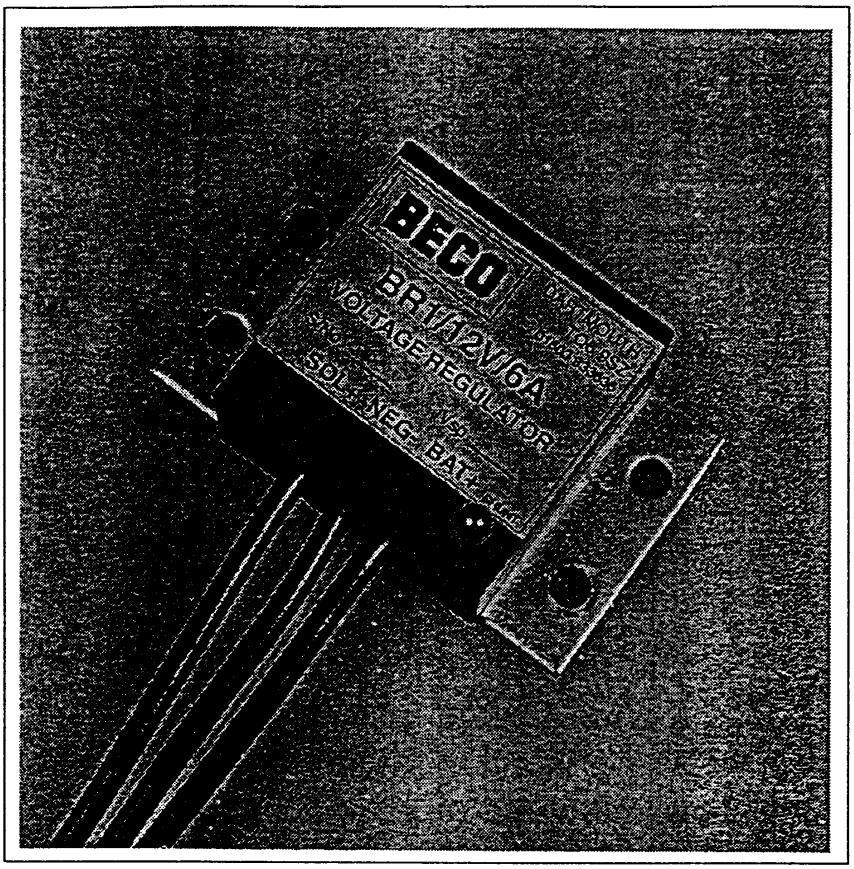
BECO 653-925.

# *Product Information*




## *Solar Shunt Regulators*

## **BR1/6/6** & **BR1/12/6**

Low power consumption
Fully encapsulated
Stainless steel heatsink / mounting plate
Rated to 6A
6V &12V versions
Temperature compensated
Status indication *(shunt)*
Solid state
Small & simple to fit
Low cost
Safely paralleled
Blocking diode included

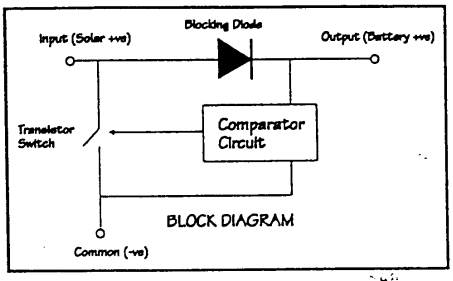
January 1996

BR1info.pm5

## *Functional Description*

The BR1 (6V & 12V versions) is a shunt regulator designed to limit the maximum voltage to which a lead acid battery can be driven when on charge from a photovoltaic (solar) module or array. It is a simple, low cost, solid state device for use with photovoltaic modules having a peak current not exceeding 6A. The unit has very low power consumption and features a single green, status indicating LED, which is illuminated when the battery voltage has reached the set-point and the module output is being shunted.

The circuit for the regulator (shown in the diagram opposite) comprise three main elements, a voltage comparator, a semiconductor switch and a blocking diode. The purpose of these elements is as follows:

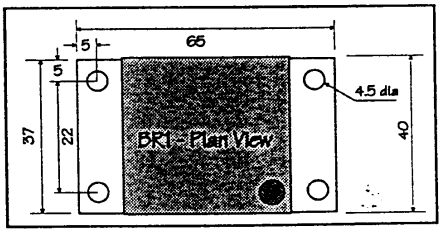



*Voltage Comparator*
The battery voltage is constantly compared with an internal reference level and when it reaches the set-point the semiconductor switch is triggered. The reference set-point voltage is automatically adjusted upwards at lower temperatures and downwards at higher ones.

*Semiconductor Switch*
When triggered the switch shunts the solar module/array, diverting its output away from the battery. When the battery voltage has decayed by 1.5V the module/array output is reconnected to the battery.

*Blocking Diode*
This is an electronic non-return valve and serves two purposes. Firstly it ensures the battery cannot discharge through the module/array at night and secondly that the battery is not shorted when the regulator shunts the module/array.

## *Detailed Description*




1) The regulator's PCB is encapsulated in polyurethane within a black ABS box measuring 40(L) x 40 (W) x 20 (H). This assembly is fastened to a 2mm thick stainless steel heatsink measuring 65 (L) x 37 (W).

2) The heat sink also enables the unit to be easily mounted via four 4.5mm DIA holes.

3) The unit is rated at 6A and will easily handle the output from one MSX-83 module.

4) The shunt set-point is fixed at 7.3V *(nominal 6V)* with reconnection at 6.5V or 14.6V *(nominal 12V)* with reconnection at 13.0V. Batches of 10 or more units may be set to customer requirements during manufacture. (Please state requirements when ordering).

5) The ends of the three 220mm leads (SOLAR + BATTERY + and COMMON NEGATIVE) are terminated with M4 spade terminals for ease of connection.

| | |
|---|---|
| Dimensions (mm) | 65(L) x 40(W) x 22(H) |
| Weight (g) | 95 |
| Lead Length (mm) / CSA (mm²) | 220 |
| Colour Code - SOLAR +ve | RED |
| COMMON -ve | BLACK |
| BATTERY +ve | YELLOW |
| Nominal Voltage (V) | 6.0 or 12.0 |
| Shunt Set-Point (V) * | 7.3 or 14.6 |
| Reconnect Voltage (V) | 6.5 or 13.0 |
| Diode Voltage Drop (V) | 0.4 |
| Temperature Coeff. of Voltage (mV/°C) | 20 |
| Input Current (max) (A) | 6 |
| Typical Consumption (mA) | <1 |

* *The set-point may be adjusted during manufacture to suit customer requirements - MOQ 10 off*

BECO

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