

## Model 2840 LiFe

8,5 A max out • 198-264 VAC input

- 3-step charge control with current detection as charge termination
- Switch mode charger
- Charging 1-16 LiFePO4 battery cells
- 2-pin IEC 320 input connector
- Waterproof (IP67) version available
- Approvals:
  - Medically certified EN 60601-1 3.1ed
  - UL approved

### Notes:

Desktop unit

Exchangeable DC plugs ( $\geq 5$  cells)

Order plugs and mains cord separately



### Available versions On request

1 cell / 8,5A

2 cells / 8,5A

3 cells / 8A

4 cells / 7A

5 cells / 5,5A

6 cells / 4,6A

7 cells / 3,9A

8 cells / 3,5A

9 cells / 3,1A

10 cells / 2,8A

11 cells / 2,5A

12 cells / 2,3A

13 cells / 2,15A

14 cells / 2A

15 cells / 1,8A

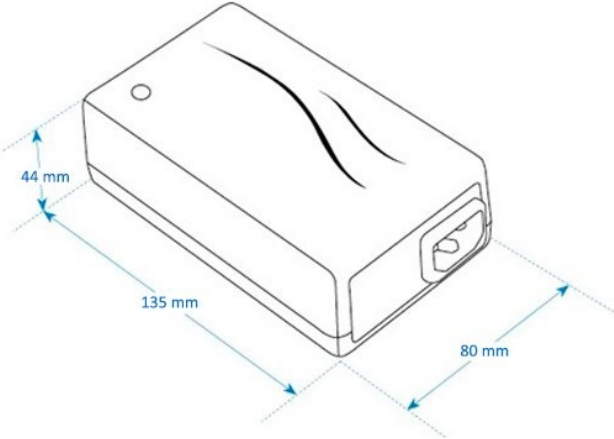
16 cells / 1,7A

Specifications for MASCOT type 2840	LiFePO <sub>4</sub> versions								
	1-cell	2-cell	3-cell	4-cell	5-cell	6-cell	7-cell	8-cell	
Input voltage:	198 - 264VAC	198 - 264VAC	198 - 264VAC	198 - 264VAC	198 - 264VAC	198 - 264VAC	198 - 264VAC	198 - 264VAC	
Line frequency:	47 - 63Hz	47 - 63Hz	47 - 63Hz	47 - 63Hz	47 - 63Hz	47 - 63Hz	47 - 63Hz	47 - 63Hz	
Max output power:	31W	62W	93W	102W	100W	101W	100W	102W	
Ripple:	<100mV p-p	<100mV p-p	<100mV p-p	<100mV p-p	<100mV p-p	<100mV p-p	<100mV p-p	<100mV p-p	
Efficiency (at 100% load, 230V) typical:	>85%	>87%	>89%	>89%	>89%	>89%	>89%	>89%	
Leakage current from battery with mains switched off:	<1.3mA	<1.3mA	<1.3mA	<1.3mA	<1.3mA	<1.3mA	<1.3mA	<1.3mA	
<b>Charge control:</b>	<b>Charge indication:</b>								
Step 1 Charge current:	Orange	8.5A +0.1/-0.75A	8.5A+0.1/-0.75A	8.5A +0.1/-0.75A	7.0A+0.05/-0.65A	5.5A+0.1/-0.45A	4.6A+0.1/-0.4A	3.9A +0.1/-0.3A	3.5A +0/-0.4A
Step 2 Charge voltage:	Orange	3.65V ±0.05V	7.3V ±0.1V	10.95V ±0.1V	14.6V ±0.1V	18.25V ±0.2V	21.9V ±0.2V	25.55V ±0.2V	29.2V ±0.2V
- Charge current >:	Orange	3.8A ±0.2A	3.5A ±0.2A	3.1A ±0.2A	2.7A ±0.2A	1.9A ±0.2A	1.7A ±0.2A	1.6A ±0.2A	1.4A ±0.2A
- Charge current <:	Yellow	3.5V ±0.05V	7.0V ±0.1V	10.5V ±0.1V	14.0V ±0.1V	17.5V ±0.1V	21.0V ±0.2V	24.5V ±0.2V	28.0V ±0.2V
Step 3 Float charge voltage:	Green	300mA ±30%	300mA ±30%	300mA ±30%	300mA ±30%	300mA ±30%	300mA ±30%	300mA ±30%	300mA ±30%
NTC input on request (10K):	0-45°C normal charge <0 or >45°C reduced charge (LED indication is yellow)								
Switch frequency approx.:	65kHz								
Protection:	Protected against reversed polarity and short circuit proof								
Temperature range:	Operating: -25 to +40°C / Storage: -25 to +85°C								
Safety:	EN 60601-1, EN 60335-2-29								
Insulation class :	Class II								
Insulation voltage: Primary – secondary:	4000VAC / 5700VDC								
EMC standards:	Med. EN 60601-1-2 / Emission EN 61000-6-3 / Immunity EN 61000-6-1								
Mains connection:	2-pins IEC 60320 connector. ( Non-detachable mains cord on request)								
Output terminals:	Battery clips or DC connector.								
IP-Grade:	IP41 (IP67 on request).								
Dimensions:	135 × 80 × 44mm								
Weight:	480g (980g IP67 version)								

Specifications for MASCOT type 2840	LiFePO <sub>4</sub> versions								
	9-cell	10-cell	11-cell	12-cell	13-cell	14-cell	15-cell	16-cell	
Input voltage:	198 - 264VAC	198 - 264VAC	198 - 264VAC	198 - 264VAC	198 - 264VAC	198 - 264VAC	198 - 264VAC	198 - 264VAC	198 - 264VAC
Line frequency:	47 - 63Hz	47 - 63Hz	47 - 63Hz	47 - 63Hz	47 - 63Hz	47 - 63Hz	47 - 63Hz	47 - 63Hz	47 - 63Hz
Max output power:	102W	102W	96W	101W	102W	102W	99W	99W	99W
Ripple:	<100mV p-p	<100mV p-p	<100mV p-p	<100mV p-p	<100mV p-p	<100mV p-p	<100mV p-p	<100mV p-p	<100mV p-p
Efficiency (at 100% load, 230V) typical:	89%	89%	89%	89%	89%	89%	89%	89%	89%
Charge control:	Charge indication:								
Step 1 Charge current:	3.1A +0/-0.4A	2.8A +0/-0.3A	2.5A +0/-0.3A	2.3A +0.05/-0.3A	2.15A +0/-0.3A	2.0A +0/-0.2A	1.8A +0.05/-0.2A	1.7A +0.05/-0.2A	1.7A +0.05/-0.2A
Step 2 Charge voltage:	32.85V ±0.2V	36.5V ±0.3V	40.15V ±0.3V	43.8V ±0.3V	47.45V ±0.3V	51.1V ±0.3V	54.75V ±0.3V	58.4V ±0.3V	58.4V ±0.3V
- Charge current >:	1.3A ±0.2A	1.2A ±0.2A	1.2A ±0.2A	0.9A ±0.2A	0.8A ±0.2A	0.7A ±0.2A	0.6A ±0.2A	0.6A ±0.2A	0.6A ±0.2A
- Charge current <:	31.5V ±0.2V	35.0V ±0.2V	38.5V ±0.4V	42.0V ±0.4V	45.5V ±0.4V	49.0V ±0.4V	52.5V ±0.4V	56.0V ±0.4V	56.0V ±0.4V
Step 3 Float charge voltage:	300mA ±30%	300mA ±30%	300mA ±30%	300mA ±30%	300mA ±30%	300mA ±30%	300mA ±30%	300mA ±30%	300mA ±30%
- Charge current <:	300mA ±30%	300mA ±30%	300mA ±30%	300mA ±30%	300mA ±30%	300mA ±30%	300mA ±30%	300mA ±30%	300mA ±30%
Leakage current from battery with mains switched off:	<1.3mA	<1.3mA	<1.3mA	<1.3mA	<1.3mA	<1.3mA	<1.3mA	<1.3mA	<1.3mA
NTC input on request (10K):	0-45°C normal charge <0 or >45°C reduced charge (LED indication is yellow)								
Switch frequency approx.:	65kHz								
Protection:	Protected against reversed polarity and short circuit proof								
Temperature range:	Operating: -25 to +40°C / Storage: -25 to +85°C								
Safety:	EN 60601-1, EN 60335-2-29								
Insulation class :	Class II								
Insulation voltage: Primary – secondary:	4000VAC / 5700VDC								
EMC standards:	Med. EN 60601-1-2 / Emission EN 61000-6-3 / Immunity EN 61000-6-1								
Mains connection:	2-pins IEC 60320 connector.( Non-detachable mains cord on request)								
Output terminals:	Battery clips or DC connector.								
IP-Grade:	IP41 (IP67 on request).								
Dimensions:	135 × 80 × 44mm								
Weight:	480g (980g IP67 version)								

# Technical drawing

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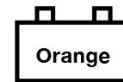


## Charging method B

### STEP 1 – BOOST CHARGE

To start a charge cycle, connect the charger to the mains.

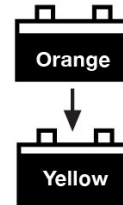
The charger is in constant current mode, charging with the maximum current indicated on the charger, the LED-indication on the charger is ORANGE. This step allows rapid charging of your battery until the battery voltage has increased to a certain set level



### STEP 2 – TOP-UP CHARGE

When the battery voltage has increased to a certain set level the charger enters constant voltage mode, charging with a decreasing current until the current is below the chargers charge termination level (indicated on the charger). The LED-indication on the charger is ORANGE.

When the battery has reached typically 90 - 95% of its full capacity the charge current has dropped below a set level and the LED-indication on the charger changes to YELLOW to indicate that the battery is almost fully charged and may be ready for use. The constant voltage charge continues and the battery reaches its full capacity at the end of this step

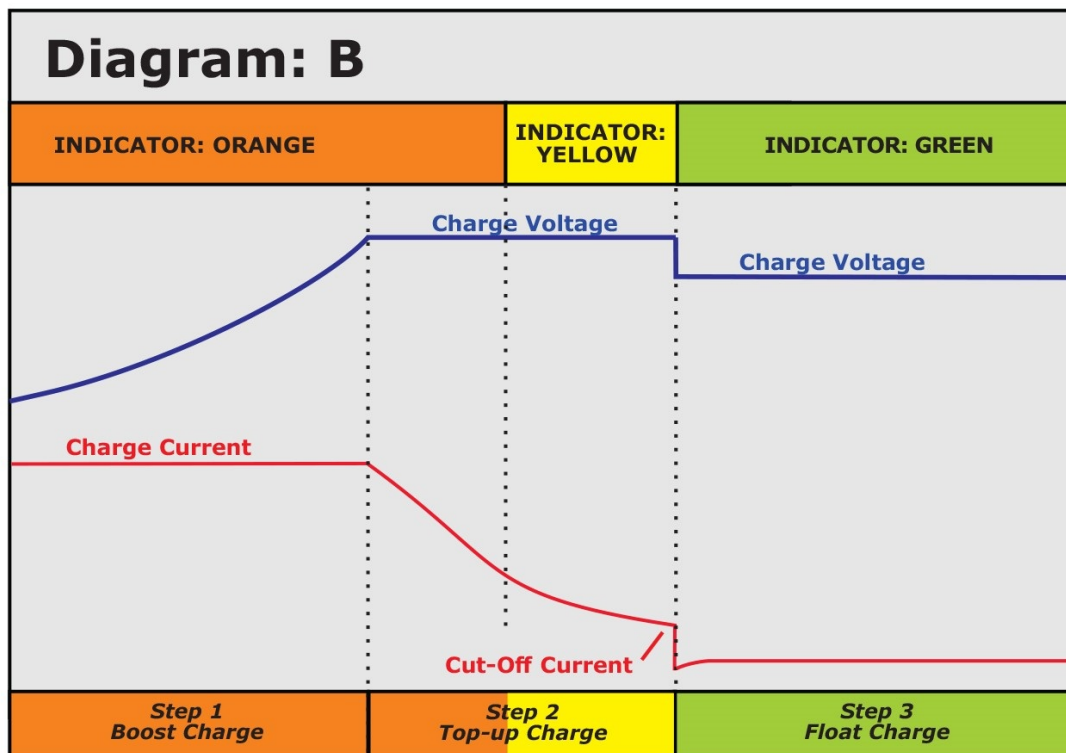


### STEP 3 - FLOAT CHARGE

The LED-indication on the charger is GREEN and the battery is fully charged.

The charge voltage is at float level and the charger may remain connected to the battery.

The charger will return to Step 1 if the battery is used. A load larger than the cut-off current will initiate a new charge cycle.



# EU Declaration of Conformity



## We, the responsible manufacturer;

Company Name:	Mascot Electronics AS		
Postal Address:	P.O.Box 177, N-1601 Fredrikstad, NORWAY		
Visiting Address:	Mosseveien 109, N-1624 Gressvik, NORWAY		
Telephone:	(+47) 69 36 43 00	E-mail:	sales@mascot.com
		WEB:	www.mascot.com

## declare that this Declaration is issued under our sole responsibility and belongs to the following product(s):

Product and intended purpose:	Battery Charger
Brand(s):	and/or <b>MASCOT</b> (may also carry additional customer name, logo or trade mark)
Type(s)/Model(s)/UDI-DI:	2840 (may also carry additional customer model name or part number)
Batch / Serial No./UDI-PI:	all CE-marked products
Description:	<p><b>Input:</b> max.1.2A 220-240VAC 50-60Hz, Class I or II</p> <p><b>Output:</b></p> <p>for Lead-Acid Batteries 6V to 48V (Ucharge = max.2.45V/cell): Charge current 8.5A - 1.7A (max.100W)</p> <p>for Li-Ion Batteries 1 to 16 cell (Ucharge = max.4.2V/cell): Charge current 8.5A - 1.5A (max.100W)</p> <p>for LiFePO4 Batteries 1 to 16 cell (Ucharge = max.3.65V/cell): Charge current 8.5A - 1.7A (max.100W)</p> <p><b>NOTES:</b></p> <p>- For EN 60601-1 and EN 60950-1 compliance output voltages &gt;60VDC may not be accessible or interconnected. - Versions with output voltage &gt;42.4 VDC are not within the scope of standard EN 60335-2-29 Ed.4 (ref. Cl.10.101).</p>

## The product(s) described above are in conformity with the relevant European Union harmonisation legislation:

2014/35/EU	EU Directive - Safety of electrical equipment ("Low-Voltage Directive") (LVD) recast, repealing Directives 2006/95/EC & 73/23/EEC
2014/30/EU	EU Directive - Electromagnetic Compatibility (EMC) recast, repealing Directives 2004/108/EC & 89/336/EEC
93/42/EEC	EU Directive - General Medical Devices (MDD), Risk Class I Device will from 05.05.2020 be repealed by Regulation (EU) 2017/745
2009/125/EC	EU Directive - Energy Related Products, Ecodesign (ERP) recast, repealing Directive 2005/32/EC (EUP)
2015/863/EU	EU Directive - Restriction on use of Hazardous Substances in EEE ("RoHS3") recast, repealing Directives 2002/95/EC, 2008/35/EC & 2011/65/EU

## The following harmonised standards and technical specifications have been applied:

(International editions and comments indicated in brackets)

### Electrical Safety (to LVD- & MDD-Directives):

EN 60950-1	EN 60950-1:2006 + /A1:2010, + /A11:2009, + /AC:2011, + /A12:2011 + /A2:2013 (IEC 60950-1:2005 modified + /A1:2009 modified + /A2:2013 modified, Edition 2.2) (will from 20.06.2019 be replaced by standard EN 62368-1:2014 + /AC:2015, Edition 2.0 A/V, ITE & COMM. Equipm.) (IEC 62368-1:2014, Edition 2.0)	IT-equipment (ITE), Edition 2.2
EN 60335-1	EN 60335-1:2012 + /AC:2014 + /A11:2014 (IEC 60335-1:2010 modified, Edition 5.0)(also IEC 60335-1:2010 modified + /A1:2013 + /A2:2016, Edition 5.2)	Household and similar appliances-General requirements, Edition 5.0
EN 60335-2-29	EN 60335-2-29:2004 + /A2:2010 (IEC 60335-2-29:2002 + /A1:2004 + /A2:2009, Edition 4.2) (also IEC 60335-2-29:2016, Edition 5.0)	Household and similar appliances-Requirements for battery chargers, Edition 4.2
EN 60601-1	EN 60601-1:2006 + /AC:2010 + /A1:2013 (IEC 60601-1:2005 + /A1:2012)	Medical electrical equipment, Edition 3.1



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## Electromagnetic Compatibility (to EMC- & MDD-Directives):

EN 61000-6-1	EN 61000-6-1:2007 (IEC 61000-6-1:2005, Edition 2.0) (also IEC 61000-6-1:2016, Edition 3.0, not yet an EN-norm)	Immunity-residential, comm. & light-industrial environment, Edition 2.0
EN 61000-6-3	EN 61000-6-3:2007 + /A1:2011 & /AC:2012 (IEC 61000-6-3:2007 + /A1:2010)	Emission-residential, comm. & light-industrial environment, Edition 2.1
EN 55014-1	EN 55014-1:2006 + /A1:2009 & /A2:2011 (CISPR 14-1:2005 + /A1:2008 & /A2:2011, Edition 5.2) (also CISPR 14-1:2016, Edition 6.0, but not yet an EN-norm)	Emission-household appliances, Edition 5.2
EN 55014-2	EN 55014-2:1997 + /AC:1997, /A1:2001, /A2:2008 (CISPR 14-2:1997 + /A1:2001 & /A2:2008, Edition 1.2) (also CISPR 14-2:2015, Edition 2.0, but not yet an EN-norm)	Immunity-household appliances, Edition 1.2
EN 55022	EN 55022:2010 + /AC:2011 (CISPR 22:2008 modified, Edition 6.0)(Note: CISPR 22 is now replaced by CISPR 32:2012)	Emission-IT-Equipment, Edition 6.0
EN 55024	EN 55024:2010 (CISPR 24:2010, Edition 2.0) (also CISPR 24:2010 + /Corr.1:2011 + /A1:2015, Edition 2.1, but not yet an EN-norm)	Immunity-IT-Equipment, Edition 2.0
EN 55032	EN 55032:2012 + /AC:2013 (CISPR 32:2012 + /Corr.1:2012 + /Corr 2:2012, Edition 1.0) (also CISPR 32:2015, Edition 2.0, but not yet an EN-norm)	Emission-Multimedia Equipment, Edition 1.0
EN 60601-1-2	EN 60601-1-2:2007 from 31/12/2018: EN 60601-1-2:2015 (IEC 60601-1-2:2007 modified, Edition 3.0)(Note: for IEC: Edition 3.0 is replaced by IEC 60601-1-2:2014, Edition 4.0)	Medical equipment, EMC - Requirements and tests, Edition 3.0 Medical equipment, EMC - Requirements and tests, Edition 4.0

## Ecodesign (to ERP-Directive):

Commission Regulation (EC) No 278/2009	implementing Directive 2005/32/EC with regard to eco-design requirements for no-load condition electric power consumption and average active efficiency of external power supplies (Note: not applicable to Battery Chargers, ref. Article 1.2 item c )
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## Ecodesign for U.S.A. (Note: depends on battery used !):

US Code of Federal Regulations (CFR) Also called "DoE compliance"	10 CFR Part 430 - Energy Conservation Program for Consumer Products, 10 CFR Part 430, Subpart B - Test Procedures, 10 CFR Appendix Y to Subpart B of Part 430, Uniform Test Method for Measuring the Energy Consumption of Battery Chargers
California Code of Regulations (CCR) Also called "CEC-400 compliance" referring to CEC-400-2017-002 "2016 Appliance Efficiency Regulations" issued by California Energy Commission	CCR Title 20 - Public Utilities and Energy, Division 2 - State Energy Resources Conservation and Development Commission, Chapter 4 - Energy Conservation, Article 4 - Appliance Efficiency Regulations, Sections 1601 to 1609

## Additional Information:

Compliance with harmonised standards and technical specifications may have been verified by the manufacturer, by third party testing or by a Certification Body (NCB).

The products are considered Risk Class I devices according to the General Medical Devices Directive.

The product(s) may be produced at production sites (for specific product: see "Made in"-marking on the product):

Mascot Electronics AS P.O.Box 177, N-1601 Fredrikstad, NORWAY	Mascot Baltic OÜ Taevakivi 15 EE-13619 Tallinn ESTONIA	Mascot Power Supplies (Ningbo) Co.,Ltd No.128 Jinchuan Road, Zhenhai Ningbo 315221 CHINA
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The production sites are certified to standard EN 29001:2015 (ISO 9001:2015):

Mascot Electronics AS: Kiwa Teknologisk Institutt certificate ref. 044	Mascot Baltic OÜ: Metrosert certificate ref. K-144	Mascot Power Supplies (Ningbo) Co.,Ltd: DNV-GL certificate ref. 179027-2015
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The most recent issue of this Declaration is available at [www.mascot.com](http://www.mascot.com).

Fredrikstad, Norway

Place of issue

2018-10-26

Date of issue

Signed on behalf of Mascot Electronics AS

  
Finn-Erik Wallin, Compliance Manager

Name, function, signature