
ESF.ESFP Smart battery charger

user manual



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overview

ESF represent car waterproof but no PFC (APFC) smart battery charger.

ESFP represent car waterproof with PFC (APFC) smart battery charger

PFC usage.

1) Saves energy: To a large extent to supply energy uses in the power net, reduce harmonic wave.

2) Reduced pollution of the power net.

ESF/ESFP series no-board charger is a smart charger with small size, high efficient with high protection and high ant-vibration grade. Using advanced single-chip computer intelligent control technology, the charger can realize fully all kinds of protection functions, set charging curves freely according to the characteristics of various batteries, ensuring that charger matches the battery exactly. At the same time, intelligent temperature compensation functions greatly extending the battery life.

Environmental Working

S/N	Item	Tech Index
1	Working temperature	-40℃~+60℃
2	Storage temperature	-40℃~+90℃
3	Relative humidity	5%~95%
4	cooling	Natural cooling
5	Altitude	3000m

Protection Features

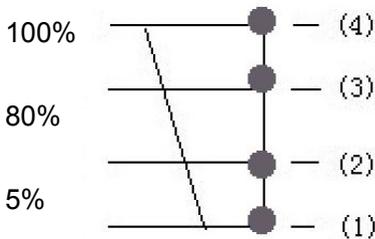
1. Output Over-Voltage Protection
2. Output Over-Current Protection
3. Output Short-Circuit Protection

4. OUTPUT Reverse Connect Protection
5. Charger temperature Protection
6. Charger temperature Protection
7. Input Over-Voltage Protection
8. Input Low-Voltage Protection

Indication function

ESF/ESFP series chargers have power indication and error indication functions

① power indication:



Power indicator

State: indicator light (1) is power indicator light, it is red when the charger connect to AC power.

indicator light (2) (3) (4) is battery capacity indicator light.

indicator light (2) is green means the battery capacity $\geq 5\%$.

indicator light (3) is green means the battery capacity $\geq 80\%$

indicator light (4) is green means the battery capacity is 100%, charging finished.

② error indication

ESF/ESFP series chargers set error indication function in order to solve the problem when find error.

- ⊙ (4) battery error
- ⊙ (3) battery overheat
- ⊙ (2) input voltage error

⊙ (1) battery charger overheat

State:

(1) When "battery charger overheating" light flash, means the charger internal protections function start due to charger long time working or external environment temperature is too high. (When the charger inside temperature reaches 75°C, the protection begin working).In the meanwhile the charger automatically cut off output, when internal temperatures below 75 °C, charger automatically start. If the "battery charger overheating" light flashes, you can ignore it, and after the temperature drop, it will automatically restart.

(2)When the "battery error" lights flash, means the battery is not match with charger voltage. Means the voltage is higher or lower than charger voltage. Such as factory set voltage 48V, the battery voltage is 60V or 36V, then the "battery error" lights flash.

(3) When the "input voltage error" light flash, means the charger's current input voltage is not match with the factory setup input voltage. Such as factory set voltage 220V, but connect to 110V, or factory set voltage 110V, but connect to 220V, then the "input voltage error" lights flash.

(4) When the "battery overheat" light flash, means the battery temperature is too high, then should stop charging the battery.

Electrical characteristics:

ESF/ESFP series Chargers have request to AC input voltage. ESF series AC input voltage is "85V-125V" or "185V-265V". ESFP series Charger AC input voltage is "85V-265V". Please see details of input voltage from Charger Label.

Safety Features:

(1) Voltage-Withstand:

Terminals to earth (shell) and the dielectric strength of circuit without electrical connection to each other should withstand the test voltages. The testing voltage is AC voltage 50~60Hz. Test between terminals should not be a corona, ionization, arcing or breakdown phenomenon.

Input/Shell	1500V AC	1min	Leakage Current \leq 10mA
input/output	1500V AC	1min	Leakage Current \leq 10mA
Output/Shell	500V AC	1min	Leakage Current \leq 10mA

(2) Insulation Resistance

The insulation resistance between live circuit and ground (shell) is not less than 20M Ω under the environmental temperature (23 \pm 2) $^{\circ}$ C and relative humidity 80% ~ 90%.

(3) Contact Current

When human or animal contacts one or more devices or equipment palpable components, the current flow should be no more than the contact current perception threshold requirement in GB/T13870.1-2008.

Grounding resistance is not more than 0.1 Ω . Grounding wires must use yellow/green double color line.

Contact Current	AC Current mA	DC Current mA
Limit Value	\leq 0.75	\leq 2

Charging Curve & Feature

(1). According to different lithium battery types, there are

different kinds of charging curve to choose.

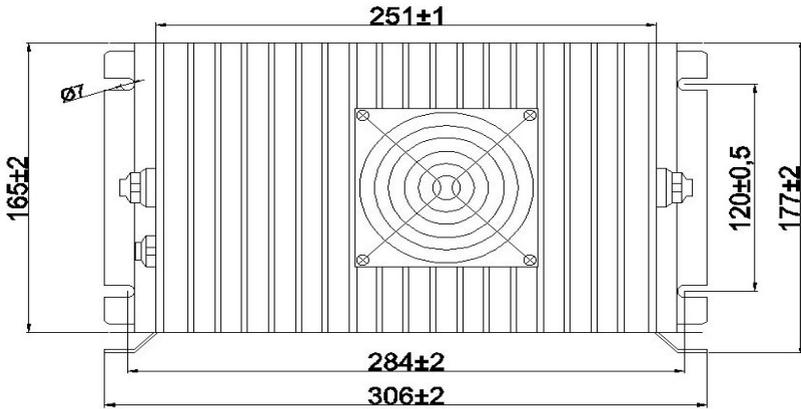
(2) According to different lead-acid types, there are different kinds of charging curve to choose.

Dimension:

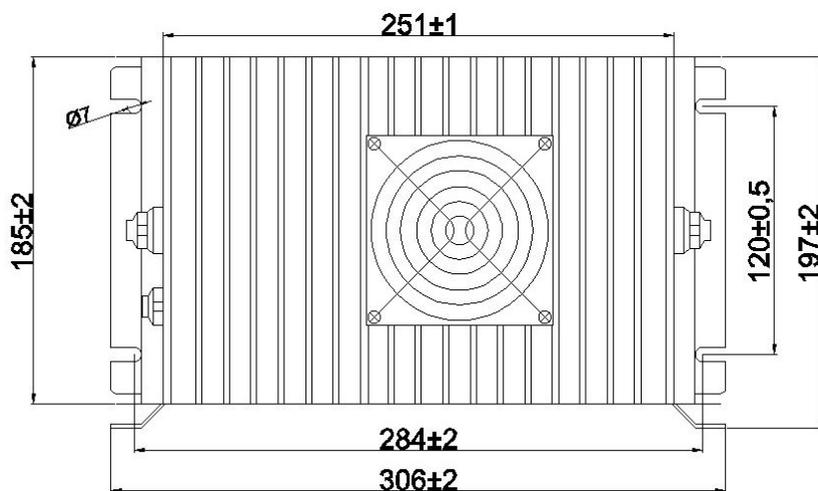
(1)ESF Model:

Front installation size

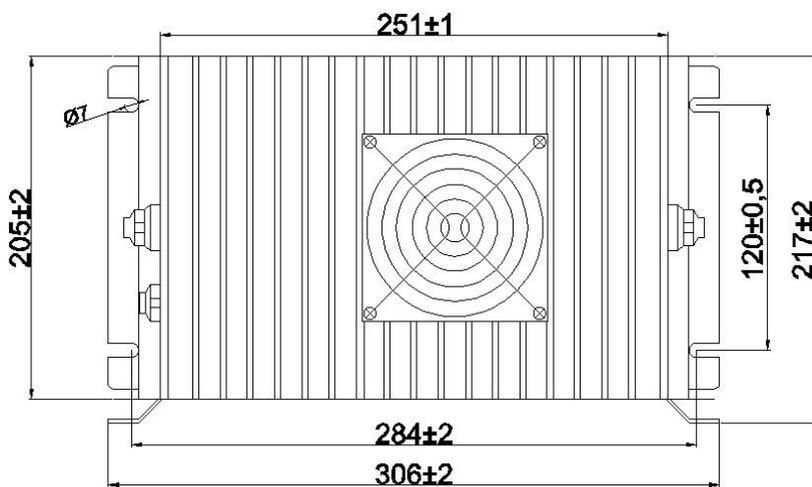
1800W Model (mm)



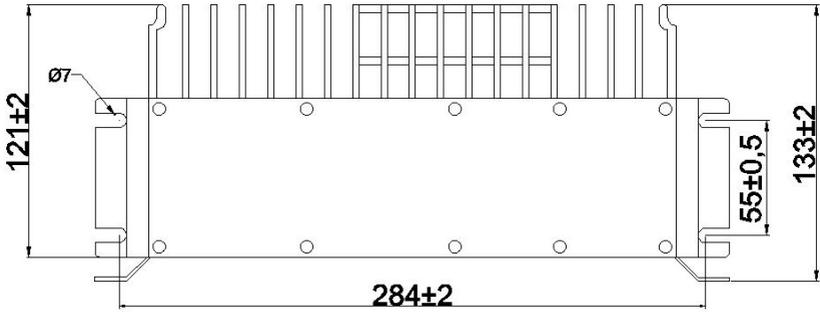
2400W Model (mm)



3000W Model (mm)



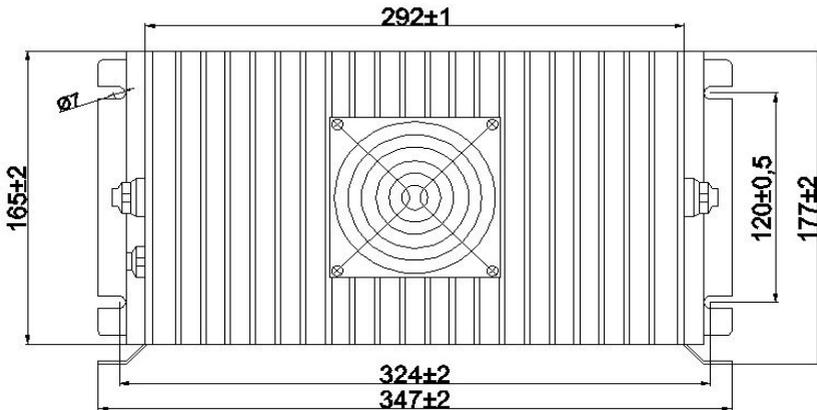
Side installation size



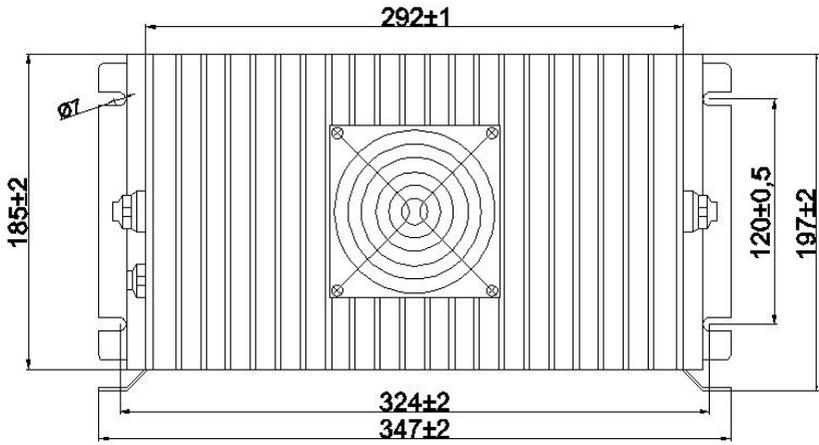
(2)ESFP Model:

Front installation size

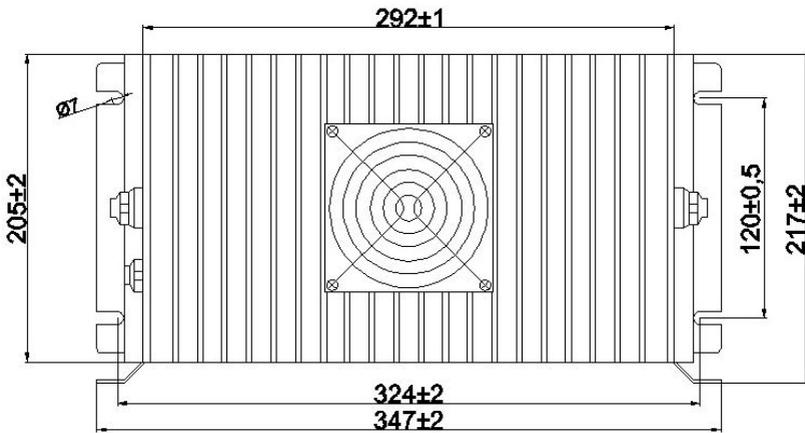
1800W Model (mm)



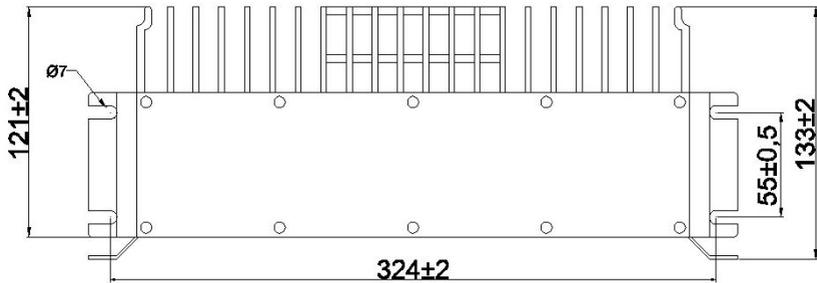
2400W Model (mm)



3000W Model (mm)



Side installation size



Installation considerations

(1) The charger should be installed in the vehicle on a level surface and keep the vertical heat sink upright. A space of 10 cm around heat sink should be open to ensure airflow.

(2) Make sure all vents are not blocked. Hot air generated from the charger should smoothly drain out of the body. The space can't be sealed or half-sealed to prevent overheating and affect the properly working of the charger.

(3) Don't put the charger near any heat sources, Charger around must be in place to ensure convenient ventilation and easily pull out and dust-proof, to avoid accumulation of dust on the surface which affect the cooling of the charger.

(4) The charger installation location should be considered waterproof, pay attention to avoid splash water wheel and other parts such as condenser water, in order to avoid the liquid slowly into the charger inside, affect the normal work of the charger.

(5) Make sure the power supply voltage and current with the charger allowed. if any doubt about it, please contact the supplier

or consulting the local power supply bureau.

(6) For safety and electromagnetic compatibility, The charger is equipped with three holes plug, applying with grounding wire socket.

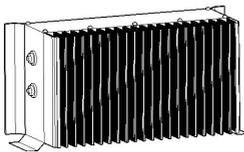
(7) Please use the cable cord with the ability to sustain current .if you are using an extension cord or power strip, Make sure that the total of amperes required by all the equipment on the extension is less than the extension's rating.

(8)The cable in the biggest battery charger and flow pressure drop to less than 1% of the battery voltage as much as possible, otherwise may affect the charging effect, at the same time, the diameter of the wire shall meet the output current value.

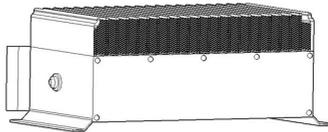
(9)As found in the battery is not working properly or has been damaged, immediately unplug the power connector and the charger interface, and contact the supplier.

(11) Don't try to disassemble the charger by yourself, Opening the charger cover may expose you to shock or other hazards.

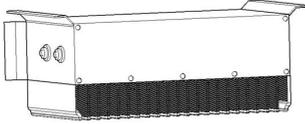
Installation



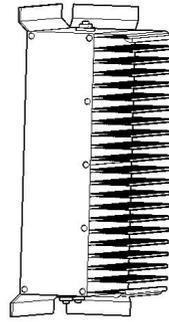
best



better



Deprecated



ok

