

1U POWER MANUAL

Model: DSL-ZX500W2AG

V1.0



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1 General

This model of power supply is systemic with monitor function, two rectified modules which are integrated ,and then output 54V/5A. system total output 54V/10A; power system has charge for battery by RS232 communicates.

2 Main characteristics

Output power	Input voltage range	Output Rated voltage	Min output current	Max. output current	Output ripple and noise(full load, frequency band is limited to 20MHz)
				Forced cooling	
540W	100—240Vac	54.0V	0A	10A	≤200mVp-p

3 Environmental characteristics

No.	Characteristics	Parameter	Unit	Conditions
1	Operating temperature limiting	-40—+40	°C	Vimin-Vimax, 54V/10A output
2	Storage temperature	-50—+85 (typical 25)	°C	
3	Relative humidity	≤95%		
4	Cooling	Air cooling with Self-fan		
5	Altitude	≤3,000	m	Operating normally, and reduce 1 degree per 100m rising, when altitude is above 3000m

4 Electrical characteristics

4.1 Input characteristics

No.	Characteristics	Parameter	Unit	Conditions
1	Input rated voltage	220	Vac	
2	Nominal Input voltage range	100-240	Vac	Rated input, full load
3	input votage range	90-265	Vac	
4	Limiting input votage range	88-300	Vac	
5	Input voltage frequency	50/60	Hz	
6	Input current	<8	A	Vinmax., rated load
7	Input shock current	<20	A	Cold start-up, Vinmax.

4.2 Output characteristics

No.	Characteristics	Parameter	Unit	Conditions
1	Min. output current	0	A	
2	Max. output current	10	A	Forced air cooling
3	Rated output voltage	53.7	Vdc	
4	Output ripple and noise	≤200	mVp-p	Rated load, frequency band is limited to 20MHz
5	PFC	>0.95		
6	Output power	540 (typical)	W	
7	efficiency	≥87%		Rated input voltage(220Vac),rated load (10A)
8	line regulation	2	%	
9	Load regulation	2	%	
10	voltage accuracy	5	%	
11	Turn-on output delay	≤2	S	Rated input voltage
12	Output rising time	≤150	mS	Output voltage rises from 10% to 90%, rated load

13	Turn on/off overshoot		≤5	%Vo	
14	Transient response	overshoot	≤5	%Vo	
		Recovery time	≤200	μS	25%—50%—25% or 50%—75%—50% load change
15	Temperature coefficient		±0.02	%/°C	
16	Current sharing imbalance(from two module) (I1-I2) /Io		≤6	%	Load current≥5A

4.3 Model protection characteristics

No.	Characteristics	Parameter	Unit	Conditions
1	Output over-voltage protection	59	V	No locked
2	Output current limiting	≥110%Io		
3	Output short circuit protection	No destruction with short circuit for long time, and auto-recovery upon the removal of failure.		Short current:12.5±0.5A
4	Over-temperature protection	Auto-recovery		

4.4 Battery management characteristics

No.	Characteristics	Parameter	Unit	Conditions
1	Number for backup battery group	1	group	
2	Floating charge voltage	53.5—53.8	V	Battery charge current is 0A
3	Floating charge current limiting	1.7±0.2	A	When battery floating charge ,output voltage is no exceed floating voltage (and relate to external battery)
4	Under-voltage alert point	46±1	V	
5	Turn off protection point	43.5±0.2	V	
6	Leakage current	≤60uA		Leakage current of after Battery turn off
7	Recovery point	After battery turn-off, until rectified module turn off		

8	Temperature compensation	none		
9	set battery group capacity arrangement	7 or 12	AH	default
		17–30	AH	Optional. Supervisory control computer sets battery capacity arrangement when max. charging current limiting is 3A, and current precision point is $\pm 5\%$.
10	Reverse input polarity protection for battery	presence		Battery terminal connector be sure
11	Battery limiting current function	current limiting for battery discharge		

4.5 Other characteristics

No.	Characteristics	Parameter	Conditions
1	noise	$\leq 50\text{dB}$	
2	Hot swappable	Support hot swappable. No influence to input/output when hot swappable	
3	Failure separation	Reliable separation when one module fails, and no influence to the other module.	
4	Remote compensation	None	
6	Lightning protection	Differential mode 3KA/common mode 5KA for ± 5	Testing waveform 8/20us

5 Safety and EMC

No.	Characteristics	Criteria	Remarks
1	Dielectric strength	input—output	3000Vac/1min, Leakage current $< 15\text{mA}$ It is right to use DC which is peak of AC voltage.
		Input—Ground	
		output—Ground	
2	Isolation resistance	input—output	Under normal atmospheric pressure, relative humidity 90%, testing voltage is 500Vdc
		Input—Ground	
		output—Ground	
3	Leakage current	$< 3.5\text{mA}$	264Vac/60Hz

4	Resistance to ground	<0.1Ω	Connect 30A/2min to the metal case and GND wire	
5	Safety	Meets UL60950 and EN60950, TUV-SUD certificate	UL60950/EN60950	
6	EMC	CE	CLASS B	EN55022
		RE	CLASS B	EN55022
		ESD	LEVEL 3	EN61000-4-2
		RS	10V/m	EN61000-4-3
		CS	10V	EN61000-4-6
		EFT	LEVEL 3	EN61000-4-4
		SUGER	LEVEL 4	EN61000-4-5

6 Reliability characteristics

Vibration	Random vibration : product can endure 5 – 500Hz random vibration at 3 axis for 20 minutes each, acceleration spectral density of 5–10Hz is $13 \text{ m}^2/\text{s}^3$, 10–200Hz is $3 \text{ m}^2/\text{s}^3$, 200–500Hz is $1 \text{ m}^2/\text{s}^3$	Power supply normally after testing.
	Operation vibration: 3 axis for 90 minutes each under frequency range is 5-100-5Hz with acceleration of 0.1g and frequency of 0.1oct/min	Power supply works normally during testing.
Drop	On 6 sides for one time each at the height of 100cm	No effect on electric performance of power supply
Dust-proof	Dust-proof function is needed.	

7 Alert, monitor function

7.1 Alert

Alert or mute for commercial power or not, for fuse burned or not on two loads, for battery fuse burned or not. Alert for output DC over/under-voltage, for over/under-voltage and current limiting of rectified module.

Set output DC over/under-voltage alert point:

Under-voltage alert point: $46 \pm 1\text{V}$, recovery point: $48 \pm 1\text{V}$, over-voltage alert point: $58 \pm 1\text{V}$

7.2 Monitor

Monitor module sends alert/state information to supervisory control computer.

State signal : Alert or mute for commercial power or not, for fuse burned or not on

two loads, for battery fuse burned or not, Alerts for output DC over/under-voltage, for over/under-voltage and current limiting of two rectified modules. And the number, address of power modules.

Date for monitoring signal board:

7.2.1 Provide latest complete monitoring data for inquiry of supervisory control computer at any time. If no inquiry, send alert signal to supervisory control computer.

7.2.2 Send out alarm in terms of relay contact through pin 6、7、8、9 of RS232S.

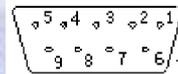
Rectified module alarms:8-9 connected operates normally: 8-9 disconnected

AC blackout alarms: 8-7 connected AC inputs normally: 8-7 disconnected

Battery under-voltage alarms: 8-6 connected battery voltage recovers normally: 8 -6 disconnected

The relay's max. contact voltage is 60Vdc; The relay's max. contact current is 300mA.

RS232 definition:



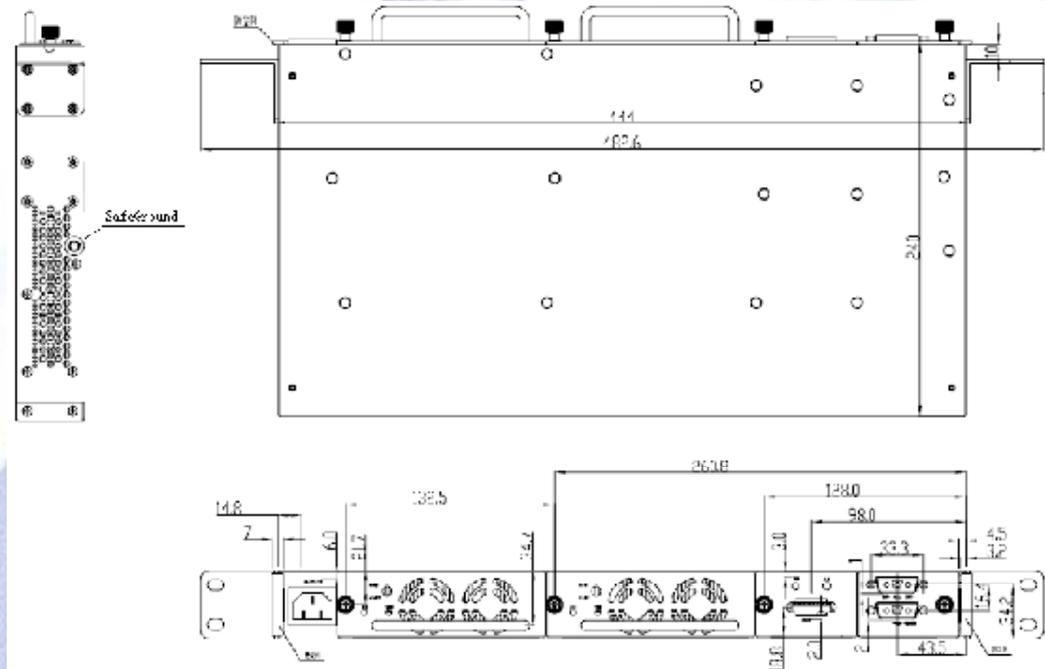
No.	Terminal definition
1	NC
2	RXD
3	TXD
4	NC
5	GND
6	Relay contact output for battery under-voltage alarm
7	Relay contact output for AC blackout alarm
8	Common output port for alarm relay contact
9	Relay contact output for rectified module alarm

7.2.3 None monitoring module, no effect power supply operate. If default battery, backup of battery's charge or discharge management has no effect.

7.2.4 Monitor module information, data of relay contact output can be deleted.

8 Mechanical characteristics

8.1 outline dimension $L \times W \times GH = 482.6 \times 262(\text{with handle}) \times 43$ (units: mm)



note:

- 1) Dimension of depth refer to requirements of ETSI 300 deep-races, the whole dimension after assemble is no more than 280mm.
- 2) Height:43mm.
- 3) fixation bar is compatible with ETSI and 19 inch standard.
- 4) Surface process: spray powder with blue ; the fixable bar is connected with electric system of whole outer rack; both standard of 19inch and ESTI employ the same fixable bar.
- 5) Safeforound: Use M4 screws to connect to the Safeforound.

8.2 Panel

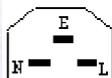
8.2.1 Single rectifier module: one button-switch, two indication light and hole for fan area .

8.2.2 Indication light definition: green on means power output ok and red means output failure.

8.2.3 Monitoring module: one RS232, two indication lights for operation normally, green light means ok, red light means failure.

8.2.4 output module: output section is designed as one power module which is drawable for the purpose of changing fuse of two circuit of outputs and one circuit of battery avoiding effect on normal power while module is inserted or drew. There should be one piece of LBD which indicates GOOD while off and fusion while red near each fuse. There are two output socket and one battery charging output interface on the output front panel. The socket is two-pin standard one with anti-reverse function.

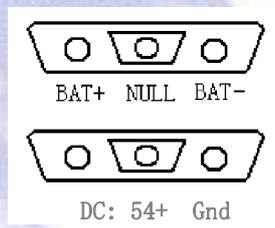
8.3 AC socket definition



AC socket	Terminal definition
E	PGND
N	AC input N-wire
L	AC input L-wire

The socket-outlet shall be installed near the equipment and shall be easily accessible.

8.4 Output definition



DC socket	Terminal definition
BAT+	Battery positive polarity
BAT-	Battery negative polarity
54V+	Positive polarity of load
Gnd	Negative polarity of load

9 Package, transportation and storage

9.1 Package

There are product name, model, making of manufacturer, safety approval, manufacturing date on the package box, and manual and packing list in the package box.

9.2 Transportation

Suit for transportation by truck, ship, and plane, The products should be shielded by tent from sunshine, and loaded and unloaded carefully.

9.3 Storage

Product should be stored in package box when it is not used. And warehouse temperature should be -50°C — $+85^{\circ}\text{C}$, and relative humidity 5%—80%. In the warehouse, there should not be harmful gas, inflammable, explosive products, and corrosive chemical products, and strong mechanical vibration, shock and strong magnetic field affection. The package box should be over ground at 20cm height, and 50cm away from wall, thermal

source, and vent. Under this requirement, product has two years of storage period, and should be rechecked when over two years.

10 other characteristics

10.1 MTBF \geq 150Khours(BELLCORE TR-NWT-332) ,25 $^{\circ}$ C room temperature, resistance load)。

10.2 Yearly patch rate: \leq 1%。

10.3 Lifespan of electrolytic capacitor: 10 years under temperature of 40 $^{\circ}$ C and full-sealed conditions.

11 Attentions

11.1 First check if rated AC input voltage accord with that of power supply frame and rectifier module under operation condition.

11.2 It is forbidden to turn on the power supply when AC voltage is above 280VAC or less than 85VAC.

11.3 Regularly check running status of the fan to recognize if there's abnormal noise of fan, uneven turn speed and ventilation choke. And of above abnormal status should be eliminated.

11.4 There should be more than 100mm space at both left and right side of power system to keep good ventilation.

11.5 Negative port of battery must be connected to BAT- and positive to BAT+, Do avoid connect negative port at 48V+ and 48- port , or it will result in lifespan-shortening caused by over-charge/discharge of battery.

11.6 Do not touch while operation due to danger.

11.7 The "Safeground" should be connected before the equipment Run.