

PV Next String Combiner Box



Operating instructions

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Document No. 2770580000
Revision 00/September 2020

1 About this documentation

1.1 Target group

These operating instructions are aimed at designers, electricians, engineers and all qualified persons who combine components and parts to form switchgear assemblies. The PV Next PCBAs may only be installed, commissioned or serviced by qualified people. Due to their technical training, knowledge, experience and familiarity with the relevant standards and regulations, qualified people are not only able to carry out work on electrical systems but also to recognise and avoid any possible dangers.

1.2 Symbols and notes

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



DANGER
Imminent risk to life!
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.



WARNING
Danger to life!
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.



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

ATTENTION

Material damage!
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 contains general safety instructions for handling the PV Next PCBA. Specific warnings on 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

- The product must be free of dangerous voltage before any work is carried out on it. This reduces the risk of electric shocks and arcing.
- The product is not suitable for use in potentially explosive atmospheres. Work on the PV Next PCBA can produce sparks that can ignite a potentially explosive air mixture.
- The permissible ambient conditions for the PV Next PCBA must be observed.
- The operator must ensure that the product is not accessible to unauthorised persons.
- The PV Next PCBA 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.
- Fuse links must not be removed or inserted under load as this may result in life-threatening arcing.
- During installation and maintenance work, no moisture or dust may reach the PV Next PCBA.
- Weidmüller does not provide a guarantee if the product has been tampered with.
- The outputs of the PV Next PCBA must never be connected to the inverter (load) while it is live.
- With inverters, charging the internal capacitors can lead to dangerous arcing.
- Never touch exposed live parts, conductor paths or cables.
- Never use a damaged PV Next PCBA under any circumstances: danger to life!

2.2 Intended use

The PV Next PCBAs are only intended for permanent installation in a generator junction box and are used exclusively for parallel connection and/or protection of PV strings up to 1,000 V DC. The integral component is an overvoltage protection module which lies between DC+ and DC-. An optional switch between the input and output terminals is used to safely disconnect the PV modules from the inverter for servicing purposes.

The PV Next PCBA (printed circuit board assembled) is suitable for vertical and horizontal installation. Overhead mounting with the fuses and surge arresters pointing downwards is not permitted!

Sufficient convection cooling of the PV Next PCBA must be ensured.

When integrating additional components, make sure that they are selected according to the application.

2.3 Heating

Ensure that the permissible limit values of the PCBA individual components are not exceeded during a heating test in accordance with DIN EN 61439-1:2011 (10.10). All inputs of the PV Next PCBA must be wired with the maximum permissible rated current and short-circuit current (rated current x 1.25).

- Overvoltage protection elements -20°C to +65°C
- gPV fuses/clip -20°C to 120°C
- Printed circuit board material -20°C to 110°C
- Printed circuit boards terminals -20°C to 110°C

2.4 IP protection class

Make sure that the PV Next PCBA is installed in an enclosure with a protection class of at least IP54 according to DIN EN 60529:13. The enclosure must be fitted with a suitable pressure compensation element.

2.5 Vibration

The PV Next PCBA was tested without fuse links in conjunction with a GFK IP65 IK 10 enclosure according to DIN EN 62093:2005 (11.8).

2.6 Shock

The PV Next PCBA was tested in conjunction with a GFK IP65 IK 10 enclosure according to DIN EN 62093:2005 (11.9).

2.7 Clearance and creepage distances

The PV Next PCBA meets the requirements of DIN EN 60664-1:2008. Ensure sufficient distance from conductive surfaces and enclosure openings.

The printed circuit board is not finger-safe according to IP2x. Installation in an enclosure without further protective barriers requires appropriate identification.

2.8 Installing a PV Next PCBA

The PV Next PCBA may only be installed and operated in vertical orientation (Fig.2) or lying down on its rear side. Overhead mounting and mounting rotated by 90° are not permitted.

Ensure sufficient support in the centre of the PV Next PCBA. You must avoid bending the circuit board when inserting cables. Make sure that the PV Next PCBA is not

mounted on a conductive mounting plate. The soldering pins on the underside must not be short-circuited or subjected to mechanical stress.

2.9 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

2.10 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.

3 Product description

3.1 Product overview

The Weidmüller PV Next PCBAs are standardised string combiner printed circuit boards with integrated surge protection. The product family comprises three power variants without string protection and four power variants with string protection (gPV fuse links) to protect against impermissibly high return currents. Depending on the design and requirements of the PV system or inverter, several PCBAs can be used in one enclosure. Per MPPT, each PV Next PCBA contains a replaceable DC surge protection of type I/II or type II. PV Next PCBAs are optionally equipped with a connection for a DC disconnect.

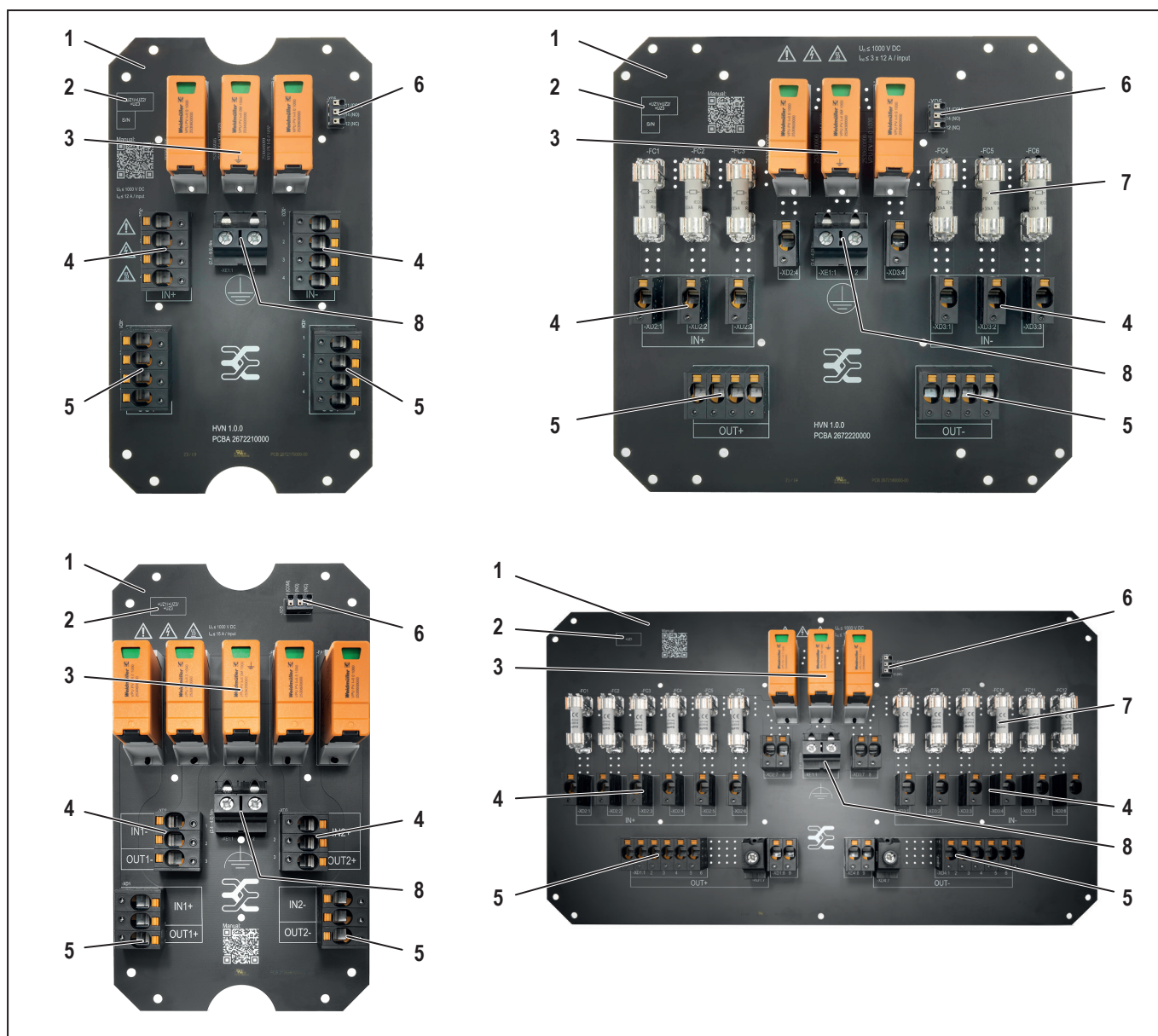


Figure 3.1 Overview of the components (examples, right: variant with fuse links)

- 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 inverter
- 6 Remote signalling contact surge protection
- 7 Fuse links
- 8 PCB terminal for functional earth

3.2 Surge protection device

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

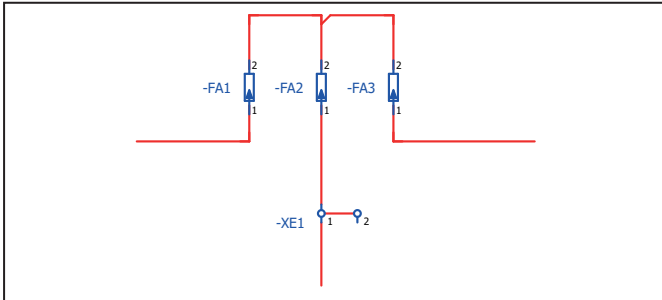


Figure 3.2 Surge protection device

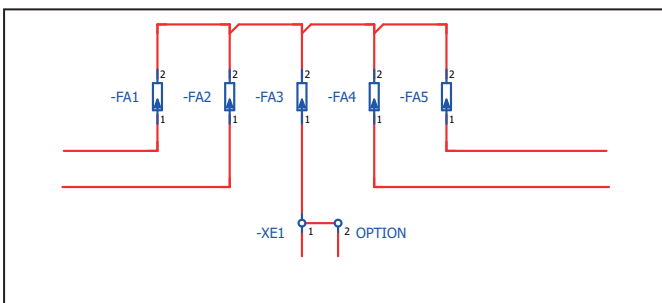


Figure 3.3 Surge protection device

3.3 PCB terminals

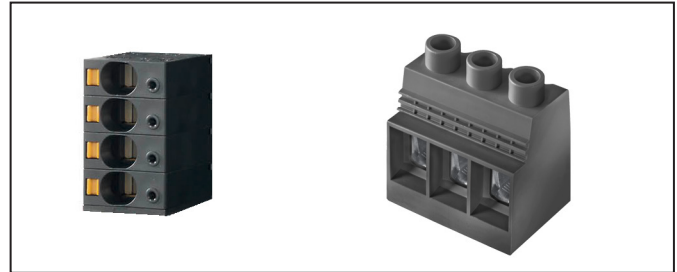


Figure 3.4 PCB terminal with PUSH IN function (left) and clamping yoke connection (right)

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.

The PCB terminal blocks with clamping yoke connection for DC Out allow the connection of conductors with 0.5 mm²–50 mm²

3.4 Remote signalling contact surge protection

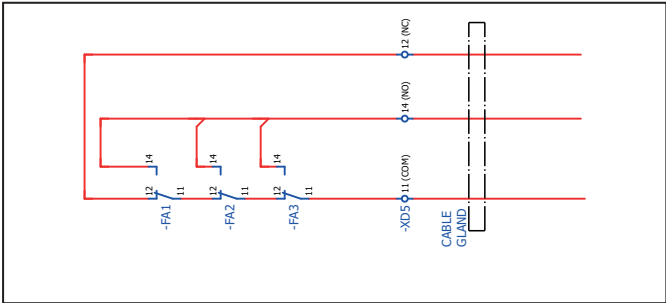


Figure 3.5 Contact surge protection

The signal contacts (NC/NO) of the surge arresters are connected in series and led out to a PUSH IN terminal. This can be used to query the status of the surge arresters. Load capacity 24 V DC / 100 mA.

3.5 Fuse holder with fuse link (optional)

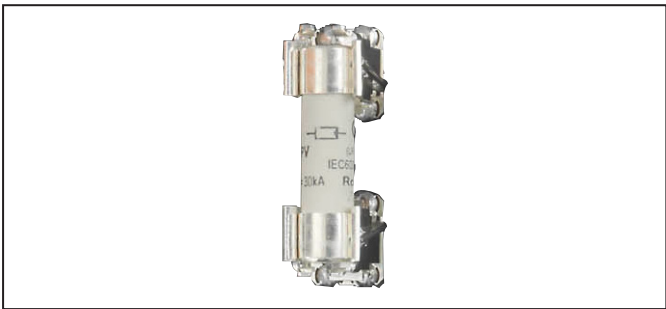


Figure 3.6 Fuse holder with fuse link

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.

ATTENTION

The product can be destroyed!

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.

3.7 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.

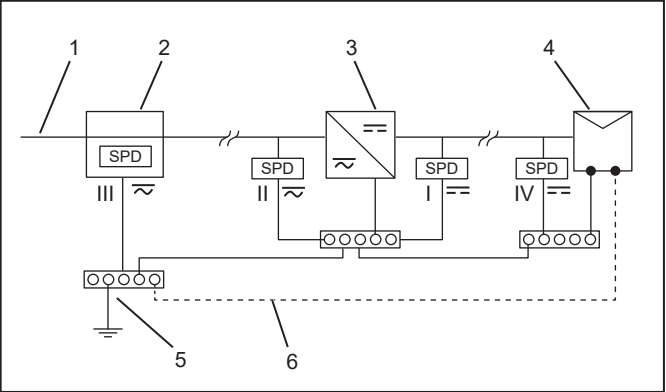


Figure 3.7 Surge protection in the PV system

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

3.8 Regarding the LPL

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

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

3.9 Technical data

	2732510000 PCBA PV SCB 1KV 2x2I10 SPD T1+2 NF	2672210000 PCBA PV SCB 1KV 3I30 SPD T1+2 NF	2672190000 PCBA PV SCB 1KV 3I30 SPD T2 NF
			
General data			
Dimensions WxHxD	145x254x90mm		
MPPT suitable for connection	2	1	1
String inputs per MPPT	2	3	3
Outputs per MPPT	1	3	3
Permissible ambient temperature in operation	-20 °C ... +65 °C	-20 °C ... +65 °C	-20 °C ... +65 °C
Permissible ambient temperature for storage and transport	-20 °C ... +70 °C		
Relative humidity for storage and transport	5 bis 50%		
Permissible height above sea level	3000 m		
Pollution severity	2		
Connections			
PCB terminal block for functional earth, connectable conductor	6 mm² ... 16 mm² solid, 6 mm² ... 25 mm² stranded, with wire-end ferrule max. 16 mm²		
PCB terminal block for functional earth, stripping length	15 mm ± 1 mm		
PCB terminal block for functional earth tightening torque	2,4 ... 4 Nm		
DC PCB terminal blocks PUSH IN conductor cross-sections	2.5 mm² to 16 mm² solid, stranded, with/without wire-end ferrule		
DC PCB terminal blocks PUSH IN stripping length	18 mm ± 1 mm		
PCB terminal block remote signalling contact	0.25 mm² ... 1.5 mm² with/without wire-end ferrule		
PCB terminal block remote signalling contact, stripping length	≤ 0,75 mm²: 10 mm ± 1 mm; 1,5 mm²: 7 mm ± 1 mm		
Electrical data			
Maximum input voltage	1000 V DC		
Maximum current per string input (Inc)	15 A	10 A	10 A
Maximum short-time current per string input	1,25 × Inc		
Overvoltage category according to IEC 60644-1	III (8 kV pulse strength)		
Maximum current per spring terminale	50A DC		
Load-bearing capacity of remote signalling contact	24V DC / 100mA		
Surge protection			
Type	I&II	I&II	II
PV system voltage, max. Ucpv	1,1kV		
I _{mp} (10/350 µs)	3,125kV	3,125kV	--
Discharge current I _n /I _{max} (8/20 µs)	20 kA / 40 kA		
I _{total} (10/350 µs)	6,25kV	12,5 kA	--

Product description

	2732510000 PCBA PV SCB 1KV 2x2110 SPD T1+2 NF	2672210000 PCBA PV SCB 1KV 3130 SPD T1+2 NF	2672190000 PCBA PV SCB 1KV 3130 SPD T2 NF
			
Total discharge current I _{total} (8/20 μs)	50 kA		
Short-circuit resistance I _{scpv}	11 kA		
Protection level Up at 20 kA (8/20 μs) +/-, -/PE, +/- PE	≤ 3,8 kV		
U _{res} at 15 kA / 5 kA	3,5 kV / 3 kV		
Standards	EN 50539-11:2015, EN 50539-12:2014 DIN EN 60664-1:2008 DIN EN 62093:2005		

	2672220000 PCBA PV SCB 1KV 3I30 SPD T1+2 F	2672200000 PCBA PV SCB 1KV 3I30 SPD T2 F	2735650000 PCBA PV SCB 1KV 6I60 SPD T1+2 F	2735690000 PCBA PV SCB 1KV 6I60 SPD T2 F
				
General data				
Dimensions WxHxD	254 x 254 x 90 mm		440 x 254 x 90 mm	
MPPT suitable for connection	1			
String inputs per MPPT	3		6	
Outputs per MPPT	3		6 / 1	
Permissible ambient temperature in operation	-20°C ... +65°C	-20°C ... +65°C	-20°C ... +65°C	-20°C ... +65°C
Permissible ambient temperature for storage and transport	-20°C ... +70°C			
Relative humidity for storage and transport	5 to 50%			
Permissible height above sea level	3000 m			
Pollution severity	2			
Connections				
PCB terminal block for functional earth, connectable conductor	6 mm² ... 16 mm² solid, 6 mm² ... 25 mm² stranded, with wire-end ferrule max. 16 mm²			
PCB terminal block for functional earth, stripping length	15 mm ± 1 mm			
PCB terminal block for functional earth tightening torque	2.4 ... 4 Nm			
DC PCB terminal blocks PUSH IN conductor cross-sections	2.5 mm² to 16 mm² solid, stranded, with/without wire-end ferrule			
DC PCB terminal blocks PUSH IN stripping length	18 mm ± 1 mm			

	2672220000 PCBA PV SCB 1KV 3I3O SPD T1+2 F	2672200000 PCBA PV SCB 1KV 3I3O SPD T2 F	2735650000 PCBA PV SCB 1KV 6I6O SPD T1+2 F	2735690000 PCBA PV SCB 1KV 6I6O SPD T2 F
				
DC PCB terminal blocks Screw connection conductor cross-sections	-	0.5–50 mm²		
DC PCB terminal blocks Screw connection stripping length		18 mm		
DC PCB terminal block tighten- ing torque		2.5 Nm ± 4 Nm		
PCB terminal block remote signalling contact	0.25 mm² ... 1.5 mm² with/without wire-end ferrule			
PCB terminal block remote sig- nalling contact, stripping length	≤0.75 mm²: 10 mm ± 1 mm; 1.5 mm²: 7 mm ± 1 mm			
Elekt Electrical data				
Maximum input voltage	1,000 V DC			
Maximum current per string input (Inc)	10 A		15 A	
Maximum short-time current per string input	1.25 × Inc			
Overvoltage category according to IEC 60644-1	III (8 kV pulse strength)			
Maximum current per spring terminal	50 A DC			
Load-bearing capacity of remote signalling contact	24 V DC / 300 mA			
Surge protection				
Type	I&II	II	I&II	II
PV system voltage, max. Ucpv	1.1 kV			
Imp (10/350 µs)	3.125 kV	--	3.125 kV	--
Discharge current In/Imax (8/20 µs)	20 kA / 40 kA			
Itotal (10/350 µs)	6.25 kV	--	6.25 kV	--
Total discharge current Itotal (8/20 µs)	50 kA			
Short-circuit resistance Iscpv	11 kA			
Protection level Up at 20 kA (8/20 µs) +/-, -/PE, +/-PE	≤3.8 kV			
Ures at 15 kA / 5 kA	3.5 kV / 3 kV			
Standards	EN 50539-11:2015, EN 50539-12:2014, DIN EN 60664-1:2008 DIN EN 62093:2005			

4 Wiring diagrams and connections

Wiring diagram and connections for the following PCBAs

- 2672190000 PCBA PV SCB 1KV 3I3O SPD T2 NF
- 2672210000 PCBA PV SCB 1KV 3I3O SPD T1+2 NF
- 2672200000 PCBA PV SCB 1KV 3I3O SPD T2 F
- 2672220000 PCBA PV SCB 1KV 3I3O SPD T1+2 F

Figure 4.2 and Figure 4.3 are optional if more than one PCBA is to be installed in one enclosure

Component	Identification	Comment
DC+ inputs	-XD2.1, -XD2.2, -XD2.3	DC+ module strings connection
DC+ outputs	-XD1.1, -XD1.2, -XD1.3	Inverter DC+ connection
DC- inputs	-XD4.1, -XD4.2, -XD4.3	DC- module strings connection
DC- outputs	-XD3.1, -XD3.2, -XD3.3	Inverter DC- connection
Remote signalling contact	-XD5.11, -XD5.14, -XD5.12	Potential-free contact state SPD cartridges
Optional DC+ switch	-XD2.4, -XD1.4	If no switch is used, use a cable bridge that can carry three times the rated current per input, min. 6 mm².
Optional DC- switch	-XD4.1, -XD4.2	If no switch is used, use a cable bridge that can carry three times the rated current per input, min. 6 mm².
Functional earth	-XE1.1, -XE1.2	Functional earth, connection arrester centre

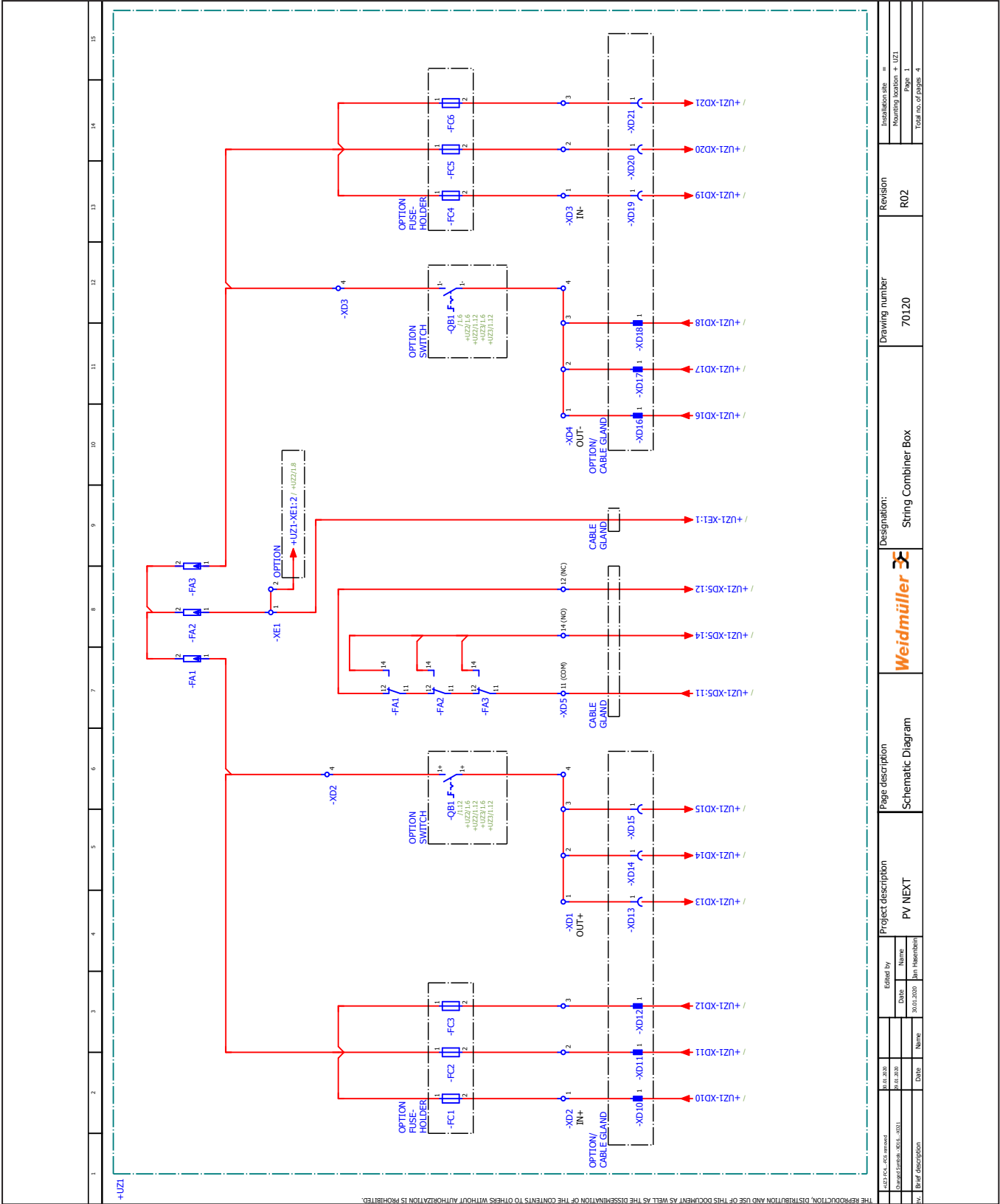


Figure 4.1

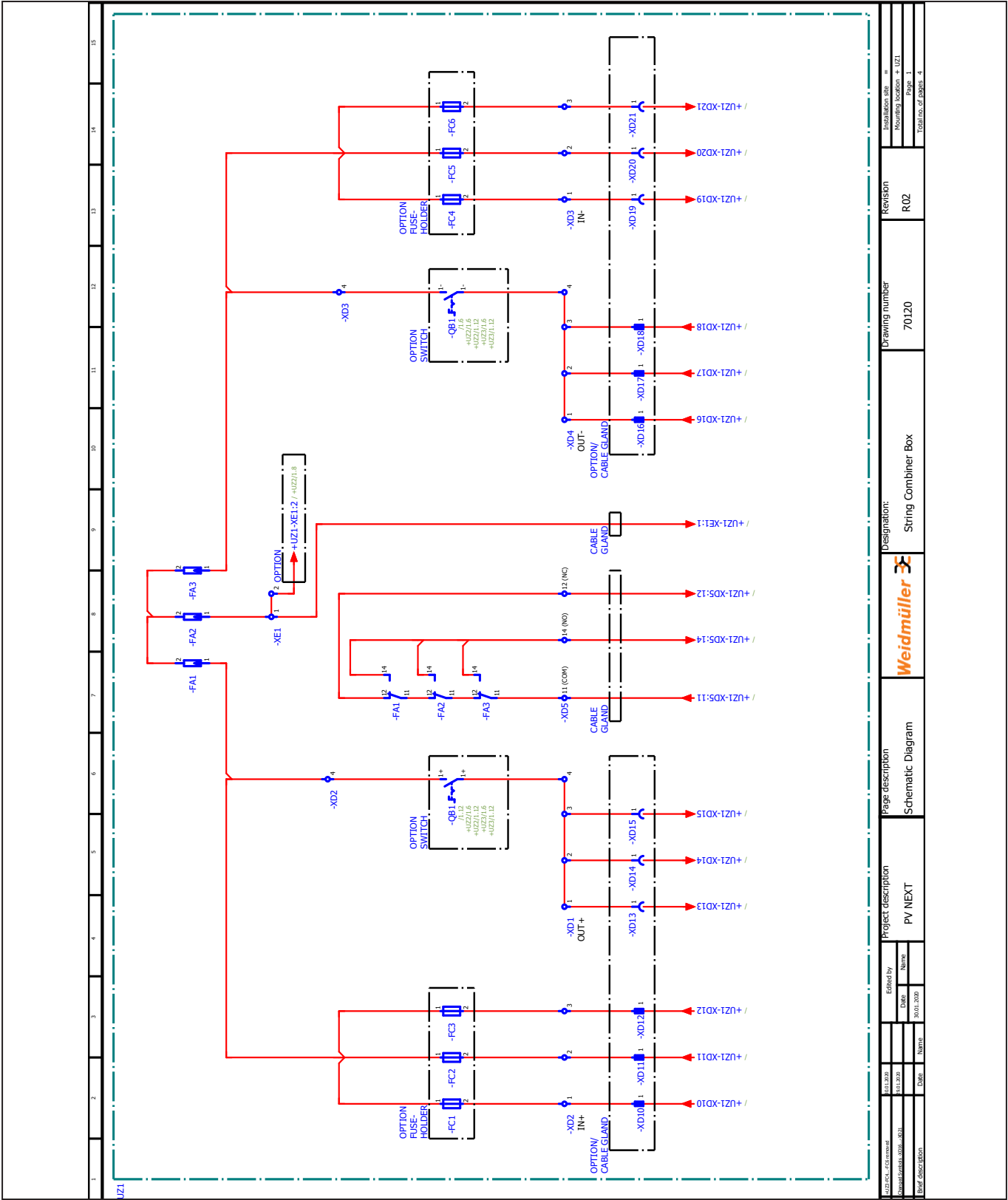


Figure 4.2

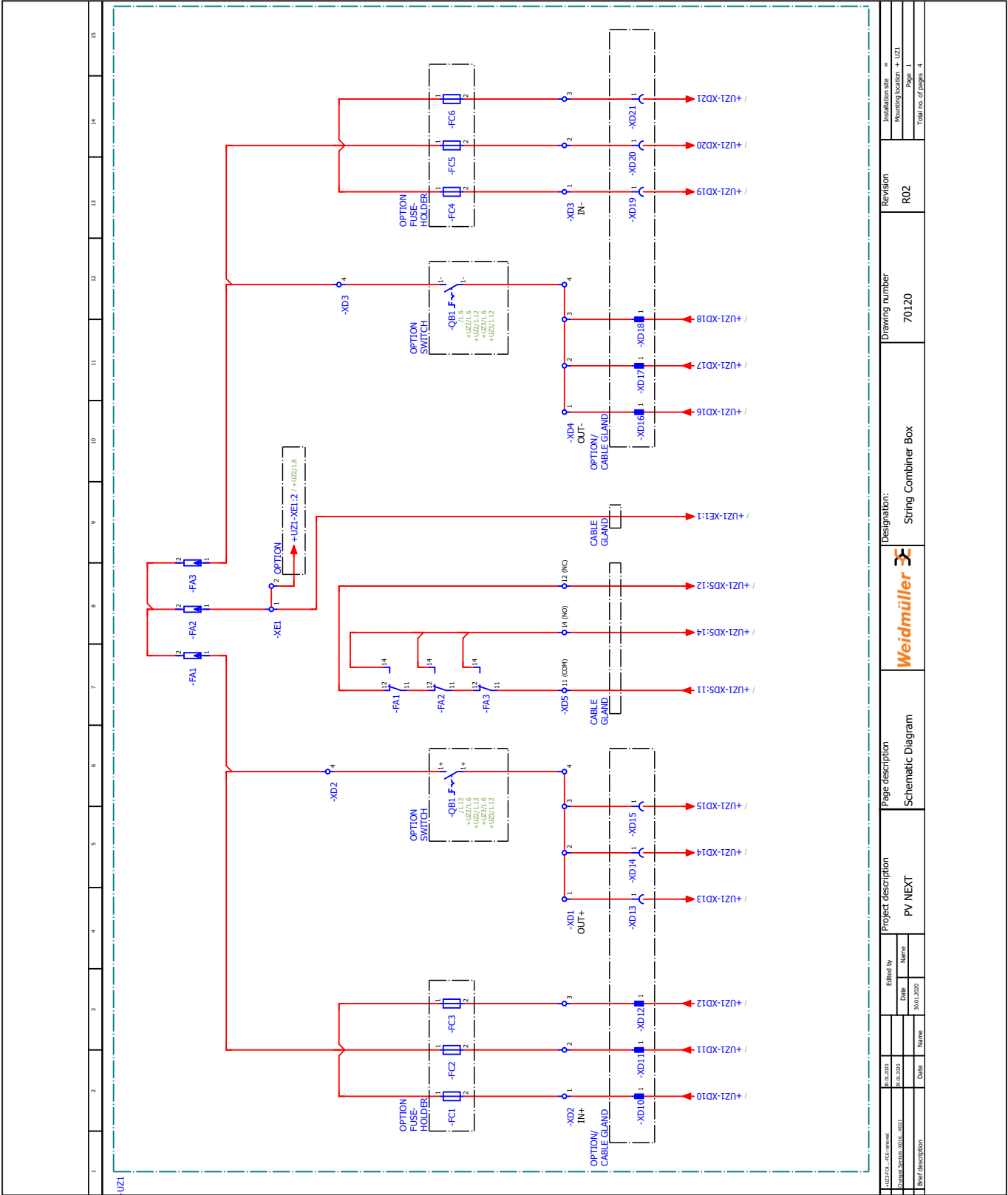
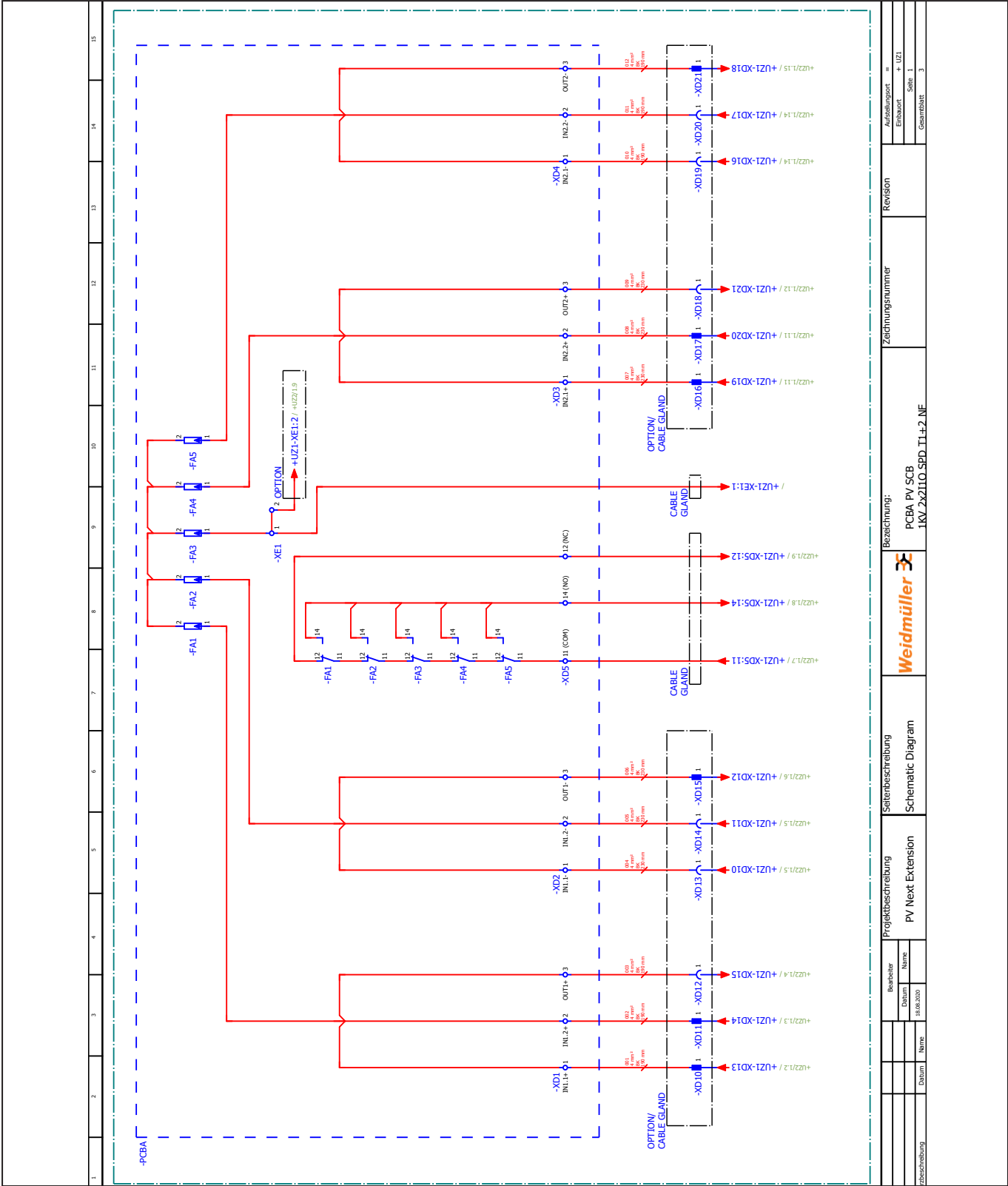


Figure 4.3

Wiring diagram and connections for the following PCBA

– 2732510000 PCBA PV SCB 1KV 2x2I1O SPD T1+2 NF

Component	Identification	Comment
DC+ inputs MPPT1	-XD1.1, -XD1.2	DC+ module strings connection
DC+ output MPPT1	-XD1.3	Inverter DC+ connection
DC- inputs MPPT1	-XD2.1, -XD2.2	DC- module strings connection-
DC- output MPPT1	-XD2.3	Inverter DC- connection
DC+ inputs MPPT2	-XD3.1, -XD3.2	DC+ module strings connection
DC+ output MPPT2	-XD3.3	Inverter DC+ connection
DC- inputs MPPT2	-XD4.1, -XD4.2	DC- module strings connection
DC- output MPPT2	-XD4.3	Inverter DC- connection
Remote signalling contact	-XD5.11, -XD5.14, -XD5.12	Potential-free contact state SPD cartridges
Functional earth	-XE1.1, -XE1.2	Functional earth, connection arrester centre



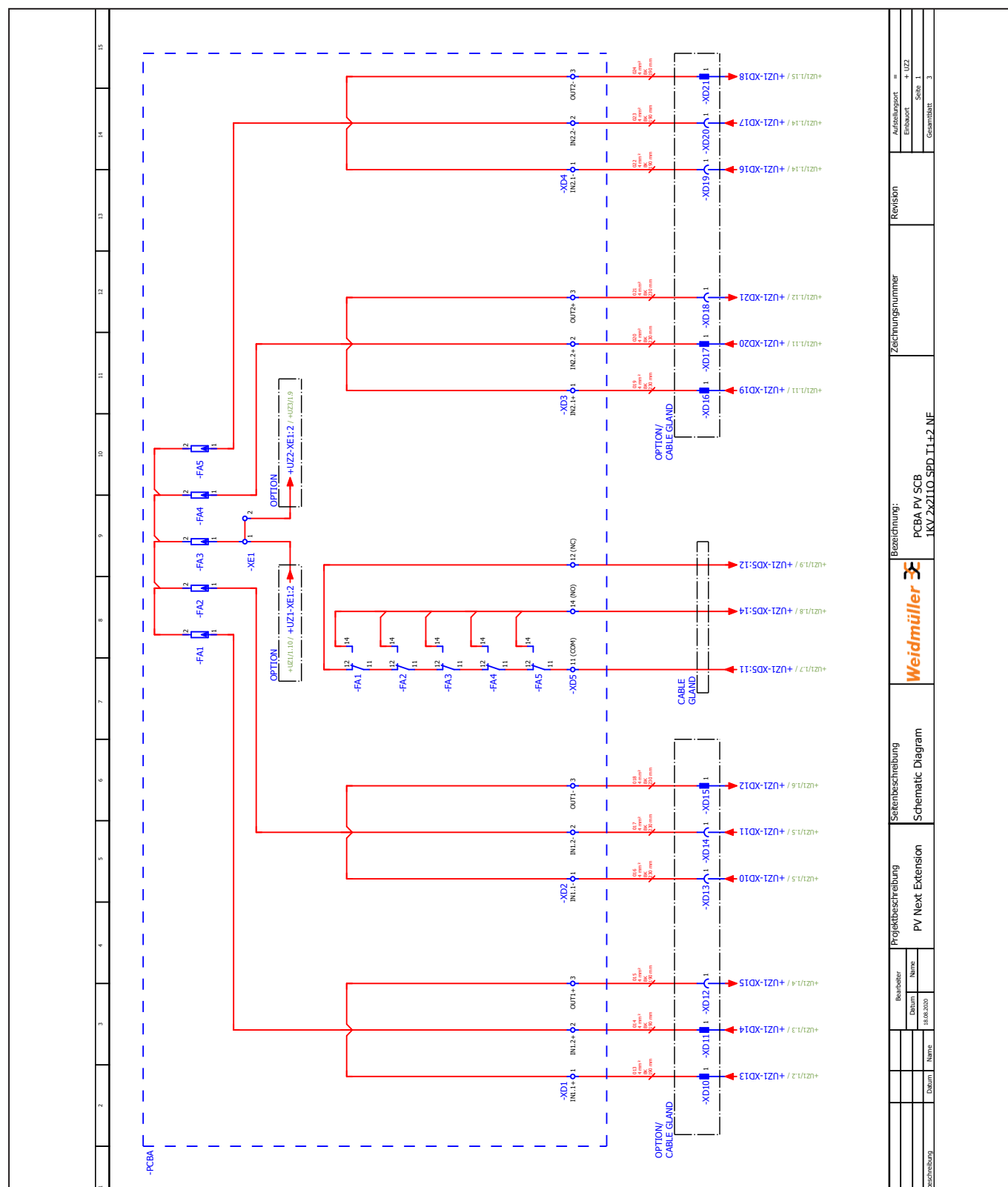


Figure 4.5

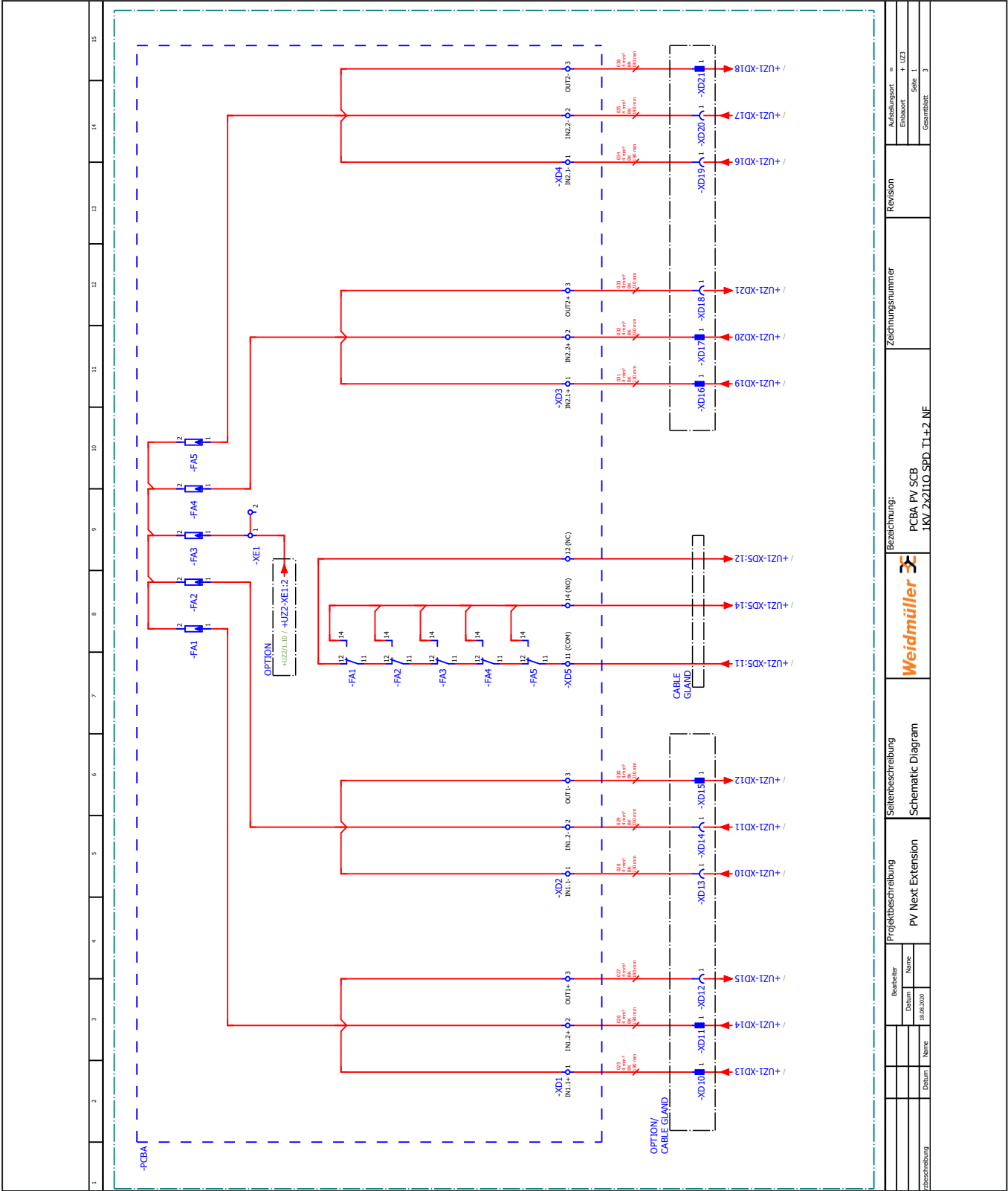


Figure 4.6

Wiring diagram and connections for the following PCBAs

- 2735650000 PCBA PV SCB 1KV 6I6O SPD T1+2 F
- 2735690000 PCBA PV SCB 1KV 6I6O SPD T2 F

Component	Identification	Comment
DC+ inputs	-XD2.1 to -XD2.6	DC+ module strings connection
DC+ outputs	-XD1.1 to -XD1.6 -XD1.7	Inverter DC+ connection Alternative to -XD1.1 to -XD1.6
DC- inputs	-XD3.1 to -XD3.6	DC- module strings connection
DC- outputs	-XD4.1 to -XD4.6 -XD4.7	Inverter DC+ connection Alternative to -XD4.1 to -XD4.6
Optional DC+ switch	-XD2.7, -XD2.8 -XD1.8, -XD1.9	If no switch is used, use a cable bridge that can carry six times the rated current per input, min. 6 mm ²
Optional DC- switch	-XD3.7, -XD3.8 -XD4.8, -XD4.9	If no switch is used, use a cable bridge that can carry six times the rated current per input, min. 6 mm ² .
Functional earth	-XE1.1, -XE1.2	Functional earth, connection arrester centre

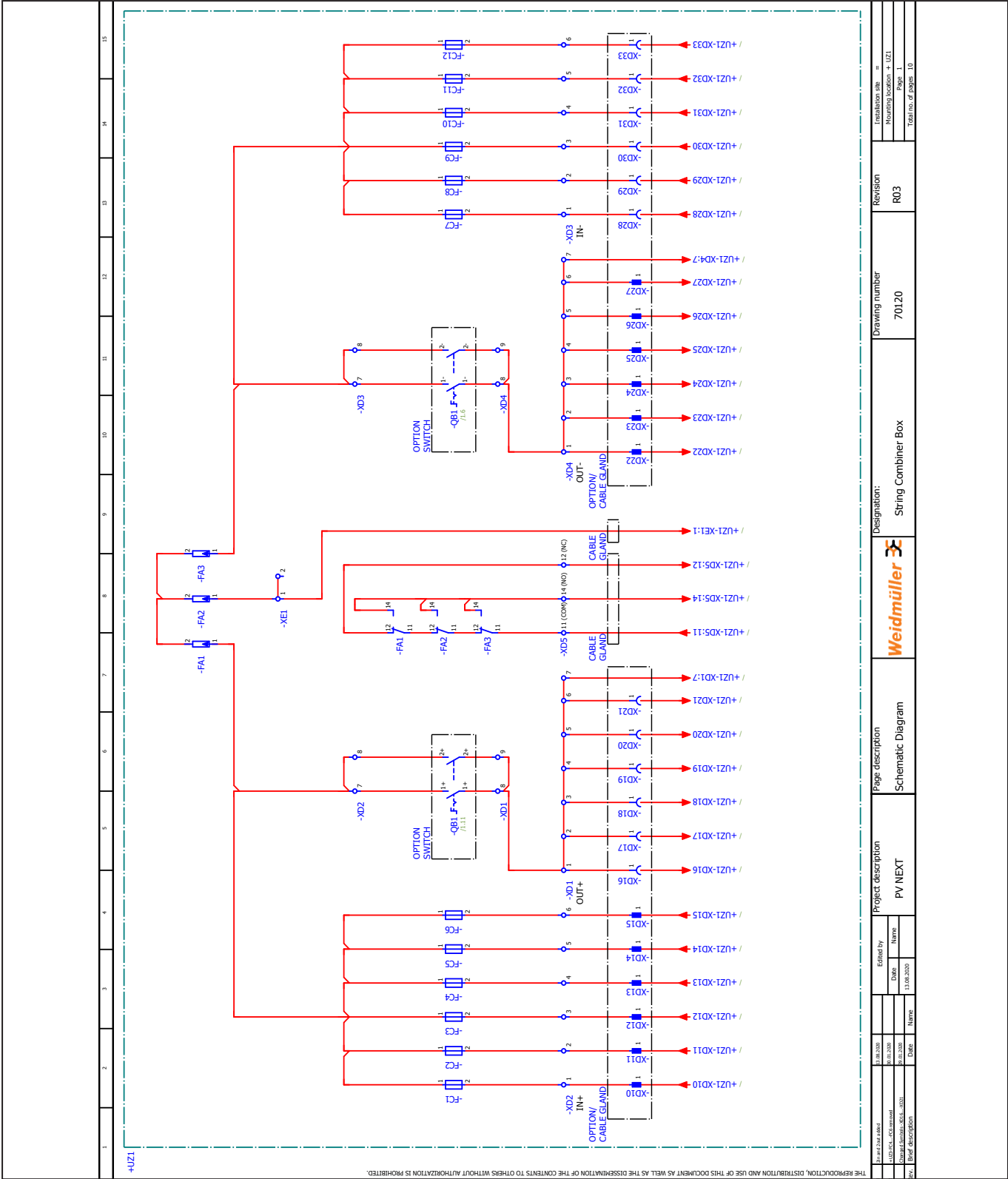


Figure 4.7

4.1 Mounting the PV Next PCBA

Make sure that the PV Next PCBA is fixed with two screws in the 5 mm holes at both the top and bottom.

To prevent the PV Next PCBA from being subjected to unnecessary loads/bends, non-conductive support elements must be fitted in the 4 mm holes.

Make sure that the PCB is screwed to the mounting plate evenly and without height offset.

Never mount the PV Next PCBA without suitable spacers, otherwise the solder pins of the PCBA rest directly on the mounting plate. This may cause damage to the product.

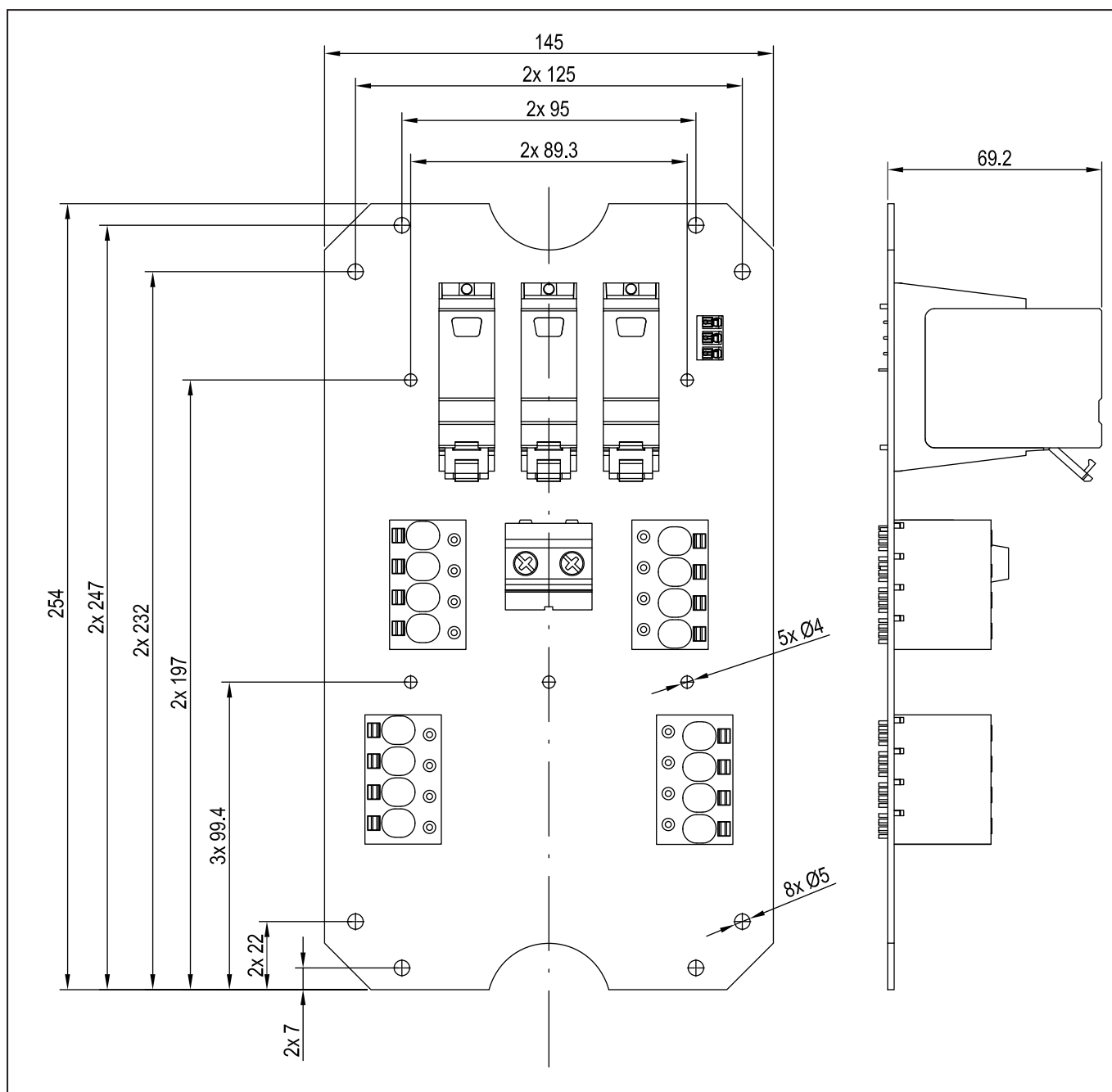


Figure 4.8 PCBA PV SCB 1 KV 3I3O SPD T2 NF (2672190000)

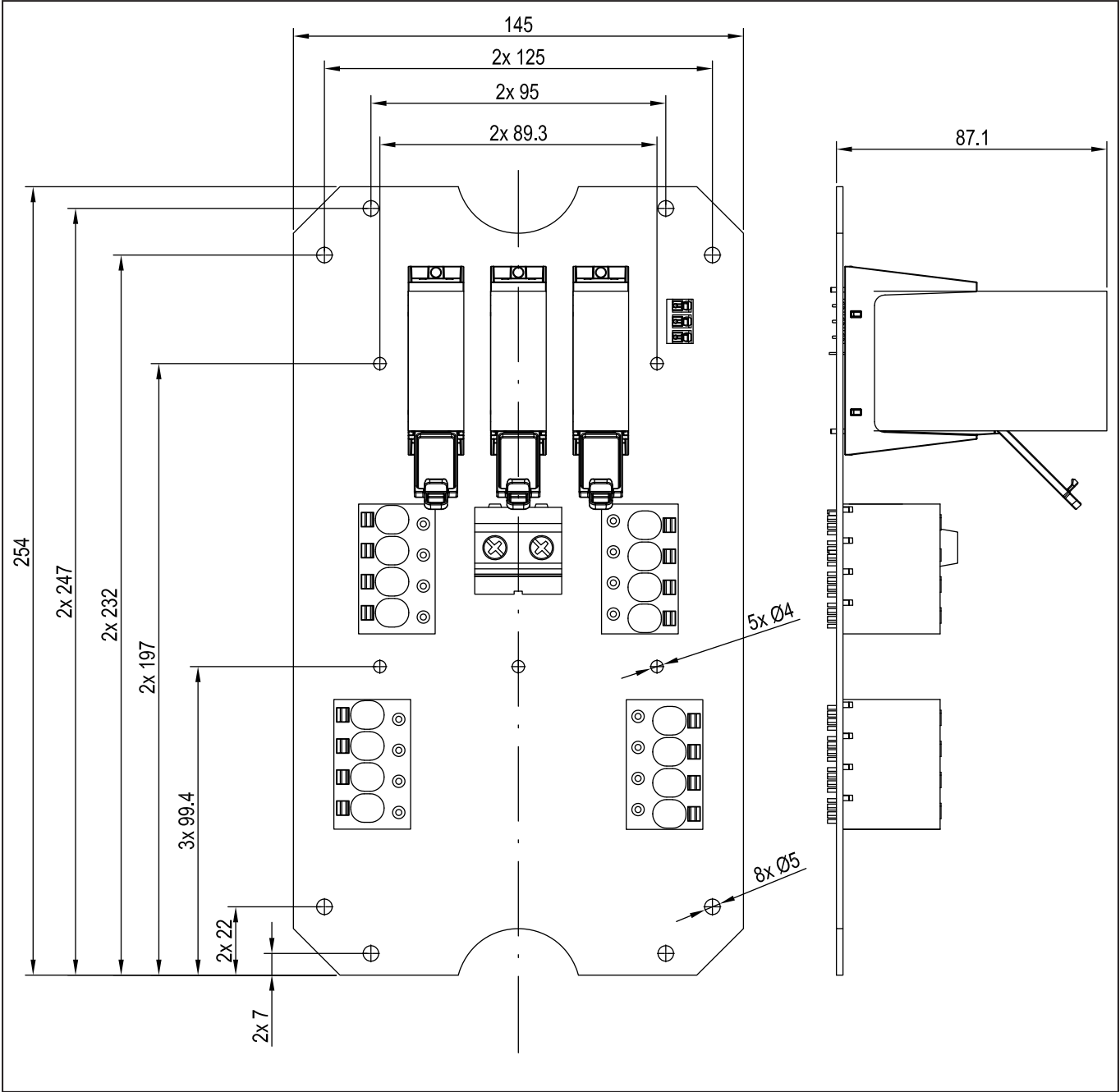


Figure 4.9 PCBA PV SCB 1 KV 3I3O SPD T1-2 NF (2672210000)

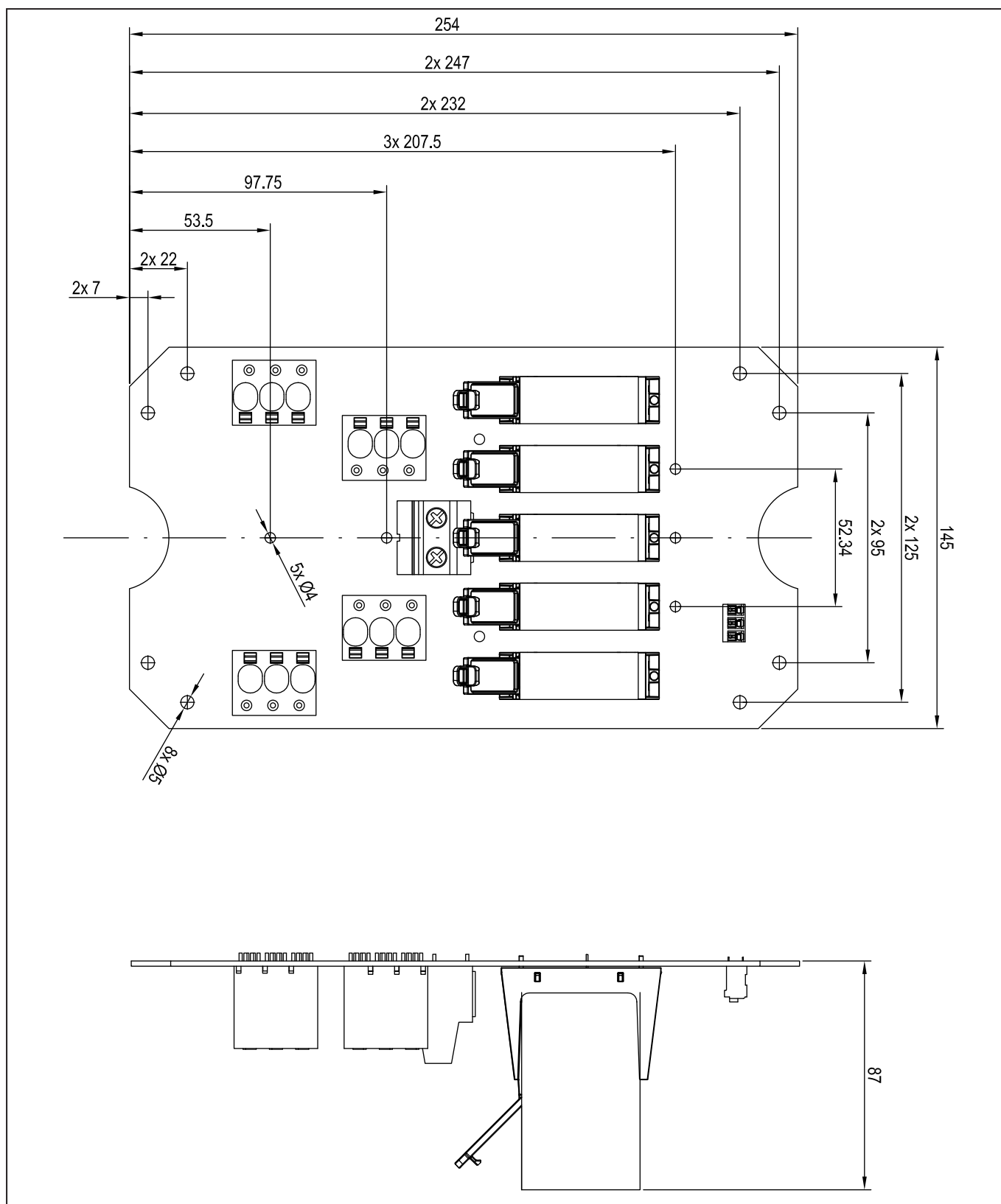


Figure 4.10 PCBA PV SCB 1 KV 2x2I2O SPD T1-2 NF (2732510000)

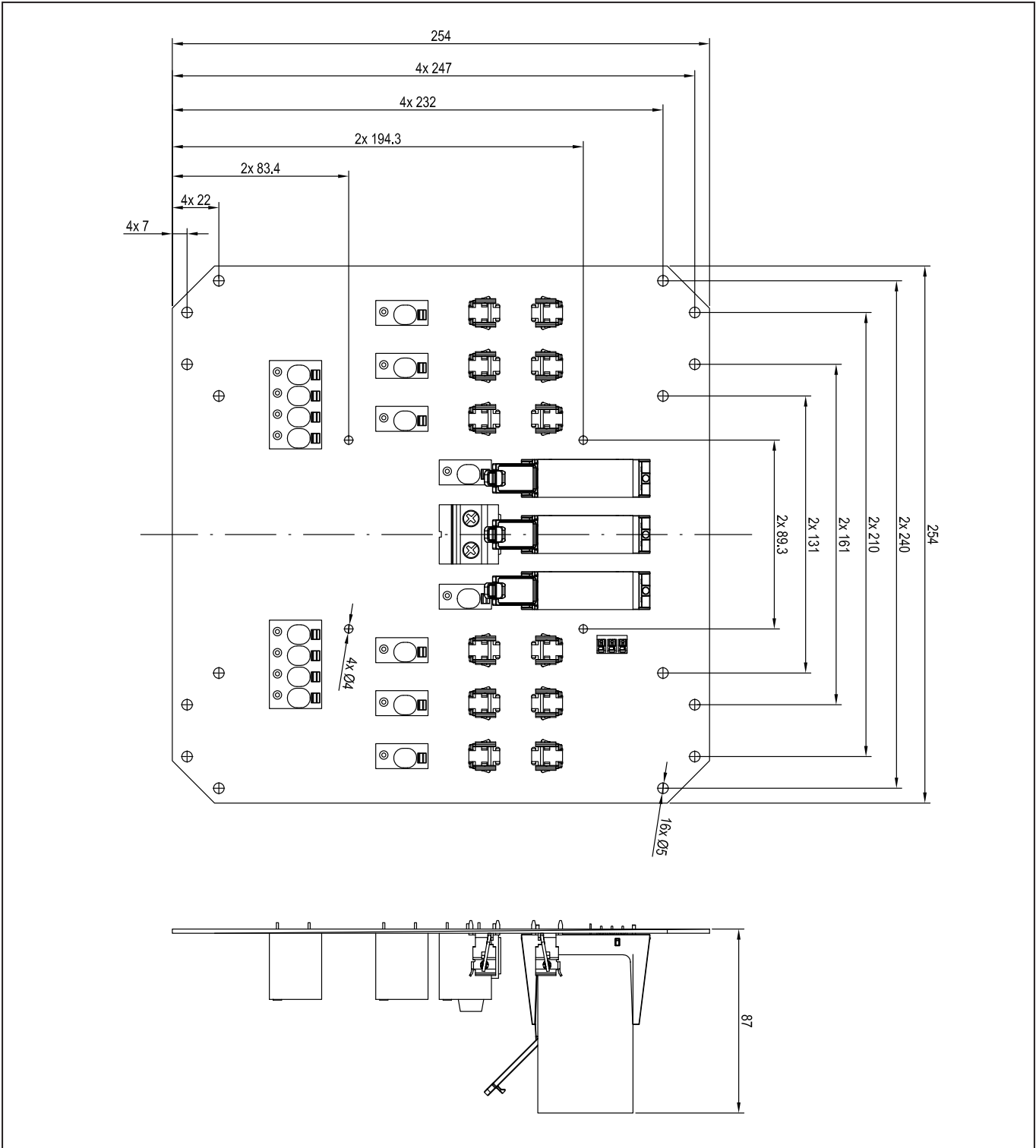


Figure 4.11 PCBA PV SCB 1 KV 3I30 SPD T1-2 F (2672220000)

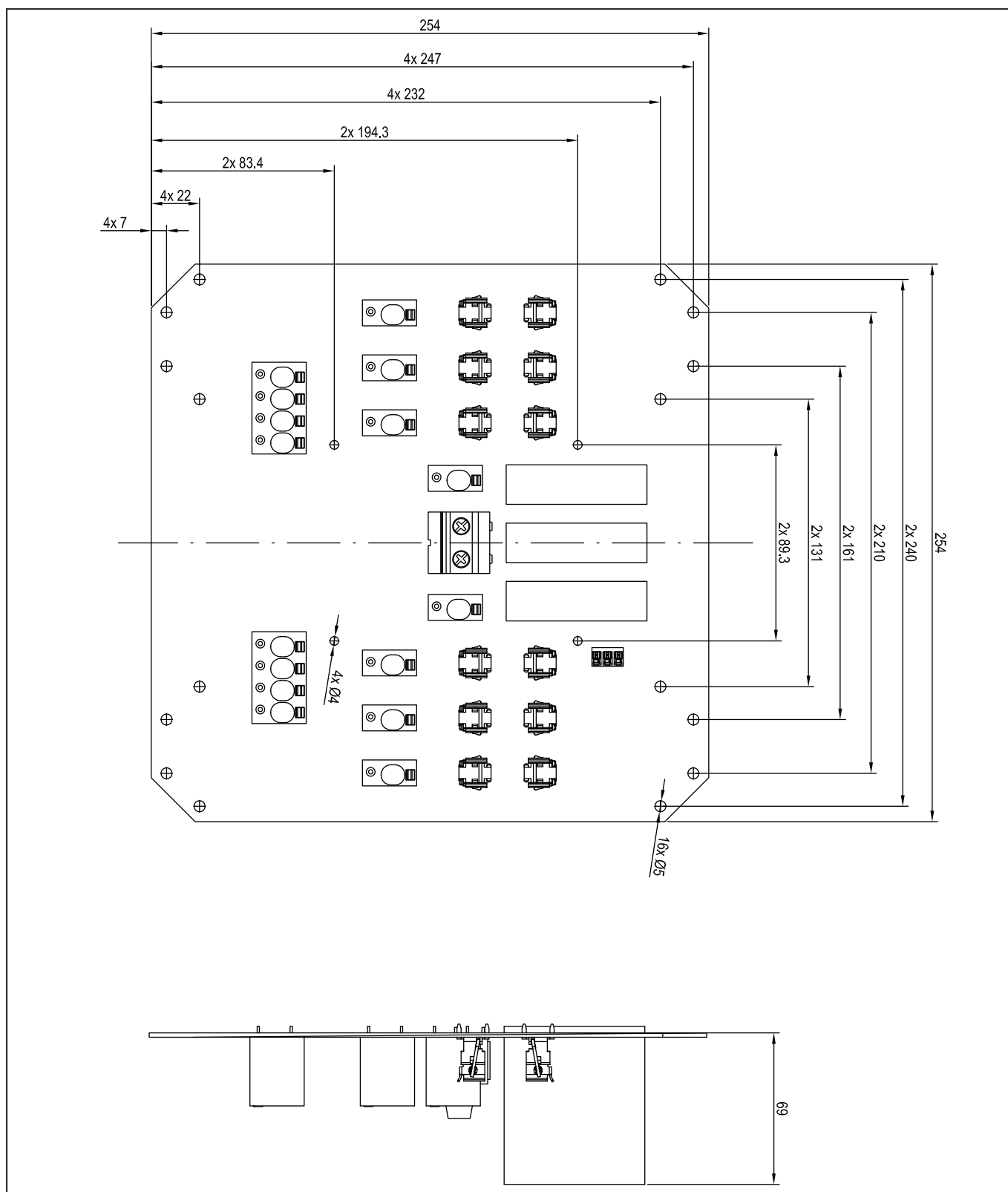


Figure 4.12 PCBA PV SCB 1 KV 3I3O SPD T2 F (2672200000)

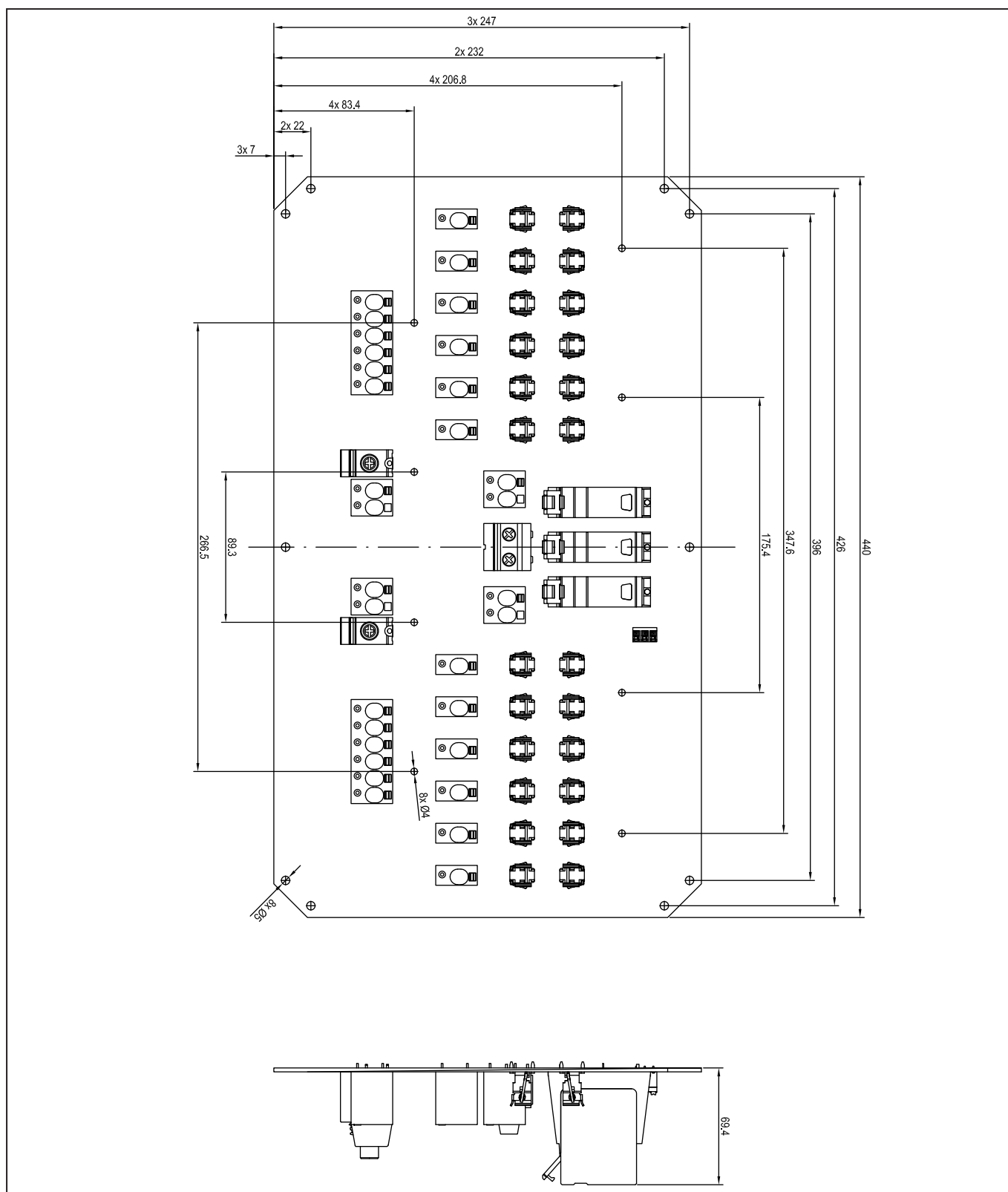


Figure 4.13 PCBA PV SCB 1 KV 6I6O SPD T2 F (2735690000)

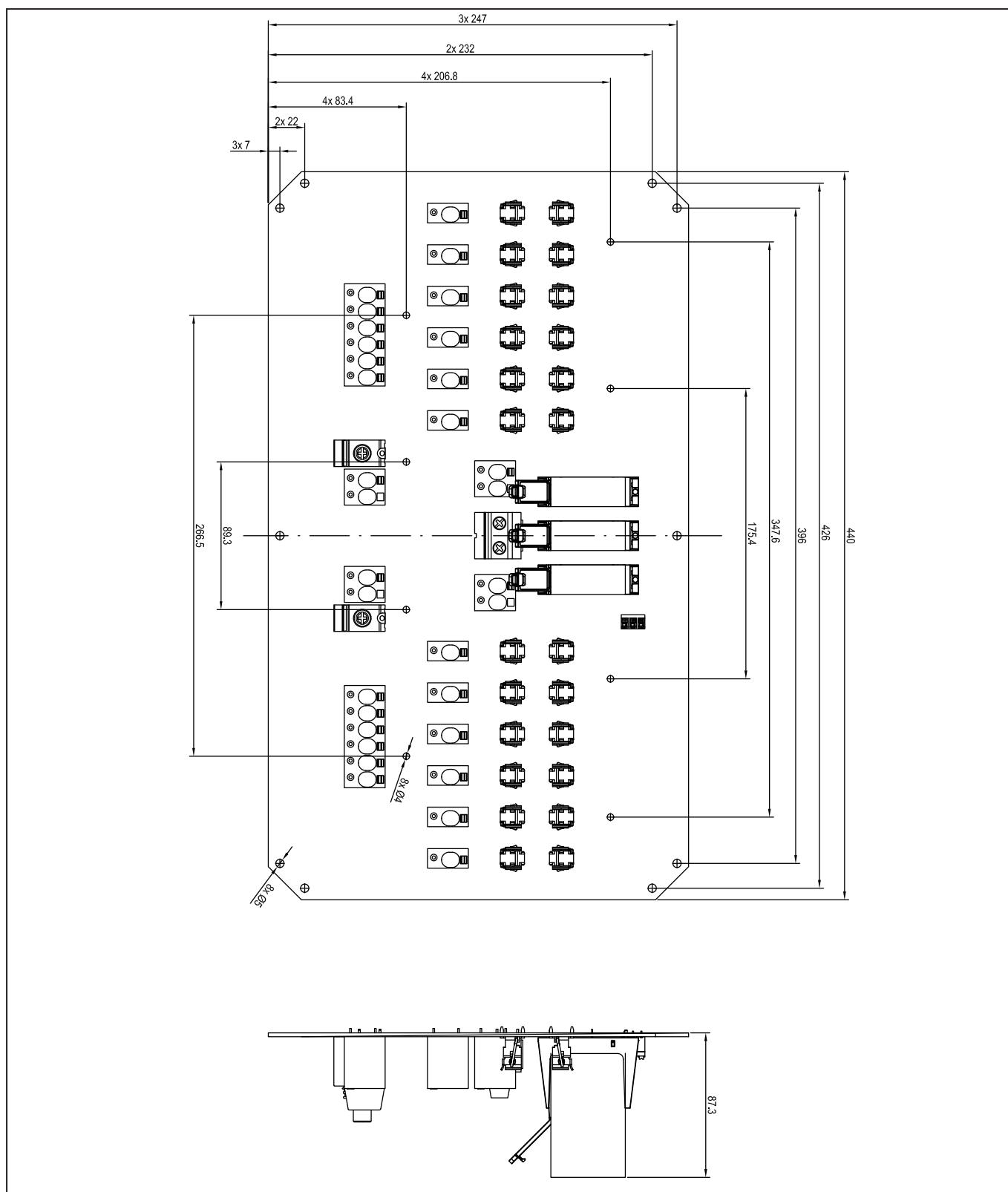


Figure 4.14 PCBA PV SCB 1 KV 6I60 SPD T1-2 F (2735650000)

5 Electrical connection

5.1 Input and output PCB terminal blocks

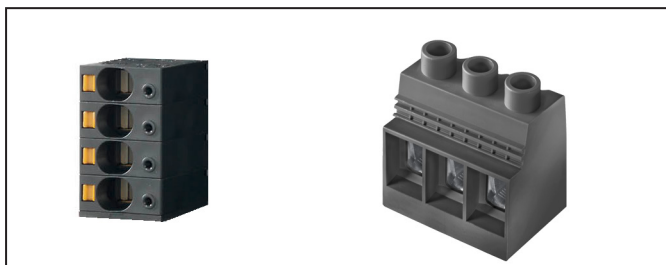


Figure 5.1 PCB terminal with PUSH IN function (left) and clamping yoke connection (right)

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.

There are two ways of connecting the PV cable to the PUSH IN printed circuit boards:

Option 1 (recommended): Conductor with wire-end ferrule

- Strip the conductor to 18 mm and 15mm for yoke connection
- Crimp the conductor with a round wire-end ferrule (with 18 mm metal shaft)
- Insert the conductor into the LUF contact point up to the end point

Option 2: Conductor without wire-end ferrule

- Strip the conductor to 18 mm and 15mm for yoke connection
- To open the contact point, press the actuating element with a suitable screwdriver 4 mm x 100 mm
- Insert the conductor into the LUF contact point up to the end point



In both cases, to remove the conductor, the actuating element (orange) must be pushed to the end point.

Suitable replacement parts and accessories see chapter 7.

	WARNING
	Risk of fire! An incorrect wire-end ferrule will result in poor contact with the conductor and can lead to fire. ► For connecting to the PUSH IN PCB terminal blocks, only use cables that are approved for the PV application. ► Provide cable strain relief when connecting the PUSH IN terminals.

5.2 Remote signalling contact for surge protection

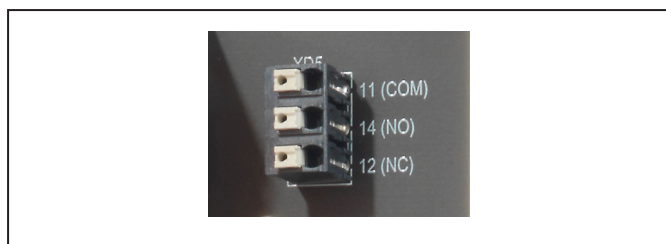


Figure 5.2 Remote signalling connector

There are two ways of connecting the PV cable to the PUSH IN printed circuit boards:

Option 1 (recommended): Conductor with wire-end ferrule

- Strip the conductor at $\leq 0.75 \text{ mm}^2$: $10 \text{ mm} \pm 1 \text{ mm}$; 1.5 mm^2 : $7 \text{ mm} \pm 1 \text{ mm}$
- Crimp the conductor with a round wire-end ferrule (with 10 mm , 7 mm metal shaft)
- Insert the conductor into the LUF contact point up to the end point

Option 2: Conductor without wire-end ferrule

- Strip the conductor at $\leq 0.75 \text{ mm}^2$: $10 \text{ mm} \pm 1 \text{ mm}$; 1.5 mm^2 : $7 \text{ mm} \pm 1 \text{ mm}$
- To open the contact point, press the actuating element with a suitable screwdriver $4 \text{ mm} \times 100 \text{ mm}$
- Insert the conductor into the LUF contact point up to the end point



In both cases, to remove the conductor, the actuating element (orange) must be pushed to the end point.

Suitable replacement parts and accessories see chapter 7.

5.3 Functional earth PCB terminal block

When connecting the functional earth, ensure that the conductor cross-section is suitable.

Outer lightning protection system present	Separation distance $S \geq 0.7 \dots 1.0 \text{ m}$ fulfilled	Cable length $l_2 < 10 \text{ m}$	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 mm^2 or equal to the cross-section of the active conductor if this is greater than 6 mm^2 .

Type I: minimum 16 mm^2 or equal to the cross-section of the active conductor if this is greater than 16 mm^2 .

Connecting the conductor with wire-end ferrulee

- Strip the conductor to 15 mm
- Crimp the conductor with a round wire-end ferrule (with 15 mm metal shaft)
- Insert the conductor into the screw terminal up to the end point
- Tighten the terminal to $2.4 \dots 4 \text{ Nm}$ using a suitable screwdriver $5.5 \text{ mm} \times 150 \text{ mm}$

Suitable replacement parts and accessories see chapter 7.

5.4 Optional switch

The following PV Next PCBAs have PCB terminal blocks for connecting a DC disconnector

- 2735650000 PCBA PV SCB 1KV 6I6O SPD T1+2 F
- 2735690000 PCBA PV SCB 1KV 6I6O SPD T2 F

The following terminals are provided for connecting a DC disconnector:

- XD2.7, -XD2.8 for DC+
- XD1.8, -XD1.9 for DC+
- XD3.7, -XD3.8 for DC-
- XD4.8, -XD4.9 for DC-

Make sure that you use both pairs of terminals for DC+ and DC-!

- 2672190000 PCBA PV SCB 1KV 3I3O SPD T2 NF
- 2672200000 PCBA PV SCB 1KV 3I3O SPD T2 F
- 2672210000 PCBA PV SCB 1KV 3I3O SPD T1+2 NF
- 2672220000 PCBA PV SCB 1KV 3I3O SPD T1+2 F

The following terminals are provided for connecting a DC disconnector

- XD2.4, -XD1.4 für DC+
- XD3.4, -XD4.4 für DC-

If no DC disconnector is installed, you must insert cable bridges between the terminals, min. 6 mm².

6 Maintenance and service

6.1 Checking and replacing fuse links

	DANGER
	Imminent risk to life! Fuse links must not be removed or inserted under load. The system must be switched off for this work. ▶ Switch 2.1. ▶ 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.

ATTENTION
The product can be destroyed! 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.

6.2 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.

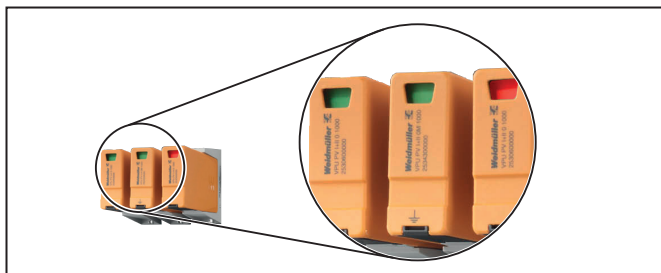


Figure 6.1 Status indicators of the surge protection arresters

At the same time, the remote signalling contact is activated, which can optionally be evaluated by your inverter or data logger. If the remote signalling contact of the surge protection is read by the inverter or a data logger, there is no need to carry out a regular visual check of the surge protection arrester.



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

6.3 Replacing surge protection arresters

	DANGER
	Imminent risk to life! The contacts in the sockets of the surge protection arresters are live. The system must be switched off for this work. ▶ Switch off the system as described in chapter 2.1. ▶ Do not reach into the sockets when the arrester is removed.



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.

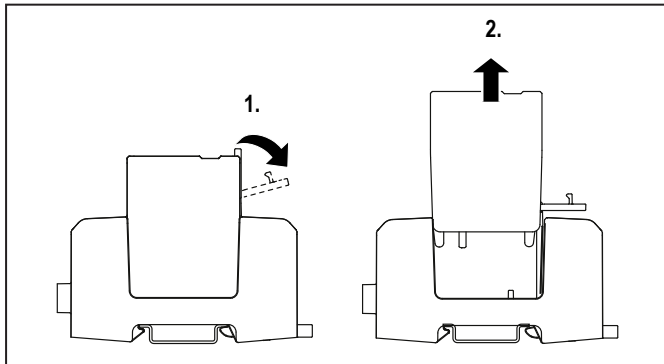


Figure 6.2 Removing surge protection arresters

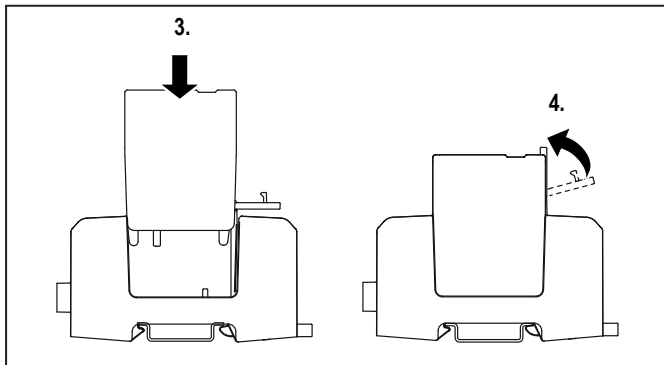


Figure 6.3 Inserting surge protection arresters

Suitable replacement parts and accessories see chapter 7.

7 Replacement parts and accessories

Product	Usage	Order No.
SFGH BOX WM4 C BT	Photovoltaic, connector, pin for enclosure installation	1530640000
SFKO WM4 C BT	Crimp contact for Photovoltaic, connector, pin for enclosure installation	1530680000
BUGH BOX WM4 C BT	Photovoltaic, connector, socket for enclosure installation	1530630000
BUKO WM4 C BT	Crimp contact for BUGH BOX WM4 C BT	1530670000
CTF PV WM4	Crimping tool for BUKO WM4C and SFKO WM4CC	1222870000
Staubschutzkappen VSSO WM4 C (Buchse und Stift)	Dust protection for unused PV connectors	1254870000
PV-STICK+ VPE10 (4 – 6 mm ²)	PV connectors	1303450000
PV-STICK- VPE10 (4 – 6 mm ²)	PV connectors	1303490000
Schneidwerkzeug	For PV cables up to 22 mm outer diameter	1157820000
Schraubendreher 4 mm x 100 mm	Release PUSH IN terminals	9008340000
Schraubendreher 5,5 mm x 150 mm	Loosen and fasten functional earth, unlock spare cartridge surge protection	9008350000
VPU PV I+II 0 1000	Spare arrester for surge protection (left or right))	2530600000
VPU PV I+II 0M 1000	Spare arrester for surge protection (centre)	2534300000
VPU PV II 0 1000	Spare arrester for surge protection	2530660000
TBF 30/19/18 TRSP	Suitable for 1 x 2732510000, 1 x 2672190000 or 1 x 2672210000	500600000
TBF 30/30/18 TRSP	Suitable for 1 x 2672200000 or 1 x 2672220000	500700000
TBF 37/30/18 TRSP	Suitable for 2 x 2732510000, 2 x 2672190000 or 2 x 2672210000	500800000
TBF 49/30/21 TRSP	Suitable for 1 x 2735650000 or 1 x 2735690000	9502840000
TBF 56/30/21 TRSP	Suitable for 3 x 2732510000, 3 x 2672190000 and 3 x 2672210000 or 2 x 2672200000 or 2 x 2672220000	9502850000
H2,5/18	Wire-end ferrule 2.5 mm ² , uninsulated, 18 mm for PUSH IN terminals	9004090000
H4,0/18	Wire-end ferrule 4 mm ² , uninsulated, 18 mm for PUSH IN terminals	9004110000
H6,0/18	Wire-end ferrule 6 mm ² , uninsulated, 18 mm for PUSH IN terminals	9004130000
H10,0/18	Wire-end ferrule 10 mm ² , uninsulated, 18 mm for PUSH IN terminals	0379300000
H16,0/18	Wire-end ferrule 16 mm ² uninsulated, 18 mm for PUSH IN terminals	0375200000
H6,0/15	Wire-end ferrule 6 mm ² , uninsulated, 15 mm for screw terminal	0124700000
H10,0/15	Wire-end ferrule 10 mm ² , uninsulated, 15 mm for screw terminal	0124800000
H16,0/15	Wire-end ferrule 16 mm ² , uninsulated, 15 mm for screw terminal	0124300000

Further accessories such as cable glands, climate valves, wire-end ferrules and tools can be found in our online catalogue: <https://catalog.weidmueller.com/catalog/Start.do>

8 Decommissioning and disposal

8.1 Decommissioning

	DANGER
	Imminent risk to life! Up to 1,000 V DC can be present on live parts. ► Switch off the system as described in chapter 2.2.



► Refer to the inverter manufacturer's documentation.

- Switch off all externally connected devices, such as inverters
- Check for absence of voltage.
- Disconnect all electrical connections.
- Observe the locally applicable disposal guidelines.