

Photovoltaics

Solutions for Photovoltaic Utility Scale Systems

Operate large-scale PV systems more efficiently



Solutions for your PV value chain

Weidmüller is a solution provider for connectivity cabinets and communication infrastructure

1.0 Combiner Boxes 4

PV DC Combiner Boxes
PV DC Combiner Boxes for High Power Panels

2.0 Communication infrastructure 8

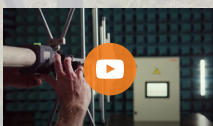
PV Communication Boxes
PV Weather Boxes

3.0 PV Components 10

PV Fuses
Lightning and Surge Protection

4.0 Tested quality 11

5.0 Proven competence 11



Tested & proven

Our PV boxes are designed and tested to withstand extreme climate fluctuations. See for yourself in our video straight from our lab.



Our offering



Connection & Combination

Connection & Combination of PV strings from field or array



Protection

Protection against surges and touching



Monitoring

Monitoring of string performance and component status

Your benefits at a glance



Standard models available in stock

Tailor-made solutions with only 4 weeks of delivery time



5 years warranty

We increase the warranty period due to the high quality of our combiner boxes



Spare parts on stock

Easy supply for O&M companies



Easy commissioning & maintenance

Products designed to reduce installation time and cost as well as future maintenance



Logistic savings

Global production locations allow cost- and time-optimised production and supply



Online selection tool

Online tool to choose the best model for each application.

1.1 PV DC Combiner Boxes

Central Inverter Concept

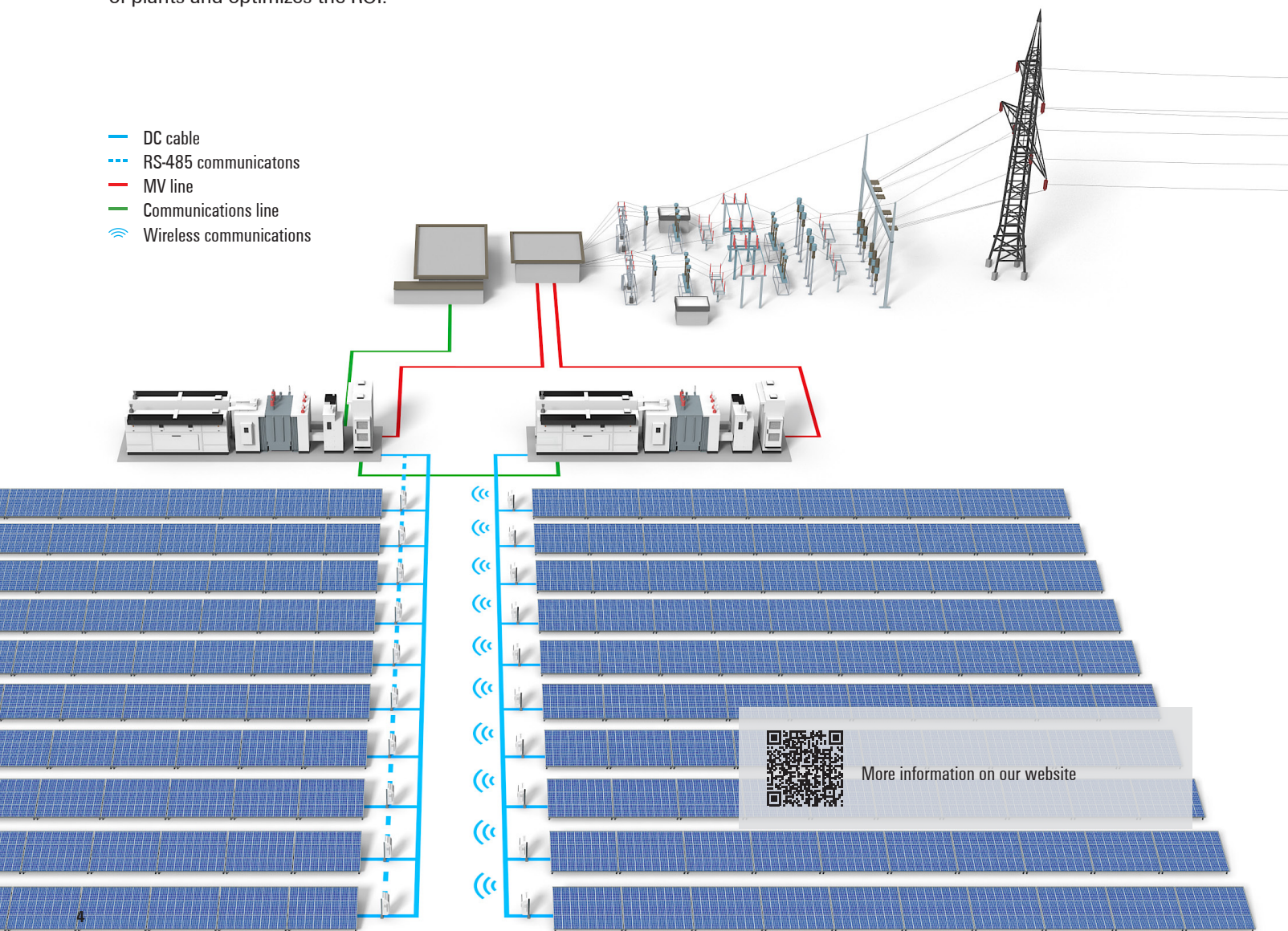
Bundle, protect and combine PV strings efficiently

Our DC combiner boxes offer users the possibility to integrate short-circuit and overvoltage protection, as well string monitoring solutions (I, V, T and SPD and switch isolator status), for PV systems using central inverters with PV panels in trackers and fix tilt systems.

Weidmüller offers a trackrecord of DC combiner boxes higher than 250,000 units sold in all climate regions of the planet for more than 15 years. The experience and expertise in DC engineering is used to provide high-end solutions covering the CAPEX and OPEX needs of the customer. Models equipped with string monitoring provide additional performance with voltage, current and temperature measurement as well as SPD health and DC switch status. This helps to improve PR of plants and optimizes the ROI.



- DC cable
- - - RS-485 communications
- MV line
- Communications line
- ⊞ Wireless communications



Product highlights

- **Optimized design** – By using advanced simulation 3D softwares, the product variants have been designed and tested to operate at the maximum mechanical and thermal efficiency in the most compact housing size.
- **All technical data available online with 1-click** – Weidmüller offers web tools to support on the selection of the best model for your application. Technical data and certifications are available in the Weidmüller online catalog.
- **Cost-optimized variants** – With the new product line cost optimized models with special accessories were designed which cover the most common applications in PV power plants.
- **Longer lifetime** – DC engineering expertise implemented in designs to allow longer lifetime and higher performance under extreme climatic conditions.
- **Better LCOE and ROI** – proven trackrecord, bankability and the reputation of our solutions simplify product due diligences, insurance contracts and even to increase value of the asset in case it is sold in the future.

Technical Data: PV DC Combiner Boxes

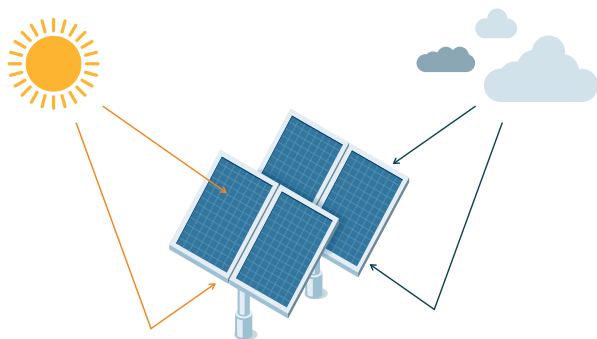
Main application features	
Inputs	from 6 to 32
Outputs	1
Operating ambient temperature	-40°C up to 50°C
DC earthing system	Floating, negative grounded or positive grounded
Installation location	Protected outdoors
Altitude above the sea level	up to 2000m (standard) higher altitude on demand
Main electrical features	
Rated DC voltage	from 1000 V DC up to 1500 V DC
Rated DC current per input	up to 48 Amps
Maximum fuse size	up to 32 Amps for 10x85 mm up to 75 Amps for 22x58 mm
Protection against overcurrent	gPV fuses according to IEC 60269-6, ANSI/UL 248-19
Fuses	On both poles or on one pole
Switch disconnecter	Yes
Switch disconnecter rating	up to 500 A (other options on demand)
Enclosure	
Enclosure material	GFRP (Glass Fiber Reinforced Polyester)
Enclosure shape	Portrait or Landscape
Enclosure fixing system	Wall mounted, pedestal or piling fixation
Degree of protection	IP65 - NEMA 4X
Form factor	Cabinet with hinged door
Polycarbonate protection plate	Yes (optional)
Surge protections	
Surge protection device	Type I+II or Type II
Auxiliary contacts	Yes (optional)
Surge protection on RS-485 ports	Yes (optional)
String monitoring	
String monitoring device	Yes (optional)
Main monitored parameters	Voltage, current, temperature, SPD status, switch isolator status and auxiliary alarms
Voltage measurement	from 200 V DC up to 1500 V DC
Current measurement	up to 50 A per string/input
Communication port	RS-485 or wireless (LoRAWAN)
Protocol	Modbus/RTU
Power supply for string monitoring device	DC/DC converter (self powered string monitoring)
Others	
Input connectors	MC4 C PV connectors or cable glands (other options on demand)
Standards	
Standards	UL 1741, 3rd Edition, 2021-08 / CSA C22.2 NO 290.19

1.2

PV DC Combiner Boxes for High Power Panels Central Inverter Concepts & High voltages

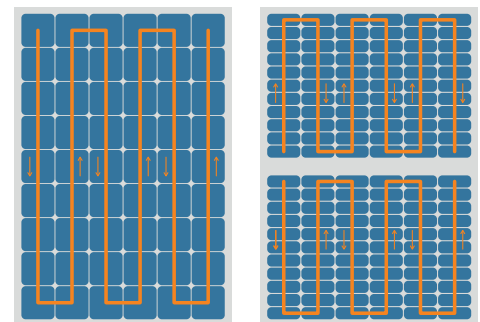
Compact and durable solutions for bifacial half-cell modules

Bifacial solar panels have solar cells on both the front and the back of the panel. This allows the solar energy to be collected on the back of the panel and increases the energy yield of the solar energy system. Our four new PV-DC combination boxes for bifacial half-cell modules allow a higher current consumption due to the fuse holders used.



Space optimized and higher reliability

Increasing the power of PV panels (mono and bifacial) with half-cut cells leads to a rise of current in the strings. The need for higher rated fuses is then mandatory and requires a new approach to system design. Our new designs of PV DC high current combiner boxes offer easy adaptation and time saving for new developments.



Product highlights

- **Standard options in stock ready to order** – A wide range of solutions, available for immediate order from stock to fit into the installation concepts with the brands of PV modules presented above. Variants: From 4 up to 8 inputs, with fuse protection in (+/-) poles and with gPV fuses from of 22x58 mm format and a rated current per fuse between 35 Amps up to 75 Amps.
- **Overvoltage protections** – With several configurations, Weidmüller offers the VPU surge protection series for 1500 V DC systems with up to 11 kA Isc and Type I+II or Type II variants.
- **Optimised design** – Through the use of advanced 3D simulation software, the product variants have been designed and tested to operate with maximum mechanical and thermal efficiency in the most compact enclosure possible.
- **Special Fuse protection** – Weidmüller fuses (WSFL) and fuse holders (WSFH) UL Listed have been specially developed for this new architecture. Rated currents of 35 to 75 Amps per input enable the connection of single and double strings.

Ordering Data for DC Combiner Boxes

PV DC Combiner Boxes

Type	Inputs	Fuse protection	Fuse value	Rated voltage	Max Isc per input	String monitoring	Enclosure orientation	Enclosure size	Qty.	Order No.
PV 232S0F0C20V100TXPX15PUS	32 strings	Both poles	20 Amp	1500Vdc	12.8 Amp	No	Portrait	1056 x 852 x 350 mm	1	8000089220
Other variants on request										

PV DC Combiner Boxes for High Power Panels

Type	Inputs	Fuse protection	Fuse value	Rated voltage	Max Isc per input	String monitoring	Enclosure orientation	Enclosure size	Qty.	Order No.
PV 208S0F0C75V100TXPX15PUS	8 Harness	Both poles	75 Amp	1500Vdc	48 Amp	No	Portrait	1056 x 852 x 350 mm	1	8000089171
Other variants on request										

PV DC Combiner Boxes Enclosure Accessories

Type	Type of Accessory	Enclosure Brand	Material	Type of enclosure	Enclosure size	Qty.	Order No.
PK FIXATION KIT NSYPLM108	Mounting kit for 2 poles	Schneider Electric	Steel-235 HDG	Portrait	1056 x 852 x 350 mm	1	8000045007
PK FIXATION KIT NSYPLM75	Mounting kit for 1 or 2 poles	Schneider Electric	Steel-235 HDG	Portrait	747 x 536 x 300 mm	1	8000045005
PK FIXATION KIT NSYPLM86	Mounting kit for 1 or 2 poles	Schneider Electric	Steel-235 HDG	Portrait	847 x 636 x 300 mm	1	8000045006
PK FIXATION KIT ARIA75	Mounting kit for 1 or 2 poles	ABB	Steel-235 HDG	Portrait	747 x 536 x 300 mm	1	8000045008
PK FIXATION KIT ARIA86	Mounting kit for 1 or 2 poles	ABB	Steel-235 HDG	Portrait	847 x 636 x 300 mm	1	8000045011
PK FIXATION KIT ARIA108	Mounting kit for 2 poles	ABB	Steel-235 HDG	Portrait	1056 x 852 x 350 mm	1	8000045013
SUNLIGHT COVER ARIA86 ALU	Cover for floating PV DC CB	ABB	AL-5754	Portrait	847 x 636 x 300 mm	1	4000004177
SUNLIGHT COVER SCH86 ALU	Cover for floating PV DC CB	Schneider Electric	AL-5754	Portrait	847 x 636 x 300 mm	1	4000004848
SUNLIGHT COVER SCH108 ALU	Cover for floating PV DC CB	Schneider Electric / ABB	AL-5754	Portrait	1056 x 852 x 350 mm	1	4000004854
METAL SUNCANOPY GALVANIZED ABB/SCH75	Canopy for ground-mounted PV DC CB	Schneider Electric / ABB	Steel-275 HDG	Portrait	747 x 536 x 300 mm	1	4000004772
METAL SUNCANOPY GALVANIZED ABB/SCH86 V2	Canopy for ground-mounted PV DC CB	Schneider Electric / ABB	Steel-275 HDG	Portrait	847 x 636 x 300 mm	1	4000004024
METAL SUNCANOPY GALVANIZED ABB/SCH108 (**)	Canopy for ground-mounted PV DC CB	Schneider Electric / ABB	Steel-275 HDG	Portrait	1056 x 852 x 350 mm	1	4000004771

2.1

PV Communication Boxes Plant Communication

Connecting photovoltaic power plants through reliable and safe industrial communications

We combine extensive experience with photovoltaic projects and industrial communication to create a complete portfolio of PV communication cabinets for PV power plants.

Our portfolio offers certified and ready-to-use cabinets for PV power plants that meet the specific environmental, electrical and data transmission requirements according to customer specifications. Weidmüller can customise the communication infrastructure requirements of the PV power plant, enabling perfect data collection for the plant owner, ultimately improving the long-term investment.

Product highlights

- Safe function due to optimal protection
- Maximum availability due to integrated energy backup
- Highly reliable industry standard with built-in communication protocols
- High cost-effectiveness through modular designs based on standard references
- TCP/RS cards for RS485 field buses
- IP certification for outdoor or indoor use

Power supply
24 VDC @ 3 ADC

RJ-45 Switch & Fibre-optic Converter
IE managed switch 6x RJ-45 ports
2x SC Multi-mode ports

Fibre-optic patch panel box
6x SC Multi-mode fibre-optic ports

Battery & UPS

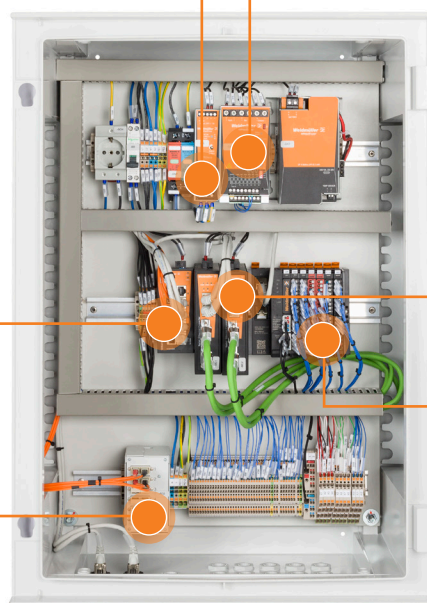
Battery 24 VDC @ 3.4 Ah
UPS 24 VDC @ 20A/10A

2 x Serial / Ethernet converter

Serial / Ethernet converter
2x RJ45
2x DB9 for RS-485

U-Control with multiple I/O

U-Control controller
16x Digital inputs
4x Analogue inputs
8 GB data storage



Other designs on request

Simply contact us and describe the application and the requirements for the PV Communication Box. We will then provide you with a custom-fit design and quote.

2.2 PV Weather Boxes

Plant Communication

Increase your energy production, monitor your system output

PV systems should deliver optimum performance. In order to use as many plant resources as possible for energy generation, regular monitoring of weather parameters is crucial.

Our PV Weather Boxes provide reliable information on all important weather parameters. Values such as temperature, irradiance, wind speed and direction, precipitation, relative humidity, and much more can be permanently recorded. The certified housings are equipped with regard to customer-specific requirements such as environmental conditions, electrics, and data transmission. They are ready for immediate use, extremely robust, and protected against all weather influences.

Product highlights

- Reliable function due to optimal protection
- Maximum availability due to integrated power backup
- High cost-effectiveness through modular designs based on standard references
- IP certification for outdoor or indoor use
- Connection of the required weather sensors (not included in the scope of delivery) via modular I/O cards

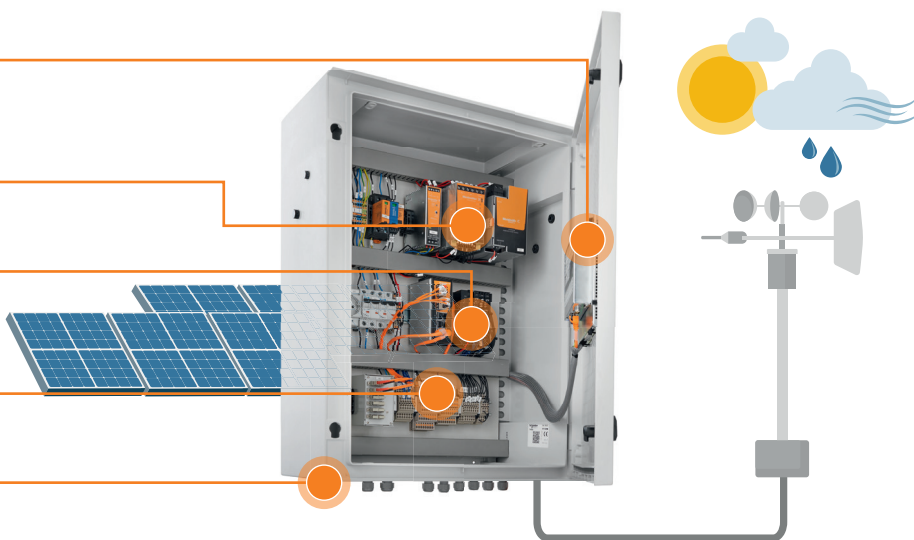
Robust and durable capacitive multi-touch panel monitor for data visualization and HMI

Safe switching, protection and integrated energy back-up

Modular I/O cards for connecting sensors to manage digital/analogue signals

Modular designs based on standard references

IP degree certified for outdoor or indoor solutions



Suitable for the most well-know brands of weather sensors

The Weidmüller PV Weather Boxes are suitable for all well known weather sensors on the market e.g.use, extremely robust, and protected against all weather influences.



Ordering data: PV Weather Boxes

Type	Type of control device	Type of IE device	UPS control unit	Type of SPD	Qty.	Order No.
PV WUCI05T1U2D1A1WXRWW	- UC20-WL2000-IOT - 10.1" capacitive multitouch-panel	- IE network managed switch 6x RJ45 2x SC multi-mode - Remote I/O 16-CH digital input - Remote I/O 4-CH analog input signals - Remote I/O communication 1-CH RS-485	- CP DC UPS 24V 20A/10A - DURA ECO LA-BAT 24V 3.4AH	AC SPD	1	8000094420
PV WUCI05TXU2D1A1WXRWW	- UC20-WL2000-IOT	- IE network managed switch 6x RJ45 2x SC multi-mode - Remote I/O 16-CH digital input - Remote I/O 4-CH analog input signals - Remote I/O communication 1-CH RS-485	- CP DC UPS 24V 20A/10A - DURA ECO LA-BAT 24V 3.4AH	AC SPD	1	8000094711

3.0 PV Components for an effective running system

Plant Equipment

PV Fuses



gPV cylindrical fuse cartridges

The gPV cylindrical fuse cartridges are designed to provide compact, safe and economical protection of photovoltaic modules. They provide protection against both overload and short circuit.

Lightning and Surge Protection



VARITECTOR PU PV for more safety

PV systems are directly exposed to environmental influences because they are always installed in exposed locations. Therefore the probability of lightning strikes and resulting overvoltage is high. The components of unprotected PV systems are again and again considerably damaged.

VPU I+II / VPU II - lightning and surge protection for PV systems

Type	Rated voltage / discharge current	Version	Network	Qty.	Order No.
Requirements class: Type I+II					
VPU PV I+II 3 1000	1000 V / 40 kA	without remote signalling contact	2 horizontal pitches	1	2530610000
VPU PV I+II 3 R 1000	1000 V / 40 kA	with remote signalling contact	2 horizontal pitches	1	2530620000
VPU PV I+II 3 1500	1500 V / 30 kA	without remote signalling contact	3 horizontal pitches	1	2530580000
VPU PV I+II 3 R 1500	1500 V / 30 kA	with remote signalling contact	3 horizontal pitches	1	2530590000
Requirements class: Type II					
VPU II 2 PV 600V DC	600 V / 40 kA	without remote signalling contact	2 horizontal pitches	1	1351340000
VPU II 2 R PV 600V DC	600 V / 40 kA	with remote signalling contact	2 horizontal pitches	1	1351370000
VPU PV II 3 1000	1100 V / 40 kA	without remote signalling contact	3 horizontal pitches	1	2530550000
VPU PV II 3 R 1000	1100 V / 40 kA	with remote signalling contact	3 horizontal pitches	1	2530180000
VPU PV II 3 1500	1500 V / 30 kA	without remote signalling contact	3 horizontal pitches	1	2530640000
VPU PV II 3 R 1500	1500 V / 30 kA	with remote signalling contact	3 horizontal pitches	1	2530650000



VPU AC I - lightning protection for PV systems

Type	Continuous current / lightning impulse current (I_{imp})	Version	Network	Qty.	Order No.
Type I arrester - 275 V AC / 25 kA - S-line					
VPU AC I 3+1 275/25 LCF S 2PE	275 V AC / 25 kA	without remote signalling contact, leakage current free	TN-C-S, TN-S, TT	1	2726760000
VPU AC I 3+1 R 275/25 LCF S 2PE	275 V AC / 25 kA	with remote signalling contact, leakage current free	TN-C-S, TN-S, TT	1	2726770000



VPU AC II - surge protection for PV systems

Type	Continuous current / discharge current (I_{max})	Version	Network	Qty.	Order No.
Type II arrester - 300 V AC / 50 kA					
VPU AC II 3+1 300/50	300 V AC / 50 kA	without remote signalling contact	TN-C-S, TN-S, TT	1	2591080000
VPU AC II 3+1 R 300/50	300 V AC / 50 kA	with remote signalling contact	TN-C-S, TN-S, TT	1	2591090000



4.0

Tested quality

Standard tests and services guaranteeing a long service life

Trust in approved quality

Our laboratory is accredited according to international standards. It operates independently and is recognized by institutions, registration services, and other authorities. As a member of the CTD program, Weidmüller is regularly audited by UL, especially about test methods, quality management and documentation.

All combiner boxes are tested according to IEC-61439-ed-2 and are constructed on the basis of the test results as well as assembled for the specific application. This ensures that each of the requirements of the target application is fully met.



Your benefits at a glance

- ✓ 5 years warranty
- ✓ Laboratory testing
- ✓ Commissioning Services
- ✓ On-Site Inspection

5.0

Proven competence

Reference projects around the globe

The best proof of the quality of our solutions is their worldwide use. More than 250,000 of our photovoltaic combiner boxes are installed in over 100 countries worldwide. They connect 120 million photovoltaic modules.



Floating dynamic solar park

Dynamic solar islands

Location: Andijk, Netherlands
Performance: 22 MWp

Start-up: 2021
Solution: 21 PV Floating DC Combiner Boxes



Suria Sungai Petani

PV Utility Park

Location: Kuala Muda, Malaysia
Performance: 116 MW

Start-up: 2021
Solution: 437 DC Combiner Boxes

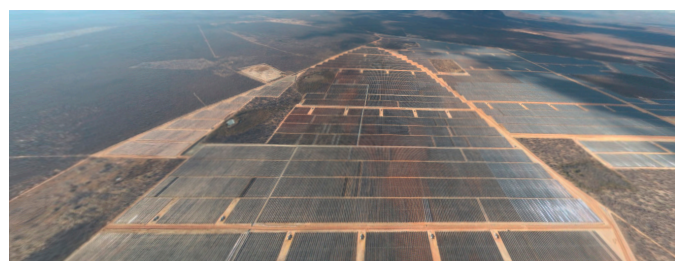


Droogfontein

PV Utility Park

Location: South Africa
Performance: 80 MWp

Start-up: 2019
Solution: 450 Combiner Boxes



Sol do Sertão

PV Utility Park

Location: Oliveira dos Brejinhos, Brazil
Performance: 474 MWp

Start-up: 2021
Solution: 2,318 DC Combiner Boxes

As experienced experts we support our customers and partners around the world with products, solutions and services in the industrial environment of power, signal and data. We are at home in their industries and markets and know the technological challenges of tomorrow. We are therefore continuously developing innovative, sustainable and useful solutions for their individual needs. Together we set standards in Industrial Connectivity.

Weidmüller, Inc

821 Southlake Blvd.
Richmond, Virginia 23236
Telephone: (800) 849-9343
Facsimile: (804) 379-2593
Email: customerservice@weidmuller.com
Website: www.weidmuller.com

Personal support can
be found on our website:
www.weidmuller.com/contact

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