


 **UTL SOLAR**

No. 1 rMPPT Solar PCU from 10 Years



  
**Go Solar**  
With **UTL SOLAR**

**SOLAR SOLUTION**  
For your home & business



Solar Inverters | Batteries | Solar PCUs | Online UPSs |  
EV Chargers | Lithium Batteries | Solar Panels

[www.upsINVERTER.com](http://www.upsINVERTER.com)

**ISO**  
9001 : 2015

**ISO**  
14001 : 2015

**CE**

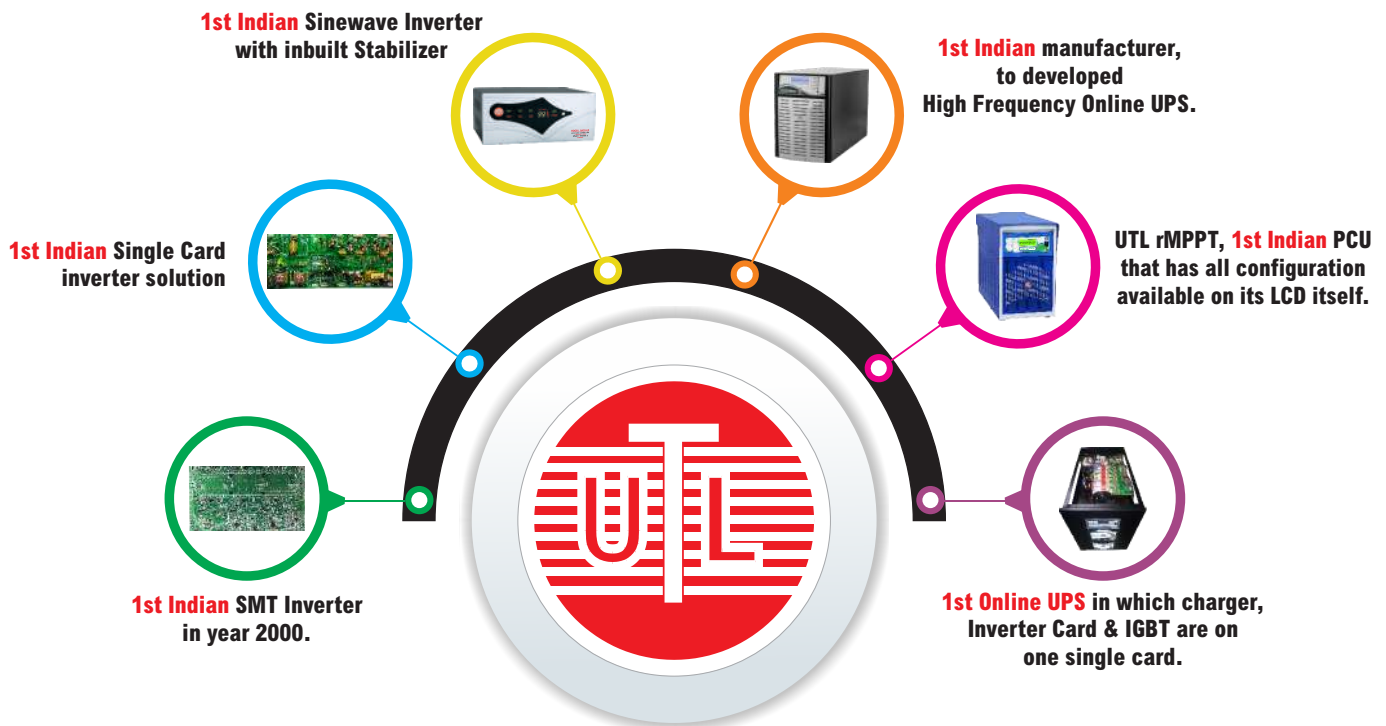
**RoHS**  
compliant



## ABOUT UTL

UTL was founded in the year 1996 by 2 proficient engineers **Mr Yogesh Dua** and **Mr Pawan Garg**. UTL is one of the leading brand in power back-up and power generation in India. UTL offers wide range of quality products, has 5 manufacturing units, strong network of distributors and dealers across the globe and highly motivated workforce. We are offering excellent R&D services through the team of more than 60+ R&D professionals and exporting R&D services & UL Certified products to various countries including USA. As the company values long term relationship, our stakeholders and even customers have very long association with UTL.

### *Some remarkable milestones covered by UTL are...*





## UTL in 2022-2023

5

Manufacturing Units

27

Years Old Brand

60+

Strong R&D Team

120

kVA- We made upto 120kVA Capacity

2000+

Associated Man Power

1100+

Per Day Production Capacity

10000+

Dealers in INDIA

10000000+

Satisfied UTL Consumers

6.5 Bn

UTL Turnover



# Manufacturing Energetic Excellence

For-sighted investment in a state-of-the-art facility with an installed capacity of 500 MW per annum.

- ☑ Fully automatic line including auto bussing in the manufacturing facility
- ☑ Solar Cells & Other Key Materials Sourced From World Renowned Suppliers
- ☑ Manufacture Solar PV Modules From 10Wp To 600Wp Using Multi/Mono Crystalline Silicon
- ☑ World Class Lab Testing Facilities



Following Stringent Production Quality Assurance Programs



## HELIAC (Solar Home PCU)

“Cost Effective PCU Compatible with SMF,  
Gel and Tubular Batteries.”

Model Available  
HL1050 to HL4000



### FEATURES

- Pure Sine Wave Output.
- Inbuilt PWM Solar Charge Controller.
- Multi-Colour LCD Display.
- Freq.-Available 50 & 60Hz.
- Multi Charging Stage (Bulk, Absorption & Float) Auto Equalize in a month.
- Solar Priority for Load & Battery Charging.
- Preference to Solar Power over Grid Power.
- Protections : RBP, RSPV, OVL, BL, BH, S.Ckt, I/P HV& LV, OHT.
- Compatible with DG as an Input Source.
- Compatible with IT Load.
- Compatible with SMF, Gel & Tubular Batteries.
- Priority Selection - PCU, Smart & Hybrid for Saving Energy and Money.
- Support 1HP Motor in Model No 3000, 3750& 4000

## HELIAC (Solar Home PCU)

Parameters		Rating						
Model No.		HL1050	HL1500	HL2000	HL2500	HL3000	HL3550	HL4000
Operating DC Voltage		12V			24V		48V	
Switching Element		Mosfet						
Charger Topology		Boost Mosfet						
Battery Capacity		200AH MAX.						
Operating Mode	SMART/PCU/HYBRID	Smart mode						
DG Mode	Enable/Disable	Disable						
Input Voltage Range (Min - Max)Voc		17V-25V			31V-49.5V		60V-100V	
Maximum PV Power Recommended		165W x 4P*	165W x 5P*	335W x 4P*/400W x 3P* 540W x 2P*		335W x 6P*/400W x 5P* 540W x 4P*		335W x 2S*/400W x 2S* & 4P*/540W x 2S* & 3P*
		650W	800W	1200W		2000W		3000W
Parameters (Grid)		Default Value						Variable Range
Nominal Grid Voltage		230V 1Φ						
Nominal Grid frequency		50Hz						
Frequency Range		47-53Hz ± 1Hz						
Default mode	TUB/SMF	Tubular						
Grid Charging Voltage	TUB	Boost		14.5V ± 0.2V				13.5V-15V
Grid Charging Voltage		Float		13.8V ± 0.2V				13V-14.2V
Grid Charging Voltage	SMF	Boost		13.5V ± 0.2V				13.5V-14.2V
Grid Charging Voltage		Float		13.5V ± 0.2V				13.5V-14.2V
Battery Charging Method 4 Stages		Bulk/Absorption/Float/Equalize						
Grid Charging Voltage (Equalize)		After 30 Days						NA
Grid Charging Current (Normal/Boost)		12A/15A ± 2A						1A-20A
Optional Grid Charging	Enable/Disable	Enable						
Grid Reconnect @ Battery Voltage		11.8V ± 0.2V						11V-12V
Grid Low Cut Voltage		170V ± 10V						
Grid Low Cut Recovery	IT Mode Enable	180V ± 10V						
Grid High Cut Voltage		265V ± 10V						
Grid High Cut Recovery		255V ± 10V						
Grid Low Cut Voltage		100V ± 10V						
Grid Low Cut Recovery	IT Mode Disable	110V ± 10V						
Grid High Cut Voltage		290V ± 10V						
Grid High Cut Recovery		280V ± 10V						
Changeover (Batt. to Mains)	IT Mode Enable/Disable	<5ms						
Changeover (Mains to Batt.)	IT Mode Enable	<12ms						
	IT Mode Disable	<30ms						
Parameters (Inverter)								
Output Phase		1Φ						
Nominal Output Voltage		220V ± 8%						
Nominal Frequency		50Hz ± 1%						50-60Hz
Max. Output Current		2.5A	2.9A	4.3A	5.6A	6.8A	9.0A	10.0A
Battery Low Buzzer		10.8V ± 0.2V						Battery Low Cut+0.3V
Battery Low Cut		10.5V ± 0.2V						10V-11.5V
Battery High Cut		16.5V ± 0.2V						16.5V-17.5V
Output Waveform		Sinewave						
Typical Efficiency		≥80%			≥85%			
Voltage Harmonic		<3% (Linear Load)						
Over Load Capacity	IT Mode Disable	>100% After 30 sec delay (with Alarm) 3Time Auto Reset, 4th Time Shut Down Note : 1HP Motor Load Run for 15min with alarm (1 sec ON 5sec OFF) in 2500 & 3000 Model.						
	IT Mode Enable	>100% After 30 sec delay 1st Time Shut Down						
		>150% Output Goes Down						
Motor 1 HP		NA	Yes(<6.5A)	Yes(<7.5A)	Yes			
Protection		Overload, Battery Low, Battery High, Output Short Ckt., Battery Reverse (Fuse Blown), Over Heat @90°C + 10°C, Over/Under Frequency, I/P Hi, I/P Low, SPV High.						
LED Indication		System ON, (IT Mode, SMF/TUB, Boost Chg., DG Mode, Grid Chg.) Enable/Disable.						
Switches (Micro)		System ON/OFF, UP, Down, Back, Enter(For LCD Calibration)						
Display (Multi Color)		Batt. Voltage, Chg. Current, Grid Voltage, Grid Freq., O/P Voltage, O/P Freq. Load%, Batt. Graph, Overheat, BLK/ABS/FLT, SPV Current, Working Operating Mode (HYB/PCU/SMT).						
Parameters (Solar)								
Switching Element		Mosfet						
Type of Charger		PWM						
SPV Charging Voltage (Boost)	TUBULAR	15V ± 0.2V						14.2V-15.5V
SPV Charging Voltage (Reconnect)		14.2V ± 0.2V						13.1V-14.5V
SPV Charging Voltage (Boost)	SMF	14.0V ± 0.2V						13.6V-14.5V
SPV Charging Voltage (Reconnect)		13.7V ± 0.2V						13.6V-14.5V
Efficiency		≥95%						
Solar Current MIN.		>3A (Below 3A, System will act like Solar Absent)						
Solar Current MAX.		50A			60A			
Parameters (Environment)								
Operating Temperature		0-50°C						
Cooling		Fan						
Max. Relative Humidity @25°C (non Condensing)		95%						
Noise @ 1meter		50dB						
Standard Compliance		IP20						
Weight (kg)		10	11	15	18	24	25	
Dimension L x W x H(mm)		275x306x128		300x306x167	300x306x207	333x306x315	333x306x315	

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



## SHAMSI (Solar Home PCU)

“Affordable Yet, Very Reliable”



Model Available  
SA 675VA to SA 1475

### FEATURES

- Maintain battery health for longer life.
- Modified Sine wave output.
- Built-in IT mode.
- Easy Installation & low maintenance.
- Best Regulated output.
- Battery Charging with Multi stage (Bulk, Absorption & Float)  
Auto Equalize in a month.
- Protections : RBP, RSPV, OVL, BL, BH, S.Ckt, I/P HV& LV, OHT.
- Inbuilt PWM Solar Charge Controller.
- Priority Mode Selection  
1) PCU 2) Hybrid 3) Smart  
For Saving Energy & Money.
- Can Operated without Solar.
- LED Display for Operation & Fault.

## SHAMSI (Solar Home PCU)

Parameters		Rating			
Model No		SA-675	SA-875	SA-1075	SA-1475
Operating DC Voltage		12V			24V
Switching Element		Mosfet			
Charger Topology		Triac Based			
Max. Battery Capacity		200AH			
Operating Mode (SMART/PCU/HYBRID)		SMART			
Input Voltage Range (Min- Max) Voc		17V-25V			31V-49.5V
Maximum PV Power Recommended		(150W/160W)X2 (Parallel)	(150W/160W)X4 (Parallel)	(150W/160W)X5 (Parallel)	335W X 4 (Parallel)
Parameters (Grid)		Default Value			
Nominal Grid Voltage		230V 1Φ			
Nominal frequency		50Hz			
Battery Charging Method 4 Stages		Bulk/Absorption/Float/Equalize			
Grid - Battery Charging Voltage (TUB) Default mode	Boost	14.5V ± 0.2V (Each battery )			
	Float	13.8V ± 0.2V (Each battery )			
Grid - Battery Charging Voltage (SMF)	Boost	13.5V ± 0.2V (Each battery )			
	Float	13.5V ± 0.2V (Each battery )			
Grid - Battery Charging Voltage (Equalize)		After 30 days			
Grid Charging Current	Normal/Boost	10A/12.5A ± 2A			
	Enable/Disable	Enable			
Grid Reconnect @ Battery Voltage		11.8V ± 0.2V (Each battery )			
Grid Low Cut Voltage		170V ± 10V			
Grid Low Cut Recovery	IT Mode Enable	180V ± 10V			
Grid High Cut Voltage		265V ± 10V			
Grid High Cut Recovery	IT Mode Disable	255V ± 10V			
Grid Low Cut Voltage		100V ± 10V			
Grid Low Cut Recovery		110V ± 10V			
Grid High Cut Voltage		290V ± 10V			
Grid High Cut Recovery		280V ± 10V			
Change Over (Battery to Mains)	IT Mode	<5ms			
Change Over (Mains to Battery)	Enable/disable	<15ms			
Parameters (Inverter)					
Output Phase		1Φ			
Nominal output voltage		240V ± 10% RMS			
Nominal Frequency		50Hz ± 1%			
Max. Output Current		2.1A	2.5A	2.9A	4.3A
Output Waveform		Modified Sinewave			
Battery Low Buzzer		10.8V ± 0.2V (Each battery )			
Battery Low Cut		10.5V ± 0.2V (Each battery )			
Battery High Cut		17V ± 0.2V (Each battery )			
Typical Efficiency		>82%	>80%	>88%	
Over Load Capacity	IT Mode Disable	>100% After 30 sec delay (with Alarm) 3Time Auto Reset , 4th Time Shut Down			
	IT Mode Enable	>100% After 30 sec delay (with alarm) 1st Time Shut Down			
		>150% Output Goes Down			
Protection		Overload, Battery Low, Battery High, Output Short Ckt, Battery Reverse (Fuse Blown), Over Heat @90°C ± 10°C , SPV High , I/P HV, I/P LV			
LED Indication		System ON, (IT mode, SMF/TUB, Boost Chg, Grid Chg.)Enable/Disable, Mains Status, Overload, Grid chg., Inverter ON, Battery Status, SPV Chg., Fault			
Switches (Micro)		System ON, (IT Mode, SMF/TUB, Boost Chg, Grid Chg.) Enable/Disable			
Parameters (Inverter)					
Switching Element		MOSFET			
Type of Charger		PWM			
SPV Charging Voltage (TUB)	Boost	15V ± 0.2V (Each Battery)			
	Float	14.2V ± 0.2V (Each Battery)			
SPV Charging Voltage (SMF)	Boost	13.7V ± 0.2V (Each Battery)			
	Float	13.7V ± 0.2V (Each Battery)			
Max. SPV Current		25A	50A	50A	50A
Efficiency		>95%			
Parameters (Environment)					
Operating Temperature		0-50°C			
Cooling		Fan			
Max. Relative Humidity @ 25°C (non Condensing)		95%			
Noise @ 1 meter		50dB			
Standard Compliance		IP20			
Weight (kg)		7.75	8.8	11	14.2
Dimension (LXWXH)		275X276X131mm		306*274*166 mm	

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## Mega (Wall Mountable Solar PCU)

with inbuilt 1.3 kWh LiFePO4 Battery

Model Available  
Mega-1024/24V



### FEATURES

- Pure sine wave output.
- Inbuilt LiFePO4 25.6V/54Ah Battery.
- High Speed Micro Controller based Solar PCU.
- Built in PWM Solar Charge Controller.
- Support 1000Watt Solar Panel
- Multi-colour LCD Display.
- Freq.:- Available - 50Hz & 60Hz.
- Charging Multi Stage (Bulk, Absorption & Float).
- Solar Priority of load & battery charging.
- Preference to Solar Power over Grid Power.
- Protections : RBP, RSPV, OVL, BL, BH, S.Ckt, I/P HV & LV, OHT.
- Compatible with DG as an Input Source.
- Compatible with IT Load.
- Priority Selection - PCU, Smart & Hybrid for-Saving Energy and Money.



**FAST  
CHARGING**



**ZERO  
MAINTENANCE**



**3X  
LONGER LIFE**



**5 YEARS  
WARRANTY**

**Mega (Wall Mounted Solar PCU)**

Parameters		Rating	
Model No.		Mega 1024	
Operating DC Voltage		25.6V	
Switching Element		Mosfet	
Charger Topology		Boost Mosfet	
Lithium Battery Capacity & Chemistry		54AH LiFePo4 (Inbuilt )	
Operating Mode	SMART/PCU/HYBRID	Smart mode	
DG mode	Enable/Disable	Disable	
Input Voltage Range (Min - Max)Voc		31V-49.5V	
Maximum PV Power Recommended		1000W	
Parameters (Grid)		Default Value	
Nominal Grid Voltage		230V 1Φ	
Nominal Grid frequency		50Hz	
Frequency Range		47-53Hz ± 1Hz	
Grid Charging Voltage		27.6V±0.2V	13.5V - 14.3V
Grid Charging Voltage (Equalize)		After 30 Days	
Grid Charging Current (Normal/Boost)		10A/12A ± 2A	1A-20A
Optional Grid charging	Enable/Disable	Enable	
Grid disconnect @ Battery Voltage (Grid+Solar)		27.6V±0.2V	
Grid Reconnect @ Battery Voltage (Grid+Solar)		25.2V±0.2V	12.5V - 13V
Grid Low Cut Voltage	IT MODE ENABLE	170V ± 10V	
Grid Low Cut Recovery		180V ± 10V	
Grid High Cut Voltage		265V ± 10V	
Grid High Cut Recovery		255V ± 10V	
Grid Low Cut Voltage	IT MODE DISABLE	100V ± 10V	
Grid Low Cut Recovery		110V ± 10V	
Grid High Cut Voltage		290V ± 10V	
Grid High Cut Recovery		280V ± 10V	
Changeover (Batt. to Mains)	IT Mode Enable/Disable	<5ms	
Changeover (Mains to Batt.)	IT MODE : ENABLE	<12ms	
	IT MODE : DISABLE	<30ms	
Parameters (Inverter)			
Output Phase		1Φ	
Nominal Output Voltage		220V±8%	
Nominal Frequency		50Hz±1%	50-60Hz
Max. Output Current		2.9A	
Battery Low Buzzer		23.8V±0.2V	+0.3V
Battery Low Cut		23.2V±0.2V	
Battery Low Cut Automatic Recovery with solar		25.4V ± 0.2V	
ID Current		50mA	
Battery High Cut (Grid/Solar CHG. OFF)		29.0V±0.2V	
Battery High Cut Recovery		28.0V ± 0.2V	
Output Waveform		Sinewave	
Typical Efficiency		≥80%	
Voltage Harmonic		<3% (Linear Load)	
Over Load Capacity	IT Mode Disable: >100% After 30 sec delay (with Alarm) 3Time Auto Reset , 4th Time Shut Down		
	IT Mode Enable: >100% After 30 sec delay 1st Time Shut Down		
	>150% Output Goes Down		
Protection		Overload, Battery Low, Battery High, Output Short Ckt., Battery Reverse (Fuse Blown) , Over Heat @90°C ± 10°C , Over/Under Frequency, I/P HV, I/P LV, SPV High.	
LED Indication		System ON, (IT Mode,Boost Chg., DG Mode, Grid Chg.) Enable/Disable.	
Switches (Micro)		System ON/OFF , UP, Down, Back, Enter(For LCD Calibration)	
Display ( Multi color)		Battery Voltage, Charging Current, Grid Voltage, Grid Frequency, Output Voltage, Output Frequency, Load%, Battery Graph, Overheat, BLK/ABS/FLT , SPV Current, Operating Mode (HYB/PCU/SMT).	
Parameters (Solar)			
Switching Element		Mosfet	
Type of Charger		PWM	
SPV Charging Voltage (Boost)		28.6V 0.2V	14V-14.4V
SPV Charging Voltage (Reconnect)		28.0V±0.2V	14V-14.3V
Efficiency		≥95%	
Solar Current MIN.		>3A (Below 3A, System will act like Solar Absent)	
Solar Current MAX.		25A	
Parameters (Environment)			
Operating Temperature		0-50°C	
Cooling		Fan	
Max. Relative Humidity @25°C (non Condensing)		95%	
Noise @ 1meter		50dB	
Standard Compliance		IP20	
Weight (kg)		27.250	
Dimension L x W x H(mm)		586x362x135	

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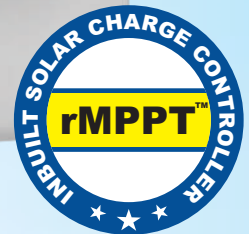


# GAMMA<sup>+</sup> LiON

Wall Mountable rMPPT Solar PCU  
with inbuilt 1.3 kWh LiFePO4 Battery



Model Available  
**GAMMA<sup>+</sup> LiON 1000**



## FEATURES

- Pure sine wave output.
- Inbuilt LiFePO4 12.8V/100Ah Battery.
- Built in rMPPT Charge Controller.
- Support 1000Watt Solar Panel
- Multi-colour LCD Display.
- Preference to Solar Power over Grid Power.
- Zero battery maintenance & Long battery life.
- Multi functional smart switches
- Protections : RBP, RSPV, OVL, BL, BH, S.Ckt, I/P HV & LV, OHT.
- Compatible with DG as an Input Source.
- Compatible with IT Load.
- Priority Selection - PCU, Smart & Hybrid for Saving Energy & Money.



**FAST  
CHARGING**



**3X  
LONGER LIFE**



**ZERO  
MAINTENANCE**



**5 YEARS  
WARRANTY**

## GAMMA+ LiON (Wall Mounted rMPPT Solar PCU)

Parameters		Rating	
Model No.		GAMMA+ LION 1000	
Operating DC Voltage		12.8V	
Switching Element		MOSFET	
Charger Topology		Boost MOSFET	
Battery Type		Prismatic (Li-ion)	
Battery Capacity		100AH	
Operating Mode		SMT (Default)	
Optional DG mode	Enable/Disable	Disable (Default)	
Input Voltage Range (Voc)		15V- 45V	
Maximum PV Power Recommended		1000W	
Parameters		Default Value	Settable value
Boost Charging Voltage	Grid	14V ± 0.1V	13.5V-14.2V
	Solar	14.2V ± 0.1V	14V - 14.5V
Float Charging Voltage	Grid	13.9V ± 0.1V	13.4V- 14.1V
	Solar	14.1V ± 0.1V	13.9V - 14.4V
Charging Current	Grid	15A ± 0.5A	5A-15A
	Solar	20A ± 0.5A	11A - 40A
Battery Charging Method		Bulk/Absorption/Float	
Parameters (Grid)			
Nominal Grid Voltage		230V 1ϕ	
Nominal Frequency		50Hz	47-53Hz ± 1Hz
Grid Charging	Enable/Disable	Enable	
Grid Disconnect @ (Grid+Solar)		100% of Charging Current or Voltage from Solar	
Grid Reconnect @ Battery Voltage (Grid+Solar)		12.4V	11V - 13V
Low Cut Voltage/ Recovery	IT Mode Enable	170/180V ± 3V	
High Cut Voltage/Recovery		265/255V ± 3V	
Low Cut Voltage/ Recovery	IT Mode Disable	100/110V ± 3V	
High Cut Voltage/Recovery		290/280V ± 3V	
Change Over(Battery to Mains)	IT Mode Enable/Disable	<6 ms	
Change Over(Mains to Battery)	IT Mode Enable	<12 ms	
	IT Mode Disable	<30 ms	
Parameters (Inverter)			
Output Phase		1ϕ	
Nominal Output Voltage		220V ± 5%	
Nominal Frequency		50 Hz ± 1 Hz	
Rated output Amp		3A ± 0.2A	
Battery Low Cut		11.6V	10V - 12.5V
Battery Low Buzzer		11.8V	
Battery Low Cut Recovery		12.7V or Grid present	
Battery High Cut (Grid/Solar CHG. OFF)		14.5V	
Battery High Cut Recovery		14.2V	
Output Waveform		Sine Wave	
Typical Efficiency		>80%	
Voltage Harmonic		<3%(Linear Load)	
Over Load Capacity	IT Mode Disable	>100% After 30 Sec Delay, 3 Times Auto Reset, 4Th Time Shut Down	
	IT Mode Enable	>100% After 30 Sec Delay, 1st Time Shut Down	
		>150% Output Goes Down	
Protection		Overload, Battery Low, Battery High, Output Short Ckt, Battery	
LED Indication		System ON, (IT mode, Grid Chg., DG mode,) Enable/Disable	
Switches		Reset for System ON/OFF, UP, Down, Back, Enter (For LCD Calibration)	
Display (Multi Color)		Battery Voltage, Charging Current, Grid Voltage, Grid Frequency,	
Parameters (Solar)			
Type of Charger		MPPT	
Efficiency		>94%	
Parameters (Environment)			
Operating Temperature		0-50°C	
Cooling		Fan	
Max. Relative Humidity @ 25°C (Non Condensing)		95%	
Noise @ 1meter		50dB	
Standard Compliance		IP20	
Dimension (LXWXH)mm		(340 x 240 x 320) mm	



## GAMMA+ (Solar Home PCU)

“Get Two Battery Back -up in Single Battery”



Model Available  
1000-3350

### FEATURES

- Controller based design, Pure Sine Wave, Built in rMPPT Charge Controller.
- Multi-colour LCD Display.
- Freq.:- Available - 50Hz & 60Hz.
- Charging Multi Stage (Bulk, Absorption & Float)
- Solar Priority of load & Battery Charging.
- Preference to Solar Power over Grid Power.
- Pure sine wave output.
- Protections : RBP, RSPV, OVL, BL, BH, S.Ckt, I/P HV & LV, OHT.
- Compatible with DG as an input Source.
- Compatible with IT Load.
- Compatible with Lithium, Gel & Tubular Batteries.
- Priority Selection - PCU, Smart & Hybrid for Saving Energy and Money.
- Support 1HP Motor in Model No 2600 and 3350.

## GAMMA<sup>+</sup> (Solar Home PCU)

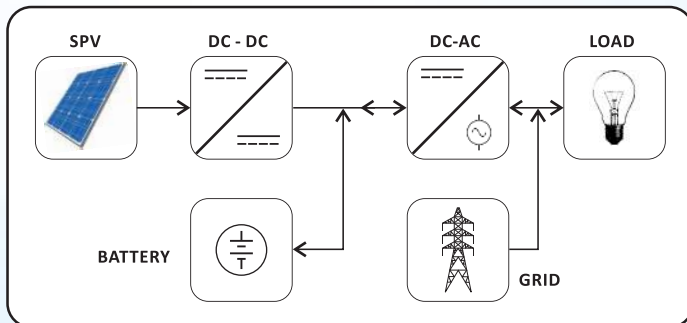
Parameters					
Model	Gamma+ PCU				
Model No.	GAMMA+1012	GAMMA+1024	GAMMA+2600	GAMMA+3350	
Operating DC Voltage	12V		24V		
Switching Element	MOSFET				
Charger Topology	Boost Mosfet				
Max. Battery Capacity	200AH				
Operating Mode	SMART/PCU/HYBRID				
Optional DG mode	Enable/Disable		Disable (Default)		
Input Voltage Range (Min - Max) Voc	15V-52V		30V-105V		
Solar Power Maximum	1000W	1000W	2000W	2160W	
Solar Panel Recommended (Watt)	165x6P, 200X5P (335x3P*) (400/440/540X2P*)	(335x3P*) (400/440/540X2P*) or 2S*)	335 (2S* & 3P*) (400/440 (2S* & 3P*), (540X3P*) Parallel	335 (2S* & 3P*) 400/440 (2SS* & 2P*) 540(2S* & 2P*)	
Parameters (Grid)		Default Value			Variable Settable Range (Each Batt.)
Nominal Grid Voltage	230V 1Φ				
Nominal frequency	50Hz				
Frequency Range	47-53Hz ± 1Hz				
Battery Charging Method 3 Stages	Bulk/Absorption/Float				
Default charging mode	TUB./LITHIUM				
Grid - Battery Charging Voltage (TUB)	Boost	14.5V ± 0.2V (Each Battery )			13.5-15V
	Float	13.8V ± 0.2V (Each Battery )			13-14.2V
Grid - Battery Charging Voltage (LITHIUM)	Boost	13.8V ± 0.2V (Each Battery )			13.5V-14.2V
	Float	13.8V ± 0.2V (Each Battery )			13.5V-14.2V
Grid Charging Current	Normal/Boost				10A/15A ± 2A
Optional Grid charging	Enable/Disable				Enable
Grid Reconnect @ Battery Voltage (TUB)	11.8V ± 0.2V (Each Battery )				11-12V
Grid Reconnect @ Battery Voltage (LITHIUM)	12.4V ± 0.2V (Each Battery )				NA
Grid Low Cut Voltage	170V ± 10V				
Grid Low Cut Recovery	180V ± 10V				
Grid High Cut Voltage	265V ± 10V				
Grid High Cut Recovery	255V ± 10V				
Grid Low Cut Voltage	100V ± 10V				
Grid Low Cut Recovery	110V ± 10V				
Grid High Cut Voltage	290V ± 10V				
Grid High Cut Recovery	280V ± 10V				
Change Over (Battery to Mains)	IT Mode Enable/Disable				<8ms
Change Over (Mains to Battery)	IT Mode Enable	<12ms			
	IT Mode Disable	<30ms			
Parameters (Inverter)					
Output Phase	1Φ				
Nominal Output Voltage	220V				
Output voltage range	220V ± 8%				
Nominal Frequency	50 Hz ± 1%				50Hz/60Hz
Max. Output Current	2.9A	2.9A	5.6A	9A	
Battery Low Buzzer (TUB)	10.8V ± 0.2V (Each Battery )				Battery Low Cut-0.3V
Battery Low Cut (TUB)	10.5V ± 0.2V (Each Battery )				10-11.5V
Battery Low Buzzer (LITHIUM)	11.9V ± 0.2V (Each Battery )				NA
Battery Low Cut (LITHIUM)	11.6V ± 0.2V (Each Battery )				NA
Battery High Cut (TUB)	16.5 ± 0.2V (Each Battery )				16.5-17.5V
Battery High Cut (LITHIUM)	14.5 ± 0.2V (Each Battery )				NA
Output Waveform	Sinewave				
Typical Efficiency	>80%		>82%		
Voltage Harmonic	<3% (Linear Load)				
Over Load Capacity	IT Mode Disable	>100% After 30 sec delay (with alarm) 3Time Auto Reset , 4th Time Shut Down Note : 1HP Motor Load Run for 15min with alarm (1 Sec ON, 5 Sec OFF) in 2600 Model .			
	IT Mode Enable	>100% After 30 sec delay (with Alarm) 1st Time Shut Down >150% Output Goes Down			
Motor 1 HP	NA		Yes (<6.5A)	Yes	
Protection	Overload, Battery Low, Battery High, Output Short Ckt, Battery Reverse (Fuse Blown), Over Heat @90°C ± 10°C, Over/Under frequency, I/P HV, I/P LV, SPV High, SPV Low				
LED Indication	System ON, (IT mode, TUB/LITHIUM, Boost Chg, DG mode, Grid Chg.) Enable/Disable				
Switches (Micro)	System ON/OFF, UP, Down, Back, Enter (For LCD Calibration)				
Display (Multi Color)	Battery Voltage, Charging Current, Grid Voltage, Grid Frequency, Output Voltage, Output Frequency, Load %, Battery Graph, Overheat, SPV Current, Operating Mode (HYB/PCU/SMT)				
Parameters (Solar)					
Switching Element	Mosfet				
Type of Charger	MPPT				
SPV Chgarging Voltage (TUB)	Boost	15V ± 0.2V (Each Battery )			14-15.5V
	Float	14.2V ± 0.2V (Each Battery )			13.8-14.5V
SPV Charging Voltage (LITHIUM)	Boost	13.9V ± 0.2V (Each Battery )			13.6-14.4V
	Float	13.9V ± 0.2V (Each Battery )			13.6-14.4V
SPV Charging Current	18A ± 2A (Default)				11-40A
Battery Charging Method 3 Stages	Bulk/Absorption/Float				
Efficiency	>94%				
Parameters (Environment)					
Operating Temperature	0-50°C				
Cooling	Fan				
Max. Relative Humidity @ 25°C (non Condensing)	95%				
Noise @ 1 meter	50dB				
Standard Compliance	IP20				
System Weight (KG)	12.4	12.5	17.6	27	
Dimension (LXWXH)mm	327.8 X305.5 X 116	327.8 X305.5 X 116	333.8 X 305.5 X 158.6	340 X 305.5 X 360	

**Note.** 1) Specification are subject to change without prior notice due to constant improvement in design & technology.  
2) Solar Panel Max. (\*S- Series, \*P- Parallel)

## GAMMA Solar PCU

“Affordable Home rMPPT PCU”

**Model Available  
3kVA-5.1kVA**



### FEATURES

- DSPic based Pure Sine Wave Design.
- Inbuilt in rMPPT charge controller (upto 30% more efficient).
- Maximum Power Preference to Solar.
- Extensive Electronic Protection.
- Digital LCD (16X2) Display.
- User Friendly Setting by LCD Switch. NLS, Grid Charging, IT Load Enable/Disable.
- Priority based working modes - Smart/PCU/Hybrid (for saving energy & money).
- Reverse AC Voltage Protection.
- Robust design-20 yrs product life, 2-5 yrs of warranty.

rMPPT™ Offline Solar PCU  
(1Ph in 1Ph out)



**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

**Application**





### GAMMA SOLAR PCU 1Ph in 1Ph out

Parameters	Units	Rating			
System Rating	KVA	3		5.1	5
Operating DC voltage	V	24	36	48	96
<b>Photovoltaic input</b>					
Input Open Circuit Voltage Range(Min-Max)	VDC	45-90	60-140	80-230	160-400
Maximum PV power recommended	KW	3.0		5.0	
Number of charge controller		1			
<b>MPPT based charge controller</b>					
Switching element		IGBT			
Controller		DSPIC			
Type of Charger		MPPT			
Peak Efficiency	%	95			
<b>Parameter</b>					
		<b>Configurable</b>			<b>Default Value</b>
Battery Low Buzzer	V	Batt Low Cut + 0.2V/BATTERY			11.2
Battery Low Cut**	V	10.0-11.7			11.0
Battery High Cut (INV.)	V	SPV Present-SPV CHG. REF +1.3V for 15Sec, SPV CHG. REF +1.8V for 2Sec			16
		SPV Absent-SPV CHG. REF +0.5V for 15Sec, SPV CHG. REF +1.2V for 2Sec			14.7
Battery Charging Voltage by SPV	V	12.8-16.0			14.5
Battery Charging Current by SPV	A	12-60			18
Battery Charging Voltage by GRID	V	12.5-15.5			14.0
Battery Charging Current by GRID	A	6-15			10
Grid Low Cut Voltage (IT Load Disable/Enable)	V	120-200 / NA			120
Grid High Cut Voltage (IT Load Disable/Enable)	V	245-280 / NA			280
Output Voltage Low(Inverter Mode)	V	170-190			185
Output Voltage High(Inverter Mode)	V	250-260			255
Grid Disconnect (Solar Available)		@14.5 / Battery for 2 minutes OR 13.5/Battery-100% Current			
Grid Connect (PCU Mode / Smart Mode)	V	11.5			11-12
Grid Charger	Configurable	Enable / Disable			Enable
IT Load		Enable / Disable			Disable
Operation Mode		SMART/PCU/HYBRID			SMART
Input Source		GRID/GENSET			GRID
<b>Inverter</b>					
Switching element		MOSFET			
Control		PWM			
Nominal output voltage	VAC	230			
Output supply phase		1 phase, 3 wire			
Output waveform		sinewave			
Nominal frequency	Hz	50.0			
Output Load Current	A	9.1	18	15.2	
Voltage regulation (No load to full load)	%	<2			
Output voltage distortion with 100% linear load	%	<3			
Overload Capacity (IT LOAD ENABLE)	%	100-110 : 10 min 110-120 : 2 min 120-150 : 30 sec	150-250 : 2sec 250-350 : 1sec >350 : 20ms	(100-150 10min in Gamma 2kVA only)	
Overload Capacity (IT LOAD DISABLE)	%	100-120(2Time auto Reset): 60sec 120-150(2Time auto Reset): 30sec 150-250 : 2sec	250-350 : 1sec >350 : 20ms	(100-150 10min in Gamma 2kVA only)	
Peak Efficiency	%	>88			
Noise @ 1meter	dB	50			
Cooling		Temp Controlled, Fan			
Protections		Overload, Battery low, Battery high, Output low, Output high, Output Short Circuit, Overheat, Under Frequency, Over Frequency, Solar panel reverse			
Display Parameters		Battery Voltage, Charging Current, Discharging Current* Solar Voltage, Solar Current, Instantaneous Power, Grid Voltage, I/P Frequency Output Voltage, Output Load% O/P Frequency Grid, Inverter & SPV Charger Status			
Switches		Reset for System ON/OFF, up, Down, Back, Enter (for LCD Configuration)			
Indications		System ON, Inv. ON, SPV Charging, Grid Charging, Batt. Low/High, Overload, Overheat, Mains Low, Mains High, Under frequency, Over frequency			
<b>Environment</b>					
Operating Temperature	°C	0-50			
Max Relative Humidity @25°C (non condensing)	%	95			
Dimension (L X W X H)	Inch	18 x 10 x 17			
Weight	Kg.	38	35	39	55

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

\*\*Once Battery Get Full Charged then Batt Low cut as per specification otherwise battery low buzzer 11.55V Per Batt. & Batt low cut 11.50V Per Batt.



## ALFA<sup>+</sup> Solar PCU

“Most Featureful Solar PCU”

rMPPT™ Offgrid Solar PCU  
(1Ph in 1Ph out)



Model Available  
1kVA-20kVA

### FEATURES

- DSPic based Pure Sine Wave Design.
- Inbuilt in rMPPT charge controller (upto 30% more efficient).
- Maximum preference to Solar Power.
- USB based communication, 30 days data logs inbuilt and AC & DC energy meter inbuilt.
- GSM based Remote Monitoring (optional)
- Comply with IEC 61683 and IEC 60068-2-(1,2,14,30) standards.
- Reverse AC Voltage Protection.
- User friendly & Easily accessible LCD Display with all AC & 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.
- Priority based working modes - Smart/PCU/Hybrid (for saving energy & money).
- NLSD, Grid Charging, IT Load - Enable/Disable by LCD.

### 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

### Application

#### Hospital



#### School



#### Industries



#### Home



#### Petrol Pump



#### Bank



## ALFA<sup>+</sup> SOLAR PCU (1Ph in 1Ph out)

Parameters	Units	Rating													
System Rating	KVA	1	1	2	3	5	5	7.5	7.5	10	10	15	15	20	
Operating DC Voltage	V	24	48				96			120		180		240	
<b>Photovoltaic Input</b>															
Input Voltage Range (Min-Max)	VDC	45-90	80-230				160-400		200-400		300-625		400-650		
Maximum PV Power Recom.	KW	1.0	1.0	2.0	3.0	5.0		7.5		10		15		20	
Solar Charge Controller Rating	A	40	20	40	60	100	50	75	60	80	50	80	60	80	
<b>MPPT Based Charging Controller</b>															
Switching Element		Mosfet	IGBT												
Controller		DSP													
Type of Charger		MPPT													
Efficiency	%	95													
<b>Parameter</b>		<b>Configurable</b>												<b>Default Value</b>	
Battery Low Buzzer	V	Batt. Low Cut +0.2												11.2	
Battery Low Cut**	V	10-11.7												11.0	
Battery High Cut (INV.)	V	SPV Present-SPV CHG. REF +1.3V for 15Sec, SPV CHG. REF +1.8V for 2Sec												16	
		SPV Absent-SPV CHG. REF +0.5V for 15Sec, SPV CHG. REF +1.2V for 2Sec												14.7	
Battery Charging Voltage by SPV	V	12.8-16												14.5	
Battery Charging Current by SPV	A	12-60												18	
Battery Charging Voltage by Grid	V	12.5-15.5												14	
Battery Charging Current by Grid	A	6-15												10	
Grid Low Cut Voltage (IT Mode/	V	NA/120-200												175/120	
Grid High Cut Voltage Normal)	V	NA/245-280												260/280	
Grid Charging		Enable/Disable												Enable	
IT Load		Enable/Disable												Disable	
Operating Mode		Smart/PCU/Hybrid												Smart	
Output Voltage Low	V	170-190												185	
Output Voltage High	V	250-260												255	
No Load Shut Down		Enable/Disable												Disable	
Input Source		Grid/Genset												Grid	
<b>Battery</b>															
Grid Disconnect (Solar Available) PCU/SMART		@14.5/Battery for 2minutes or 13.5/Battery-100% Current													
Grid Reconnect (PCU Mode/ Smart Mode)	V	11-12												11.5	
Temp. Compensation		@3mV/cell/°C ; 18mV/Battery/°C													
<b>Inverter</b>															
Switching Element		Mosfet						IGBT							
Control		PWM													
Nominal Output Voltage	VAC	220													
Output Supply Phase		1Phase, 3Wire													
Output Waveform		Pure Sine Wave													
Nominal Frequency	Hz	50.0													
Load Current	A	4.5	4.5	9	13.5	18	18	27	27	36	36	54	72		
Voltage Regulation	%	1													
Output Voltage Distortion with 100% Linear Load	%	<3													
Overload Capacity (IT LOAD DISABLE)		100-120(2time auto reset) : 60sec						200-300 : 1sec							
		120-150(2time auto reset) : 30sec						300-400 : 250ms							
		150-200 : 2sec						>400 : 20ms							
Overload Capacity (IT LOAD ENABLE)	%	100-110 : 10 Min				150-200 : 2Sec				>400 : 20ms					
		110-120 : 2 Min				200-300 : 1Sec									
		120-150 : 30sec				300-400 : 250ms									
Peak Efficiency	%	>82						>88							
Noise @ 1meter	dB	50													
Cooling		Temp Controlled, Fan													
Protections		Overload, Battery Low, Battery High, Output Low, Output High, Output Short Ckt., Overheat, Under Frequency, Over Frequency, Solar Panel Reverse													
Display Parameters		Battery Voltage, Charging Current, Discharging Current, Charging KWH, Discharging KWH, Solar Voltage, Solar Current, Instantaneous Power, Cumulative Power, Grid Voltage, Grid Current, Grid Frequency, Output Voltage, Output Current, Output Frequency													
Switches		NLSD En/Dn, IT Load En/Dn Grid Charger En/Dn, Operating Mode PCU/SMT/HYD													
Indications		Reset for System ON/OFF, UP, DOWN, BACK, ENTER (for LCD Configuration)													
		System ON, Inverter ON, SPV Charging, Grid Charging, Battery Low/High, Overload, Overheat, Mains Low, Mains High, Under Frequency, Over Frequency, NLSLD, Fault													
<b>Environment</b>															
Operating Temperature	C	0-50													
Max Relative Humidity @25°C(non condensing)	%	95													
Degree of Protection		IP21													
Data Loggin	Inch	30 Day Data Storage													
Dimension (LxWxH)	Kg.	18 X 10 X 18					24 X 13 X 23				24 X 13 X 26			32 X 16 X 25	
Weight (Approx)		32	33	40	44	50	71	65	80	103	120	165			

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

\*\*Once Battery Get Full Charged then Batt Low cut as per specification otherwise battery low buzzer 11.55V Per Batt. & Batt low cut 11.50V Per Batt.

## SIGMA<sup>+</sup> 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.
- USB based communication, 30 days data logs inbuilt and AC& DC energy meter inbuilt.
- GSM based remote monitoring (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, NLSD, 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

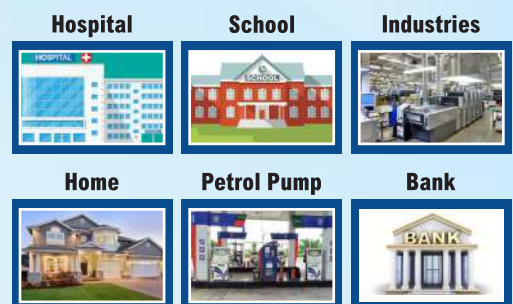
#### Smart Mode Priority

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

#### Grid Export Mode

Solar/Grid/Battery

#### Application



## SIGMA<sup>+</sup> Grid Export SOLAR PCU (1Ph in 1Ph out)

Parameters	Units	Rating											
System Rating	KVA	1	1	2	3	4	5	7.5	10	15			
Operating DC Voltage	V	24	48					96	120	180	240		
<b>Photovoltaic Input</b>													
Input Voltage range (Min.-Max.)	V <sub>oc</sub>	45-90	80-200				160-400	200-400	300-625	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
<b>MPPT Based Charge Controller</b>													
Switching Element		MOSFET					IGBT						
Controller		DSP											
Type of Charger		MPPT											
Peak Efficiency	%	95											
<b>Configurable Parameters</b>													
Parameters	Units	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 Enb/Dis)	V	NA/120-200										175/120	
Grid high cut volt. (IT Mode Enb/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	
No load shutdown		Enable/Disable										Disable	
<b>Grid Export Mode Enable</b>													
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	
<b>Battery</b>													
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	
Temp. Compensation		@ 3mV/cell/°C; 18mV/Battery/°C											
<b>Inverter</b>													
Switching Element		MOSFET					IGBT						
Control		PWM											
Nominal Output voltage		220											
Output supply phase		1Phase, 3 Wire											
Output waveform		Pure Sine Wave											
Nominal frequency	Hz	50											
Load Current	A	4.5	4.5	9	13.5	14.2	18	27	36	54			
Voltage regulation	%	1											
Output voltage distortion with 100% linear load	%	<3											
Overload capacity	%	<b>IT Load Disable</b> 100-120(2Time auto Reset): 60sec 200 - 300%:1 Sec; 120-150(2Time auto Reset): 30sec 300 - 400%:250msec; 150-200 : 2sec >400%:20msec;					<b>IT Load Enable</b> 100 - 110%:10min; 150 - 200%:2sec; 110 - 120%: 2min; 200 - 300%:1sec; 120 -150%:30sec; 300 - 400%:250msec; >400%(20 msec - 30msec)			<b>Grid Tie ON</b> Over Load Indication @>200% >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, Solar Panel Reverse, Anti-islanding, Surge Protection, Grid/Solar Charger Open Circuit, NTC Open., Battery Voltage, Charging Current, Discharging Current, charging KWH and discharging KWH											
Display Parameters		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 & Commutative Energy											
		Grid, Inverter & SPV Charger Status											
Switches		System Info : NLSD-EN, Grid CHG-EN, IT Load-EN, Input Source-Grid, Operation Mode-Smart 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/NLSD, Overload / Overheat, Mains Low / Mains High, Under frequency/Over frequency, Operating modes (smart, Hybrid, PCU and Gridexport), Fault, HOE											
<b>Environment</b>													
Operating temperature	°C	0-50											
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 Solar PCU

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

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



Model Available in  
5kVA-50KVA

### 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.
- RS485 based monitoring.
- Process to Certification - IEC 61683, 61727, 60529, 60068-2 (1,2,14,30) & 62116 standards.
- Robust Design-20 years product life, 2-5 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

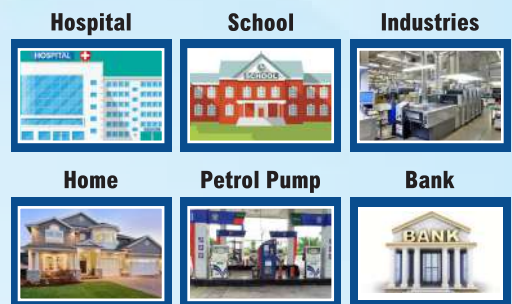
#### Smart Mode Priority

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

#### Grid Export Mode

Solar/Grid/Battery

#### Application



\* As Compare with PWM  
\*\* 2 Year Default

## ZETA SOLAR PCU (3Ph in 3Ph out)

Parameters	Units	Rating				
System Rating	KVA	5	7.5	10	15	
Operating DC Voltage	VDC	48	96	120	180	
<b>Photovoltaic Input</b>						
Input open circuit voltage range(Min-Max)	Voc	80-144	160-360	200-360	300- 540	
Maximum PV Power Recommended / No. of Charge Controller		5KW / 1	7.5KW / 1	10KW / 1	15KW / 1	
Switching Element / Type of Charger / Solar Charge Controller Rating		IGBT / MPPT / 100A		IGBT / MPPT / 80A		
Peak Efficiency (DC to DC)	%	95				
Panel configuration		335W-3 Panel in Series X 5 String, 400W-3 Panel in series x 4 string 440W-3 Panel in series x 3 string 540W-3 Panel in series x 3 string	335W-6 Panel in Series X 4 String, 400W-6 Panel in Series X 3 String, 440W-6 Panel in series x 3 string 540W-7 Panel in series x 2 string	335W-6 Panel in Series X 5 String, 400W- 6 Panel in series x 4 string 440W-6 Panel in series x 3 string 540W-6 Panel in series x 3 string	335W-9 Panel in Series X 5 String, 400W-9 Panel in series x 4 string 440W-9 Panel in series x 4 string 540W-9 Panel in series x 3 string	
<b>Grid parameter</b>					<b>Default</b>	
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)	VAC	NA/120-200			175/120	
GridHigh 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	
<b>Grid Export Mode Enable Parameter</b>						
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				
<b>Battery Parameter</b>					<b>Default</b>	
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				
<b>Inverter Parameter</b>					<b>Default</b>	
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	5.8	8.7	11.6	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				
<b>Environment</b>						
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)	cm	85x41x70				
Weight	Kg	70	90	105	125	

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

## ZETA SOLAR PCU (3Ph in 3Ph out)

Parameters	Units	Rating			
System Rating	KVA	20	30	40	50
Operating DC Voltage	VDC	240			
<b>Photovoltaic Input</b>					
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, 400W-10 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, 400W-10 Panel in series x 8 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, 400W- 10 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, 400W-10 Panel in series x 13 string 440W-10 Panel in series x 11 string 540W-10 Panel in series x 9 string
<b>Grid parameter</b>					<b>Default</b>
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)	VAC	NA/120-200			175/120
GridHigh 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
<b>Grid Export Mode Enable Parameter</b>					
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			
<b>Battery Parameter</b>					<b>Default</b>
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			
<b>Inverter Parameter</b>					<b>Default</b>
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 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			
<b>Environment</b>					
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)	cm	85x41x70	696.3X693X1538		
Weight	Kg	145	180	350	400

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## MARS Online Solar PCU

“3 Phase with Zero Changeover Time”

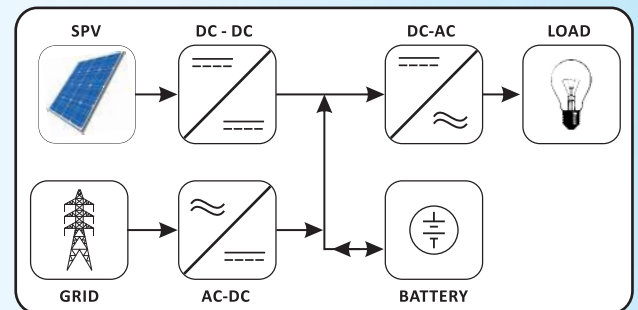
## rMPPT™ Online Solar PCU



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

### FEATURES

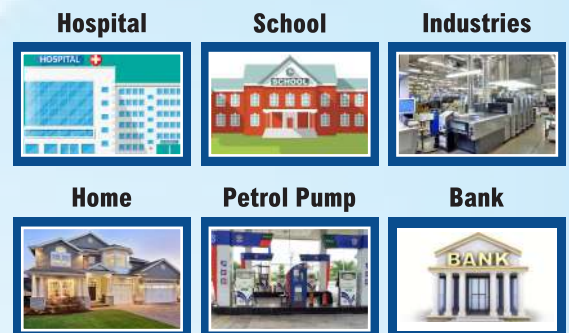
- DSPic based design Pure Sine wave, inbuilt rMPPT charge controller.
- Thermal Protection.
- Maximum Preference to Solar Power.
- Ethernet based monitoring (Optional).
- Noiseless in Operation.
- Robust Design - 20 years Product life.
- Configurable Priority.
  - a) Solar/Battery/Grid
  - b) Solar/Grid/Battery
- 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





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

<b>Input</b>	Power Rating	5kVA/240V	7.5kVA/240V	10kVA/240V	15kVA/240V
	Voltage Range	400V±20% Three phase four wire			
	Frequency	50Hz±20%			
	Power Factor	>0.92			
	Charger Topology	Buck			
	Connection Type	Terminal Block			
<b>Solar</b>	K Watt	5KW	7.5KW	10KW	15KW
	Voc (min-max)	400V - 740V			
	Vmp	288V - 660V			
	Configurable (72 Cell)	16 panel in series *1 string	12 panel in series *2 string	16 panel in series *2 string	12 panel in series *4 string
	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	
<b>Output</b>	Voltage	220V/230V/240V±1% (1phase 2 wire)			
	Load Current	17.4A	26.08A	34.78A	52.17A
	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				
<b>Miscellaneous</b>	Transfer Time	0 msec			
	Extended Battery Charging	Optional			
	Caster Wheels	Yes			
<b>Environmental</b>	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	

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

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

<b>Input</b>	Power Rating	5kVA/240V	7.5kVA/240V	10kVA/240V	15kVA/240V	20kVA/240V
	Voltage Range	400V±20% Three phase four wire				
	Frequency	50Hz±20%				
	Power Factor	>0.92				
	Charger Topology	Buck				
	Connection Type	Terminal Block				
<b>Solar</b>	K Watt	5KW	7.5KW	10KW	15KW	20KW
	Voc (min-max)	400V - 740V				
	Vmp	288V - 660V				
	Configurable (72 Cell)	16 panel in series *1 string	12 panel in series *2 string	16 panel in series *2 string	12 panel in series *4 string	16 panel in series *4 string
	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	
	<b>Output</b>	Voltage	220V/230V/240V±1% (1phase 2 wire)			
Load Current		17.4A	26.08A	34.78A	52.17A	69.56A
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				
<b>Miscellaneous</b>		Transfer Time	0 msec			
	Extended Battery Charging	Optional				
	Caster Wheels	Yes				
<b>Environmental</b>	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		38x26x35

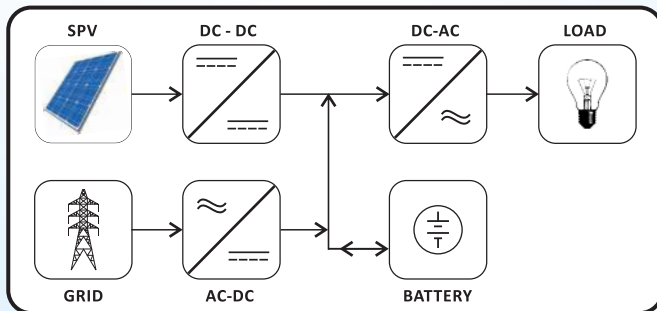
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## STAR Online Solar PCU

“3 Phase with Zero Changeover Time for Heavy Loads”

Available in  
20-120kVA

## Online Solar PCU



### 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.
- Lightning, Surge Protection by SPD.
- Ethernet based Monitoring.
- Intelligent Charge Sharing.

### Working Mode

Solar/Grid/Battery  
or  
Solar/Battery/Grid

### Application



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

Power Rating	20kVA/240V	25kVA/360V	30kVA/360V	40kVA/360V
<b>Input</b>				
Voltage Range	400V± 20% Three phase four wire			
Frequency	50 Hz ± 3Hz			
Power Factor	0.94			
Charger Topology	Buck			
Connection Type	Terminal Block			
<b>Solar</b>				
K watt	20	25	30	40
Voc (min-max)	360-720	540-810		
Vmp	320-680	430-730		
Configuration 72 Cell	5 string of 13 panel	5 string of 16 panel	6 string of 16 panel	8 string of 16 panel
switching devices	IGBT			
switching freq.	16KHZ			
charge controller	One			
Charger Topology	Buck			
Type of Charger	MPPT			
<b>Output</b>				
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			
<b>Audible warning</b>				
Alarm	Battery Low, Battery High, Overload			
<b>Indications</b>				
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			
<b>Protections</b>				
Parameters	# Output Overvoltage/Undervoltage # Overload # Output Short Circuit # Battery Overvoltage/Undervoltage #Input Overvoltage/Undervoltage			
<b>Miscellaneous</b>				
Transfer Time	0 msec			
Extended Battery Charging	Optional			
Caster wheels	Yes			
<b>Environmental</b>				
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

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



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

Power Rating	20kVA/360V	30kVA/360V	40kVA/360V	50kVA/360V	60kVA/360V	80kVA/360V	100kVA/360V	120kVA/360V
<b>Input</b>								
Voltage Range	400V±20% Three phase four wire							
Frequency	50 Hz ± 3Hz							
Power Factor	0.95							
Charger Topology	Buck							
Connection Type	Terminal Block							
<b>Solar</b>								
K watt	20	30	40	50	60	80	100	120
Voc (min-max)	540-810							
Vmp	430-730							
Configuration 72 Cell	4 string of 16 panel	6 string of 16 panel	8 string of 16 panel	10 string of 16 panel	12 string of 16 panel	16 string of 16 panel	20 string of 16 panel	24 string of 16 panel
Switching devices	IGBT							
Switching freq.	16KHZ							
No. of Charge Controller	One							
Charger Topology	Buck							
Type of Charger	MPPT							
Peak Efficiency(DC to DC)	96%							
<b>Output</b>								
Voltage (Ph-Ph)	380/ 400V/415V ± 1% Configurable by LCD Display							
Load Current Per Phase	23A	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							
<b>Audible warning</b>								
Alarm	Battery Low, Battery High, Overload							
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							
<b>Protections</b>								
Parameters	#Input Overvoltage/Undervoltage # Overload # Output Short Circuit # Battery Overvoltage #Input Overvoltage/Undervoltage.							
<b>Miscellaneous</b>								
Transfer Time	0 msec							
Extended Battery Charging	Optional							
Caster wheels	Yes							
<b>Environmental</b>								
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.

**PWM (Solar Charge Controller)**

Available in  
10A & 20A



**FEATURES**

- **Controller Based PWM Technology.**
- **Works Efficiently.**
- **LED/LCD Indication.**
- **Over Charging Current Protection.**
- **Over Charging Voltage Protection.**
- **Battery Reverse Protection.**
- **Overload Protection.**
- **SPV Reverse Polarity Protection.**
- **Reverse current flow from Battery Solar Array Protection.**

## PWM (Solar Charge Controller)

General				
Model	PWM1224/10A		PWM1224/20A	
DC Voltage	12V	24V	12V	24V
Precise	Micro controller			
Operating Temperature	0-50°C			
Storage Temperature	-20° to 70°C			
Battery Type	Tubular			
Battery Capacity	200 AH Max.			
Battery Charging Regulation Mode	PWM			
Operating Solar Input Voltage (Voc) Max	25V	49.5V	25V	49.5V
Solar Module Size(Max)	165W*1	390W*1	165W*2 (Parallel)	390W*2 (Parallel)
Electrical				
Nominal Battery voltage	12/24V DC (Auto Sensing)			
SPV Chg. Voltage Boost	14.5V	29V	15.5V	31V
Charging Current (max)	10A		20A	
Load Current Max.	10A		20A	
Charge Controller Efficiency	>95%			
Idle Consumption	<30mA			
Min. Solar Input Voltage(Voc) @ Startup	17V±2V	30V±2V	17V±2V	30V±2V
Load Condition				
USB Port	5V / 2A			
Battery Low Voltage Load Disconnect	10.8V±0.2V	21.6V±0.4V	10.8V±0.2V	21.6V±0.4V
Battery Low Voltage Load Recovery	12.6V±0.2V	25.2V±0.4V	12.6V±0.2V	25.2V±0.4V
Battery High Voltage Load Disconnect	15.0V±0.2V	30.0V±0.4V	16.0V±0.2V	32.0V±0.4V
Battery High Voltage Load Recovery	14.0V±0.2V	28.0V±0.4V	15.5V±0.2V	31.0V±0.4V
LED Indication				
Solar ON	Green		NA	
Solar Over Load	Red		NA	
Batt. High	Green		NA	
Batt. Low	Red		NA	
Load ON	Green		NA	
Over Load	Red		NA	
Display Parameter				
Batt. Voltage, Batt. Current	NA		Yes	
Solar Status: Absent, Charging OFF, Overload	NA		Yes	
Load Current	NA		Yes	
Charger ON	NA		Yes	
Overload				
100%	Continues			
101%-120%	10 Min ON/1 Min OFF		30 Sec. ON/1 Min OFF	
121%-150%	30 Sec. ON/1 Min. OFF		1 Sec. ON/1 Min. OFF	
150%-200%	2 Sec. ON/1Min. OFF		250mSec. ON/1Min. OFF	
>200%	250mSec. ON 1 Min. OFF			
Protections				
Battery Voltage (High/Low)	Available			
Battery Reverse	Available			
SPV Reverse	Available			
SPV Current (High/Low)	Available			
Reverse Current Flow from Battery to Solar Panel Array	Available			
Load short Circuit through DC Fuce	Available			
Physical				
Weight	130gm		300gm	
Dimension (LXWXH) MM	75x132x36 mm		100x161x50 mm	

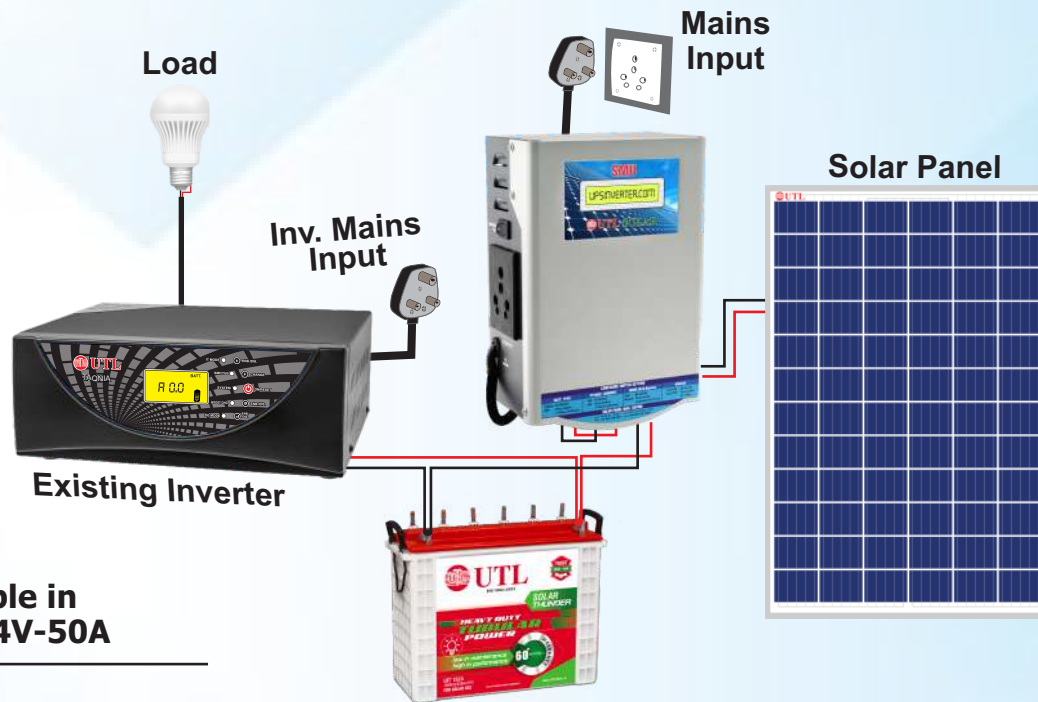
Protect Solar Charge Controller from direct Sunlight & Water.

Panel open circuit voltage should not to do be more than specified voltage.

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

## SMU (PWM) Solar Management Unit

“Convert your Home Inverter into Solar Inverter”



Available in  
12V/24V-50A

### FEATURES

- High speed and high performance micro-controller.
- High reliability with longer operational life.
- Inbuilt protection to avoid battery undercharge and over-charge.
- Inbuilt PWM Technology Charge Controller.
- Automatic voltage selection for 12V or 24V.
- Solar Prioritization.
- Compact design with wall mounting.
- Eco friendly.



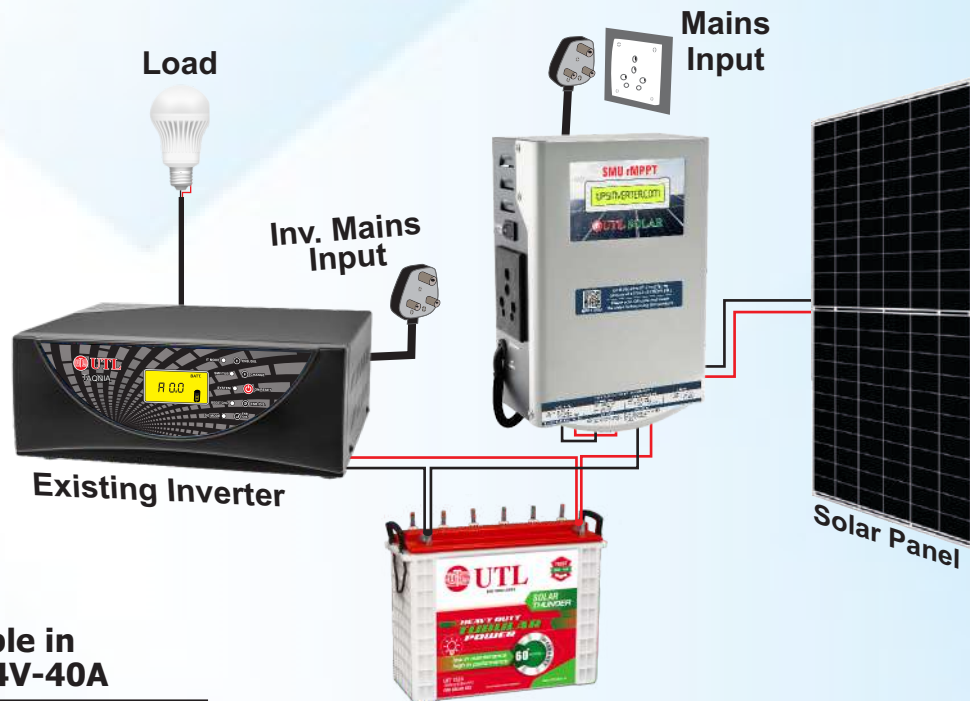
## SOLAR MANAGEMENT UNIT

General		
Model	SMU122450	
Operating Temperature	0°C to 50°C	
Storage Temperature	-10°C to 60°C	
System Operating Voltage	12V/24V DC	
Battery Type	Tubular/SMF	
Battery Capacity Max.	200AH	
Battery Charging Regulation Method	4 Stage PWM (Bulk/Absorption/Float/Equalize)	
Maximum Solar Power	12V : 500W, 24V : 1000W	12V : 800W, 24V : 1700W
Max. Solar Panels Recommended	12V, 20A:150W/165W *2 (Parallel)	12V, 25A:150W/165W *3 (Parallel)
	24V, 20A : 250W/390W*2 ( Parallel)	24V, 25A:250W/315W/325W*3 ( Parallel)
	12V, 40A:150W/165W *4 (Parallel)	12V, 50A:150W/165W *5 (Parallel)
	24V, 40A : 250W*4 , 315W/325W/390W*3 ( Parallel)	24V, 50A : 250W*6 , 315W/325W*5, 390W/400W/425W*4 ( Parallel)
Electrical		
Nominal Grid Voltage	230V AC 1Φ	
Grid Low Cut	90V ± 10V	
Grid High Cut	290V ± 10V	
Charging Current (Solar)	50A/25A	
Charge Controller Efficiency	>95%	
Idle Consumption	<20mA	
Max. Solar input Voltage (Voc)	17V-25V (12V Batt.)	
	31V-49.5V (24V Batt.)	
Min. Solar input voltage (Voc) @ Start-up	15V/30V ± 2%	
Solar Panel Recovery Voltage	17V/34V ± 2%	
Max. Solar Current	50A By Default	
Efficiency	>95%	
Battery Set Points @ 25°C		
Bulk Voltage Tubular Battery	14.6V/29.2V ± 2%	
Absorption Voltage Tubular Battery	14.2V/28.4V ± 2%	
Float Voltage Tubular Battery	14V/28V ± 2%	
Bulk Voltage SMF Battery	13.7V/27.4V ± 2%	
Float Voltage SMF Battery	13.5V/27.0V ± 2%	
Absorption Duration	3Hr	
Equalize Voltage	14.9V/29.8V ± 2%	
Equalize Duration	3Hr	
Equalize calender	28 days	
Mains reconnect when Solar not present	At any Batt. Voltage	
Mains reconnect when insufficient Solar Power	<11.8V/ 23.6V ± 2%	
Mains disconnect when sufficient Solar Power For Tubular	>13.8V/27.6V ± 2%	
Mains disconnect when sufficient Solar Power For SMF	13.7V/27.4V ± 2%	
Display Parameters		Protections
1. Batt. Voltage, Batt. Current, Batt. Type	1. Battery Reverse Polarity	
2. Solar Voltage, Solar Current	2. Batt. Reverse Current	
3. Mode Selection	3. Over Current of SPV : >40A/20A	3. Over Current of SPV : >56A/28A
4. Solar Status: High, Low, Overload, Overheat	4. Solar High Voltage	
5. Saving- KWh	5. SPV Reverse Polarity	
6. Mains Present, Low, High, Absent	6. Load Short Circuit through AC Fuse	
7. Max. PV Current	7. Solar Low Voltage	
	8. Over Temperature	
Physical		
Ingress Protection	IP-20	
Fixing	Wall Mounted	
Weight (Kg)	2.33	
Dimension (LxWxH) Inch	9.6 X 6.9 X 4.9	

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

## SMU (rMPPT) Solar Management Unit

“Convert your Home Inverter into Solar Inverter”



Available in  
12V/24V-40A

### FEATURES

- High speed and high performance micro-controller.
- High reliability with longer operational life.
- Inbuilt protection to avoid battery undercharge & over-charge.
- Inbuilt rMPPT Technology Charge Controller.
- 3 Stage Charging BLK, ABS, FLT.
- Automatic Voltage selection for 12V or 24V.
- Solar Prioritization.
- Compact design with Wall Mounting.
- Eco friendly.
- Transient and Surge Protection.
- Over Temperature Protection.

## SOLAR MANAGEMENT UNIT

General		
Model	SMUMPPT122440	
Nominal System Voltage	12V DC	24V DC
Battery Capacity Max.	200AH	
Battery Type	Tubular/SMF	
Battery Charging Regulation Method	3 Stage (Bulk/Absorption/Float)	
Solar Charger Type	MPPT	
Solar Power (Max.)	600W	1200W
Max. Solar Panel (Recommended)	150W/165W X2 (Series) X 2 (Parallel) 315W/325W/330W/335W X 2 (Parallel) 390WX1	315W/325W/330W/335WX4 (Parallel) 390W/425WX3. 540WX2 (Parallel) 315W/325W/330W/335WX 2 (Series) X 2 (Parallel)
Max. Solar input Voltage(Voc)	15V-49.5V	30V-99V
Idle Consumption	<20mA	
Efficiency	>95%	
Battery set points		
Tubular	Boost Voltage :- 14.5V $\pm$ 0.2V	Boost Voltage :- 29.0V $\pm$ 0.2V
	Float voltage :- 14V $\pm$ 0.2V	Float voltage :- 28V $\pm$ 0.2V
	Bulk Absorption :14.8V $\pm$ 0.2V	Bulk Absorption :29.6V $\pm$ 0.2V
SMF	Boost/Float Voltage : 13.8V $\pm$ 0.2V	Boost/Float Voltage : 27.6V $\pm$ 0.2V
	Bulk Absorption : 14.1V $\pm$ 0.2V	Bulk Absorption : 28.2V $\pm$ 0.2V
Battery Current Max.	40A	
Grid		
Mains Low cut /Recovery	90V/100V $\pm$ 10V	
Mains high cut /Recovery	290V/280V $\pm$ 10V	
Mains reconnect when Solar not present	At any Batt. Voltage	
Mains Disconnect	If Battery reaches boost level then after <5 min. Mains will be disconnected.	
Mains Reconnect	Battery volt. : 11.8V	Battery volt. : 23.6V
Display Parameters		
Display Type	LCD	
Display Parameters	Batt. Voltage, Batt. Current, Batt. Type(TUB/SMF), Solar Voltage, Solar Current, Solar Saving- KWh, Mode Selection (Auto/Manual), Mains Present, Absent	
Protections		
Protections	Battery Reverse Polarity (Fuse blown), Batt. Reverse Current, SPV Over Current, Solar High Voltage, SPV Reverse Polarity, Over Temperature, Mains High Cut, Mains Low Cut	
Operating Temperature	0°C to 50°C	
Storage Temperature	0°C to 60°C	
Ingress Protection	IP-20	
Fixing	Wall Mounted	
Weight (Kg)	2.6	
Dimension (LXWXH) Inch	9.25 x 9 x 4.15	

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

**POLYCRYSTALLINE SOLAR PANEL**

**CLEAN, GREEN  
&  
INFINITE ENERGY**

Available in  
40W - 335W



AR Coated Tempered Glass  
Anti-Reflective Module Surface



PID Resistant with  
Long Term Reliability



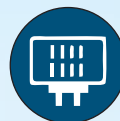
Strengthened Mechanical Support  
5400 Pa snow load, 2400 Pa  
wind load



100% EL Tested  
High PTC rating



Quality and Reliability assurance  
in standard weather condition



IP68, IP67  
for Long Term Endurance



## POLY TECHNICAL SPECIFICATION

Electrical Characteristics					
Nominal power at STC Pmax (W)	40	60	100	165	335
Short Circuit Current Isc (A)	2.40	3.45	5.69	8.90	9.09
Operating voltage at Pmax Vmp (V)	18.5	18.5	19.04	18.40	39
Operating current Imp (A)	2.17	3.25	5.37	8.70	8.6
Open circuit voltage Voc (V)	22.00		22.61	22.50	46.15
Module efficiency %	14.9			16.10	17.26
Operating Temperature	-40°C to +80°C				
Maximum system voltage (DC)	1000V				
Power Tolerance	± 3%				
Fill Factor	77%				
Standard Test Condition	irradiance of 1000 W/m <sup>2</sup> , spectrum AM 1.5 and cell temperature of 25°C				
Mechanical Characteristics					
Cell type	Poly				
No of Busbar	5BB				
No of Cell	36			72	
Cell arrangement	9 X4			12 X 6	
Module Dimension (mm)	431*665*30	595*665*30	1010*666*35	1495*670*35	1960*990*40
Weight (kg)	3.5Kg	5.0Kg	10.5Kg	12.5Kg	21.00Kg
Front side Junction Box	IP65, 1 DIODE		IP65, 2 DIODE		IP68, 3 DIODE
Frame	Anodized Aluminum Alloy				
Front Glass	3.2mm Toughened Textured				
Cables & Connectors	Without Cable & Connt.		4mm <sup>2</sup> , 800mm/ mc4 Connector		4mm <sup>2</sup> ,1200mm / mc4 Connector
Temperature Coefficient					
Temperature Coefficient Power (γ)	(-)0.43 %/°C				
Temperature Coefficient Voltage (β)	(-)0.36 %/°C				
Temperature Coefficient Current (α)	(+)0.06 %/°C				
Warranty					
Output Tolerance	±2%				
Performance Warranty	25 Years				

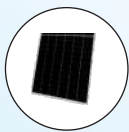
\*Specification are subject to change without prior notice due to constant improvement in design & technology.

\*T&C Apply .

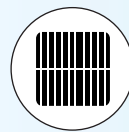
**MONO-PERC SOLAR PANEL**

**CLEAN, GREEN  
&  
INFINITE ENERGY**

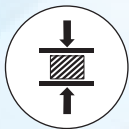
**Available in  
200W - 540W**



Half Cut Cells Are More Physically Durable, More Resistant To Cracking Reduce Power Loss increase module efficiency (Mono-Perc up to 20.95 %)



9BB/10BB instead of 5MBB Technology decreases the distance between bus bars and finger grid line which is benefit to power increase.



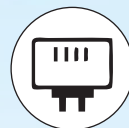
Strengthened Mechanical Support  
5400 Pa snow load, 2400 Pa wind load



Quality and Reliability assurance  
in standard weather condition



Higher lifetime Power Yield  
2.0% first year degradation,  
0.55% linear degradation



IP68, IP67  
for Long Term Endurance

## TECHNICAL SPECIFICATION

### MONO-PERC SOLAR PANEL

Electrical Characteristics at STC	Mono-Perc		Half Cut Mono-Perc	
Maximum Power (Pmax) Mono Perc	200W	400W	440W	540W
Open Circuit Voltage (Voc)	24.9V	49.30V	49.40V	49.65V
Short Circuit Current (Isc)	9.95A	10.47A	11.42A	14.00A
Voltage at Maximum Power (Vmp)	20.6V	40.78V	41.40V	41.80V
Current at Maximum Power (Imp)	9.5A	9.82A	10.67A	13.01A
Module Efficiency (%)	20.05	20.20	20.22	20.75
Operating Temperature	-40°C to +85°C			
Maximum System Voltage	1000V DC	1500V DC		
Fire Resistance Rating	Type 1(in accordance with UL 1703)/Class C(IEC 61730)			
Maximum Series Fuse Rating	15A	25A/20A	30A	

STC: Irradiance 1000W/m<sup>2</sup>, Cell temperature 25°C, AM1.5

Mechanical Characteristics				
Cell type	Mono Perc			
Number of cells	36 (9x4)	72 (12x6)	144 (12x6),(12x6)	
Module dimensions (MM)	1495x670x35	1995x1000x40	2095x1040x40	2285x1140x40
Weight	11.84kg	24kg	26kg	28.6kg
Front cover	Low iron, Tempered glass			
Frame	Anodized aluminum alloy			
Junction box	IP65/2 Diodes	IP68/3 Diodes	Split Junction Box	
Cable	4mm <sup>2</sup> , 1000mm	4mm <sup>2</sup> , 1200mm	4mm <sup>2</sup> , 400mm	
Connector	MC4 compatible			

Temperature Characteristics	
Nominal Operating Cell Temperature (NOCT)	46°C±2°C
Temperature Coefficients of Pmax	-0.40%/°C
Temperature Coefficients of Voc	-0.32%/°C
Temperature Coefficients of Isc	0.04%/°C

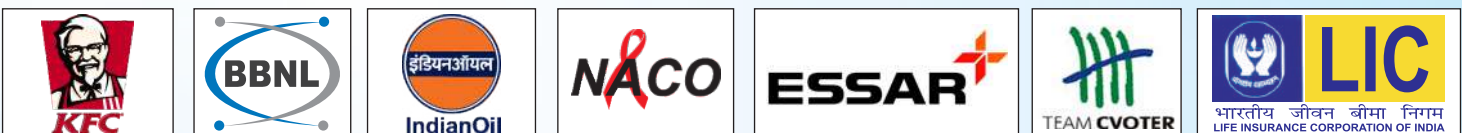
Packaging			
Standard packaging	200W(3in1)	400W(2in1)	440/540W(2in1)
Warranty	25 Years		27 Years

Note :-

- The specifications included in this datasheet are subject to change without notice.
- The electrical data given here is for reference purpose only.
- Please confirm your exact requirements with the sales representative while placing your order.
- Module size can be changed without any prior notice

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




and many more...



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