

**PROJOY**  
electric

– Switch To Safety! –



# Installation Guide

PEFS-EL Series

[www.projoy-electric.com](http://www.projoy-electric.com)

# CONTENTS

## User Manual of Projoy Fire Fighter Safety Switch (FFSS)

<b>1. Scope and General</b>	<b>1</b>
<b>2 Important Safety Precautions</b>	<b>1</b>
<b>3 Using of FFSS</b>	<b>1</b>
<b>4 Shutdown Ways</b>	<b>2</b>
<b>5 Specifications of FFSS</b>	<b>2</b>
<b>6 Installation</b>	<b>3</b>
<b>7 PID Recovery Function (Optional)</b>	<b>6</b>
<b>8 Aftersales service and warranty</b>	<b>7</b>
<b>9 Contact us</b>	<b>7</b>

## 1 Scope and General

This manual is used for PEFS-EL Series of Fire Fighter Safety Switch (FFSS).

Version	Date	Remark	Chapter
V1.0	2021-10-15	First Edition	-
V2.0	2022-04-20	Content Modified	6 Installation
V2.1	2022-05-18	Content Modified	4 Shutdown Ways
V2.2	2022-06-23	Content Modified	6 Installation
V2.3	2022-08-01	Content Addition	7 PID Recovery Function
V2.4	2023-06-29	Content Modified	6.2 3) FB1 FB2 function

1. Changes or modifications not explained/approved in this manual avoids your authority to operate this equipment.
2. PROJOY shall not be held responsible for any damage caused by incorrect installation and/or the misunderstanding of this manual.
3. PROJOY reserves the right to make modification to this manual or the information contained herein at any time without notice.
4. No design data such as sample pictures provided in this manual should be modified or duplicated except for personal use.
5. Check the system regularly every 3 months

## 2 Important Safety Precautions

Components in the installations are exposed to high voltages and currents.

Follow these instructions carefully to avoid the risk from fire or electric shock.

The following regulations and standards are applicable and must be read before installation:

1. Wiring should be done by professional and qualified people;
2. Wiring should be done after confirming of complete disconnection of power supply;
3. International Standards: IEC 60364-7-712 Electrical installations requirements of PV system.
4. Local building regulations.
5. Guidelines for lightning and over voltage protection.

### Note!

1. It is essential to maintain voltage and current limits under all possible operating conditions. Also keep in mind the literature on the correct dimensions and dimensions of cables and components.
2. The installation of such equipment should only be carried out by certified technicians.
3. The wiring schematics of the Firefighter Safety Switch can be found at the end of this manual.
4. All installation works shall be tested in accordance with relevant local laws and regulations during installation.

## 3 Using of FFSS

### 3.1 Using of the Rapid Shutdown

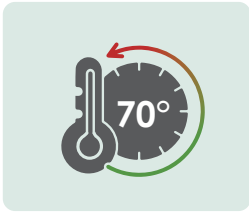
The Rapid Shutdown was developed as a safety device for disconnecting the DC strings, when emergency case occurs, like fire.

### 3.2 Installation of the Rapid Shutdown

The Rapid Shutdown should to be placed as close to the solar array as possible, which is IP65 for outdoor installation.

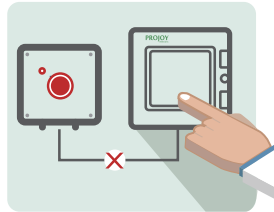
## 4 Shutdown Ways

### Shutdown By Tem.



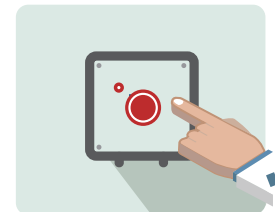
Automatically shutdown when detecting ambient temperature is over than 70 C.

### By AC Power cut-off



Automatically shutdown by AC power cut-off

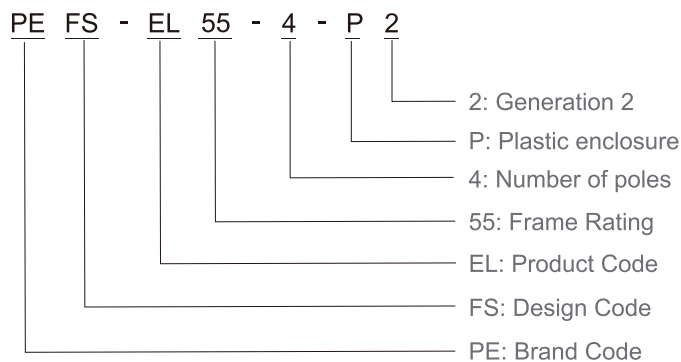
### By Manual



Automatically shutdown by pressing emergency stop button

## 5 Specifications of FFSS




### 5.1 Description



### 5.2 Technical parameters

Number of poles	2	4	6	8	10	12	14	16	18	20
Appearance										
Frame Rating In(A)	16, 25, 32, 40, 50, 55									
Working temperature	-40 ~ +70°C									
Fiducial temperature	+40°C									
Pollution degree	3									
Protection class	IP65									
Outline dimensions(mm)	210×194×100.5		375×227×96			375×227×162				
Installation dimensions(mm)	Φ6×269		Φ6×436							

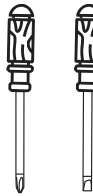
### 5.3 Wiring Options

Number of poles	2	4	6	8	10	12	14	16	18	20
Appearance										
3-core wire	1 *1.2m for AC power supply									
MC4 cable	4	8	12	16	20	24	28	32	36	40

## 6 Installation

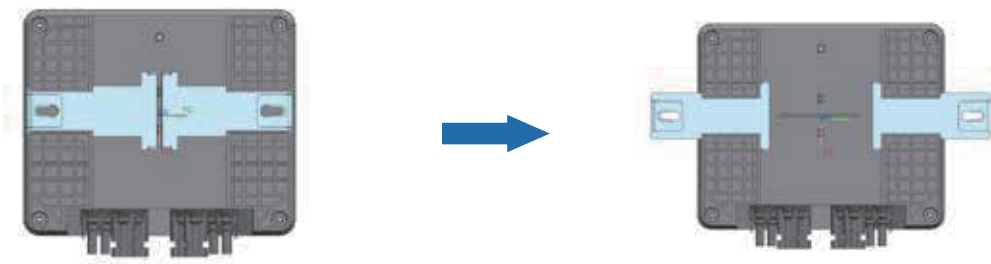
### 6.1 Installation Requirements

Open the box, take out PEFS, read this manual, and prepare cross/straight screwdriver.



### 6.2 Installation Steps

1) Pull out the bottom bracket



2) Mount the switch enclosure on the wall.









### 3) Wiring AC cable

Wire Color: According to American and Europe standard requirements.

US: L: Black; N: White; G: Green

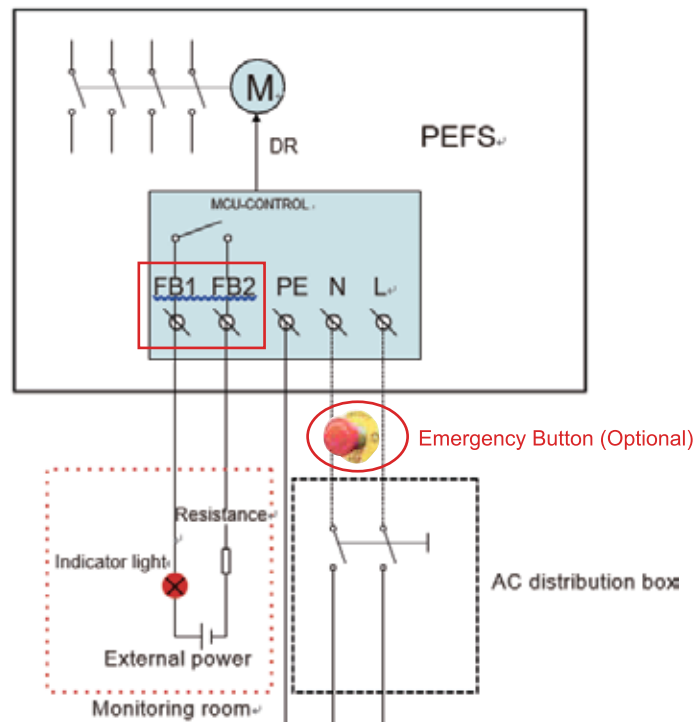
EU: L: Brown; N: Blue; G: Green-Yellow

	L	N	G
US			
EU			

#### Note!

If there is FB1 FB2 at the end of the model, then it has this function, otherwise it doesn't.

FB1, FB2 are used to remotely display the on/off status of the switch. When the switch is closed, FB1 is connected to FB2; when the switch is open, FB1 is disconnected from FB2.



Contact capacity of FB1 FB2 : 250VAC,16A

### 4) Wiring and connectors

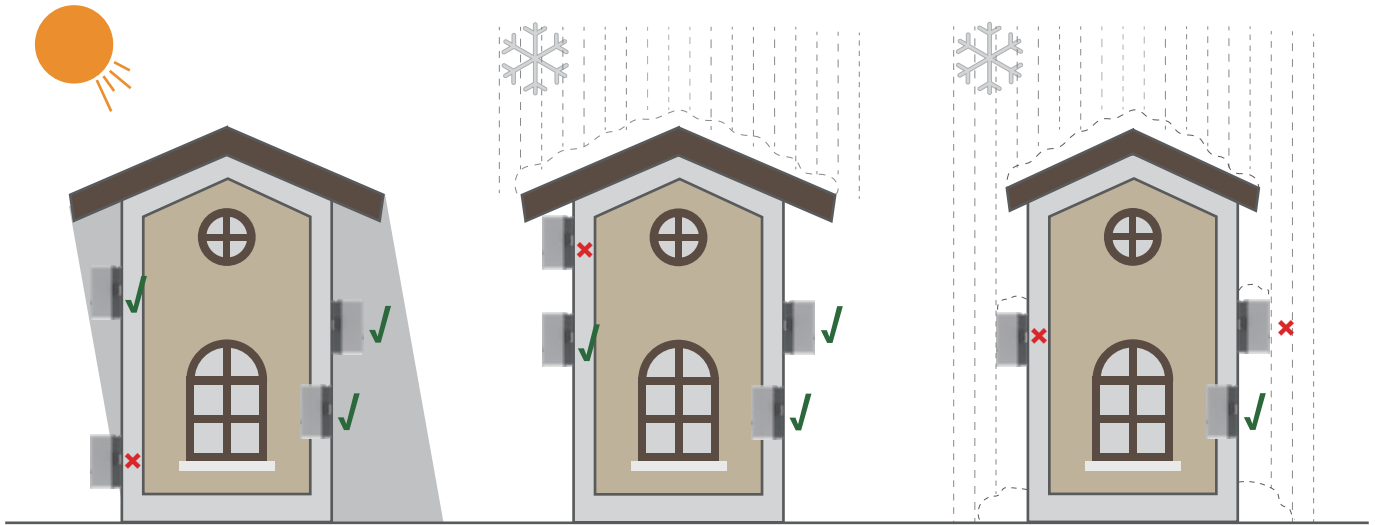


Please follow the marks (1+, 1-, 2+, 2-) for PV wiring.

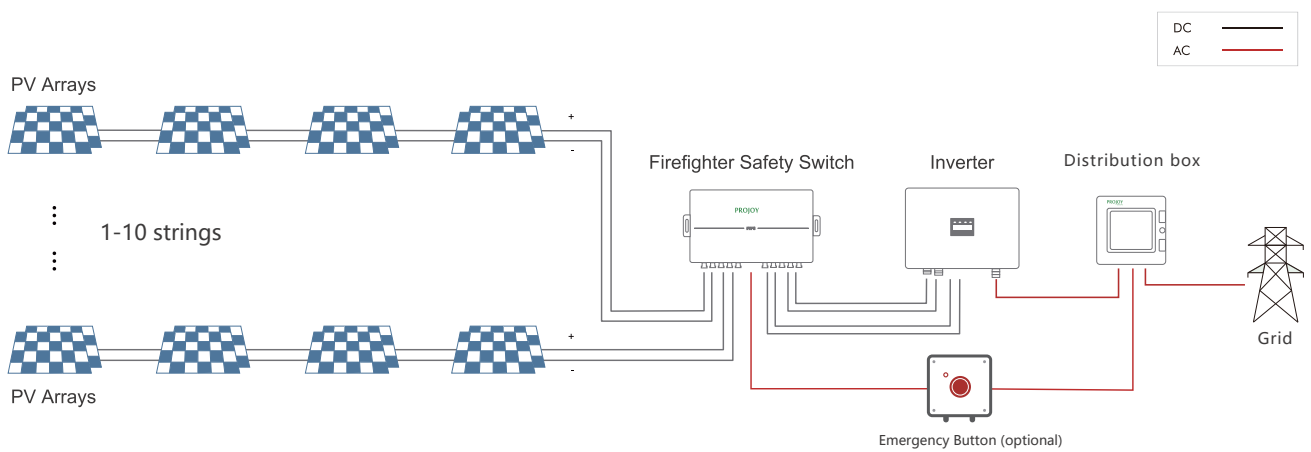
### 5) Installation

#### Note!

Do not expose it to direct sunlight and should be with good ventilation condition.



6) Diagram



6.3 Test

1) Step1. Activate AC power (Capacitors charging).

AC POWER ON



2) Step 2. Wait for one minute for the first time, motor drives switch to turn on and LED indicator light on



Approx. 1 min

3) Step 3. Deactivate AC power. Motor drives switch to turn off and LED indicator light off

AC POWER OFF



Approx. 7 sec.

4) Step 4. Again activate AC power circuit. motor drives switch to turn on and LED indicator light on

AC POWER ON



Approx. 8 sec.

5) Step 5. Test is completed.

## 7 PID Recovery Function (Optional)

### 7.1 PID can be understood as a sign of ageing

The so-called PID (Potential Induced Degradation) of photovoltaic panels is an effect that affects the potential of the modules with respect to the ground and that affects the power of the module by reducing it consistently over time.

The main cause of PID is considered to be the high voltage between the encapsulated solar cells and the front glass surface, which is grounded through the frame or substructure.

This can lead to an unwanted migration of the charge carriers (ions / electrons), that reduces the performance of the cell. In case of high voltages due to long string connections, the PID effect can also occur more heavily. High humidity and temperature accelerate this process.

PID is a highly critical concern, because it generally only develops months after the installation of the photovoltaic system. And in addition to that, unlike other module defects (such as delamination or yellowing of EVA parts), the PID is not distinguishable with the naked eye.

### 7.2 Projoy PID solution

Projoy FF Box with PID recovery function can inject mA current at 600Vdc between negative electrode and the earth on solar modules via solar inverter negative common bus.

FF starts up & shutdown automatically when detecting string voltage less & more than 30Vdc. It requires solar module must be P crystalline silicon type.

### 7.3 Datasheet

AC Input	Static Power	<0.5W
	Operating Power	3.75W
	Max. Power	8.75W
DC Output	Rated Output Voltage To Ground	600V
	Rated Output Current	3.3mA
	Max. Short Circuit Current	6.7mA
PV Modules And Inverter Requirements	Max. System Volatage	1500V
	Module Type Required	P Crystalline Silicon Type
	Minimum Insulating Impedance	200kΩ
Other Info	Operating Temperature Range	-40°C ~ +70°C
	Operating Relative Humidity	0% ~ 98%
	Max. Altitude Without Derating	4000m

## 8 Aftersales service and warranty

### 8.1 Warranty

Projoy PEFS Series String Level Rapid Shutdown Device : 5 years standard warranty and up to 25 years extension, which commencing from 3 months later of the manufacturing date. PROJOY will repair or replace any fault unit which is damaged or cannot work normally due to product quality issue. However, for the faults caused by following reasons, PROJOY would do service with charge even under warranty.

- 1) Inappropriate use or installation, self-modification or improper maintenance, etc.:
- 2) Beyond the prescribed scope of use;
- 3) Earthquakes, fires, lightning strikes, abnormal voltages, other natural disasters and secondary disasters, etc.

### 8.2 Aftersales service

- 1) Please contact Projoy local distributors for after-sales service

## 9 Contact us

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