erneuerbar

Verantwortlicher erneuer.bar services GmbH
Hofgut 13, Wiler b. Utzenstorf
Michael Sebel, Geschäftsführung

ist Hersteller und verantwortlich für:

Konformitätserklärung / Declaration of Conformity

Produkt-Typ:	Plug & Play Photovoltaik-Set für Netzparallelbetrieb steckbar mittels Haushaltsstecker in Endstromkreis
Modell:	445 Wp Plug & Play (CN), 1 Panel / Hoymiles
Komponenten:	• 1x Jinko JKM445N-54HL4R-B / 445 Wp / IP-67 / Schutzklasse II • 1x Hoymiles HM-400 mit N/A Schutz und eingebauter RCMU / IP67 Schutzart / Schutzklasse II / Input max. 60VDC, Output max. 230VAC, 50-60Hz, 400VA, 1,74A • 1x Anschlusskabel vorkonfektioniert mit Betteri Buchse IP67, 5m, 10m, 15m oder 20m / 3x1,5mm2 Leitung / AC Seitig CH-Typ 13 Stecker IP 55

Konform nach ESTI-Mitteilung 07/2014 und in Übereinstimmung mit der Verordnung über elektrische Niederspannungserzeugnisse (NEV; SR 734.26) (Stand 23.04.2026).

Dazu angewandte Normen:

Jinko JKM445N-54HL4R-B	N 61215-1:2016, EN 61215-1-1:2016, IEC 61215-2:2016, EN 61215-2:2017, IEC 61730-1:2016, EN IEC 61730-1:2018, EN IEC 61730-1:2018/AC:2018-06, IEC 61730-2:2016, EN IEC 61730-2:2018, EN IEC 61730-2:2018/AC:2018-06
Hoymiles HMS-400W-1T	VDE-ARN-N 4105: 2018-11, VDE V 0124-100:2019 & EN50549-1:2019, VFR 2019 IEC/EN 62109-1:2010/-2:2011, IEC/EN 61000-6-1:2019;EN 61000-6-2:200; EN 61000-6-3:2007+A1:2011; EN 61000-6-4:2019; EN 61000-3-2:2019; EN 61000-3-3:2013+A1:2019, IEC/EN 62311:2008 NEMA (IP67) Gehäuse; 6000 V Stromstossschutz
Hoymiles Anschlusskabel vorkonfektioniert in 5m, 10m, 15m oder 20m	Betteri Buchse Wechselrichterseite, Schutzart IEC EN 60529 IP67, Anschlusskabel 5m oder 10m H07RN-F, EN 50525-2-21: 2011, Stecker CH Typ 13: IEC 60884-1 (Ed 4.0): 2022 / SN 441011-1: 2019 +Corr2019 / SN 441011-2-1:2021, IP55
ROHS Konformität	Gesamtes Set konform gemäss IEC EN 63000: 2018

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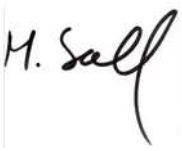

ZERTIFIKAT ◆ CERTIFICATE ◆ 認證證書 ◆ СЕРТИФИКАТ ◆ CERTIFICADO ◆ CERTIFICAT

Product Service

C E R T I F I C A T E

No. Z2 118443 0003 Rev. 00

Holder of Certificate: **Jinko Solar Co., Ltd.**
No.1, Yingbin Road, Economic Development Zone
334100 Shangrao City, Jiangxi
PEOPLE'S REPUBLIC OF CHINA

Certification Mark:

Product: **Crystalline Silicon Terrestrial Photovoltaic (PV) Modules**

Crystalline Silicon Photovoltaic Module

The product was tested on a voluntary basis and complies with the essential requirements. The certification mark shown above can be affixed on the product. It is not permitted to alter the certification mark in any way. In addition, the certification holder must not transfer the certificate to third parties. This certificate is valid until the listed date, unless it is cancelled earlier. All applicable requirements of the testing and certification regulations of TÜV SÜD Group have to be complied. For details see: www.tuvsud.com/ps-cert

Test report no.: 704062217001-05

Valid until: 2027-10-16

Date, 2022-10-28

(Zhulin Zhang)

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No. Z2 118443 0003 Rev. 00

Model(s):

1500VDC system voltage:
JKMxxxM-72-V, JKMxxxM-72B-V, JKMxxxM-72(Plus)-V, JKMxxxM-72L-V, JKMxxxM-72BL-V, JKMSxxxM-72-V, JKMSxxxM-72-V-J, JKMSxxxM-72-V-TI, JKMSxxxM-72L-V-TI, JKMSxxxM-72B-V-TI, JKMSxxxM-72BL-V-TI (xxx=335-410, in steps of 5, 72 cells)
JKMxxxM-60-V, JKMxxxM-60B-V, JKMxxxM-60(Plus)-V, JKMxxxM-60L-V, JKMxxxM-60BL-V, JKMSxxxM-60-V, JKMSxxxM-60-V-J, JKMSxxxM-60-V-TI, JKMSxxxM-60L-V-TI, JKMSxxxM-60B-V-TI, JKMSxxxM-60BL-V-TI (xxx=270-340, in steps of 5, 60 cells)
JKMxxxM-72H-V, JKMxxxM-72HL-V, JKMxxxM-72HB-V, JKMxxxM-72HBL-V, JKMSxxxM-72H-V-TI, JKMSxxxM-72HL-V-TI, JKMSxxxM-72HB-V-TI, JKMSxxxM-72HBL-V-TI (xxx=335-425, in steps of 5, 144 cells)
JKMxxxM-60H-V, JKMxxxM-60HL-V, JKMxxxM-60HB-V, JKMxxxM-60HBL-V, JKMSxxxM-60H-V-TI, JKMSxxxM-60HL-V-TI, JKMSxxxM-60HB-V-TI, JKMSxxxM-60HBL-V-TI (xxx=270-350, in steps of 5, 120 cells)
MMxxx-72LA-MBV, MMxxx-72LA-ABV, SMMxxx-72LA-MBV, SMMxxx-72LA-MBV-TI, SMMxxx-72LA-ABV-TI (xxx=335-410, in steps of 5, 72 cells)
MMxxx-60LA-MBV, MMxxx-60LA-ABV, SMMxxx-60LA-MBV-TI, SMMxxx-60LA-ABV-TI (xxx=270-340, in steps of 5, 60 cells)
JKMxxxM-72HL-V-Q, JKMSxxxM-72HL-V-TI-Q, MMxxx-72HLA-MBV, MMxxx-72HLA-ABV, SMMxxx-72HLA-MBV-TI, SMMxxx-72HLA-ABV-TI (xxx=335-425, in steps of 5, 144 cells)
JKMxxxM-60HL-V-Q, JKMSxxxM-60HL-V-TI-Q, MMxxx-60HLA-MBV, MMxxx-60HLA-ABV, SMMxxx-60HLA-MBV-TI, SMMxxx-60HLA-ABV-TI (xxx=270-350, in steps of 5, 120 cells)
JKMxxxPP-72-V, JKMxxxPP-72B-V, JKMxxxPP-72(Plus)-V, JKMSxxxPP-72-V, JKMSxxxPP-72-V-J (xxx=320-355, in steps of 5, 72 cells)
JKMxxxPP-60-V, JKMxxxPP-60B-V, JKMxxxPP-60(Plus)-V, JKMSxxxPP-60-V, JKMSxxxPP-60-V-J (xxx=260-290, in steps of 5, 60 cells)
JKMxxxPP-72H-V, JKMxxxPP-72HB-V (xxx=330-380, in steps of 5, 144 cells)
JKMxxxPP-60H-V, JKMxxxPP-60HB-V (xxx=260-315, in steps of 5, 120 cells)
JKMxxxM-72H-TV, JKMxxxM-72HL-TV (xxx=375-425, in steps of 5, 144 cells)
JKMxxxM-60H-TV, JKMxxxM-60HL-TV (xxx=315-355, in steps of 5, 120 cells)
JKMxxxM-72HL-TV-Q, MMxxx-72HLA-BBV (xxx=375-425, in steps of 5, 144 cells)
JKMxxxM-60HL-TV-Q, MMxxx-60HLA-BBV (xxx=315-355, in steps of 5, 120 cells)
JKMxxxN-72H-TV, JKMxxxN-72HL-TV (xxx=375-425, in steps of 5, 144 cells)
JKMxxxN-60H-TV, JKMxxxN-60HL-TV (xxx=315-355, in steps of 5, 120 cells)
JKMSxxxM-72-V-MX3, JKMSxxxM-72B-V-MX3, JKMSxxxM-72L-V-MX3, JKMSxxxM-72BL-V-MX3 (xxx=335-395, in steps of 5, 72 cells)
JKMSxxxM-60-V-MX3, JKMSxxxM-60B-V-MX3, JKMSxxxM-60L-V-MX3, JKMSxxxM-60BL-V-MX3 (xxx=270-340, in steps of 5, 60 cells)
SMMxxx-72LA-MBV-MX3, SMMxxx-72LA-ABV-MX3 (xxx=335-395, in steps of 5, 72 cells)
SMMxxx-60LA-MBV-MX3, SMMxxx-60LA-ABV-MX3 (xxx=270-340, in steps of 5, 60 cells)
JKMSxxxM-72H-V-MX3, JKMSxxxM-72HB-V-MX3, JKMSxxxM-72HL-V-MX3, JKMSxxxM-72HBL-V-MX3 (xxx=335-395, in steps of 5, 144cells)
JKMSxxxM-60H-V-MX3, JKMSxxxM-60HB-V-MX3, JKMSxxxM-60HL-V-MX3, JKMSxxxM-60HBL-V-MX3 (xxx=270-340, in steps of 5, 120 cells)
JKMSxxxM-72HL-V-MX3-Q, SMMxxx-72HLA-MBV-MX3, SMMxxx-72HLA-ABV-MX3 (xxx=335-395, in steps of 5, 144cells)
JKMSxxxM-60HL-V-MX3-Q, SMMxxx-60HLA-MBV-MX3, SMMxxx-60HLA-ABV-MX3 (xxx=270-340, in steps of 5, 120 cells)
JKMSxxxPP-72-V-MX3, JKMSxxxPP-72B-V-MX3, JKMSxxxPP-72L-V-MX3, JKMSxxxPP-72BL-V-MX3 (xxx=320-355, in steps of 5, 72 cells)
JKMSxxxPP-60-V-MX3, JKMSxxxPP-60B-V-MX3, JKMSxxxPP-60L-V-MX3, JKMSxxxPP-60BL-V-MX3 (xxx=260-290, in steps of 5, 60 cells)
JKMSxxxPP-72H-V-MX3, JKMSxxxPP-72HB-V-MX3, JKMSxxxPP-72HL-V-MX3, JKMSxxxPP-72HBL-V-MX3 (xxx=330-380, in steps of 5, 144cells)
JKMSxxxPP-60H-V-MX3, JKMSxxxPP-60HB-V-MX3, JKMSxxxPP-60HL-V-MX3, JKMSxxxPP-60HBL-V-MX3 (xxx=260-315, in steps of 5, 120 cells)
JKMxxxN-72H-MBB-TV (xxx=390-420, in steps of 5, 144 cells)
JKMxxxN-60H-MBB-TV (xxx=330-350, in steps of 5, 120 cells)
MNxxx-72HLA-BBV-MBB (xxx=390-420, in steps of 5, 144 cells)
MNxxx-60HLA-BBV-MBB (xxx=330-350, in steps of 5, 120 cells)
JKMxxxM-72H-MBB-TV (xxx=385-405, in steps of 5, 144 cells)
JKMxxxM-60H-MBB-TV (xxx=320-335, in steps of 5, 120 cells)

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MM-72HLA-BBV-MBB, MMxxx-72HLA-BBV-MBB (xxx=385-405, in steps of 5, 144 cells)
MM-60HLA-BBV-MBB, MMxxx-60HLA-BBV-MBB (xxx=320-335, in steps of 5, 120 cells)
JKMxxxM-72H-MBB-V, JKMSxxxM-72H-MBB-V-TI, JKMSxxxM-72H-MBB-V-MX3 (xxx=385-425, in steps of 5, 144 cells)
JKMxxxM-60H-MBB-V, JKMSxxxM-60H-MBB-V-TI, JKMSxxxM-60H-MBB-V-MX3 (xxx=320-355, in steps of 5, 120 cells)
MM-72HLA-MBV-MBB, SMM-72HLA-MBV-MBB-TI, MMxxx-72HLA-MBV-MBB, SMMxxx-72HLA-MBV-MBB-TI (xxx=385-425, in steps of 5, 144 cells)
MM-60HLA-MBV-MBB, SMM-60HLA-MBV-MBB-TI, MMxxx-60HLA-MBV-MBB, SMMxxx-60HLA-MBV-MBB-TI (xxx=320-355, in steps of 5, 120 cells)
JKSN3-DCCA-xxx (xxx=410-440, in steps of 5, 156 cells)
JKSN3-CCCA-xxx (xxx=345-370, in steps of 5, 132 cells)
JKSM3-DCCA-xxx (xxx=400-450, in steps of 5, 156 cells)
JKSM3-CCCA-xxx (xxx=340-380, in steps of 5, 132 cells)
JKSM3-DACA-xxx (xxx=400-440, in steps of 5, 156 cells)
JKSM3-CACA-xxx (xxx=335-370, in steps of 5, 132 cells)
JKMxxxM-78H-V, JKMSxxxM-78H-V-TI (xxx=405-465, in steps of 5, 156 cells)
JKMxxxM-66H-V, JKMSxxxM-66H-V-TI (xxx=340-390, in steps of 5, 132 cells)
JKMxxxM-78H-V-Q, JKMSxxxM-78H-V-TI-Q, MMxxx-78HLA-MBV, SMMxxx-78HLA-MBV-TI (xxx=405-465, in steps of 5, 156 cells)
JKMxxxM-66H-V-Q, JKMSxxxM-66H-V-TI-Q, MMxxx-66HLA-MBV, SMMxxx-66HLA-MBV-TI (xxx=340-390, in steps of 5, 132 cells)
JKMxxxM-78HB-V, JKMSxxxM-78HB-V-TI (xxx=405-435, in steps of 5, 156 cells)
JKMxxxM-66HB-V, JKMSxxxM-66HB-V-TI (xxx=340-365, in steps of 5, 132 cells)
MMxxx-78HLA-ABV, SMMxxx-78HLA-ABV-TI (xxx=405-435, in steps of 5, 156 cells)
MMxxx-66HLA-ABV, SMMxxx-66HLA-ABV-TI (xxx=340-365, in steps of 5, 132 cells)
JKMxxxM-78H-TV-Q, MMxxx-78HLA-BBV (xxx=405-455, in steps of 5, 156 cells)
JKMxxxM-66H-TV-Q, MMxxx-66HLA-BBV (xxx=340-385, in steps of 5, 132 cells)
JKMxxxN-78H-TV (xxx=410-460, in steps of 5, 156 cells)
JKMxxxN-66H-TV (xxx=345-385, in steps of 5, 132 cells)
JKMxxxM-7RL3-V, JKMxxxM-7RL3-V-J, JKMSxxxM-7RL3-V-TI, JKMxxxM-7RL3-S-V, JKMxxxM-7RL3-S-V-J (xxx=430-495, in steps of 5, 156 cells)
JKMxxxM-6RL3-V, JKMxxxM-6RL3-V-J, JKMSxxxM-6RL3-V-TI, JKMxxxM-6RL3-S-V, JKMxxxM-6RL3-S-V-J, JKMSxxxM-6RL3-V-MX3 (xxx=360-415, in steps of 5, 132 cells)
JKMxxxM-6TL3-V, JKMSxxxM-6TL3-V-TI, JKMxxxM-6TL3-S-V, JKMSxxxM-6TL3-V-MX3 (xxx=335-380, in steps of 5, 120 cells)
MMxxx-7RLC-MBV, SMMxxx-7RLC-MBV-TI (xxx=430-475, in steps of 5, 156 cells)
MMxxx-6RLC-MBV, SMMxxx-6RLC-MBV-TI (xxx=360-400, in steps of 5, 132 cells)
MMxxx-6TLC-MBV, SMMxxx-6TLC-MBV-TI (xxx=335-365, in steps of 5, 120 cells)
JKMxxxN-7RL3-V, JKMxxxN-7RL3-V-J, JKMSxxxN-7RL3-V-TI (xxx=430-500, in steps of 5, 156 cells)
JKMxxxN-6RL3-V, JKMxxxN-6RL3-V-J, JKMSxxxN-6RL3-V-TI, JKMSxxxN-6RL3-V-MX3 (xxx=360-420, in steps of 5, 132 cells)
JKMxxxN-6TL3-V, JKMSxxxN-6TL3-V-TI, JKMSxxxN-6TL3-V-MX3 (xxx=335-390, in steps of 5, 120 cells)
MNxxx-7RLC-MBV, SMNxxx-7RLC-MBV-TI (xxx=430-475, in steps of 5, 156 cells)
MNxxx-6RLC-MBV, SMNxxx-6RLC-MBV-TI (xxx=360-400, in steps of 5, 132 cells)
MNxxx-6TLC-MBV, SMNxxx-6TLC-MBV-TI (xxx=335-365, in steps of 5, 120 cells)
JKMxxxM-7RL3-TV, JKMxxxM-7RL3-TV-J, JKMxxxM-7RL3-S-TV, JKMxxxM-7RL3-S-TV-J (xxx=420-475, in steps of 5, 156 cells)
JKMxxxM-6RL3-TV, JKMxxxM-6RL3-TV-J, JKMxxxM-6RL3-S-TV, JKMxxxM-6RL3-S-TV-J (xxx=355-400, in steps of 5, 132 cells)
JKMxxxM-6TL3-TV, JKMxxxM-6TL3-S-TV (xxx=325-365, in steps of 5, 120

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cells)
MMxxx-7RLC-BBV (xxx=420-475, in steps of 5, 156 cells)
MMxxx-6RLC-BBV (xxx=355-400, in steps of 5, 132 cells)
MMxxx-6TLC-BBV (xxx=325-365, in steps of 5, 120 cells)
JKMxxxN-7RL3-TV, JKMxxxN-7RL3-TV-J, JKMxxxN-7RL3-S-TV, JKMxxxN-7RL3-S-TV-J (xxx=425-500, in steps of 5, 156 cells)
JKMxxxN-6RL3-TV, JKMxxxN-6RL3-TV-J, JKMxxxN-6RL3-S-TV, JKMxxxN-6RL3-S-TV-J (xxx=355-420, in steps of 5, 132 cells)
JKMxxxN-6TL3-TV, JKMxxxN-6TL3-S-TV (xxx=325-380, in steps of 5, 120 cells)
MNxxx-7RLC-BBV (xxx=425-475, in steps of 5, 156 cells)
MNxxx-6RLC-BBV (xxx=355-400, in steps of 5, 132 cells)
MNxxx-6TLC-BBV (xxx=325-365, in steps of 5, 120 cells)
JKMxxxN-72H-MBB-V, JKMSxxxN-72H-MBB-V-TI (xxx=385-425, in steps of 5, 144 cells)
JKMxxxN-60H-MBB-V, JKMSxxxN-60H-MBB-V-TI (xxx=320-350, in steps of 5, 120 cells)
MNxxx-72HLA-MBV-MBB, SMNxxx-72HLA-MBV-MBB-TI (xxx=385-425, in steps of 5, 144 cells)
MNxxx-60HLA-MBV-MBB, SMNxxx-60HLA-MBV-MBB-TI (xxx=320-350, in steps of 5, 120 cells)
JKMxxxM-7RL3-B-V, JKMxxxM-7RL3-S-B-V, JKMSxxxM-7RL3-B-V-TI (xxx=425-480, in steps of 5, 156 cells)
JKMxxxM-6RL3-B-V, JKMxxxM-6RL3-S-B-V, JKMSxxxM-6RL3-B-V-TI (xxx=360-405, in steps of 5, 132 cells)
JKMxxxM-6TL3-B-V, JKMxxxM-6TL3-S-B-V, JKMSxxxM-6TL3-B-V-TI (xxx=320-365, in steps of 5, 120 cells)
MMxxx-7RLC-ABV, SMMxxx-7RLC-ABV-TI (xxx=425-480, in steps of 5, 156 cells)
MMxxx-6RLC-ABV, SMMxxx-6RLC-ABV-TI (xxx=360-405, in steps of 5, 132 cells)
MMxxx-6TLC-ABV, SMMxxx-6TLC-ABV-TI (xxx=320-365, in steps of 5, 120 cells)
JKMxxxN-7RL3-B-V, JKMSxxxN-7RL3-B-V-TI, JKMxxxN-7RL3-S-B-V (xxx=425-480, in steps of 5, 156 cells)
JKMxxxN-6RL3-B-V, JKMSxxxN-6RL3-B-V-TI, JKMxxxN-6RL3-S-B-V (xxx=360-405, in steps of 5, 132 cells)
JKMxxxN-6TL3-B-V, JKMSxxxN-6TL3-B-V-TI, JKMxxxN-6TL3-S-B-V (xxx=320-365, in steps of 5, 120 cells)
MNxxx-7RLC-ABV, SMNxxx-7RLC-ABV-TI (xxx=425-480, in steps of 5, 156 cells)
MNxxx-6RLC-ABV, SMNxxx-6RLC-ABV-TI (xxx=360-405, in steps of 5, 132 cells)
MNxxx-6TLC-ABV, SMNxxx-6TLC-ABV-TI (xxx=320-365, in steps of 5, 120 cells)
JKMxxxN-72H-MBB-B-V, JKMSxxxN-72H-MBB-B-V-TI (xxx=380-400, in steps of 5, 144 cells)
JKMxxxN-60H-MBB-B-V, JKMSxxxN-60H-MBB-B-V-TI (xxx=315-330, in steps of 5, 120 cells)
MNxxx-72HLA-ABV-MBB, SMNxxx-72HLA-ABV-MBB-TI (xxx=380-400, in steps of 5, 144 cells)
MNxxx-60HLA-ABV-MBB, SMNxxx-60HLA-ABV-MBB-TI (xxx=315-330, in steps of 5, 120 cells)
JKMxxxM-72HLM-V, JKMSxxxM-72HLM-V-MX3 (xxx=420-465, in steps of 5, 144 cells)
JKMxxxM-60HLM-V, JKMSxxxM-60HLM-V-MX3 (xxx=350-385, in steps of 5, 120 cells)
MMxxx-72HLM-MBV (xxx=420-465, in steps of 5, 144 cells)
MMxxx-60HLM-MBV (xxx=350-385, in steps of 5, 120 cells)
JKMxxxM-78H-MBB-V, JKMSxxxM-78H-MBB-V-MX3 (xxx=440-465, in steps of 5, 156 cells)
JKMxxxM-66H-MBB-V, JKMSxxxM-66H-MBB-V-MX3 (xxx=370-390, in steps of 5, 132 cells)
MM-78HLA-MBV-MBB, MMxxx-78HLA-MBV-MBB (xxx=440-465, in steps of 5, 156 cells)
MM-66HLA-MBV-MBB, MMxxx-66HLA-MBV-MBB (xxx=370-390, in steps of 5, 132 cells)
JKMxxxM-78HL4-V, JKMxxxM-78HL4-S-V (xxx=565-605, in steps of 5, 156 cells)
JKMxxxM-72HL4-V, JKMxxxM-72HL4-V-J, JKMxxxM-72HL4-S-V,

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JKMxxxM-72HL4-S-V-J (xxx=475-570, in steps of 5, 144 cells)
JKMxxxM-66HL4-V, JKMxxxM-66HL4-S-V (xxx=440-505, in steps of 5, 132 cells)
JKMxxxM-60HL4-V, JKMxxxM-60HL4-S-V (xxx=400-470, in steps of 5, 120 cells)
JKMxxxM-54HL4-V, JKMxxxM-54HL4-S-V (xxx=360-420, in steps of 5, 108 cells)
MMxxx-78HLD-MBV (xxx=565-605, in steps of 5, 156 cells)
MMxxx-72HLD-MBV (xxx=475-570, in steps of 5, 144 cells)
MMxxx-66HLD-MBV (xxx=440-505, in steps of 5, 132 cells)
MMxxx-60HLD-MBV (xxx=400-470, in steps of 5, 120 cells)
MMxxx-54HLD-MBV (xxx=360-420, in steps of 5, 108 cells)
JKMxxxM-78HL4-TV, JKMxxxM-78HL4-S-TV (xxx=555-595, in steps of 5, 156 cells)
JKMxxxM-72HL4-TV, JKMxxxM-72HL4-TV-J, JKMxxxM-72HL4-S-TV, JKMxxxM-72HL4-S-TV-J (xxx=475-565, in steps of 5, 144 cells)
JKMxxxM-66HL4-TV, JKMxxxM-66HL4-S-TV (xxx=440-500, in steps of 5, 132 cells)
JKMxxxM-66HL4-TV, JKMxxxM-66HL4-S-TV (xxx=440-500, in steps of 5, 132 cells)
JKMxxxM-60HL4-TV, JKMxxxM-60HL4-S-TV (xxx=400-455, in steps of 5, 120 cells)
JKMxxxM-54HL4-TV, JKMxxxM-54HL4-S-TV (xxx=360-410, in steps of 5, 108 cells)
JKMxxxM-7RL4-V, JKMxxxM-7RL4-V-J (xxx=535-590, in steps of 5, 156 cells)
JKMxxxM-7TL4-V, JKMxxxM-7TL4-V-J (xxx=495-570, in steps of 5, 144 cells)
JKMxxxM-6RL4-V (xxx=455-495, in steps of 5, 132 cells)
JKMxxxM-6TL4-V (xxx=415-450, in steps of 5, 120 cells)
JKMxxxM-5RL4-V (xxx=375-405, in steps of 5, 108 cells)
MMxxx-7RLD-MBV (xxx=535-590, in steps of 5, 156 cells)
MMxxx-7TLD-MBV (xxx=495-540, in steps of 5, 144 cells)
MMxxx-6RLD-MBV (xxx=455-495, in steps of 5, 132 cells)
MMxxx-6TLD-MBV (xxx=415-450, in steps of 5, 120 cells)
MMxxx-5RLD-MBV (xxx=375-405, in steps of 5, 108 cells)
JKMxxxM-7RL4-TV, JKMxxxM-7RL4-TV-J (xxx=525-590, in steps of 5, 156 cells)
JKMxxxM-7TL4-TV, JKMxxxM-7TL4-TV-J (xxx=485-570, in steps of 5, 144 cells)
JKMxxxM-6RL4-TV (xxx=445-495, in steps of 5, 132 cells)
JKMxxxM-6TL4-TV (xxx=405-450, in steps of 5, 120 cells)
JKMxxxM-5RL4-TV (xxx=365-405, in steps of 5, 108 cells)
JKMxxxN-78HL4-V (xxx=570-625, in steps of 5, 156cells)
JKMxxxN-72HL4-V (xxx=485-600, in steps of 5, 144 cells)
JKMxxxN-72HL4R-V (xxx=485-600, in steps of 5, 144 cells)
JKMxxxN-66HL4-V (xxx=445-525, in steps of 5, 132 cells)
JKMxxxN-60HL4-V (xxx=405-500, in steps of 5, 120 cells)
JKMxxxN-60HL4R-V (xxx=405-500, in steps of 5, 120 cells)
JKMxxxN-54HL4-V, JKMxxxN-54HL4R-V (xxx=365-455, in steps of 5, 108 cells)
MNxxx-72HLD-MBV (xxx=485-555, in steps of 5, 144 cells)
MNxxx-66HLD-MBV (xxx=445-505, in steps of 5, 132 cells)
MNxxx-60HLD-MBV (xxx=405-460, in steps of 5, 120 cells)
MNxxx-54HLD-MBV (xxx=365-415, in steps of 5, 108 cells)
JKMxxxN-78HL4-TV (xxx=570-625, in steps of 5, 156 cells)
JKMxxxN-72HL4-TV (xxx=480-605, in steps of 5, 144 cells)
JKMxxxN-72HL4R-TV (xxx=480-605, in steps of 5, 144 cells)
JKMxxxN-66HL4-TV (xxx=440-525, in steps of 5, 132 cells)
JKMxxxN-60HL4-TV (xxx=400-480, in steps of 5, 120 cells)
JKMxxxN-54HL4-TV (xxx=360-430, in steps of 5, 108 cells)
MNxxx72HLD-BBV (xxx=480-545, in steps of 5, 144 cells)
MNxxx66HLD-BBV (xxx=440-495, in steps of 5, 132 cells)
MNxxx60HLD-BBV (xxx=400-450, in steps of 5, 120 cells)
MNxxx54HLD-BBV (xxx=360-405, in steps of 5, 108 cells)
JKMxxxN-7RL4-V (xxx=535-590, in steps of 5, 156 cells)
JKMxxxN-7TL4-V (xxx=495-570, in steps of 5, 144 cells)
JKMxxxN-6RL4-V (xxx=455-495, in steps of 5, 132 cells)
JKMxxxN-6TL4-V (xxx=415-450, in steps of 5, 120 cells)
JKMxxxN-5RL4-V (xxx=375-460, in steps of 5, 108 cells)
MNxxx7RLD-MBV (xxx=535-590, in steps of 5, 156 cells)

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MNxxx7TLD-MBV (xxx=495-540, in steps of 5, 144 cells)
MNxxx6RLD-MBV (xxx=455-495, in steps of 5, 132 cells)
MNxxx6TLD-MBV (xxx=415-450, in steps of 5, 120 cells)
MNxxx5RLD-MBV (xxx=375-405, in steps of 5, 108 cells)
JKMxxxN-7RL4-TV (xxx=520-585, in steps of 5, 156 cells)
JKMxxxN-7TL4-TV (xxx=480-570, in steps of 5, 144 cells)
JKMxxxN-6RL4-TV (xxx=440-495, in steps of 5, 132 cells)
JKMxxxN-6TL4-TV (xxx=400-450, in steps of 5, 120 cells)
JKMxxxN-5RL4-TV (xxx=365-405, in steps of 5, 108 cells)
MNxxx7RLD-BBV (xxx=520-585, in steps of 5, 156 cells)
MNxxx7TLD-BBV (xxx=480-540, in steps of 5, 144 cells)
MNxxx6RLD-BBV (xxx=440-495, in steps of 5, 132 cells)
MNxxx6TLD-BBV (xxx=400-450, in steps of 5, 120 cells)
MNxxx5RLD-BBV (xxx=365-405, in steps of 5, 108 cells)
JKMxxxM-72HL4-B-V, JKMxxxM-72HL4-S-B-V
(xxx=510-535, in steps of 5, 144 cells)
JKMxxxM-66HL4-B-V, JKMxxxM-66HL4-S-B-V
(xxx=465-490, in steps of 5, 132 cells)
JKMxxxM-60HL4-B-V, JKMxxxM-60HL4-S-B-V
(xxx=425-445, in steps of 5, 120 cells)
JKMxxxM-54HL4-B-V, JKMxxxM-54HL4-S-B-V
(xxx=380-400, in steps of 5, 108 cells)
JKMxxxN-72HL4-B-V (xxx=510-535, in steps of 5, 144 cells)
JKMxxxN-66HL4-B-V (xxx=465-490, in steps of 5, 132 cells)
JKMxxxN-60HL4-B-V (xxx=425-445, in steps of 5, 120 cells)
JKMxxxN-54HL4-B-V (xxx=380-400, in steps of 5, 108 cells)
JKMxxxM-7RL4-B-V (xxx=540-575, in steps of 5, 156 cells)
JKMxxxM-7TL4-B-V (xxx=495-530, in steps of 5, 144 cells)
JKMxxxM-6RL4-B-V (xxx=455-485, in steps of 5, 132 cells)
JKMxxxM-6TL4-B-V (xxx=415-440, in steps of 5, 120 cells)
JKMxxxM-5RL4-B-V (xxx=375-395, in steps of 5, 108 cells)
JKMxxxN-7RL4-B-V (xxx=540-575, in steps of 5, 156 cells)
JKMxxxN-7TL4-B-V (xxx=495-530, in steps of 5, 144 cells)
JKMxxxN-6RL4-B-V (xxx=455-485, in steps of 5, 132 cells)
JKMxxxN-6TL4-B-V (xxx=415-440, in steps of 5, 120 cells)
JKMxxxN-5RL4-B-V (xxx=375-395, in steps of 5, 108 cells)
JKMxxxM-72HLM-TV (xxx=425-460, in steps of 5, 144 cells)
JKMxxxM-60HLM-TV (xxx=355-380, in steps of 5, 120 cells)
JKMxxxM-72HLM-B-V, JKMSxxxM-72HLM-B-V-MX3
(xxx=415-445, in steps of 5, 144 cells)
JKMxxxM-60HLM-B-V, JKMSxxxM-60HLM-B-V-MX3
(xxx=350-370, in steps of 5, 120 cells)
JKxxxM-66R5-MWV (xxx=630-665, in steps of 5, 132 cells)
JKxxxM-66R5-BTV (xxx=630-660, in steps of 5, 132 cells)
JKxxxM-66H5-MWV (xxx=635-670, in steps of 5, 132 cells)
JKxxxM-66H5-BTV (xxx=630-665, in steps of 5, 132 cells)
JKxxxN-66H5-BTV (xxx=635-670, in steps of 5, 132 cells)

1000VDC system voltage:
JKMxxxM-72, JKMxxxM-72(Plus), JKMxxxM-72L, JKMxxxM-72B,
JKMxxxM-72BL, JKMSxxxM-72, JKMSxxxM-72-J, JKMSxxxM-72-TI,
JKMSxxxM-72L-TI, JKMSxxxM-72B-TI, JKMSxxxM-72BL-TI
(xxx=335-410, in steps of 5, 72 cells)
JKMxxxM-60, JKMxxxM-60(Plus), JKMxxxM-60L, JKMxxxM-60B,
JKMxxxM-60BL, JKMSxxxM-60, JKMSxxxM-60-J, JKMSxxxM-60-TI,
JKMSxxxM-60L-TI, JKMSxxxM-60B-TI, JKMSxxxM-60BL-TI
(xxx=270-340, in steps of 5, 60 cells)
MMxxx-72LA-MB, MMxxx-72LA-AB, SMMxxx-72LA-MB, SMMxxx-72LA-MB-TI,
SMMxxx-72LA-AB-TI (xxx=335-410, in steps of 5, 72 cells)
MMxxx-60LA-MB, MMxxx-60LA-AB, SMMxxx-60LA-MB-TI,
SMMxxx-60LA-AB-TI (xxx=270-340, in steps of 5, 60 cells)
JKMxxxM-72H, JKMxxxM-72HL, JKMxxxM-72HB, JKMxxxM-72HBL,
JKMSxxxM-72H-TI, JKMSxxxM-72HL-TI, JKMSxxxM-72HB-TI,
JKMSxxxM-72HBL-TI (xxx=335-425, in steps of 5, 144 cells)
JKMxxxM-60H, JKMxxxM-60HL, JKMxxxM-60HB, JKMxxxM-60HBL,
JKMSxxxM-60H-TI, JKMSxxxM-60HL-TI, JKMSxxxM-60HB-TI,
JKMSxxxM-60HBL-TI (xxx=270-350, in steps of 5, 120 cells)
MMxxx-72HLA-MB, MMxxx-72HLA-AB, SMMxxx-72HLA-MB-TI,
SMMxxx-72HLA-AB-TI (xxx=335-425, in steps of 5, 144 cells)
MMxxx-60HLA-MB, MMxxx-60HLA-AB, SMMxxx-60HLA-MB-TI,

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SMMxxx-60HLA-AB-TI (xxx=270-350, in steps of 5, 120 cells)
JKMxxxM-72HL-Q, JKMxxxM-72HBL-Q, JKMSxxxM-72HL-TI-Q,
JKMSxxxM-72HBL-TI-Q (xxx=335-425, in steps of 5, 144 cells)
JKMxxxM-60HL-Q, JKMxxxM-60HBL-Q, JKMSxxxM-60HL-TI-Q,
JKMSxxxM-60HBL-TI-Q (xxx=270-350, in steps of 5, 120 cells)
JKMxxxPP-72, JKMxxxPP-72(Plus), JKMxxxPP-72B, JKMSxxxPP-72,
JKMSxxxPP-72-J (xxx=320-355, in steps of 5, 72 cells)
JKMxxxPP-60, JKMxxxPP-60(Plus), JKMxxxPP-60B, JKMSxxxPP-60,
JKMSxxxPP-60-J (xxx=260-290, in steps of 5, 60 cells)
JKMxxxPP-72H, JKMxxxPP-72HB (xxx=330-380, in steps of 5, 144 cells)
JKMxxxPP-60H, JKMxxxPP-60HB (xxx=260-315, in steps of 5, 120 cells)
JKMxxxM-72H-T, JKMxxxM-72HL-T (xxx=375-425, in steps of 5, 144 cells)
JKMxxxM-60H-T, JKMxxxM-60HL-T (xxx=315-355, in steps of 5, 120 cells)
JKMxxxM-72HL-T-Q, MMxxx-72HLA-BB (xxx=375-425, in steps of 5, 144 cells)
JKMxxxM-60HL-T-Q, MMxxx-60HLA-BB (xxx=315-355, in steps of 5, 120 cells)
JKMxxxN-72H-T, JKMxxxN-72HL-T (xxx=375-425, in steps of 5, 144 cells)
JKMxxxN-60H-T, JKMxxxN-60HL-T (xxx=315-355 in steps of 5, 120 cells)
JKMSxxxM-72-MX3, JKMSxxxM-72B-MX3, JKMSxxxM-72L-MX3,
JKMSxxxM-72BL-MX3 (xxx=335-395, in steps of 5, 72 cells)
JKMSxxxM-60-MX3, JKMSxxxM-60B-MX3, JKMSxxxM-60L-MX3,
JKMSxxxM-60BL-MX3 (xxx=270-340, in steps of 5, 60 cells)
SMMxxx-72LA-MB-MX3, SMMxxx-72LA-AB-MX3 (xxx=335-395,
in steps of 5, 72 cells)
SMMxxx-60LA-MB-MX3, SMMxxx-60LA-AB-MX3 (xxx=270-340,
in steps of 5, 60 cells)
JKMSxxxM-72H-MX3, JKMSxxxM-72HB-MX3, JKMSxxxM-72HL-MX3,
JKMSxxxM-72HBL-MX3 (xxx=335-395, in steps of 5, 144 cells)
JKMSxxxM-60H-MX3, JKMSxxxM-60HB-MX3, JKMSxxxM-60HL-MX3,
JKMSxxxM-60HBL-MX3 (xxx=270-340, in steps of 5, 120 cells)
JKMSxxxM-72HL-MX3-Q, JKMSxxxM-72HBL-MX3-Q, SMMxxx-72HLA-MB-MX3,
SMMxxx-72HLA-AB-MX3, (xxx=335-395, in steps of 5, 144 cells)
JKMSxxxM-60HL-MX3-Q, JKMSxxxM-60HBL-MX3-Q, SMMxxx-60HLA-MB-MX3,
SMMxxx-60HLA-AB-MX3 (xxx=270-340, in steps of 5, 120 cells)
JKMSxxxPP-72-MX3, JKMSxxxPP-72B-MX3, JKMSxxxPP-72L-MX3,
JKMSxxxPP-72BL-MX3 (xxx=320-355, in steps of 5, 72 cells)
JKMSxxxPP-60-MX3, JKMSxxxPP-60B-MX3, JKMSxxxPP-60L-MX3,
JKMSxxxPP-60BL-MX3 (xxx=260-290, in steps of 5, 60 cells)
JKMSxxxPP-72H-MX3, JKMSxxxPP-72HB-MX3, JKMSxxxPP-72HL-MX3,
JKMSxxxPP-72HBL-MX3 (xxx=330-380, in steps of 5, 144cells)
JKMSxxxPP-60H-MX3, JKMSxxxPP-60HB-MX3, JKMSxxxPP-60HL-MX3,
JKMSxxxPP-60HBL-MX3 (xxx=260-315, in steps of 5, 120 cells)
JKMxxxM-72H-MBB, JKMSxxxM-72H-MBB-TI, JKMSxxxM-72H-MBB-MX3
(xxx=385-425, in steps of 5, 144 cells)
JKMxxxM-60H-MBB, JKMSxxxM-60H-MBB-TI, JKMSxxxM-60H-MBB-MX3
(xxx=320-355, in steps of 5, 120 cells)
MMxxx-72HLA-MB-MBB, SMMxxx-72HLA-MB-MBB-TI
(xxx=385-425, in steps of 5, 144 cells)
MMxxx-60HLA-MB-MBB, SMMxxx-60HLA-MB-MBB-TI
(xxx=320-355, in steps of 5, 120 cells)
JKMxxxM-72H-MBB-T (xxx=385-405, in steps of 5, 144 cells)
JKMxxxM-60H-MBB-T (xxx=320-335, in steps of 5, 120 cells)
JKMxxxN-72H-MBB-T (xxx=390-420, in steps of 5, 144 cells)
JKMxxxN-60H-MBB-T (xxx=330-350, in steps of 5, 120 cells)
JKSM3-DFCA-xxx (xxx=400-440, in steps of 5, 156 cells)
JKSM3-CFCA-xxx (xxx=335-370, in steps of 5, 132 cells)
JKSM3-DHCA-xxx (xxx=400-450, in steps of 5, 156 cells)
JKSM3-CHCA-xxx (xxx=340-380, in steps of 5, 132 cells)
JKSN3-DHCA-xxx (xxx=410-440, in steps of 5, 156 cells)
JKSN3-CHCA-xxx (xxx=345-370, in steps of 5, 132 cells)
JKMxxxM-78H, JKMSxxxM-78H-TI (xxx=405-465, in steps of 5, 156 cells)
JKMxxxM-66H, JKMSxxxM-66H-TI (xxx=340-390, in steps of 5, 132 cells)
MMxxx-78HLA-MB, SMMxxx-78HLA-MB-TI (xxx=405-465,
in steps of 5, 156 cells)
MMxxx-66HLA-MB, SMMxxx-66HLA-MB-TI (xxx=340-390,
in steps of 5, 132 cells)
JKMxxxM-78HB, JKMSxxxM-78HB-TI (xxx=405-435, in steps of 5, 156
cells)
JKMxxxM-66HB, JKMSxxxM-66HB-TI (xxx=340-365, in steps of 5, 132 cells)
MMxxx-78HLA-AB, SMMxxx-78HLA-AB-TI (xxx=405-435, in steps of 5, 156
cells)

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MMxxx-66HLA-AB, SMMxxx-66HLA-AB-TI (xxx=340-365, in steps of 5, 132 cells)
JKMxxxM-78H-T (xxx=405-455, in steps of 5, 156 cells)
JKMxxxM-66H-T (xxx=340-385, in steps of 5, 132 cells)
JKMxxxN-78H-T (xxx=410-460, in steps of 5, 156 cells)
JKMxxxN-66H-T (xxx=345-385, in steps of 5, 132 cells)
JKMxxxM-7RL3, JKMxxxM-7RL3-J, JKMSxxxM-7RL3-TI (xxx=430-495, in steps of 5, 156 cells)
JKMxxxM-6RL3, JKMxxxM-6RL3-J, JKMSxxxM-6RL3-TI, JKMSxxxM-6RL3-MX3 (xxx=360-415, in steps of 5, 132 cells)
JKMxxxM-6TL3, JKMSxxxM-6TL3-TI, JKMSxxxM-6TL3-MX3 (xxx=335-380, in steps of 5, 120 cells)
MMxxx-7RLC-MB, SMMxxx-7RLC-MB-TI (xxx=430-475, in steps of 5, 156 cells)
MMxxx-6RLC-MB, SMMxxx-6RLC-MB-TI (xxx=360-400, in steps of 5, 132 cells)
MMxxx-6TLC-MB, SMMxxx-6TLC-MB-TI (xxx=335-365, in steps of 5, 120 cells)
JKMxxxN-7RL3, JKMxxxN-7RL3-J, JKMSxxxN-7RL3-TI (xxx=430-500, in steps of 5, 156 cells)
JKMxxxN-6RL3, JKMxxxN-6RL3-J, JKMSxxxN-6RL3-TI, JKMSxxxN-6RL3-MX3 (xxx=360-420, in steps of 5, 132 cells)
JKMxxxN-6TL3, JKMSxxxN-6TL3-TI, JKMSxxxN-6TL3-MX3 (xxx=335-390, in steps of 5, 120 cells)
MNxxx-7RLC-MB, SMNxxx-7RLC-MB-TI (xxx=430-490, in steps of 5, 156 cells)
MNxxx-6RLC-MB, SMNxxx-6RLC-MB-TI (xxx=360-410, in steps of 5, 132 cells)
MNxxx-6TLC-MB, SMNxxx-6TLC-MB-TI (xxx=335-375, in steps of 5, 120 cells)
JKMxxxM-7RL3-T, JKMxxxM-7RL3-T-J (xxx=420-475, in steps of 5, 156 cells)
JKMxxxM-6RL3-T, JKMxxxM-6RL3-T-J (xxx=355-400, in steps of 5, 132 cells)
JKMxxxM-6TL3-T (xxx=325-365, in steps of 5, 120 cells)
JKMxxxN-7RL3-T, JKMxxxN-7RL3-T-J (xxx=425-475, in steps of 5, 156 cells)
JKMxxxN-6RL3-T, JKMxxxN-6RL3-T-J (xxx=355-400, in steps of 5, 132 cells)
JKMxxxN-6TL3-T (xxx=325-365, in steps of 5, 120 cells)
JKMxxxN-72H-MBB, JKMSxxxN-72H-MBB-TI (xxx=385-425, in steps of 5, 144 cells)
JKMxxxN-60H-MBB, JKMSxxxN-60H-MBB-TI (xxx=320-350, in steps of 5, 120 cells)
MNxxx-72HLA-MB-MBB, SMNxxx-72HLA-MB-MBB-TI (xxx=385-425, in steps of 5, 144 cells)
MNxxx-60HLA-MB-MBB, SMNxxx-60HLA-MB-MBB-TI (xxx=320-350, in steps of 5, 120 cells)
JKMxxxM-7RL3-B, JKMSxxxM-7RL3-B-TI (xxx=425-480, in steps of 5, 156 cells)
JKMxxxM-6RL3-B, JKMSxxxM-6RL3-B-TI, JKMSxxxM-6RL3-B-MX3 (xxx=360-405, in steps of 5, 132 cells)
JKMxxxM-6TL3-B, JKMSxxxM-6TL3-B-TI, JKMSxxxM-6TL3-B-MX3 (xxx=320-365, in steps of 5, 120 cells)
MMxxx-7RLC-AB, SMMxxx-7RLC-AB-TI (xxx=425-480, in steps of 5, 156 cells)
MMxxx-6RLC-AB, SMMxxx-6RLC-AB-TI (xxx=360-405, in steps of 5, 132 cells)
MMxxx-6TLC-AB, SMMxxx-6TLC-AB-TI (xxx=320-365, in steps of 5, 120 cells)
JKMxxxN-7RL3-B, JKMSxxxN-7RL3-B-TI (xxx=425-480, in steps of 5, 156 cells)
JKMxxxN-6RL3-B, JKMSxxxN-6RL3-B-TI, JKMSxxxN-6RL3-B-MX3 (xxx=360-425, in steps of 5, 132 cells)
JKMxxxN-6TL3-B, JKMSxxxN-6TL3-B-TI, JKMSxxxN-6TL3-B-MX3 (xxx=320-385, in steps of 5, 120 cells)
MNxxx-7RLC-AB, SMNxxx-7RLC-AB-TI (xxx=425-480, in steps of 5, 156 cells)
MNxxx-6RLC-AB, SMNxxx-6RLC-AB-TI (xxx=360-405, in steps of 5, 132 cells)
MNxxx-6TLC-AB, SMNxxx-6TLC-AB-TI (xxx=320-365, in steps of 5, 120 cells)
JKMxxxN-72H-MBB-B, JKMSxxxN-72H-MBB-B-TI (xxx=380-400, in steps of 5, 144 cells)
JKMxxxN-60H-MBB-B, JKMSxxxN-60H-MBB-B-TI (xxx=315-330, in steps of 5, 120 cells)
JKMxxxN-48H-MBB-B (xxx=255-265, in steps of 5, 96 cells)
JKMxxxN-32H-MBB-B (xxx=170-175, in steps of 5, 64 cells)
MNxxx-72HLA-AB-MBB, SMNxxx-72HLA-AB-MBB-TI (xxx=380-400, in steps of 5, 144 cells)
MNxxx-60HLA-AB-MBB, SMNxxx-60HLA-AB-MBB-TI (xxx=315-330, in steps of 5, 120 cells)
JKMxxxM-72HLM, JKMSxxxM-72HLM-MX3 (xxx=420-465,

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in steps of 5, 144 cells)
JKMxxxM-60HLM, JKMSxxxM-60HLM-MX3 (xxx=350-385,
in steps of 5, 120 cells)
MMxxx-72HLM-MB (xxx=420-465, in steps of 5, 144 cells)
MMxxx-60HLM-MB (xxx=350-385, in steps of 5, 120 cells)
JKMxxxM-72HL4, JKMxxxM-72HL4-J (xxx=475-570, in steps of 5, 144 cells)
JKMxxxM-66HL4 (xxx=440-505, in steps of 5, 132cells)
JKMxxxM-60HL4 (xxx=400-470, in steps of 5, 120 cells)
JKMxxxM-54HL4 (xxx=360-420, in steps of 5, 108 cells)
MMxxx-72HLD-MB (xxx=475-570, in steps of 5, 144 cells)
MMxxx-66HLD-MB (xxx=440-505, in steps of 5, 132cells)
MMxxx-60HLD-MB (xxx=400-470, in steps of 5, 120 cells)
MMxxx-54HLD-MB (xxx=360-420, in steps of 5, 108 cells)
JKMxxxM-7RL4, JKMxxxM-7RL4-J (xxx=535-590, in steps of 5, 156 cells)
JKMxxxM-7TL4, JKMxxxM-7TL4-J (xxx=495-570, in steps of 5, 144 cells)
JKMxxxM-6RL4 (xxx=455-495, in steps of 5, 132 cells)
JKMxxxM-6TL4 (xxx=415-450, in steps of 5, 120 cells)
JKMxxxM-5RL4 (xxx=375-405, in steps of 5, 108 cells)
MMxxx-7RLD-MB (xxx=535-590, in steps of 5, 156 cells)
MMxxx-7TLD-MB (xxx=495-540, in steps of 5, 144 cells)
MMxxx-6RLD-MB (xxx=455-495, in steps of 5, 132 cells)
MMxxx-6TLD-MB (xxx=415-450, in steps of 5, 120 cells)
MMxxx-5RLD-MB (xxx=375-405, in steps of 5, 108 cells)
JKMxxxM-78H-MBB, JKMSxxxM-78H-MBB-MX3 (xxx=440-465,
in steps of 5, 156 cells)
JKMxxxM-66H-MBB, JKMSxxxM-66H-MBB-MX3 (xxx=370-390,
in steps of 5, 132 cells)
MMxxx-78HLA-MB-MBB (xxx=440-465, in steps of 5, 156 cells)
MMxxx-66HLA-MB-MBB (xxx=370-390, in steps of 5, 132 cells)
JKMxxxN-78HL4 (xxx=570-625, in steps of 5, 156 cells)
JKMxxxN-72HL4 (xxx=485-600, in steps of 5, 144 cells)
JKMxxxN-72HL4R (xxx=485-600, in steps of 5, 144 cells)
JKMxxxN-66HL4 (xxx=445-525, in steps of 5, 132 cells)
JKMxxxN-60HL4 (xxx=405-500, in steps of 5, 120 cells)
JKMxxxN-60HL4R (xxx=405-500, in steps of 5, 120 cells)
JKMxxxN-54HL4, JKMxxxN-54HL4R (xxx=365-455, in steps of 5, 108 cells)
MNxxx-72HLD-MB (xxx=485-555, in steps of 5, 144 cells)
MNxxx-66HLD-MB (xxx=445-505, in steps of 5, 132 cells)
MNxxx-60HLD-MB (xxx=405-460, in steps of 5, 120 cells)
MNxxx-54HLD-MB (xxx=365-415, in steps of 5, 108 cells)
JKMxxxN-7RL4 (xxx=535-590, in steps of 5, 156 cells)
JKMxxxN-7TL4 (xxx=495-570, in steps of 5, 144 cells)
JKMxxxN-6RL4 (xxx=455-495, in steps of 5, 132 cells)
JKMxxxN-6TL4 (xxx=415-450, in steps of 5, 120 cells)
JKMxxxN-5RL4 (xxx=375-460, in steps of 5, 108 cells)
MNxxx-7RLD-MB (xxx=535-590, in steps of 5, 156 cells)
MNxxx-7TLD-MB (xxx=495-540, in steps of 5, 144 cells)
MNxxx-6RLD-MB (xxx=455-495, in steps of 5, 132 cells)
MNxxx-6TLD-MB (xxx=415-450, in steps of 5, 120 cells)
MNxxx-5RLD-MB (xxx=375-405, in steps of 5, 108 cells)
JKMxxxM-72HL4-B (xxx=510-535, in steps of 5, 144 cells)
JKMxxxM-66HL4-B (xxx=465-490, in steps of 5, 132 cells)
JKMxxxM-60HL4-B (xxx=425-445, in steps of 5, 120 cells)
JKMxxxM-54HL4-B (xxx=380-405, in steps of 5, 108 cells)
JKMxxxN-72HL4-B (xxx=510-535, in steps of 5, 144 cells)
JKMxxxN-66HL4-B (xxx=465-490, in steps of 5, 132 cells)
JKMxxxN-60HL4-B (xxx=425-470, in steps of 5, 120 cells)
JKMxxxN-54HL4-B, JKMxxxN-54HL4R-B
(xxx=380-450, in steps of 5, 108 cells)
JKMxxxM-7RL4-B (xxx=540-575, in steps of 5, 156 cells)
JKMxxxM-7TL4-B (xxx=495-530, in steps of 5, 144 cells)
JKMxxxM-6RL4-B (xxx=455-485, in steps of 5, 132 cells)
JKMxxxM-6TL4-B (xxx=415-440, in steps of 5, 120 cells)
JKMxxxM-5RL4-B (xxx=375-395, in steps of 5, 108 cells)
JKMxxxN-7RL4-B (xxx=540-575, in steps of 5, 156 cells)
JKMxxxN-7TL4-B (xxx=495-530, in steps of 5, 144 cells)
JKMxxxN-6RL4-B (xxx=455-485, in steps of 5, 132 cells)
JKMxxxN-6TL4-B (xxx=415-440, in steps of 5, 120 cells)
JKMxxxN-5RL4-B (xxx=375-455, in steps of 5, 108 cells)

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Product Service

C E R T I F I C A T E

No. Z2 118443 0003 Rev. 00

JKMxxxN-72HL3-MBB-B (xxx=400-445, in steps of 5, 144 cells)
JKMxxxN-60HL3-MBB-B (xxx=330-370, in steps of 5, 120 cells)
JKMxxxN-48HL3-MBB-B (xxx=270-295, in steps of 5, 96 cells)
JKMxxxN-32HL3-MBB-B (xxx=180-195, in steps of 5, 64 cells)
JKMxxxM-72HLM-B, JKMSxxxM-72HLM-B-MX3 (xxx=415-445, in steps of 5, 144 cells)
JKMxxxM-60HLM-B, JKMSxxxM-60HLM-B-MX3 (xxx=350-370, in steps of 5, 120 cells)
JKxxxM-66R5-MW (xxx=630-665, in steps of 5, 132 cells)
JKxxxM-66H5-MW (xxx=635-670, in steps of 5, 132 cells)
JKMxxxM-36H (xxx=195-205, in steps of 5, 72 cells)
xxx is standing for rated output power at STC

Parameters:

Fire Safety Class:	Class C according to UL790.
Safety Class:	Class II
Max. System Voltage:	1500V DC or 1000V DC
Construction:	Framed, with Junction box, cable and connector.

Production Facility(ies):

074043, 105416, 115863, 115864, 115883, 115858, 115859, 115861, 115876, 116025, 096853, 118612, 097323, 098143, 115860, 115856, 115862, 004170, 075612, 077075

Tested according to:

IEC 61215-1:2016
IEC 61215-1-1:2016
IEC 61215-2:2016
IEC 61730-1:2016
IEC 61730-2:2016
EN 61215-1:2016
EN 61215-1-1:2016
EN 61215-2:2017
EN IEC 61730-1:2018
EN IEC 61730-1:2018/AC:2018-06
EN IEC 61730-2:2018
EN IEC 61730-2:2018/AC:2018-06

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TÜV®

SUPSI PVLab

CERTIFICATE n. 23-223-B

Issued by: **SUPSI - PV LAB**
SAS accredited laboratory ISO 17025 n. 0531

Based on the test report: n. 23-223/B-REP1-rev0 dated 2024.03.06

Issued by: SUPSI – PV LAB
Campus Mendrisio, CH - 6850 Mendrisio – Switzerland

We declare that the building component: photovoltaic module with associated mounting system, mod.

Jinko Solar Co., Ltd.- Model/Type: **JKM435N-54HL4R-V**

PV Module Type	Cells n.	Cell technology	Glass / superstrate	Module size (gross)	Power [W]
JKM435N-54HL4R-V	108	Mono-crystalline Si-mono -facial N-Type - half-cut	tempered solar glass with anti-reflective coating - thickness 3.2 mm	1762 x 1134 x 30 mm	435

Extended by similarity, without retesting to:

PV Module Type	Cells n.	Cell technology	Glass / superstrate	Module size (gross)	Power [W]
JKM435N-54HL4R	108	Mono-crystalline Si-monofacial N-Type - half-cut	tempered solar glass with anti-reflective coating - thickness 3.2 mm	1762 x 1134 x 30 mm	435
JKM425N-54HL4R					425
JKM425N-54HL4R-V					
JKM430N-54HL4R					430
JKM430N-54HL4R-V					
JKM440N-54HL4R					440
JKM440N-54HL4R-V					
JKM445N-54HL4R					445
JKM445N-54HL4R-V					
JKM450N-54HL4R					450
JKM450N-54HL4R-V					

Manufactured by:	**Jinko Solar Co., Ltd.** - No.1, Yingbin Road, Economic Development Zone, Shangrao City, 334100 Jiangxi, P.R. - CHINA
License holder:	**JinkoSolar GmbH** - Konrad Zuse Platz 8 | 81929 München | GERMANY

has been tested according to:

HAIL RESISTANCE CLASS **HW 4**

(According to VKF - Prüfbestimmung Nr. 25 - Photovoltaik Module - ver. 1.03)

The relevant technical data, materials and components descriptions are listed in the report. Any changes of the design, materials, components or processing may require the repetition of testing.

Mendrisio, 2024.03.06

Giovanni Bellenda
Head of SUPSI PVLab
Giovanni Bellenda
2024-03-08 09:21
Digitally signed by Giovanni Bellenda

Mauro Caccivio
Head of SUPSI PV sector
Mauro Caccivio
2024-03-13 07:31
Digitally signed by Mauro Caccivio

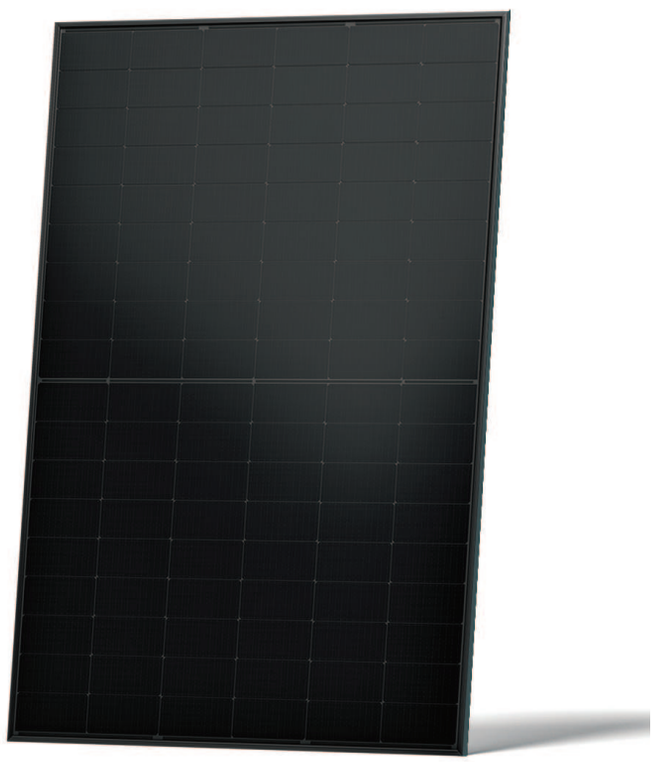
www.jinkosolar.com

Tiger Neo

54HL4R-B

430-455 Watt

ALL-BLACK MONOFAZIALES MODUL



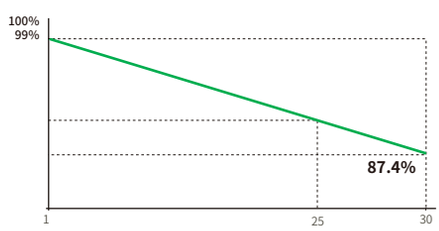
N-Typ

N-Typ Technologie

N-Typ Module mit Tunnel-Oxid Passivierungskontakten (TOPCon) bieten eine geringere LID/LeTID-Degradation und eine bessere Leistung bei schwachem Licht.

HOT 3.0 Technologie

N-Typ-Module mit der HOT 3.0-Technologie von JinkoSolar bieten eine höhere Zuverlässigkeit und Effizienz.



25 Jahre Produktgarantie | **30** Jahre lineare Leistungsgarantie | **1**% Degradierung im ersten Jahr | **0.4**% jährliche Degradation über 30 Jahre

Beständigkeit gegen extreme Umweltbedingungen

Hohe Salznebel- und Ammoniak-Beständigkeit.

Mechanische Belastung Erhöht

Zertifiziert, um zu widerstehen:
6000 Pa maximale statische Prüflast auf der Vorderseite
4000 Pa Rückseite max. statische Prüflast

- IEC61215:2021 / IEC61730:2023
- IEC61701 / IEC62716 / IEC60068 / IEC62804
- ISO9001:2015: Qualitätsmanagementsystem
- ISO14001:2015: Umweltmanagementsystem
- ISO45001:2018: Managementsysteme für Sicherheit und Gesundheit bei der Arbeit

SMBB Technologie

Mehr Modulleistung und Zuverlässigkeit dank verbesserter Lichtabsorption und verbesserten Stromtransport.

Anti-PID-Garantie

Minimiert die durch PID-Phänomene verursachte Degradationsgefahr durch Optimierung der Zellproduktionstechnologie und der Materialkontrolle.

CLEAN ENERGY COUNCIL MEMBER

POSITIVE QUALITY™ Continuous Quality Assurance

EU-JKM430-455N-54HL4R-B-F8-DE

54HL4R-B 430-455 Watt

Mechanische Eigenschaften

Zellentyp	Monokristallin N-Typ
Zellenanzahl	108（54×2）
Maße	1762×1134×30 mm
Gewicht	21.0 kg
Glas Vorderseite	3.2 mm, Antireflexionsbeschichtung, hohe Transmission, eisenarm, gehärtetes Glas
Rahmen	Anodisierte Aluminiumlegierung
Anschlusskasten	Schutzklasse IP68
Schutzklasse	Klasse II
IEC-Brandschutz Typ	Klasse C
Anschlusskabel	4.0 mm^2 (+): 400 mm , (-): 200 mm oder kundenspezifische Länge

Verpackungseinheiten

Abmessungen der Paletten	1792×1140×1249 mm
Details zur Verpackung (Zwei Paletten = Ein Stapel)	37 Stück/Paletten, 74 Stück/Stapel, 962 Stück/40'HQ Container

Spezifikationen (STC)

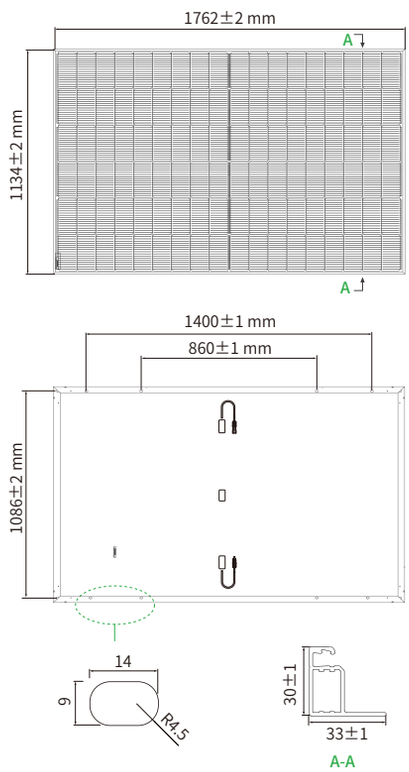
Maximale Leistung - Pmax [Wp]	430	435	440	445	450	455
Maximale Spannung - Vmp [V]	32.58	32.78	32.99	33.19	33.39	33.58
Maximale Strom - Imp [A]	13.20	13.27	13.34	13.41	13.48	13.55
Leerlaufspannung - Voc [V]	39.16	39.36	39.57	39.77	39.97	40.17
Kurzschlussstrom - Isc [A]	13.65	13.72	13.80	13.87	13.94	14.01
Modulwirkungsgrad STC [%]	21.52	21.77	22.02	22.27	22.52	22.77
Leistungstoleranz	0 ~ + 3 %					
Temperaturkoeffizient Pmax	-0.29 %/°C					
Temperaturkoeffizient Voc	-0.25 %/°C					
Temperaturkoeffizient Isc	0.045 %/°C					

STC: Bestrahlungsstärke 1000W/m^2, Zellentemperatur 25°C, AM=1.5

Anwendungsbedingungen

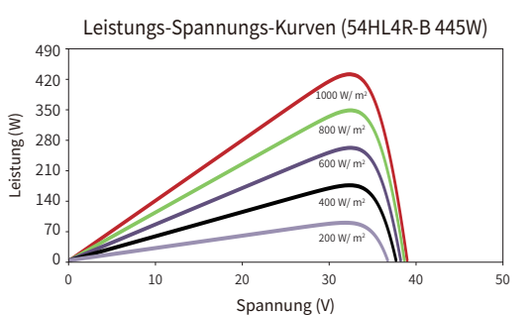
Betriebstemperatur	-40 v°C ~ +70 °C
Maximale Systemspannung	1000 VDC (IEC)
Rückstromsicherung	25 A

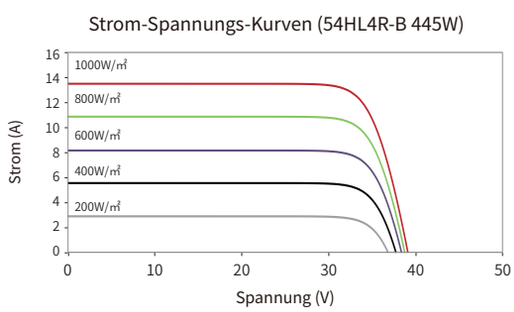
Technische Zeichnungen



Hinweis: Die spezifischen Abmessungen und Toleranzbereiche sind den entsprechenden Detailzeichnungen der Module zu entnehmen.

Elektrische Leistung





Hinweis: Bitte lesen Sie die Sicherheits- und Installationsanleitung, bevor Sie das Produkt verwenden. Wir behalten uns das Recht auf endgültige Auslegung vor, die Spezifikationen in diesem Datenblatt können ohne vorherige Ankündigung geändert werden.

Dieses Dokument ist eine unverbindliche Übersetzung aus dem Englischen. Im Falle einer Abweichung vom Originaltext ist immer die englische Version maßgebend.

EU DECLARATION OF CONFORMITY

(DoC No. 23013002)

We **Hoymiles Power Electronics Inc.**
No.18 Kangjing Road, Hangzhou 310015, Zhejiang Province, P.R. China

as the manufacturer, declare under our sole responsibility that the following products

PRODUCT: **PV Microinverter**
MODELS: **HMS-2000-4T, HMS-1800-4T, HMS-1600-4T**
HMS-2000C-4T, HMS-1800C-4T, HMS-1600C-4T, HMS-1400C-4T
HMS-1000-2T, HMS-900-2T, HMS-800-2T, HMS-700-2T, HMS-600-2T
HMS-500-1T, HMS-450-1T, HMS-400-1T, HMS-350-1T, HMS-300-1T

to which this declaration relates, are in conformity with the following directive and standards:

Directives	2014/53/EU (RE Directive)
Article 3.1(b) EMC	EN 301 489-1 V2.2.3 (2019-11) EN 301 489-3 V2.1.1 (2019-03) EN 61000-6-1:2019 EN 61000-6-2:2019 EN 61000-6-3:2021 EN 61000-6-4:2019 EN 61000-3-2:2019+A1:2021 EN 61000-3-3:2013+A1:2019+A2:2021
Article 3.1(a) Safety	EN 62109-1:2010 EN 62109-2:2011
Article 3.1(a) Health	EN 62479:2010 EN 50663:2017
Article 3.2 Radio	EN 300 220-1 V3.1.1 (2017-02) EN 300 220-2 V3.1.1 (2017-02)

Manufacturer: Hoymiles Power Electronics Inc.

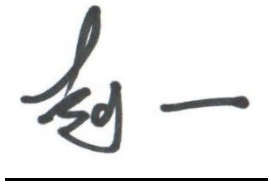
Address: No.18 Kangjing Road, Hangzhou 310015, Zhejiang Province, P.R. China

EU Importer: Hoymiles Power Electronics B.V.

Address: High Tech Campus 9, Unit BK 3.28, 5656 AE Eindhoven, Netherlands

This Declaration of Conformity is not valid any longer, in case, without any written authorization by Hoymiles Power Electronics Inc.:

- The product is modified, supplemented or changed in any other way
- The product is used or installed improperly.

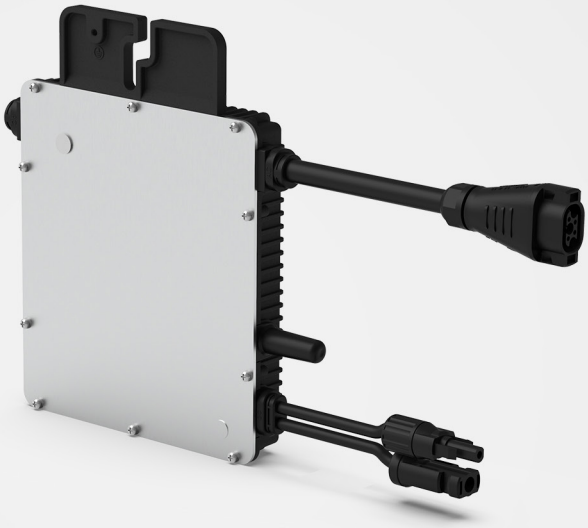


Yi Zhao, Vice President.
2023-01-30
Hangzhou, China

Hoymiles Power Electronics Inc.
No.18 Kangjing Road, Hangzhou 310015, China
Tel: +86 571 28056101
Fax: +86 571 28056137
http://www.hoymiles.com/

Appendix:

Product Specifications	
Frequency Range	863.25 MHz to 869.75 MHz
RF Output Power (EIRP)	11.69 dBm
Modulation Type	GFSK
Type of Antenna	External Omni Antenna
Antenna Gain	2.0 dBi



Datenblatt Mikro-Wechselrichter

HMS-300
HMS-350
HMS-400
HMS-450
HMS-500

Beschreibung

Mit einer Ausgangsleistung von bis zu 500 VA gehört Hoymiles neue Mikro-Wechselrichter-Serie HMS-500 zu den besten 1-in-1-Mikro-Wechselrichtern.

Alle aufgeführten Modelle sind mit einer Blindleistungssteuerung ausgestattet und erfüllen die Anforderungen von EN 50549-1:2019, VDE-AR-N 4105:2018, VFR2019 usw.

Die neue Sub-1G-Funklösung ermöglicht eine stabilere Kommunikation unter verschiedenen Umgebungsbedingungen.

Merkmale

01 Hochleistungs-1-in-1-Mikro-Wechselrichter mit einer Ausgangsleistung von bis zu 500 VA

02 Mit Blindleistungssteuerung, konform mit EN 50549-1:2019, VDE-AR-N 4105:2018, VFR2019 usw.

03 Sicherer für Aufdach-Solarstationen mit Schnellabschaltung und isoliertem Transformator

04 An ein Modul angeschlossen; flexibel für verschiedene Anwendungen

05 Die Sub-1G-Funklösung ermöglicht eine stabile Kommunikation mit dem Hoymiles-Gateway DTU

hoymiles.com
sales@hoymiles.com

Technische Daten

Modell	HMS-300-1T	HMS-350-1T	HMS-400-1T	HMS-450-1T	HMS-500-1T
Angaben zum Eingangsstrom (DC)					
Üblicherweise verwendete Modulleistung (W)	240 bis 405+	280 bis 470+	320 bis 540+	360 bis 600+	400 bis 670+
Maximale Eingangsspannung (V)	60	60	65	65	65
MPPT-Spannungsbereich (V)	16 - 60				
Einschaltspannung (V)	22				
Maximaler Eingangsstrom (A)	11,5	11,5	12,5	13,3	14
Maximaler Eingangskurzschlussstrom (A)	16	16	20	20	20
Angaben zum Ausgangsstrom (AC)					
Nennausgangsleistung (VA)	300	350	400	450	500
Nennausgangsstrom (A)	1,30	1,52	1,74	1,96	2,17
Nennausgangsspannung/-bereich (V)[1]	230/180 - 275				
Nennfrequenz/-bereich (Hz)[1]	50/45 - 55				
Leistungsfaktor (einstellbar)	> 0,99 standardmäßig 0,8 voreilend ... 0,8 nacheilend				
Klirrfaktor	< 3 %				
Maximale Einheiten pro 10-AWG-Strang[2]	24	21	18	16	14
Maximale Einheiten pro 12-AWG-Strang[2]	15	13	11	10	9
Wirkungsgrad					
CEC-Spitzenwirkungsgrad	96,7 %	96,7 %	96,7 %	96,5 %	96,5 %
MPPT-Nennwirkungsgrad	99,8 %				
Leistungsaufnahme bei Nacht (mW)	< 50				
Mechanische Daten					
Umgebungstemperaturbereich (°C)	-40 bis +65				
Abmessungen (B × H × T mm)	182 × 164 × 30				
Gewicht (kg)	1,75				
Schutzart	Außenbereich IP67 (NEMA 6)				
Kühlung	Natürliche Konvektion - Keine Lüfter				
Merkmale					
Kommunikation	Sub-1G				
Art der Isolierung	Galvanisch isolierter HF-Transformator				
Überwachung	Hoymiles S-Miles Cloud[3]				
Konformität	EN 50549-1: 2019, VDE-AR-N 4105: 2018, VFR2019, IEC/EN 62109-1/-2, IEC/EN 61000-6-1/-2/-3/-4, IEC/EN 61000-3-2/-3				

*1 Nennspannung/-frequenzbereich können je nach örtlichen Anforderungen variieren.
*2 Die genaue Anzahl der Mikro-Wechselrichter pro Strang entnehmen Sie bitte den örtlichen Anforderungen.
*3 Hoymiles-Überwachungssystem