



User Manual

TSUN Module Level Rapid Shutdown(DC 24V)

TSOL-PL80S-11/TSOL-PL80S-21
TSOL-PL120S-11/TSOL-PL120S-21



120V

80V

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User Manual of module level rapid shutdown

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1 Scope and General

This manual is used to TSOL-PL series products only.










| Version | Date | Remark | Chapter |
|---------|------------|---------------|---------|
| V1.0 | 2023-11-29 | First Edition | - |

2 Safety instructions

For your safety and effective operation, please read the safety instructions thoroughly before using the products. Safety Instructions should always be observed to prevent accident or risk during operating.

2.1 Symbols explanation



| SYMBOLS | DIRECTIONS | NOTE |
|--|--|---|
|  DANGER | CAUTION- Hot surfaces -To reduce the risk of burns - Do not touch. | |
|  DANGER | Risk of electric shock from energy stored in capacitor, remove Do not cover until ___ minutes after disconnecting all source of supply | If there is capacitor  45 minutes |
|  DANGER | Risk of Electric Shock | |
|  WARNING | Risk of Electric Shock, Do Not Remove Cover. No User Serviceable Parts Inside. Refer Service To Qualified Service Personnel | |
|  CAUTION | The installation and operation can be operated by qualified people only | |
|  | The product must not be disposed together with household waste | |
|  | Do not touch | |
|  | Read all documentations which accompanies with the product | |

2.2 Safety instruction Caution!

- 1) Only qualified people who can install and operate
- 2) Read all documentations which accompanies with the product
- 3) Must follow the National Wiring Rules and local standards related.

3 Technical Data

3.1 Parameters Table

Technical Data

| Type | TSOL-PL80S-11 | TSOL-PL80S-21 | TSOL-PL120S-11 | TSOL-PL120S-21 |
|-------------------------------|--------------------------------------|---------------|----------------|----------------|
| Number of PV Inputs | 1 | 2 | 1 | 2 |
| Number of Modules Recommend | 1 | 2 | 2 | 4 |
| Maximum Allowed Input Voltage | 80V | 80V | 120V | 120V |
| Maximum Allowed Input Current | 20A | | | |
| Maximum Output Voltage | 80V | 160V | 120V | 240V |
| System Voltage | 1000V / 1500V | | | |
| Control Compliance | 24VDC + 2 x 0.8mm ² Cable | | | |
| Control Requirements | 17 V~28 V at nomi. 20 mA/unit | | | |
| Ambient Operating Temperature | -30° C to +80° C | | | |
| Protection Temperature | 85° C | | | |
| IP Level | >IP68, NEMA 4X | | | |
| Fire-proof Level | Flame retardant, UL94-V0 | | | |
| Humidity | 0%~90% | | | |
| PV Connectors | MC4 (Customized) | | | |
| Design Life Span | 25 years | | | |
| Size | 139.6*59*21.4mm | | | |
| Weight | < 200g (Excluding Cables) | | | |

| Cable Length | Option I | | | |
|---------------------|---|---------------|---------------|---------------|
| PV1+ Input | 120mm | 600 mm | 120 mm | 600mm |
| PV1- Input | 120 mm | 600 mm | 120 mm | 600mm |
| PV2+ Input | / | 600 mm | / | 600mm |
| PV2- Input | / | 600 mm | / | 600mm |
| Power Output | 1200mm+1200mm | 1200mm+1200mm | 2400mm+2400mm | 2400mm+2400mm |
| 24Vdc Control Cable | 1200mm+1200mm | 1200mm+1200mm | 2400mm+2400mm | 2400mm+2400mm |
| Standard Compliance | NEC2017/2020 (690.12); UL1741; UL3741; IEC/EN62109; IEC/EN61000 | | | |

| Cable Length | Option II | | | |
|---------------------|---|---------------|---------------|---------------|
| PV1+ Input | 120mm | 600mm | 1200mm | 1500mm |
| PV1- Input | 1200mm | 1200mm | 1200mm | 2400mm |
| PV2+ Input | / | 1200mm | / | 2400mm |
| PV2- Input | / | 600mm | / | 1500mm |
| Power Output | 1250mm+1250mm | 1250mm+1250mm | 1250mm+1250mm | 2450mm+2450mm |
| 24Vdc Control Cable | 1250mm+1250mm | 1250mm+1250mm | 1250mm+1250mm | 2450mm+2450mm |
| Standard Compliance | NEC2017/2020 (690.12); UL1741; UL3741; IEC/EN62109; IEC/EN61000 | | | |

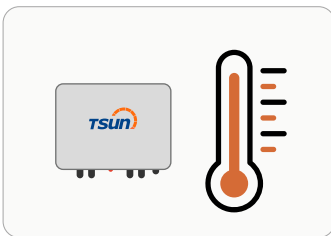
*Suitable for vertical photovoltaic modules

*If the length of cable is not enough, extension cables of 0.6m,1.2m,1.8m and 2.4m can be used.

3.2 Product Information

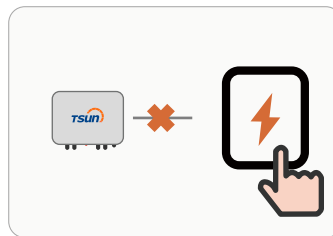
- 1) Fire-retardant V-0/UV resistant materials used, high temperature resistance, corrosion resistance and security impact resistance.
- 2) Clip installation design, simple and convenient
- 3) Long lifespan design for 25 years
- 4) Normal working temperature is at $-30^{\circ}\text{C}\sim+80^{\circ}\text{C}$
- 5) Auto off once the temperature is over 85°C .
- 6) The connection cable used is UL and TUV qualified.
- 7) 24Vdc wiring control way makes it more reliable and stable
- 8) More than 200m control distance, which is suitable for C&I solar systems.

Temperature Rise Trigger



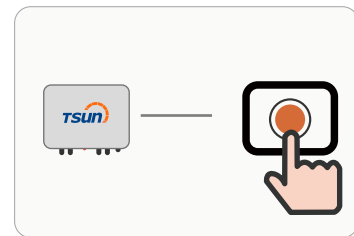
Automatic shutdown occurs if the temperature sensor on board of the RSD detects an ambient temperature rise above 85°C

AC Supply Cut-Off



Disconnection of the external AC supply, by whatever means, causes automatic remote operation of the Emergency Rapid Shutdown Switch and solar panel shutdown.

Manual Operation



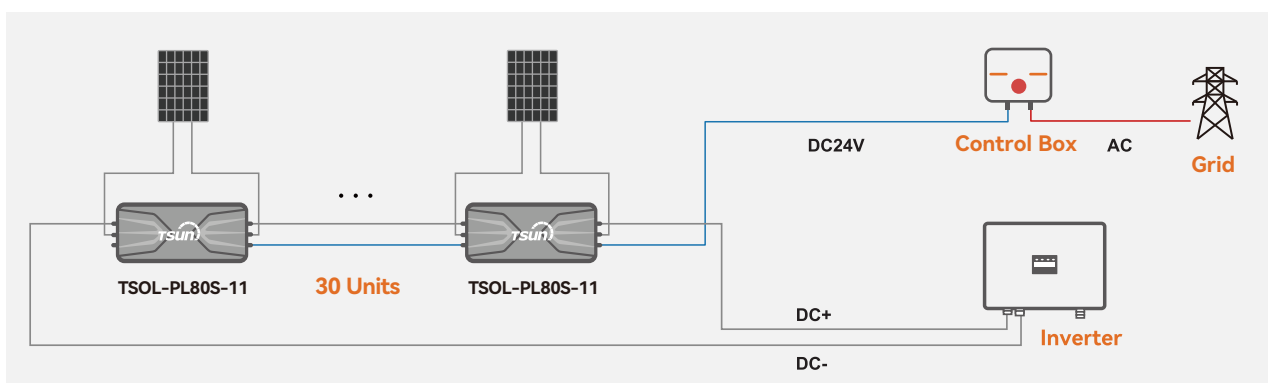
Manual shutdown is initiated within less than 0.1 second of operation by pressing the Emergency Switch can be conveniently located at ground level for easy access or multiple switches can be installed in different multi-level building zones.

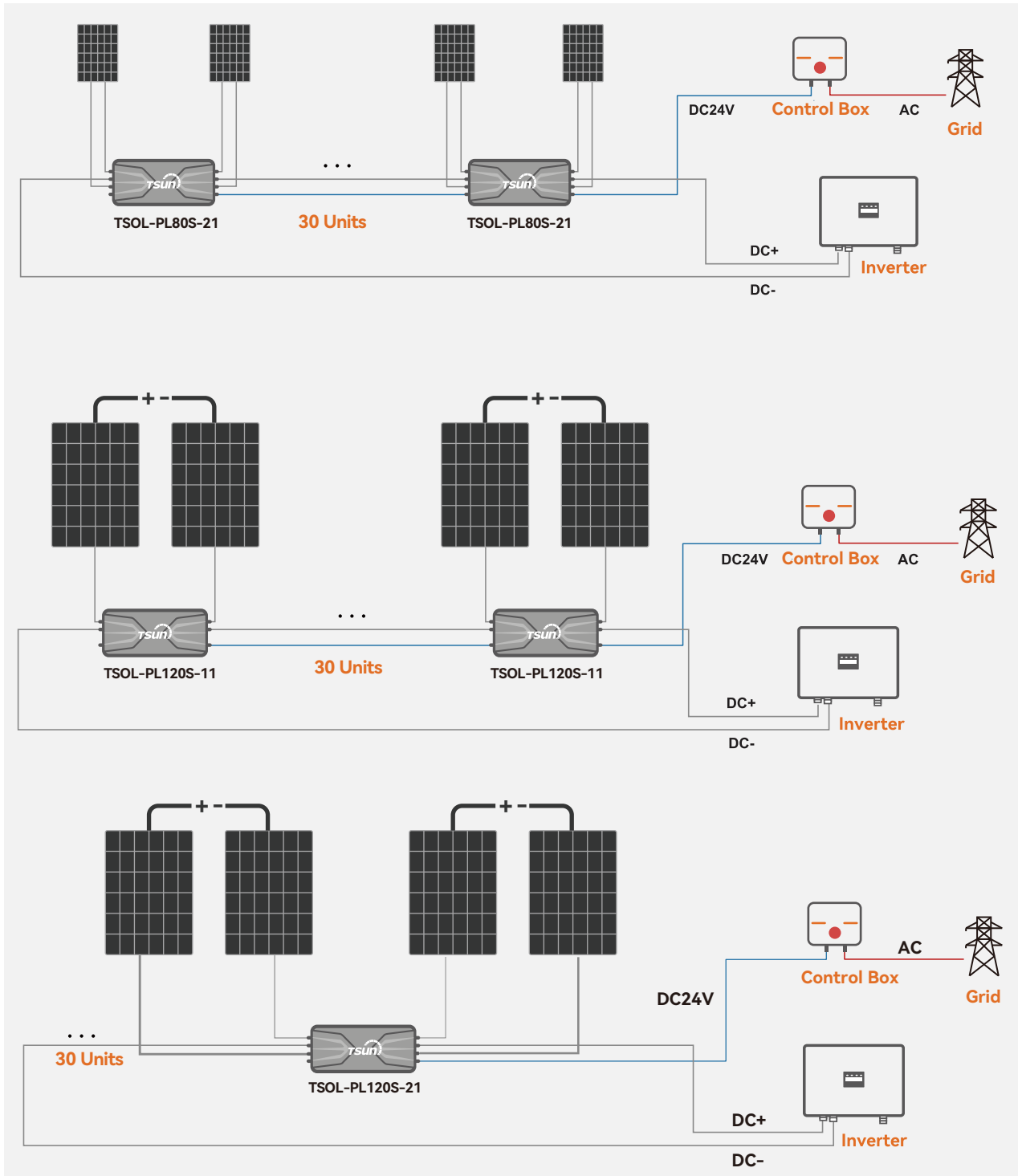
4 Installation

Normal installation of TSOL-PL series will be 1/2/4 PV panels VS 1 RSD unit. Typical wiring example below:

Connect the PV panel Positive (+) output connector to the RSD Positive (+) input connector.

Connect the PV panel Negative (-) output connector to the RSD Negative (-) input connector.



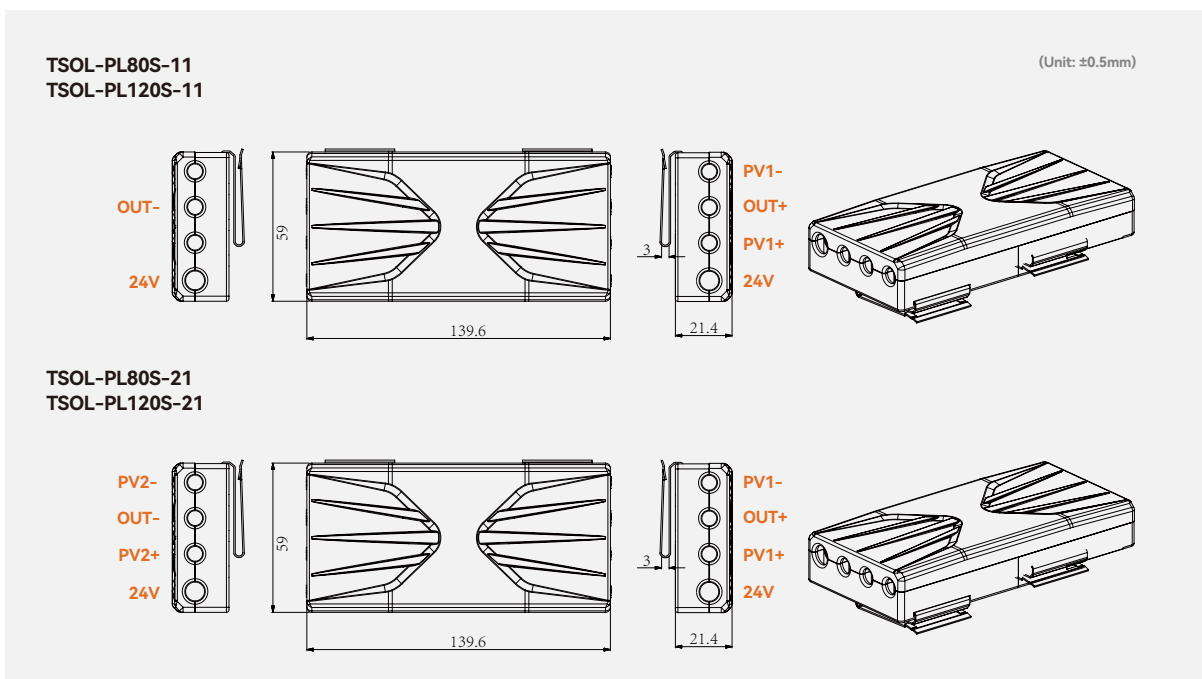


Notes:

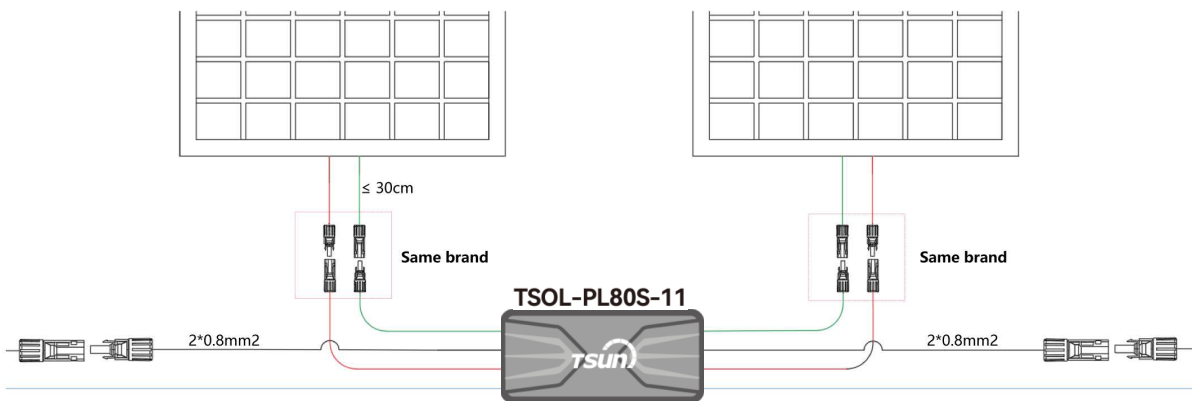
- 1)The 24VDC power source can be supplied separately with UL certificate and should be class 2 (AC/DC or DC/DC type) with fast shutdown function (<100ms)
- 2)Meanwhile, temperature degradation and voltage drop should be considered when selecting the DC power source. TSOL-PL 80/120S-11 type needs 0.8W minimum,TSOL-PL80/120S-21 type needs 1.5W minimum. The control voltage is 21.6V minimum.
- 3)In-line fuse should be used to protect the 24Vdc cable
- 4)24V cable size is 2*0.8mm² recommended

Installation Precautions:

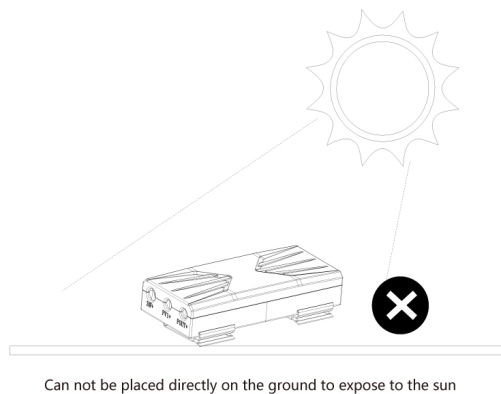
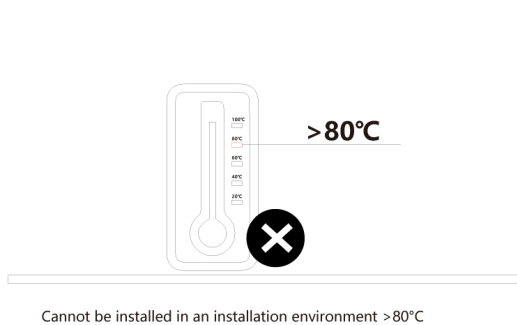
1) Make sure cable wiring correctly



2) Make sure the MC4 connector of PV panel and RSD is the same brand or compatible



3) Make sure the installation environment is applicable



5 Trouble shooting

If RSD can not work properly, please follow the process below the check and resolve.

- 1) Check if the 24V power supply works properly
- 2) Check the 24Vdc cable connecting well or not
- 3) Check if the installation temperature of power source is too high or not ($< 50^{\circ}\text{C}$)
- 4) Check if the installation temperature of RSD is too high or not ($< 80^{\circ}\text{C}$)

6 Maintenance and Repair

Please check regularly. Specifically, you can press the control box to check whether the output of the whole string is stopped or the output voltage is less than 10V. If the output voltage is greater than 10V, it indicates that there is a fault in the system. Please contact Projoy after-service for handling.

7 Warranty commitment

7.1 Warranty

TSUN TSOL Series Module Level Rapid Shutdown Device: Up to 25 years lifespan design, which commencing from 3 months later of the manufacturing date. TSUN 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, TSUN 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.
- 4) Any lost caused by any inappropriate use out of the scope defined in this manual, Projoy will not take the responsibility

7.2 Aftersales service

Please contact TSUN local distributors for after-sales service

1. Beyond the warranty period;
2. No valid quality assurance card and product serial number;
3. Transportation damage;
4. Improper use, operation and modification;
5. Operating in an environment beyond the specified in this manual;
6. Any installation and use beyond the scope specified in relevant international standards;
7. Damage caused by abnormal natural disasters (earthquake, fire, flood, etc.).

8 Contact us

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