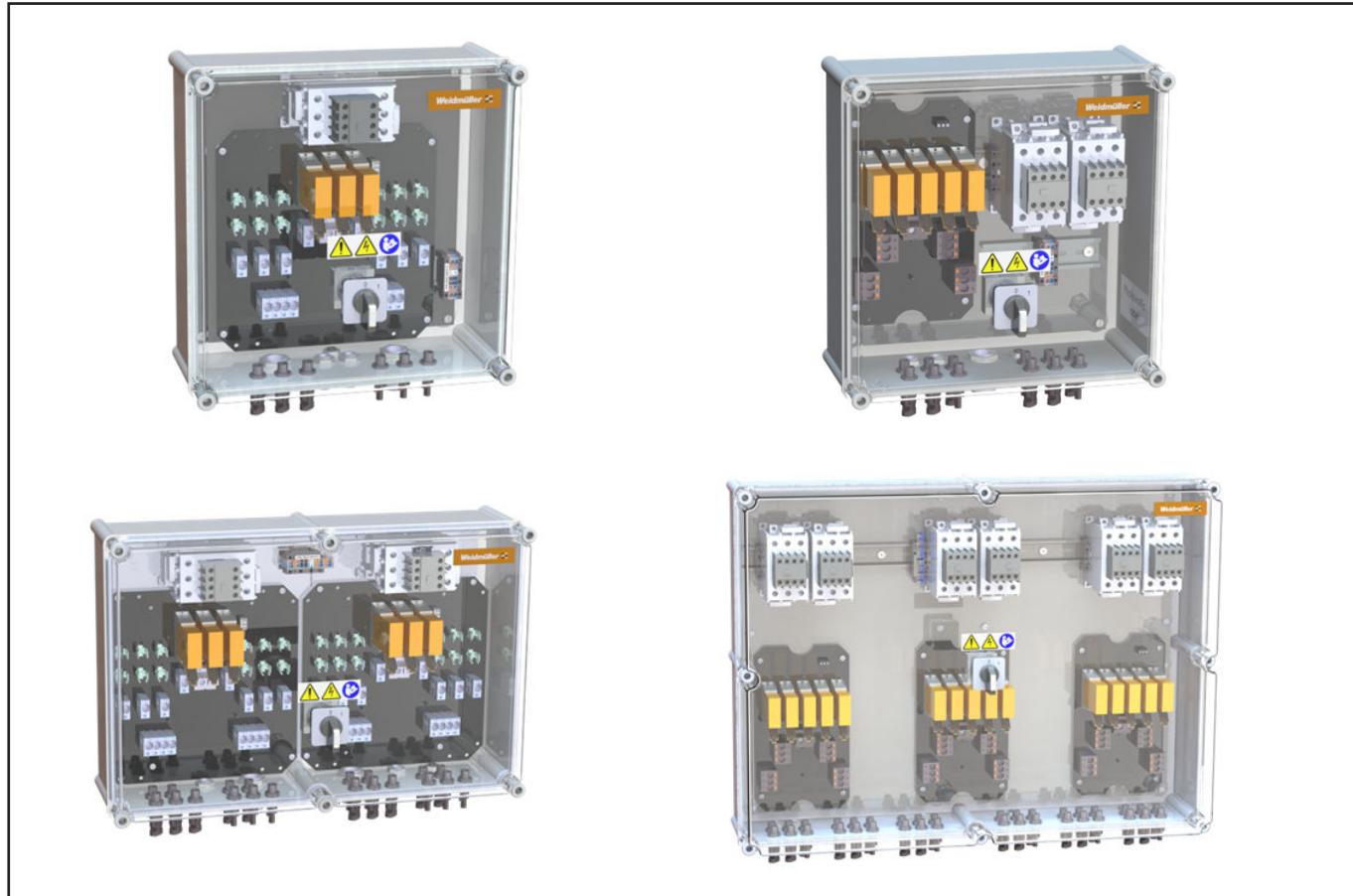


# PV Next String Combiner Box with fireman switch functionality



Operating instructions



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# 1 About this documentation

## 1.1 Target group

These operating instructions are intended for the operator of the photovoltaic system (PV system) and for all persons handling the product during its life cycle.

The required knowledge of this group of persons is defined in the safety chapter.

## 1.2 Symbols and notes

The warnings contained in the documentation are divided into hazard categories.

<b>DANGER</b>	
	<b>Imminent risk to life!</b> Notes with the signal word "DANGER" warn you of situations which will result in serious injury or death if you do not observe the specified instructions.

<b>WARNING</b>	
	<b>Danger to life!</b> Notes with the signal word "WARNING" warn you of situations which may result in serious injury or death if you do not observe the specified instructions.

<b>CAUTION</b>	
	<b>Risk of injury!</b> Notes with the signal word "CAUTION" warn you of situations which may result in injury if you do not observe the specified instructions.

<b>ATTENTION</b>	
<b>Material damage!</b> Notes with the signal word "ATTENTION" warn you about hazards which may result in damage to property.	

The situation-dependent warnings may contain the following warning symbols:

Symbol	Meaning
	Warning of dangerous electrical voltage
	Warning of electrostatically charged components
	Mandatory: Observe the documentation

Additional formatting is used in the rest of the text which has the following meaning:



Sections of text next to this arrow contain information which is not related to safety, but which provides important information regarding correct and effective work.

- All instructions can be identified by the black triangle next to the text.
- Lists are indicated with dashes.



- Store the instructions such that they are available at all times. Do not store the instructions in the product enclosure.

The document is available to download from Weidmüller Website.

<https://www.weidmueller.com/pvnext>

- Also refer to the inverter manufacturer's documentation.

## 2 Safety

This section includes general safety notes for handling the product. Specific warnings for specific tasks and situations are given at the appropriate places in the documentation. Failure to observe the safety notes and warnings can result in physical injury and property damage.

### 2.1 General safety note

- Before carrying out any work on the product, it must be switched off and free of dangerous voltage (see section 2.2). This reduces the risk of electric shocks or arcing.
- The product is not suitable for use in potentially explosive atmospheres. Work on the PV Next String Combiner Box can produce sparks that can ignite a potentially explosive air mixture.
- The approved environmental conditions for the installation site must be observed.
- The operator must ensure that the product is not accessible to unauthorised persons.
- No combustible or electrically conductive materials may be stored inside the enclosure.
- The PV Next String Combiner Box must not be operated with damaged cables or connectors, as they may cause electric shock, short circuit or fire. Do not touch damaged areas and ensure the system is not live. Have the system checked and repaired by a specialist.
- Fuse links must not be removed or inserted under load as this may result in life-threatening arcing.
- Suitable personal protective equipment must be worn during all work on the product.
- During installation and maintenance work, make sure that no moisture can penetrate into the enclosure.
- The PV system must be designed in such a way that all components are operated exclusively within their permissible operating range.
- Local installation regulations must be observed.
- If a fault in the product cannot be remedied by the measures described in these instructions, you must return the product to Weidmüller. Weidmüller does not provide a guarantee if the product has been tampered with.
- The outputs of the PV Next String Combiner Box must never be connected to the inverter (load) while it is live. Even when the inverter is switched off, charging the internal capacitors can lead to dangerous arcing.
- Never touch exposed live parts or cables.
- Do not disconnect PV connectors under load.
- Disconnect the inverter before carrying out any maintenance work. Inverters contain capacitors that store life-threatening voltages. Wait until the capacitors are discharged.
- Follow the operating instructions of the inverter you are using. Contact the manufacturer for more information and advice.

### 2.2 Switching off and on safely

<b>DANGER</b>	
	<b>Risk of fatal electric shock when touching live DC cables and live parts in the opened product!</b> <p>PV systems can generate dangerous voltages. Before starting work, ensure that the PV system and devices are disconnected from the mains and from the PV generators.</p> <p>► Before carrying out any work on the product, it must be disconnected from the power supply and secured against being switched on again.</p>

#### Switching off safely

- Make sure there is no voltage before you open the PV Next String Combiner Box. Proceed exactly in this order:
  1. Switch off the inverter.
  2. Switch the switch-disconnector of the PV Next String Combiner Box or of the inverter to the off-position.
  3. Disconnect all string cables to the inputs of the PV Next String Combiner Box. Both the positive and negative connections must be disconnected.

You can now open the PV Next String Combiner Box.

#### Switch on once all work has been completed:

- Close the PV Next String Combiner Box with the cover.
- Check the voltage, polarity and absence of earth faults of the string cables.
- Reconnect the string cables to the connectors on the underside of the PV Next String Combiner Box.
  - Pay attention to the correct polarity and assignment of the string cables.
  - Only connect string cables with identical open-circuit voltages.
- Switch the inverter on again using the switch-disconnector on the output side.

### 2.3 Intended use

The PV Next String Combiner Box is intended to be installed in the DC connection between photovoltaic modules and inverters. Any other use is considered improper. Modifications to the product and the installation of further components are only permitted if recommended by Weidmüller. Observance of the documentation is also part of the intended use.

## 2.4 Personnel



All activities described in this document may only be carried out by specialists and instructed persons with the following qualifications:

- Knowledge of the functionality and principle of PV systems
- Training in handling dangers and risks during installation and handling electrical devices and systems
- Knowledge of applicable standards and guidelines
- Knowledge and observance of these operating instructions and the safety instructions contained therein

It is a common practice in the sector to apply the five safety rules contained in standard EN 50110. In all cases, qualified electricians must analyse each system individually to determine the best approach to safety.

The five safety rules are the following:

1. Disconnect the system completely from the power supply
2. Secure against re-connection
3. Check that the system is not live
4. Carry out earthing and measures against short-circuiting.
5. Provide protection against adjacent live parts

## 2.5 Legal notice

The product is CE compliant according to Directive 2014/35/EU (Low Voltage Directive).

The product meets the requirements of IEC 61439-2:2011 and the integrated surge protection meets the requirements of EN 50539-11:2015, EN 50539-12:2014.

## 2.6 Warnings on the product

The following warnings are attached to the cover of the PV Next String Combiner Box as a sticker:



The symbols must be clearly visible throughout the service life of the product. If the legibility decreases, the operator of the system must arrange for the warning sticker to be replaced.



### 3 Product description

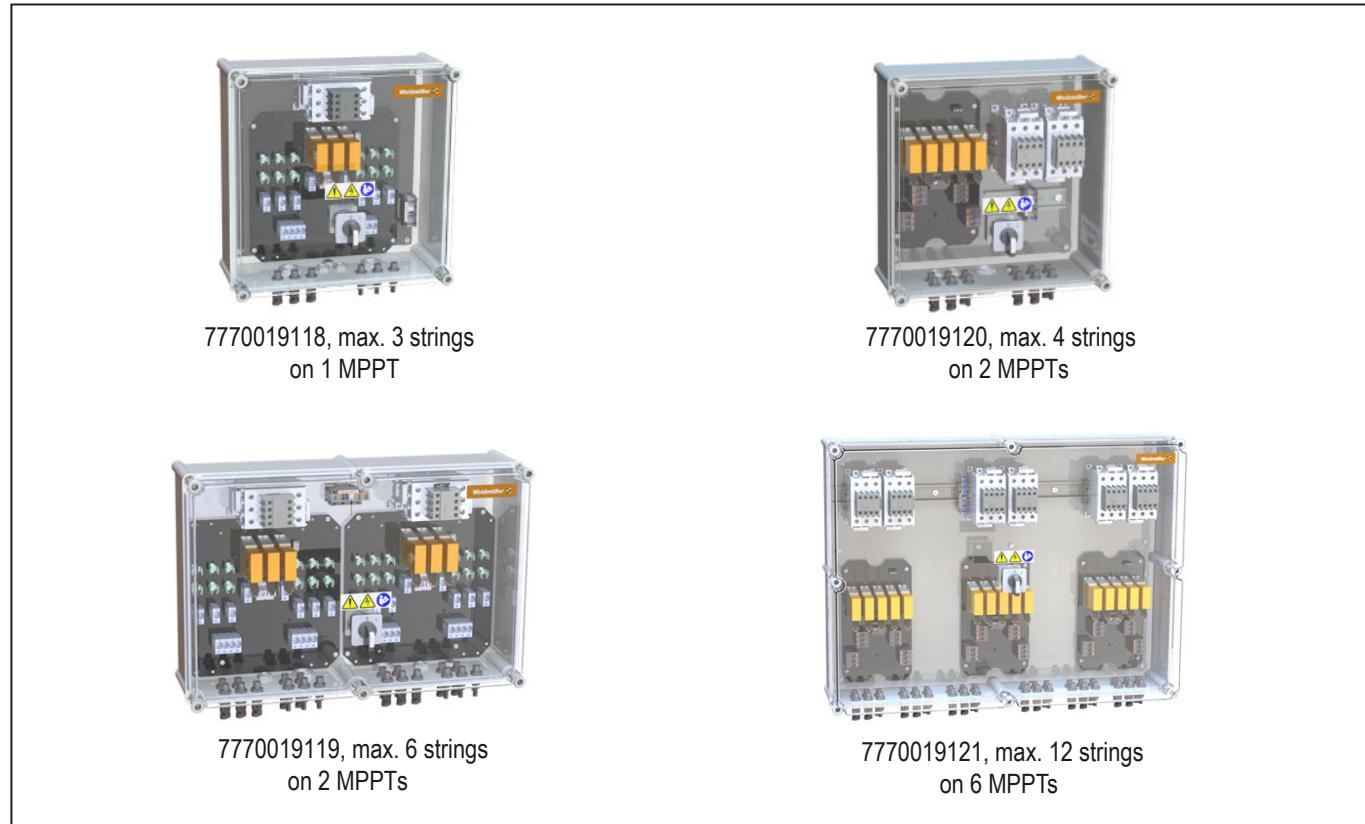


Figure 3.1 Overview of the variants

#### 3.1 Product overview

The Weidmüller PV Next String Combiner Boxes are standardised string combiners with which photovoltaic string cables in private or commercial PV systems can be connected safely and easily to the inverters.

The product family is comprised of two power variants without string protection and two power variants with string protection (gPV fuse links) to protect against impermissibly high return currents.

Depending on the design of the PV system, up to six electrically isolated Maximum Power Point Trackers (MPPT) can be connected.

Per MPPT, each PV Next String Combiner Box contains a replaceable DC surge protection of type I/II or type II.

All four boxes are also equipped with power contactors for switching off the entire installation. The power contactors can be operated either with the manual switch on the front of the box or remotely by a fireman switch.

The connections to string cables and inverters are made either with PV connectors on the underside of the enclosure or via a direct connection to the circuit board within the enclosure.

The type designation of your product can be found on the type plate inside the enclosure.

Order No.	Type
7770019118	PVNCM1I3S1F3V101TXPX10
7770019119	PVNCM2I4S1FXV101TXPX10
7770019120	PVNCM2I6S1F3V101TXPX10
7770019121	PVNCM6I12S1FXV101TXPX10

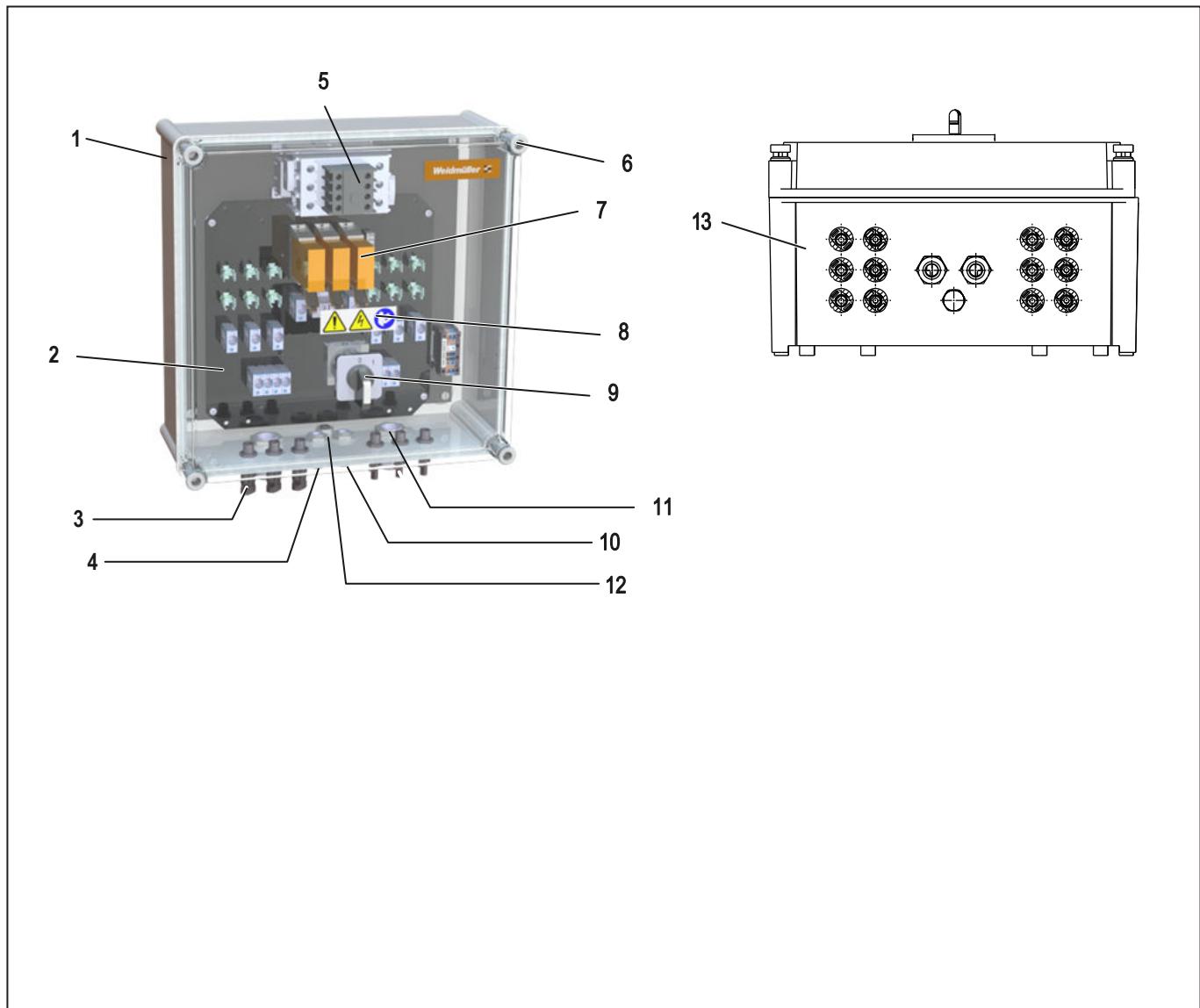


Figure 3.2 Product overview (example) and view from below

- 1 Enclosure base part (type plate on the inside)
- 2 Enclosure cover
- 3 PV connectors for string inputs and outputs
- 4 Cable gland for functional earth
- 5 Power contactor
- 6 Mounting screws for cover
- 7 Surge protections
- 8 Sticker with warning symbols
- 9 Switch-disconnector
- 10 Cable gland for remote fireman switch and power contactor auxiliary contacts
- 11 Cable gland for string outputs (only on 7770019118 and 7770019119)
- 12 Pressure equalisation element
- 13 Bottom side with PV connectors and cable glands.

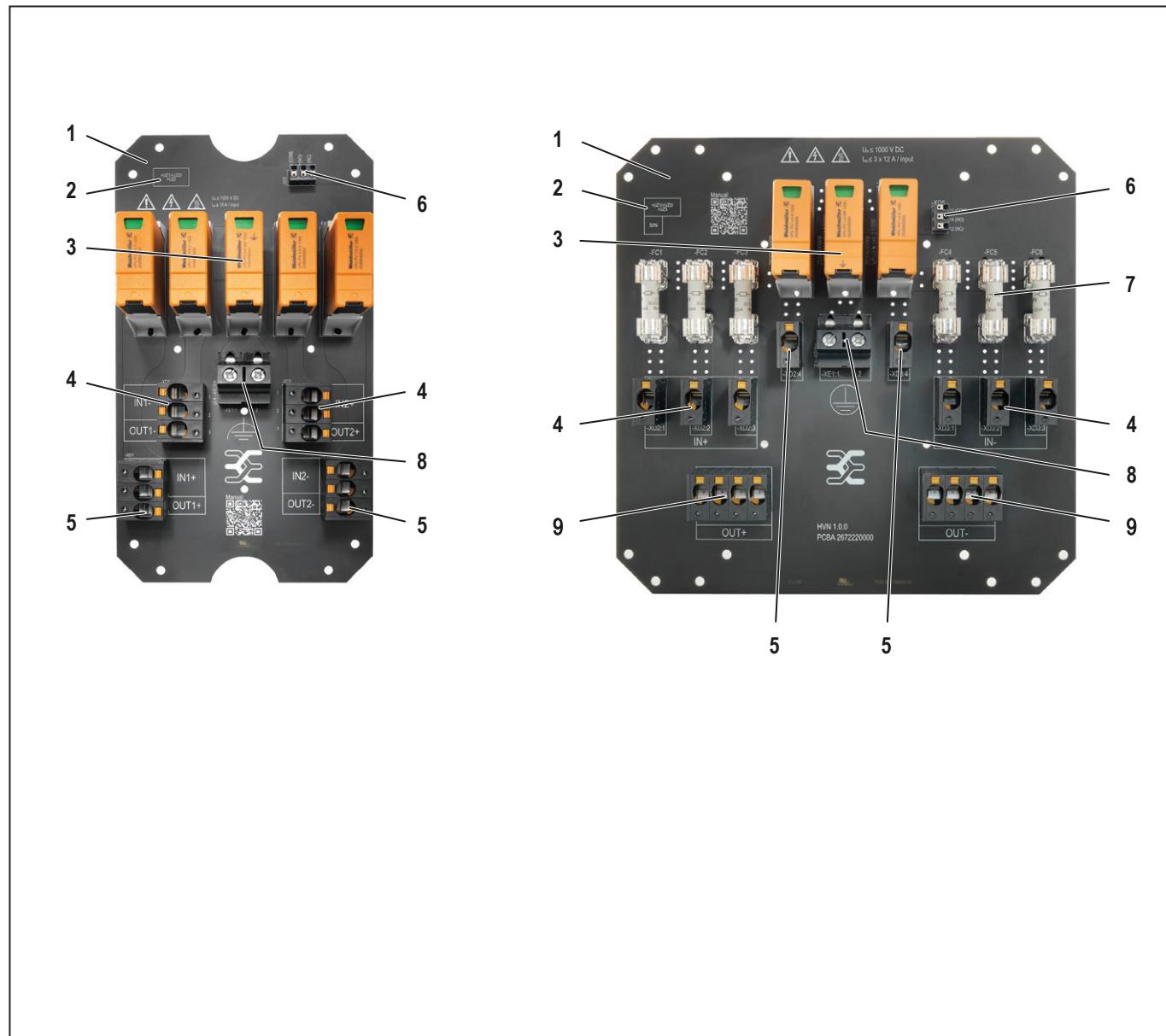


Figure 3.3 Overview of the PCB components (examples, right: variant with fuse links)

- 1 Printed circuit board (PCB)
- 2 Equipment identifier
- 3 Surge protection
- 4 DC PCB terminal for string input
- 5 DC PCB terminal for output to the power contactors
- 6 Remote signalling contact surge protection
- 7 Fuse links
- 8 PCB terminal for functional earth
- 9 DC PCB terminal for output to the inverter

## 3.2 Enclosure



Figure 3.4 Enclosure (example)

The enclosure base part of the PV Next String Combiner Box is made of glass-fibre reinforced polyester (GFRP), the transparent cover is made of polycarbonate. The enclosure corresponds with protection class IP65 (according to IEC 60529). The label with warning symbols must be legible at all times.

## 3.3 Switch-disconnector



Figure 3.5 Switch-disconnector

The switch-disconnector can be used to manually operate the power contactors in order to switch off the entire installation.

## 3.4 Connections



Figure 3.6 Cable glands (A) and PV connectors (B)

The PV Next String Combiner Box is equipped with cable glands (A) and with PV connectors (B).

PV connectors reduce installation and maintenance time. The connectors meet the requirements of the DIN EN 50521 standard.

## 3.5 SL SET PV Next seal set

The combiner box is supplied with one bag per M25 cable gland containing the SL SET PV Next seal set. The seal set consists of the following parts:

- 1 x multiple sealing insert 3x7,0 mm
- 3 x blind pin Ø7x28mm
- 1 x reducing sealing insert 9–16 mm

## 3.6 Surge protection device



Figure 3.7 Surge protection device

The surge protection device complies with IEC 61643-32 Type I+II or Type II.

## 3.7 PCB terminals



Figure 3.8 PCB terminal with PUSH IN function

The PUSH IN PCB terminals enable faster and safer connection of the DC cables and require no maintenance. We recommend using a slotted screwdriver 0.8 mm x 4 mm (Weidmüller Order No. 9008340000) to operate the pusher.

Connection to the PCB terminal is optionally and only valid for combiner box 777009118 and 7770019119 in case of output current >30A (above the limit for PV connectors).

### 3.8 DC power contactor

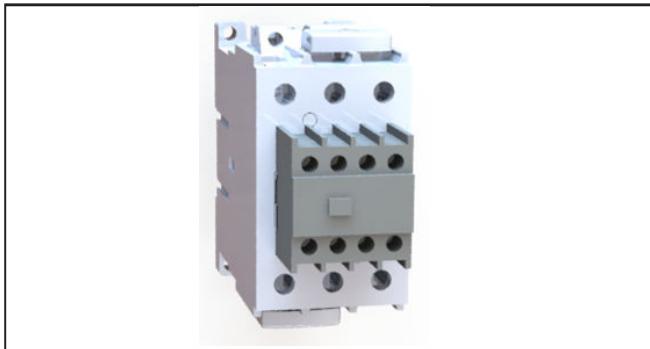


Figure 3.9 DC power contactors

Each combiner box are equipped with one or up to six DC power contactors. These are used to disconnect the solar panels from the entire installation.

The power contactors can be operated either locally by the manual disconnector-switch on the box front or remotely by a fireman switch.

The contactors will also automatically switch off the panels in case of low AC voltage in the building (230 VAC). The contactors are equipped with potential free auxiliary contacts which can be connected to an external device for remote status check of the contactors. Refer to connection diagram for details.

### 3.9 Fireman switch

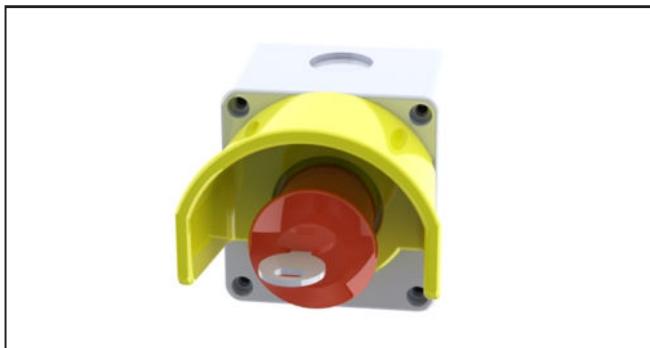


Figure 3.10 The fireman switch

The fireman switch is used to remotely switch off the power contactors.

In case of installation at larger premises, it is possible to use several fireman switches connected in serial for maximum safety.

An activated fireman switch can only be released by using a key, normally performed by authorised personnel.

### 3.10 Fireman switch terminals



Figure 3.10 Fireman switch terminals

The 230 VAC power supply required to operate the power contactors is normally connected to the terminals inside the combiner box.

For enabling a remote control of the contactors the power supply should be wired via the fireman switch.

For further details refer to the connection diagrams related to the actual box type.

### 3.11 Surge protection status contact

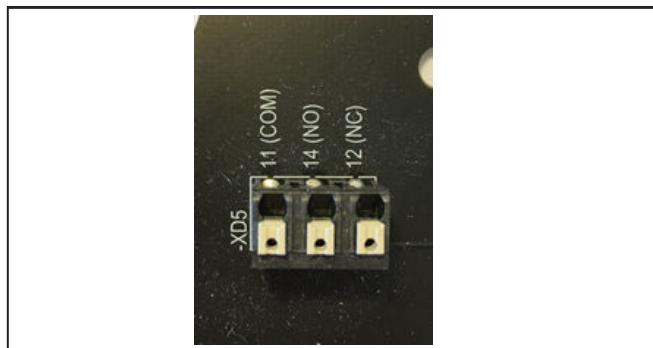


Figure 3.11 Status contact connection terminal on the PCB

The surge protection on the PCB are equipped with a signal contact for remote reading of the status.

For further details on the function and connection refer to the connection diagrams.

## 3.12 Fuse holder with fuse link



Figure 3.12 Fuse holder with fuse link

Note: fuse holders are present on boxes 7770019118 and 7770019119 only. Each fuse holder is covered with a silver layer and supplied with a spring. This ensures a long life contact between the fuse link and the fuse holder. The fuse links with gPV fuses according to IEC 60269-6:2010 protect the PV string cables against overcurrent. The fuse links are equipped with silver-coated end caps for the lowest possible contact resistance.

## 3.13 Surge protection according to DIN EN 50539-12

The use of the PV Next String Combiner Box as surge protection according to DIN EN 50539-12:2014 depends on the distance between the PV generators and the inverter.

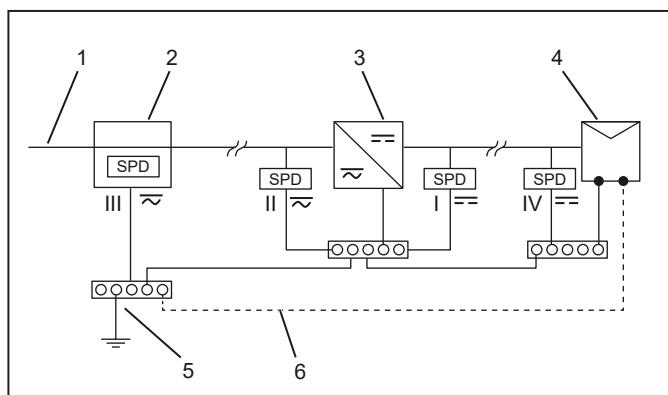


Figure 3.13 Surge protection in the PV system

- 1 Mains connection
- 2 Main distribution
- 3 PV inverter
- 4 PV generator
- 5 Earthing system
- 6 Additional earthing connection

Outer lightning protection system present	Separation distance $S \geq 0.7 \dots 1.0 \text{ m}$ fulfilled	Cable length $ l  < 10 \text{ m}$	In front of the inverter	Behind the PV generators
-	-	-	Type II	Type II
-	-	x		-
-	-	-		Type II
-	-	x		-
x	x	-	Type II	Type II
x	x	x		-
x	x	-		Type II
x	x	x		-
x	-	-	Type I	Type I
x	-	x		
x	-	-		
x	-	x		

DIN EN 50539-12: Requirements for surge voltage arresters depending on application



Observe the cross-sections of the functional earth cable required in DIN EN 50539-12:2014:  
 Type II: minimum  $6 \text{ mm}^2$  or equal to the cross-section of the active conductor if this is greater than  $6 \text{ mm}^2$ .  
 Type I: minimum  $16 \text{ mm}^2$  or equal to the cross-section of the active conductor if this is greater than  $16 \text{ mm}^2$ .

## 3.14 Regarding the LPL



Choose the products in a way that they meet the lightning protection level (LPL) at the installation site.

Please ask your building insurance company for the appropriate LPL.

LPL	10/350 $\mu\text{s}$	8/20 $\mu\text{s}$
LPL I	$I_{\text{imp}} \geq 5 \text{ kA}, I_{\text{total}} \geq 10 \text{ kA}$	$I_n \geq 10 \text{ kA}, I_{\text{total}} \geq 20 \text{ kA}$
LPL II	$I_{\text{imp}} \geq 3,75 \text{ kA}, I_{\text{total}} \geq 7,5 \text{ kA}$	$I_n \geq 7,5 \text{ kA}, I_{\text{total}} \geq 15 \text{ kA}$
LPL III/IV	$I_{\text{imp}} \geq 2,5 \text{ kA}, I_{\text{total}} \geq 5 \text{ kA}$	$I_n \geq 5 \text{ kA}, I_{\text{total}} \geq 10 \text{ kA}$

### 3.15 Technical data

General data	
MPPT suitable for connection	1 ... 6
String inputs per MPPT	2 ... 3
Outputs per MPPT	1 ... 2
Permissible ambient temperature in operation	-40°C ... +40°C
Permissible ambient temperature for storage and transport	-40°C ... +70°C
Relative humidity for storage and transport	5 to 50%
Permissible height above sea level	3,000 m
Input connectors string cables	PV connectors (type WM4 C)
Output connections	PV connectors (type WM4 C) or cable glands
Enclosure	
Enclosure base part	Glass-fiber reinforced polyester (GFRP)
Enclosure cover	Polycarbonate, transparent
Enclosure mounting	Wall mounting
Degree of protection according to IEC 60529	IP65 for the entire product
Seal material	Polyurethane
Impact resistance	IK08 (IEC 62208), IK10 (IEC 62262)
Flammability rating according to UL94	V-2
Cover attachment	Cross-head screws (Nylon)
Screws for wall mounting (not included)	Example: $\phi$ 4.8 mm, head: $\phi$ 9.5 mm, e.g. ISO 14585
Connections	
PV connectors (WM4 C), connectable wire cross-sections	4 mm <sup>2</sup> ... 6 mm <sup>2</sup>
PV connectors (WM4 C), stripping length	8 mm $\pm$ 1 mm
DC PCB terminals string input, output, connectable conductors	2.5 mm <sup>2</sup> to 16 mm <sup>2</sup> solid, stranded, with/without wire-end ferrule
DC PCB terminal string input, output, stripping length	18 mm $\pm$ 1 mm
PCB terminal remote signalling contact and switch-disconnector, connectable wire cross-section	0.25 mm <sup>2</sup> ... 1.5 mm <sup>2</sup> with/without wire-end ferrule
PCB terminal remote signalling contact, stripping length	$\leq$ 0.75 mm <sup>2</sup> : 10 mm $\pm$ 1 mm; 1.5 mm <sup>2</sup> : 7 mm $\pm$ 1 mm
PCB terminal for functional earth, connectable conductor	6 mm <sup>2</sup> ... 16 mm <sup>2</sup> solid, 6 mm <sup>2</sup> ... 25 mm <sup>2</sup> stranded, with wire-end ferrule max. 16 mm <sup>2</sup>
PCB terminal for functional earth, stripping length	15 mm $\pm$ 1 mm
Torques and clamping ranges	
PCB terminal for functional earth	2.4 ... 4 Nm
Cable gland M16 cap nut	3.0 Nm $\pm$ 0.2 Nm
Clamping range cable gland M16	5 ... 7 mm
Cable gland M25 cap nut	8.0 Nm $\pm$ 0.2 Nm
Clamping range cable gland M25	5 ... 7 mm, (triple reducing insert) 9 ... 16 mm (single reducing insert)
Cover attachment screws	1.5 Nm $\pm$ 0.15 Nm
Switch-disconnector	1.7 Nm

Electrical data			
	Type I+II		Type II
Maximum input voltage	1,000 V DC		
Maximum current per string input ( $I_{nc}$ )	15 A DC		
Maximum short-time withstand current per string input	$1.25 \times I_{nc}$		
Maximum current per PV connector	30 A DC		
Maximum current per MPPT	30 ... 50 A DC		
Maximum current per spring terminal	50 A DC		
Overvoltage category according to IEC 60644-1	III (8 kV pulse strength)		
Pollution degree within the box	2		
Surge protection	Type I+II	Type II	
PV system voltage, max. $U_{cpv}$	1.1 kV		
$I_{mp}$ (10/350 $\mu$ s)	6,25 kA (2IN1 = 3.125 kV)	-	
Discharge current $I_n/I_{max}$ (8/20 $\mu$ s)	20 kA / 40 kA		
$I_{total}$ (10/350 $\mu$ s)	12,5 kA (2IN1 = 6.25 kV)	-	
Overall leakage current $I_{total}$ (8/20 $\mu$ s)	50 kA		
Short-circuit resistance $I_{scpv}$	11 kA		
Protection level $U_p$ at 20 kA (8/20 $\mu$ s) +/-, -/PE, +/PE	$\leq 3.8$ kV		
$U_{res}$ at 15 kA / 5 kA	3.5 kV / 3 kV		
Remote signalling contact	24 V / max. 100 mA; 48 V / max. 200 mA		
Standards	EN 50539-11:2015, EN 50539-12:2014		
Spare arrester	2530600000 (outside) 2534300000 (middle)	2530660000	
DC power contactor			
Switching current at 600 V / 1000 V	80 A DC / 60 A DC		
Maximum switching voltage	1000 V DC		
Coil operating voltage	230 VAC		
Coil operating voltage range $U_c$	0,85 - 1,1 (195 - 253 VAC)		
Power consumption of coil	Inrush 250 VA (approx. 1,1A), sealed 18VA(approx. 80mA)		
Standards	Data according to IEC 60947-4-1, VDE 0660		
Auxiliary contact switching capacity	AC15 230VAC, 3A		



Please refer to the data sheet enclosed with the product.

## 4 Transport and storage

### 4.1 Transport



- Observe the total weight and use appropriate transportation equipment.

### 4.2 Unpacking the delivery

#### ATTENTION

##### The product can be destroyed!

The connectors and the cable glands on the enclosure bottom can be damaged.

- Always place the product on the rear side after unpacking.



- Do not install the device if you have noticed a problem or damage!



- If you have not received the product you ordered, or if the delivery is incomplete or damaged, please contact your Weidmüller representative or distributor.

### 4.3 Storage

For longer storage periods, the approved environmental conditions must be observed (see "Technical data").

#### ATTENTION

##### The product can be destroyed!

The connectors and the cable glands on the enclosure bottom can be damaged.

- Always store the product so that it lies flat on the rear side.



If dirt, moisture or damage has occurred to the product during storage, you must not use the product.

Contact your Weidmüller representative or distributor.

# 5 Installation

## 5.1 Installation site

The PV Next String Combiner Box is suitable for protected outdoor installation. For safe operation and to avoid damage to the product, the following requirements must be observed when selecting the installation site.

- The installation site must not be located in an environment where flammable liquids, gases or dusts may be present. Work on the PV Next String Combiner Box can produce sparks that can ignite a potentially explosive air mixture.
- Direct exposure to sunlight and precipitation over long periods of time, as well as excessively high or low temperatures, can damage the product and shorten its service life. Select an installation site where the product is protected from rain and direct sunlight.
- The environment must be free of gases which, in combination with humidity, have an aggressive effect on surfaces (e.g. ammonia).
- The installation site must be chosen such that the product is easily accessible for installation work and subsequent maintenance, and can be worked on safely.
- The site for wall mounting must be sufficiently load-bearing and must not be made of combustible material.
- Unauthorised persons must not have access to the product.
- The PV Next String Combiner Box and all cables must be mounted and installed in such a way that they cannot be damaged by rodents.
- Observe the permissible ambient conditions. The temperature range is indicated on the label inside the combiner box.
- The PV Next String Combiner Box must be mounted on a flat wall. Unevenness can cause the enclosure to warp and leak.
- The distance from adjacent objects should be at least 250 mm, ideally 400 mm. This ensures sufficient cooling of the enclosure and free access for maintenance work.

## Orientation

The PV Next String Combiner Box is designed for wall mounting in vertical orientation. PV connectors and cable glands must face downwards. The forward or backward inclination should not exceed 20°.

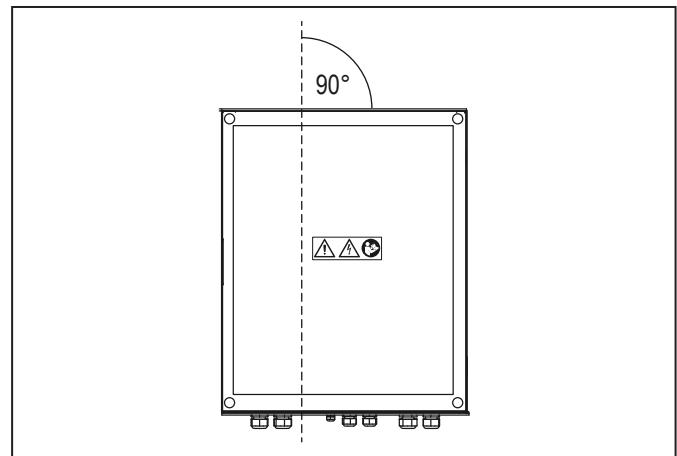


Figure 5.1 Vertical orientation

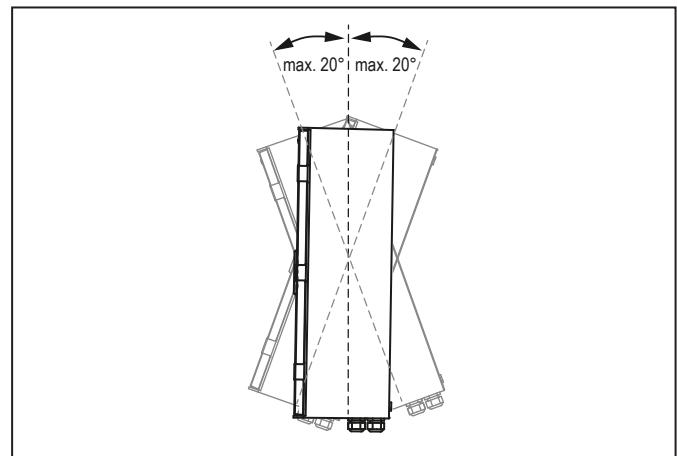


Figure 5.2 Maximum permissible forward or backward inclination



- The PV Next String Combiner Box may only be mounted horizontally on its rear side, if it is ensured that the box is protected from direct sunlight at all times.
- The PV Next String Combiner Box must not be suspended under a ceiling.

## 5.2 Mounting the product



During installation, make sure that no moisture, dust or foreign objects can penetrate into the product.

### ATTENTION

#### Damage to property due to unsuitable screws!

If the diameter of the screw or screw head is too small or too large, the screw may become wedged in the mounting hole and damage the enclosure. For the same reason, countersunk screws are unsuitable.

- For wall mounting, use screws with the properties described below.

Half-round head screws or cylinder head screws are suitable, e.g. according to DIN 7049, DIN 7981 or ISO 14585.

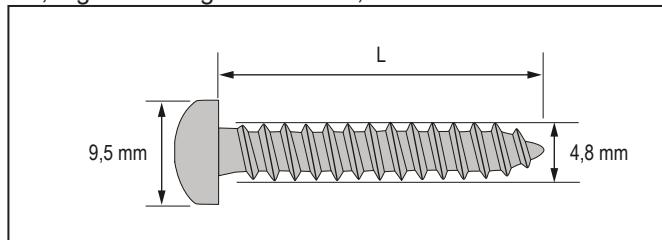


Figure 5.3 Dimensions of the mounting screws

The length X (penetration depth into the wall) must be dimensioned in such a way that a secure hold in the wall is guaranteed.

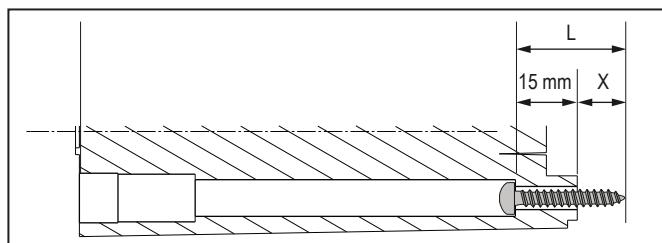
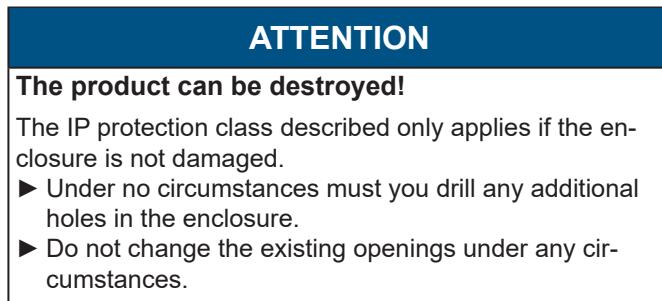


Figure 5.4 Drilling depth for wall mounting



- Lift the PV Next String Combiner Box out of the packaging.

- Measure the exact distance between the fixing holes and mark the positions on the wall (see dimension tables in chapter 5.3).
- Drill the holes in the wall and insert suitable dowels as required.
- Remove the enclosure cover from the PV Next String Combiner Box.
- Screw the PV Next String Combiner Box to the wall through the mounting holes.

### Cable entries

The cable glands ensure both the strain relief and the tightness of the cable entries.

- Always ensure that the correct torques are used.
- Seal all unused cable entries. For this purpose, please use the accessories from the enclosed SL SET PV next seal set (multiple sealing inserts, reducing sealing inserts, blind pins).

### PV connectors

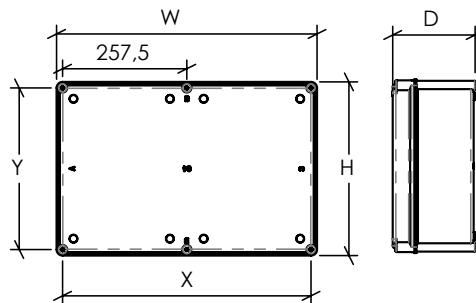
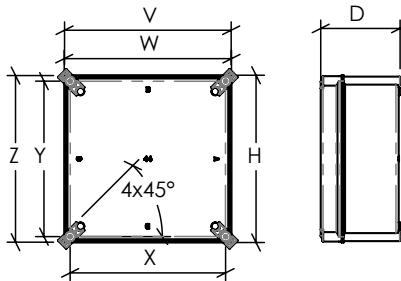
- If your product is equipped with PV connectors, protect unused connectors with protective caps to prevent dust and moisture from penetrating inside.

Protective caps: VSSO WM4 C (Order No. 1254870000)



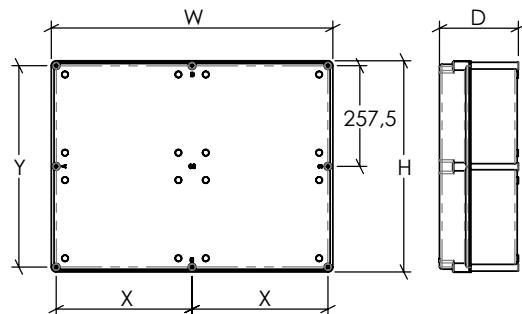
Take care not to cover the pressure equalisation element on the underside of the product. This element significantly reduces the formation of condensation in the enclosure.

### 5.3 Enclosure and mounting dimensions



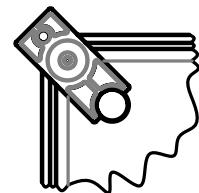
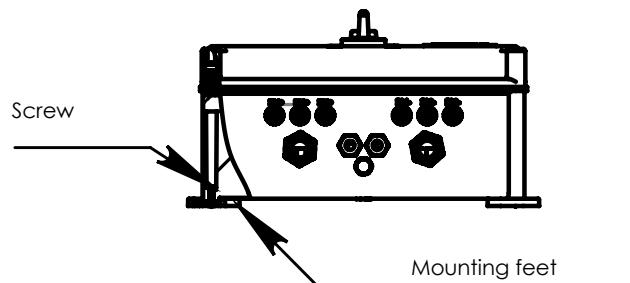
Order No.	Type		mm
7770019118	PVNCM1I3S1F3V101TXPX10	W	360
7770019120	PVNCM2I4S1FXV101TXPX10	H	360
	Mounting with brackets:	D	168
	Z 359	X	335
	V 359	Y	335

Order No.	Type		mm
7770019119	PVNCM2I6S1F3V101TXPX10	W	540
		H	360
		D	168
		X	515
		Y	335



Order No.	Type		mm
7770019121	PVNCM6I12S1FXV101TXPX10	W	720
		H	540
		D	202
		X	348
		Y	515

#### Mounting with brackets



View from back

# 6 Commissioning

## 6.1 Preconditions for commissioning

The PV Next String Combiner Box is fully mounted.

- Before commissioning, check that the product is not damaged.



If the enclosure, printed circuit board or individual components are damaged or heavily soiled, do not operate the product. Contact your Weidmüller representative or distributor.



During commissioning, ensure that no moisture, dust or foreign objects can penetrate into the product.



Two procedures are permitted for installation work:

- Working on live components: Only electricians who are qualified to work on live components may work under voltage. They must comply with local regulations (e.g. personal protective equipment and risk assessment).
- Voltage-free working: Input and output cables must be properly disconnected and secured against being switched on again. Voltage-free work may be carried out by electricians and trained personnel.

► Refer to the inverter manufacturer's documentation.



The Weidmüller WM4C and PV-Stick PV connectors are compatible with each other. Weidmüller accepts no liability for damage caused by the use of connectors from other manufacturers.

## 6.2 Commissioning the PV Next String Combiner Box

<b>DANGER</b>	
	<b>Imminent risk to life!</b> Work on live components may only be carried out by qualified electricians. ► Observe the country-specific regulations for working on live components. ► When working on live components, always use suitable tools and aids that eliminate the risk of electric arcs and electric shocks.
	<b>Imminent risk to life!</b> Up to 1,000 V DC can be present on live parts. ► Make sure that the voltage is not restored until the work has been completed.

- Switch off the inverter. If there is a switch-disconnector on the inverter, it must be in the off-position.
- The switch-disconnector on the PV Next String Combiner Box, must be in the off-position.
- Insert the functional earth cable and the remote signalling cable into the enclosure.
- Disconnect the functional earth cable, crimp a wire-end ferrule onto the cable and connect it.
- Disconnect the wires of the remote signalling cable, crimp the wire end ferrules onto the wires and connect them to the terminal of the remote signalling contact.
- Check that all cables are connected with the correct polarity.
- Carry out the further steps according to your product variant.

### Variant with cable glands:

- ▶ Remove the caps and the rubber seals from the M25 cable glands for IN+ and OUT+ as well as IN- and OUT-.
- ▶ Insert the new multiple sealing insert (3x7 mm) into each cable gland and fit both caps.
- ▶ If not all openings of the multiple sealing insert are required, seal all openings that are not required with the supplied blind pins (Ø7x28 mm).
- ▶ If only one output line is provided for OUT+ and OUT-, you can alternatively fit the M25 cable gland using the supplied reducing sealing insert 9–16 mm.
- ▶ Feed the output cable through the cable glands into the enclosure.
- ▶ Strip the output cable and connect it.
- ▶ Connect the output cable to the inverter(s). Refer to the inverter manufacturer's documentation.
- ▶ Ensure that the string cables are free of voltage.
- ▶ Check the absence of voltage using a suitable voltage tester.
- ▶ Insert the string cable.
- ▶ Strip the string cable and connect it.
- ▶ Check that all cables are connected with the correct polarity.
- ▶ Tighten the cap nuts of the cable glands (observe torque).
- ▶ Optional: Insert the fuse links into the fuse holders.
- ▶ Mount the cover of the PV Next String Combiner Box (observe torque).
- ▶ Connect the string cables to the PV generators.
- ▶ Move the switch-disconnector of the PV Next String Combiner Box to the on-position.
- ▶ Switch on the inverter.

### Variant with PV connector:

- ▶ Plug the output cables into the output connectors.
- ▶ Connect the output cables to the inverter(s). Refer to the inverter manufacturer's documentation.
- ▶ Check that all cables are connected with the correct polarity.
- ▶ Optional: Insert the fuse links into the fuse holders.
- ▶ Mount the cover of the PV Next String Combiner Box.
- ▶ Plug the string cables into the input connectors.
- ▶ Tighten the cap nuts of the cable glands (observe torque).
- ▶ Move the switch-disconnector of the PV Next String Combiner Box to the on-position.
- ▶ Switch on the inverter.

## 7 Cleaning

### ATTENTION

#### **The product can be destroyed!**

The enclosure and cover may be damaged by detergents, scouring agents, solvents and high-pressure cleaners.

- ▶ Use a cloth moistened with clear water for cleaning.
- ▶ Clean the PV Next String Combiner Box at regular intervals so that the warning symbols are always clearly visible.
- ▶ Only clean the exterior of the enclosure when it is closed.
- ▶ Take care not to damage the sticker with warning symbols.

## 8 Maintenance

The PV Next String Combiner Box is low-maintenance. The connections of all DC cables are designed as maintenance-free, self-adjusting PUSH IN spring-loaded terminals.

- A visual inspection must be carried out once a year.
- More intensive maintenance and inspection of all components must be carried out at least every five years.

 During maintenance work, make sure that no moisture, dust or foreign objects can penetrate into the product.

 Two procedures are permitted for maintenance work:

- Working on live components: Only electricians who are qualified to work on live components may work under voltage. They must comply with local regulations (e.g. personal protective equipment and risk assessment).
- Voltage-free working: Input and output cables must be properly disconnected and secured against being switched on again. Voltage-free work may be carried out by electricians and trained personnel.

### 8.1 Annual visual inspection

	<b>DANGER</b>
	<b>Imminent risk to life!</b> Up to 1,000 V DC can be present on live parts. The system must be switched off for this work. ► Switch off the system as described in chapter 2.2.

- Check the String Combiner Box, all PV connectors, cable glands and cables for damage.
- Check the legibility and fixation of the warning symbols on the enclosure cover. The legibility may be impaired by weather conditions or UV radiation.
- Check the outer control panel of the switch-disconnector for damage.
- Check the seal in the enclosure cover. It must be undamaged and flexible. A porous seal or cracks can lead to leaks.
- Check the PCB, the fuse holders and all PCB terminals for damage.
- Check the earthing connection for tight fit (observe torque).
- Check the clamping points on the switch-disconnector for tight fit.
- In the event of damage, contact your Weidmüller representative or distributor.



The fuse holders have a silver layer which can discolour due to oxidation and sulphation. This discoloration does not constitute a technical defect as it does not affect the electrical properties.

### 8.2 Checking and replacing fuse links

	<b>DANGER</b>
	<b>Imminent risk to life!</b> Fuse links must not be removed or inserted under load. The system must be switched off for this work. ► Switch off the system as described in chapter 2.2. ► Before removing a fuse, make sure that no current is flowing through it. Equalising currents between the string cables can also lead to life-threatening arcing and cause damage to the product. ► Ensure that the open circuit voltages of the string cables are identical before you insert the fuse links or connect the string cables to the input terminals. Failure to observe can lead to dangerous arcing due to equalising currents.

<b>ATTENTION</b>
<b>The product can be destroyed!</b> Fuse links with an incorrect surface can damage the product (e.g. nickel or tin coatings). ► Only use fuse links with silver-plated end caps.



Fuse links must be replaced if they are visibly damaged or do not pass the continuity test.

For this work you need suitable tools:

- Fuse change pliers or combination pliers
- Multimeter

- Remove the cover from the enclosure.
- Pull the fuse link out of the fuse holder with the tool perpendicular to the PCB, without bending the fuse holder.
- Check the fuse holder visually for damage and the correct seating of the overspring.
- If the fuse link has no visible damage, check it with a multimeter in the "continuity" setting (resistance measurement).
  - Continuous fuse links can be reused.
  - Non-continuous fuse links must be replaced.

- ▶ Carefully push the (new) fuse link into the fuse holder using the tool. Take care not to damage the PCB!
- ▶ Make sure that the fuse links are properly seated in the fuse holders by visually checking the position of the fuse link between the clamping jaws of the fuse holder.
- ▶ If you do not want to carry out any further work, close the PV NextString Combiner Box again.

### 8.3 Checking surge protection arresters

Weidmüller surge protection devices are equipped with replaceable arresters. If an arrester is damaged or has reached the end of its service life, it switches off automatically. The status indicator of the affected arrester turns red.

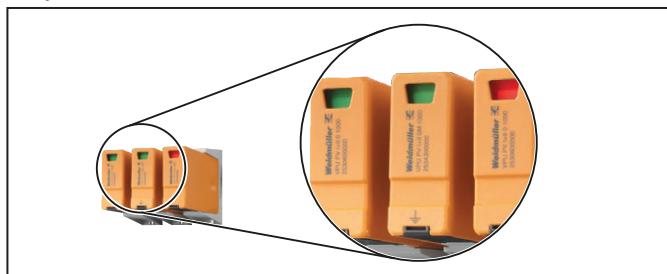


Figure 8.1 Status indicators of the surge protection arresters

At the same time, the remote signalling contact (X1.1) is activated which will switch off the power contactors. The power contactors are equipped with an auxiliary contact which can be read by the inverter or a data logger. See also chapter 3.8.



Switched off arresters no longer have a protective function and must be replaced immediately.

### 8.4 Replacing surge protection arresters

DANGER	
 <b>Imminent risk to life!</b> <p>The contacts in the sockets of the surge protection arresters are live. The system must be switched off for this work.</p> <ul style="list-style-type: none"> <li>▶ Switch off the system as described in chapter 2.2.</li> <li>▶ Do not reach into the sockets when the arrester is removed.</li> </ul>	



The surge protection arresters are coded with a pin on the underside. This ensures that only the correct arrester can be plugged into a socket.

- ▶ Only use arresters with identical article numbers.

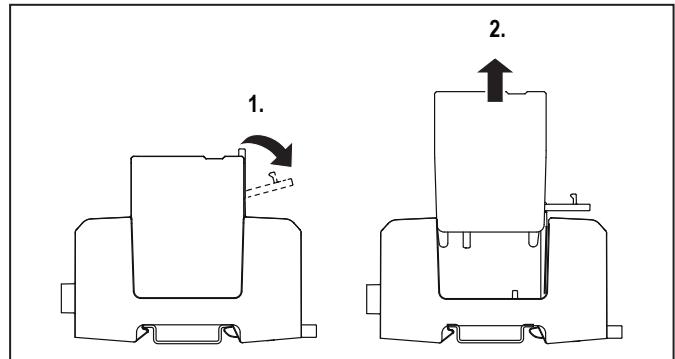


Figure 8.2 Removing surge protection arresters

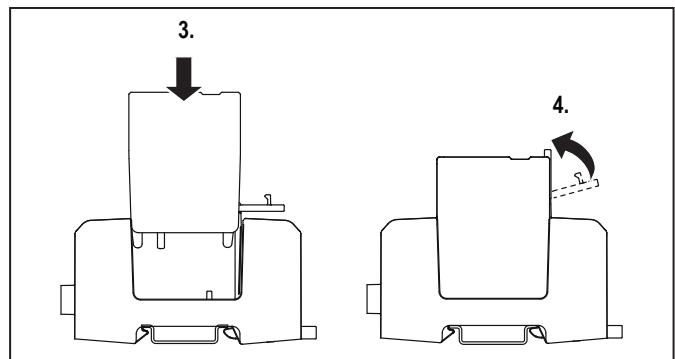


Figure 8.3 Inserting surge protection arresters

- ▶ If you do not want to carry out any further work, close the PV Next String Combiner Box again.

### 8.5 Checking insulation resistance



Measuring the insulation resistance of plugged-in surge protection arresters leads to an incorrect measurement.

- ▶ Before measuring, remove the surge protection arresters (see chapter 8.4).
- ▶ After the measurement has been completed, reinsert the surge protection arresters into their sockets (see chapter 8.4).
- ▶ If you do not want to carry out any further work, close the PV Next String Combiner Box again.

### 8.6 Service

If you have questions about the PV Next String Combiner Box, please contact the Weidmüller representative in your country.

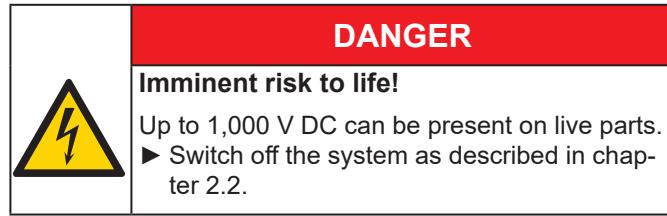
Further information about the PV Next String Combiner Box, such as videos, assembly instructions and FAQs, can be found on the Weidmüller website.  
[www.weidmueller.com/pvnext](http://www.weidmueller.com/pvnext)

## 8.7 Spare parts and accessories

Product	Usage	Order No.
Mounting brackets	Wall mounting	7770019105
PV-STICK+ VPE10 (4–6 mm <sup>2</sup> )	PV-connector	1303450000
PV-STICK- VPE10 (4–6 mm <sup>2</sup> )	PV-connector	1303490000
Dust protection caps VSSO WM4 C (socket and pin)	Dust protection for unused PV-connectors	1254870000
SL SET PV Next seal set with 1 x multiple sealing insert 3 x 7,0 mm 3 x blind pin Ø 7 x 28 mm 1 x reducing sealing insert 9–16 mm	Sealing the not required openings in cable glands	7770019187
VPU PV I+II 0 1000	Spare arrester for the overvoltage protection (left or right)	2530600000
VPU PV I+II 0M 1000	Spare arrester for the overvoltage protection (middle)	2534300000
Fireman switch	For remote control of power contactors	7770019148
Fuse link 10 mm x 38 mm 1000 V DC gPV, 1 A	In boxes 7770019118 and 7770019119	2783160000
Fuse link 10 mm x 38 mm 1000 V DC gPV, 2 A	In boxes 7770019118 and 7770019119	2783170000
Fuse link 10 mm x 38 mm 1000 V DC gPV, 3 A	In boxes 7770019118 and 7770019119	2783180000
Fuse link 10 mm x 38 mm 1000 V DC gPV, 4 A	In boxes 7770019118 and 7770019119	2783190000
Fuse link 10 mm x 38 mm 1000 V DC gPV, 5 A	In boxes 7770019118 and 7770019119	2783200000
Fuse link 10 mm x 38 mm 1000 V DC gPV, 6 A	In boxes 7770019118 and 7770019119	2783210000
Fuse link 10 mm x 38 mm 1000 V DC gPV, 8 A	In boxes 7770019118 and 7770019119	2783220000
Fuse link 10 mm x 38 mm 1000 V DC gPV, 10 A	In boxes 7770019118 and 7770019119	2783230000
Fuse link 10 mm x 38 mm 1000 V DC gPV, 12 A	In boxes 7770019118 and 7770019119	2783240000
Fuse link 10 mm x 38 mm 1000 V DC gPV, 15 A	In boxes 7770019118 and 7770019119	2783250000
Fuse link 10 mm x 38 mm 1000 V DC gPV, 16 A	In boxes 7770019118 and 7770019119	2783260000
Fuse link 10 mm x 38 mm 1000 V DC gPV, 20 A	In boxes 7770019118 and 7770019119	2783280000
Fuse link 10 mm x 38 mm 1000 V DC gPV, 30 A	In boxes 7770019118 and 7770019119	7791401024

# 9 Decommissioning and disposal

## 9.1 Decommissioning



- ▶ Refer to the inverter manufacturer's documentation.

1. Remove the enclosure cover from the PV Next String Combiner Box.
2. Disconnect all connections from the PV Next String Combiner Box.
3. Loosen the screws on the wall mount and remove the product from the wall.

## 9.2 Disposal



Observe the local disposal regulations for electrical appliances.



