

Rectifier
Battery Charger
DC Uninterruptible Power Supply (DC UPS)



Designed and manufactured to requirements.
Project planning and solutions
After sales service.
Preventive maintenance
Training.

General Applications

The SUNPOWER TECHNOLOGIES series standby power system is built for both charging lead acid and nickel cadmium batteries 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 abroad ensures substantial and qualified attention to our customers.

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

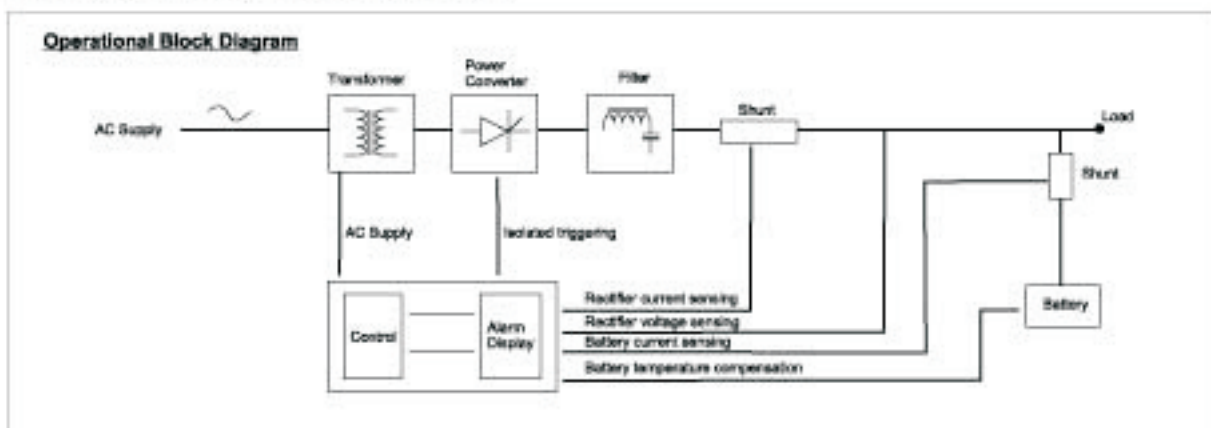
- Charging of battery for engine starting of standby generator set.
- DC standby system where the battery is used to supply DC power when the mains fails. This battery is kept at float charged continuously at all time.
- ON-line DC systems, where the charger/rectifier is used to charge the battery as 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 Controlled automatic constant voltage type with current limit facilities 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 mains 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 conduction 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.



Single Phase & Three Phase Rectifier & Battery Charger Technical Data

Rectifier 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

Rectifier 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 \leq 5%
Ripper Voltage (with Battery Connected)	: RMS \leq 2% (when battery Ah is min. 4 times that of charger rating)
Current Output Ratings	: 3 - 1000 Ampere
Output Current Limitation	: 50-110% Nom (accuracy: +/-2%)
Battery Current Limitation	: 10-100% Nom (Accuracy:+/-2%)

General Data

Storage Temperature	: -20 to +70°C
Operation Temperature	: -10 to 40°C (>40 to +55°C derate 1.25% per °C)
Altitude	: up to m (>1000m to 4000m derate 7% per 1000 m)
Humidity	: \leq 95%RM (non-condensing)
Audible Noise	: \leq 65dBA at 1m
Audible Noise with Redundant Fans	: \leq 70dBA 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 60 146 Semiconductor Converters
Cabinet Colour	: RAL 7032 (light grey) or customise colour
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	: \geq 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

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

Technical Data								
Model	Nominal Voltage (Vdc)	Output Current (A dc)	Current Consumption	Mains Voltage (Vac)	No. of Cells Pb	No. of Cells NiCd	Cabinet Dimension* L X D X H (mm)	Approx. Weight (kg)
12V dc System								
SPS12-3	12	3	0.46	240	6	10	400 X 300 X 600	15
SPS12-6	12	6	0.84	240	6	10	400 X 300 X 600	17
SPS12-10	12	10	1.34	240	6	10	400 X 300 X 600	19
SPS12-20	12	20	2.62	240	6	10	500 X 400 X 800	25
SPS12-30	12	30	3.88	240	6	10	500 X 400 X 800	33
SPS12-50	12	50	6.42	240	6	10	600 X 600 X 1200	45
SPS12-100	12	100	12.75	240	6	10	600 X 600 X 1200	98
SPS12-150	12	150	19.75	240	6	10	600 X 600 X 1600	118
SPS12-200	12	200	25.4	240	6	10	600 X 600 X 1600	155
24V dc System								
SPS24-3	24	3	0.78	240	12	20	400 X 300 X 600	17
SPS24-6	24	6	1.49	240	12	20	400 X 300 X 600	20
SPS24-10	24	10	2.43	240	12	20	400 X 300 X 600	30
SPS24-20	24	20	4.78	240	12	20	500 X 400 X 800	38
SPS24-30	24	30	7.12	240	12	20	500 X 400 X 800	45
SPS24-50	24	50	11.8	240	12	20	600 X 600 X 1200	95
SPS24-100	24	100	23.5	240	12	20	600 X 600 X 1600	130
SPS24-150	24	150	35.2	240	12	20	600 X 600 X 1600	190
SPS24-200	24	200	47.0	240	12	20	600 X 600 X 1600	268
30V dc System								
SPS30-3	30	3	1.00	240	15	25	400 X 300 X 600	17
SPS30-6	30	6	1.91	240	15	25	400 X 300 X 600	20
SPS30-10	30	10	3.14	240	15	25	400 X 300 X 600	30
SPS30-20	30	20	6.20	240	15	25	500 X 400 X 800	38
SPS30-30	30	30	9.25	240	15	25	500 X 400 X 800	45
SPS30-50	30	50	15.4	240	15	25	600 X 600 X 1200	95
48V dc System								
SPS48-6	48	6	2.78	240	24	40	400 X 300 X 600	25
SPS48-10	48	10	4.58	240	24	40	600 X 600 X 1200	110
SPS48-20	48	20	9.09	240	24	40	600 X 600 X 1200	120
SPS48-30	48	30	13.6	240	24	40	600 X 400 X 1200	125
SPS48-40	48	40	20	240	24	40	600 X 600 X 1200	130
SPS48-50	48	50	22.0	240	24	40	600 X 600 X 1200	135
SPS48-60	48	60	30	240	24	40	600 X 600 X 1600	215
SPS48-80	48	80	40	240	24	40	600 X 600 X 1600	220
SPS48-100	48	100	45.1	240	24	40	600 X 600 X 1600	230
110V dc System								
SPS110-3	110	3	3.00	240	54	87	400 X 300 X 600	28
SPS110-6	110	6	5.90	240	54	87	400 X 300 X 600	33
SPS110-10	110	10	9.80	240	54	87	400 X 300 X 600	45
SPS110-20	110	20	19.6	240	54	87	500 X 400 X 800	90
SPS110-35	110	35	34.3	240	54	87	600 X 500 X 800	220
220V dc System								
SPS220-6	220	6	11.7	240	108	174	400 X 300 X 600	50
SPS220-10	220	10	19.4	240	108	174	400 X 300 X 600	99
SPS220-20	220	20	38.8	240	108	174	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

* Sunpower Technologies Sdn Bhd reserves the right to change specification without prior notice

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

Technical Data								
Model	Nominal Voltage (Vdc)	Output Current (A dc)	Current Consumption	Main Voltage (Vac)	No. of Cells Pb	No. of Cells Nicd	Cabinet Dimension* L X D X H (mm)	Approx. Weight (kg)
12V dc System								
SPT12-25	12	25	0.99	415	6	10	600 X 600 X 1200	80
SPT12-35	12	35	2.3	415	6	10	600 X 600 X 1200	90
SPT12-50	12	50	3.3	415	6	10	600 X 600 X 1600	100
SPT12-100	12	100	6.3	415	6	10	600 X 600 X 1600	150
SPT12-150	12	150	9.5	415	6	10	600 X 600 X 1800	180
SPT12-200	12	200	12.5	415	6	10	800 X 800 X 1800	230
24V dc System								
SPT24-25	24	25	1.9	415	12	20	600 X 600 X 1200	100
SPT24-35	24	35	2.7	415	12	20	600 X 600 X 1200	130
SPT24-50	24	50	3.7	415	12	20	600 X 600 X 1600	150
SPT24-100	24	100	7.3	415	12	20	600 X 600 X 1600	240
SPT24-150	24	150	10.8	415	12	20	600 X 600 X 1800	250
SPT24-200	24	200	14.5	415	12	20	800 X 600 X 1800	280
SPT24-300	24	300	21.4	415	12	20	800 X 800 X 1800	450
SPT24-400	24	400	28.5	415	12	20	800 X 800 X 1800	580
SPT24-500	24	500	36.2	415	12	20	1200 X 800 X 1800	750
48V dc System								
SPT48-25	48	25	3.6	415	24	40	600 X 600 X 1200	150
SPT48-35	48	35	4.9	415	24	40	600 X 600 X 1200	150
SPT48-50	48	50	6.9	415	24	40	600 X 600 X 1600	180
SPT48-75	48	75	10.3	415	24	40	600 X 600 X 1600	250
SPT48-100	48	100	13.7	415	24	40	600 X 600 X 1600	270
SPT48-150	48	150	20.3	415	24	40	800 X 800 X 1800	450
SPT48-200	48	200	26.9	415	24	40	800 X 600 X 1800	450
SPT48-250	48	250	33.7	415	24	40	800 X 600 X 1800	550
SPT48-500	48	500	67	415	24	40	800 X 800 X 2000	780
SPT48-1000	48	1000	132	415	24	40	1600 X 800 X 2000	1050
110V dc System								
SPT110-25	110	25	7.50	415	54	87	600 X 600 X 1200	180
SPT110-35	110	35	10.40	415	54	87	600 X 600 X 1200	190
SPT110-50	110	50	14.70	415	54	87	600 X 600 X 1600	290
SPT110-60	110	60	15.90	415	54	87	600 X 600 X 1600	350
SPT110-75	110	75	22	415	54	87	800 X 800 X 1800	450
SPT110-100	110	100	29.2	415	54	87	800 X 800 X 2000	480
SPT110-150	110	150	44.3	415	54	87	1600 X 800 X 2000	550
SPT110-200	110	250	53	415	54	87	1600 X 800 X 2000	780
SPT110-250	110	250	66	415	54	87	1600 X 800 X 2000	780
220V dc System								
SPT220-25	220	25	14.6	415	108	174	600 X 600 X 1200	230
SPT220-35	220	35	21.2	415	108	174	600 X 600 X 1200	250
SPT220-50	220	50	29.1	415	108	174	600 X 600 X 1800	450
SPT220-75	220	75	43.2	415	108	174	600 X 600 X 1800	550
SPT220-100	220	100	57.2	415	108	174	800 X 800 X 2000	630
SPT220-500	220	500	264	415	108	174	800 X 800 X 2000	950

* AC supply are base on 415V 50Hz

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

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INSTRUMENTS, INDICATIONS AND CONTROLS



INDICATION FACILITIES	
Indication	Indicator
Voltmeter	AC Charger Input Voltage
	DC Charger Output Voltage
	DC Battery Output Voltage
Ammeter	DC Charger Output Current
	DC Battery Output Current
Selector Switch	Float/Boost/Auto/Manual
MCB/MCCBs	AC Mains Input ON/OFF DC Mains Output ON/OFF

ALARM FACILITIES		Indicator	Colour
Neon		AC Mains ON	Green
LED	<p>Front Panel Display</p>	Charger on Float	White
		Charger on Manual Float	White
		Charger on Manual Boost	White
		Charger on Automatic Boost	Amber
		Fast Charge Commissioning	Amber
		Battery Voltage Low	Red
		Charger Fail	Red
		Battery Voltage High	Red
		AC Mains Fail	Red
		DC earth Fault	Red
	Battery Low Electrolyte Level	Amber/Red	

ALARM FACILITIES (Option)		Indicator	Colour
LED	<p>Alarm Card</p>	Charger AC Volts High	Red
		Charger AC Volts Low	Red
		Charger AC Failed	Red
		Charger Rectifier Fuse Blown	Red
		Charger Capacitor Fuse Blown	Red
		Charger Temperature High	Red
		High Battery Current	Red
		High Rectifier Current	Red
		High Rate	Red

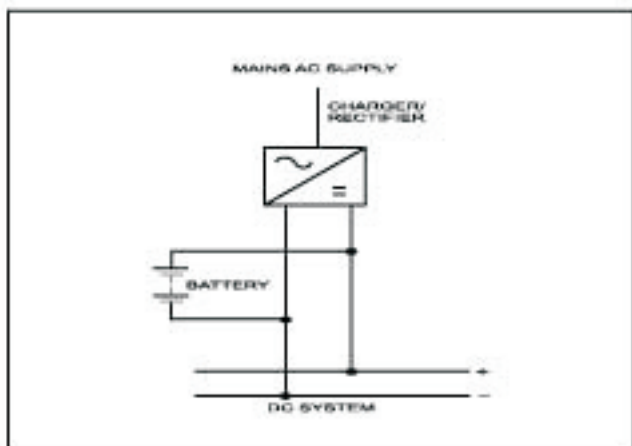
The Alarms facilities are to initiate the individual and summary alarm Alarm Volt Free Contact with contact rating at 125Vdc/250Vac 5A

OTHER FACILITIES
DC Transducer (4 to 20mA)
Audible alarm Buzzer
Battery Low Voltage Disconnected
Cabinet Index Protection (IP)
Special requirement also available upon request

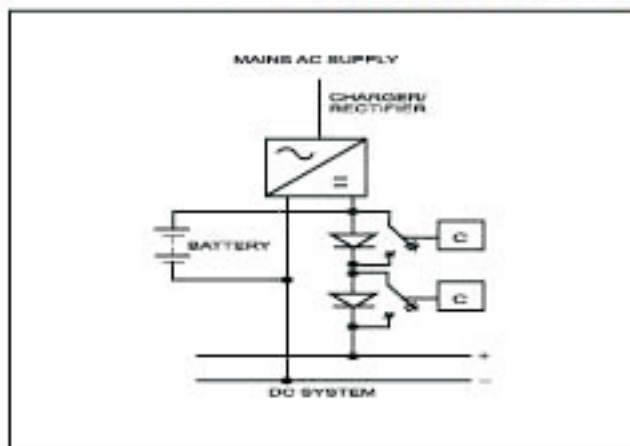


Control Card

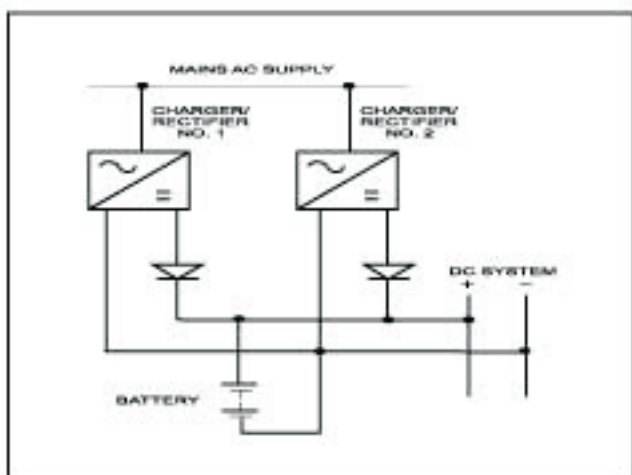
System Configuration



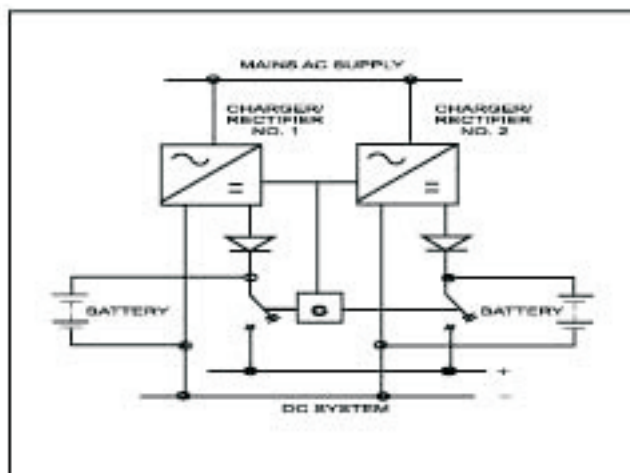
Single DC system



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



Parallel redundant system with single battery bank

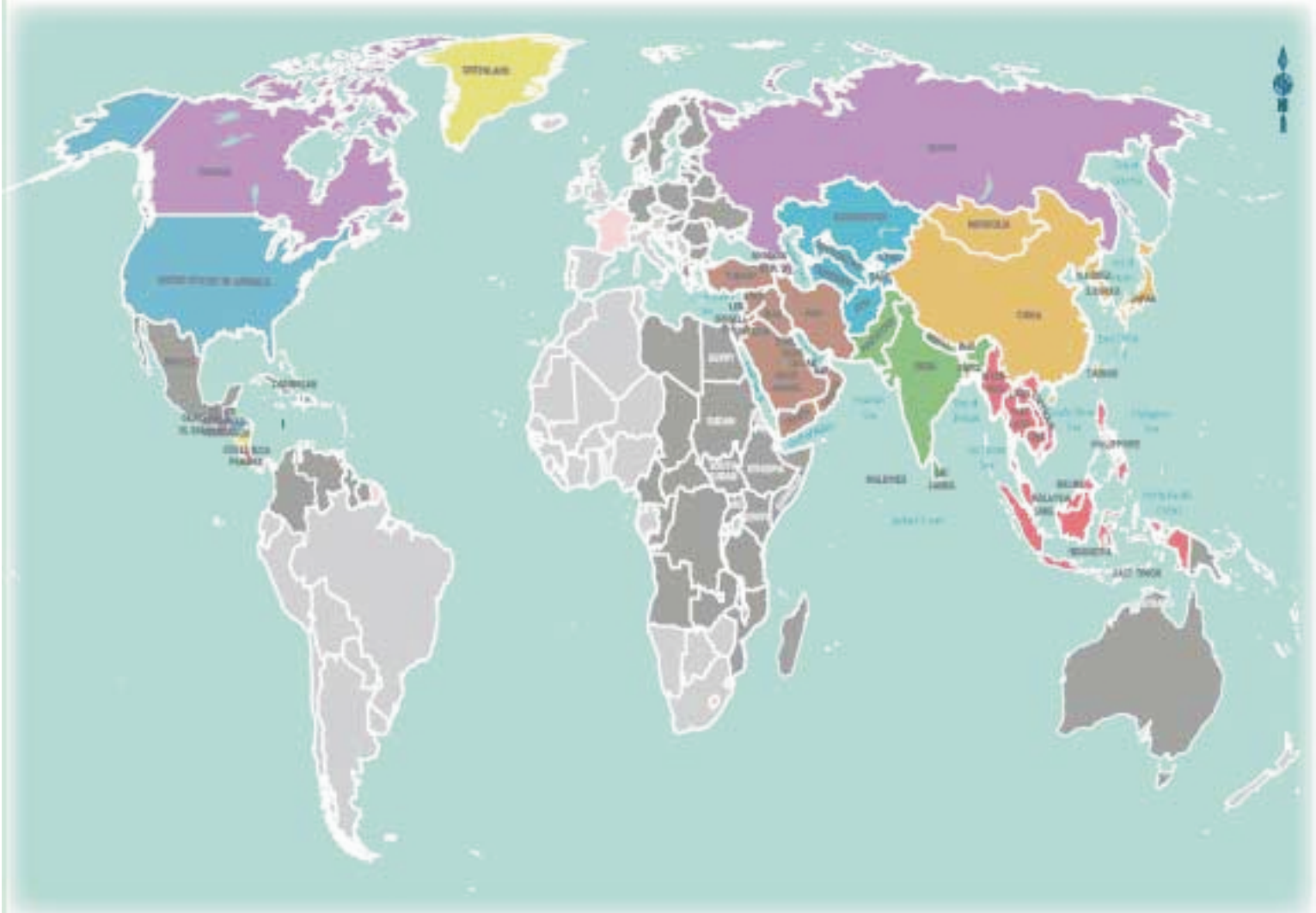


Parallel redundant system with dual 100% battery bank and off load boost interlocking system

System Application



Regional Representation



ISO9001:2000 Certificates



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