

ZBENY



RAPID SHUTDOWN SAFETY SOLUTION

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For the latest version of specification, please refer to www.benyi.com or contact to benyi@zjbeny.com
We reserve the right to explain the terms of specification.





COMPANY INTRODUCTION

BENY new energy offers a reliable and robust electric fast charger with an attractive design that is easy to own and operate, with high quality power electronic components. It is a powerful charging station that can deliver up to 262 kW, with CCS1/CCS2/CHAdeMO/AC charging outlets.

We are a leading brand in annually producing hundreds of thousands of quality DC protection products and EV charging stations for complete and reliable solar photovoltaic, battery energy storage, and EV charging system. Certified by UL, SAA, CB, CE, TUV, UKCA, ISO, and RoHS, we have the first listed patented DC switch and produce creative solutions like the AFCI solution for rooftop fire protection, dynamic load balancing, and PEN fault detection EV charger.

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Solar Module Level Rapid Shutdown Safety Solution

BFS Series



- Module Level Rapid Shutdown
- Manual Shutdown by button switch
- Automatic Shutdown on AC Power Loss
- Over temperature Automatic Shutdown
- Compatible with most string inverters and panels
- No cross-talk with inverter or WIFI



Application

BFS-11/BFS-12/BFS-11B/BFS-12B is a module level rapid shutdown device offers fire safety for solar rooftop and building, remains the rapid shutdown function period the solar PV system whole working life.

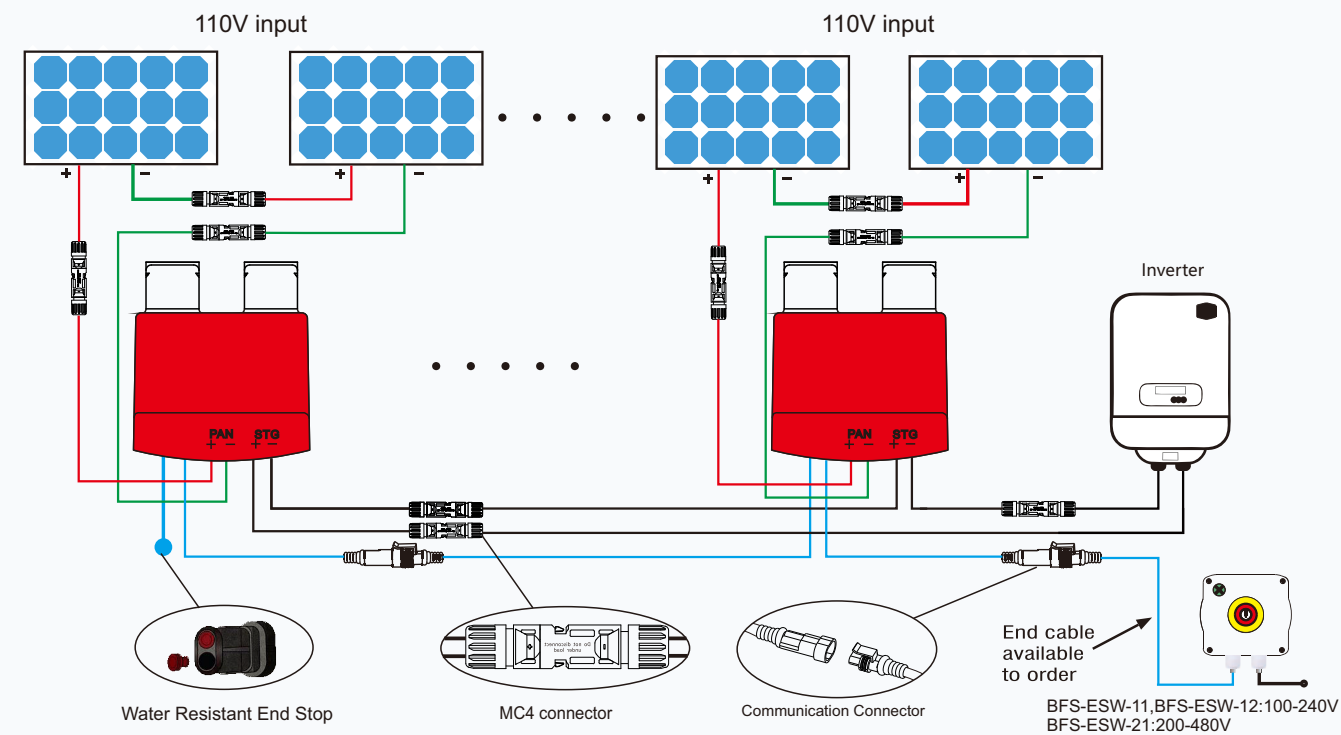
Emergency button switch/Rapid Shutdown Monitoring Device is required to initiate the rapid shutdown operating, as a trigger placed on the ground and easier to reach.

The communication cable on the rapid shutdown device should be connected in series and wire to the button switch/Rapid Shutdown Monitoring Device. So the button switch/Rapid Shutdown Monitoring Device can control the BFS rapid shutdown devices.

A communication without cross-talk with the inverter or WIFI source.

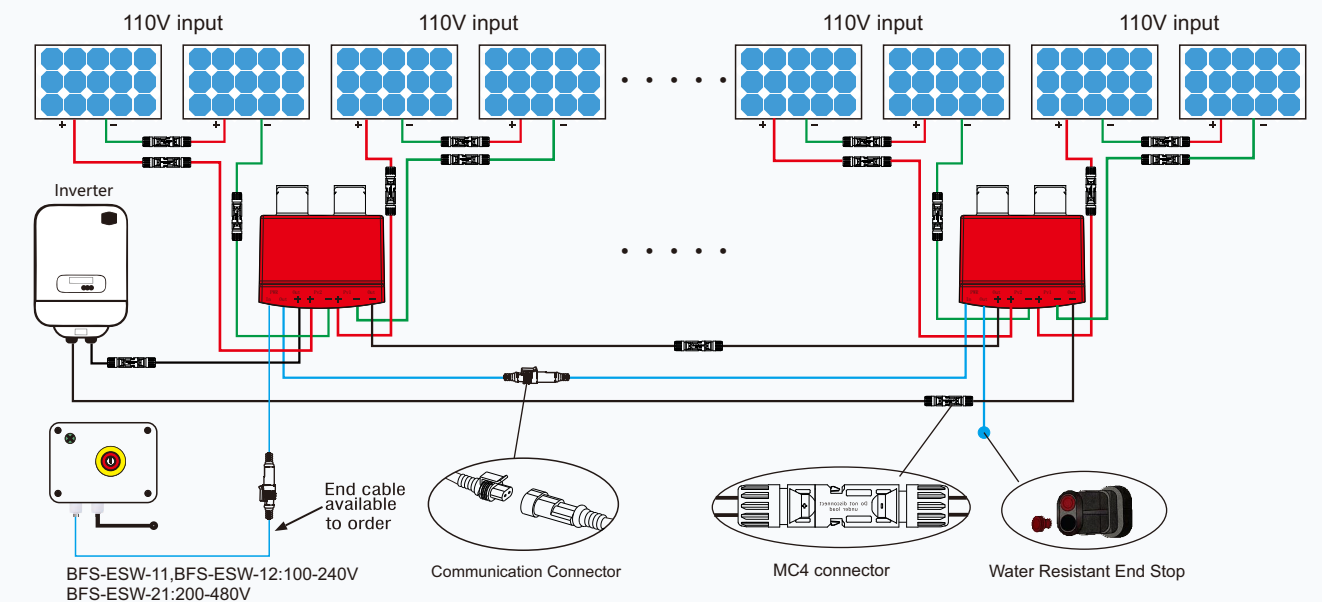
BFS-11 RSD Specifications

Model	BFS-11	
Maximum Input Voltage	110V	70V
Maximum Input Current	20A	25A
Maximum Power	2200W	1750W
PV Input and Output Cables	4.0mm ² (12AWG) Cables + MC4 Connectors	
PV Input Cables Length	180mm	
PV Output Cables Length	1800mm	
IP Protection	IP68	
Operating Temperature	-40°C to +85°C	
Storage Temperature	-40°C to +85°C	
Standard Compliance	EN 62109-1:2010, EN 61058-1:2018	
PV Connectors	Staubli MC4 (Standard) Jinko connectors for option	
DC Power Supply for each RSD		
Voltage Range	14V ~ 28V	
Maximum Current	8mA	
Maximum Power	0.15W	
Power Supply Cables (Signal Cables)	2x0.823mm ² (18AWG) Signal Cables + Signal Connectors	
Power Supply Cables Length	1800mm	



BFS-12 RSD Specifications

Model	BFS-12	
Maximum Input Voltage	110V*2	70V*2
Maximum Input Current	20A	25A
Maximum Power(Input1+Input2)	4400W	3500W
PV Input and Output Cables	4.0mm ² (12AWG) Cables + MC4 Connectors	
PV Input 1 Cables Length	180mm	
PV Input 2 Cables Length	300mm	
PV Output Cables Length	1800mm	
IP Protection	IP68	
Operating Temperature	-40°C to +85°C	
Storage Temperature	-40°C to +85°C	
Standard Compliance	EN 62109-1:2010, EN 61058-1:2018	
PV Connectors	Staubli MC4 (Standard) Jinko connectors for option	
DC Power Supply for each RSD		
Voltage Range	14V ~ 28V	
Maximum Current	12mA	
Maximum Power	0.2W	
Power Supply Cables (Signal Cables)	2x0.823mm ² (18AWG) Signal Cables + Signal Connectors	
Power Supply Cables Length	1800mm	

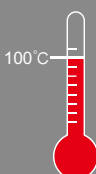


Each BFS-11/BFS-12 device can hold solar modules output max: 1500V total, the modules connect in series as solar string goes to inverter as PV system designing. The connection of BFS-11/BFS-12 RSD and button switch is via communication cable.

Note: If your market requires NEC2017/NEC2020 requirement, we recommend one RSD BFS-11 connects 1 panel($\geq 40V$) or 2 panels($< 40V$); BFS-12 connects 2 panels($\geq 40V$) or 4 panels($< 40V$).

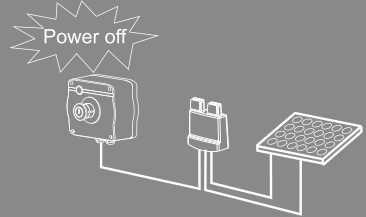
A Complete RSD Solution

Method1



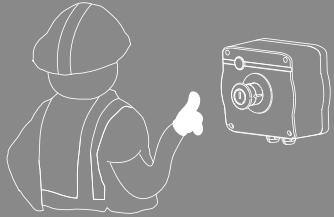
Automatic shutdown the panels when there is a temperature in the area higher than 100°C detected.

Method2



Automatic shutdown the panels when the power supply loss in the button switch box.

Method3



The fireman and people can manual the button switch to shutdown the panels when there is an emergency.



Emergency Shutdown Switch



The Emergency Switch offers the manual shutdown of solar panels on the rooftop by pushing the button. AC power from grid or AC side at solar inverter both could be the power source for the emergency switch.

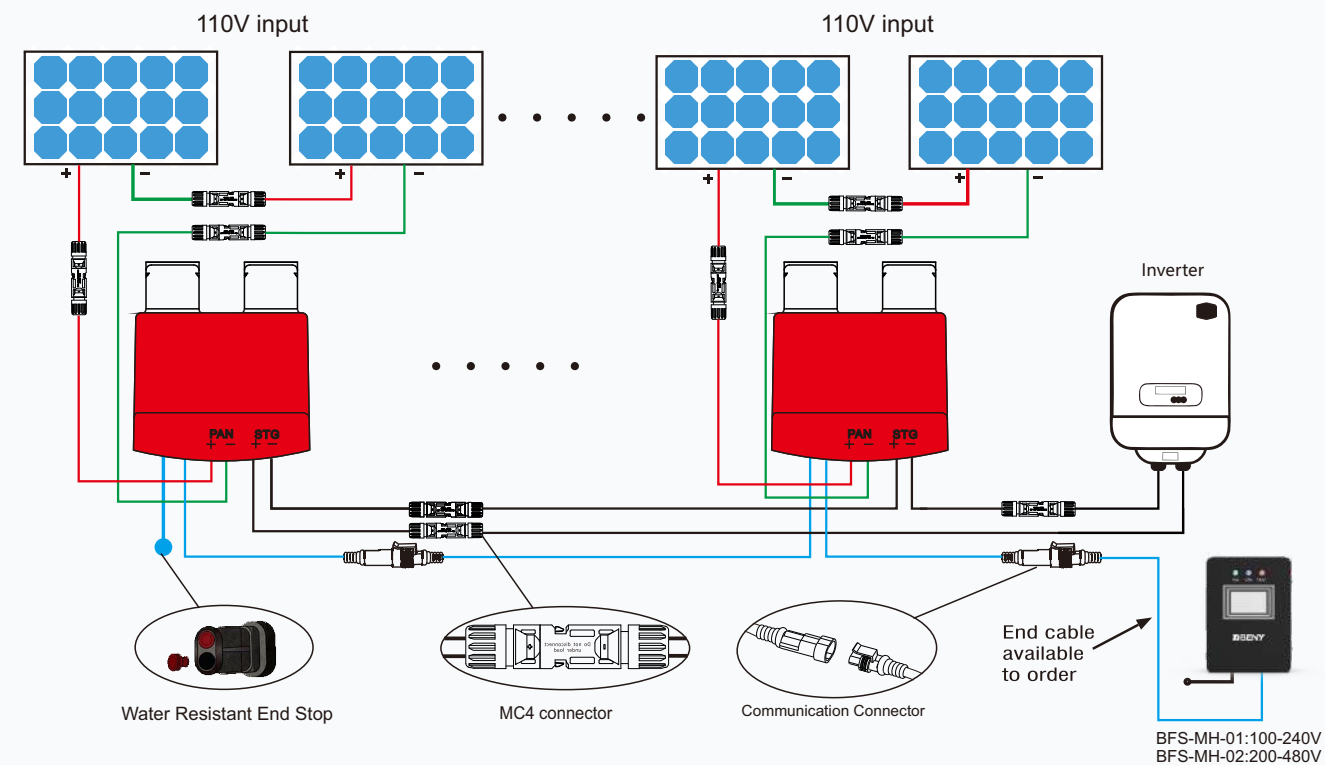
And when the AC power loss, automatically shuts down the DC panels at the meantime. (The green light is ON only indicates the AC power supply is live on).

Emergency Button Switch Specifications

Model	BFS-ESW11(-K)	BFS-ESW12(-K)	BFS-ESW21(-K)
Input Voltage Range	100~240VAC		200V~480VAC
Maximum Working Current	0.5A	0.88A	0.7A
Input Frequency Range	47~63Hz		
Rated Output Voltage	24VDC		
Maximum Output Current	315mA	750mA	1250mA
Maximum Output Power	7.06W	18W	30W
Power Supply Cables	0.823mm ² / 18AWG		
Cables Torque	0.5 NM/4.5lbin		
DIN Terminal Connector Wiring	0.5-4mm ² /26AWG-10(Note:BFS-11/ BFS-12 uses communication connector 2x0.823mm ²)		
DIN Terminal Torque	0.5-0.8Nm/4.5-7lbin		
Ambient Operating Temperature	-30°C to +70°C		-30°C to +85°C
Maximum BFS-11 Units	40 Units	90 Units	90 Units
Maximum BFS-12 Units	20 Units	45 Units	45 Units
Maximum Distance (First RSD to the Emergency Button Switch)	150m		

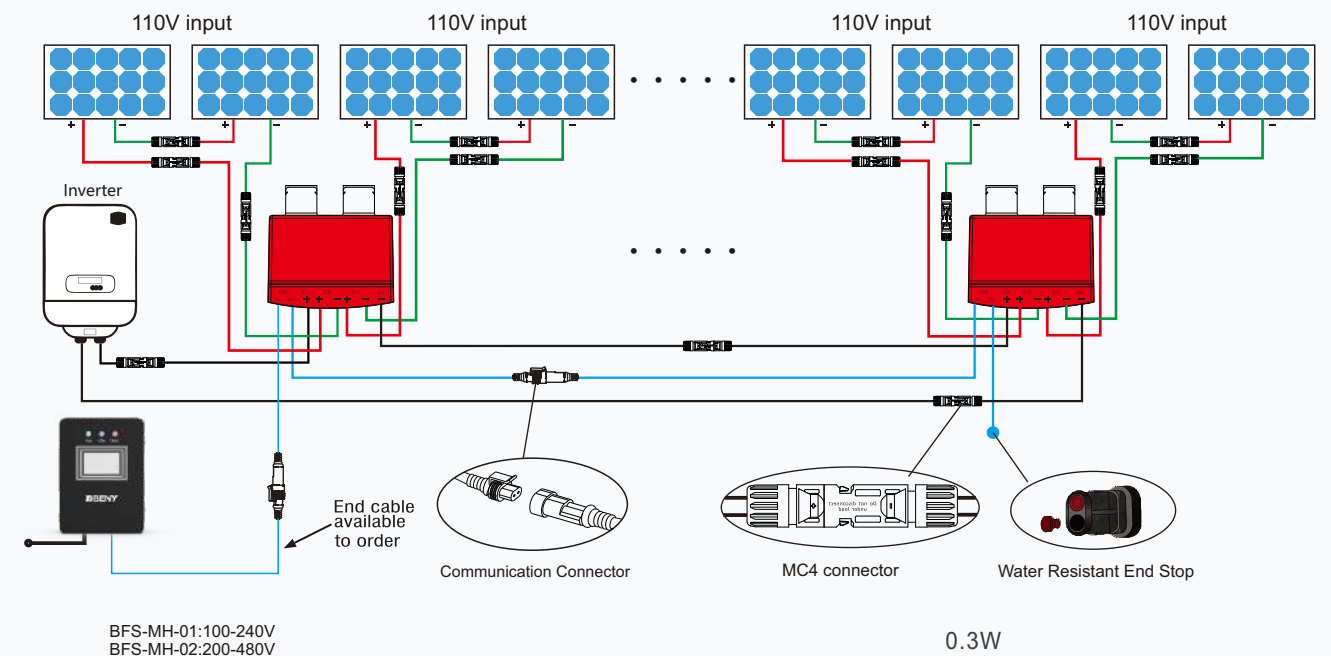
BFS-11B RSD With Monitoring

Model	BFS-11B
Maximum Input Voltage	110V
Maximum Input Current	20A
Maximum Power	2200W
PV Input and Output Cables	4.0mm ² (12AWG) Cables + MC4 Connectors
PV Input Cables Length	180mm
PV Output Cables Length	1800mm
IP Protection	IP68
Operating Temperature	-40°C to +85°C
Storage Temperature	-40°C to +85°C
Standard Compliance	EN 62109-1:2010, EN 61058-1:2018
PV Connectors	Staubli MC4 (Standard) Jinko connectors for option
DC Power Supply for each RSD	
Voltage Range	14V ~ 28V
Maximum Current	15mA
Maximum Power	0.2W
Power Supply Cables (Signal Cables)	2x0.823mm ² (18AWG) Signal Cables + Signal Connectors
Power Supply Cables Length	1800mm



BFS-12B RSD With Monitoring

Model	BFS-12B
Maximum Input Voltage	110V*2
Maximum Input Current	20A
Maximum Power(Input1+Input2)	4400W
PV Input and Output Cables	4.0mm ² (12AWG) Cables + MC4 Connectors
PV Input 1 Cables Length	180mm
PV Input 2 Cables Length	300mm
PV Output Cables Length	1800mm
IP Protection	IP68
Operating Temperature	-40°C to +85°C
Storage Temperature	-40°C to +85°C
Standard Compliance	EN 62109-1:2010, EN 61058-1:2018
PV Connectors	Staubli MC4 (Standard) Jinko connectors for option
DC Power Supply for each RSD	
Voltage Range	14V ~ 28V
Maximum Current	20mA
Maximum Power	0.3W
Power Supply Cables (Signal Cables)	2x0.823mm ² (18AWG) Signal Cables + Signal Connectors
Power Supply Cables Length	1800mm

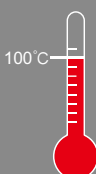


Each BFS-11B/BFS-12B device can hold solar modules output max: 1500V total, the modules connect in series as solar string goes to inverter as PV system designing. The connection of BFS-11B/BFS-12B RSD and Rapid Shutdown Monitoring Device is via communication cable.

Note: If your market requires NEC2017/NEC2020 requirement, we recommend one RSD BFS-11B connects 1 panel(≥40V) or 2 panels(<40V); BFS-12B connects 2 panels(≥40V) or 4 panels(<40V).

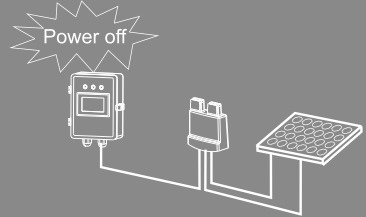
A Complete RSD Solution

Method1



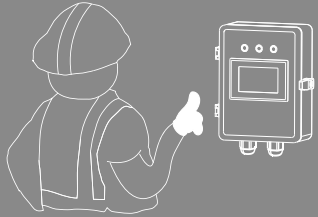
Automatic shutdown the panels when there is a temperature in the area higher than 100°C detected.

Method2



Automatic shutdown the panels when the power supply loss in the Rapid Shutdown Monitoring Device.

Method3



The fireman and people can manual the monitoring device by screen or the emergency stop button on the outer box to shutdown the panels when there is an emergency.



Rapid Shutdown Monitoring Device



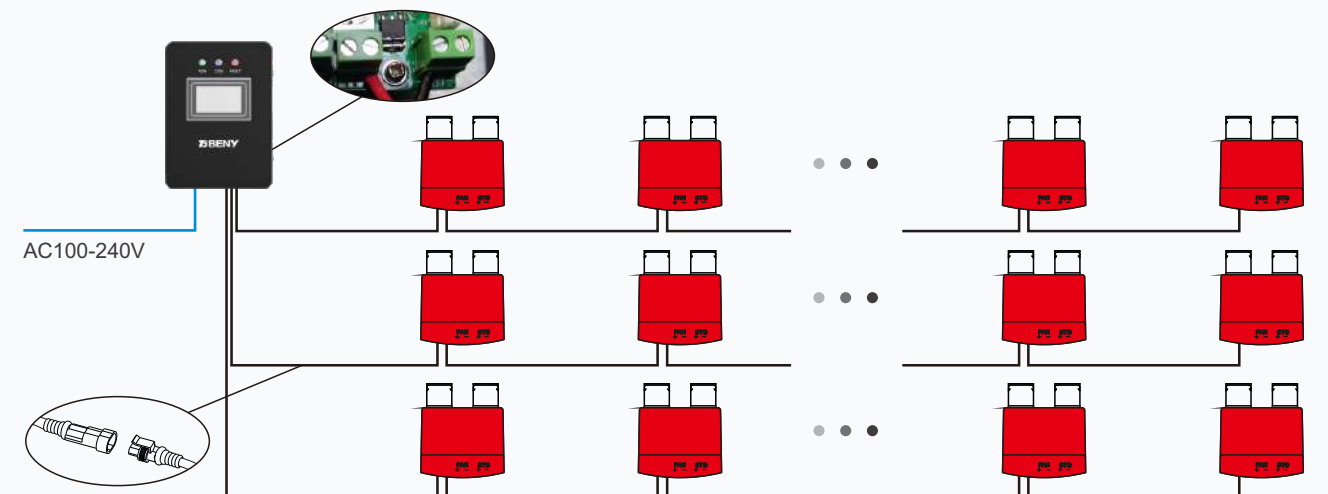
Rapid Shutdown Monitoring Device can simultaneously monitor the failure and communication status of multiple Rapid Shutdown Devices.

AC power from grid or AC side at solar inverter both could be the power source for the Rapid Shutdown Monitoring Device.

And when the AC power loss, automatically shuts down the DC panels at the meantime.

Rapid Shutdown Monitoring Device Specifications

Product Model	BFS-MH-01	BFS-MH-02
Rated Working Voltage	100V-240VAC	200V-480VAC
Communication Mode	POWERBUS	
The Maximum Number of Loops	3	
The Maximum Number of Strings Per Loop	4	
The Maximum On-load Per String	BFS-11B:45	
	BFS-12B:20	
The Maximum Distance: (From the First RSD to the Monitoring Device)	150 meter	
Operating Temperature	-25°C~55°C	
Storage Temperature	-30°C~80°C	
Polling Speed	4 times per second is for each channel, and 12 times per second can be achieved when three channels work simultaneously.	
Display Mode	LCD screen and indicator light	
Interactive Mode	Touch screen	
Total maximum number of standby	BFS-11B:3*4*45=540	
	BFS-12B:3*4*20=240	

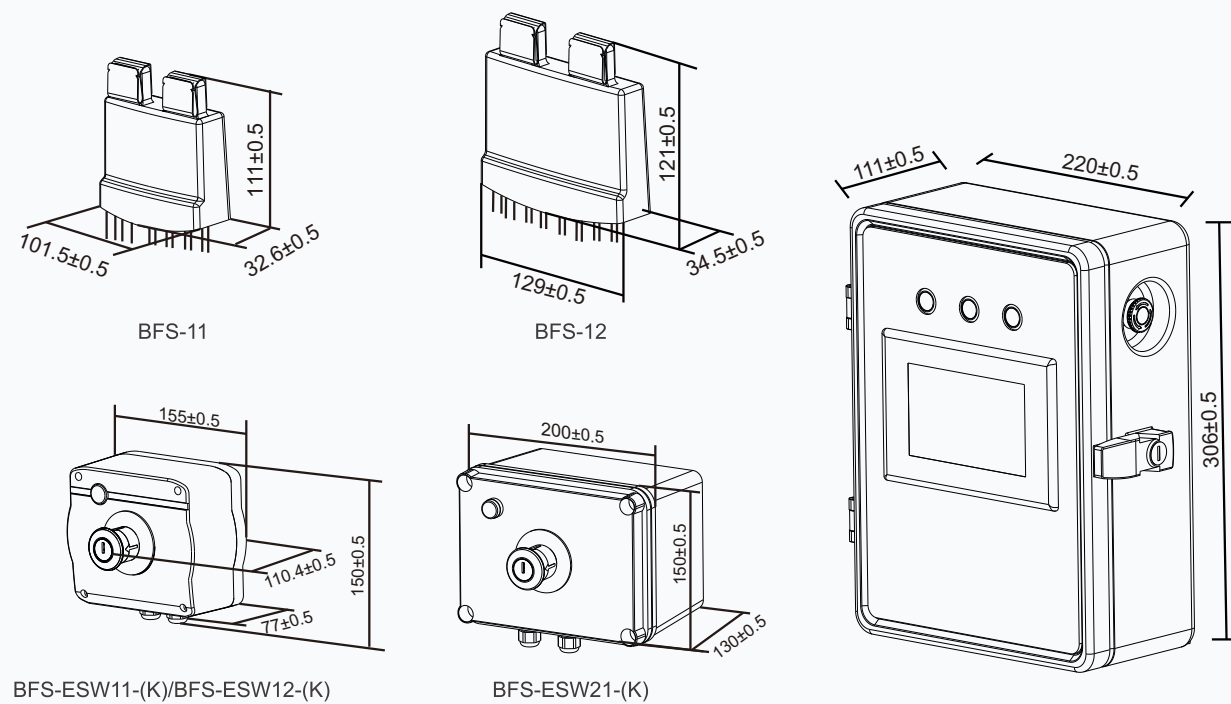


Ordering Information

Model Number	Description
BFS-11	Rapid Shutdown Unit for solar panel(s)
BFS-12	Rapid Shutdown Unit for solar panel(s)
BFS-11B	Rapid Shutdown Unit for solar panel(s)
BFS-12B	Rapid Shutdown Unit for solar panel(s)
BFS-ESW11	Emergency Button Switch for BFS-11/ BFS-12. (100-240V AC power input).
BFS-ESW12	Emergency Button Switch for BFS-11/ BFS-12. (100-240V AC power input).
BFS-ESW11-K	Emergency Button Switch with Key Lock for BFS-11 / BFS-12. (100-240V AC power input).
BFS-ESW12-K	Emergency Button Switch with Key Lock for BFS-11 / BFS-12. (100-240V AC power input).
BFS-ESW21	Emergency Button Switch for BFS-11 / BFS-12. (200V-480V AC power input).
BFS-ESW21-K	Emergency Button Switch with Key Lock for BFS-11 / BFS-12. (200V-480V AC power input).
BFS-MH-01	Rapid Shutdown Monitoring Device for BFS-11B/BFS-12B.(100-240V AC power input)
BFS-MH-02	Rapid Shutdown Monitoring Device for BFS-11B/BFS-12B.(200-480V AC power input)
BFS-CCABLE	20m signal cable with female connector for end of string.
BFS-CCABLES	2m signal cable with male and female connectors for between strings or panels.

Install Dimension

Unit: (mm)



CASE STUDY: Philippines with 1.2MW solar installation.



CASE STUDY: Pampanga, Philippines 1.3MW.

SunSpec Solar Module Level Rapid Shutdown Safety Solution



- Module Level Rapid Shutdown
- Manual Shutdown by RSD Transmitter
- Automatic Shutdown on AC Power Loss
- Over temperature Automatic Shutdown
- Compatible with most string inverters and panels



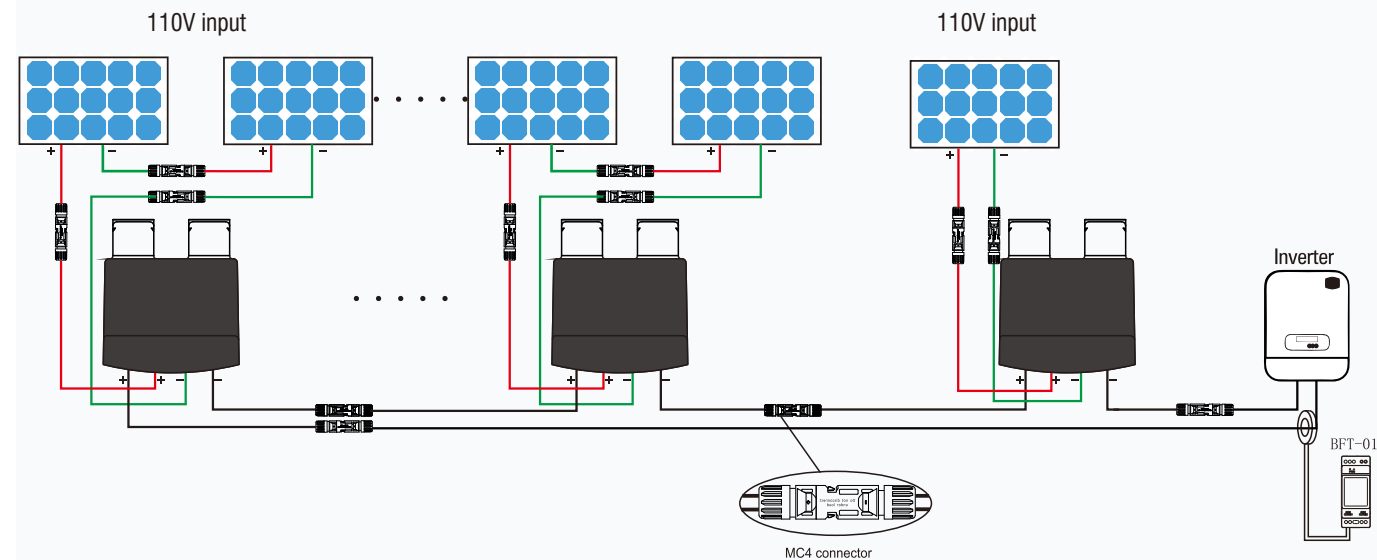
Application

BFS-21/BFS-22 is a module level rapid shutdown device offers fire safety for solar rooftop and building, remains the rapid shutdown function period the solar PV system whole working life.

The BENY Rapid Shutdown Device Transmitter(BFT-01) is part of a rapid shutdown solution when paired with BENY BFS-21/22, a PV module rapid shutdown unit. While powered on, the RSD Transmitter sends a signal to the BFS-21/22 units to keep their PV modules connected and supplying energy. BFS-21/22 units automatically enter rapid shutdown mode when the RSD Transmitter is switched off.

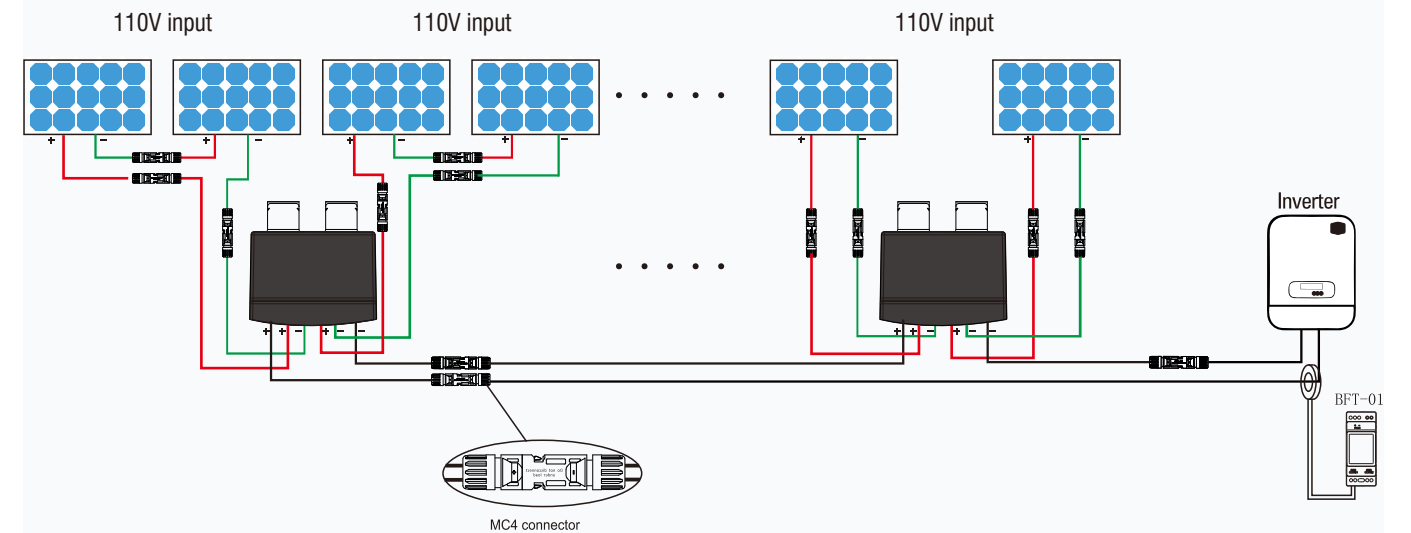
BFS-21 RSD Specifications

Model	BFS-21
Maximum Input Voltage	110V
Operating Voltage Range	16-110V
Maximum Input Current	20A
Maximum Power	2200W
PV Input and Output Cables	4.0mm ² (12AWG) Cables + MC4 Connectors
PV Input 1 Cables Length	180mm
PV Output Cables Length	1800mm
PV Connectors	Staubli MC4 (Standard) Jinko connectors for option
IP Protection	IP68
Operating Temperature	-40°C to +85°C
Storage Temperature	-40°C to +85°C
Standard Compliance	EN 62109-1:2010, EN 61058-1:2018
Over Temperature Protection	100°C
Communication	PLC(Sunspec)



BFS-22 RSD Specifications

Model	BFS-22
Maximum Input Voltage	110V*2
Operating Voltage Range	16-110V*2
Maximum Input Current	20A
Maximum Power(Input1+Input2)	4400W
PV Input and Output Cables	4.0mm ² (12AWG) Cables + MC4 Connectors
PV Input 1 Cables Length	180mm
PV Input 2 Cables Length	300mm
PV Output Cables Length	1800mm
PV Connectors	Staubli MC4 (Standard) Jinko connectors for option
IP Protection	IP68
Operating Temperature	-40°C to +85°C
Storage Temperature	-40°C to +85°C
Standard Compliance	EN 62109-1:2010, EN 61058-1:2018
Over Temperature Protection	100°C
Communication	PLC(Sunspec)

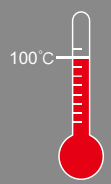


Each BFS-21/22 device can hold solar modules output max: 1500V total, the modules connect in series as solar string goes to inverter as PV system designing. The connection of BFS-21/22 RSD and Rapid Shutdown Monitoring Device is via communication cable.

Note: If your market requires NEC2017/NEC2020 requirement, we recommend one RSD BFS-21 connects 1 panel($\geq 40V$) or 2 panels($< 40V$); BFS-22 connects 2 panels($\geq 40V$) or 4 panels($< 40V$).

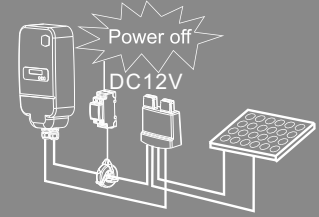
A Complete RSD Solution

Method1

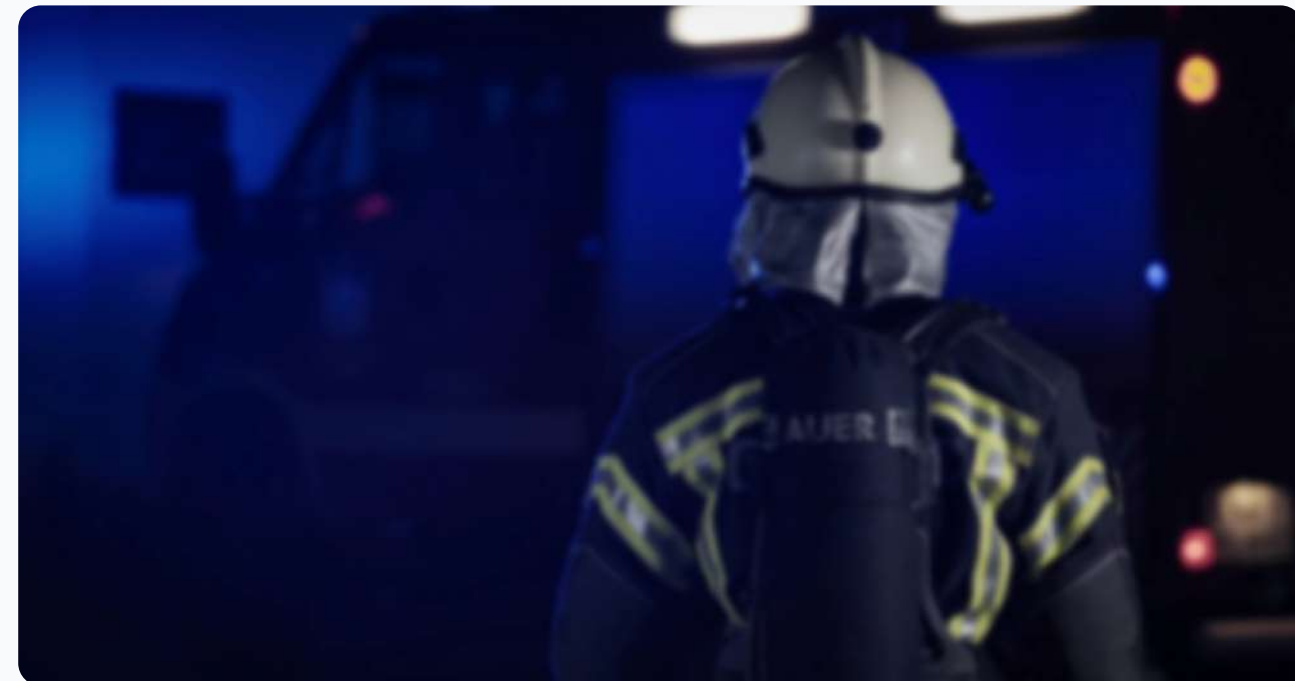


Automatic shutdown the panels when there is a temperature in the area higher than 100°C detected.

Method2



Automatic shutdown the panels when the power supply loss in the Rapid Shutdown Device Transmitter.



Application

The BENY Rapid Shutdown Device (RSD) Transmitter(BFT-01) is part of a rapid shutdown solution when paired with BENY BFS-21/22 , a PV module rapid shutdown unit. While powered on, the RSD Transmitter sends a signal to the BFS-21/22 units to keep their PV modules connected and supplying energy.

BFS-21/22 units automatically enter rapid shutdown mode when the RSD Transmitter is switched off and resume energy production when power is restored to the RSD Transmitter. This solution uses PLC signaling for rapid shutdown.

BFT-01 Specifications

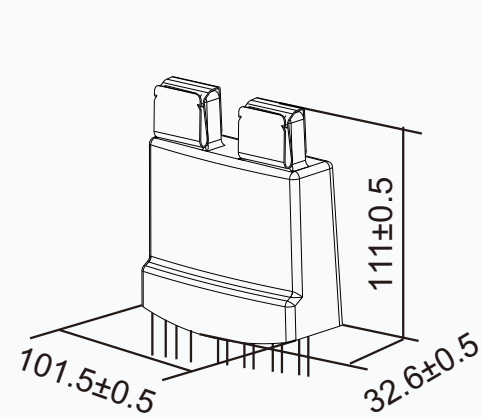
BFT-01	
Max Working Voltage (DC)	12V
Max Working Current	1A
Average Supply Power	0.85W
Installation method:	DIN-rail mounting
Operating Temperature range:	-20°C to +50°C
Storage Temperature range	-40°C to +85°C
RSD Core	
Maximum Current	Single Core:100A,Dual Core:200A
Maximum String Voltage	1500VDC
Maximum Number of Strings Per Core	5
Maximum Supported PV Modules Per String	30
Max cable length from inverter (+) to inverter (-)	1000ft (300m)
Inside Dimension of RSD Core	25mm
Installation method	DIN-rail mounting

Ordering Information

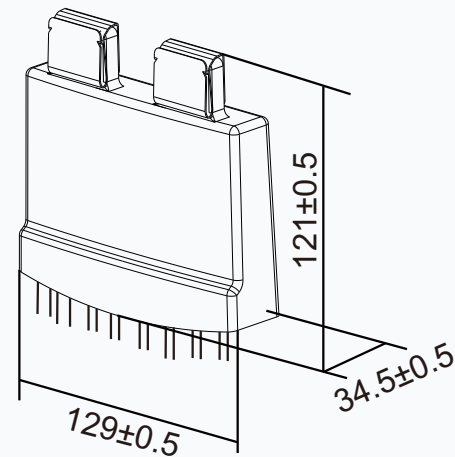
Model Number	Description
BFS-21	Rapid Shutdown Unit for solar panel(s)
BFS-22	Rapid Shutdown Unit for solar panel(s)
BFT-01(single)	One RSD core Rapid Shutdown Activator for BFS-21/22
BFT-01(dual)	Two RSD Core Rapid Shutdown Activator for BFS-21/22

Install Dimension

Unit: (mm)

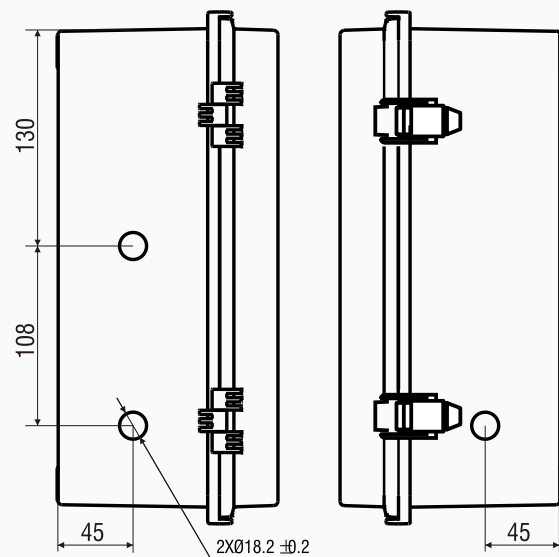


BFS-21

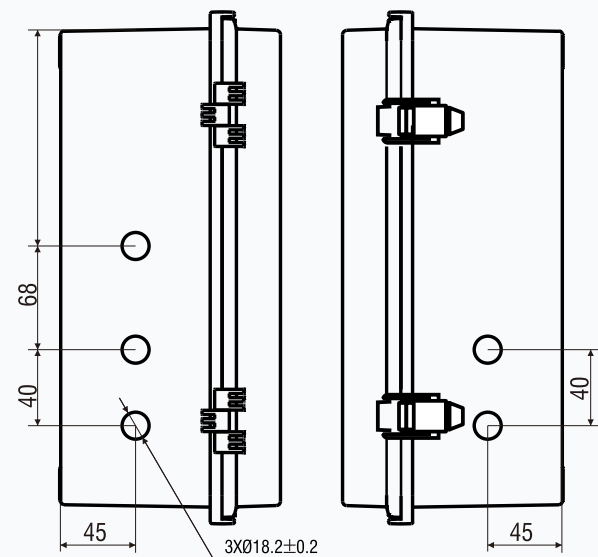


BFS-22

Single Core



Dual Core



Fire Fighter Safety Switch for Solar Building



Automatic DC Power Shutdown



AC Power Manual Shutdown



Application

ZBENY The BFS-S Series Firefighter Safety Switch is a DC Isolation Solution for solar rooftop fire safety, providing DC power mechanical and complete isolation in the event of a fault. Make a safe area and operating space to protect the firefighter from DC electric shock. As the firefighter cut off the AC power in the house, the safety switch will disconnect the DC power at the same time.

- String Level Rapid Shutdown
- Up to 1500VDC, 50A per string
- Plug and Play for easy installation
- No cross-talk with inverter or Wifi
- Compatible with most string inverters and panels

Features

IP66 Aluminum enclosure with breathing valve



UI508i listed and IEC PV2 DC switch built-in







Genuine MC4 Plug and Play



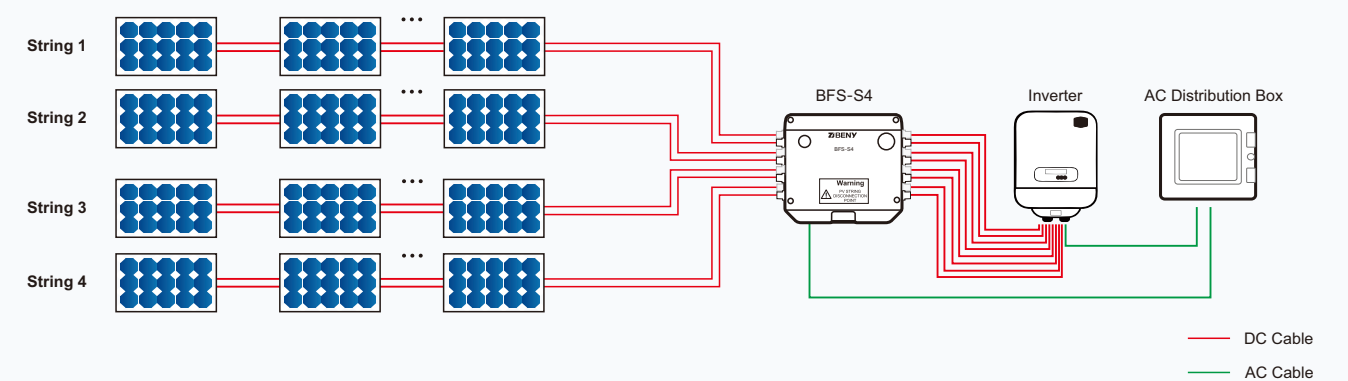
Protection cover for rooftop installation is available



Specifications

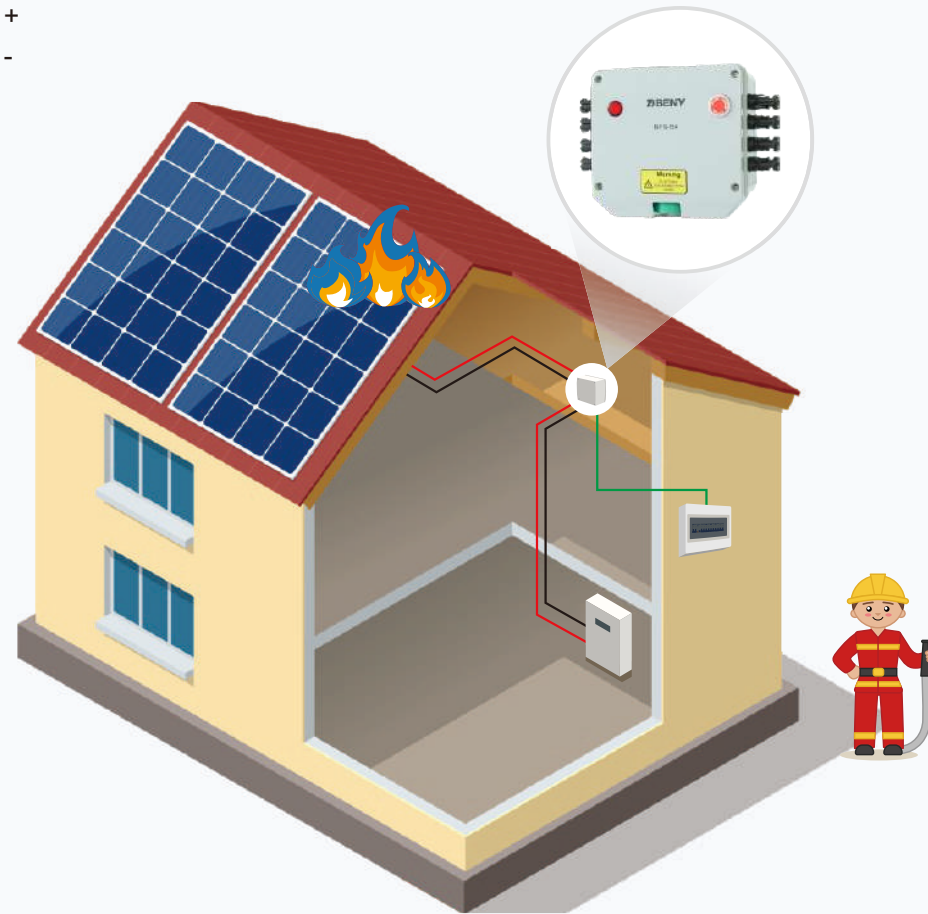
Models	BFS-S			
Models	BFS-S1	BFS-S2	BFS-S3	BFS-S4
Number of Strings	1 string	2 strings	3 strings	4 strings
				
Max String Voltage(Vdc)	300V-1500V			
Max String Current(A)	50A			
Operating Voltage	90Vac-260Vac			
Nominal Voltage	230Vac			
Nominal Current	30mA			
Start up Current	Average 100mA			
Switch on Action Current	Max 300mA			
Standard Compliance	IEC / EN 60947-3			
Protection Degree	IP66			
Storage Temperature Allowed Between	-40°C~+85°C			
Operating Temperature Range	-20°C~+50°C			
Maximum Operating Temperature Before Automatic Switch OFF	+85°C			
Protection Level	Class II			
Mechanical Endurance	9700			
Electrical Endurance	300			

Diagram



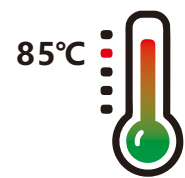
How the solution works?

- DC Cable +
- DC Cable -
- AC Cable



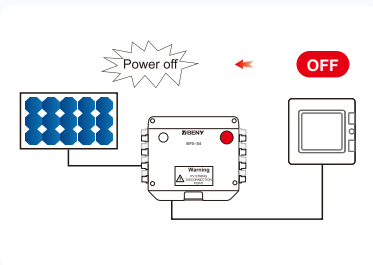
Shutdown Mode

Automatic Shutdown When Over Temperature



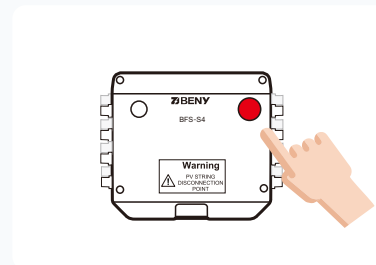
Automatically OFF the DC Power, when temperature inside of BFS-S enclosure $\geq 85^{\circ}\text{C}$.
Once temperature drop to $\leq 75^{\circ}\text{C}$, DC power will be back automatically.

Automatic Shutdown When AC Power Loss



Automatically OFF the DC Power, when AC Power is loss accidentally or manually turn off by firefighter, so to make safety zone for firefighters.
Once AC Power is back, DC Power will be back automatically.

100% Shutdown By Emergency Button



Press the emergency button to keep DC Power 100% OFF even when AC Power is back, so to keep a total safety zone for firefighters.

Dimensions

