PO Box 177 ● 1601 Fredrikstad NORWAY ● sales@mascot.no ● www.mascot.no

Model 2440 LiFe

4 A max out • 90-264 VAC input

- 3-step charge control with current detection as charge termination
- Universal input voltage (90-264 VAC)
- 3 coloured LED indicator
- 2-pin IEC 320 input connector
- Custom specifications on request
- Waterproof IP67 version available
- Approvals:
  - Home Healthcare EN 60601-1-11
  - Medically certified
    Safety: EN 60601-1 ed. 3.1
    EMC: EN 60601-1-2 ed. 4
  - UL approved

Notes:
Desktop unit
Exchangeable DC plugs available
Standard DC output cord (exch. DC plugs):
Female connector L 1.8m, AWG 18, OD: 2.7 X 5.4 Black w. white line, UL 2468
Order plugs and mains cord separately
Mounting bracket available

Available versions

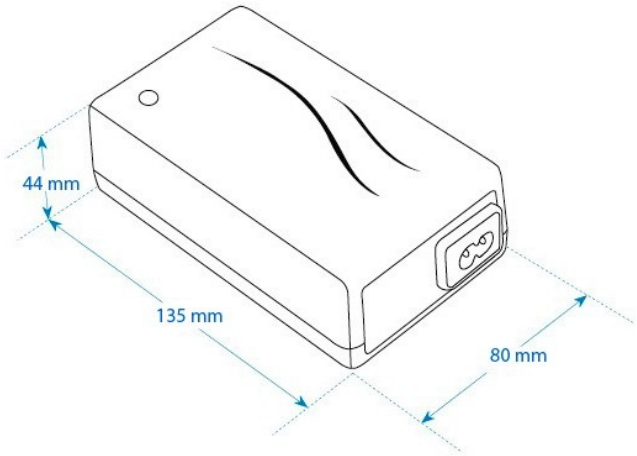
On request

1 cell / 4,0A	2 cells / 4,0A
3 cells / 4,0A	4 cells / 4,0A
5 cells / 3,9A	6 cells / 3,3A
7 cells / 2,8A	8 cells / 2,5A
9 cells / 2,2A	10 cells / 1,95A
11 cells / 1,8A	12 cells / 1,65A
13 cells / 1,5A	14 cells / 1,4A
15 cells / 1,3A	16 cells / 1,2A

Specifications for MASCOT type 2440	**LiFePo$_4$ versions**							
	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	90 - 264VAC	90 - 264VAC	90 - 264VAC
Line frequency:	47 - 63Hz	47 - 63Hz	47 - 63Hz	47 - 63Hz	47 - 63Hz	47 - 63Hz	47 - 63Hz	47 - 63Hz
Max output power:	15W	29W	44W	58W	71W	72W	72W	73W
Ripple (measured on PCB):	<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:	>60%	>77%	>80%	>81%	>85%	>85%	>85%	>87%
Leakage current from battery with mains switched off:	<0.4mA @3.2V	<0.4mA @6.4V	<0.7mA @9.6V	<0.7mA @12.8V	<0.7mA @16.0V	<0.7mA @19.2V	<0.7mA @22.4V	<0.8mA @25.6V
Charge control: Charge indication: Step 1 Charge current: Orange	4.0A ±0.2A	4.0A ±0.2A	4.0A ±0.2A	4.0A ±0.2A	3.9A ±0.2A	3.3A ±0.1A	2.8A ±0.1A	2.5A ±0.1A
Step 2 Charge voltage:	3.65V ±0.05V	7.3V ±0.1V	10.95V ±0.1V	14.6V ±0.1V	18.25V ±0.1V	21.9V ±0.2V	25.55V ±0.2V	29.2V ±0.2V
- Charge current >: Orange - Charge current <: Yellow	1.8A ±0.2A	1.8A ±0.1A	1.8A ±0.1A	1.6A ±0.1A	1.6A ±0.1A	1.6A ±0.1A	0.8A ±0.1A	0.8A ±0.1A
Step 3 Charge termination <: Green	300mA	300mA	300mA	300mA	300mA	300mA	300mA ±25%	300mA
Float charge voltage:	3.5V ±0.05V	7.0V ±0.1V	10.5V ±0.1V	14.0V ±0.1V	17.5V ±0.2V	21.0V ±0.2V	24.5V ±0.2V	28.0V ±0.2V
NTC input on request (10K):	0-45°C normal charge <0 or >45°C reduced charge (LED indication is yellow)							
Switch frequency approx.:	40kHz							
Protection:	Protected against reversed polarity and short circuit proof							
Temperature range:	Operating: ÷25 to +40ºC / Storage: ÷25 to +85ºC							
Safety:	Medical EN 60601-1 / Home Healthcare EN 60601-1-11 / Battery Charger EN 60335-2-29							
Insulation class :	Class II. (Class I on request)							
Insulation voltage: Primary – secondary:	4000VAC / 5700VDC							
EMC standards:	Medical EN 60601-1-2 / Emission EN 61000-6-3 / Immunity EN 61000-6-1							
Mains connection:	2-pins IEC 60320/C8 connector. (3-pins IEC 60320/C14 connector or non-detachable mains cord on request)							
Output terminals:	Battery clips or DC connector.							
IP-Grade:	IP4X (IP67 on request).							
Dimensions:	135 x 80 x 44mm							
Weight:	390g (890g IP67 version)							

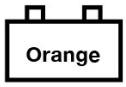
Specifications for MASCOT type 2440	**LiFePo$_4$ versions**							
	9-Cell	**10-Cell**	**11-Cell**	**12-Cell**	**13-Cell**	**14-Cell**	**15-Cell**	**16-Cell**
Input voltage:	90 - 264VAC	90 - 264VAC	90 - 264VAC	90 - 264VAC	90 - 264VAC	90 - 264VAC	90 - 264VAC	90 - 264VAC
Line frequency:	47 - 63Hz	47 - 63Hz	47 - 63Hz	47 - 63Hz	47 - 63Hz	47 - 63Hz	47 - 63Hz	47 - 63Hz
Max output power:	72W	71W	72W	72W	71W	72W	71W	70W
Ripple (measured on PCB):	<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%	>87%	>87%	>87%	>87%	>87%	>87%
Leakage current from battery with mains switched off:	<1.5mA @28.8V	<1.5mA @32.0V	<1.5mA @35.2V	<1.5mA @38.4V	<1.5mA @41.6V	<1.5mA @44.8V	<1.5mA @48.0V	<1.5mA @51.2V
Charge control: Charge indication:								
Step 1 Charge current: Orange	2.2A ±0.2A	1.95A ±0.1A	1.8A ±0.1A	1.65A ±0.1A	1.5A ±0.1A	1.4A ±0.1A	1.3A ±0.1A	1.2A ±0.1A
Step 2 Charge voltage:	32.85V ±0.2V	36.5V ±0.2V	40.15V ±0.2V	43.8V ±0.3V	47.45V ±0.3V	51.1V ±0.3V	54.75V ±0.3V	58.4V ±0.3V
- Charge current >: Orange	0.8A ±0.1A	0.8A ±0.1A	0.8A ±0.1A	0.6A ±0.1A	0.6A ±0.1A	0.6A ±0.1A	0.6A ±0.1A	0.6A ±0.1A
- Charge current <: Yellow								
Step 3 Charge termination <: Green	200mA	200mA	200mA	200mA	100mA	100mA	100mA	100mA
Float charge voltage:	31.5V ±0.2V	35.0V ±0.2V	38.5V ±0.2V	42.0V ±0.3V	45.5V ±0.3V	49.0V ±0.3V	52.5V ±0.3V	56.0V ±0.3V
NTC input on request (10K):	0-45°C normal charge <0 or >45°C reduced charge (LED indication is yellow)							
Switch frequency approx.:	40kHz							
Protection:	Protected against reversed polarity and short circuit proof							
Temperature range:	Operating: ÷25 to +40ºC / Storage: ÷25 to +85ºC							
Safety:	Medical EN 60601-1 / Home Healthcare EN 60601-1-11 / Battery Charger EN 60335-2-29							
Insulation class :	Class II. (Class I on request)							
Insulation voltage: Primary – secondary:	4000VAC / 5700VDC							
EMC standards:	Medical EN 60601-1-2 / Emission EN 61000-6-3 / Immunity EN 61000-6-1							
Mains connection:	2-pins IEC 60320/C8 connector. (3-pins IEC 60320/C14 connector or non-detachable mains cord on request)							
Output terminals:	Battery clips or DC connector.							
IP-Grade:	IP4X (IP67 on request).							
Dimensions:	135 x 80 x 44mm							
Weight:	390g (890g IP67 version)							

Technical drawing



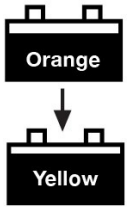
Charging method B

STEP 1 – BOOST CHARGE



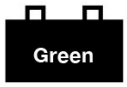
To start a charge cycle, connect the charger to the mains.
The charger is in constant current mode, charging with the maximum current indicated on the charger, the LED-indication on the charger is ORANGE. This step allows rapid charging of your battery until the battery voltage has increased to a certain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

STEP 2 – TOP-UP CHARGE

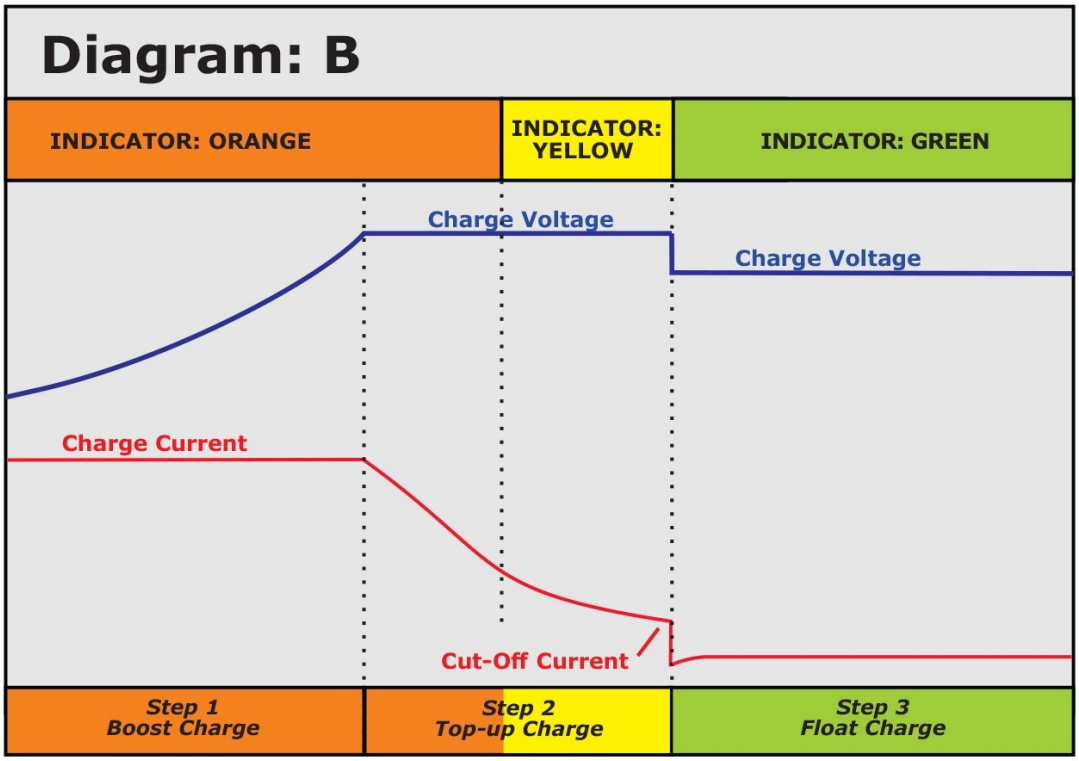


When the battery voltage has increased to a certain set level the charger enters constant voltage mode, charging with a decreasing current until the current is below the chargers charge termination level (indicated on the charger). The LED-indication on the charger is ORANGE.
When the battery has reached 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 & 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-, $LiFePO_4$- or Lead-Acid Batteries**
Brand(s):	**and/or** (may also carry additional customer name, logo or trade mark)
Type(s)/Model(s)/ UDI-DI:	**2440** (may also carry additional customer model name) (model 2440 apply 2MOOP protection to IEC 60601-1, model 2440P apply 2MOPP)
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.1.6A 100-240VAC 50-60Hz, Class I or II **Output:** for Lead-Acid Batteries 6V to 48V: 4.5A - 1.0A for Li-Ion Batteries 1 to 16 cell: 4.5A - 1.0A for LiFePO4 Batteries 1 to 16 cell: 4.5A - 1.2A Power Supply Unit with fixed output within range 4 - 67VDC: 4.5A - 1.1A NOTES: - Versions with output voltage >42.4VDC are not within the scope of standard EN 60335-2-29 Cl.10.101. - For compliance with EN 60601-1 output terminals >60VDC must be inaccessible to the operator. - For EN 60950-1 output voltages >60VDC are regarded ELV and may not be accessible/interconnected. - Versions with output voltage >42.4 VDC are not within the scope of standard EN 60335-2-29 Ed.4 (ref. Cl.10.101).

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 amending Directive 2001/83/EC, Regulations (EC) 178/2002 & (EC) 1223/2009 and repealing Directives 90/385/EEC & 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

EU & UK Declaration of Conformity

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)	IT-equipment (ITE), Edition 2.2 *(OBS! expired for CE-marking !!)*
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

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

EN 60601-1	EN 60601-1:2006 + /AC:2010 +/A1:2013 (IEC 60601-1:2005 + /A1:2012)	Medical electrical equipment, Edition 3.1
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) (*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 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

Ecodesign to EU ERP-Directive:

Commission Regulation (EC) No 2019/1782	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*))

Ecodesign for U.K.:

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

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

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 Device Regulation (MDR) 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

The most recent issue of this Declaration is available at www.mascot.com.

Signed on behalf of Mascot Electronics AS

Fredrikstad, Norway	**2021-08-16**	**Finn-Erik Wallin, Compliance Manager**
Place of issue	Date of issue	Name, function, signature