

SONEIL

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SPECIFICATIONS - 1212SR CHARGER

Totally Automatic Switch-Mode Battery Chargers

"Suitable for Gel, Sealed & Wet Lead Acid Batteries"

Summary: **12 Volts, 5Amp Constant Current**
(equivalent to 10 A tapered charger in charging time)

- Automatic Cut-off and then true Float. Can be left connected indefinitely without harming the battery.
- **UL, CSA & CE Listed.**
- **Input 115/230 VAC** - Suitable for U.S., Canada, Japan (100VAC) and Europe.
- Suitable for On-board (internal) & Off-board (external) applications. **Onboard interlock is provided.**
- Increases battery life by de-sulfating the battery
- Many advance features described in this spec.
- **Very small size and very lightweight**

Explanation of the Features:

The advance technology of the OEM Battery Chargers supplied by Soneil is fundamentally different from other battery chargers. The conventional linear battery charger is an electrical device whereas the 1212SR is a light weight sophisticated electronic device.

1. **Switch-Mode Technology:**

Most of the battery chargers use linear technology, which convert the 115/230 VAC to 12 VDC at 60 or 50 Hz. This requires a large transformer, which has the disadvantage of lower efficiency resulting in higher heat generation, larger size and weight.

Soneil's Battery Charger transforms the 115/230 VAC into 12 VDC at 100,000 Hz (1667 times faster than conventional charger) which requires a much smaller transformer and this results in a unit of smaller size, low weight and improved efficiency.

The 1212SR uses sophisticated electronic circuitry with microchip. All present day computers use switch-mode technology.

2. **International Safety Approvals & Listings:**

Both North American (UL & ULc) and European (CE) listings in a single charger.

3. **Input Requirements:**

- a) 115 VAC (range 90 - 130 VAC) and 230VAC (180-260 VAC).
- b) 47 - 63 Hz

Input AC tolerance +/- 20%. This means 1212SR will operate satisfactorily in areas where the input voltage is low.

This charger is also **suitable for every part of the world** where 115/230 VAC is used and for **Japan** where input is 100 VAC.

4. **Output:**

5 Amps Constant Current @ 12 Volts DC
(Equivalent to 10 Amps tapered charger in charging time)

- a) Line Regulation @ Full Load 2%
- b) Load Regulation @ 115/230 VAC 3%
- c) **Ripple Voltage:** Very low
The peak-to-peak ripple voltage into a resistive load is less than 200mV for the output voltage above 12 VDC.

5. **Charging Cycle:**

The charging curve is attached. The explanation of the charging cycle is as following.

a) **AC connected and battery not connected:**

When the charger is connected to the AC power, the light will be ON, showing that AC power is connected. If the output is not connected to the battery, the light will flash green informing the user that battery side is not connected. Some of the scooter users may be old and if they forget to connect the battery side, the green flashing light reminds them.

b) **Charging:**

When the charger is connected to the battery and AC is plugged in, the light will be yellow (charging).

i) **Deep discharge battery:**

The charger can start charging at the battery voltage as low as 0.5 volts. Soneil charger can charge a very deeply discharged battery. Not many chargers can do this. When charging starts, up to 5 volts, the current is $1/3^{\text{rd}}$ of full current. We want to protect a very deeply discharged battery and do not want to give full current. This charging from 0.5V to 5V only takes few seconds (sometime a fraction of a second) and sometimes it is difficult to measure without sensitive equipment. The yellow lights will be on.

Then the charger will charge at about full constant current rate and the yellow light will be on. Due to the constant current, the charging time will be same as a tapered charger of twice the current rating (e.g. In charging time the Soneil 5A constant current charger is equivalent to 10A tapered charger).

ii) **Full Charge:**

When the battery voltage reaches about 14.4 volts (called upper cut-off voltage), the yellow light changes to green light.

iii) **Maintaining full charge:**

Soneil charger maintains the battery at full charge and does not overcharge. This is done by pulse charging. The light remains green.

At upper cut-off voltage, the charger shuts-off complete (zero current) and floats at 13.8V (standby voltage). When the battery voltage falls (due to internal losses) below 13.8 volts the charger turns ON and gives a current until the voltage reaches 14.4V (gives a pulse of current). Then the charger shuts-off again.

By using the pulse method for final charging, the Soneil charger maintains the battery at full charge at all time without overcharging. For a new battery with lower internal losses, the pulses are less often. With an older battery with higher internal losses, the pulses are more often. The charger adjusts itself to the requirement of the battery.

Soneil charger can charge gel, sealed or wet lead acid batteries without use of any switch.

6. **Two colors in one LED:**

LEDs are used to show the charging status. The LED ON shows AC on. It is Yellow when charging and changes to Green when the battery is fully charged. The charger will continue to provide very small current to cover internal losses and will maintain the battery at full charge.

7. **Very low voltage start:** 0.5 Volts

Will charge very deeply discharged batteries. Many 12 volts chargers in the market will not charge batteries discharge below 9 volts.

8. **De-sulfation of battery:** The charger will remove loose sulfation and increase the battery life. (Hard sulfation cannot be reversed).

9. **Protection:**

User accessible output fuse is provided.

- a) **Reverse polarity protection** - provided
- b) **Short circuit protection** - provided
- c) **Over-Voltage Protection** - provided
- d) **Over current protection** - provided
- e) **AC Surge Protection** - provided
- f) **Soft start and stop:** Starts and stops gradually.

No sudden in-rush of current. This protects both the batteries and any other circuits connected to the charger.

10. **No current drain:**

No (zero) current is taken from the battery when connected to battery but AC not plugged in. (Many other chargers in the market draw 30-40 mA that drains the battery.)

11. **Reliability:**

- a) **Mean Time between failures (MTBF):**
30,000 power-on-hours (POH) or greater. This translates into 10 years of everyday operation of 8 hours.
- b) **Burn-in:** All chargers are burned in at an average DC load of 5 Amps.

12. **Electromagnetic Interference (EMI):**

The charger will not generate excessive radiated or conducted emissions. No interference with TV, radio, computer or other equipment. Meets EN55022, EN50081-1 & -2, EN60555 -2 & -3, EN 50082 -1, IEC 801 -2, -3 & -4.

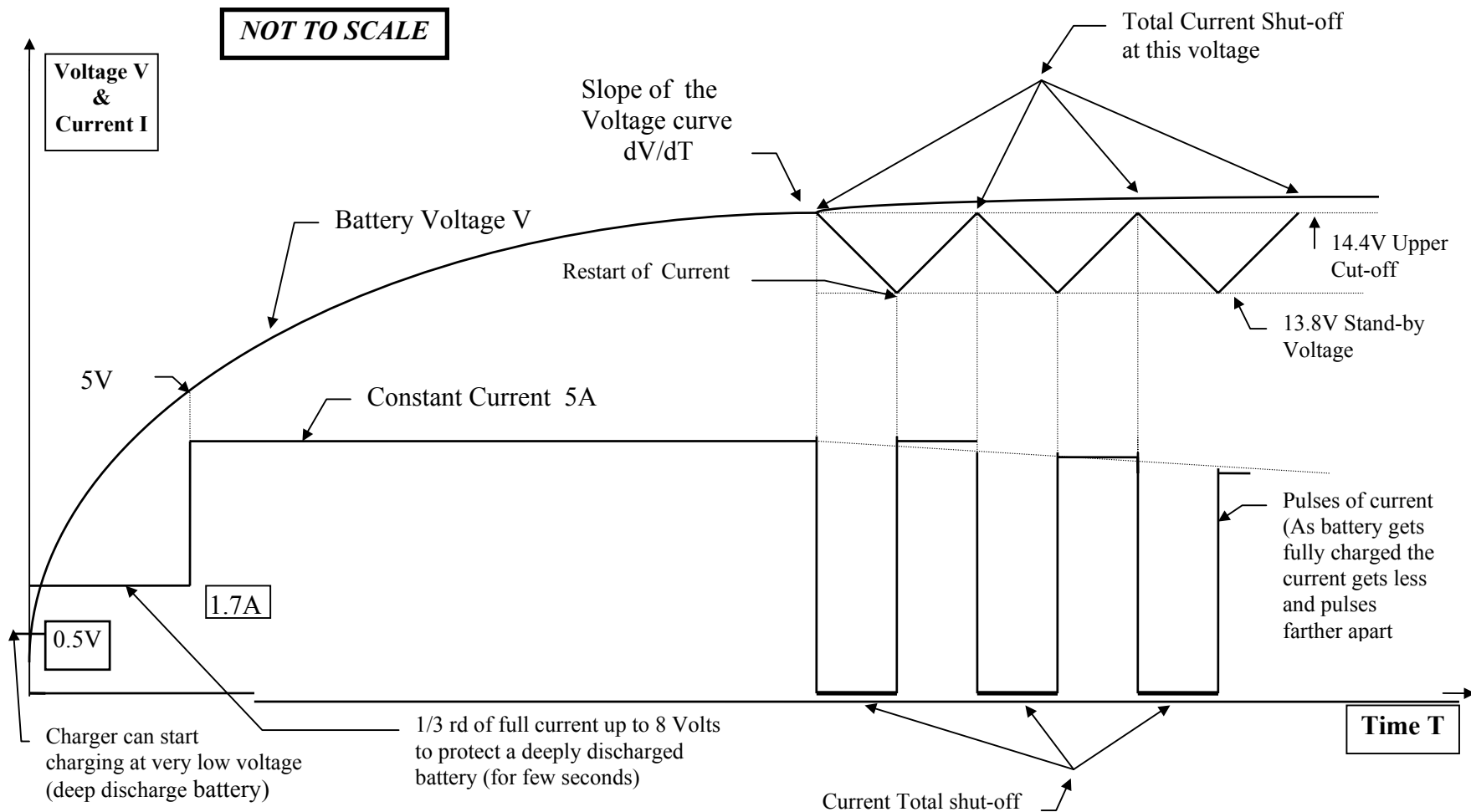
The ground leakage current is 87 microAmp, which complies with the requirements.

- Very Light Weight** 1.5 lbs (700 grams)

Ref: 1212SR(rev08).22-Jul-03

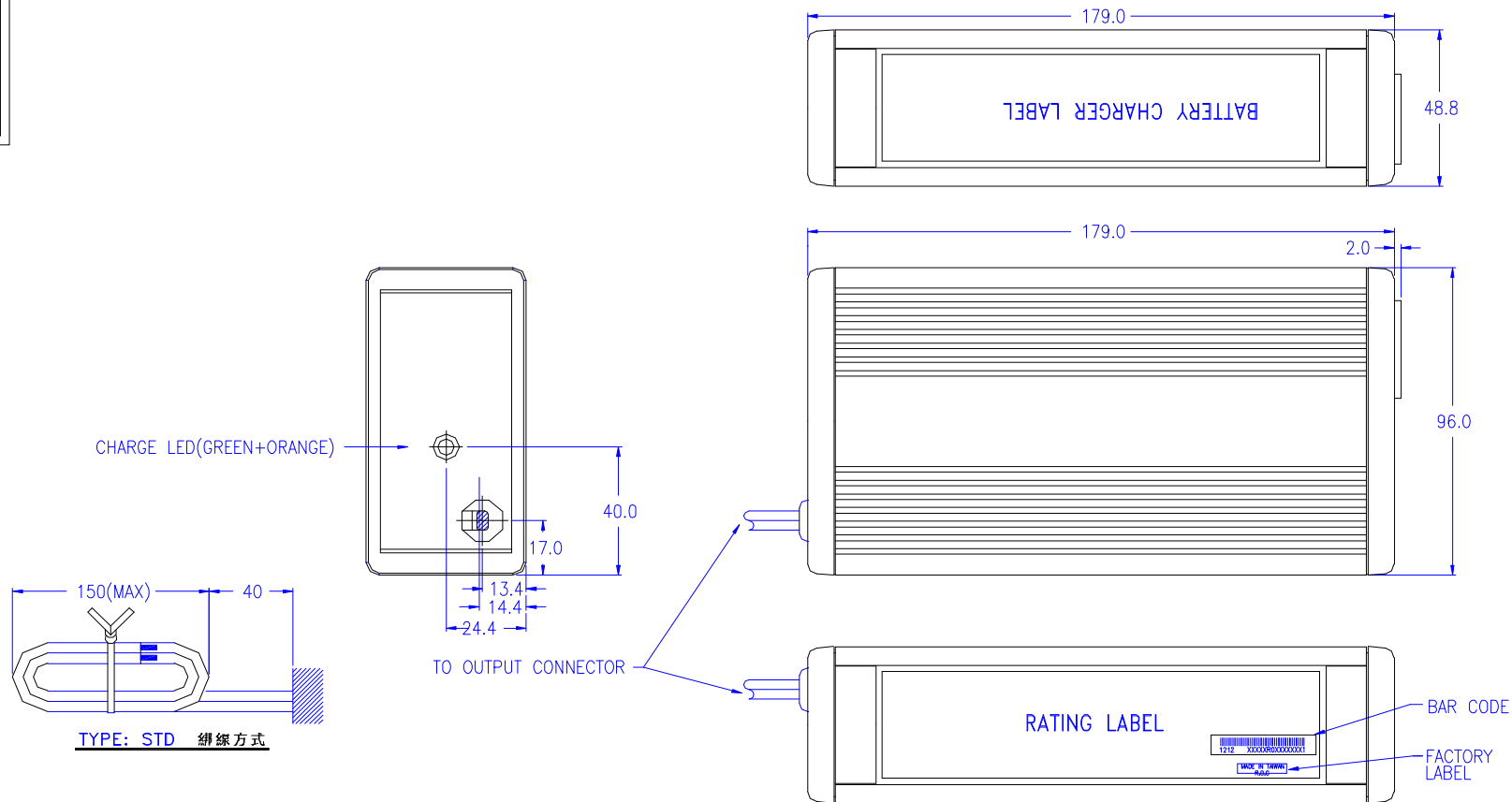
CHARGING CURVE

MODEL 1212SR
SONEIL 12V/5A CONSTANT CURRENT CHARGER



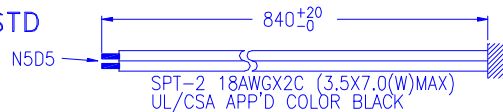
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506-1212-SR1



OUTPUT CONNECTOR: (SEE REMARK A)

TYPE: STD



FILE: 1212SR\OUTLINE

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SONEIL - MISSISSAUGA, ONTARIO, CANADA

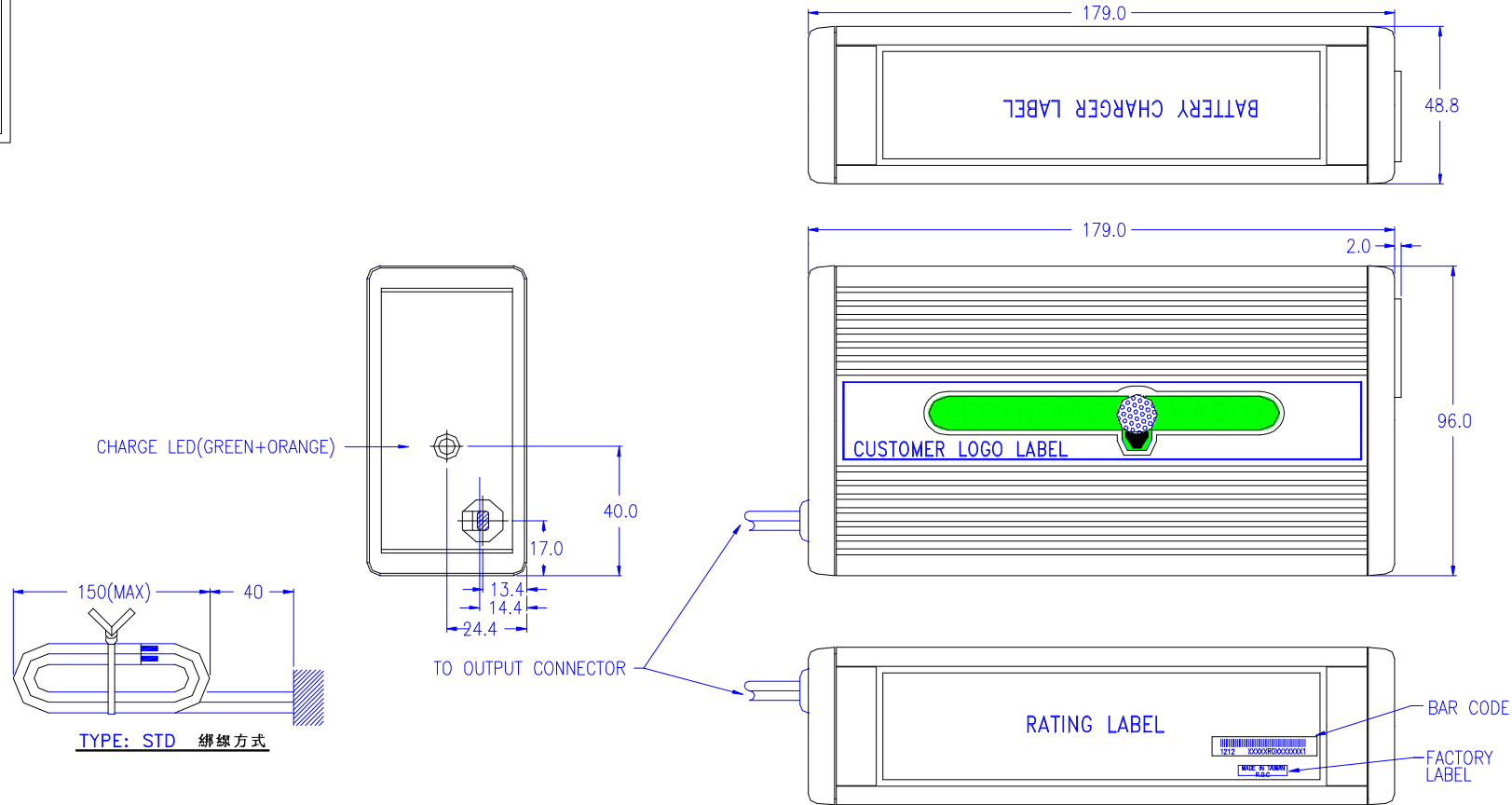
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TOLERANCE: UNLESS OTHERWISE SPECIFIED .XX ±0.3 .XX ±0.5 .XX ±0.05					
DRAWN	DESIGNED	CHECKED	APPV'D	DATE	
				FEB.24.1998	

506-1212-SR1

TITLE

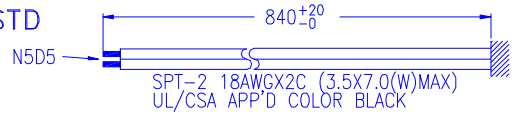
1212SR

506-1212-SR2



OUTPUT CONNECTOR: (SEE REMARK A)

TYPE: STD



FILE: 1212SR\OUTLINE

ISSUE

SONEIL - MISSISSAUGA CANADA
ONTARIO

UNIT mm	SCALE 1X	SHEET 1 OF 1	R 0 A
TOLERANCE: UNLESS OTHERWISE SPECIFIED			
DRAWN	DESIGNED	CHECKED	APPV'D
			DATA FEB.08.1999

506-1212-SR2

TITLE
1212SR(LK)