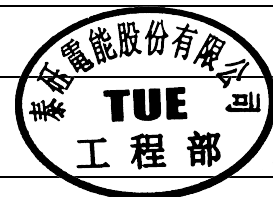


SPECIFICATION FOR REFERENCE

CUSTOMER	
CUSTOMER P/N	
MODEL No.	F300SC-D252E
PART No.	
DESCRIPTION	<p>TYPE: Balance Charger for 6S Li-Ion Battery</p> <p>Input: 100-240 VAC 50/60 Hz (C14 Inlet)</p> <p>Output: 25.2V / 8.0A</p> <p>DC cord: UL2464, 16AWG, 0.2M</p> <p>DC Plug : Charger: TW60M Balancer: B7B-XH-A</p> <p>AC cord: US 3P AC Plug, SVT 3X0.824mm², (18AWG), 1.2M</p> <p>Standby: Detection output</p> <p>FW: Charger: CP01006_V00 Balancer: Balancer_CP01008_V00</p>
REVISION	A4



CUSTOMER APPROVED SIGNATURE	
Approval Signature	
Date	

Top-Unum Electronics Co., Ltd.	
Edited by	Patrick
Checked by	Ghome
Approved by	Robert
Date	2025/05/12

Revision History

Revision	DESCRIPTION		
	Before	After	Date
A0	X	Initial release	2025/01/20
A1			2025/02/21
A2			2025/03/11
A3			2025/04/21
A4			2025/05/12

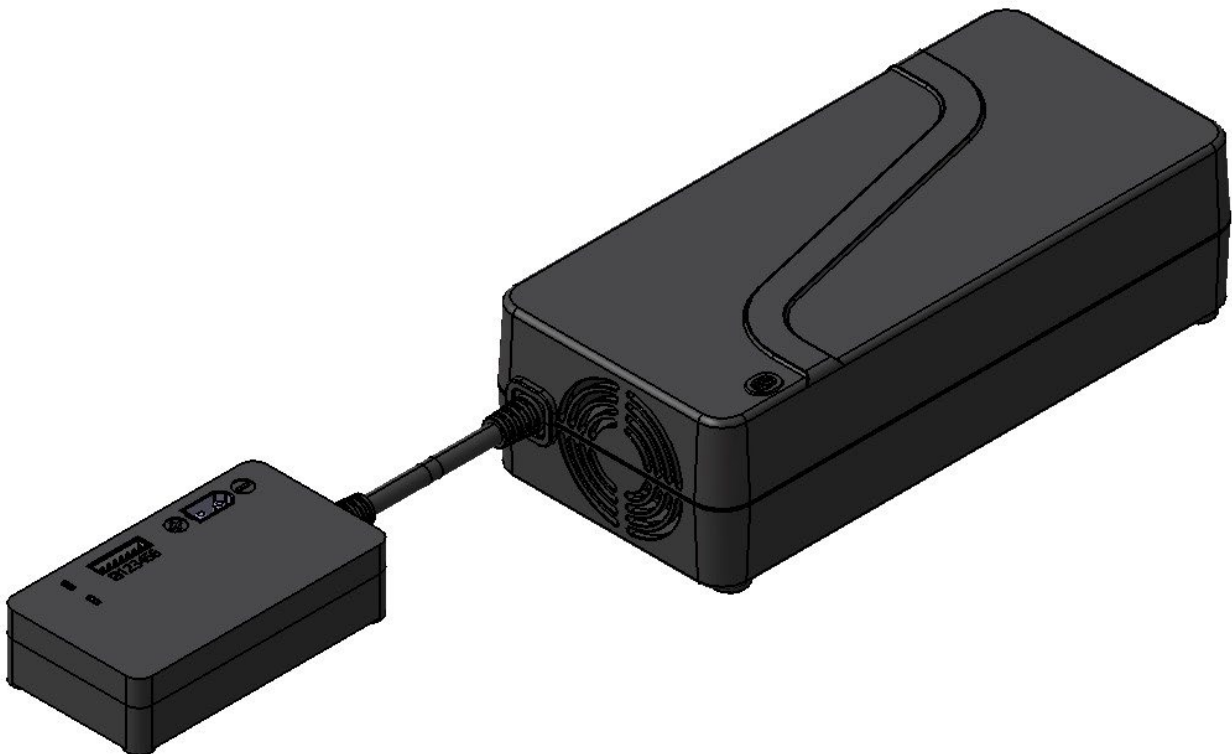
Announcement 注意事項

Before charging, please connect the battery first, and then connect the AC power source.

After charging is complete, disconnect the AC power first, and then disconnect the charger from the battery.

充電之前，請先連接電池，然後再連接交流電源。

充電完成後，請先斷開交流電源，然後將充電器與電池脫離。



Troubleshooting 故障排除

When the red LED flash.

當紅色 LED 閃爍時。

Disconnect the AC power, remove the abnormality, and then reconnect the AC power to normal.

斷開交流電源，排除異常，然後重新連接交流電源將可恢復正常。

If the fault condition persists, check the battery pack.

如果故障情況仍然存在，請檢查電池組。

SPECIFICATION

characteristics 特性指標	SPECIFICATION 規格參數
Max. Charging Voltage 最大充電電壓	25.0V \pm 0.2V (25.2V Max.)
Charging Current 充電電流	8.0A \pm 0.3A Constant Current Mode
AC Input Voltage 輸入電壓	100Vac ~ 240Vac, 50/60Hz (Range: 90Vac ~ 264Vac)
Efficiency 效率	84% Min. @ 230Vac input voltage, 24.0V and 8.0A rated load.
Charging characteristics 充電特性	Standby mode (not connected to battery) Vo: 無輸出 (偵測輸出)
	Battery Low: STOP charging when battery low, Red LED flashing. under 15.0V \pm 1.0V, stop charging.
	Pre-Charge : Constant Current Mode Vo: 15.0 \pm 1.0V ~ 18.0V \pm 1.0V Io= 0.75 \pm 0.1A
	C.C. Fast Charge: Constant Current Mode Vo: 18.0V \pm 1.0V ~ 24.0V \pm 1.0V Io= 8.0 \pm 0.3A
	C.V. mode: Constant Voltage Mode Vo: > 24.0V \pm 1.0V Io : 8.0A \rightarrow 0.25A
	Fully Charged: When the charging current is less than 250mA, is defined as fully charged. The charger output is turned off and the green LED is on. Vo: 25.0V \pm 0.2V Io: < 0.25A, The Green LED ON.
LED indicator 指示燈號	Standby mode: (not connected to battery) / Full Charged mode : The Green LED is ON.
	Charging Mode: The Red LED is ON.
	Fault mode: The Red LED is blinking.
Environmental 環境要求	Operation Temperature : -10 ~ 45 °C Storage Temperature : -20 ~ 70 °C Operation Humidity : 10% - 90% RH Storage Humidity : 10% - 90% RH

characteristics 特性指標	SPECIFICATION 規格參數
Over voltage protection 過電壓保護	> 26.0V, the charger stops charging and the LED blinking.
Over current protection 過電流保護	> 8.5A, the charger stops charging and the LED blinking.
Short circuit protection 短路保護	When an output short circuit occurs, the charger stops charging and the LED blinking. Remove the abnormality, and then reconnect the AC power to resume to normal.
Reverse battery current 逆向電流	Reverse battery current < 1.0 mA
Recharge level 自放電回充電壓	Battery Voltage < 22V ± 1.0V
Timing Protection 定時充電保護	(1) Pre-charge over 1 hrs, stop charging. (2) CC Fast Charge Mode over 10 hrs, stop charging. (3) CV Mode over 4hrs, stop charging
Mechanical Dimensions 機械尺寸	Dimensions: L 211mm* W 94.97mm* H 61mm (± 2.0mm)
AC Inlet socket 輸入 AC 座	C14 (IEC60320)
DC power cord 輸出 DC 線	UL2464, 16AWG, 0.2M, DC Plug: TW60M Balancer: B7B-XH-A
Insulation resistance 絕緣阻抗	> 10Mohm
Dielectric strength 絕緣耐壓	3000VAC 5mA 1 minute
MTBF	> 50,000 hours MTBF @ 25° C
Environmental 環保要求	RoHS, REACH

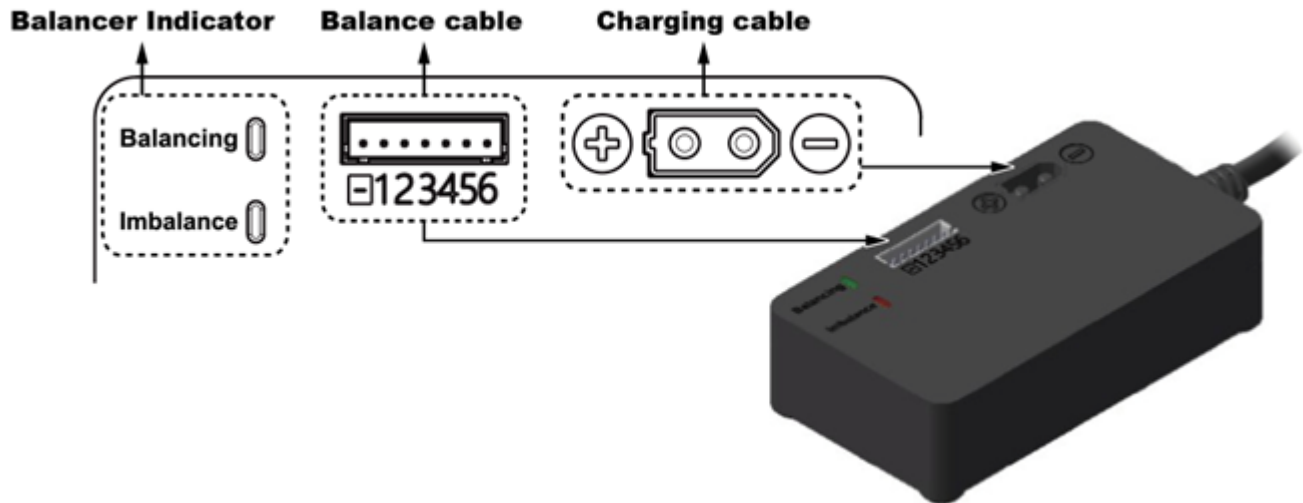
電池平衡器規格 Balancer Box

CP01008

characteristics 特性指標	SPECIFICATION 規格參數
平衡器功能說明	<ol style="list-style-type: none"> 平衡線未連接只連接充電線 (平衡器指示燈號不亮): 平衡器不執行功能, 充電器停止充電。 只連接平衡線未連接充電線 (參閱平衡器指示燈號說明): 只能檢查電池電壓平衡狀態, 但無法充電。 平衡線與充電線皆正確連接 (參閱平衡器指示燈號說明): 任一串電池電壓 < 3.8V 時, 平衡器不執行功能, 充電器依電池電壓狀態進行相應電流充電。
Balancer indicator (平衡器指示燈號說明)	<p>綠色 LED : 平衡動作指示燈 綠色 LED 閃爍 : 電池間電壓差過大, 執行平衡動作中。 綠色 LED 恆亮 : 電池間電壓差正常。</p> <p>啟動平衡條件:</p> <ol style="list-style-type: none"> 任一串電池電壓 > 3.8V 時 : 最大電壓與最小電壓差 > 50mV, 綠燈閃爍, 開始平衡。 直至最大電壓與最小電壓差 ≤ 30mV, 綠燈恆亮, 結束平衡。 <p>紅色 LED : 電池老化指示燈 紅色 LED 不亮 : 電池正常。 紅色 LED 恆亮 : 電池老化。 紅/綠 LED 閃爍 : 電池電壓過低。</p> <p>電池老化判斷條件:</p> <ol style="list-style-type: none"> 任一串電池電壓 > 3.8V 時 : 最大電壓與最小電壓差 ≥ 100mV, 代表電池老化, 紅燈恆亮, 停止充電。 最大電壓與最小電壓差 < 50mV, 代表電池正常, 紅燈不亮, 重啟充電。 單串過充電壓 : 4.23V 當任一串電池 ≥ 4.23V, 代表過度充電, 紅燈恆亮, 停止充電。 單串過充恢復電壓 < 4.18V, 代表恢復正常, 紅燈不亮, 重啟充電。 任一串電池過低壓 : 2.3V 當任一串電池 < 2.3V, 代表電池過低壓, 紅/綠 LED 閃爍, 停止充電。 需移除平衡線, 更換電池。

Balancer Box

Balancer Function Description



Function

1. The balance cable is not connected and only the charging cable is connected (the balance indicator light is off):

The balancer does not perform its function and the charger stops charging.

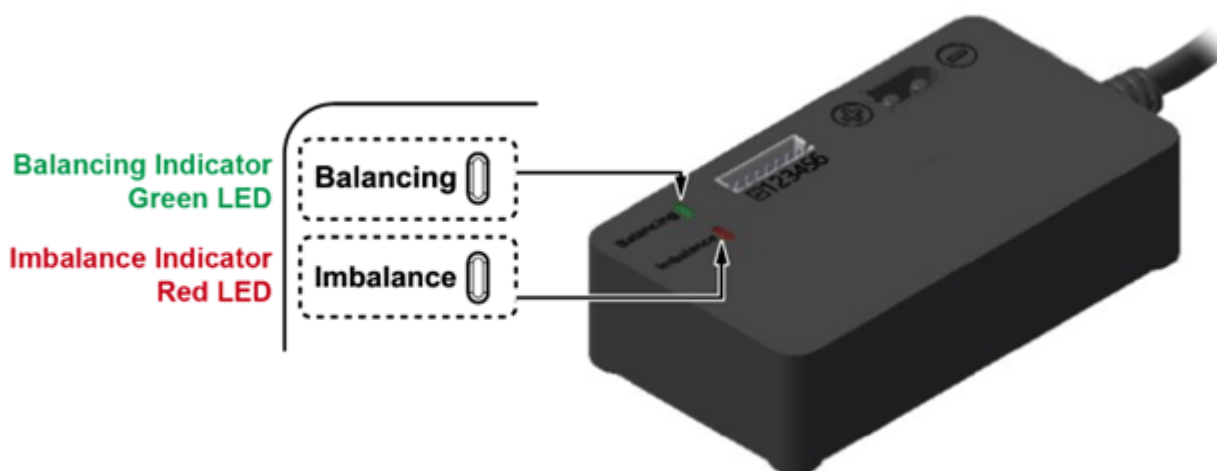
2. Connect only the balancing cable without the charging cable (refer to the indicator light description of the balancer):

Can only check battery voltage balance status, but cannot charge.

3. The balance cable and charging cable are correctly connected (refer to the balance indicator light description):

When the voltage of any battery string is less than 3.8V, the balancer will not function. The charger will charge the battery with appropriate current based on the voltage status.

Balancer Indicator Description



Balancing Indicator: Green LED

- Green LED Blinking: Voltage difference between cells is too large; balancing in progress.
- Green LED solid on: Voltage difference between cells is normal.

Conditions for Starting Balancing

If the voltage of any cell is greater than 3.8V:

- *When the voltage difference between the highest and lowest cell exceeds 50mV, the green light blinks, and balancing starts.
- *When the voltage difference is $\leq 30\text{mV}$, the green light stays on, and balancing stops.

Imbalance Indicator: Red LED

- Red LED off: Battery is normal.
- Red LED on: battery unbalanced.
- Red/Green LED flashes alternately: battery voltage is too low.

Battery imbalance judgment conditions

When the voltage of any cell is greater than 3.8V:

- *If the voltage difference between the highest cell and the lowest cell is $\geq 100\text{mV}$, the cells are unbalanced. The red LED lights up and charging stops.
- *If the voltage difference is less than 50mV, the battery is normal. The red LED goes out and charging resumes.

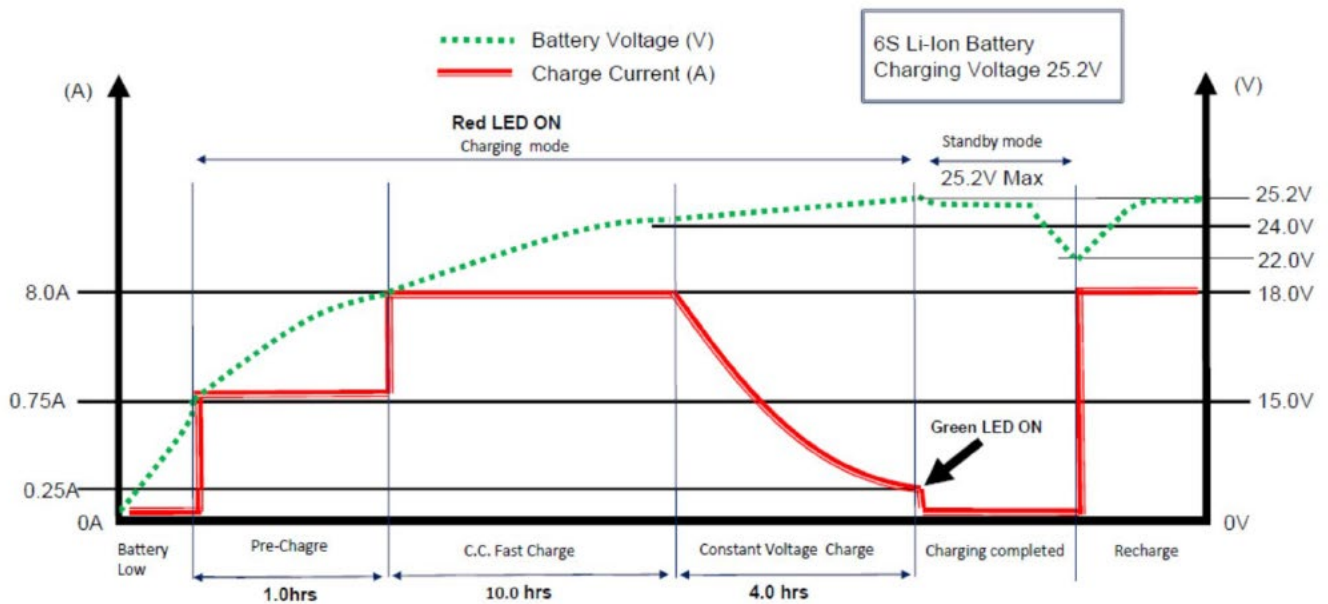
Overcharge Voltage for Single Cell: 4.23V

If any single cell $\geq 4.23\text{V}$, it's considered overcharged. The red LED turns on, and charging stops. If the single cell overcharge recovery voltage is $< 4.18\text{V}$, it returns to normal, the red light goes out, and charging resumes.

Low Voltage for Single Cell: 2.3V

When any cell is less than 2.3V, it means the battery voltage is too low, the Red/Green LED flashes alternately, and charging stops. The balance cable needs to be removed and the battery should be replaced.

Charging curve 充電曲線



Charging Mode 充電模式

Mode	Output Voltage	Output Current	status
1	< 15.0V ± 1.0V	0A	STOP charging
	When the battery voltage is less than 15.0V, it is defined as battery damaged. The charger stops charging and the Red LED blinking.		
2	15.0~18.0V ± 1.0V	750mA ± 0.1A	Constant Current
	The Red LED is ON.		
3	18.0~24.0V ± 1.0V	8.0A ± 0.3A	Constant Current
	Constant current charging. The Red LED is ON.		
4	> 24.0V ± 1.0V	8.0A → 0.25A	Constant Voltage
	Constant voltage charging. The Red LED is ON.		
5	25.0V ± 0.2V	< 0.25A ± 0.1A	STOP charging
	When the charging current is less than 250mA, is defined as fully charged. The charger output is turned off and the green LED is on.		
6	無輸出	0A	Battery not connected
	When the charger is not connected to the battery, No output and the greed LED is on.		
7	< 22V ± 1.0V	8.0A	Constant Current
	After a full charge, the charger will restart when the battery voltage drops below 22.0V.		

Protection characteristics 保護功能

Timing Protection characteristics 定時保護功能

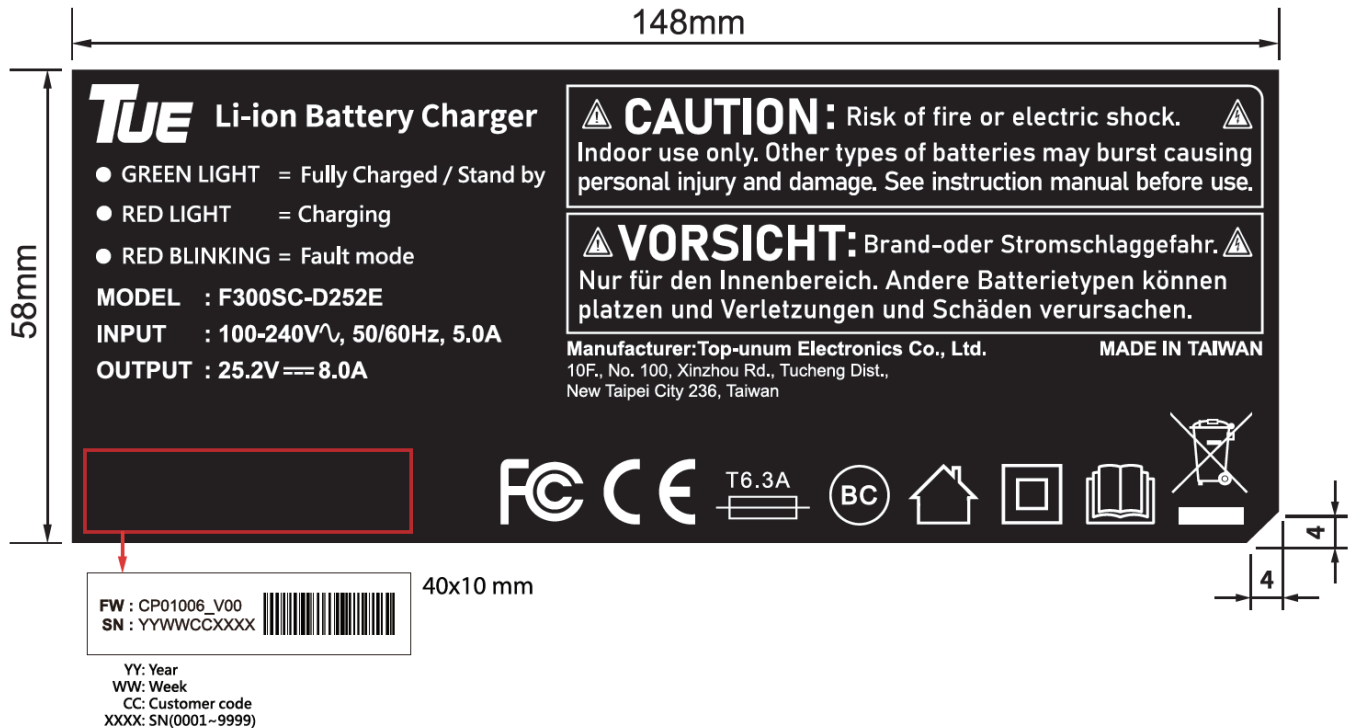
Status 保護狀態		SPEC 規格	Charging Status 充電器狀態
1	Pre-Charge 預充電模式	Battery voltage 15.0~18.0V ± 1.0V	Charging time: 1.0 hours ± 10 minutes The battery voltage is still lower than 18V, Battery voltage is too low, stop charging, the Red LED is blinking.
2	Charge Mode 充電模式	Battery voltage 18.0V~24.0V ±1.0V	Charging time: 10.0 hours ± 60 minutes If the charger uses constant current fast charge for more than 10 hours, it means that the battery capacity does not match. Charging will stop and the Red LED is blinking.
3	C.V. mode 定電壓充電模式	Battery voltage >24.0V ±1.0V	Charging time: 4 hours ± 30minutes If the charger uses the constant voltage mode to charge for more than 4 hours, the charging will stop and the green LED will light up, indicating that the charging is complete.

Safety and EMC compliance 安規與電磁相容

Mark Used		Country	Standard
1	CE (LVD)	Europe	EN 60335-1:2012/A15:2021; EN 60335-2-29:2021/A1:2021
2	CE (EMC)	Europe	EN IEC 55014-1:2021 EN IEC 55014-2:2021 EN IEC 61000-3-2:2019/A1:2021 EN 61000-3-3:2013/A2:2021
3	FCC	USA	47 CFR FCC Part15, Subpart B ANSI C63.4:2014

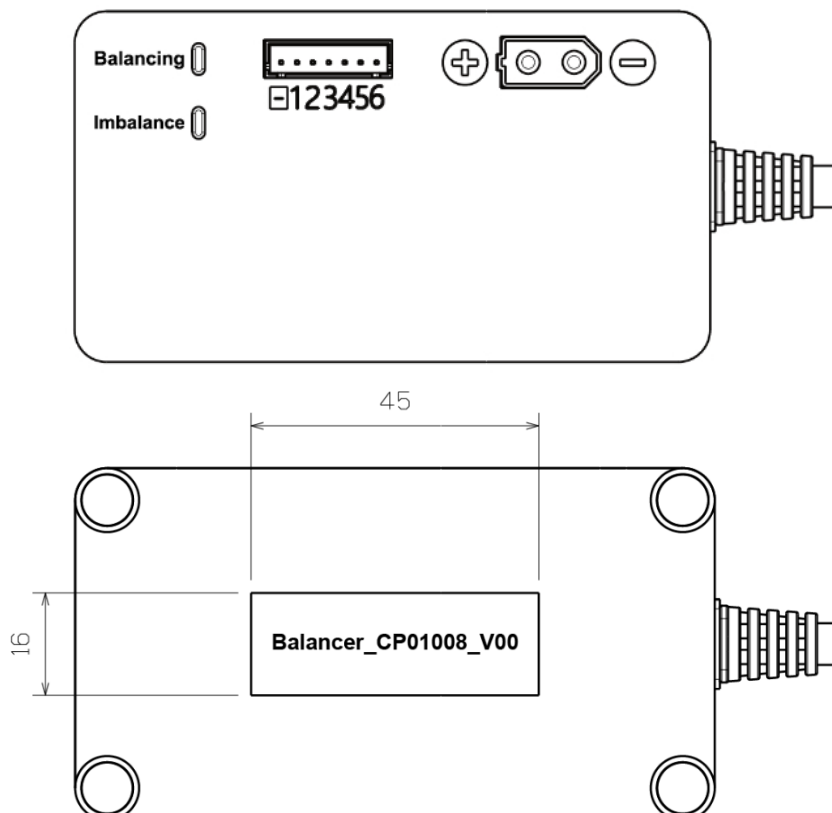
Label for reference

Case



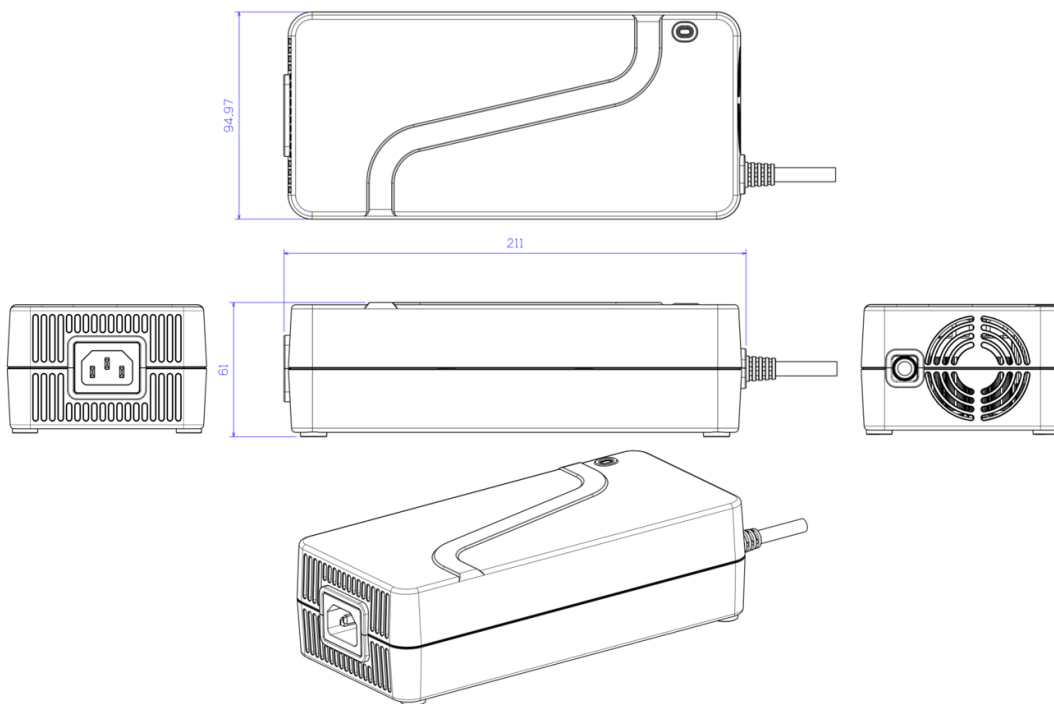
版次 : F300SC-D252E_CP01006_L02

Balance_Box 雷雕



Drawing 外觀尺寸圖

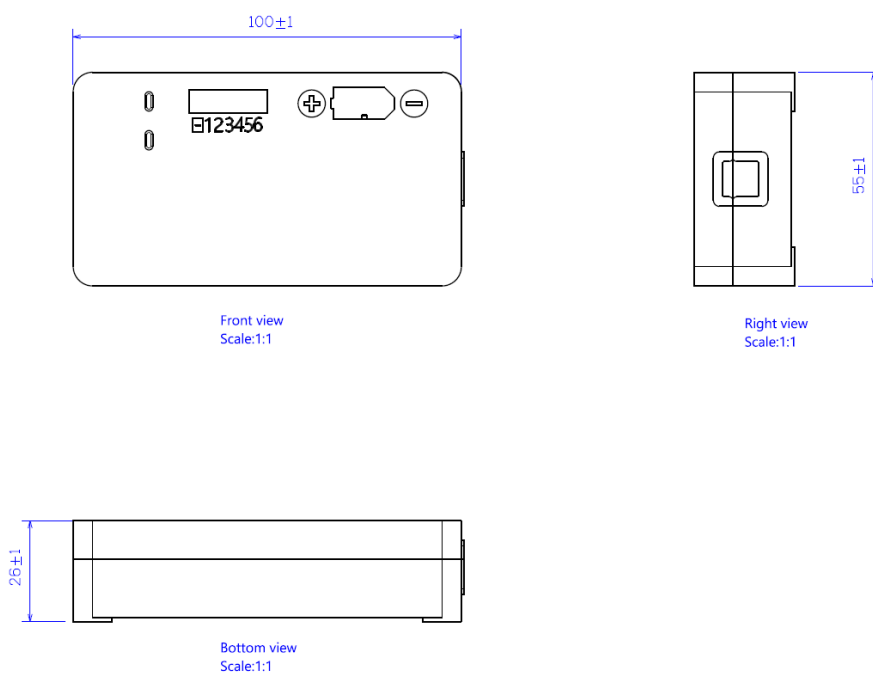
CASE



Dimension: L 211 x W 94.97 x H 61 (mm)

Color: Black

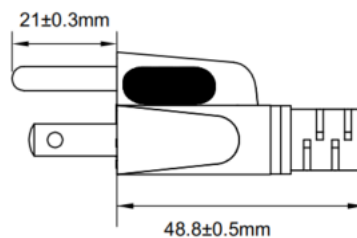
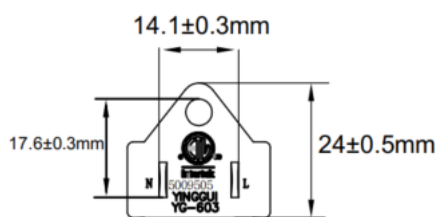
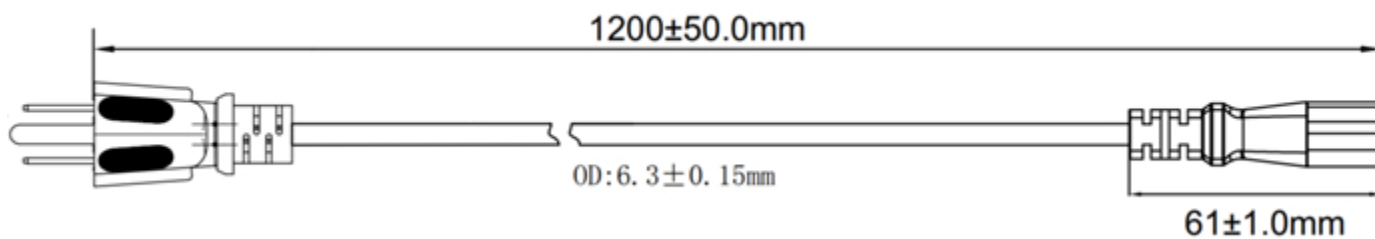
Balance_Box



Dimension: L 100 x W 55 x H 26 (mm)

Color: Black

AC CORD

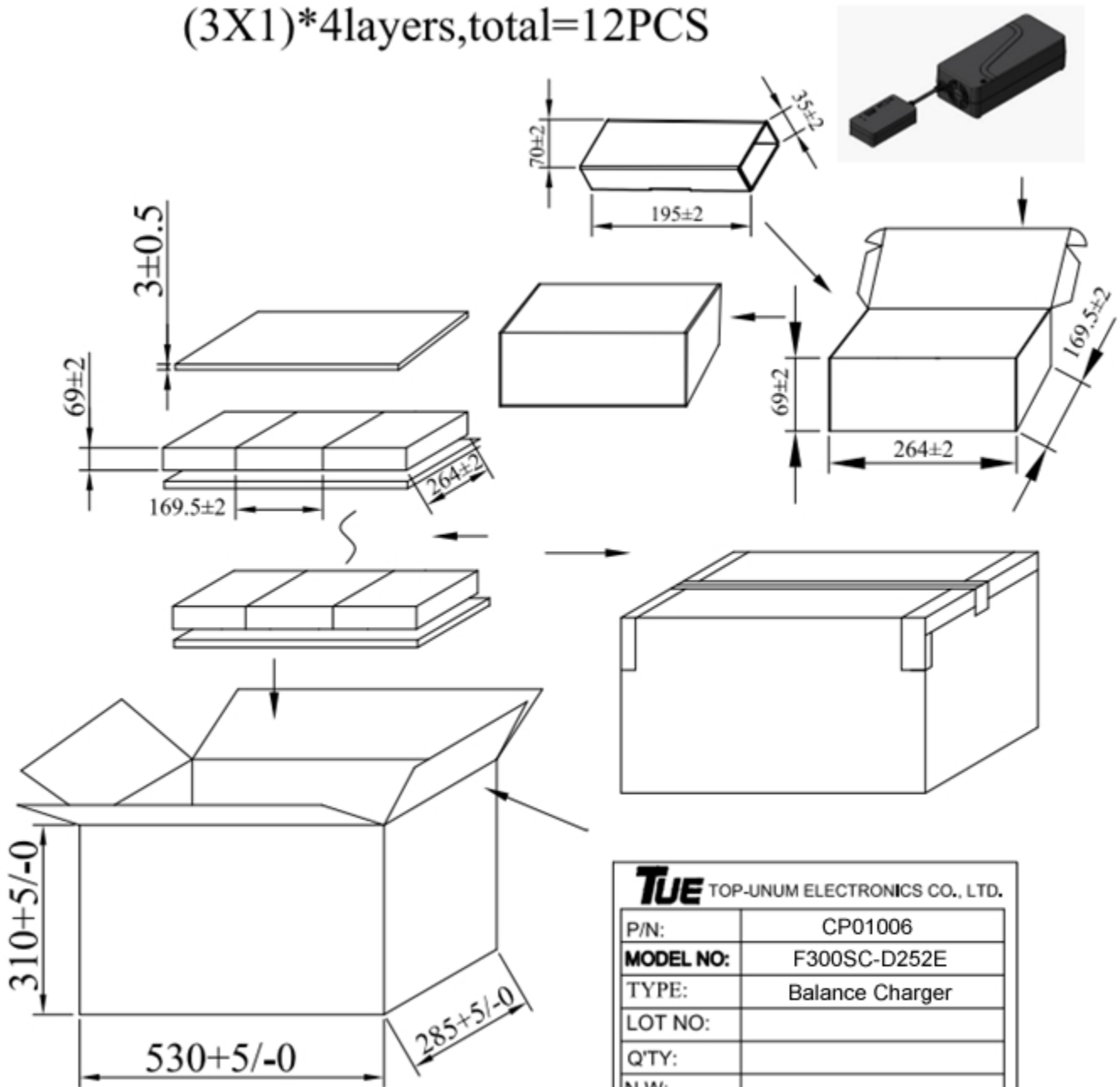


US 3P AC Plug, SVT 3X0.824mm², (18AWG), 1.2M

Note: 同等規格

Packing 包裝

(3X1)*4layers,total=12PCS



TUE TOP-UNUM ELECTRONICS CO., LTD.	
P/N:	CP01006
MODEL NO:	F300SC-D252E
TYPE:	Balance Charger
LOT NO:	
Q'TY:	
N.W:	
G.W:	
DATE:	