Deutsche
Qualität
Garantiert

AE SOLAR
alternative energy

TIER 1
Bloomberg
NEW ENERGY FINANCE

108
HALF CELLS

182 mm
CELL SIZE

LID RESISTANT

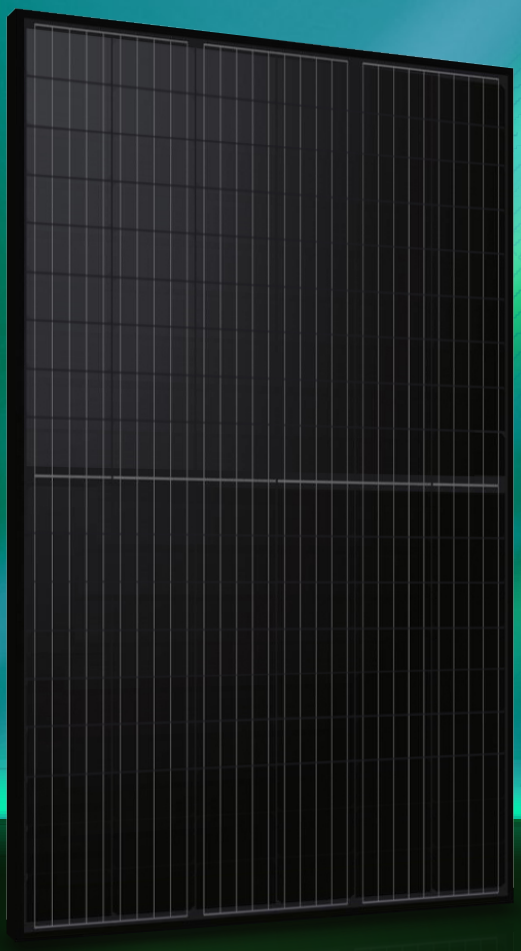
PID
PID RESISTANT

SALT CORROSION RESISTANT

SAND RESISTANT

NH_3
S
AMMONIA RESISTANT

HIGHLY STABLE AND TOUGH



AURORA

HIGH ENERGY YIELD RELIABILITY DURABILITY

30 years
Performance Guarantee

15 years
Product Warranty

MONO-CRYSTALLINE PV MODULES
HALF-CUT CELLS • MONO-FACIAL • FULL BLACK

395W-415W
AE MD-108 Series

ISO 9001 : 2105 QUALITY MANAGEMENT SYSTEM
ISO14001 CERTIFIED
ISO 45001 : 2018 HEALTH AND SAFETY
TÜVRheinland ZERTIFIZIERT

IEC 61215
IEC 61730
Regular Production Surveillance
Type Tested and Monitored

IEC 62716 (Ammonia corrosion)
IEC 61701 (Salt mist corrosion)
IEC 60068 (Sand and dust)
IEC 62804 (PID resistance)

Ariel Re
LLOYD'S Underwriters
CE

www.ae-solar.com

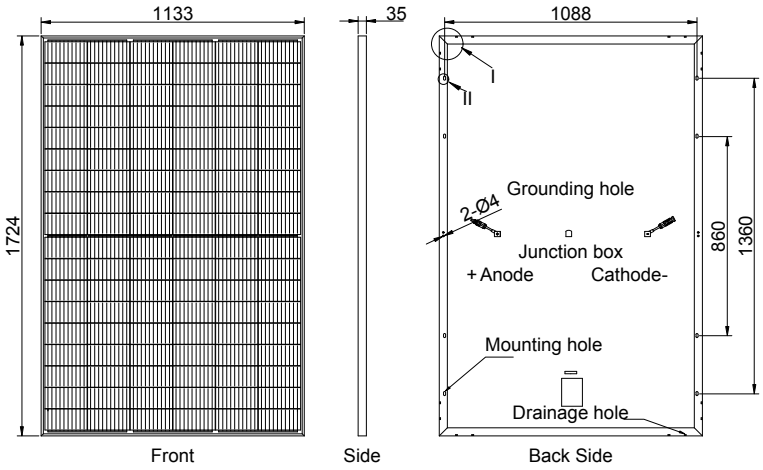
AE SOLAR
alternative energy

MONO-CRYSTALLINE PV MODULES
HALF-CUT CELLS • MONO-FACIAL • FULL BLACK

AE MD-108 Series 395W-415W

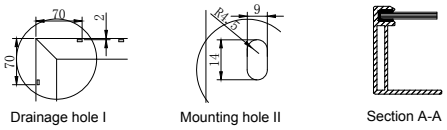
Mechanical and design specification

Cell type	Gallium-doped Mono c-Si PERC, Half-cut cells, 182 mm
No. of cells	108
Glass	3.2 mm, high transmission, AR coated, tempered
Encapsulation	EVA
Back cover	White backsheet
Junction box	IP 68 rated
Frame	35 mm anodized Aluminium alloy
Cable	1 x 4 mm², 350 mm length or customized
Connectors	MC 4 / MC 4 compatible
Dimension	1724 mm x 1133 mm x 35 mm
Weight	21.5 kg
Hail resistance	Max. Ø 25 mm at 23 m/s
Wind load	2400 Pa/ 244 kg/ m²
Mechanical load	5400 Pa/ 550 kg/ m²



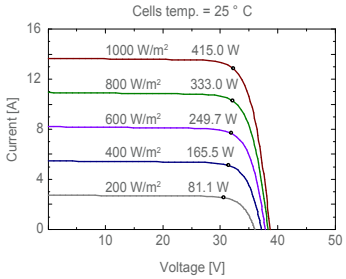
Packaging information

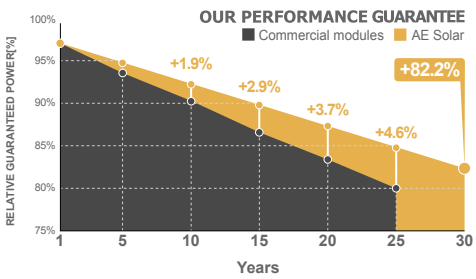
Packaging configuration	62 pcs / double pallet
Loading capacity	806 pcs / 40 HQ
Size / Pallet	1755 mm x 1140 mm x 2490 mm
Weight	1432 kg / double pallets



Temperature ratings

Operating temperature	(°C)	-40 to +85
Temp.coefficient of P_{max}	(%/°C)	-0.35
Temp.coefficient of V_{oc}	(%/°C)	-0.275
Temp.coefficient of I_{sc}	(%/°C)	0.045
Nom. operating temp. NOCT	(°C)	45 ± 2





Electrical specifications (STC*):

		AE395MD-108	AE400MD-108	AE405MD-108	AE410MD-108	AE415MD-108
Nominal Max. Power	P_{max} (Wp)	395	400	405	410	415
Maximum operating voltage	V_{MPP} (V)	31.08	31.35	31.62	31.88	32.12
Maximum operating current	I_{MPP} (A)	12.71	12.76	12.81	12.86	12.92
Open-circuit voltage	V_{oc} (V)	37.36	37.69	38.02	38.35	38.67
Short-circuit current	I_{sc} (A)	13.47	13.52	13.57	13.62	13.67
Module efficiency	η (%)	20.22	20.48	20.73	20.99	21.25
Power tolerance	(W)			0~+5		
Maximum system Voltage	(V)			1500		
Maximum series fuse rating	(A)			25		

*STC: Standard test conditions (Irradiance 1000 W/m², Cell temperature 25°C and air mass of AM1.5)

Electrical specifications (NMOT*):

		AE395MD-108	AE400MD-108	AE405MD-108	AE410MD-108	AE415MD-108
Nominal Max. Power	P_{max} (Wp)	298	301	304	308	311
Maximum operating voltage	V_{MPP} (V)	29.30	29.50	29.70	29.90	30.10
Maximum operating current	I_{MPP} (A)	10.17	10.21	10.25	10.29	10.34
Open-circuit voltage	V_{oc} (V)	35.20	35.40	35.60	35.80	36.00
Short-circuit current	I_{sc} (A)	10.78	10.82	10.86	10.90	10.94

*NMOT: Normal Module Operating Temperature (Irradiance 800 W/m², Ambient temperature 20°C, air mass of AM1.5 and wind speed of 1 m/s)

+49 8231 92 92 52 2
sales@ae-solar.com
www.ae-solar.com

Messerschmittring 54
86343 Königsbrunn, Germany

LIMITED WARRANTY STATEMENT
PHOTOVOLTAIC MODULE PRODUCTS

1. Limited Product Warranty - 15 Years Repair, Replacement or Refund Remedy

AE Solar warrants to the original buyer (the "Buyer") that the modules shall be free from defects in materials and workman ship that have an effect on module functionality under normal application, installation, use and service conditions as specified in AE Solar's standard product documentation.

AE Solar guarantees that the module will maintain the mechanical integrity and stability in accordance with approved operation methods described in our installation instructions; the glass of a module will maintain its integrity provided there are no indications of localized impacts or external forces; and that the cable and connector plug of a module will remain safe and operational provided modules are professionally installed. Any damages caused by abrasion, improper installation or animals are exempt from this warranty.

Claims under the warranty can only be accepted if the Buyer can provide proof that the malfunctioning or nonconformity of a module results exclusively from defects in materials and/or workmanship under normal application, installation, use and service conditions specified in AE Solar's standard product documentation. Any color change on module or any other changes on module appearance do not represent defects, insofar as the change in appearance does not stem from defects in material and/or workmanship, and does not cause degradation of functionality of the module. If the product fails to conform to this warranty, AE Solar will, at its option, either repair or replace the product, or provide an appropriate residual market value of the product(s) as compensation.

2. Limited Peak Power Warranty - Limited Remedy

2.1 For polycrystalline and monocrystalline module products, AE Solar guarantees the first year power degradation is no more than 3% from its nameplate power. From year 2 to year 30, the actual annual power decline will be no more than 0.57%. By the end of year 30, the actual power output will be no less than 80% of the labeled power output.

2.2 The actual power output of the module shall be determined for verification using Standard Testing Conditions only. The actual power output measurement is either carried out by a AE Solar facility or by a AE Solar recognized 3rd party testing institute. Testing equipment tolerances will be applied to all actual power output measurements.

2.3 In the event it is determined that there is a negative deviation of actual performance from the warranted values then AE Solar, at its option, will compensate for such loss in power by either providing to the Buyer additional modules to make up the total wattage loss, or by repairing or replacing the modules or providing an appropriate residual market value of the product(s) as compensation.

AE NO 110 09/2018

3. Exclusions and Limitations

3.1 Warranty claims must in any event be filed within the applicable warranty period.

3.2 The limited warranties do not apply to any PV modules which, in AE Solar's absolute judgment, have been subjected to:

- Misuse, abuse, neglect or accident;
- Alternation, improper installation or application;
- Non-observance of AE Solar's installation-users and maintenance instructions;
- Repair or modifications by someone other than a qualified service technician;
- Power failure surges, lighting, flood, fire, accidental breakage or other events outside AE Solar's control;
- Any move and subsequent installation of the module.

3.3 The limited warranties do not cover any shipping costs for the return of the PV modules, or for reshipment of any repaired or replaced PV modules, or cost associated with installation, removal or reinstallation of the PV modules.

3.4 Warranty claims will not be honored if the type or serial number of the PV modules have been altered, removed or made illegible. All other statements made by AE Solar (including without limitation to those made in the AE Solar's promotional materials) in respect of the properties, performance characteristics and other aspects of the modules are for illustration only and are not legally binding on AE Solar. To the fullest extent permitted by law, AE Solar excludes all implied representations and warranties in respect of the modules, their properties and performance characteristics. To the fullest extent permitted by law, AE Solar also excludes all liabilities to the Buyer and any user of the PV modules produced by AE Solar for any loss of actual or anticipated profits, revenues, turnover, anticipated savings, business or goodwill.

4. Disputes

No action, regardless of form, arising out of or in any way connected with this limited warranty policy, may be brought by the Buyer more than one (1) year after the cause of action has accrued.

5. Various

The repair or replacement of the PV modules or the supply of additional PV modules does not cause the beginning of new warranty terms, nor shall the original terms of this limited warranty be extended. Any replaced PV modules shall become the property of AE Solar. AE Solar has the right to deliver another type (different in size, color, shape and /or power) in case AE Solar discontinues producing the PV-module in question at the time of the claim.

Zertifikat *Certificate*

TÜVRheinland®

Zertifikat Nr. *Certificate No.*
PV 50536079

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0001

Ihr Zeichen *Client Reference*	**Unser Zeichen** *Our Reference*	**Ausstellungsdatum** *Date of Issue*
F.C.	01-ZYF-CN22QJ8O 001	21.03.2022 *(day/mo/yr)*

Genehmigungsinhaber *License Holder*
AE SOLAR GmbH
Messerschmittring 54
86343 Königsbrunn
Germany

Fertigungsstätte *Manufacturing Plant*
Refer to latest revision
of the annex list of factories

Prüfzeichen *Test Mark*

TÜVRheinland® CERTIFIED
IEC 61215
IEC 61730
Regular Production Surveillance
www.tuv.com
ID 1111251295

Geprüft nach *Tested acc. 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 61730-2:2018

Zertifiziertes Produkt (Geräteidentifikation)
Certified Product (Product Identification)

Lizenzentgelte - Einheit
License Fee - Unit

PV Module

Type Designations:
Max. System Voltage: up to 1500 VDC (Voc at STC):
With ½ cut of 210 mono c-Si cell:
AExxxME-132 (xxx=640-670, in steps of 5, 132 cells)
AExxxME-120 (xxx=580-610, in steps of 5, 120 cells)
AExxxME-110 (xxx=535-555, in steps of 5, 110 cells)
With ⅓ cut of 210 mono c-Si cell:
AExxxME-T150 (xxx=480-520, in steps of 5, 150 cells)
AExxxME-T120 (xxx=385-415, in steps of 5, 120 cells)
With ½ cut of 182 mono c-Si cell:
AExxxMD-156 (xxx=565-600, in steps of 5, 156 cells)
AExxxMD-144 (xxx=520-555, in steps of 5, 144 cells)
AExxxMD-132 (xxx=480-505, in steps of 5, 132 cells)
AExxxMD-120 (xxx=435-460, in steps of 5, 120 cells)
AExxxMD-108 (xxx=390-415, in steps of 5, 108 cells)
AExxxMD-96 (xxx=350-370, in steps of 5, 96 cells)
AExxxMD-72 (xxx=260-275, in steps of 5, 72 cells)
Continued on Page 0002

Dem Zertifikat liegt unsere Prüf- und Zertifizierungsordnung zugrunde.
Das Produkt entspricht den o.g. Anforderungen, die Herstellung wird überwacht.
This certificate is based on our Testing and Certification Regulation. The product fulfills above mentioned requirements, the production is subject to surveillance.

Zertifizierungsstelle

TÜV Rheinland LGA Products GmbH TÜVRheinland®

Dipl.-Ing. (FH) Tim Kirschner

TÜV Rheinland LGA Products GmbH, Tillystraße 2, 90431 Nürnberg
http://www.tuv.com/safety E-mail: markcheck@tuv.com
Fax: +49 221 806-3935

Zertifikat *Certificate*

TÜVRheinland®

Zertifikat Nr. *Certificate No.*
PV 50536079

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0002

Ihr Zeichen *Client Reference*	**Unser Zeichen** *Our Reference*	**Ausstellungsdatum**	*Date of Issue*
F.C.	01-ZYF-CN22QJ8O 001	21.03.2022	*(day/mo/yr)*

Genehmigungsinhaber *License Holder*
AE SOLAR GmbH
Messerschmittring 54
86343 Königsbrunn
Germany

Fertigungsstätte *Manufacturing Plant*
Refer to latest revision
of the annex list of factories

Prüfzeichen *Test Mark*

TÜVRheinland® CERTIFIED
IEC 61215
IEC 61730
Regular Production Surveillance
www.tuv.com
ID 1111251295

Geprüft nach *Tested acc. 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 61730-2:2018

Zertifiziertes Produkt (Geräteidentifikation)
Certified Product (Product Identification)

Lizenzentgelte - Einheit
License Fee - Unit

PV Module

Continuation of Page 1
With ½ cut of 166 mono c-Si cell:
AExxxMC-144 (xxx=420-460, in steps of 5, 144 cells)
AExxxMC-132 (xxx=385-420, in steps of 5, 132 cells)
AExxxMC-120 (xxx=350-385, in steps of 5, 120 cells)
AExxxMC-108 (xxx=315-345, in steps of 5, 108 cells)
AExxxMC-96 (xxx=280-305, in steps of 5, 96 cells)
AExxxMC-72 (xxx=210-230, in steps of 5, 72 cells)

Remarks:
Class II acc. to IEC 61140
Fire Rating: Class C (according to UL 790)
Design Load/ Safety Factors: 3600 Pa / 1.5 (downward)
1600 Pa / 1.5 (upward)

Conditions:
The product test is voluntarily according to technical regulations. Any change of the design, materials, components or processing may require the repetition of some of the qualification tests in order to retain type approval.
The certificate is valid until 17 March 2027.

Dem Zertifikat liegt unsere Prüf- und Zertifizierungsordnung zugrunde.
Das Produkt entspricht den o.g. Anforderungen, die Herstellung wird überwacht.
This certificate is based on our Testing and Certification Regulation. The product fulfills above mentioned requirements, the production is subject to surveillance.

Zertifizierungsstelle

TÜV Rheinland LGA Products GmbH
TÜVRheinland®

Dipl.-Ing. (FH) Tim Kirschner

TÜV Rheinland LGA Products GmbH, Tillystraße 2, 90431 Nürnberg
http://www.tuv.com/safety E-mail: markcheck@tuv.com
Fax: +49 221 806-3935

Zertifikat *Certificate*

Zertifikat Nr. *Certificate No.*
PV 50536079

Blatt *Sheet*
0003

Ihr Zeichen *Client Reference*	Unser Zeichen *Our Reference*	Ausstellungsdatum *Date of Issue*
F.C.	01-ZYF-CN22QJ8O 002	27.05.2022 *(day/mo/yr)*

Genehmigungsinhaber *License Holder*
AE SOLAR GmbH
Messerschmittring 54
86343 Königsbrunn
Germany

Fertigungsstätte *Manufacturing Plant*
Refer to latest revision
of the annex list of factories

Prüfzeichen *Test Mark*

TÜVRheinland CERTIFIED
IEC 61215
IEC 61730
Regular Production Surveillance
www.tuv.com
ID 1111251295

Geprüft nach *Tested acc. 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 61730-2:2018

Zertifiziertes Produkt (Geräteidentifikation)
Certified Product (Product Identification)

Lizenzentgelte - Einheit
License Fee - Unit

PV Module

Same as Page 1-2
In addition:
Type Designations:
With 156 mono c-Si cell:
AExxxMA-72 (xxx=370-385, in steps of 5, 72 cells)
AExxxMA-60 (xxx=310-320, in steps of 5, 60 cells)
AExxxMA-36 (xxx=185-195, in steps of 5, 36 cells)
With 158 mono c-Si cell:
AExxxMB-72 (xxx=385-400, in steps of 5, 72 cells)
AExxxMB-60 (xxx=320-335, in steps of 5, 60 cells)
AExxxMB-36 (xxx=185-200, in steps of 5, 36 cells)
With ½ cut of 158 mono c-Si cell:
AExxxMB-144 (xxx=390-415, in steps of 5, 144 cells)
AExxxMB-120 (xxx=325-345, in steps of 5, 120 cells)
With 158 mono c-Si cell:
AExxxSMB-72 (xxx=385-400, in steps of 5, 72 cells)
AExxxSMB-60 (xxx=320-335, in steps of 5, 60 cells)
AExxxSMB-36 (xxx=185-200, in steps of 5, 36 cells)
Remarks:
- Additional new manufacturing plant see annex.

Dem Zertifikat liegt unsere Prüf- und Zertifizierungsordnung zugrunde.
Das Produkt entspricht den o.g. Anforderungen, die Herstellung wird überwacht.
This certificate is based on our Testing and Certification Regulation. The product fulfills above mentioned requirements, the production is subject to surveillance.

TÜVRheinland LGA Products GmbH Zertifizierungsstelle

Zertifizierungsstelle

TÜV Rheinland LGA Products GmbH, Tillystraße 2, 90431 Nürnberg
http://www.tuv.com/safety E-mail: markcheck@tuv.com
Fax: +49 221 806-3935

Dipl.-Ing. Matthias Grzam

VDE Prüf- und Zertifizierungsinstitut

ZEICHENGENEHMIGUNG
MARKS APPROVAL

AE Alternative Energy GmbH
Messerschmittring 54
D-86343 KÖNIGSBRUNN
GERMANY

ist berechtigt, für ihr Produkt /
is authorized to use for their product

Terrestrische Photovoltaik-Module mit Silizium-Solarzellen
Crystalline silicon terrestrial photovoltaic modules

die hier abgebildeten markenrechtlich geschützten Zeichen
für die ab Blatt 2 aufgeführten Typen zu benutzen /
the legally protected Marks as shown below for the types referred to on page 2 ff.

Geprüft und zertifiziert nach /
Tested and certified according to

DIN EN 61215-1 (VDE 0126-31-1):2017-05; EN 61215-1:2016
DIN EN 61215-1-1 (VDE 0126-31-1-1):2018-06; EN 61215-1-1:2016
DIN EN 61215-2 (VDE 0126-31-2):2019-02; EN 61215-2:2017+AC:2017+AC:2018
DIN EN IEC 61730-1 (VDE 0126-30-1):2018-10; EN IEC 61730-1:2018+AC:2018
DIN EN IEC 61730-2 (VDE 0126-30-2):2018-10; EN IEC 61730-2:2018+AC:2018
IEC 61215-1:2016
IEC 61215-1-1:2016
IEC 61215-2:2016
IEC 61730-1:2016
IEC 61730-2:2016

Aktenzeichen: 5026092-3972-0001 / 264737
File ref.:

VDE Prüf- und Zertifizierungsinstitut GmbH
VDE Testing and Certification Institute
Zertifizierungsstelle / *Certification*

Ausweis-Nr. 40050536 Blatt 1
Certificate No. *Page*

Weitere Bedingungen siehe Rückseite und Folgeblätter /
further conditions see overleaf and following pages

Offenbach, 2019-08-12

J. Richter

VDE Zertifikate sind nur gültig bei Veröffentlichung unter: http://www.vde.com/zertifikat
VDE certificates are valid only when published on: *http://www.vde.com/certificate*

VDE

VDE Prüf- und Zertifizierungsinstitut
Zeichengenehmigung

Name und Sitz des Genehmigungs-Inhabers / *Name and registered seat of the Certificate holder*
AE Alternative Energy GmbH, Messerschmittring 54, 86343 Königsbrunn

Aktenzeichen / *File ref.*
5026092-3972-0001 / 264737 / IC6 / FB

Datum / *Date*
2019-08-12

Dieses Blatt gilt nur in Verbindung mit Blatt 1 des Zeichengenehmigungsausweises Nr. 40050536.
This supplement is only valid in conjunction with page 1 of the Certificate No. 40050536.

Terrestrische Photovoltaik-Module mit Silizium-Solarzellen
Crystalline silicon terrestrial photovoltaic modules

Typ(en) / *Type(s)*

A) AExxxM6-72H
B) AExxxM6-60H
C) AExxxM6-72
D) AExxxM6-60
E) AExxxP6-72H
F) AExxxP6-60H
G) AExxxP6-72
H) AExxxP6-60
I) AExxxHM6-72
J) AExxxHM6-60
K) AExxxHP6-72
L) AExxxHP6-60
M) AExxxHM6L-72
N) AExxxHM6L-60

Weitere Angaben / *Further information*: siehe Anlage 100 vom 12.08.2019 / *see annex 100 dated 2019-08-12*

VDE Prüf- und Zertifizierungsinstitut GmbH
VDE Testing and Certification Institute
Zertifizierungsstelle
Certification

gez. Dr.-Ing. Klaus Kreß

Merianstrasse 28, D-63069 Offenbach
Telefon +49 (0) 69 83 06-0
Telefax +49 (0) 69 83 06-555