PEFS SERIES

Firefighter Safety Switch

PROJOY PEFS Series

PROJOY electric

– Switch To Safety! –

www.projoy-electric.com

V3.0 20201230

PEFS Series

Firefighter Safety Switch

PROJOY electric

– Switch To Safety! –

Features

- Up to 1strings, 2strings
- Up to 9-55A
- Up to 1500Vdc
- CE certification
- Motor driven switch disconnection
- PC+ABS ,Robust plastic enclosure IP66
- Knock outs | Cable glands | MC4 connectors
- Built-in DC isolator with TUV, CE, CB, SAA, UL certifications
- Shut down automatically exceeding 70℃
- Equipped with breathing valve to avoid conden-sation inside the enclosure
- Applied to rooftop and commercial solar installations

Select Code

PEFS	EL	x	y
Projoy electric Firefighter safety switch	Enclosure	Rated current	Wiring

Models: PEFS-ELx-y. Rated current: x=16/25/32/40/55/40H/50H, Wiring types: y=2/2H/4S/4T/4B/4

Unit with knock outs, M12

Unit withcable glands, M12

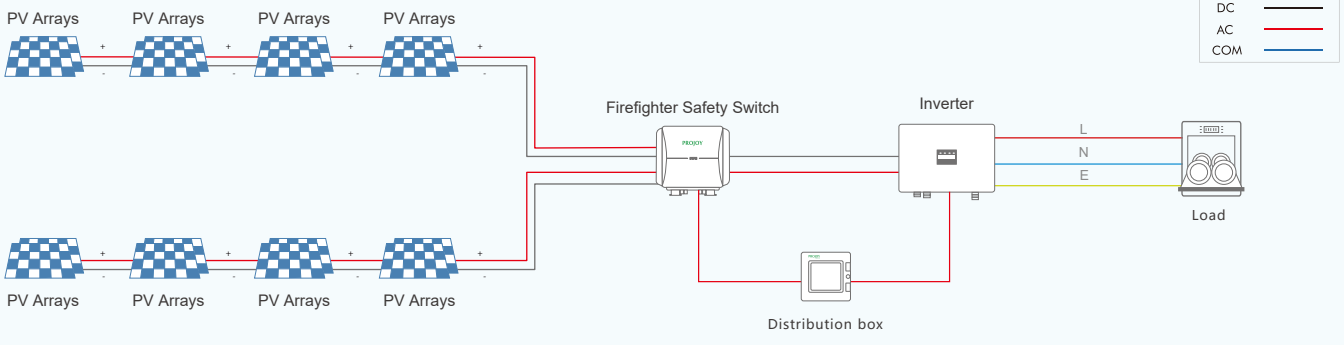
Unit with MC4 connectors

When the current is greater than 40A, please select cable glands or knockouts.

Technical data

Technical Parameter	
Main Parameters	**PEFS**
String voltages (Vdc)	300~1500
String current (A)	9~55
Number of strings	1/2
Switch wiring	2/2H/4S/4T/4B/4
Operating voltage	100Vac - 270Vac
Nominal voltage	230Vac
Nominal current	30mA
Start up (loading) current	average 100mA
Switch on action current	max 300mA
Feedback contact	24Vdc - 300mA max
Operating temperature range	-20° C - +50° C
Max. operating temperature before automatic switch off	+70° C
Storage temperature range	-40° C - +85° C
Protection degree	IP66
Protection level	Class II
Certification	CE
DC Switch disconnect according to	EN 60947-1&3
Number of operations	10000
Number of operations under load (PV1)	>1500

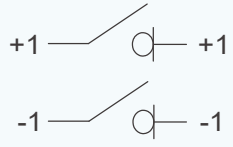
Diagram



Technical data

Data of PEFS refer to built-in DC isolators. Data according to IEC60947-3(ed.3.2):2015, UL508i. Utilization category DC-PV1.								Poles	No. of Strings	Part Number
300V	600V	700V	800V	900V	1000V	1200V	1500V			
16	16	16	16	13	9	6	3	2	1	PEFS-EL16-2
25	25	23	22	16	11	8	4	2	1	PEFS-EL25-2
32	32	27	26	20	13	10	5	2	1	PEFS-EL32-2
40	40	35	30	25	20	10	6	2	1	PEFS-EL40-2
55	55	55	45	35	25	15	8	2	1	PEFS-EL55-2
16	16	16	16	13	9	6	3	4	2	PEFS-EL16-4
25	25	23	22	16	11	8	4	4	2	PEFS-EL25-4
32	32	27	26	20	13	10	5	4	2	PEFS-EL32-4
40	40	35	30	25	20	10	6	4	2	PEFS-EL40-4
55	55	55	45	35	25	15	8	4	2	PEFS-EL55-4
16	16	16	16	16	16	16	16	4	1	PEFS-EL16-4S
25	25	25	25	25	25	25	20	4	1	PEFS-EL25-4S
32	32	32	32	32	32	32	23	4	1	PEFS-EL32-4S
40	40	40	40	40	40	40	30	4	1	PEFS-EL40-4S
55	55	55	55	55	55	55	40	4	1	PEFS-EL55-4S
16	16	16	16	16	16	16	16	4	1	PEFS-EL16-4T
25	25	25	25	25	25	25	20	4	1	PEFS-EL25-4T
32	32	32	32	32	32	32	23	4	1	PEFS-EL32-4T
40	40	40	40	40	40	40	30	4	1	PEFS-EL40-4T
55	55	55	55	55	55	55	40	4	1	PEFS-EL55-4T
16	16	16	16	16	16	16	16	4	1	PEFS-EL16-4B
25	25	25	25	25	25	25	20	4	1	PEFS-EL25-4B
32	32	32	32	32	32	32	23	4	1	PEFS-EL32-4B
40	40	40	40	40	40	40	30	4	1	PEFS-EL40-4B
55	55	55	55	55	55	55	40	4	1	PEFS-EL55-4B
50	50	50	50	50	50	40	30	2	1	PEFS-EL50H-2
40	40	40	40	40	40	30	20	2	1	PEFS-EL40H-2
50	50	50	50	50	50	40	30	4	2	PEFS-EL50H-4
40	40	40	40	40	40	30	20	4	2	PEFS-EL40H-4
50	50	50	50	50	50	50	50	4	1	PEFS-EL50H-4S
40	40	40	40	40	40	40	40	4	1	PEFS-EL40H-4S
50	50	50	50	50	50	50	50	4	1	PEFS-EL50H-4B
40	40	40	40	40	40	40	40	4	1	PEFS-EL40H-4B
50	50	50	50	50	50	50	50	4	1	PEFS-EL50H-4T
40	40	40	40	40	40	40	40	4	1	PEFS-EL40H-4T

Contact Configuration



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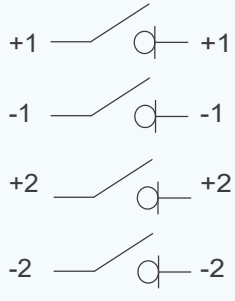

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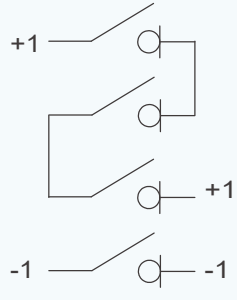

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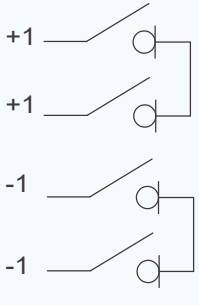

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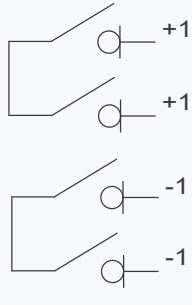
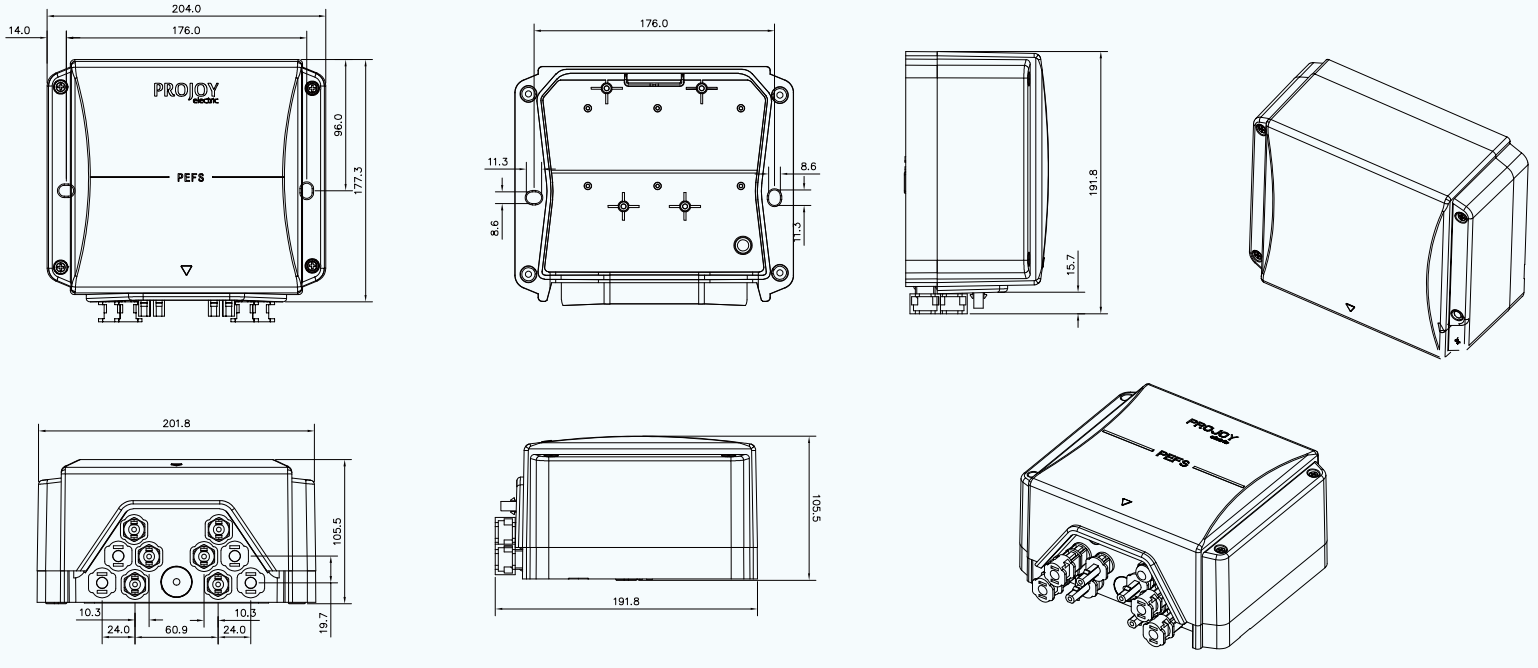


4B

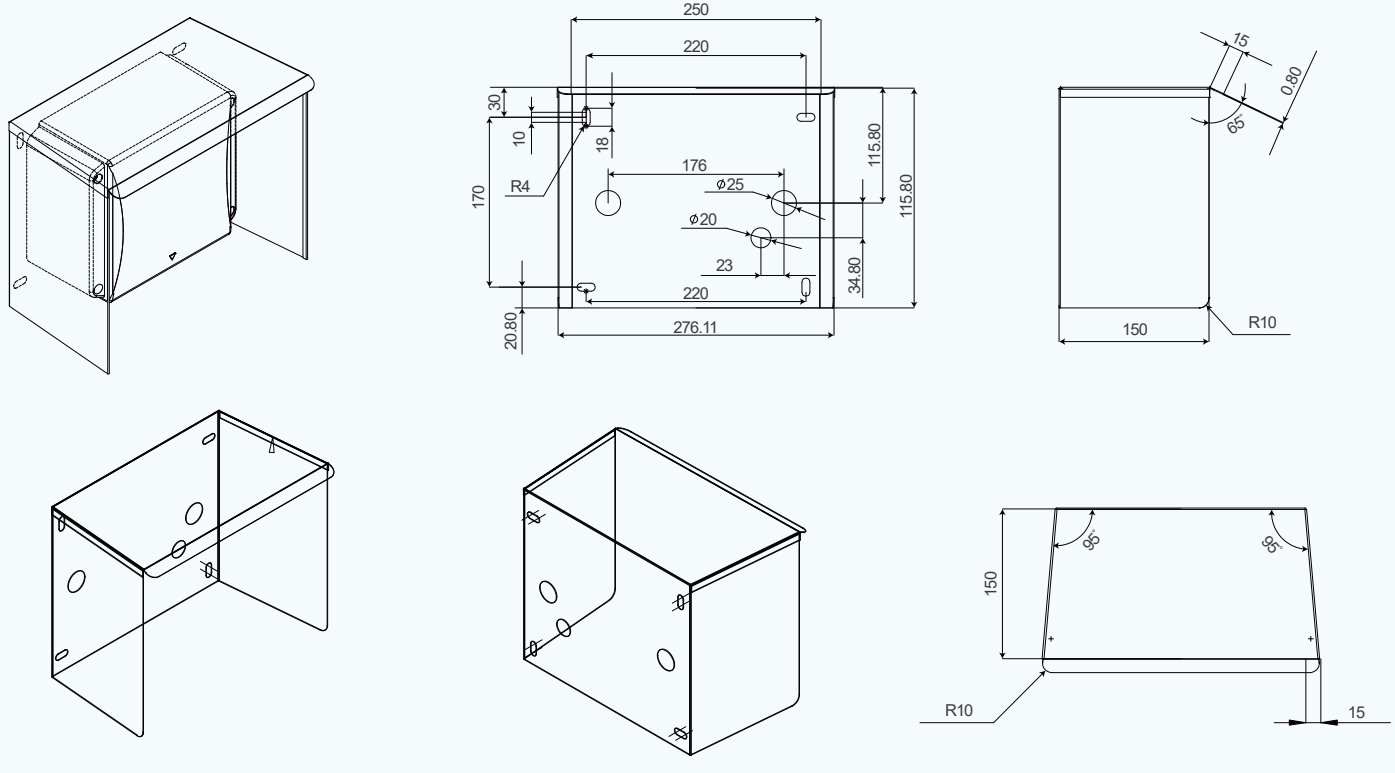
Dimensions of PEFS

Dimensions



Dimensions of PEFS

Dimensions



NOTE: The switch enclosure may not be installed in direct sunlight or be in direct contact with (continuous) ingress water.

PEFS Series

Firefighter Safety Switch

PROJOY electric

– Switch To Safety! –

Features

- Up to 3 strings, 4 strings， 5strings
- Up to 55A
- Up to 1500V DC
- CE certification
- Motor driven switch disconnection
- Sheet metal material enclosure IP65
- Built-in DC isolator with TUV, CE, CB, SAA, UL
- Shut down automatically exceeding 70℃
- Equipped with breathing valve to avoid conden-sation inside the enclosure
- Applied to Commercial and Utility scale solar installations

Select Code

PEFS	EL	x	y
Projoy electric Firefighter safety switch	Enclosure	Rated current	Wiring

Models: PEFS-ELx-y. Rated current: x=16/25/32/40/55/40H/50H, Wiring types: y=6/8/10/6T/9T

Unit withcable glands, M12

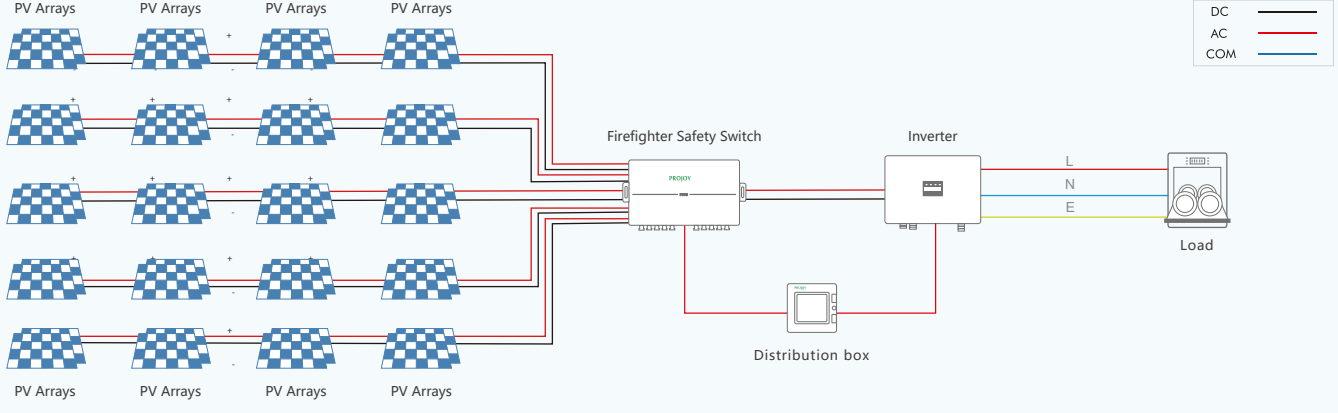
Unit with MC4 connectors

When t he current is greater than 40A, please select cable glands .

Technical data

Technical Parameter	
Main Parameters	**PEFS**
String voltages (Vdc)	300~1500
String current (A)	9~55
Number of strings	3~5
Switch wiring	6/8/10/6T/9T
Operating voltage	100Vac - 270Vac
Nominal voltage	230Vac
Nominal current	30mA
Start up (loading) current	average 100mA
Switch on action current	max 300mA
Feedback contact	24Vdc - 300mA max
Operating temperature range	-20°C - +50°C
Max. operating temperature before automatic switch off	+70°C
Storage temperature range	-40°C - +85°C
Protection degree	IP66
Protection level	Class II
Certification	CE
DC Switch disconnect according to	EN 60947-1&3
Number of operations	10000
Number of operations under load (PV1)	>1500

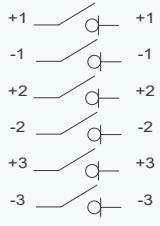
Diagram



Technical data

Data of PEFS refer to built-in DC isolators. Data according to IEC60947-3(ed.3.2):2015. Utilization category DC-PV1.								Poles	No. of Strings	Part Number
300V	600V	700V	800V	900V	1000V	1200V	1500V			
16	16	16	16	13	9	6	3	6	3	PEFS -EL16-6
25	25	23	22	16	11	8	4	6	3	PEFS -EL25-6
32	32	27	26	20	13	10	5	6	3	PEFS -EL32-6
40	40	35	30	25	20	10	6	6	3	PEFS -EL40-6
55	55	55	45	35	25	15	8	6	3	PEFS -EL55-6
16	16	16	16	13	9	6	3	8	4	PEFS -EL16-8
25	25	23	22	16	11	8	4	8	4	PEFS -EL25-8
32	32	27	26	20	13	10	5	8	4	PEFS -EL32-8
40	40	35	30	25	20	10	6	8	4	PEFS -EL40-8
55	55	55	45	35	25	15	8	8	4	PEFS -EL55-8
50	50	50	50	50	50	40	30	6	3	PEFS -EL50H-6
40	40	40	40	40	40	30	20	6	3	PEFS -EL40H-6
50	50	50	50	50	50	40	30	8	4	PEFS -EL50H-8
40	40	40	40	40	40	30	20	8	4	PEFS -EL40H-8
50	50	50	50	50	50	40	30	10	5	PEFS -EL50H-10
40	40	40	40	40	40	30	20	10	5	PEFS -EL40H-10
50	50	50	50	50	50	50	40	6	2	PEFS -EL50H-6T
40	40	40	40	40	40	40	30	6	2	PEFS -EL40H-6T
50	50	50	50	50	50	50	40	9	3	PEFS -EL50H-9T
40	40	40	40	40	40	40	30	9	3	PEFS -EL40H-9T

Contact Configuration



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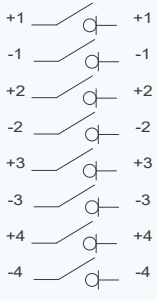

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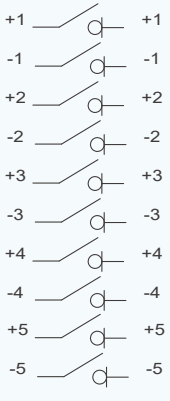

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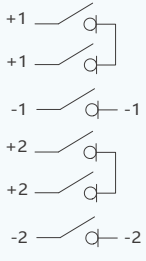

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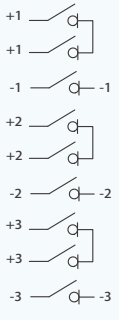
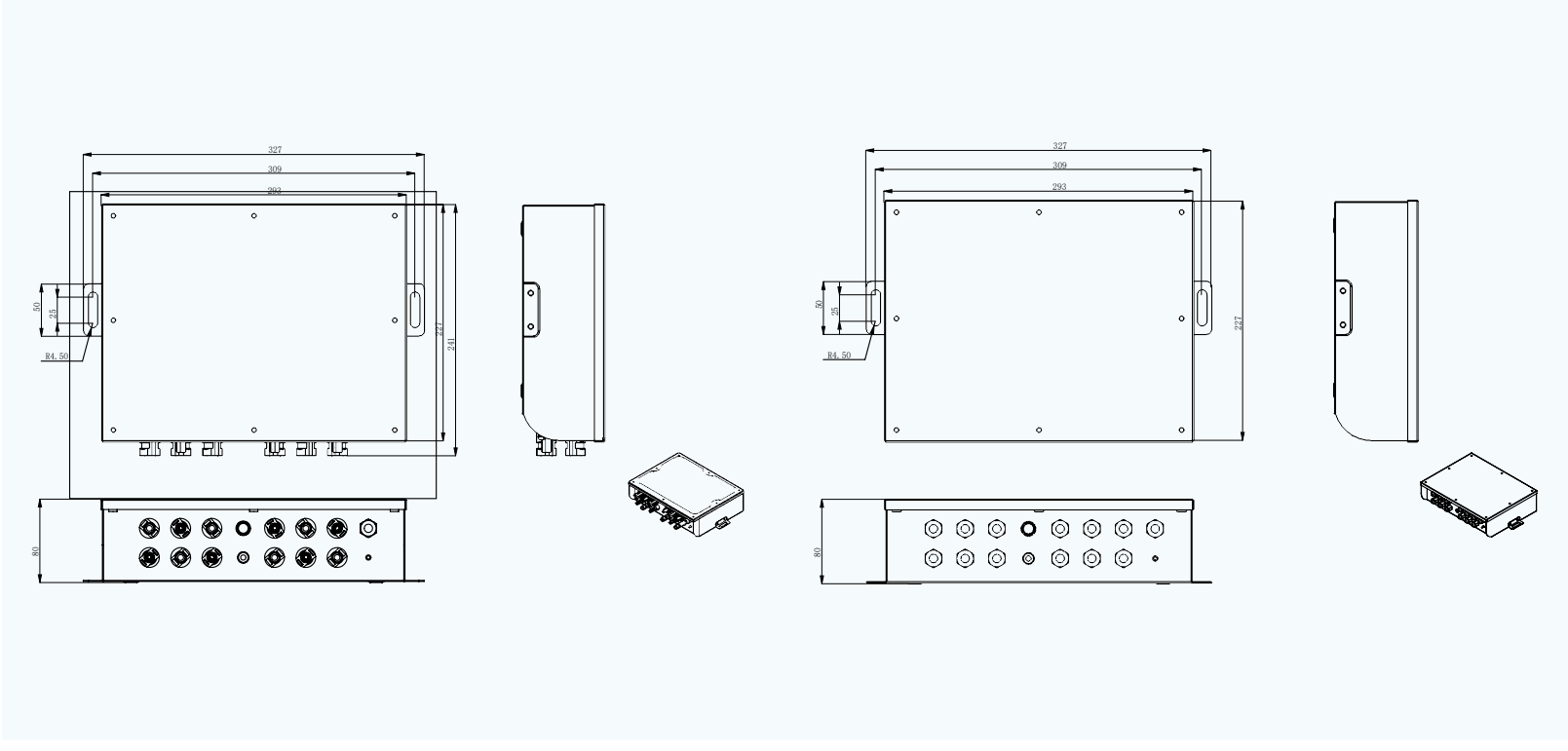


9T

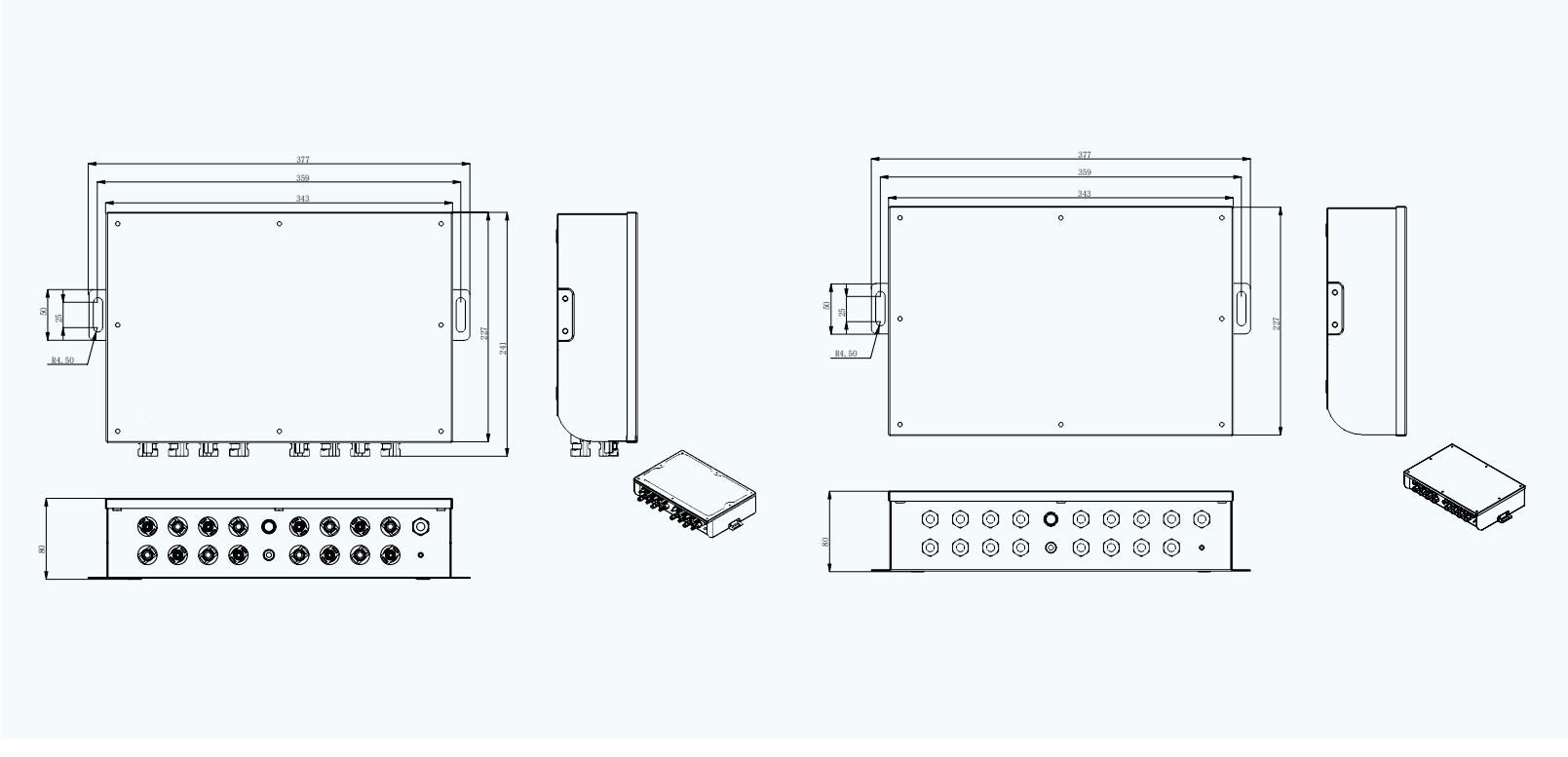
Dimensions of PEFS

PEFS-6P



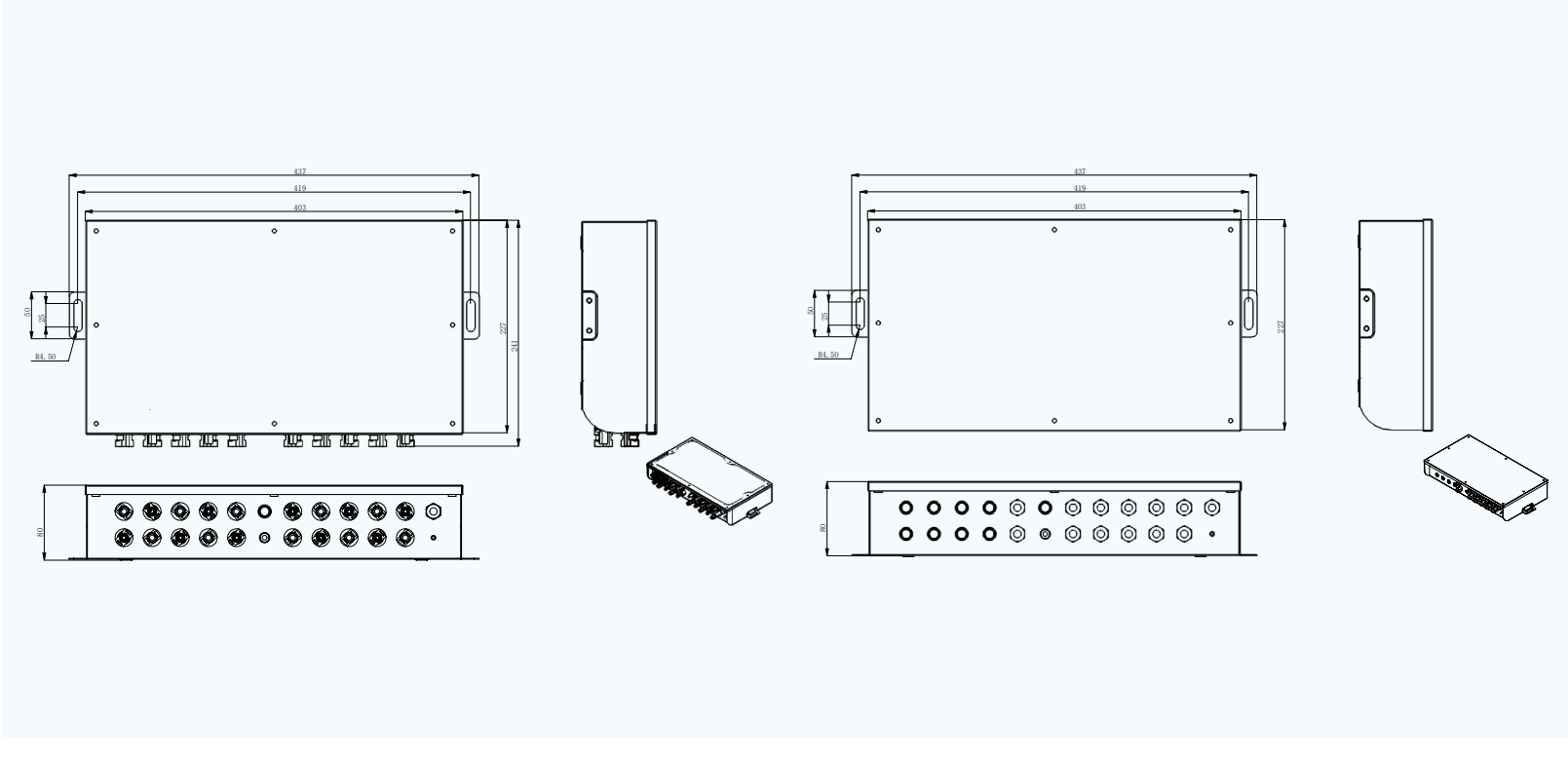
Dimensions of PEFS

PEFS-8P



Dimensions of PEFS

PEFS-10P



PEFS Series

Large Firefighter Safety Switch

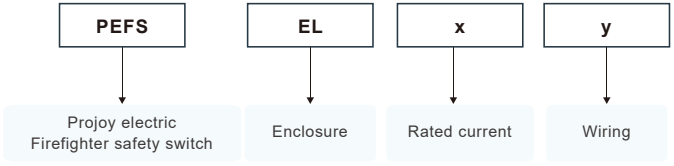
PROJOY electric

— Switch To Safety! —

Features

- Up to 6-10 strings
- Up to 55A
- Up to 1500V DC
- CE certification
- Motor driven switch disconnection
- Sheet metal material enclosure IP65
- Built-in DC isolator with TUV, CE, CB, SAA, UL
- Shut down automatically exceeding 70℃
- Equipped with breathing valve to avoid conden-sation inside the enclosure
- Applied to Commercial and Utility scale solar installations

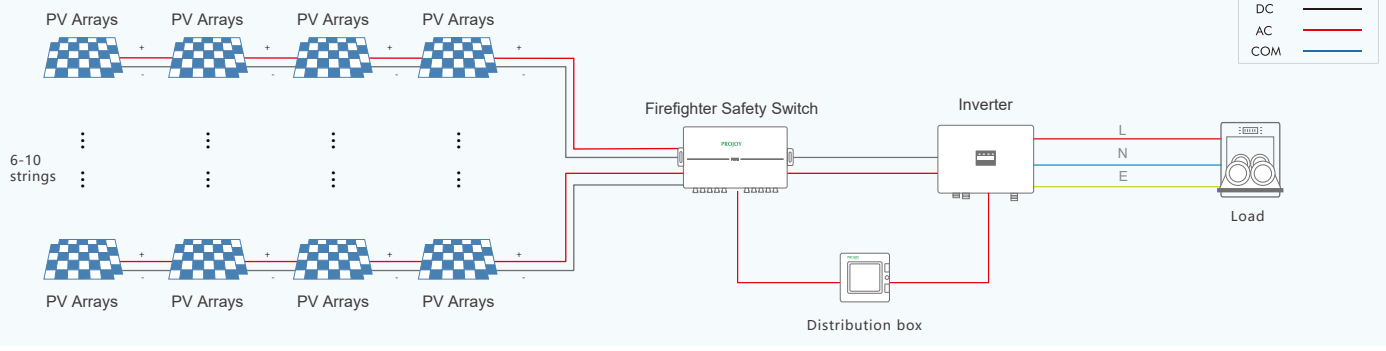
Select Code



Technical data

Technical Parameter	
Main Parameters	**PEFS**
String voltages (Vdc)	300~1500
String current (A)	9~55
Number of strings	6, 8, 10
Switch wiring	12, 16, 20
Operating voltage	100Vac - 270Vac
Nominal voltage	230Vac
Nominal current	60mA
Start up (loading) current	average 200mA
Switch on action current	max 600mA
Feedback contact	24Vdc-600mA max
Operating temperature range	-20°C - +50°C
Max. operating temperature before automatic switch off	+70°C
Storage temperature range	-40°C - +85°C
Protection degree	IP66
Protection level	Class II
Certification	CE
DC Switch disconnect according to	EN 60947-1&3
Number of operations	10000
Number of operations under load (PV1)	>1500

Diagram



Technical data

Data of PEFS refer to built-in DC isolators. Data according to IEC60947-3(ed.3.2):2015, UL508i. Utilization category DC-PV1.						Poles	No. of Strings	Part Number
300V	600V	800V	1000V	1200V	1500V			
16	16	16	9	6	3	12	6	PEFS-EL16-12
25	25	22	11	8	4	12	6	PEFS-EL25-12
32	32	26	13	10	5	12	6	PEFS-EL32-12
40	40	30	26	20	13	12	6	PEFS-EL40-12
55	55	45	33	33	18	12	6	PEFS-EL55-12
40	40	40	40	32	20	12	6	PEFS-EL40H-12
60	60	60	52	42	32	12	6	PEFS-EL50H-12
16	16	16	9	6	3	16	8	PEFS-EL16-16
25	25	22	11	8	4	16	8	PEFS-EL25-16
32	32	26	13	10	5	16	8	PEFS-EL32-16
40	40	30	26	20	13	16	8	PEFS-EL40-16
55	55	45	33	33	18	16	8	PEFS-EL55-16
40	40	40	40	32	20	16	8	PEFS-EL40H-16
60	60	60	52	42	32	16	8	PEFS-EL50H-16
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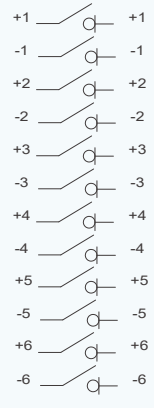
60	60	60	52	42	32	20	10	PEFS-EL50H-20

Contact Configuration



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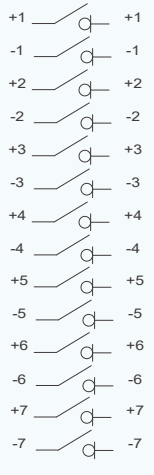

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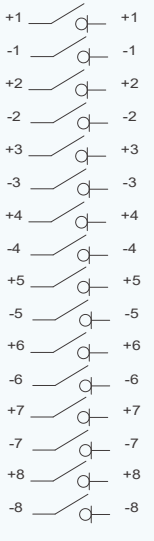

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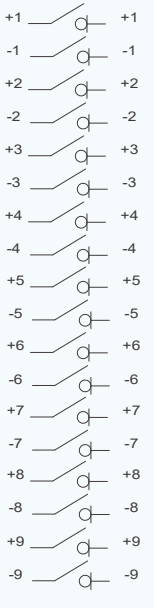

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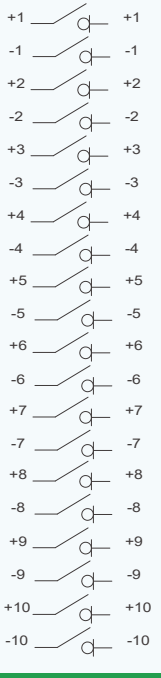
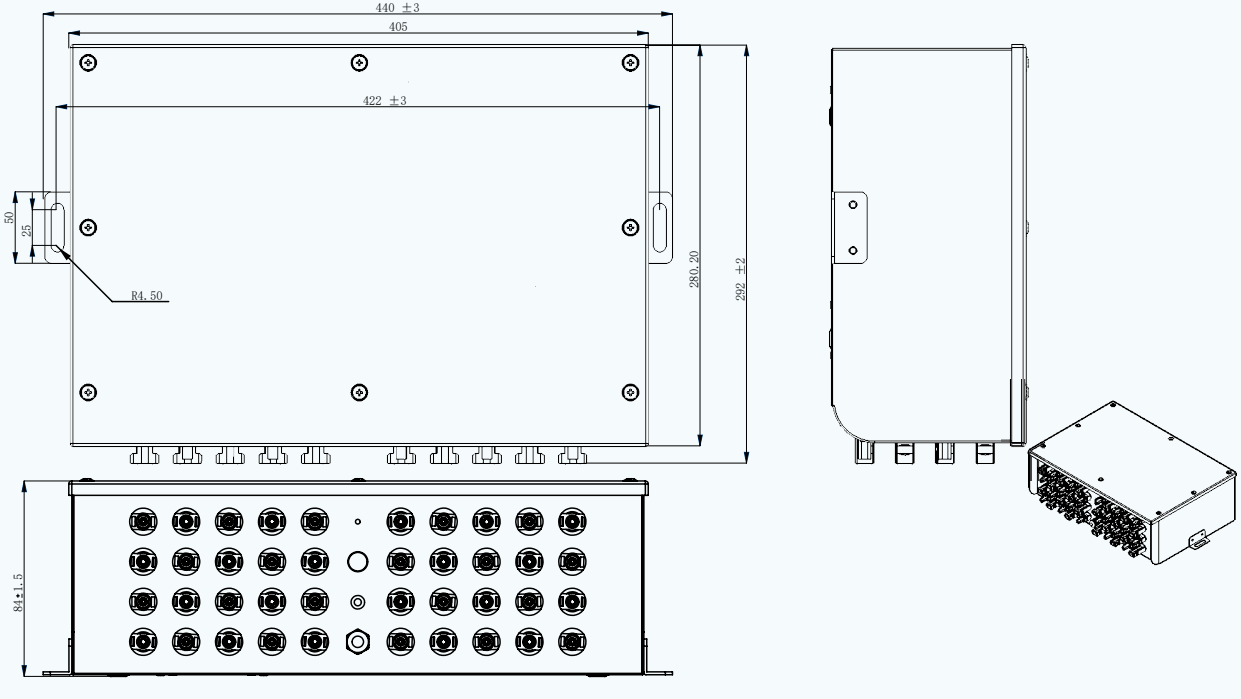


20

Dimensions of PEFS

PEFS-12P~PEFS-20P



PEFS-PL Series

Panel Level Firefighter Safety Switch

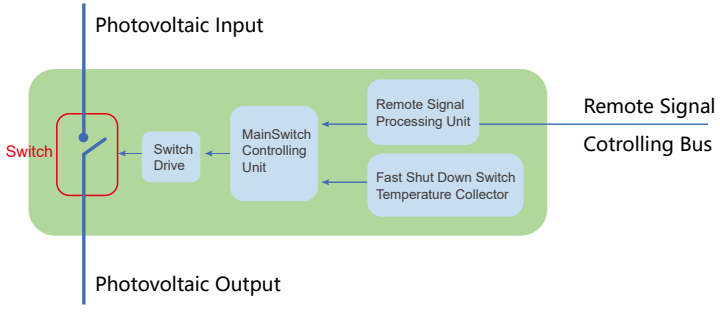
PROJOY electric

— Switch To Safety! —

Features

- Built-in temperature sensor, automatically shutdown while over 85°C (185°F)
- Protection Level: IP68
- Flame retardant rating: UL94-V0
- Slim size, match module perfectly

Working Principle



Select Code

Fast shutdown select code:

PE	FS	–	PL
Projoy Electric	Fast shutdown	–	Panel level

Controller box select code:

PE	FS	–	CL	R	A
Projoy Electric	Fast shutdown	–	Control	R: With lock None: without lock	0: Without Remote control 1: With Remote control

Solution

PEFS-PL rapid shutdown will control 2 solar modules, and totally comform with requirements from UL 1741 and NEC 2017 690.12. PEFS-PL provide 3 forms of shutdown in case of emergency:

AC power loss shutdown

Rapid shutdown will operate and cut out of systems connect with DC-out ports if AC power disconnected by any means, and keep the voltage in the rapid shutdown boundary less than 80V with 30 seconds of R.S. initiation.

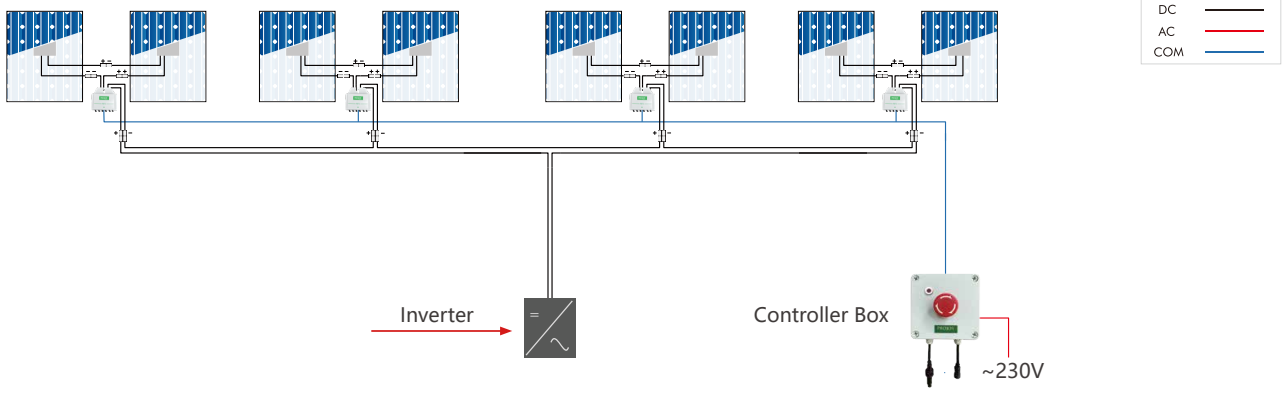
Automatic exceeding temperature shutdown

Automatic exceeding termperature shut down occur via the temperature in the rapid shutdown exceed 85℃. And it will be recovered if the internal temperature drops back below 85℃.

Manual emergency shutdown

Rapid shutdown could be triggered by push the emergency button on the controller box. The controller box can be conveniently installed at where could be access at any emergency situation.

Application Scenarios

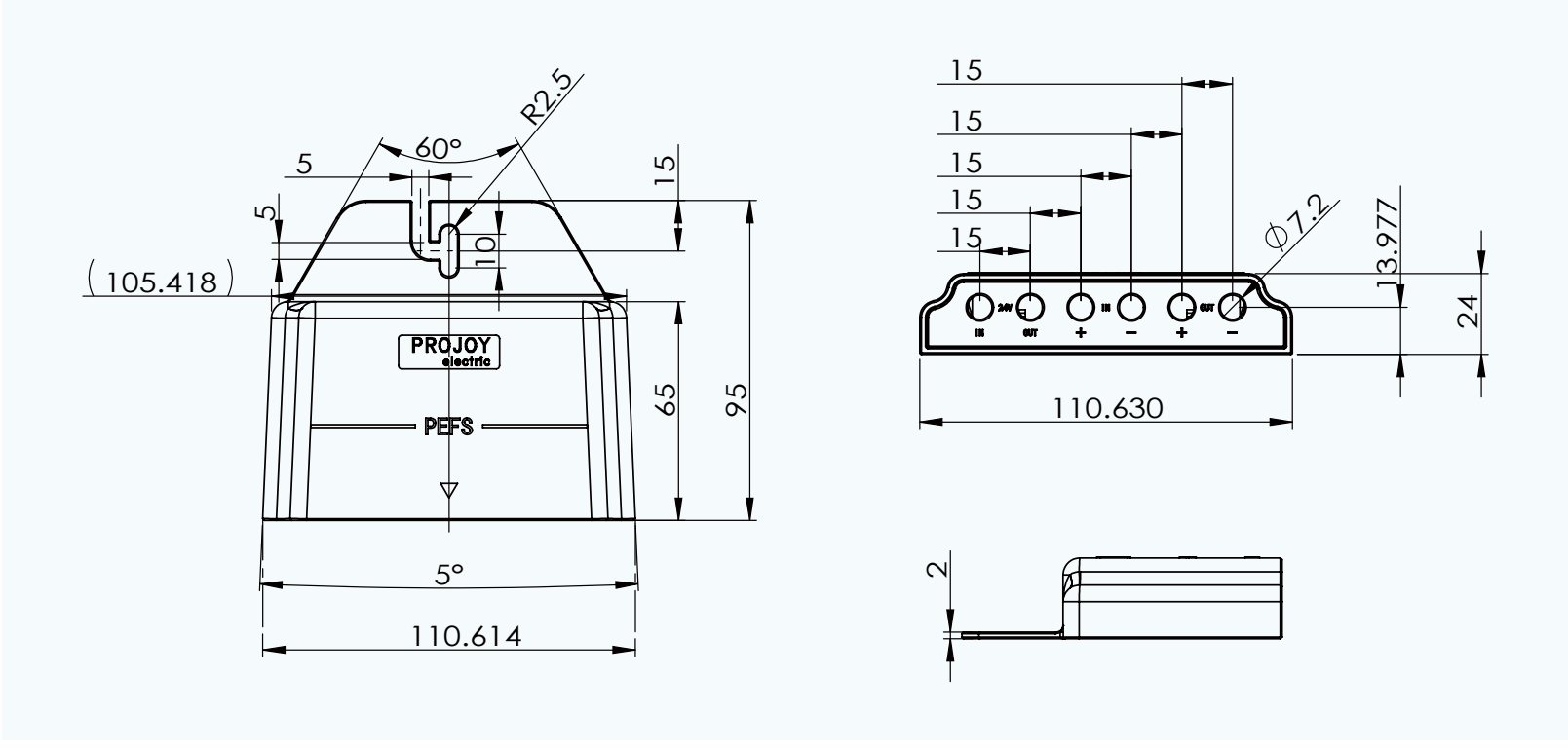


Note: The control box can convert AC 230V to DC 24V, and then control the working status of PEFS.
PEFS-PL can be powered by EPS output while used in a solar storage system.

Fast Shutdown Specification

Type	PEFS-PL	PEFS-PL
Number of PV modules	1	2
Maximum Input Power	600W	1200W (600W*2)
Maximum Input Voltage	80V	150V (75V*2)
Maximum Input Current	15A	15A
Maximum Short Circuit Current	15A	15A
Maximum System Output Current	15A	15A
Maximum System Output Voltage	80V	150V
Maximum System Voltage	1500V	
Supply Voltage	24VDC	
Ambient Operating Temperature	-30° C to +85° C (Automatic shutdown over 85 ° C)	
Storage Temperature	-30° C ~ +85° C	
IP Level	IP68	
Fire-proof Level	UL94-V0	
Humidity	0%~90% at 20℃	
Connector	MC4	
Warranty	10 years	
Weight	300g	
Size	110*95*24mm	
Signal Cable Length	1200mm	
Panel Cable Length	120mm	
String Cable Length	1200mm	
Standard	UL 1741 /NEC 2017 690.12	

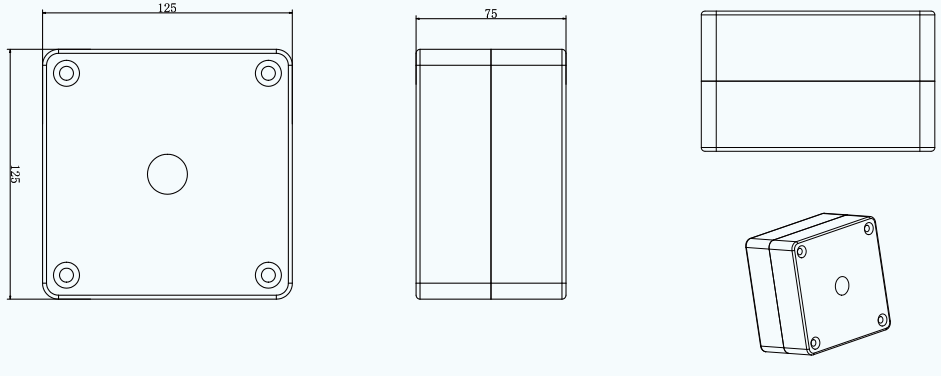
Dimension


R2.5
60°
5
5
15
10
105.418
PROJOY
electric
PEFS
65
95
5°
110.614
15
15
15
15
15
Ø7.2
13.977
24
110.630
2

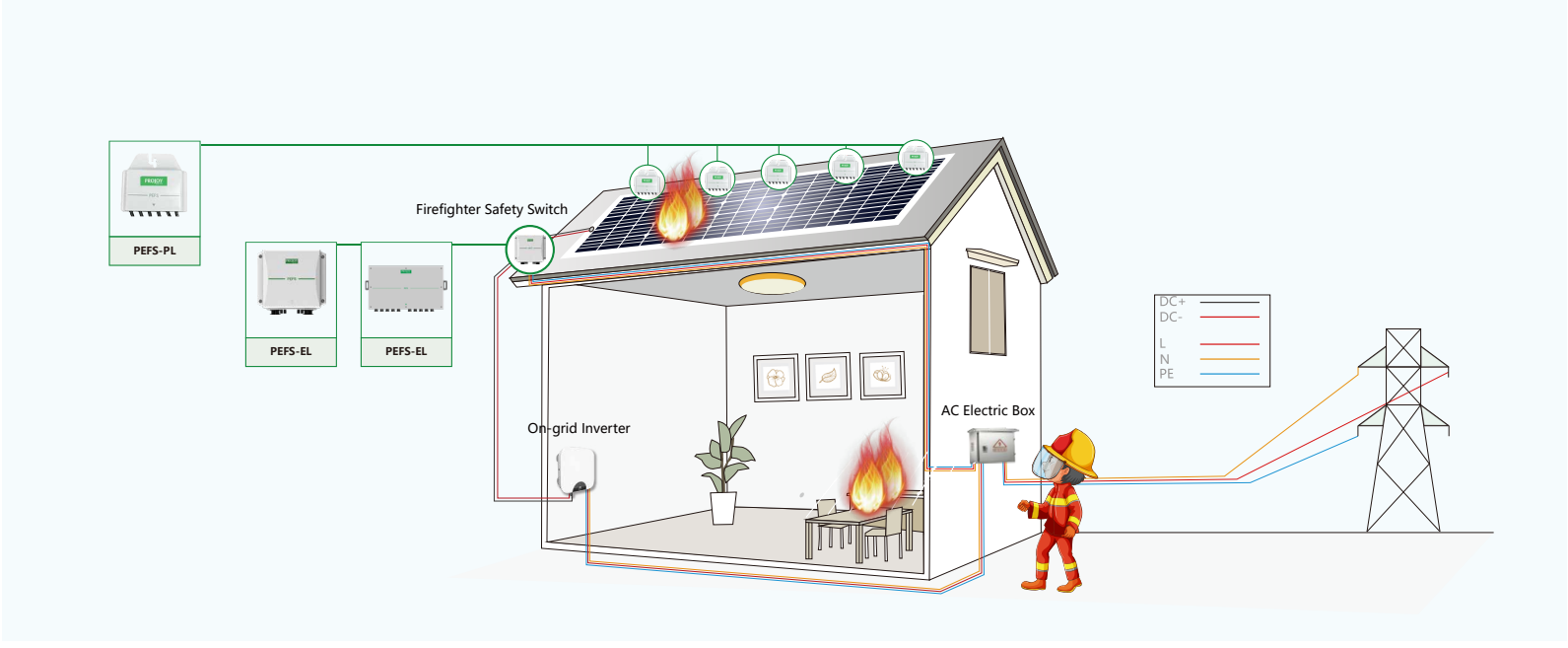
Controller Box Specification

Type	
Input Voltage	100~240V AC
Rated input current	200mA (Vi 115VAC) / 135mA (Vi 230VAC) Rated
Output Voltage	24V DC
Controlled fast shutdown number	≤40
With Lock	Optional
Dimensions	125*125*75 mm
Ambient Operating Temperature	-30℃ ~ +55℃

Dimensions



PROJOY'S FIREFIGHTER SAFETY SWITCH - EFFECTIVELY ENSURES THE SAFETY OF PV SYSTEM



In most PV systems, DC isolation switches are integrated into the PV inverters. But even when the DC switch is turned off, there will still be up to 600~1500VDC between the inverter and the PV panels. In case of fire, firefighters may be exposed to very serious potential hazards. But if firefighters shut down the AC before putting out the fire, the PEFS series firefighter safety switch will detect the grid failure, and after 5 seconds, the PEFS will automatically turn off the isolation switch. Because this saftey switch is mounted close to the PV panel, the DC within the building is disconnected, which creates a safe environment for firefighters, reduces the potential damage, and ensures the safety of the PV system.

1.SEIZE THE VALUABLE TIME TO PUT OUT FIRE

PEFS series firefighter safety switch matches international standard firefighter working procedure. In case of fire, once the AC circuit is turned off, the fast-shutdown switch will automatically turn off and isolate the PV panels, so the firefighters can eliminate the high voltage risk of PV panels on the roof and obtain the precious time to deal with the accident.

2.ISOLATE PV PANELS COMPLETELY

The PEFS series use PEDS switch and can be used directly with PV panels. In case of fire, the firefighter safety switch can rapidly shut down the PV array, without any risk of high DC voltage. If the client wants the entire roof to achieve an even lower DC voltage (e.g. under 80V ~ 120V), it is possible to apply multiple safety switches (one for each 2-3 panels) to ensure maximum safety.

3.RESET AUTOMATICALLY

Projoy's PEFS series firefighter safety switch resets automatically. When the AC power supply is turned off (e.g. during a power cut) and then the supply is restored, the PEFS series will reset and connect the circuit quickly and automatically. The client doesn't need to reset it manually each time.

4.REQUIRES NO ADDITIONAL NETWORKING AND MORE STABLE ON-OFF ABILITY

Compared with common fast isolation devices using remote communication technology in the market, Projoy PEFS series firefighter safety switch is directly controlled by the AC circuit which requires no additional networking. It just uses the existing AC power system. In addition, PEFS does not carry out on-off function through electronic components, but through an isolation switch with arc-extinguishing function, which disconnects the DC circuit directly with much more stability.

5.PROLONG THE LIFE CYCLE OF PV INVERTERS

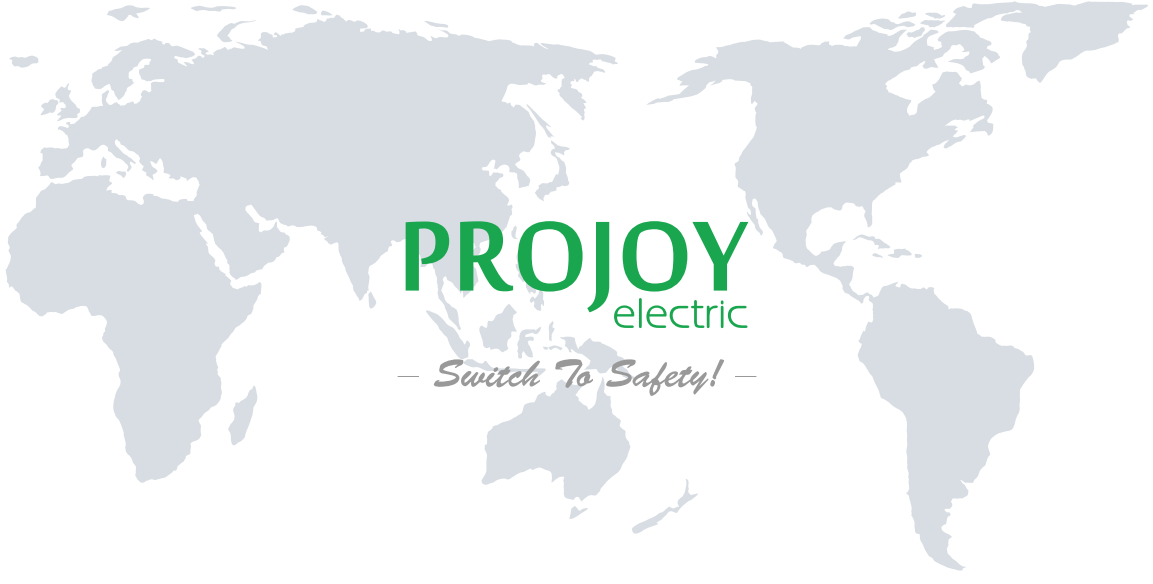
When Projoy's PEFS product is installed in the system, in case the AC circuit has no power such as during a power cut, powerline maintenance or grid failure, the DC circuit will be automatically shut down. This will greatly prolong the life of the PV inverters, and makes it safer to repair or replace PV inverters.

6.USE THE MOST POPULAR DC SWITCHES

Projoy's PEFS series are equipped with a PEDS switch, which is the most popular PV application DC switch worldwide. The response time of Projoy's spring mechanism bounce is only 5 milliseconds, which can quickly extinguish the arc. Combined with self-cleaning contacts, the switches have increased durability and safety. For this reason, the PEDS has been selected as the preferred DC switch by many PV inverter manufacturers.

7.AS A PROFESSIONAL DC SWITCH MANUFACTURER

Projoy has rich experience in developing DC switches and has customers worldwide. Projoy has become the No. 1 company in China developing physical isolation with arc extinguishing capability for direct current without using remote communication technology, effectively ensuring the safety of high DC voltage roofs.



PROJOY electric

— Switch To Safety! —

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