

Model 2241 LI

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 1-7 battery cells
- Waterproof (IP67) version available
- Approvals:
 - Medically certified
 - Safety: EN 60601-1 ed. 3.1
 - Home healthcare EN 60601-1-11
 - 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](#)



Available versions

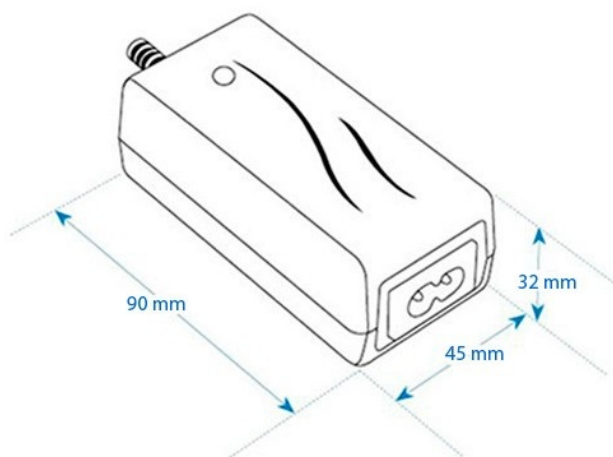
- 1 cell / 1,3A
- 2 cells / 1,3A
- 3 cells / 1,2A
- 4 cells / 0,9A
- 5 cells / 0,7A
- 6 cells / 0,6A
- 7 cells / 0,56A

Notes:

Plug-in/Desktop unit
Exchangeable AC and DC plugs available
Standard DC output cord (exch. DC plugs):
Female connector L 1.8m, AWG 20, UL 2468
Mounting bracket available
Order plugs and mains cord separately

SPECIFICATIONS FOR TYPE 2240/2241 Li-Ion:	1-cell	2-cell	3-cell	4-cell	5-cell	6-cell	7-cell
Input voltage:	90 - 264VAC	90 - 264VAC	90 - 264VAC	90 - 264VAC	90 - 264VAC	90 - 264VAC	90 - 264VAC
Line frequency:	47 - 63Hz	47 - 63Hz	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%	1.2A +5/-7%	0.9A +5/-7%	0.7A +5/-7%	0.6A +5/-7%	0.56A +5/-7%
Step 2. Charge voltage: Orange	4.2V ±0.05V	8.4V ±0.1V	12.6V ±0.1V	16.8V ±0.1V	21.0V +0.1/-0.15	25.2V +0.1/-0.15	29.4V ±0.10V
Step 3. Charge termination I <: Green	100mA ±25%	100mA ±25%	100mA ±25%	100mA ±25%	100mA ±25%	100mA ±25%	100mA ±25%
Charge start Vbat<:	4.05V +0.05/-0.15V or mains turn-on	8.1V +0.1/-0.15V or mains turn-on	12.3V +0.1/-0.15V or mains turn-on	16.4V +0.1/-0.15V or mains turn-on	20.5V +0.1/-0.15V or mains turn-on	24.6V +0.1/-0.15V or mains turn-on	28.7V +0.1/-0.15V or mains turn-on
Max output power:	5.5W	10.9W	15.1W	15.1W	14.7W	15.1W	16.4W
Ripple:	< 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) approx.:	58%	72%	77%	80%	82%	82%	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 – CONSTANT CURRENT 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 – CONSTANT VOLTAGE 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.

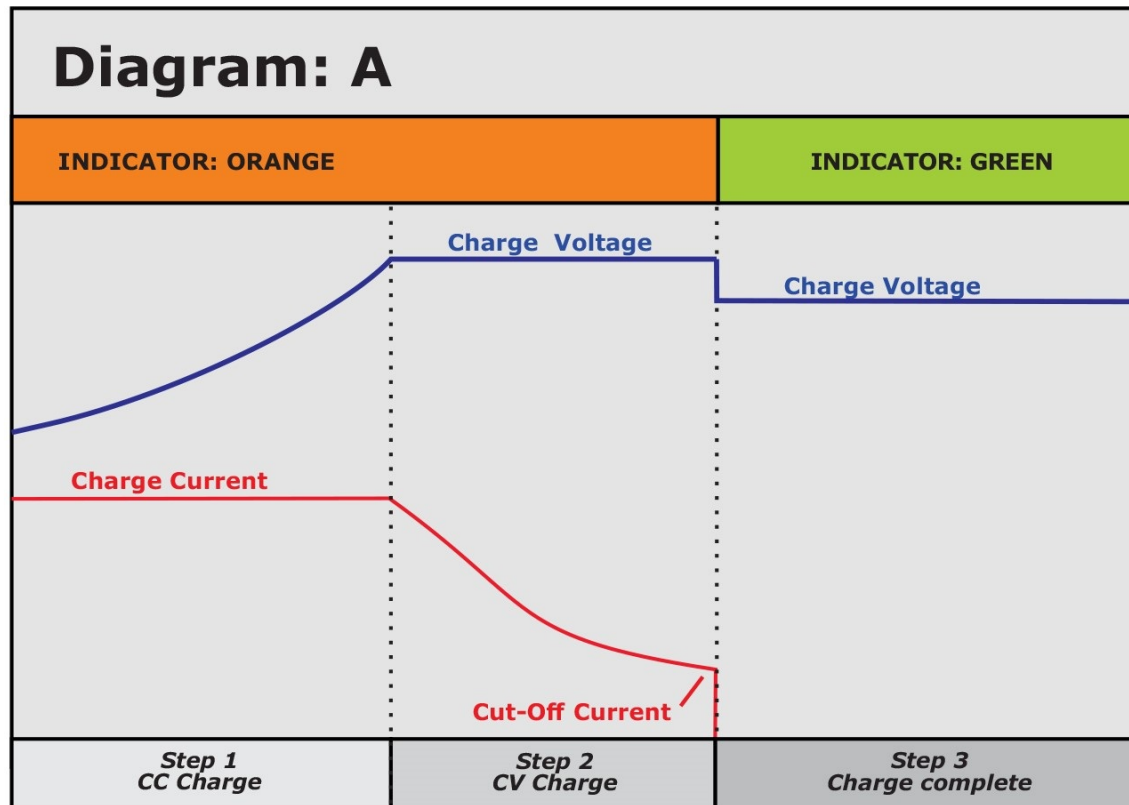


STEP 3 –CHARGE COMPLETE

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

For Li-Ion batteries the charge current is zero and the battery has been charged to its full capacity.

After end of charge battery voltage will remain at "Step 2" level even if output voltage of charger is indicated as lower in the diagram. 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-, LiFePO₄- 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 LiFePO₄ 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:
 - 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
(EU) 2017/745	EU Regulation - Medical Devices Regulation (MDR), Risk Class I Device repealing directive 93/42/EEC
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/or 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)	IT-equipment (ITE), Edition 2.2 <i>(OBS! expired for CE-marking !!)</i>
EN 60335-1	EN 60335-1:2012 + /AC:2014 + /A11:2014 (IEC 60335-1:2010 modified, Edition 5.0)	Household and similar appliances-General requirements, Edition 5.0 (also IEC 60335-1:2010 modified + /A1:2013 + /A2:2016, Edition 5.2)
EN 60335-2-29	EN 60335-2-29:2021 (IEC 60335-2-29:2016, Edition 5.0)	Household and similar appliances-Requirements for battery chargers, Edition 5.0

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

EN 60601-1	EN 60601-1:2006 + /AC:2010 + /A1:2013/A2:2021 (IEC 60601-1:2005 + /A1:2012/A2:2020)	Medical electrical equipment, Edition 3.2
EN 60601-1-2	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):

EN 61000-6-1	EN 61000-6-1:2007 (IEC 61000-6-1:2005, Edition 2.0)	Immunity-residential, comm. & light-industrial environment, Edition 2.0 <i>(also IEC 61000-6-1:2016, Edition 3.0, not yet an EN-norm)</i>
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 55014-1:2017 <i>(CISPR 14-1:2020, Edition 7.0)</i>	Emission-household appliances, Edition 6.0
EN 55014-2	EN 55014-2:1997 + /AC:1997, /A1:2001, /A2:2008 <i>(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)</i>	Immunity-household appliances, Edition 1.2
EN 55024	EN 55024:2010 <i>(CISPR 24:2010, Edition 2.0) (also CISPR 24:2010 + /Corr.1:2011 + /A1:2015, Edition 2.1, but not yet an EN-norm)</i>	Immunity-IT-Equipment, Edition 2.0
EN 55032	EN 55032:2015 <i>(CISPR 32:2015, Edition 2.0)</i>	Emission-Multimedia Equipment, Edition 2.0

Ecodesign to EU ERP-Directive:

Commission Regulation (EC) No 2019/1782	implementing Directive 2009/125/EC with regard to eco-design requirements for no-load condition electric power consumption and average active efficiency of external power supplies <i>(Note: not applicable to Battery Chargers, ref. Article 1.2 item c)</i>
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Ecodesign for U.K.:

Draft Regulation only (awaiting implementation)	Draft "Ecodesign for Energy-Related Products (External Power Supplies) Regulations 2020" <i>(Note: not applicable to Battery Chargers)</i>
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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 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.
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

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

2015/863/EU "RoHS3"	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:

The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

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.

Fredrikstad, Norway

Place of issue

2023-06-02

Date of issue

Signed on behalf of Mascot Electronics AS

Fredrik Johansen, Compliance Manager

Name, function, signature