

## Model 2240 LiFe

1,3 A max out • 90-264 VAC input

- 3-step charge control with current detection as charge termination
- Universal input voltage (90-264 VAC)
- Charging 1-8 battery cells
- Waterproof (IP67) version available
- Approvals:
  - Medically certified
    - Safety: EN 60601-1 ed. 3.1
    - EMC: EN 60601-1-2 ed. 4
  - UL approved
- Custom specifications on request:
  - Charging parameters, connectors, cords, logo print, housing/open frame/IP rating and certificates. For more information: [custom design info sheet](#)

### Notes:

Desktop unit

Exchangeable DC plugs available

Standard DC output cord (exch. DC plugs):

Female connector L 1.8m, AWG 20, UL 2468

Order plugs and mains cord separately

Mounting bracket available



### Available versions

On request

1 cell / 1,3A

2 cells / 1,3A

3 cells / 1,2A

4 cells / 0,9A

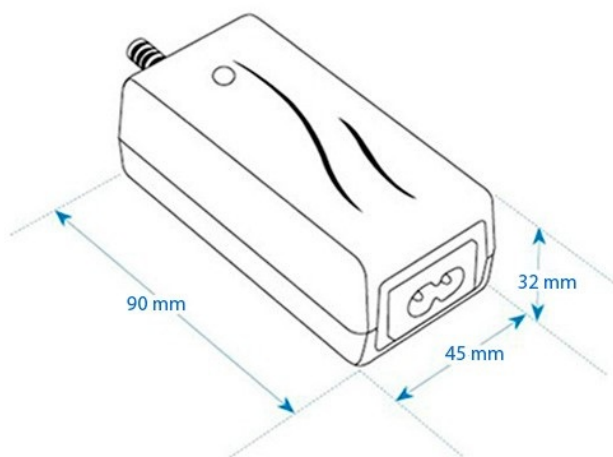
5 cells / 0,7A

6 cells / 0,6A

8 cells / 0,56A

SPECIFICATIONS FOR TYPE 2240/2241 LiFePO <sub>4</sub> :	1-cell	2-cell	3-cell	4-cell	5-cell	6-cell	7-cell	8-cell
Input voltage:	90 - 264VAC	90 - 264VAC		90 - 264VAC	90 - 264VAC			90 - 264VAC
Line frequency:	47 - 63Hz	47 - 63Hz		47 - 63Hz	47 - 63Hz			47 - 63Hz
Charge control: Charge indication:								
Step 1. Charge current: Orange	1.3A +5/-7%	1.3A +5/-7%		0.9A +5/-7%	0.88A +5/-7%			0.56A +5/-7%
Step 2. Charge voltage: Orange	3.65V ±0.05V	7.30V ±0.1V		14.6V ±0.1V	18.25V ±0.1V			29.2V ±0.1V
Step 3. Charge termination I <: Green	100mA ±25%	100mA ±25%		100mA ±25%	100mA ±25%			100mA ±25%
Float Charge voltage	3.50V ±0.15V	7.00V ±0.15V		14.0V ±0.15V	17.5V ±0.15V			28.0V ±0.15V
Max output power:	4.7W	9.5W		13.1W	16.1W			16.35W
Ripple:	< 100mV p-p	< 100mV p-p		< 100mV p-p	< 100mV p-p			< 100mV p-p
Efficiency (at 100% load, 230V) approx.:	51%	70%		78%	81%			82%
Switch frequency approx.:	40kHz							
Leakage current from battery with mains switched off:	≈ 0							
Protection:	Protected against reversed polarity and short circuit proof							
Temperature range: *Operating:	+25 til +40°C							
*Storage:	+25 til +85°C							
Safety:	EN 60950-1, EN 60601-1, EN 60335-2-29, UL60601-1							
Insulation class :	Class II							
Insulation voltage: Primary – secondary:	4000VAC / 5640VDC							
EMC standards:	EMC med. EN 60601-1-2 / Emission EN 61000-6-3 / Immunity EN 6100-6-1							
MTBF at Ta = 30°C and full load: Calculated according to MIL – HDBK – 217F	>250 000 hours							
Input terminal	2-pins IEC 320 mains connector. 2241:changeable mains plug (EU, US and UK).							
Output terminals:	Cord with/without plug. Exchangeable plugs available.							
IP-Grade:	4X							
Dimensions:	90 x 45 x 32mm (2241: 103.5 x 46.8 x 38.7mm)							
Weight:	115g 2241: 140g							

## Technical drawing



## Charging method A

### STEP 1 – BOOST CHARGE

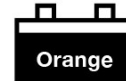
To start a charge cycle, connect the charger to the mains.

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 reaches typically 80 - 95% of its capacity.



### STEP 2 – TOP-UP CHARGE

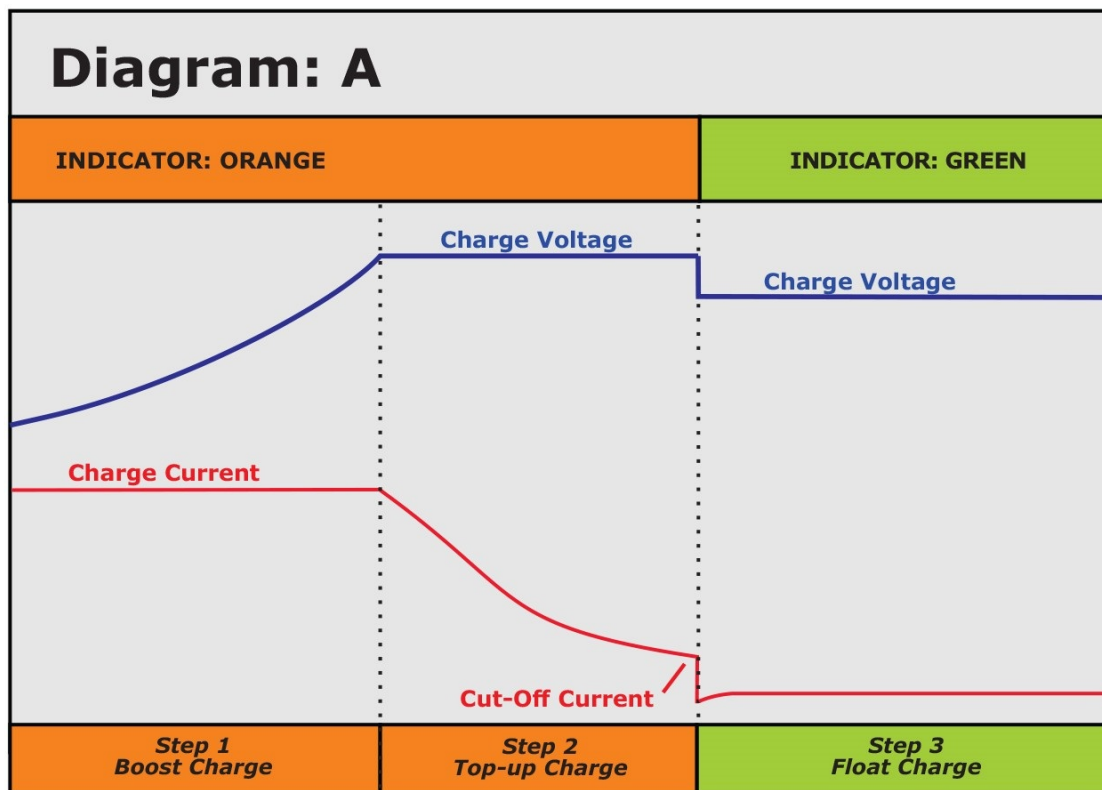
The charger is in constant voltage mode, charging with a decreasing current until the current is below the charger's charge termination level (indicated on the charger). The LED-indication on the charger is ORANGE. The battery is charged to its full capacity at the end of this step.



### 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 & UK 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 for Li-Ion-, LiFePO<sub>4</sub>- or Lead-Acid Batteries**

Brand(s): **and/or  (may also carry additional customer name, logo or trade mark)**

Type(s)/Model(s)/UDI-DI: **2240 and 2241 (may also carry additional customer model name or part number)**

Batch / Serial No./UDI-PI: **all CE- and/or UKCA- marked products produced from the date indicated below (for production date: see marking on the product)**

Description: **Input: max. 0.35 A 100-240 VAC 50-60 Hz, Class II**  
**Output:**  
 versions for Lead-Acid Batteries 6 - 48 V:  
 6 V max. 1.3 A    12 V max. 1.0 A    24 V max. 0.5 A    36 V max. 0.35 A    48 V max. 0.27 A  
 versions for Li-Ion Batteries 1 - 16 cell:  
 1 cell max. 1.3 A    2 cell max. 1.3 A    3 cell max. 1.2 A    4 cell max. 0.9 A    5 cell max. 0.75 A  
 6 cell max. 0.65 A    7 cell max. 0.56 A    8 cell max. 0.49 A    9 cell max. 0.43 A    10 cell max. 0.39 A  
 11 cell max. 0.35 A    12 cell max. 0.32 A    13 cell max. 0.3 A    14 cell max. 0.27 A    15 cell max. 0.24 A  
 16 cell max. 0.22 A  
 versions for LiFePO<sub>4</sub> Batteries 1 - 16 cell:  
 1 cell max. 1.3 A    2 cell max. 1.3 A    3 cell max. 1.3 A    4 cell max. 1.0 A    5 cell max. 0.88 A  
 6 cell max. 0.73 A    7 cell max. 0.64 A    8 cell max. 0.56 A    9 cell max. 0.5 A    10 cell max. 0.45 A  
 11 cell max. 0.4 A    12 cell max. 0.37 A    13 cell max. 0.34 A    14 cell max. 0.32 A    15 cell max. 0.3 A  
 16 cell max. 0.28 A  
 NOTES:  
 - Versions with output voltage >42.4 VDC are not within the scope of standard EN 60335-2-29 Ed.4 (ref. CI.10.101).  
 - For compliance with EN 60601-1 and EN 60950-1 output terminals >60 VDC must be inaccessible to operator and may not be interconnected.

The product(s) described above are in conformity with the relevant European Union harmonisation legislation for CE-marking:

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 26.05.2021 be repealed by "MDR" 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 product(s) described above are in conformity with the relevant U.K. legislation for UKCA-marking:

Electrical Equipment (Safety) Regulations 2016
Electromagnetic Compatibility (EMC) Regulations 2016
The Medical Devices (Amendment etc.) (EU Exit) Regulations 2020, Risk Class I Device
Ecodesign for Energy-Related Products (External Power Supplies) Regulations 2020 Draft Regulation, awaiting implementation
The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012



The following harmonised standards and technical specifications have been applied:

(International editions and comments indicated in brackets):

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

<b>EN 60950-1</b>	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)	IT-equipment (ITE), Edition 2.2 <i>(OBS! expired for CE-marking !!)</i>
<b>EN 60335-1</b>	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
<b>EN 60335-2-29</b>	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
<b>EN 60601-1</b>	EN 60601-1:2006 + /AC:2010 + /A1:2013 (IEC 60601-1:2005 + /A1:2012)	Medical electrical equipment, Edition 3.1

**Electrical Safety and Electromagnetic Compatibility (to MDR/MDD-Directives):**

<b>EN 60601-1</b>	EN 60601-1:2006 + /AC:2010 + /A1:2013 (IEC 60601-1:2005 + /A1:2012)	Medical electrical equipment, Edition 3.1
<b>EN 60601-1-2</b>	EN 60601-1-2:2015 (IEC 60601-1-2:2014, Edition 4.0)	Medical equipment, EMC - Requirements and tests, Edition 4.0

**Electromagnetic Compatibility (to EMC-Directive):**

<b>EN 61000-6-1</b>	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
<b>EN 61000-6-3</b>	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
<b>EN 55014-1</b>	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
<b>EN 55014-2</b>	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
<b>EN 55024</b>	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
<b>EN 55032</b>	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

**Ecodesign to EU ERP-Directive:**

<b>Commission Regulation (EC) No 2019/1782</b>	implementing Directive 2005/32/EC with regard to ecodesign requirements for no-load condition electric power consumption and average active efficiency of external power supplies (Repealing Commission Regulation (EC) No 2019/1782 from 2020-04-01) (Note: not applicable to Battery Chargers, ref. Article 1.2 item c)
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**Ecodesign for U.K.:**

<b>Draft Regulation only</b> (awaiting implementation)	Draft "Ecodesign for Energy-Related Products (External Power Supplies) Regulations 2020" (Note: not applicable to Battery Chargers)
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**Ecodesign for U.S.A. (Note: depends on battery used !):**

<b>US Code of Federal Regulations (CFR)</b> 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 or 10 CFR Appendix Z to Subpart B of Part 430, Uniform Test Method for Measuring the Energy Consumption of External Power Supplies, whichever applicable.
<b>California Code of Regulations (CCR)</b> 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

**Restriction of the Use of certain Hazardous Substances (RoHS) for EU:**

<b>2015/863/EU "RoHS3"</b>	EU Directive - Restriction on use of Hazardous Substances in EEE Restriction of the Use of certain Hazardous Substances in Electrical and Electronic Equipment
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**Restriction of the Use of certain Hazardous Substances for UK:**

<b>The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012</b>
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# EU & UK Declaration of Conformity



## 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 EU Medical Devices Directive, EU Medical Devices Regulation and the U.K. Medical Devices (Amendment etc.) (EU Exit) Regulations 2020.

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

- Mascot Baltic OÜ, Taevakivi 15, EE-13619 Tallinn, ESTONIA
- Mascot Power Supplies (Ningbo) Co.,Ltd, No.128 Jinchuan Road, Zhenhai, Ningbo 315221, CHINA

The production sites are certified to standard EN 29001:2015 (ISO 9001:2015) by:

- Mascot Baltic OÜ: Metrosert, certificate ref. K-144
- Mascot Power Supplies (Ningbo) Co.,Ltd: DNV-GL, certificate ref. 179027-2015

Type 2240 may be delivered with 2-pins IEC 60320 inlet for detachable mains cord or with non-detachable mains cord) and may also be delivered as protected against ingress of objects and water according to IP67 to standard EN/IEC 60529 (fitted with non-detachable mains cord and filled with PUR compound)

Type 2241 is for Direct Plug-In (when used with exchangeable mains plug-adapters) and for detachable mains cord.

The most recent issue of this Declaration is available at [www.mascot.com](http://www.mascot.com).

Fredrikstad, Norway

Place of issue

2021-01-21

Date of issue

Signed on behalf of Mascot Electronics AS

  
Finn-Erik Wailin, Compliance Manager

Name, function, signature