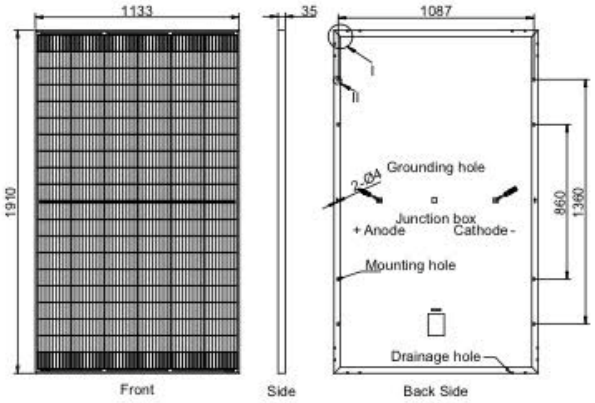
AE SOLAR
alternative energy

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

AE MD-120 Series 440W-460W

Mechanical and design specification

Cell type	Gallium-doped Mono c-Si PERC, Half-cut cells, 182 mm
No. of cells	120
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
Dimension	1910 mm x 1133 mm x 35 mm
Weight	24 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
Fire Rating	Class C (according to UL 790)

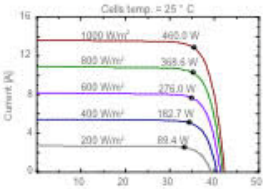


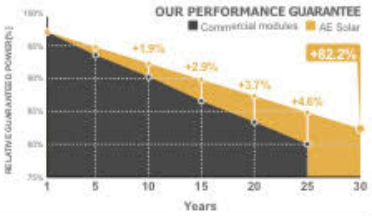
Packaging information

Packaging configuration	62 pcs / double pallet
Loading capacity	744 pcs / 40 HQ
Size / Pallet	1945 mm x 1140 mm x 2490 mm
Weight	1598 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*):		AE440MD-120	AE445MD-120	AE450MD-120	AE455MD-120	AE460MD-120
Nominal Max. Power	P_{max} (Wp)	440	445	450	455	460
Maximum operating voltage	V_{MPP} (V)	34.62	34.87	35.13	35.38	35.60
Maximum operating current	I_{MPP} (A)	12.71	12.76	12.81	12.86	12.92
Open-circuit voltage	V_{oc} (V)	41.35	41.66	41.98	42.29	42.60
Short-circuit current	I_{sc} (A)	13.47	13.52	13.57	13.62	13.67
Module efficiency	η (%)	20.33	20.56	20.79	21.03	21.26
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*):		AE440MD-120	AE445MD-120	AE450MD-120	AE455MD-120	AE460MD-120
Nominal Max. Power	P_{max} (Wp)	331	335	338	342	345
Maximum operating voltage	V_{MPP} (V)	32.60	32.80	33.00	33.20	33.40
Maximum operating current	I_{MPP} (A)	10.17	10.21	10.25	10.29	10.34
Open-circuit voltage	V_{oc} (V)	38.80	39.00	39.20	39.40	39.60
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)

Country of Mnufacture: China

The specifications and characteristics contained in this datasheet may deviate slightly from our actual products due to the product developments and uncertainty of measurement devices.

SPIC ENERGY

SUN2000-8/10/12/15/17/20KTL-M2(High Current Version)

Technical Specification

Technical Specification	SUN2000 -8KTL-M2	SUN2000 -10KTL-M2	SUN2000 -12KTL-M2	SUN2000 -15KTL-M2	SUN2000 -17KTL-M2	SUN2000 -20KTL-M2
Efficiency						
Max. efficiency	98.50%	98.50%	98.50%	98.65%	98.65%	98.65%
European weighted efficiency	97.80%	98.00%	98.00%	98.20%	98.30%	98.30%
Input						
Recommended max. PV power [1]	12,000 Wp	15,000 Wp	18,000 Wp	22,500 Wp	25,500 Wp	30,000 Wp
Max. input voltage [2]	1,080 V					
Operating voltage range [3]	160 V ~ 950 V					
Start-up voltage	200 V					
Rated input voltage	600 V					
Max. input current per MPPT	27 A [4]					
Max. short-circuit current	39 A					
Number of MPP trackers	2					
Max. number of inputs	4					
Output						
Grid connection	Three phase					
Rated output power	8,000 W	10,000 W	12,000 W	15,000 W	17,000 W	20,000 W
Rated AC Apparent power	8,000 VA	10,000 VA	12,000 VA	15,000 VA	17,000 VA	20,000 VA
Max. apparent power	8,800 VA	11,000 VA	13,200 VA	16,500 VA	18,700 VA	22,000 VA
Rated output voltage	230 Vac / 400 Vac, 3W + N + PE					
Rated AC grid frequency	50 Hz / 60 Hz					
Max. output current	13.4 A	17 A	20 A	25.2 A	28.5 A	33.5 A
Adjustable power factor	0.8 leading ... 0.8 lagging					
Max. total harmonic distortion	≤ 3 %					
Features & Protections						
Input-side disconnection device	Yes					
Anti-islanding protection	Yes					
AC over-current protection	Yes					
AC short-circuit protection	Yes					
AC over-voltage protection	Yes					
DC reverse-polarity protection	Yes					
DC surge protection	TYPE II					
AC surge protection	Yes, compatible with TYPE II protection class according to EN/IEC 61643-11					
Residual current monitoring unit	Yes					
Arc fault protection	Yes					
Ripple receiver control	Yes					
Integrated PID recovery [5]	Yes					
General Data						
Operation temperature range	-25 ~ + 60 °C (-13 °F ~ 140 °F)					
Relative humidity	0 % RH ~ 100% RH					
Max. operating altitude	0 ~ 4,000 m (13,123 ft.) (Derating above 2000 m)					
Cooling	Natural Convection					
Display	LED Indicators; Integrated WLAN + FusionSolar App					
Communication	RS485; WLAN/Ethernet via Smart Dongle-WLAN-FE (Optional) 4G / 3G / 2G via Smart Dongle-4G (Optional)					
Weight (with mounting plate)	25 kg					
Dimensions (W x H x D) (incl. mounting plate)	525 x 470 x 262 mm (20.7 x 18.5 x 10.3 inch)					
Degree of protection	IP65					
Country of Manufacture	China					
Optimizer Compatibility						
DC MBUS compatible optimizer	SUN2000-450W-P					
Standard Compliance (more available upon request)						
Safety	EN/IEC 62109-1, EN/IEC 62109-2					
Grid connection standards	G98, G99, EN 50549, CEI 0-21, CEI 0-16, VDE-AR-N-4105, VDE-AR-N-4110, AS/NZS 4777.2 2020, C10/11, ABNT, VFR 2019, RD 1699, RD 661, PO 12.3, TOR D4, IEC61727, IEC62116, DEWA					

*1 [illegible]
*2 [illegible]
*3 [illegible]
*4 [illegible]
*5 [illegible]

Version No. 02-(20190012)

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