

HARNESS THE POWER OF THE SUN

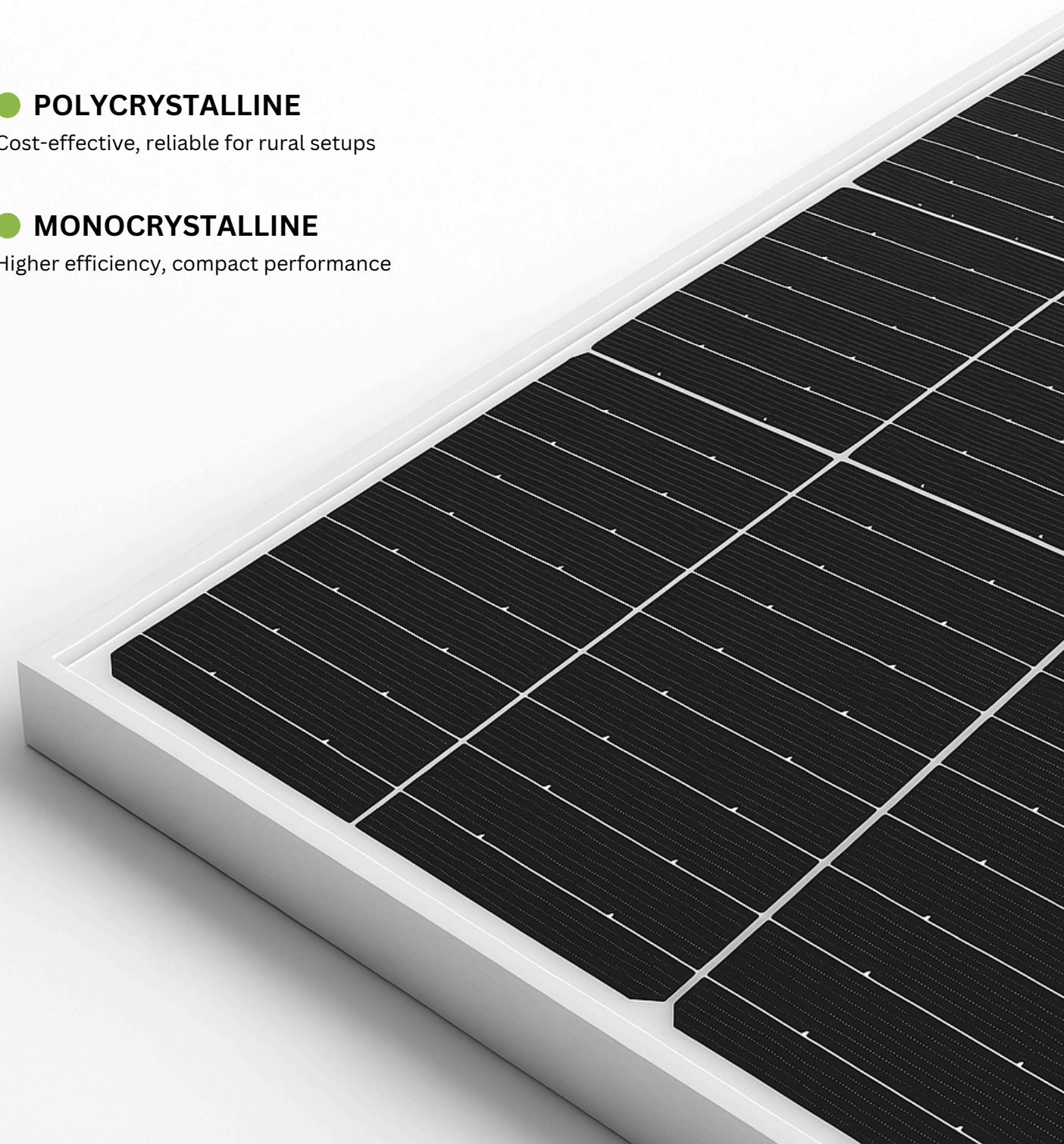
THE PERFECT BALANCE OF POWER AND EFFICIENCY

● **POLYCRYSTALLINE**

Cost-effective, reliable for rural setups

● **MONOCRYSTALLINE**

Higher efficiency, compact performance



DELPHIN ENERGY PVT LTD



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POLYCRYSTALLINE
PV MODULE

MAXIMUM PERFORMANCE, SUSTAINABLE POWER



OPTIMAL
EFFICIENCY

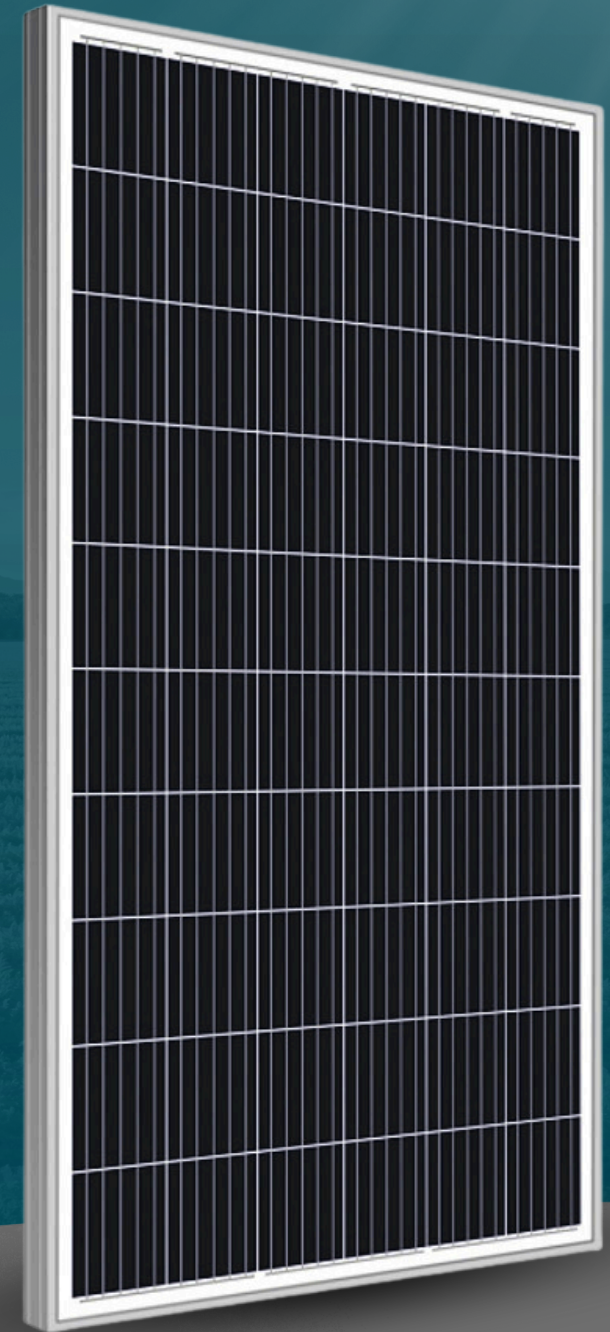


ROBUST
RELIABILITY



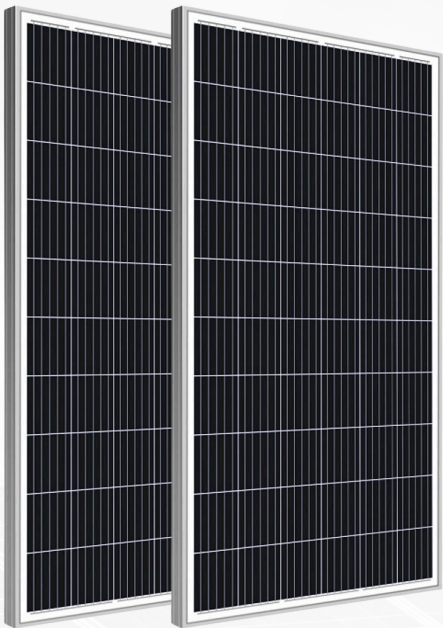
SMART
SAVINGS

POLYCRYSTALLINE
PV MODULE



TECHNICAL DATA - POLYCRYSTALLINE PV MODULE

PERFORMANCE UNDER STANDARD TEST CONDITION



NORMAL MAXIMUM POWER (P _{MAX})	40W	50W	60W	75W	80W	100W	110W	120W	165W	335W
OPTIMUM OPERATING VOLTAGE (V _{MP})	17.85	17.89	18.04	17.99	18	17.99	18.43	17.9	19.2	37.38
OPTIMUM OPERATING CURRENT (I _{MP})	2.25	2.8	3.33	4.17	4.44	5.57	5.97	6.75	8.79	8.97
OPEN CIRCUIT VOLTAGE (V _{OC})	21.95	21.7	21.66	22.12	22	21.84	22.51	21.58	22.2	44.89
SHORT CIRCUIT VOLTAGE (I _{SC})	2.44	3.04	3.67	4.49	4.85A	6.11	6.48	7.36	9.34	9.28
MODULE EFFICIENCY (%)	13.07	13.55	14.21	14.74	13.05	13.67	14.66	14.2	14.6	17.26

MECHANICAL SPECIFICATION

ATTRIBUTE	40W	50W	60W	75W	80W	100W	110W	120W	165W	335W
DIMENSION (LENGTH) IN MM	351	546	601	731	670	1031	1120	1146	1485	1986
DIMENSION (W X T) IN MM	666* 35	666* 35	666* 35	666* 35	915* 30	666* 35	670* 30	666* 35	666* 35	100* 35
WEIGHT (KG)	3.40	4.05	5.00	5.40	7.3	7.20	8.4	9.80	12.7	21.5
NUMBER OF CELLS	36	36	36	36	36	36	36	36	36	72
JUNCTION BOX (IP68) TERMINAL	2	2	2	3	3	3	3	3	3	3
NUMBER OF BYPASS DIODES	1	1	1	2	2	2	2	2	2	3
MOUNTING HOLE PITCH (Y-MM)	218	273	303	365.5	--	515.5	--	573	742.5	--
MOUNTING HOLE PITCH (X-MM)	635	635	635	635	--	635	--	635	635	--



MONOCRYSTALLINE
PV MODULE

INNOVATION THAT POWERS THE FUTURE



MAXIMUM
OUTPUT

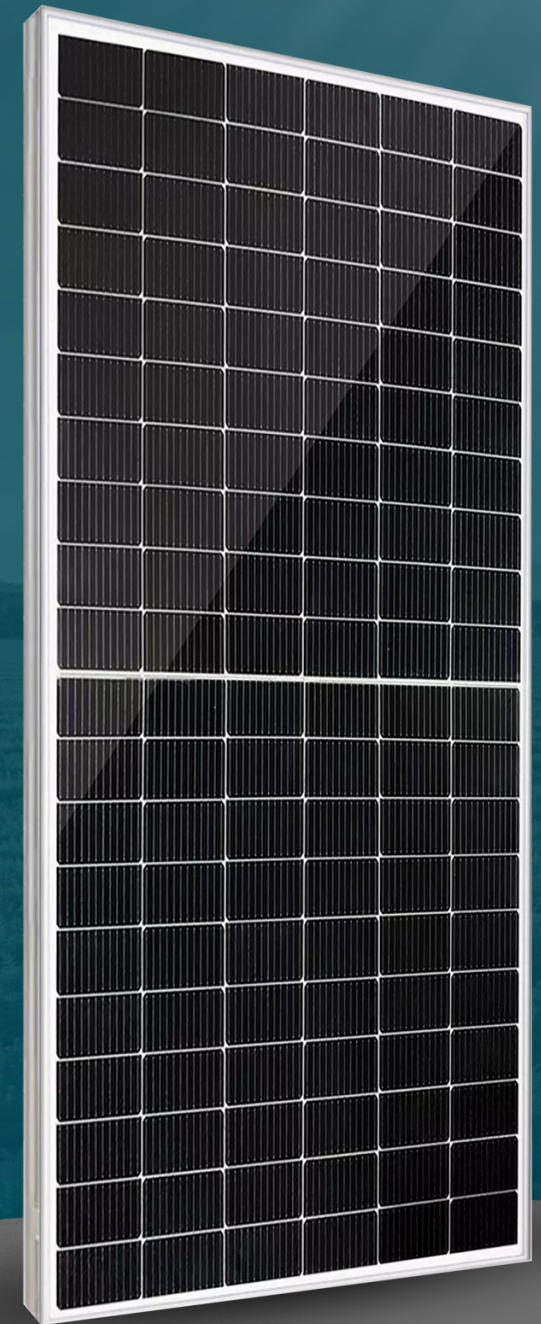


ENHANCED
DURABILITY



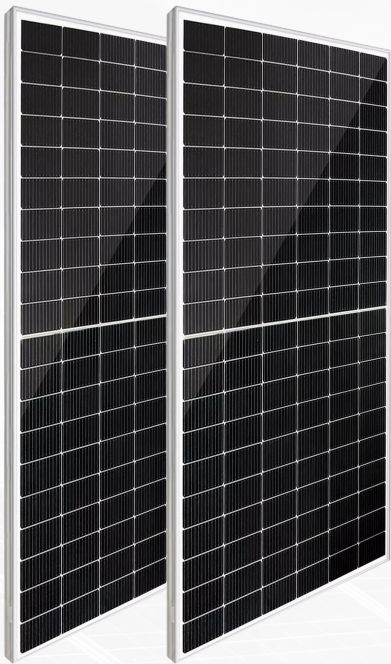
RELIABLE
PERFORMANCE

MONOCRYSTALLINE
PV MODULE



TECHNICAL DATA - MONOCRYSTALLINE PV MODULE

PERFORMANCE UNDER STANDARD TEST CONDITION



NORMAL MAXIMUM POWER (P _{MAX})	40W	50W	60W	75W	100W	120W	150W	200W
OPTIMUM OPERATING VOLTAGE (V _{MP})	18.2	20.00	18	20.00	19.23	18.6	18.5	23.56
OPTIMUM OPERATING CURRENT (I _{MP})	2.2	2.51	3.33	3.75	5.21	6.45	8.56	8.49
OPEN CIRCUIT VOLTAGE (V _{OC})	22.2	22.5	22.68	22.7	22.12	22.7	22.5	27.76
SHORT CIRCUIT VOLTAGE (I _{SC})	2.37	2.65	3.88	4.40	5.50	6.84	8.11	9.00
MODULE EFFICIENCY (%)	18.80	18.80	18.80	18.80	18.80	18.80	18.80	18.80

MECHANICAL SPECIFICATION

ATTRIBUTE	40W	50W	60W	75W	100W	120W	150W	200W
DIMENSION (LENGTH) IN MM	361	432	545	606	776	1031	1151	1650
DIMENSION (W X T) IN MM	666*30	666*35	666*35	666*35	666*35	666*35	666*35	666*35
WEIGHT (KG)	2.85	3.40	4.05	5.0	5.50	7.30	9.12	12
NUMBER OF CELLS	36	36	36	36	36	36	36	36
JUNCTION BOX (IP68) TERMINAL	2	2	3	3	3	3	3	3
NUMBER OF BYPASS DIODES	2	2	2	2	2	2	2	2
MOUNTING HOLE PITCH (Y-MM)	180	218	273	303	365.5	515.5	575.5	825
MOUNTING HOLE PITCH (X-MM)	635	635	635	635	635	635	635	635



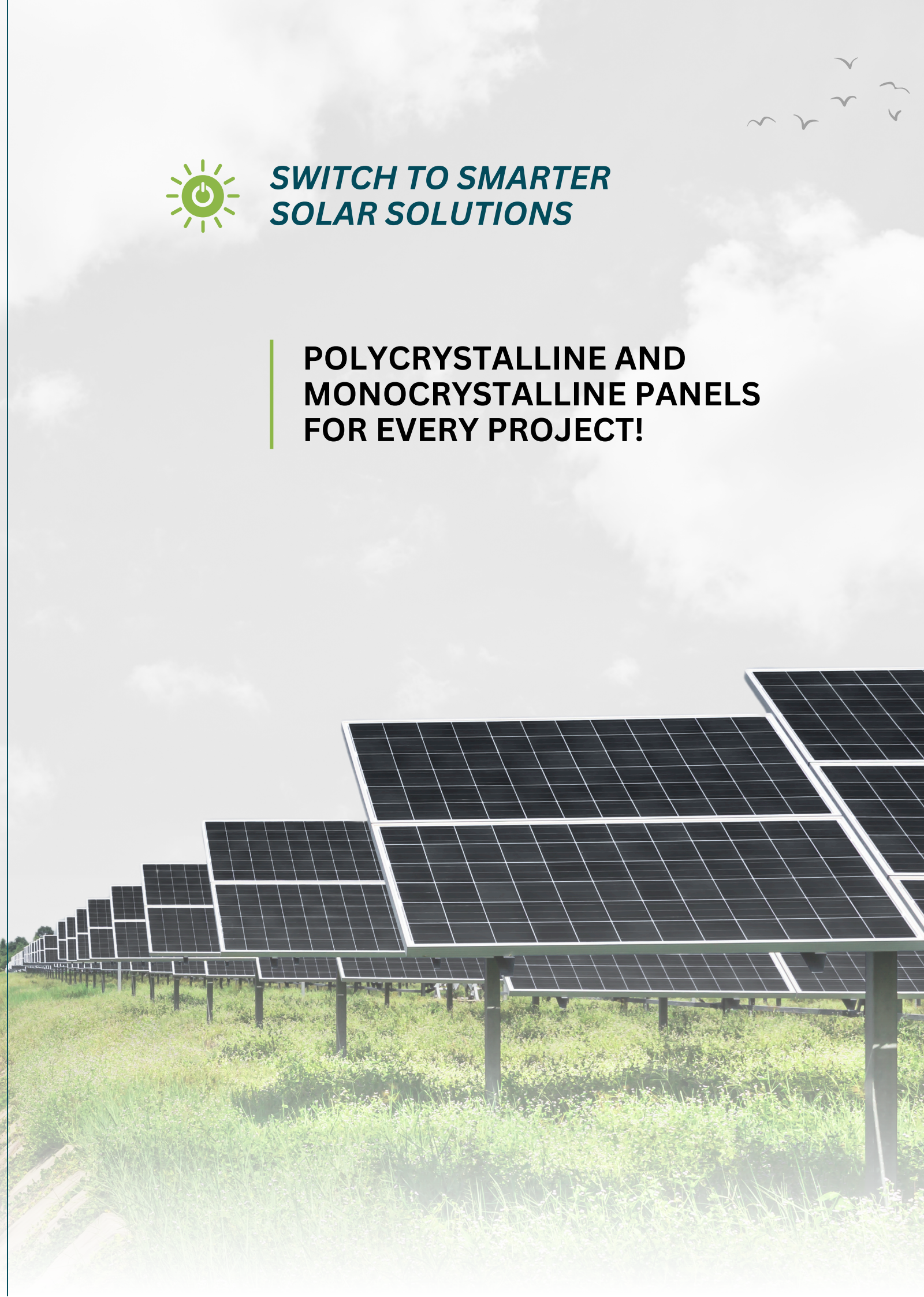
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HARNESSING THE POWER OF THE SUN WITH ADVANCED SOLAR TECHNOLOGY



**SWITCH TO SMARTER
SOLAR SOLUTIONS**

**POLYCRYSTALLINE AND
MONOCRYSTALLINE PANELS
FOR EVERY PROJECT!**



570-595W

Mono PERC

nTOPCon

HJT

FRAME TYPE

ALUMINIUM

STEEL

SUBSTRATE

GLASS

MESH GLASS

FRAME VARIANT

SILVER

BLACK

BUS RIBBON

SILVER

BLACK

MAXIMUM EFFICIENCY %

23.06

CELL TYPE

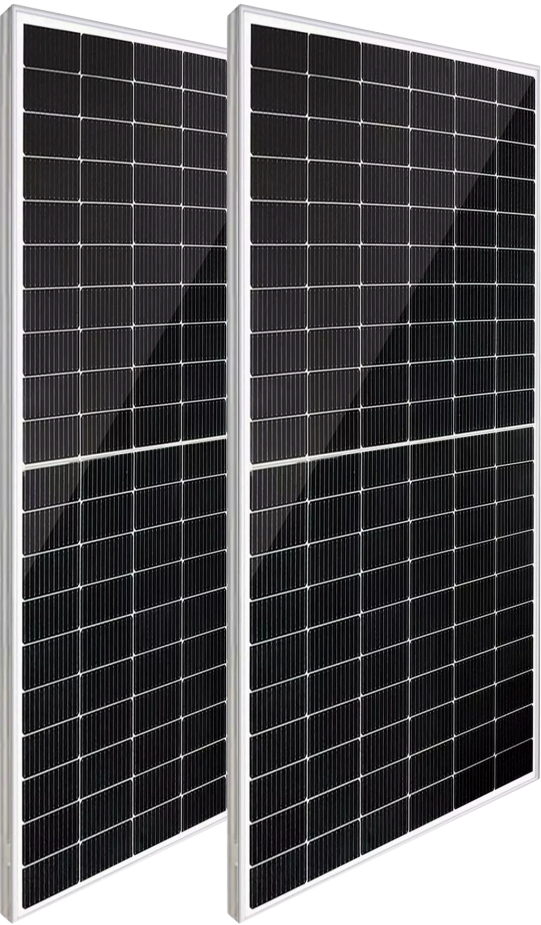
M10 HALF CUT

PRODUCT WARRANTY

12 YEARS

PERFORMANCE WARRANTY

30 YEARS



0% NEGATIVE POWER TOLERANCE

- Positive power tolerance of upto 0 ~ 4.99Wp
- Module impinning radically reduces string mismatch losses



IMPROVED LONGEVITY

- Excellent anti-PID performance via optimized process and materials control
- Lower susceptibility to LID & LeTID



LOWER LCOE

- Lower balance of systems cost
- Improves value proposition of the product with competitive ROI



HIGHLY AUTOMATED PRODUCTION LINE

- Multi stage EL and digitalised visual inspection results lower defect rates
- Implemented engineering excellence ensures top notch quality



SUPERIOR HAIL TEST PERFORMANCE

- Ø 45mm hail test passed from third party laboratory with impact velocity up to 27m/s

SYSTEM CERTIFICATES^

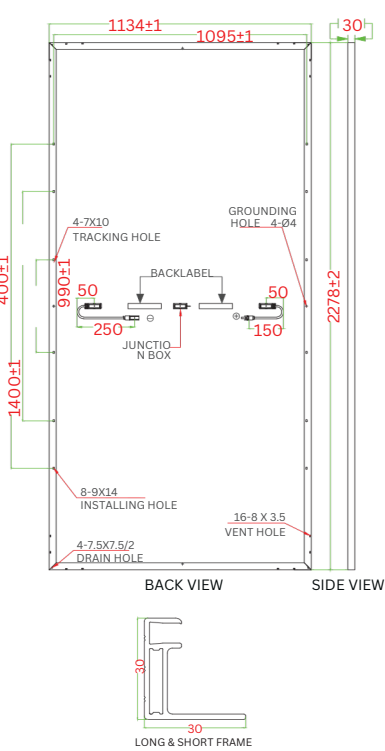
IEC 61215 : 2021, IEC 61730, UL 61215, UL 61730, IS 14286, IS/IEC 61730, IEC 61701, IEC 62716, IEC 60068-2-68, CAN-CSA INTERNATIONAL ORGANIZATION FOR STANDARDIZATION:

- ISO 9001:2015/ Quality Management System
- ISO 14001:2015/ Environmental Management System
- ISO 45001:2018/ Occupational Health and Safety Management System
- SA 8000 :2014/ Social Accountability International

TECHNICAL DATA

570-595W

DIMENSIONS IN MM



ELECTRICAL PARAMETERS | STC1,2

Peak Power Pmax (Wp)	570	575	580	585	590	595
Maximum Voltage Vmpp (V)	42.4	42.6	42.8	43	43.2	43.4
Maximum Current Imp (A)	13.46	13.51	13.56	13.62	13.67	13.72
Open Circuit Voltage Voc (V)	50.5	50.7	50.9	51.1	51.3	51.5
Short Circuit Current Isc (A)	14.09	14.14	14.2	14.26	14.32	14.37
Module Efficiency (%)	22.09	22.28	22.47	22.67	22.87	23.06

1)STC:1000 W/M IRRADIANCE, 25°C CELL TEMPERATURE, AM1.5G SPECTRUM ACCORDING TO EN 60904-3 2) TOLERANCE OF RATING AT STC (PMPP / ISC / VOC) [%]: 0-3/±5/±5 | ELECTRICAL MEASUREMENT UNCERTAINTY IS WITHIN ± 2%

ELECTRICAL PARAMETERS | NOCT3

Peak Power Pmax (Wp)	430	433	437	443	447	452
Maximum Voltage Vmpp (V)	39.8	40	40.2	40.6	40.9	41.1
Maximum Current Imp (A)	10.78	10.82	10.88	10.91	10.94	10.99
Open Circuit Voltage Voc (V)	47.5	47.7	47.9	48.2	48.5	48.7
Short Circuit Current Isc (A)	11.38	11.42	11.47	11.51	11.55	11.59

3) NOCT IRRADIANCE 800 W/M2, AMBIENT TEMPERATURE 20°C, WIND SPEED 1 M/SEC

ELECTRICAL PARAMETERS | BNPI 4,5

Peak Power Pmax (Wp)	632	637	643	648	654	659
Maximum Voltage Vmpp (V)	42.4	42.6	42.8	43	43.2	43.4
Maximum Current Imp (A)	14.91	14.97	15.02	15.09	15.15	15.2
Open Circuit Voltage Voc (V)	50.5	50.7	50.9	51.1	51.3	51.5
Short Circuit Current Isc (A)	15.61	15.67	15.73	15.8	15.86	15.92

4) BNPI: 1000W/M2+φ.135, BIFACILITY COEFF. (φ) AT BNPI PMAX, ISC IS 80±5% & FOR Voc IS 99±10%, AM 1.5, 25°C 5) TOLERANCE OF RATING AT BNPI (P and Voc) [%]: 0-3/±5/±5

TEMPERATURE COEFFICIENTS (Tc) PERMISSIBLE OPERATING CONDITIONS

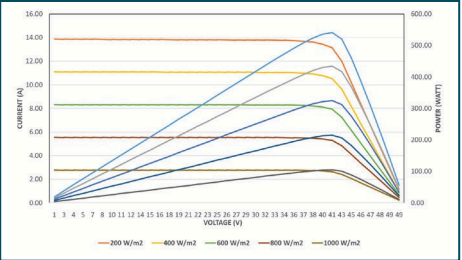
Tc of Open Circuit Voltage (β)	-0.26%/°C
Tc of Short Circuit Current (α)	0.046%/°C
Tc of Power (γ)	-0.30%/°C
Maximum System Voltage	1500V 45°C ±
NOCT	2°C
Temperature Range	-40°C to + 85°C

MECHANICAL DATA

Length × Width × Height	2278 X 1134 X 30 mm (89.68 x 44.65 x 1.18 inches)
Weight	33.4 Kg (73.63 lbs)
Junction Box	IP 68, Split Junction Box with individual bypass diodes
Cable & Connectors#	200 mm (+ve terminal) and 300 mm (-ve terminal) length cables, MC4 Compatible/MC4 Connectors
Application Class	Class A (Safety class II)
Superstrate##	2.0 mm (0.098 inches) high transmission ARC Semi-tempered glass (low iron content)
Cells	72 (144 half-cells) TOPCon n-Type bifacial solar cells
Substrate	2.0 mm (0.098 inches) high transmission heat strengthened glass/ mesh glass## (low iron content)
Frame	Anodized aluminium/ Alloy steel frame##
Mechanical Load Test	5400 Pa (Snow load), 2400 Pa (Wind load)
Cell Encapsulant	EPE/ EVA
Maximum Series Fuse Rating	30A
Hail Test*	Ø 45mm Impact Velocity up to 27m/s

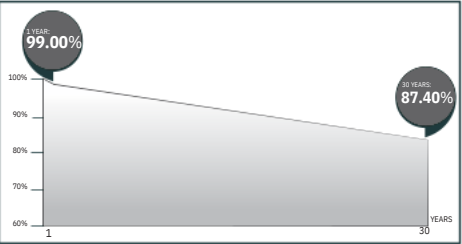
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TYPICAL I-V CURVES6



6) AVERAGE RELATIVE EFFICIENCY REDUCTION OF 5% AT 200 W/M² ACCORDING TO EN 60904-1

PERFORMANCE WARRANTY



PACKAGING INFORMATION

Quantity/Pallet	36
Pallets/Container (40'HC)	20
Quantity/Container (40'HC)	720

All () certifications under progress. | **Refer to Delphin Energy warranty document for terms and conditions. | #400mm(15.75 inches), 1000mm(39.37 inches), 1200mm (47.24 inches) cable lengths are also available | ##Anti-glare Glass is also available | *As per applicable product | #With additional Cost & Lead Time subject to availability | STC : Standard Testing Condition | BNPI : Bifacial Nameplate Irradiance | NOCT : Nominal Operating Cell Temperature

WARRANTY

Product Warranty**	12 years
Performance Warranty**	Linear Power Warranty for 30 years with 1% for 1st year degradation and 0.4% from year 2 to year 30

535-560W

MAXIMUM EFFICIENCY %

21.72

POSITIVE POWER TOLERANCE WP

0~+4.99

CELLS

M10 144

MODULE TECHNOLOGY

HALF CUT & MICRO GAP DESIGN

WITH IMPROVED SHADE TOLERANCE



FRAME

SILVER

SUPERSTRATE

GLASS

SUBSTRATE

BACKSHEET WHITE

DCR CONTENT MODULE AVAILABLE

- CYLINDRICAL TABBING WIRE** increases cell absorption by enhancing scattering effects
- Implementation of bypass diodes in split JB series parallel connections enable the module to perform in **PARTIAL SHADOW CONDITIONS** with respect to full-cell module
- HIGHER NUMBER OF BUSBARS** make the PV modules less prone to loss in efficiency and increases tolerance to micro cracks
- FIELD RELIABILITY** is improved due to multiple contact points on the cell which lowers the cell stress during module fabrication
- LCOE IS CUT BACK** by using M10 size solar cell with adding more power output than lower size cell module
- LOWER INTERNAL RESISTANCE** boosts module power helping to achieve minimal power loss with respect to previous variant modules

APPLICATIONS

- On-grid large scale utility systems
- On-grid rooftop industrial and commercial systems
- Rooftop residential systems

TECHNICAL DATA535-560W

Electrical Data^{1,2}

All data refers to STC (AM 1.5, 1000 W/m², 25°C)

Peak Power Pmax (Wp)	535	540	545	550	555	560
Maximum Voltage Vmpp (V)	41.6	41.7	41.8	41.9	42	42.1
Maximum Current Impp (A)	12.87	12.96	13.05	13.14	13.23	13.32
Open Circuit Voltage Voc (V)	49.4	49.5	49.6	49.7	49.8	49.9
Short Circuit Current Isc (A)	13.56	13.64	13.73	13.82	13.95	14.05
Module Efficiency (%)	20.75	20.94	21.13	21.33	21.52	21.72

1) STC:1000 W/m² irradiance, 25°C cell temperature, AM1.5g spectrum according to EN 60904-3. | 2) Power measurement uncertainty is within +/- 2%.

Electrical Parameters at NOCT³

Power (W)	399.20	402.80	406.70	410.60	414.20	418.10
V@Pmax (V)	38.40	38.40	38.70	38.80	39.10	39.20
I@Pmax (A)	10.39	10.48	10.51	10.58	10.59	10.66
Voc (V)	46.00	46.00	46.20	46.20	46.70	46.80
Isc (A)	10.96	11.06	11.09	11.17	11.17	11.24

3) NOCT irradiance 800 W/m², ambient temperature 20°C, wind speed 1 m/sec

ELECTRICAL PARAMETERS | BNPI^{4,5}

Peak Power Pmax (Wp)	632	637	643	648	654	659
Maximum Voltage Vmpp (V)	42.4	42.6	42.8	43	43.2	43.4
Maximum Current Impp (A)	14.91	14.97	15.02	15.09	15.15	15.2
Open Circuit Voltage Voc (V)	50.5	50.7	50.9	51.1	51.3	51.5
Short Circuit Current Isc (A)	15.61	15.67	15.73	15.8	15.86	15.92

4) BNPI: 1000W/M2+φ.135, BIFACILITY COEFF. (φ) AT BNPI Pmax, ISC IS 80±5% & FOR Voc IS 99±10%, AM 1.5, 25°C | 5) TOLERANCE OF RATING AT BNPI (Pmax / Isc / Voc) [%]: 0-3/±5/±5

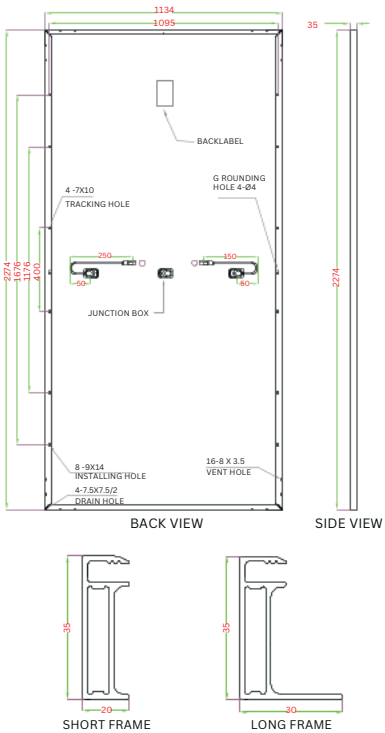
Temperature Coefficients (Tc) permissible operating conditions

Tc of Open Circuit Voltage	-0.27%/°C
Tc of Short Circuit Current	0.050%/°C
Tc of Power	-0.35%/°C
Maximum System Voltage	1500V
NOCT	45°C ± 2°C
Temperature Range	-40°C to + 85°C

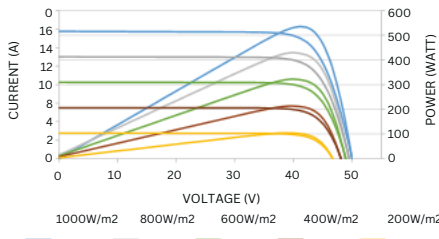
MECHANICAL DATA

Length × Width × Height	2274 × 1134 × 35mm (89.53 × 44.65 × 1.38 inches)
Weight	28.2 Kg (62.17 lbs)
Junction Box	IP68, Split Junction Box with individual bypass diodes
Cable & Connectors#	200 mm (+ve terminal) and 300 mm (-ve terminal) length cables, MC4 Compatible/MC4 Connectors
Application Class	Class A (Safety class II)
Superstrate##	3.2 mm (0.125 inches) high transmission low iron tempered glass, AR coated
Cells	72 Mono PERC (144 half-cells) P-Type solar cells
Back Sheet	Composite film
Frame	Anodized aluminium frame with twin wall profile
Mechanical Load Test	5400 Pa (Snow load), 2400 Pa (Wind load)
Maximum Series Fuse Rating	25A

DIMENSIONS IN MM

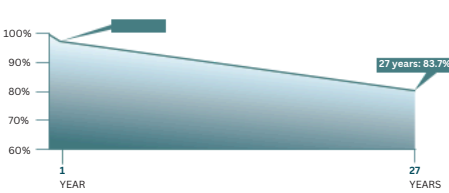


TYPICAL I-V CURVES⁶



4) Average relative efficiency reduction of 5% at 200 W/m2 according to EN 60904-1.

PERFORMANCE WARRANTY



All () certifications under progress. | **Refer to Delphin Energy warranty document for terms and conditions. | #400mm(15.75 inches), 1000mm(39.37 inches), 1200mm (47.24 inches) cable lengths are also available | ##Anti-glare Glass is also available | *As per applicable product | #**With additional Cost & Lead Time subject to availability | 5) STC: Standard Testing Condition | BNPI: Bifacial Nameplate Irradiance | NOCT: Nominal Operating Cell Temperature

PACKAGING INFORMATION

Quantity/Pallet	31
Pallets/Container (40'HC)	20
Quantity/Container (40'HC)	620

* All (*) certifications under progress. | ** Refer to Delphin Energy warranty document for terms and conditions. | # 400mm(15.75 inches), 1000mm(39.37 inches), 1200mm (47.24 inches) cable lengths are also available | ## Anti-glare Glass is also available

WARRANTY

Product Warranty** 12 years

Performance Warranty** Linear Power Warranty for 27 years with 2% for 1st year degradation and 0.55% from year 2 to year 27

Approvals & Certificates*

IEC 61215 : 2016, IEC 61730 : 2016, IEC 61701, IEC 62716, IEC 60068-2-68, IEC 62804, CE, CEC (California), UL 61215, UL 61730, CAN-CSA

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