



# Product Catalogue



**enwi-etec GmbH**

Scherrwies 2  
84329 Rogglfing  
Germany

Phone +49 8725 9664-0  
Fax +49 8725 9664-96  
info@enwi-etec.com  
www.enwi-etec.com

# Index

<b>Introduction</b>	<b>4 -5</b>
<b>PV-connection technology</b>	<b>6 - 41</b>
Generator connection boxes 600V	11 - 13
Generator connection boxes 1000V	14 - 16
Generator connection boxes with 4 fuses	17 - 20
Generator connection boxes with 6 fuses	21 - 23
Generator connection boxes 800V with blocking diodes	24 - 27
Generator connection boxes 1000V with blocking diodes	28 - 29
String array boxes 1000V	30 - 32
String array boxes 1000V with monitoring (meteocontrol)	33 - 34
String array boxes 1000V with monitoring (skytron® energy)	35
Array junction boxes for larger PV-plants	36
AC-low voltage distribution boards	37
Emergency shut off switches	38 -39
Inverter stations	40 - 41
Offgrid systems	42 - 43
<b>Electric-Mobility</b>	<b>44 - 49</b>
e-towers	48
e-boxes	49
<b>Components and accessories</b>	<b>50 - 63</b>
<b>Technical explanations / The enwi match code</b>	<b>64 - 67</b>

Your professional partner for:



**the complete PV-connection technology of photovoltaic plants**



**charging stations for electric-mobility**

enwi-etec GmbH situated in Roggfling / Germany is a leading manufacturer for complete solutions in connection technology of photovoltaic plants and specialist for charging stations for electric vehicles.

enwi offers ready-for-use, pre-assembled standard and customized solutions for solar home systems as well as for large PV-parks.

Aligned solutions are used for collecting individual string cables, providing protection against overvoltage as well as against too high currents and allow the monitoring of the PV plants.

In the field of electric mobility enwi-etec offers modular charging stations for the public domain as well as compact charging stations for private use.

Due to its long standing experience and nearness to the market, enwi-etec GmbH is a valuable service provider and partner for its customers. High quality and continuous innovation characterize the products.

*enwi means: engineering with innovations.*

## Long-standing experience in the PV-market

- Highly skilled staff
- Continuous development
- Flexibility to customer requirements
- High quality
- Short response time and delivery times
- Independence on the market
- Strong partners
- Documentation in 5 languages

## Customers of enwi-etec GmbH

- Inverter and module manufacturers
- Electrical and PV wholesaler
- EPC-companies
- Industry
- Electrician



## Generator connection boxes:

For a proper connection of PV-systems the application of generator connection boxes is strongly recommended. They allow the accumulation of the different strings and facilitate the installation and operation process. Another important role is the system protection of overvoltage and overcurrent. These measures are leading to a maximization of the energy output.



## Inverter stations:

With the innovative „Grid Cluster“ concept, enwi provides a turnkey solution for string inverters in outdoor applications. The solid and thermal optimized construction offers perfect conditions and assures a long product life-time. This enwi- solution minimizes the installation time. Completely installed monitoring systems allow a quick integration in different monitoring software applications and ensure an easy operation management.



## Projectmanagement, installation and service:

Support and consulting for plant design of inverter stations:

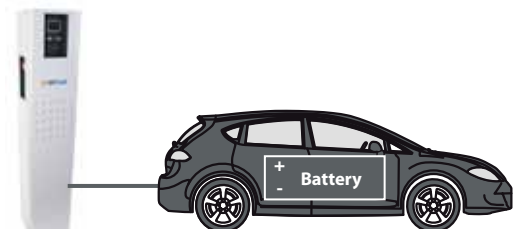
- Product and component selection
- Integration in complete solution
- Logistics
- Installation and commissioning

For the operation management of the plant, service technicians are available to support and consult on site.



## Charging systems for electrical vehicles:

With the „e-tower“ enwi offers a charging station for public areas and companies, as well as with the „e-boxes“ for the private sector. The „e-tower“ with its color display , buttons in stainless steel and a clearly arranged menu, allows a comfortable charging up to 2 vehicles at the same time. It´s equipped with comprehensive safety features for authorization, registration and overload shut-off and allows different payment methods. Two different types of wall mounting boxes for the private sector complement the product range of charging. The e-boxes are working without authorization, registration and billing. Energy meter with S0 interface can be integrated for monitoring.







# PV-connection technology

# PV-connection technology

## Generator connection boxes

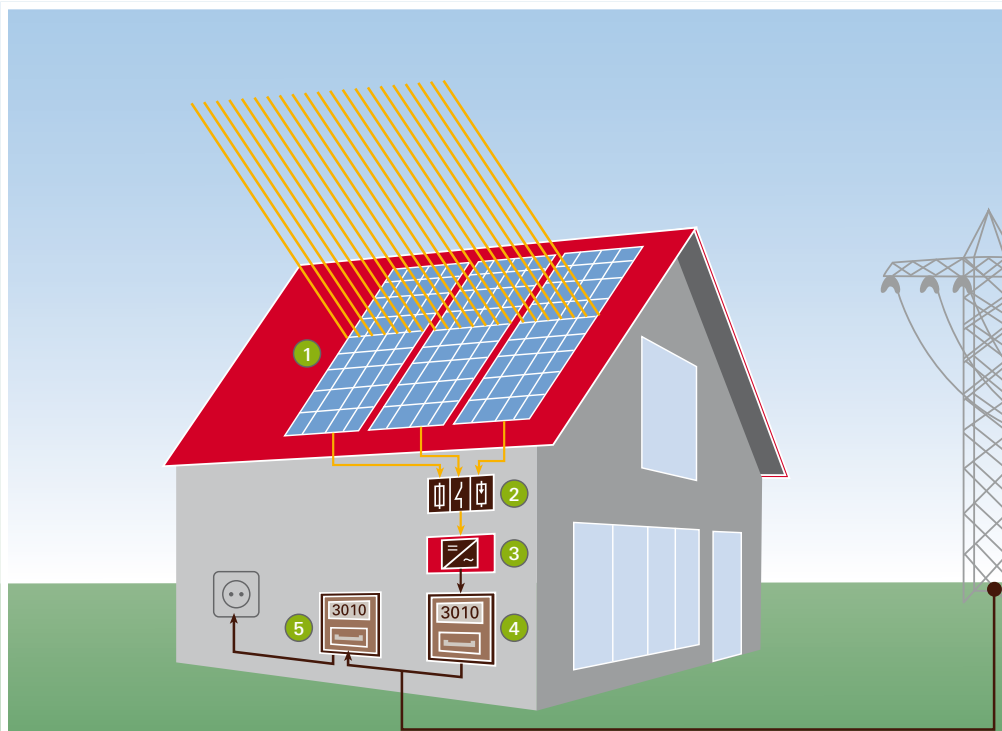
are devices to combine different strings in PV-systems and protect the inverter, as well as the modules (DC-Side) from perilous overvoltage and overcurrent.

The close installation to the module fields results in a lower wiring complexity and reduces material and installation costs.

In modern PV-systems, the generator connection boxes have much bigger application range, than only the protective function. Due to the high amount of strings, single failures in the system are difficult to identify. The generator connection boxes with its integrated measuring technology are offering maximum of yield stability.

During maintenance, specific parts of the system can be switched off with the integrated disconnect terminals, without having any effect to the rest of the PV-system.

enwi generator connection boxes are manufactured according to DIN EN 60439-1 und IEC 60364-7-712 in protection class II. A maximum possible system security is achieved with a consistent separation of plus and minus poles, double insulation of the string cables, appropriate air- and leakage distances and high quality enclosures.



**1. PV-generator**  
produces direct current

**2. Generator connection box**  
combines individual string cables

**3. Inverter**  
converts direct current into alternating current

**4. Feed-in meter**  
measures the power input to the grid

**5. Electric meter**  
measures as usual the current consumption



**We recommend:**

- installation of an overvoltage protection in any plant
- taking into consideration the installation of an overvoltage protection at any cable (BUS/DSL/modem) being connected to the inverter

The overvoltage protection device integrated in inverters doesn't protect the complete PV-system against hazardous overvoltage!  
The charge dissipation capability of class III conductors is very low.



**Disconnect terminals:**

- for measuring purposes enabling a check of the plant without difficulties
- for an easy and safe commissioning
- for a high contact security due to application of spring-type technology



**Load breakers:**

- according to IEC 60364-7-712, DC load disconnectors are obligatory between inverter and panel field
- serve as additional disconnection point in PV plants for repair and maintenance
- serve as an emergency disconnection device in case of failure



**Blocking diodes when using thin-layer panels:**

- for a maximum safety against reverse currents in panels and strings
- for a considerable reduction of wiring effort in the PV plant

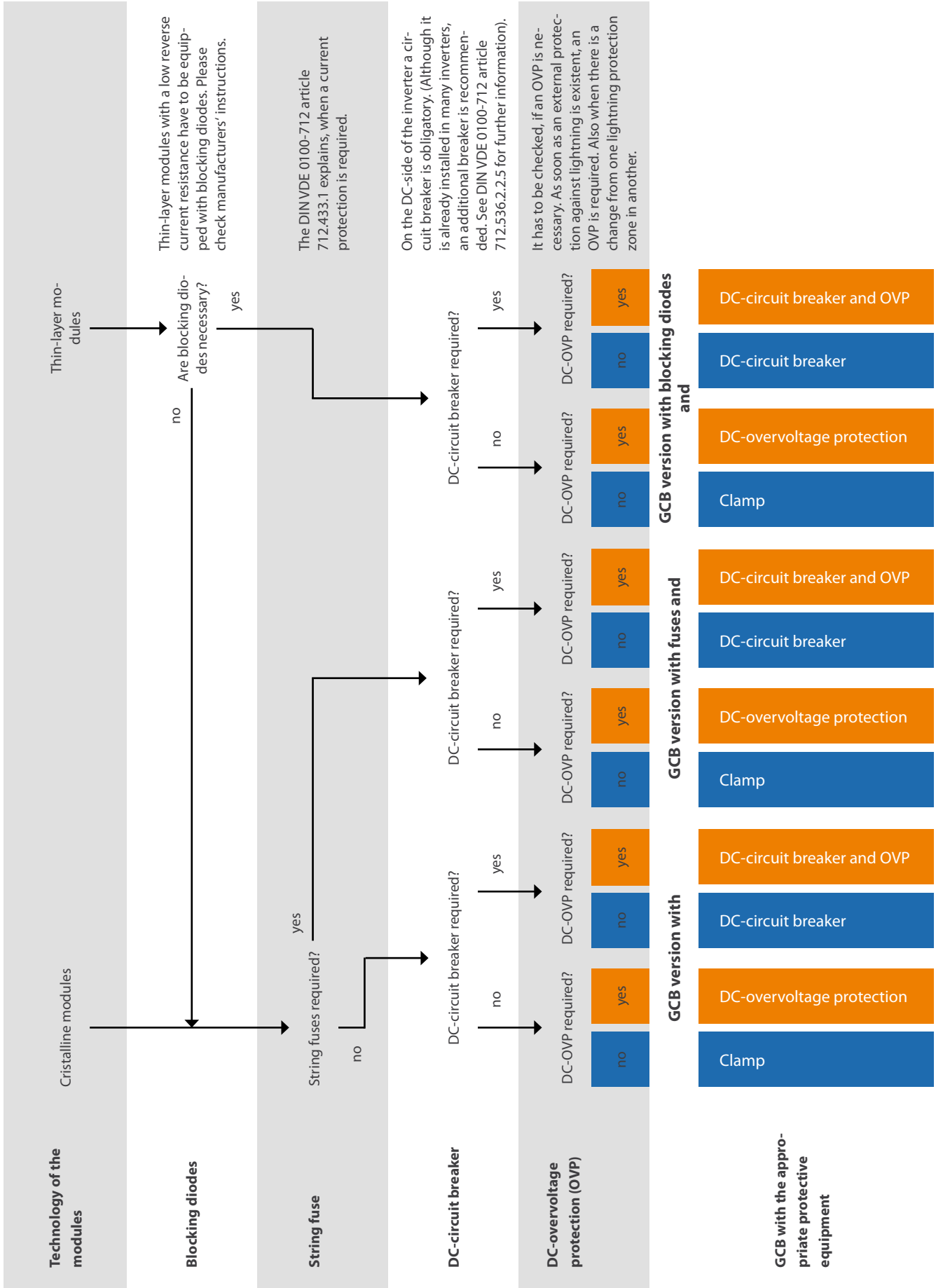


**Integrated monitoring systems:**

- string current measurement
- evaluation of string and inverter data
- transmission of measured results to a data logger
- visualization locally by software or by an internet portal



# Help for choosing the appropriate generator connection box



enwi generator connection boxes are collecting the individual strings of PV arrays and are minimizing the effort for cabling. The option models with surge arresters protect PV arrays and inverters additionally against overvoltage. Disconnect terminals allow to make measurements very easily. All boxes are supplied together with the appropriate DIN-glands. All string cables can be inserted from the bottom.



Type	S-600-1R-X-M-PC-4.0	S-600-4RT-X-M-PC-4.0
Max. Uoc	600V	600V
Max. Umpp (Ue)	-	-
Max. Isc (Σ)	40A	40A
Max. Isc (String)	40A	30A
Strings	1	4
Multi-MPP	-	-
Input terminals	16mm <sup>2</sup>	6mm <sup>2</sup>
Output terminals	16mm <sup>2</sup>	16mm <sup>2</sup>
Overvoltage protection device	C	C
Load breaking device	-	-
String fuse	-	-
String-diode	-	-
String-monitoring	-	-
Protection class	II	II
Cable inlets	DIN-cable glands	DIN-cable glands
Material of the enclosure	IP65; PC	IP65; PC
Dimensions (WxHxD)	110x180x111mm	180x180x111mm
Article-no.	<b>20001000</b>	<b>20001001</b>

Accessories		
Overvoltage protection device	10007872 (see page 50)	10007872 (see page 50)
Door lock	-	-
Wall mounting strap	10008475 (see page 61)	10008475 (see page 61)
MC4 connector	20001031 (see page 61)	20001031 (see page 61)
Fuses 8A	-	-
Fuses 10A	-	-
Fuses 12A	-	-



# Generator connection boxes 600V



Type	S-600-4RT-T32-X-PC-4.0	S-600-4RT-T32-M-PC-4.0
Max. Uoc	600V	600V
Max. Umpp (Ue)	560V	560V
Max. Isc ( $\Sigma$ )	32A	32A
Max. Isc (String)	30A	30A
Strings	4	4
Multi-MPP	-	-
Input terminals	6mm <sup>2</sup>	6mm <sup>2</sup>
Output terminals	16mm <sup>2</sup>	16mm <sup>2</sup>
Overvoltage protection device	-	C
Load breaking device	DC21-A	DC21-A
String fuse	-	-
String-diode	-	-
String-monitoring	-	-
Protection class	II	II
Cable inlets	DIN-cable glands	DIN-cable glands
Material of the enclosure	IP65; PC	IP65; PC
Dimensions (WxHxD)	200x200x122mm	200x200x122mm
Article-no.	<b>20001002</b>	<b>20001003</b>

Accessories		
Overvoltage protection device	-	10007872 (see page 50)
Door lock	10008163 (see page 61)	10008163 (see page 61)
Wall mounting strap	-	-
MC4 connector	20001031 (see page 61)	20001031 (see page 61)
Fuses 8A	-	-
Fuses 10A	-	-
Fuses 12A	-	-



S-600-2x3R-X-M-PC-4.0

S-600-2x4RT-T32-M-PC-4.0

600V	600V
-	560V
40A	32A
40A	30A
4	4
2	2
16mm <sup>2</sup>	6mm <sup>2</sup>
16mm <sup>2</sup>	16mm <sup>2</sup>
C	C
-	DC21-A
-	-
-	-
-	-
II	II
DIN-cable glands	DIN-cable glands
IP65; PC	IP65; PC
254x180x111mm	250x370x122mm
<b>20001004</b>	<b>20001005</b>

10007872 (see page 50)	10007872 (see page 50)
-	10008163 (see page 61)
10008475 (see page 61)	-
20001031 (see page 61)	20001031 (see page 61)
-	-
-	-
-	-



## Generator connection boxes 1000V

Due to the increased system voltages of the inverters we offer now all generator connection boxes in versions for 1000 VDC.

Double insulated solar cables together with components which are particularly designed for the PV applications are the basis for the high quality of our boxes.



Type	S-1000-1R-X-Y-PC-4.0	S-1000-4RT-X-X-PC-4.0
Max. Uoc	1000 V	1000V
Max. Umpp (Ue)	-	-
Max. Isc (Σ)	40A	40A
Max. Isc (String)	40A	30A
Strings	1	4
Multi-MPP	-	-
Input terminals	16mm <sup>2</sup>	6mm <sup>2</sup>
Output terminals	16mm <sup>2</sup>	16mm <sup>2</sup>
Overvoltage protection device	C	C
Load breaking device	-	-
String fuse	-	-
String-diode	-	-
String-monitoring	-	-
Protection class	II	II
Cable inlets	DIN-cable glands	DIN-cable glands
Material of the enclosure	IP65; PC	IP65; PC
Dimensions (WxHxD)	110x180x111mm	180x180x111mm
Article-no.	<b>20001006</b>	<b>20001007</b>

Accessories		
Overvoltage protection device	10006519 (see page 50)	-
Door lock	-	-
Wall mounting strap	10008475 (see page 61)	10008475 (see page 61)
MC4 connector	20001031 (see page 61)	20001031 (see page 61)
Fuses 8A	-	-
Fuses 10A	-	-
Fuses 12A	-	-



S-1000-4RT-X-Y-PC-4.0

S-1000-4RT-T30-X-PC-4.0

S-1000-4RT-T30-Y-PC-4.0

1000V	1000V	1000V
-	1000V	1000V
40A	30A	30A
30A	30A	30A
4	4	4
-	-	-
6mm <sup>2</sup>	6mm <sup>2</sup>	6mm <sup>2</sup>
16mm <sup>2</sup>	16mm <sup>2</sup>	16mm <sup>2</sup>
C	C	C
-	DC21-A	DC21-A
-	-	-
-	-	-
-	-	-
II	II	II
DIN-cable glands	DIN-cable glands	DIN-cable glands
IP65; PC	IP65; PC	IP65; PC
180x180x111mm	200x200x122mm	250x200x122mm
<b>20001008</b>	<b>20001009</b>	<b>20001010</b>

10006519 (see page 50)	-	10006519 (see page 50)
-	10008163 (see page 61)	10008163 (see page 61)
10008475 (see page 61)	-	-
20001031 (see page 61)	20001031 (see page 61)	20001031 (see page 61)
-	-	-
-	-	-
-	-	-



# Generator connection boxes 1000V



Type	S-1000-2x3R-X-Y-PC-4.0	S-1000-2x3RT-T30-Y-PC-4.0
Max. Uoc	1000V	1000V
Max. Umpp (Ue)	-	1000V
Max. Isc ( $\Sigma$ )	40A	30A
Max. Isc (String)	40A	30A
Strings	3	3
Multi-MPP	2	2
Input terminals	16mm <sup>2</sup>	6mm <sup>2</sup>
Output terminals	16mm <sup>2</sup>	16mm <sup>2</sup>
Overvoltage protection device	C	C
Load breaking device	-	DC21-A
String fuse	-	-
String-diode	-	-
String-monitoring	-	-
Protection class	II	II
Cable inlets	DIN-cable glands	DIN-cable glands
Material of the enclosure	IP65; PC	IP65; PC
Dimensions (WxHxD)	254x180x111mm	250x370x122mm
Article-no.	<b>20001012</b>	<b>20001011</b>

Accessories		
Overvoltage protection device	10006519 (see page 50)	10006519 (see page 50)
Door lock	-	-
Wall mounting strap	10008475 (see page 61)	10008475 (see page 61)
MC4 connector	20001031 (see page 61)	20001031 (see page 61)
Fuses 8A	-	-
Fuses 10A	-	-
Fuses 12A	-	-



The generator connection boxes with string fuses of the gPV-series ensure already at minor overcurrent, as it occurs typically in PV applications, sufficient protection against overload. In addition they protect polycrystalline PV modules against too high reverse currents. DIN-glands are included in the delivery of all versions.



Type	S-1000-4(x2)Sx-X-X-PC-4.0	S-1000-4Sx-X-X-PC-4.0
Max. Uoc	1000V	1000V
Max. Umpp (Ue)	-	-
Max. Isc (Σ)	40A	40A
Max. Isc (String)	8,5A	8,5A
Strings	4	4
Multi-MPP	-	-
Input terminals	10mm <sup>2</sup>	6mm <sup>2</sup>
Output terminals	16mm <sup>2</sup>	16mm <sup>2</sup>
Overvoltage protection device	-	-
Load breaking device	-	-
String fuse	10x38mm	10x38mm
String-diode	-	-
String-monitoring	-	-
Protection class	II	II
Cable inlets	DIN-cable glands	DIN-cable glands
Material of the enclosure	IP65; PC	IP65; PC
Dimensions (WxHxD)	254x180x111mm	254x180x111mm
Article-no.	<b>20001013</b>	<b>20001014</b>

Accessories		
Overvoltage protection device	-	-
Door lock	-	-
Wall mounting strap	10008475 (see page 61)	10008475 (see page 61)
MC4 connector	20001031 (see page 61)	20001031 (see page 61)
Fuses 8A	10007591 (see page 62)	10007591 (see page 62)
Fuses 10A	10007592 (see page 62)	10007592 (see page 62)
Fuses 12A	10007593 (see page 62)	10007593 (see page 62)



## Generator connection boxes with 4 fuses



Type	S-600-45x-X-M-PC-4.0	S-1000-45x-X-Y-PC-4.0
Max. Uoc	600V	1000V
Max. Umpp (Ue)	-	-
Max. Isc ( $\Sigma$ )	40A	40A
Max. Isc (String)	8,5A	8,5A
Strings	4	4
Multi-MPP	-	-
Input terminals	6mm <sup>2</sup>	6mm <sup>2</sup>
Output terminals	16mm <sup>2</sup>	16mm <sup>2</sup>
Overvoltage protection device	C	C
Load breaking device	-	-
String fuse	10x38mm	10x38mm
String-diode	-	-
String-monitoring	-	-
Protection class	II	II
Cable inlets	DIN-cable glands	DIN-cable glands
Material of the enclosure	IP65; PC	IP65; PC
Dimensions (WxHxD)	254x180x111mm	254x180x111mm
Article-no.	<b>20001015</b>	<b>20001016</b>

Accessories		
Overvoltage protection device	10007872 (see page 50)	10006519 (see page 50)
Door lock	-	-
Wall mounting strap	10008475 (see page 61)	10008475 (see page 61)
MC4 connector	20001031 (see page 61)	20001031 (see page 61)
Fuses 8A	10007591 (see page 62)	10007591 (see page 62)
Fuses 10A	10007592 (see page 62)	10007592 (see page 62)
Fuses 12A	10007593 (see page 62)	10007593 (see page 62)



S-1000-4(x2)Sx-X-Y-PC-4.0

S-600-4(x2)Sx-X-M-PC-4.0

S-600-4(x2)Sx-T32-M-PC-4.0

1000V	600V	600V
-	-	560V
40A	40A	32A
8,5A	8,5A	8,5A
4	4	4
-	-	-
10mm <sup>2</sup>	10mm <sup>2</sup>	10mm <sup>2</sup>
16mm <sup>2</sup>	16mm <sup>2</sup>	16mm <sup>2</sup>
C	C	-
-	-	DC21-A
10x38mm	10x38mm	10x38mm
-	-	-
-	-	-
II	II	II
DIN-cable glands	DIN-cable glands	DIN-cable glands
IP65; PC	IP65; PC	IP65; PC
254x180x111mm	254x180x111mm	254x360x165mm
<b>20001017</b>	<b>20001018</b>	<b>20001019</b>

10006519 (see page 50)	10007872 (see page 50)	10007872 (see page 50)
-	-	-
10008475 (see page 61)	10008475 (see page 61)	10008475 (see page 61)
20001031 (see page 61)	20001031 (see page 61)	20001031 (see page 61)
10007591 (see page 62)	10007591 (see page 62)	10007591 (see page 62)
10007592 (see page 62)	10007592 (see page 62)	10007592 (see page 62)
10007593 (see page 62)	10007593 (see page 62)	10007593 (see page 62)



# Generator connection boxes with 4 fuses



Type	S-1000-4(x2)Sx-T40-Y-PC-4.0	S-1000-4(x2)Sx-T40-X-PC-4.0
Max. Uoc	1000V	1000V
Max. Umpp (Ue)	900V	900V
Max. Isc ( $\Sigma$ )	40A	40A
Max. Isc (String)	8,5A	8,5A
Strings	4	4
Multi-MPP	-	-
Input terminals	10mm <sup>2</sup>	10mm <sup>2</sup>
Output terminals	16mm <sup>2</sup>	16mm <sup>2</sup>
Overvoltage protection device	C	-
Load breaking device	DC21-A	DC21-A
String fuse	10x38mm	10x38mm
String-diode	-	-
String-monitoring	-	-
Protection class	II	II
Cable inlets	DIN-cable glands	DIN-cable glands
Material of the enclosure	IP65; PC	IP65; PC
Dimensions (WxHxD)	254x360x165mm	254x360x165mm
Article-no.	<b>20001020</b>	<b>20001021</b>

Accessories		
Overvoltage protection device	10006519 (see page 50)	-
Door lock	-	-
Wall mounting strap	10008475 (see page 61)	10008475 (see page 61)
MC4 connector	20001031 (see page 61)	20001031 (see page 61)
Fuses 8A	10007591 (see page 62)	10007591 (see page 62)
Fuses 10A	10007592 (see page 62)	10007592 (see page 62)
Fuses 12A	10007593 (see page 62)	10007593 (see page 62)

The generator connection boxes with string fuses of the gPV-series ensure already at minor overcurrent, as they occur typically in PV applications, sufficient protection against overload. In addition they protect polycrystalline PV modules against too high reverse currents. DIN-glands are included in the delivery of all versions.



Type	S-1000-6Sx-X-X-PC-4.0	S-1000-6(x2)Sx-X-X-PC-4.0
Max. Uoc	1000V	1000V
Max. Umpp (Ue)	-	-
Max. Isc ( $\Sigma$ )	40A	40A
Max. Isc (String)	8,5A	8,5A
Strings	6	6
Multi-MPP	-	-
Input terminals	6mm <sup>2</sup>	10mm <sup>2</sup>
Output terminals	16mm <sup>2</sup>	16mm <sup>2</sup>
Overvoltage protection device	-	-
Load breaking device	-	-
String fuse	10x38mm	10x38mm
String-diode	-	-
String-monitoring	-	-
Protection class	II	II
Cable inlets	DIN-cable glands	DIN-cable glands
Material of the enclosure	IP65; PC	IP65; PC
Dimensions (WxHxD)	254x180x111mm	360x254x165mm
Article-no.	<b>20001022</b>	<b>20001023</b>

Accessories		
Overvoltage protection device	-	-
Door lock	-	-
Wall mounting strap	10008475 (see page 61)	10008475 (see page 61)
MC4 connector	20001031 (see page 61)	20001031 (see page 61)
Fuses 8A	10007591 (see page 62)	10007591 (see page 62)
Fuses 10A	10007592 (see page 62)	10007592 (see page 62)
Fuses 12A	10007593 (see page 62)	10007593 (see page 62)



# Generator connection boxes with 6 fuses



Type	S-1000-6(x2)Sx-X-Y-PC-4.0	S-600-6(x2)Sx-X-M-PC-4.0
Max. Uoc	1000V	600V
Max. Umpp (Ue)	-	-
Max. Isc ( $\Sigma$ )	40A	40A
Max. Isc (String)	8,5A	8,5A
Strings	6	6
Multi-MPP	-	-
Input terminals	10mm <sup>2</sup>	10mm <sup>2</sup>
Output terminals	16mm <sup>2</sup>	16mm <sup>2</sup>
Overvoltage protection device	C	C
Load breaking device	-	-
String fuse	10x38mm	10x38mm
String-diode	-	-
String-monitoring	-	-
Protection class	II	II
Cable inlets	DIN-cable glands	DIN-cable glands
Material of the enclosure	IP65; PC	IP65; PC
Dimensions (WxHxD)	360x254x165mm	360x254x165mm
Article-no.	<b>20001024</b>	<b>20001025</b>

Accessories		
Overvoltage protection device	10006519 (see page 50)	10007872 (see page 50)
Door lock	-	-
Wall mounting strap	10008475 (see page 61)	10008475 (see page 61)
MC4 connector	20001031 (see page 61)	20001031 (see page 61)
Fuses 8A	10007591 (see page 62)	10007591 (see page 62)
Fuses 10A	10007592 (see page 62)	10007592 (see page 62)
Fuses 12A	10007593 (see page 62)	10007593 (see page 62)



S-600-6(x2)Sx-T40-M-PC-4.0

S-1000-6(x2)Sx-T40-Y-PC-4.0

S-1000-6(x2)Sx-T40-X-PC-4.0

600V	1000V	1000V
600V	900V	900V
40A	40A	40A
8,5A	8,5A	8,5A
6	6	6
-	-	-
10mm <sup>2</sup>	10mm <sup>2</sup>	10mm <sup>2</sup>
16mm <sup>2</sup>	16mm <sup>2</sup>	16mm <sup>2</sup>
C	C	-
DC21-A	DC21-A	DC21-A
10x38mm	10x38mm	10x38mm
-	-	-
-	-	-
II	II	II
DIN-cable glands	DIN-cable glands	DIN-cable glands
IP65; PC	IP65; PC	IP65; PC
254x360x165mm	254x360x165mm	254x360x165mm
<b>20001026</b>	<b>20001027</b>	<b>20001028</b>

10007872 (see page 50)	10006519 (see page 50)	-
-	-	-
10008475 (see page 61)	10008475 (see page 61)	10008475 (see page 61)
20001031 (see page 61)	20001031 (see page 61)	20001031 (see page 61)
10007591 (see page 62)	10007591 (see page 62)	10007591 (see page 62)
10007592 (see page 62)	10007592 (see page 62)	10007592 (see page 62)
10007593 (see page 62)	10007593 (see page 62)	10007593 (see page 62)



# Generator connection boxes 800V with blocking diodes

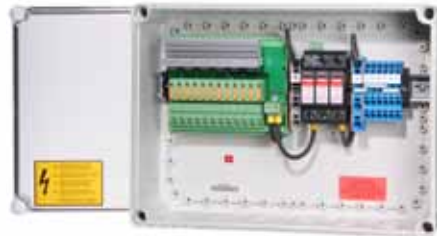
The generator connection boxes with blocking diodes protect thin film panels against too high reverse currents. The specially designed low-loss diode technology is due to different cooling components also suitable for outdoor applications. Particular attention was paid to the thermo management, as the boxes are exposed to deviating temperatures. All diode units are equipped with disconnect terminals which allow easy measurements of individual strings. Pressure differential valves prevent condensation inside the box.



Type	S-800-6DT-X-X-PC-2.0	S-800-12DT-X-X-PC-2.0
Max. U <sub>oc</sub>	800V	800V
Max. U <sub>mpp</sub> (U <sub>e</sub> )	-	-
Max. I <sub>sc</sub> (Σ)	18A	36A
Max. I <sub>sc</sub> (String)	3A	3A
Strings	6	12
Multi-MPP	-	-
Input terminals	6mm <sup>2</sup>	6mm <sup>2</sup>
Output terminals	16mm <sup>2</sup>	16mm <sup>2</sup>
Overvoltage protection device	-	-
Load breaking device	-	-
String fuse	-	-
String-diode	1600V/30A	1600V/30A
String-monitoring	-	-
Protection class	II	II
Cable inlets	DIN-cable glands	DIN-cable glands
Material of the enclosure	IP65; PC	IP65; PC
Dimensions (WxHxD)	280x280x130mm	280x280x130mm
Article-no.	<b>10006873</b>	<b>10006874</b>

Accessories		
Overvoltage protection device	-	-
Door lock	-	-
Wall mounting strap	-	-
MC4 connector	-	-
Fuses 8A	-	-
Fuses 10A	-	-
Fuses 12A	-	-





S-800-6DT-X-Y-PC-2.0	S-800-12DT-X-Y-PC-3.0	S-800-6DT-T25-Y-PC-2.0
800V	800V	800V
-	-	600V
18A	36A	18A
3A	3A	3A
6	12	6
-	-	-
6mm <sup>2</sup>	6mm <sup>2</sup>	6mm <sup>2</sup>
16mm <sup>2</sup>	16mm <sup>2</sup>	16mm <sup>2</sup>
C	C	C
-	-	DC21-A
-	-	-
1600V/30A	1600V/30A	1600V/30A
-	-	-
II	II	II
DIN-cable glands	DIN-cable glands	DIN-cable glands
IP65; PC	IP65; PC	IP65; PC
280x280x130mm	380x280x130mm	380x280x130mm
<b>10006875</b>	<b>10006876</b>	<b>10006877</b>

10006519 (see page 50)	10006519 (see page 50)	10006519 (see page 50)
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-



# Generator connection boxes 800V with blocking diodes



Type	S-800-12DT-T40-Y-PC-3.0	S-800-12DT-X-X-AL-1.0
Max. U <sub>oc</sub>	800V	800V
Max. U <sub>mpp</sub> (U <sub>e</sub> )	600V	-
Max. I <sub>sc</sub> (Σ)	36A	36A
Max. I <sub>sc</sub> (String)	3A	3A
Strings	12	12
Multi-MPP	-	-
Input terminals	6mm <sup>2</sup>	6mm <sup>2</sup>
Output terminals	16mm <sup>2</sup>	16mm <sup>2</sup>
Overvoltage protection device	C	-
Load breaking device	DC21-A	-
String fuse	-	-
String-diode	1600V/30A	1600V/30A
String-monitoring	-	-
Protection class	II	II
Cable inlets	DIN-cable glands	DIN-cable glands
Material of the enclosure	IP65; PC	IP65; ALU
Dimensions (WxHxD)	380x280x130mm	280x230x110mm
Article-no.	<b>10006878</b>	<b>10007079</b>

Accessories		
Overvoltage protection device	10006519 (see page 50)	-
Door lock	-	-
Wall mounting strap	-	-
MC4 connector	-	-
Fuses 8A	-	-
Fuses 10A	-	-
Fuses 12A	-	-



S-800-14DT-X-X-AL-1.0

800V
-
36A
2,6A
12
-
6mm <sup>2</sup>
16mm <sup>2</sup>
-
-
-
1600V/30A
-
II
DIN-cable glands
IP65; ALU
280x230x110mm
<b>10007189</b>

-
-
-
-
-
-
-
-



# Generator connection boxes 1000V with blocking diodes

The generator connection boxes with blocking diodes protect thin film panels against too high reverse currents. The specially designed low-loss diode technology is due to different cooling components also suitable for outdoor applications. Particular attention was paid to the thermo management, as the boxes are exposed to deviating temperatures. All diode units are equipped with disconnect terminals which allow easy measurements of individual strings. Pressure differential valves prevent condensation inside the box.



Type	S-1000-6DT-X-X-PC-1.0	S-1000-12DT-X-X-PC-1.0
Max. U <sub>oc</sub>	1000V	1000V
Max. U <sub>mpp</sub> (U <sub>e</sub> )	-	-
Max. I <sub>sc</sub> (Σ)	18A	36A
Max. I <sub>sc</sub> (String)	3A	3A
Strings	6	12
Multi-MPP	-	-
Input terminals	6mm <sup>2</sup>	6mm <sup>2</sup>
Output terminals	16mm <sup>2</sup>	16mm <sup>2</sup>
Overvoltage protection device	-	-
Load breaking device	-	-
String fuse	-	-
String-diode	2200V/30A	2200V/30A
String-monitoring	-	-
Protection class	II	II
Cable inlets	DIN-cable glands	DIN-cable glands
Material of the enclosure	IP65; PC	IP65; PC
Dimensions (WxHxD)	320x320x179mm	320x320x179mm
Article-no.	<b>10007423</b>	<b>10007246</b>

Accessories		
Overvoltage protection device	-	-
Door lock	-	-
Wall mounting strap	-	-
MC4 connector	-	-
Fuses 8A	-	-
Fuses 10A	-	-
Fuses 12A	-	-



Diodenbox MINI 1000/9

1000V
-
9A
9A
1
-
MC4
MC4
-
-
-
2200V/30A
-
II
-
IP65; ALU
126x46x32mm
<b>10008068</b>

-
-
-
-
-
-
-
-



# String array box 1000V

The enwi string array box was specially designed for the outdoor environment and for the application of powerful central inverters. For the reverse current protection we use the string fuses of the gPV-series, which reliably cuts off fault currents already at low irradiation. Cross-sections and ampacity comply with market standards and can be optionally increased. Especially in exposed installations we recommend the deployment of surge arresters to protect inverters and solar panels against overvoltage.



Type	S-1000-8Sx-X-X-PC-3.0	S-1000-12Sx-X-X-PC-3.0
Max. Uoc	1000V	1000V
Max. Umpp (Ue)	-	-
Max. Isc (Σ)	70A	70A
Max. Isc (String)	8,5A	5A
Strings	8	12
Multi-MPP	-	-
Input terminals	10mm <sup>2</sup>	10mm <sup>2</sup>
Output terminals	35mm <sup>2</sup>	35mm <sup>2</sup>
Overvoltage protection device	-	-
Load breaking device	-	-
String fuse	10x38mm	10x38mm
String-diode	-	-
String-monitoring	-	-
Protection class	II	II
Cable inlets	DIN-cable glands	DIN-cable glands
Material of the enclosure	IP65; PC	IP65; PC
Dimensions (WxHxD)	380x280x130mm	560x280x130mm
Article-no.	<b>10006879</b>	<b>10006880</b>

Accessories		
Overvoltage protection device	-	-
Door lock	-	-
Wall mounting strap	-	-
MC4 connector	20001031 (see page 61)	20001031 (see page 61)
Fuses 8A	10007591 (see page 62)	10007591 (see page 62)
Fuses 10A	10007592 (see page 62)	10007592 (see page 62)
Fuses 12A	10007593 (see page 62)	10007593 (see page 62)



S-1000-85x-X-Y-PC-3.0	S-1000-125x-X-Y-PC-3.0	S-1000-85x-T160-Y-PC-3.0
1000V	1000V	1000V
-	-	1000V
70A	70A	70A
8,5A	5A	8,5A
8	12	8
-	-	-
10mm <sup>2</sup>	10mm <sup>2</sup>	10mm <sup>2</sup>
35mm <sup>2</sup>	35mm <sup>2</sup>	25 - 50mm <sup>2</sup>
C	C	C
-	-	DC21-A
10x38mm	10x38mm	10x38mm
-	-	-
-	-	-
II	II	II
DIN-cable glands	DIN-cable glands	DIN-cable glands
IP65; PC	IP65; PC	IP65; PC
380x280x130mm	560x280x130mm	760x320x179mm
<b>10006881</b>	<b>10006882</b>	<b>10006883</b>

10006519 (see page 50)	10006519 (see page 50)	10006519 (see page 50)
-	-	-
-	-	-
20001031 (see page 61)	20001031 (see page 61)	20001031 (see page 61)
10007591 (see page 62)	10007591 (see page 62)	10007591 (see page 62)
10007592 (see page 62)	10007592 (see page 62)	10007592 (see page 62)
10007593 (see page 62)	10007593 (see page 62)	10007593 (see page 62)



# String array box 1000V



Type	S-1000-125x-T160-Y-PC-3.0
Max. Uoc	1000V
Max. Umpp (Ue)	1000V
Max. Isc ( $\Sigma$ )	70A
Max. Isc (String)	5A
Strings	12
Multi-MPP	-
Input terminals	10mm <sup>2</sup>
Output terminals	25 - 50mm <sup>2</sup>
Overvoltage protection device	C
Load breaking device	DC21-A
String fuse	10x38mm
String-diode	-
String-monitoring	-
Protection class	II
Cable inlets	DIN-cable glands
Material of the enclosure	IP65; PC
Dimensions (WxHxD)	960x320x179mm
Article-no.	<b>10006884</b>

Accessories	
Overvoltage protection device	10006519 (see page 50)
Door lock	-
Wall mounting strap	-
MC4 connector	20001031 (see page 61)
Fuses 8A	10007591 (see page 62)
Fuses 10A	10007592 (see page 62)
Fuses 12A	10007593 (see page 62)



The enwi string array box with string current measurement is predominantly used in large PV parks. The measurement of string currents allows the precocious detection of faults and ensures there for the best yield. Due to the distance between the PV panels and the inverter we recommend additional disconnect terminals in the field.

For security reasons, the string array box could be optionally equipped with a DC-breaker which can be remotely switched off. In connection with our UPS controller and a small automatic fire detection system, dangerous DC-voltages could be shut off and thus protect inverter stations against fire.



Type	SV-1000-9S12-T125-Y-US-PC-1.0	SV-1000-12S8-T125-Y-US-PC-2.0
Max. Uoc	1000V	1000V
Max. Umpp (Ue)	1000V	1000V
Max. Isc (Σ)	125A	125A
Max. Isc (String)	8,5A	8,5A
Strings	8	12
Multi-MPP	-	-
Input terminals	10mm <sup>2</sup>	10mm <sup>2</sup>
Output terminals	M10	M10
Overvoltage protection device	C	C
Load breaking device	4-pol. 125A	4-pol. 125A
String fuse	10x38mm	10x38mm
String-diode	-	-
String-monitoring	i'checker (meteocontrol)	i'checker (meteocontrol)
Protection class	II	II
Cable inlets	DIN-cable glands	DIN-cable glands
Material of the enclosure	IP65; PC	IP65; PC
Dimensions (WxHxD)	660x320x179mm	760x320x179mm
Article-no.	<b>10003751</b>	<b>10005385</b>

Accessories		
Overvoltage protection device	10006519 (see page 50)	10006519 (see page 50)
Door lock	-	-
Wall mounting strap	-	-
MC4 connector	20001031 (see page 61)	20001031 (see page 61)
Fuses 8A	10007591 (see page 62)	10007591 (see page 62)
Fuses 10A	10007592 (see page 62)	10007592 (see page 62)
Fuses 12A	10007593 (see page 62)	10007593 (see page 62)



## String array box 1000V with monitoring (meteocontrol)



Type	SV-1000-16S12-T315-Y-US-PC-1.0
Max. Uoc	1000V
Max. Umpp (Ue)	1000V
Max. Isc ( $\Sigma$ )	145A
Max. Isc (String)	8,5A
Strings	16
Multi-MPP	-
Input terminals	10mm <sup>2</sup>
Output terminals	M12
Overvoltage protection device	C
Load breaking device	4-pol. 315A
String fuse	10x38mm
String-diode	-
String-monitoring	i'checker (meteocontrol)
Protection class	II
Cable inlets	DIN-cable glands
Material of the enclosure	IP65; PC
Dimensions (WxHxD)	960x320x179mm
Article-no.	<b>10006090</b>

Accessories	
Overvoltage protection device	10006519 (see page 50)
Door lock	-
Wall mounting strap	-
MC4 connector	20001031 (see page 61)
Fuses 8A	10007591 (see page 62)
Fuses 10A	10007592 (see page 62)
Fuses 12A	10007593 (see page 62)

The enwi string array box with string current measurement is predominantly used in large PV parks. The measurement of string currents allows the precocious detection of faults and ensures there for the best yield. Due to the distance between the PV panels and the inverter we recommend additional disconnect terminals in the field.

For security reasons, the string array box could be optionally equipped with a DC-breaker which can be remotely switched off. In connection with our UPS controller and a small automatic fire detection system, dangerous DC-voltages could be shut off and thus protect inverter stations against fire.



Type	SA-1000-8(x2)-TSX-T125-Y-PES-1.0
Max. Uoc	1000V
Max. Umpp (Ue)	1000V
Max. Isc (Σ)	140A
Max. Isc (String)	8,5A
Strings	16
Multi-MPP	1
Input terminals	6mm <sup>2</sup>
Output terminals	M10
Overvoltage protection device	C
Load breaking device	4-pol. 200A
String fuse	14x51mm
String-diode	-
String-monitoring	StringGuard (skytron® energy)
Protection class	II
Cable inlets	DIN-cable glands
Material of the enclosure	IP43; Polyester
Dimensions (WxHxD)	528x820x266mm
Article-no.	<b>10003516</b>

Accessories	
Overvoltage protection device	10006595 (see page 52)
Door lock	-
Wall mounting strap	-
MC4 connector	-
Fuses 8A	-
Fuses 10A	-
Fuses 12A	-



## Array junction boxes for larger PV-plants

The enwi junction boxes provide basically the protection of string cables in large PV plants. The especially powerful NH-DC fuses prevent an overload of the cables in case of short circuits. Optionally they can be equipped with disconnect terminals and surge arresters to protect the inverters or to disconnect for maintenance works. Beside standard array junction boxes we offer also customized solution for complex PV projects.



Please contact us for further details!

The enwi-etec low voltage distribution boards are especially designed for the particular requirements of PV systems and for the permanent resulting current values.

All AC-products are configured according to IEC EN 60439-1, IEC EN 62208, VDE 0298-4 and VDE 0100-520.

Beside standard low voltage distribution boards we offer also customized solutions.

Please contact us for further details!



# Emergency shut off switch

Due to the growing number of PV installations it happens more often that fire fighters are confronted with PV systems.

Although the PV system is in most of the cases not the cause for the fire, there is a danger that the PV arrays cannot be completely shut off or de-energized.

The challenge for the firemen is not the direct splashing of water on the PV array. There are existing instructions depending on the distance and the voltage. The real danger occurs when they enter a building in which walls, floors or cable ducts are immersed with water.

enwi-etc offers an intelligent solution which consists of an emergency shut off switch, which can be remotely activated and an UPS controller. It ensures a reliable de-energizing of all power lines inside the building. Through this, the risk for the fire fighters is minimized.

The emergency shut off switch is placed right after the entry into the building or in case of a protected outer space directly next to the PV array. It shuts off on request or automatically in connection with an existing automatic fire detection system.

## Emergency shut off switch

The functionality of the emergency shut off switch can be integrated in many of our standard string or combiner boxes. However enwi has developed special solutions which are adjusted for the particular application.

We are relying on proven industry technology. All boxes are equipped with safety relays according cat. 4 EN954-1/ PL e and EN ISO 13849-1. To avoid an undesired shut off due to short-term interruptions of the power supply the emergency shut off switch is interconnected with an UPS controller. In this case all switch settings are transmitted via potential free contacts to the controller.

## UPS Controller

The controller is the center of the intelligent security solution. All data and operating modes are collected here.

The integrated back-up system prevents from uncontrolled shut off due to short-term interruptions of the power supply.

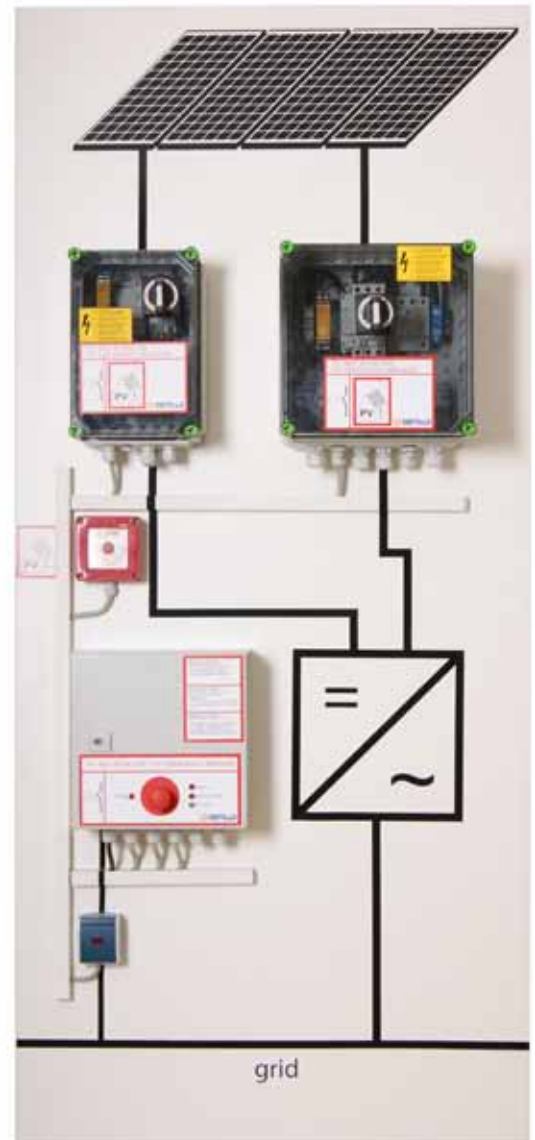
Besides the back-up function there is also the possibility to connect peripheral devices.

Two additional inputs are available to connect an external shut off switch. There is also the provision for interconnection with an automatic fire detection system.

Status reports can be sent with SMS or e-mails to individuals or groups via an optional available GSM controller.

This controller can also be used to control the system with SMS or to request status reports.

LEDs at the front side show the different operating modes.





Type	S-1000-2RT-T30-X-PC-1.0_BR	S-1000-1R-T60-X-PC-1.0_24_BR
Max. Uoc	1000V	1000V
Max. Umpp (Ue)	1000V	1000V
Max. Isc (Σ)	-	-
Max. Isc (String)	30A	63A
Strings	2	1
Multi-MPP	-	-
Input terminals	16mm <sup>2</sup>	35mm <sup>2</sup>
Output terminals	16mm <sup>2</sup>	35mm <sup>2</sup>
Overvoltage protection device	-	-
Load breaking device	DC-21A	DC-21A
String fuse	-	-
String-diode	-	-
String-monitoring	-	-
Protection class	II	II
Cable inlets	DIN-cable glands	DIN-cable glands
Material of the enclosure	IP65; PC	IP65; PC
Dimensions (WxHxD)	220x320x235mm	320x320x315mm
Article-no.	<b>10008216</b>	<b>10008235</b>

Type	UPS-Controller_230AC_BR_V1.0
Nominal voltage	230V/50Hz
Fuse	Max. 16A
Control voltage	24V
Backup voltage	24V
Battery	24V/1,3Ah
Max. UPS current	4A
Overvoltage protection device	-
Connection in/out	4mm <sup>2</sup>
Backup time	Adjustable 0-8h
Signal	LED front
Mounting	Wall
Material of the enclosure	IP54; steel
Dimensions (WxHxD)	300x300x205mm
Cable inlets	DIN-cable glands
Article-no.	<b>10008224</b>



# Inverter stations

## Concept

The innovativ concept „enwi Grid Cluster“ offers a plug-and-play solution for string inverters in the outdoor area. The strong and thermally optimized construction, offers perfect conditions for a long life of your inverters. The installation time will be reduced to a minimum.

## Development

The thermal optimized cabinet is especially developed for outdoor applications. It is a high quality product with stainless steel and double wall aluminium profiles, which provides excellent stability and user friendliness. The desired configuration will be individual prepared from our experienced team of technicians, according to national or international requirements.

## Connection

The Grid Cluster is pre-assembled from enwi-etic and will be delivered ready for connection to the PV-field. The inverters could be mounted in the field or before in our production. All necessary parts for the AC connection, like fuses, RCD, switches and over voltage protection, are in a separate compartment.

The DC connection could be planned customer specific with load breaker and/or overvoltage protection. Fuses to protect the strings against overcurrent could be implemented as well.

## Mounting

The socket of the Grid Cluster can be fixed on up to 6 points. Statically it can also be placed on 4 points with ground screws. In this situation no concrete foundation is required.

By means of four mounting eyes on the top it can be lifted to the exact position on the foundation.

## Experience

Our customers are very satisfied with this solution: Due to the utilization of standard components and string inverters it is possible that local placed maintenance companies could take care of the support after a short training.

## Visual appearance

The design enables the positioning underneath or behind the modules. Grid cluster and the modul array are aligned.

## It's the efficiency!

Our concept allows the integration of the newest generation of high efficiency inverters. In contrast to a central inverter our solution offers multiple independent MPP trackers.

This avoids mismatching losses and minimizes the drop of power caused by shadows.

## Monitoring

With the application of string- respectively mini central inverters, there will be no further costs for expensive junction boxes with string current measuring systems.

Our recommendation is to use in the field only boxes with overvoltage protection and fuses.







Type	Grid Cluster
Max. inverter power AC	100kW
AC-connection	230/400VAC/50Hz
Protection class	IP54
Material of the enclosure	Aluminium
Enclosure socket	V2A
Climatisation	Continuous control
Connection	Grid feed-in; External grid supply
Colour cover/socket	RAL5002
Colour frame/doors	RAL7035
Weight (without inverter)	600kg
Dimensions (WxHxD)	2400x2015x650mm
Article-no.	<b>On request</b>



## Offgrid systems

Intelligent photovoltaic island systems are an important step to make sure that people all over the world have access to electric energy. Electrical infrastructure allows you to have more comfort on isolated places, like supply of water, electric light, television and internet. "enwi offgrid boxes" are complete island systems, fully assembled including all technical equipment like charge controller, inverter and batteries. Solid steel cases provide an optimal protection against environmental conditions and external influences. The usage of standard components allow an easy service in case of a failure.

Typical applications for "enwi offgrid boxes" are mountain shelters, boats, holiday houses and small tap water supplies. Solar Home Systems make sure that you have continual energy to use your equipment.

Depending on the irradiation in your area the offgrid boxes can be used with one or two PV-modules. Furthermore high efficient consumer loads like LED-lights and special refrigerators for island systems are extending the operation time of the system.

enwi uses charge controllers with a high power efficiency factor to get a maximum of energy to the batteries. Real sine-wave inverters allow a usage of electronic devices without any risk of damage.

The charge controller protects the batteries by a deep discharge protection and it shows the actual state of charge via different colored LED's on the front.

All "enwi offgrid boxes" have an included main switch which allows the user to shut down the complete system.

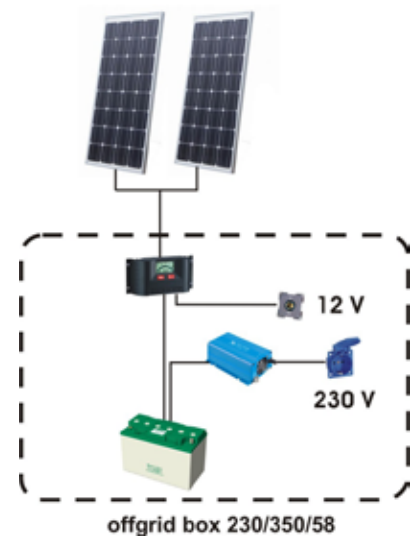
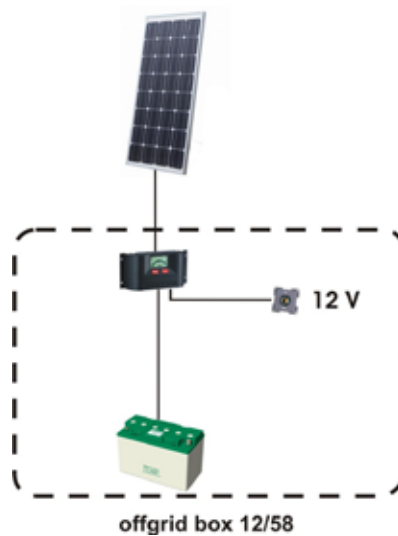
Special keylocks at the front-door are protecting the system of unauthorized usage.

The sine-wave inverters are working with a passive ventilation system without any fans, which afford a usage also in high ambient temperatures.






Type	enwi offgrid boxes 12/58	enwi offgrid boxes 230/350/58
Nominal voltage (Un)	12V DC	230V AC
Max. rated current	10A	2,8A (10s)
Nominal power	120W	300VA
Battery	12V/58Ah	24V/58Ah
Power PV-module	80-100Wp	200-400Wp
Charge controller	10A	20A
Plugs	12V	3x230V
Connection consumer load	Clamps 10m <sup>2</sup>	-
Main switch	Yes	Yes
Material	IP54; Steel	IP54; Steel
Door lock	Yes	Yes
Module connection	Clamps	MC4 plug
Dimensions (WxHxD)	400x500x250mm	600x600x250mm
Typical applications	Energy saving lamp 4x9W (5h)	Energy saving lamp 4x9W (5h); TV 75W (5h); Refrigerator 280Wh/day
Article-no.	<b>10008570</b>	<b>10008571</b>







# Electric-Mobility

# Charging stations for electric-mobility

## Electric driving is the future

Driving on electricity is the new alternative to conventional driving with combustion engines. Nowadays, electric cars have a range between 100 and 400 kilometers. During the next years, most types will enable a range from 150 to 200 km without recharging. Several studies show that more than 60 % of all car trips are shorter than 50 kilometers, more than 30 % are even shorter than 25 kilometers. Moreover, the average car has a daily idle time of 23 hours. These figures demonstrate that the range of electric cars is already sufficient nowadays in order to cover most part of our mobility, particularly in commuting and city traffic. If in addition sufficient possibilities exist to recharge the vehicle again and again at appropriate places, e.g. on public car parks, on the premises of the employer, at the supermarket or at home, electromobility will be no longer limited. enwi-etec offers high-functional charging stations for public areas and companies as well as for private users.

## e-tower for public areas and companies

e-tower is a modularly constructed electric charging station with innovative details for up to 4 vehicles. Three different types are offered subject to the chosen connector types. The available plug types are earthed plugs 230V/10 or 16A, CEE 230V/16A, CEE 400V/32A as well as CEE 7-pin 400V/32A. As the sockets are installed on exchangeable adapter plates, further connector types can be used on demand. The easy menu-driven operation by means of a color display and two lighted stainless steel buttons enables a comfortable charging of up to two electric cars at the same time. A stand-alone device is offered for individual installation. For charging facilities with several charging columns, e.g. used for public car parks or companies' electric vehicle fleets, master – slave configurations are used. As the e-tower is mostly installed outdoors, the perfectly designed high-quality stainless steel housing is noncorrosive and weather-proof and it is configured for a temperature range from -20°C to +50°C.

## Security

Because the column is as a rule freely accessible and the owner of the electric vehicle standardally is not present during the complete recharging time, comprehensive security measures are necessary. The registration and authorization is realized by means of a RFID chip or a chip card. The socket is de-energized as long as the electric vehicle and the charging station are correctly connected. At the same time, the connector at the column is secured. If the connection is interrupted or if any manipulation attempt is made, the charging process is immediately stopped and an error message is created. In order to continue the charging process, the user authorization becomes necessary again. In case of overload, the system is automatically disconnected and an alarm message is given. Optionally, a sub-surface pedestal equipped with a collision sensor is available. If the column is damaged, the power supply to the column is interrupted.

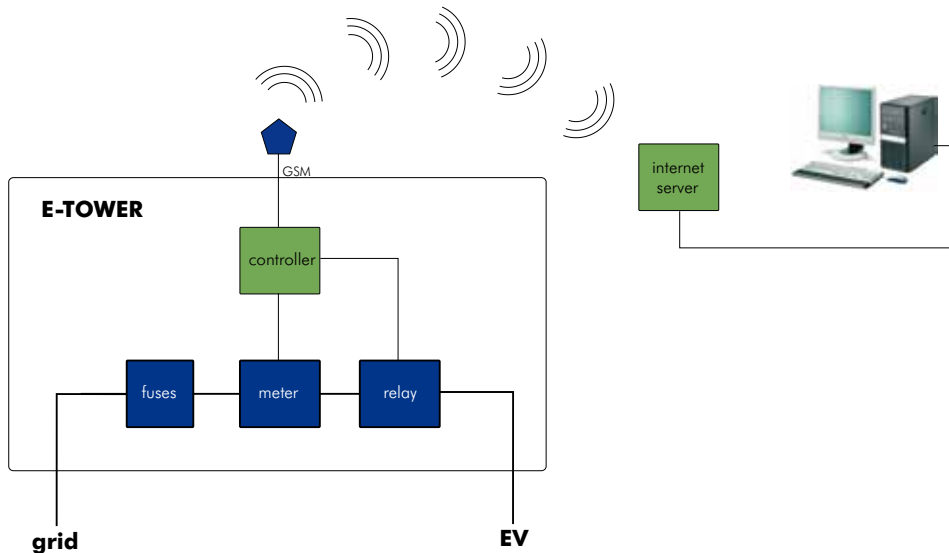
## Customer administration and payment options

The central administration of customer data is realized via SQL database using a MS-SQL server express software being free of charge. Due to registration and authorization with the RFID chip, all customer data for the charging process are registered, saved in the SQL database and are made available for invoicing by a report manager. The reporting can be carried out via any PC being part of the network or with the standard browser via TCP/IP. Invoicing (e.g. monthly) can be automatized at any time. Further options are a "prepaid version" and a flat rate.



### Data transmission and network connection

The transmission of data and the communication from the e-tower to the SQL server or rather between master and slave can be carried out by a wired Ethernet or optionally via GSM (VPN).



### e-boxes for private use

enwi's product range of charging stations is completed by two different types of compact wall housings for private use. The e-boxes are not designed for authorization, registration and invoicing. For installations used in accessible outdoor areas (e.g. of hotels and restaurants), a key lock is optionally possible. The e-boxes can be equipped with earthed sockets and CEE sockets (230V/16A; 400V/16A/32A). In order to monitor electricity consumption, an electricity meter having a S0 interface is integrated into the box.

### Electricity is not all the same

The climate neutrality of electric vehicles which is often praised ("zero-emission vehicle") can only be reached when the electricity used for recharging the vehicle is produced in a climate neutral way. The one who only displaces carbon production from the vehicle's engine to the generators of coal-fired power plants has not yet contributed to climate protection. According to an analysis of the Agency of Renewable Energies, electromobility only reduces carbon emission per driven kilometer in a significant way when electricity originates from renewable energies (RE). Anyhow, the German federal government has the objective that renewable energies will cover 35 percent of the electricity supply in 2020 and that the number of electric vehicles will amount up to 1 million. The larger the share of renewable energies in the electricity supply, the more climate-friendly is an electric vehicle if it is recharged with public electricity.

### Putting the sun into the fuel tank! – Solar mobility

The most climate-friendly way is to transfer electricity produced from renewable energies directly at the place of its production to the electric car. As photovoltaic plants can even be installed on very small roofs and plant surfaces of 20 m<sup>2</sup> are already sufficient for operating electric cars, compared with all other renewable energies solar electricity offers the best possibility of supplying electric cars with electricity. Even if the energy required for producing solar modules is taken into consideration, only a few grams of carbon are emitted per driven kilometer in result. Moreover, cars always need a parking area and therefore it is recommended to equip car parks with solar carports. The surface of a car park is sufficient for producing more than two-thirds of the annual energy demand for an electric car by means of photovoltaic systems. In this context, the financial support stipulated since 2009 in the German Renewable Energy Law for solar electricity that is not fed into the grid but consumed directly at the place of its production is a favorable aspect. The supply of electricity to electric vehicles can be realized by using on-grid or off-grid systems. In case of on-grid charging stations, the photovoltaic plant produces the amount of electricity which is used for recharging electric vehicles at the recharging facility. In case of off-grid supply, the electricity produced from photovoltaic systems is intermediately stored.

As one of the leading manufacturers of connection technology for photovoltaic systems, enwi-eteC has many years of experience in the photovoltaic industry and together with its cooperation partners it has the necessary know-how and range of products in order to realize intelligent charging facilities.





Type	e-tower CEE	e-tower Mix	e-tower Pro
Nominal voltage	400V/50Hz	400V/50Hz	400V/50Hz
Fuses	63A	63A	63A
Protection class	IP44	IP44	IP44
Standards	VDE 0100; EN 61851-1; EN 61851-21/22; EN 61180-1	VDE 0100; EN 61851-1; EN 61851-21/22; EN 61180-1	VDE 0100; EN 61851-1; EN 61851-21/22; EN 61180-1
Communication	Ethernet (GSM, UMTS as option)	Ethernet (GSM, UMTS as option)	Ethernet (GSM, UMTS as option)
Material of the enclosure	Stainless steel V2A (powder-coated)	Stainless steel V2A (powder-coated)	Stainless steel V2A (powder-coated)
Plug (right hand side)	230/16A Schuko; 400V/32A 5-pol CEE	400V/32A 7-pol CEE 7/7	400V/32A 7-pol CEE 7/7
Plug (left hand side)	230/16A Schuko; 400V/32A 5-pol CEE	230/16A Schuko; 400V/32A 5-pol CEE	400V/32A 7-pol CEE 7/7
Dimensions (WxHxD)	330x1600x300mm	330x1600x300mm	330x1600x300mm
Identification	RFID	RFID	RFID
Operation	Menu-driven	Menu-driven	Menu-driven
Article-no.	<b>10008419</b>	<b>10008420</b>	<b>10008421</b>





Type	e-box-400-2-C-S0	e-box ST230_S0
Nominal voltage	400V/50Hz	230V/50Hz
Current max.	32A	16A
Fuses	16A/25A	16A
RCD	40A/0,03A	25A/0,03A
Material of the enclosure	Polycarbonate IP65	Polycarbonate IP65
Plug	CEE 230V/16A, CEE 400V/32A	Schuko 230V/16A
Protection class	IP44	IP44
Meter	65A/400V with S0	32A/230V with S0
Dimensions (WxHxD)	300x450x142mm	125x200x122mm
Article-no.	<b>10007627</b>	<b>10008423</b>







# Components and accessories

# DC overvoltage protection

Surge arresters protect inverters and PV panels against overvoltage. Depending on the application especially designed versions of arresters are used.



Type	DS50 PV 600FS Type 2 arrester	DS50 PV 1000FS Type 2 arrester	DS50VGPVS-500 Type 2 arrester
Nominal voltage (Un)	600V	1000V	500V
Max. period voltage (Uc)	600V	1060V	600V
Surge current (10/350) $\mu$ s (Iimp)	-	-	-
Max. discharge surge current (8/20) $\mu$ s (Imax)	40A	40A	40A
Nom. discharge surge current (8/20) $\mu$ s (In)	20A	20A	20A
Protection level (Up)	1,8kV	3,6kV	2,5kV
Protection level (Up) at 5 kA	1,0kV	2,6kV	1,8kV
Leakage current (Ic)	<1mA	<1mA	-
Grid follow current (If)	-	-	-
Grid follow current extintion (Ifi)	$\infty$	$\infty$	$\infty$
Response time (tA)	<25ms	<25ms	<25ms
Short circuit (Ip)	25A	25A	25A
Fuses	125A	125A	-
Defect indication	Mech. + contact	Mech. + contact	Mech. + contact
Temperature (operation)	-40 to +85°C	-40 to +85 °C	-40 to +85°C
Protection class	IP20	IP20	IP20
Mounting on	Cap rail	Cap rail	Cap rail
Dimensions	2TE	3TE	3TE
DIN EN 61643-11 Germany	Type 2	Type 2	Type 2
IEC 61643-1 International	SPD Class II	SPD Class II	SPD Class II
EN-61643-11 Europe	SPD Class II	SPD Class II	SPD Class II
UL1449 ed.2 USA	TVSS	TVSS	TVSS
Article-no.	<b>10007872</b>	<b>10006519</b>	<b>10008116</b>



DS50VGPVS-1000 Type 2 arrester	DS60VGPV-500 Type 1+2 arrester	DS60VGPV-1000 Type 1+2 arrester
1000V	500V	1000V
1200V	600V	1200V
-	12,5A	12,5A
40A	40A	40A
20A	20A	20A
3,6kV	1,7kV	2,8kV
2,6kV	1,4kV	2,3kV
-	-	-
-	-	-
∞	∞	∞
<25ms	<25ms	<25ms
25A	25A	25A
-	-	-
Mech. + contact	Mech. + contact	Mech. + contact
-40 to +85°C	-40 to +85°C	-40 to +85°C
IP20	IP20	IP20
Cap rail	Cap rail	Cap rail
3TE	4TE	4TE
Type 2	Type 1+2	Type 1+2
SPD Class II	SPD Class I+II	SPD Class I+II
SPD Class II	SPD Class I+II	SPD Class I+II
TVSS	TVSS	TVSS
<b>10008115</b>	<b>10008118</b>	<b>10008117</b>



# DC overvoltage protection



Type	VAL-MS 1000DC/2+V-FM/40	DG M YPV SCI 1000	DG M YPV SCI 1000 FM
Nominal voltage (Un)	1000V	1000V	1000V
Max. period voltage (Uc)	1000V	1000V	1000V
Surge current (10/350) $\mu$ s (Iimp)	-	-	-
Max. discharge surge current (8/20) $\mu$ s (Imax)	30A	40A	40A
Nom. discharge surge current (8/20) $\mu$ s (In)	15A	25A	25A
Protection level (Up)	5kV	4kV	4kV
Protection level (Up) at 5 kA	4kV	3,5kV	3,5kV
Leakage current (Ic)	-	-	-
Grid follow current (If)	-	-	-
Grid follow current extintion (Ifi)	$\infty$	$\infty$	$\infty$
Response time (tA)	<25ms	<25ms	<25ms
Short circuit (Ip)	n. s.	1000A	1000A
Fuses	80A	-	-
Defect indication	Optic + contact	Optic	Optic + contact
Temperature (operation)	-40 to +80°C	-40 to +80°C	-40 to +80°C
Protection class	IP20	IP20	IP20
Mounting on	Cap rail	Cap rail	Cap rail
Dimensions	3TE	3TE	3TE
DIN EN 61643-11 Germany	Type 2	Type 2	Type 2
IEC 61643-1 International	SPD Class II	Class II	Class II
EN-61643-11 Europe	SPD Class II	Class II	Class II
UL1449 ed.2 USA	n. s.	UL	UL
Article-no.	<b>10006595</b>	<b>10007579</b>	<b>10007277</b>

In modern PV system there are many data and telecommunication lines. Beside solarization sensors and RS485 lines other networks are very often connected. An overvoltage on these lines could also lead to damages of the PV equipment. Due to this risk it is always recommended to install a suitable overvoltage protection.



Type	DLU-06D3	DLU-24D3	DLA-170
Application	RS485/RS422	4-20	Analogue + DSL
Connection	1 twin wire + shield	1 twin wire + shield	1 twin wire + shield
Nominal voltage (Un)	6V	24V	150V
Max. operating voltage DC/AC (Uc)	10/7V	28/20V	170/121V
Max. operating current (IL)	300mA	300mA	300mA
Protection level (8/20) $\mu$ s (Up)	20V	40V	220V
Nominal impulse discharge surge current (8/20) $\mu$ s (In)	5kA	5kA	5kA
Marginal leakage current (8/20) $\mu$ s (Imax)	20kA	20kA	20kA
Surge current (10/350) $\mu$ s (Iimp)	5kA	5kA	5kA
Resistor per path (R)	<4 $\Omega$	<4 $\Omega$	<4 $\Omega$
Capacity (C)	<25pF	<25pF	<25pF
Response time (tA)	<1ns	<1ns	<1ns
Device defekt	Short circuit	Short circuit	Short circuit
Mounting on	Cap rail	Cap rail	Cap rail
Terminal cross-section	Max. 1,5mm <sup>2</sup>	Max. 1,5mm <sup>2</sup>	Max. 1,5mm <sup>2</sup>
Earthing via	Cap rail/screw	Cap rail/screw	Cap rail/screw
Article-no.	<b>10008183</b>	<b>10008184</b>	<b>10006385</b>



# Overvoltage protection for data and telecommunication lines



Type	DLU2-12D3	DLU2-24D3	DS210-24DC
Application	RS232	4-20mA	24V
Connection	2 twin wire	2 twin wire	2 twin wire
Nominal voltage (Un)	12V	24V	24V
Max. operating voltage DC/AC (Uc)	15/10V	28/20V	30/15V
Max. operating current (IL)	300mA	300mA	10A
Protection level (8/20) $\mu$ s (Up)	30V	40V	105V
Nominal impulse discharge surge current (8/20) $\mu$ s (In)	5kA	5kA	1kA
Marginal leakage current (8/20) $\mu$ s (Imax)	20kA	20kA	2kA
Surge current (10/350) $\mu$ s (Iimp)	5kA	5kA	-
Resistor per path (R)	<4 $\Omega$	<4 $\Omega$	-
Capacity (C)	<25pF	<25pF	-
Response time (tA)	<1ns	<1ns	<25ns
Device defekt	Short circuit	Short circuit	LED
Mounting on	Cap rail	Cap rail	Cap rail
Terminal cross-section	max. 1,5mm <sup>2</sup>	max. 1,5mm <sup>2</sup>	1,5 - 10mm <sup>2</sup>
Earthing via	Cap rail	Cap rail	PE 2,5 - 25mm <sup>2</sup>
Article-no.	<b>10008186</b>	<b>10008187</b>	<b>10006387</b>



According to the IEC60364-7-712-1 DC-load breakers are mandatory between inverters and PV generators. Beside the reliable disconnection of the solar panel field from the inverter a DC load breaker serves as an additional disconnection point for maintenance and measurements.



Type	P-SOL30	P-SOL60
Poles	3	3
Isolation voltage (Uoc)	n. s.	n. s.
Rated operation voltage (Ue)	1000V	1000V
Rated operation current (Ie)	30A	63A
Rated short-circuit making capacity (Icm)	0,32kA	0,6kA
Rated short-time with stand current 1 sec. (Icw)	0,36kA	0,72kA
Utilization category	DC21-A	DC21-A
Rated impulse with stand voltage (Uimp)	8kV	8kV
Electrical switching cycle on Ue and Ie	100.000	30.000
Internal resistance	5mΩ	3mΩ
Dimensions (WxHxD)	58x98x76mm	55x140x160mm
Mounting	Cap rail	Cap rail
Protection class	IP20	IP20
Clamp-cross-section	2 x 1 - 6mm <sup>2</sup>	2 x 1 - 35mm <sup>2</sup>
Draft torque	n. s.	n. s.
Max. ambient temperature	n. s.	n. s.
Article-no.	<b>10008218</b>	<b>10008219</b>

Accessories		
External front operation	10008223 (see page 61)	10008223 (see page 61)
Direct operation	-	-
Jumper	-	-
End cover	-	-
Extension axis	-	-
Undervoltage release	10008220 (see page 61)	10008220 (see page 61)
Auxiliary contact	10008221 (see page 61)	10008221 (see page 61)



# DC-load circuit breaker



Type	KFD32 T304/D-P113 VE2	KFD32 T000/DLT131 VE2	KG41B T306*D-P001 VE2
Poles	4	5	6
Isolation voltage (Uoc)	690V	1000V	780V
Rated operation voltage (Ue)	600V	1000V	600V
Rated operation current (Ie)	32A	25A	40A
Rated short-circuit making capacity (Icm)	-	-	-
Rated short-time with stand current 1 sec. (Icw)	-	-	-
Utilization category	DC-21B	DC-21B	DC-21B
Overvoltage category	-	-	-
Rated impulse with stand voltage (Uimp)	-	-	-
Electrical switching cycle on Ue and Ie	-	-	-
Internal resistance	-	-	-
Dimensions (WxHxD)	56x54x84mm	66x54x84mm	100x70x93,5mm
Mounting	Cap rail	Cap rail	Cap rail
Protection class	IP20	IP20	IP20
Clamp-cross-section	1,5 - 6mm <sup>2</sup>	1,5 - 6mm <sup>2</sup>	1,5 - 10mm <sup>2</sup>
Draft torque	1,25Nm	1,25Nm	1,80Nm
Max. ambient temperature	55°C	55°C	55°C
Article-no.	<b>10008276</b>	<b>10008275</b>	<b>10004524</b>



KG41BT308/D-P001 VE2

KG80 T306/D-P001 VE2

KG80 T308/D-P001 VE2

8	6	8
1000V	750V	1000V
900V	630V	800V
40A	60A	60A
-	-	-
-	-	-
DC-21B	DC-21B	DC-21B
-	-	-
-	-	-
-	-	-
-	-	-
132x70x93,5mm	140x90x110,2mm	184x90x110,2mm
Cap rail	Cap rail	Cap rail
IP20	IP20	IP20
1,5 - 10mm <sup>2</sup>	10 - 35mm <sup>2</sup>	10 - 35mm <sup>2</sup>
1,80Nm	3,00Nm	3,00Nm
55°C	55°C	55°C
<b>10008277</b>	<b>10008312</b>	<b>10008313</b>



# DC-load circuit breaker



Type	Sirco PV 4x125A	Sirco PV 4x250A	Sirco PV 4x315A PV
Poles	4	4	4
Isolation voltage (Uoc)	1200V	1200V	1200V
Rated operation voltage (Ue)	1000V	1000V	1000V
Rated operation current (Ie)	125A	250A	315A
Rated short-circuit making capacity (Icm)	-	-	-
Rated short-time with stand current 1 sec. (Icw)	-	-	-
Utilization category	DC-21A	DC21-A	DC21-A
Overvoltage category	-	-	-
Rated impulse with stand voltage (Uimp)	12kV	12kV	12kV
Electrical switching cycle on Ue and Ie	-	-	-
Internal resistance	-	-	-
Dimensions (WxHxD)	230x160x125mm	230x160x125mm	230x160x125mm
Mounting	Mounting plate	Mounting plate	Mounting plate
Protection class	-	-	-
Clamp-cross-section	M10/50mm <sup>2</sup>	M10/120mm <sup>2</sup>	M10/185mm <sup>2</sup>
Draft torque	20 - 26Nm	20 - 26Nm	20 - 26Nm
Max. ambient temperature	-	-	-
Article-no.	<b>10007807</b>	<b>10007810</b>	<b>10007777</b>

Accessories			
External front operation	10001273 (see page 61)	10001273 (see page 61)	10001273 (see page 61)
Direct operation	10001272 (see page 61)	10001272 (see page 61)	10001272 (see page 61)
Jumper	10008234 (see page 61)	10008234 (see page 61)	10008234 (see page 61)
End cover	10004068 (see page 61)	10004068 (see page 61)	10004068 (see page 61)
Extension axis	10001304 (see page 61)	10001304 (see page 61)	10001304 (see page 61)
Undervoltage release	-	-	-
Auxiliary contact	-	-	-

High class cable glands ensure a high protection rating of the enclosure. A wide selection of special accessories is available.



Cable glands			Screw anut		
Type	Packing unit	Article-no.	Type	Packing unit	Article-no.
M12x1,5/9	50 units	<b>10000735</b>	EMUG12 M12x1,5	100 units	<b>10001476</b>
M16x1,5/9	50 units	<b>10000736</b>	EMUG16 M16x1,5	100 units	<b>10000721</b>
M20x1,5/10	50 units	<b>10000737</b>	EMUG20 M20x1,5	100 units	<b>10000722</b>
M25x1,5/10	50 units	<b>10000738</b>	EMUG25 M25x1,5	100 units	<b>10000723</b>
M32x1,5/12	25 units	<b>10000739</b>	EMUG32 M32x1,5	100 units	<b>10000724</b>
M40x1,5/12	10 units	<b>10000740</b>	EMUG40 M40x1,5	50 units	<b>10000725</b>
M50x1,5/14	4 units	<b>10000741</b>	EMUG50 M50x1,5	25 units	<b>10001480</b>
M63x1,5/15	3 units	<b>10000742</b>	EMUG63 M63x1,5	10 units	<b>10001481</b>

Type	wall-mounting clips for TK-Serie	Door lock for Aki-series	MC4 connector set	Jumper for Sirco 125/250A	Jumper for Sirco 315A
Article-no.	<b>10008475</b>	<b>10008163</b>	<b>20001031</b>	<b>10008234</b>	<b>10008233</b>

Type	Sirco external front operation	Sirco end cover	Sirco extension axis	Sirco direct operation	Eaton external front operation
Article-no.	<b>10001273</b>	<b>10004068</b>	<b>10001304</b>	<b>10001272</b>	<b>10008223</b>

Type	Eaton undervoltage release	Eaton auxiliary switch
Article-no.	<b>10008220</b>	<b>10008221</b>



## Fuses / fuse holders gPV 10x38

Due to high continuous power rating, high DC-voltages, changing loads and low short circuit currents the application in PV systems requires special characteristics for fuses. The fuses of the gPV-series especially meet the specification of the solar industry and reliably switch off faults and short circuits.



Type	SPF 10x38mm gPV DC 1000V	SPF 10x38mm gPV DC 1000V	SPF 10x38mm gPV DC 1000V	SPF 10x38mm gPV DC 1000V	SPF 10x38mm gPV DC 1000V
Rated current	3A	4A	6A	8A	10A
Rated voltage	1000V	1000V	1000V	1000V	1000V
Rated breaking capacity	20kA	20kA	20kA	20kA	20kA
Standard	UL/VDE	UL/VDE	UL/VDE	UL/VDE	UL/VDE
Power loss @ 80%	0,82W	0,69W	0,78W	0,91W	1,36W
Packing unit	10 units	10 units	10 units	10 units	10 units
Article-no.	<b>10007588</b>	<b>10007589</b>	<b>10007590</b>	<b>10007591</b>	<b>10007592</b>

Type	SPF 10x38mm gPV DC 1000V	SPF 10x38mm gPV DC 1000V
Rated current	12A	15A
Rated voltage	1000V	1000V
Rated breaking capacity	20kA	20kA
Standard	UL/VDE	UL/VDE
Power loss @ 80%	1,10W	1,38W
Packing unit	10 units	10 units
Article-no.	<b>10007593</b>	<b>10007594</b>



Type	Fuse holder LPH- V0001Z
Rated current	30A
Rated voltage	1000V
Terminal cross-section	2,5 - 16mm <sup>2</sup>
Draft torque	2Nm
Article-no.	<b>10008273</b>



Type	URZ 10x38mm gPV DC 1000V	URZ 10x38mm gPV DC 1000V	URZ 10x38mm gPV DC 1000V	URZ 10x38mm gPV DC 1000V	URZ 10x38mm gPV DC 1000V
Rated current	3A	4A	6A	8A	10A
Rated voltage	1000V	1000V	1000V	1000V	1000V
Rated breaking capacity	30kA	30kA	30kA	30kA	30kA
Standard	IEC/UL	IEC/UL	IEC/UL	IEC/UL	IEC/UL
Power loss @ 100%	1,6W	1,8W	2,5W	1,6W	2,0W
Packing unit	10 units	10 units	10 units	10 units	10 units
Article-no.	<b>10007566</b>	<b>10007414</b>	<b>10007415</b>	<b>10007412</b>	<b>10007416</b>

Type	URZ 10x38mm gPV DC 1000V	URZ 10x38mm gPV DC 1000V
Rated current	12A	15A
Rated voltage	1000V	1000V
Rated breaking capacity	30kA	30kA
Standard	IEC/UL	IEC/UL
Power loss @ 100%	2,4W	2,1W
Packing unit	10 units	10 units
Article-no.	<b>10007413</b>	<b>10007417</b>




Type	Fuse holder
Rated current	30A
Rated voltage	1000V
Terminal cross-section	2,5 - 10mm <sup>2</sup>
Draft torque	2Nm
Article-no.	<b>10008171</b>









Technical explanations/  
The enwi match code

**Open circuit voltage (Max. Uoc)**

Maximum voltage occurring in a string, taking into consideration the temperature coefficient of the PV panel and the expected ambient temperature.

**MPP-Voltage (Max. Umpp)**

Voltage occurring at the maximum power point.

 **$\Sigma$ -current (Max. Isc ( $\Sigma$ ))**

Max. permitted short-circuit current of all strings connected to the generator connection box.

**Short-circuit current (Max. Isc (String))**

Current occurring at a short-circuited panel or string.

**Strings**

Qty. of the possible strings per string-box.

**MPP-current**

Current occurring at the maximum power point.

**Multi-MPP**

If multiple inverters are connected to a generator connection box or if an inverter has multiple MPP-Trackers, it's possible to use a multi-MPP generator connection box.

**Input terminals**

Terminals to which the individual panel strings are connected.

**Output terminals**

Output terminal to the inverter. Depending on the amperage screw terminals or eyelet connectors are used.

**Overvoltage protection device**

Serves as protection from electrical inputs due to atmospheric discharge. (Should not be mixed up with lightning protection devices!)

**Load breaking device**

Disconnecter between inverter and panel field; required according to IEC 60364-7-712. Provides the galvanic separation between inverter and panel field.

**String fuse**

Fuse for protecting cables and panels in the case of a short-circuit. (For fuses used in the PV technology a special de-rating has to be observed depending on the manufacturer!)

**Fuse holder**

Holder for PV fuses 10x38mm or larger. Do not remove under load (electric arc!).

**String-diode**

Blocking diode, which avoids reverse currents to the module field or the different strings.

**String-monitoring**

Integrated measuring system for string monitoring.

**Cable inlets**

Depending on the installation place (Indoor/Outdoor), membrane spouts or DIN-glands are used.

**Material of the enclosure**

Plastic material for most applications. UV and weather resistant. In some cases also stainless steel or aluminium.

**PV-String**

Electric circuit, in which PV panels are connected in series to a PV partial generator.

S | 800 | 2x2S10 | T25 | Y | US | PC | 1.0  
 1 | 2 | 3 4 5 6 | 7 8 | 9 | 10 | 11 | 12

- S = standard connection box
- SV = array string connection box
- 1 SG = assembly string connection box
- SA = array string connection box (Outdoor)

2 Max. system voltage (Uoc)

3 Number of MPP-tracker  
 Without = only 1 MPP-tracker

4 Number of strings with fuses on +/- „(2x)“  
 e. g. S-1000-(2x)4Sx-...

- R = only with parallel clamp
- S = with string fuses
- 5 D = with string-diodes
- T = with disconnect terminal  
 (combination is possible e. g. 4RT)

6 Value of the string fuse (A)  
 x = not included in delivery

- „Load breaker“ yes/no
- X = without breaker
- 7 T = load breaker, cut-off performed by a switch
- A = disconnection point, performed by an automatic circuit breaker

8 With breaker:  
 Load breaker or circuit breaker current

Overvoltage protection:  
 X = without

9 Y = „Y“-connection, Class II, „C“  
 M = standard 2 varistors  
 BC = class I/II, „B/C“

String control system:  
 10 US = interface monitoring system  
 Without = no placeholder

Material of enclosure:  
 PC = polycarbonate

11 AL = aluminium  
 PES = polyester  
 ST = steel

12 Update status



## Questionnaire generator connection boxes

### 1. Customer information

<b>Company</b>	Name	Address	City
<b>Contact 1</b>	Name	Tel	Email
<b>Contact 2</b>	Name	Tel	Email
Project name		Project location	

### 2. Product requirements

<b>Technical requirements</b>			
Each project has different specifications for the generator-connection-boxes. To create an appropriate offer, the following information is needed.			
Infos to the PV-system		Requirements for the string	<input type="checkbox"/> outside <input type="checkbox"/> inside <input type="checkbox"/> plinth installation <input type="checkbox"/> DIN-screwings
Manufacturer module		Type of enclosure	IP_____ (standard IP54/65)
Module type		Protection level	<input type="checkbox"/> yes <input type="checkbox"/> no
Manufacturer inverter		Load disconnecting switch	<input type="checkbox"/> yes <input type="checkbox"/> no
Inverter type/types		String fuses	<input type="checkbox"/> yes <input type="checkbox"/> no
Modules in a row (string)		String diodes	<input type="checkbox"/> yes <input type="checkbox"/> no
Qty. of strings		Overvoltage protection	<input type="checkbox"/> Type C <input type="checkbox"/> Type B/C <input type="checkbox"/> other
MPP-current per string		Cable inlets	<input type="checkbox"/> yes <input type="checkbox"/> no
Isc per String		Other	
Isc max. (system)		Draft	
Max. Uoc at -20°C			
MPP-voltage per string			
Ø string cable (mm <sup>2</sup> )			
Ø DC-main cable (mm <sup>2</sup> )			
<b>FAX: +49 8725/9664-96</b>		<b>Email: sales@enwi-etec.com</b>	

## Questionnaire charging stations

### 1. Customer information

<b>Company</b>	Name	Adress	City
<b>Contact 1</b>	Name	Tel	Email
<b>Contact 2</b>	Name	Tel	Email
Project name		Project location	

### 2. Product requirements

Technical requirements			
<b>Selection of the version:</b>			
Due to the different connector types, the e-tower is available in 3 basic versions. Depending on the information of the vehicle manufacturer, the appropriate connector has to be chosen.			
Type	Plug (right hand side)	Plug (left hand side)	
<input type="checkbox"/> e-tower CEE	<ul style="list-style-type: none"> <li>• Schuko 230V/16A</li> <li>• CEE 400V/32A</li> </ul>	<ul style="list-style-type: none"> <li>• Schuko 230V/16A</li> <li>• CEE 400V/32A</li> </ul>	
<input type="checkbox"/> e-tower MIX	• CEE 400V/32A 7pol. (new standard)	<ul style="list-style-type: none"> <li>• Schuko 230V/16A</li> <li>• CEE 400V/32A</li> </ul>	
<input type="checkbox"/> e-tower PRO	• CEE 400V/32A 7pol. (new standard)	• CEE 400V/32A 7pol. (new standard)	
<b>Communication between the charging stations</b>		<input type="checkbox"/> Standard: ethernet (cable) <input type="checkbox"/> Option (*1): WLAN (wireless) <input type="checkbox"/> Option (*2): communication via GSM	
<b>Communication to the server</b>		<input type="checkbox"/> Standard: ethernet (cable) <input type="checkbox"/> Option (*1): WLAN (wireless) <input type="checkbox"/> Option (*2): communication via GSM	
<b>Payment system</b>		<input type="checkbox"/> Invoice via Reportmanager <input type="checkbox"/> Prepaid	
Additional important information			
For a proper operation a connection to a central server is needed. The GSM availability should be checked previously.			
<b>GSM</b>	<b>Availability</b>	<input type="checkbox"/> D1 <input type="checkbox"/> D2 <input type="checkbox"/> O <sup>2</sup> <input type="checkbox"/> other _____	<b>Signal quality</b>
	<input type="checkbox"/> yes <input type="checkbox"/> no		<input type="checkbox"/> excellent <input type="checkbox"/> sufficient <input type="checkbox"/> poor
<b>Qty. of charging stations at the location</b>		<input type="checkbox"/> 1 <input type="checkbox"/> 4 <input type="checkbox"/> other _____ <input type="checkbox"/> 2 <input type="checkbox"/> 5 <input type="checkbox"/> 3 <input type="checkbox"/> 6	

*1	<b>WLAN: Wireless Local Area Network</b> as possible connection type.
*2	<b>GSM:</b> connection via GSM-VPN modem for systems without Ethernet or WLAN.

# General terms of supply of enwi-etec GmbH

## I. Validity

The supplier's offers, acceptance of orders and all supplies will only take place on the basis of the following „General Terms and Conditions of Sale and Supply“.

The buyer's terms and conditions of purchase are hereby expressly excluded and shall not be binding on the supplier even if not expressly excluded when the contract is formed.

Any other terms and conditions shall only be valid if the supplier expressly agrees to the validity of the buyer's terms and conditions.

## II. Offer; formation of contract

1. The supplier's offers shall be made subject to change and the supplier's written confirmation unless expressly agreed otherwise in writing. The acceptance of orders received from salesmen or representatives is reserved, and the supplier's written confirmation is also required.  
Any documents belonging to an offer such as drawings, designs or weight specifications and other descriptions are only approximate and provide a rough description and definition of the delivery items. The same applies to the performance and consumption data.  
This data represents no guarantee of the character or durability of the delivery items. The supplier reserves the right to alter the dimensions and weight of the items until they are delivered.
2. The supplier shall retain the right of ownership and copyrights of all drawings, designs, calculations and other documents including brochures and catalogues. Any use not covered by this Agreement or any disclosure to third parties must be expressly authorised by the supplier in writing.

## III. Prices; payment

1. The prices are stated exclusive of packaging, freight and insurance, ex-works, and do not cover re-orders.  
The costs of packaging will be charged separately, transport and insurance will be charged when incurred and upon agreement.  
Framework agreements will not be affected by these provisions and the respective terms and conditions will be agreed separately.
2. The prices are based on the actual costs up until the time of the supplier's written confirmation. If these actual costs increase before the delivery date due to increases in taxes, the prices of raw materials, supplies, energy, transport costs or wages, the supplier is entitled to adjust the agreed price accordingly.  
Such price increases shall not give the buyer the right to withdraw from the contract.
3. If the agreed delivery date is more than four months after the contract is formed or if the supply takes place more than four months after the contract is formed for reasons attributable to the buyer, the supplier is entitled to charge the price which is valid on the date the supply is made.
4. The agreed delivery price plus statutory VAT shall become due and payable on receipt of the invoice, without prejudice to any other agreement. Payments to the supplier's salesmen or representatives are not permitted, without a written authority for collection.  
If several invoices are outstanding, payments will first be allocated to the oldest claims and if costs and interest have accrued, payments will first be allocated to the costs then to the interest and finally to the main service, and in turn to the oldest invoices.
5. Retentions or offsetting against the purchase price will only be permitted with in the case of unchallenged or legally-binding claims.  
The buyer may only exercise its right of retention if its counterclaim relates to the same contract.

## IV. Default

1. If the payment deadline is exceeded or in the event of subsequent delay, legal interest will be charged.
2. If the buyer fails to honour a cheque or if the supplier becomes aware of a significant worsening in the buyer's circumstances which jeopardises its ability to pay, the total remaining debt outstanding will become due.  
If the total remaining debt is not paid immediately, the buyer shall lose its right to use the delivery items.  
The supplier is entitled either to have the delivery items returned to it, without prejudice to its claims, or to withdraw from the contract.  
If such circumstances are known after formation of the contract but before the supply is made, the supplier may refuse to supply the goods and request that payment and delivery be reciprocal and simultaneous even if other payment terms and deadlines have been agreed. Alternatively, the supplier may request a guarantee.
3. If the buyer fails to fulfil its payment obligations even after having been served with a notice to pay within an appropriate deadline, the supplier may have the delivery items returned, or withdraw from the contract. In the case of a hire purchase business, the supplier may withdraw from the contract on account of the buyer's delay in paying, under the terms and conditions provided for by law.
4. If the supplier withdraws from the contract, the supplier is also entitled to claim compensation in lieu of performance or the reimbursement of any expenditure made in vain, if it has first given the buyer notice to perform with an appropriate deadline, to no avail.  
If the supplier has demanded compensation in lieu of performance, it may charge 25 % of the agreed purchase price, with no deductions, as the amount of compensation.  
The supplier is free to prove and claim further losses and the buyer is also free to prove that a loss has not arisen or that it is significantly lower than the sum demanded. This shall also apply if the buyer not only defaults in respect of payment but also in respect of accepting the goods or any other obligation to cooperate.
5. If the withdrawal takes place after the goods are delivered, the supplier not only has the right to the return of the goods but may also claim compensation for making the goods available for use. This claim shall take effect independently of claims for compensation and reimbursement of expenditure made in vain.
6. All the above provisions shall also apply in the case of direct delivery to the end customer at the behest of the buyer.

## V. Delivery period

Delivery, the delivery period or collection by the buyer will be agreed separately.

The delivery period shall begin on the day on which the order confirmation is sent and shall be deemed to have been complied with if the goods have left the factory at the end of the delivery period.

The delivery period will be extended accordingly in the case of industrial action, in particular strikes or lock-outs, or in the event of unforeseen circumstances beyond the supplier's control such as disruptions to operations, shortages of raw materials or traffic disruptions etc., provided that it can be proven that such events have a significant influence on the production or delivery of the goods to be supplied.

This shall also apply if the events affect sub-suppliers or subcontractors.

The aforementioned circumstances shall not be attributed to the supplier if they occur during an existing period of delay.

Compliance with the delivery period requires the buyer's compliance with the contractual conditions, and in particular the procurement of any permits or licences required from the authorities.

Otherwise the delivery period and delivery date shall be extended accordingly.

## VI. Shipping

All shipments shall be made according to the supplier's best judgement, at the buyer's expense.

The supplier reserves the right to choose the method of shipment, and no claims may be made against the supplier on the grounds of the chosen method.

## VII. Shipment abroad

Shipments abroad are also subject to the additional terms and conditions of export and any other specific agreements.

It is also agreed that Incoterms 2010 shall apply, upon which the supplier may rely.

## VIII. Transfer of risk; acceptance

The risk is transferred to the buyer upon delivery of the goods to the carrier, regardless of whether the supplier or the buyer commissioned the carrier, even in the case of partial deliveries or if the supplier still has other services to perform, without prejudice to any other agreements.

In the event of a delay to the shipment which may take place by rail or freight at the supplier's discretion, caused by circumstances attributable to the buyer, the risk shall be transferred to the buyer from the date on which the goods were prepared for shipment; however the supplier must take out any insurance requested by the buyer, at the expense of the latter. The delivered goods must be accepted by the buyer even if they display minor defects, without prejudice to the rights under clause 9.

Partial deliveries are permitted to the extent that this is reasonable for the buyer.

#### **IX. Warranty**

If the delivery has deficiencies, these deficiencies shall, at the discretion of the Supplier, either be remedied or the defective parts replaced by the delivery of new goods free of defects, whereby the goods replaced shall become property of the Supplier.

Of the direct costs arising from subsequent improvements and/or replacement deliveries, the Supplier – provided the complaint is deemed to be justified – shall bear the costs of the replacement part. Repair of defective goods shall be performed on the manufacturer's premises. Expenses incurred for the disassembly and reassembly, transportation, packaging etc. shall be borne by the Purchaser.

Manufacturer's warranties passed on within the scope of the delivery such as conformity and/or clearance certificates of the manufacturer shall not represent any warranty of the Supplier nor any contractual agreement of the Supplier on quality.

In case of transactions in which no consumer is involved, the Supplier shall not assume any responsibility for product components which have been provided by the Purchaser.

#### **X. Limitation period**

Warranty claims shall expire after two years from delivery of the goods.

The legal period shall however be the longer period specified under sections 478 and 479 of the German Civil Code, in respect of material defects in buildings and building components, retrospective claims of the buyer or construction.

The legal limitation period shall also apply in cases of death or injury to body or health, in the event of gross negligence or wilful misconduct by the supplier or fraudulent concealing of defects.

#### **XI. Liability for compensation**

1. The supplier shall be liable to pay compensation in accordance with the law if the customer enforces claims based on fraud or gross negligence including the fraud or gross negligence of its representatives or servants.  
If the supplier is not accused of any intentional breach of contract the liability to pay compensation will be limited to Typical and foreseeable damages.
2. The supplier shall be liable by law if it is guilty of a material breach of contract. In such a case, the compensation for damages will be limited to Typical and foreseeable damages.
3. Liability due to death, culpable bodily injury or injury to health shall remain. This shall also apply in the case of mandatory liability under the Product Liability Act.
4. Liability is excluded except where governed by the foregoing.

#### **XII. Reservation of title**

1. The supplier shall retain title to the goods until receipt of all payments under the contract.  
The buyer must handle the goods carefully, and in particular must insure them at its own expense against fire, water and theft up to the replacement value.  
Any maintenance and inspection works must be carried out by the buyer at its own expense, promptly and diligently.
2. The buyer must report to the supplier promptly and in writing in respect of any seizure, confiscation or other third party access to the goods, so that the supplier can exercise its rights as holder of title to the goods.  
If this provision is violated the buyer shall be liable for any corresponding loss of the supplier.
3. The buyer may dispose of the goods during the Standard course of business, however it hereby assigns to the supplier all receivables in the amount of the gross sale price of the supplier's account to which it may be entitled as a result of the resale.  
The above is irrespective of whether the goods are re-sold before or after conversion.  
The customer is entitled to collect receivables even after assignment, subject to the supplier's authority to disclose the assignment of receivables and collect the receivables itself.  
This shall remain provided that the buyer fulfils its payment obligations, does not fall into arrears and no petition for winding-up or insolvency proceedings is submitted.  
In such a case the buyer must immediately provide the supplier with all the required information about its customers together with the necessary documents and allow the supplier to disclose the assignment.
4. The conversion or alteration of the goods by the buyer will always be conducted for the supplier.  
If the goods are converted with other items not belonging to the supplier, the latter shall hold joint ownership of the new items to the extent of the value of its own claim on the other items converted up to the date of the conversion.  
The retention of title shall continue to apply entirely to the items created through conversion.  
The buyer is authorised to re-sell the goods subject to retention of title during the course of its business operations.  
The customer hereby assigns its claims to re-sale of the goods subject to retention of title to the retailer, regardless of whether said goods are re-sold without conversion or after conversion.
5. If the delivered goods are inseparably mixed with other items not belonging to the supplier, the latter shall hold joint ownership of the new items in proportion to the value of the sale item to the other items included up to the date of the conversion.  
If the items are mixed in such a way that the items of the buyer is considered the main item, then the buyer shall confer to the supplier a proportional share of joint ownership and the buyer shall hold the sole or joint ownership of the supplier on its behalf.
6. If the delivered goods or items or objects manufactured as a consequence are further disposed of, converted directly or converted on a site belonging to a third party, in such a way that they become a material part of the third party site, the buyer's claims in lieu of these items against its customer or third party shall pass to the supplier as security, without the need for the latter to give a specific notice of assignment.
7. The supplier shall release the securities owing at the request of the buyer provided that the realisable value of the securities exceeds the claims to be secured by more than 10%, and the choice of which securities to be released is the responsibility of the supplier.

#### **XIII. Miscellaneous**

1. If even part of this Agreement is found to be unenforceable, the remaining provisions shall remain in force. The unenforceable provision shall be replaced with a provision that best reflects the economic intention of the parties.
2. The place of performance and jurisdiction shall be the place in which the supplier has its head office, to the extent that the buyer is construed as the trader in the sense of the law. The supplier shall however be free to bring an action in the place in which the buyer has its registered office.  
All agreements between the supplier and the buyer must be made in writing. The requirement for the written form also applies to any amendments or side letters prior to or following formation of the contract.  
The written form requirement also applies to any deletion of this written form clause.
3. German substantive law shall apply to any legal relationships connected to this Agreement. The UN Convention on Contracts for the International Sale of Goods (CISG) is hereby excluded.



### **PV-Connection technology**

Generator connection boxes, AC/DC switch boards, protection units, monitoring, inverter stations, offgrid systems



### **Electric-Mobility**

e-tower, e-boxes



*engineering with innovations*

#### **enwi-etec GmbH**

Scherrwies 2  
84329 Rogglfing  
Germany

Phone +49 8725 9664-0  
Fax +49 8725 9664-96  
info@enwi-etec.com  
www.enwi-etec.com

#### **Branch Office France**

58 Avenue de Wagram  
75017 Paris  
France

Phone +33 786 638126  
Fax +33 957 257249  
info@enwi-etec.com  
www.enwi-etec.com

#### **Sales Representative Italy**

Roberto Pasini

Phone +39 3481141099  
r.pasini@enwi-etec.com