

SIGMA⁺ Grid Export Solar PCU

rMPPT Hybrid Solar PCU
(1Ph in 1Ph out)



Model Available
1kVA-15KVA

FEATURES

- DSPIC based Pure Sine Wave Design.
- Inbuilt in rMPPT charge controller (upto 30% more efficient).
- Grid Interactive.
- Maximum Preference to Solar Power.
- Wi-Fi based remote monitoring (GSM Optional).
- Certified by IEC 61683, 61727, 60529, 60068-2 (1,2,14,30) & 62116 standards.
- Robust Design-20 years product life, 5 yrs of warranty.
- User Friendly & Easily accessible LCD Display with all AC and DC Parameter Configurable by Display Switches & Digital LCD (20X4).
- User Friendly Control :- Output Voltage, Chg. Voltage - SPV/Grid, Chg. Current - SPV/Grid, Grid Reconnect, Batt. Low.
- Reverse AC Voltage Protection.
- Priority based working modes - Smart/PCU/Hybrid (for saving energy & money).
- Grid Export Mode, Grid Charging & IT Load - Enable/Disable by Display Switch.

PCU Mode Priority

Solar/Battery/Grid

Hybrid Mode Priority

For Load - Grid/Solar/Battery
For Charging - Solar/Grid

Smart Mode Priority

For Day Time - Solar/Battery/Grid
For Night Time - Grid/Battery

Grid Export Mode

Solar/Grid/Battery

Application



SIGMA⁺ Grid Export SOLAR PCU (1Ph in 1Ph out)

Parameters		Units		Rating														
Model (UGE)				1024	1048	2048	3048	4048	5048	5096	7596	8120	10120	10180	15180	15240		
System Rating		KVA		1	1	2	3	4	5		7.5		10		15			
Operating DC Voltage		V		24	48				96		120		180				240	
Photovoltaic Input																		
Input Voltage range (Min.-Max.)		V _{oc}		45-90	80-195				180-360		200-400	220-400	300-540		400-650			
Maximum PV power recommended		kW		1		2	3	4	5		7.5		10		15			
Solar Charge Controller Rating		A		40	20	40	60	80	100	50	75		60	80	55	60		
MPPT Based Charge Controller																		
Switching Element			MOSFET								IGBT							
Controller											DSP							
Type of Charger											MPPT							
Peak Efficiency		%									95							
Parameters			Configurable								Default Value							
Battery Low Buzzer		V									Batt. Low Cut +0.2						11.2	
Battery Low cut		V									10-11.7						11	
Battery High cut (INV.)		V									SPV Present-SPV CHG. REF +1.3V for 15Sec, SPV CHG. REF +1.8V for 2Sec						15.5	
											SPV Absent-SPV CHG. REF +0.5V for 15Sec, SPV CHG. REF +1.2V for 2Sec						15	
Battery Charging Voltage with SPV		V									12.8-16						14.5	
Battery Charging Current with SPV		A									12-60						18	
Battery Charging Voltage with Grid		V									12.5-15.5						14	
Battery Charging Current with Grid		A									6-15						10	
Grid low cut volt. (IT Mode Enable/Dis)		GRID EXPORT MODE DISABLE	V									NA/120-200						175/120
Grid high cut volt. (IT Mode Enable/Dis)			V									NA/245-280						260/280
Grid Charging		V									Enable/Disable						Enable	
IT Mode											Enable/Disable						Disable	
Operating mode											Smart/PCU/Hybrid/Grid Export						Smart Mode	
Input Source											Grid/Genset(for Genset, Grid Export Mode must be Disable)						Grid	
Output voltage low		V									170-190						185	
Output voltage high		V									250-260						255	
Li Ion Parameter																		
100AH																		
No. of Cells				8	15				30		38		56		75			
Battery Low Buzzer		V		24.4	45.75				91.5		115.9		170.8		228.75			
Battery Low Cut**		V		23.6	44.25				88.5		112.1		165.2		221.25			
Battery Charging Voltage by SPV		V		28.4	53.25				106.5		134.9		198.8		266.25			
Battery Charging Current by SPV		A		20	20				20		20		20		20			
Battery Charging Voltage by Grid		V		28	52.5				105		133		196		262.5			
Battery Charging Current by Grid		A		10	10				10		10		10		10			
Grid Export Mode Enable																		
Grid Low/recover		V									185/195							
Grid High/recover		V									280/275							
Synchronization voltage range		V									185-280V							
Synchronization frequency range		Hz									47 to 53							
Maximum Charging Current from Grid (Import)		A									6-15						10	
Battery																		
Grid Disconnect (Solar Available) PCU/SMART											@14.5V/Battery for 2 minutes OR 13.5V/Battery-100% Current (if Grid Chg. Volt. Ref. set to 14.0V)							
Grid Reconnect (PCU Mode / Smart Mode), Import ON (Grid Export mode)		V									11-12						11.5	
Inverter																		
Switching Element			MOSFET								IGBT							
Control											PWM							
Nominal Output voltage											220, 1Phase, 3 Wire, Pure Sine Wave							
Nominal frequency		Hz									50							
Load Current		A	4.5	9	13.5	14.2	18	27	36	54								
Voltage regulation		%									1							
Output voltage distortion with 100% linear load		%									<3							
Overload capacity		%	IT Load Disable 100-120(2Time auto Reset) : 60sec 120-150(2Time auto Reset) : 30sec								IT Load Enable 100 - 110% : 10min; 110 - 120% : 2min; 120 - 150% : 30sec;		Grid Tie Over Load Indication @>200% ON >200 - 300% : 10min >300 - 400% : 1min >400% : 250ms					
Peak efficiency		%									>85							
Noise @ 1 meter		dB									50							
Cooling											Either Load Based (On ≥ 60, Off ≤ 50) or Temperature Based (On ≥ 55°C ±3°C, Off ≤ 42°C ±3°C)							
Protections											Overload, Battery Low, Battery High, Output Low, Output High, Input Low, Input High, SPV Low, SPV High, Output Short Ckt., Input Short Ckt., Over Temp., Under Frequency, Over Frequency, Solar Panel Reverse, Anti-islanding, Surge Protection, Grid/Solar Charger Open Circuit, NTC Open.							
Display Parameters										Battery Voltage, Charging Current, Discharging Current, charging KWH and discharging KWH								
										Solar Voltage, Solar Current, Instantaneous Power, Cumulative Energy								
										Grid Voltage, Grid Current, Frequency, Import Power, Import Energy								
										Export Power, Export Energy								
										Output Voltage, Output Current, Frequency, Instantaneous Power & Cumulative Energy								
										Grid, Inverter & SPV Charger Status								
System Info : Grid CHG-EN, IT Load-EN, Input Source-Grid, Operation Mode-Smart																		
Switches											Reset for System ON/OFF, UP, DOWN, BACK, ENTER (for LCD Configuration)							
Indications											System ON, Inv. ON, SPV Charging, Grid Charging, Grid Tie ON, Battery Low/High, Overload / Overheat, Mains Low / Mains High, Under frequency/Over frequency, Operating modes (smart, Hybrid, PCU and Gridexport), Fault, HOE							
Environment																		
Operating temperature		°C									0-45							
Max. Relative Humidity @ 25 C (non condensing)		%									95							
Degree of Protection											IP-21				IP-20		IP-21	
Data Logging											30 Days Data Storage							
Dimension (LxWxH)		Inch	15x16x15	18 x 10 x 20				23 x 13 x 26				26 x 13 x 26	30 x 16 x 27	26 x 13 x 26				
Weight (Approx)		kg	30	35	43	50	52	60	70	78	103	160	120					

*Specification are subject to change without prior notice due to constant improvement in design & technology.

*If battery is not fully charged, battery low cut voltage is 11.5V/batt. If battery is fully charged, battery low cut voltage is equal to set Voltage.

ZETA PRO SOLAR PCU

“A Smart PCU - Which Stores as well as Exports Electricity”

**Model Available in
7.5kVA-50KVA**

**rMPPT™ Hybrid Solar PCU
(3Ph in 3Ph out)**



FEATURES

- DSPIC based Pure Sine Wave Design.
- Inbuilt in rMPPT charge controller (upto 30% more efficient*).
- Grid Interactive.
- Maximum Preference to Solar Power.
- USB based communication, 31 days data logs inbuilt and AC& DC energy meter inbuilt.
- Wi-Fi Based Monitoring.
- Robust Design-20 years product life, 5 yrs of warranty.
- User Friendly & Easily accessible LCD Display with all AC and DC Parameter Configurable by Display Switches & Digital LCD (20X4).
- User Friendly Control :- Output Voltage, Chg. Voltage - SPV/Grid, Chg. Current - SPV/Grid, Grid Reconnect, Batt. Low.
- Reverse AC Voltage Protection.
- Priority based working modes - Smart/PCU/Hybrid (for saving energy & money).
- Grid Export Mode, Grid Charging & IT Load - Enable/ Disable by Display Switch.
- Phase Sequence Protection.

PCU Mode Priority

Solar/Battery/Grid

Hybrid Mode Priority

For Load - Grid/Solar/Battery
For Charging - Solar/Grid

Smart Mode Priority

For Day Time - Solar/Battery/Grid
For Night Time - Grid/Battery

Grid Export Mode

Solar/Grid/Battery

Application



* As Compare with PWM

ZETA SOLAR PCU (3Ph in 3Ph out)

Parameters	Units	Rating			
System Rating	KVA	7.5	10	15	
Operating DC Voltage	VDC	96	120	180	
Photovoltaic Input					
Input open circuit voltage range(Min-Max)	Voc	160-360	200-360	300- 540	
Maximum PV Power Recommended / No. of Charge Controller		7.5KW / 1	10KW / 1	15KW / 1	
Switching Element / Type of Charger / Solar Charge Controller Rating		IGBT / MPPT / 80A			
Peak Efficiency (DC to DC)	%	95			
PANEL CONFIGURATION (S-SERIES, P-PARALLEL)		400W-6S X 3P 440W-6S x 3P 540W-7S x 2P	335W-6S X 5P, 390/400W-6S x 5P 540W-6S x 4P	335W-6S X 5P, 390/400W-6S or 7S x 5P 540W-7S x 4P	
Grid parameter		Configurable			Default
Input Voltage (R,Y,B w.r.t.. N) Nominal	VAC	220V/ Phase			
Frequency Range (R,Y,B w.r.t.. N)	Hz	50 ±3			
Supply Phase & Connection		3Phase / 4Wire			
Switching Element / Bypass Element / Grid charger Efficiency (AC-DC)		IGBT/ SCR / >85%			
Grid Low Cut Voltage R-Y-B w.r.t N (IT Mode-Enable/Disable)	VAC	NA/120-200			175/120
Grid High Cut Voltage R-Y-B w.r.t N (IT Mode-Enable/Disable)	VAC	NA/245-280			260/280
Grid Charger		Enable/Disable			Enable
Grid Export		Enable/Disable			Disable
IT Load		Enable/Disable			Disable
Input Source		Grid/Genset(for Genset, Grid Export Mode must be Disable)			Grid
Grid Export Mode Enable Parameter		Configurable			Default
Grid Low Cut/Recover Voltage R-Y-B w.r.t N	AC	185/195			
Grid High Cut/Recover Voltage R-Y-B w.r.t N	VAC	280/275			
Synchronization voltage range	VAC	165-280			
Synchronization frequency range	Hz	50±3			
Battery Parameter		Configurable			Default
Battery Low Buzzer	VDC	Batt.Low Cut+0.2			11.2
Battery Low Cut	VDC	10-11.7			11
Battery High Cut(Inverter)	VDC	SPV Present- SPV Chg. Ref.+ 1.0V for 15Sec., SPV Chg. Ref.+1.5V for 25Sec			16
		SPV Absent- SPV Chg. Ref for 15Sec, SPV Chg. Ref + 0.2V for 2Sec			14.7
Battery Charging Voltage with SPV	VDC	12.8-16			14.5
Battery Charging Current with SPV	A	12-60			16
Battery Charging Voltage with Grid	VDC	12.5-15.5			14.2
Battery Charging Current with Grid	A	6-15			10
Operation Mode		Smart/Hybrid/PCU			Smart
Grid Disconnect (Solar Available) PCU/SMART	VDC	@14.5V/Battery for 2 minutes or 13.5V/Battery with 100% Charging Current			
Grid Reconnect (PCU Mode/SMART Mode)	VDC	11-12			11.5
Temperature Compensation		@3mV/cell/°C			
Inverter Parameter		Configurable			Default
Switching Element / Control	VAC	IGBT/ PWM			
Nominal Output Voltage (R,Y,B w.r.t.. N)	VAC	220V,230V,240V/ Phase			230V
Output Voltage Low Cut (R,Y,B w.r.t.. N) (Inv. Mode)	VAC	170-190			165
Output Voltage High Cut (R,Y,B w.r.t.. N)(Inv. Mode)		250-260			255
Output Supply Phase / Output Waveform	Hz	3Phase / 4Wire / Pure Sine Wave			
Frequency	A	50± 0.05			
Output Current Per Phase (R,Y,B)	%	8.6	11.5	17.4	
Voltage Regulation	%	±1			
THDv	%	Less than 3% Linear load			
Overload Capacity (IT LOAD DISABLE)	%	100 - 120 % @ 60 Sec (2 Times Retry), 120 - 150 % @ 30 Sec(2 Times Retry), 150 - 200 % @ 2 Sec			
Overload Capacity (IT LOAD ENABLE)	%	100 - 110 % @ 10 Min, 110 - 120 % @ 2Min, 120 - 150 % @ 30 Sec			
Overload Capacity (Grid Tie ON)	%	200 - 300 % @ 10 Min, 300 - 400 % @ 1Min, >400% @250ms			
Peak Efficiency		>85			
Manual Bypass		Rotary Switch			
Cooling		Temperature Controlled Fan			
Protections		Overload, Battery Low, Battery High, Output AC Low, Output AC High, Input AC Low, Input AC High, SPV High, SPV Low, Output AC Short Circuit, Input AC Short Circuit, Over temperature, Under Frequency, Over Frequency, Grid/Solar Charger Open Circuit, NTC Open, Solar Panel Reverse, Anti-islanding, Surge Protection			
Display Parameters		Input R Y B Voltage/Current/Frequency/Import Power/Export Power/Import Energy/Export Energy, Output R Y B Voltage/Current/Frequency/Power/Energy, Solar Voltage/Current/Power/Energy, Battery Voltage/Charg. Current/Discharging Current/Charging kWh/Discharging kWh, Inverter Status , Grid Charger Status, Solar Charger Status			
Switches		Reset Switch for System ON/OFF, UP, DOWN, BACK, ENTER(for LCD Configuration)			
LED Indications		System ON, Inverter ON, Grid Charger ON, Grid Tie ON, SPV Charger ON, Grid High/Low R Y B, Grid Frequency under and over R Y B, Output High/Low R Y B, Battery Low/High ,SPV Low/ High, Inverter/Grid charger Overheat, MPPT Overheat, Fault, Overload R Y B, HOE R Y B			
Environment					
Operating Temperature	°C	0 - 50			
Max. Relative Humidity @25°C (non condensing)	%	95			
Noise at 1 Meter / Degree of Protection		60 dBA / IP20			
REMOTE MONITORING SYSTEM (RMS)		Wi Fi			
Data Log		31 Days			
Dimension (L X W X H)	Inch	33 X 16.3 X 27.5			
Weight	Kg	90	105	125	

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ZETA SOLAR PCU (3Ph in 3Ph out)

Parameters		Units	Rating				
System Rating		KVA	20		30	40	50
Operating DC Voltage		VDC	240				
Photovoltaic Input							
Input open circuit voltage range(Min-Max)		Voc	400-720				
Maximum PV Power Recommended / No. of Charge Controller			20KW / 1		30KW / 1	40KW / 1	50KW / 1
Switching Element / Type of Charger / Solar Charge Controller Rating			IGBT / MPPT / 80A		IGBT / MPPT / 125A	IGBT / MPPT / 160A	IGBT / MPPT / 200A
Peak Efficiency (DC to DC)		%	95				
Panel configuration			335W-12 Panel in Series X 5 String, 440W-11 Panel in series x 4 string 540W-12 Panel in series x 3 string	335W-13 Panel in Series X 7 String, 440W-10 Panel in series x 7 string 540W-11 Panel in series x 5 string	335W-12 Panel in Series x 10 String, 440W-10 Panel in series x 9 string 540W-11 Panel in series x 7 string	335W-12 Panel in Series X 12 String, 440W-10 Panel in series x 11 string 540W-10 Panel in series x 9 string	
Grid parameter							Default
Input Voltage (R,Y,B w.r.t. N) Nominal		VAC	220V/ Phase				
Frequency Range (R,Y,B w.r.t. N)		Hz	50 ±3				
Supply Phase & Connection			3Phase / 4Wire				
Switching Element / Bypass Element / Grid charger Efficiency (AC-DC)			IGBT/ SCR / >85%				
Grid Low Cut Volt. Range R-Y-B w.r.t N (IT Mode-Enable/Disable)	Grid Export Mode Disable	VAC	NA/120-200				175/120
Grid High Cut Volt. Range R-Y-B w.r.t N (IT Mode-Enable/Disable)		VAC	NA/245-280				260/280
Grid Charger			Enable/Disable				Enable
Grid Export Mode			Enable/Disable				Disable
IT Load			Enable/Disable				Disable
Input Source			Grid/Genset(for Genset, Grid Export Mode must be Disable)				Grid
Grid Export Mode Enable Parameter							
Grid Low Cut/Recover Voltage R-Y-B w.r.t N		AC	185/195				
Grid High Cut/Recover Voltage R-Y-B w.r.t N		VAC	280/275				
Synchronization voltage range		VAC	185-280				
Synchronization frequency range		Hz	50±3				
Battery Parameter							Default
Battery Low Buzzer		VDC	Batt.Low Cut+0.2				11.2
Battery Low Cut		VDC	10-11.7				11
Battery High Cut(Inverter)		VDC	SPV Present- SPV Chg. Ref + 1.0V for 15Sec., SPV Chg. Ref + 1.5V for 2Sec				16
			SPV Absent- SPV Chg. Ref for 15Sec, SPV Chg. Ref + 0.2V for 2Sec				14.7
Battery Charging Voltage Range with SPV		VDC	12.8-16				14.5
Battery Charging Current Range with SPV		A	12-60				18
Battery Charging Voltage Range with Grid		VDC	12.5-15.5				14.2
Battery Charging Current Range with Grid		A	6-15				10
Operation Mode			Smart/Hybrid/PCU				Smart
Grid Disconnect (Solar Available) PCU/SMART		VDC	@ 14.5V/Battery for 2 minutes or 13.5V/Battery with 100% Charging Current				
Grid Reconnect Range (PCU Mode Smart Mode)		VDC	11-12				11.5
Temperature Compensation			@3mV/cell/°C				
Inverter Parameter							Default
Switching Element / Control			IGBT/ PWM				
Nominal Output Voltage (R,Y,B w.r.t. N)		VAC	230V/ Phase				
Output Volt. Range Low Cut R-Y-B w.r.t N (Inv. Mode)		VAC	170-190				185
Output Volt. Range High Cut R-Y-B w.r.t N (Inv. Mode)		VAC	250-260				255
Output Supply Phase / Output Waveform			3Phase / 4Wire / Pure Sine Wave				
Frequency		Hz	50± 0.05				
Output Current Per Phase (R,Y,B)		A	23	34.7	46.3	57.9	
Voltage Regulation		%	±1				
THDv		%	Less than 3% Linear load				
Overload Capacity (IT LOAD DISABLE)		%	100 - 120 % @ 60 Sec (2 Times Retry), 120 - 150 % @ 30 Sec(2 Times Retry), 150 - 200 % @ 2 Sec				
Overload Capacity (IT LOAD ENABLE)		%	100 - 110 % @ 10 Min, 110 - 120 % @ 2Min, 120 - 150 % @ 30 Sec				
Overload Capacity (Grid Tie ON)		%	200 - 300 % @ 10 Min, 300 - 400 % @ 1Min, >400% @250ms				
Peak Efficiency		%	>85				
Manual Bypass			Rotary Switch				
Cooling			Temperature Controlled Fan				
Protections			Overload, Battery Low, Battery High, Output AC Low, Output AC High, Input AC Low, Input AC High, SPV High, SPV Low, Output AC Short Circuit, Input AC Short Circuit, Over temperature, Under Frequency, Over Frequency, Grid/Solar Charger Open Circuit, NTC Open, Solar Panel Reverse, Anti-Islanding, Surge Protection				
Display Parameters			Input R Y B Voltage/Current/Frequency/Import Power/Export Power/Import Energy/Export Energy, Output R Y B Voltage/Current/Frequency/Power/Energy, Solar Voltage/Current/Power/Energy, Battery Voltage/Charg. Current/Discharging Current/Charging KWh/Discharging Kwh, Inverter Status, Grid Charger Status, Solar Charger Status				
Switches			Reset Switch for System ON/OFF, UP, DOWN, BACK, ENTER(for LCD Configuration)				
LED Indicators			System ON, Inverter ON, Grid Charger ON, Grid Tie ON, SPV Charger ON, Grid High/Low R Y B, Grid Frequency under and over R Y B, Output High/Low R Y B, Battery Low/High, SPV Low/High, Inverter/Grid charger Overheat, MPPT Overheat, Fault, Overload R Y B, HOF R Y B				
Environment							
Operating Temperature		°C	0 - 50				
Max. Relative Humidity @25°C (non condensing)		%	95				
Noise at 1 Meter / Degree of Protection			60 dBA / IP20				
Dimension (L X W X H)		Inch	33 X 16.5 X 27.5	27.5 X 27.5 X 67.5			
Weight		Kg	145	300	350	400	

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MARS Online Solar PCU

“3 Phase with Zero Changeover Time”

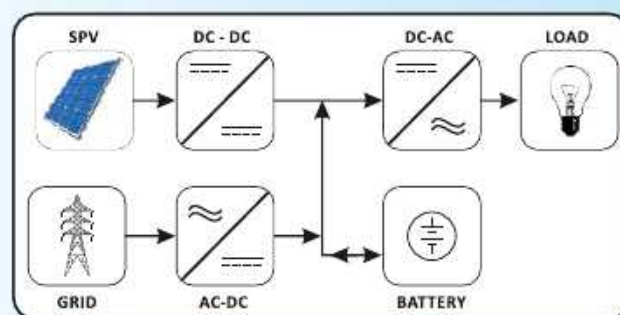
Available in
5-20KVA (3 in - 1 Out)

rMPPT™ Online Solar PCU



FEATURES

- DSPIC based design Pure Sine wave, inbuilt rMPPT charge controller.
- Thermal Protection.
- Maximum Preference to Solar Power.
- Ethernet based monitoring (Optional).
- Noiseless in Operation.
- Robust Design - 20 years Product life.
- Configurable Priority.
 - a) Solar/Battery/Grid
 - b) Solar/Grid/Battery
- AC and DC Parameter Configurable from LCD.
- AC-Output Voltage.
- DC- Charging Voltage Battery Charging Current, Battery Low Cut/High Cut.
- High Surg Capability (up to 300%) for starting heavy load.
- High Efficiency & High Reliability.



Working Mode

Solar/Grid/Battery
or
Solar/Battery/Grid

Application

Hospital

School

Industries



Home

Petrol Pump

Bank



MARS ONLINE SOLAR PCU (3Ph in 1Ph out)

Input	Power Rating	5kVA/240V	7.5kVA/240V	10kVA/240V	15kVA/240V	20kVA/360V
	Voltage Range	400V±20% Three phase four wire				
	Frequency	50Hz ±3%				
	Power Factor	>0.92				
	Charger Topology	Buck				
	Connection Type	Terminal Block				
Solar	K Watt	5KW	7.5KW	10KW	15KW	20KW
	Voc (min-max)	400V - 740V				
	Vmp	288V - 660V				
	Panel Configuration (S-SERIES, P-PARALLEL)	335W	14S X 1P	11S X 2P	10S X 3P	11S X 4P
		440W	11S X 1P	9S X 2P	11S X 2P	11S X 3P
		540W	9S X 1P	14S X 1P	10S X 2P	10S X 3P
	Switching Devices	IGBT				
	Switching Freq.	16KHz				
	No. of Charger Controller	One				
	Charger Topology	Buck				
	Type of Charger	PWM with MPPT				
	Peak Efficiency (DC - DC)	96%				
	Parameter	Configurable				Default
	Battery Low Buzzer	Batt Low Cut + 0.2				10.7V
	Battery Low Cut	10-11.7V				10.5V
	Battery High Cut (Charger)	Batt Volt By SPV + 0.7				14.5
	Batt. CHG. Volt. by Grid	13-14.5V				13.3V
	Batt. CHG. Current. by Grid	3-12A				10A
	Batt. CHG. Volt. by SPV	13.5-15V				13.8V
	Batt. CHG. Current. by SPV	5-24V				18V
	Grid Charger Reconnect	Enable /Disable				Disable
	Output Voltage Low Cut	170-190V				180V
	Output Voltage High Cut	250-260V				255V
Output	Voltage	220V/230V/240V±1% (1phase 2 wire)				
	Load Current	17.4A	26.08A	34.78A	52.17A	69.6A
	Efficiency (AC - AC)	>90%@Full Load				
	Frequency	50Hz				
	Waveform	Pure Sine Wave				
	Transient Response	<8 (10%-90% Linear Load)				
	Voltage Harmonics	<3% Linear Load				
	Overload Capacity	100 to 110%-10 Min.; 110 to 120%-2 Min.; 120 to 150%-30 Sec; 150 to 200%-2 Sec; 200 to 300%-1sec.; 300 to 400%-250msec.; >400%-20-30msec				
	Crest Factor	3:1				
	Voltage Harmonics	±1%				
	Frequency Regulation	±0.05Hz				
	Connection Type	Terminal Block				
	Alarm	Battery Low, battery High, Overload				
	LED Indication	#UPS ON #Mains CHG. #Overload #Output High/Low #Battery High/Low, #Bypass #SPVCG. ON #SPV High/Low #CHG. OVERHEAT #AC Input High/Low R,Y,B #fault				
	LCD (20*4) Display	#Input Voltage & Freq. R,Y,B #Output Voltage, Freq. & Load% # Battery Voltage #Charging Current #Solar Voltage, Solar Current, Solar Watt, #Working Status				
	Protections	#Output Overvoltage/Undervoltage, #Overload, #Output Shortcircuit, #Battery Overvoltage/undervoltage #SPV Under Voltage/ Over Voltage #Input Under Voltage/Over Voltage				
Miscellaneous	Transfer Time	0 msec				
	Extended Battery Charging	Optional				
	Caster Wheels	Yes				
Environmental	Operating Environment	0-50° C				
	Operating Relative Humidity	(5%-95%) Non-condensed				
	Storage Environment	0-75°C				
	Operational Logic	SOLAR BATTERY GRID SOLAR GRID BATTERY				
	Storage Relative Humidity	0-95%				
	Degree of Protection	IP20				
	Remote Monitoring	Ethernet (Optional)				
	Dimension (LXWXH) Inch	30x16x27				

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MARS ONLINE SOLAR PCU (3Ph in 3Ph out)

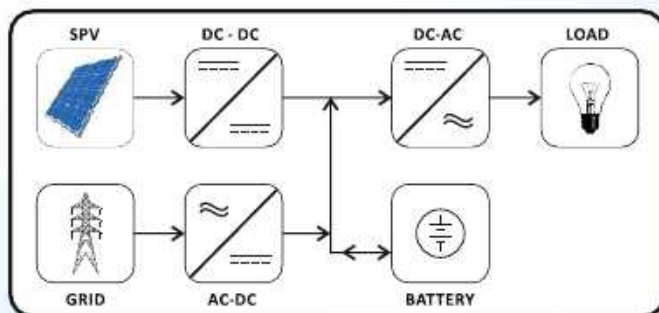
Input	Power Rating	5kVA/240V	7.5kVA/240V	10kVA/240V	15kVA/240V	
	Voltage Range	400V±20% Three phase four wire				
	Frequency	50Hz ±3%				
	Power Factor	>0.92				
	Charger Topology	Buck				
	Connection Type	Terminal Block				
Solar	K Watt	5KW	7.5KW	10KW	15KW	
	Voc (min-max)	400V - 740V				
	Vmp	288V - 660V				
	Panel Configuration (S-SERIES, P-PARALLEL)	335W	14S X 1P	11S X 2P	10S X 3P	11S X 4P
		440W	11S X 1P	9S X 2P	11S X 2P	11S X 3P
		540W	9S X 1P	14S X 1P	10S X 2P	10S X 3P
	Switching Devices	IGBT				
	Switching Freq.	16KHz				
	No. of Charger Controller	One				
	Charger Topology	Buck				
	Type of Charger	PWM with MPPT				
	Peak Efficiency (DC - DC)	96%				
	Parameter	Configurable			Default	
	Battery Low Buzzer	Batt Low Cut + 0.2			10.7V	
	Battery Low Cut	10-11.7V			10.5V	
	Battery High Cut (Charger)	Batt Volt By SPV + 0.7			14.5	
	Batt. CHG. Volt. by Grid	13-14.5V			13.3V	
	Batt. CHG. Current. by Grid	3-12A			10A	
	Batt. CHG. Volt. by SPV	13.5-15V			13.8V	
	Batt. CHG. Current. by SPV	5-24V			18V	
	Grid Charger Reconnect	Enable /Disable			Disable	
	Output Voltage Low Cut	170-190V			180V	
	Output Voltage High Cut	250-260V			255V	
Output	Voltage	380V/400V/415V ±1% (3phase 4 wire)				
	Load Current	5.8A	8.7A	11.6A	17.4A	
	Efficiency (AC - AC)	>90%@Full Load				
	Frequency	50Hz				
	Waveform	Pure Sine Wave				
	Transient Response	<8 (10%~90% Linear Load)				
	Voltage Harmonics	<3% Linear Load				
	Overload Capacity	100 to 110%-10 Min., 110 to 120%-2 Min.; 120 to 150%-30 Sec; 150 to 200%-2 Sec; 200 to 300%-1sec.; 300 to 400%-250msec., >400%-20-30msec.				
	Crest Factor	3:1				
	Voltage Harmonics	±1%				
	Frequency Regulation	±0.05Hz				
	Connection Type	Terminal Block				
	Alarm	Battery Low, battery High, Overload				
Indication	LED	#UPS ON #Mains CHG. #Overload R,Y,B #Output High/Low R,Y,B #Battery High/Low #SPVCHG. ON #SPV High/Low #CHG. OVERHEAT #AC Input High/Low R,Y,B #FAULT.				
	LCD (20*4)	#Input Voltage & Freq. R,Y,B #Output Voltage, Freq. & Load% R,Y,B # Battery Voltage #Charging Current #Solar voltage, Solar Current, Solar Watt, #Working & Fault Status.				
Protect-ions	Parameters	#Output Overvoltage/Undervoltage, #Overload, #Output Shortcircuit, #Battery Overvoltage/undervoltage #SPV Under Voltage/ Over Voltage #Input Under Voltage/Over Voltage.				
Miscell aneous	Transfer Time	0 msec				
	Extended Battery Charging	Yes				
	Caster Wheels	Yes				
Environ mental	Operating Environment	0-50° C				
	Operating Relative Humidity	(5%-95%) Non-condensed				
	Storage Environment	0-75°C				
	Storage Relative Humidity	0-95%				
	Degree of Protection	IP20				
	Remote Monitoring	Ethernet (Optional)				
	Dimension (LXWXH) Inch	23x13x26		30x16x27		

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STAR Online Solar PCU

**"3 Phase with Zero Changeover Time
for Heavy Loads"**

**Available in
20-120kVA**



FEATURES

- Upto 30% more Efficient because of rMPPT Charge Controller.
- Short Circuit, Input Under/Over Voltage Protection.
- Advanced DSPic based Design Pure Sine Wave
- User Configurable Parameters.
- Lightening, Surge Protection by SPD.
- Ethernet based Monitoring with Solar Data logs.
- Intelligent Charge Sharing.
- RS485 Based Monitoring (optional).
- Inbuilt Solar Energy Meter with 31 days data logs.

Online Solar PCU



Working Mode

**Solar/Grid/Battery
or
Solar/Battery/Grid**

Application



STAR ONLINE PCU 20-40KVA (3Ph in 1Ph out)

Power Rating		20kVA/240V	25kVA/240V	25kVA/360V	30kVA/360V	40kVA/360V
Input						
Voltage Range		400V± 20% Three phase four wire				
Frequency		50 Hz ± 3Hz				
Power Factor		0.94				
Charger Topology		Buck				
Connection Type		Terminal Block				
Solar						
K watt		20	25		30	40
Voc (min-max)		360-720	360-720	540-810		
Vmp		320-680	430-730			
Panel Configuration (S-SERIES, P-PARALLEL)	335W	12SX5P	15SX5P	15SX5P	15SX6P	15SX8P
	440W	12SX4P	11SX5P	14SX4P	14SX5P	15SX6P
	540W	12SX3P	12SX4P	12SX4P	14SX4P	15SX5P
switching devices		IGBT				
switching freq.		16KHZ				
charge controller		One				
Charger Topology		Buck				
Type of Charger		rMPPT				
Output						
Voltage		220V/230V/240V Default 230V± 1%				
Load Current		69.6A	86.9A		104.3A	139A
Efficiency(AC to AC)		>90% @ Full Load				
Frequency		50 Hz				
Waveform		Pure Sine Wave				
Transient Response		<8 (10%~90% Linear Load)				
Voltage Harmonics		< 3 % (Linear load)				
Overload Capacity		100- 110%@10 Min, 110 -120%@2 Min; 120-150%@30s; 150- 200%@ 2s; 200- 300% @1s; 300-400%@250ms; >400%@20ms				
Crest Factor		3:1				
Voltage Regulation		± 1%				
Frequency Regulation		± 0.05 Hz				
Connection Type		Terminal Block				
Audible warning						
Alarm		Battery Low, Battery High, Overload				
Indications						
LED		UPS ON # CHG ON # Input R,Y,B High / low # Output Low-High # Overload # Fault # Batt. Low/High # SPV Low/High # SPV CHG ON #				
LCD (20*4)		Output Voltage, Load & Freq. # Battery Voltage # Charging Current # Input Voltage, Freq R,Y,B # Solar Voltage # Solar Current # Solar Watt # Working Status				
Protections						
Parameters		# Output Overvoltage/Undervoltage # Overload # Output Short Circuit # Battery Overvoltage/Undervoltage #Input Overvoltage/Undervoltage				
Miscellaneous						
Transfer Time		0 msec				
Extended Battery Charging		Optional				
Caster wheels		Yes				
Environmental						
Operating Environment		0-50 °C				
Operating Relative Humidity		5 - 95 % (Non-condensed)				
Storage Environment		0-75 °C				
Storage Relative Humidity		0-95%				
Degree of Protection		IP 20				
Remote Monitoring		Ethernet (Optional)				
Dimension (LXWXH) Inch		39X26X35				34X34X43

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STAR ONLINE PCU 20-120KVA (3Ph in 3Ph out)

Power Rating	20kVA/240V	20kVA/360V	25kVA/240V	30kVA/360V	40kVA/360V	50kVA/360V	60kVA/360V	80kVA/360V	100kVA/360V	120kVA/360V	
Input											
Voltage Range	400V±20% Three phase four wire										
Frequency	50 Hz ± 3Hz										
Power Factor	0.95										
Charger Topology	Buck										
Connection Type	Terminal Block										
Solar											
K watt	20		25	30	40	50	60	80	100	120	
Voc (min-max)	400-720	540-810	400-720	540-810							
Panel Configuration (S-SERIES, P-PARALLEL)	335W	12SX5P	15SX4P	15SX5P	15SX6P	15SX8P	15SX10P	15SX12P	15SX16P	15SX20P	15SX24P
	440W	12SX4P	15SX3P	11SX5P	14SX5P	15SX6P	14SX8P	14SX10P	15SX12P	14SX16P	15SX18P
	540W	12SX3P	13SX3P	12SX4P	14SX4P	15SX5P	13SX8P	14SX8P	15SX10P	12SX16P	13SX18P
Switching devices	IGBT										
Switching freq.	16KHZ										
No. of Charge Controller	One										
Charger Topology	Buck										
Type of Charger	MPPT										
Peak Efficiency(DC to DC)	96%										
Output											
Voltage (Ph-Ph)	380/ 400V/415V ± 1% Configurable by LCD Display										
Load Current Per Phase	23A		29A	34.8A	46.3A	57.9A	69.5A	92.75A	115.9A	139A	
Efficiency(AC to AC)	>88% @ Full Load						>90% @ Full Load				
Frequency	50 Hz										
Waveform	Pure Sine Wave										
Transient Response	<8 (10%~90% Linear Load)										
Voltage Harmonics	< 3 % (Linear load)										
Overload Capacity	100- 110%@10 Min, 110 -120%@2 Min; 120-150%@30s; 150- 200%@ 2s; 200- 300% @1s; 300-400%@250ms; >400%@20ms										
Crest Factor	3:1										
Voltage Regulation	± 1%										
Frequency Regulation	± 0.05 Hz										
Connection Type	Terminal Block										
Audible warning											
Alarm	Battery Low, Battery High, Overload										
Indications											
LED	UPS On #Mains Chg. # Battery High / Low # Overload R,Y,B # Output High/Low R,Y,B # AC Input High / Low R,Y,B # SPV Charging ON # CHG, Overheat # SPV High/ Low										
LCD (20*4)	#Input Voltage & Freq. R,Y,B # Output Voltage, Freq. & Load % R,Y,B # Battery Voltage # Charging Current # Solar Voltage, Solar Current, Solar Watt # Working Status										
Protections											
Parameters	#Input Overvoltage/Undervoltage # Overload # Output Short Circuit # Battery Overvoltage #Input Overvoltage/Undervoltage.										
Miscellaneous											
Transfer Time	0 msec										
Extended Battery Charging	Optional										
Caster wheels	Yes										
Environmental											
Operating Environment	0-50 °C										
Operating Relative Humidity	5 - 95 % (Non-condensed)										
Storage Environment	0-75 °C										
Storage Relative Humidity	0-95%										
Degree of Protection	IP 20										
Remote Monitoring	Ethernet (Optional)										
Dimension (LXWXH) Inch	39X26X35				34X34X43			49X34X69			

*Specification are subject to change without prior notice due to constant improvement in design & technology.