

Model 3546 LA

2 A max out • 90-264 VAC input

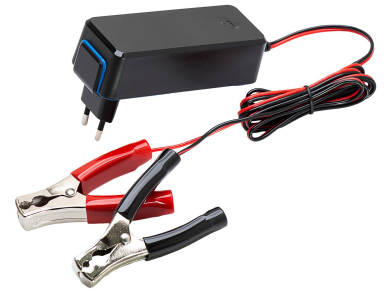
- 3-step charge control with current detection
- Universal input voltage
- Wake up and low current start-up of deeply discharged batteries
- Safety indication and protection: against reverse polarity, short circuit, charging battery packs with the wrong number of cells and safety timer run-out
- Approvals:
 - Household safety, EN 60335-1 & -2-29 (6V, 12V, 18V and 24V)
 - 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](#)

Notes:

Plug-in/Desktop unit
Exchangeable AC and DC plugs
Exchangeable DC cable connectors available
Version with fixed battery clips available
Order plugs & mains cord separately

Blueline



Available versions

12V / 2A

18V / 1,3A

24V / 1A

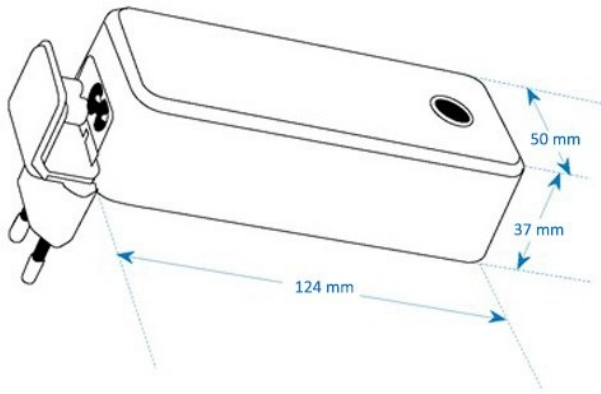
MASCOT type 3546 Lead Acid chargers:	24V Lead Acid	
Input voltage: / Line frequency	90 - 264VAC / 47 - 63Hz	
Max output power	29.4W	
Charge control: Charge indication:		
Step 0 < 30min Yellow	CC 100mA ± 25mA, when batt voltage < 21V.	
Step 0 > 30min Red (4 blinks)	0A / 0V	
Step 1 (Constant Current) Yellow	CC 1.0A ± 0.1A, when 21V < Vbat < 29.4V.	
Step 2 (Constant Voltage) Flashing Yellow	CV 29.4V ± 0.2V, until I charge < 250mA or max. 4h.	
Charge timer (step2, CV)	4h	
Safety timer (all steps) Red (5 blinks)	72h	
Step 3 (Charge Completed) Green	27.4V	
Restart voltage	26.0V	
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 (optional)	-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.:	85 %	
Switch frequency approx.:	35kHz	
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 100mA 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	
Safety:	Medical EN 60601-1 / Home Health care 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, C8.	
Output terminals:	DC connector, Battery clips, Push-on terminals or open ends.	
IP-Grade:	4X	
Rec. battery capacity:	10Ah (C/5) to 25Ah (<500mA charge current as EoC detection) or up to 100Ah (utilizing the 4h CV timer as EoC detection)	5Ah (C/5) to 12.5Ah (<250mA charge current as EoC detection) or up to 50Ah (utilizing the 4h CV timer as EoC detection)
Dimensions:	123.5 × 49.5 × 37 mm	
Weight:	220g	

MASCOT type 3546 Lead Acid chargers:	12V Lead Acid	18V Lead Acid
Input voltage: / Line frequency	90 - 264VAC / 47 - 63Hz	
Max output power	29.4W	28.9W
Charge control: Charge indication:		
Step 0 < 30min Yellow	CC 100mA ± 25mA, when batt voltage < 10.5V.	CC 100mA ± 25mA, when batt voltage < 16V.
Step 0 > 30min Red (4 blinks)	0A / 0V	0A / 0V
Step 1 (Constant Current) Yellow	CC 2.0A ± 0.1A, when 10.5V < Vbat < 14.7V.	CC 1.3A ± 0.1A, when 16V < Vbat < 22.05V.
Step 2 (Constant Voltage) Flashing Yellow	CV 14.7V ± 0.2V, until I charge < 500mA or max. 4h.	CV 22.05V ± 0.2V, until I charge < 300mA or max. 4h.
Charge timer (step2, CV)	4h	4h
Safety timer (all steps) Red (5 blinks)	72h	72h
Step 3 (Charge Completed) Green	13.7V	20.5V
Restart voltage	13.0V	19.5V
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 (optional)	-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.:	85 %	
Switch frequency approx.:	35kHz	
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 100mA 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	
Safety:	Medical EN 60601-1 / Home Health care 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, C8.	
Output terminals:	DC connector, Battery clips, Push-on terminals or open ends.	
IP-Grade:	4X	
Rec. battery capacity:	10Ah (C/5) to 25Ah (<500mA charge current as EoC detection) or up to 100Ah (utilizing the 4h CV timer as EoC detection)	6.5Ah (C/5) to 15Ah (<300mA charge current as EoC detection) or up to 50Ah (utilizing the 4h CV timer as EoC detection)
Dimensions:	123.5 × 49.5 × 37 mm	
Weight:	220g	

Standard output cordsets

Type	Versions	Part no.	AWG	Length (M)	Notes
Female conn	all	131479	18	0.75	Coax, UL 1185
Battery Clips	all	131062	18	1.9	UL 2468, w. batt. Clips
Exch. Conn. charger	female	131685	16	1.05	EMI core, coax
-to battery, clips	male	131686	16	0.6	UL 2468, fuse holder
-to battery, ring	male	131687	16	0.6	Ø8.4, UL 2468, fuse hold

Technical drawing



Charging method E

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.



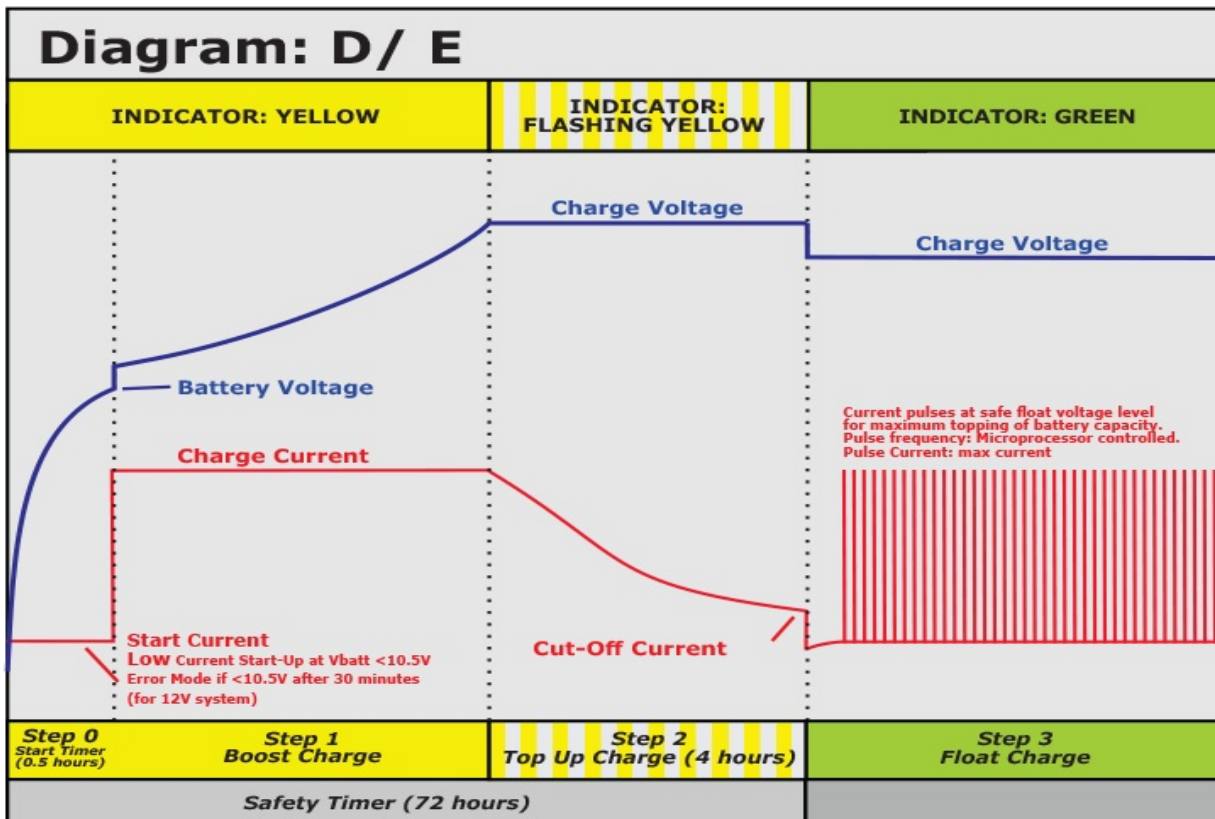
In this mode charger will apply short pulses attempting to wake up deeply discharged batteries. ★

ERROR INDICATIONS

- 2 red blinks: Battery is connected to charger with wrong polarity!
- 3 red blinks: Charger output is shorted. Check output cable connection! ★
- 4 red blinks: Battery voltage is low. Check battery status or voltage.
- 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. Check battery voltage.



★ NOT USED FOR 3540



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 -, Li-Titanate, Lead-Acid or NiMH/NiCd Batteries
Brand(s):	and/or MASCOT (may also carry additional customer name, logo or trade mark)
Type(s)/Model(s)/	3546
UDI-DI:	(may also carry additional customer model name or part number)
Batch / Serial No./	all CE- and/or UKCA- marked products produced from the date indicated below
UDI-PI:	(for production date: see marking on the product)
Description:	<p>Input: max. 0.35 A 100-240 VAC 50-60 Hz, Class II</p> <p>Output: max. 28 W (see product specific technical information)</p> <p>1- to 16-cell for Lithium-Ion Batteries or</p> <p>1- to 16-cell for LiFePO₄ Batteries or</p> <p>1-to 20-cell for Li-Titanate Batteries or</p> <p>12V, 24V, 36V or 48V for Lead Acid Batteries or</p> <p>2- to 20-cell for NiMH/NiCd Batteries.</p> <p>NOTES: - Versions with output voltage >42.4 VDC are not within the scope of standard EN 60335-2-29 Ed.4 (ref. Cl.10.101).</p>

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):

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)(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) (<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.
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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
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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
