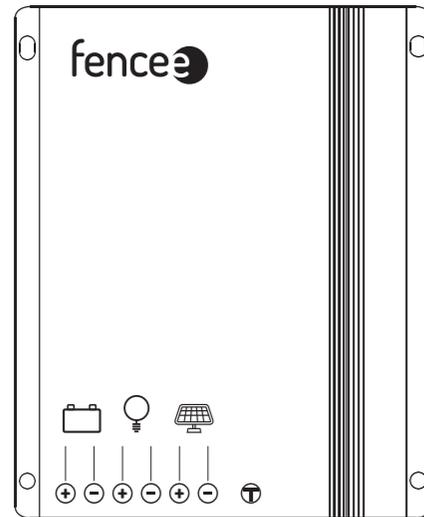


# fencee

## Solar Charge Controller 10/15 A



### User Manual

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### fencee solar charge controller 10/15 A

Dear Clients,  
 Thanks for selecting the fencee solar charge controller. Please take the time to familiarise yourself with this user manual, as it will help you take full advantage of the controller's features. This manual gives important recommendations for installing, using, and programming the solar controller. Read this manual in full before installing or connecting the solar controller.

#### 1. Functions

fencee solar charge controller is programmable, waterproof and well-suited for a wide range of solar systems. The charging efficiency of this controller is higher than a traditional PWM controller, helping to get the most out of the solar panel.

It comes with a number of outstanding features, such as:

- Innovative Maximum Power Point Tracking(MPPT) technology, tracking efficiency >99.9%
- High charge conversion efficiency up to 97.5%
- Adjustable 5-stage timer for load output
- Monitoring of the running status and parameters
- Suitable for Gel, Liquid, AGM and Lithium battery
- Four stage charging: MPPT, boost, equalization, float
- 0°C Charging Protection (Lithium)
- When BMS power is off because of LVD, it can activate the system automatically
- Day/Night threshold can adjust automatically
- Configurable with an LCD remote programmer (S-Unit)
- Waterproof IP67, strong and durable aluminum case
- Full automatic electronic protect function

#### 2. Safety Instructions

##### 2.1 Safety

①The solar charge controller may only be used in PV systems in accordance with this user manual and with solar panels specifications in line with the requirements of this controller. No energy source other than solar panels may be connected to the solar charge controller.

②Batteries store a large amount of energy, never short-circuit a battery under any circumstances. We strongly recommend connecting an in-line fuse or circuit-breaker on the "+" wire between the battery and controller, no more than 15cm from the battery terminal.

③Batteries can produce flammable gases. Avoid sparks and flames near the batteries. Make sure the battery is installed in a well ventilated area.

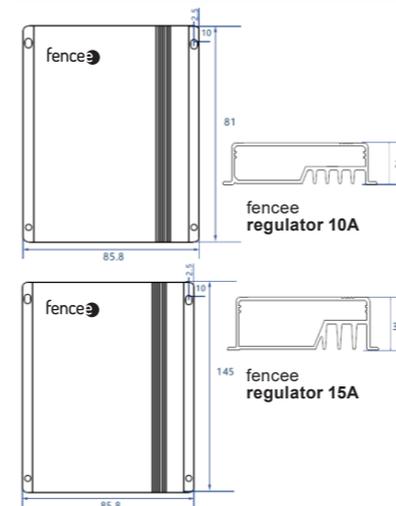
④Avoid touching or short circuiting wires or terminals. Be aware that the voltages on special terminals or wires can be several times greater than the battery voltage. Use isolated tools and only perform any work in a dry environment.

⑤Keep children away from batteries and the charge controller.

##### 2.2 Liability Exclusion

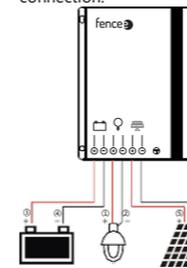
The manufacturer shall not be liable for damages to the controller or battery caused by use other than as instructed in this manual, or if the battery manufacturer's recommendations are neglected. The manufacturer shall not be liable if there has been service or repair carried out by any unauthorised person, unusual use, incorrect setup, or bad system design.

#### 3. Dimensions (Unit: mm)



#### 4. Installation

The following diagram provides an overview of the terminals. Please make sure to follow the proper order of connection.



1. As the chart, Connect the load first with corresponding red(positive) and black (negative) cables, then seal them with tape.
2. Connect the battery with corresponding positive and negative cables, load will be on.
3. Connect panel with the corresponding red(positive) and black(negative) cables, the controller begins charging.
4. Confirm the LED display status, please refer to the 6.2 **Faults and Alarms** to identify the reason.

Make sure the wire length between battery and controller is as short as possible. Recommended Wire size:

- 10A: 2.5mm<sup>2</sup>
- 15/20A: 4mm<sup>2</sup>.

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#### 5.LVD, LVR, Threshold

##### 5.1 Low Voltage Disconnect (LVD)

When the battery voltage drops below the LVD voltage, the controller will disconnect the load to prevent deep discharge of the battery. If this occurs, the battery should be well charged before resuming use.

##### 1. Gel, Liquid and AGM Battery Battery capacity control

- SOC1 : 11.0~11.6V/22.0~23.2 V
- SOC2 : 11.1~11.7V/22.2~23.4 V
- SOC3 : 11.2~11.8V/22.4~23.6 V
- SOC4 : 11.4~11.9V/22.8~23.8 V
- SOC5 : 11.6~12.0V/23.2~24.0 V

##### Battery voltage control

LVD range: 10.8~11.8V/21.6~23.6V.

##### 2. Lithium Battery

LVD range: 9.0~30.0V.

##### 5.2 Low Voltage Reconnect (LVR)

If the low voltage disconnect is triggered, the controller will restore load connection only when the battery voltage increases above the LVR voltage.

##### 1. Gel, Liquid and AGM Battery

LVR range: 11.4~12.8V/22.4~25.6V.

##### 2. Lithium Battery

LVR range: 9.6~31.0V.

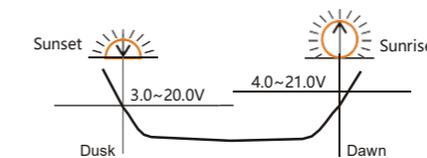
##### 5.3 Day/Night Threshold, Day/Night Delay

The controller recognizes day and night based on the solar array open circuit voltage. This day/night threshold can be modified according to local light conditions and the solar array used.

Day/Night threshold setting range: 3.0~20.0V.

The actual time of turning on can be delayed by up to 30 minutes from the time the threshold was reached using the Day/Night delay setting (D/N Dly).

Day/Night delay time setting range: 0~30min.

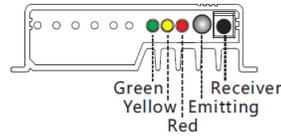


Day/Night threshold voltage of load disconnect is 1V higher than the setting data, means the load will disconnect when the solar voltage is at 4.0~21.0V.

The controller will automatically adjust the day/night threshold. If the lowest solar voltage is higher than the day/night threshold. The load will have no output the first night, then 24 hours later the controller will automatically adjust the setting to give output the following night.

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### 6.LED indicators, Faults & Alarms



#### 6.1 LED Display Explanation

LED	Status	Function
Green LED	On	Not charged
	Flash fast(0.1/0.1s)	MPPT charging
	Flash(0.5/0.5s)	Equal or Boost charging (Gel, Liquid or AGM)
	Flash slowly(0.5/2s)	Charging
Yellow LED	Off	Over voltage protection
	On	Battery is normal
	Slow flash(0.5/2s)	Battery voltage is low
Red LED	Fast flash(0.1/0.1s)	Low voltage protection
	On	Work normal
	Off	The output power is 0.
	Flash(0.5s/0.5s)	Over temperature
	Fast flash(0.1/0.1s)	Short circuit or over * current protection

\* Detailed fault information can be read by S-Unit remote controller.

#### 6.2 Faults & Alarms

Fault	Status	Reason	Remedy
Loads are not powered	Low volt. protection	Low Battery capacity	Recharge battery above LVR.
	Overcurrent, short circuit protection	Overload or load short-circuit	Switch off all loads, remove short-circuit, load will be reconnected after 1 minute.
	Over temp. protection	Controller temp is too high	Controller will turn the system off until temperature is below 60 ° C.
High voltage at battery terminal	Over voltage protection	Battery overvoltage > 15.5V/31V (Li: CVT+0.2V)	Check if other sources overcharge the battery. If not, controller is damaged.
		Battery wires or battery fuse damaged, battery has high resistance.	Check battery wires, fuse and battery.
Incorrect system voltage	All LED fast flashing	Battery voltage not in right range	Charge or discharge battery to correct the voltage
Battery is empty after a short time	Low voltage protection	Battery has low capacity	Change battery
Battery not charging	Green LED is on	PV panel fault or reverse connection	Check panels and wire connections

### 7.Safety Features

	Solar terminal	Battery terminal	Load terminal
Reverse polarity	Protected *1	Protected	Protected *1
Short circuit	Protected	Protected *2	Switches off immediately
Over current			Switches off with delay
Reverse Current	Protected		
Over voltage	Max.55V *3	Max. 35V *4	
Under voltage			Switches off
Over temp.	The controller cuts off the load if the temperature reaches the set value.		

\*1. Controller can protect itself, but load might be damaged.

\*2. Battery must be protected by fuse.

\*3. Please refer to "8.Technical Data" to get the max voltage of PV panel.

\*4. Please refer to "8.Technical Data" to get the max voltage of battery.

#### Warning:

**The combination of different error conditions may cause damage to the controller.**

**Always remove the error before you continue connecting the controller.**

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### 8.Technical Data

	Item	Controller fencee 10A	Controller fencee 15A	
Battery Parameters	Max Charging Current	10A	15A	
	System Voltage	12V	12V/24V automatical recognition	
	Max input power	130W	200W/400W	
	Max volt on Bat. Terminal	25V	35V	
	Battery Type	Lithium, Liquid, Gel, AGM ( Programmable, default: Gel )		
	Liquid, Gel, AGM	MPPT Charging Volt.	<14.5V@25°C	<14.5/29V@25°C
		Boost Voltage	14.5V @25°C	14.5/29V @25°C
		Equalization Volt.	14.8V @25°C	14.8/29.6V @25°C ( Liquid, AGM )
		Float Voltage	13.7V @25°C	13.7/27.4V @25°C
		Low Volt. Disconnect	10.8~11.8V,SOC1~5	10.8~11.8V/21.6~23.6V; SOC1~5(Default: 11.2/22.4V )
		Reconnect Voltage	11.4~12.8V	11.4~12.8V/22.8~25.6V(Default: 12.0/24.0V )
		Overcharge Protect	15.5V	15.5/31.0V
	Temp. Compensation	-4.17mV/K per cell (Boost, Equalization) , -3.33mV/K per cell (Float)		
	Lithium	Charging Volt. target	10.0~17.0V	10.0~32.0V(Lithium, Programmable )
		Charging Volt. recovery	9.2~16.8V	9.2~31.8V(Lithium, Programmable )
Low Volt. disconnect		9.0~15.0V	9.0~30.0V(Lithium, Programmable )	
Low Volt. reconnect		9.6~16.0V	9.6~31.0V(Lithium, Programmable )	
0°C Charge Protection		Yes, No, Slow(Default: Yes)		
Panel Parameters	Max volt on PV terminal	45V	55V *1	
	Dusk/Dawn detect volt.	3.0~8.0V	3.0~20.0V(Programmable )	
	Day/Night delay time	0~30Min(Programmable )		
	MPPT tracking range	( Battery Voltage + 1.0V ) ~Voc*0.9 *2		
	Max tracking efficiency	>99.9%		
Load	Output Current	10A	15A	
	Max charge conversion	96.5%	97.5%	
System Parameters	Self consumption	6mA		
	Dimensions	85.8 * 81 *23.1mm	85.8 * 145 * 30mm	
	Weight	260g	600g	
	Ambient temperature	-35~ +60°C		
	Ambient humidity	0~100%RH		
	Protection degree	IP67		
	Max Altitude	4000m		

\*1.PV panel Voc can not exceed this value, otherwise it will damage the controller.

\*2.Voc means the open circuit voltage of the solar panel.