



PURSUIT OF PERFECTION

# INDEPENDENT POWER

S O L U T I O N S

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## Company Introduction

TBB Power aim to supply multiple independent power solutions for area without grid or suffers unstable grid. Solutions offered include power backup, solar offgrid and solar hybrid power solution. It can be applied for residential, commercial, remote resort and rural electrification.

Products supplied including inverter charger combination, bi-directional inverter, MPPT charge controller, distribution, system monitor and remote monitoring etc. Till 2018, Over 40000 products have been installed worldwide and being widely accepted as trustworthy and dependable brand.

### Residential

Various power solutions are available which are suitable for residential applications of both urban and suburb region. It can be power backup, solar offgrid or solar hybrid solution integrating various energy sources including public grid, solar or diesel generator.

### Commercial

Solar offgrid for Power backup solution could satisfy continuous energy requirement of commercial projects, such as holiday villas, farms, shops etc. System can guarantee continuous power supply with minimum manual operation. Meantime, multiple monitoring solutions are available for professional user.

### Rural

Rural electrification projects satisfy basic needs like lighting, entertainment systems, water pump and refrigeration. Or, projects involved with more appliances such as washing machine and air conditioning. Multiple remote monitoring solutions were available for professional user.

WE  
ARE  
FULL  
OF

ENERGY

# OFF GRID

The presence of a functional electricity grid is not always as obvious as it would seem to be. An insufficient infrastructure is often the cause for an unreliable grid. Things become even more difficult when there is no grid at all. And yet you are in need of a reliable electricity supply. An independent power system is the only answer at this point.

TBB Power offers you such an answer, to have free and reliable power supply independent from unstable or limited grid. There are two different ways of configuring an off grid system, DC-Coupling and AC-Coupling, and each have unique advantages. Different choices will have an impact on the system efficiency, battery life expectancy and flexibility of your system.



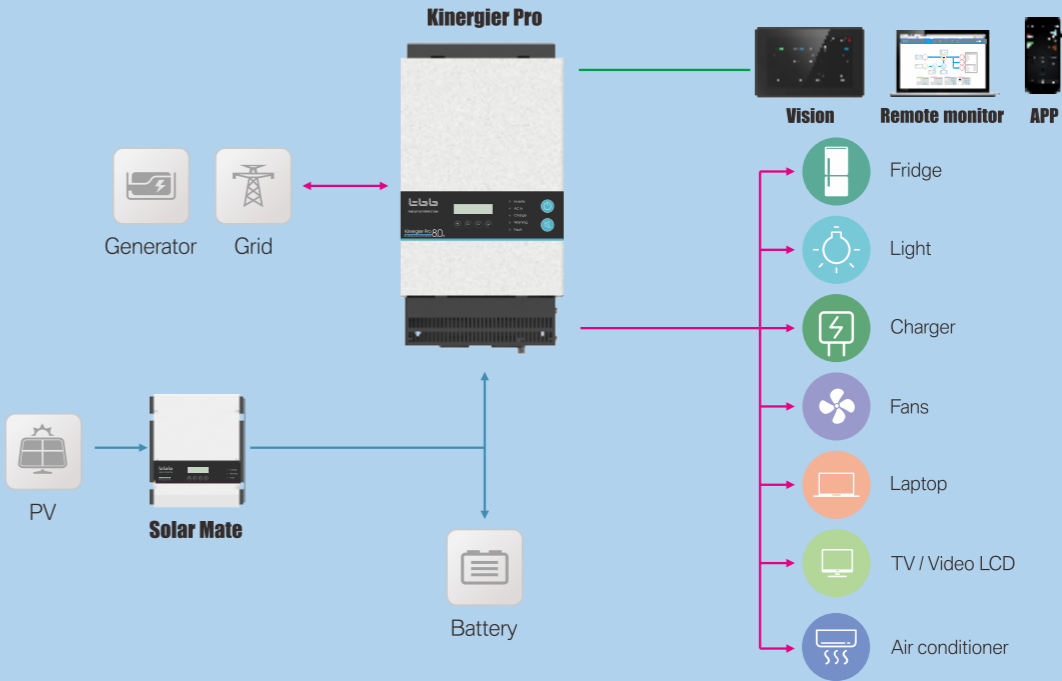
## DC coupling system

Featuring lower component cost and simplicity, DC coupled system is an ideal solution for small residential application, where power transmission distance is short and system power is fairly low.

MPPT is in charge of sun harvest, which is flexible with various models and meantime offers the convenience of expansion. In case sun can't provide enough energy, a generator can be connected to power the load and meantime charge the battery.

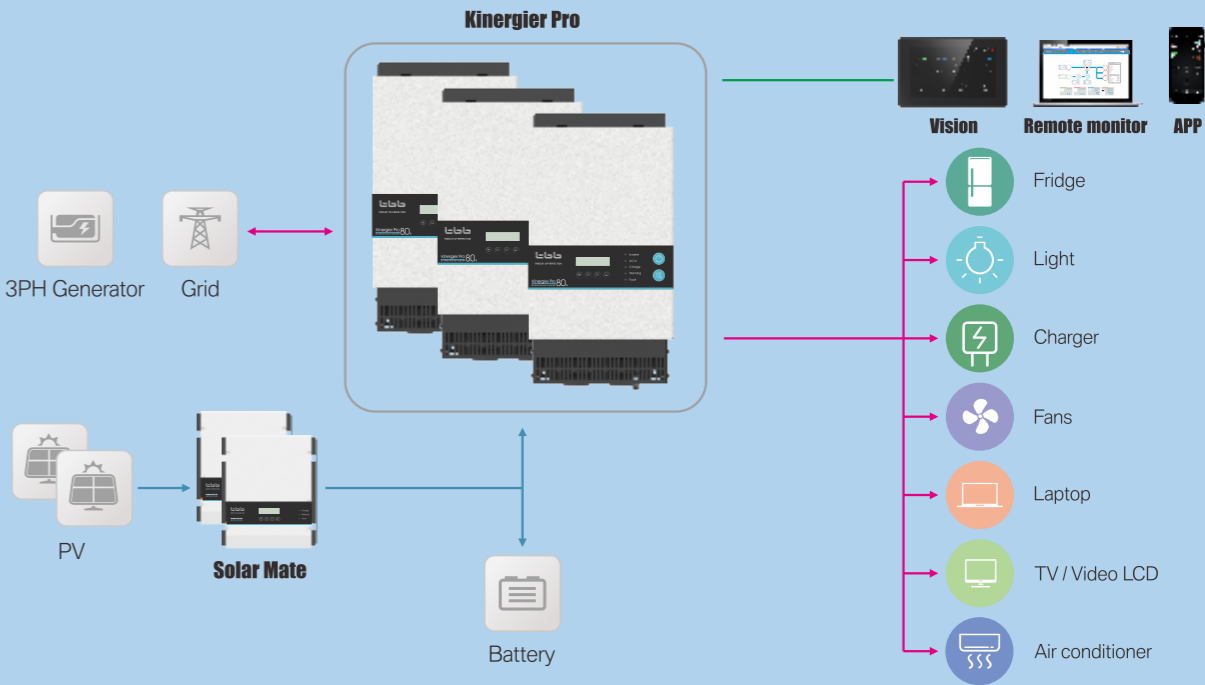
Automatic Energy Allocation (AEA) : in case of peak power, which is often required for a limited period of time, this unique feature will allows the Kinegier Pro take power from battery to supplement the capacity of generator or grid. Upon power of the load drops, Kinegier Pro can take spare energy to quickly recharge the battery.

System size:  
4KW - 24KW single phase



\* Remark: Energies Pro, Kinegier Pro and Energies Apollo can be used for this application

System size:  
12KW - 48KW three phase



\* Remark: Energies Pro, Energies Apollo and Kinegier Pro all can be used for this application



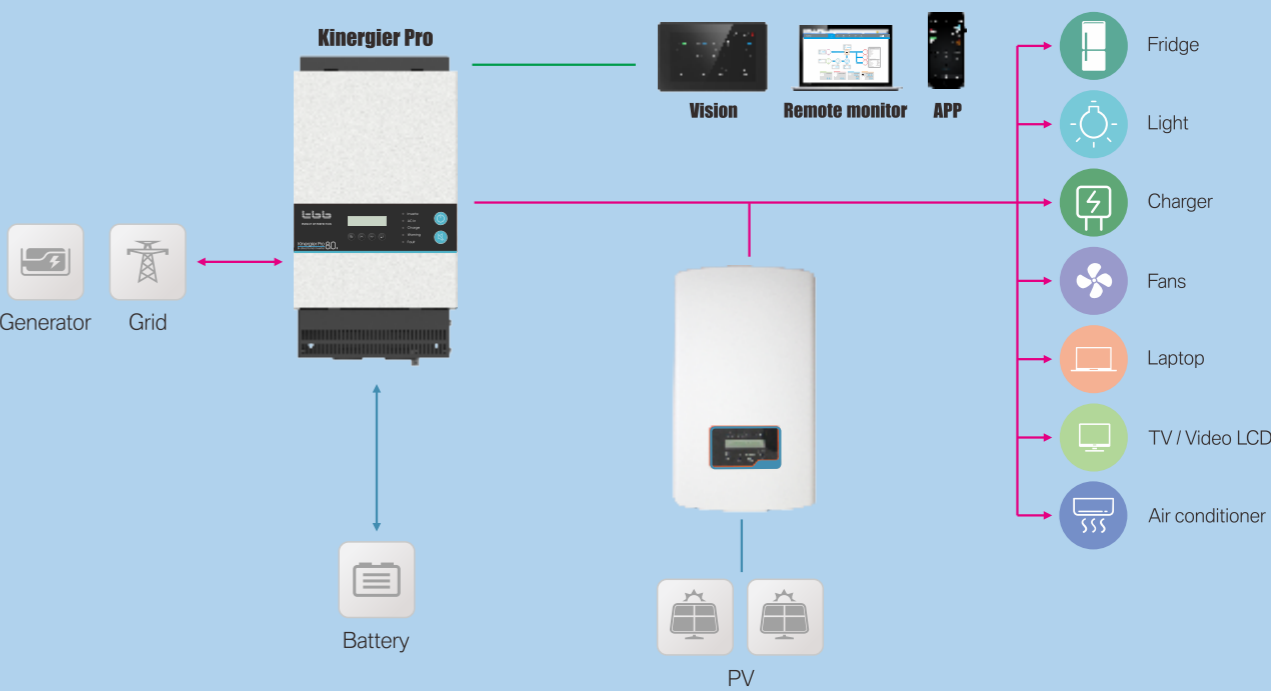
### AC coupling system

AC coupled system can achieve higher system power and is much more suitable for commercial project, which works at higher DC solar voltages results in lower solar array wiring losses. In the meantime, AC coupled offers greater flexibility about the placement of solar arrays or other electrical equipment.

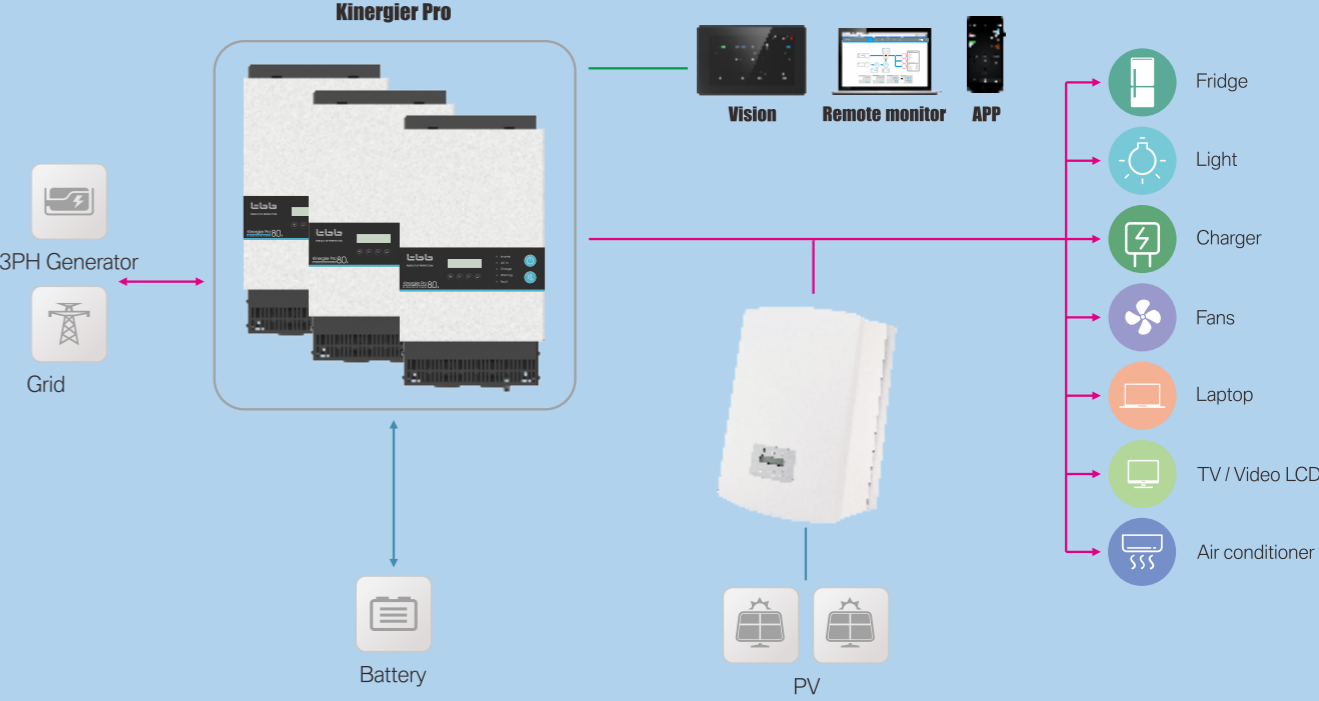
Compared with DC coupled system, solar array can directly power AC loads during daylight hours resulting in higher system efficiency. Excess solar power during daylight hours is then used to charge the batteries via the Kinegier Pro bi-directional inverter. Directly powering appliances during the daytime can bypass batteries which will enhance the battery bank life expectancy.

Diesel generator can be AC coupled. As the result of Automatic Energy Allocation function (AEA) of Kinegier Pro bi-directional inverter, its generation capacity can be reduced precisely according to the load requirement and inverter capacity, providing a significant system advantage at times of high system power demand or low renewable energy generation.

System size:  
4KW - 24KW single phase



System size:  
12KW - 48KW three phase



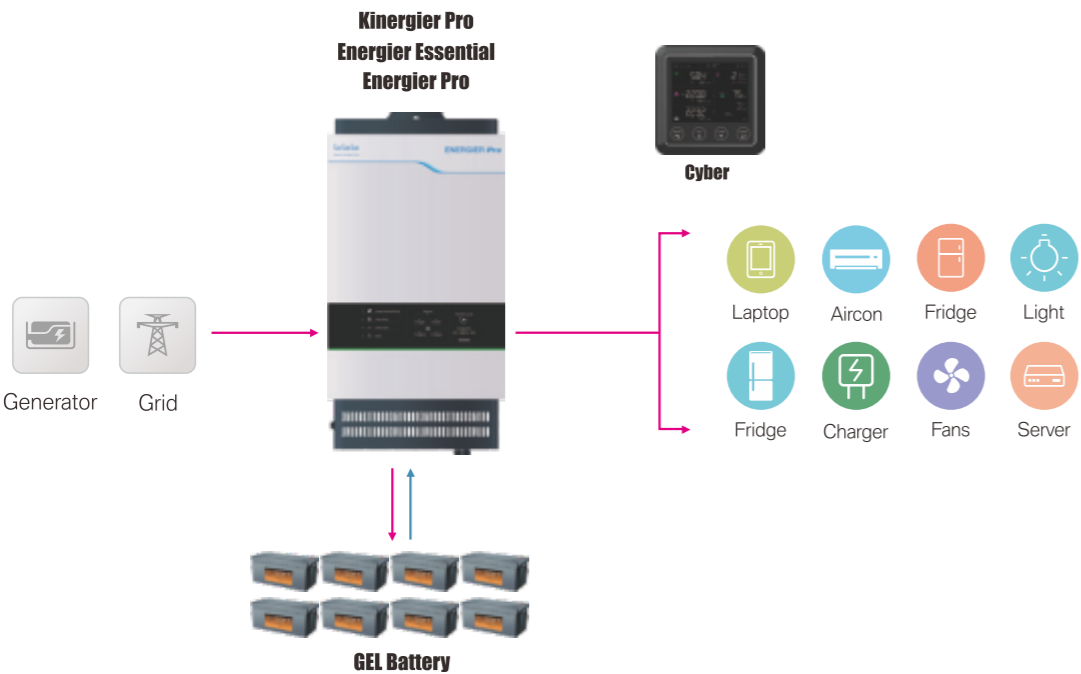
# Power Backup

Many people and business are still suffered from frequent power shedding, TBB inverter charger and bi-directional inverter are designed to provide clean and uninterruptible backup power with durations much longer than your traditional UPS system. TBB power products are capable of operating in harsh environments and working in conjunction with a generator for longer backup runtimes.

TBB Power offers various alternative solutions satisfying power backup requirement, of which could provide clean, reliable, powerful power that seamlessly work with your present utility with minimum manual operation and no safety risk.

## Residential backup power system

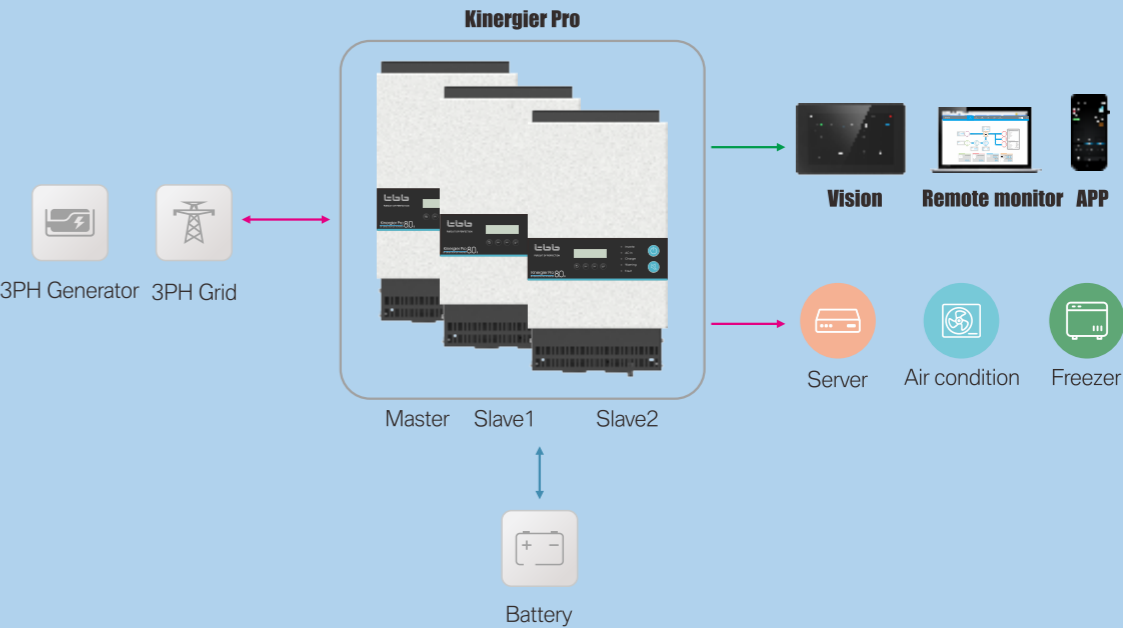
- Fully automatic transfer without manual operation
- High quality power : pure sine wave output with higher quality than that of grid
- Outstanding surge capability : is capable to power the most demanding home appliances, such as air conditioner, washing machine, fridge and etc without oversize the inverter too much like many competitors in the market
- Powerful and Professional Charger: can charge the battery bank quicker and assure the right charging at different environments prolonging the battery life expectancy
- Generator compatible: can work with weak grid and the majority of cheap generator in the local market



## Commercial backup power solution

Power outages will have financial consequences for many businesses such as banks, hotels, offices, hospital and restaurants etc. They all need reliable and economical power backup solution against unpredictable grid outages, to minimize the production loss. Kinergie Pro from TBB Power can assure the seamless transfer with capability integrating with generator for longer autonomy.

- System available for both single phase and three phase
  - 4KW - 24KW single phase
  - 12KW - 48KW three phase
- UPS class transfer time : built in automatic transfer with less than 2ms, power drop can be avoided for all kinds of sensitive electronic equipment, such as server or ATM machines
- Powerful and Professional Charger : is capable to charge a big battery bank and assure the right charging at different environments prolonging the battery life expectancy
- High quality power : pure sine wave output with higher quality than that of grid Outstanding surge capability : is capable to power the most demanding home appliances, such as air conditioner, water pump, fridge and etc without oversize the inverter too much like many competitors in the market
- Three phase capability : is capable to handle three phase load such as air conditioner, freezer, water pump etc



# ENERGIER PRO



## Inverter Charger Combination 3 KW - 7.5 KW

Energier Pro is the inverter charger combination designed for solar offgrid and power backup solution. Energier Pro delivers high reliability, performance and industry leading efficiency for mission critical application. In areas where the grid is limited or unreliable, where diesel generators are still being heavily relied on, Energier Pro will be a perfect choice to compose a power backup or offgrid power solution.

Energier Pro integrated multiple functions, including a powerful battery charger, true sine wave inverter and a high speed automatic transfer switch. Its distinguishing surge capability makes it capable to power most demanding appliances, such as air conditioner, water pump, washing machine, freezer etc.

- Pure sine wave output with outstanding peak power
- High efficiency up to 94.8%
- Extremely low status consumption power
- Solar mode makes the energy from sun be used as primary
- TBB premium II multi stage charging algorithm with built in automatic temperature & voltage compensation charging
- Equalization charging program was available
- Lithium Battery charging algorithm was available
- Fully programmable with Vision Lite or Rapconfig software
- GEN mode makes it compatible with cheap generators in the market
- Weak Grid mode can dramatically increase the usage of grid upon available
- Built in Power Sharing Function
- Standby level adjustable
- Build in AGS with Power sharing feature
- Compatible with T-bus



Vision Pro



Vision Lite



Model No.	24 VDC	CF3045M	CF4080M	CF50100M	/	/
	48 VDC	CF3020S	CF4030S	CF5050S	CF6060S	CF8080S

### Inverter

Nominal Voltage		24VDC/48VDC				
Power 30mins @25°C (W)		3000	4000	5000	6000	7500
Cont. Power @25°C (VA)		3000	4000	5000	6000	8000
Cont. Power@25°C (W)		2500	3500	4500	5000	7000
Cont.power @40°C (W)		2200	3200	4000	4500	6000
Output Voltage		230 VAC ± 2%				
Output frequency		50 / 60 Hz ± 0.1%				
Surge		300%				
Efficiency (MAX)	24 V	92%				
	48 V	95%				
Crest factor		3:1				
THD		<3%				
Bypass Range	UPS mode	184 VAC -264 VAC				
	GEN mode	173 VAC -276 VAC				
	Weak Grid mode	167 VAC -264 VAC				
Zero load power		17W	25W	26W	28W	30W
Zero load power (power save mode)		4W	6W	6.5W	7W	7.5W
Overload protection		auto disconnect				
Shortcut protection		auto disconnect				

### Charger

Nominal Output Voltage		24VDC/48VDC				
Max Output Current (A) - adjustable		90 / 45 / 20	80 / 30	100 / 50	60	80
AC Input range		170VAC -264 VAC				
Battery types		AGM / GEL(OPzV) LFP / Flooded				
Absorption time		variable				
Temperature compensation		-4mV / °C / cell				
Slave Charger		3 - 5 A float charge (24Vdc model only)				

### Other Data

Transfer time	UPS mode	15 ms				
	GEN mode	2 s				
Transfer switch		31 A		90 A		
Dry contact		X1, programmable				
Battery connector		M6 x 2		M8 x 2		
AC terminal		M4				
Enclosure		Steel with powder paint				
Dimension (mm)(max)		485 x 265 x 145		550 x 285 x 190		
Net Weight (KGs)		19.2	21	35	40	46
Cooling		Forced fan				
Protection		IP22		IP20		

### Standard

Safety	IEC62109 - 1					
EMC	EN61000-6-1, EN61000-6-3, EN61000-3-11, EN61000-3-12, EN55014-1, EN55014-2, EN55032, EN55024					

# KINERGIER PRO

CK4.0S / CK6.0S / CK8.0S



## Bi-directional inverter

Kinergy Pro is the new generation bi-directional inverter designed for various types of off grid systems including AC coupling system, DC coupling system and generator hybrid system. It can provide UPS class switching speed and with capability to support parallel as well as composing three phase system.

Kinergy Pro delivers high reliability, performance and industry leading efficiency for mission critical application. Its distinguishing surge capability makes it capable to power most demanding appliances, such as air conditioner, water pump, washing machine, freezer etc.

With the function of AEA (automatic energy allocation), it can be used to work with a limited AC source such as generator or limited grid. Kinergy Pro can automatically adjust its charging current avoiding grid or generator to be overloaded. In case of temporary peak power appears, it can work as the supplement source to generator or grid.

- UPS class transfer speed, <2ms
- Support AC coupling system, DC coupling system and solar hybrid systems
- Parallel and three phase capability, up to 9 units can operate in parallel
- Can be used for self consumption system support feed back to grid
- AEA function (power sharing and power assist)
- Outstanding overload capability for all kinds of inductive loads
- Harmonic distortion < 2%
- High efficiency up to 96%
- Extremely low status consumption power
- TBB premium II battery charging management
- With built in battery SOC estimation
- Two programmable AC outputs for smart load management
- Built in AGS
- Fully programmable by APP
- Remote monitoring and control available



Wireless Module



BGK



Vision Pro



Model No.	CK4.0S	CK6.0S	CK8.0S
AEA / Power Assist	Yes		
AC inputs	voltage range : 165 ~ 265Vac, Frequency :45Hz ~65Hz		

### Inverter

Nominal battery voltage	48 VDC		
Input voltage range	42~60Vdc		
Output	Voltage: 220~240 VAC ± 2%,Frequency: 50~60 Hz ± 0.05%		
Harmonic distortion	<2%		
Power 30 mins @25°C (W)	4000W	6000W	8000W
Cont. output power @25°C (W)	3000W	4500W	6000W
Peak power (5 sec) (W)	6000W	9000W	12000W
Cont. output power @40°C (W)	2400W	3600W	4800W
Surge	300%		
Max efficiency	95%	95%	96%
Zero load power	17W	20W	26W

### Charger

Absorption voltage	57.6Vdc		
Float charge voltage	55.2Vdc		
Battery types	AGM / GEL / OPZV / Li-ion		
Max battery charge current	50A	75A	100A
Temperature compensation	yes		

### General Data

Transfer time	<2ms (<15ms in weakgrid mode)		
Remote on-off	Yes		
Programmable relay	2x		
Protection	Output short circuit		
	Overload		
	Battery voltage too high / too low		
	Temperature too high		
	Input voltage out of range / ripple too high		
CAN Bus communication port	For parallel and three phase operation, remote monitoring and system integration		
General purpose com. Port	RS485, Bluetooth, GPRS, WLAN		
Operating temperature range	-20°C ~ 60°C		
Relative humidity in operation	95% without condensation		

### Mechanical Data

Dimension	530*285*185	530*285*185	530*285*185
Net weight	28KG	35KG	40KG
Cooling	Forced fan		
Protection category	IP20		

### Standard

Safety	EN60950-1,EN-IEC 62109-1		
EMC	EN61000-6-1,EN61000-6-3,		

# ENERGIER APOLLO



**PWM version 1.2 KW - 1.7 KW**  
**MPPT version 2 KW- 4 KW**



EnergiER Apollo is a powerful inverter integrated multiple functions, including a high performance true sine wave inverter, a powerful battery charger, a MPPT or PWM charge controller, a high speed automatic transfer switch and two outputs for load management.

EnergiER Apollo inverter can be used in multiple applications. With a simple setting, you can compose a power backup or solar offgrid system. Its distinguishing surge capability makes it capable to power most demanding appliances, such as fridge, freezer, water pump and air-conditioner etc.

EnergiER Apollo has some distinguished features designed especially for African, Middle East and South East Asian countries where the grid is not stable and low voltage is frequently encountered. EnergiER Apollo can maximize the usage of grid and automatically adjust its charging in accordance with the setting.

- All in one unit integrating multiple functions
- Can be applied for solar hybrid and power backup system
- High efficiency up to 95%
- Extremely low status consumption power
- Standby level adjustable
- High performance designed for all kinds of home appliances
- TBB premium II multi stage charging algorithm with built in automatic temperature & voltage compensation charging
- Equalization charging program was available for flooded and OPZS Battery
- Lithium Battery charging was available
- Multiple working mode can be configured
- Designed for tropical region
- Designed to work with weak grid
- GEN mode makes it compatible with cheap generators in the market
- With built in AGS and power sharing feature
- Fully programmable with Vision Lite or Rapconfig software
- Built-in AC input and output MCB (for MPPT version only)



**Wireless Module**  
for MPPT version only



Model No.	CH1350L	CH2040M	CH2.0M	CH2.0S	CH3.0S	CH4.0S
LCD display	No	No	yes			
AC IN MCB	No	No	D25	D25	D32	D40
AC OUT MCB	No	No	C16	C16	C25	C32

## Inverter

Nominal battery voltage		12Vdc	24Vdc		48Vdc		
Nominal input voltage range		11.3Vdc~16Vdc	22.6Vdc~32Vdc	18Vdc~34Vdc	40Vdc~62.8Vdc		
Cont. power @25°C (VA)		1300	2000	2000	2000	3000	4000
Power 30mins @25°C (W)		1200	1700	2000	2000	3000	4000
Cont. power @25°C (W)		1100	1300	1800	1800	2700	3600
Cont. power @40°C (W)		1000	1200	1600	1600	2400	3200
Output voltage		230Vac± 2% , 220Vac~240Vac Settable, 50Hz ± 0.05%, Settable					
Total harmonic distortion		<3%					
Efficiency (MAX)		90.5%	93%	93%	95%		
Zero load power		11W	13W	14W	14W	17W	20W
Zero load power (power save mode)		2.5W	3W	3.5W	3.5W	4.5W	5W
AC Input range	UPS mode	184Vac-264Vac					
	Weakgrid &GEN	168Vac-276Vac					
AC input frequency range		50Hz: 40Hz-55Hz; 60Hz: 55Hz-65Hz					
Typical transfer time		<20ms (typical 10ms)					
Transfer switch		16A			31A		

## AC Charger & Solar Charger

Solar Charger type		PWM		MPPT			
Nominal output voltage		12Vdc	24Vdc		48Vdc		
Max PV open circuit voltage(Voc)		25Vdc	50Vdc	100Vdc	150Vdc		
Recommended PV		640W	1520W	1440W	1920W	2880W	3840W
MPPT range		N/A	N/A	32Vdc-100Vdc	64Vdc-145Vdc		
Max PV short circuit current		N/A	N/A	35A			
Rated charging current - adjustable	AC Charger	50A	40A	40A	20A	30A	40A
	Solar Charger	50A	50A	60A	35A	50A	60A
Max charging current		100A	90A	100A	55A	80A	100A
MPPT efficiency		N/A	N/A	99.5%			
Solar Charger Maximum efficiency		N/A	N/A	98%			
Battery types		AGM/GEL/LFP/FLOODED					
Temperature compensation		-4mV/cell°C, settable					

## Other Data

Protection	a)shortcut, b)over load ,c) over temperature, d) input voltage out of range ,e) battery low voltage disconnect ,f) battery high voltage protection ,g)fan lock	
Auxiliary output	X1, programmable	X2, programmable
Operating ambient temperature range	-20°C ~ 60°C	
Storage temperature range	-40°C ~ 85°C	

## Mechanical Data

Dimension (mm) (max)	470x233x95		515x275x145			
Net weight (KG)	11.6	12	20	20	22	25
Cooling	forced fan					
Protection	IP20		IP21			

## Standard

Safety	EN60950-1,EN62109-1/-2					
EMC	EN61000-6-4,EN61000-6-2,EN61000-3-3,EN61000-3-2					

# ENERGIER ESSENTIAL



## Inverter Charger Combination 1KW - 4KW

Energier Essential inverter charger combination is designed for power shedding application. With battery, you can quickly compose a power backup system to support 2 -6hrs backup time. Compared with diesel generator, it has many distinguished features such as automatic, much less operation cost, fully automatic, less noise, high quality power etc.

Energier Essential integrates multiple functions, including a powerful battery charger, ture sine wave inverter and a high speed automatic transfer switch. Its distinguishing surge capability makes it capable to power most demanding appliances, such as air conditioner, water pump, washing machine, freezer etc.

Energier Essential has some distinguished features designed especially for African, Middle East and South East Asian countries where the grid is not stable and low voltage is frequently encountered.

Energier Essential can maximize the usage of grid and automatically adjust its charging in accordance with grid condition.

- Inverter charger combination with pure sine wave output
- High performance designed for all kinds of home appliances
- TBB premium II multi stage charging algorithm with built in automatic temperature compensation
- Equalization charging program was available
- Compatible with majority of cheap generators in the market
- Designed to work with weak grid
- Designed for tropical region with working temperature up to 60 °C
- Optional CM was available for automatic generator start
- Dry contacts
- Optional SNMP card for remote internet access



**RCC**  
Simple remote LED Display



**LMD**  
Load management device



**SNMP**  
Remote monitor via TCP / IP



### Inverter

Model No.	12 VDC	CS0625L	CS1040L	CS2080L	/	/
	24 VDC	CS0615M	CS1020M	CS2040M	CS3060M	CS4080M
	48 VDC	/	/	/	CS3030S	CS4040S
Nominal Voltage		12 VDC / 24VDC / 48VDC				
Power 30mins @25°C (W)		600W	1000W	2000W	3000W	4000W
Cont. Power@25°C (W)		600W	1000W	1800W	2500W	3600W
Cont.power @40°C (W)		600W	1000W	1500W	2000W	3000W
Cosφ		0.9 - 1				
Surge		300%				
Output Voltage		230 VAC / 110 VAC ±2%			230 VAC ± 2%	
Output Frequency		50 / 60 Hz ± 0.1%				
Efficiency (MAX)	12 V	88%				
	24 V	88%				
	48 V	92%				
Bypass Range	UPS mode	184 VAC -264 VAC / 92 VAC -132 VAC				184 VAC -264 VAC
	GEN mode	160 VAC -280 VAC / 80 VAC -140 VAC				160 VAC -280 VAC
Crest factor		3:1				
THD		<3%				
Zero load power		17W	22W	27W	36W	72W
Zero load power (power save mode)		4W	5W	7W	9W	18W
Output circuit breaker		5A	10A	10A	15A	30A
Overheat protection		auto disconnect				
Overload protection		auto disconnect				
Shortcut protection		auto disconnect				

### Charger

Nominal Output Voltage		12 VDC / 24 VDC / 48 VDC				
Max Output Current (A) - adjustable		25 / 15	40 / 20	80 / 40	60 / 30	80 / 30
AC Input range	UPS mode	184VAC -264 VAC / 92VAC -132 VAC				184VAC -264 VAC
	GEN mode	160VAC -280 VAC / 80VAC -140 VAC				160VAC -280 VAC
Battery types		AGM / GEL / LFP / Flooded				
Absorption time		variable				
Temperature compensation		-4mV / °C / cell				
Charger circuit breaker		5A	10A	15A	30A	30A

### Other Data

Transfer time	UPS mode	15 ms				
	GEN mode	2 s				
Transfer switch		40 A				
Dry contact		3				
Battery connector		M8 x 2				
AC terminal		terminal block (M3 screw)				
Enclosure		steel with powder paint				
Dimension (mm)(max)		444 x 186 x 135	512 x 216 x 176			
Net Weight (KGs)		9.5	14	16	18.5	22.5
Cooling		Forced fan				
Protection		IP22				

### Standard

Safety	EN60950 - 1				
EMC	,EN55022,EN55024				



# SOLAR MAX



## Solar Inverter 600W - 4KW

Solar Max solar inverter is especially designed for solar off-grid application featuring high efficiency, extremely low atatus consumption power as well as outstanding reliability. It could provide a continuous rated power at 40°C and 80% even at scorching temperature up to 60°C. Combined with outstanding overload capability, this inverter could comfortably power large load such as air conditioner, refrigerators and water pumps at tropical regions.

- Pure sine wave output
- High ambient temperature design
- Peak efficiency up to 94.8%
- Extremely low status consumption power
- Outstanding peak power, suitable for all home appliances
- PWM solar charge controller is built inside of 600W and 1KW model
- Built in auxiliary contact
- Nearly silent operation
- Insect proof design



RSC



LMD

Load management device



Model No.	12VDC	SC600L		CPI1000L	CPI1500L	CPI1200L		
	24VDC	SC600M	SC1000M		CPI1500M	CPI2000M	CPI3000M	CPI4000M
	48VDC					CPI2000S	CPI3000S	CPI4000S
PWM controller		YES	YES	NO	NO	NO	NO	NO

### Electrical

Nomrinal voltage		12VDC/ 24VDC	24VDC	12VDC	12VDC/ 24VDC	12 VDC / 24 VDC / 48 VDC		
Power 30mins @ 25°C		600	1000	1000	1500	2000	3000	4000
Cont. power @ 25°C (W)		600	1000	1000	1300	1900	2700	3600
Cont. power @ 40°C (W)		480	800	1000	1200	1700	2200	3000
Cosφ		0.9-1						
Surge		300%						
Output voltage		240Vac, 230Vac, 220Vac, 208Vac ± 2% or 127Vac, 120Vac, 110Vac, 100Vac ± 2%						
Output frequency		50Hz or 60Hz ±0.5%						
Efficiency (max)	12VDC	89%						
	24VDC	92%						
	48VDC	94%						
Crest factor		3:1						
THD		<3%						
Zero load power		7.4W/17W	18W	12.5W	13W	14W	15W	18W
Zero load power (power save mode)		2W/4W	4.5W	3W	3.5W	3.5W	3.75W	4.5W
Battery fuse		SC600L / SC100M: 30A / 32VDC * 3 PCS  SC600M: 20A / 32VDC * 3 PCS			N/A			
Output circuit breaker		N/A	N/A	10A	10A	15A	30A	30A
Overload protection		auto disconnect						
Shortcut protection		auto disconnect						

### Solar Charge controller

Battery type	lead acid battery		N/A					
Max PV open circuit voltage (Voc)	25VDC/50VDC	50VDC	N/A					
Recommended PV (Vmp)	12V : 16-19VDC 24V : 32-37VDC		N/A					
Current max	20A	10A	N/A					
Temperature compensation	automatic, -4mV / °C / Cell		N/A					
Charging algorithm	TBB Premium II		N/A					

### Other Data

Battery connector	M6 x 2			M8 x 2			
Enclosure	steel with powder paint						
Dimmension (mm)	400 x 236 x 89		505.5 x 240 x 134.5	538.9 x 228 x 180			
Net weight (kgs)	9	10.6	15.5	17	18	21	24
Cooling	forced fan			/			
Protection	IP20						
Dry contact	/			Battery low			

### Standard

Safety / EMC	IEC62109-1, IEC62109-2 / EN61000-6-1, EN61000-6-3		EN55022, EN55024 / EN61000-3-2, EN61000-3-3 EN60950-1					
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# SOLAR MATE



## MPPT Charger Controller

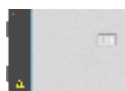
**150V 120A   150V 80A**  
**250V 100A   250V 70A**

Solar Mate is a solar charge controller with built in Maximum Power Point Tracking (MPPT) technology, which enables them to increase the output from a solar photovoltaic (PV) array by as much as 30% compared with non-MPPT designs.

Solar Mate can optimize the PV's output and eliminate the fluctuation due to shading or temperatures variables. It is a multi-voltage MPPT with built in sophisticated battery charging algorithm for both lead acid battery or lithium-ion battery, of which could support a wide variety of system designs. Meanwhile, the data management with 365 days of history record can tell user actual performance of its system.

Thanks to its self cooling design, it is suitable for most rugged environment with dust or bugs. All range products can operate at their full rating in ambient temperatures as high as 40°C.

- High dynamic MPPT efficiency up to 99%
- High efficiency up to 98%, and European weighted efficiency up to 97.3%
- Up to 6600W of charging power at 40°C, and power de-rating to 50% when temperature reaches 60°C
- Excellent performance at sunrise and low solar insulation levels
- Wide MPPT operating voltage range
- Parallel function, up to 8 units can operate in parallel
- Self cooling design for high reliability
- Built in TBB premium II battery charging algorithm for lead acid battery
- Support positive grounding
- Low self consumption
- Data logging 365 days
- Communication : Auxiliary contact, RS485 support T-bus



PVB



Model No.	SP150-120	SP150-80	SP250-100	SP250-70
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### Electrical

Nominal battery voltage	48VDC			
Maximum charging current (40°C)	120A	80A	100A	70A
Maximum charging power	6720W	4480W	5600W	3920W
Recommended PV	8000W	5280W	6660W	4440W
PV open circuit voltage (Voc)	150Vdc		250Vdc	
Max. PV short circuit current	70A			
Max efficiency	98%@48Vdc system			
Max MPPT efficiency	>99.9%			
Standby power consumption	<2W			
Self-consumption	Less than 5mA @ 48V			
Charge voltage 'absorption'	Default setting: 57.6V			
Charge voltage 'float'	Default setting: 54V			
Charging algorithm	TBB III multiple stages			
Temperature compensation	Automatic, -4mV/C/cell			
Equalization charging	Programmable			

### Others

Display	LED or LED+LCD
Communication port	RS485
Dry contact	1 programmable
Remote on/off	Yes (2 pole connector)
Data logging	365days of history record - AH, WH, time in float, peak watts, Amps, Solar Array voltage, Max battery voltage, Min Battery voltage and Absorb for eady day along with total accumulated Amp Hours and kW hours of production
Storage temperature	-40°C ~ 70°C
Operating temperature	-25°C ~ 60°C (power derated above 40 )
Humidity	95%, non-condensing
Altitude	3000m (full rated output up to 2000m)
Dimension (LxWxH) - mm	327.5*293*116.2
Weight (kgs)	7.5
Max wire sizes	35mm²
Protection category	IP21
Cooling	Natural cooling
Warranty	5 years
Standard	EN61000-6-1,EN61000-6-3, EN62109-1,EN62109-2

# IG Grid-tied INVERTER



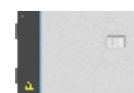
## Grid-tied Inverter

3KW, 5KW, 15KW

Grid-tie systems are the most cost effective and easiest systems to install. But in a pure grid tie system you will have no power supply if there is a power shedding. To solve this problem, you can connect IG series Grid tie inverter to the output of TBB Kinergier Pro inverter to form an AC-Coupled system.

An AC-Coupled system has numerous advantages, including its efficiency for powering AC loads during the day (since grid tie inverters are more efficient ), its ease in retrofitting batteries onto pre-existing solar PV systems.

- High frequency switching technology
- Dual MPPT design with precise MPPT algorithm
- Max efficiency: 98.7%
- RS485 communication available
- Optional WIFI / LAN / GPRS interface
- 5 years warranty



PVB



Model No.	IG3.0	IG5.0	IG15.0
Phase	single phase	single phase	three phases

### Input Side (DC)

Max. DC input power (KW)	3.5	5.8	18
Max. DC input voltage (V)	1000		600
Start-up voltage (V)	180		120
MPPT voltage range (V)	90-520		160-850
Max. input current per MPPT (A/B)	11A + 11A		22A + 22A
MPPT number / Max input strings number	2 / 2		2 / 4

### Output Side (AC)

Rated output power (KW)	3	5	15
Max. apparent output power (KVA)	3.3	5	16.5
Max. output power (KW)	3.3	5	16.5
Rated grid voltage (V <sub>L</sub> )	220 / 230		400
Rated grid frequency (Hz)	50 / 60		
Operation phase	single		three
Rated grid output current (A)	13.6 / 13	22.7 / 21.7	21.7
Max. output current (A)	15.7	25	23.8
Power factor (at rated output power)	0.8 leading ... 0.8 lagging		
THDi	< 3%		< 1.5%
DC injection current (mA)	< 0.5% I <sub>n</sub>		
Grid frequency range (Hz)	46~52.7 Hz or 56~62.7 Hz		

### Efficiency

Max. efficiency	97.8%	98.1%	98.7%
EU efficiency	97.1%	97.3%	98.1%
MPPT efficiency	> 99.5%		

### Protection

DC reverse-polarity protection	yes
Short circuit protection	yes
Output over current protection	yes
Output over voltage protection	yes
Insulation resistance monitoring	yes
Residual current detection	yes
Surge protection	yes
Islanding protection	yes
Temperature protection	yes
Integrated DC switch	optional

### General Data

Dimensions (mm)	310W * 543H* 160D	310W * 563H* 219D
Weight (KG)	11.5	18.9
Topology	transformerless	
Self consumption (night)	< 1W (night)	
Operating ambient temperature range	-25°C ~ 60°C	
Ingress protection	IP65	
Noise emission (typical)	< 30 dBA	
Cooling concept	natural convection	
Max. operation altitude	4000m	
Designed lifetime	> 20 years	
Grid connection standard	En50438, G83/2, G59/3, AS4777.2:2015, VDE0126-1-1, IEC61727, VDEN4105	EN50438, G83/2, G59/3, AS4777 VDE0126-1-1, IEC61727, VDEN4105
Relative humidity	0~100%	
Safety / EMC standard	IEC62109-1/2, AS3100	

### Features

DC connection	MC-4 mateable
AC connection	terminal connectors
Display	LCD, 2 x 20Z

# M series lithium battery



**12VDC 100AH 12VDC 200AH**  
**24VDC 100AH 48VDC 50AH**

M series lithium Iron Phosphate battery module is available with 24Vdc and 48Vdc which can be used for energy storage systems, which features light weight, high power and exceptional performance in cycling.

Supporting up to 1C continuous discharge current, M series lithium battery is perfect to be used for high power appliance assuring you make full use of designed energy from storage battery. It has built-in BMS against overcharging, over discharging or over temperature by monitoring current, voltage and temperature of each cell. Featuring high cycle life and high discharging capability, M series lithium battery could offer significant value for end user with lower total ownership cost.



Light weight



Longer life



Faster charging



More usable energy

- Long cycle life, over 2500 cycles at 100% DOD @25°C
- Maintenance free with very low self-discharge rate
- Lighter weight with over 50%
- Supports high discharge current (max 1C) with exceptional
- Exceptional voltage stability
- More usable energy up to 100% capacity
- Partial state of charge tolerant, with no damage from PSoC
- Built-in BMS with automatic balancing and protection against over-charge, over discharge, and over-temperature
- Capability of parallel, up to 6 batteries in series
- Working temperature : -20°C -60°C
- Environment friendly : No toxic, no acid can be installed in any direction
- Support RS485 communication
- Built-in Bluetooth



## Electrical

Model No.		M100-12	M200-12	M100-24	M50-48
Nominal voltage (Vdc)		12.8	12.8	25.6	51.2
Nominal capacity (AH)		100	200	100	50
Energy (KWH)		1.28	2.56	2.56	2.56
Charging @25°C	Charge voltage	14~14.6	14~14.6	28~29.2	56~58.4
	Max.Charge current	100	200	100	50
Discharging @25°C	Max Discharge current(A)	100	200	100	50
	Discharge Cut-off voltage(V)	10	10	20	40
Operating temperature	Charging	-10°C ~ +55°C			
	Discharging	-20°C ~ +60°C			
Operating humidity		60 ± 25% RH, Non-condensing			
Storage temperature		-40°C ~ +70°C			
Certifications		UL / CE / UN 38.3			
Dimensions (L*W*H)(mm)		330*171*222	520*269*208	520*269*208	270*360*267
Weight (Kg)		15	31.5	31.5	30
Series configuration		max 2			
Parallel configuration		max 6			
Communication		RS485, built-in Bluetooth			
Dry contact		2 (Charge / Discharge)			
Communication	Red light	charge protection			
	Green light	discharge protection			

# SUPER G



## GEL Battery

12V 100AH  
12V 200AH

Super G 12V series is designed solar and other renewable energy system application. The series battery is a genuine gelled electrolyte valve regulated battery featured an enhanced cycle cycling life in comparison to traditional AGM products.

- Completed maintenance free
- Electrolyte will not stratify, no equalization charge required
- Enhanced cycle life with Genuine Gelled thixotropic electrolyte (Silicon Gel)
- Increase durability and deep cycle ability for heavy demand applications
- Low self-discharge
- Spill proof / leak proof



Model No.	TGB12-100	TGB12-200
Rated voltage	12V	
Nominal capacity @ 25°C (77°F)	20 hour rate 5.02A to 1.75Vpc--100.4Ah	20 hour rate 10.03A to 1.75Vpc--200.6Ah
	10 hour rate 9.78A to 1.75Vpc--98.7Ah	10 hour rate 19.57A to 1.75Vpc--195.7Ah
Internal resistance	fully charged battery @25°C / 77°F--6m	fully charged battery @25°C / 77°F--3.5m
	max.discharge current @25°C / 77°F--1000A(5S)	max.discharge current @25°C / 77°F--2000A(5S)
Charge methods: constant voltage charge @25°C / 77°F	Cycle Use--14.7 ~ 14.9V	Cycle Use--14.7 ~ 14.9V
	max current--25A	max current--50A
	standby use--13.6 ~ 13.8V	standby use--13.6 ~ 13.8V
Operating temperature range	-30°C ~ 50°C	
Self-discharge	< 3% of capacity declined per month @25°C (77°F)	
Design floating life @ 25°C (77°F)	10years	

### Dimension & Weight

Dimension(±2%)	327*172*216	522*240*219
Weight (±2%)	31 kg	62 kg

# Battery Guard



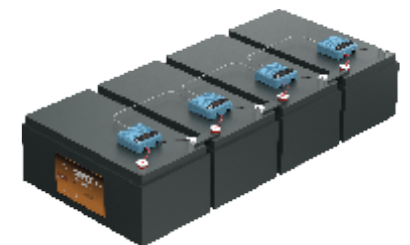
## Battery Monitor And Equalization Unit

For the new battery bank of 24Vdc or 48Vdc which is composed by several batteries, minor difference of internal leakage current will cause undercharge or overcharge of parallel or series connected batteries. The frequent encountered Partial Stage of Charge (PSoC) make this situation even worse, as the result of rare opportunity to fully charge the battery.

Battery Guard equalizes each battery individually and in the meantime monitors the real time voltage and temperature of each battery unit. The SOC difference will be iron out during charging.

Taking an example of 48Vdc battery bank composed by 4 units 12V battery in series connection, when any single unit battery voltage is higher than 13V, its corresponding module will trigger on. The BGK will draw a current of up to 200mA from the battery (or parallel connected batteries) with the higher voltage. This will help all batteries in series / parallel connected to have the same stage of charge.

Working with TBB inverter or system monitor, BGK can improve battery life span, also with alarm for over voltage and under voltage of individual battery. It will send real time data to TBB inverter or central monitor. There is LCD display on each module as well showing voltage and temperature.



	BGK -12	BGK-2
Electrical		
Voltage range	8V-18V	1V-3V
Maximun balancing current	200mA	1000mA
Alarm trigger level	200mV	40mV
Alarm trigger reset	100 mV	20mV
Over voltage protection	yes	yes
Over temperature protection	yes	yes
Others		
Display	LED	LED
Communication port	RS485	RS485
Dimensions	80 x 80 x 30 mm	80 x 80 x 30 mm
Operating temperature	-20°C ~ +60 °C	-20°C ~ +60 °C
Humidity (non condensing)	95%	95%
Weight	0.4kg	0.4kg
Protection category	IP21	IP22
Cooling	Natural cooling	Natural cooling
Stands	EN60950	EN60950

# WIRELESS MODULE



Available with GPRS and Wifi version, WCM wireless module is an external communication module connected to the TBB inverter through RS-232 interface. It is designed for system owner to have easier, flexible, cost saving and convenient way to see the system performance remotely. In the meantime, by working together with the TBB TEMS system, remote system configuration, firmware updating and system control will be available accordingly.

Dimension	WCM - GPRS	WCM - WIFI
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## Other Data

Dimension	60*32.3*143mm
Weight	56g
IP class	Ip65
DC voltage range	DC4.5V-18V
Nominal voltage	DC12V
Max current	320mA
Operation temp	-30°C ~ +85°C
Storage temp	-40°C ~ +90°C
Certificate	CE
Max connection device	1

## GPRS Module

Antenna type	External
Operating frequency	EGSM900/GSM1800MHz
Wireless protocol standard	GPRS multi-slot class 10 IS-95A/B IS-2000
Max data transmission distance	85.6Kbps
Max transmission distance	Operator GSM network

## WIFI Module

Antenna type	External IPEX
Wireless standard	IEEE802.11b/g/n
Frequency range	2.4GHz
Hardware encryption	WEP,WPA/WPA2,PSK
Data speed	16.5dBm@11b,14.5dBm@11g,13.5dBm@11n
Max transmission distance	100m(no obstacle)

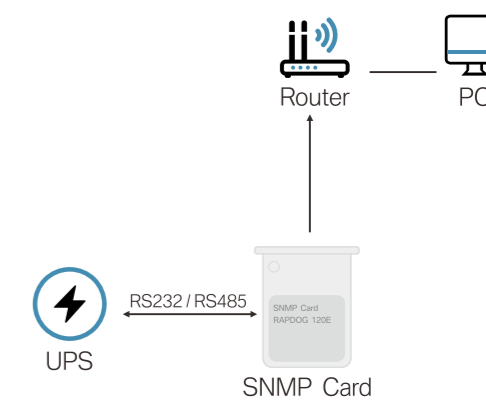
# SNMP CARD



The SNMP Card Provides a very simple and easily usable tool-set for managing remote device via the simple network management protocol, with which makes TBB inverter / other equipment communicable with below functions.

- Real time status monitoring
- System Configuration
- System warning: In case there is any system failure, the users will be informed via Email, SNMP trap and etc
- Data record, Event record

## Remote monitoring and operation



Wiring Diagram

## Specification

Power connection	Internal / External
Working voltage	5Vdc
Working current	Max Current: 630mA
Working temperature	-40°C ~60°C
Communication	RS232/RS485/TTL

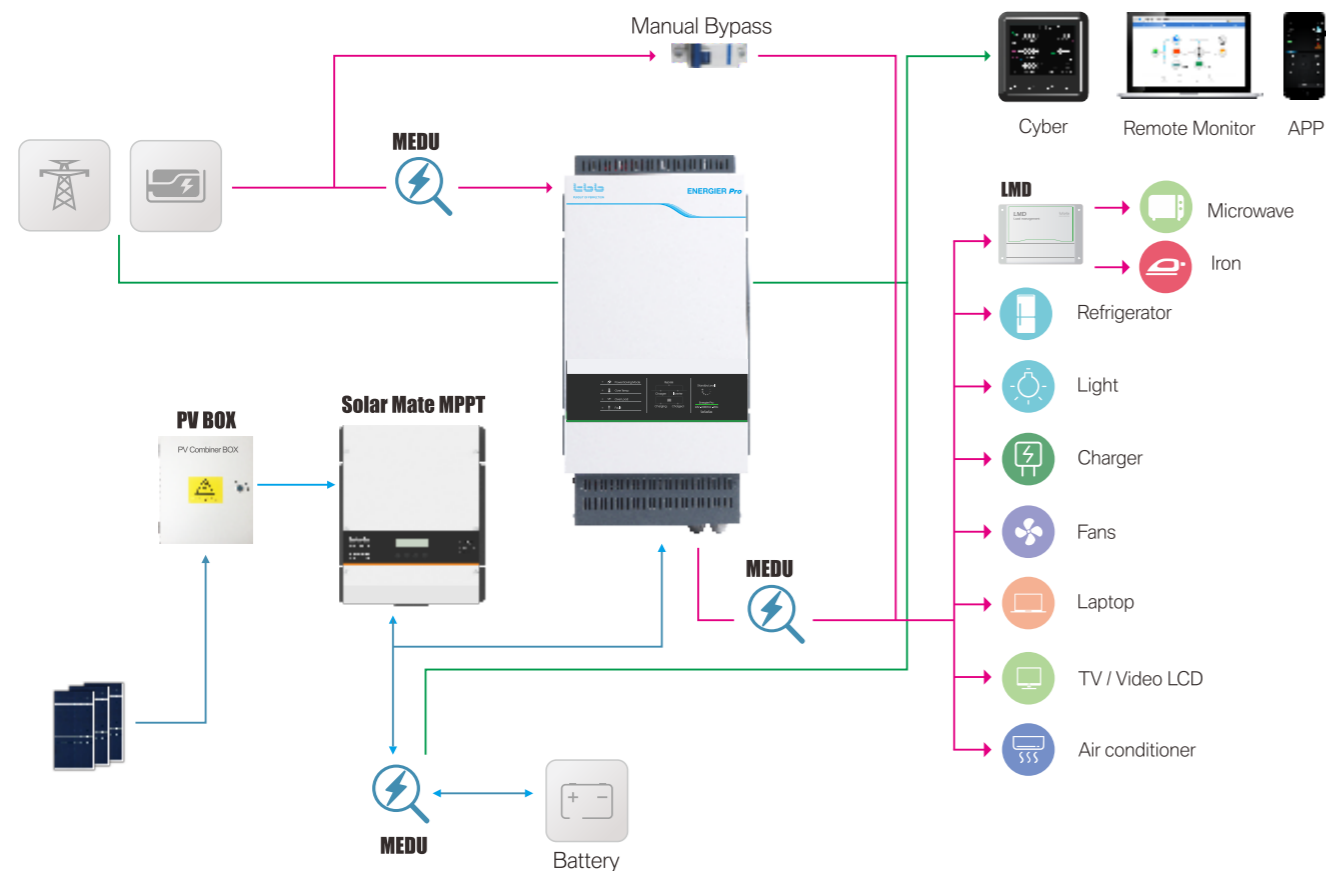
# SIES

SIES is the self consumption PV system developed by TBB Power. With high performance battery designed as the storage, SIES could take use of energy both from sun, grid and generator, allowing you to be energy independent. SIES could take the control of generator start and stop.

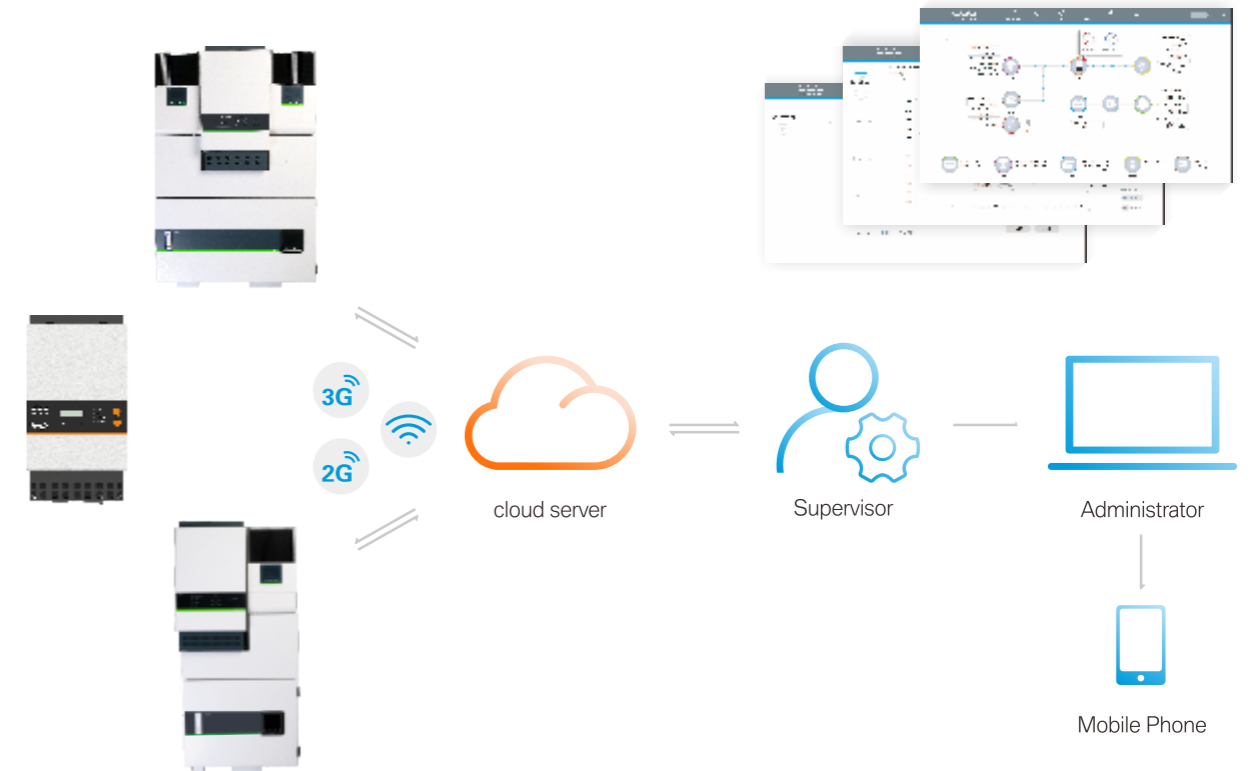
SIES is a fully integrated system designed with concept of plug and play, it requires no further configuration and only a small number of connections. System installation turns out to be an easy job and system performance was assured as well.

According to the chose logic, software inside of SIES will automatically take on control of all energy flow. Energy produced by PV system and from grid will be optimized in combination for your usage. Generator can be connected with system, SIES can take full control of generator.

SIES offers comprehensive monitoring solution. Cycle central monitor shows all data of energy production, energy consumption and battery state of charge, clearly and in real time. Meantime, TEMS remote monitoring function is available either through GPRS or Wifi. Through web supported by cloud server, customer could obtain all data of running system in both real time and history records.



# TEMS



TEMS(TBB Energy Manages System) is a comprehensive monitoring system developed by TBB POWER, aims for providing real time monitoring and analysis for TBB system energy system. In the meantime, it could provide different level of access for different group of cleents : Distributor, Installer and End user etc. You could manage multiple sites through TEMS.

- Real time monitoring
- History record and analysis
- Dynamic authorization
- Remote firmware update
- High capacity data storage
- Supporting web, android and mobile phone (Android and IOS)