

Model 3546 LI

2,5 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](#)

BlueLine



Available versions

- | | |
|----------------|----------------|
| 1 cell / 2,5A | 2 cell / 2,5A |
| 3 cell / 2,2A | 4 cell / 1,6A |
| 5 cell / 1,35A | 6 cell / 1,15A |
| 7 cell / 1,0A | 8 cell / 0,85A |
| 10 cell / 0,7A | 14 cell / 0,5A |

Notes:

Plug-in/Desktop unit

Exchangeable AC and DC plugs available

Order plugs & mains cord separately

Standard DC output cord:

Female connector L 0.75m, AWG 18, UL 1185 Coax

With NTC input on request

Animation showing charge error indications:

<https://vimeo.com/679995332>

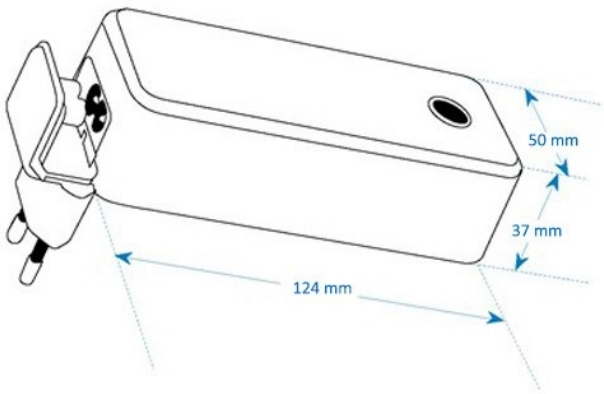
| MASCOT type 3546 Li-Ion chargers: | 1-cell Li-Ion | 2-cell Li-Ion | 3-cell Li-Ion |
|---|--|---|---|
| Input voltage: / Line frequency | 90-264 Vac/ 47-63 Hz | | |
| Max output power | 10.5W | 21W | 27.7W |
| Charge control: Charge indication: | | | |
| Step 0 < 10min Yellow | CC 100mA ± 25mA, when battery voltage < 3V. | CC 100mA ± 25mA, when battery voltage < 6V. | CC 100mA ± 25mA, when battery voltage < 9V. |
| Step 0 > 10min Red (4 blinks) | 0A / 0V | 0A / 0V | 0A / 0V |
| Step 1 (Constant Current) Yellow | CC 2.5A ± 0.3A, when 3V < Vbat < 4.2V. | CC 2.5A ± 0.3A, when 6V < Vbat < 8.4V. | CC 2.2A ± 0.2A, when 9V < Vbat < 12.6V. |
| Step 2 (Constant Voltage) Flashing Yellow | CV 4.2V ± 0.05V, until I charge < 100mA or max. 1h. | CV 8.4V ± 0.1V, until I charge < 100mA or max. 1h. | CV 12.6V ± 0.1V, until I charge < 100mA or max. 1h. |
| Charge timer (step2, CV) | 1h | 1h | 1h |
| Safety timer (all steps) Red (5 blinks) | 72h | 72h | 72h |
| Step 3 (Charge Completed) Green | 0A | 0A | 0A |
| Restart voltage | 4.1V | 8.2V | 12.3V |
| Formation Charge (Step 0) | Low current start-up of deeply discharged battery. | | |
| Wake-up of deeply discharged battery. | Yes, will apply voltage which deactivates deep discharge protection in battery pack. | | |
| Indication when "Battery not connected" | Flashing Green (1s/1s) | | |
| NTC input, on request (std is 10kohm, B-value approx. 4000) | 0 – 45 °C: Normal charge. Battery temperature < 0 °C (too cold) or > 45°C (too hot): No charge, wait until temp. is OK. | | |
| Ripple: | < 100mV p-p | | |
| Efficiency (at 100% load) approx.: | 85 % (70% for 1 cell version) | | |
| 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 10min. 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: | 2.5 Ah (1C) to 10Ah (<100mA charge current as EoC detection) or up to 100Ah (utilizing the 1h CV timer as EoC detection) | 2.5 Ah (1C) to 10Ah (<100mA charge current as EoC detection) or up to 100Ah (utilizing the 1h CV timer as EoC detection) | 2.2Ah (1C) to 10Ah (<100mA charge current as EoC detection) or up to 88Ah (utilizing the 1h CV timer as EoC detection) |
| Dimensions: | 123.5 × 49.5 × 37 mm | | |
| Weight: | 220g | | |

| MASCOT type 3546 Li-Ion chargers: | 4-cell Li-Ion | 5-cell Li-Ion | 6-cell Li-Ion |
|---|--|---|---|
| Input voltage: / Line frequency | 90 - 264VAC / 47 - 63Hz | | |
| Max output power | 26.9W | 28.4W | 29W |
| Charge control: Charge indication: | | | |
| Step 0 < 10min Yellow | CC 100mA ± 25mA, when batt voltage < 12V. | CC 100mA ± 25mA, when battery voltage < 15V. | CC 100mA ± 25mA, when batt voltage < 18V. |
| Step 0 > 10min Red (4 blinks) | 0A / 0V | 0A / 0V | 0A / 0V |
| Step 1 (Constant Current) Yellow | CC 1.6A ± 0.15A, when 12V < Vbat < 16.8V. | CC 1.35A ± 0.2A, when 15V < Vbat < 21.0V. | CC 1.15A ± 0.1A, when 18V < Vbat < 25.2V. |
| Step 2 (Constant Voltage) Flashing Yellow | CV 16.8V ± 0.1V, until I charge < 100mA or max. 1h. | CV 21.0V ± 0.1V, until I charge < 100mA or max. 1h. | CV 25.2V ± 0.2V, until I charge < 100mA or max. 1h. |
| Charge timer (step2, CV) | 1h | 1h | 1h |
| Safety timer (all steps) Red (5 blinks) | 72h | 72h | 72h |
| Step 3 (Charge Completed) Green | 0A | 0A | 0A |
| Restart voltage | 16.4V | 20.5V | 24.6V |
| Formation Charge (Step 0) | Low current start-up of deeply discharged battery. | | |
| Wake-up of deeply discharged battery. | Yes, will apply voltage which deactivates deep discharge protection in battery pack. | | |
| Indication when "Battery not connected" | Flashing Green (1s/1s) | | |
| NTC input, on request (std is 10kohm, B-value approx. 4000) | 0 - 45 °C: Normal charge. Battery temperature < 0 °C (too cold) or > 45°C (too hot): No charge, wait until temp. is OK. | | |
| 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 10min. 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: | 1.6 Ah (1C) to 10Ah (<100mA charge current as EoC detection) or up to 64Ah (utilizing the 1h CV timer as EoC detection) | 1.35 Ah (1C) to 10Ah (<100mA charge current as EoC detection) or up to 54Ah (utilizing the 1h CV timer as EoC detection) | 1.15 Ah (1C) to 10Ah (<100mA charge current as EoC detection) or up to 46Ah (utilizing the 1h CV timer as EoC detection) |
| Dimensions: | 123.5 × 49.5 × 37 mm | | |
| Weight: | 220g | | |

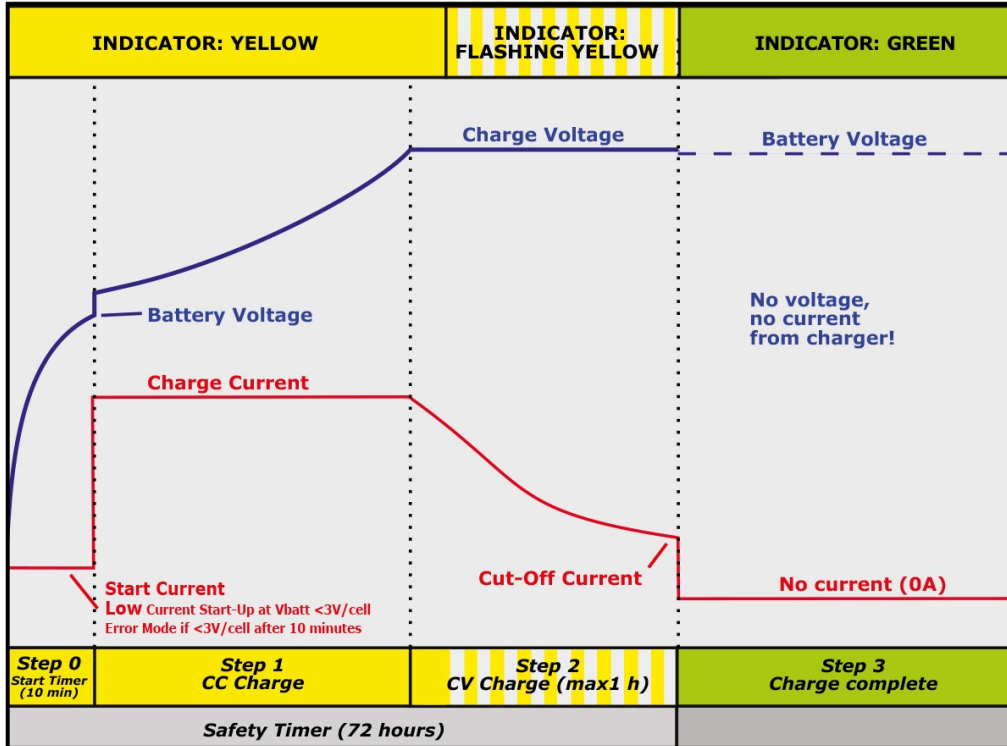
| MASCOT type 3546 Li-Ion chargers: | 7-cell Li-Ion | 8-cell Li-Ion | 10-cell Li-Ion |
|---|---|--|---|
| Input voltage: / Line frequency | 90 - 264VAC / 47 - 63Hz | | |
| Max output power | 29.4W | 28.6W | 29.4W |
| Charge control: Charge indication: | | | |
| Step 0 < 10min Yellow | CC 100mA ± 25mA, when batt voltage < 21V. | CC 100mA ± 25mA, when batt voltage < 24V. | CC 100mA ± 25mA, when batt voltage < 30V. |
| Step 0 > 10min Red (4 blinks) | 0A / 0V | 0A / 0V | 0A / 0V |
| Step 1 (Constant Current) Yellow | CC 1.0A ± 0.1A, when 21V < Vbat < 29.4V. | CC 0.85A ± 0.1A, when 24V < Vbat < 33.6V. | CC 0.7A ± 0.07A, when 30V < Vbat < 42V. |
| Step 2 (Constant Voltage) Flashing Yellow | CV 29.4V ± 0.2V, until I charge < 100mA or max. 1h. | CV 33.6V ± 0.2V, until I charge < 100mA or max. 1h. | CV 42V ± 0.3V, until I charge < 100mA or max. 1h. |
| Charge timer (step2, CV) | 1h | 1h | 1h |
| Safety timer (all steps) Red (5 blinks) | 72h | 72h | 72h |
| Step 3 (Charge Completed) Green | 0A | 0A | 0A |
| Restart voltage | 28.7V | 32.8V | 41V |
| Formation Charge (Step 0) | Low current start-up of deeply discharged battery. | | |
| Wake-up of deeply discharged battery: | Yes, will apply voltage which deactivates deep discharge protection in battery pack. | | |
| Indication when "Battery not connected" | Flashing Green (1s/1s) | | |
| NTC input, on request (std is 10kohm, B-value approx. 4000) | 0 - 45 °C: Normal charge. Battery temperature < 0 °C (too cold) or > 45 °C (too hot): No charge, wait until temp. is OK. | | |
| 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 (75mA) and terminated after 10min. 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: | 1Ah (1C) to 10Ah (<100mA charge current as EoC detection) or up to 40Ah (utilizing the 1h CV timer as EoC detection) | 0.85Ah (1C) to 10Ah (<100mA charge current as EoC detection) or up to 34Ah (utilizing the 1h CV timer as EoC detection) | 0.7Ah (1C) to 10Ah (<100mA charge current as EoC detection) or up to 28Ah (utilizing the 1h CV timer as EoC detection) |
| Dimensions: | 123.5 × 49.5 × 37 mm | | |
| Weight: | 220g | | |

| MASCOT type 3546 Li-Ion chargers: | 14-cell Li-Ion | | |
|---|---|--|--|
| Input voltage: / Line frequency | | | |
| Max output power | 29.4W | | |
| Charge control: Charge indication: | | | |
| Step 0 < 10min Yellow | CC 60mA ± 15mA, when batt voltage < 42V. | | |
| Step 0 > 10min Red (4 blinks) | 0A / 0V | | |
| Step 1 (Constant Current) Yellow | CC 0.5A ± 0.05A, when 42V < Vbat < 58.8V. | | |
| Step 2 (Constant Voltage) Flashing Yellow | CV 58.8V ± 0.5V, until I charge < 75mA or max. 1h. | | |
| Charge timer (step2, CV) | 1h | | |
| Safety timer (all steps) Red (5 blinks) | 72h | | |
| Step 3 (Charge Completed) Green | 0A | | |
| Restart voltage | 57.4V | | |
| Formation Charge (Step 0) | Low current start-up of deeply discharged battery. | | |
| Wake-up of deeply discharged battery: | Yes, will apply voltage which deactivates deep discharge protection in battery pack. | | |
| Indication when "Battery not connected" | Flashing Green (1s/1s) | | |
| NTC input, on request (std is 10kohm, B-value approx. 4000) | 0 - 45 °C: Normal charge. Battery temperature < 0 °C (too cold) or > 45°C (too hot): No charge, wait until temp. is OK. | | |
| 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 (75mA) and terminated after 10min. 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: | 0.5 Ah (1C) to 7.5Ah (<75mA charge current as EoC detection) or up to 20Ah (utilizing the 1h CV timer as EoC detection) | | |
| Dimensions: | 123.5 × 49.5 × 37 mm | | |
| Weight: | 220g | | |

Technical drawing



Charging characteristics and LED indication *



* an animated video of this charging progress is available on our website

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.
 LED off: Battery voltage is too high. Check battery voltage.

WAIT MODE INDICATIONS

Yellow with 1 red blink: Battery temperature is too low ($< 0^{\circ}C$)
 Yellow with 2 red blink: Battery temperature is too high ($> 45^{\circ}C$)

EU 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)/ UDI-DI: | 3546 (may also carry additional customer model name or part number) |
| Batch / Serial No./ UDI-PI: | all CE-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: max. 28 W (see product specific technical information) 1- to 16-cell for Lithium-Ion Batteries or 1- to 16-cell for LiFePO₄ Batteries or 1-to 20-cell for Li-Titanate Batteries or 12V, 24V, 36V or 48V for Lead Acid Batteries or 2- to 20-cell for NiMH/NiCd Batteries. |

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

| | |
|---------------|--|
| 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 Device 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 following harmonised standards and technical specifications have been applied:

(International editions and comments indicated in brackets)

Electrical Safety (to LVD- Directive):

| | | |
|---------------|---|---|
| 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) (OBS Expired from CE-marking!) | IT-equipment (ITE), Edition 2.2 |
| EN 60335-1 | EN 60335-1:2012 + /A1:2013 + /A2:2016 (IEC 60335-1:2010 + /A1:2013 + /A2:2016, Edition 5.2) | Household and similar appliances-General requirements, 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-Directive):

| | | |
|--------------|--|--|
| 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 |

EU Declaration of Conformity



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 55014-1:2017 (CISPR 14-1:2016, Edition 6.0) | Emission-household appliances, Edition 6.0 |
| 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 55032:2015 + /A1:2020 (CISPR 32:2015, Edition 2.0) | Emission-Multimedia Equipment, Edition 2.0 |

Ecodesign (to ERP-Directive):

| | |
|--|---|
| Commission Regulation (EC) No 278/2009 | 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 (Note: not applicable to Battery Chargers, ref. Article 1.2 item c) |
|--|---|

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 the General Medical Devices Directive.

The product(s) may be produced at production sites (for specific product: see "Made in"-marking on the product):

| | | |
|--|---|---|
| Mascot Electronics AS P.O.Box 177, N-1601 Fredrikstad, NORWAY | 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):

| | | |
|--|--|---|
| Mascot Electronics AS: Kiwa Teknologisk Institutt certificate ref. 044 | 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

Place of issue

2023-08-24

Date of issue

Fredrik Johansen, Compliance Manager

Name, function, signature