

## ANTI ISLANDING PROTECTION AUXSOL INVERTERS

Ningbo AUX Solar Technology CO., Ltd

hereby certifies, that the inverters

ASN-3.6SL,ASN-4SL,ASN-4.6SL,ASN-5SL,ASN-6SL,ASN-7SL,ASN-8SL;ASN-5TL,ASN-6TL,ASN-8TL,ASN-10TL,ASN-12TL,ASN-15TL,ASN-17TL,ASN-20TL,ASN-23TL,ASN-25TL;ASN-110TL,ASN-100TL,ASN-90TL,ASN-80TL,ASN-75TL,ASN-70TL  
ASG-3.6SL-ZH,ASG-4SL-ZH,ASG-4.6SL-ZH,ASG-5SL-ZH,ASG-6SL-ZH;ASG-5TL-ZH,ASG-6TL-ZH,ASG-8TL-ZH,ASG-10TL-ZH,ASG-12TL-ZH

Fulfil all requirements, which are postulated by the Greek Energy Supply Industry, including the Anti Islanding Protection.

1. The disconnection and connection of the inverter to the point of power injection is done with internal relays which are controlled by a software which will initiate:
  - a. an automatic (re-)connection to the public grid provided that voltage and frequency are within the range of  $0,8 \times V_{nom} - 1,15 \times V_{nom}$  and  $47 \text{ Hz} - 52 \text{ Hz}$ .
  - b. an immediate ( $< 0,2 \text{ s}$ ) disconnection if the voltage, the frequency or both are not within these limits.
  - c. the software with its adjustments can be accessed by the end-user by setting up account and password.
2. The connection time and the reconnection time after clearance of grid failure is not shorter than 180 s.
3. The injected DC current into the grid is  $< 0,5\%$  of nominal current.
4. The total harmonic distortion of the output current (THDI) is lower than 5%.
5. In addition to the passive protection limits (voltage and frequency) an Active Anti Islanding method according to VDE 0126-1-1 is implemented. The pattern detection method injects reactive current pulses and analyses the resulting frequency behavior

Με το παρόν βεβαιώνει ότι όλα τα είδη των μετατροπέων

ASN-3.6SL,ASN-4SL,ASN-4.6SL,ASN-5SL,ASN-6SL,ASN-7SL,ASN-8SL;ASN-5TL,ASN-6TL,ASN-8TL,ASN-10TL,ASN-12TL,ASN-15TL,ASN-17TL,ASN-20TL,ASN-23TL,ASN-25TL;ASN-110TL,ASN-100TL,ASN-90TL,ASN-80TL,ASN-75TL,ASN-70TL  
ASG-3.6SL-ZH,ASG-4SL-ZH,ASG-4.6SL-ZH,ASG-5SL-ZH,ASG-6SL-ZH;ASG-5TL-ZH,ASG-6TL-ZH,ASG-8TL-ZH,ASG-10TL-ZH,ASG-12TL-ZH

Εκπληρώνουν όλες τις απαιτήσεις οι οποίες αξιώνονται από την Ελληνική βιομηχανία παραγωγής ενέργειας, συμπεριλαμβανομένης της προστασίας έναντι του φαινομένου της νησιδοποίησης.

1. Ο μετατροπέας συνδέεται στο σημείο εισαγωγής ισχύος και αποσυνδέεται από αυτό με τη βοήθεια εσωτερικών ηλεκτρονικών που ελέγχονται μέσω λογισμικού το οποίο πραγματοποιεί:
  - a. αυτόματη (επανα-)σύνδεση στο δημόσιο δίκτυο, εφόσον οι τιμές της τάσης και της συχνότητας εμπίπτουν εντός του εύρους τιμών  $0,8 \times V_{nom} - 1,15 \times V_{nom}$  και  $47 \text{ Hz} - 52 \text{ Hz}$ .
  - b. άμεση ( $< 0,2 \text{ s}$ ) αποσύνδεση, εφόσον η τάση, η συχνότητα ή και τα δύο δεν εμπίπτουν εντός αυτού του εύρους.
  - c. ο τελικός χρήστης μπορεί να έχει πρόσβαση  
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μ
2. Ο χρόνος σύνδεσης και ο χρόνος επανασύνδεσης μετά την επαναφορά του δικτύου από σφάλμα είναι τουλάχιστον 180 s.
3. Η έγχυση συνεχούς ρεύματος στο δίκτυο είναι  $< 0,5\%$  του ονομαστικού
4. Η συνολική αρμονική παραμόρφωση του ρεύματος εξόδου (THDI) είναι μικρότερη από 5%.
5. Επιπλέον των ορίων προστασίας της τάσης και της συχνότητας, εφαρμόζεται ενεργή μέθοδος προστασίας έναντι του φαινομένου της νησιδοποίησης κατά το πρότυπο VDE 0126-1-1. Η σύμφωνη με το πρότυπο μέθοδος ανίχνευσης, αναλύει την συμπεριφορά της συχνότητας ως αποτέλεσμα της έγχυσης παλμών άεργου ρεύματος.

**Ningbo AUX Solar Technology Co., Ltd.**  
No.16 Fengwan Road,Cicheng Town  
Jiangbei District, Ningbo, 315034,  
China



Wang Zhaoming  
R&D Director

# Certificate of Conformity

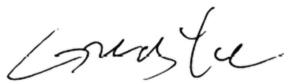
Certificate Number: CN-PV-230297

On the basis of the tests undertaken, the samples of the below product have been found to comply with the requirements of the referenced specifications /standards at the time the tests were carried out. It does not imply that Intertek has performed any surveillance or control of the manufacture. The manufacturer shall ensure that the manufacturing process assures compliance of the production units with the examined products mentioned in this certificate.

Applicant Name & Address:	Ningbo AUX Solar Technology Co., Ltd. No. 17 Fenglin Road, Cicheng Town, Jiangbei District, Ningbo City, Zhejiang Province, China
Product Description: Ratings & Principle Characteristics:	Hybrid solar inverter See Annex to Certificate of Conformity
Models/Type References:	ASG-3.6SL-ZH, ASG-4SL-ZH, ASG-4.6SL-ZH, ASG-5SL-ZH, ASG-6SL-ZH
Brand Name:	<b>AUXSOL</b>
Specification/Standard:	EN 50549-1: 2019, Requirements for generating plants to be connected in parallel with distribution networks Part 1: Connection to a LV distribution network - Generating plants up to and including Type B Type approval for type B
Certificate Issuing Office Name & Address:	Intertek Testing Services Ltd. Shanghai West Area, 2 <sup>nd</sup> Floor, No. 707, Zhangyang Road China (Shanghai) Pilot Free Trade Zone, Shanghai, P. R. China Accredited by ACCREDIA in accordance with ISO/IEC 17065:2012
Test Report Number:	230509124GZU-001

According to Annex H of the standard EN 50549-1:2019, generating plants compliant with the clauses of this European Standard are considered to be compliant with the relevant Article of COMMISSION REGULATION (EU) 2016/631, provided, that all settings as provided by the DSO and the responsible party are complied with.

Additional information in Appendix.



**Signature**

**Certification Manager: Grady Ye**

**Date: 05 June 2023**



PRD N° 306B

## APPENDIX: Certificate of Conformity

This is an Appendix to Certificate of Conformity Number: CN-PV-230297

Model	ASG-3.6SL-ZH	ASG-4SL-ZH	ASG-4.6SL-ZH
PV Input			
Max. input voltage	550V		
MPPT voltage range	90-520V		
Max. input current	16A/16A		
Max. short circuit current	20A/20A		
Input Battery			
Battery type	Li-ion		
Battery voltage range	80-480V		
Max.charge/discharge current	30A/30A		
Output AC (Grid side)			
Rated output power	3.6kW	4kW	4.6kW
Max. apparent output power	3.96kVA	4.4kVA	4.96kVA
Rated grid voltage	1/N/PE, 220V / 230V		
Rated grid frequency	50Hz		
Max. output current	17.2A	19.1A	22A
Power factor	>0.99 default (0.8 leading...0.8 lagging)		
Input AC (Grid side)			
Max. input power	4.8kW	5.3kW	6.2kW
Max. input current	21A	23A	26.8A
Rated input voltage	1/N/PE, 220V / 230V		
Rated input frequency	50/60Hz		
Output AC (Back-up)			
Rated output power	3.6kW	4kW	4.6kW
Max. apparent output power	4.3kVA	4.8kVA	5.5kVA
Max. output current	15.6A	17.4A	20A
Rated output voltage	220V / 230V		
Rated frequency	50/60Hz		
Ambient temperature range	-30...+60°C		
Degree of protection	IP66		
Software Version	DSP: D2301; ARM: A2301		

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## APPENDIX: Certificate of Conformity

This is an Appendix to Certificate of Conformity Number: CN-PV-230297

Model	ASG-5SL-ZH	ASG-6SL-ZH
PV Input		
Max. input voltage	550V	
MPPT voltage range	90-520V	
Max. input current	16A/16A	
Max. short circuit current	20A/20A	
Input Battery		
Battery type	Li-ion	
Battery voltage range	80-480V	
Max.charge/discharge current	30A/30A	
Output AC (Grid side)		
Rated output power	5kW	6kW
Max. apparent output power	5.5kVA	6.6kVA
Rated grid voltage	1/N/PE, 220V / 230V	
Rated grid frequency	50Hz	
Max. output current	23.9A	28.7A
Power factor	>0.99 default (0.8 leading...0.8 lagging)	
Input AC (Grid side)		
Max. input power	6.7kW	8kW
Max. input current	29.1A	34.8A
Rated input voltage	1/N/PE, 220V / 230V	
Rated input frequency	50/60Hz	
Output AC (Back-up)		
Rated output power	5kW	6kW
Max. apparent output power	6kVA	7.2kVA
Max. output current	21.7A	26A
Rated output voltage	220V / 230V	
Rated frequency	50/60Hz	
Ambient temperature range	-30...+60°C	
Degree of protection	IP66	
Software Version	DSP: D2301; ARM: A2301	

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## APPENDIX: Certificate of Conformity

This is an Appendix to Certificate of Conformity Number: CN-PV-230297

Interface protection settings according to EN 50549-1:2019			
Parameter	Max. disconnection time	Min. operate time	Trip value
Undervoltage threshold stage 1 [27 < ]	100s	0.1s (0.1 s steps)	Trip value Config. from 0.2 to 1 Un (0.01 Un steps)
Undervoltage threshold stage 2 [27 << ]	5s	0.1s (0.05 s steps)	Trip value Config. from 0.2 to 1 Un (0.01 Un steps)
Overvoltage threshold stage 1 [59 > ]	100s	0.1s (0.1 s steps)	Trip value Config. from 1.0 to 1.2 Un (0.01 Un steps)
Overvoltage threshold stage 2 [59 >> ]	5s	0.1s (0.05 s steps)	Trip value Config. from 1.0 to 1.3 Un (0.01 Un steps)
Overvoltage 10 min mean protection	Trip time Config ≤ 3s not adjustable Time delay setting = 0 ms		Trip value Config. from 1.0 to 1.15Un (0.01 Un steps)
Underfrequency threshold stage 1 [81 < ]	100s	0.1s (0.1s steps)	Trip value Config. from 47.0 to 50.0Hz (0.1Hz steps)
Underfrequency threshold stage 2 [81 << ]	5s	0.1s (0.05 s steps)	Trip value Config. from 47.0 to 50.0Hz (0.1Hz steps)
Overfrequency threshold stage 1 [81 > ]	100s	0.1s (0.1s steps)	Trip value Config. from 50.0 to 52.0Hz (0.1Hz steps)
Overfrequency threshold stage 2 [81 >> ]	5s	0.1s (0.05 s steps)	Trip value Config. from 50.0 to 52.0Hz (0.1Hz steps)
Starting to and reconnection settings for voltage	50%-120% adjustable, 85%Un ≤ U ≤ 1.10Un default		
Starting to generate electrical power	47Hz – 52Hz adjustable, 49.5Hz ≤ U ≤ 50.1Hz default		
Reconnection settings for frequency	47Hz – 52Hz adjustable, 49.5Hz ≤ U ≤ 50.2Hz default		
Observation time	10s-60s adjustable, 60s default		
Active power increase gradient	6%-3000%/min adjustable, 10%/min default		
Permanent DC injection	0.5% of rated inverter output		
Loss of mains according to EN 62116	Within 2s		

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CNAS L11038

Shenzhen Nore Testing Center Co.,Ltd.  
South, No.1, Building 10, Maqueling Industrial Zone,  
Nanshan Shenzhen, Guangdong, 518057, China  
TEL: +86-755-33525266 Wed: www.ntc-c.com



# CERTIFICATE OF CONFORMITY

Electromagnetic Compatibility Directive 2014/30/EU

Certificate No.: SZNTC2305005EV00

**Applicant** : Ningbo AUX Solar Technology Co., Ltd.  
**Address** : No. 17 Fenglin Road, Cicheng Town, Jiangbei District, Ningbo City, Zhejiang Province, China

**Manufacturer** : Ningbo AUX Solar Technology Co., Ltd.  
**Address** : No. 17 Fenglin Road, Cicheng Town, Jiangbei District, Ningbo City, Zhejiang Province, China

**Factory** : Ningbo AUX Solar Technology Co., Ltd.  
**Address** : No. 17 Fenglin Road, Cicheng Town, Jiangbei District, Ningbo City, Zhejiang Province, China

**E.U.T.** : Hybrid Solar Inverter

**Brand Name** : **AUXSOL**

**Model No.** : ASG-6SL-ZH, ASG-5SL-ZH, ASG-4.6SL-ZH, ASG-4SL-ZH, ASG-3.6SL-ZH

**Test Report No.** : SZNTC2305005EV00

**Standard** : EN IEC 61000-6-1: 2019  
EN IEC 61000-6-2: 2019  
EN IEC 61000-6-3: 2021  
EN IEC 61000-6-4: 2019  
EN IEC 61000-3-11: 2019  
EN 61000-3-12: 2011

CE



Han Song  
June 05, 2023


The certificate of conformity is based on an evaluation of a sample of the above mentioned product. Technical report and documentation are at the applicant's disposal. This is to certify that the tested sample is in conformity with all provisions of Annex I of Council Directive 2014/30/EU, in its latest amended version, referred to EMC Directive. The certificate does not imply assessment of the production and does not permit the use of Lab's logo.

Remark: The CE Marking may be used only if all relevant and effective EC Directives are complied with.

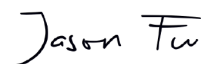
# Test Verification of Conformity

Verification Number: 230509124GZU-VOC001

On the basis of the referenced test reports, sample tested of the below product have been found to comply with the standards harmonized with the directives listed on this verification at the time the tests were carried out. Other standards and Directives may be relevant to the product. This verification is part of the full test reports and should be read in conjunction with them.

Once compliance with all product relevant  mark directives are verified, including any relevant e.g. risk assessment and production control, the manufacturer may indicate compliance by signing a Declaration of Conformity themselves and applying the mark to products identical to the tested sample(s).

Applicant Name & Address:	Ningbo AUX Solar Technology Co., Ltd. No. 17 Fenglin Road, Cicheng Town, Jiangbei District, Ningbo City, Zhejiang Province, China
Product Description:	Hybrid solar inverter
Ratings & Principle Characteristics:	See Appendix: Test Verification of Conformity
Models/Type References:	ASG-3.6SL-ZH, ASG-4SL-ZH, ASG-4.6SL-ZH, ASG-5SL-ZH, ASG-6SL-ZH
Brand Name:	
Relevant Standards/Directives:	IEC/EN 62109-1: 2010 Safety of power converters for use in photovoltaic power systems – Part 1: General requirements IEC/EN 62109-2: 2011 Safety of power converters for use in photovoltaic power systems – Part 2: Particular requirements for inverters IEC 62477-1:2022 EN 62477-1:2012 + A12:2021 Safety requirements for power electronic converter systems and equipment Part 1: General Low Voltage Directive 2014/35/EU
Verification Issuing Office Name & Address:	Intertek Testing Services Shenzhen Ltd. Guangzhou Branch Room 02, & 101/E201/E301/E401/E501/E601/E701/E801 of Room 01 1-8/F., No. 7-2. Caipin Road, Science City, GETDD, Guangzhou, Guangdong, China
Date of Tests:	17 April 2023 – 16 Jun 2023
Test Report Number(s):	230509124GZU-002, 230509124GZU-003, 230509124GZU-004
Additional information in Appendix.	



## Signature

**Name: Jason Fu**

**Position: Supervisor**

**Date: 29 June 2023**

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## APPENDIX: Test Verification of Conformity

This is an Appendix to Test Verification of Conformity Number: 230509124GZU-VOC001

Ratings & Principle Characteristics:

Model	ASG-3.6SL-ZH	ASG-4SL-ZH	ASG-4.6SL-ZH
PV Input			
Max. input voltage	550V		
MPPT voltage range	90-520V		
Max. input current	16A/16A		
Max. short circuit current	20A/20A		
Input Battery			
Battery type	Li-ion		
Battery voltage range	80-480V		
Max.charge/discharge current	30A/30A		
Output AC (Grid side)			
Rated output power	3.6kW	4kW	4.6kW
Max. apparent output power	3.96kVA	4.4kVA	4.96kVA
Rated grid voltage	1/N/PE, 220V / 230V		
Rated grid frequency	50/60Hz		
Max. output current	17.2A	19.1A	22A
Power factor	>0.99 default (0.8 leading...0.8 lagging)		
Input AC (Grid side)			
Max. input power	4.8kW	5.3kW	6.2kW
Max. input current	21A	23A	26.8A
Rated input voltage	1/N/PE, 220V / 230V		
Rated input frequency	50/60Hz		
Output AC (Back-up)			
Rated output power	3.6kW	4kW	4.6kW
Max. apparent output power	4.3kVA	4.8kVA	5.5kVA
Max. output current	15.6A	17.4A	20A
Rated output voltage	220V / 230V		
Rated frequency	50/60Hz		
Ambient temperature range	-30...+60°C		
Degree of protection	IP66		
Software Version	DSP: D2301; ARM: A2301		

*Jason Fu*

**Signature**

**Name: Jason Fu**

**Position: Supervisor**

**Date: 29 June 2023**

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# APPENDIX: Test Verification of Conformity

This is an Appendix to Test Verification of Conformity Number: 230509124GZU-VOC001

Ratings & Principle Characteristics:

Model	ASG-5SL-ZH	ASG-6SL-ZH
PV Input		
Max. input voltage	550V	
MPPT voltage range	90-520V	
Max. input current	16A/16A	
Max. short circuit current	20A/20A	
Input Battery		
Battery type	Li-ion	
Battery voltage range	80-480V	
Max.charge/discharge current	30A/30A	
Output AC (Grid side)		
Rated output power	5kW	6kW
Max. apparent output power	5.5kVA	6.6kVA
Rated grid voltage	1/N/PE, 220V / 230V	
Rated grid frequency	50/60Hz	
Max. output current	23.9A	28.7A
Power factor	>0.99 default (0.8 leading...0.8 lagging)	
Input AC (Grid side)		
Max. input power	6.7kW	8kW
Max. input current	29.1A	34.8A
Rated input voltage	1/N/PE, 220V / 230V	
Rated input frequency	50/60Hz	
Output AC (Back-up)		
Rated output power	5kW	6kW
Max. apparent output power	6kVA	7.2kVA
Max. output current	21.7A	26A
Rated output voltage	220V / 230V	
Rated frequency	50/60Hz	
Ambient temperature range	-30...+60°C	
Degree of protection	IP66	
Software Version	DSP: D2301; ARM: A2301	

*Jason Fu*

**Signature**

**Name: Jason Fu**

**Position: Supervisor**

**Date: 29 June 2023**

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# Certificate of Conformity

Certificate Number: CN-PV-230374

On the basis of the tests undertaken, the samples of the below product have been found to comply with the requirements of the referenced specifications /standards at the time the tests were carried out. It does not imply that Intertek has performed any surveillance or control of the manufacture. The manufacturer shall ensure that the manufacturing process assures compliance of the production units with the examined products mentioned in this certificate.

Applicant Name & Address:	Ningbo AUX Solar Technology Co., Ltd. No. 17 Fenglin Road, Cicheng Town, Jiangbei District, Ningbo City, Zhejiang Province, China
Product Description:	Hybrid solar inverter
Ratings & Principle Characteristics:	See Annex to Certificate of Conformity
Models/Type References:	ASG-3.6SL-ZH, ASG-4SL-ZH, ASG-4.6SL-ZH, ASG-5SL-ZH, ASG-6SL-ZH
Brand Name:	<b>AUXSOL</b>
Specification/Standard:	IEC 61727:2004 Photovoltaic (PV) systems – Characteristics of the utility interface IEC 62116:2014 Test procedure of islanding prevention measures for utility-interconnected photovoltaic inverters IEC 61683:1999 Photovoltaic systems – Power conditioners – Procedure for measuring efficiency
Certificate Issuing Office Name & Address:	Intertek Testing Services Ltd. Shanghai West Area, 2 <sup>nd</sup> Floor, No. 707, Zhangyang Road China (Shanghai) Pilot Free Trade Zone, Shanghai, P. R. China
Test Report Number:	Accredited by ACCREDIA in accordance with ISO/IEC 17065:2012 230612021GZU-001, 230612021GZU-002, 230612021GZU-003

Additional information in Appendix.



Signature

**Certification Manager: Grady Ye**  
**Date: 30 June 2023**



PRD N° 306B

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## APPENDIX: Certificate of Conformity

This is an Appendix to Certificate of Conformity Number: CN-PV-230374

Model	ASG-3.6SL-ZH	ASG-4SL-ZH	ASG-4.6SL-ZH
PV Input			
Max. input voltage	550V		
MPPT voltage range	90-520V		
Max. input current	16A/16A		
Max. short circuit current	20A/20A		
Input Battery			
Battery type	Li-ion		
Battery voltage range	80-480V		
Max.charge/discharge current	30A/30A		
Output AC (Grid side)			
Rated output power	3.6kW	4kW	4.6kW
Max. apparent output power	3.96kVA	4.4kVA	4.96kVA
Rated grid voltage	1/N/PE, 220V / 230V		
Rated grid frequency	50/60Hz		
Max. output current	17.2A	19.1A	22A
Power factor	>0.99 default (0.8 leading...0.8 lagging)		
Input AC (Grid side)			
Max. input power	4.8kW	5.3kW	6.2kW
Max. input current	21A	23A	26.8A
Rated input voltage	1/N/PE, 220V / 230V		
Rated input frequency	50/60Hz		
Output AC (Back-up)			
Rated output power	3.6kW	4kW	4.6kW
Max. apparent output power	4.3kVA	4.8kVA	5.5kVA
Max. output current	15.6A	17.4A	20A
Rated output voltage	220V / 230V		
Rated frequency	50/60Hz		
Ambient temperature range	-30...+60°C		
Degree of protection	IP66		
Software Version	DSP: D2301; ARM: A2301		

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## APPENDIX: Certificate of Conformity

This is an Appendix to Certificate of Conformity Number: CN-PV-230374

Model	ASG-5SL-ZH	ASG-6SL-ZH
PV Input		
Max. input voltage	550V	
MPPT voltage range	90-520V	
Max. input current	16A/16A	
Max. short circuit current	20A/20A	
Input Battery		
Battery type	Li-ion	
Battery voltage range	80-480V	
Max.charge/discharge current	30A/30A	
Output AC (Grid side)		
Rated output power	5kW	6kW
Max. apparent output power	5.5kVA	6.6kVA
Rated grid voltage	1/N/PE, 220V / 230V	
Rated grid frequency	50/60Hz	
Max. output current	23.9A	28.7A
Power factor	>0.99 default (0.8 leading...0.8 lagging)	
Input AC (Grid side)		
Max. input power	6.7kW	8kW
Max. input current	29.1A	34.8A
Rated input voltage	1/N/PE, 220V / 230V	
Rated input frequency	50/60Hz	
Output AC (Back-up)		
Rated output power	5kW	6kW
Max. apparent output power	6kVA	7.2kVA
Max. output current	21.7A	26A
Rated output voltage	220V / 230V	
Rated frequency	50/60Hz	
Ambient temperature range	-30...+60°C	
Degree of protection	IP66	
Software Version	DSP: D2301; ARM: A2301	

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