

Photovoltaic (PV) Rapid Shutdown Equipment

- GR-B1F-20
- GR-B2F-20

User Manual

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NOTICE

The information in this document is subject to change due to product updates or other reasons. This document cannot replace the product labels or the safety precautions unless otherwise specified. All descriptions in the document are for guidance only.

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1 Overview

This manual describes the product information, installation, electrical connection, and troubleshooting about the Photovoltaic (PV) Rapid Shutdown Equipment (RSD for short).

2 SAFETY PRECAUTIONS

2.1 SAVE THESE INSTRUCTIONS

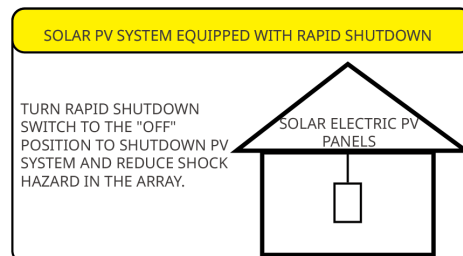
This manual contains important instructions for Models (model as indicated in front of Report)

that shall be followed during installation and maintenance of the RSD.

Please strictly follow these safety instructions in the guide during the operation.

WARNING

- 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.
- The equipments are designed and tested strictly complies with related safety rules. Read and follow all the safety instructions and cautions before any operations. Improper operation might cause personal injury or property damage as the equipment are electrical equipment.
- PVRSE that will be mounted behind a PV module, no portion of the PVRSE enclosure will be less than 12.7 mm (1/2 in) from the module substrate. The installer that the PV module instructions should be reviewed to determine if any restrictions for mounting devices under the module exist as part of the PV module listing.
- To reduce the risk of fire, connect only to a circuit provided with maximum branch-circuit overcurrent protection in accordance with the National Electrical Code, ANSI/NFPA 70.
- Test your rapid shutdown system by switching off the AC power to the Transmitter or inverter. The PV module will reduce their output to 30V in 30seconds when the transmitter is powered off.
- Place rapid shutdown system label no more than 1m (3ft) from initiator in accordance with Section 690.56(C) of the NEC (NFPA 70).



2.2 General Disclaimer

- The information in this guide is subject to change due to product updates or other reasons. This guide cannot replace the safety instructions or labels on the device unless otherwise specified. All descriptions here are for guidance only.
- Before installations, read through the documents of the device, inverter, and PV module to learn about the product and the precautions.
- All operations should be performed by trained and knowledgeable technicians who are familiar with local standards and safety regulations.
- Use insulating tools and wear personal protective equipment when installing or operating the device to ensure personal safety.
- Check the deliverables for correct model, complete contents, and intact appearance. Contact after-sales service if any damage is found or any component is missing.
- Strictly follow the installation, operation, and configuration instructions in this manual. The manufacturer shall not be liable for device damage or personal injury if you do not follow the instructions. For more warranty information, please visit <https://www.goodwe.com/support-service/warranty-related>.










2.3 Safety Disclaimer

- Make sure the voltage and the current of the PV module match the device specifications.
- Disconnect the DC switch and AC switch of the inverter before installation.
- Make sure the PV connectors connected to the device are of the same type as the input and output connectors of the device.
- Do not short-circuit the output connectors. Otherwise, the device may be damaged.
- After installing the device, turn on the AC switch of the inverter first and then the DC switch. Otherwise, the system may fail to start.
- To avoid interfering the rapid shutdown function, do not install transmitters from other manufacturers to the PV cable during the use of the RSD device.
It is recommended to use the corresponding GoodWe transmitter.

2.4 Installation Notice

- It is recommended install the device in a sheltered place to avoid direct sunlight, rain, and snow.
- Connect the device to the PV modules first and then to the inverter
- Measure the PV input voltage of the inverter to confirm that the number of PV modules connected is the same as the actual number of modules.
- Measure the PV modules using a current clamp to confirm that each module has current output.
- Measure the input current and output current of the device to confirm that the input and output current are the same.

2.5 Safety Symbols and Certification Marks

No.	No.	Meaning
1		Potential risks exist. Wear proper PPE before any operations.
2		HIGH VOLTAGE HAZARD. Power off the equipment before any operations.
3		Read through the document before any operations.
4		Do not dispose of the equipment as household waste. Discard the product in compliance with local laws and regulations, or send it back to the manufacturer.
5		The inverter surface is at high temperature. Do not touch during operation. Otherwise it may cause burns.
6		Double Insulation or Reinforced Insulation.
7		PE Connection Point.
8		CSA Marking.
9		FCC Marking.

2.6 EU Declaration of Conformity

GoodWe Technologies Co., Ltd. hereby declares that the inverter without wireless communication modules sold in the European market meets the requirements of the following directives:

- Electromagnetic compatibility Directive 2014/30/EU (EMC)
- Electrical Apparatus Low Voltage Directive 2014/35/EU (LVD)
- Restrictions of Hazardous Substances Directive 2011/65/EU and (EU) 2015/863 (RoHS)
- Waste Electrical and Electronic Equipment 2012/19/EU
- Registration, Evaluation, Authorization and Restriction of Chemicals (EC) No 1907/2006 (REACH)

You can download the EU Declaration of Conformity on www.goodwe.com.

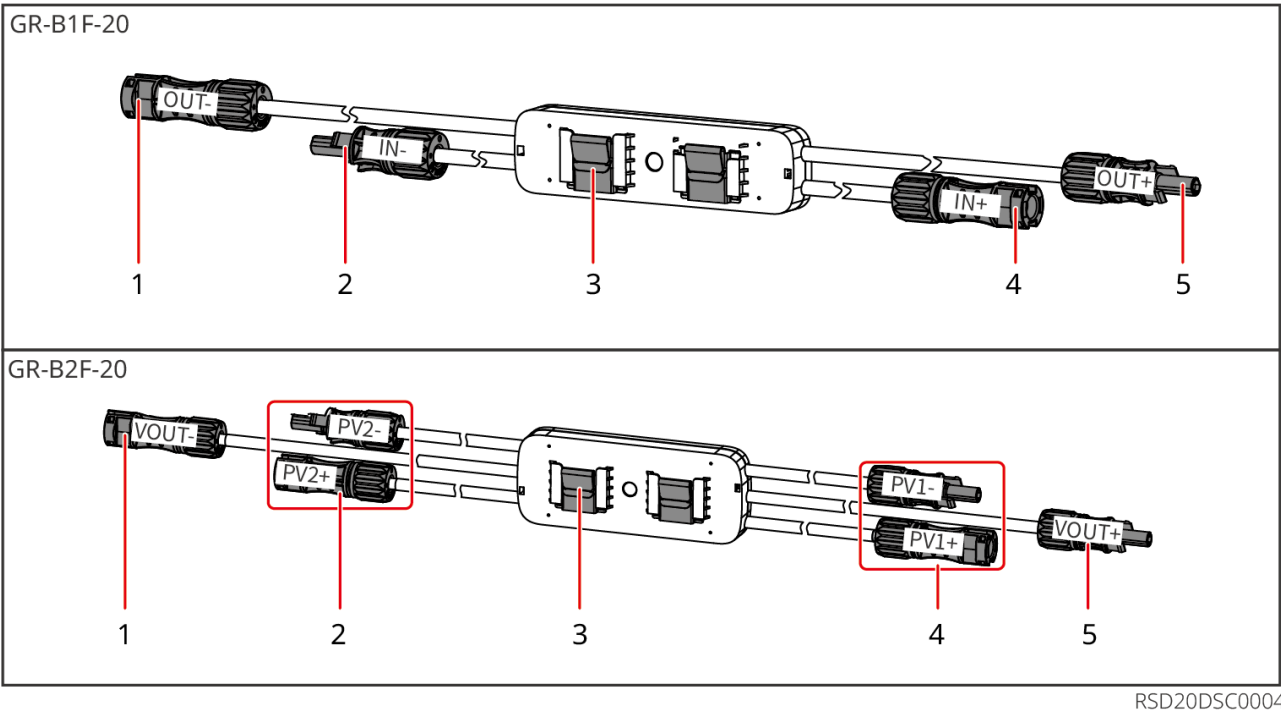
3 Product Introduction

3.1 Product Introduction

The RSD maintains the modules working by continuously receiving a heartbeat signal from a transmitter. The transmitter can be external or integrated into the inverter. In case of an emergency, enable the external initiator to shut down the transmitter. The RSD will stop working and shut down the modules after the transmitter signal absenting.

3.2 Parts

Appearance



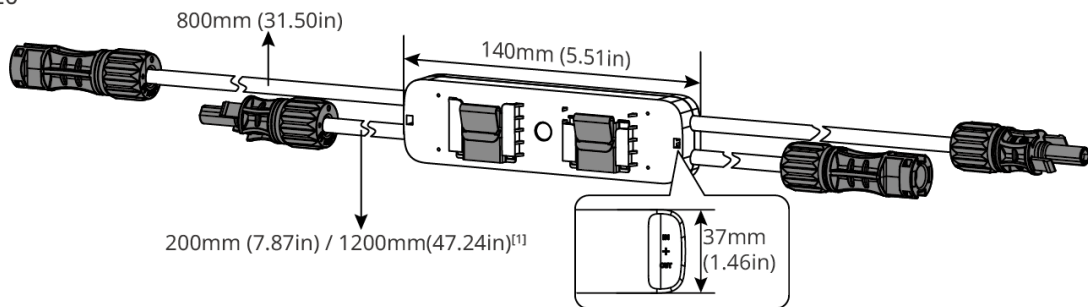
1	Output connector (-)	2	Input connector (-)
3	Installation buckle	4	Input connector (+)
5	Output connector (+)	-	-

Dimension

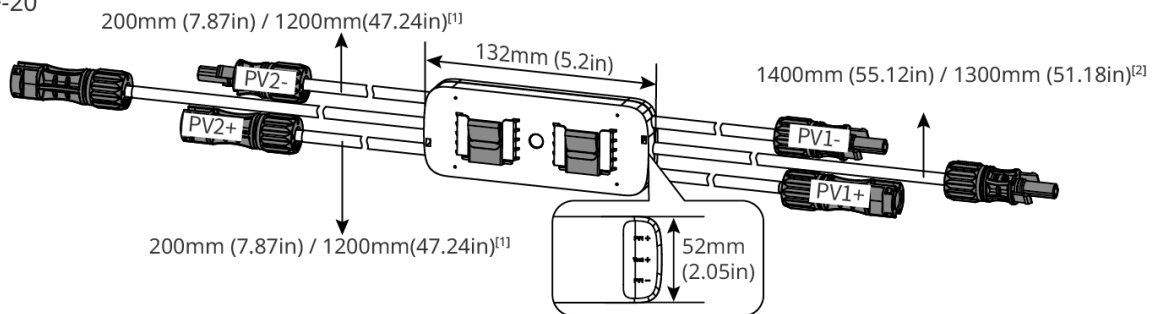
NOTICE

- GR-B1F-20: The cable lengths for conventional components are 200mm (input) , and for triple split-junction box assemblies, the lengths are 1200mm (input). The actual situation prevails.
- GR-B2F-20: The cable lengths for conventional components are 200mm (input) and 1400mm (output), and for triple split-junction box assemblies, the lengths are 1200mm (input) and 1300mm (output). The actual situation prevails.

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GR-B2F-20



RSD20DSC0005

[1] Cable length optional: 200mm (7.87in), 1200mm(47.24in) or customize.

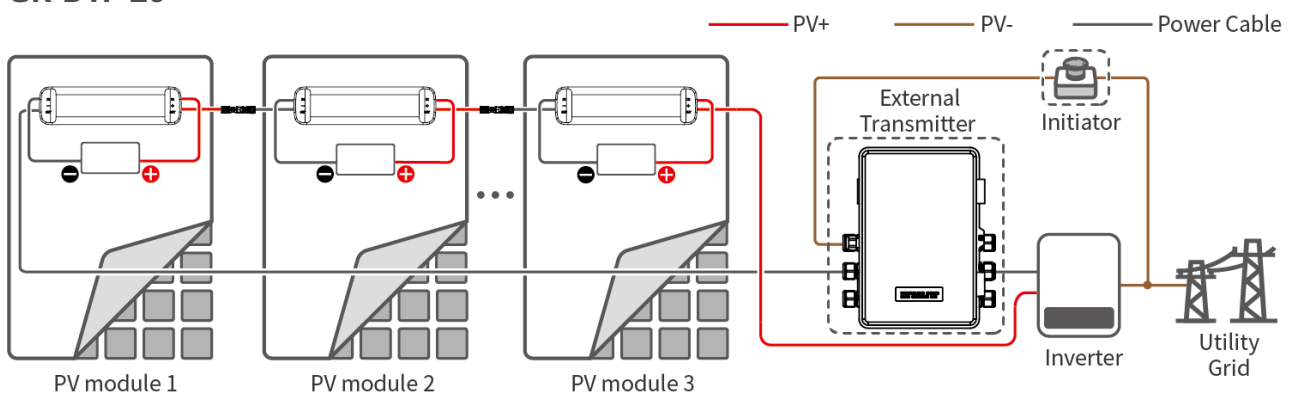
[2] Cable length optional: 1300mm (51.18in), 1400mm(55.12in) or customize.

3.3 Wiring System

NOTICE

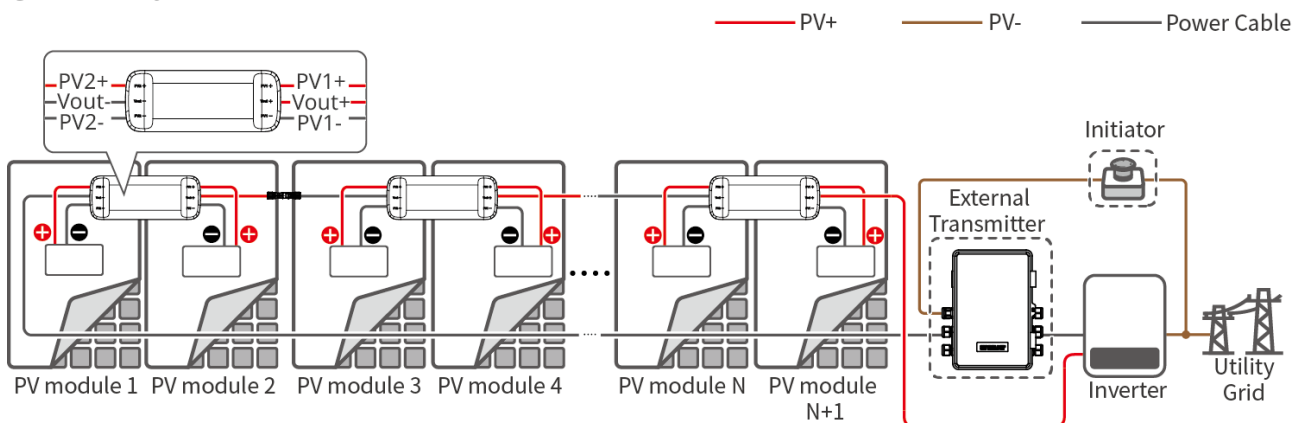
- Cable colors in this document are for reference only. The actual situation prevails.
- Install an external transmitter and prepare an external initiator like breaker or stop button by yourself if the inverter is not integrated with an internal transmitter.

GR-B1F-20



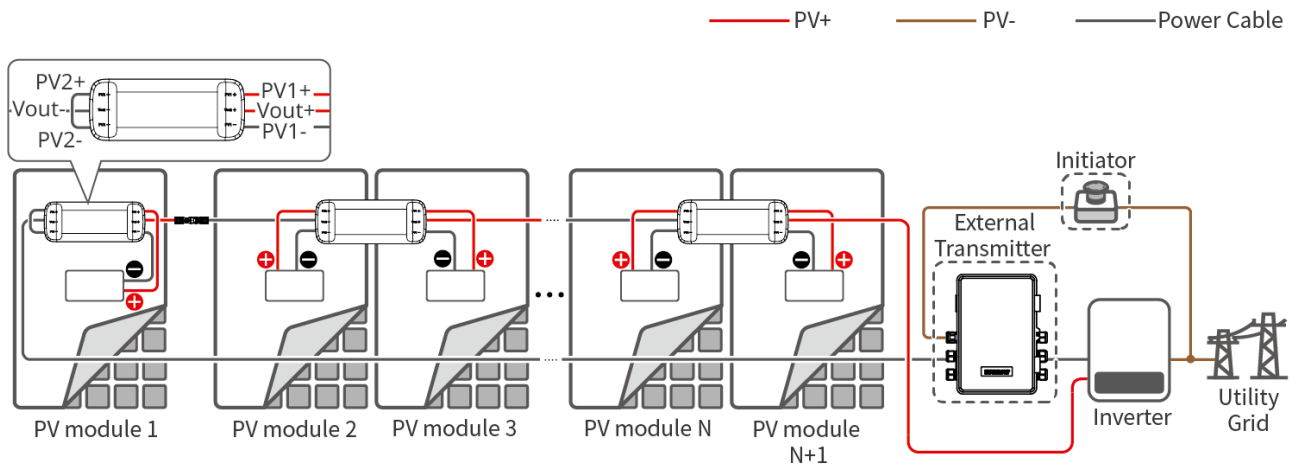
RSD20NET0003

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RSD20NET0004

- Short circuit PV2+ and PV2- as below when only one PV module is applied.



RSD20NET0005

4 Installation

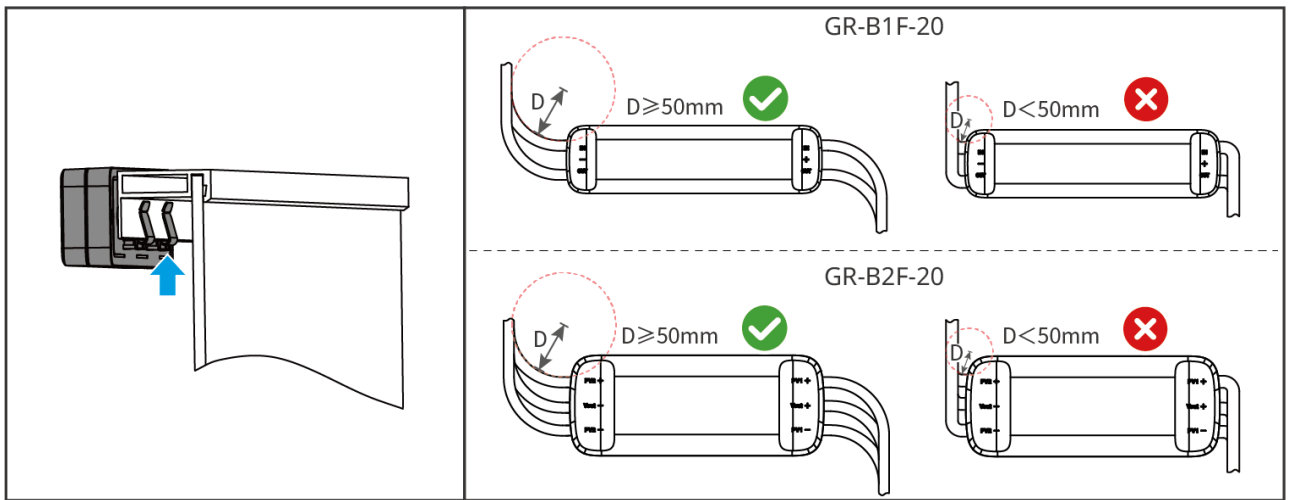
NOTICE

Make sure the cable bend radius of the RSD is at least 50mm (1.97in) as shown in the figure below.

Step 1: Attach the RSD to the PV module using the buckle.

Step 2: Connect the input connectors (IN+/-) of RSD to the PV modules.

Step 3: Connect the output connectors (OUT+/-) of RSD in series to the string.



RSD20INT0005

5 Troubleshooting

If any of the following faults occur, please deal with them as soon as possible to avoid failure of the rapid shutdown function.

No.	Problems	Solutions
1	Inverter Arc fault	<ol style="list-style-type: none">1. Check the wiring between the PV strings and inverters for proper and continuous connections without breakpoints. And check the device for intact appearance, such as deformation or broken.2. Contact the dealer or installer if there is any deformation or broken. Contact the after-sales service if the appearance is intact and the problem persists after checking the wiring.
2	Abnormal low power generation or PV voltage	<ol style="list-style-type: none">1. Check the PV panels to make sure there is no foreign matters, dust, or dirty.2. Check the voltage and current value per input strings. If the voltage or current value is significantly low, check the wiring between the PV strings and inverters for proper and continuous connections without breakpoints, and check the device for intact appearance, such as deformation or broken.3. Contact the dealer or installer if there is any deformation or broken. Contact the after-sales service if the appearance is intact and the problem persists after checking the wiring.

No.	Problems	Solutions
3	PV insulation fault	<ol style="list-style-type: none"> 1. Check the cables in the system, like PV panel cables, RSD cables, and extension cables are well insulated. 2. Contact the dealer or installer if there is any deformation or broken. Contact the after-sales service if the appearance is intact and the problem persists after checking the wiring.
4	The inverter cannot start properly after turning on the DC switch.	<ol style="list-style-type: none"> 1. Check whether the AC switch of the inverter is on. 2. Check the wiring between the PV strings and inverters for proper and continuous connections without breakpoints. And check the device for intact appearance, such as deformation or broken. 3. Contact the dealer or installer if there is any deformation or broken. Contact the after-sales service if the appearance is intact and the problem persists after checking the wiring.
5	Failure to turn off the RSD properly.	<p>The RSD is switched off by turning off the grid connection switch of the inverter (with built-in transmitter) or by turning off the external transmitter.</p> <ol style="list-style-type: none"> 1. Check if there are other transmitters working in the PV system or attached to the inverter. 2. Check the device for intact appearance, such as deformation or broken. 3. Contact the dealer or installer if there is any deformation or broken. Contact the after-sales service if the appearance is intact and the problem persists after checking the wiring.

6 Technical Parameters

Technical Parameters	GR-B1F-20	GR-B2F-20
Maximum Shutdown Component Number	1	2
Operating Voltage Range (V)	8~80 Per channel	
Rated Input Current (A)	22	
Maximum System Voltage (V)	1.3	
Mode of Communication	PLC	
Operating Temperature Range (°C/°F)	-40~+85°C (-40~+185°F)	
Ingress Protection Rating	IP68/UL Type 6P	
Maximum System Voltage (V)	1500	
Security Certification	NEC 2017&2020 & 2023 (690.12); UL1741; CSA C22.2 No. 330; IEC/EN62109-1;	
EMC	FCC Part15; ICES-003; IEC/EN61000-6-1/-2/-3/-4	
Whether the SunSpec Protocol is Supported	Yes	
Dimension (W×H×D mm/in)	140×37×23	132×52×23
Cable Length (m)	① In: 0.2m, Out: 0.8 m (conventional component) ② In: 1.2m, Out: 0.8 m (Triad Junction Box Component) or Customize	① In: 0.2m, Out: 1.4 m (Conventional Component) ② In: 1.2m, Out: 1.3 m (Triad Junction Box Component) or Customize
Connector	MC4 or Customize	