KACO new energy.

Application instructions

Installing overvoltage protection

Powador 12.0 TL3

blueplanet 15.0 TL3

blueplanet 20.0 TL3

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1 Introduction

The Powador 12.0 TL3/ blueplanet 15.0 TL3 and 20.0 TL3 unit series allow you to upgrade the DC lightning and overvoltage protection in a straightforward and cost-efficient manner.
The overvoltage protection prevents damage being caused by overvoltage in the inverter.
We recommend installing overvoltage design type I+II or design type II for the units
Overvoltage protection type I+II combines coarse and moderate protection.
Coarse protection (overvoltage protection type I) diverts lightning currents from the power cables into the ground.
Moderate protection (overvoltage protection type II) protects the unit against further cases of overvoltage.
This document describes how to upgrade the system by installing plug-in modules.

The base of the overvoltage protection is located under the connection cover.
The base must be fitted with overvoltage protection elements for operation.

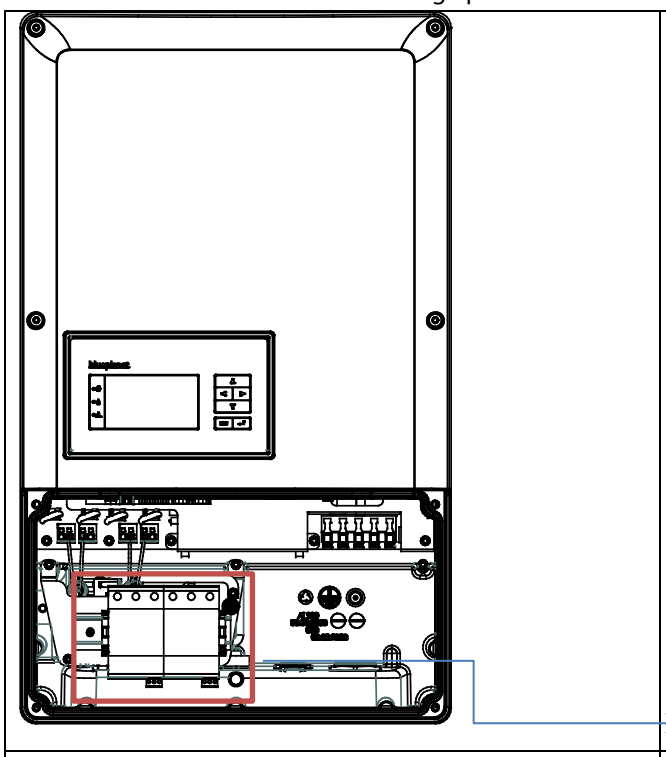


Figure 1. DC overvoltage protection

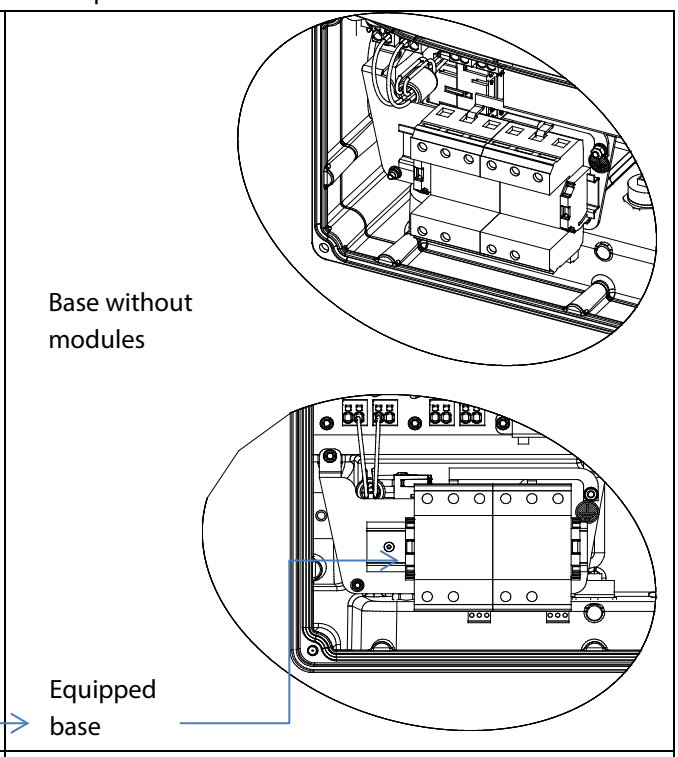


Figure 2. DC overvoltage protection - detailed view

2 Connection

2.1 Required components

Overvoltage protection elements		
Photo of the required component		
Required amount		**6 modules (3 modules per base)**
Manufacturer		**Phoenix Contact**
Possible design type I+II or II	**SPD**	**I + II**
	Order description	VAL-MS-T1/T2 1000DC-PV-ST - article no. 2801162
	KACO article no.	3010608
	SPD	**II**
	Order description	VAL-MS 1000DC-PV-ST - article no. 2800624
Base		**Built-in**
Manufacturer		Phoenix Contact
Manufacturer part number		VAL-MS/2+V-BE FM-PU40 - article no. 2908425

Table 1: Required components

2.2 Installing the overvoltage protection element

DANGER

Risk of electric shock and fire hazard

Installation and commissioning must only be carried out by suitably qualified technicians.

Check for any damage to the exterior before commencing with installation. Installation must not take place if the base is defective.

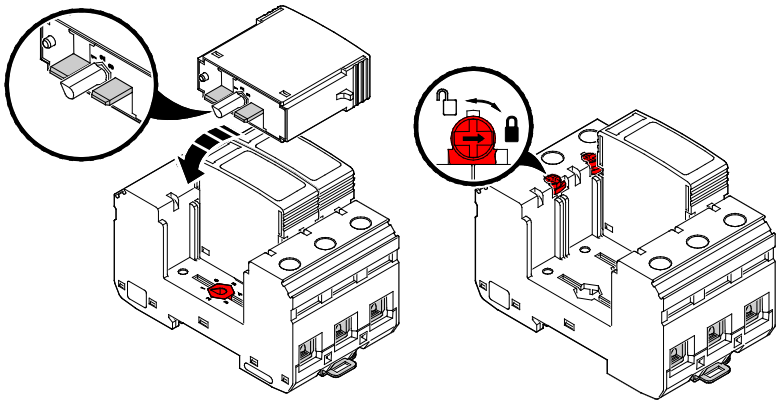


Figure 3. Inserting the overvoltage protection

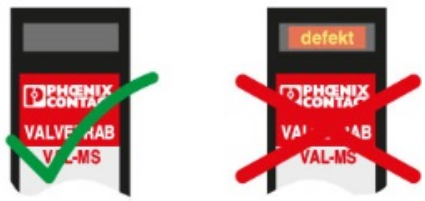


Figure 4. Status display

Installing the overvoltage protection

↻ Ensure there is no AC/DC voltage present.

1. Unscrew the four Torx screws on the front side of the connection cover (blue).
2. Remove the connection cover and take a look at the installation area for overvoltage protection.

Note: The coding at the base plug-in position must match the coding on the module.

3. Insert the DC overvoltage modules into the base one after another.

Note: If the status “defective” appears, the module is damaged. Exchange the module for another module of the same design.

4. Lock the modules over the locking latches using a screwdriver (see the detailed view on the right side of image 5).
5. Ensure that all protective elements are properly secured.

» Installation completed successfully. Move on to connect remote signal monitoring or close the connection cover.

2.3 Connecting remote signal monitoring

DANGER

Risk of electric shock and fire hazard

Installation and commissioning must only be carried out by suitably qualified technicians.

Check for any damage to the exterior before commencing with installation. Installation must not take place if the base is defective.

NOTE

It is not possible to monitor the DC overvoltage protection externally using the software.
It is possible to connect external remote signal monitoring.

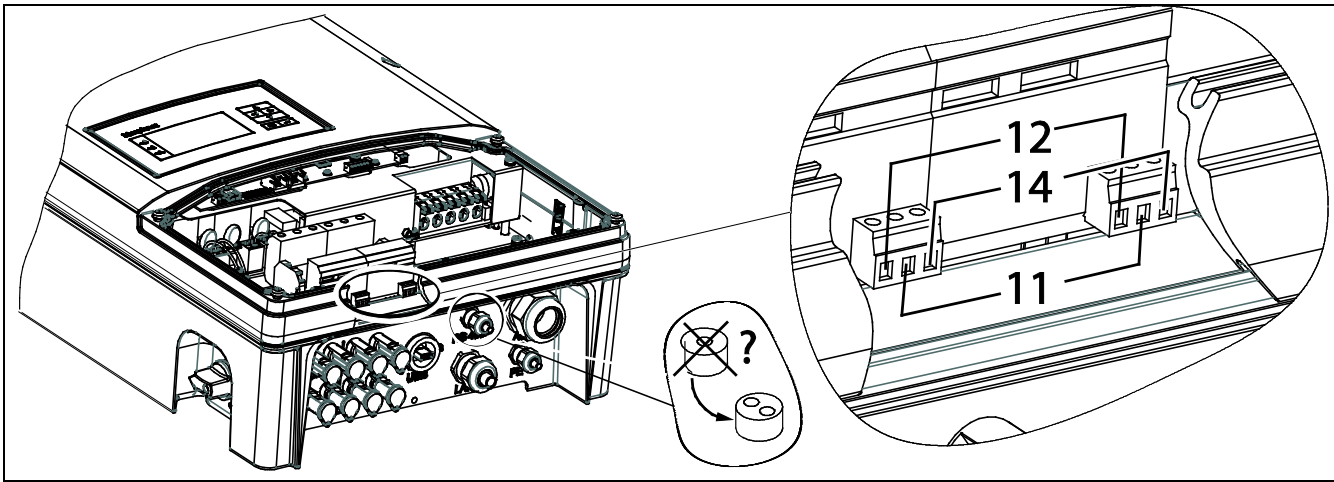


Figure 5. Connecting the DC overvoltage protection element

Connecting remote signal monitoring

1. Unscrew the four Torx screws on the front side of the connection cover (blue).
2. Remove the connection cover and take a look at the installation area.

Note: If the RS-485 cable bushing is already occupied by a cable, then the existing sealing insert must be replaced with a multiple sealing insert (supplied with the inverter).

3. Slacken the RS-485 cable bushing.
4. Feed the remote signal monitoring cable through the cable gland and the chosen sealing insert into the housing.

Note: Take note of the technical details listed in table 1 on page 6.

5. Connect the cables in accordance with the DC overvoltage protection terminal allocation (see Figure 5)
6. Lay cables correctly.
7. To meet protection class IP65 requirements, tighten the cable gland with a tightening torque of 2.5 Nm.
8. Fit the connection cover and fasten it with four Torx screws.
9. Switch on the unit and ensure that the power supply is active.

» Installation completed successfully. Close the connection cover.

Technical details – connecting remote signal monitoring	
Operating voltage [AC] / [DC]	5 – 250 V / 30 V
Operating current [AC] * / [DC]	5mA – 1.5 A / 1 A
Type of connection	Screw connection
Screw thread	M2
Tightening torque [Nm]	0.25
Length of insulation to be stripped off [mm]	7
Conductor cross-section flexible / rigid [mm^2]	0.14 – 1.5
Conductor cross-section AWG	28… 16
Terminal allocation	11, 12 normally closed contact
	11, 14 normally open contact

Table 2: Extract from data sheet – lightning / overvoltage conductor type 1/2 - VAL-MS-T1/T2 1000DC-PV/2+V-FM - 2908425

*) There must be a current of >5mA at all times to act as corrosion protection in order to use the evaluation contact.

2.4 Additional information

You can find information on the overvoltage protection modules described above on the manufacturer's website:

- https://www.phoenixcontact.com/online/portal/de

Further information on lightning and overvoltage protection can be found in the following publications:

- DIN EN 62305 / VDE 0185-305-3 Lightning protection part 3: Protecting structural installations and persons (2006)
- DIN EN 62305-3 / VDE 0185-305-3 Lightning protection part 3: Protecting structural installations and persons - addendum 5: Lightning and overvoltage protection for PV power supply systems (2009)
- Federal Association of the Solar Industry, Central Association of German Electrical and Installation Trades (2008): Data sheet for PV installation technicians - Lightning and overvoltage protection for photovoltaic systems on buildings. (Available for download in the info area at www.zveh.de)
- Michael Beer (2009): Lightning Protection Guide for Solar Systems - Guidebook for Solar System Installation Technicians and Lightning Protection Technicians, 4th completely revised and extended edition, wAgner & Co Cöble/Marburg. (www.wagner-solar.com)

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