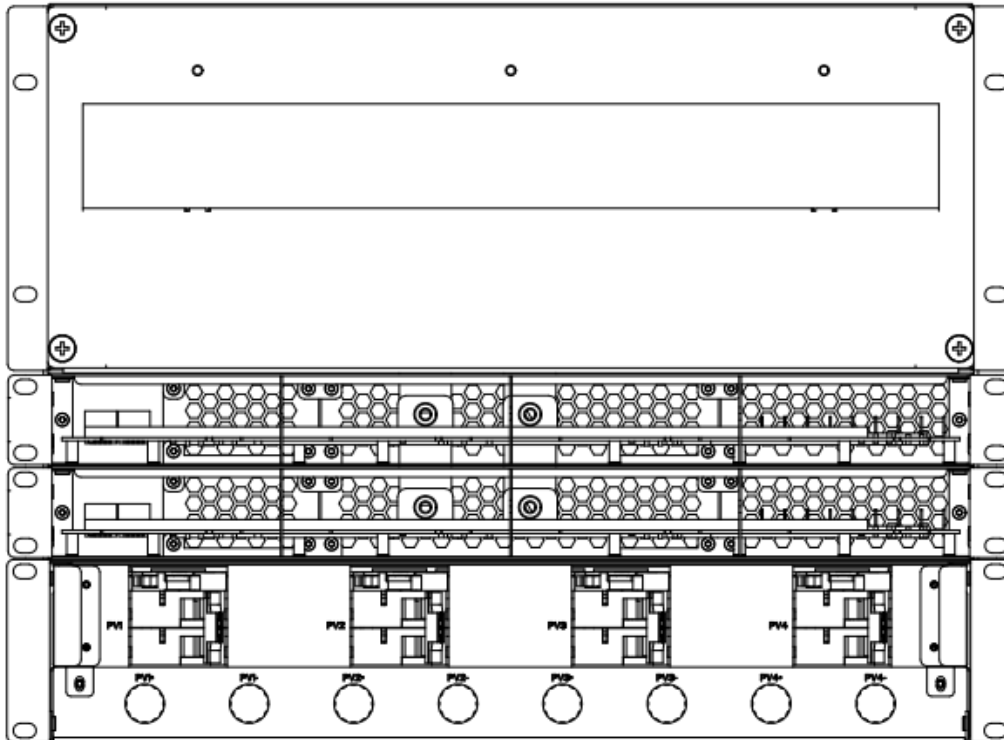


Product overview

The 48V hybrid power supply is designed of high efficiency switch mode rectifier modules and intelligent controller, complete with the respective load and battery distribution, AC incoming as well as surge protection.

The solution can be customized accordingly to specific requirements.



Product Number

ZHPS48XXX_XXX 1 2 3 4	Hybrid power supply 48V
*1, ZHPS, Hybrid power supply	
*2, 48, indicate the Nom. output voltage, 48V	
*3, XXX, indicate the output rectifier currents, such as 100- 100A, 200-200A	
*4, XXX, indicate the special request, such as the output MCB configure or monitor request	

Features

Hot-Swap Rectifier Modules
Modular, Scalable Cabinet Design
High Power Density
Highly Efficient>95%
Front-to-back Air flow
Excellent EMC Performance
Wide Input Voltage Range
Wide Temperature Range
Compliant with Global Standards

Technical Specification

Input	
Main input AC	3-phase 380Vac (electrical grid)
	100Vdc to 380Vdc (solar)
Power factor	≥ 0.99
Frequency (for AC input)	45Hz to 65Hz
THD	<5% (50% to 100% load)
Input Protection	Soft Start
	Surge Protection
	Overvoltage Protection
Output	
Nominal Output Voltage	48Vdc
Output Power	Base on the request
Efficiency	>95%
Battery Distribution	
Battery Distribution	125A/1P*3
Load Distribution	
Load Distribution1 (LLVD)	Base on the request
Load Distribution2 (BLVD)	Base on the request
Controller and Rectifier Type	
Controller Type	ZHM19LG

Rectifier Type	ZHR483KG
Solar Module Type	ZHS483KG
Environmental	
Operating Temperature Range	-20°C to +65°C (de-rates above 55°C)
Storage Temperature Range	-40°C to +70°C
Relative Humidity	Operating: 5% to 98% RH non-condensing
	Storage: 0% to 98% RH non-condensing
Acoustic Noise	<58dB
Physical	
Dimensions (W*D*H mm)	Base on the configuration
Net Weight (kg)	Base on the configuration
Design Standards	
Electrical Safety	EN/IEC 62368
EMC	EN55022/CISPR22Class A, EN61000-4-2/-3/-4/-5/-11
Communication Interfaces	
Protocols	HTTP, MODBUS, SNMP, TELNET

Component introduction

Control module ZHM19LG

Function	
1	Battery Management Functions
2	LVD (Low voltage detached)
3	Sleep Management Function
4	DI (digital input)
5	DO (digital output)
6	Analog Sampling Function
7	Alarm management function
8	Intelligent lithium battery function
8.1	Pass-through mode: boost mode is not enabled
8.2	Normal Mode: enable the boost module to keep its voltage at a certain amount.
9	Rectifier module hot-swappable
10	Sampling box communication function
11	Staggered peaks

12	Peak shaving
13	BMS Function
14	Diesel engine function
15	Battery Recording Function
16	Log Management Function
17	LCD display
18	Background Communication Function
19	Online Upgrade Function
20	SNMP Service Functions
21	Web Server Service Functions
22	ARM Upgrade Function

Rectifier module ZHR483KG

The appearance of the ZHR483KG rectifier module is shown below.



Parameter	Min.	Typical	Max.	Unit	Remark
Input					
Input voltage range	185	230	275	Vac	Single-phase/full load (275~305VAC can work, no index assessment)
Input voltage range	90		185	Vac	Single-phase/power-limited
Input frequency	45	50	66	Hz	Rated load
Input current	/	13	18	A	
Power factor	/	0.99			Rated I/O, 100% of maximum power
	/	0.99			Rated I/O, 50% of maximum power
	/	0.97			Rated I/O, 30% of maximum power
Harmonic currents	/	< 5%			Rated I/O, 100% of maximum power
		< 8%			Rated I/O, 50% of maximum power
	/	< 12%			Rated I/O, 30% of maximum power

The impulse current is instantaneous when the machine is turned on	≤Maximum steady-state input 150% of peak current				Rated input/rated load
Output					
Output voltage	42	53.5	58.5	Vdc	Customer setting, performance for 43.0V~58.0V
Output current		50	62.5	A	When input 185~275Vac Output 48.0V-58.0V
Output power			3000	W	When input 185~275Vac Output 48.0V-58.0V
Voltage regulation accuracy			±0.6	%	10%-100% Rated load
Loading effect			±0.5	%	10%-100% Rated load
Source effects			±0.1	%	
efficiency	95.0			%	100% of Rated load
	96.0			%	50% of Rated load
	95.5			%	30% of Rated load
Temperature coefficient			±0.02	%/℃	
Dynamically respond to recovery times			200	us	25%-50%-25% lo load change 50%-75%-50% lo load change
			50	ms	10%-90%-10% lo load change
Boot time	3		10	s	
Switching on and off overshoot			5	%	
Fluid averaging			±5	%	50%-100% rated load
Steady flow accuracy			±3	%	20%-100% rated load
Environment data					
Operating temperature	-40 to +75			℃	
Storage temperature	-40 to +85			℃	
relative humidity	≤90			%	
atmospheric pressure	70-106			kPa	
Cooling method	Air-cooled				
noises	< 58			dB	
Ground resistance	≤0.1			Ω	
Leakage current	≤3.5			mA	
Safety standards					

ESD immunity requirements: EN/IEC 61000-4-2, level 3
 Radiation immunity: EN/IEC 61000-4-3, level 3
 Fast transient burst immunity requirements: EN/IEC 61000-4-4, level 3
 Lightning strike: EN/IEC61000-4-5 Level 4, ANSI C62.41 Level A3
 Conductive immunity: EN/IEC 61000-4-6 level 3
 Harmonic emission: EN/IEC61000-3-2
 Radiated emissions*: EN55022, Class B
 Conducted emissions: EN55022, AC- Class B, DC- Class A

Environment alarms

Items	Description	Remark
Short-circuit protection	The current retracts to a given current value	Automatically resume work after the fault is eliminated
Overvoltage protection	Setable, default is 59.7Vdc Cannot be restored and needs to be rebooted and restored	There is no DC output after protection
Undervoltage alarm	Less than setting, default is 42Vdc	Still DC output after protection This feature is not available for individual modules
Overvoltage protection point	$\geq 305\text{Vac}$, Recoverable	No DC output after protection
Undervoltage protection point	$< 185\text{Vac}$	No DC output after protection
	$< 75\text{Vrms} \pm 5\text{V}$, module shutdown	No DC output after protection
Over-temperature protection	When $> 75^{\circ}\text{C}$, output power 0 Watter	
Power over-temperature protection	When the PFC power temperature $> 105^{\circ}\text{C}$ or the SR power temperature $> 115^{\circ}\text{C}$, the module shuts down, and the module powers back on when the PFC power temperature $< 80^{\circ}\text{C}$ and the SR power temperature $< 100^{\circ}\text{C}$	Module shutdown protection; When the temperature drops to the recovery point, work can be automatically resumed
Fan temperature control	Adopt a temperature-controlled fan rotation method	
Limited power control	When the output voltage is	

	48.0V~58.0V, the constant power control, the maximum output power is 3000W, and when the output voltage is 42.0~48.0V, the maximum output current limiting point is 62.5A; When the ambient temperature $T_a > 55^{\circ}\text{C}$, the power limit is started	
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Rectifier module ZHS483KG (support solar panel)

The appearance of the ZHS483KG rectifier module is shown below.



Parameter		Min.	Typical	Max.	Unit	Remark
Input						
Power on voltage		120	/	430	Vdc	
Input voltage		85	360	430	Vdc	
Input voltage MPPT		100	360	380	Vdc	
Static tracking efficiency, MPPT		99			%	
Input current		/	13	18	A	
The impulse current is instantaneous when the machine is turned on		≤Maximum steady-state input 150% of peak current				Rated input/rated load
Output						
MPPT	Output voltage	43	53.5	58	Vdc	Customer setting
	Output current		56	62.5	A	

	Output power			3000	W	Max.3200W @25±10℃
Voltage regulation accuracy				±0.6	%	10%-100% Rated load
Loading effect				±0.6	%	10%-100% Rated load
Source effects				±0.1	%	
Ripple (peak-to-peak)				150	mV	100% of Rated load
Prototype peak efficiency		96.3			%	Rated load
Batch peak efficiency		96			%	Rated load
Temperature coefficient				±0.02	%/℃	20℃
Dynamically respond to recovery times				50	ms	
				±5	%	
Boot time		3		10	s	
Switching on and off overshoot				5	%	50-100% rated load
Steady flow accuracy				±3	%	20%-100% rated load
Hold time		20			ms	
Environment data						
Operating temperature		-40 to +75			℃	
Storage temperature		-40 to +85			℃	
relative humidity		≤95			%	
atmospheric pressure		70-106			kPa	
Cooling method		Air-cooled				
Noises		< 58			dB	
Ground resistance		≤0.1			Ω	
Leakage current		3.5			mA	
Safety standards						
ESD immunity requirements: EN/IEC 61000-4-2, level 3						
Radiation immunity: EN/IEC 61000-4-3, level 3						
Fast transient burst immunity requirements: EN/IEC 61000-4-4, level 3						
Lightning strike: EN/IEC61000-4-5 Level 4, ANSI C62.41 Level A3						
Conductive immunity: EN/IEC 61000-4-6 level 3						
Harmonic emission: EN/IEC61000-3-2						
Radiated emissions*: EN55022, Class B						
Conducted emissions: EN55022, Class A						

Environment alarms		
Items	Description	Remark
Short-circuit protection	Retracts to a given current value	Automatically resume work after the fault is eliminated
Overvoltage protection	Settable, manually resume work	No DC output after protection
Undervoltage alarm	Monitoring alarm	Not available for individual modules
Overvoltage protection point	Module powered off	Restored when voltage return
Undervoltage shutdown	Module shutdown	
Over-temperature protection	At >75°C, the module shuts down	
Power over-temperature protection	Module shutdown protection	When the temperature drops to the recovery point, work can be automatically resumed
Fan temperature control	Linear speed regulation	
Output-limited power control	When the output voltage is 48.0V~58.0V, the constant power control, the maximum output power is 3000W, and when the output voltage is 42.0~48.0V, the maximum output current limiting point is 62.5A	

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