DC RECTIFIER BATTERY CHARGER

RDA / RDAT AUTOMATION BATTERY CHARGER

The Battery Charger is SCR controlled AC/DC rectifier with automatic constant voltage and constant current ability. On LCD panel, you can see all measurement values, real time base events and failures and communicate remotly with in RS 232 port or modbus. All operations are controlled and progressed by micro controller. Adjustable timer is used for boost charging the batteries automatically. Output current, battery current, boost and Float Charge Voltages are adjustable on the control panel easily. The Timer is a decrementing counter by one hour. The Charger output gives the boost charging voltage by setting the timer to any value larger than zero. The Charger returns to floating voltage level when the timer value reaches to zero.

Also automatic boost charge can be selected on menu. The automatic boost menu has the options for selecting the boost and float current accroding to battery capacity. The user should set the suitable float and boost currents of the battery before selecting the automatic boost option. After the set-up the automatic boost function will monitor the battery current and select boost or float option by referring to the set values. If the charging current is higher than set boost current the system will select boost and if the charging current is lower than set float current the system will select float option. In case low battery alarm the automatic boost will select boost option until the battery charging current reaches to the set float value.

The input and output of the charger are protected against to misuse and line disturbances electronically. Input and output can be switched by circuit breakers individually. It has self-protection against to over temperature. The alarm contacts can be used for external system in the case of any anomaly. The output is fully isolated from the AC line input. The Charger has a modular design to provide service and maintenance simplicity. The outputs of the Battery Chargers can be connected in parallel according to need.

Standart Features

- Adjustable Timer for Boost Charging
- Adjustable Boost and Float Charge Voltages
- Automatic Boost Charge Selection according to boost / float current set value
- Adjustable Rectifier Output Current and Battery Charge Current
- LCD Display for DC Load / Battery Voltage, DC Load / Battery Current, Input AC Voltage / Line Current/ Frequency
- Event History for all Electrical values and failures
- Automatic and Manuel Battery Test
- Boost inhibit facility for interlock redundant application
- Output Filter Inductor and DC Longlife Capacitor
- Electronic Over / Under Voltage, Over Current and Short Circuit Protections
- Isolated Output by Input Transformer and output halleffect current module
- Parallel Redundant Operation
- Boost and Float dropper control output for Ni-Cd and Lead Acid Battery
- Input Filter and input surge Voltage protection
- Internal Over Temperature protection
- Temperature Compensetion for Battery
- Low Battery Indication and Alarm contacts
- Rectifier Failure Indication and Alarm contacts
- Rectifier Over Voltage Indication and Alarm contacts

- Over Temperature Indication and Alarm contacts
- Line Failure Indication and Alarm contacts
- Input MCB Indication and Alarm contacts
- Load MCB Indication and Alarm contacts
- Battery MCB Indication and Alarm contacts
- Reverse Battery Connection Protection
- Reset Button
- RS- 232 comminacition
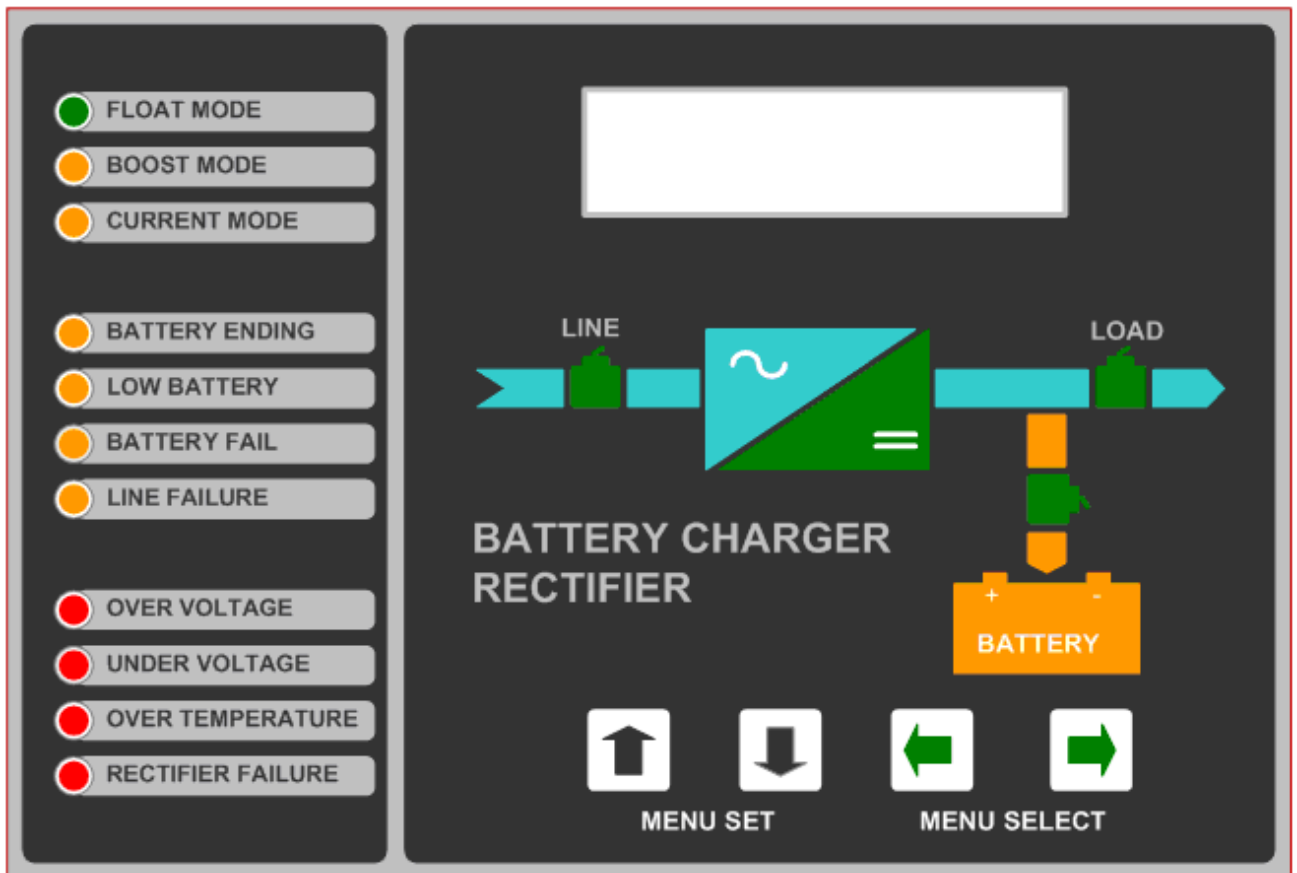
Options

RS-485

Silicon Dropper Module For Load Output (Load voltage output ± 5 %)

Rectifier and Battery Group with the same cabinent

LVD Deep Discharge Battery Protection contactor

Earth Fault Indication and Alarm contacts

TECHNICAL SPECIFICATIONS

Input

Input Voltage	380 VAC / 400 VAC / 415 VAC ±15%
	220 VAC / 230 VAC / 240 VAC ±15%
Input Frequency	50 / 60 Hz ±5%
Input Protection	Thermic–Magnetic Over current protection MCB, Over voltage protection
Input Power Factor	>0.8

Output

Floating Output Voltage	24 VDC ±1% / 48 VDC ±1% / 110 VDC ±1% / 220 VDC ±1%
Output Voltage Adjustment	± 20% of Nominal Output Voltage
Boost Output Voltage	100% to 120% of Floating Output Voltage
Nominal Output Current	30A / 60A / 100A / 200A / 400A
Output Ripple	≤ 1% RMS AC of Output Voltage
Transient Response	5% of Output Voltage (25% load change at 50% load)
Output Protection	Short Circuit, Over voltage and reverse polarity protection

Display Panel

Measurements	LCD Displays for Load Output Voltage / Current, Battery Output Voltage / Current and Lıne Voltage / Line Current / Frequency
Indicator	Boost Charging, Float Charging, Charger Failure, Over voltage, Over temperature, Low battery, Under voltage, Battery endıng, Battery test, Earth Fault and Input Power OK.
Buttons	Timer Setting, Boost Voltage Setting, Float Voltage Setting, Output current setting, battery current setting, automatic boost setting and Reset buttons.

Event History

AC Line Input high / Low, Rectifier output high / Low, Battery test failed, Over temperature, Low Battery, Line / Battery / Load MCB events are displayed on time base.

Communication

RS 232 communiciation on real time base for remote monitoring and control.
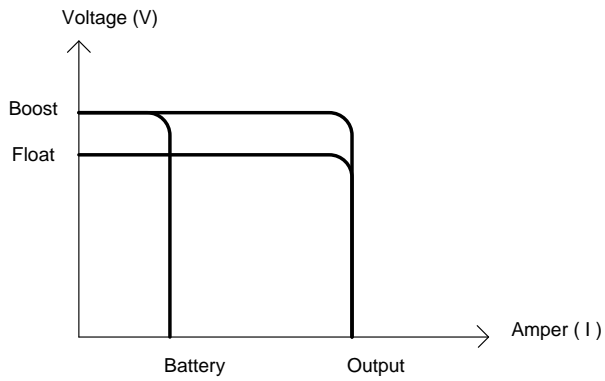
Alarm Contacts

Charger Failure	Open or closed free contacts
Low Battery	Open or closed free contacts
Rectifier over voltage	Open or closed free contacts
Over temperature	Open or closed free contacts
Line Failure	Open or closed free contacts
Load MCB	Open or closed free contacts

| Battery MCB | Open or closed free contacts |
| Line MCB | Open or closed free contacts |

General

Boost Timer	0 – 99.9 hours adjustable
Cooling	Forced by internal fan
Isolation Voltage	3000VAC (input / output- input /chassis - output /chassis)
Efficiency	>90% @ full load
Operating Temperature	-10 / + 50 ºC
Protection Level	IP 20 (IP 54 on request)
Relative Humidity	5% to 90% non condensing
Circuit Breakers	Thermic – magnetic circuit breakers for Input, Battery and Load (up to 100A)
Reset Button	in case of failure of the system for re-operation. (Without disconnecting the load from battery group)
Boost inhibit	Parallel redundant mode for interlock application inhibits one of the rectifiers boost operation

Battery voltage

Boost voltage
Float voltage

0   6   8   Time hour

Battery current

Charge current

Boost current

Float current

0   6   8   Time hour
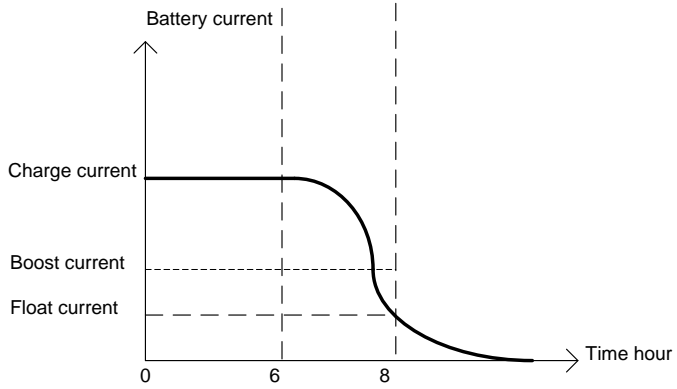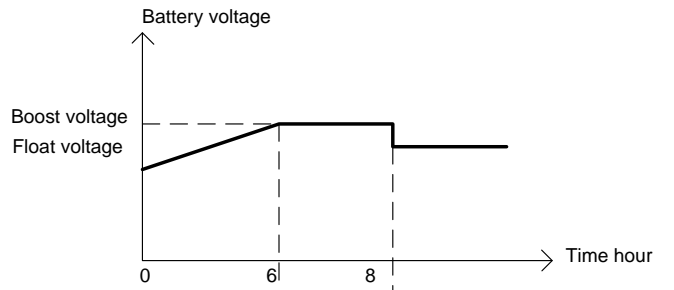
Battery automatic boost/float charge technique

Voltage (V)

Boost

Float

Battery   Output   Amper (I)

Constant voltage / constant current rectifier output
V/I characteristics

↑ **↓** **←** **→**

Menu set **Menu select**

NOTE: all given values are for 4 battery systems.

BATTERY CHARGER
UP=ON DOWN=OFF

NOTE:
Red colored values can be set Using menu set(**up-down**) buttons
Firstly set the parameters and then
push **right** button to **save.** Push left button to escape.

L1 = 220   f=50.0
Iin=21   Vb=54.4

Menu 1
monitorring

Vb = 54.4   Vl=48.0
Ib=10.0   IL=50.0

Menu 2
monitorring

→ Main menu
and
screen saver

Boost V=56.8
Float V=54.4

Menu 3
controlling

Set low battery value
LOW BAT. V= 44.0

Menu 4
controlling

Boost I=6
Float I=3

Menu 5
Controlling

Out I = 5
Charge I = 3

Menu 6
controlling

There are three switch conditions.
1:auto (automatic mode)   2:never (switch off mode)
3:do now(do now manuelly)

A. b. Test 17 hr
M. boost 8 hr

Menu 7
controlling

Boost ch. = 1
Bat. test = 1

Menu 8
controlling

Show that: total events number is equal 32. And 1. (the last event) given below.
You can see other events (2.,3.,4. etc.) using up-down buttons.
7 is event code.
180 is event value (it exist only voltage events;line low,line high,line ok, low battery etc...)
3(day) **4**(month) **12**(hour) **35**(minute) of event.

Date   3 4 10
Time   12 32 55

Menu 9
controlling

Events 32 1
7 180 3 4 12 35

Menu 10
monitorring

EVENT CODES:

1:        LINE MCB OFF
2:        LINE MCB ON
3:        BATTERY MCB OFF
4:        BATTERY MCB ON
5:        LOAD MCB OFF
6:        LOAD MCB ON,
7:        LINE LOW
8:        LINE HIGH
9:        LINE NORMAL
10:      LOW BATTERY
11:      BATTERY OK
12:      RECTIFIER OVER
13:      RECTIFIER UNDER
14:      RECTIFIER OK
15:      OVER TEMPERATURE
16:      NORMAL TEMPERATURE
17:      BATTERY TEST FAIL
18:      BATTERY TEST OK.

First screen (blank state)

MONITORRING

- Battery Voltage
- Battery Current
- Load Voltage
- Load Current
- Line voltage L12
- Line voltage L13
- Line voltage L23
- LINE FRQ
- FLOAT Vdc
- BOOST Vdc
- RECT Imax
- BAT Imax
- BAT TEST
- BAT TEST TIME — HOUR
- BOOST
- BOOST TIME — HOUR
- I FLOAT
- I BOOST
- LOW BAT. V
- DATE
- TIME

EVENT HISTORY

CLEAR HISTORY

READ COMPLETE HISTORY

SET PARAMETERS

Parameter		SAVE
FLOAT Vdc		SAVE
BOOST Vdc		SAVE
RECT Imax		SAVE
BAT Imax		SAVE
BAT TEST	(1=AUTO 2=NEVER 3=DO_NOW)	SAVE
BAT TEST TIME	HOUR	SAVE
BOOST	(1=AUTO 2=NEVER 3=DO_NOW)	SAVE
BOOST TIME	HOUR	SAVE
I FLOAT		SAVE
I BOOST		SAVE
LOW BATTERY VOLTAGE		SAVE
DATE		
TIME		SAVE

COM PORT

START / STOP COMMUNICATION   START / STOP RECTIFIER

ALARM RELAYS

- OVER TEMPERATURE
- RECTIFIER OVER
- RECTIFIER UNDER
- LOW BATTERY
- LINE FAILURE
- LINE MCB
- BATTERY MCB
- LOAD MCB

Second screen (Form1 — with data)

MONITORRING

- Battery Voltage: 120.7
- Battery Current: 9.1
- Load Voltage: 34.9
- Load Current: 14.6
- Line voltage L12: 366.3
- Line voltage L13: 364.1
- Line voltage L23: 364.0
- LINE FRQ: 50.0
- FLOAT Vdc: 122.3
- BOOST Vdc: 125.0
- RECT Imax: 59.9
- BAT Imax: 10.0
- BAT TEST: 1
- BAT TEST TIME: 24.0 HOUR
- BOOST: 1
- BOOST TIME: 8.0 HOUR
- I FLOAT: 3.0
- I BOOST: 6.0
- LOW BAT. V: 95.0
- DATE: 14: 7:10
- TIME: 17:22

EVENT HISTORY

LOAD MCB ON   0   14/7   17/20

CLEAR HISTORY

READ COMPLETE HISTORY

SET PARAMETERS

Parameter	Value		SAVE
FLOAT Vdc	122.3		SAVE
BOOST Vdc	125.0		SAVE
RECT Imax	59.9		SAVE
BAT Imax	10.0		SAVE
BAT TEST	1	(1=AUTO 2=NEVER 3=DO_NOW)	SAVE
BAT TEST TIME	24.0	HOUR	SAVE
BOOST	1	(1=AUTO 2=NEVER 3=DO_NOW)	SAVE
BOOST TIME	8.0	HOUR	SAVE
I FLOAT	3.0		SAVE
I BOOST	6.0		SAVE
LOW BATTERY VOLTAGE	95.0		SAVE
DATE			
TIME			SAVE

COM PORT: COM1

START / STOP COMMUNICATION   START / STOP RECTIFIER

ALARM RELAYS

- OVER TEMPERATURE
- RECTIFIER OVER
- RECTIFIER UNDER
- LOW BATTERY
- LINE FAILURE
- LINE MCB
- BATTERY MCB
- LOAD MCB