

## Model 4040 LA

8 A max out • 90-264 VAC input

- 3-step charge control with current detection and timer
- Universal input voltage 90-264 VAC
- 2-pin IEC 60320 C8, 3-pin C6 on request
- Output terminal: Battery clips, DC conn., push-on terminals or open ends
- Temp. compensation of charge voltage
- Wake up and low current start-up of deeply discharged batteries
- Safety indication and protection: against reverse polarity, short circuit, charging battery packs with the wrong number of cells and safety timer run-out
- Active power factor correction
- Approvals:
  - Medically certified
    - Safety: EN 60601-1 ed. 3.1 and ed. 3.2
    - 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

12 V / 8,0 A

24 V / 4,0 A

36 V / 2,66 A

48 V / 2,0 A

### Notes:

Desktop unit

Wall mount bracket available

With active power factor correction

2MOOP standard, 2MOPP available

Wall mount bracket available

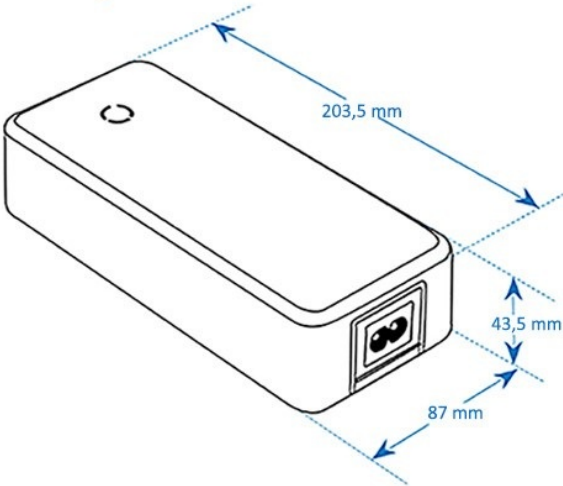
With battery clips and temp sensor

Std output cord: L 1.2m, AWG 14, UL 2464

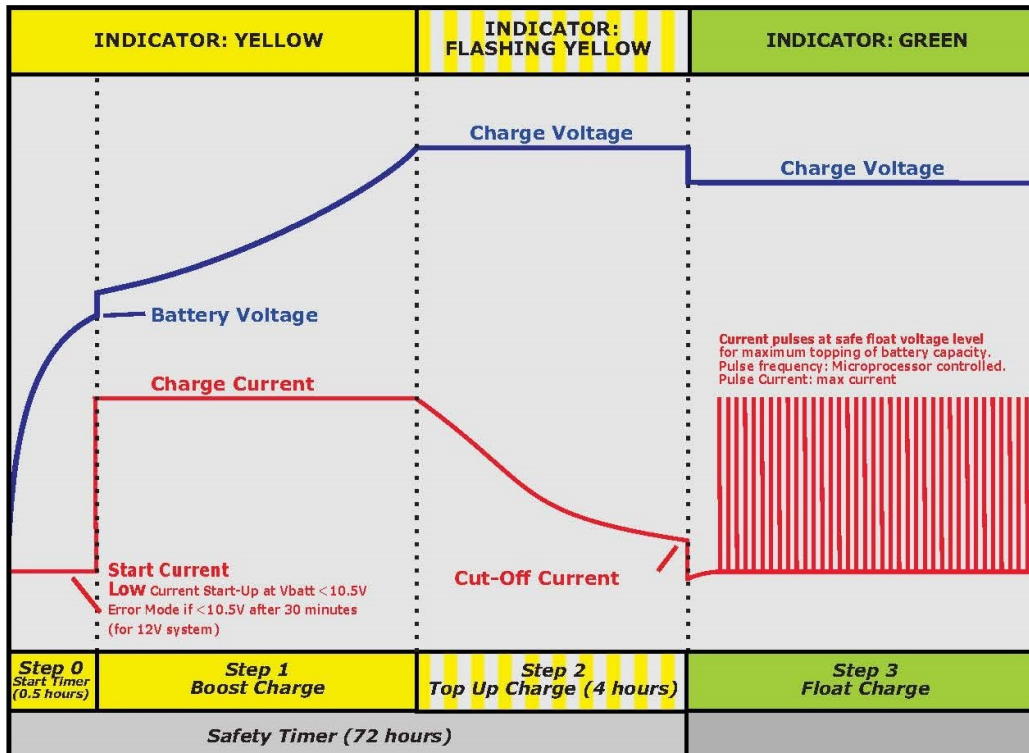
MASCOT type 4040 Lead Acid chargers:	12V Lead Acid	24V Lead Acid	36V Lead Acid
Input voltage: / Line frequency	90-264Vac 47-63Hz		
Active power factor correction:	Yes		
Max output power	117.6W	117.6W	117.3W
Charge control: Charge indication:			
Step 0 < 30min Yellow	CC 800mA ± 50mA, when batt voltage < 10.5V.	CC 500mA ± 50mA, when batt voltage < 21V.	CC 300mA ± 50mA, when batt voltage < 31.5V.
Step 0 > 30min Red (4 blinks)	0A / 0V	0A / 0V	0A / 0V
Step 1 (Constant Current) Yellow	CC 8.0A ± 0.2A, when 10.5V < Vbat < 14.7V.	CC 4.0A ± 0.2A, when 21V < Vbat < 29.4V.	CC 2.65A ± 0.2A, when 31.5V < Vbat < 44.1V.
Step 2 (Constant Voltage) Flashing Yellow	CV 14.7V ± 0.2V < 5.5A until I charge < 1.3A or max. 4h.	CV 29.4V ± 0.2V < 2.8A until I charge < 0.65A or max. 4h.	CV 44.1V ± 0.2V < 1.5A until I charge < 0.45A or max. 4h.
Charge timer (step2, CV)	4h	4h	4h
Safety timer (all steps) Red (5 blinks)	72h	72h	72h
Step 3 Float Charge voltage Green	13.7V	27.4V	41.1V
Restart voltage	13.0V	26.0V	39.0V
Formation Charge (Step 0)	Low current start-up of deeply discharged battery.		
Float charge:	CC 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:	-3.5mV/°C pr cell. Nominal charge voltage at 20°C. (min 2.2V/cell, max 2.67V/cell)		
Ripple:	< 100mV p-p		
Efficiency (at 100% load) approx.:	91 %		
Switch frequency approx.:	45-75kHz		
Leakage current from battery with mains switched off:	Approx. 1.0 mA at nominal battery voltage (< 0.72 Ah/month)		
Protection:	Protected against reversed polarity. Error Indication: Red (2 blinks)		
	Short circuit proof. Error Indication: Red (3 blinks)		
	Charging of wrong lower voltage battery pack will be limited to 0.8A (0.5A at 24V 0.3A at 36V) and terminated after 30min. Indication: Red (4 blinks)		
	Safety timer. Error Indication: Red (5 blinks)		
	No charge (or charge terminated) if connecting wrong battery pack with higher voltage. Indication: LED is OFF.		
Temperature range:	Operating: -25 to +40°C. Transport and short time storage: -25 to +85°C		
Derating at 40°C approx.:	5.5A	3.1A	1.8A
Safety:	Medical EN 60601-1 / Home Health care EN 60601-1-11/ Battery Charger EN 60335-2-29. A/V and Comm. tech: IEC 62368-1		
Insulation class :	Class II (Class I on request)		
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, C8. (3pins IEC 320 connector, C6 on request)		
Output terminals:	DC connector, Battery clips, Push-on terminals or open ends.		
IP-Grade:	41		
Rec. battery capacity:	40-400Ah	20-200Ah	13 -130Ah
Dimensions:	203.5 × 87 × 43.5 mm		
Weight:	775g		

MASCOT type 4040 Lead Acid chargers:		48V Lead Acid	
Input voltage: / Line frequency		90-264Vac 47-63Hz	
Active power factor correction:		Yes	
Max output power		117.6W	
Charge control: Charge indication:			
Step 0 < 30min	Yellow	CC 200mA ± 50mA, when batt voltage < 42V.	
Step 0 > 30min	Red (4 blinks)	0A / 0V	
Step 1 (Constant Current)	Yellow	CC 2.0A ± 0.2A, when 42V < Vbat < 58.8V.	
Step 2 (Constant Voltage)	Flashing Yellow	CV 58.8V ± 0.2V < 1.4A until I charge < 0.35A or max. 4h.	
Charge timer (step2, CV)		4h	
Safety timer (all steps)		72h	
Step 3 Float Charge voltage	Green	54.8.4V	
Restart voltage		52.0V	
Formation Charge (Step 0)		Low current start-up of deeply discharged battery.	
Float charge:		CC 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:		-3.5mV/°C pr cell. Nominal charge voltage at 20°C. (min 2.2V/cell, max 2.67V/cell)	
Ripple:		< 100mV p-p	
Efficiency (at 100% load) approx.:		91 %	
Switch frequency approx.:		45-75kHz	
Leakage current from battery with mains switched off:		< 300 µA at nominal battery voltage (< 0.22 Ah/month)	
Protection:		Protected against reversed polarity. Error Indication: Red (2 blinks) Short circuit proof. Error Indication: Red (3 blinks) Charging of wrong lower voltage battery pack will be limited to 0.2A and terminated after 30min. Indication: Red (4 blinks) Safety timer. Error Indication: Red (5 blinks) No charge (or charge terminated) if connecting wrong battery pack with higher voltage. Indication: LED is OFF.	
Temperature range:		Operating: -25 to +40°C. Transport and short time storage: -25 to +85°C	
Derating at 40°C approx.:		1.50A	
Safety:		Medical EN 60601-1 / Home Health care EN 60601-1-11/ Battery Charger EN 60335-2-29. A/V and Comm. tech: IEC 62368-1	
Insulation class :		Class II (Class I on request)	
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, C8. (3pins IEC 320 connector, C6 on request)	
Output terminals:		DC connector, Battery clips, Push-on terminals or open ends.	
IP-Grade:		41	
Rec. battery capacity:		10-100Ah	
Dimensions:		203.5 × 87 × 43.5 mm	
Weight:		775g	

Technical drawing



## Charging characteristics and LED indication



### 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. A load larger than the cut-off current will initiate a new charge cycle.



### BATTERY NOT CONNECTED

Battery not connected is indicated by FLASHING GREEN. In this mode charger will apply short pulses attempting to wake up deeply discharged batteries.

### ERROR INDICATIONS

- 2 red blinks: Battery is connected to charger with wrong polarity!
- 4 red blinks: Charging of wrong lower voltage battery pack (e.g. 12V) will be limited to 1.4A and terminated after 30min
- 5 red blinks: Safety timer has run out. Check battery status or capacity.
- 6 red blinks: Defect battery
- LED off: Battery voltage is too high ( $> 32V$ ). Check battery voltage.

# 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>-, Li-Titanate-, NiMH/NiCd- or Lead-Acid Batteries**

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

Type(s)/Model(s)/  
UDI-DI:

<b>4040</b>	2xMOOP to IEC 60601-1, rated input voltage 100- 240 V, 50- 60 Hz
<b>4040V</b>	2xMOOP to IEC 60601-1, rated input voltage 100- 240 V 50 Hz/ 100- 220 V 60 Hz
<b>4040P</b>	2xMOPP to IEC 60601-1, rated input voltage 100- 240 V, 50- 60 Hz
<b>4040VP</b>	2xMOPP to IEC 60601-1, rated input voltage 100- 240 V 50 Hz/ 100- 220 V 60 Hz
<b>4040B</b>	2xMOOP to IEC 60601-1, PWB-only, for building-in, rated input voltage 100 - 240 V, 50 - 60 Hz
<b>4040VB</b>	2xMOOP to IEC 60601-1, PWB-only, for building-in, rated input voltage 100 - 240 V 50 Hz/ 100 - 220 V 60 Hz
<b>4040BP</b>	2xMOPP to IEC 60601-1, PWB-only, for building-in, rated input voltage 100 - 240 V, 50 - 60 Hz
<b>4040VBP</b>	2xMOPP to IEC 60601-1, PWB-only, for building-in, rated input voltage 100 - 240 V 50 Hz/ 100 - 220 V 60 Hz

(all models 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. 1.6 A 100-240 VAC 50-60 Hz, Class I or Class II**  
**Output:**  
 versions for Lead-Acid Batteries 6 - 48 V:  
     6 V max. 10.0 A    12 V max. 8.0 A    18 V max. 5.3 A    24 V max. 4.0 A    36 V max. 2.66 A  
     48 V max. 2.0 A  
 versions for Li-Ion Batteries 1 - 14 cell:  
     1 cell max. 10.0 A    2 cell max. 10.0 A    3 cell max. 9.0 A    4 cell max. 7.0 A    5 cell max. 5.6 A  
     6 cell max. 4.65 A    7 cell max. 4.0 A    8 cell max. 3.5 A    9 cell max. 3.1 A    10 cell max. 2.8 A  
     11 cell max. 2.54 A    12 cell max. 2.33 A    13 cell max. 2.15 A    14 cell max. 2.0 A  
 versions for LiFePO<sub>4</sub> Batteries 1 - 16 cell:  
     1 cell max. 10.0 A    2 cell max. 10.0 A    3 cell max. 10.0 A    4 cell max. 8.0 A    5 cell max. 6.4 A  
     6 cell max. 5.3 A    7 cell max. 4.6 A    8 cell max. 4.0 A    9 cell max. 3.5 A    10 cell max. 3.2 A  
     11 cell max. 2.92 A    12 cell max. 2.68 A    13 cell max. 2.47 A    14 cell max. 2.3 A    15 cell max. 2.15 A  
     16 cell max. 2.0 A  
 versions for Li-Titanate Batteries 1 - 20 cell:  
     1 cell max. 10.0 A    2 cell max. 10.0 A    3 cell max. 10.0 A    4 cell max. 10.0 A    5 cell max. 8.2 A  
     6 cell max. 6.8 A    7 cell max. 5.9 A    8 cell max. 5.1 A    9 cell max. 4.5 A    10 cell max. 4.1 A  
     11 cell max. 3.7 A    12 cell max. 3.4 A    13 cell max. 3.17 A    14 cell max. 2.94 A    15 cell max. 2.75 A  
     16 cell max. 2.57 A    17 cell max. 2.42 A    18 cell max. 2.29 A    19 cell max. 2.17 A    20 cell max. 2.00 A  
 versions for NiMH/NiCd Batteries:  
     2 cell max. 10.0 A    3-6 cell max. 10.0 A    4-8 cell max. 8.0 A    5-10 cell max. 6.5 A    6-12 cell max. 5.4 A  
     10-20 cell max. 3.2 A    10-22 cell max. 2.9 A    15-30 cell max. 2.18 A    20-40 cell max. 1.96 A

## NOTES:

- For compliance with EN 60601-1 output terminals >60 VDC must be inaccessible to operator and may not be interconnected.

# EU & UK Declaration of Conformity



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

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

# EU & UK Declaration of Conformity



The following harmonised standards and/or technical specifications have been applied:

(International editions and comments indicated in brackets):

## Electrical Safety and Electromagnetic Compatibility (to MDR-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 (Also tested according to 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
EN 60601-1-11	EN 60601-1-11:2015 (IEC 60601-1-2:2015/A1:2020, Edition 2.1)	Medical equipment, Home Healthcare, Edition 2.0

## 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

## Ecodesign to EU ERP-Directive:

Commission Regulation (EC) No 2019/1782	implementing Directive 2009/125/EC with regard to ecodesign 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.K.:

Draft Regulation only (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 !):

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
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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: Metrocert, 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](http://www.mascot.com).

Fredrikstad, Norway

Place of issue

2023-06-16

Date of issue

Signed on behalf of Mascot Electronics AS

A handwritten signature in blue ink, reading 'Fredrik Johansen'.

Fredrik Johansen, Compliance Manager

Name, function, signature