



日燭科技有限公司
JD Auspice Co., Ltd.

pidGuard®

PID Guard User Manual PID Recovery System



JDA reserve the rights to change specifications without any notice



Warning: Before installing the pidGuard®, please ensure there is no voltage bothon DC side and AC side,When disconnecting the DC side in working state, the capacitor still has electricity. It will take 2 minutes to let the capacitor discharge

Precautions

- Installation person and user must be qualified electricians or people who have received professional training.
- pidGuard® is a special high voltage device, and its DC voltage is 1000V, AC voltage is 110V/240V. Please dispose the product following your local laws and regulations.
- When installing the pidGuard®, please make sure grounding line is well connected to avoid person injury.
- You could contact JDA if there is any question about the pidGuard®.

Warning and Symbols

There are some warnings and symbols in this document.

	Indicates that a high voltage is used here. Touching the part causes a possibly electric shock. If physical contact is required by your work, start work only after you make sure that no voltage is here.
	Danger: Danger indicates a hazardous situation which, if not avoided, could cause serious injury or death.
	Warning: Warning indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
	Caution: Notice indicates a hazardous situation which, if not avoided, could result in equipment working abnormally or property loss.
	Instruction: Instruction indicates important supplementary information or provides skills or tips that can be used to help you solve a problem or save your time.

Abbreviations

There are some abbreviations in this document.

Abbreviation	Designation
AC	Alternating Current
DC	Direct Current
PV	Photovoltaic
L	Live Wire
N	Null Wire
PE	Ground Wire
SV	Voltage of the DC side of the inverter
OV	Output voltage of pidGuard®



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1. General

1.1 pidGuard® introduction

More and more problems appear in the application of solar power plant. One problem is power dropping which is perhaps caused by PID, the voltage, current and FF of the module dropped seriously.

pidGuard® produced by JDA could be used to recover the dropped parameter of the PV modules to improve the yield of the power plant. It could be easily installed at the DC side of the inverter, as in figure 1.

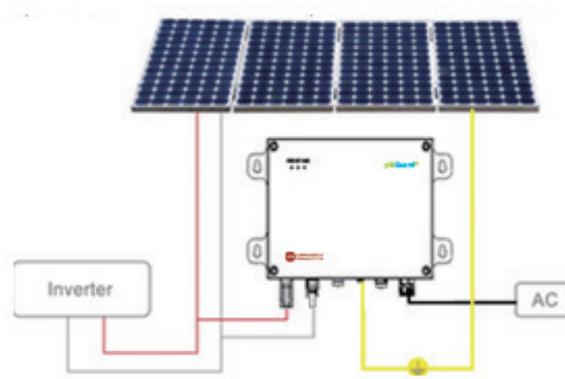


Figure 1. pidGuard® connection sketch

1.2 Using Scope

The manual is suit for the pidGuard® product produced by JDA. It mainly includes components and structure, installation introduction, operation introduction and so on.

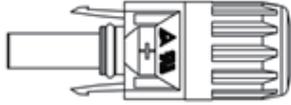
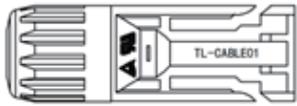
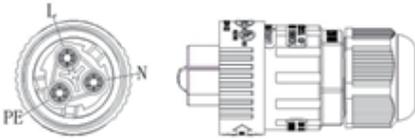
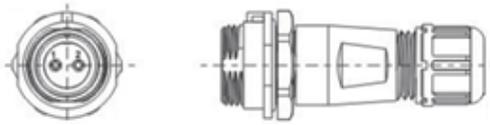
2. Components and Structure

2.1 Unpacking

Upon receiving the product, please confirm that the components are included and have not been damaged in transportation. If any damage or shortage be found, please contact JDA.

No.	Components	Quantity	Diagram
1	pidGuard®	1	



No.	Components	Quantity	Diagram
2	PV+ male connector	1	
	PV+ male connector	1	
3	PV- female connector	1	
	PV- female connector	1	
4	AC Connector	1	
5	Ground cable(2m)	1	
6	Discrete Signal contactor	1	

 If possible, please keep the package aside to move the product.

2.2 Structure

2.2.1 Dimension(Figure 2)

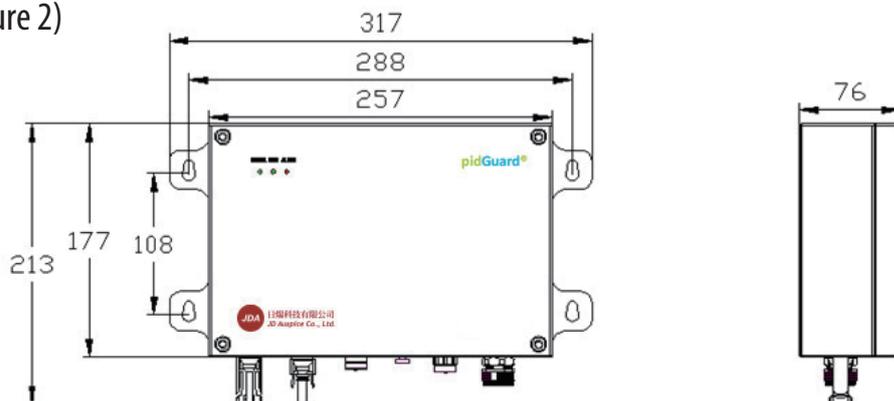


Figure 2. Dimension of the product(unit: mm)

2.2.2 Front view(Figure 3)

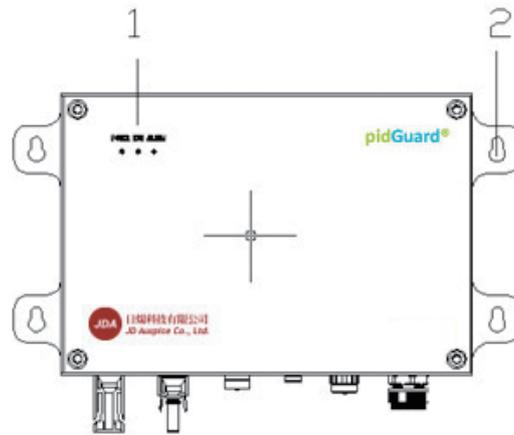


Figure 3. Front view

Item	Name	Description
1	Operation Panel	Setting the parameter, Displaying the state, voltage and running time information.
2	Hanger	Fixing the device.

2.2.3 Bottom view(Figure 4)

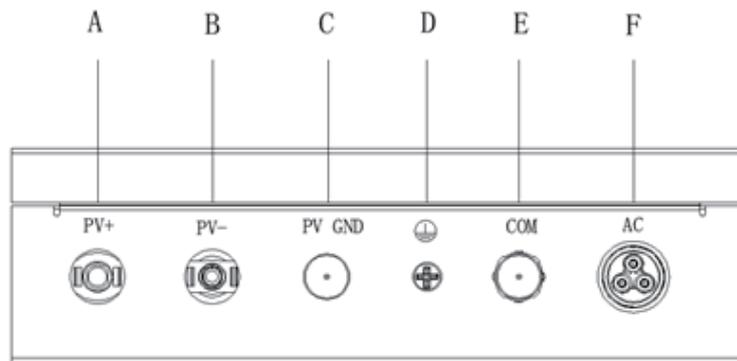
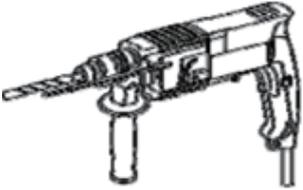
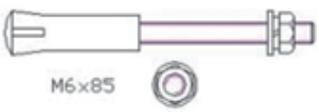
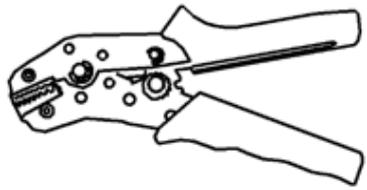
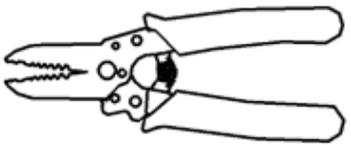
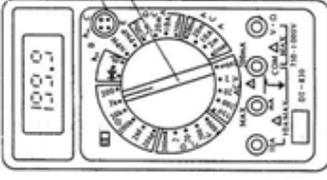
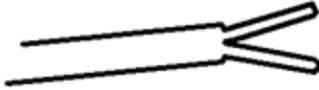
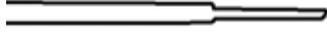
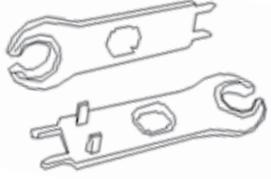


Figure 4. Bottom view

Item	Name	Description
A	PV1+female connecto	To be connected with PV+ of the inverter
B	PV1-male connector	To be connected with PV-of the inverter
C	PV GND	For Ventilation.
D	Ground post	To be connected with Ground of the PV system or Frame of the module.
E	Faulty Relay connector(Optional)	To be connected with I/O or information light
F	AC power plug	To be connected with AC power

3. Installation

3.1 Instruments and materials maybe used

<p>Jackhammer (for Ø8m drill)</p> 	<p>Expansion Screws</p>  <p>M6x85</p>	<p>Ratchet Crimping Plier</p> 
<p>Wire Stripper</p> 	<p>Needle-Nose Plier</p> 	<p>Tape Measure</p> 
<p>Solder iron (30W)</p> 	<p>Solder wire</p> 	<p>Communication</p> 
<p>Voltmeter</p> 	<p>Power cable (3*0.5mm²)</p> 	<p>PV cable (4mm²)</p> 
<p>BK cable (2*0.5mm²)</p> 	<p>Ground cable (4mm²)</p> 	<p>Cross</p> 
<p>Adjustable wrench</p> 	<p>Inner hexagon spanner</p> 	<p>Special wrench for MC4 connector</p> 

3.2 Precautions for installation

- ⚠ The ambient temperature range should be $-25^{\circ}\text{C} \sim 65^{\circ}\text{C}$.
- ⚠ The ambient humidity should be less than 95%.

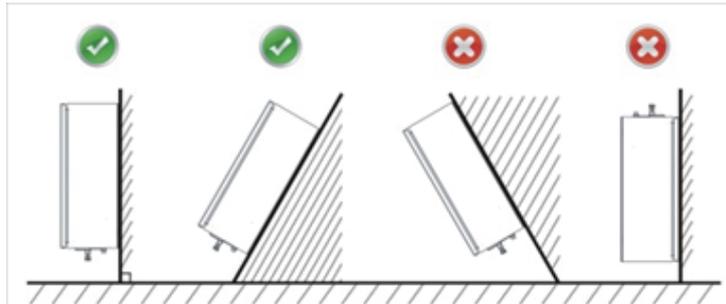


Figure 5. Permitted and prohibited mounting angle

- ⚠ The mounting surface should be flat.
- ⚠ The connection area should point downwards.
- ⚠ The angle between mounting wall and vertical line of the earth should be less than 30° (Figure 5)
- ⚠ The mounting position is prohibited to be in inflammable and explosive atmosphere.
- ⚠ There should be no gas pipes behind the mounting points.
- ⚠ There should be no hard objects possibly to hit the product.
- ⚠ There should be enough clearances around the product as figure 6. There should be at least 100mm, 100mm, 100 mm, 300 mm, and 300 mm away from the top, left side, right side, bottom, and front respectively.
- ⚠ The mounting wall should be solid enough.
- ⚠ The suggested insulation resistance of solar system should be larger than $25\text{K}\Omega$.
- ⚠ The suggested installed position should avoid sun, rain, snow etc. The reference sketch is as Figure 7.

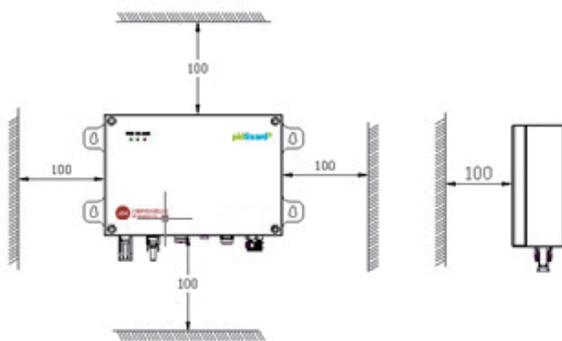


Figure 6. Recommended spaces around the product (mm)



Figure 7. Reference sketch of the installed position

3.3 Mounting (Figure 8)

- Determine the holes positions.
- Mark the position of the drill holes and drill the holes.
- Insert the expansion screws into the holes.
- Screw the setscrew to fix the product.

⚠ Check that the product is fixed firmly on the wall.



Figure 8. Mounting sketch (Take wall installation as example)

3.4 Connecting the cables

⚠ The product must be powered off during the follow connecting operation.

⚠ Connect the AC power cable after the ground cable and PV cables have been connected. When disconnecting the cables, disconnect AC power cable firstly.

Cables connecting order :

- Connect ground cable;
- Connect PV cables;c) Connect PV cables;

⚠ PV+ connection must be prior to PV-.

- Connect AC power.

3.4.1 Connecting ground cable

Fix one terminal of the ground cable on the grounding point of solar system or module frame.
Fix the other terminal on the ground post of pidGuard® (Figure 9).

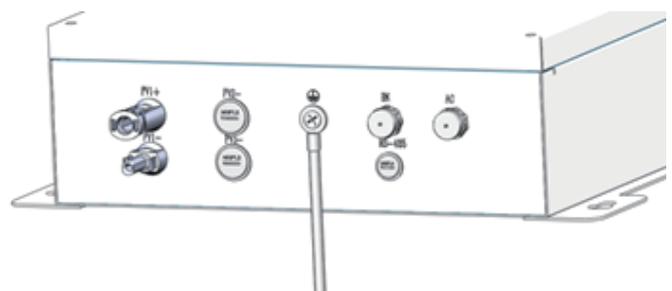


Figure 9. Ground cable connecting sketch

3.4.2 Connecting PV + cable

Connect one terminal of the PV+ cable with DC+ of the inverter. Connect the other terminal of PV+ cable with PV1+ female connector of pidGuard® (Figure 10).

- ⚠ The voltage of PV+ cable must be larger than 1000V.

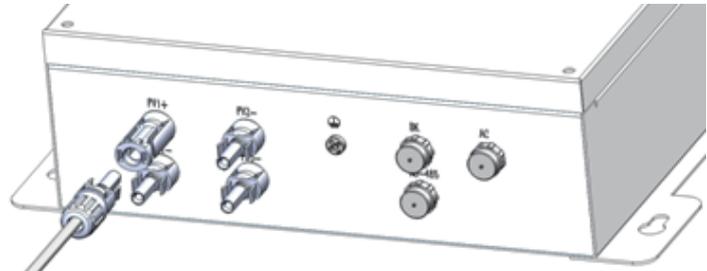


Figure 10.PV + connecting sketch

3.4.3 Connecting PV- cable

Connect one terminal of the PV- cable with DC- of the inverter. Connect the other terminal of PV- cable with PV- male connector of pidGuard® (Figure 11).

- ⚠ The voltage of PV+ cable must be larger than 1000V.

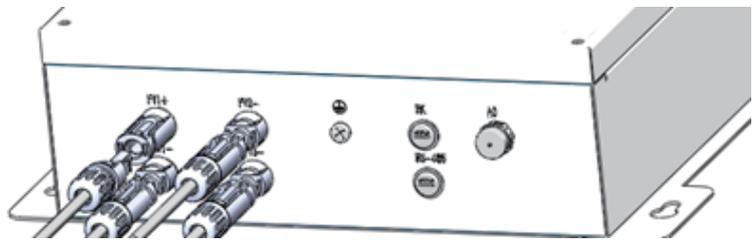


Figure 11.PV-connecting sketch

3.4.4 Connecting the AC input power cable

Connect one terminal of AC power cable with the AC connector (Figure 12). Insert the connector into the AC plug on the pidGuard® (Figure 13). Connect the other terminal of AC cable with the L, N and PE of the AC power (100-240V).

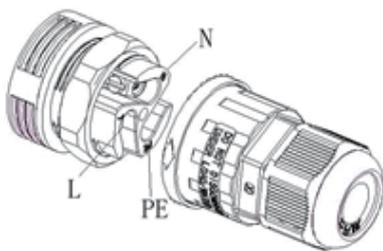


Figure 12.AC connector

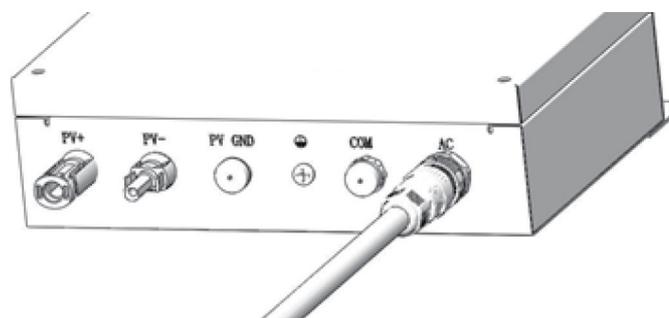


Figure 13.AC connecting sketch

4.0 Operating Instructions

4.1 Panel Introduction

4.1.1 General Introduction of the Panel

There is one POWER light, one RUN light and one ALARM on the panel, 3 Time lights, and 4 buttons on the panel, as in figure 14.

Item	Name	Description
A	POWER light(Green)	Indicate the power state
B	RUN light(Green)	Indicate working state
C	ALARM light(Green)	Indicate alarm state

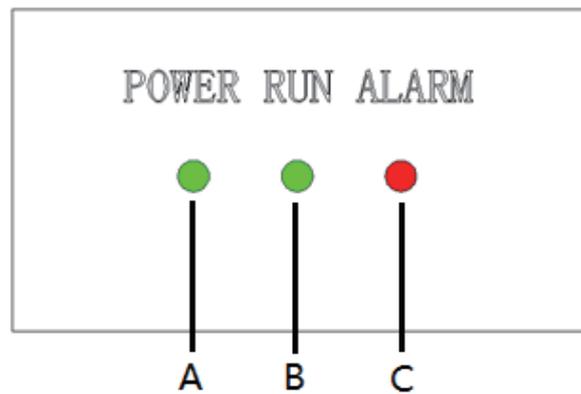


Figure 14. Panel sketch

4.1.2 Working mode

Working modes: Voltage rising state, Stable working state, Stable current state, Standby state, Alarm state, as in following table.

Working mode	Description	Light state
With Power	The AC power supply is connected correctly	POWER light is always on
Voltage rising state	The output voltage is rising.	RUN light blinks as per 0.5HZ
Stable current state	Output current is controlled at stable value	RUN light blinks as per 2HZ
Stable working state	Output voltage is stable	RUN light is always on
Standby state	Device is waiting for emit voltage	RUN light is always off
Alarm state	See troubleshooting table	ALARM light is always on/ blink at 1Hz

4.2 Operating

4.2.1 Starting

- Check whether the cables are rightly connected. (⚠ PV+ and PV- must be confirmed)
- Connect the power cable, pidGuard® would start automatically.

4.2.2 Resume Default Setting

Disconnecting the AC power, the device can finish "Resume Default Setting".

4.3 Control Description

The device is smartly controlled by self-study software. By monitor the DC voltage of the solar plant, the regulation of the plant could be remembered by the device. Then pidGuard® could automatically control the value of the output voltage, when begin to emit the voltage and length of the output voltage to recover and prevent PID issue at night time.

4.4 Inspection

At the second night after installation, randomly select 1pcs PV panel and disconnect positive connector or negative connector with nearby panel. Inspect the voltage between electric circuit in the connector and the frame. There should exist voltage(Figure 15).

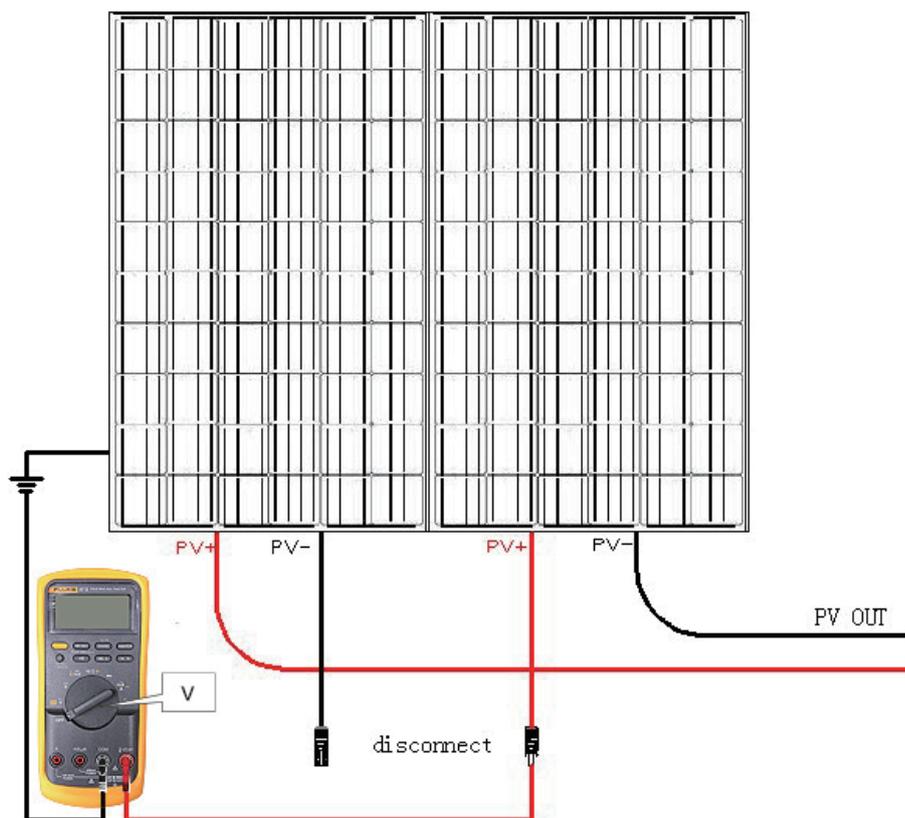


Figure 15. Voltage inspection sketch



5. Troubleshooting table

Indicator	Trouble	Possible reason	Shooting method
ALARM light on	Fuse open	Fuse at output site broke	Replace the fuse
	Output over voltage	Control problem. pidGuard® could not effectively control the OV.	Resume default setting
		The drift of voltage detective system is too high.	Resume default setting
	Output over current alarm	The drift of current detective system is too high.	Resume default setting
		The PV system insulation resistance is too low.	Check the insulation of PV system
		OV cable maybe short circuit.	Check the circuit
ALARM light blink	Output under voltage	Control problem. pidGuard® could not effectively control the OV.	Resume default setting
		The drift of voltage detective system is too high.	Resume default setting
		OV cable maybe short circuit.	Check the circuit
		The PV system insulation resistance is too low.	Check the insulation of PV system
	PV under voltage alarm	Wrong polarity of PV+ and PV-	Check the connecting of PV polarity
		PV cable connecting problem.	Check the connector and PV cable
	PV over voltage alarm	The drift of current detective system is too high.	Resume default setting
		The voltage of PV system exceed 1000V	Confirm the PV voltage below 1000V
POWER light off	Power supply fault	AC voltage exceed the permit range	Inspect the AC voltage
		AC cable break	Check the AC cable
		AC cable problem	Check the connecting and AC cable
		Fuse at input site broke	Replace the fuse
Other trouble			Contact the company



6. Technical datasheet

Item		pidGuard®
General Data	No. of inverters Connecting with	1
	Operating Temperature(°C)	-25~65
	Operating Humidity(%RH)	≤95
	Dimension(mm)	260*180*76
	Weight(kg)	≤3.0
	Altitude(m)	≤4000
Control Method	Control method	Self-learn
	Display	LED
DC Output	Voltage (V)	600~900
	Voltage Resolution(V)	1
	Rated current(mA)	8
	Rated power(W)	8
	Suggested Insulating Resistance (KΩ)	≥25
AC Input	Voltage(V)	100~240
	Frequency(Hz)	50/60
	Ground Cable	Optional
Module Voltage Inspection	Range(V)	0~1000
	Resolution(V)	1
IP class		IP65
Communication(Optional)		Fault Relay