ETA ENGINEERING

PBR SERIES

PV BATTERY CHARGE REGULATOR
12, 24, 36, 48 VOLTS DC • 5-44 AMP

LOW CURRENT

5 AMP PV BATTERY CHARGE REGULATOR
PBR 12-5, 24-5, 36-5, 48-5

SPECIFICATIONS

Rated Input Current-	**5 Amps**
Surge Rating-	10 amps for 20 sec
Voltage Available-	12, 24, 36, 48 VDC
Mounting Holes-	Two
Hole Diameter-	3/16 in
Weight-	0.28 lbs (0.13 kg)
Dimensions (inches)-	3.25 x 3.25 x 1.32

9 AMP PV BATTERY CHARGE REGULATOR
PBR 12-9, 24-9

SPECIFICATIONS

Rated Input Current-	**9 Amps**
Surge Rating-	18 Amps for 20 Sec
Voltage Available-	12, 24 VDC
Mounting Holes-	Two
Hole Diameter-	3/16 in
Weight-	0.28 lbs (0.13 kg)
Dimensions (inches)-	3.25 x 3.25 x 1.32

MID CURRENT

12 AMP PV BATTERY CHARGE REGULATOR
PBR 12-12

SPECIFICATIONS

Rated Input Current-	**12 Amps**
Surge Rating-	24 Amps for 20 Sec
Voltage Available-	12 VDC
Mounting Holes-	Two
Hole Diameter-	3/16 in
Weight-	0.88 lbs (0.40 kg)
Dimensions (inches)-	4.75 x 3.88 x 1.75

16 AMP PV BATTERY CHARGE REGULATOR
PBR 12-16, 24-16, 48-16

SPECIFICATIONS

Rated Input Current-	**16 Amps**
Surge Current-	32 Amps for 20 Sec
Voltage Available-	12, 24, 48 VDC
Mounting Holes-	Two
Hole Diameter-	3/16 in
Weight-	0.88 lbs (0.40 kg)
Dimensions (inches)-	4.75 x 3.88 x 1.75

22 AMP PV BATTERY CHARGE REGULATOR
PBR 12-22, 24-22

SPECIFICATIONS

Rated Input Current-	**22 Amps**
Surge Rating-	44 Amps for 20 Sec
Voltage Available-	12, 24 VDC
Mounting Holes-	Two
Hole Diameter-	3/16 in
Weight-	0.88 lbs (0.40 kg)
Dimensions (inches)-	4.75 x 3.88 x 1.75

FEATURES

PATENTED PARALLEL SWITCHING SHUNT
When the maximum charging voltage is reached, the patented parallel switch (U.S. Patent # 4661758) automatically shunts the incoming PV array current.

PULSE WIDTH MODULATION
Automatically adjusting to the load requirements and battery age, Pulse Width Modulation brings the battery up to maximum charge without trickle charging. High charge rates maintain current density across the surface of the plates, maximizing battery life.

TRANSIENT SURGE PROTECTION
Surge rating of twice the rated input current for 20 seconds. Solid state transient absorbing avalanche diodes protect the regulators from lightning induced surges and inductive load spikes.

TEMPERATURE COMPENSATED
To extend battery life and prevent stratification, the PBR Regulators automatically adjust the maximum charge voltage for the temperature of the batteries.

HIGH CURRENT

32 AMP PV BATTERY CHARGE REGULATOR
PBR 12-32, 24-32, 48-32

SPECIFICATIONS

Rated Input Current-	**32 Amps**
Surge Rating-	64 Amps for 20 Sec
Voltage Available-	12, 24, 48 VDC
Mounting Holes-	Four
Hole Diameter-	3/16 in
Weight-	1.625 lbs (0.74 kg)
Dimensions (inches)-	7 x 4.75 x 1.75

44 AMP PV BATTERY CHARGE REGULATOR
PBR 12-44, 24-44

SPECIFICATIONS

Rated Input Current-	**44 Amps**
Surge Rating-	88 Amps for 20 Sec
Voltage Available-	12, 24 VDC
Mounting Holes-	Four
Hole Diameter-	3/16 in
Weight-	1.625 lbs (0.74 kg)
Dimensions (inches)-	7 x 4.75 x 1.75

BATTERY CAPACITY METER

BATTERY CAPACITY METER
BCM 12, 24, 36, 48

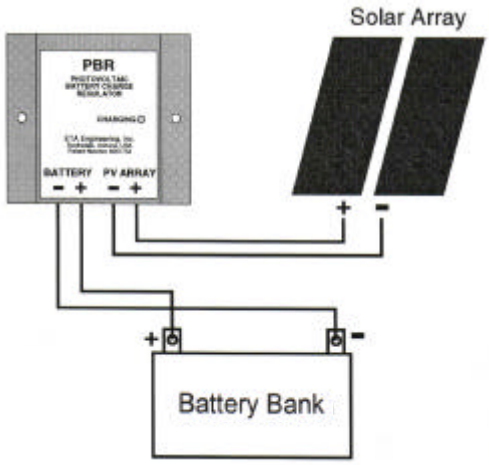
Indicates Battery Capacity, Float, Equalize, Low Voltage

SPECIFICATIONS

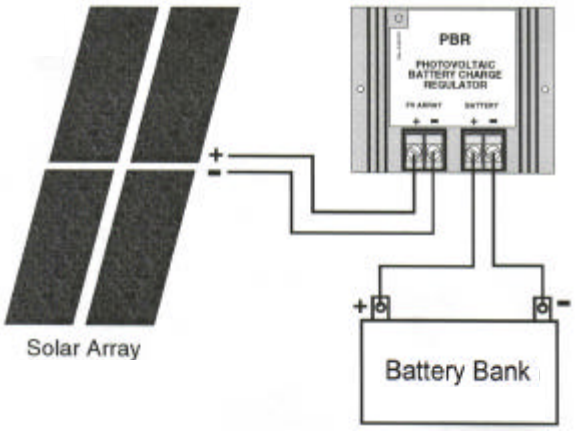
Voltage Available-	12, 24, 36, 48 VDC
Cable Length-	60 in (152.4 cm)
Weight-	0.375 lb (0.170 kg)
Dimensions (inches)-	2.0 x 4.0 x 0.75
Accuracy-	± 0.05 Vdc (12 V dc)

The four function BCM may be used in conjunction with the PBR Battery Charge Regulator or as a separate unit. Utilizing 13 LEDs, the BCM indicates Battery Capacity, Float, Equalize and Low Voltage.

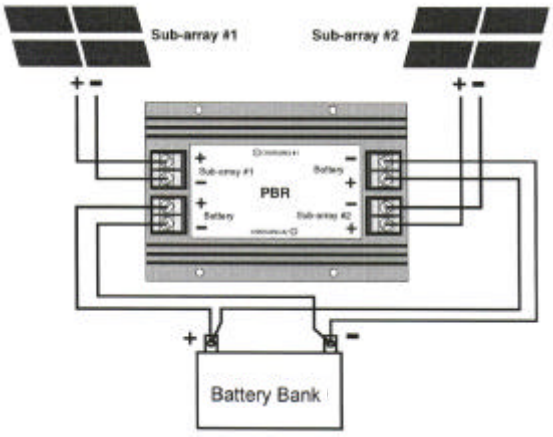
Low Current PBR Wiring Diagram



Mid Current PBR Wiring Diagram



High Current PBR Wiring Diagram



Installation and Operation Notes:

1. Bare wire connections under the PBR charge regulator terminal blocks are acceptable. Mid- and High-Current PBR models accept up to two #10 gauge bare wire inputs under each terminal clamp.
2. When the battery reaches the pre-set maximum voltage level at a given temperature, the PV module input will be shorted ("shunted") to a value near zero volts. The battery voltage will gradually drop back to a lower voltage, at which point the regulator will release the PV input, and charging will resume. At this time, the regulator input (module voltage) will be about one-half volt higher than the regulator output (battery voltage).
3. There are no field adjustments. The "Shunt" voltage level is factory set.

PBR Charge Regulator Selection Guide

Nominal System Voltage	Rated Array Power	PBR Model #	Rated Input Current
12 Vdc	85 Wp	PBR 12-5	5 Amps
	153 Wp	PBR 12-9	9 Amps
	204 Wp	PBR 12-12	12 Amps
	272 Wp	PBR 12-16	16 Amps
	374 Wp	PBR 12-22	22 Amps
	544 Wp	PBR 12-32	32 Amps
	748 Wp	PBR 12-44	44 Amps
24 Vdc	170 Wp	PBR 24-5	5 Amps
	216 Wp	PBR 24-9	9 Amps
	544 Wp	PBR 24-16	16 Amps
	748 Wp	PBR 24-22	22 Amps
	1088 Wp	PBR 24-32	32 Amps
	1496 Wp	PBR 24-44	44 Amps
36 Vdc	255 Wp	PBR 36-5	5 Amps
48 Vdc	340 Wp	PBR 48-5	5 Amps
	1088 Wp	PBR 48-16	16 Amps
	2176 Wp	PBR 48-32	32 Amps

Vdc - Volts Direct Current, Wp -Peak Watts

PBR Selection Guide Instructions

1. **Determine the nominal operating voltage of your PV array and battery system** (this may be dependent on your application, system size or inverter input requirements). We recommend increasing your system operating voltage to 24 Vdc when your PV array is larger than 1 kWp, or 48 Vdc when your PV array is larger than 2 kWp.
2. **Select the rated array power** to the left of the nominal system voltage that is equal to or less than your actual array power rating.*
3. **The PBR model listed to the right is recommended for use with your system.** If you plan to expand your photovoltaic array in the future, you may chose to select a PBR model with a higher current rating than the one that meets your current requirements.
4. **When ordering your PBR, please indicate the battery chemistry** you have selected for your system. ETA Charge Regulators are factory set to operate with specific battery types, thereby ensuring that your battery life is maximized. *

* Note: If your actual rated array power is larger than those listed in the selection table for your nominal operating voltage, please see ETA Engineering's PBRX Datasheet to select a PBRX regulator system that will meet your

Installation Instructions

When installing your PBR charge regulator, mount or locate the unit in or near the battery storage location. This will allow the charge regulator to approximate the temperature of the battery system and ensures that temperature compensated charging takes place.

Wiring Instructions:

1. Ensure that the photovoltaic array is properly wired to match the nominal operating voltage of the regulator and battery system (usually 12, 24 or 48 Vdc). Proper wiring diagrams for PV module/array can be obtained from the manufacturer or system designer. Identify the positive and negative leads of the PV array prior to connecting to the charge regulator.
2. Connect the battery leads to the terminal blocks on the PBR charge regulator labeled "Battery", also ensuring that the polarity of the battery leads are matched to the polarity of the terminal blocks.
3. Due to the regulator's very high efficiency, it will be destroyed if hooked-up improperly. Connect the PV array input leads to the terminal blocks on the PBR charge regulator labeled "PV Array", ensuring that the polarity of the input leads are matched to the polarity of the terminal blocks **(positive to positive, negative to negative)**.

Note: The regulators are protected if the battery connections are removed and the PV array remains connected. (It will rapidly turn on and off without overheating.)

For technical assistance, contact ETA Engineering:
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