Why Choose Projoy's PEFS Photovoltaic Rapid Shutdown?

In a photovoltaic power station, as long as there is light illuminating the solar panel, a voltage of 600~1500V will be generated on the DC side. Although the built-in DC isolator switch in the inverter can cut off the DC power of the inverter, it cannot do anything about the DC power between the solar panel and the inverter.

In the long-term operation of a photovoltaic power station, problems such as poor contact caused by unfastened joints, quality problems of contacts, and aging of insulation parts will directly lead to DC arc phenomena. Unlike the AC arc, the DC arc does not have a zero-crossing point, which means that if a DC arc occurs, the trigger part will maintain stable combustion for a long time without extinguishing. The high temperature generated by the DC arc can be as high as 3000 ℃, which can directly cause fire. Even if the probability of a DC arc is only 1/1000, a 10MW power station will have 80 times DC arc events during its 25-year power station operation time.

Therefore, with the global popularity of photovoltaic power plants, how to prevent the fire risk of photovoltaic facilities and how to ensure that non-professionals identify and cut off the risk in the first time have become a matter of widespread concern in the photovoltaic industry.

Countries respond to the safety standards of photovoltaic DC high voltage

At present, in developed countries such as the United States, Europe countries, Japan, Australia, etc., compulsory measures have been introduced against the DC high voltage problem in photovoltaic systems.

United States	NEC 690.12 standard requires: 1 foot (304.8mm) from the photovoltaic array as the limit, the voltage within the boundary must be reduced to below 80V within 30 seconds, and the voltage outside the limit must be reduced to below 30V within 30 seconds. This means that if the photovoltaic system needs to enter the building, a quick shut down device needs to be installed within 1 foot (304.8mm) of the entry point. On the inverter side, if the inverter cannot drop the circuit voltage to 30V internally or isolate the capacitor within 10 seconds, another quick shut down device needs to be installed within 5 inches (127mm) of the inverter interface.
Germany	The VDE fire safety standard clearly stipulates that a DC cut-off device should be added between the inverter and the solar panel in the photovoltaic system.
Australia	OVE R11-1: The 2013 regulations requires that there must be a circuit breaker device near the solar panel.
Poland	Photovoltaic systems larger than 6.5kW need to install a DC rapid shutdown device.
China	China Building Material Test & Certification Group Co., Ltd. issued and implemented the requirements of CTS 13001-2018 "Inspection and Evaluation of residential off-grid Photovoltaic Systems". For residential off-grid photovoltaic systems installed on the roof, when the DC voltage is greater than 120V, a single solar panel or string should be shut off quickly to control the dangerous DC voltage.

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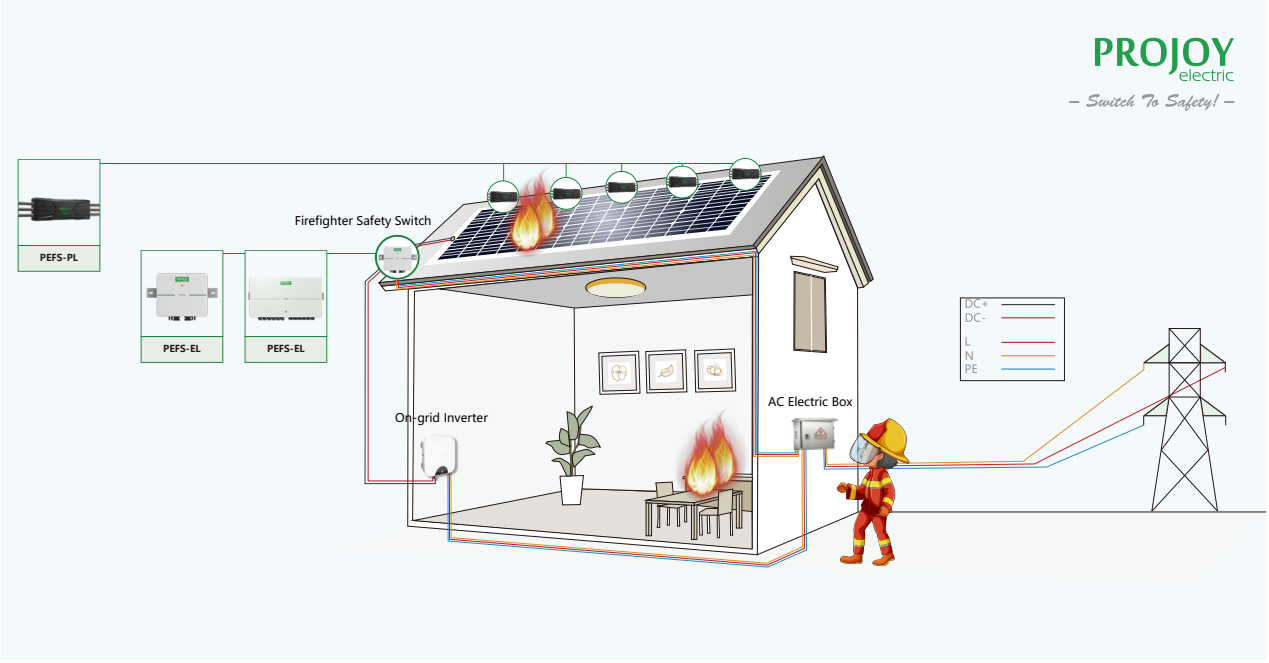
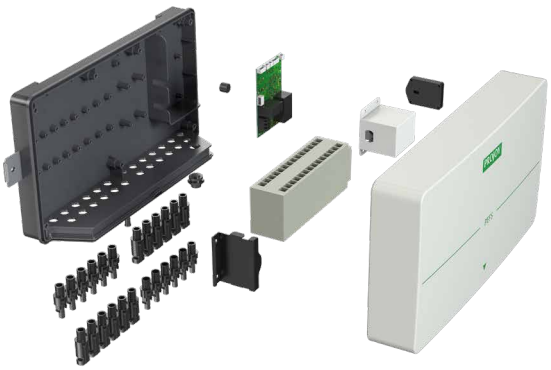
PROJOY electric
– Switch To Safety! –

Based on market demand, Projoy has successively launched PEFS-EL series string level rapid shutdown solution and PEFS-PL series panel level rapid shutdown solution.



● Projoy's PEFS-EL string level rapid shutdown solution

Projoy's PEFS-EL series rapid shutdown, 1-2 strings, 3-6 strings and 7-12 strings products can be respectively applied to residential, industrial and commercial or large-scale photovoltaic systems. The maximum loop voltage can reach to 1500V. The built-in advanced temperature sensor can detect the temperature in the shell in real time. When the internal temperature exceeds 70°C, the switch is automatically cut off. In the event of a fire, firefighters can first turn off the AC power. At this time, Projoy's PEFS-EL series can quickly shut down the signal collected from the power grid. The disconnection switch will be automatically turned off if the power failure time exceeds 5s, and then the DC power will be cut off.



- The max. loop voltage is 1500Vdc, the max. loop current is 55A, and 2-12 strings loop can be shut down
- Casting plastic shell is optional, IP65 protection level
- Active control, safe and reliable
- Fire and flame retardant grade UL94-V0 / anti-UV material
- High-quality materials, improve the high temperature resistance, corrosion resistance and impact resistance of the product
- External slide block mounting hole design, easy, convenient, efficient and stable to install
- DC interface has knock-out holes, glands, MC4 optional
- Built-in ventilate valve to avoid condensation in the cavity
- Built-in isolator switch with TUV, CE, CB, SAA, UL certification

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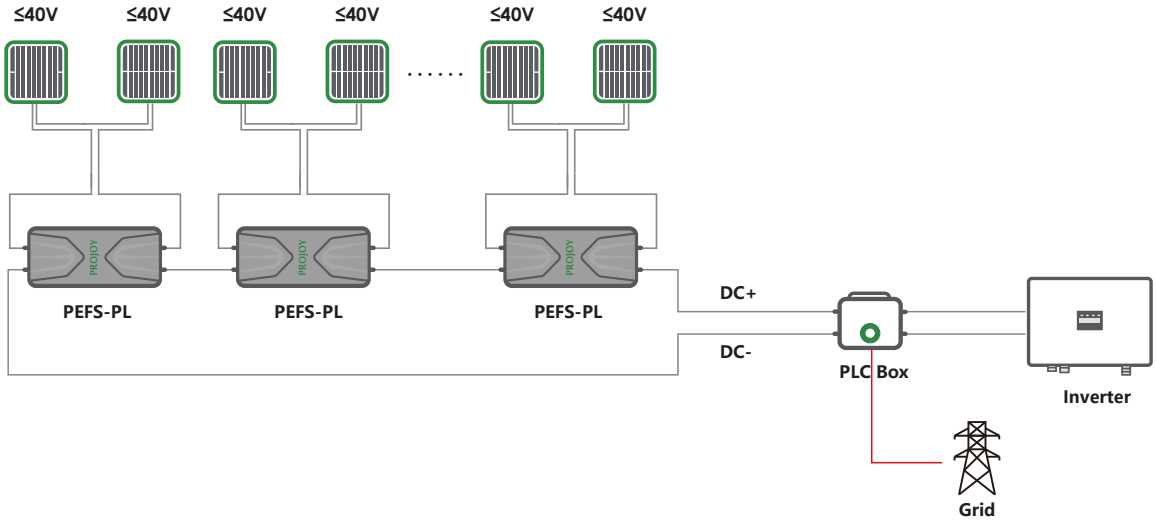
Porjoy PEFS-PL panel level rapid shutdown solution

Projoy's PEFS-PL series rapid shutdown is a device that can realize panel level quick shut down, and each device can serve 1 or 2 panels. When Projoy's PEFS-PL is installed in the photovoltaic systems, each panel can be left open. In an emergency, the AC switch or quick-off button can be used to quickly shut down the panels, to ensure the personnel safety of the system or firefighters.



- Lightweight design, buckle installation, simple and convenient, perfect matching panel installation;
- Meet UL, NEC NEC 2017/2020 (690.12) , SUNSPEC agreement
  Match LVRT feature of the inverter.
- PLC control / DC24V power control optional
- One for one, one for two optional
- White / orange / black colors are available
- Built-in temperature sensor, automatically shut down when over 85℃;
- Fire and flame retardant grade UL94-V0 / anti-UV material / IP67 protection grade
- High-quality materials, improve the high temperature resistance, corrosion resistance and impact resistance of the product
- Automatic reset function, it can automatically close after power is restored, no need manual reset.

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Comparison of string level solution					
	No.	Item	Projoy PEFS Series	A certain brand DFS series	Comparison
Electrical parameters	1	Max. operating voltage	1500VDC	1000VDC	Projoy PEFS are more suitable for 1500V photovoltaic systems
	2	Current	9~55A	10~32A	Projoy's applicable current range is wider and larger
	3	No. of shut-off strings	Up to 12 strings	Up to 3 strings	Projoy PEFS-EL 1-6 strings can meet residential or small industrial and commercial photovoltaic roofs; Projoy PEFS-EL 7-8 strings can meet industrial, commercial and power station application scenarios.
	4	Single channel current	1000V 55A	1000V 16A	Projoy PEFS current is larger
	5	Electrical life	1500	1500	Same electrical life
	6	Control voltage	100~270Vac	100~240Vac	Projoy PEFS should have a wider voltage range
	7	Application scenarios	Off-grid system, storage system	Off-grid system	Projoy PEFS has more application scenarios
Mechanical parameters	8	Mechanical life	10000	10000	Same mechanical life
	9	Indication port	LED luminous indication	Mechanical color indication	Projoy PEFS can be easily distinguished the switch status
	10	Protection level	IP66/IP67	IP65	Projoy PEFS has stronger protection ability
	11	Noise	Low noise	High noise	Projoy PEFS has low noise and can be used in quiet places
	12	Breathable valve	Yes	Yes	Projoyv PEFS ventilate valve can avoid condensation in the cavity
	13	DC interface	knock-out hole, gland, MC4	knock-out hole, gland, MC4	Same DC interface
	14	AC interface	1m AC line	Without AC line	Projoy PEFS are more convenient for customers to connect to the AC control line
	15	Structural design	Modular and simple structure design, quick response to after-sales maintenance and easy realization of single - board-level maintenance	Product parts are intertwined and maintenance is difficult	Projoy PEFS are more convenient to maintain
R & D capabilities	16	Product iteration	Continue to develop more cost-effective products	Slow update	Projoy has stronger R&D capabilities
	17	Panel-level rapid shutdown	Yes	No	
Commercial	18	Delivery time	Less than two weeks, more production lines	Three weeks on average, fewer production lines	Projoy's delivery will be faster
	19	Service	7*24H after-sales, offices in various regions	Original service	Projoy after-sales service is more efficient
	20	Trainning	Local training, on-site installation guidance	Appointment training and on-site installation guidance	Projoy training is more convenient

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