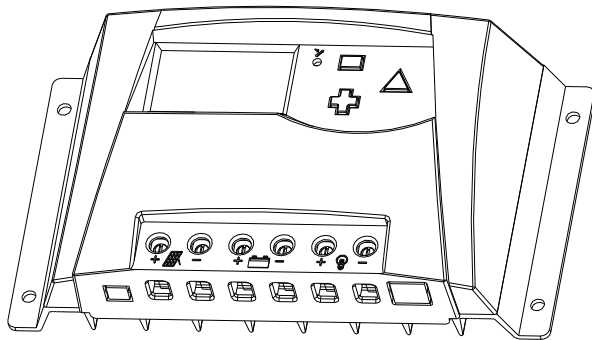


## Solar Charge Controller User Manual



**SK30D SK40D SK3048D SK4048D SK3048DA SK4048DA**

Please read this manual carefully before use. This manual is subject to change without notice, and the company's interpretation of it shall prevail!

## **1. Safety Instruction**

- (1) Please keep installation site clear of flammable or explosive, or corrosive gases and dust etc.
- (2) Please protect the controller from direct sunlight or rain.
- (3) Please prevent foreign object or liquid approaching controller.
- (4) Please contact technical personnel to dismantle or repair the controller.
- (5) Please don't put metal object beside battery.
- (6) Please do not touch terminals or back plate of controller in case of electric shock or scald.

## **2. Product Introduction**

### **2.1 Profile**

This series is a new series of intelligent multi-purpose solar charge controllers. Its innovative design makes it easy to install and quite user-friendly. Optimized charging and discharging management extends the service life of batteries considerably. Meanwhile, parameters are explicitly displayed. Most parameter values can be set to meet various applications.

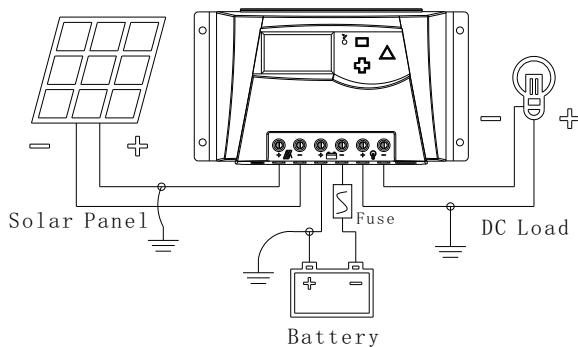
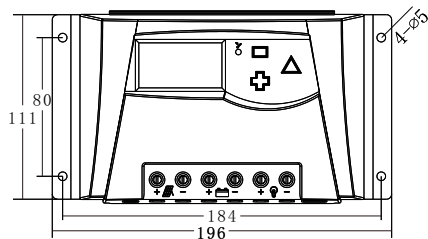
### **2.2 Function**

- (1) Four-stage PWM charging mode.
- (2) Preset charging parameters for three battery types.
- (3) Detecting mode for battery voltage level is adjustable.
- (4) Charging and Discharging parameters are adjustable.
- (5) Temperature compensation is applied.
- (6) Real-time clock display.

- (7) Various controlling mode for load.
- (8) Optional communication function.
- (9) Protection against reverse connected solar panel and input over-current.
- (10) Protection against under-voltage, over-voltage, reverses connection and reverse discharge of battery.
- (11) Protection against over-current and short circuit of load.
- (12) Protection against internal over-heat.

### 3. Installation

#### 3.1 Dimension and Circuit Layout



### 3.2 Installation Procedure



Please make sure battery and solar panel are disconnected to controller, and do not contact the positive and negative terminals of solar panel and battery at the same time in case of electric shock.



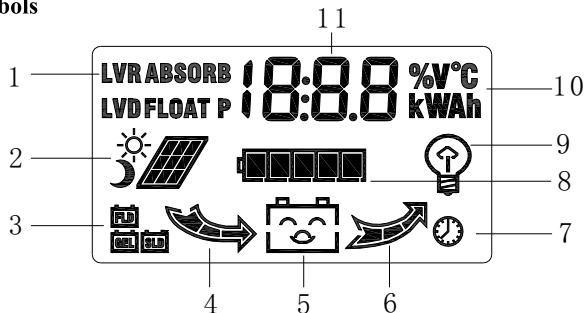
A free space of 15cm on all sides must be provided for better heat dissipation.

Current density control system wiring cables within the  $3A / mm^2$ .

- (1) Make sure installation site meets safety requirements first.
- (2) Make sure voltage of solar panel and battery are compatible with controller.
- (3) Connect battery to controller and check whether the LCD display is on, if not, please solve the problem as mentioned in chapter 5.2.
- (4) Connect solar panel to controller accordingly. If there's sunlight, controller starts charging battery immediately and charging indicator arrow on LCD on.
- (5) Connect load to controller.

## 4. Operating Instruction

### 4.1 Symbols



1. LVR ABSORB LVD FLOAT P(PM)

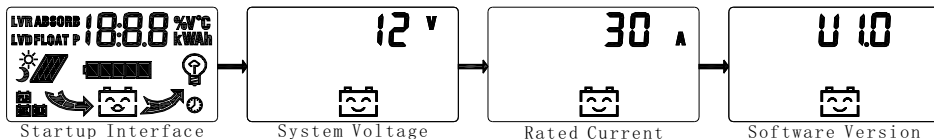
2. Day and night 3. Battery type: FLD GEL SLD Null means Usr

4. Charging 5. Error 6. Discharging 7. Time 8. Capacity

9. Load state 10. Unit 11. Data display area

## 4.2 LCD Interfaces

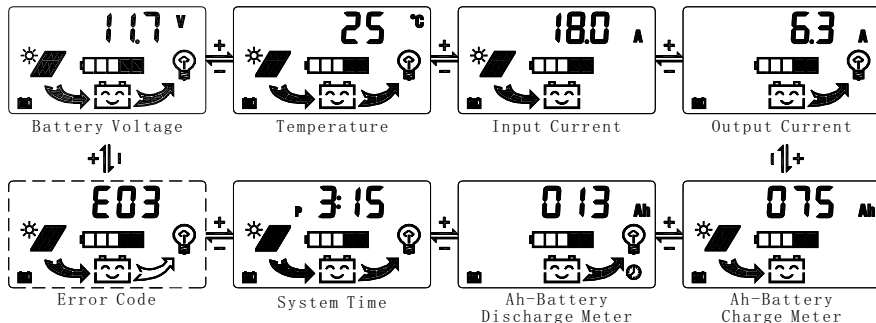
### 4.2. 1 Startup Interface



- (1) Startup interface: the interface when system is powered on by which you check whether the LCD is in good condition
- (2) System Voltage: battery voltage detected by controller
- (3) Rated current: Rated charging and discharging current of controller



### 4.2.2 LCD Main Loop Interface

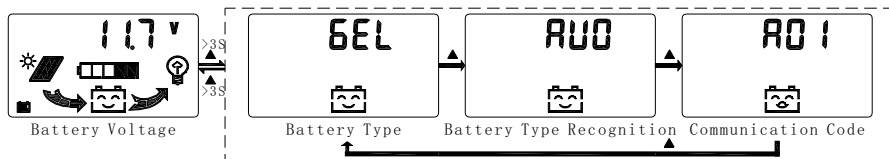


- (1) Interface two-way circulation is performed by press + or - . If there's no failure, display presents the current interface until press any key; if there's failure, after 20s absence of key operation the error code interface is presented.
- (2) In interface “Battery voltage”, “System Time” or “Error code” by short pressing ▲ load is

switched on or off.

- (1) In interface “Ah-Battery Charge Meter” or “Ah-Battery Discharge Meter” by long pressing ( $>3S$ ) ▲, data is cleared.
- (2) In “Battery voltage” interface, by long pressing + and - simultaneously until the screen is fully bright controller is restored to factory defaults.

### 4.2.3 Battery, Communication



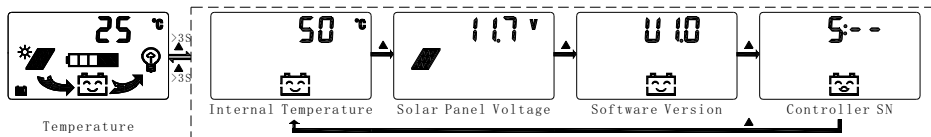
In main loop “Battery voltage” interface, by long pressing (>3S)▲ you can access secondary one-way loop. In secondary loop, by short pressing ▲ you can circulate interfaces, and by short pressing + or - you can change values, while a long-pressing (>3S) enables data saving and exit, and a 20s absence of operation bring you to main loop interface with data unsaved.

- (1) Battery type: Four battery types are preset which are GEL, SLD, FLD and USr. Only parameters of USr type are adjustable.

- (2) Battery voltage level identification: automatic identification (AUO), fixed 12V, fixed 24V, fixed 36V and fixed 48V. Different types of controllers automatically recognize different voltage ranges, and please refer to real controller.
- (3) Controller Communication SN: the number can be set in the range of 1 to 99, the default value is 1. (For controller with communication function only.)

Controller restarts automatically to update data after battery type and voltage grade are set.

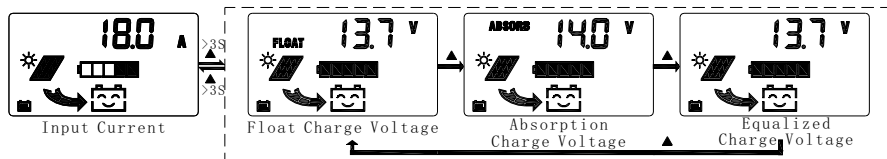
#### 4.2.4 Controller SN



In main loop “Temperature” interface, by long pressing (>3S) ▲ you can access secondary one-way loop. In secondary loop, by short pressing ▲ you can circulate interfaces and a long-pressing (>3S) or a 20s absence of operation, you can exit.

Controller communication SN: composed of 8 digits, every 2 digits displayed sequentially, eg:-- 88 56 73 24 .

## 4.2.5 Charging Settings

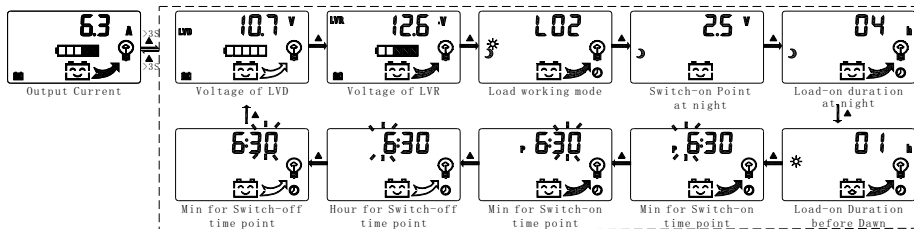


In main loop “Input current” interface, by long pressing(>3S) ▲ you can access secondary one-way loop. In secondary loop, by short pressing ▲ you can circulate interfaces, and by short pressing + or - you can change values, while a long-pressing (>3S) enables data saving and exit, and a 20s absence of operation bring you to main loop interface with data unsaved.

Note: Only parameters of USr type are adjustable.

## 4.2.6 Load Working Mode

In main loop “Output Current” interface, by long pressing (>3S) ▲ you can access secondary one-way loop. In secondary loop, by short pressing ▲ you can circulate interfaces, and by short pressing + or - you can change values, while a long-pressing (>3S) enables data saving and exit, and a 20s absence of operation bring you to main loop interface with data unsaved.



4 working mode for load as below:

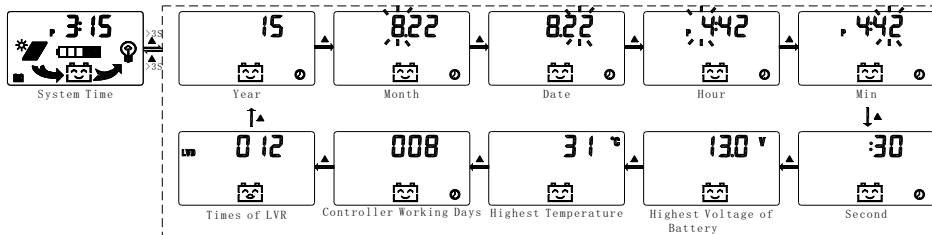
Code	Working mode for load
L00	Regular controller mode(Mode 0)
L01	Light control with switch-off point at night and switch-on point before dawn (Mode 1)
L02	Light control mode(Mode 2)
L03	Self-timing switch on/of (Mode 3)

Different load controlling modes defines parameters adjustable and interface displayed.



#### 4.2.7 Time and Date

In main loop “System Time” interface, by long pressing(>3S) ▲ you can access secondary one-way loop. In secondary loop, by short pressing ▲ you can circulate interfaces, and by short pressing + or - you can change values, while a long-pressing (>3S) enables data saving and exit, and a 20s absence of operation bring you to main loop interface with data unsaved.



## 5 Fault Management

### 5.1 Error Code and Correction

Error code	Cause	Correction
<b>E01</b>	Low voltage of battery and load switched off	Manually recharge the battery
<b>E02</b>	Excessive load current and load switched off	Reduce load current at load output, and switch on load manually or wait for 10 mins for auto switch-on by controller.
<b>E03</b>	Short circuit at load output and load switched off	Rectify short circuit and switch on load manually or wait for 5 mins for auto switch-on by controller.
<b>E04</b>	Excessive solar panel current and load switched off	Make sure connection between battery and controller is good.

		<p>Make sure battery capacity is not too low.</p> <p>Make sure voltage of other battery charger connected to battery is not too high.</p> <p>When battery voltage is 0.5V lower than defined overvoltage protection point, load switched on automatically by controller.</p>
<b>E05</b>	Battery charging switched off due to over-temperature of controller.	Allow the controller to cool down and restart charging automatically.
<b>E06</b>	Over-voltage of solar panel	Make sure voltage of open circuit is not too high and reduce panel in series connection.
<b>E07</b>	Charging switched off by controller due to excessive solar panel current.	Check power of solar panel and reduce solar panel quantity in parallel connection and wait for 2 mins for restart charging.

## 5.2 Failure and Correction

Failure	Correction
No sign on LCD initialization	Make sure no reverse connected battery. Make sure connection between battery and controller is good. Make sure circuit of battery switched on. Make sure fuse protector connected.
No charging current	Make sure no reverse connected solar panel. Make sure connection between solar panel and controller is good with no open circuit.
Load not work	Make sure there 's no reverse connected load. Make sure controller is not in protection against overload, short circuit, under-voltage or overvoltage.
Load not switched on at preset point	Make sure load controlling mode is correctly set. Make sure battery voltage not too low.

Load unable to be switched on at night in Light control mode	Make sure load controlling mode is correctly set. Check solar panel not illuminated by other light sources at night.
--	---

## 6 After Sales Service

### 6.1 Warranty

Manufacturer provides

- (1) One-month warranty of free replacement is provided for this product commencing from the date of purchase.
- (2) Two-year warranty of free repair is provided for this product commencing from the date of purchase.
- (3) Lifetime warranty of payable repair is provided for this product commencing from the date of purchase.

Free guarantee service will not be provided to the said equipment if

- (1) It has been damaged through transportation or storage or
- (2) It has been operated otherwise than in accordance with the instructions or
- (3) Any unauthorized repair or modification has been carried out on the unit or
- (4) It has been operated otherwise than in accordance with the instructions or
- (5) It has been damaged through natural calamities

## **6.2 Return & Repair**

Please contact customer service before return controller for repair and send controller together with original invoice and associated information like controller model, SN, cause. After receiving return controller, customer service will contact you to confirm cost and time etc. Please note any cost of transportation is on the account of purchaser.

## 7 Technical data

Model	SK30D	SK40D	SK3048D	SK4048D	SK3048DA	SK4048DA
Input						
PV voltage	≤50V		≤100V		12V/24V≤50V 36V/48V≤100V	
Rated current	30A	40A	30A	40A	30A	40A
Output						
System voltage	12V/24V (Auto)		48V		12V/24V/36V/48V (Auto)	
HVD	16.00V×1/×2/×3/×4					
Rated current	30A	40A	30A	40A	30A	40A
No-load loss	≤13mA		≤15mA		≤25mA	
Charge loop voltage drop	≤0.17V		≤0.28V		≤0.17V	≤0.28V

Charge loop voltage drop	$\leq 0.10\text{V}$	$\leq 0.10\text{V}$	$\leq 0.10\text{V}$	$\leq 0.10\text{V}$
Charging mode	PWM 4-stage (bulk, absorption, float, equalized)			
Voltage of float charging	$13.8(13\text{V}\sim 15\text{V}) \times 1/ \times 2/ \times 3/ \times 4$			
Voltage of absorption charging	$14.4\text{V}(13\text{V}\sim 15\text{V}) \times 1/ \times 2/ \times 3/ \times 4$			
Duration of absorption charging	2hs			
Voltage of equalized charging *	$14.6\text{V}(13\text{V}\sim 15.5\text{V}) \times 1/ \times 2/ \times 3/ \times 4$			



Duration of equalized charging	2hs
LVD	$10.7\text{V}(10\text{V}\sim 14\text{V}) \times 1/\times 2/\times 3/\times 4$
LVR	$12.6\text{V}(10\text{V}\sim 14\text{V}) \times 1/\times 2/\times 3/\times 4$
Load working mode	<p>Regular control mode</p> <p>Light control with switch-off point at night and switch-on point before dawn</p> <p>Light control mode</p> <p>Self-timing switch on/off mode</p>
Light control voltage	$5\text{V}(1\text{V}\sim 10\text{V}) \times 1/\times 2/\times 3/\times 4$
Battery type	GEL, SLD, FLD and USr(default)
<b>Other</b>	

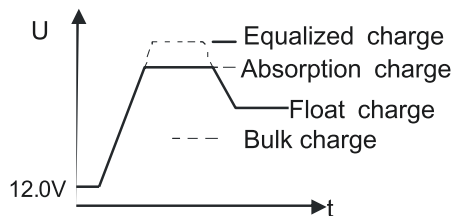
Buttons	LCD, 3 buttons			
Heat sink	AL alloy heat sink			
Wiring	PCB terminal, $\leq 16\text{mm}^2$			
Working temperature	$-20 \sim +55^{\circ}\text{C}$			
Storage temperature	$-30 \sim +80^{\circ}\text{C}$			
Working humidity	10% ~ 90%, no condensation			
Dimension	196 x 111 x 54 mm			
Net Weight	401 g	403 g	410 g	412g
IP grade	IP30			
Optional function	Remote communication, TTL, standard ModBus protocol			
Accessory	Temperature sensor			

**Battery type**

Battery type	Voltage of float charging (V)	Voltage of absorption charging (V)	Time of absorption charging(h)	Voltage of equalized charging(V)	Time of equalized charging(h)	Interval of equalized charging(day)
GEL	13.8	14.2	2	--.-	-	--
Sealed	13.8	14.4	2	14.6	2	28
Flooded	13.8	14.6	2	14.8	2	28
User	13.8	14.4	2	14.6	2	28

**Note: No equalized charging mode for GEL batteries.**

### Charging mode:



### Load working mode:

