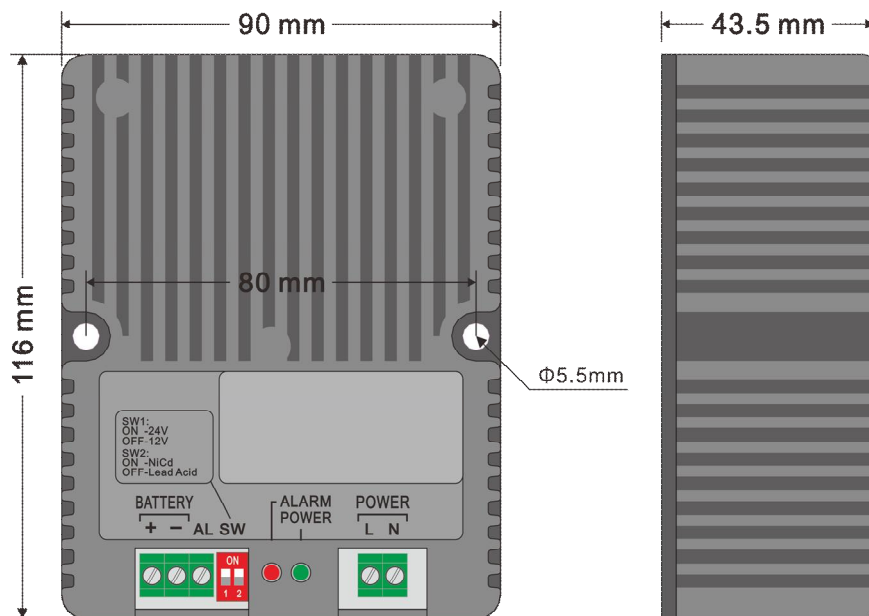


1 Introduction:

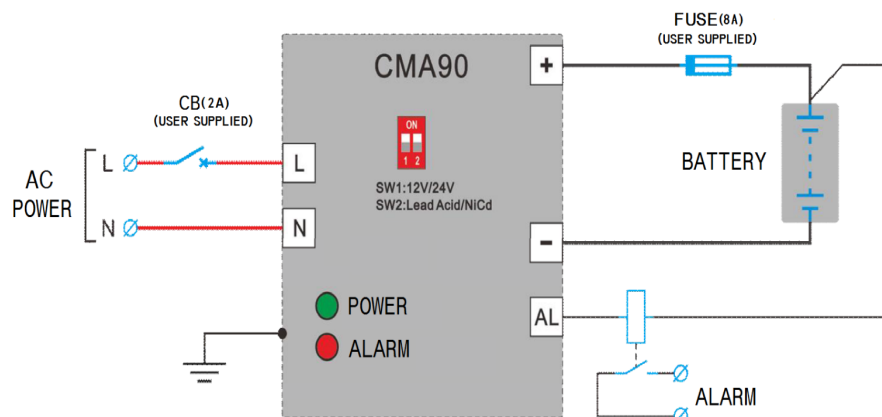
CMA90 is an intelligent charger for engine, is used for engine starting, telecom base stations and power back-up power supply which used lead-acid batteries and nickel-cadmium batteries charging to design, the professional design makes it suitable for all kinds of harsh environments. Feature:

- Microprocessor control measure
- Compatible with 12 / 24V battery, panel microswitch selection
- 3 stage charging
- Full range AC input (Up to300VAC)
- High efficiency of switch power supply circuit
- Precision die-cast aluminum case, compact appearance
- Fanless design, natural air-cooled
- Built-in multiple battery types Charge mode selection
- Perfect protection function: battery high and low voltage, overcurrent, high temperature, reverse polarity protection and so on.

2 Shape and installation dimensions:



3 Typical wiring diagram:



4 Auto charging process

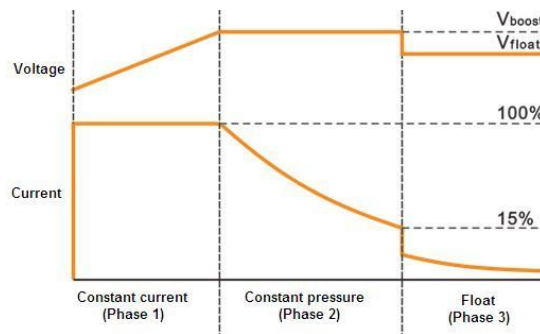
According to the features of the battery charging to design, the charger have 3 stage charging method, charging process as follows:

Phase 1 (constant current): charger at a constant current for the battery, at this stage the battery voltage is gradually increased, when the battery voltage reaches V_{boost} voltage, the charger into the charging phase 2.

Phase 2 (constant pressure) : charger at a onstant voltage V_{boost} (Fast charge voltage) for the battery, the charging current at this stage will gradually decline, when the charge current drops to 15% of rated current, the charger into the charging phase 3.

Phase 3 (float): charger at a constant voltage V_{float} (Float voltage) for the battery. Float process, the charging current is generally less for maintaining the battery fully charged.

Charge graph:



5 LED indicating lamp

POWER: When connected to the AC power, and in the normal range, the indicator illuminate.

ALARM: When the charging failure occurs, the LED flashes. According shiny frequencies representing different fault.

6 Protection function (reverse polarity protection, high-voltage, over-current, high temperature):

Reverse polarity protection: When the battery charger output port positive and negative reverse polarity, output fault effectively, fault indicator light flashes once every 3 seconds, such cycle. Charge stop.

High and low voltage: When the battery voltage is detected to be higher than the high limit voltage, the fault output is effectively, when continuous fault indicator flashes twice and stopped 3 seconds, charge stoped. When the battery voltage is lower than the lower limit, the fault output is valid, the fault indicator flashes 5 times every 3 seconds, the charging does not stop.

Overcurrent fault: When the detected charge current is greater than the limit current, the fault output is effectively, fault indicator continuous flashes 3 times, and stopped 3 seconds, then continuous flashes three times, such cycle. Charge stop.

High temperature fault: when detecting the charger internal temperature is higher than the built-in protection value (95°C), duration of 30 seconds, high-temperature failure, the fault output is effectively, fault indicator continuous flashes 4 times, and stopped 3 seconds, then continuous flashes 4 times, such cycle. Charge stop.

7 Electrical Specifications

Selector witch (SW2)	Lead Acid	NiCd
Vboost	14.0V / 28.0V	14.5V / 29.0V
Vfloat	13.6V / 27.2V	14.1V / 28.2V
Rated output current	5A (12V) / 3A (24V)	
AC input voltage	100 to 277VAC	
Frequency	45 to 65Hz	
Maximum output power	90W	
Operating temperature range	-40 to 70°C	
Storage temperature range	-40 to 80°C	