# TSM1500

# High Efficiency Intelligent Charger

## I. Product Overview

TSM1500 high efficiency intelligent charger is designed to charge traction batteries of electric vehicles. This series of products adopt the most advanced technologies such as LLC resonant, active power factor correction, microcomputer measurement and control, digital adjusting, all in a fully sealed IP66 waterproof case.

Its features include: wide input voltage range adapted to global general voltage; High input power factor that significantly reduces the input current as well as heat generated by input cables adding to overall safety; Low harmonic current that reduces interference to other electric equipment. Full range soft switching is utilized to achieve high conversion efficiency and slight electromagnetic interference; the charger is more energy-saving and money-saving to use This charger is designed according to IP66 protection grade and achieves high waterproof performance. Another feature includes small size, light weight, quiet operation, beautiful appearance, simple installation, operation and low maintenance.

The charger adopts microcomputer measurement and control technology, an embedded CPU can accurately detect the various states of battery charge. Advanced multi-stage charging mode can prevent the battery from over-charging and over-discharging, minimize overheating and water boiling caused by over-charging, slow down polar plate vulcanization phenomenon caused by over-discharge, extending the service life of batteries. The charger will stop automatically after pack is fully charged.

The charger has functions of temperature compensation, automatically shut down after fully charged, battery reverse connection protection, output short circuit protection, AC input under-voltage protection, overheating protection and so on, and these functions help ensure safe and reliable use.

## II. Technical Specifications

**Input voltage range:** 85~265Vac (Note: When the Input voltage is lower than 185Vac, the output power will be limited to 1KW)

**Input Current:** ＜10A @220Vac Input；

**Power Factor:** ≥0.99 @220Vac Input；

Note: Full Power=1.25.Un.In；

**Nominal output voltage (Un):** See Model Description；

**Maxim output voltage:** 140%Un；

**Rated output current (Ir):** See Model Description；

**Conversion efficiency:** ≥ 93%full power output；

**Protection class:** IP66；

**Audible Noise:** ≤ 40dB；

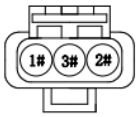
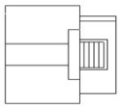
**Vibration Class ：** According to “GB/T 2423.10”；

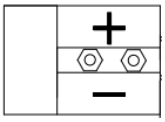
**Working temperature:** -25~55℃;

**Storage temperature:** - 40~80℃;

**Recognition certificates:** CE

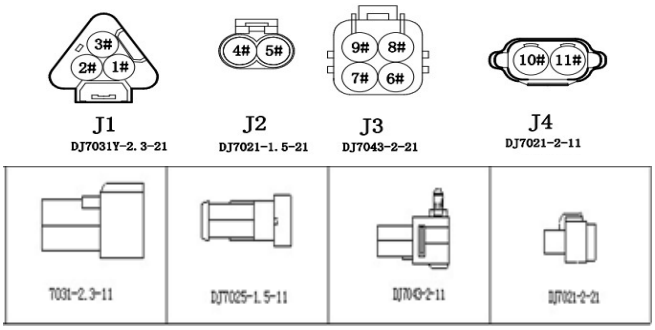
## III. Interface Instructions

| **Input Cables** | | | |
|---|---|---|---|
| **Terminal Model** | | DJ7031-4.8-11 |   |
| **Terminal Model for matching** | | DJ7031-4.8-21 |  |
| **No.** | **Color** | **Wire Diameter** | **Function Description** |
| 1# | Brown | 2.5mm$^2$ | L-Live wire |
| 2# | Blue | 2.5mm$^2$ | N-Neutral wire |
| 3# | Yellow and green | 2.5mm$^2$ | PE-Protective grounding wire |

| Output Cables | | | |
|---|---|---|---|
| Terminal Model | | SB50 |  |
| No. | Color | Wire Diameter | Function Description |
| + | Red | 6.0mm² | Output positive pole |
| - | Black | 6.0mm² | Output negative pole |

| Signal Cables | | | | |
|---|---|---|---|---|
| No. | Color | Terminal Model and Function | Pin Description | Terminal Model for matching |
| 1# | Brown | DJ7031Y-2.3-21 External LED indicator interface | Red Light | DJ7031Y -2.3-11 |
| 2# | Blue | | Common- | |
| 3# | Yellow | | Green Light | |
| 4# | Purple | DJ7021-1.5-21 Battery Temperature sensor interface | Sensor+ | DJ7021 -1.5-11 |
| 5# | White | | Sensor- | |
| 6# | Pink | DJ7043-2-21 Serial communication interface | GND | DJ7043 -2-11 |
| 7# | Yellow and green | | VCC | |
| 8# | Blue and white | | TXD | |
| 9# | Green and white | | RXD | |
| 10# | Orange | DJ7021-2-11 Forbidden signal interface (normal close) | COM | DJ7021 -2-21 |
| 11# | Grey | | NC | |
| Wire Diameter | | 0.5 mm² for all Signal wires | | |

**Signal Cables Terminal Diagram**




**Direction of view: form the cables to terminal for all.**

## V. Charging Indicator Information Description

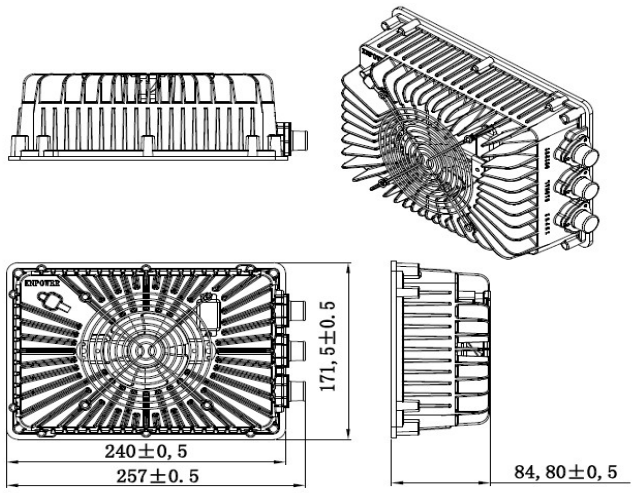
| LED Indicator Information Description | | | |
|---|---|---|---|
| **I. Charging Process Information** | | | |
| 1 | Low battery power | | R--- |
| 2 | Battery charge lower than 80% | | R- |
| 3 | Battery charge between 80%--90% | | Y- |
| 4 | Battery charge between 90%--100% | | G- |
| 5 | Fully charged | Normal process of charging | continuous Green light |
| | | Battery temperature sensor fault | Green light (3S) Yellow light (0.3s) |
| **II. Alarm Information** | | | |
| 1 | Battery Not connected | | R-G--- |
| 2 | Charger over-temperature protection | | R-G-Y--- |
| 3 | Input fault protection | | R-G-Y-Y--- |
| 4 | Charging timeout | | R-G-Y-Y-Y--- |
| 5 | Battery Overheating | | R-G-Y-Y-Y-Y--- |
| 6 | Pre-Charge timeout | | R-G-Y-Y-Y-Y-Y--- |
| 7 | Internal temperature sensor fault | | R-G-Y-Y-Y-Y-Y-Y--- |
| 8 | Output voltage feedback fault | | R-G-Y-Y-Y-Y-Y-Y-Y--- |
| 9 | Low temperature start delay (When the internal temperature of charger is between -20 to -30 ° C, the charger will delay starting for 1~2 minutes) | | R-G-Y-Y -Y-Y-Y-Y-Y--- |

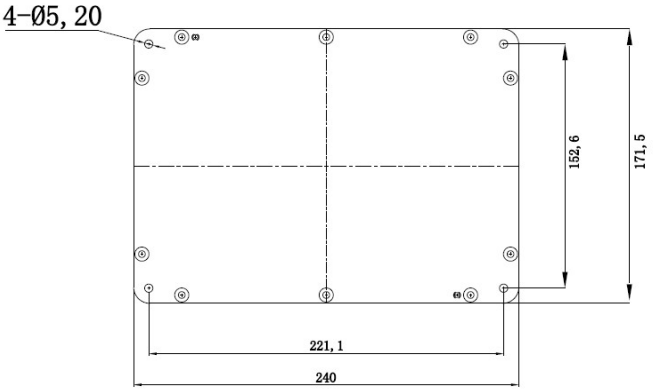
Note：
1."-" represents led that does not light for 0.5s, a color word represents that the LED of this color lights for 0.2s.
2. R --red G —green Y—yellow

## VI. Methods of Operation

1. Connect the output terminal of the charger to the battery terminal.
2. Connect the input plug of the charger to AC power socket until the charger turns into normal charging process (observe the LED Indicator), then Charger will automatically charge the batteries. When fully charged, the charger will automatically shut down, and display ‘full power’.
3. If observed the battery become overheating or ballooning during charging process, you should stop the charger immediately by unplug the plug from the AC socket.

## VII. Appearance and Installation Dimensions（mm）


171, 5±0. 5
240±0, 5
257±0. 5
84, 80±0, 5


4-Ø5, 20
152, 6
171, 5
221, 1
240