

## 6. Battery Charger

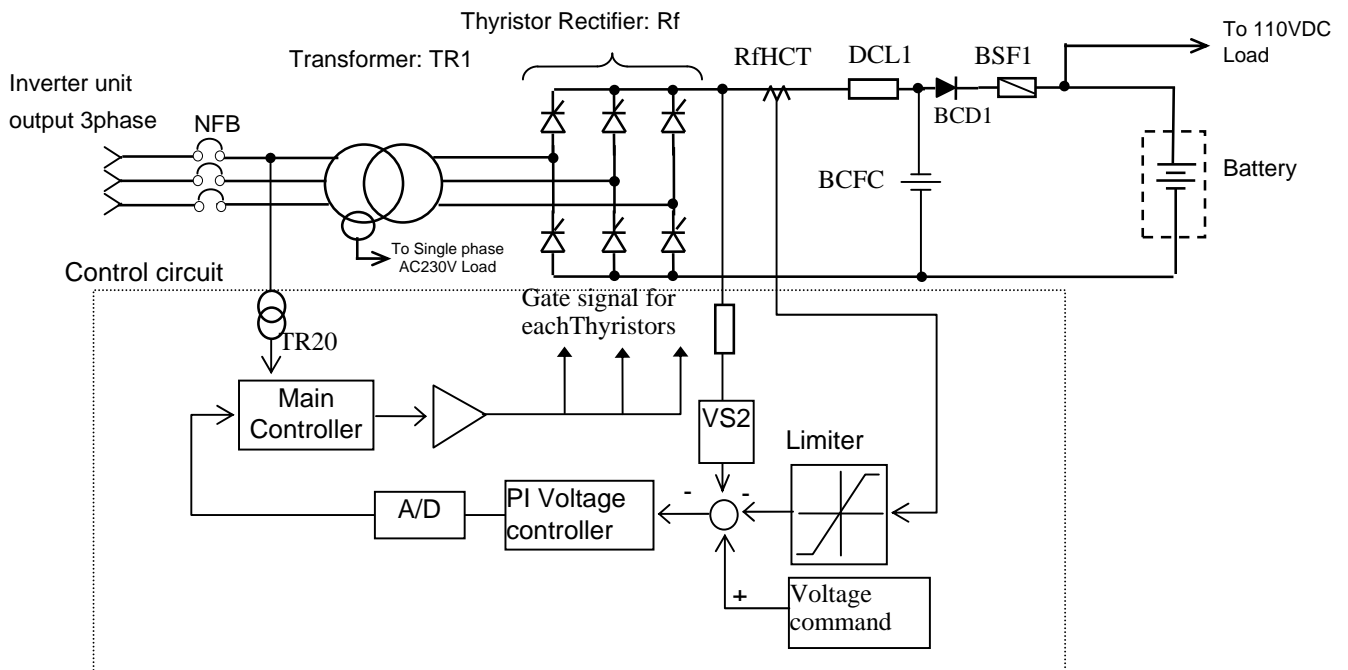
The battery charger circuit is consisted by the Thyristor 6-phase rectifier with current limit. This outputs DC110V power to low voltage loads and the batteries.

### 6.1. Battery Charger Main and control circuit

Figure. 12 shows the main circuit of battery charger.

The PI voltage controller with the current limit function controls the output voltage.

After supplied AC input voltage, the Thyristor Rectifier starts automatically.



**Figure 12: Battery charger Circuit**

### 6.2. Battery Charger Control

The function of control circuit in Figure.12 is described as follows,

(1) The output voltage is feedback to the control circuit through DC voltage sensor (VS2). The output current is feedback to the control through RfHCT. The output current feedback value is limited by the limiter.

(2) Voltage Error

The voltage command and the output voltage and the output current values are compared and produce the voltage error. This voltage error is input to the voltage controller.

(3) Voltage Controller

The output of the voltage controller is converted at A/D converter and the output of the A/D converter is input to the main controller.

(4) Main Controller

The main controller generates the gate pulse for the thyristors.

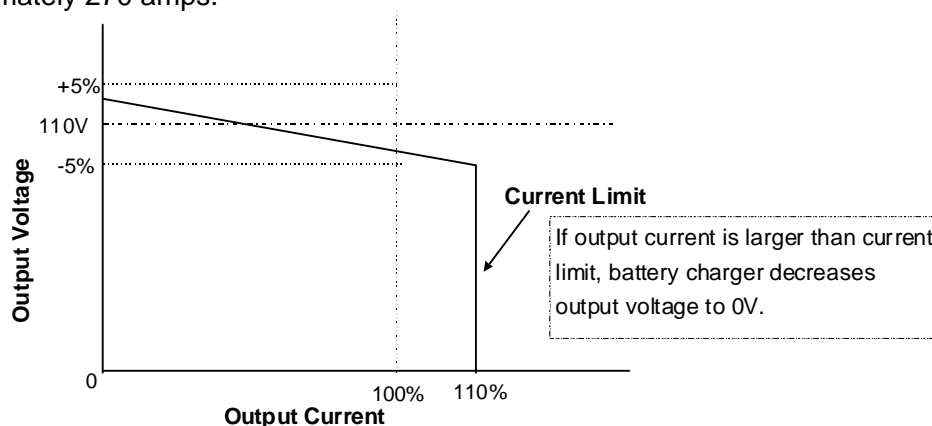
The Battery Charger output characteristic is shown in Figure.13.

The output voltage may vary between the 110V +5% to -5%.

The battery temperature compensation control will be applied to BCG output voltage. A

However, Battery charger output voltage will be decided based on normal battery voltage recommended by Battery supplier, so that there is a possibility not to keep output voltage within 110V-5% and 110V+5% if normal battery voltage recommended by Battery supplier is not suitable value for 110V output.

Battery charger output voltage decreases if the battery charger output current increases according to regulation. If the battery charger output current including the battery current is more than limitation of the battery charger output current, the battery charger will decrease output voltage up to 0V and the battery charger output current will be limited. The current controller limits the output current below 110% of the design maximum current load, approximately 270 amps.



**Figure 13: Battery Charger Output Characteristic**