JX CRYSTALS, INC

JX Crystals Inc
1105 12th Ave NW Suite A2 Issaquah, WA 98027
Tel. 245-392-5237 sales@jxcrystals.com

1.8 kW ROOFTOP SOLAR GENERATING SYSTEM

with SUN TRACKING CAROUSELS

INCLUDES:

- 2 SUNTRACK CAROUSELS for building flat rooftops
- 8 SHARP 224 W PV modules
- SUNNY BOY 1800U inverter for grid-tied installation
- Optional SUNNY BOY webbox for monitoring power output

FEATURES:

- Sun tracking provides up to 40% more kW-Hs output from kW power installed
- No penetration roof installation
- Low wind resistance
- Pre-assembled delivery for low cost installation

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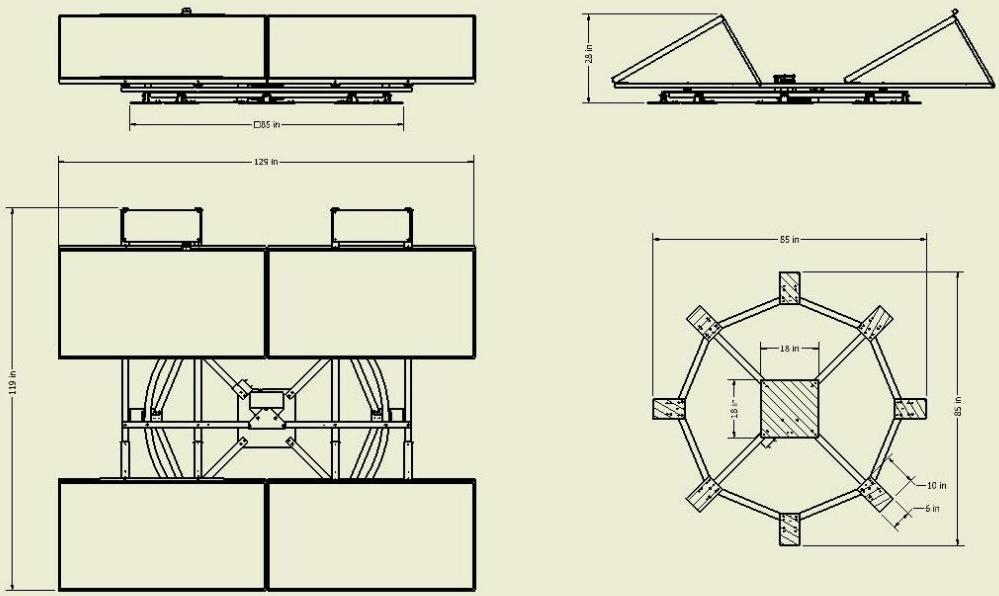


SunTrack Carousel Dimensions:

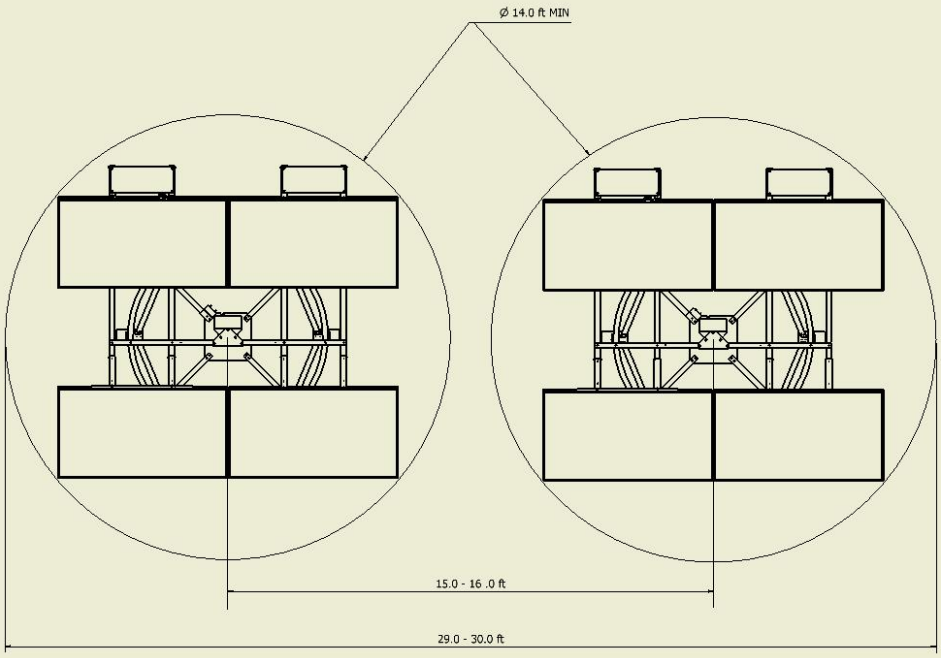
- Height: 28 in (0.71 m)
- Plan: 129 x 119 in (3.3 x 3.0 m)
- Base: 85 x 85 in (2.2x 2.2 m)
- Footprint:
  Center plate: 18 x 18 in (0.55 x 0.55 m)
  8 plates 10 in x 6 in (0.25 x 0.18 m)

SunTrack Carousel Weight:

- Total with Modules: 400 lb (180 kg)
- Carousel Tracker: 200 lb (90 kg)
- Footprint Pressure: 0.5 psi (0.035 kg/sm2)

1.8 kW System Installation – 2 Carousels

- Total area: 30 x 14 ft (9.1 x 4.3 m)
- Total weight: 800 lb (360 kg)
- Roof slope: up to 3 degrees
- Ballast: for each carousel: 12 cement blocks 16 in x16in x 2 in (406 x 406 x 51 mm)
- Area Pressure: 0.03 psi (0.002 kg/sm2)
- Roof protection: 1/4 - 1/2 in (6 – 12 mm) rubber mats under base plates
- System includes 24 VDC power supply for motor driver



SHARP

MULTI-PURPOSE MODULE
IMPROVED FRAME TECHNOLOGY

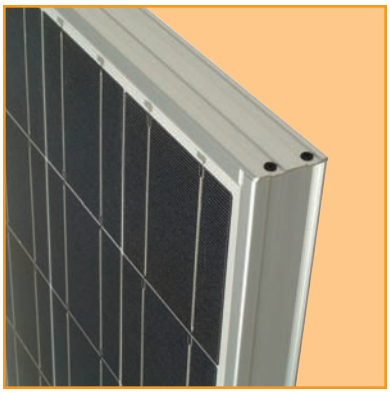
ND-224U2

224 WATT

NEXT GENERATION. BREAKTHROUGH PERFORMANCE.

POLY-CRYSTALLINE SILICON PHOTOVOLTAIC MODULE WITH 224W MAXIMUM POWER

This poly-crystalline 224 watt module features 13.74% module efficiency for an outstanding balance of size and weight to power and performance. Reengineered frame includes a contoured edge to improve water management, reducing surface moisture and debris. The new back support bars allow better performance under mechanical load. Using breakthrough technology, perfected by nearly 50 years of Sharp's research and development, the ND-224U2 modules incorporate an advanced surface texturing process to increase light absorption and improve efficiency. Common applications include commercial and residential grid-tied roof systems as well as ground-mounted arrays. Designed to withstand rigorous operating conditions, Sharp's ND-224U2 modules offer high power output per square foot of solar array.



Improved Frame Technology

Sharp multi-purpose modules offer outstanding performance for a variety of applications.

FEATURES

- **High-power module (224W) using 156mm square poly-crystalline silicon solar cells with 13.74% module conversion efficiency**
- **Sharp's advanced surface texturing process increases light absorption and efficiency while providing a more subdued, "natural" look**
- **Bypass diodes minimize the power drop caused by shade**
- **Water white tempered glass, EVA resin, and a weatherproof film, plus aluminum frame for extended outdoor use**
- **UL Listings: UL1703, cUL**
- **Sharp modules are manufactured in ISO 9001 certified facilities**
- **25-year limited warranty on power output (see dealer for details)**

ND-224U2

MULTI-PURPOSE MODULE
IMPROVED FRAME TECHNOLOGY

224 WATT

ELECTRICAL CHARACTERISTICS

Cell	Poly-crystalline silicon
No. of Cells and Connections	60 in series
Open Circuit Voltage (Voc)	36.6V
Maximum Power Voltage (Vpm)	29.28V
Short Circuit Current (Isc)	8.33A
Maximum Power Current (Ipm)	7.66A
Rated Power (Pm)*	224W (+10% / -5%)
Module Efficiency	13.74%
Maximum System Voltage	600V
Series Fuse Rating	15A
Type of Output Terminal	Lead Wire with MC Connector

* (STC) Standard Test Conditions: 25˚C, 1 kW/m², AM 1.5

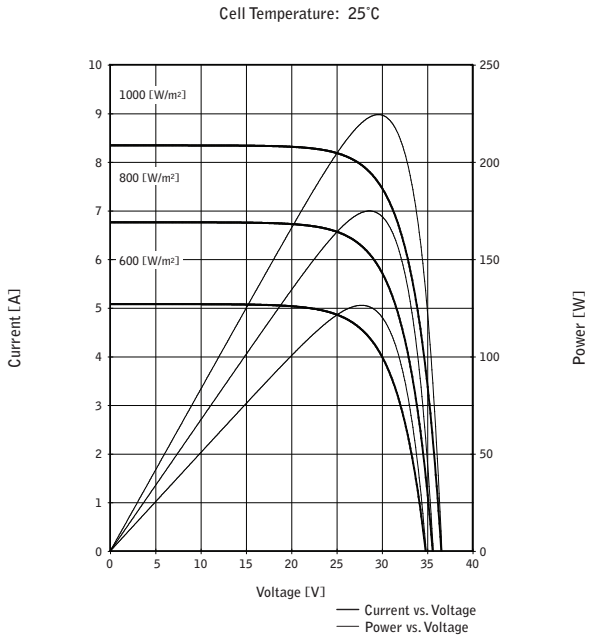
MECHANICAL CHARACTERISTICS

Dimensions (A x B x C below)	39.1" x 64.6" x 1.8" (994mm x 1640mm x 46mm)
Weight	44 lbs / 20 kg
Size of Carton	65.16" x 39.76" x 4.25" (1655mm x 1010mm x 108mm)
Carton Quantity	2 pcs per carton
Pallet Quantity	30 pcs per pallet

ABSOLUTE MAXIMUM RATINGS

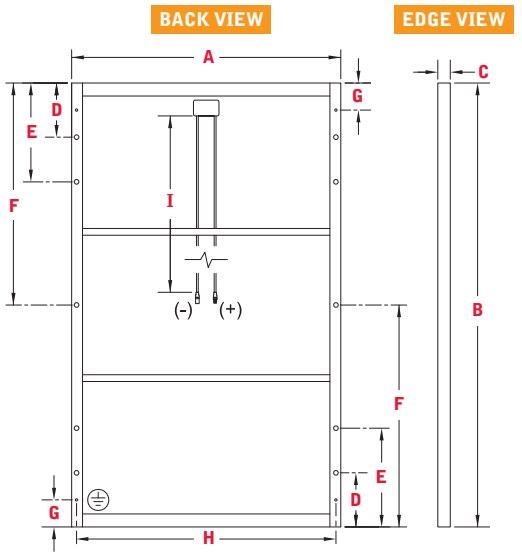
Operating Temperature (min to max, ˚F/˚C)	-40 to 194˚F / -40 to +90˚C
Storage Temperature (min to max, ˚F/˚C)	-40 to 194˚F / -40 to +90˚C

IV CURVES



Current, Power vs. Voltage Characteristics

DIMENSIONS



A	B	C	D	E
39.1"/994mm	64.6"/1640mm	1.8"/46mm	7.9"/200mm	14.4"/365mm

F	G	H	I
32.3"/820mm	3.9"/100mm	37.7"/958mm	43.3"/1100mm

Design and specifications are subject to change without notice.

SHARP

SHARP ELECTRONICS CORPORATION • 5901 Bolsa Avenue, Huntington Beach, CA 92647
Tel: 1-800-SOLAR-06 • E-mail: sharpsolar@sharpusa.com • www.sharpusa.com/solar

Cover photo: Solar installation by Pacific Power Management, Auburn CA

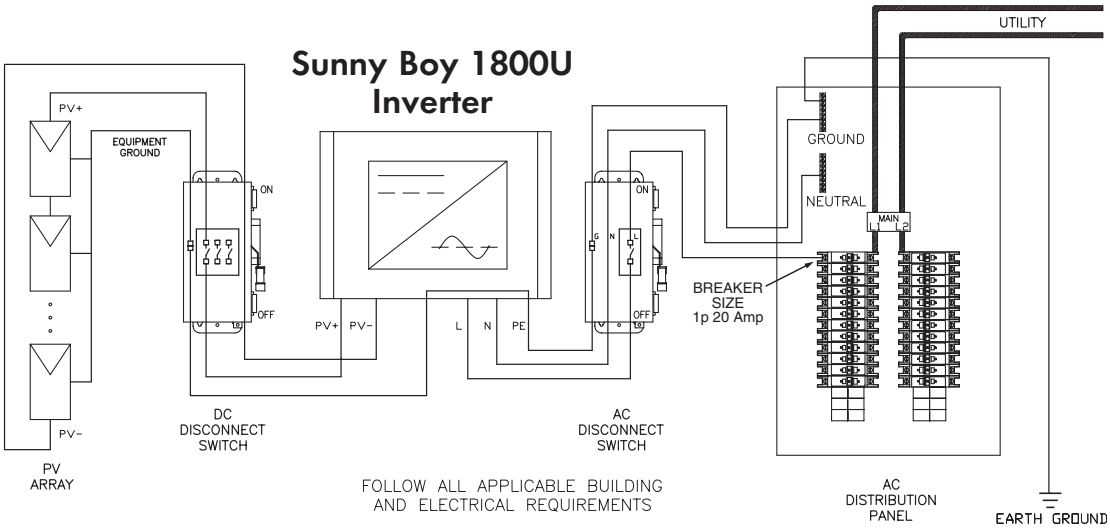
SESG-224U2-0408
Printed in the USA

Sunny Boy 1800U

The leading grid-tied photovoltaic inverters in Europe and America

- **UL 1741 Listed for grid interactive inverters**
- **5-year comprehensive warranty standard**
- **Rugged NEMA 4X stainless steel enclosure standard**
- **Exceptional reliability and energy capture ratio**
- **Easy to install three-point mounting system**
- **Comprehensive communications and data collection options**
- **SMA's modular string inverter design is expandable to virtually any size system**

The SMA Sunny Boy inverter, the most popular grid-tied photovoltaic inverter in Europe, is now UL 1741 Listed and available in North America. Sunny Boy's extensive track record in some of the world's most demanding markets has made it a favorite among PV professionals everywhere. Over 250,000 Sunny Boy inverters have been installed worldwide. Superior design, rock-solid German engineering and exceptional real-world efficiency have made Sunny Boy the top choice for American solar designers.



Sunny Boy's unsurpassed reliability and efficiency are the result of SMA's manufacturing philosophy that combines simple design with robust execution. SMA's state-of-the-art maximum power point tracking performance results in greater real-world energy capture than any other grid-tied inverter. Sunny Boy's safety and reliability record is also exceptional due, in part, to the inverter's redundant grid monitoring and built-in ground fault detection and interruption protection. The inverter's IGBT power stage generates a nearly perfect sine wave with the lowest harmonic distortion in the industry and meets ultra-strict FCC EMC standards. SMA's unique String Inverter technology makes future system expansion simple. SMA advanced communication options are available to satisfy almost any application.

Specifications

Inverter Technology	Real sine-wave, current source, high frequency PWM
AC Input Voltage	106 - 132 (120V AC)
AC Input Frequency	59.3 - 60.5 (60Hz) (50Hz also available)
DC Input Voltage	156 - 400V DC
Peak Power Tracking Voltage	156 - 350V DC
Minimum DC Input Voltage	139 - 170V DC dependent on available line voltage
Maximum Array Input Power	2200W (DC @ STC)
Maximum AC Power Output	1800W
Current THD	< 4%
Power Factor	Unity
Peak Inverter Efficiency	93.6%
Cooling	*Convection cooling (no fan)
PV Start Voltage	180V DC
Maximum AC Output Current	15.0A
Maximum DC Input Current	12.0A
DC Voltage Ripple	< 5%
Power Consumption	0.25W nighttime,< 7W standby
Ambient Temperature Rating	45°C

Enclosure	NEMA 4X (iP65) Stainless Steel
Dimensions	17.10W x 11.60H x 8.40D in 434W x 295H x 214D mm
Weight	59.4 lbs (27 kg)
Compliance	United States UL 1741, E210376, UL 1998, IEEE 519, IEEE 929, ANSI C62.41 C1 & C3, FCC part 15 A & B International DIN EN50082 Part 1, 61000-32, 50081, 50014, 600055 Part 2 55011 Group 1 Class B, 50178, 60146 Part 1-1

* Optional external fan (Sunny Breeze) available

SMA America, Inc.
12438-C Loma Rica Dr.
Grass Valley, CA. 95945
Tel: 530.273.4895
Fax: 530.274.7271
www.sma-america.com

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