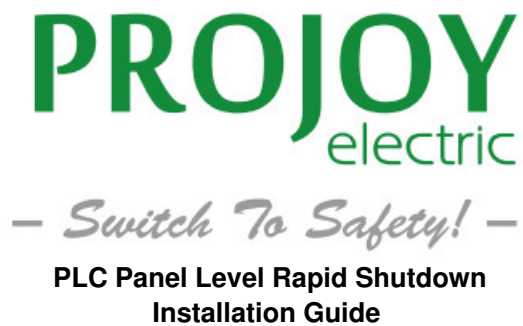




PROJOY electric PLC Panel Level Rapid Shutdown Installation Guide

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Safety Precautions

1.1 Scope of Application

This User Manual describes instructions and detailed procedures for installing, operating, maintaining, and troubleshooting of the following Projoy Panel-level Rapid Shutdown Equipment:

PEFS-PL80P-11 PEFS-PL80P-21 PEFS-PLC-CN

Please keep this manual at all time available in case of emergency.

1.2 Safety Instructions



- **DANGER** indicates a hazardous situation that, if not avoided, will result in death or serious injury.



- **WARNING** indicates a hazardous situation that, if not avoided, can result in death or serious injury or moderate injury.



- **CAUTION** indicates a hazardous condition that, if not avoided, can result in minor or moderate injury.



- **NOTICE** indicates a situation that can result in potential damage, if not avoided.

1.3 Target Group

Only qualified electricians who have read and fully understood all safety regulations contained in this manual can install, maintain and repair the Panel-level rapid shutdown equipment.

Preparation



- Do not disconnect PEFS-PL while the PVRSS is working. There is the possibility of dying due to electrical shock and high voltage.
- To prevent the risk of electric shock during installation and maintenance, please make sure that PEFS-PLC-CN or any other control unit, such as the DC switch of the inverter, is turned off.

WARNING

- The installation, service, recycling, and disposal of the PVRSS must be performed by qualified personnel only in compliance with national and local standards and regulations.
- Any unauthorized actions including modification of product functionality of any form may cause a lethal hazard to the operator, third parties, the units, or their property. Projoy is not responsible for the loss and these warranty claims.
- While PSFS-PL80P-11 or PEFS-PL80P-21 are used without PEFS-PLC-CN, be sure that this photovoltaic rapid shutdown equipment (PVRSE) does not perform all of the functions of a complete photovoltaic rapid shutdown system (PVRSS). This PVRSE must be installed with other equipment to form a complete PVRSS that meets

the requirements of NEC (NFPA 70) section 690.12 for controlled conductors outside the array. Other equipment installed in or on this PV system may adversely affect the operation of the PVRSS. It is the responsibility of the installer to ensure that the completed PV system meets the rapid shut down functional requirements. This equipment must be installed according to the manufacturer's installation instructions.





- While PSFS-PL80P-11 or PEFS-PL80P-21 are used with PEFS-PLC-CN, be sure that this photovoltaic rapid shutdown system (PVRSS) incorporates one or more pieces of equipment that exercise the rapid shutdown control of PV system conductors required by section 690.12 of the NEC (NFPA 70). other equipment installed in or on this PV system may adversely affect the operation of this PVRSS. it is the responsibility of the installer to ensure that the completed PV system meets the applicable rapid shut down functional requirements. this equipment must be installed according to the manufacturer's installation instructions.



CAUTION

- The PSFS-PL80P-11 or PEFS-PL80P-21 will become hot during operation. Please do not touch the surface during or shortly after operation.
- Risk of damage due to improper modifications.
- All electrical installations must be done in accordance with the National Wiring Rules of Standard and local code.

2.2 Explanations of Symbols

Symbol	Description
	Danger of high electrical voltage This device is connected in series to the solar inverter, thus all work to the PVRSE shall only be carried out by qualified personnel.
	Danger of hot surface The components inside the PVRSE will release a lot of heat during operation. Do not touch the surface during operating.
	Read the User Manual First Please read the User Manual first before the installation and operation.
	Recycling and Disposal This device SHALL NOT be disposed of in the residential waste.
RoSH	RoHS Directive This device complies with the RoHS Directive.

Product Information

3.1 Application Scope of Products

3.2 Specification for Product Model

PEFS – PL80P-11

PEFS: RSD represents Rapid Shutdown.

PL: Panel-level.

80: Voltage parameter.

P: Power carrier communication.

1/2: Input port.

1/2: Product Iteration.

3.3 System Diagram

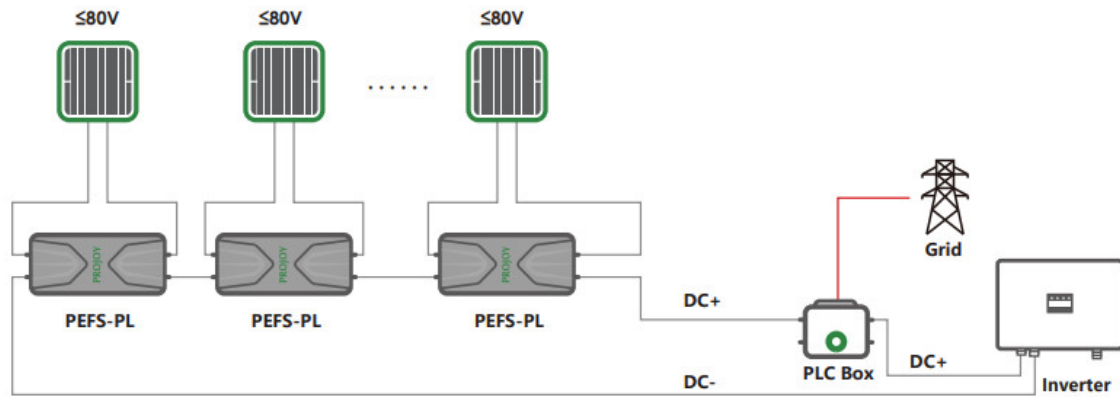


Figure 3.1 System Diagram (PEFS-PL80P-11 and PEFS-PLC-CN)

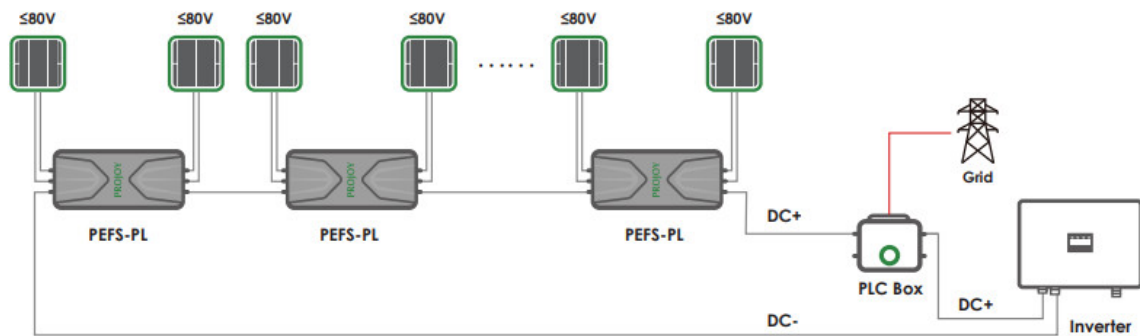


Figure 3.2 System Diagram (PEFS-PL80P-21 and PEFS-PLC-CN)

3.4 Overview and Dimensions of products

The dimensions of PEFS-PL80P-11 and PEFS-PL80P-21 are shown in Figure 3.3.

(Unit: mm)

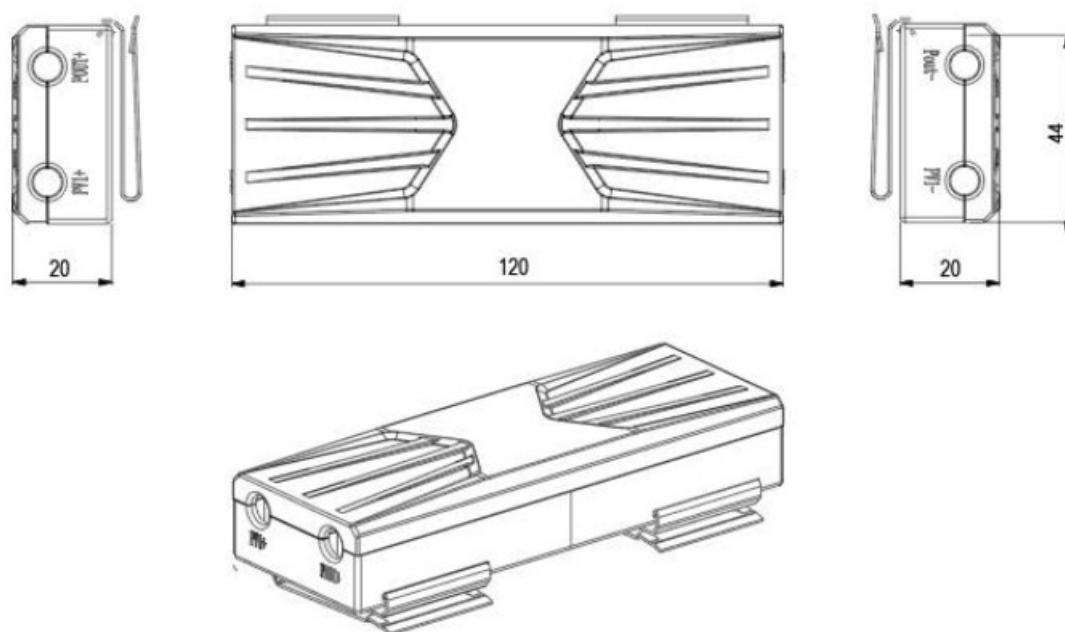


Figure 3.3 Dimensions of PEFS-PL80P-11 and PEFS-PL80P-21

The dimensions of PEFS-PLC-CN are shown in Figure 3.4.

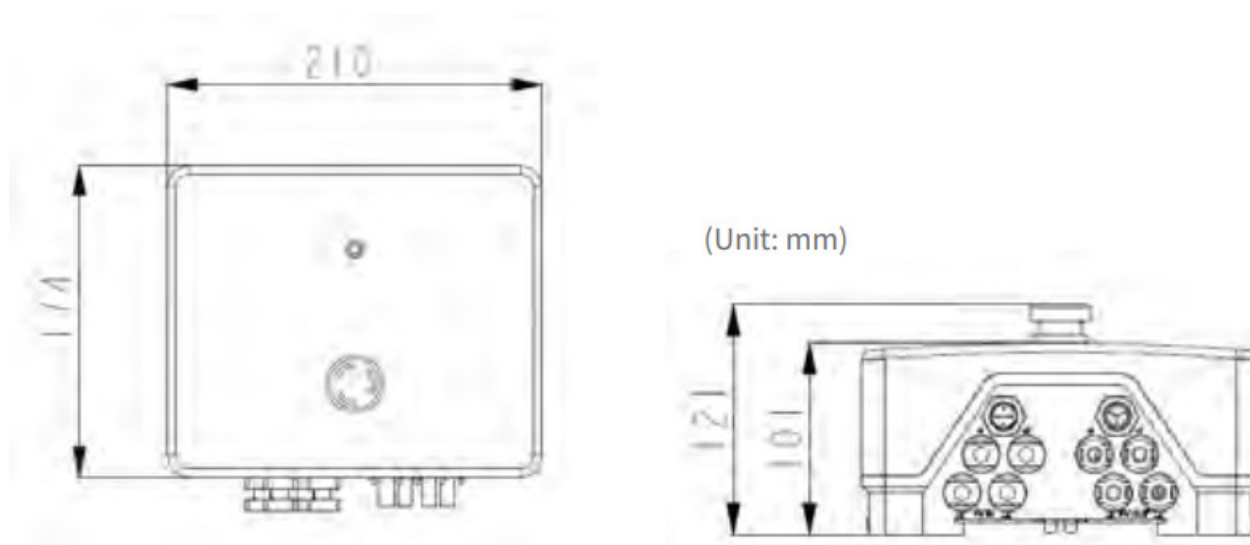


Figure 3.4 Dimensions of PEFS-PLC-CN

3.5 Datasheet

MODEL	PEFS-PL80P-11	PEFS-PL80P-21
Max. Input Current [A]	20	20/20
Input Vmax PV [Vdc]	80	80/80
Output Vmax PV [Vdc]	80	160
Max. System Voltage [V]	1500	1500
Isc PV (absolute Max.) [A]	20	20
Rapid Shutdown Time Limit [s]	10	
Tripping	PLC Signal	
Operating Temperature [Ti]	-40 to +80	
Ingress Protection	Type 6P	
Humidity	0 – 90%	
Communication	PLC	
Overvoltage Category	II	
Mounting	Clip	
Dimension W" WD [mm]	120 " 44 * 20	

MODEL	PEFS-PLC-CN
Operating AC Voltage Range	100 V-240 V
Nominal Frequency	50/60 Hz
Power Consumption	<1W
DC Input Strings	4 Strings
Operating Temperature Range	-30°C to +55°C
Protection Class	IP65
Communication	PLC
Mounting	Wall Mounted
Connector	MC4 Compatible (DC), Plug-in Connector (AC)
Dimension(W*HD)	210mm*174mm 101mm
Weight	1800g

Instructions for installation

4.1 Safety Instructions



DANGER

- To prevent risk of electric shock during installation and maintenance, please make sure that PEFS-PC or any other control unit, such as the DC switch of inverter, are turned off.

NOTICE

- All electrical installations must be done in accordance with the National Wiring Rules of Standard and local code.

4.2 Pre-installation Check

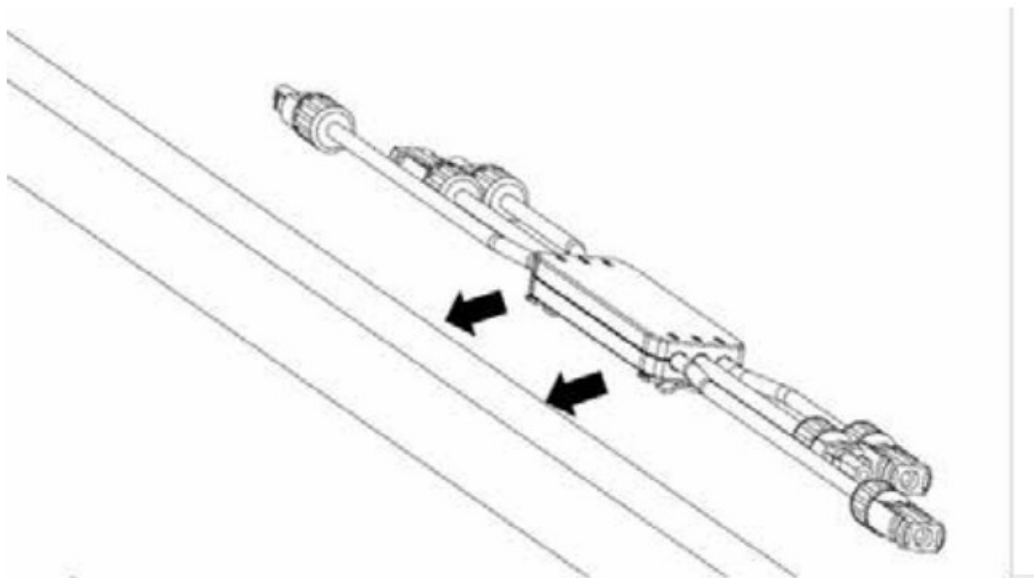
Although Projoy's products have surpassed stringent testing and are checked before they leave the factory, it is uncertain that the products may suffer damage during transportation. Please check the package for any obvious signs of damage, and if such evidence is present, do not open the package and contact your dealer as soon as possible.

4.3 Installation of PEFS-PL80P-11/21

WARNING

While PEFS-PL80P-11/21 are used without PEFS-PLC-CN, be sure that this photovoltaic rapid shutdown equipment (PVRSE) does not perform all of the functions of a complete photovoltaic rapid shutdown system (PVRSS). This PVRSE must be installed with other equipment to form a complete PVRSS that meets the requirements of NEC (NFPA 70) section 690.12 for controlled conductors outside the array. Other equipment installed in or on this PV system may adversely affect the operation of the PVRSS. It is the responsibility of the installer to ensure that the completed PV system meets the rapid shutdown functional requirements. This equipment must be installed according to the manufacturer's installation instructions.

1. Fix the rapid shutdown device (PEFS-PL80P-11/21) on the frame of solar module.



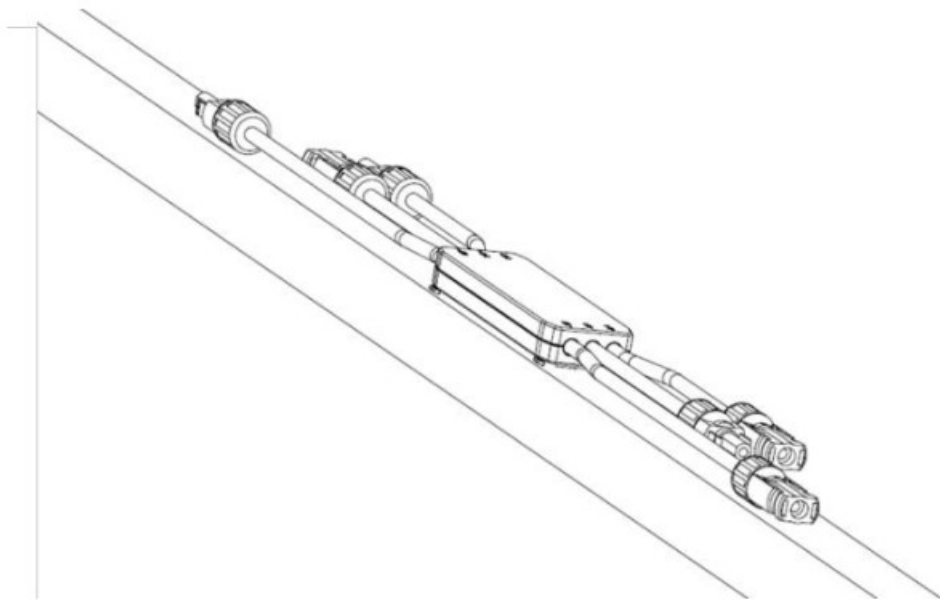


Figure 4.1&4.2 Fixing the Rapid Shutdown Device

2. Connect the input of the rapid shutdown device to the solar module.

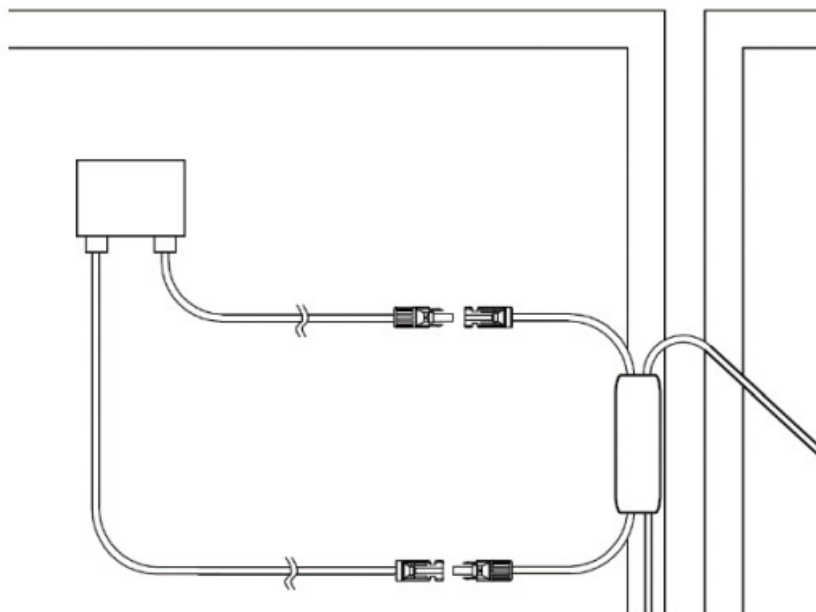


Figure 4.3 Connecting PEFS-PL80P-11 and solar module

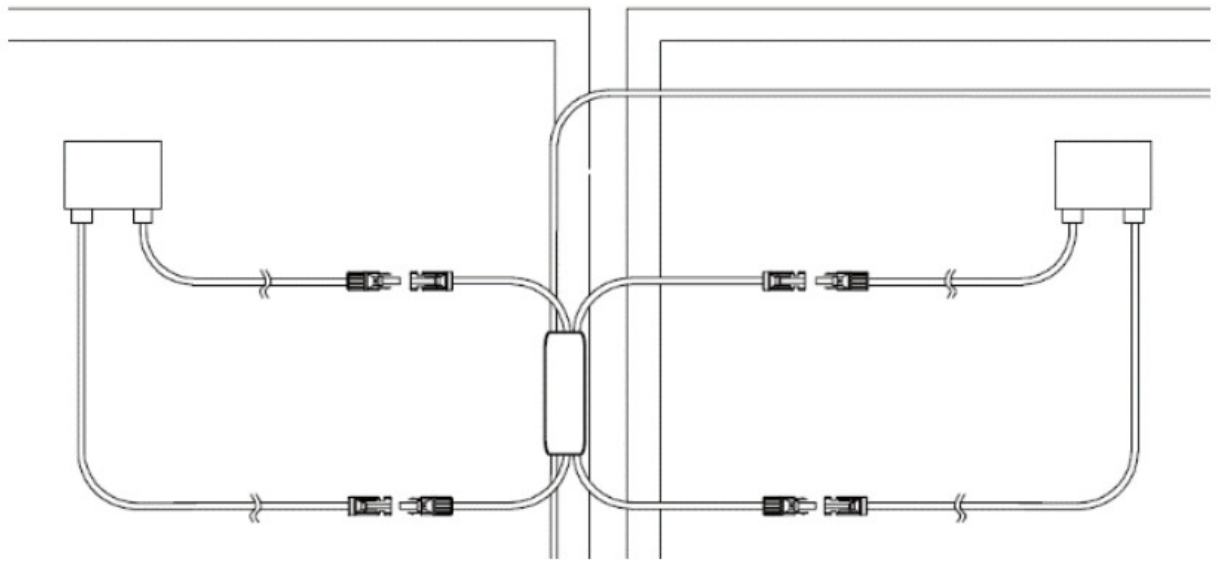


Figure 4.4 Connecting PEFS-PL80P-21 and solar modules

3. Connect the outputs of all the rapid shutdown devices one after another.

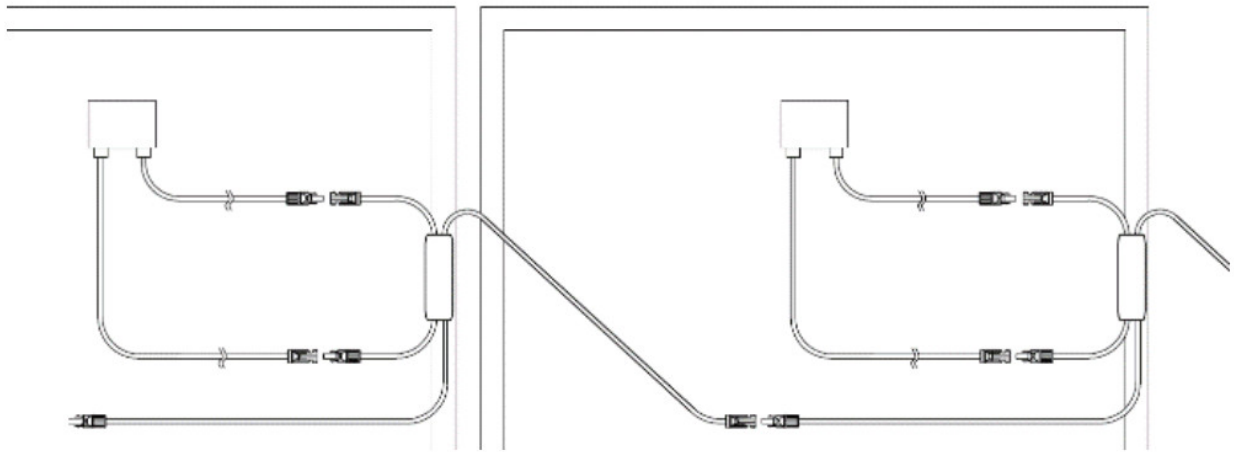


Figure 4.5 Connecting Rapid Shutdown Device in Series

4. While PEFS-PL80P-21 are used without PEFS-PLC-CN, connect each string of the rapid shutdown devices to the solar inverter.

4.4 Installation of PEFS-PC

WARNING

While PEFS-PL80P-21 are used with PEFS-PLC-CN, be sure that this photovoltaic rapid shutdown system (PVRSS) incorporates one or more pieces of equipment that exercise the rapid shutdown control of PV system conductors required by section 690.12 of the NEC (NFPA 70). Other equipment installed in or on this PV system may adversely affect the operation of this PVRSS. It is the responsibility of the installer to ensure that the completed PV system meets the applicable rapid shutdown functional requirements. This equipment must be installed according to the manufacturer's installation instructions.

Installers should determine the installation location of the rapid shutdown controller according to local regulations.

1. Push out the bracket of the rapid shutdown controller. Fix the rapid shutdown controller (PEFS-PLC-CN) on the wall.

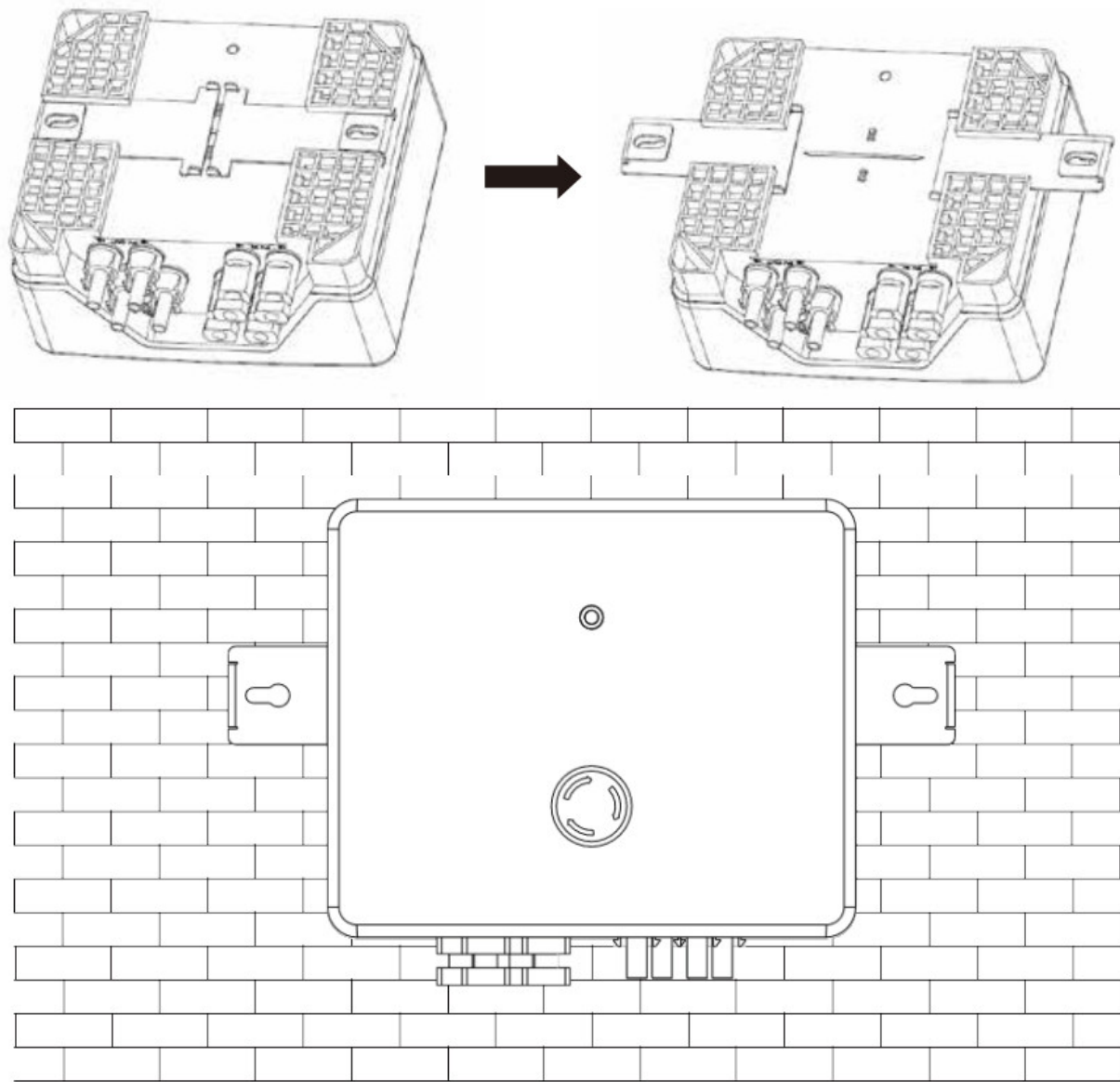


Figure 4.6&4.7 Fixing the Rapid Shutdown Controller

2. Plug each string of rapid shutdown devices to the rapid shutdown controller. Then plug each output cable to the solar inverter.

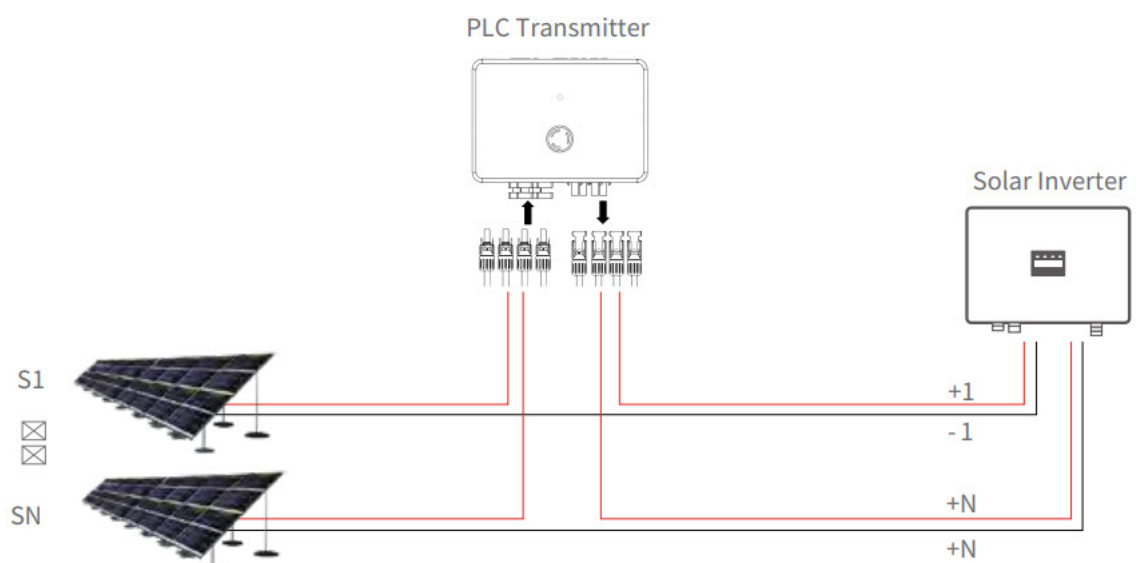


Figure 4.8 Wiring diagram of control box

N=4,N=6,N=8,N=10,N=20

3. Multiple control boxes can be connected in series and can be controlled by a single master control box.



Figure 4.9 Connection diagram of multiple control boxes

4. Put the warning label in the PV system as required in section 690.56(C) of NEC (NFPA70).

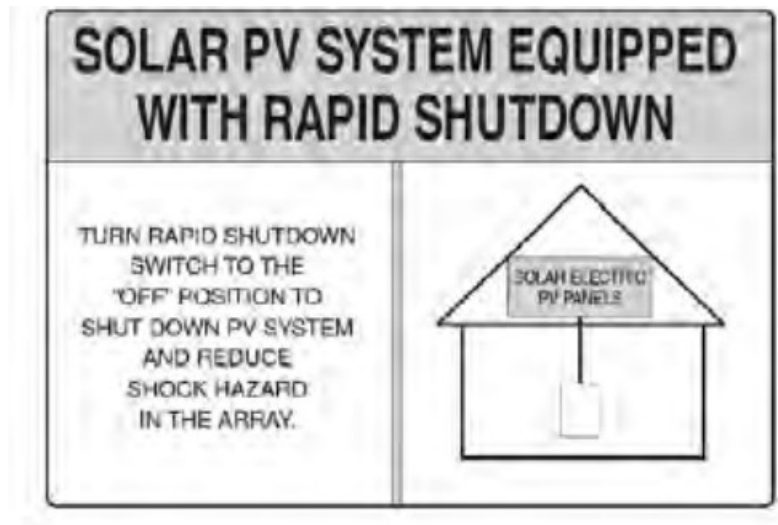


Figure 4.10 Connecting PEFS-PL80P-21 and solar modules

4.5 Start the PVRSS system

Turn on the power source of the rapid shutdown controller. The rapid shutdown control system will start to work. The status of the lights is shown below:

	On	Off
Power (Red)	The rapid shutdown controller is powered on and sends signals to the rapid shutdown devices in each string. The status of the lights is shown below:	The rapid shutdown controller is powered off or stops sending signals to the rapid shutdown devices in each string.

Table 4.1 Light Status

Firefighters can push the button to cut off all the solar modules while in an emergency. After the emergency, users can rotate the button and the solar module will work again.

System Test and Troubleshooting

5.1 System test

5.1.1 Function test

Please do the function test regularly.

1. Push the button of the rapid shutdown controller. The status of light will be off. Check the solar inverter. The DC current will be cut off and the DC voltage will be lower than 30V in 30 seconds.
2. Rotate the button of rapid shutdown controller. The status of light will be on. The solar will start to work again.

5.1.2 Maintain test

When the PEFS-PLC-CN stops working, the PEFS-PL80P-11 will have a continuous 0.9 V output and the PEFS-PL80P-21 will have a continuous 1.75 V output.

1. Push the button and stop the PEFS-PLC-CN.
2. Separate the DC cable and rapid shutdown controller. Test the voltage of each DC cable.

System Voltage = 0.9 V * Quantities of PEFS-PL80P-11 or System Voltage = 1.75 V * Quantities of PEFS-PL80P-21	System Work Normally
System Voltage < 0.9 V * Quantities of PEFS-PL80P-11 or System Voltage < 1.75 V * Quantities of PEFS-PL80P-21	System Work Abnormally

5.2 Troubleshooting

Description	Troubleshooting
The status light is always off. PVRSS doesn't work.	1) Check if the button of the controller is turned to off; 2) Check if the AC power supply is normal; 3) Check if the AC voltage is over the operating voltage range; 4) Contact Projoy.
The status light is on. The DC voltage of the inverter is 0V. PVRSS doesn't work.	1) Test the voltage of the DC cable. If the voltage of the DC cable is zero, check the connection of the DC cable. 2) If the voltage of the DC cable is normal as described in §5.1.2, there is something wrong with the DC input of the inverter. Contact the supplier of the inverter. 3) Contact Projoy.
The status light is on. The DC voltage of the inverter is 0V. PVRSS doesn't work.	1) Check if the button of the controller is turned to off; 2) Check if the AC power supply is normal; 3) Check if the AC voltage is over the operating voltage range; 4) Contact Projoy.
The status light is on. PVRSS works well. DC voltage of the inverter is abnormal (§5.1.2).	1) Test the output voltage of each rapid shutdown device. If the output voltage is not 0.9V or 1.8V. Replace the rapid shutdown device. 2) Contact Projoy.

Recycling and Disposal

This device should not be disposed of as residential waste. A rapid shutdown device or controller that has reached the end of its life and is not required is to be returned to your dealer or you must find an approved collection and recycling facility in your area.

Guarantee Service




Within the warranty period of the products, the invoice and date of purchase are required for the service. Besides, the trademark on the product should be clearly visible, otherwise, warranty is not available.
The product warranty covers all damage caused by design or production. However, the followings are not covered:

- Beyond the warranty period;
- No valid warranty card and product serial number;
- Damage in transportation;
- Incorrect use, operation, and modification;
- Operation in a very harsh environment not as described in this manual;
- Out of the scope of installation and use specified in relevant international standards;
- Damage is caused by the abnormal natural environment.

Contact us

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Documents / Resources

	<p>PROJOY electric PLC Panel Level Rapid Shutdown [pdf] Installation Guide PLC Panel Level Rapid Shutdown, PLC, Panel Level Rapid Shutdown, Rapid Shutdown, Shud own</p>
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	<p>PROJOY electric PLC Panel-Level Rapid Shutdown [pdf] Installation Guide PLC Panel-Level Rapid Shutdown, Panel-Level Rapid Shutdown, Rapid Shutdown</p>

References

- [Tric.com may be for sale - PerfectDomain.com](#)
- [- \(\)](#)
- [DC Isolator, AC Isolator, DC Isolator Switch, Solar PV Isolator Switch manufacturer-Projoy Electric](#)

