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

Model 2440 LA

4 A max out • 90-264 VAC input

- 3-step charge control with microprocessor
- Low current start up of deeply discharged batteries (step 0)
- Unaffected by fluctuations in mains voltage
- Protected against reverse polarity and short circuit proof
- Waterproof (IP67) version available
- Wall mount IP67 version go to 2440 IP67
- 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 On request

6V / 4,0A | 12V / 4,0A | 24V / 2,5A | 36V / 1,6A | 48V / 1,3A

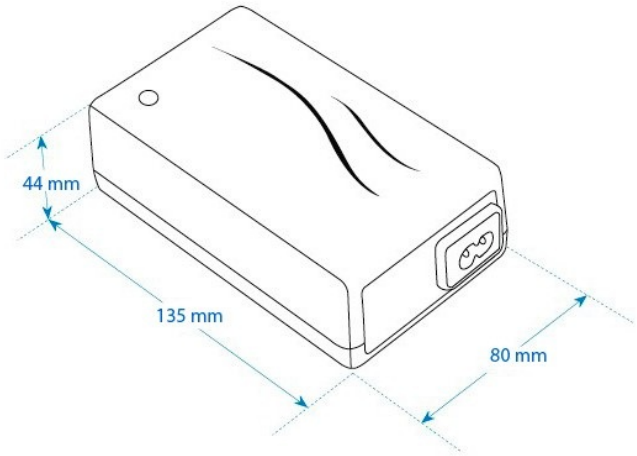
Notes:
Desktop, 2-pin IEC 60320 unit
Battery clips, push-on terminals or exchangeable DC plugs
Standard DC output cord (exch. DC plugs):
Female connector L 1.8m, AWG 18, OD: 2.7 X 5.4 Black w. white line, UL 2468
Mounting bracket available
Order plugs and mains cord separately
IP67 desktop version: Fixed cord, weight 890g

MASCOT type 2440 12V LA Charger:	**2440 1250 00** w. female connector	**2440 0120 00** w. battery clips
Input voltage: / Line frequency:	90 - 264VAC / 47 - 63Hz	
Max output power:	58W	
Charge control: / Charge indication: Step 0 < 30min / Yellow Step 0 > 30min / Red (Error-mode) Step 1 (until Vbat = 14.7V) / Yellow Step 2 (until I charge < 1.2A or > 4h) / Flashing Yellow Step 3 (until I charge > 4.0A) / Green Charge timer (step2): Safety timer: Restart charge current:	1.2A ± 0.2A, when battery voltage < 10.5V < 0.2A 4.0A ± 0.2A, when battery voltage >10.5V. 14.7V ± 0.1V and charge current is tapering. 13.7V ± 0.2V, supply current up to maximum 4.0A for possible parallel load. 4h 72h 4.0A	
Formation Charge:	Low current start-up of deeply discharged battery.	
Float charge:	4.0A pulses at safe float voltage level for maximum topping of battery capacity.	
Indication when "Battery not connected"	Flashing Green (1s/1s)	
Temperature compensation of charge voltage:	-	-3 to -4mV/°C pr. cell
Ripple:	< 100mV p-p	
Efficiency (at 100% load, 90V) approx.:	> 85 %	
Switch frequency approx.:	40kHz	
Leakage current from battery with mains switched off:	< 200 µA at 13V battery voltage (0.15Ah/month)	
Protection:	Protected against reversed polarity and short circuit proof. Safety timer. Charging of wrong lower voltage battery pack (e.g. 6V) will be limited to 1.2A and terminated after 30min.	
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	
Insulation voltage: Primary – secondary:	4000VAC / 5700VDC	
EMC standards:	EN 55014-1 and –2, Emission EN 61000-6-3, Immunity EN 61000-6-1, EN 60601-1-2	
Input terminal:	2-pins IEC 320 connector	
Output terminals:	Battery clips, Push-on terminals or DC connector	
IP-Grade:	41	
Rec. battery capacity:	20 - 200Ah	
Dimensions:	135 × 80 × 44 mm	
Weight:	390g	610g

MASCOT type 2440 24V LA Charger:	**2440 2450 00** **w. female connector**	**2440 2400 00** **w. battery clips**
Input voltage: / Line frequency:	90 - 264VAC / 47 - 63Hz	
Max output power:	74W	
Charge control: / Charge indication: Step 0 < 30min / Yellow Step 0 > 30min / Red (Error-mode) Step 1 (until Vbat = 29.4V) / Yellow Step 2 (until I charge < 0.6A or > 4h) / Flashing Yellow Step 3 (until I charge > 2.5A) / Green Charge timer (step2): Safety timer: Restart charge current:	0.6A ± 0.2A, when battery voltage < 21V < 0.2A 2.5A - 0.2A + 0.05A, when battery voltage >21V. 29.4V ± 0.1V and charge current is tapering. 27.4V ± 0.2V, supply current up to maximum 2.5A for possible parallel load. 4h 72h 2.5A	
Formation Charge:	Low current start-up of deeply discharged battery.	
Float charge:	2.5A pulses at safe float voltage level for maximum topping of battery capacity.	
Indication when “Battery not connected”	Flashing Green (1s/1s)	
Temperature compensation of charge voltage:	-	
Ripple:	< 100mV p-p	
Efficiency (at 100% load, 90V) approx.:	> 83%	
Switch frequency approx.:	40kHz	
Leakage current from battery with mains switched off:	< 200 µA at 26V battery voltage (0.15Ah/month)	
Protection:	Protected against reversed polarity and short circuit proof. Safety timer. Charging of wrong lower voltage battery pack (e.g. 12V) will be limited to 0.6A and terminated after 30min.	
Temperature range:	Operating: ÷25 to +40°C. Storage: ÷25 to +85°C	
Safety:	Medical EN 60601-1 / Home Healthcare EN 60601-1-11 / Battery Charger EN 60335-2-29	
Insulation class :	Class II	
Insulation voltage: Primary – secondary:	4000VAC / 5700VDC	
EMC standards:	EN 55014-1 and –2, Emission EN 61000-6-3, Immunity EN 61000-6-1, EN 60601-1-2	
Input terminal	2-pins IEC 320 connector	
Output terminals:	Battery clips, Push-on terminals or DC connector	
IP-Grade:	41	
Rec. battery capacity:	12 - 125Ah	
Dimensions:	135 × 80 × 44 mm	
Weight:	390g	610g

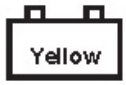
MASCOT type 2440 Lead Acid Charger:	**2440 4850 00** **w. female connector**	**2440 0480 00** **w. battery clips**
Input voltage: / Line frequency:	90 - 264VAC / 47 - 63Hz	
Max output power:	76.5W	
Charge control: / Charge indication: Step 0 < 30min / Yellow Step 0 > 30min / Red (Error-mode) Step 1 (until Vbat = 58.8V) / Yellow Step 2 (until I charge < 0.3A or > 4h) / Flashing Yellow Step 3 (until I charge > 1.3A) / Green Charge timer (step2): Safety timer: Restart charge current:	0.3A ± 0.1A, when battery voltage < 42.0V < 0.2A 1.3A ± 0.1A, when battery voltage > 42.0V. 58.8V ± 0.2V and charge current is tapering. 54.8V ± 0.2V, supply current up to maximum 1.3A for possible parallel load. 4h 72h 1.3A	
Formation Charge:	Low current start-up of deeply discharged battery.	
Float charge:	1.3A pulses at safe float voltage level for maximum topping of battery capacity.	
Indication when “Battery not connected”	Flashing Green (1s/1s)	
Temperature compensation of charge voltage:	-	-3 to -4mV/°C pr. cell
Ripple:	< 100mV p-p	
Efficiency (at 100% load, 90V) approx.:	> 85%	
Switch frequency approx.:	40kHz	
Leakage current from battery with mains switched off:	< 200 µA at 52V battery voltage (0.15Ah/month)	
Protection:	Protected against reversed polarity and short circuit proof. Safety timer. Charging of wrong lower voltage battery pack (e.g. 6V) will be limited to 0.3A and terminated after 30min.	
Temperature range:	Operating: ÷25 to +40°C. Storage: ÷25 to +85°C	
Safety:	Medical EN 60601-1 / Home Healthcare EN 60601-1-11 / Battery Charger EN 60335-2-29	
Insulation class :	Class II	
Insulation voltage: Primary – secondary:	4000VAC / 5700VDC	
EMC standards:	EN 55014-1 and -2, Emission EN 61000-6-3, Immunity EN 61000-6-1, EN 60601-1-2	
Input terminal	2-pins IEC 320 connector	
Output terminals:	Battery clips, Push-on terminals or DC connector	
IP-Grade:	41	
Rec. battery capacity:	7 - 70Ah	
Dimensions:	135 × 80 × 44 mm	
Weight:	390g	610g

Technical drawing



Charging method D

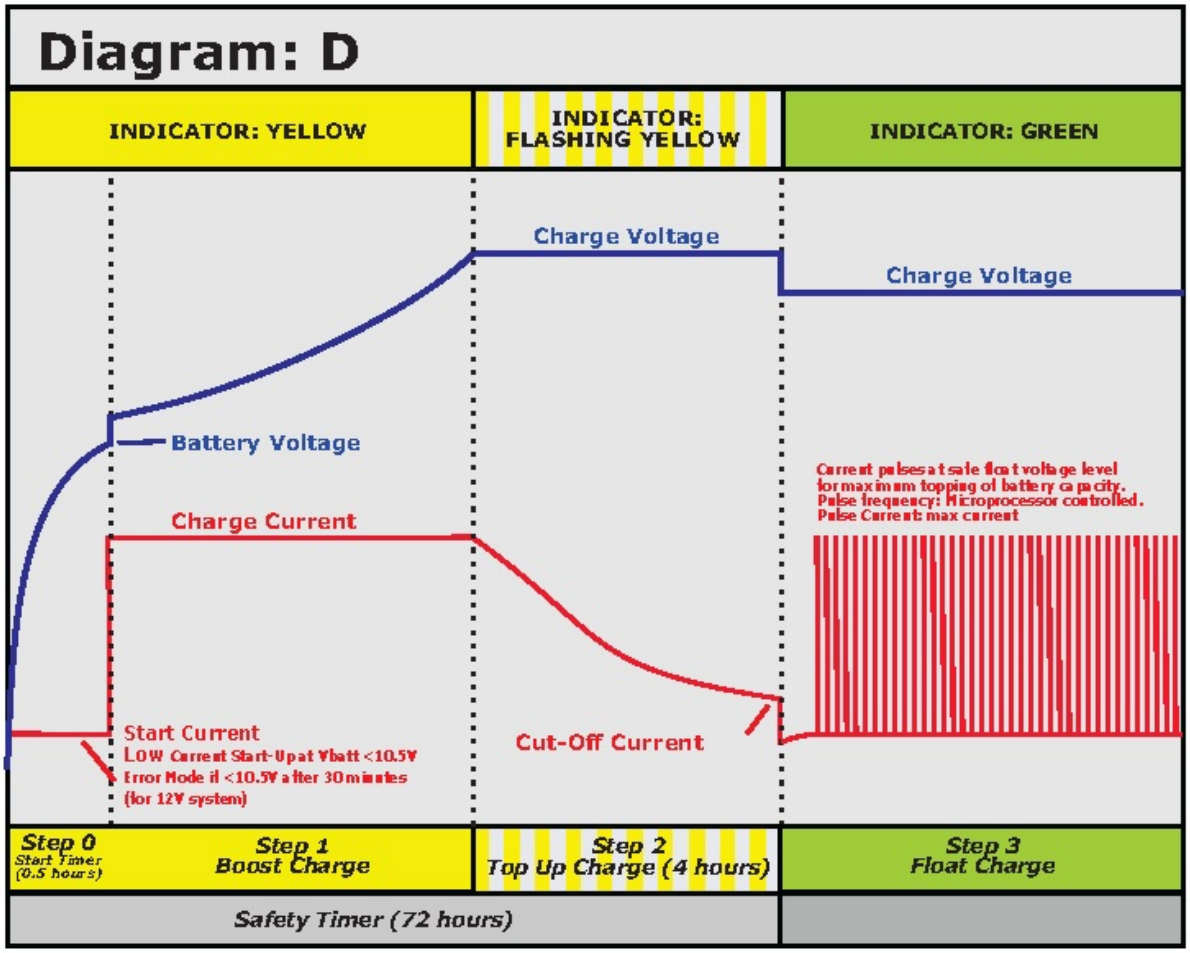
STEP 1 - BOOST CHARGE
LED-indicator: YELLOW
The charger is in constant current mode (CC), charging with the maximum current until battery voltage reach Top-Up level.



STEP 2 – TOP-UP CHARGE
The charger is in constant voltage mode. The LED-indication will be FLASHING YELLOW during Top-up charge. The charger stays in this mode until the charge current decreases to charge termination level or the Top-Up Charge Timer runs out. 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 charger is in standby mode. The charge voltage is at standby level and the charger may remain connected to the battery.
The charger will return to boost charge if the battery is used.

BATTERY NOT CONNECTED INDICATIONS
Battery not connected is indicated by FLASHING GREEN



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