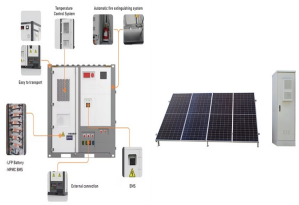
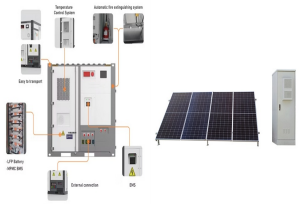
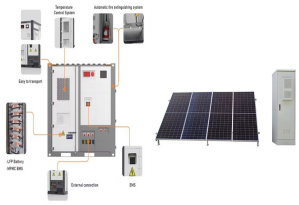
ROOFTOP PHOTOVOLTAIC PANEL LIGHTNING PROTECTION TEST REPORT



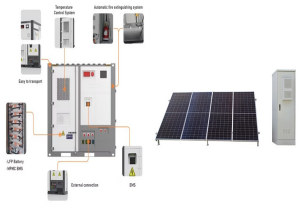
Do rooftop photovoltaic systems need a lightning protection system? This guideline also requires that LPL III and thus a lightning protection system accord-ing to class of LPS III be installed for rooftop PV systems (> 10 kWp) and that surge protection measures be taken. As a general rule, rooftop photovoltaic systems must not interfere with the existing lightning pro-tection measures.



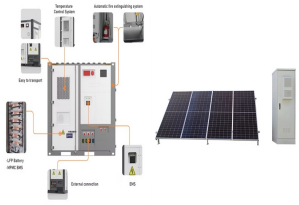
Does a PV rooftop have a lightning surge test? There is nocircuit model or test for the PV Rooftop system dedicated to lightning surge studies,especially in aspects of SPD placement,selection of suitable ratings,cable length,and sizing,and number of SPDs required. Direct strikes may trigger fires and even explosions to the PV Rooftop installation.



Why is a sensitivity analysis necessary in a rooftop PV system? A sensitivity analysis is necessary for the development of lightning overvoltagein a Rooftop PV system,bearing in mind the impact of lightning striking spot,the lightning current ampli-tude,the building height,the soil resistivity and the distance between the solar arrays and the external protection system.



Can Lightning affect a roof top PV system? It has been shown that for buildings with roof top PV systems only the avoidance of lightning attachment to unprotected parts of the building is not sufficient. Lightning currents passing through the lightning protection system may still affect the PV power system through inductive coupling.



Can a PV rooftop system withstand lightning strikes in Malaysia? The PV Rooftop system is commonly located in high-rise buildings which makes it very prone to lightning strikes .As far as Malaysia is concerned,no standards exist on lightning protection for PV systems,except for MS 1837:2010 which focuses on the PV installation.

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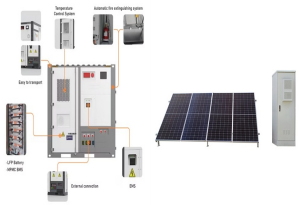
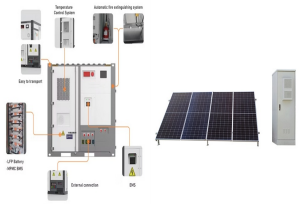


Do PV systems need lightning protection? With all the barriers discussed in Section 3.3,the need for lightning protection on PV systems must be evaluatedon the basis of the risk analysis and protection costs. Table 10 presents the recommended standards related to PV systems including PV installations,lightning protection systems and electrical installations. Table 10.



Lightning Protection Techniques for Roof-Top PV Systems Narjes Fallah#1, Chandima Gomes*#2, Mohd Zainal Abidin Ab Kadir#3, Ghasem Nourirad#4, Mina Baojahmadi#5, Rebaz j.Ahmed#6 #Centre for

Such lightning protection is potentially inefficient for areas with high lightning probability. Enhanced Lightning Protection Solution. Before considering adequate lightning protection of a PV system, we need to understand the common types of lightning strikes. For residential PV systems, the type I and type II lightning strikes ??? direct

Lightning is a common cause of failures in photovoltaic (PV) and wind-electric systems. Try to route part of the system into wetter areas, like where a roof drains or where plants are to be watered. If steel well-casing is nearby, you can use it as a ground rod (make a strong, bolted connection to the casing). A lot of lightning

A Guideline Report 01 N rooftop PV plants,but most of the procedures and protection measures suggested also apply toground-mounted PV plants. The general procedureconsists of a set of three separated procedures,whichshould be followed byproject engineers to ensure that a PV plant is safe for both people and

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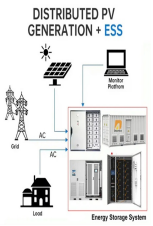
In general, the grounding holes of the solar panel are used for connection between strings, and the solar panel grounding holes at both ends of the string are connected to the metal bracket. Another point, solar panel has an aging problem, and it may cause large leakage current or low Insulation resistance to ground.


Abstract???In this paper, the lightning protection requirements of a typical residential building have been discussed and techniques have been provided to protect the building from both direct

related to protect photovoltaic systems against lightning damages. Thus, the method proposed has estimated the induced voltages and currents by lightning strikes in PV systems installed in buildings, with or without lightning protection system [29]. In addition, to complete the analysis the methodology has quantified the


Therefore, an adequate lightning protection system (LPS) must be installed to protect the PV panels. In addition, the transient performance of PV panels during lightning strikes must be analyzed well.

PSCAD was also used to model a rooftop grid-connected PV without a protection system and a large-scale PV system (1 MW) to analyze the lightning behavior in [15] and [16], respectively. An

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The Lightning Protection Systems (LPS) associated with Surge Protection Device (SPD) are the effective protection against electromagnetic effects. This study estimated the values of overvoltage and overcurrent ???

LPL III and thus a lightning protection system accord-ing to class of LPS III be installed for rooftop PV systems (> 10 kW p) and that surge protection measures be taken. As a general rule, ???

There is no circuit model or test for the PV Rooftop system dedicated to lightning surge studies, especially in aspects of SPD placement, selection of suitable ratings, cable length, and sizing, ???

Hundreds of MW of rooftop systems and utility-scale PV parks are installed every year. Best system availability and minimised OPEX (operational expenses) define the profitability of any size of system. PV plants, which combine many panels in a string, are efficiently protected up to 11 kA of the prospective short-circuit current

The occurrence of lightning is unstoppable and thus, protection is essential. Photovoltaic systems'' vulnerability to lightning strikes???both direct and indirect???means that they must be built with reliable and properly installed ???

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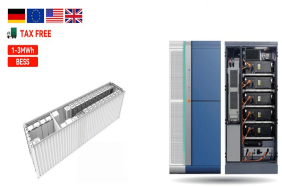
It must be adapted to the relevant building and include lightning and surge protection. Good coordination between the different trades is important. The most important goal of PV installers is to optimise the use of the roof area. Lightning protection installers, however, have to observe the separation distance 1 for the lightning protection

The PV modules must qualify (enclose Test Reports/Certificates from IEC/NABL accredited laboratory) as per relevant IEC standard. The Performance of PV Modules at STC conditions must be tested and approved by one of the IEC/NABL Accredited Testing Laboratories. 13. PV modules used in solar power plant/ systems must be warranted for 10 years for



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Research, as described in a recent review on the performance of lightning protection on photovoltaic systems (roof mounted or solar farms) has just started due to high penetration on the power

Pros-Reduced energy costs: Rooftop solar installations are the best way to reduce or even eliminate your electric bills over the long term.-Increase in property value: Studies have shown that homes with rooftop solar systems have a higher resale value than those without.-Environmental benefits: Generating your own power with rooftop solar helps reduce your ???

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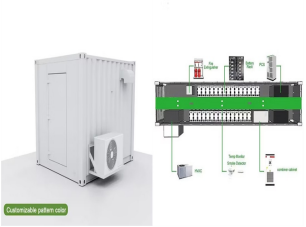
IEA PVPS Task 3 ??? Common practices for protection against the effects of lightning on stand-alone photovoltaic systems 5 Executive summary This report first gathers general information about photovoltaic installations lightning protection measures and then describes lightning experts'' recommendations for different specific installations.

The increasing of photovoltaic microsystems in Brazil follows global trend for low-cost panels and efficient cells. Although the solar modules are located on roofs and lightning strikes can damage

global trend for low-cost panels and efficient cells. Although the solar modules are located on roofs and lightning strikes can damage all components of PV System (PVS). The Lightning ???



There is no circuit model or test for the PV Rooftop system dedicated to lightning surge studies, especially in aspects of SPD placement, selection of suitable ratings, cable length, and sizing

rooftop solar PV systems in Sri Lanka. The guide was prepared based on the applicable international standards and best industry practices around the world. This document would provide a guideline to plan and install a rooftop PV system for a solar system service provider.

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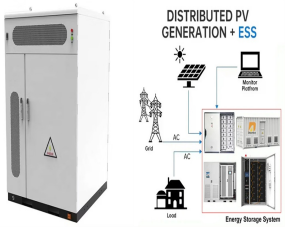
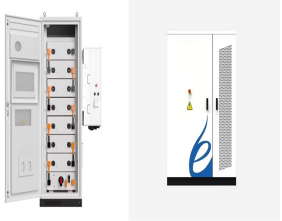
The PV Rooftop system is commonly located in high-rise buildings which makes it very prone to lightning strikes .As far as Malaysia is concerned, no standards exist on lightning protection for PV systems, except for MS 1837:2010 which focuses on the PV installation. Thus; there were no previous studies that dealt with lightning surge analysis prior to the solar PV ???

The results presented in Tab. 1 to Tab. 5 was compared to similar works (peers) treating the effect of lightning on a Page | 81 Swytz Jose Silva Tavares et al. International Journal of Advanced Engineering Research and ???

If a photovoltaic system is subsequently placed on a roof area where a lightning protection system is already installed, there are several aspects that need to be considered. It is important to ensure the functionality of the external lightning protection and also the effective protection of the PV system provided by the lightning protection.



??? Photovoltaic Panels ??? v5 Lightning: ??? Provide lightning protection (air-termination rods and conductors) for any roof-mounted PV plant if required by assessment or recognised international or local codes (e.g. IEC 62305 risk assessment tool and application of part 4). ??? Separate PV systems by at least 1m from lightning protection.



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