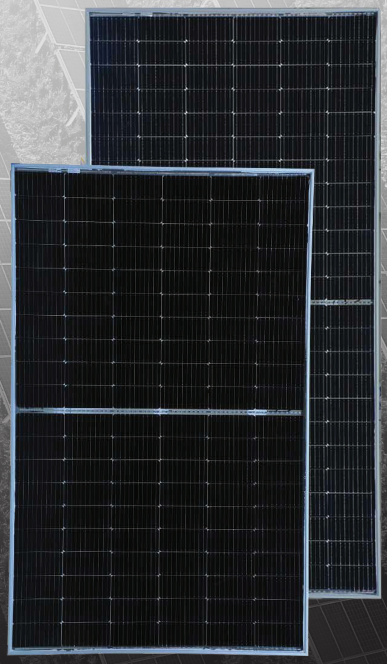
EMMVEE

YOUR RELIABLE PARTNER FOR SOLAR ENERGY SINCE 1992

30 YEARS. POWER FOR GOOD.



SAPPHIRE

BIFACIAL GLASS TO GLASS MODULE

DESIGNED TO DELIVER MAXIMUM POWER OUTPUT

EMMVEE IS INDIA'S FIRST INTEGRATED SOLAR SOLUTIONS COMPANY, WITH 30 YEARS OF EXPERTISE IN DEVISING HIGHLY INNOVATIVE AND EFFICIENT SOLAR POWER SOLUTIONS, FROM SOLAR WATER HEATING SYSTEMS TO PHOTOVOLTAIC MODULES AND SOLAR WATER PUMPS.

Since our inception in 1992, we have dedicated ourselves to developing smart and innovative solar energy solutions using cutting edge technology. As always, our promise is to maintain enviable standards of excellent quality, timely delivery and reliable support to our customers as they explore and adopt environmentally friendly solar power solutions.

Today, we are proud of our robust presence in some of the most pioneering green energy projects across India and Europe. Our path-breaking photovoltaic modules have provided valuable and sustainable alternative power solutions in the field for over 15 years, and we continue to innovate with our new range of higher WP modules that combine exceptional quality and unbeatable efficiency.

Our goal is simple: to provide clean and reliable energy that saves our natural resources and reduces our carbon footprint, while ensuring that our diverse range of domestic and commercial solar power-related products and services always keep the needs of our customers at the forefront.

FEATURES

- AR COATED HIGH TRANSMISSION GLASS
- MC4 COMPATIBLE CONNECTORS
- PID RESISTANCE
- ANODISED ALUMINIUM FRAME
- MECHANICAL LOAD OF 5400 Pa

BENEFITS

- LOW LCOE, FASTER PAYBACK PERIOD
- 30% MORE POWER BEST IN CLASS EFFICIENCY UPTO 21.5%
- MULTI-BUS BAR TECHNOLOGY FOR BETTER CURRENT COLLECTION
- LOWEST GUARANTEED FIRST YEAR AND ANNUAL DEGRADATION
- WELL-COMPOSED COMPONENTS STRESS TO REDUCE MICRO CRACKS

TECHNICAL SPECIFICATION
144 CUT CELL BI-FACIAL MODULE

Electrical data at 1000W/m², 25°C and A.M 1.5 (STC in accordance with IEC 60904-3)

MODEL NAME	E535HCBG144	E540HCBG144	E545HCBG144	E550HCBG144
RATED POWER AT STC	535	540	545	550
POWER TOLERANCE	+5W	+5W	+5W	+5W
MODULE EFFICIENCE AT STC	20.71%	20.90%	21.10%	21.29%
OPEN CIRCUIT VOLTAGE - VOC(VOLTS) (±10%)	49.35	49.5	49.75	49.9
SHORT CIRCUIT CURRENT - ISC (AMPS) (± 10%)	13.59	13.62	13.88	14.01
MAX POWER VOLTAGE - VPM (VOLTS)	41.32	41.54	41.61	41.62
MAX POWER CURRENT - IPM (AMPS)	12.95	13	13.1	13.22
AT LOW IRRADIANCE (200W/M², 25°C AND AM1.5) THE MODULE YIELDS AT LEAST 95% OF THE STC EFFICIENCY.				

Test uncertainty for Pmax ±3%

Thermal data

TEMP. COEFFICIENT OPEN-CIRCUIT VOLTAGE	-0.28%/°C
TEMP. COEFFICIENT SHORT CIRRCUIT CURRENT	0.05%/°C
TEMP. COEFFICIENT RATED POWER	-0.35%/°C
NOCT (NORMAL OPERATING CELL TEMPERATURE)	45°C ± 2°C

Mechanical data

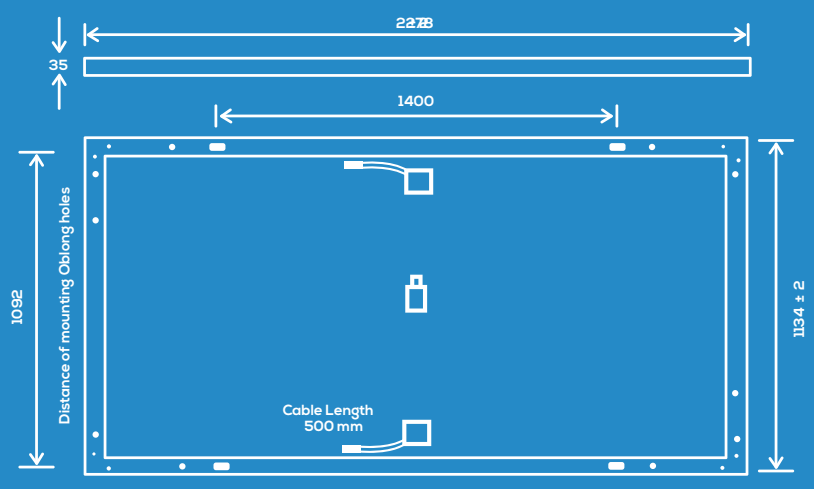
NUMBER OF CELLS AND CELL TYPE	144 BI-FACIAL SOLAR CELLS (182mm X 91mm)
DIMENSIONS (L X W X H)	2278 mm X 1134 mm X 35 mm
WEIGHT	30 Kg
FRONT GLASS	2 mm HIGH TRANSMISSION, SOLAR GLASS
EMBEDDING	TOP EVA, BOTTOM POE
BACK GLASS	2 mm HIGH TRANSMISSION, SOLAR GLASS
JUNCTION BOX	3 SPLIT JUNCTION BOX IP68
NUMBER OF BYPASS DIODES	3
CABLES	4mm² SOLAR CABLES, LENGTH 500 ± 10mm
CONNECTORS	MC4 COMPATIBLE

Permissible operating conditions

OPERATING TEMPERATURE RANGE	-40°C TO 85°C
MAX. SYSTEM VOLTAGE	1500V DC
MAXIMUM SNOW LOAD CAPACITY	5400PA
RESISTANCE AGAINST HAIL	MAX Ø24 MM WITH IMPACT SPEED OF 83KM/H
PROTECTION CLASS AGAINST ELECTRICAL SHOCK	II
MAXIMUM REVERSE CURRENT	30 A
BIFACIALITY	70 ± 5%

Warranty

PRODUCT WARRANTY	12 YEARS
PERFORMANCE WARRANTY	30YEARS
ANNUAL DEGRADATION	1ST YEAR DEGRADATION, 2%, FROM 2ND YEAR 0.45% ANNUAL DEGRADATION AND 84.95% AT THE END OF 30 YEARS.



TECHNICAL SPECIFICATION
132 CUT CELL BI-FACIAL MODULE

Electrical data at 1000W/m², 25°C and A.M 1.5(STC in accordance with IEC 60904-3)

MODEL NAME	E485HCBG132	E490HCBG132	E495HCBG132	E500HCBG132
RATED POWER AT STC	485	490	495	500
POWER TOLERANCE	+5W	+5W	+5W	+5W
MODULE EFFICIENCE AT STC	20.40%	20.61%	20.82%	21.03%
OPEN CIRCUIT VOLTAGE - VOC(VOLTS) (±10%)	44.43	44.65	44.79	44.92
SHORT CIRCUIT CURRENT - ISC (AMPS) (± 10%)	13.00	13.09	13.15	13.24
MAX POWER VOLTAGE - VPM (VOLTS)	38.81	38.94	39.14	39.27
MAX POWER CURRENT - IPM (AMPS)	12.50	12.58	12.65	12.73
AT LOW IRRADIANCE (200W/M², 25°C AND AM1.5) THE MODULE YIELDS AT LEAST 95% OF THE STC EFFICIENCY.				

Test uncertainty for Pmax ±3%

Thermal data

TEMP. COEFFICIENT OPEN-CIRCUIT VOLTAGE	-0.28%/°C
TEMP. COEFFICIENT SHORT CIRRCUIT CURRENT	0.05%/°C
TEMP. COEFFICIENT RATED POWER	-0.35%/°C
NOCT (NORMAL OPERATING CELL TEMPERATURE)	45°C ± 2°C

Mechanical data

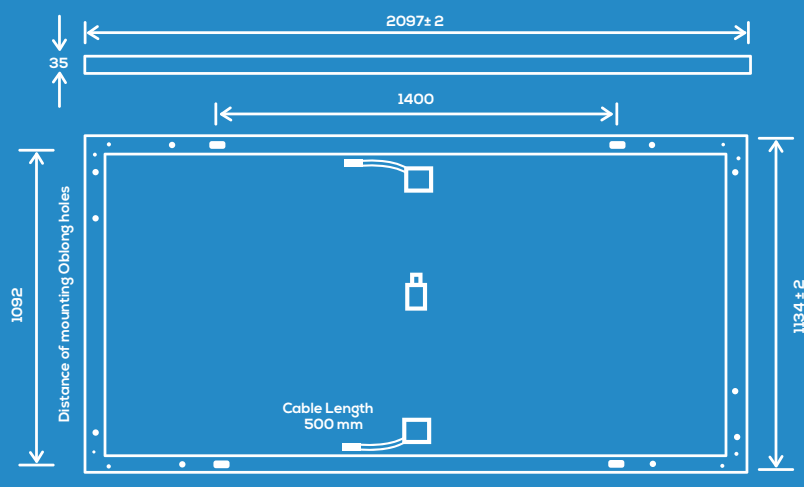
NUMBER OF CELLS AND CELL TYPE	132 BI-FACIAL SOLAR CELLS (182mm X 91mm)
DIMENSIONS (L X W X H)	2097 mm x 1134 mm x 35 mm
WEIGHT	28 Kg
FRONT GLASS	2 mm HIGH TRANSMISSION, SOLAR GLASS
EMBEDDING	TOP EVA, BOTTOM POE
BACK GLASS	2 mm HIGH TRANSMISSION, SOLAR GLASS
JUNCTION BOX	3 SPLIT JUNCTION BOX IP68
NUMBER OF BYPASS DIODES	3
CABLES	4mm² SOLAR CABLES, LENGTH 500 ± 10mm
CONNECTORS	MC4 COMPATIBLE

Permissible operating conditions

OPERATING TEMPERATURE RANGE	-40°C TO 85°C
MAX. SYSTEM VOLTAGE	1500V DC
MAXIMUM SNOW LOAD CAPACITY	5400PA
RESISTANCE AGAINST HAIL	MAX Ø24 MM WITH IMPACT SPEED OF 83KM/H
PROTECTION CLASS AGAINST ELECTRICAL SHOCK	II
MAXIMUM REVERSE CURRENT	25 A
BIFACIALITY	70 ± 5%

Warranty

PRODUCT WARRANTY	12 YEARS
PERFORMANCE WARRANTY	30YEARS
ANNUAL DEGRADATION	1ST YEAR DEGRADATION, 2%, FROM 2ND YEAR 0.45% ANNUAL DEGRADATION AND 84.95% AT THE END OF 30 YEARS.



TECHNICAL SPECIFICATION
120 CUT CELL BI-FACIAL MODULE

Electrical data at 1000W/m², 25°C and A.M 1.5 (STC inaccordance with IEC 60904-3)

MODEL NAME	E440HCBG120	E445HCBG120	E450HCBG120
RATED POWER AT STC	440	445	450
POWER TOLERANCE	+5W	+5W	+5W
MODULE EFFICIENCE AT STC	20.28%	20.51%	20.74%
OPEN CIRCUIT VOLTAGE - VOC(VOLTS) (±10%)	41.44	41.46	41.56
SHORT CIRCUIT CURRENT - ISC (AMPS) (± 10%)	13.55	13.75	13.81
MAX POWER VOLTAGE - VPM (VOLTS)	34.21	34.28	34.31
MAX POWER CURRENT - IPM (AMPS)	12.87	12.99	13.12
AT LOW IRRADIANCE (200W/M², 25°C AND AM1.5) THE MODULE YIELDS AT LEAST 95% OF THE STC EFFICIENCY.			

Test uncertainty for Pmax ±3%

Thermal data

TEMP. COEFFICIENT OPEN-CIRCUIT VOLTAGE	-0.28%/°C
TEMP. COEFFICIENT SHORT CIRRCUIT CURRENT	0.05%/°C
TEMP. COEFFICIENT RATED POWER	-0.35%/°C
NOCT (NORMAL OPERATING CELL TEMPERATURE)	45°C ± 2°C

Mechanical data

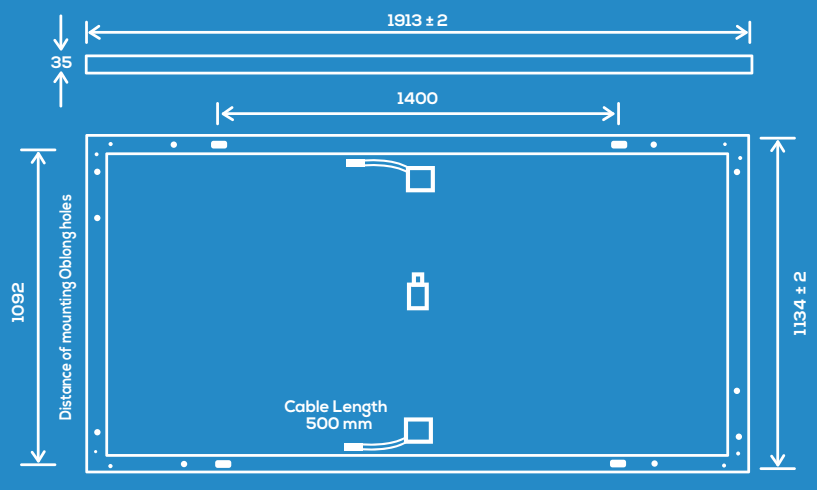
NUMBER OF CELLS AND CELL TYPE	120 BI-FACIAL SOLAR CELLS (182mm X 91mm)
DIMENSIONS: (L X W X H)	1913 mm X 1134 mm X 35 mm
WEIGHT	26 Kg
FRONT GLASS	2 mm HIGH TRANSMISSION, SOLAR GLASS
EMBEDDING	TOP EVA, BOTTOM POE
BACK GLASS	2 mm HIGH TRANSMISSION, SOLAR GLASS
JUNCTION BOX	3 SPLIT JUNCTION BOX IP68
NUMBER OF BYPASS DIODES	3
CABLES	4mm² SOLAR CABLES, LENGTH 500±10mm
CONNECTORS	MC4 COMPATIBLE

Permissible operating conditions

OPERATING TEMPERATURE RANGE	-40°C TO 85°C
MAX.SYSTEM VOLTAGE	1500V DC
MAXIMUM SNOW LOAD CAPACITY	5400PA
RESISTANCE AGAINST HAIL	MAX Ø24 MM WITH IMPACT SPEED OF 83KM/H
PROTECTION CLASS AGAINST ELECTRICAL SHOCK	II
MAXIMUM REVERSE CURRENT	30 A
BIFACIALITY	70 ± 5%

Warranty

PRODUCT WARRANTY	12 YEARS
PERFORMANCE WARRANTY	30 YEARS
ANNUAL DEGRADATION	1ST YEAR DEGRADATION, 2%, FROM 2ND YEAR 0.45% ANNUAL DEGRADATION AND 84.95% AT THE END OF 30 YEARS.



TECHNICAL SPECIFICATION
108 CUT CELL BI-FACIAL MODULE

Electrical data at 1000W/m², 25°C and A.M 1.5(STC in accordance with IEC 60904-3)

MODEL NAME	E395HCBG108	E400HCBG108	E405HCBG108
RATED POWER AT STC	395	400	405
POWER TOLERANCE	+5W	+5W	+5W
MODULE EFFICIENCE AT STC	20.25%	20.51%	20.76%
OPEN CIRCUIT VOLTAGE - VOC(VOLTS) (±10%)	36.34	36.61	36.77
SHORT CIRCUIT CURRENT - ISC (AMPS) (± 10%)	13.15	13.21	13.24
MAX POWER VOLTAGE - VPM (VOLTS)	31.54	31.81	32.13
MAX POWER CURRENT - IPM (AMPS)	12.53	12.58	12.61
AT LOW IRRADIANCE (200W/M², 25°C AND AM1.5) THE MODULE YIELDS AT LEAST 95% OF THE STC EFFICIENCY.			

Test uncertainty for Pmax ±3%

Thermal data

TEMP. COEFFICIENT OPEN-CIRCUIT VOLTAGE	-0.28%/°C
TEMP. COEFFICIENT SHORT CIRRCUIT CURRENT	0.05%/°C
TEMP. COEFFICIENT RATED POWER	-0.35%/°C
NOCT (NORMAL OPERATING CELL TEMPERATURE)	45°C ± 2°C

Mechanical data

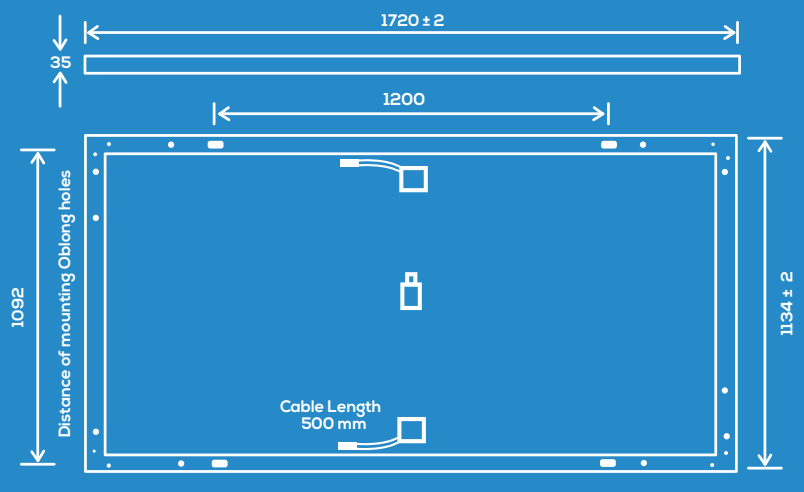
NUMBER OF CELLS AND CELL TYPE	108 BI-FACIAL PERC SOLAR CELLS (182x91mm)
DIMENSIONS: (L X W X H)	1720 mm x 1134 mm x 35 mm
WEIGHT	22 Kg
FRONT GLASS	2 mm HIGH TRANSMISSION, SOLAR GLASS
EMBEDDING	TOP EVA, BOTTOM POE
BACK GLASS	2 mm HIGH TRANSMISSION, SOLAR GLASS
JUNCTION BOX	3 SPLIT JUNCTION BOX IP68
NUMBER OF BYPASS DIODES	3
CABLES	4mm² SOLAR CABLES, LENGTH 500±10mm
CONNECTORS	MC4 COMPATIBLE

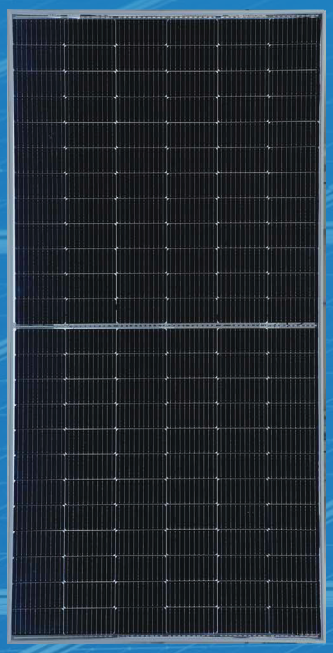
Permissible operating conditions

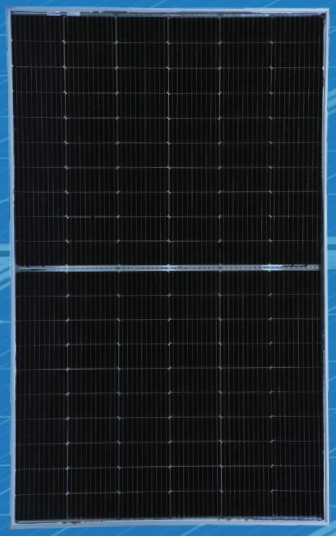
OPERATING TEMPERATURE RANGE	-40°C TO 85°C
MAX.SYSTEM VOLTAGE	1500V DC
MAXIMUM SNOW LOAD CAPACITY	5400PA
RESISTANCE AGAINST HAIL	MAX Ø24 MM WITH IMPACT SPEED OF 83KM/H
PROTECTION CLASS AGAINST ELECTRICAL SHOCK	II
MAXIMUM REVERSE CURRENT	30 A
BIFACIALITY	70 ± 5%

Warranty

PRODUCT WARRANTY	12 YEARS
PERFORMANCE WARRANTY	30 YEARS
ANNUAL DEGRADATION	1ST YEAR DEGRADATION, 2%, FROM 2ND YEAR 0.45% ANNUAL DEGRADATION AND 84.95% AT THE END OF 30 YEARS.







BI-FACIAL MODULE

Positive power tolerance +5W

- Glass to Glass Composition
- Half Cut Cell Technology
- Best Warranty
- 10BB instead of 5BB
- Enhanced Mechanical Load
- Higher lifetime Power Yield
- Multi Busbar Technology
- Longer Life-time Power Yield
- PID Resistance
- Excellent Low-light Performance
- Higher Power Output

EMMVEE PHOTOVOLTAIC POWER PRIVATE LIMITED

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(An ISO 9001:2015, ISO 14001:2015 & OHSAS 45000:2018 Certified Company)