surge arresters	1
Surge arrester DC	Phoenix T1/T2
Surge arrester AC	Noark T1/T2
Overcurrent circuit breaker	Noark B 10A 3F
Residual current circuit breaker	1 x 300mA type A
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes
Standard warranty	5 years

SH-75 DCAC

DC+AC connection combiner box with 1000V surge arrester type 2, 1 x PV string, 1 x MPPT // surge arrester AC type 2, 10A 3-F

Number of PV strings	1
Number of surge arresters	1
Surge arrester DC	Phoenix T2
Surge arrester AC	Noark T2
Overcurrent circuit breaker	Noark B 10A 3F
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes
Standard warranty	5 years

SH-279 DCAC

DC+AC connection combiner box with 1000V surge arrester type 2, 1 x PV string, 1 x MPPT // surge arrester AC type 2, 10A 3-F, RCD type A 100mA



Number of PV strings	1
Number of surge arresters	1
Surge arrester DC	Phoenix T2
Surge arrester AC	Noark T2
Overcurrent circuit breaker	Noark B 10A 3F
Residual current circuit breaker	1 x 100mA type A
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes

SH-714 DCAC

DC+AC connection combiner box with 1000V surge arrester type 2, 1 x PV string, 1 x MPPT // surge arrester AC type 2, 10A 3-F, RCD type A300mA



Number of PV strings	1
Number of surge arresters	1
Surge arrester DC	Phoenix T2
Surge arrester AC	Noark T2
Overcurrent circuit breaker	Noark B 10A 3F
Residual current circuit breaker	1 x 300mA type A
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes

DCAC 8KW**SH-90 DCAC**

DC+AC connection combiner box with 1000V surge arrester type 1+2, 1x PV string, 1x MPPT // surge arrester AC type 1+2, 16A 3-F



Number of PV strings	1
Number of surge arresters	1
Surge arrester DC	Phoenix T1/T2
Surge arrester AC	Noark T1/T2
Overcurrent circuit breaker	Noark B 16A 3F
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes
Standard warranty	5

SH-1016 DCAC

DC+AC connection combiner box with 1000V surge arrester type 1+2, 1 x PV string, 1 x MPPT // surge arrester AC type 1+2, 16A 3-F, RCD type A 100mA 40A

Number of PV strings	1
Number of surge arresters	1
Surge arrester DC	Phoenix T1/T2
Surge arrester AC	Noark T1/T2
Overcurrent circuit breaker	Noark B 16A 3F
Residual current circuit breaker	1 x 100mA type A
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes

SH-719 DCAC

DC+AC connection combiner box with 1000V surge arrester type 1+2, 1 x PV string, 1 x MPPT // surge arrester AC type 1+2, 16A 3-F, RCD type A 40A 300mA 40A

Number of PV strings	1
Number of surge arresters	1
Surge arrester DC	Phoenix T1/T2
Surge arrester AC	Noark T1/T2
Overcurrent circuit breaker	Noark B 16A 3F
Residual current circuit breaker	1 x 300mA type A
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes

SH-40 DCAC

DC+AC connection combiner box with 1000V surge arrester type 2, 1 x PV string, 1 x MPPT // surge arrester AC type 2, 16A 3-F

Number of PV strings	1
Number of surge arresters	1
Surge arrester DC	Phoenix T2
Surge arrester AC	Noark T2
Overcurrent circuit breaker	Noark B 16A 3F
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes
Standard warranty	5 years

SH-297 DCAC

DC+AC connection combiner box with 1000V surge arrester type 2, 1 x PV string, 1 x MPPT // surge arrester AC type 2, 16A 3-F, RCD type A 100mA 40A



Number of PV strings	1
Number of surge arresters	1
Surge arrester DC	Phoenix T2
Surge arrester AC	Noark T2
Overcurrent circuit breaker	Noark B 16A 3F
Residual current circuit breaker	1 x 100mA type A
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes

SH-1100 DCAC

DC+AC connection combiner box with 1000V surge arrester type 2, 1 x PV string, 1 x MPPT // surge arrester AC type 2, 16A 3-F, RCD type A 40A 300mA



Number of PV strings	1
Number of surge arresters	1
Surge arrester DC	Phoenix T2
Surge arrester AC	Noark T2
Overcurrent circuit breaker	Noark B 16A 3F
Residual current circuit breaker	1 x 300mA type A
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes
Standard warranty	5 years

□ DCAC 8KW TWO STRINGS

SH-92 DCAC

DC+AC connection combiner box with 1000V surge arrester type 1+2, 2 x PV string, 2 x MPPT // surge arrester AC type 1+2, 16A 3-F



Number of PV strings	2
Number of surge arresters	2
Surge arrester DC	Phoenix T1/T2
Surge arrester AC	Noark T1/T2
Overcurrent circuit breaker	Noark B 16A 3F
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes
Standard warranty	5 years

SH-283 DCAC

DC+AC connection combiner box with 1000V surge arrester type 1+2, 2 x PV string, 2 x MPPT // surge arrester AC type 1+2, 16A 3-F, RCD type A 100mA 40A

Number of PV strings	2
Number of surge arresters	2
Surge arrester DC	Phoenix T1/T2
Surge arrester AC	Noark T1/T2
Overcurrent circuit breaker	Noark B 16A 3F
Residual current circuit breaker	1 x 100mA type A
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes
Standard warranty	5 years

SH-117 DCAC

DC+AC connection combiner box with 1000V surge arrester type 2, 2 x PV string, 2 x MPPT // surge arrester AC type 2, 16A 3-F

Number of PV strings	2
Number of surge arresters	2
Surge arrester DC	Phoenix T2
Surge arrester AC	Noark T2
Overcurrent circuit breaker	Noark B 16A 3F
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes
Standard warranty	5 years

SH-175 DCAC

DC+AC connection combiner box with 1000V surge arrester type 2, 2 x PV string, 2 x MPPT // surge arrester AC type 2, 16A 3-F, RCD type A 100mA 40A

Number of PV strings	2
Number of surge arresters	2
Surge arrester DC	Phoenix T2
Surge arrester AC	Noark T2
Overcurrent circuit breaker	Noark B 16A 3F
Residual current circuit breaker	1 x 100mA type A
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes

SH-528 DCAC

DC+AC connection combiner box with 1000V surge arrester type 2, 2 x PV string, 2 x MPPT // surge arrester AC type 2, 16A 3-F, RCD type A 300mA 40A



Number of PV strings	2
Number of surge arresters	2
Surge arrester DC	Phoenix T2
Surge arrester AC	Noark T2
Overcurrent circuit breaker	Noark B 16A 3F
Residual current circuit breaker	1 x 300mA type A
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes

□ DCAC 10KW

SH-214 DCAC

DC+AC connection combiner box with 1000V surge arrester type 1+2, 2 x PV string, 2 x MPPT // surge arrester AC type 1+2, 20A 3-F



Number of PV strings	2
Number of surge arresters	2
Surge arrester DC	Phoenix T1/T2
Surge arrester AC	Noark T1/T2
Overcurrent circuit breaker	Noark B 20A 3F
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes
Standard warranty	5 years

SH-618 DCAC

DC+AC connection combiner box with 1000V surge arrester type 1+2, 2 x PV string, 2 x MPPT // surge arrester AC type 1+2, 20A 3-F, RCD type A 40A 300mA



Number of PV strings	2
Number of surge arresters	2
Surge arrester DC	Phoenix T1/T2
Surge arrester AC	Noark T1/T2
Overcurrent circuit breaker	Noark B 20A 3F
Residual current circuit breaker	1 x 300mA type A
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes

SH-102 DCAC

DC+AC connection combiner box with 1000V surge arrester type 2, 2 x PV string, 2 x MPPT // surge arrester AC type 2, 20A 3-F

Number of PV strings	2
Number of surge arresters	2
Surge arrester DC	Phoenix T2
Surge arrester AC	Noark T2
Overcurrent circuit breaker	Noark B 20A 3F
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes
Standard warranty	5 years

SH-176 DCAC

DC+AC connection combiner box with 1000V surge arrester type 2, 2 x PV string, 2 x MPPT // surge arrester AC type 2, 20A 3-F, RCD type A 100mA 40A

Number of PV strings	2
Number of surge arresters	2
Surge arrester DC	Phoenix T2
Surge arrester AC	Noark T2
Overcurrent circuit breaker	Noark B 20A 3F
Residual current circuit breaker	1 x 100mA type A
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes
Standard warranty	5 years

SH-588 DCAC

DC+AC connection combiner box with 1000V surge arrester type 2, 2 x PV string, 2 x MPPT // surge arrester AC type 2, 20A 3-F, RCD type A 300mA 40A

Number of PV strings	2
Number of surge arresters	2
Surge arrester DC	Phoenix T2
Surge arrester AC	Noark T2
Overcurrent circuit breaker	Noark B 20A 3F
Residual current circuit breaker	1 x 300mA type A
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes

□ DCAC 12KW TWO STRINGS

SH-286 DCAC



DC+AC connection combiner box with 1000V surge arrester type 1+2, 2 x PV string, 2 x MPPT / surge arrester AC type 1+2, 40A 3-F

Number of PV strings	2
Number of surge arresters	2
Surge arrester DC	Phoenix T1/T2
Surge arrester AC	Noark T1/T2
Overcurrent circuit breaker	Noark B 40A 3F
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes
Standard warranty	5 years

SH-129 DCAC



DC+AC connection combiner box with 1000V surge arrester type 2, 2 x PV string, 2 x MPPT// surge arrester AC type 2, 40A 3-F

Number of PV strings	2
Number of surge arresters	2
Surge arrester DC	Phoenix T2
Surge arrester AC	Noark T2
Overcurrent circuit breaker	Noark B 40A 3F
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes
Standard warranty	5 years

□ DCAC 15KW TWO STRINGS

SH-260 DCAC



DC+AC connection combiner box with 1000V surge arrester type 1+2, 2 x PV string, 2 x MPPT // surge arrester AC type 1+2, 32A 3-F

Number of PV strings	2
Number of surge arresters	2
Surge arrester DC	Phoenix T1/T2
Surge arrester AC	Noark T1/T2
Overcurrent circuit breaker	Noark B 32A 3F
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes
Standard warranty	5 years

SH-1048 DCAC

DC+AC connection combiner box with 1000V surge arrester type 1+2, 2 x PV string, 2 x MPPT // surge arrester AC type 1+2, 32A 3-F, RCD type A 40A 300mA

Number of PV strings	2
Number of surge arresters	2
Surge arrester DC	Phoenix T2
Surge arrester AC	Noark T2
Overcurrent circuit breaker	Noark B 32A 3F
Residual current circuit breaker	1 x 300mA type A
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes
Standard warranty	5 years

SH-118 DCAC

DC+AC connection combiner box with 1000V surge arrester type 2, 2 x PV string, 2 x MPPT // surge arrester AC type 2, 32A 3-F

Number of PV strings	2
Number of surge arresters	2
Surge arrester DC	Phoenix T1/T2
Surge arrester AC	Noark T1/T2
Overcurrent circuit breaker	Noark 32A 3F
Residual current circuit breaker	1 x 300mA type A
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes
Standard warranty	5 years

1. KENO

2. STANDARDS

3. PRODUCTS

4. ADDITIONAL OFFER

ALLVIEW SERIES



ALLVIEW connection combiner boxes with success can be used in small and medium-sized domestic and industrial installations.

A wide range of applications of the combiner box is ensured by: protection class IP 65, **increased resistance to high and low temperatures, increased resistance to fire.**

The new series of combiner box is characterized not only by a wide range of applications, but also by a modern design.

- Modern, designer housing
- The mounting holes have been located outside the gasket, so the installation does not affect the leakage class
- Certified for 1500V DC voltage and 1000V AC
- Enhanced housing strength class IK08
- Enhanced fire resistance – UL94 fire resistance class 5VA
- At the bottom of the combiner box there is a pressure equalization plug, which significantly prevents the formation of condensate



Type	6T	8T	12T	24T
Dimensions (without connectors) (WxHxD)	187x122x90	201x163x98	240x191x107	344x289x117
Number of fields in a row	6	8	12	12
Number of rows	1	1	1	2
Expandability	No			
Mounting method	Surface mounting			
Degree of protection	IP 65			
Protection class	II			
Rated insulation voltage Ui	1000 V AC, 1500 V DC			
Design in accordance with	EN 62208:2011:2011			
UV resistance	Yes			
Impact resistance	IK 07 / IK 08			
Glow rod test	960°C			
Flammability class	UL 94-5VA / UL 94-V0			
Recyclable plastics	Halogen-free			
Material	Polycarbonate			
Gasket material	Polyurethane			
NEMA standard	NEMA 1, 4, 4X, 12			
Temp °C (continuous operation)	-40 ... 80 °C			
Temp °C (short term)	-40 ... 120 °C			

MODEL EQUIVALENTS

STANDARD	ALLVIEW
SH-1 DC	AV-1 DC
SH-2 DC	AV-2 DC
SH-81 DC	AV-81 DC
SH-103 DC	AV-103 DC
SH-5 DC	AV-5 DC
SH-6 DC	AV-6 DC
SH-181 DC	AV-181 DC
SH-426 DC	AV-426 DC

AV-1 DC



ALLVIEW connection combiner box with DC 1000V surge arrester type 2, 1x PV string, 1x MPPT

Number of PV strings	1
Number of surge arresters	1
Surge arrester	Phoenix T2
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes
Standard warranty	5 years

AV-2 DC



ALLVIEW connection combiner box with DC 1000V surge arrester type 2, 2x PV string, 2x MPPT

Number of PV strings	2
Number of surge arresters	2
Surge arrester	Phoenix T2
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes
Standard warranty	5 years

AV-81 DC



ALLVIEW connection combiner box with DC 1000V surge arrester type 2, 3x PV string, 3x MPPT

Number of PV strings	3
Number of surge arresters	3
Surge arrester	Phoenix T2
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes
Standard warranty	5 years

AV-103 DC



ALLVIEW connection combiner box with DC 1000V surge arrester type 2, 4x PV string, 4x MPPT

Number of PV strings	4
Number of surge arresters	4
Surge arrester	Phoenix T2
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes
Standard warranty	5 years

AV-5 DC

ALLVIEW connection combiner box with DC 12.5kA 1000V surge arrester 1000V type 1+2, 1x PV string, 1x MPPT

Number of PV strings	1
Number of surge arresters	1
Surge arrester	Phoenix T1/T2
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes
Standard warranty	5 years

AV-6 DC

ALLVIEW connection combiner box with DC 12.5kA 1000V surge arrester 1000V type 1+2, 2x PV string, 2x MPPT

Number of PV strings	2
Number of surge arresters	2
Surge arrester	Phoenix T1/T2
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes
Standard warranty	5 years

AV-181 DC

ALLVIEW connection combiner box with DC 12.5kA 1000V surge arrester 1000V type 1+2, 3x PV string, 3x MPPT

Number of PV strings	3
Number of surge arresters	3
Surge arrester	Phoenix T1/T2
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes
Standard warranty	5 years

AV-426 DC

ALLVIEW connection combiner box with DC 12.5kA 1000V surge arrester 1000V type 1+2, 4x PV string, 4x MPPT

Number of PV strings	4
Number of surge arresters	4
Surge arrester	Phoenix T1/T2
Protection class	IP 65
Rated insulation voltage	400 V AC, 1500 V DC
UV resistance	Yes
Standard warranty	5 years

SECURE SERIES



Polycarbonate cabinets for use in harsh environments. **SECURE** connection combiner boxes are designed for use in **large industrial installations** where harsh environmental conditions may occur.

A wide range of applications of the combiner box is ensured by a robust design, a material with high mechanical resistance that does not corrode and is suitable for use in harsh environments – the **good protection and preservation of properties over a long period of time.**

- Increased fire resistance, mechanical durability and resistance to low and high temperatures
- Good resistance to chemicals
- IP66 rated for dust and water tightness
- Excellent mechanical resistance – IK 10
- Hinge system that allows the door to open wide (120°)
- IP66 combiner box has two pressure equalization regulators – prevents condensation inside the combiner box



Type	TPC 48T
Dimensions (WxHxD)	500x400x210
Number of fields in a row	16
Number of rows	3
Expandability	No
Lock	2-point lock
Mounting method	Surface mounting
Degree of protection	IP66
Protection class	II
Rated insulation voltage Ui	1000 V AC, 1500 V DC
Design in accordance with	EN 62208:2011, IEC 62208:2011 EN 61439-1:2011, relevant parts IEC 61439-1:2011, relevant parts EN 61439-4:2013, relevant parts IEC 61439-4:2012, relevant parts
UV resistance	UL 508
Impact resistance	IK10 +35°C /IK09 – 25°C
Glow rod test	960°C
Flammability class	UL 94 5VA
Recyclable plastics	Halogen-free
Material	Polycarbonate
Gasket material	Polyurethane
Standard NEMA	NEMA 4, 4X, 12, 13
Temp °C (continuous operation)	-40 ... 80 °C
Temp °C (short term)	-40 ... 120 °C

SH-1014 DC



DC combiner box IP66 with 1000V surge arrester type 1+2, 8x PV string, 8x MPPT

Number of PV strings	8
Number of surge arresters	8
Surge arrester	Phoenix T1/T2
Protection class	IP 66
Rated insulation voltage	1000 V AC, 1500 V DC
UV resistance	Yes

SH-967 DC



DC combiner box IP66 with 1000V surge arrester type 1+2, 9 x PV string, 9 x MPPT

Number of PV strings	9
Number of surge arresters	9
Surge arrester	Phoenix T1/T2
Protection class	IP 66
Rated insulation voltage	1000 V AC, 1500 V DC
UV resistance	Yes

SH-1037 DC



DC combiner box IP66 with 1000V surge arrester type 1+2, 10x PV string, 10x MPPT

Number of PV strings	10
Number of surge arresters	10
Surge arrester	Phoenix T1/T2
Protection class	IP 66
Rated insulation voltage	1000 V AC, 1500 V DC
UV resistance	Yes

SH-1041 DC



DC combiner box IP66 with 1000V surge arrester type 1+2, 12x PV string, 12x MPPT

Number of PV strings	12
Number of surge arresters	12
Surge arrester	Phoenix T1/T2
Protection class	IP 66
Rated insulation voltage	1000 V AC, 1500 V DC
UV resistance	Yes

□ AC 50 KW

SH-680 AC



AC connection combiner box, IP66 with AC surge arrester type 1+2, 100A 3-F, FR 100A, phase sig.

Surge arrester	Noark T1/T2
Overcurrent circuit breaker 1	Noark B 100A 3F
FR isolating disconnecter	100A
Phase signaling	Yes
Protection class	IP 66
Rated insulation voltage	1000 V AC, 1500 V DC
UV resistance	Yes
Standard warranty	5 years

SH-807 AC



AC connection combiner box, IP66 with AC surge arrester type 2, 100A 3-F, FR 100A, phase sig.

Surge arrester	Noark T2
Overcurrent circuit breaker 1	Noark B 100A 3F
FR isolating disconnecter	100A
Phase signaling	Yes
Protection class	IP 66
Rated insulation voltage	1000 V AC, 1500 V DC
UV resistance	Yes
Standard warranty	5 years

□ DCAC DO 50 KW

SH-855 DCAC



DC+AC connection combiner box IP66 with 1000V surge arrester type 1+2, 4 x PV string, 4 x MPPT // surge arrester AC type 1+2, 100A 3-F, FR 100A, phase sig. + socket

Number of PV strings	4
Number of surge arresters	4
Surge arrester DC	Phoenix T1/T2
Surge arrester AC	Noark T1/T2
FR isolating disconnecter	100A
Phase signaling	Yes
1F service socket	Yes
Overcurrent circuit breaker	Noark B 100A 3F
Protection class	IP 66
Rated insulation voltage	1000 V AC, 1500 V DC
UV resistance	Yes
Standard warranty	5 years

SH-854 DCAC

DC+AC connection combiner box IP66 with 1000V surge arrester type 1+2, 5 x PV string, 5 x MPPT // surge arrester AC type 1+2, 100A 3-F, FR 100A, phase sig. + socket



Number of PV strings	5
Number of surge arresters	5
Surge arrester DC	Phoenix T1/T2
Surge arrester AC	Noark T1/T2
FR isolating disconnecter	100A
Phase signaling	Yes
1F service socket	Yes
Overcurrent circuit breaker	Noark B 100A 3F
Protection class	IP 66
Rated insulation voltage	1000 V AC, 1500 V DC
UV resistance	Yes
Standard warranty	5 years

SH-1096 DCAC

DC+AC connection combiner box IP66 with 1000V surge arrester type 1+2, 6x PV string, 6x MPPT // surge arrester AC type 1+2, 100A 3-F, FR 100A, phase sig. + socket



Number of PV strings	6
Number of surge arresters	6
Surge arrester DC	Phoenix T1/T2
Surge arrester AC	Noark T1/T2
FR isolating disconnecter	100A
Phase signaling	Yes
1F service socket	Yes
Overcurrent circuit breaker	Noark B 100A 3F
Protection class	IP 66
Rated insulation voltage	1000 V AC, 1500 V DC
UV resistance	Yes
Standard warranty	5 years

SH-1008 DCAC

DC+AC connection combiner box IP66 with 1000V surge arrester type 2, 4 x PV string, 4 x MPPT // surge arrester AC type 2, 100A 3-F, FR 100A, phase sig. + socket



Number of PV strings	4
Number of surge arresters	4
Surge arrester DC	Phoenix T2
Surge arrester AC	Noark T2
FR isolating disconnecter	100A
Phase signaling	Yes
1F service socket	Yes

SH-1008 DCAC

DC+AC connection combiner box IP66 with 1000V surge arrester type 2, 4 x PV string, 4 x MPPT // surge arrester AC type 2, 100A 3-F, FR 100A, phase sig. + socket

Overcurrent circuit breaker	Noark B 100A 3F
Protection class	IP 66
Rated insulation voltage	1000 V AC, 1500 V DC
UV resistance	Yes
Standard warranty	5 years

SH-1007 DCAC

DC+AC connection combiner box IP66 with 1000V surge arrester type 2, 5x PV string, 5x MPPT // surge arrester AC type 2, 100A 3-F, FR 100A, phase sig. + socket



Number of PV strings	5
Number of surge arresters	5
Surge arrester DC	Phoenix T2
Surge arrester AC	Noark T2
FR isolating disconnecter	100A
Phase signaling	Yes
1F service socket	Yes
Overcurrent circuit breaker	Noark B 100A 3F
Protection class	IP 66
Rated insulation voltage	1000 V AC, 1500 V DC
UV resistance	Yes
Standard warranty	5 years

SH-1009 DCAC

DC+AC connection combiner box IP66 with 1000V surge arrester type 2, 6x PV string, 6x MPPT // surge arrester AC type 2, 100A 3-F, FR 100A, phase sig. + socket



Number of PV strings	6
Number of surge arresters	6
Surge arrester DC	Phoenix T2
Surge arrester AC	Noark T2
Phase signaling	Yes
1F service socket	Yes
Overcurrent circuit breaker	None
Protection class	IP 66
Rated insulation voltage	1000 V AC, 1500 V DC
UV resistance	Yes
Standard warranty	5 years

ATSE SERIES



1. KENO

2. STANDARDS

3. PRODUCTS

4. ADDITIONAL OFFER

ATSE combiner boxes allow **automatic reserve switching in hybrid installations.**

It is thanks to the use of the ATSE combiner box, hybrid inverter and energy storage that the system automatically switches to emergency power supply in case of power failure from the operator (grid failure or planned modernization) giving the **possibility of using electricity** in the building.

- Each manufactured ATSE combiner box is tested by plugging into an inverter
- Separate normal and emergency circuits
- Built-in overcurrent circuit breaker and AC surge arrester
- Designed to work with leading hybrid inverters, including GoodWe, Huawei, Fronius, FoxESS
- Emergency power source – energy storage or PV generator



Type	12T	24T	36T	48T
Dimensions (without connectors) (WxHxD)	259x319x144	384x319x144	508x319x144	664x319x144
Number of fields in a row	12	12	12	12
Number of rows	1	2	3	4
Expandability	No			
Key lock	Optional			
Mounting method	Surface mounting			
Degree of protection	IP 65			
Protection class	II			
Rated insulation voltage Ui	400 V AC			
Design in accordance with	EN 60670, EN 62208			
UV resistance	Yes			
Impact resistance	IK 08			
Glow rod test	650°C			
Operating temperature	-20°C / 40°C			
Recyclable plastics	Halogen-free			

AVAILABLE MODELS

SH-AIO3H-SZR	ATSE connection combiner box for FoxESS AIO inverter
SH-GEN24-SZR	ATSE connection combiner box for Fronius GEN24 inverter
SH-GEN24-PP	ATSE connection combiner box with Smart Meter for Fronius GEN24 inverter
SH-GWET-SZR	ATSE connection combiner box for GoodWe ET inverter
SH-HWL1-SZR	ATSE connection combiner box for Huawei L1 inverter
SH-HWM1-SZR	ATSE connection combiner box for Huawei M1 inverter

SH-GWET-SZR



ATSE connection combiner box for GoodWe ET inverter

Compatibility	GoodWe GW5-10K ET
Number of phases supplied by emergency power	3F
Emergency power source	Energy storage / PV generator
Energy meter	None – space for a meter
Double disconnection of emergency operation	Yes
AC protection	Yes
Switching time (sec.)	0,5 > t
Warranty	2 years

SH-GWET1-SZR



ATSE connection combiner box for GoodWe ET inverter

Compatibility	GoodWe GW15K-ET
Number of phases supplied by emergency power	3F
Emergency power source	Energy storage / PV generator
Energy meter	None – space for a meter
Double disconnection of emergency operation	Yes
AC protection	Yes
Switching time (sec.)	0,5 > t
Warranty	2 years

SH-GWET2-SZR



ATSE connection combiner box for GoodWe ET inverter

Compatibility	GoodWe 20-29,9K-ET
Number of phases supplied by emergency power	3F
Emergency power source	Energy storage / PV generator
Energy meter	None – space for a meter
Double disconnection of emergency operation	Yes
AC protection	Yes
Switching time (sec.)	0,5 > t
Warranty	2 years

SH-GEN24-SZR**ATSE connection combiner box with Smart Meter for Fronius GEN24 inverter**

Compatibility	Fronius Symo GEN24 / Symo Hybrid
Number of phases supplied by emergency power	3F
Emergency power source	Energy storage
Energy meter	Yes
Control	Realized by the inverter
Double disconnection of emergency operation	Yes
AC protection	Yes
Switching time (sec.)	≈ 60
Warranty	2 years

SH-GEN24-PP**Single-phase combiner box with automatic switching to PV-POINT power supply for GEN24 inverter**

Compatibility	Fronius Symo GEN24
Number of phases supplied by emergency power	1F
Emergency power source	Energy storage / PV generator
Double disconnection of emergency operation	Yes
Switching time (sec.)	< 90
Warranty	2 years

SH-HWM1-SZR**ATSE connection combiner box for Huawei M1 inverter**

Compatibility	SUN2000 3-10 KTL M1
Number of phases supplied by emergency power	1F
Emergency power source	Energy storage
Double disconnection of emergency operation	Yes
Switching time (sec.)	≈ 2
Warranty	2 years

SH-HWL1-SZR**ATSE connection combiner box for Huawei L1 inverter**

Compatibility	SUN2000 2-3,68 KTL L1
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Number of phases supplied by emergency power	1F
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Emergency power source	Energy storage
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Double disconnection of emergency operation	Yes
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Switching time (sec.)	≈ 2
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Warranty	2 years
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SH-AIO3H-SZR**ATSE connection combiner box for FoxEss AIO inverter**

Compatibility	FoxEss AIO 3H 5.0-E – 10.0-E
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Number of phases supplied by emergency power	3F
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Emergency power source	Energy storage
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Energy meter	None – space for a meter
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Switching time (sec.)	0,2
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Warranty	2 years
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1. KENO

2. STANDARDS

3. PRODUCTS

4. ADDITIONAL OFFER

ADDITIONAL OFFER

K-50

MC4 connector tester



Additional information

Verification of correct and safe assembly of MC4 connectors.
MC4 Stäubli compatible.

KPVMC4

Wrench for MC4 connectors



Additional information

Designed for mounting and dismounting MC4 connectors.
Equipped with grooves for dismounting MC4 connectors.

SM-PV

PV module simulator - 143-286 VDC; 0,7A



Additional information

Simulator with prepared MC4, SunClix, Amphenol connectors.
Enables configuration and commissioning of inverters after dark or in the absence of sufficient voltage and current parameters from PV modules.

SM-PV BS

PV module simulator - 143-286 VDC; 0,7A



Additional information

PV module simulator constant-current (version without SUNCLIX connectors) is a programmable power supply for photovoltaic applications. It allows you to configure and start inverters after dark or when there are insufficient current and voltage parameters from PV modules.

PRZ-4...6MM

Extension with MC4 connectors – solar KENO cable



Nominal conductor cross-section [mm²] 4 / 6

Lenght [m] 0,5 / 1 / 2 / 3,8

Available colours Red / Black

Connector type MC4

Additional information

Used in photovoltaic installations for connections between individual photovoltaic modules and between modules and inverter. It is possible to manufacture a DC extension cable to the customer's specification.

PRZ-EVO2-4...6MM

Extension with MC4 EVO2 connectors – solar KENO cable



Nominal conductor cross-section [mm ²]	4 / 6
Length [m]	0,5 / 1 / 2 / 3,8
Available colours	Red / Black
Connector type	EVO2
Additional information	Used in photovoltaic installations for connections between individual photovoltaic modules and between modules and inverter. It is possible to manufacture a DC extension cable to the customer's specification.

ZPVMC4

Crimping pliers for MC4 connectors



Additional information	3 work sockets. Designed to make MC4 connectors on wires with a cross-section: 2,5mm ² , 4mm ² , 6mm ² .
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610 924 KENO

AC toolkit RENNSTEIG WERA



Manufacturer	Rennsteig
Includes	1. Crimping pliers for MC4 connectors Rennsteig / KENO 2. Stripping tool 4-10mm ² - Rennsteig / KENO 3. Wera Allen key 4. Wera ratcheting combination wrench with anti-slip protection 5. Cable cutters KENO 6. Wrench for MC4 connectors Knipex 7. MC4 connector tester

624 105-58 KENO

DC toolkit RENNSTEIG WERA



Manufacturer	Rennsteig
Includes	1. Stripping tool 0.08-16mm ² Rennsteig / KENO 2. Crimping pliers 0,14-16 Rennsteig / KENO 3. Torque screwdriver 1,7-3,5Nm with bit set

TRAINING OFFER

TRAINING COURSES PREPARING TO TAKE THE EXAM FOR A CERTIFIED RES INSTALLER

We operate Accredited Training Center of the Office of Technical Inspection (UDT) in the field of training for Certified RES Installer. By Taking part in the training, you will learn about general photovoltaics and acquire the theoretical basics of PV systems operation. You will become familiar with sizing rules and connection systems to the power grid, you will learn how to install and adjust them. Finally, we will familiarize you with the principles of upgrading and maintaining systems.

For organized groups of more than 15 people, we offer the possibility of organizing closed-door training.

For more information, visit the UDT website:

WWW.UDT.GOV.PL

WEBINARS

We periodically conduct remote training sessions (webinars) with manufacturers to keep our customers and employees up to date with current technologies and news from the PV market.

If you are interested in this form of education, we warmly invite you to like and follow our social media profiles:



TRAINING COURSES TO RENEW INSTALLER'S LICENSES

If you have already taken the Certified RES Installer training and earned your certification, remember that it has a validity of 5 years. In order not to lose them, the Office of Technical Inspection requires attendance at a training course to renew installation authorizations, which can be taken at KENO headquarters.

In order to renew your licenses you must:

- + Meet the conditions for the issuance of the certificate set forth in Article 136, paragraph 3 of the Act on Renewable Energy Sources (Journal of Laws of 2015, item 478, as amended),
- + Complete refresher training within the 12 months preceding the expiration date of the certificate,
- + Install, upgrade or maintain in good technical condition min. 5 microinstallations, small installations or RES installations with a total installed thermal power of not more than 600kW.

REMEMBER! The renewal application must be submitted no later than 30 days before the expiration of the certificate!

PRODUCT TRAINING

We organize certified product training courses conducted by specialists and representatives of manufacturers of photovoltaic systems from our offer. They allow you to increase your knowledge, learn about the latest technology and solutions used in their equipment.

Dates of upcoming trainings and registration in the TRAININGS tab on:

WWW.B2B.KENO-ENERGY.COM

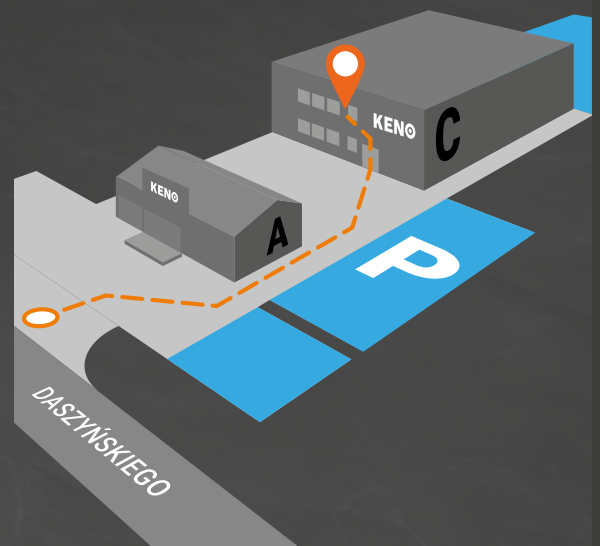


ACCESS

KENO is located in Gliwice (Ostropa), at ul. Daszyńskiego 609 A, close to the exit from the A4 highway. The distance from the city center is 7 km.

Training sessions are held in Building C located directly behind the building on Daszyńskiego Street. The modern training room is located on the second floor.

Ample free parking is available for trainees on the company's premises in front of and behind Building C.



KENO Energy Ltd.

VAT GB433186013

209 Mirror Works, 12 Marshgate
Lane, E15 2NH London

tel. +44 203 542 6292

www.keno-energy.uk
www.B2B.keno-energy.com

HEADQUARTERS

Daszyńskiego 609, 44-151 Gliwice, POLAND

MAIN WAREHOUSE

Gustawa Eiffel'a 15, 44-109 Gliwice, POLAND

WARSAW WAREHOUSE

Sadowa 19D, 05-850 Jawczyce, POLAND