

TM Series®

HC ALL BLACK

120 Cells (60) - 182mm

435 - 455 WP

- Mismatch loss reduction for maximum efficiency
- Reduced power loss by minimizing the effect of shadow shading (**9-12 BusBar**)
- **Positive** (0 - 3%) **tolerance** in all our TM Series® modules
- Proven reliability through PVEL's weatherproofing tests
- **Fully automated production** at all stages



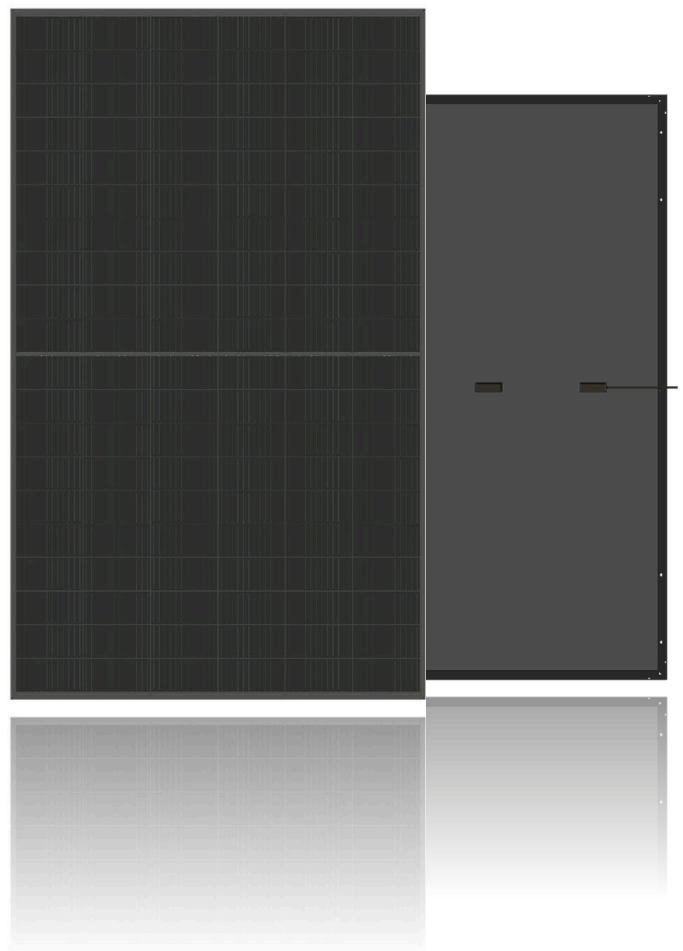
25-YEAR WARRANTY
MATERIALS & PROCESSING



30-YEAR WARRANTY
LINEAR POWER OUTPUT



EUROPEAN WARRANTY &
AFTER-SALES SERVICE



Product Certifications

CE

EC 61215

IEC 61730

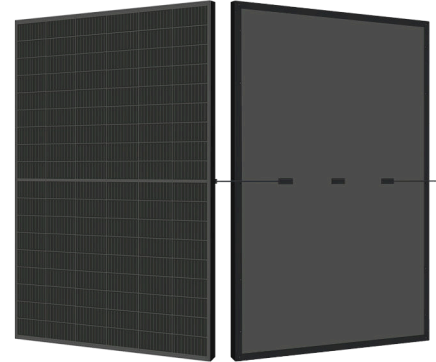
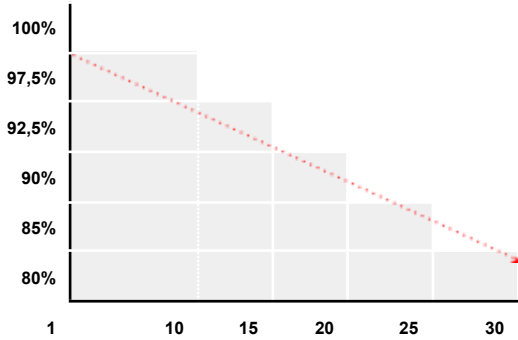
ISO 9001: Quality Management System

ISO 14001: Environmental Management System



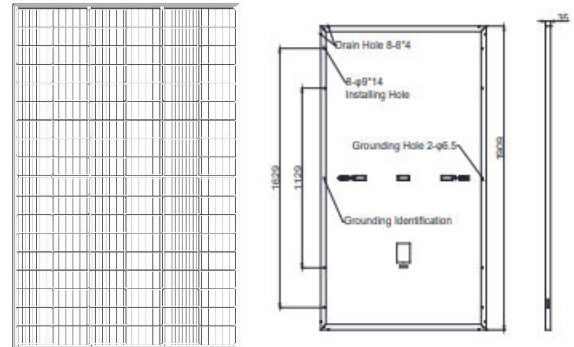
21,02% MAX MODULE EFFICIENCY	0 - 3% POWER TOLERANCE	2,5% FIRST YEAR POWER DEGRADATION	0,50% YEAR 2-30 POWER DEGRADATION	ALL BLACK Lower operating temperature
---	-------------------------------------	--	--	---

30-Year Linear Power Warranty



Mechanical parameters

Cell Orientation	Single crystal PERC182x91mm (120 pieces)
Junction Box	IP68, three diodes
Output Cable	4.0mm² 1200mm(+)/ 1200mm(-) or customized
Glass	3.2mm tempered coated glass, low iron
Frame	Anodized aluminum alloy frame
Weight	23kg
Dimensión	1909x1134x35mm
Packaging	31 pcs*pallet / 255cs*20GP / 744 pcs*40HC



Electrical Characteristics

STC: AM1.5 1.000W/m2 NOTC: AM1.5 800W/m2 20° 1 m/s Test uncertainty for Pmax + -3%

Module type	TM - 435M-120 AB		TM - 440 M-120 AB		TM - 445M-120 AB		TM - 450 M-120 AB		TM - 455M-120 AB	
	STC	NOTC	STC	NOTC	STC	NOTC	STC	NOTC	STC	NOTC
Testing condition	STC	NOTC	STC	NOTC	STC	NOTC	STC	NOTC	STC	NOTC
Maximum Power (Pmax/w)	435	324	440	327	445	331	450	335	455	339
Open Circuit Voltage (Voc/V)	40.8	38.6	41,0	38.79	41.2	38,98	41,4	39,16	41.6	39,35
Short Circuit Current (Isc/A)	13,34	10.51	13,41	10.53	13,49	10,6	13,60	10,7	13,69	10,79
Voltage at Maximum Power (Vmp/V)	34.53	32.67	34.70	32.83	34,87	32,99	35.04	33,14	35,22	33,32
Current at maximum Power (Imp/A)	12,60	9.92	12,69	9.96	12,77	10,04	12,85	10,11	12,92	10,18
Module Efficiency (%)	20,09%	14.97%	20,33%	15.11%	20,56%	15,29	20,79%	15,47%	21,02%	15,66%

Operating Parameters

Operational Temperature	-40°C - +85°C
Power Output Tolerance	(0, +3%)
Voc and Isc Tolerance	±3%
Maximum System Voltage	1500V DC
Maximum Series Fuse Rating	25 A
Nominal Operating Cell Temperature	45±2°C
Protection Glass	Class II
Fire Rating	Class C

Mechanical Loading

Front Side Maximum Static Loading	5400 PA
Rear Side Maximum Static Loading	2400 PA
Hailstone Test	Diameter 25mm, impact speed 23m/s

Temperatura ratings (STC)

Temperature Coefficient of Isc	+0.05%/°C
Temperature Coefficient of Voc	-0.27%/°C
Temperature Coefficient of Pmax	-0.35%/°C