

SMART

DC UNINTERRUPTIBLE POWER SUPPLY SYSTEM

SMART

**SMART LOW MAINTENANCE SERIES by
Microcontroller Unit (MCU) Thyristor Control
Battery Charger /Rectifier Systems**

- Constant Voltage Current Limiting Battery Charger ●
- Designed & Manufactured to Customer Requirements ●
- After Sales & Services ●
- Preventive Maintenance and Training ●
- Project Planning ●
- Spare Parts ●

SMART

Proudly designed and manufactured in Malaysia

ECOGREEN POWER SDN BHD (1000680K)

Lot 2278, Sungai Laksamana, Mukim Teluk Baru, 36100 Bagan Datoh, Perak. Malaysia

SMART Low Maintenance Battery Charger

The SMART Low Maintenance Series standby power system is built for charging both lead acid battery and low maintenance nickel cadmium batteries



The SMART Low Maintenance Battery Charger Series standby power system is built for charging both lead acid and low maintenance nickel cadmium batteries.

Our range of products comprise both the manufacturing of our time tested brand name Charger as well as the design of special equipment to meet customer's requirement.

Our organized distribution network both at home and abroad ensures substantial and qualified attention to our customers.

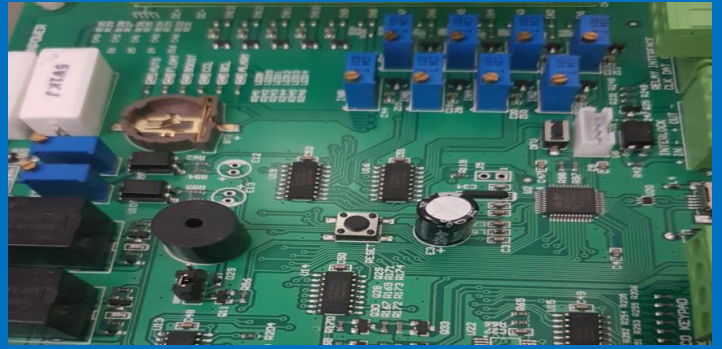
The Battery Charger / Rectifier is specially designed for applications such as :

- Charging of battery for engine starting of standby generator set
- DC standby system where the battery is used to supply DC power when the mains fails. The battery is kept at float charged condition continuously.
- On-Line DC System where the charger /rectifier is used to charge the battery as well as supply power to the load.
- Telecommunication systems in which the charger is used as a power supply with or without battery connected.
- Standby DC power for switchgear closing and tripping.
- Standby centralized DC emergency lighting systems.
- Standby Fire and Security systems.
- Process control and monitoring systems.

SMART

The SMART Low Maintenance series Description :

The SMART Low Maintenance Series is protected against overload by charger current limit and charging current by battery current limit



The SMART low maintenance thyristor rectifier are equipped with a "slow start" device. This slow start ensures the gradual increase of rectifier output voltage up to the preset value. This limits the starting current and protects the rectifier in the event it is "turned on" with a short circuited output. All rectifiers are provided with surge suppressors to protect against transient AC mains input voltage.

The mains supply voltage is stepped down by the isolating transformer to suitable low level.

A thyristor bridge is used to rectify the stepped down voltage from the isolating transformer to give a pulsating DC output voltage. The mean output DC voltage is precisely controlled by fixing the angle of the thyristor. The pulsating DC is then filtered to meet the required level of ripple and noise using DC inductance filter to give a stable output voltage. Output level of the rectified voltage is controlled by adjusting the conduction time of the thyristor, by constantly monitoring the output voltage and variation in the AC mains voltage and load conditions.

The SMART Low maintenance rectifier is protected against overload by the charger current limit device, whenever the load current exceeds the rated output current of the rectifier.

The SMART Low maintenance rectifier is protected against charging battery current by battery current limit device. The setting of battery charging current is based on 20% of the rated AH of the nickel cadmium battery.



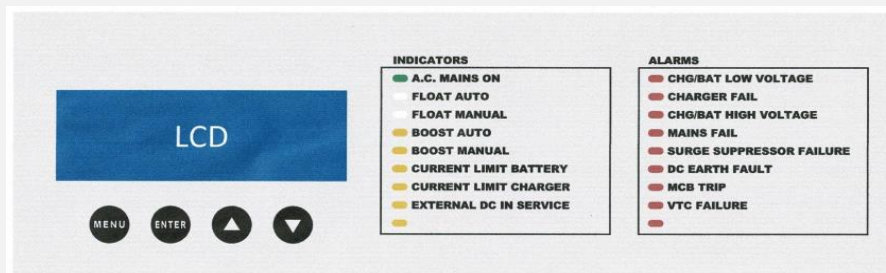
The SMART Low Maintenance Series is provided with surge suppressors protecting the device against transient AC mains voltage

Technical data for Battery Charger / Rectifier

○ Manufacturer	: ECOGREEN POWER SDN BHD (1000680K)
○ Model	: SMART Low Maintenance Series (as per page 7)
○ Brand	: SMART
○ Country of Origin	: Proudly designed and manufactured in Malaysia
○ Standard compliance	: IEC60146-1-1, IEC60529 (IP31), MS IEC 61000-4-11:2015
○ Type	: Thyristor Controlled (2 Pulse drive for Single Phase)
○	: Thyristor Controlled (6 Pulse drive for Three Phase)
○ Input Data	: 240Vac +/- 10%, for Single Phase, 50Hz/60Hz +/-5%
○	: 415Vac +/- 10%, for Three Phase, 50Hz/60Hz +/-5%
○ Output Voltage (Vdc)	: 12V, 24V, 30V, 48V, 60V, 110V & 220Vdc
○ Output Current (Adc)	: 1A to 1000 Amperes
○ Float Charge Data	: 80% to 140% (adjustable)
○ Boost Charge Data	: 100% to 150% (adjustable)
○ Commisioning Charge	: 110% to 160% (adjustable)
○ Stability regulation output	: +/- 1.0 % from 0 - 100% DC load at simultaneous variations of AC voltage input of +/-10% and frequency variation of +/-5%.
○ Ripple Voltage (Vrms)	: Standard 5% (without battery connected). Optional : < 0.1% / 1% / 2% / 3% or 4%.
○ Rectification	: Fullwave thyristor and diode control
○ Overload	: 110% continuos overload with short circuit protection by current limitng thyristor controlled.
○ Charger Current Limiting	: Adjustable from 50% to 110% nominal current
○ Battery Current Limiting	: Adjustable from 10% to 20% from rated battery Ampere Hour (AH)
○ Protection	: Automatic current limiting : Slow start device : DC High voltage trip AC incoming MCB/MCCB : Mains DC incoming MCB/MCCB : Load Output MCB/MCCB : Battery Fuse/MCB/MCCB : AC suppression : Reverse battery protection : High speed fuse for charger output : RC suppression network : Voltmeter fuse : Blocking diode device : Boost Interlocking facilities to allow only one charger in Boost operation at one time

Technical data for Battery Charger / Rectifier

- Front Panel metering (1.5% Acc. : Charger output DC voltmeter & Ammeter , size 72x72mm
: Load output DC voltmeter & Center Zero Ammeter , size 72x72mm
: Battery output DC voltmeter & Center Zero Ammeter , size 72x72mm
: AC Input voltmeter & Ammeter , size 72x72mm
- Facility for manual and Automatic Boost Charge incorporated for both charger : " Auto" mode
: " Manual Float" mode
: " Manual Boost: mode
- Charge Mode Indicators LED : "AUTO FLOAT" LED indicator (Green)
: "AUTO BOOST" LED indicator (Amber)
: "MANUAL FLOAT" LED indicator (Green)
: "MANUAL BOOST" LED indicator (Amber)
: " CHARGER CURRENT LIMIT" LED indicator (Red)
: " BATTERY CURRENT LIMIT" LED indicator (Red)
- Alarm LED Indicators complete with SCADA ready terminal for individual/ summary alarm volt free contacts for NO or NC with max. 3A 250Vac contact : "CHARGER/BATTERY LOW VOLTAGE " LED indicator (Red)
: "CHARGER/BATTERY HIGH VOLTAGE " LED indicator (Red)
: " CHARGER FAIL " LED indicator (Red)
: "MAINS FAIL " LED indicator (Red)
: "DC EARTH FAULT " LED indicator (Red)
: "MCB TRIP " LED indicator (Red)
: "SURGE SUPPRESSOR FAIL " LED indicator (Red)
: " VOLTAGE TEMPERATURE COMPENSATION FAIL " LED indicator (Red)
: " EXTERNAL DC IN SERVICE " LED indicator (Red)
- Transducer Ready : A Charger output transducer with current output 4-20mA is provided to give battery charger DC output voltage
- Front LCD Display : Control by MicroProcessor Control (MCU)



Microcontroller MCU Controller Board
Core: ARM®32-bit Cortex®-M0 CPU, frequency 48 MHz
64 Kbytes of Flash memory
16 Kbytes of SRAM with HW parity

Technical data for DC Distribution Board

○ Manufacturer	: ECOGREEN POWER SDN BHD (1000680K)
○ Brand	: SMART DB
○ Country of Origin	: Malaysia
○ Nominal Voltage	: 110V DC & 220V DC
○ Busbar dimension	: 5 x 30 mm (342A 20KA RMS)
○ Rated Current	: 342A
○ Short circuit Current	: 20KA / 1 sec
○ Busbar Material	: Copper (tinned)
○ Incomer Circuit	: MCCB from 100A, 125A, 150A, 200A & 250A Pole (only 2 Pole used)
○ Outgoing Circuit	: MCB/MCCB from 10A, 16A, 20A, 25A, 32A, 40A, 50A & 63A 2 Pole

Technical data for Charger/Rectifier & Distribution Board Cabinet

○ Country of Origin	: Malaysia
○ Cubicle Finishing	: Chemical resistant epoxy paint coating
○ Finishing	: RAL7032 light Grey (Interior & External), ther colour is availabe upon request.
○ Ventilation	: Natural Ventilation
○ Lighting	: Cabinet built in energy saving lighting
○ Door Stopper	: Door with stopper to prevent over swing
○ Mounting	: Floor standing 2.0mm thick sheet steel cubicle
○ Termination	: All terminal connections for output circuit through terminal blocks
○ Index Protection (IP)	: IP20, IP21, IP22, IP23, IP30, IP31, IP32, IP54 and so on
○ Max ambient Temperature	: 45 degree celcius
○ Cable entry	: Bottom or Top (depend on request)
○ Construction	: Access to all component from the front
○ Dimensions	: Standard cabinet (H1200 x W600 x D600)mm : Standard cabinet (H1600 x W600 x D600)mm : Standard cabinet (H1800 x W600 x D600)mm : Extra large cabinet (H2000 x W800 x D800)mm

CHG/BAT VOLT: 26.7 V
BAT AMB TEMP: 20.0° C
CHG MODE: M. FLOAT

MENU

ENTER

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INDICATORS

- A.C. MAINS ON
- FLOAT AUTO
- FLOAT MANUAL
- BOOST AUTO
- BOOST MANUAL
- CURRENT LIMIT BATTERY
- CURRENT LIMIT CHARGER
- EXTERNAL DC IN SERVICE

ALARMS

- CHG/BAT LOW VOLTAGE
- CHARGER FAIL
- CHG/BAT HIGH VOLTAGE
- MAINS FAIL
- SURGE SUPPRESSOR FAILURE
- DC EARTH FAULT
- MCB TRIP
- VTC FAILURE

Technical data for Installation & Cable Sizing

Single Phase Charger /Rectifier Data

Model	System Voltage (Vdc)	System Current (Adc)	Input Current (Aac)	Recommended AC Input Cable (mm2)	Recommended DC Output Cable (mm2)	Cabinet Dimension H x W x D (mm)	Cabinet & Charger Approx. Wiegth (kg)
SMART12-10	12	10	1.17	4	6	1200 x 600 x 600	110
SMART12-50	12	50	5.83	4	16	1600 x 600 x 600	120
SMART12-100	12	100	11.66	4	35	1600 x 600 x 600	180
SMART24-10	24	10	2.34	4	6	1200 x 600 x 600	120
SMART24-25	24	25	5.86	4	10	1200 x 600 x 600	130
SMART24-35	24	35	8.21	4	10	1200 x 600 x 600	140
SMART30-10	30	10	3.06	4	6	1100 x 800 x 520	120
SMART30-35	30	35	10.70	4	10	1600 x 600 x 600	150
SMART30-100	30	100	30.58	6	35	1800 x 600 x 600	200
SMART48-10	48	10	4.7	4	6	1200 x 600 x 600	190
SMART48-50	48	50	23.45	6	16	1800 x 600 x 600	210
SMART48-100	48	100	46.9	16	35	1800 x 800 x 800	290
SMART110-10	110	10	9.95	4	6	1600 x 600 x 600	200
SMART110-25	110	25	24.89	6	10	1600 x 600 x 600	210
SMART110-35	110	35	34.85	10	10	1600 x 600 x 600	230
SMART220-10	220	10	19.91	4	6	1600 x 600 x 600	210
SMART220-25	220	25	49.8	16	10	1600 x 600 x 600	250
SMART220-35	220	35	69.7	16	10	1600 x 600 x 600	280

Three Phase Charger /Rectifier Data

SMART300-24-10	24	10	0.66	4	6	1200 x 600 x 600	130
SMART300-24-50	24	50	3.30	4	16	1200 x 600 x 600	150
SMART300-24-100	24	100	6.60	4	35	1600 x 600 x 600	190
SMART300-30-10	30	10	0.82	4	6	1200 x 600 x 600	125
SMART300-30-50	30	50	4.12	4	16	1600 x 600 x 600	160
SMART300-30-100	30	100	8.24	4	35	1600 x 600 x 600	210
SMART300-48-10	48	10	1.32	4	6	1200 x 600 x 600	195
SMART300-48-50	48	50	6.60	4	16	1600 x 600 x 600	215
SMART300-48-100	48	100	13.21	6	35	1800 x 600 x 600	295
SMART300-110-25	110	25	6.60	4	6	1600 x 600 x 600	215
SMART300-110-35	110	35	9.25	4	6	1600 x 600 x 600	250
SMART300-110-50	110	50	13.21	4	16	1800 x 600 x 600	265
SMART300-110-75	110	75	19.82	6	25	1800 x 600 x 600	275
SMART300-110-100	110	100	26.43	6	35	1800 x 800 x 800	290
SMART300-110-125	110	125	33.04	6	50	1800 x 800 x 800	310
SMART300-110-150	110	150	39.65	10	70	1800 x 800 x 800	350
SMART300-220-10	220	10	5.28	4	6	1200 x 600 x 600	200
SMART300-220-25	220	25	13.21	4	6	1600 x 600 x 600	220
SMART300-220-35	220	35	18.50	6	10	1600 x 600 x 600	240
SMART300-220-300	220	300	158.60	70	150	1800 x 800 x 800	450

Note :

AC supply are based on 415V/240V 50 Hz, Standard Index Protection class is IP31,

All cabinet are floor standing type, special requirement also available upon request,

We are customised battery charger/rectifier manufacturer, the system voltage & current is upon request.