KD5ZYV'S HURRICANE PROOF RADIO POWER SUPPLY

I use a solar and battery backup for my radio system.

The Batt is a 100 amp hour sealed lead acid.

The solar panel or PV panel is a BP model 3125 (120 watt) @ 7.5 amps

The Charge controller is a Morningstar – Prostar model ps-30

The power supply is just your std. 35 amp power supply

one spdt switch

lots of 10ga wire

and the radios, I have a 706 mkIIg on mine

I have left my radio on the solar / batt for weeks with the radio on 100% of the time.
And have yet to have killed the battery.....

The charge controller is very important. Here are some reasons of why that is...

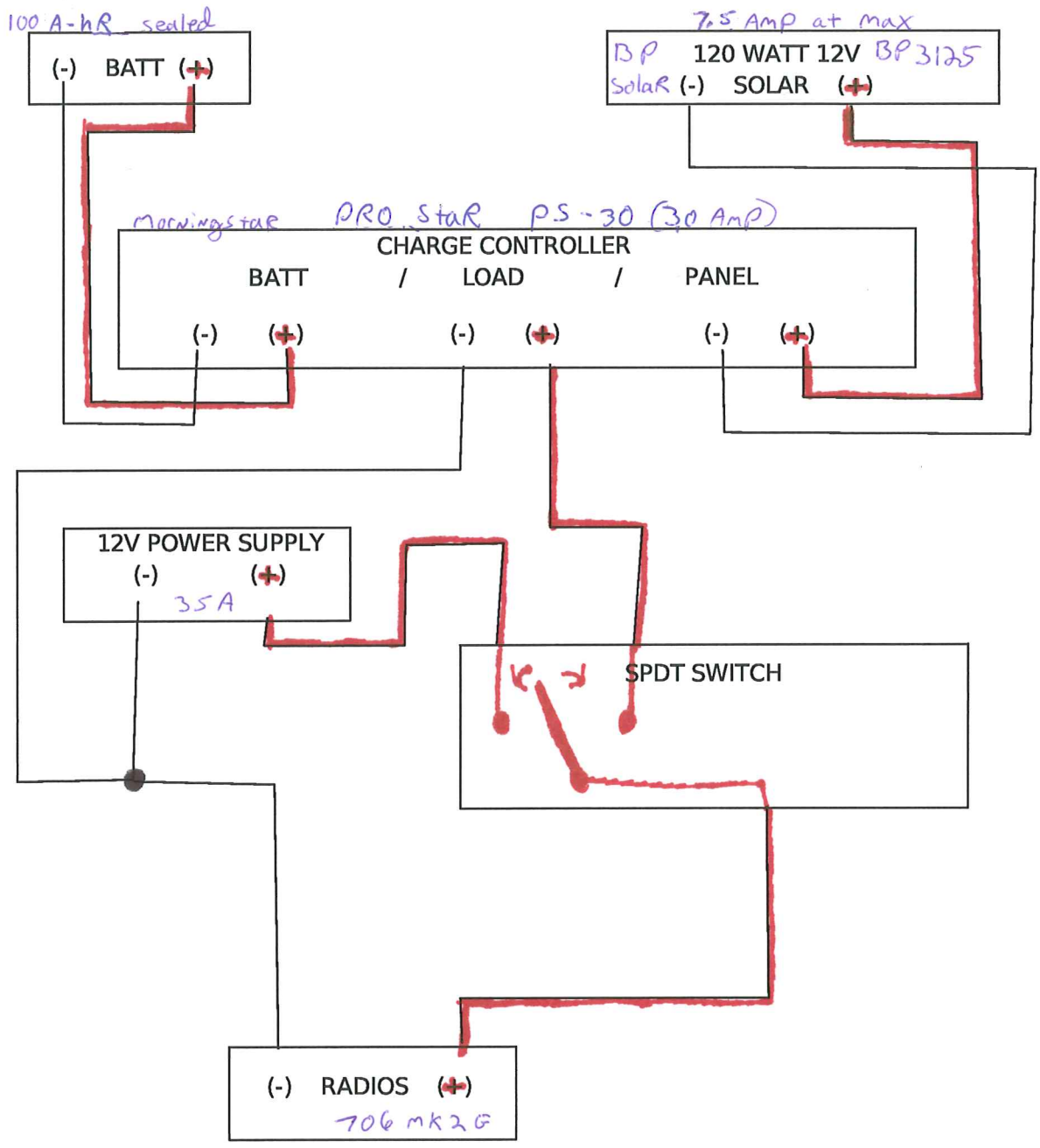
1. to keep from cooking the batt.
2. To keep the batt from back-feeding into the pv panel at night
3. to charge the batt and keep it charged
4. load control (when the batt is full, it diverts the pv power to the load)

The only bummer to this setup is the manual spdt switch.... one day
I will build a relay network that auto switches when the power from the power supply dies.

73

KD5ZYV

KD5ZYV setup 1/09



bp solar

BP 3135

135 Watt Photovoltaic Module

High-efficiency photovoltaic module using silicon nitride multicrystalline silicon cells.

Performance

Rated power (P_{max})	135W
Power tolerance	± 5% (BP3135) ±3% (BP3130 & BP3125) and ± 3% (BP3115 & BP3110)
Nominal voltage	12V
Limited Warranty[1]	25 years

Configuration

S BP 3125S	Clear universal frame with LoPro J-Box and polarized Multicontact (MC) connectors
J BP 3125J	Clear universal frame and standard J-Box

Electrical Characteristics[2]

	BP3135	BP3130	BP3125	BP3115	BP3110
Maximum power (P_{max})[3]	135W	130W	125W	115W	110W
Voltage at Pmax (V_{mp})	17.4V	17.4V	17.4V	17.1V	16.9V
Current at Pmax (I_{mp})	7.7A	7.5A	7.2A	6.7A	6.5A
Warranted minimum P_{max}	128.2W	126.1W	121.3W	109.3W	104.5W
Short-circuit current (I_{sc})	8.4A	8.2A	8.1A	7.5A	7.4A
Open-circuit voltage (V_{oc})	22.1V	22.0V	22.0V	21.8V	21.6V
Temperature coefficient of I_{sc}	(0.065±0.015)%/ °C				
Temperature coefficient of V_{oc}	-(80±10)mV/°C				
Temperature coefficient of power	-(0.5±0.05)%/ °C				
NOCT (Air 20°C; Sun 0.8kW/m^2; wind 1m/s)	47±2°C				
Maximum series fuse rating	15A (S); 20A (J)				
Maximum system voltage	600V (US NEC rating) 1000V (TÜV Rheinland rating) 1000V (IEC 61215 rating)				

Mechanical Characteristics

Dimensions	**S,J**	Length: 1510mm (59.4") Width: 674mm (26.5") Depth: 50mm (1.97")
Weight	**S,J**	12.0 kg (26.5 pounds)
Solar Cells	**S,J**	36 cells (156mm x 156mm) in a 4x9 matrix connected in series
Output Cables	**S**	RHW AWG# 12 (4mm^2) cable with polarized weatherproof DC rated Multicontact connectors; asymmetrical lengths - 900mm (-) and 800mm (+)
Junction Box	**J**	J-Version junction box with 6-terminal connection block; IP 65, accepts PG 13.5, M20, ½ inch conduit, or cable fittings accepting 6-12mm diameter cable. Terminals accept 2.5 to 10mm^2 (8 to 14 AWG) wire.
Diodes	**S,J**	***IntegraBus***™ technology includes Schottky by-pass diodes integrated into the printed circuit board bus
Construction	**S,J**	Front: High-transmission 3mm (1/8th inch) tempered glass; Back: Polyester; Encapsulant: EVA
Frame	**S,J**	Clear anodized aluminum alloy type 6063T6 Universal frame; Color: silver

1. Module Warranty: 25-year limited warranty of 80% power output; 12-year limited warranty of 90% power output; 5-year limited warranty of materials and workmanship. See your local representative for full terms of these warranties.
2. These data represent the performance of typical BP 3125 products, and are based on measurements made in accordance with ASTM E1036 corrected to SRC (STC.)
3. During the stabilization process that occurs during the first few months of deployment, module power may decrease by up to 3% from typical P_{max}.

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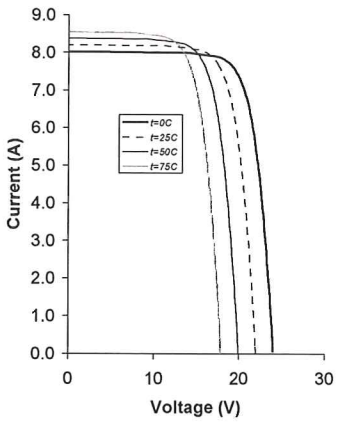
Quality and Safety

ESTI	Module power measurements calibrated to World Radiometric Reference through ESTI (European Solar Test Installation at Ispra, Italy)
CE	Manufactured in ISO 9001-certified factories; conforms to European Community Directives 89/33/EEC, 73/23/EEC, 93/68/EEC; certified to IEC 61215
TÜV	Framed modules certified by TÜV Rheinland as Safety Class II (IEC 60364) equipment for use in systems up to 1000 VDC
UL	Listed by Underwriter's Laboratories for electrical and fire safety (Class C fire rating)
FM	Approved by Factory Mutual Research in NEC Class 1, Division 2, Groups C & D hazardous locations (U)

BP 3130 I-V Curves

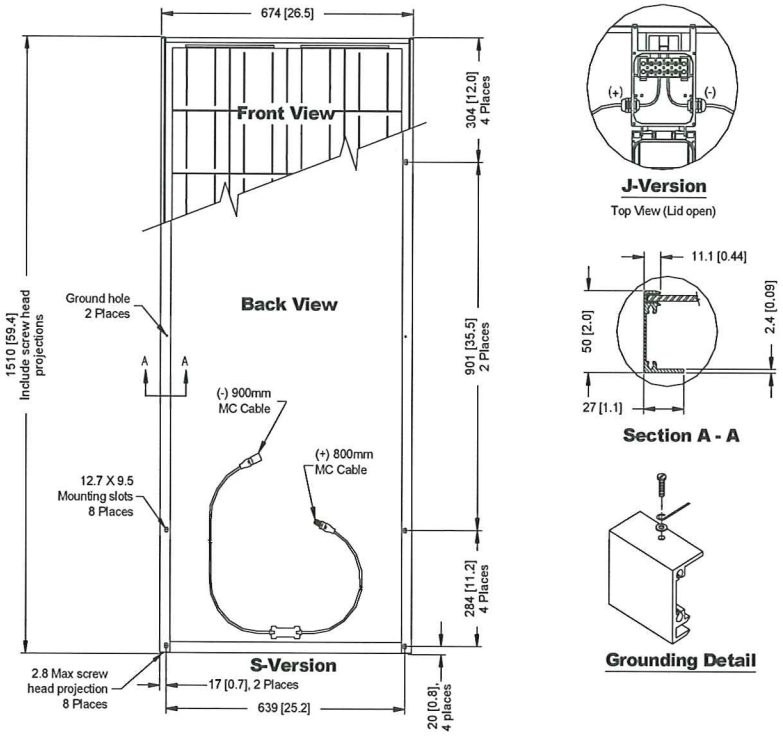


Qualification Test Parameters

Temperature cycling range	-40°C to +85°C (-40°F to 185°F)
Humidity freeze, damp heat	85% RH
Static load front and back (e.g. wind)	2,400 pa (50psf)
Front loading (e.g. snow)	5,400 pa (113psf)
Hailstone impact	25mm Ø (1 inch) at 23 m/s (52mph)

Module Diagram

Dimensions in brackets are in inches. Un-bracketed dimensions are in millimeters. Overall tolerances ±3mm (1/8")



Included with each module: self-tapping grounding screw, instruction sheet, and warranty document.

Note: This publication summarizes product warranty and specifications, which are subject to change without notice. Additional information may be found on our web site: www.bpsolar.com

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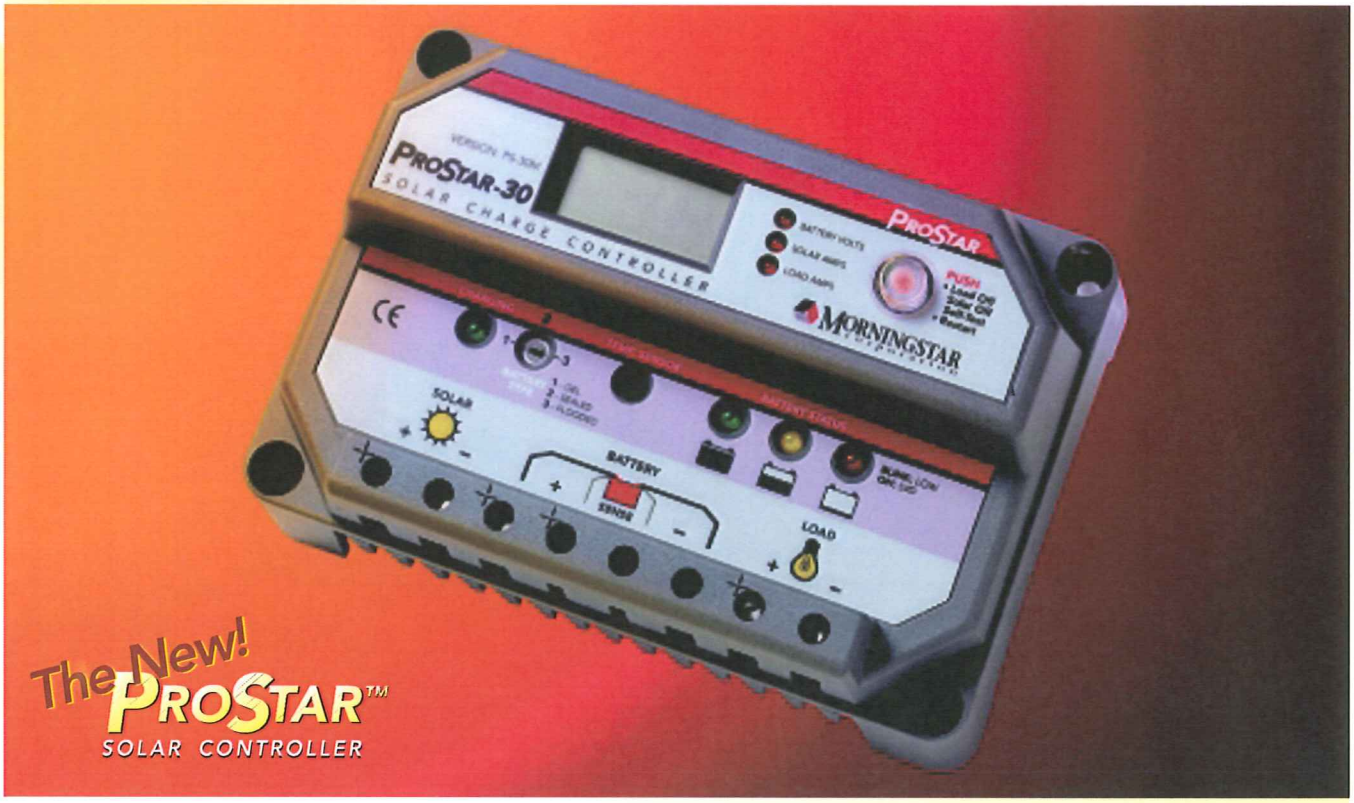


Morningstar's ***ProStar*** is the world's leading mid-range solar controller for both professional and consumer applications. This second generation ProStar:

- Adds new features and protections using highly advanced technology
- Provides longer battery life and improved system performance
- Sets new standards for reliability and self-diagostics

Standard Features:

- Versions available: 15 or 30 amp
  12 / 24 or 48 volt
  negative or positive ground
- Estimated 15 year life
- PWM series battery charging (not shunt)
- 3-position battery select: gel, sealed or flooded
- Very accurate control and measurement
- Jumper to eliminate telecom noise
- Parallel for up to 300 amps
- Temperature compensation
- Tropicalization: conformal coating, stainless-steel fasteners & anodized aluminum heat sink
- No switching or measurement in the grounded leg
- 100% solid state
- Very low voltage drops
- Current compensated low voltage disconnect (LVD)
- LED's indicate battery status and faults
- Capable of 25% overloads
- Remote battery voltage sense terminals

Electronic Protections:

- Short-circuit — solar and load
- Overload — solar and load
- Reverse polarity
- Reverse current at night
- High voltage disconnect
- High temperature disconnect
- Lightning and transient surge protection
- Loads protected from voltage spikes
- Automatic recovery with all protections

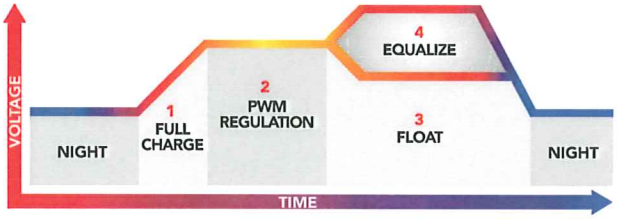
PROSTAR™ TECHNICAL SPECIFICATIONS

ProStar Options:

- Digital meter
  - Highly accurate voltage and current display
  - Low self-consumption (1 mA)
  - Includes manual disconnect button
  - Displays 5 different protection functions and disconnect conditions
  - Self-diagnostics (self-test) provides a comprehensive test of the ProStar —
    - Displays 9 different controller status parameters, including temperature
    - Displays detected faults
- Positive ground
- Remote temperature probe

Optimized Battery Charging:

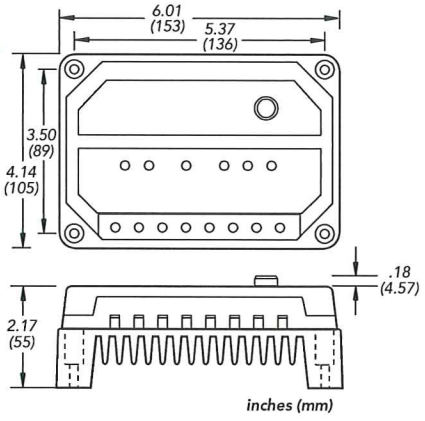
The ProStar has 4 stages of charging to provide increased battery capacity and life.



Mechanical Specifications:

Weight:
12 oz
(0.34 kg)

Wire Size:
#6 AWG
(16 mm²)



ProStar Versions:

	PS-15	PS-30	PS15M-48V
Rated Solar Current	15A	30A	15A
Rated Load Current	15A	30A	15A
System Voltage	12/24V	12/24V	48V
Options:			
Digital Meter	yes	yes	standard
Positive Ground	no	yes	yes
Remote Temp. Probe	yes	yes	yes

Battery Voltage Setpoints*

	Gel	Sealed	Flooded
Regulation Voltage	14.0	14.15	14.4
Float	13.7	13.7	13.7
Equalization	n/a	14.35	14.9/15.1
Load Disconnect	11.4	11.4	11.4
Load Reconnect	12.6	12.6	12.6

Note: values are for 12V. Use 2X for 24V and 4X for 48V.

Electrical Specifications:

	12V	24V	48V
Temp. Comp. (mV/°C)*	– 30mV	– 60mV	– 120mV
Accuracy	40mV	60mV	80mV
Min. voltage to operate	8V	8V	15V
Self-consumption	22mA	25mA	28mA
LVD current coefficient**	– 20mV	– 40mV	– 80mV
Charge algorithm	PWM, constant voltage		
Operating temperature	– 40°C to + 60°C		
Digital Display:			
Operating temperature	– 30°C to + 85°C		
Voltage accuracy	0.5%		
Current accuracy	2.0%		
Self-consumption	1 mA		

* 25°C reference
** per amp of load

WARRANTY: ***Five year warranty period. Contact Morningstar or your authorized distributor for complete terms.***

AUTHORIZED MORNINGSTAR DISTRIBUTOR:

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