



EPISODE 58

Enhancing Inverter Protection Best Practices for Outdoor Installations

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Enhancing Inverter Protection Best Practices for Outdoor Installations

>> Background

PV inverters often need to be installed outdoors, which requires attention to installation details to combat environmental challenges. This Solis Seminar highlight key protective considerations providing valuable insights for installers to enhance equipment safeguarding.

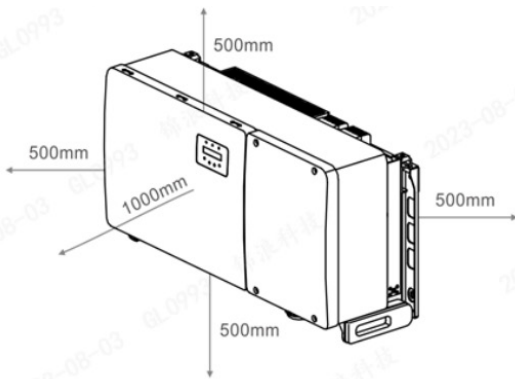


Examples and solutions

Example: The installation position is in a dip or the installation height fails to meet requirements, it may lead to the inverter or cable port being exposed to water.

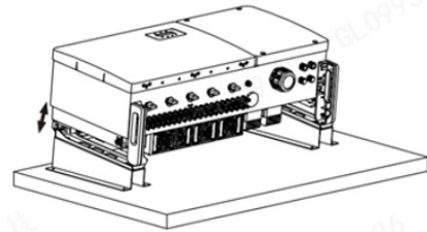
Solution: Refer to the product manual for installation spacing, the bottom of the conventional installation inverter is $\geq 500\text{mm}$ from the ground; For tilt-mounted installations, the distance from the inverter

AC-DC waterproof joint to the roof should be $\geq 300\text{mm}$ to prevent water or snow impact. For some mountainous powerstations, if the inverter is in a depression prone to water accumulation, it's recommended to move the inverters and distribution boxes to higher ground or indoors temporarily before the rainstorm.

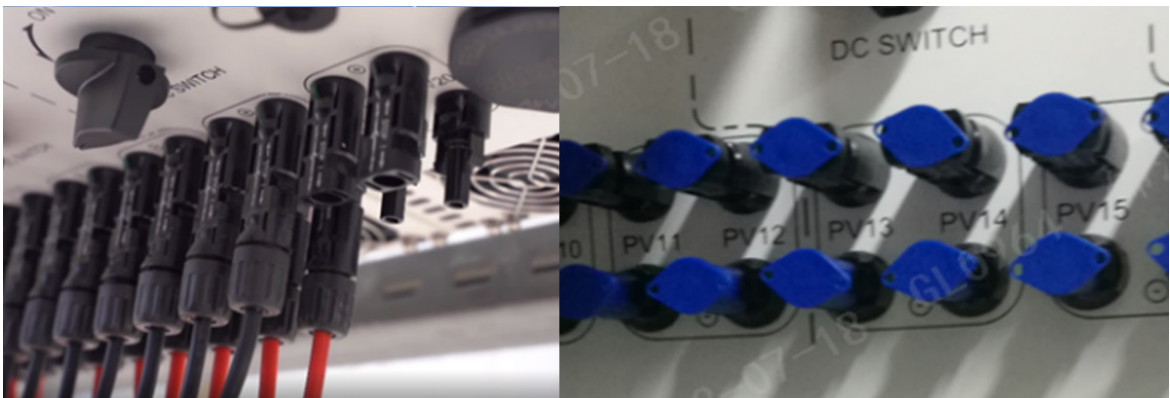


Tilt angle $\geq 15^\circ$

Ground clearance $\geq 300\text{mm}$



Example: Rainwater enters the equipment through the DC interface.



Solution: Ensure a reliable DC connection with tightened wire nuts. In addition, ports that are not connected to the PV string must be sealed with a matching cover to prevent rain or water vapor from entering the device through the DC port.

Example: Rain or water vapor enters the device through the AC interface.

Solution: AC cable selection needs to be appropriate, and pay attention to problems such as wire sleeve processing and installation process, mainly including:

- ① Reinstall the sealing ring in the port's sealing cover.



- ② The diameter of the AC cable must meet the requirements, and the sheath processing is too long, the sealing ring pruning is too large, etc., will hinder the sealing cover's fit to the cable, resulting in poor air tightness.

Comparison table of AC multi-core cable diameter and wire protection block

Unfolding view	Large circle size	Small circle size
	26-30	18-22
	36-40	28-32
	46-50	
	56-60	

- ③ Ensure that the AC seal cover is tightly fastened to the AC cable.

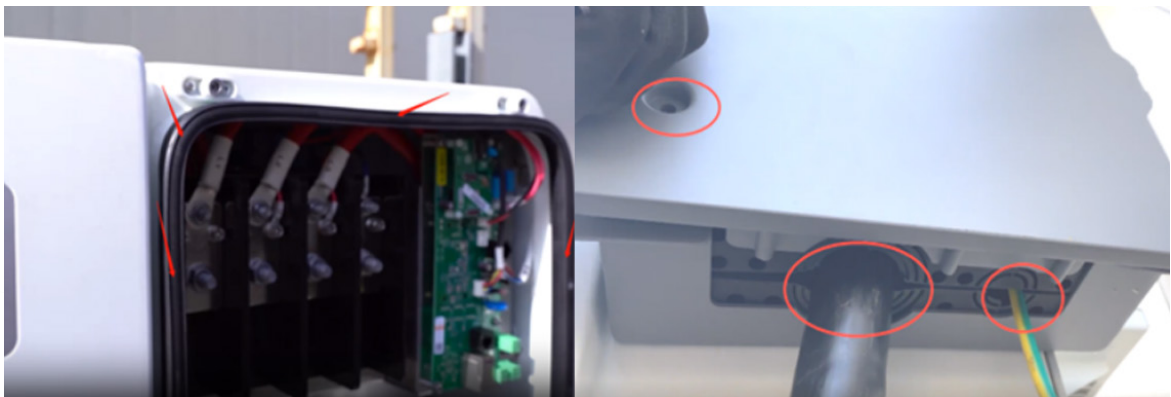
Example: Rainwater enters the device through the communication port.

Solution: The plastic film over unused communication ports must be kept intact. If broken, use fire mud or waterproof tape and other measures to seal it.



Example: The sealing of the cover plate on the AC side is damaged.

Solution: Pay attention to avoid damage to the plastic seal between the metal cover; Ensure that each screw hole of the cover is secured with screws and the screws are tightened.



Example: External water enters the inverter through the pipe or cable. In some field installations, the communication line, AC line, ground cable and other cables have protective sleeves outside, one end of which extends to the inverter wiring bin, and the other end is often high and has an opening, so that rainwater can flow into the inverter through the pipe.



Solution: Create a gap at the bottom of the casing, allowing rain water to flow out. Alternatively position the sleeve port outside the cable bay, prohibiting water from entering the inverter. In addition, the ground cable terminal connected to the AC side of the inverter must be treated with a heat shrink sleeve to prevent rainwater from entering the inverter through the ground cable sleeve.

Conclusion:

- >> The protection level of PV inverters is above IP65, and its sealing can effectively prevent foreign bodies such as sand and rain from reaching the interior. However, during the installation process, construction problems such as dismantling and wiring are involved, so it is necessary to pay attention to the installation and protection details to avoid debris entering the interior of the inverter and causing issues.