INSTRUCTIONA MANUAL

----------*For SHS controller, with remote meter*
----------Controller: *SHS20-COM series*
----------Meter: *MeTer-2*

CHARACTERISTICS

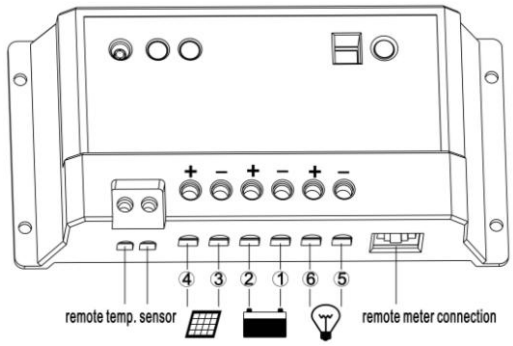
- LCD display: all systems parameters in digital value, system status as symbols
- Intelligent software control
- PWM charging mode
- Battery type option
- Battery Ah setting
- Over-load, short circuit, polarity reverse protection, electronic fuse
- Temperature compensation setting
- Modify parameters through four keys

TECHNICAL INFORMATION

Type	EPIP20-D(10A)	EPIP20-D(20A)
System voltage	12V/24VAUTOWORK	
Rated charging current(IE)	10A	20A
Rated load current	10A	20A
Over load, short circuit protection	1.25 times of IE for 60 seconds, 1.5 times of IE by for 5secs overload protection; ≥3times of IE short circuit protection	
Self consumption	≤6 mA	
Charging circuit voltage drop	≤0.26V	
Discharging circuit voltage drop	≤0.15V	
Work temperature	Industrial(I series)：-35℃ to +55℃； commercial :-5℃to +50℃	
Temperature compensation	0-10mv/℃/2V	
Control mode	PWM charging mode	
Remote meter LCD specification		
Working current	Strong backlight on < 23mA， 15 seconds	

	Low backlight on < 20mA，15 seconds Backlight and LED indicator off < 15mA
Work temperature	-10℃ to +40℃
Communication port	RJ45（8PIN）
Communication cable	1.5 meters

INSTALLATION

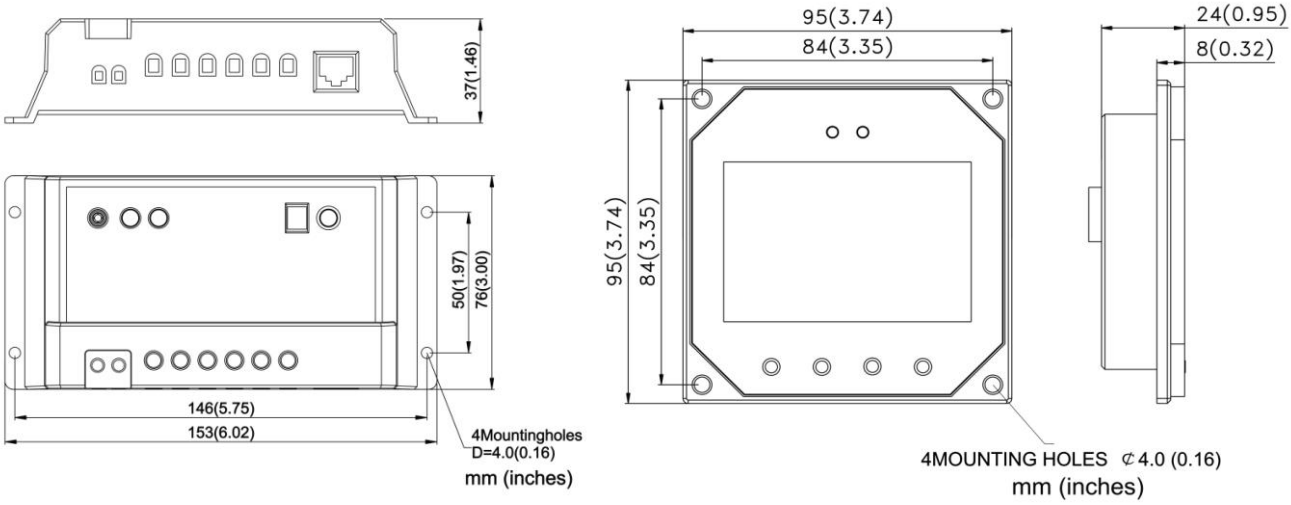


Connect the individual components to the symbols provided, they are solar panel, battery and loads in order indicated 1-6.

Only install the regulator near the battery, the installation environment should be indoor, dry and nonflammable. If for outdoor use, ensure the waterproof and dustproof. The cable should be as short as possible and have a suitable cable diameter size to minimize loss, e.g. use 2.5 mm^2 at 10A; use 5 mm^2 at 20A.

1. Mount the controller and meter to a surface. Allow space above and below the controller for air flow. Connect the controller and meter by communication cable.
2. Connect the battery to the controller. Note the plus and minus. If connection correct, the battery indicator will be on.
   Note : if reverse polarity, the output polarity reverse, don't turn on the loads. We suggest connect a fuse to the battery to avoid short circuit. The fuse protection current should be over controller rated current.
3. Connect the photovoltaic module to the charge regulator, note plus and minus. If there is sunshine, the charging indicator should be on.
   Note: when solar panel under the intensive sunshine, the voltage may be harm to people.
4. Connect the load to the charge controller: press ON/OFF button. Ensure off status, note the plus and minus.
5. Remote temp. sensor(**RTS**): A connection point for RTS(OPTION) to remotely monitor battery temperature. Local temp. sensor: Measure ambient temperature. Battery regulation is adjusted accordingly.
   Note: where is no RTS, the controller calculate the data which got from the local temp. sensor. The controller will come to RTS automatically when the RTS was connected.

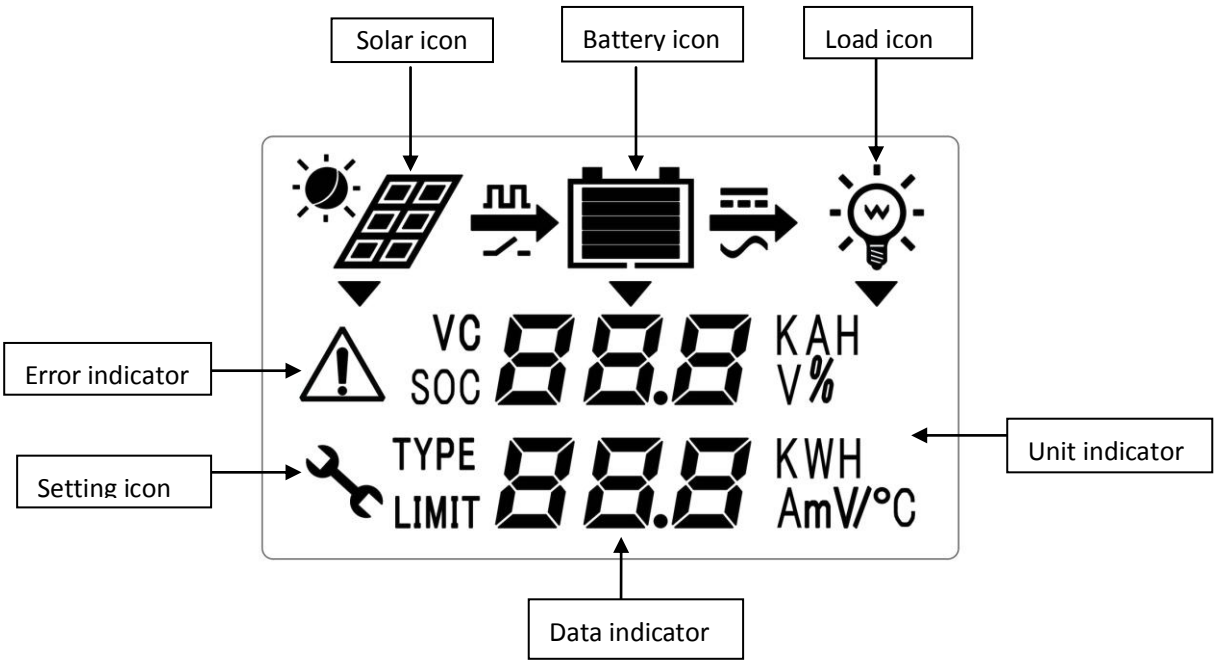
MECHANICAL DRAWING



CONTAINS

Wall mounting board, can be mounted in or on the wall. With 1.5 meter cable

REMOTE METER DISPLAY



Two LED indicator above LCD, green on when charging. Yellow on when error.

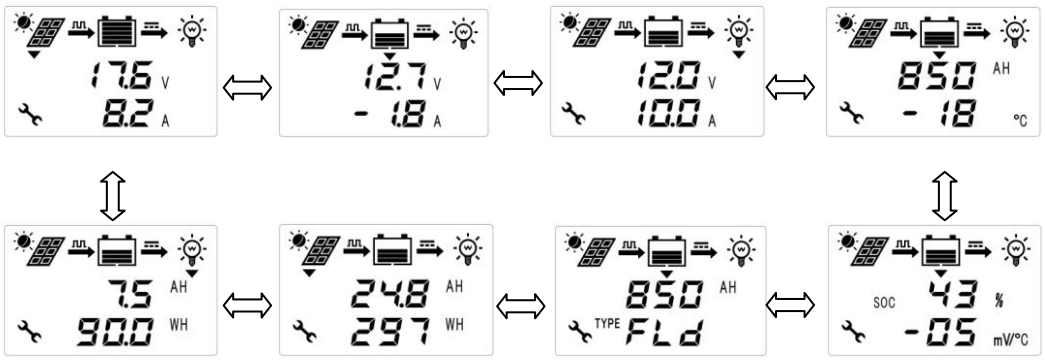
The meter backlight has 2 class, high bright on for 15 seconds and turn to low bright. After 15seconds, the backlight is off.

REMOTE METER OPERATION INSTRUCTION

The key from left to right is: K1~K4， or Set, Left ⇦ , Right ⇨, ON/OFF/ESC

1. The meter display as following order:

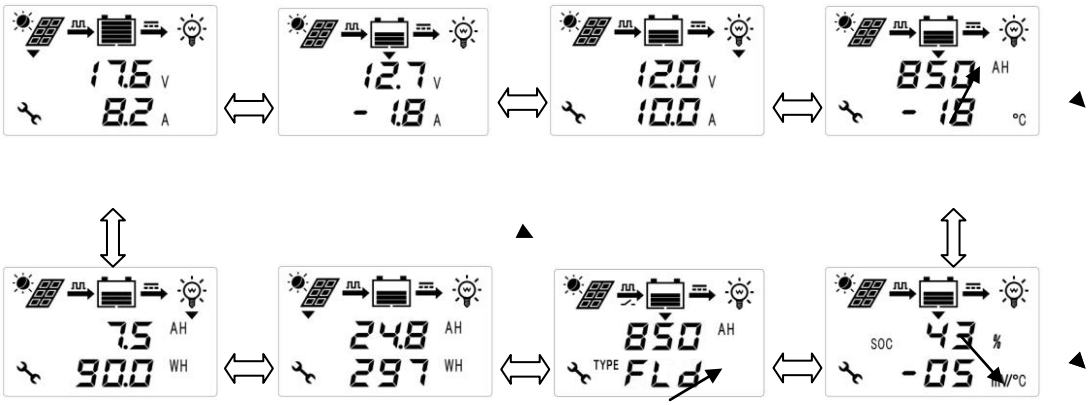
(solar panel voltage, solar panel charging current), (battery voltage, charging current), (load voltage, load current), (battery capacityAH, battery temp.), (battery capacity percentage, temp. compensation), (battery capacityAH, battery type), (charging accumulation AH, charging accumulation WH), (discharging accumulation AH, discharging accumulation WH) as eight team data. Use K2, K3, or Left, right key for repeating the data for the team. Data shows as following picture.



is setting icon. It appears in setting status, and disappears in reading status.

2. Data setting operation:

Reading status, press K1/SET to setting status, press K2, K3 to modify data. K1 for back to reading status and saving data. K4 for back to reading status without saving data. Only battery voltage and current can't be set.
Operation shows as following picture.



The data can be adjusted: battery capacity AH, battery temp. compensation, battery type. On read status, press K1/SET for setting data.

3. Data setting instruction

Battery capacity modify: capacity modify range from 10AH to 900AH, the default value is 200AH. The modify data should be near or equal to the real capacity. While display battery capacity and temp., press K1 into setting mode, modify the data through K2, K3. Battery capacity will be up/down 10AH, press K1 for saving data and back to the reading status. Or press K4 for back to reading status without saving. The capacity remain the same.

Battery temp. compensation: temp. compensation data modify ranges from 0 to 10mV/Cell/℃, while the data is 0, there is no temp. compensation function. While on displaying battery capacity percentage, temp. compensation, press K1 into setting mode, modify the data through K2, K3. The temp. compensation will be up/down 1 mV/Cell/℃.

Battery type: battery type has three option: SEL-sealed battery, GEL- gel battery, FLD- flooded battery. While on displaying battery capacity percentage, temp. compensation, press K1 into setting mode, choosing suitable battery type through K2, K3.

4.Other operation:

Delete accumulate data: while displaying charging discharging accumulation, press K4/SET, then press K1/ESC, the data will be deleted. The controller will delete the data automatically while over 999 times accumulation. Within 24 hours, the accumulation start point is the solar panel voltage over 8V.

OTHER INSTRUCTION

Error icon instruction: red flashing on error status. Please check the load connection, press K4 for delete error icon.

1. when load current over 1.25 times and less than 1.5 times of rated current, load will be off automatically after 60 seconds.
2. When load current over 1.5 times of rated current but less than short circuit, load will be off automatically after 5 seconds.
3. When load current over short circuit, short circuit protection shut the load.

LED indicator:

Green on when solar is charging battery, green off without charging.

Yellow on when there is error. Yellow off in normal status.

Telecommunication port:

While the meter run by individual power or the communication cut off, it displays graphical symbols. Press key,

no answer. The display will resume while communications is on.

Note: the data displayed got from the communication, check if the cable correct while the data is error, or if there is strong interference. Too long cable may bring mistakes too.

Battery capacity strip flash:

Each strip equals to 20% of battery capacity.

Note: the calculation takes fully charged voltage as 100%, and over discharge as 0%. All is based on battery voltage, not the real battery capacity.

Data updating:

Serial communication happen every 10 seconds between control module and display module, so the data update takes in 10-20 seconds.

Battery capacity AH:

AH is the accumulation of charging, each one minute will count. The data is not accurate while the charge current is too small. The min. is 1AH, means 1 amps charging for 1 hour, AH comes to show.

Charging and discharging accumulation WH:

Solar panel displaying is open circuit voltage . it can’t be calculated. WH is product of battery voltage and charging current accumulation.