Data Sheet & Operational Manual
For
Charging & Balancing System

1582 Series Charger + Balancer up to 14S, up to 10A

Revision table

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Table of Contents

1. GENERAL 3
2. PRODUCTS 3
3. COMPANY WARRANTY 3
4. CHARGERING SYSTEM 4
5. CHARGER P.N. 5
6. CHARGING + BALANCING HARNESS 6
7. INLET HARNESS 6
8. POWER SUPPLY 6
9. ADDITIONAL OPTIONS 7
10. REQUIRED DATA BEFORE ORDER 7
11. CHARGING INSTRUCTIONS - GENERAL 8
12. CHARGING PROCEDURE 8
13. CHARGE COMPLETION 10
14. COMPUTER CONNECTION 10
15. SYSTEM MAINTENANCE & TROUBLESHOOTING 10
16. SAFETY INSTRUCTIONS - CHARGER 11
17. APPENDIX A - PICTURES 13

1. GENERAL

1.1. This document is a Data Sheet for the products, manufactured by "Amicell - Amit Industries", as described in paragraph 2.

1.2. The data sheet specifies the products characteristics, performance, user manual and safety.

1.3. Upon ordering this product – please answer questions in paragraph 1010.

Figure 1 – Charger – Front view

2. PRODUCTS

2.1. Charging + Balancing system for Li-Ion/Polymer battery pack calibrated to battery voltage and required charging current X 1

2.2. Inlet harness – from 9-36VDC X 1

2.3. Optional: Charging + Balancing Harness X 1

2.4. Optional: AC-DC power supply X 1

3. COMPANY WARRANTY

3.1. Warranty for charging system – 12 months from production.

3.2. Amicell - Amit Industries will not be liable for any damage caused by misuse of the product supplied or any other use that does not correlates the manufacturer instructions.

4. CHARGERING SYSTEM

4.1. DATA SHEET

	Item	Specification
4.1.1.	Description	**Lithium-Ion/Polymer Charger + Balancing system, calibrated according to customer request**
4.1.2.	Cat. No.	See paragraph 5.
4.1.3.	Charging Method	CC-CV
4.1.4.	Charging Voltage	According to charger calibration (±0.2V) See paragraph 5.2.
4.1.5.	Charging current	Up to 10A / 600W
4.1.6.	Electronic System	▪ Lithium-Ion Charging system ▪ Balancing system ▪ Battery status - Charging + Balancing – OLED display ▪ SOC: Full / Storage / Transportation ▪ Battery Thermal protection during charge [1] ▪ Battery recovery function - slow charge in low voltage ▪ Electronic Load 150W
4.1.7.	Charger + Balancer safety systems	▪ Reverse polarity ▪ Over charge on each cell
4.1.8.	Input Voltage	9-36VDC
4.1.9.	Charge connector	See paragraph 5.5 [2]
4.1.10.	Inlet connector	Anderson PP-15-45 x 2 (Red/Black)
4.1.11.	Switches	▪ "ON/OFF switch" ▪ SOC button selector
4.1.12.	Output data	RS232 connection (RS232 cable not supplied)
4.1.13.	Charging Temperatures[3]	0 - +40°C
4.1.14.	Case	Amicell case – D240 x W120 x H230

4.2. State Of Charge - SOC level Selector

4.2.1. 3 States of charge ~30%, ~60%, 100%.

4.2.2. For each channel the user decides to what SOC to charge the battery. The system decides automatically if charge/discharge in order to achieve it.

4.2.3. Note: This option **MUST** be decided upon charger activation. It cannot be changed once the charging process has started. In order to change charging level - turn off the charger and restart.

[1] In accordance with battery design.
[2] Default option. On request, and with Amicell approval, the charger connector can be replaced.
[3] The functional parameters of the charger are defined for ambient temperature +25°C

5. CHARGER P.N.

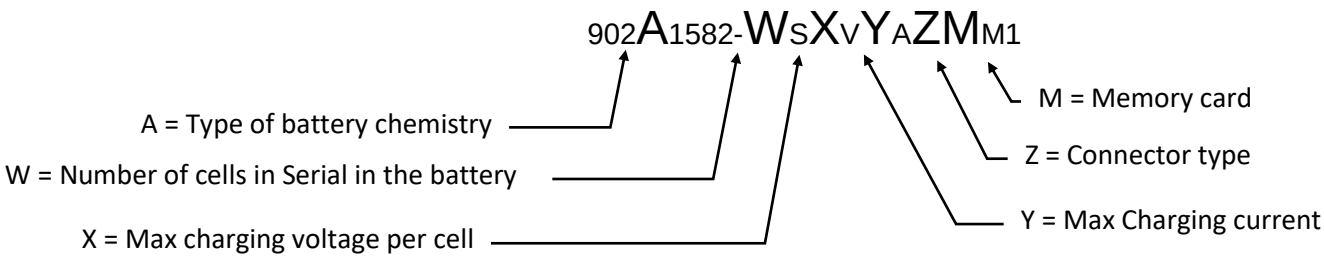

Figure 2 – Amicell charger P.N.

5.1. **A** = Type of chemistry

	A = Type of chemistry
Li	Lithium-Ion / Polymer (NCA, NMC,…)
LF	Lithium iron phosphate (LFE/$LiFEPO_4$)

Table 1 – Battery cell chemistry type

5.2. **W** = Number of cells in serial - Integer number up to 14

5.3. **X** = Max charging voltage per single cell

5.3.1. 4.2V max per Li-Ion/Polymer battery packs

5.3.2. 4.3V max per Li-Ion/Polymer battery packs, under Amicell approval.

5.3.3. 3.65V max per Lithium iron phosphate battery packs

5.4. **Y** = max charging current – Up to 10 (A)

5.5. **Z** = Connector type

	Z = Connector type
1	D-type 21WA4 Male
2	D-type 17W2 Male

Table 2 – Connector type

Please note: For a requrment of different connector type – please contact Amicell.

5.6. **M** = Memory card

	M = Memory Card
0	No Amicell Memory Card
1	Amicell Memory Card

Table 3 – Memory Card

6. CHARGING + BALANCING HARNESS

6.1. Optional.

6.2. Will be defined with Amicell in accordance to:

6.2.1. Customer's battery connectors.

6.2.2. Wiring length – Recommended <30cm

6.3. Ordered separately from the charger.

7. INLET HARNESS

7.1. Charger inlet - 15-45PP Anderson pins – Red/Black

7.2. Will be defined with Amicell in accordance to customer requirements:

7.2.1. Grid connector.

7.2.2. Wiring length (1.5m default).

8. POWER SUPPLY

8.1. Optional. For 110 or 230VAC grid connection.

8.2. Will be defined with Amicell in accordance to customer requirements:

8.2.1. Charge Power = Max charge voltage × Max charge current

8.2.2. Grid voltage.

8.2.3. Grid connector.

8.2.4. Wiring length (1.5m default).

9. ADDITIONAL OPTIONS

9.1. **Charger read of internal Memory card in the battery.**

9.1.1. Adding Amicell Memory card to the battery.

9.1.2. Can include:

9.1.2.1. Battery Serial number.

9.1.2.2. Manufacturing date - year and week.

9.1.2.3. Cycles counter.

9.2. **MODE TEST**

9.2.1. Running a test on the customer battery pack – Discharging for short time and displaing results:

9.2.1.1. Battery State Of Charge.

9.2.1.2. ΔV open circuit + with load.

Please contact Amicell regarding this option

9.3. Optional Timer: The Charging circuit will automatically disconnect the charger after 17hours

9.4. Label: can manufacture the charger as OEM (see Figure 9).

10. REQUIRED DATA BEFORE ORDER

10.1. Type of battery chemistry – Li-Ion/Polymer or LiFePO4

10.2. Battery max voltage / Number of cells in serial.

10.3. Required charging current.

10.4. Characterizing Charging & balancing harness – See paragraph 5.

10.5. Characterizing Inlet harness – See paragraph 7.

10.6. If ordering a power supply – See paragraph 8.

10.7. Required ability to read Amicell Memory card (see paragraph 9.1).

11. CHARGING INSTRUCTIONS - GENERAL

11.1. For optimal charge performance, charge in room temperature +20ºC - +25ºC.

11.2. Battery pack must not be connected to a load while charging.

11.3. Do not charge a battery if battery temperature >+40ºC (for example - immediately after discharging process) or in environment of ambirnt temperature >+40ºC.

11.4. Do not block the ventilation inlet on the side of the charger case nor the Fan outlet.

11.5. It is advised to keep record of all the tests, examinations and charges made in a “Technical file”.

12. CHARGING PROCEDURE

Pay attention: It is highly recommended to connect the charger to the battery while the charger is turned off.

12.1. Make sure that the Charger is **turned OFF**.

12.2. Check that there is no damage in the harnesses.

12.3. Connect the Charger+Balancer to the Battery Pack, using the harnesses supplied for charging & balancing.

12.4. **Turn ON** the Charger (Switch at the back of the charger, see Figure 10). The OLED screen will show the current charge mode of the charger.

12.5. Select SOC level by pressing SOC selector button for less than 0.5sec & release.

Figure 3 – SOC Mode options

12.6. Press the SOC selector button for more than 2 sec & release. The process will start.

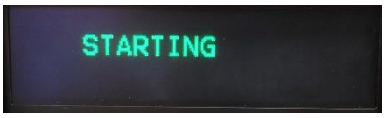

Figure 4 – Starting process

12.7. The charger checks SOC of the battery and decids automaticly - Charging / discharging.

12.8. Charger will be monitoring the charging process and show status in two (2) switching dispalys or three (3) switching dispalys (if there is additional Memory card – see paragraph 9.1):

12.8.1. Charge display: Mode + Voltage + Current:

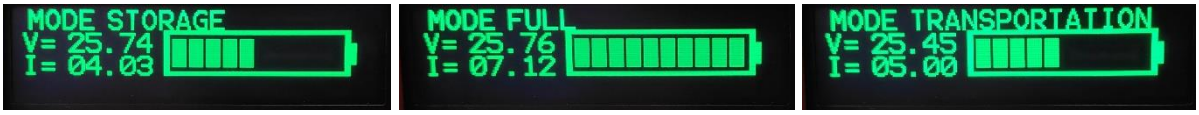

Figure 5 – Display – Charge

12.8.2. Balance display:

Figure 6 – Display – Balance

12.8.3. Memory card display:

Figure 7 – Display - Memory card

12.9. To stop the charging process - long press (>2 sec) and release. The charger will return to "MODE" selector.

13. CHARGE COMPLETION

13.1. Finish charging + balancing process.

13.2. The display:

Figure 8 – Mode FULL - OLED complete

14. COMPUTER CONNECTION

14.1. It is possible to connect the Balancer to a computer through standard D-sub 9pin (RS232) connector. This will enable the user to view the each cell-charging graph.

14.2. Software: will be sent on request. Please send e-mail to sales@amicell.co.il

15. SYSTEM MAINTENANCE & TROUBLESHOOTING

15.1. The charger does not require annual calibration. However in case that full charge battery voltage exceeds max charge voltage in more than +0.2V please send the charging system to "Amicell - Amit Industries" for laboratory tests.

15.2. Troubleshooting:

15.2.1. No Battery

15.2.2. Charge harness not connected or the charger cannot measure battery voltage.

15.2.3. Check Charging harmness – intact and connected to the charger.

15.3. No Balance

15.3.1. Balance harness not connected.

15.3.2. Check Balancing harmness – intact and connected to the charger.

15.4. Input Voltage

15.4.1. Input voltage <9VDC

15.4.2. Increase input voltage – up to 36V

16. SAFETY INSTRUCTIONS - CHARGER

16.1. The Safety Instructions detailed here refers to the Charger, manufactured by “Amicell - Amit Industries”.

16.2. CAUTIONS!

16.2.1. Do not leave the battery unsupervised while charging.

16.2.2. The Charger is designed for specified charging method / Voltage / Current only. **Do not charge any other type of battery with it.**

16.2.3. Do not connect more than one battery in parallel.

16.3. Warning

16.3.1. Do not block the charger’s ventilation entrance.

16.3.2. **Do not charge/Discharge a high temperature battery** (for example – charging immediately after discharging process). While charging – check periodically battery temperature.

16.3.3. **Do not Charge nearby heated place:** At high Temperature the charging efficiency is low. At +45°C-55°C the Charging circuit will disconnect the Charger.

16.3.4. **Charging duration:** The Charger will reduce the charging current in accordance with the Battery’s capacity.

16.3.5. **Charger and Charge Condition:** Use only specified charger and pay attention to charging requirements. If the Battery pack is charged under unspecified condition (high temperature/excessive high voltage or current, over the regulated value) it might be overcharged, causing an abnormal chemical reaction in the cells. This situation might cause generating of smoke, rupture or flame.

17. APPENDIX A - PICTURES

Figure 9 –Charger - Front

Figure 10 –Charger - Rear