

HIGH PERFORMANCE SOLAR MODULES

REC PEAK ENERGY (BLK) SERIES

REC Peak Energy Series modules are the perfect choice for building solar systems that combine long lasting product quality with reliable power output. REC combines high quality design and manufacturing standards to produce high-performance solar modules with uncompromising quality.



MORE POWER PER M²



ENERGY PAYBACK TIME OF ONE YEAR



ROBUST AND DURABLE DESIGN



OPTIMIZED FOR ALL SUNLIGHT CONDITIONS

REC PEAK ENERGY (BLK)



	DECODEDE	DECOODE	DECOOEDE			DECOEDDE
ELECTRICAL DATA @ STC	REC225PE BLK	BLK	BLK	BLK	REC245PE BLK	BLK
MaximumPower-P _{MAX} (Wp)	225	230	235	240	245	250
Watt Class Tolerance - P _{TOL} (W)	0/+5	0/+5	0/+5	0/+5	0/+5	0/+5
Maximum Power Voltage - V _{MPP} (V)	28.9	29.2	29.6	29.9	30.2	30.5
Maximum Power Current - I _{MPP} (A)	7.8	7.9	8.0	8.0	8.1	8.2
Open Circuit Voltage - V _{oc} (V)	36.2	36.5	36.7	37.0	37.2	37.5
Short Circuit Current - I _{sc} (A)	8.3	8.4	8.5	8.6	8.7	8.8
Module Efficiency (%)	13.6	13.9	14.2	14.5	14.8	15.1

Values at standard test conditions STC (airmass AM 1.5, irradiance 1000 W/m², cell temperature 25°C). At low irradiance of 200 W/m² (AM 1.5 and cell temperature 25°C) at least 97% of the STC module efficiency will be achieved.

ELECTRICAL DATA @ NOCT	REC225PE	REC230PE	REC235PE	REC240PE	REC245PE	REC250PE
	BLK	BLK	BLK	BLK	BLK	BLK
MaximumPower-P _{MAX} (Wp)	167	170	173	176	179	182
$MaximumPowerVoltage-V_{MPP}(V)$	26.6	26.8	27.1	27.3	27.6	27.9
Maximum Power Current - I _{MPP} (A)	6.3	6.3	6.4	6.4	6.5	6.6
Open Circuit Voltage - $V_{oc}(V)$	33.4	33.6	33.8	34.1	34.3	34.5
Short Circuit Current - I _{sc} (A)	6.8	6.8	6.9	7.0	7.0	7.1

Nominal cell operating temperature NOCT (800 W/m², AM 1.5, windspeed 1 m/s, ambient temperature 20°C).

Certified according to IEC 61215 and IEC 61730.



WARRANTY

10 year product warranty. 25 year linear power output warranty (max. degression in performance of 0.7% p.a.).

15.1%	EFFICIENCY	
10	YEAR PRODUCT WAR	RANTY
25	YEAR LINEAR POWER WARRANTY	ROUTPUT
TEMPERATUR	ERATINGS	
Nominal Oper Temperature Temperature Temperature	ating Cell Temperature (NOCT) Coefficient of P _{MPP} Coefficient of V _{oc} Coefficient of I _{sc}	47.9°C (±2°C -0.43 %/°(-0.33 %/°(0.074 %/°(

GENERAL DATA	
Cell Type	60 REC PE multi-crystalline cells 3 strings of 20 cells - 3 by-pass diodes
Glass	Solar glass with antireflection surface treatment by Sunarc Technology
Back Sheet	Double layer highly resistant polyester
Frame	Black anodized aluminium
Cable	Radox 4mm² solar cable, 0.90m +1.20m
Connectors	Radox 4mm ² twist locking connector

MAXIMUM RATINGS	
Operational Temperature	-40+80°C
Maximum System Voltage	1000V
Maximum Load	551 kg/m² (5400 Pa)
Maximum Wind Speed	197 km/h (safety factor 3)
Maximum Series Fuse Rating	15A
Maximum Reverse Current	15A

MECHANICAL DATA	
Dimensions	1665 x 991 x 38 mm
Area	1.65 m ²
Weight	18 kg

Note! Specifications subject to change without notice.

REC is a leading vertically integrated player in the solar energy industry. Ranked among the world's largest producers of polysilicon and wafers for solar applications and a rapidly growing manufacturer of solar cells and modules, REC also engages in project development activities in selected PV segments. Founded in Norway in 1996, REC is an international solar company employing about 4,000 people worldwide with revenues close to EUR 1.7 billion. Visit www.recgroup.com to learn more about REC.



SUNNY BOY 3000-US / 3800-US / 4000-US





• Integrated DC disconnect switch

SUNNY BOY 3000-US / 3800-US / 4000-US

UL certified, reliable system managers

The Sunny Boy 3000-US, 3800-US and 4000-US inverters are specially designed for countries that require UL certification. Automatic grid voltage detection* and an integrated DC disconnect switch simplifies installation, ensuring safety as well as saving time. These models feature galvanic isolation and can be used with all types of modules-crystalline as well as thin-film. The die-cast aluminum enclosure, with the OptiCool active temperature management system, guarantees the highest yields possible and a long service life, even under extreme conditions. The Sunny Boy 3800-US is designed for projects with a current limit of 16A.

* 1 * 11.	Sunny Boy 3000-US		Sunny Boy 3800-US	Sunny Boy 4000-US		
lechnical data	208 V AC	240 V AC	240 V AC	208 V AC	240 V AC	
Input (DC)						
Max. recommended PV power (@ module STC)	375	io W	4750 W	4375 W	5000 W	
Max. DC power (@ cos $\varphi = 1$)	3200 W		4200 W	4200 W		
Max. DC voltage	50	0 V	600 V	60	0 V	
DC nominal voltage	25	0 V	310 V	31	0 V	
MPP voltage range	175 - 400 V	200 - 400 V	250 - 480 V	220 - 480 V	250 - 480 V	
Min. DC voltage / start voltage	175 / 228 V	200 / 228 V	250 / 285 V	220 / 285 V	250 / 285 V	
Max. input current / per string (at DC disconnect)	17 A	/ 17 A	18 A / 18 A	18 A	18 A / 18 A	
	36 A @ com	oined terminal	36 A @ combined terminal	36 A @ combined terminal		
Number of MPP trackers / fused strings per MPP tracker			1 / 4 (DC disconnect)			
Output (AC)						
AC nominal power	300	W 00	3800 W	3500 W	4000 W	
Max. AC apparent power	300	0 VA	3800 VA	3500 VA	4000 VA	
Nominal AC voltage / adjustable	208 V / 🔸	240 V / •	240 V / -	208 V / •	240 V / •	
AC voltage range	183 - 229 V	211 - 264 V	211 - 264 V	183 - 229 V	211 - 264 V	
AC grid frequency; range	60 Hz; 59.	3 - 60.5 Hz	60 Hz; 59.3 - 60.5 Hz	60 Hz; 59.	3 - 60.5 Hz	
Max. output current	15 A	13 A	16 A	17	7 A	
Power factor (cos φ)		1	1		1	
Phase conductors / connection phases	1,	/ 2	1 / 2	1,	/ 2	
Harmonics	< .	4%	< 4%	< 4%		
Efficiency						
Max. efficiency	96.0%	96.5%	96.8%	96.5%	96.8%	
CEC efficiency	95.0%	95.5%	96.0%	95.5%	96.0%	
Protection devices						
DC reverse-polarity protection		•	•		•	
AC short circuit protection		•	•		•	
Galvanically isolated / all-pole sensitive monitoring unit	•	/-	•/-	•	/-	
Protection class / overvoltage category	1/	/ 111	1/11	17	/ 111	
General data						
Dimensions (W / H / D) in mm (in)		4	150 / 350 / 235 (18 / 14 / 9	?)		
DC Disconnect dimensions (W / H / D) in mm (in)		1	87 / 297 / 190 (7 / 12 / 7.	5)		
Packing dimensions (W / H / D) in mm (in)		39	0 / 580 / 470 (15 / 23 / 18	3.5)		
DC Disconnect packing dimensions (W / H / D) in mm (in)		3	370 / 240 / 280 (15 / 9 / 1	1)		
Weight / DC Disconnect weight			38 kg (84 lb) / 3.5 kg (8 lb)			
Packing weight / DC Disconnect packing weight			44 kg (97 lb) / 4 kg (9 lb)			
Operating temperature range (full power)		-25	°C +45 °C (-13 °F +11	3 °F)		
Noise emission (typical)	40 c	B(A)	www.SMA-Solar.com	37 c	B(A)	
Internal consumption at night	0.1	W	0.1 W	0.1	W	
Тороlоду	LF tran	sformer	LF transformer	LF tran	sformer	
Cooling concept	Opt	iCool	OptiCool	Opt	iCool	
Electronics protection rating / connection area	NEMA 3R	/ NEMA 3R	NEMA 3R / NEMA 3R	NEMA 3R	/ NEMA 3R	
Features						
Display: text line / graphic	•	/-	•/-	•	/-	
Interfaces: RS485 / Bluetooth	0	/0	0/0	0	/0	
Warranty: 10 / 15 / 20 years	•/•	0/0	●/0/0	•/0	0/0	
Certificates and permits (more available on request)	UL1741, UL	.1998, IEEE 154	7, FCC Part 15 (Class A & B), (CSA C22.2 No.	107.1-2001	
NOTE: US inverters ship with aray lids						
Data at nominal conditions						
 Standard features _ O Optional features _ Not available 						
Type designation	SB 30	000115	SB 3800-US-10	SB AC	000115	



Accessories



Bluetooth® Piggy Back BTPBINV-NR



Combiner Box Simplify wiring for added convenience and safety

convenience and safety SBCB-6-3R or SBCB-6-4

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- SERIES 100 STANDOFF ASSEMBLY

- SERIES 100 STANDARD RAIL

- MODULE

SOLAR ARRAY LAYOUT (24) REC SOLAR 235 WATT MODULES 5.64 kW DC

PROJECT NOTES: 1) 5.64 KW DC SOLAR PHOTOVOLTAIC SYSTEM 2) SOLAR MODULES MOUNTED FLUSH TO ROOF USING SNAPNRACK RACKING SYSTEM SERIES 100 SYSTEM WEIGHT: 3 LB/FT². SYSTEMS ARE NON BALLASTED. 3) SEE SNAPNRACK INSTALLATION MANUAL FOR SUPPORT TO SUPPORT AND CANTILEVER MAXIMUM SPANS. 4) CONNECT SYSTEM TO MAIN PANEL VIA 240V CIRCUIT BREAKER. 5) USE (24) REC235PE(BLK) MODULES 6) CENTER ALL PENETRATIONS OVER EXISTING ROOF FRAMING SAMPLE MODULE REV: A PV-01 LAYOUT 10/6/2011 **RESIDENTIAL SOLAR INSTALLATION**



ALTERNATIVE SOLAR ARRAY LAYOUT (24) REC SOLAR 235 WATT MODULES 5.64 kW DC

PROJECT NOTES: 1) 5.64 KW DC SOLAR PHOTOVOLTAIC SYSTEM 2) SOLAR MODULES MOUNTED FLUSH TO ROOF USING SNAPNRACK RACKING SYSTEM SERIES 100 SYSTEM WEIGHT: 3 LB/FT². SYSTEMS ARE NON BALLASTED. 3) SEE SNAPNRACK INSTALLATION MANUAL FOR SUPPORT TO SUPPORT AND CANTILEVER MAXIMUM SPANS. 4) CONNECT SYSTEM TO MAIN PANEL VIA 240V CIRCUIT BREAKER. 5) USE (24) REC235PE(BLK) MODULES 6) CENTER ALL PENETRATIONS OVER EXISTING ROOF FRAMING SAMPLE MODULE REV: A PV-02 LAYOUT 10/6/2011 **RESIDENTIAL SOLAR INSTALLATION**



TORQUE ALL 5/16" HARDWARE TO 10 FT-LBS RAIL CAN MOUNT TO EITHER SIDE OF L-FOOT FOR UNEVEN ROOFS, USE 1" STANDOFF SHAFT

> STEP 3: SECURE L-FOOT TO STANDOFF BASE TO SECURE FLASHING AND MOUNTING RAILS STEP 2: SLIP FLASHING OVER L-FOOT BASE

STEP 1: BOLT L-FOOT BASE TO ROOF WITH LAG BOLT

ROOF DECKING

ING DETAIL	
SCALE: NTS	<u>PV-03</u>

REV: A 10/6/2011



SYSTEM CHARACTERISTICS

System Size	5.64	kW
System Open Circuit Voltage	551	V
System Operating Voltage	355	V
Max Allowable DC Voltage	600	V
System Operating Current	16.0	Amps
System Short Circuit Current	21.3	Amps

NOTE: SYSTEM OPEN CIRCUIT VOLTAGE CORRECTED PER 690.7, ASSUMING -51C WORST CASE TEMPERATURE

MODULE CHARACTERISTICS

REC SOLAR : REC235PE	235	Watts
Open Circuit Voltage	36.7	V
Open Circuit Voltage: (NEC 690.7)	45.9	V
Max Power Voltage	29.6	V
Short Circuit Current	8.5	Amps
Short Circuit Current: (NEC690.8(A)(1))	10.63	Amps

ELECTRICAL NOTES:

- 1. GROUNDING WIRE WILL BE BONDED DIRECTLY TO FACILITY GROUND.
- 2. ELECTRICAL SYSTEM GROUNDING WILL COMPLY WITH 2008 NEC 250.
- 3. ARRAY CONDUCTORS ARE SIZED FOR DERATED CURRENT PER STRING. 8.5 AMPS SHORT CIRCUIT CURRENT 125% DERATING FOR EXTREME IRRADIANCE CONDITIONS
 - (NEC 690-8 (a))
 - 125% DERATING, CONTINUOUS PHOTOVOLTAIC SOURCE CURRENT (NEC 690-8 (b))
 - 156% TOTAL DERATING (COMBINATION OF ABOVE)

13.26 AMPS TOTAL CAPACITY

(AMPS TOTAL CAPACITY = STRING SHORT CIRCUIT CURRENT MULTIPLIED BY TWO ABOVE DERATES, 1.25 X 1.25 X SHORT CIRCUIT CURRENT)

4. INVERTER PROVIDES NECESSARY GROUND FAULT PROTECTION AS REQUIRED BY 2008 NEC 690.5 GROUND FAULT PROTECTION.

5. PHOTOVOLTAIC SYSTEM HAS CONDUCTOR BONDED TO GROUND IN INVERTER AS REQUIRED BY 2008 NEC 690.41 SYSTEM GROUNDING, AND 690.42 POINT OF SYSTEM GROUNDING CONNECTION.

6. WHERE DC PHOTOVOLTAIC OUTPUT CIRCUITS ARE RUN INSIDE A BUILDING THEY SHALL BE CONTAINED IN A METALLIC RACEWAY OR ENCLOSURE FROM THE POINT OF PENETRATION TO THE FIRST READILY ACCESSIBLE DISCONNECTING MEANS - 2008 NEC 690.31 (E).

7. USE UL APPROVED BONDING FITTINGS AT ALL CONDUIT/BOX JUNCTIONS.

8. MODULES CONFORM TO AND ARE LISTED UNDER UL 1703.

9. INVERTER CONFORMS TO AND IS LISTED UNDER UL 1741.

10. SYSTEM INTERCONNECTION MUST COMPLY WITH REQUIREMENTS OF 2008 NEC 690.64. SUPPLY SIDE CONNECTION PER 690.64(A) IS ACCEPTABLE IF 30AMP FUSED AC DISCONNECT IS PRESENT.

11. ALL WIRE AND CONDUIT SIZES LISTED ARE MINIMUM SIZES.



	Coller	PROJECT CONTRACTOR:		DESCRIPTION:	PROJECT ADDRESS:	ELEC
-74	Solar			PHOTOVOLTAIC SYSTEM		

RESI) EN [SN]