

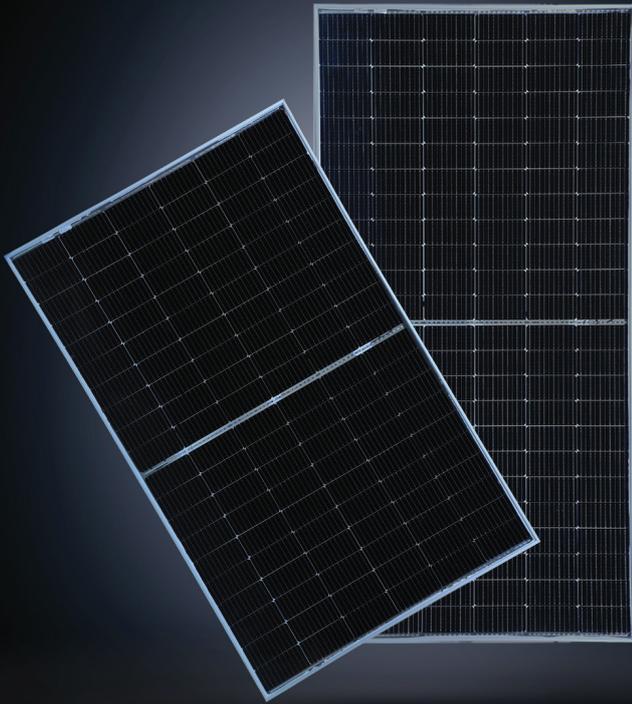


YOUR RELIABLE
PARTNER FOR
SOLAR ENERGY
SINCE 1992



SAPPHIRE | A MULTI-FACETED SOLAR SOLUTION

DESIGNED TO DELIVER MAXIMUM POWER OUTPUT



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

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

TECHNICAL SPECIFICATION

144 CUT CELL BI-FACIAL MODULE

Electrical data at 1000W/m², 25°C and A.M1.5 (STC in accordance with IEC 60904-3)

| MODEL NAME | E530HCBG144 | E535HCBG144 | E540HCBG144 | E545HCBG144 |
|--|-------------|-------------|-------------|-------------|
| RATED POWER AT STC | 530 | 535 | 540 | 545 |
| POWER TOLERANCE | +5W | +5W | +5W | +5W |
| MODULE EFFICIENCY AT STC | 20.52% | 20.71% | 20.90% | 21.10% |
| OPEN CIRCUIT VOLTAGE - VOC(VOLTS) (±10%) | 49.2 | 49.35 | 49.5 | 49.75 |
| SHORT CIRCUIT CURRENT - ISC (AMPS) (± 10%) | 13.56 | 13.59 | 13.62 | 13.88 |
| MAX POWER VOLTAGE - VPM (VOLTS) | 41.1 | 41.32 | 41.54 | 41.61 |
| MAX POWER CURRENT - IPM (AMPS) | 12.9 | 12.95 | 13 | 13.1 |

AT LOW IRRADIANCE (200W/M², 25°C AND AM1.5) THE MODULE YIELDS AT LEAST 95% OF THE STC EFFICIENCY.

Test uncertainty for P_{max} ±3%

Thermal data

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

Mechanical data

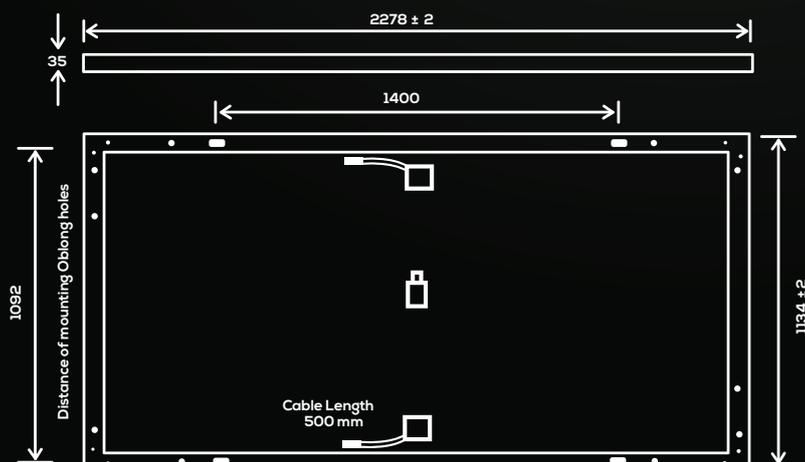
| | |
|-------------------------------|--|
| NUMBER OF CELLS AND CELL TYPE | 144 BI-FACIAL SOLAR CELLS (182mm X 91mm) |
| DIMENSIONS (L X W X H) | 2278 mm X 1134 mm X 35 mm |
| WEIGHT | 30 Kg |
| FRONT GLASS | 2 mm HIGH TRANSMISSION, SOLAR GLASS |
| EMBEDDING | TOP EVA, BOTTOM POE |
| BACK SHEET | 2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

120 CUT CELL BI-FACIAL MODULE

Electrical data at 1000W/m², 25°C and A.M1.5 (STC in accordance with IEC 60904-3)

| MODEL NAME | E440HCBG120 | E445HCBG120 | E450HCBG120 |
|--|-------------|-------------|-------------|
| RATED POWER AT STC | 440 | 445 | 450 |
| POWER TOLERANCE | +5W | +5W | +5W |
| MODULE EFFICIENCY 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 CIRCUIT CURRENT | 0.05%/°C |
| TEMP. COEFFICIENT RATED POWER | -0.35%/°C |
| NOCT (NORMAL OPERATING CELL TEMPERATURE) | 45°C ± 2°C |

Mechanical data

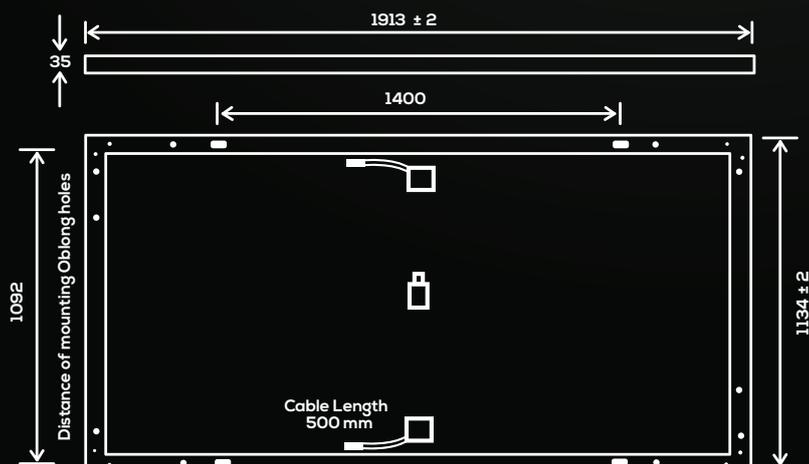
| | |
|-------------------------------|--|
| NUMBER OF CELLS AND CELL TYPE | 120 BI-FACIAL SOLAR CELLS (182mm X 91mm) |
| DIMENSIONS: (L X W X H) | 1913 mm X 1134 mm X 35 mm |
| WEIGHT | 26 Kg |
| FRONT GLASS | 2 mm HIGH TRANSMISSION, SOLAR GALSS |
| EMBEDDING | TOP EVA, BOTTOM POE |
| BACK GLASS | 2 mm HIGH TRANSMISSION, SOLAR GALSS |
| JUNCTION BOX | 3 SPLIT JUNCTION BOX IP68 |
| NUMBER OF BYPASS DIODES | 3 |
| CABLES | 4mm ² 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.M1.5(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 EFFICIENCY 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 | -0.29%/°C |
| TEMP. COEFFICIENT SHORT CIRCUIT CURRENT | 0.05%/°C |
| TEMP. COEFFICIENT RATED POWER | -0.35%/°C |
| NOCT (NORMAL OPERATING CELL TEMPERATURE) | 45°C ± 2°C |

Mechanical data

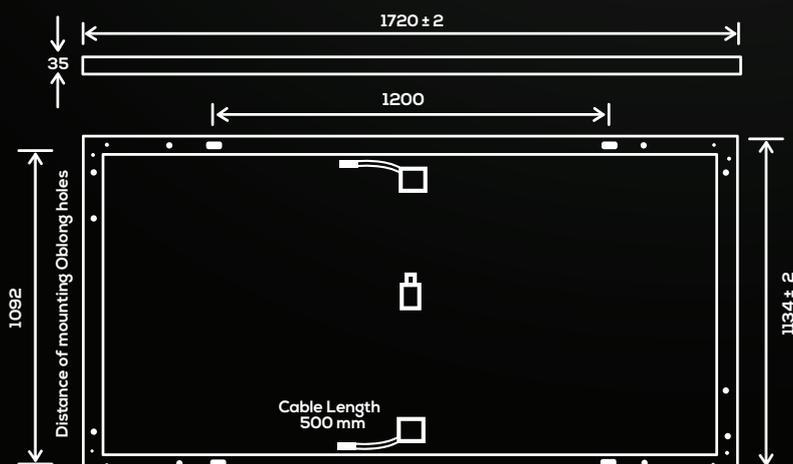
| | |
|-------------------------------|--|
| NUMBER OF CELLS AND CELL TYPE | 108 BI-FACIAL PERC SOLAR CELLS (182x91mm) |
| DIMENSIONS: (L X W X H) | 1720 mm x 1134 mm x 35 mm |
| WEIGHT | 22 Kg |
| FRONT GLASS | 2 mm HIGH TRANSMISSION, SOLAR GLASS |
| EMBEDDING | TOP EVA, BOTTOM POE |
| BACK GLASS |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

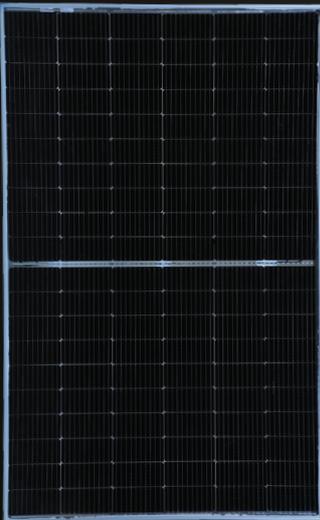
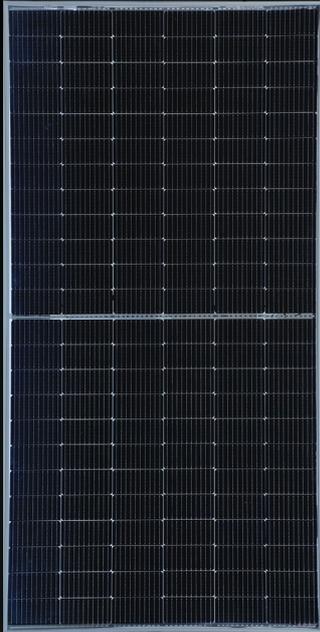
Permissible operating conditions

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|---|--|
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| 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

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| PRODUCT WARRANTY | 12 YEARS |
| PERFORMANCE WARRANTY | 30 YEARS |
| ANNUAL DEGRADATION | 1ST YEAR DEGRADATION, 2%, FROM 2ND YEAR 0.55% 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



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