



UNIVERSIDAD
RICARDO PALMA

Proyecto: Universidad Ecológica

Cantidad de energía renovable en KW- hora generada en la Universidad Ricardo Palma

Fichas técnicas de luminarias instaladas

OVNI 1

TECNOLOGIA SOLAR



PROLIGHT^{ING}

G R E E N



IP65

1000W/M2

charging

LED lighting

waterproof

Luminaria con caja de aleación de aluminio , diseño con patente integrada, amplia distribución de iluminación, 15.6W de panel solar con 900 lúmenes , batería reemplazable y puede soportar 3 noches de iluminación, Fácil instalación en poste.

ESPECIFICACIONES

MODELO	TIPO OVNI I
LED	9W / 900 Lúmenes – 50,000hrs a 2700k-6500k
PANEL SOLAR	Silicio Monocristal, 17% eficiencia, 15.6w – 10 años
BATERIA	Bateria Recargable de Li – ion / 3.7V -26000mAh / 1000 ciclos
TIEMPO DE RECARGA	9-10 Horas de sol - 1000w/m2 – ilum +3noches con carga completa
MODALIDAD	5 Hrs luz intensa (100%) – 7 hrs luz tenue (75%)
MATERIAL	Aleación de aluminio + ABS
REST. AL AGUA	IP65
T° OPERACIONAL	- 25 °C – 65°C
ALTURA OPTIMA	3-4 MTS
MEDIDAS	525mm x 525mm x 161mm
USOS	Para jardines, parques, calles, caminos peatonales, condominios, estacionamientos, plazas, campus universitarios, granjas, perímetros de seguridad, áreas rurales, etc.

RESUMEN DE CUADRO COMPARATIVO

CARACTERISTICAS	LUMINARIA LED (65w)	LAMPARA DE DESCARGA DE SODIO (70w)	LUMINARIA TIPO OVNI (9w)
MODELOS			
VIDA UTIL (hrs)	50000	15000	50000
A 12 HORAS DIARIAS	10 AÑOS	3 AÑOS	10 AÑOS
EFICIENCIA ENERGETICA			
LUZ VISIBLE	85%	31%	85%
LUZ ULTRAVIOLETA	---	---	---
LUZ INFRARROJA	---	25%	---
CALOR EMITIDO	15%	44%	15%
COLOR DE TEMPERATURA	BLANCA	AMARILLO O AMBAR	BLANCA
TIPO DE LUZ EMITIDA	FRIA	CALIDA	FRIA
DESLUMBRAMIENTO	---	FUERTE	---
FLUJO LUMINOSO			
FLUJO LUMINOSO MAXIMO (Lm)	6500	6300	900
EFICACIA LUMINICA (Lm/w)	100	90	100
TIEMPO DE ENCENDIDO DE LUMINARIA (min)	1SEGUNDO	3 MINUTOS	1SEGUNDO

OVNI 1

TECNOLOGIA SOLAR

PROLIGHT^{ING}

G R E E N

RESUMEN DE CUADRO COMPARATIVO



CARACTERISTICAS	LUMINARIA LED (65w)	LAMPARA DE DESCARGA DE SODIO (70w)	LUMINARIA TIPO OVNI (9w)
MODELOS			
CONSUMO DE ENERGIA			
CONSUMO ENERGETICO TEORICO (w)	65	70	9
CONSUMO ENERGETICO REAL (w)	65	88	9
CONSUMO ENERGETICO A 12HORAS (KW/H)	0.78	1.06	0.11
CONSUMO ENERGETICO MENSUAL (KW/H)	23.40	31.68	0.00
CONSUMO ENERGETICO ANUAL (KW/H)	284.70	385.44	0.00
TARIFA ELECTRICA PERU			
PAGO ELECTRICO (MENSUAL)	S/. 74.65	S/. 101.06	COSTO DE LA LUMINARIA
PAGO ELECTRICO (ANUAL)	S/. 908.19	S/. 1,229.55	
GASTOS DE INSTALACION			
INST. DE UNIDAD DE ALUMBRADO INCLUYE POSTE DE ACERO GALVANIZADO TRONCOCONICO	S/. 5,200.00	S/. 5,800.00	COSTO DE INSTALACION DE LUMINARIA
EMPALME EN DERIVACION	S/. 161.88	S/. 161.88	NO APLICA
SUMINISTRO E INSTALACION DE CABLE SUBTERRANEO N2XY (8 mts)	S/. 220.00	S/. 220.00	NO APLICA
TUBO DE PVC-P	S/. 120.00	S/. 120.00	NO APLICA
CRUZADA DE CONCRETO DE 2 VIAS	S/. 30.00	S/. 30.00	NO APLICA
CONECTORES PARA CABLE	S/. 24.64	S/. 24.64	NO APLICA
TOTAL DE GASTOS DE INSTALACION	S/. 5,756.52	S/. 6,356.52	INST. LUMINARIA
NOTA: Se esta considerando precio de tarifa electrica en un rango de consumo menor, dicho precio incluye IGV			



1000W/M2



charging



LED lighting



waterproof



ALTA RADIACION



BAJA RADIACION

STREET 3000

ALTA RADIACION
TECNOLOGIA SOLAR



PROLIGHT ING
G R E E N

Luminaria con caja de aleación de aluminio , diseño con patente integrada, Led super brillantes de 2000 - 3000 lúmenes con mas de 140° angulos de amplia iluminación, cada elemento es de fácil reemplazo por el usuario, puede soportar 3 noches de iluminación, Fácil instalación en poste..

ESPECIFICACIONES

MODELO	STREET 3000
LED	3000 LUM/ 30W – 50,000hr
PANEL SOLAR	Silicio Monocristal, 17% eficiencia, 47w/30V – 10 años
BATERIA	Bateria Recargable de Li – ion / 3.7V -26000mAh / 1000 ciclos
TIEMPO DE RECARGA	12 Horas de sol - 1000w/m2 – ilum +3noches con carga completa
MODALIDAD	5 Hrs luz intensa (100%) – 7 hrs luz tenue (75%)
MATERIAL	Aleación de aluminio + vidrio de acero
REST. AL AGUA	IP65
T° OPERACIONAL	- 25 °C – 65°C
ALTURA OPTIMA	5-6 MTS
MEDIDAS	1092x488mmx117mm
USOS	Para jardines, parques, calles, caminos peatonales, condominios, estacionamientos, plazas, campus universitarios, granjas, perímetros de seguridad, áreas rurales, etc.

RESUMEN DE CUADRO COMPARATIVO

CARACTERISTICAS	LUMINARIA VAPOR DE SODIO ALTA PRESION (150w)	LUMINARIA VAPOR DE MERCURIO (250w)	LUMINARIA STREET LIGHT 30w (ESL30)
MODELOS			
VIDA UTIL (hrs)	15000	5000	50000
A 8 HORAS DIARIAS	5 AÑOS	2 AÑOS	17 AÑOS
A 12 HORAS DIARIAS	3 AÑOS	1 AÑO	11 AÑOS
EFICIENCIA ENERGETICA			
LUZ VISIBLE	31%	17%	85%
LUZ ULTRAVIOLETA	---	4%	---
LUZ INFRARROJA	25%	15%	---
CALOR EMITIDO	44%	64%	15%
COLOR DE TEMPERATURA	AMARILLO O AMBAR	AMARILLO O AMBAR	BLANCA
TIPO DE LUZ EMITIDA	CALIDA	CALIDA	FRIA
DESLUMBRAMIENTO	FUERTE	FUERTE	NO TIENE

STREET 3000

TECNOLOGIA SOLAR



RESUMEN DE CUADRO COMPARATIVO

CARACTERISTICAS	LUMINARIA VAPOR DE SODIO ALTA PRESION (150w)	LUMINARIA VAPOR DE MERCURIO (250w)	LUMINARIA STREET LIGHT 30w (ESL30)
MODELOS			
FLUJO LUMINOSO			
FLUJO LUMINOSO MAXIMO (Lm)	13500	22500	3000
EFICACIA LUMINICA (Lm/w)	90	90	100
TIEMPO DE ENCENDIDO DE LUMINARIA (min)	3	5 a 7	INSTANTANEO
CONSUMO DE ENERGIA			
CONSUMO ENERGETICO TEORICO (w)	150	250	30
CONSUMO ENERGETICO REAL (w)	188	285	30
CONSUMO ENERGETICO A 12HORAS (KW/H)	2.26	3.42	0.36
CONSUMO ENERGETICO MENSUAL (KW/H)	67.68	102.60	...
CONSUMO ENERGETICO ANUAL (KW/H)	823.44	1248.30	...
TARIFA ELECTRICA PERU			
PAGO ELECTRICO (MENSUAL)	S/. 215.90	S/. 327.29	COSTO DE LA LUMINARIA
PAGO ELECTRICO (ANUAL)	S/. 2,590.80	S/. 3,927.48	
GASTOS DE INSTALACION			
INST. DE UNIDAD DE ALUMBRADO INCLUYE POSTE DE C.A.C. 8m/200	S/. 6,500.00	S/. 6,800.00	COSTO DE INSTALACION DE LUMINARIA
ABRAZADERA DE AoGo	S/. 100.00	S/. 100.00	NO APLICA
CONDUCTOR DE COBRE RECOCIDO TIPO N2XY DE 2x2,5mm2 (15 mts)	S/. 375.00	S/. 375.00	NO APLICA
PASTORAL TIPO PARABOLICO AoGo	S/. 150.00	S/. 150.00	NO APLICA
CONECTOR BIMETALICO TIPO CUÑA	S/. 20.00	S/. 20.00	NO APLICA
FERRETERIAS DE AoGo	S/. 35.00	S/. 35.00	NO APLICA
TOTAL DE GASTOS DE INSTALACION	S/. 7,130.00	S/. 7,430.00	INST. LUMINARIA

NOTA: Se esta considerando precio de tarifa electrica en un rango de consumo menor, dicho precio incluye IGV



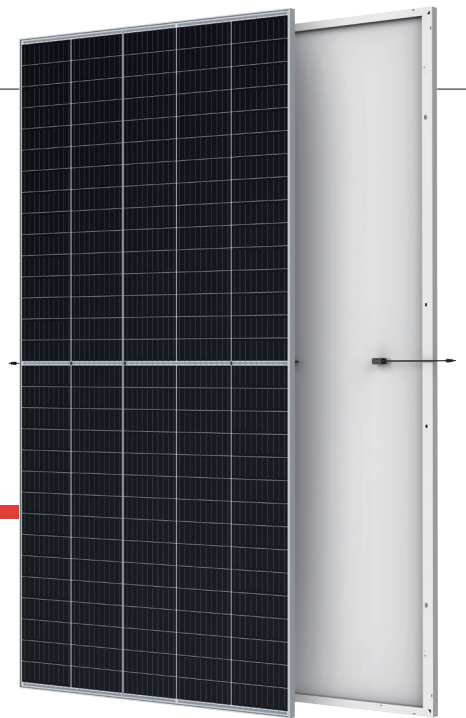
ALTA RADIACION



BAJA RADIACION

THE Vertex

BACKSHEET MONOCRYSTALLINE MODULE



500W+
MAXIMUM POWER OUTPUT

21.1%
MAXIMUM EFFICIENCY

0~+5W
POSITIVE POWER TOLERANCE

PRODUCTS

TSM-DE18M(II)

POWER RANGE

480-505W



High customer value

- Lower LCOE (Levelized Cost Of Energy), reduced BOS (Balance Of System) cost, shorter payback time
- Lower guaranteed first year and annual degradation
- Designed for compatibility with existing mainstream system components
- Higher return on Investment



High power up to 505W

- Large area cells based on 210mm silicon wafers and 1/3-cut cell technology
- Up to 21.1% module efficiency with high density interconnect technology
- Multi-busbar technology for better light trapping effect, lower series resistance and improved current collection



High reliability

- Minimized micro-cracks with innovative non-destructive cutting technology
- Ensured PID resistance through cell process and module material control
- Resistant to harsh environments such as salt, ammonia, sand, high temperature and high humidity areas
- Mechanical performance up to 5400 Pa positive load and 2400 Pa negative load



High energy yield

- Excellent IAM (Incident Angle Modifier) and low irradiation performance, validated by 3rd party certifications
- The unique design provides optimized energy production under inter-row shading conditions
- Lower temperature coefficient (-0.36%) and operating temperature

Founded in 1997, Trina Solar is the world's leading total solution provider for solar energy. With local presence around the globe, Trina Solar is able to provide exceptional service to each customer in each market and deliver our innovative, reliable products with the backing of Trina as a strong, bankable brand. Trina Solar now distributes its PV products to over 100 countries all over the world. We are committed to building strategic, mutually beneficial collaborations with installers, developers, distributors and other partners in driving smart energy together.

Comprehensive Products and System Certificates

IEC61215/IEC61730/IEC61701/IEC62716

ISO 9001: Quality Management System

ISO 14001: Environmental Management System

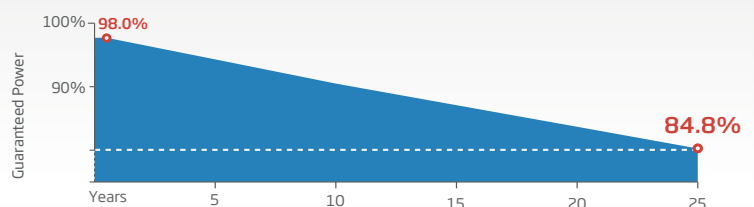
ISO14064: Greenhouse Gases Emissions Verification

ISO45001: Occupational Health and Safety Management System

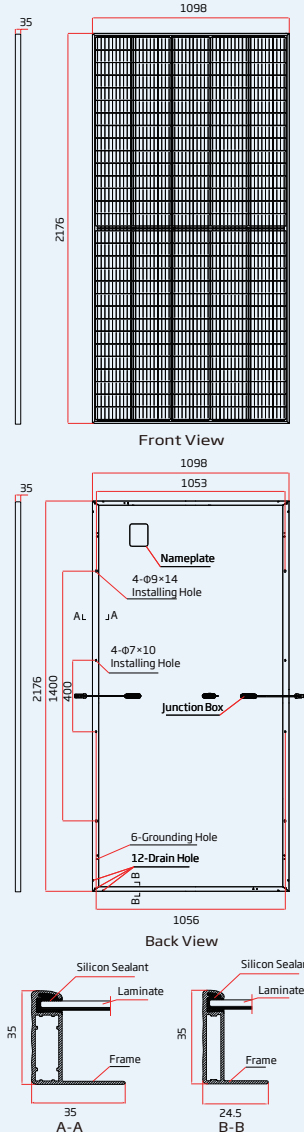


Trinasolar

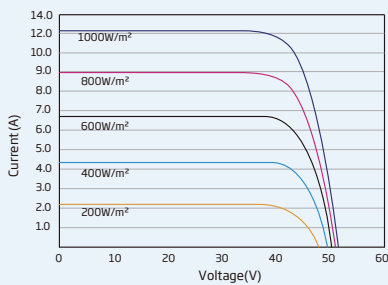
Trina Solar's VERTEX Backsheet Performance Warranty



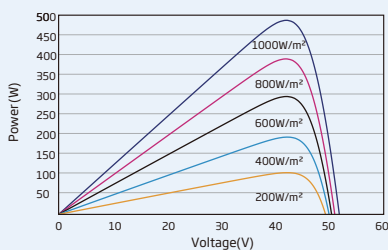
DIMENSIONS OF PV MODULE(mm)



I-V CURVES OF PV MODULE(490W)



P-V CURVES OF PV MODULE(490W)



ELECTRICAL DATA (STC)

Peak Power Watts- P_{MAX} (Wp)*	480	485	490	495	500	505
Power Tolerance- P_{MAX} (W)	0 ~ +5					
Maximum Power Voltage- V_{MPP} (V)	42.0	42.2	42.4	42.6	42.8	43.0
Maximum Power Current- I_{MPP} (A)	11.42	11.49	11.56	11.63	11.69	11.75
Open Circuit Voltage- V_{OC} (V)	50.8	51.1	51.3	51.5	51.7	51.9
Short Circuit Current- I_{SC} (A)	11.99	12.07	12.14	12.21	12.28	12.35
Module Efficiency η_m (%)	20.1	20.3	20.5	20.7	20.9	21.1

STC: Irradiance 1000W/m², Cell Temperature 25°C, Air Mass AM1.5.

*Measuring tolerance: $\pm 3\%$.

ELECTRICAL DATA (NMOT)

Maximum Power- P_{MAX} (Wp)	363	367	371	375	379	382
Maximum Power Voltage- V_{MPP} (V)	39.6	39.8	40.0	40.2	40.4	40.6
Maximum Power Current- I_{MPP} (A)	9.15	9.20	9.26	9.32	9.37	9.43
Open Circuit Voltage- V_{OC} (V)	48.0	48.2	48.4	48.6	48.8	49.0
Short Circuit Current- I_{SC} (A)	9.65	9.72	9.77	9.83	9.89	9.94

NMOT: Irradiance at 800W/m², Ambient Temperature 20°C, Wind Speed 1m/s.

MECHANICAL DATA

Solar Cells	Monocrystalline
Cell Orientation	150 cells
Module Dimensions	2176 × 1098 × 35 mm (85.67 × 43.23 × 1.38 inches)
Weight	26.3 kg (58.0 lb)
Glass	3.2 mm (0.13 inches), High Transmission, AR Coated Heat Strengthened Glass
Encapsulant Material	EVA
Backsheet	White
Frame	35 mm (1.38 inches) Anodized Aluminium Alloy
J-Box	IP 68 rated
Cables	Photovoltaic Technology Cable 4.0mm ² (0.006 inches ²), Portrait: N 280mm/P 280mm(11.02/11.02inches) Landscape: N 1400 mm /P 1400 mm (55.12/55.12 inches)
Connector	MC4 EV02 / TS4*

*Please refer to regional datasheet for specified connector.

TEMPERATURE RATINGS

NMOT (Nominal Module Operating Temperature)	41 °C (± 3 °C)
Temperature Coefficient of P_{MAX}	- 0.36%/ °C
Temperature Coefficient of V_{OC}	- 0.26%/ °C
Temperature Coefficient of I_{SC}	0.04%/ °C

(Do not connect Fuse in Combiner Box with two or more strings in parallel connection)

WARRANTY

12 year Product Workmanship Warranty
25 year Power Warranty
2% first year degradation
0.55% Annual Power Attenuation

(Please refer to product warranty for details)

MAXIMUM RATINGS

Operational Temperature	-40~+85 °C
Maximum System Voltage	1500V DC (IEC)
Max Series Fuse Rating	20A

PACKAGING CONFIGURATION

Modules per box: 30 pieces
Modules per 40' container: 600 pieces