Rectifier & Battery Charger

Technical Data

Rectifier / Battery Charger
DC Power Supply Systems

SUNPOWER TECHNOLOGIES SDN BHD

Designed And Manufactured To Requirements
Project Planning And Solutions After Sales Services
Preventive Maintenance And Training

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Rectifier & Battery Charger

General Applications

The SUNPOWER TECH series standby power system is built for both charging lead acid and nickel cadmiumbatteries and is available in single and three phase input dependent on the power rating.

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

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

The 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. This battery is kept at float charged continuously at all time.
- ON-line DC systems, 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. The charger functions as a battery eliminator when no battery is connected.
- Standby DC power for switchgear closing and tripping.
- Standby centralizes DC emergency lighting systems.
- Standby Fire and security systems.
- Process control and monitoring systems.

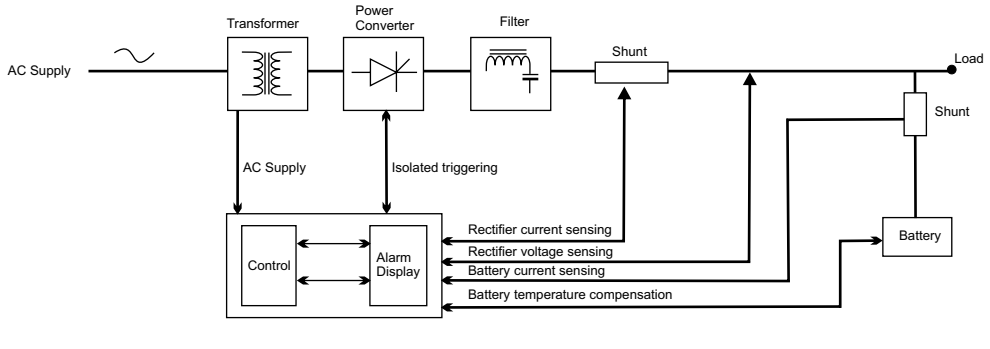
Charger / Rectifier Circuit Descriptions

The thyristor rectifiers are equipped with a device call slow start. This ensures the gradual increase of the rectifier output voltage up to the preset value. This limits the starting current and protects the rectifier in the event that they are turned on with a short circuit output. All rectifiers are provide with surge suppressors protecting against transient mains voltage.

The manis supply voltage is stepped down by the isolating transformer to a suitable low level. A thyristor is used to rectify an AC voltage from an isolating transformer to give a pulsating DC output voltage. The mean output DC voltage is precisely controlled by fixing the firing angle of the thyristor. This 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 conductin time of the thyristor. By constantly monitoring the output voltage and varying the conduction time accordingly, the output voltage level is kept well regulated regardless of variation in the mains voltage or load conditions.

The rectifier is protected against overload by current limit device. When the load current is High than the rated output current of the rectifier.

Operational Block Diagram



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Rectifier & Battery Charger

Single Phase & Three Phase Rectifier / Battery Charger Technical Data

Recitifier Input (AC)

Voltage	: 110 / 220 / 230 / 240Vac	: 220 / 380 / 400 / 415Vac
Phase	: 1 Phase	: 3 Phase
Voltage Variation	: +/- 10%	: +/- 10%
Frequency	: 50Hz +/-6% or 60Hz	: 50Hz +/-6% or 60Hz

Recitifier Output (DC)

System Voltage	: 12, 30, 48, 110 & 220 Vdc
Float Voltage	: 80 - 135% (Adjustable)
High Rate Voltage (Boost)	: 90 - 145% (Adjustable)
Commissioning Voltage	: Up to 155% (Adjustable)
Float Voltage Static Regulation	: +/-1% (at +/-10 % Input Voltage Variation)
Dynamic Voltage Regulation (10%-100% and 100-10% Load Step)	: Maximum Voltage Dip 5% and Recovery Time is max. 250ms
Ripple Voltage (without Battery Connected)	: RMS ≤ 5%
Ripper Voltage (with Battery Connected)	: RMS ≤ 2% (when batery Ah is min. 4 times that of charger rating)
Current Output Ratings	: 3 -300Ampere
Output Current Limitation	: 50-110% Nom (accuracy: =/-2%)
Battery Current Limitation	: 10-100% Nom (Accuracy:+/-2%)

Genaral Date

Storage Temperature	: -20 to +70°C
Operation Temperature	: -10 to 40°C (>40 to +55°C derate 1.25% per °C)
Altitude	: up to 1000 m (>1000m to 4000m derate 7% per 1000 m)
Humidity	: ≤95%RM (non-condensing)
Audible Noise	: ≤65dBA at 1m
Audible Noise with Redundant Fans	: ≤70aBA at 1m
Stabilized power supplies DC output	: IEC 478
Electrical Measurement Instrument	: IEC 51
Power Transformers	: IEC 76
Degree of Protection	: IP20 according to IEC 529
Performance Test	: IEC 146 Semiconductor Converters
Cabinet Colour	: RAL 7032 (light grey)
Conductor Insulated Cables	: HOV5-K & HOV7-K (IEC 228) HOV5-K (300/500V), HOV7-K(450/750V) Test Voltage HOV5-K (2000V), HOV7-K(2500V)
Cooling	: Natural Convection up to 100A, > 100A Forced Ventilation Fan
Dielectric Insulation Test	: 2kV for 1 minute between Input and Output to Earth
Insulation Resistance Test	: ≥10 Mohm at 500Vdc Input and Output to Earth
:	
Protection	: The Rectifier is protected by Surge Absorber (RC Circuit) for DC Circuit and Surge Suppressor for AC incoming Circuit : Overload Current Limitation Circuit : Input and Output Fuses /MCBs

Rectifier & Battery Charger

Single Phase Rectifier & Battery Charger
Data for Installation and Cabinet Sizes

Technical Data								
Model	System Voltage (Vdc)	System Current (Adc)	Input Current (Aac)	Input Fuse (Aac)	Recommended Input Cable ($mm^{2)}$	Recommended Input Cable ($mm^{2)}$	Cabinet Dimension* L X D X H (mm)	Approx. Weight (kg)
12V dc System								
SPS12-3	12	3	0.46	1	1.5	1.5	400 X 300 X 600	15
SPS12-6	12	6	0.84	2	1.5	1.5	400 X 300 X 600	17
SPS12-10	12	10	1.34	2	1.5	2.5	400 X 300 X 600	19
SPS12-20	12	20	2.62	4	1.5	4	500 X 400 X 800	25
SPS12-30	12	30	3.88	6	1.5	4	500 X 400 X 800	33
SPS12-50	12	50	6.42	10	1.5	10	600 X 600 X 1200	45
SPS12-100	12	100	12.75	20	2.5	25	600 X 600 X 1200	98
SPS12-150	12	150	19.75	32	4	70	600 X 600 X 1600	118
SPS12-200	12	200	25.4	40	6	95	600 X 600 X 1600	155
24V dc System								
SPS24-3	24	3	0.78	2	1.5	1.5	400 X 300 X 600	17
SPS24-6	24	6	1.49	4	1.5	1.5	400 X 300 X 600	20
SPS24-10	24	10	2.43	4	1.5	2.5	400 X 300 X 600	30
SPS24-20	24	20	4.78	8	1.5	4	500 X 400 X 800	38
SPS24-30	24	30	7.12	12	2.5	4	500 X 400 X 800	45
SPS24-50	24	50	11.8	20	2.5	10	600 X 600 X 1200	95
SPS24-100	24	100	23.5	40	6	25	600 X 600 X 1600	130
SPS24-150	24	150	35.2	63	16	50	600 X 600 X 1600	190
SPS24-200	24	200	47.0	80	16	70	600 X 600 X 1600	268
30V dc System								
SPS30-3	30	3	1.00	2	1.5	1.5	400 X 300 X 600	17
SPS30-6	30	6	1.91	4	1.5	1.5	400 X 300 X 600	20
SPS30-10	30	10	3.14	6	1.5	2.5	400 X 300 X 600	30
SPS30-20	30	20	6.20	10	1.5	4	500 X 400 X 800	38
SPS30-30	30	30	9.25	16	2.5	4	500 X 400 X 800	45
SPS30-50	30	50	15.4	25	2.5	10	600 X 600 X 1200	95
48V dc System								
SPS48-6	48	6	2.78	6	1.5	1.5	400 X 300 X 600	25
SPS48-10	48	10	4.58	8	1.5	1.5	400 X 300 X 600	27
SPS48-20	48	20	9.09	16	4	4	500 X 400 X 800	80
SPS48-30	48	30	13.6	20	4	4	500 X 400 X 800	90
SPS48-50	48	50	22.0	40	10	10	600 X 600 X 1200	135
SPS48-100	48	100	45.1	80	25	25	600 X 600 X 1600	230
110V dc System								
SPS110-3	110	3	3.00	6	1.5	1.5	400 X 300 X 600	28
SPS110-6	110	6	5.90	8	1.5	1.5	400 X 300 X 600	33
SPS110-10	110	10	9.80	16	2.5	2.5	400 X 300 X 600	45
SPS110-20	110	20	19.6	32	4	4	500 X 400 X 800	90
SPS110-30	110	30	34.3	50	6	6	500 X 400 X 800	220
SPS110-50	110	50	49.0	80	10	10	600 X 600 X 1200	250
220V dc System								
SPS220-6	220	6	11.7	20	1.5	1.5	400 X 300 X 600	50
SPS220-10	220	10	19.4	32	2.5	2.5	400 X 300 X 600	99
SPS220-20	220	20	38.8	63	4	4	500 X 400 X 800	250

* AC supply are base on 240v 50Hz

* All cabinets are floor standing type. Special requirements also available upon request

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Three Phase Rectifier & Battery Charger
Data for Installation and Cabinet Sizes

Technical Data								
Model	System Voltage (Vdc)	System Current (Adc)	Input Current (Aac)	Input Fuse (Aac)	Recommended Input Cable ($mm^{2)}$	Recommended Input Cable ($mm^{2)}$	Cabinet Dimension* L X D X H (mm)	Approx. Weight (kg)
12V dc System								
SPT12-25	12	25	0.99	2	1.5	4	600 X 600 X 1200	80
SPT12-35	12	35	2.3	4	1.5	6	600 X 600 X 1200	90
SPT12-50	12	50	3.3	6	2.5	10	600 X 600 X 1600	100
SPT12-100	12	100	6.3	10	2.5	25	600 X 600 X 1600	150
SPT12-150	12	150	9.5	16	2.5	50	600 X 600 X 1800	180
SPT12-200	12	200	12.5	20	2.5	70	800 X 800 X 1800	230
24V dc System								
SPT24-25	24	25	1.9	4	1.5	4	600 X 600 X 1200	100
SPT24-35	24	35	2.7	4	1.5	6	600 X 600 X 1200	130
SPT24-50	24	50	3.7	6	1.5	16	600 X 600 X 1600	150
SPT24-100	24	100	7.3	12	1.5	25	600 X 600 X 1600	240
SPT24-150	24	150	10.8	16	1.5	50	600 X 600 X 1800	250
SPT24-200	24	200	14.5	25	4	70	1200X 600 X 1800	280
SPT24-300	24	300	21.4	32	6	150	1200X 800 X 1800	450
SPT24-400	24	400	28.5	50	10	70X2	1200X 800 X 1800	580
SPT24-500	24	500	36.2	63	10	95X2	1200 X 800 X 1800	750
48V dc System								
SPT48-25	48	25	3.6	6	1.5	6	600 X 600 X 1200	150
SPT48-35	48	35	4.9	8	1.5	6	600 X 600 X 1200	150
SPT48-50	48	50	6.9	12	2.5	10	600 X 600 X 1600	180
SPT48-75	48	75	10.3	16	2.5	16	600 X 600 X 1600	250
SPT48-100	48	100	13.7	20	2.5	25	600 X 600 X 1600	270
SPT48-150	48	150	20.3	32	4	50	800 X 800 X 1800	450
SPT48-200	48	200	26.9	40	6	70	1200X 600 X 1800	450
SPT48-250	48	250	33.7	50	10	95	1200 X 600 X 1800	550
SPT48-500	48	500	67	100	25	95X2	1600X 800 X 2000	780
110V dc System								
SPT110-25	110	25	7.50	12	2.5	6	600 X 600 X 1200	180
SPT110-35	110	35	10.40	16	2.5	6	600 X 600 X 1200	190
SPT110-50	110	50	14.70	25	4	10	600 X 600 X 1600	290
SPT110-75	110	75	22	32	6	16	800 X 800 X 1800	450
SPT110-100	110	100	29.2	50	10	25	800 X 800 X 2000	480
SPT110-150	110	150	44.3	80	16	50	1600 X 800 X 2000	550
220V dc System								
SPT220-25	220	25	14.6	25	4	6	600 X 600 X 1200	230
SPT220-35	220	35	21.2	32	6	6	600 X 600 X 1200	250
SPT220-50	220	50	29.1	50	10	10	600 X 600 X 1800	450
SPT220-75	220	75	43.2	63	16	16	600 X 600 X 1800	550
SPT220-100	220	100	57.2	100	25	25	800 X 800 X 2000	630

* AC supply are base on 415V 50Hz
* All Cabinets are floor standing type. Special requirements also available upon request
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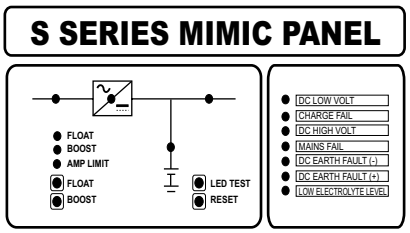
Indicator and Optional Accessories

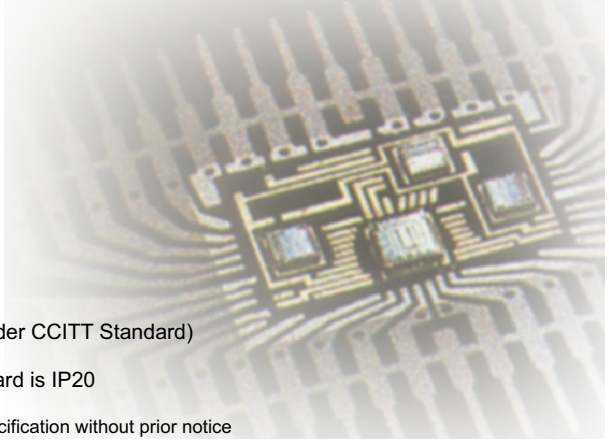


Standard Features	Status	Description
Control Board		
Charger On	Green	Charger on operation mode
Float Charge	Green	Normal operation maintains the battery in fully charged condition
High Rate Charge (Boost)	Amber	High Rate Charge restores the battery to full capacity, by manual or automatic selection Auto High Rate charge reverts back to Float Charge after the battery fully charge.

Standard Alarms Indicator	Status	Description
Multi-Alarm Board		
Charger Failure / Rectifier Failure	Red	Individual or Common Volt Free Contact at 125Vdc/250Vac 5A
DC Low Voltage	Red	Individual or Common Volt Free Contact at 125Vdc/250Vac 5A
DC High Voltage	Red	Individual or Common Volt Free Contact at 125Vdc/250Vac 5A
DC Earth Fault (positive or negative)	Red	Individual or Common Volt Free Contact at 125Vdc/250Vac 5A
Low Electrolyte Level	Red	Individual or Common Volt Free Contact at 125Vdc/250Vac 5A
Mains Failure	Red	Individual or Common Volt Free Contact at 125Vdc/250Vac 5A

Optional Features	Status	Description
Multi-Alarm Board		
Mains Incoming Voltage High / Low	Red	Individual or Common Volt Free Contact at 125Vdc/250Vac 5A
Battery MCB / MCCB Trip or Fuse Blown	Red	Individual or Common Volt Free Contact at 125Vdc/250Vac 5A
Battery Cabinet Temperature High / Low	Red	Individual or Common Volt Free Contact at 125Vdc/250Vac 5A
Battery Voltage High / Low	Red	Individual or Common Volt Free Contact at 125Vdc/250Vac 5A
Charger Cabinet Temperature High / Low	Red	Individual or Common Volt Free Contact at 125Vdc/250Vac 5A
Load Output Voltage High / Low	Red	Individual or Common Volt Free Contact at 125Vdc/250Vac 5A

Optional Features / Accessories	Status	Description
Audible Alarm Buzzer		
Battery Low Voltage Disconnect		
Transducer 4 to 20mA dc		
digital Meter		
Cabinet Lighting		
Programmed Battery Discharge Test		
Telecom Ripple Voltage Filter (RMS≤2mV psophometric under CCITT Standard)		
Other Cabinet Index of Protection (IP) upon request. Standard is IP20		



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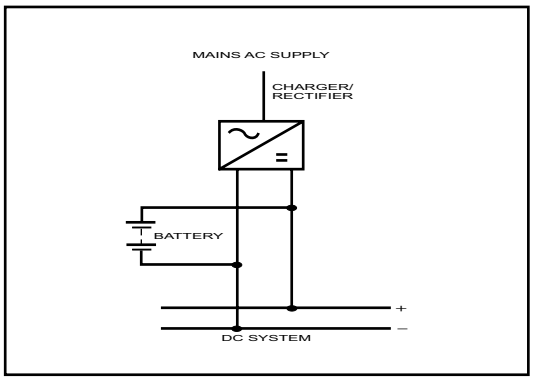
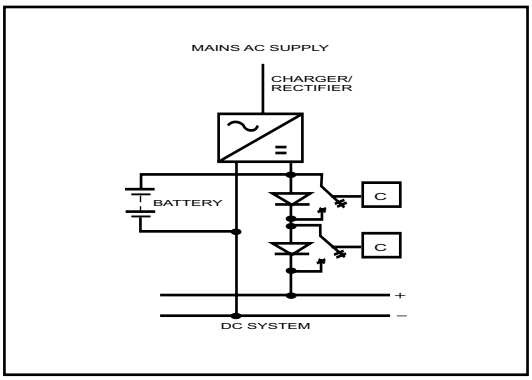
Rectifier & Battery Charger

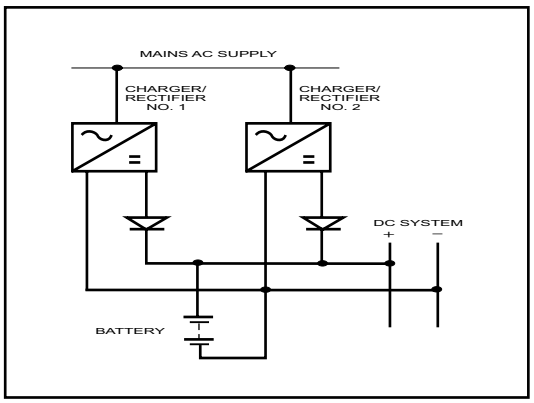
System Configuration



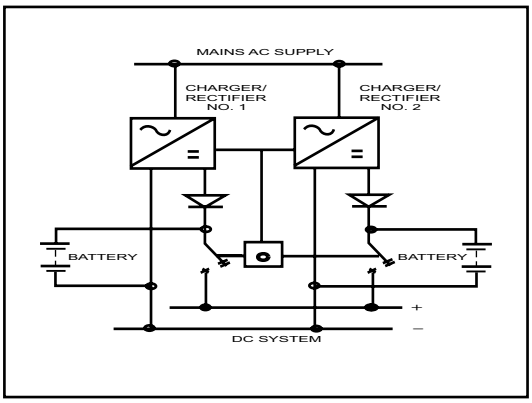
Single DC system



The load output voltage is regulated with series of dropper diode device



Parallel redundant system
with single battery bank



Parallel redundant system
with dual 100% battery bank
and off load boost interlocking system

System Application

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WORLD MAP