

PERUN GLASS **DUO**

KS440MNHTR3-BI

Kensol-Module verwenden spezielles Glas, um die Transparenz zu erhöhen. Die doppelseitigen Module können im Vergleich zu herkömmlichen Paneelen bis zu 30 % mehr Energie erzeugen.



Polnische Marke
Polnischer Garantiegeber

30

30 Jahre Produktgarantie
30 Jahre lineare Leistungsgarantie



Mehr Leistung bei
Standardgröße

TÜV

TÜV Zertifikat

MCS

MCS Zertifikat

440W

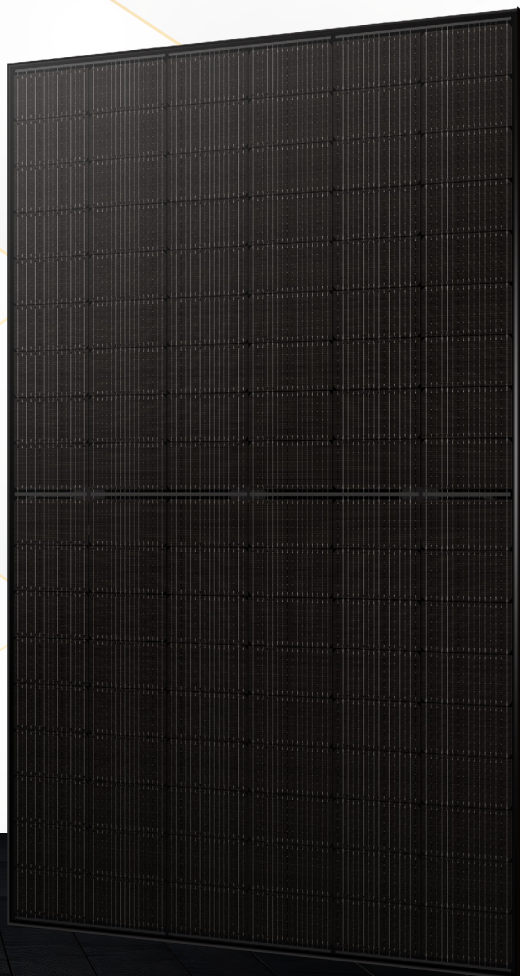
HÖCHSTE AUSGANGSLEISTUNG

22.02%

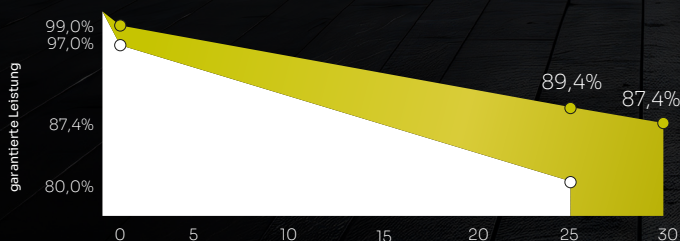
HÖCHSTE MODULLEISTUNG

0~+3%

TOLERANZ DER AUSGANGSLEISTUNG



Garantie der linearen Leistung



Elektrische Eigenschaften STC**					
Modul Typ	KS430 MNHTR3-BI	KS435 MNHTR3-BI	KS440 MNHTR3-BI	KS445 MNHTR3-BI	KS450 MNHTR3-BI
Testbedingungen	Vordere Seite	Vordere Seite	Vordere Seite	Vordere Seite	Vordere Seite
Höchstleistung (Pmax) (W)	430	435	440	445	450
Spannung MPP (Vmp) (V)	32.97	33.15	33.33	33.51	33.69
Strom MPP (Imp)(A)	13.04	13.12	13.20	13.28	13.36
Leerlaufspannung (Voc)(V)	38.37	38.57	38.77	38.97	39.17
Kurzschlussstrom (Isc)(A)	13.86	13.93	14.00	14.07	14.14
Effizienz des Moduls (%)	21.52	21.77	22.02	22.27	22.52

**STC: Strahlungsintensität 1000 W/m2, Zelltemperatur 25°C, AM1,5 Die obigen Daten dienen nur als Referenz und die tatsächlichen Daten entsprechen praktischen Tests. Toleranz bei der Leistungsmessung ±3%.

Elektrische Eigenschaften NOCT*					
Testbedingungen	Vordere Seite	Vordere Seite	Vordere Seite	Vordere Seite	Vordere Seite
Höchstleistung (Pmax) (W)	322	326	330	333	337
Spannung MPP (Vmp) (V)	31.57	31.74	31.91	32.08	32.26
Strom MPP (Imp)(A)	10.20	10.27	10.33	10.39	10.45
Leerlaufspannung (Voc)(V)	36.74	36.93	37.12	37.32	37.51
Kurzschlussstrom (Isc)(A)	11.19	11.25	11.30	11.36	11.42

*NOCT: Strahlungsintensität 800 W/m2 Umgebungstemperatur 20°C, Windgeschwindigkeit 1 m/s

Betriebseigenschaften	
Betriebstemperatur (°C)	-40°C~+85°C
Maximale Systemspannung(V)	1500V DC (IEC)
Maximale serienmäßige Sicherung (A)	30
Frontale statische Belastung	Schneelast 5400 Pa, Windlast 2400 Pa
Zweiseitig*	80%
*Zweiseitigkeit=Pmax hinten (STC)/Pmax vorne (STC), Toleranz der Zweiseitigkeit: ±5%.	
Temperaturkoeffizient	
Temperaturkoeffizient Pmax Pmax*	-0.300%/°C
Temperaturkoeffizient Voc	-0.250%/°C
Temperaturkoeffizient Isc	+0.045%/°C
Nennbetriebstemperatur der Zelle (NOCT)	42±2°C
*Temperaturkoeffizient Pmax±0,03%/°C	

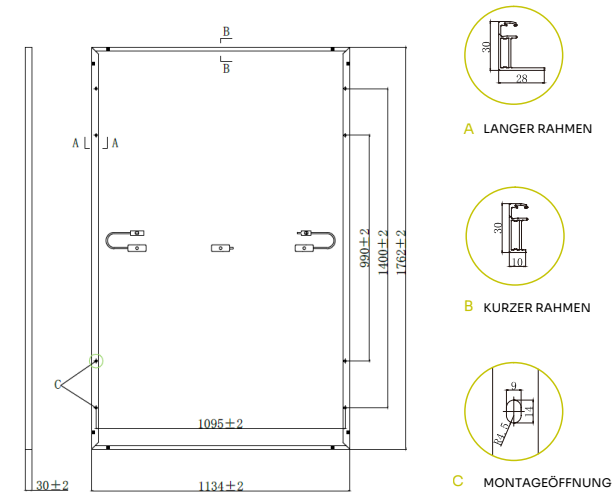
Mechanische Eigenschaften	
Zellenmenge	108
Abmessungen des Moduls	1762mm*1134mm*30mm
Gewicht	21.2kg
Gläser vordere/hintere*	1,6 mm/1,6 mm thermisch verstärktes Glas
Rahmen	Eloxierte Aluminiumlegierung
Verteilerdose	IP68 (3 Dioden)
Kabellänge	4.0mm², +1200mm/-1200mm (Länge des Kabels kann man anpassen)
Verpackungskonfiguration	36Stück/Palette, 936 Stück/40'HQ

*Hitzebeständiges Glas

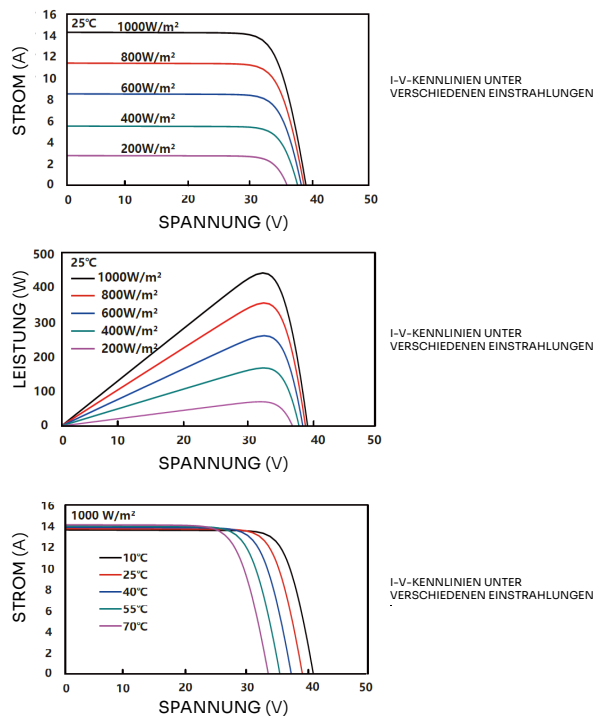
Mit verschiedenen Leistungsstufen (am Beispiel von 415 W)					
Leistungsan- stieg(%)	Höchstle- istung (Pmax) (W)	Spannung MPP (Vmp)(V)	Strom MPP (Imp)(A)	Leerlau- spannung (Voc) (V)	Kurz- schlussstrom (Isc) (A)
10	495.00	33.69	14.69	39.17	15.55
15	517.50	33.69	15.36	39.17	16.26
20	540.00	33.69	16.03	39.17	16.96
25	562.50	33.79	16.65	39.27	17.63
30	585.00	33.79	17.31	39.27	18.33

Aufgrund ständiger technischer Neuerungen können die oben genannten technischen Daten entsprechend geändert werden. KENSOL informiert, dass es das ausschließliche Recht hat, jederzeit ohne vorherige Ankündigung Änderungen vorzunehmen.

Technische Zeichnung (Einheit: mm)



Charakteristische Kurven



*Die in diesem Datenblatt beschriebenen Spezifikationen und Hauptmerkmale können geringfügig abweichen und sind nicht garantiert. Aufgrund der kontinuierlichen Innovation und F&E-Entwicklung behält sich KENSOL Ltd. das Recht vor, die in diesem Dokument beschriebenen Informationen jederzeit und ohne vorherige Ankündigung zu ändern. Die neueste Version des Datenblatts muss immer angefordert werden und wird ordnungsgemäß in eine verbindliche Vereinbarung zwischen den Parteien aufgenommen, die alle Transaktionen im Zusammenhang mit dem Kauf und Verkauf der in diesem Dokument beschriebenen Produkte regelt.



Product Service

CERTIFICATE

No. Z2 121267 0001 Rev. 00

Holder of Certificate: **Kensol sp. z o.o.**
ul. Daszynskiego 609a
44-151 Gliwice
POLAND

Certification Mark:



Product: **Crystalline Silicon Terrestrial Photovoltaic (PV) Modules**
Mono-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, Certification, Validation and Verification Regulations of TÜV SÜD Group have to be complied. For details see: www.tuvsud.com/ps-cert

Test report no.: 701262400302-00

Valid until: 2029-04-24

Date, 2024-05-27

(Zhulin Zhang)

CERTIFICATE

No. Z2 121267 0001 Rev. 00

Model(s):

KSxxxMNH-BI (xxx=610-635, in steps of 5)
KSxxxMNH-BI (xxx=545-590, in steps of 5)
KSxxxMNH-BI (xxx=415-445, in steps of 5)
KSxxxMNHT-BI (xxx=415-445, in steps of 5)
KSxxxMNHR0-BI (xxx=610-645, in steps of 5)
KSxxxMNHR0-BI (xxx=570-595, in steps of 5)
KSxxxMNHR0-BI (xxx=420-450, in steps of 5)
KSxxxMNHTR0-BI (xxx=420-450, in steps of 5)
KSxxxMNHR3-BI (xxx=480-515, in steps of 5)
KSxxxMNHTR3-BI (xxx=480-515, in steps of 5)
KSxxxMNHR3-BI (xxx=430-460, in steps of 5)
KSxxxMNHTR3-BI (xxx=430-460, in steps of 5)
KSxxxMNH-BI (xxx=685-715, in steps of 5)
KSxxxMNH-BI (xxx=640-655, in steps of 5)
KSxxxMNH (xxx=610-635, in steps of 5)
KSxxxMNH (xxx=545-590, in steps of 5)
KSxxxMNH (xxx=415-445, in steps of 5)
KSxxxMNHR0 (xxx=615-645, in steps of 5)
KSxxxMNHR0 (xxx=570-600, in steps of 5)
KSxxxMNHR0 (xxx=420-450, in steps of 5)
KSxxxMNHR3 (xxx=480-510, in steps of 5)
KSxxxMNHR3 (xxx=430-460, in steps of 5)

xxx is standing for rated output power at STC

Parameters:

Construction:	Framed, with Junction box, Cable and Connectors.
Safety Class:	Class II
Maximum System Voltage:	1500 V DC
Fire Safety Class:	Class C according to UL 790
Test Laboratory:	Changzhou HuaYang Inspection and Testing Technology Co., Ltd. NO.8 Lanxiang Road, Wujin Economic Development Zone, Changzhou, Jiangsu, China

Tested according to:

IEC 61215-1:2021
IEC 61215-1-1:2021
IEC 61215-2:2021
IEC 61730-1:2023
IEC 61730-2:2023



Product Service

Attestation of Conformity

No. N8A 121267 0002 Rev. 00

Holder of Attestation: **Kensol sp. z o.o.**

ul. Daszynskiego 609a
44-151 Gliwice
POLAND

Product: **Crystalline Silicon Terrestrial Photovoltaic (PV) Modules**
Mono-Crystalline Silicon Photovoltaic Module

This Attestation of Conformity is issued on a voluntary basis according to the Low Voltage Directive 2014/35/EU relating to electrical equipment designed for use within certain voltage limits. It confirms that the listed equipment complies with the principal protection requirements of the directive and is based on the technical specifications applicable at the time of issuance. It refers only to the particular sample submitted for conformity assessment. For details see: www.tuvsud.com/ps-cert

Test report no.: 704062459901-00

Date, 2024-05-27

(Zhulin Zhang)

Page 1 of 2

This Attestation does not replace the regulatory EU Declaration of Conformity (DoC) and does not allow for CE marking. After preparation of the necessary documentation and establishing compliance to requirements of all applicable directives, the manufacturer may sign a DoC and apply the CE marking. The DoC is issued under the sole responsibility of the manufacturer.



Product Service

Attestation of Conformity

No. N8A 121267 0002 Rev. 00

Model(s):

KSxxxMNH-BI (xxx=610-635, in steps of 5)
 KSxxxMNH-BI (xxx=545-590, in steps of 5)
 KSxxxMNH-BI (xxx=415-445, in steps of 5)
 KSxxxMNHT-BI (xxx=415-445, in steps of 5)
 KSxxxMNHR0-BI (xxx=610-645, in steps of 5)
 KSxxxMNHR0-BI (xxx=570-595, in steps of 5)
 KSxxxMNHR0-BI (xxx=420-450, in steps of 5)
 KSxxxMNHTR0-BI (xxx=420-450, in steps of 5)
 KSxxxMNHR3-BI (xxx=480-515, in steps of 5)
 KSxxxMNHTR3-BI (xxx=480-515, in steps of 5)
 KSxxxMNHR3-BI (xxx=430-460, in steps of 5)
 KSxxxMNHTR3-BI (xxx=430-460, in steps of 5)
 KSxxxMNH-BI (xxx=685-715, in steps of 5)
 KSxxxMNH-BI (xxx=640-655, in steps of 5)
 KSxxxMNH (xxx=610-635, in steps of 5)
 KSxxxMNH (xxx=545-590, in steps of 5)
 KSxxxMNH (xxx=415-445, in steps of 5)
 KSxxxMNHR0 (xxx=615-645, in steps of 5)
 KSxxxMNHR0 (xxx=570-600, in steps of 5)
 KSxxxMNHR0 (xxx=420-450, in steps of 5)
 KSxxxMNHR3 (xxx=480-510, in steps of 5)
 KSxxxMNHR3 (xxx=430-460, in steps of 5)

xxx is standing for rated output power at STC

Parameters:

Construction:	Framed, with Junction box, Cable and Connectors.
Safety Class:	Class II
Maximum System Voltage:	1500 V DC
Fire Safety Class:	Class C according to UL 790
Test Laboratory:	Changzhou HuaYang Inspection and Testing Technology Co., Ltd. NO.8 Lanxiang Road, Wujin Economic Development Zone, Changzhou, Jiangsu, China

Tested according to:

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

Page 2 of 2

This Attestation does not replace the regulatory EU Declaration of Conformity (DoC) and does not allow for CE marking. After preparation of the necessary documentation and establishing compliance to requirements of all applicable directives, the manufacturer may sign a DoC and apply the CE marking. The DoC is issued under the sole responsibility of the manufacturer.

To / 致:

Company / 公司: Kensol Sp. z o.o.

Contact / 联系人: Tymoteusz Wieczorek

Email / 邮箱: serwis@keno-energy.com

From / 自:Company / 公司: TÜV NORD (HANGZHOU)
CO., LTD. / 杭州汉德质量认证
服务有限公司

Contact / 联系人: Ms. Serena.Wu / 郭玉婷 小姐

Email / 邮箱: sewu@tuv-nord.com

Subject: Announcement of cancellation**主题: 证书取消通知**

File No.: PVP04038/23P-05

项目号:

License holder: Kensol Sp. z o.o.

持证人:

Certificate No.: 44 780 23 406749 - 458

证书号:

Product: Crystalline Silicon Terrestrial Photovoltaic (PV) Modules

产品: 地面用晶体硅光伏组件

Herewith it is declared, that the above noted certificate(s) has (have) been invalidated since 2024-07-04.

特此声明, 上述证书自 2024 年 7 月 4 日起失效。

The cancellation is due to:

取消原因:

☐ License holder applied for cancellation.

持证人申请取消。

☒ New certificate(s) (no: 44 780 23 406749 - 458R1M1) has (have) been issued to replace the cancelled one(s).新证书 (证书号: 44 780 23 406749 - 458R1M1) 签发, 取代旧证书。☐ Certificate(s) is (are) expired.

证书有效期至。

☐ Certificate(s) has (have) been suspended for one year, and the factory inspection, verification, and rectification required to restore the certificate(s) has (have) not been completed.

证书暂停满一年, 未完成恢复证书所需厂检、核查、整改等。

☐ Certificate(s) has (have) been suspended for one year, and the annual certificate fee has (have) not been paid.

证书暂停满一年, 未支付证书年费。

☐ Others: _____

其他情况: _____

Please pay attention to stop using the invalid certificate(s) from 2024-07-04. Meanwhile, please send back the original copies of above mentioned certificate(s) to us.

请注意从 2024 年 7 月 4 日开始停止使用无效证书。同时，请将上述证书原件寄回给我们。

TÜV NORD reserved the right of final explanation about the cancellation of certificate(s). TÜV NORD will not take any responsibility for the circumstance of misusing the invalid certificate(s) by the license holder or the manufacturer.

TÜV NORD 保留对证书取消的最终解释权。TÜV NORD 对证书持有者或制造商滥用无效证书的情况不承担任何责任。

Renewable Energy / 可再生能源

TÜV NORD (Hangzhou) Co., Ltd. / 杭州汉德质量认证服务有限公司



Serena.Wu / 邬玉婷

Technical Support / 技术支持

CERTIFICATE

TÜV NORD CERT GmbH

herewith declares that

Kensol Sp. z o.o.

ul. Daszyńskiego 609a

44-151 Gliwice

is authorized to provide the product mentioned below with the mark as illustrated:

Description of product (details see Annex 2):

Crystalline Silicon Terrestrial Photovoltaic (PV) Modules



Valid from: 2024-07-04

Valid until: 2028-04-02

Certification program:	P12-VA-01 Rev. 17 09.20
Certification fundamental(s):	P12.4-AA-02 Rev. 00 (IEC TS 62804-1:2015 modified)
Remark:	Test temperature: 85°C; Relative humidity: 85%; Test duration: 96 hours.
Registered No.:	44 780 23 406749 - 458R1M1
Manufacturer and factory(-ies):	See Annex 1
Test Report No.:	492012510.002
File No.:	PVP04092/24P-04



TÜV NORD CERT GmbH
Certification Body
Consumer Products



Essen, 2024-07-04

Please also pay attention to the information stated overleaf.

Anlage 1 zum Zertifikat Nr.: / Annex 1 to Certificate No.: **44 780 23 406749 - 458R1M1**

Seite / Page **1** von / of **1**

Aktenzeichen: / File reference: **PVP04092/24P-04**

2024-07-04

Manufacturer and factory(-ies):

Manufacturer: **Kensol Sp. z o.o.**
ul. Daszyńskiego 609a, 44-151 Gliwice

Factory 1: **Coded by debtor no. 55474906**
Factory inspection report no.: 862010439.005

Factory 2: **Coded by debtor no. 55581281**
Factory inspection report no.: 862010737.001

Remark:

Factory inspection is mandatory to be performed annually. Please refer to factory inspection report for detailed information.



TÜV NORD CERT GmbH
Certification Body
Consumer Products

Description of product(s):

Module types:	Double Glass PV Modules with 182mm Half-cut Mono n-type Bifacial Solar Cells: 156 cells:KSxxxMNH-BI (xxx=610-635, in steps of 5) 144 cells:KSxxxMNH-BI (xxx=545-590, in steps of 5) 108 cells:KSxxxMNH-BI (xxx=415-445, in steps of 5) 108 cells:KSxxxMNHT-BI (xxx=415-445, in steps of 5) Remark: xxx indicates output power from the front side only
Maximum system voltage:	1500V
Maximum overcurrent protection rating:	30A
Electrical protection class:	Class II
Module types:	Double Glass PV Modules with 210mm Half-cut Mono n-type Bifacial Solar Cells: 132 cells:KSxxxMNH-BI (xxx=685-715, in steps of 5) 120 cells:KSxxxMNH-BI (xxx=640-655, in steps of 5) Remark: xxx indicates output power from the front side only
Maximum system voltage:	1500V
Maximum overcurrent protection rating:	35A
Electrical protection class:	Class II
Module types:	Double Glass PV Modules with 182.2*183.75 Half-cut Mono n-type Bifacial Solar Cell NM10L16B, N183.75R16B 156 cells: KSxxxMNHR0-BI (xxx=610-645, in steps of 5) 144 cells: KSxxxMNHR0-BI (xxx=570-595, in steps of 5) 108 cells: KSxxxMNHR0-BI (xxx=420-450, in steps of 5) 108 cells: KSxxxMNHTR0-BI (xxx=420-450, in steps of 5) Remark: xxx indicates output power from the front side only
Maximum system voltage:	1500V
Maximum overcurrent protection rating:	30A
Electrical protection class:	Class II



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Certification Body
Consumer Products

Module types: **Double Glass PV Modules with 182.2*186.7 and 182.2*187.5 Half-cut Mono n-type Bifacial Solar Cell NM10L216B, NM10L4-16B**
120 cells: KSxxxMNHR3-BI (xxx=480-515, in steps of 5)
120 cells: KSxxxMNHTR3-BI (xxx=480-515, in steps of 5)
108 cells: KSxxxMNHR3-BI (xxx=430-460, in steps of 5)
108 cells: KSxxxMNHTR3-BI (xxx=430-460, in steps of 5)
Remark: xxx indicates output power from the front side only

Maximum system voltage: 1500V

Maximum overcurrent protection rating: 30A

Electrical protection class: Class II

Module types: **Double Glass PV Modules with 182.2*191.6 Half-cut Mono n-type Bifacial Solar Cell N191.6R16B**
144 cells: KSxxxMNHR1-BI (xxx=595-625, in steps of 5)
120 cells: KSxxxMNHR1-BI (xxx=495-525, in steps of 5)
120 cells: KSxxxMNHTR1-BI (xxx=495-525, in steps of 5)
108 cells: KSxxxMNHR1-BI (xxx=445-470, in steps of 5)
108 cells: KSxxxMNHTR1-BI (xxx=445-470, in steps of 5)
Remark: xxx indicates output power from the front side only

Maximum system voltage: 1500V

Maximum overcurrent protection rating: 30A

Electrical protection class: Class II



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Consumer Products

Module types:	Double Glass PV Modules with 182*210 Half-cut Mono n-type Bifacial Solar Cell N210R16B 132 cells: KSxxxMNHR2-BI (xxx=595-625, in steps of 5) 120 cells: KSxxxMNHR2-BI (xxx=540-570, in steps of 5) 108 cells: KSxxxMNHR2-BI (xxx=485-515, in steps of 5) 108 cells: KSxxxMNHTR2-BI (xxx=485-515, in steps of 5) Remark: xxx indicates output power from the front side only
Maximum system voltage:	1500V
Maximum overcurrent protection rating:	35A
Electrical protection class:	Class II

Remark:

For detailed product information, please refer to CDF (Constructional Data Form).



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