



An Honest Partner You can Trust !

Ten Pao International Ltd.

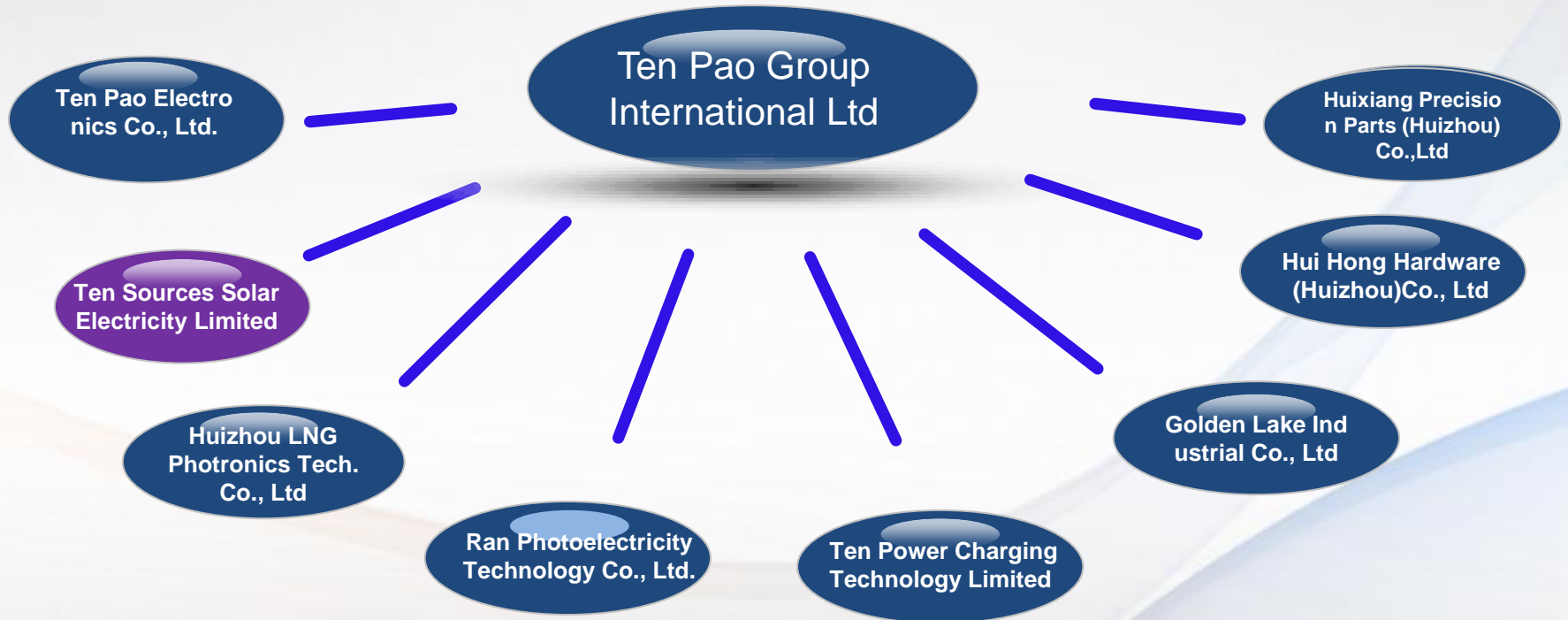
www.tenpao.com

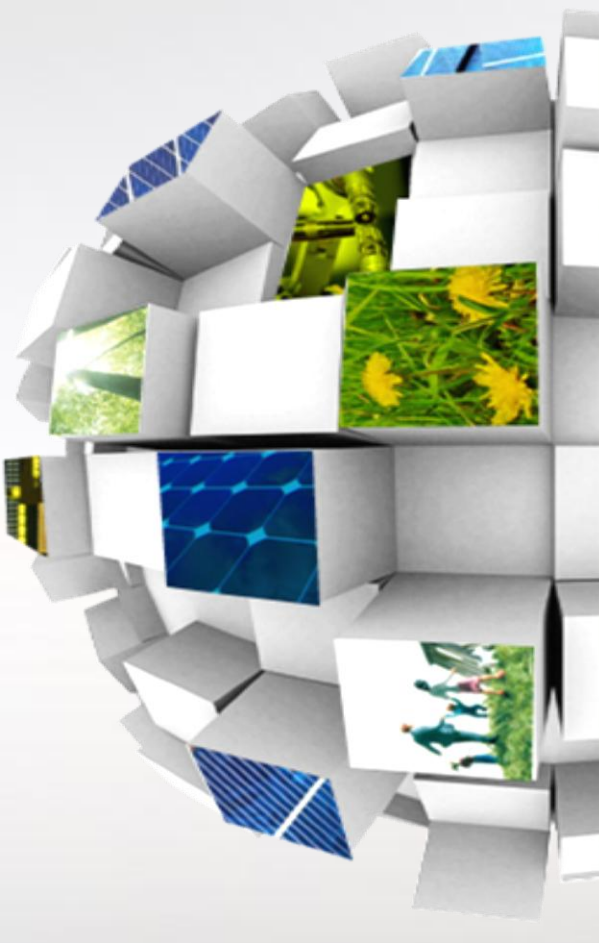
www.tsolpv.com

整理 整顿 清扫 清洁 素养 安全 节约

质量方针
保质 保量 保客户满意







Ten Sources Solar Electricity Limited is a wholly-owned subsidiary company of Ten Pao Group.

Ten Sources offers full section solar inverter ranged from 1.6kw to 20 kw for residential PV Solar project, 50kw to 1000kw central item for solar power plant , and 200w to 10kw for off-grid DC-AC product, It can efficiently convert solar energy from DC to AC.

In future, Ten Sources continues to innovate and improve the solar inverter technology according to the latest market trend. We are gradually moving forward to the international, and aim to be the first priority solar power cooperative partner for the world wide customers.

Main Customers



PHILIPS



SIEMENS



vtech

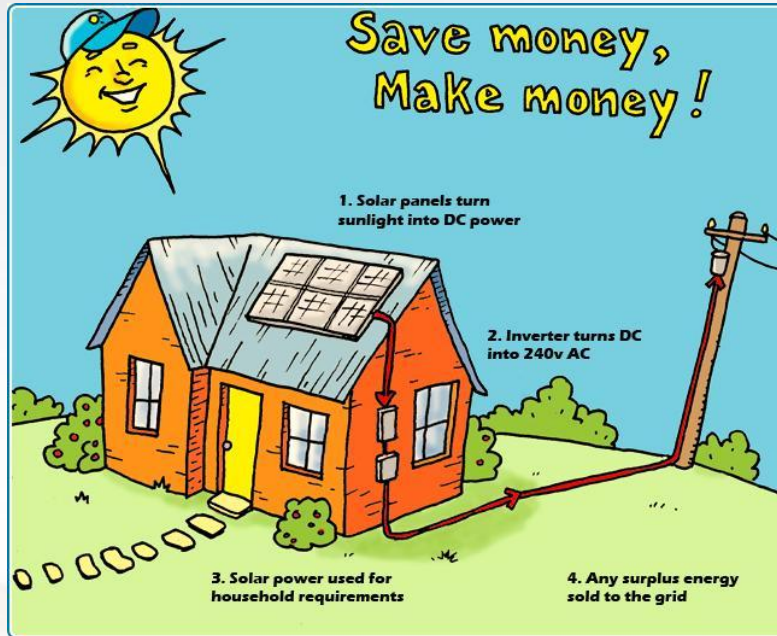
Panasonic
ideas for life



NETGEAR
Connect with Innovation™

HARMAN





Grid-Connected Inverter



- Control by DSP
- Original IGBT module assembly
- Anti-islanding
- Option of CAN, Bluetooth, Ethernet

T-sol on-grid mono phase inverter	Feature	Transformerless	Transformerless	Transformerless
Item		TSG1K6TL	TSG2K5TL	TSG3KTL-S
Delivery period (Week)		1-4w	1-4w	1-4w
Type		Outdoor	Outdoor	Outdoor
Input DC	Max DC power	1700w	2800w	3.3KW
	Max. DC input voltage	450V	450V	450V
	MPP voltage range	180V-420V	210V-420V	210V-420V
	Rated input voltage (V)	380V	380V	380V
	Maximum input current	12A	15A	22A
	Number of MPP inputs	1	1	1
	Number of DC inputs	2	2	2
Output AC	Related power	1.6KVA	2.5KVA	3KVA
	Related AC voltage	120/230V	120/230V	120/230V
	Rated frequency (Hz)	50Hz/60Hz	50Hz/60Hz	50Hz/60Hz
	Max. output current (A)	7A	12A	13A
	THD(rated power)	<2%	<2%	<2%
	Power factor at rated power	≥0.99	≥0.99	≥0.99
Efficiency	connection phases	Single-phase	Single-phase	Single-phase
	Max. efficiency	97.40%	97.40%	97.40%
	European efficiency	96.30%	96.30%	96.30%
Protection	Input-side disconnection device	no	no	No
	Output-side disconnection device	no	no	No
	Grid monitoring	●	●	●
	Ground fault monitoring	●	●	●
	Insulation monitoring	●	●	●
	Electrical isolation	no	no	No
Physical	Dimensions (W) (mm)	335x460x135	335x460x135	335x460x135
	Package:	1088/40HQ	1088/40HQ	1088/40HQ
	Weight (Kg)/per unit	N.17/G.20kgs	N.17/G.20kgs	N.17/G.20kgs
	Weight (Kg)/per 40HQ	21760 kgs	21760 kgs	21760 kgs
	Operating temperature range (°C)	-25~+60	-25~+60	-25~+60
	Max self-consumption	20W/0W	20W/0W	20W/0W
	Cooling concept	self cooling	self cooling	Self- cooling
Application	Degree of Protection	IP65	IP65	IP65
	Relative humidity range (non-condensation)	0~95%	0~95%	0~95%
	Max operating altitude above MSL	2000 m	2000 m	2000 m
Feature	Display	LCD	LCD	LCD
	Communication interface	RS485	RS485	RS485
	Certification	CE/VDE/G83/ENEL/AS4777		



- Easy to install and operate
- Modular Design
- Option of Bluetooth
- Anti-islanding

T-sol on-grid mono phase inverter	Feature	Transformerless	Transformerless	Transformerless
Item		TSG3KTL-S	TSG4KTL	TSG5KTL
Delivery period (Week)		1-4w	1-4w	1-4w
Type		Outdoor	Outdoor	Outdoor
Input DC	Max DC power	3.3KW	4.4KW	5KW
	Max. DC input voltage	450v	520v	520v
	MPP voltage range	210V-420V	210V-420V	260V-420V
	Rated input voltage (V)	380V	360V	360V
	Maximum input current	22A	20A	20A
	Number of MPP inputs	1	1	1
	Number of DC inputs	2	2	2
Output AC	Related power	3KVA	4KVA	4.6KVA
	Related AC voltage	120/230V	120/230V	120/230V
	Rated frequency (Hz)	50Hz/60Hz	50Hz/60Hz	50Hz/60Hz
	Max. output current (A)	13A	20A	25A
	THD(rated power)	<2%	<2%	<2%
	Power factor at rated power	≥0.99	≥0.99	≥0.99
	connection phases	Single-phase	Single-phase	Single-phase
Efficiency	Max. efficiency	97.40%	97.40%	97.40%
	European efficiency	96.30%	96.30%	96.30%
Protection	Input-side disconnection device	No	no	no
	Output-side disconnection device	No	no	no
	Grid monitoring	●	●	●
	Ground fault monitoring	●	●	●
	Insulation monitoring	●	●	●
	Electrical isolation	No	no	no
Physical	Dimensions (W) (mm)	335x460x135	415x530x176	415x530x176
	Package:	1088/40HQ	700/40HQ	700/40HQ
	Weight (Kg)/per unit	N.17/G.20kgs	N.35/G.38kgs	N.35/G.38kgs
	Weight (Kg)/per 40HQ	21760 kgs	26600 kgs	26600 kgs
	Operating temperature range (°C)	-25~+60	-25~+60	-25~+60
	Max self-consumption	20W/0W	20W/0W	20W/0W
	Cooling concept	Self- cooling	Forced cooling	Forced cooling
	Degree of Protection	IP65	IP55	IP55
Application	Relative humidity range (non-condensation)	0~95%	0~95%	0~95%
	Max operating altitude above MSL	2000 m	2000 m	2000 m
Feature	Display	LCD	LCD	LCD
	Communication interface	RS485	RS485	RS485
	Certification	CE/VDE/G83/ENEL/AS4777		



- High efficiency, Maximum efficiency of MPPT is more than 99%
- Variety of communication interfaces
- Data remote acquisition

	Feature	Transformerless-3 phases	
T-sol on-grid 3 phase inverter	Item	TSG17KTL	TSG20KTL
	Delivery period (Week)	1-4w	1-4w
	Type	Outdoor	Outdoor
Input DC	Max DC power	17.5kw	20.5KW
	Max. DC input voltage	1000	1000V
	MPP voltage range	400V-800V	480V-800V
	Rated input voltage (V)	700V	700V
	Maximum input current	22*2	2x22A
	Number of MPP inputs	2	2
	Number of DC inputs	6	6
Output AC	Related power	17.5KVA	20.5KVA
	Related AC voltage	380V	380V
	Rated frequency (Hz)	50HZ	50HZ
	Max. output current (A)	24.6A	30A
	THD(rated power)	<3%	<3%
	Power factor at rated power	≥0.99	≥0.99
	connection phases	three-phase	three-phase
Efficiency	Max. efficiency	97.40%	97.40%
	European efficiency	96.60%	96.60%
Protection	Input-side disconnection device	●	●
	Output-side disconnection device	no	no
	Grid monitoring	●	●
	Ground fault monitoring	●	no
	Insulation monitoring	●	●
	Electrical isolation	no	no
Physical	Dimensions (W) (mm)/Package Size:	605X786X230/900*720*400mm	
	Loading capacity per 40HQ	250 pcs / 40HQ	250 pcs / 40HQ
	Weight (Kg)/per unit	N.50/G.55kgs	N.50/G.55kgs
	Weight (Kg)/per 40HQ	13750 KGS	13750 KGS
	Operating temperature range (°C)	-25~+60	-25~+60
	Max self-consumption	50W/0W	50W/0W
	Cooling concept	Forced cooling	Forced cooling
	Degree of Protection	IP65	IP65
Application	Relative humidity range (non-condensation)	0~95%	0~95%
	Max operating altitude above MSL	2000 m	2000 m
Feature	Display	LCD	LCD
	Communication interface	RS485	RS485
	Certification	CE(EMC+LVD);VDE 0126/4105/AS4777/G59	



- Control by DSP made in USA
- High efficiency and low temperature rise
- Multi-language LCD display

Input (DC)	TSG3K outdoor	TSG4K outdoor	TSG5K outdoor
Max. DC power (@cosφ=1)	3300W	4400W	5500W
Max. input voltage	550V	550V	550V
MPP voltage range (@ 25 °C)	250V~450V	250V~450V	250V~450V
Rated input voltage	300V	300V	300V
Maximum input current	14A	18A	22A
Number of independent MPP inputs	1	1	1
Number of DC inputs	4	4	4
Output (AC)			
Rated power (@25 °C)	3kVA	4 kVA	5 kVA
Nominal AC voltage / range	220 V / 180 V–260 V	220 V / 180 V–260 V	220 V / 180 V–260 V
AC power frequency	50 Hz, 60 Hz	50 Hz, 60 Hz	50 Hz, 60 Hz
Rated power frequency / rated power voltage	50 Hz / 220 V	50 Hz / 220 V	50 Hz / 220 V
Max. output current	15A	20A	25A
Max. THD	<3%	<3%	<3%
Power factor at rated power	≥0.99	≥0.99	≥0.99
Feed-in phases / connection phases	Single phases	Single phases	Single phases
Efficiency 2)			
Max. efficiency / European efficiency	94.2 % / 93.2 %	94.2 % / 93.2 %	94.2 % / 93.2 %
Protection			
Input side disconnection device	-	-	-
Output side disconnection device	-	-	-
Grid monitoring	yes	yes	yes
Ground fault monitoring	opt.	opt.	opt.
Insulation monitoring	opt.	opt.	opt.
Galvanic isolation	yes	yes	yes
Surge arrester for auxiliary supply	-	-	-
General Data			
Dimensions (W / H / D)	414*620*220mm	414*620*220mm	414*620*220mm
Weight	62.4KG	62.4KG	62.4KG
Operating temperature range	-25 °C...60 °C	-25 °C...60 °C	-25 °C...60 °C
Max. self-consumption (in operation) / self-consumption (at night)	20 W / 0 W	20 W / 0 W	20 W / 0 W
External auxiliary supply voltage	-	-	-
Cooling concept	Forced cooling	Forced cooling	Forced cooling
Degree of protection: electronics / connection area (as per IEC 60529)	IP54	IP54	IP54/IP65
Application			
Maximum permissible value for relative humidity (non-condensing)	15 % ... 95 %	15 % ... 95 %	15 % ... 95 %
Maximum operating altitude above MSL	2000m	2000m	2000m

11kw Grid connected / With Transformer



- Programmable for protection
- With Sun golden certification
- Easy to install and operate

Input (DC)	TSG11K3 indoor
Max. DC power (@cosφ=1)	11.7KW
Max. input voltage	1000V
MPP voltage range (@ 25 °C)	450 V~850 V
Rated input voltage	470V
Maximum input current	25A
Number of independent MPP inputs	1
Number of DC inputs	1
Output (AC)	
Rated power (@25 °C)	11 kVA
Nominal AC voltage / range	400 V / 310 V~450 V
AC power frequency	50Hz,±5Hz
Rated power frequency / rated power voltage	50 Hz / 380 V
Max. output current	16 A
Max. THD	< 3 %
Power factor at rated power	>0.99
Feed-in phases / connection phases	3/3
Efficiency 2)	
Max. efficiency / European efficiency	95 % / 94 %
Protection	
Input side disconnection device	-
Output side disconnection device	yes
Grid monitoring	yes
Ground fault monitoring	opt.
Insulation monitoring	opt.
Galvanic isolation	yes
Surge arrester for auxiliary supply	yes
General Data	
Dimensions (W / H / D)	1109/520/544mm
Weight	200 kg
Operating temperature range	
Max. self-consumption (in operation) / self-consumption (at night)	60 W / < 30 W
External auxiliary supply voltage	230 V, 50 / 60 Hz
Cooling concept	Forced cooling
Degree of protection: electronics / connection area (as per IEC 60529)	IP20
Application	
Maximum permissible value for relative humidity (non-condensing)	15 % ... 95 %
Maximum operating altitude above MSL	2000m
Features	
Display	LCD HMI
Communication protocols	Ethernet / RS485
Analog inputs / overvoltage protection for analog inputs	NO
Certificates and approvals (more upon request)	CGC
Type designation	Indoor



- Hottest item for solar park
- Control by MPPT or CVT
- Double CPU Control

	Item	TSG50K-50kw	TSG100K3-100kw
3 phases inverter	Delivery period (Week)	4	4
	Type	Indoor	Indoor
Input DC	Max DC power	55kw	110kw
	Max. DC input voltage	1000V	1000V
	MPP voltage range	450V-850V	450V-850V
	Rated input voltage (V)	700V	700V
	Maximum input current	125A	238A
	Number of MPP inputs	1	1
	Number of DC inputs	1	1
Output AC	Related power	50KVA	100KVA
	Related AC voltage	380V	380V
	Rated frequency (Hz)	50Hz /60Hz	50Hz /60Hz
	Max. output current (A)	76A	152A
	THD(rated power)	<3%	<3%
	Power factor at rated power	≥0.99	≥0.99
	connection phases	three-phase	three-phase
Efficiency	Max. efficiency	96.20%	96.50%
	European efficiency	95.30%	96.00%
Protection	Input-side disconnection device	●	●
	Output-side disconnection device	●	●
	Grid monitoring	●	●
	Ground fault monitoring	no	no
	Insulation monitoring	●	●
	Electrical isolation	●	●
Physical	Dimensions (W) (mm)	850x2000x1000	850x2000x1000
	Package:	60 pcs / 40HQ	60 pcs / 40HQ
	Weight (Kg)/per unit	730 KGS	925 KGS
	Weight (Kg)/per 40HQ	43800 KGS	55500 KGS
	Operating temperature range (°C)	-25~+55°C	-25~+55°C
	Max self-consumption	430W/35W	430W/35W
	Cooling concept	Forced cooling	Forced cooling
	Degree of Protection	IP20	IP20
Application	Relative humidity range (non-condensation)	0~95%	0~95%
	Max operating altitude above MSL	2000 m	2000 m
Feature	Display	LCD	LCD
	Communication interface	RS485	RS485
	Certification	CGC/CE	CGC/CE



- Hottest item for solar park
- Control by MPPT or CVT
- Double CPU Control

	Item	TSG1000kw	TSG100K3-500kw
Input DC	Max. DC input voltage	425-900Vdc	425-900Vdc
	MPP voltage range	450-820Vdc	450-820Vdc
	Max. input current	2290A	1145A
Output AC	Rated power	1000KW	500KW
	Rated AC voltage	270Vac	270Vac
	Rated frequency	50Hz/60Hz	50Hz/60Hz
	Max. output current	2640A	1320A
	THD	<3% THDi	<3% THDi
	Power factor	-0.9 to +0.9	-0.9 to +0.9
	Connection phases	three-phase	three-phase
	Max. efficiency	98.70%	98.70%
	European efficiency	97.50%	97.50%
Efficiency	CEC efficiency	97.00%	97.00%
	Self-consumption	0 to 200W	0 to 200W
Communication	Interface	120x32 LCD	120x32 LCD
	Networking of multiple units	Ethernet, CANopen, Modbus	Ethernet, CANopen, Modbus
	Single unit	USB, RS232/RS485	USB, RS232/RS485
Physical of Indoor type	Terminal equipment	Laptop, iPad	Laptop, iPad
	Dimensions (HxWxD)	2000x3200x600mm	2000x3200x600mm
	Weight	2400Kg	2400Kg
	Color	RAL7035	RAL7035
Physical of Outdoor type	Degree of Protection	IP20	IP20
	Dimensions (HxWxD)	2500x3700x1400mm	2500x3700x1400mm
	Weight	4500Kg	4000Kg
	Color	Customized	Customized
Application	Degree of Protection	IP54	IP54
	Operating altitude above MSL	≤3000m	≤3000m
	Operating temperature	-25 to +50	-25 to +50
	Storing temperature	-40 to +70	-40 to +70
	Relative humidity	95% (non-condensation)	95% (non-condensation)
Standard Applied	CGC/CE		
	UL1741, CSA 107.1-01		
	IEEE1547, IEEE C62.41.2, IEEE C37.90.1, IEEE C37.90.2 CE (EN 50178, EN 61000-6-, EN 61000-6-4)		



Off-grid Inverter

Integrated off-grid inverter/charger



- Integrated design of controller and inverter
- High-Level reliability
- Multiple Protections
- Stackable Designed

Feature	Integrated inverter/charge controller						
Item	TEC1K	TEC2K	TEC3K	TEC4K-S	TEC4K	TEC5K	TEC6K
Max.PV DC output	1000W	2000W	3000W	4000W	4000W	5000W	6000W
Delivery period (Week)	1/4 week	1/4 week	1/4 week	1/4 week	1/4 week	1/4 week	1/4 week
Battery voltage	48V	48V	48V	48V	96V	96V	192V
Max. PV input voltage	96V	96V	96V	96V	192V	192V	380V
Max. PV input current	20A	35A	50A	75A	35A	50A	30A
Float voltage	55.2V	55.2V	55.2V	55.2V	110.4V	110.4V	220.8V
Overcharge protection voltage	57.6V	57.6V	57.6V	57.6V	115.2V	115.2V	230.4V
MPPT tracking rate	99%	99%	99%	99%	99%	99%	99%
MPPT tracking voltage range	48—88V	48—88V	48—88V	96—180V	96—180V	96—180V	192—360V
Over loading capability 10S	1500W	3000W	4500W	6000W	6000W	7500W	9000W
Over-voltage protection voltage	62V	62V	62V	62V	120V	120V	240V
Efficiency	90%	90%	90%	90%	91%	91%	91%
Output isolation	high frequency isolation						
AC output voltage	220V±2%						
AC output waveform	pure sine wave						
Output frequency	50Hz±0.5%						
Waveform distortion (linear load)	≤3%						
Power factor	0.9						
Dynamic response (load 0-100%)	≤50ms						
Noise	≤40dB @1m					≤52dB @1m	
Communication	RS485 /RS232						
Display	LCD						
Ambiance temperature	-25—55℃						
Ambiance humidity	0-95% (non-condensation)						
Protection class	IP20						
Certificate	GBT 19064-2003、CE						
Altitude (m)	≤5000 (please refer to GB/T3859.2 standdards when over 1,000m)						
Protection function	Input reverse connection protection, LV protection for storage battery, battery input over voltage protection, output over-loading protection, output short circuit protection, over-heating protection.						

Moveable Integrated energy storage system



The power storage system contains a steel housing, batteries, controller, Inverter integrated together ,Can be directly used for whole off-grid PV solar project;

- Integrated / Moveable
- Off-grid Inverter
- Charge controller
- Batteries

Item	Specification	Batteries Needed		Measurement Weights
		Spec	QTY	
TES800	800 Watts Inverter /Controller /Steel Housing Batteries 482×170×240mm /4pcs	12V/150AH	4pcs	1190×550×600mm 42 kgs/unit/60kgs x4 batteries
TES1K	1000 Watts Inverter / Controller /Steel Housing Batteries 482×170×240mm /4pcs	12V/150AH	4pcs	1190×550×600mm 43.5kgs/unit/60kgs x4 batteries
TES2K	2000 Watts Inverter /Controller /Steel Housing Batteries 520×238×240mm /4pcs	12V/150AH	4pcs	1190×560×600mm 56kgs/unit/60kgs x 4 batteries
TES3K	3000 Watts Inverter / Controller /Steel Housing Batteries 528×282×250mm /4pcs	12V/260AH	4PCS	1350×650×800mm 65kgs/unit/70kgs x4/batteries
TES4K	4000 Watts Inverter /Controller /Steel Housing Batteries 528×282×250mm /4pcs	12V/260AH	4PCS	1350×650×800mm 69 kgs/unit/ 70kgs x4/batteries
TES5K	5000 Watts Inverter /Controller /Steel Housing Batteries 528×282×250mm /4pcs	12V/260AH	4PCS	1350×650×800mm 85 kgs/unit /70kgs x4/batteries



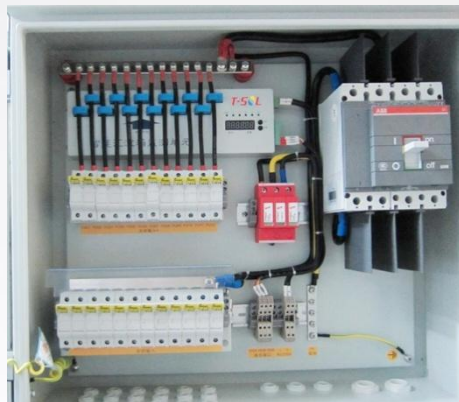
- Two Design with and without LCD screen
- Collected operation data from power plant
- Connected by RS 485 or Wifi module (opt)
- Alarm function will send “Error message” by email or message in the first time.
- Accessible checking without PC



PV Convergence Box



- Intelligent PV cabinet box



Model and specification	TSPV-CBS4	TSPV-CBS8	TSPV-CBS16
Max. input number	4-way	6-way	16-way
Max. voltage		1000V DC	
Subcircuit fuse rated current (can be replaced)		12A/16A/20A	
Output terminal size		PG21	
Protection class		IP65	
Ambiance temperature/humidity		-25°C ~ +80°C/0 ~ 99%	
Width x Height x Depth	550 x 550 x 190(mm)	550 x 550 x 190(mm)	600 x 550 x 190(mm)
Weight	14kg	16kg	20kg
Housing material		Cold-rolled steel/Stainless steel/PC	
Communication		RS485/Wireless	
Monitoring modular power supply		220VAC/24VDC/Self-powered	

