



IPSU ENERGY

Solar Street Lighting



IPSU ENERGY & TECHNOLOGIES LLC/SRL

8400 N.W. 25th Street, Suite 100,

Doral, Florida, USA 33198

+1 786 868 0303

Costambar, Puerto Plata,

Dominican Republic

+1 829 537 2308

www.ipsuenergy.com

info@ipsuenergy.com





what we offer

**YOUR
BEST
PV
SUPPLIER**

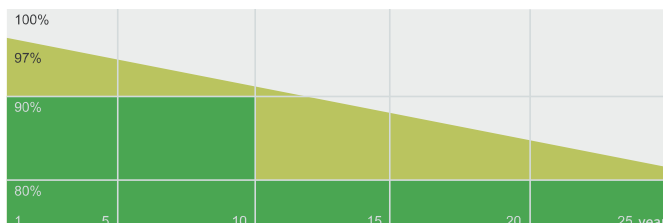
BSM410M-72HC ***Mono Half Cell Module 144cells 390w-410w***

1 ***Reliable Quality***

- Positive power tolerance: 0-+5W
- 100% EL double-inspection ensures modules are free
- Modules binned by current to improve system performance
- Potential Induced Degradation(PID) Resistant

2 ***Superior Warranty***

- 10-year product warranty
- 25-year linear power output warranty



3 ***Key Features***



Mono Perc Half-cut cell technology can reduce the internal power loss and improve component overall power. Excellent heat dissipation avoids hot spot production



Monocrystalline modules designed for commercial and solar farm grid-tied appliances



The optimized number and width of main gate lines, Maximize the light receiving area of components and Reduce component power consumption



All the modules are sorted and packaged by amperage, reducing mismatch losses and maximizing system output



Entire module certified to with stand extreme wind (2400 Pa) and snow loads (5400 Pa)



High salt and ammonia resistance certified by TÜV.





IPSU ENERGY
Giving Power To The People

ELECTRICAL PARAMETERS AT STC

Model	BSM390M-72HC	BSM395M-72HC	BSM400M-72HC	BSM405M-72HC	BSM410M-72HC
Maximum Power at STC(P _{max})	390W	395W	400W	405W	410W
Open-circuit Voltage(V _{oc})	49V	49.2V	49.24V	49.39V	50.12V
Short-Circuit Current(I _{sc})	10.44A	10.53A	10.57A	11.02A	11.14A
Optimum Operating Voltage (V _{mp})	40.8V	41V	41.17V	41.45V	41.76V
Optimum Operating Current(I _{mp})	9.57A	9.64A	9.72A	9.77A	9.82A
Module Efficiency	19.79%	20.04%	20.61%	20.87%	21.13%
Power Tolerance	0 ~ +5W				
Maximum System Voltage	1000V / 1500V DC(IEC)				
Maximum Series Fuse Rating	15A				
Operating Temperature	-40 °C to +85 °C				

*STC: Irradiance 1000W/m², module temperature 25, AM=1.5
Optional black frame or white frame module according to customer requirements

NOCT

Model	BSM390M-72HC	BSM395M-72HC	BSM400M-72HC	BSM405M-72HC	BSM410M-72HC
Maximum Power	289W	293W	296W	300W	303W
Open Circuit Voltage (V _{oc})	46.3V	46.5V	46.52V	45.67V	46.72V
Short Circuit Current (I _{sc})	8.43A	8.5A	8.53A	8.57A	8.63A
Maximum Power Voltage (V _{mp})	38.6V	38.7V	38.76V	38.82V	38.89V
Maximum Circuit Current (I _{mp})	7.49A	7.57A	7.64A	7.72A	7.76A
NOCT	45°C±2°C				

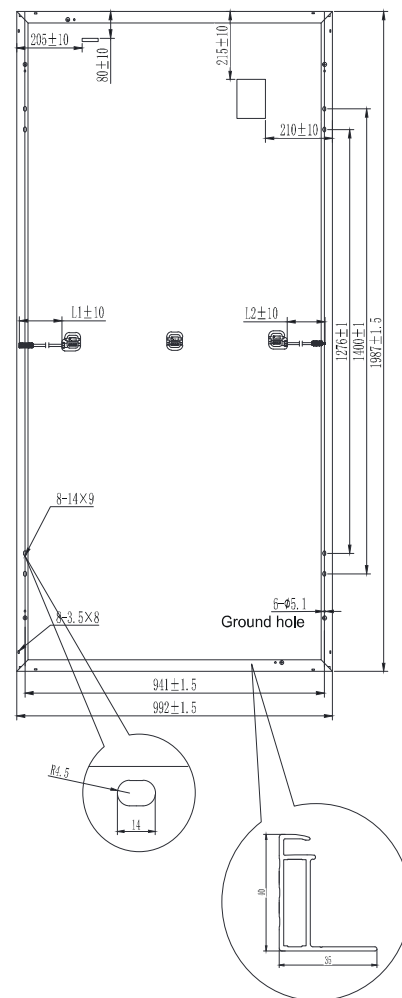
*NOCT: Irradiance 800W/m², ambient temperature 20°C, wind speed 1 m/s

Mechanical Characteristics

Solar Cells	Monocrystalline 158.75 × 79.38mm
No.of Cells	144(6×24)
Dimensions	1987mm×992mm×40mm
Weight	23.0kg
Front Glass	High transmission tempered glass
Frame	Anodized aluminium alloy
Junction Box	IP67
Cable	4mm ² (IEC)
Connectors	MC4 / MC4 Compatible
Packaging Configuration	26pcs / box, 572pcs / 40'HQ Container

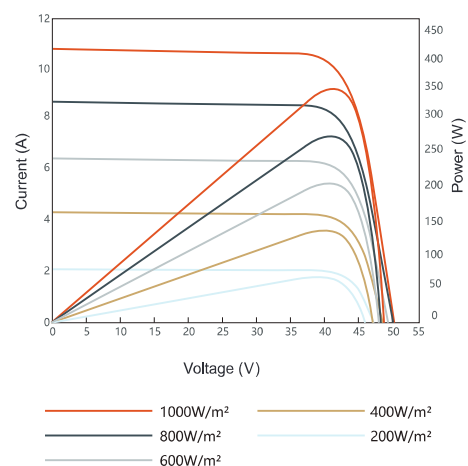
Temperature Characteristics

Temperature Coefficient of P _{max}	γ (P _m)	-0.39%/K
Temperature Coefficient of V _{oc}	β (V _{oc})	-0.29%/K
Temperature Coefficient of I _{sc}	α (I _{sc})	0.049%/K



I-V Curves

Current-Voltage & Power-Voltage Curve



(786) 868-0707



derek@ipsuenergy.com



8400 N.W.25th Street, Miami, FL USA

<http://ipsuenergy.com>



IPSU- BSM455M-72HPH

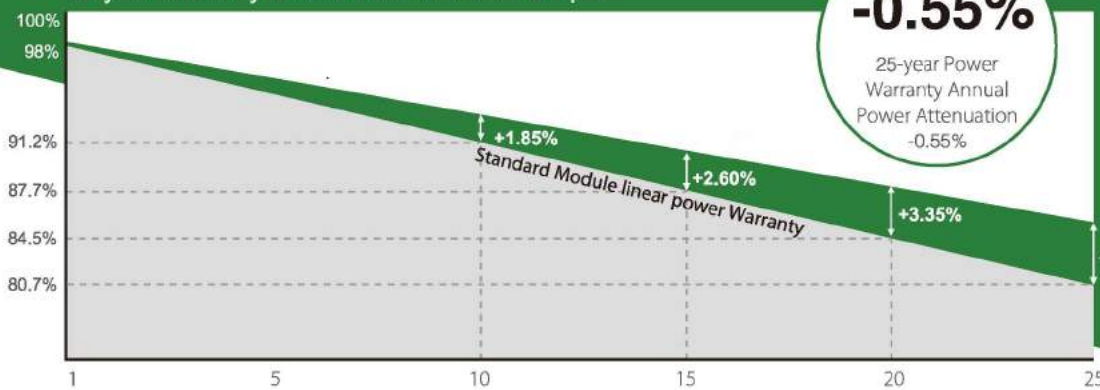
425~455W



*Both 6BB & 9BB are available

High Efficiency
Low LID Mono PERC with
Half-cut Technology

25-year Warranty for Extra Linear Power Output



Complete System and Product Certifications

IEC 61215, IEC61730, UL61730

ISO 9001:2008: ISO Quality Management System

ISO 14001: 2004: ISO Environment Management System

TS62941: Guideline for module design qualification and type approval

OHSAS 18001: 2007 Occupational Health and Safety



* Specifications subject to technical changes and tests.

Positive power tolerance (0 ~ +5W) guaranteed

High module conversion efficiency (up to 20.9%)

Slower power degradation enabled by Low LID Mono PERC technology: first year <2%, 0.55% year 2-25

Solid PID resistance ensured by solar cell process optimization and careful module BOM selection

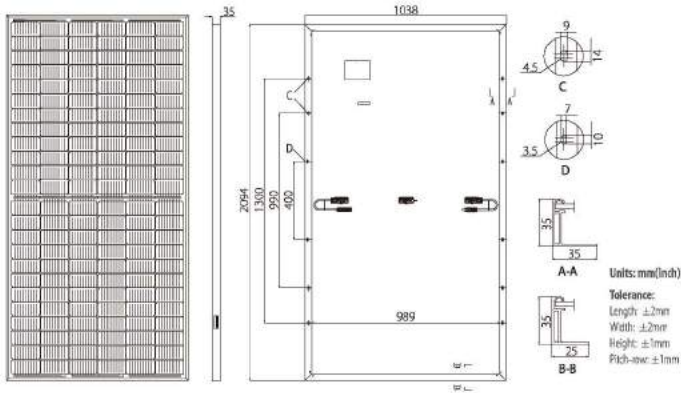
Reduced resistive loss with lower operating current

Higher energy yield with lower operating temperature

Reduced hot spot risk with optimized electrical design and lower operating current

IPSU-BSM455M-72HPH 425~455W

Design (mm)



Mechanical Parameters

Cell Orientation: 144 (6×24)
 Junction Box: IP68, three diodes
 Output Cable: 4mm², 300mm in length,
 length can be customized
 Glass: Single glass
 3.2mm coated tempered glass
 Frame: Anodized aluminum alloy frame
 Weight: 23.5kg
 Dimension: 2094×1038×35mm
 Packaging: 260pcs per 20'GP
 660pcs per 40'HC

Operating Parameters

Operational Temperature: -40℃ ~ +85℃
 Power Output Tolerance: 0 ~ +5 W
 Voc and Isc Tolerance: $\pm 3\%$
 Maximum System Voltage: DC1500V (IEC/UL)
 Maximum Series Fuse Rating: 20A
 Nominal Operating Cell Temperature: 45 ± 2 ℃
 Safety Class: Class II
 Fire Rating: UL type 1 or 2

Electrical Characteristics

Test uncertainty for Pmax: $\pm 3\%$

Model Number	BSM425M-72HPH BSM430M-72HPH BSM435M-72HPH BSM440M-72HPH BSM445M-72HPH BSM450M-72HPH BSM455M-72HPH													
Testing Condition	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT
Maximum Power (Pmax/W)	425	314.8	430	318.5	435	322.2	440	326.0	445	329.7	450	333.4	455	337.1
Open Circuit Voltage (Voc/V)	48.3	45.1	48.5	45.3	48.7	45.5	48.9	45.6	49.1	45.8	49.3	46.0	49.5	46.2
Short Circuit Current (Isc/A)	11.23	9.06	11.31	9.12	11.39	9.18	11.46	9.24	11.53	9.30	11.60	9.35	11.66	9.40
Voltage at Maximum Power (Vmp/V)	40.5	37.4	40.7	37.6	40.9	37.8	41.1	38.0	41.3	38.1	41.5	38.3	41.7	38.5
Current at Maximum Power (Imp/A)	10.50	8.42	10.57	8.47	10.64	8.53	10.71	8.59	10.78	8.64	10.85	8.70	10.92	8.75
Module Efficiency(%)	19.6	19.8	20.0	20.2	20.5	20.7	20.9							

STC (Standard Testing Conditions): Irradiance 1000W/m², Cell Temperature 25℃, Spectra at AM1.5

NOCT (Nominal Operating Cell Temperature): Irradiance 800W/m², Ambient Temperature 20℃, Spectra at AM1.5, Wind at 1m/s

Temperature Ratings (STC)

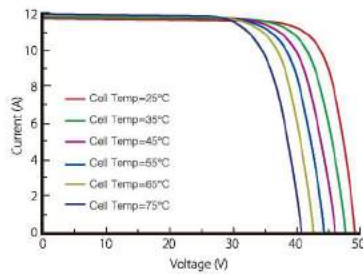
Temperature Coefficient of Isc	+0.048%/℃
Temperature Coefficient of Voc	-0.270%/℃
Temperature Coefficient of Pmax	-0.350%/℃

Mechanical Loading

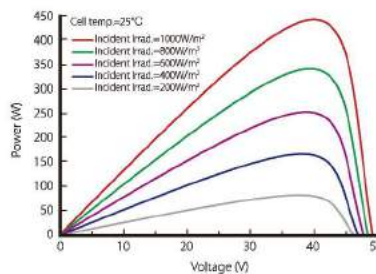
Front Side Maximum Static Loading	5400Pa
Rear Side Maximum Static Loading	2400Pa
Hailstone Test	25mm Hailstone at the speed of 23m/s

I-V Curve

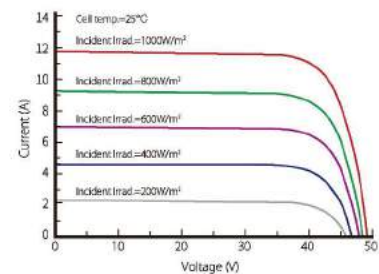
Current-Voltage Curve (BSM440M-72HPH)



Power-Voltage Curve (BSM440M-72HPH)



Current-Voltage Curve (BSM440M-72HPH)



No.	Photo	Series	Cell Type	Peak Power (W)	Model	cells/Module (pcs)	Vmp (V)	Size	Quantity/ Carton	Quantity/ 20GP	Quantity/ 40HQ
1		Poly Crystalline IPSU M2-60	156.75×156.75mm IPSU 5BB	265	IPSU 265M2-60	60 (6×10)	30	1650×992×35mm	31	334	924
2				270	IPSU 270M2-60						
3				275	IPSU 275M2-60						
4				280	IPSU 280M2-60						
5		Poly Crystalline IPSU M2-72	156.75×156.75mm IPSU 5BB	320	IPSU 320M2-72	72 (6×12)	37	1956×992×40mm	27	282	696
6				325	IPSU 325M2-72						
7				330	IPSU 330M2-72						
8				335	IPSU 335M2-72						
9		Mono Crystalline IPSU S2-60	156.75×156.75mm IPSU 5BB	300	IPSU 300S2-60	60 (6×10)	30	1650×992×35mm	31	334	924
10				305	IPSU 305S2-60						
11				310	IPSU 310S2-60						
12				315	IPSU 315S2-60						
13		Mono Crystalline IPSU S2-72	156.75×156.75mm IPSU 5BB	360	IPSU 360S2-72	72 (6×12)	37	1956×992×40mm	27	282	696
14				365	IPSU 365S2-72						
15				370	IPSU 370S2-72						
16				375	IPSU 375S2-72						

All test under the STC(Standard Test Condition): 1000W/m², 1.5AM and 25°C Cell Temperature.

No.	Photo	Series	Cell Type	Peak Power (W)	Model	cells/Module (pcs)	Vmp (V)	Size	Quantity/ Carton	Quantity/ 20GP	Quantity/ 40HQ
1		Mono Crystalline IPSU S2-60	158.75×158.75 mm IPSU 5BB	315	IPSU 315S2-60	60 (6×10)	33	1670×1000×35mm	31	330	858
2				320	IPSU 320S2-60						
3				325	IPSU 325S2-60						
4				330	IPSU 330S2-60						
5		Mono Crystalline Half Cell IPSU S2HC-120	158.75×79.38mm IPSU 5BB	325	IPSU 325S2HC-120	120 (6×20)	34	1708×1000×35mm	31	330	858
6				330	IPSU 330S2HC-120						
7				335	IPSU 335S2HC-120						
8		Mono Crystalline IPSU S2-72	158.75×158.75mm IPSU 5BB	380	IPSU 380S2-72	72 (6×12)	40	1980×1000×40mm	27	253	638
9				385	IPSU 385S2-72						
10				390	IPSU 390S2-72						
11				395	IPSU 395S2-72						
12		Mono Crystalline Half Cell IPSU S2HC-144	158.75×79.38mm IPSU 5BB	390	IPSU 390S2HC-144	144 (6×24)	41	2038×1000×40mm	27	253	638
13				395	IPSU 395S2HC-144						
14				400	IPSU 400S2HC-144						

All test under the STC(Standard Test Condition): 1000W/m², 1.5AM and 25°C Cell Temperature.

IPSU ENERGY Hybrid Inverter

SUN-3.6/5K-SG01/03LP1-EU



Colorful touch LCD,
IP65 protection degree

6

6 time periods for battery
charging/discharging

120

Max. charging/discharging
current of 120A

16

Frequency droop control,
Max.16pcs parallel



DC couple and AC couple to
retrofit existing solar system



Support storing energy from
diesel generator

Technical Specifications

SUN- 3.6/5K-SG01/03LP1-EU

Model	SUN-3.6K-SG01/03LP1-EU		SUN-5K-SG01/03LP1-EU	
Battery Input Data				
Battery Type	Lead-acid or Lithium-ion			
Battery Voltage Range (V)	40~60V			
Max. Charging Current (A)	90A		120A	
Max. Discharging Current (A)	90A		120A	
Charging Curve	3 Stages / Equalization			
External Temperature Sensor	Optional			
Charging Strategy for Li-Ion Battery	Self-adaption to BMS			
PV String Input Data				
Max. DC Input Power (W)	4680W		6500W	
PV Input Voltage (V)	370V (100V~500V)			
MPPT Range (V)	125~425V			
Full Load DC Voltage Range	240~425V			
Start-up Voltage (V)	150V			
PV Input Current (A)	12.5A+12.5A			
No.of MPPT Trackers	2			
No.of Strings Per MPPT Tracker	1+1			
AC Output Data				
Rated AC Output and UPS Power (W)	3600W		5000W	
Max. AC Output Power (W)	3960W		5500W	
Peak Power (off grid)	2 times of rated power, 10 S			
AC Output Rated Current (A)	16.3A		22.7A	
Max. AC Current (A)	18A		25A	
Max. Continuous AC Passthrough (A)	35A			
Power Factor	0.8 leading to 0.8 lagging			
Output Frequency and Voltage	50/60Hz; 220/230 / 240Vac (single phase)			
Grid Type	Single Phase			
Current Harmonic Distortion	THD<3% (Linear load<1.5%)			
Efficiency				
Max. Efficiency	97.60%			
Euro Efficiency	96.50%			
MPPT Efficiency	99.90%			
Protection				
PV Input Lightning Protection	Integrated			
Anti-islanding Protection	Integrated			
PV String Input Reverse Polarity Protection	Integrated			
Insulation Resistor Detection	Integrated			
Residual Current Monitoring Unit	Integrated			
Output Over Current Protection	Integrated			
Output Shorted Protection	Integrated			
Output Over Voltage Protection	Integrated			
Surge protection	DC Type II / AC Type II			
Certifications and Standards				
Grid Regulation	VDE 0126, AS4777, NRS2017, G98, G99, IEC61683, IEC62116, IEC61727, RD1699: 2011, XP C15-712-3: 2019-05			
Safety Regulation	IEC62109-1, IEC62109-2			
EMC	EN61000-6-1, EN61000-6-3			
General Data				
Operating Temperature Range (°C)	-25~60°C, >45°C Derating			
Cooling	Fan			
Noise (dB)	<30			
Communication with BMS	RS485; CAN			
Weight (kg)	20.5			
Size (mm)	580W×330H×208D			
Protection Degree	IP65			
Installation Style	Wall-mounted			
Warranty	5 years			

IPSU ENERGY Hybrid Inverter

SUN-5/6K-SG01LP1-US SUN-7.6/8K-SG01LP1-US/EU



Colorful touch LCD,
IP65 protection degree



6 time periods for battery
charging/discharging



Max. charging/discharging
current of 190A



Frequency droop control,
Max.16pcs parallel



DC couple and AC couple to
retrofit existing solar system



Support storing energy from
diesel generator

Technical Specifications

SUN-5/6K-SG01LP1-US / SUN-7.6/8K-SG01LP1-US/EU

Model	SUN-5K-SG01LP1 -US	SUN-6K-SG01LP1 -US	SUN-7.6K-SG01LP1 -US/EU	SUN-8K-SG01LP1 -US/EU
Battery Input Data				
Battery Type	Lead-acid or Lithium-ion			
Battery Voltage Range (V)	40~60V			
Max. Charging Current (A)	120A	135A	190A	190A
Max. Discharging Current (A)	120A	135A	190A	190A
Charging Curve	3 Stages / Equalization			
External Temperature Sensor	Optional			
Charging Strategy for Li-Ion Battery	Self-adaption to BMS			
PV String Input Data				
Max. DC Input Power (W)	6500W	7800W	9880W	10400W
PV Input Voltage (V)	370V (100V~500V)			
MPPT Range (V)	125V-425V			
Start-up Voltage (V)	150V			
PV Input Current (A)	12.5A+12.5A	22A+12.5A	22A+22A	22A+22A
No.of MPPT Trackers	2			
No.of Strings Per MPPT Tracker	1+1	2+1	2+2	2+2
AC Output Data				
Rated AC Output and UPS Power (W)	5000W	6000W	7600W	8000W
Max. AC Output Power (W)	5500W	6600W	8360W	8800W
Peak Power (off grid)	2 times of rated power, 10 S			
AC Output Rated Current (A)	20.8A	25A	31.7A / 33A	33.4A / 35A
Max. AC Current (A)	26.4A	31.7A	40.1A / 38A	42.3A / 40A
Max. Continuous AC Passthrough (A)	35A	40A	50A	50A
Output Frequency and Voltage	50 / 60Hz; 120 / 240Vac (split phase), 208Vac (2 / 3 phase), 230Vac (single phase)			
Grid Type	Split phase 、 2 / 3 phase 、 Single Phase			
Current Harmonic Distortion	THD<3% (Linear load<1.5%)			
Efficiency				
Max. Efficiency	97.60%			
Euro Efficiency	97.00%			
MPPT Efficiency	99.90%			
Protection				
PV Arc Fault Detection	Integrated (Except European Type)			
PV Input Lightning Protection	Integrated			
Anti-islanding Protection	Integrated			
PV String Input Reverse Polarity Protection	Integrated			
Insulation Resistor Detection	Integrated			
Residual Current Monitoring Unit	Integrated			
Output Over Current Protection	Integrated			
Output Shorted Protection	Integrated			
Output Over Voltage Protection	Integrated			
Surge protection	DC Type II / AC Type II			
Certifications and Standards				
Grid Regulation	UL1741, IEEE1547, RULE21, VDE 0126, AS4777, NRS2017, G98, G99, IEC61683, IEC62116, IEC61727			
Safety Regulation	IEC62109-1, IEC62109-2			
EMC	EN61000-6-1, EN61000-6-3, FCC 15 class B			
General Data				
Operating Temperature Range (°C)	-25~60°C, >45°C Derating			
Cooling	Fan			
Noise (dB)	<30			
Communication with BMS	RS485; CAN			
Weight (kg)	32			
Size (mm)	670W × 420H × 233D			
Protection Degree	IP65			
Installation Style	Wall-mounted			
Warranty	5 years			

IPSU ENERGY 3 PHASE INVERTER

SUN- 8 / 10 / 12 K-SG01LP3



48 48V low voltage battery, transformer isolation design

6 6 time periods for battery charging/discharging

250 Max. charging/discharging current of 250A

16 Frequency droop control, Max.16pcs parallel

 DC couple and AC couple to retrofit existing solar system

 Support storing energy from diesel generator

Technical Specifications

SUN- 8 / 10 / 12 K-SG01LP3

Model	SUN-8K-SG01LP3	SUN-10K-SG01LP3	SUN-12K-SG01LP3
Battery Input Data			
Battery Type		Lead-acid or Li-Ion	
Battery Voltage Range (V)		40~60V	
Max. Charging Current (A)	190A	210A	240A
Max. Discharging Current (A)	190A	210A	240A
Charging Curve		3 Stages / Equalization	
External Temperature Sensor		Optional	
Charging Strategy for Li-Ion Battery		Self-adaption to BMS	
PV String Input Data			
Max. DC Input Power (W)	9880W	13000W	15000W
PV Input Voltage (V)		370V (100V~500V)	
MPPT Range (V)		125V-425V	
Start-up Voltage (V)		150V	
PV Input Current (A)	12.5A+12.5A	12.5A+12.5A	22A+12.5A
No.of MPPT Trackers		2	
No.of Strings Per MPPT Tracker	1+1	1+1	1+1
AC Output Data			
Rated AC Output and UPS Power (W)	8000W	10000W	12000W
Max. AC Output Power (W)	8800W	11000W	13000W
Peak Power (off grid)		2 times of rated power, 10 S	
AC Output Rated Current (A)	11.6A	14.5A	17.4A
Max. AC Current (A)	17.4A	21.7A	26A
Max. Continuous AC Passthrough (A)	48A	48A	48A
Output Frequency and Voltage		50/60Hz; 230/400Vac (Three phase)	
Grid Type		Three Phase	
Current Harmonic Distortion		THD<3% (Linear load<1.5%)	
Efficiency			
Max. Efficiency		97.60%	
Euro Efficiency		97.00%	
MPPT Efficiency		99.90%	
Protection			
PV Arc Fault Detection		Integrated (Except European Type)	
PV Input Lightning Protection		Integrated	
Anti-islanding Protection		Integrated	
PV String Input Reverse Polarity Protection		Integrated	
Insulation Resistor Detection		Integrated	
Residual Current Monitoring Unit		Integrated	
Output Over Current Protection		Integrated	
Output Shorted Protection		Integrated	
Output Over Voltage Protection		Integrated	
Surge protection		DC Type II / AC Type II	
Certifications and Standards			
Grid Regulation	UL1741, IEEE1547, RULE21, VDE 0126, AS4777, NRS2017, G98, G99, IEC61683, IEC62116, IEC61727		
Safety Regulation	IEC62109-1, IEC62109-2		
EMC	EN61000-6-1, EN61000-6-3, FCC 15 class B		
General Data			
Operating Temperature Range (°C)		-25~60°C, >45°C Derating	
Cooling		Fan	
Noise (dB)		<30	
Communication with BMS		RS485; CAN	
Weight (kg)		45	
Size (mm)		673W×462H×265D	
Protection Degree		IP65	
Installation Style		Wall-mounted	
Warranty		5 years	

Powerwall Home Battery

Product Specification



This specification is applied to the reference battery in this Specification .

Production

Product Name : LiFePO4 Battery Pack

Specification : LFP100-48/51.2 48/51.2V 100Ah (5KWH)

LFP150-48/51.2 48/51.2V 150Ah (7KWH)

LFP200-48/51.2 48/51.2V 200Ah (10KWH)

48V Package



Battery Module		LFP100-48	LFP150-48	LFP200-48
Combination method			15S	
Rated Capacity	Typical	100Ah	150Ah	200Ah
	Minimum	100Ah	150Ah	200Ah
Factory Voltage			49.5-50.5V	
Voltage at end of Discharge			40-42.5V	
Charging Voltage			53.2-54V	
Internal Impedance			≤50mΩ	
Standard charge		Constant Current 20A Constant Voltage 0.01CA cut-off		
Standard discharge		Constant current : 20A end voltage		
Maximum Continuous Charge Current			100A	
Maximum Continuous Discharge Current			100A	
Operation Temperature Range			Charge: 0~45°C Discharge: -20~55°C	
Storage Temperature Range			Less than 12 months : -10~35°C Less than 3 months: -10~45°C Less than 7 day : -20~65°C	
Volumetric specific energy		100 WH/L	95WH/L	127WH/L
Gravimetric specific energy		99WH/KG	90WH/KG	109WH/KG
Cycle life			≥6000cycle	
Dimensions		480*450*222 mm	480*650*242mm	480*650*242 mm
Weight		48kg	70kg	88kg

51.2V Package



Battery Module		LFP100-51.2	LFP150-51.2	LFP200-51.2
Combination method		16S		
Rated Capacity	Typical	100Ah	150Ah	200Ah
	Minimum	100Ah	150Ah	200Ah
Factory Voltage		52.8-53.9V		
Voltage at end of Discharge		42.5-45.5V		
Charging Voltage		56.8-57.6V		
Internal Impedance		≤50mΩ		
Standard charge		Constant Current 20A Constant Voltage 0.01CA cut-off		
Standard discharge		Constant current : 20A end voltage		
Maximum Continuous Charge Current		100A		
Maximum Continuous Discharge Current		100A		
OperationTemperature Range		Charge: 0~45°C Discharge: -20~55°C		
Storage Temperature Range		Less than 12 months : -10~35°C Less than 3 months: -10~45°C Less than 7 day : -20~65°C		
Volumetric specific energy		65 WH/L	95WH/L	127WH/L
Gravimetric specific energy		61.2WH/KG	90WH/KG	109WH/KG
Cycle life		≥6000cycle		
Dimensions		480*650*242 mm	480*650*242mm	480*650*242 mm
Weight		51kg	74.5kg	92.75kg

BMS Specification

1. The BMS is designed for 15/16 series lithium battery.
2. The BMS have all functions which are :
 - Overcharge detection function
 - Over discharge detection function
 - Over current detection function
 - Short detection function
 - Temperature detection function
 - Balance function
 - Communicate function
 - Alarm function

BMS Parameter

48V 15S / 16S Typical value specifications

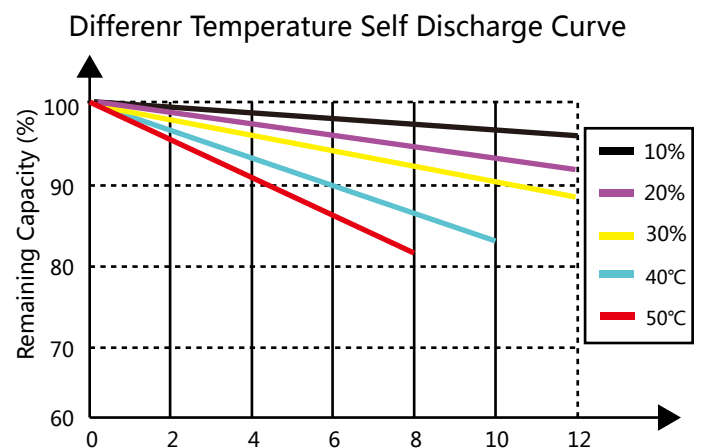
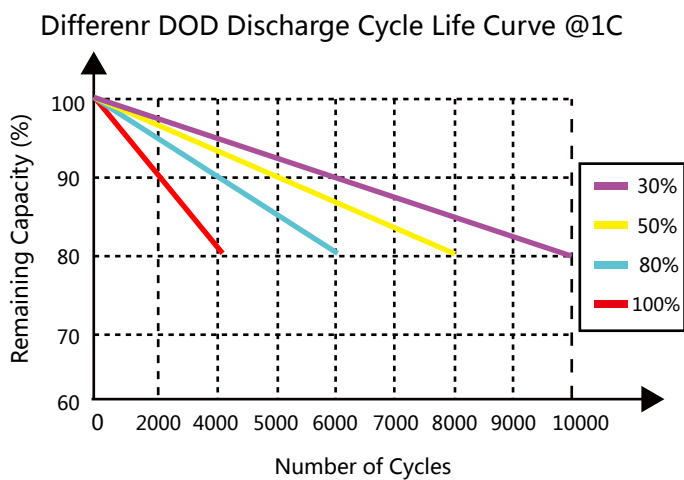
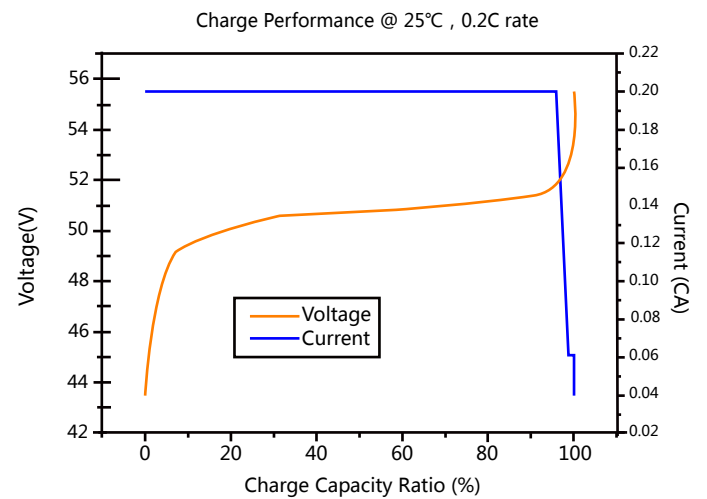
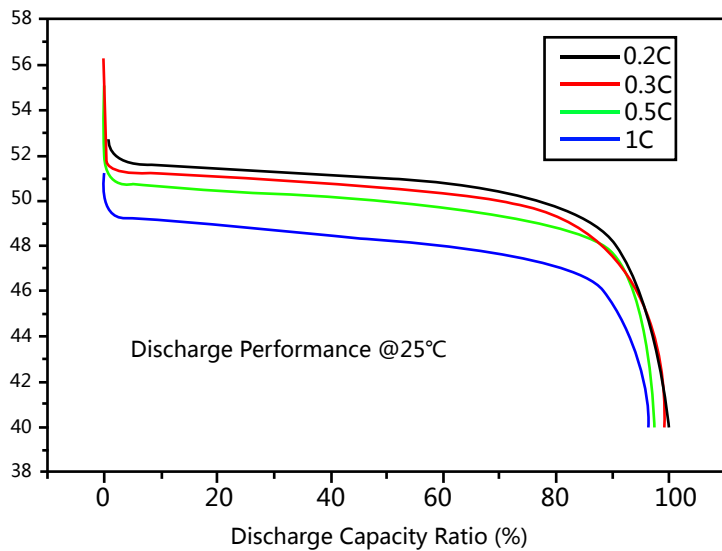
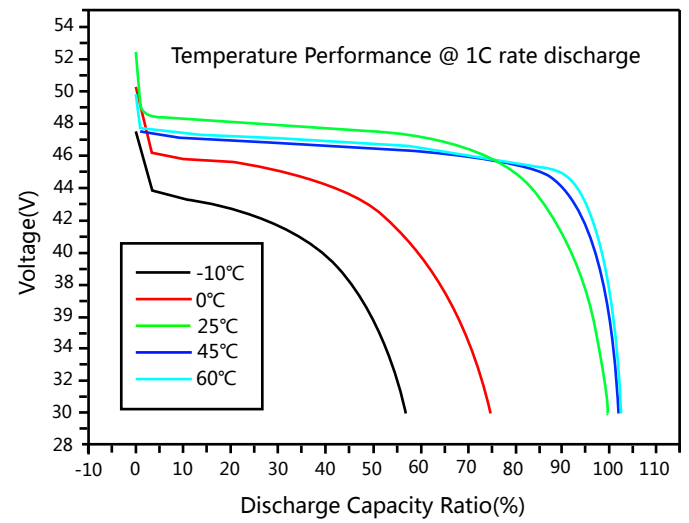
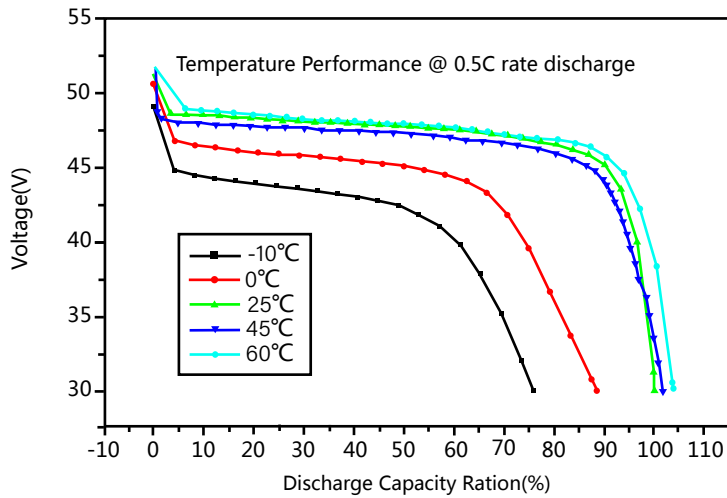
Items	Details	Standard
Cell overcharge protection	Overcharge detection voltage	3.70±0.025V
	Overcharge detection delay time	Typical:1.0s
	Overcharge release voltage	3.45±0.02V
Cell over-discharge protection	Over-discharge detection voltage	2.75±0.02V
	Over-discharge detection delay time	Typical:1.0s
	Over-discharge release voltage	3.05±0.02V or charge release

48V 15S / 16S Typical value specifications

Items	Details	Standard
Over-current protection	discharge Over-current protection current1	120±10A
	discharge Over-current detection delay time 1	1S
	discharge Over-current protection current2	150±10A
	discharge Over-current detection delay time2	3.45±100ms±0.02V
	Charge OC protection current	120±10A
Short protection	Short protection current	350±10A
	Protection condition	Load short
	Detection delay time	≤800us
	Protection release condition	Charging release
Temperature(T) protection	Charge high (T) protection	65±2℃
	Charge high (T) recover	60±5℃
	Discharge high (T) protection	65±2℃
	Discharge high (T) recover	60±5℃
	Charge low (T) protection	-5±2℃
	Charge low (T) recover	0±2℃
	Discharge low (T) protection	-20±5℃
	Discharge low (T) recover	-15±5℃
Balance	Balance threshold voltage	3.45V
Communication	It has RS232 and RS485 standard communication interface, it can real-time monitoring the capacity of battery bank, the voltage, current, environment temperature, and charging/discharging current.	
Alarm	It has over-temperature, over charge, under-voltage, over-current, short circuit alarm function.	



Discharge Curve& Charge Curve





High Temperature Deep Cycle GEL Battery

HTL6-200

The HTL deep cycle gel battery adopts the advanced developed nano gel electrolyte with super-C additive plus heavy duty plates design inside. It has a longer service life even deep cycle discharge use and can provide optimum and reliable service under extreme condition such as high temperature and frequent power failure, thus it is highly suited for tropical area in outdoor applications such as Telecom BTS stations and Off-grid PV system.

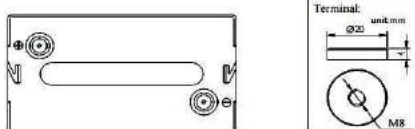
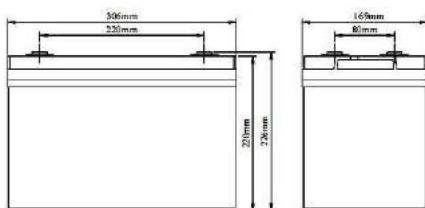
GENERAL FEATURES

- Able to operate at 40-60°C
- Integrated design to ensure the best uniformity and reliability
- Longer life and higher stability under high temp. environment (no air-con needed)
- Super-C additives: Deep discharge recovery capability, 1600cycles @50%DOD



DIMENSIONS, WEIGHT

Length (mm)	306±1
Width (mm)	168±1
Height (mm)	220±1
Total Height (mm)	225±1
Weight (kg)	30.1±3%



APPLICATIONS

- ◇ BTS Stations
- ◇ Solar & Wind energy system
- ◇ UPS system
- ◇ Telecom systems
- ◇ Wheel chair, Golf cart

TECHNICAL SPECIFICATIONS

Nominal Voltage		6V (3 cells per unit)
Design Floating Life @25°C		20 Years
Nominal Capacity @25°C (20 hour rate@10.0A, 5.4V)		200Ah
Capacity @25°C	10hour rate (18.0A, 5.4V)	180Ah
	5 hour rate (31.8A, 5.25V)	159Ah
	1 hour rate (115.5A, 4.8V)	115.5Ah
Internal Resistance	Full Charged Battery@25°C	≤3.0mΩ
Ambient Temperature	Discharge	-25°C~60°C
	Charge	-25°C~60°C
	Storage	-25°C~60°C
Max.Discharge Current@25°C		600A(5s)
Capacity affected by Temperature (10 hour)	40°C	108%
	25°C	100%
	0°C	90%
	-15°C	70%
Self-Discharge@25°C per Month		3%
Charge (Constant Voltage) @25°C	Standby Use	Initial Charging Current Less than 40A Voltage 6.8-6.9V
	Cycle Use	Initial Charging Current Less than 40A Voltage 7.2-7.45V

6V Voltage	200Ah Capacity	Gel Technology	Deep Cycle
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COMPLIED STANDARDS

IEC 60896-21/22	JIS C8704
IEC61427	BS6290 part4
GB/T 19638	CE/ISO

BATTERY DISCHARGE TABLE

Discharge Constant Current per Cell (Amperes at 25°C)

F.V/Time	15min	30min	45min	1h	2h	3h	5h	8h	10h	20h	100h
1.60V	312.4	185.9	132.0	115.5	70.5	49.5	33.7	22.2	19.8	10.8	2.40
1.65V	306.7	182.5	129.6	113.4	69.2	48.6	33.0	21.8	19.4	10.6	2.35
1.70V	301.0	179.1	127.2	111.3	67.9	47.7	32.4	21.4	19.1	10.4	2.31
1.75V	295.4	175.8	124.8	109.2	66.7	46.8	31.8	21.0	18.7	10.2	2.26
1.80V	284.0	169.0	120.0	105.0	64.1	45.0	30.6	20.2	18.0	10.0	2.22

Discharge Constant Power per Cell (Watts at 25°C)

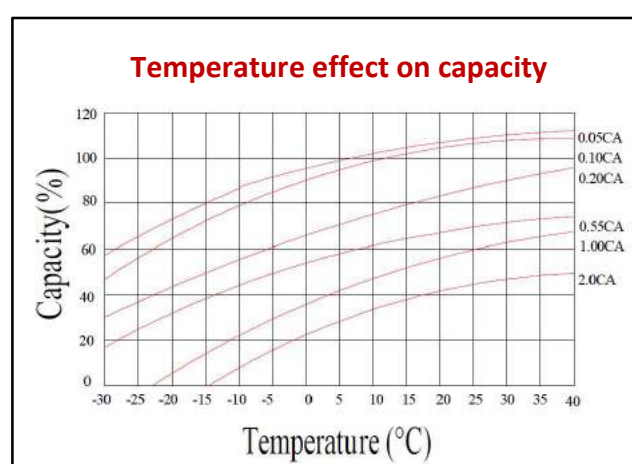
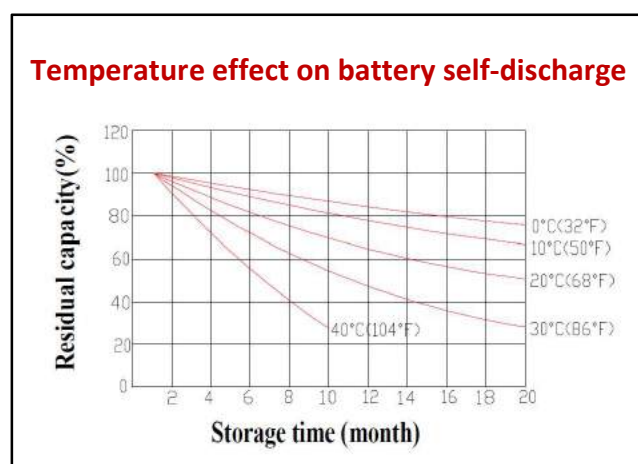
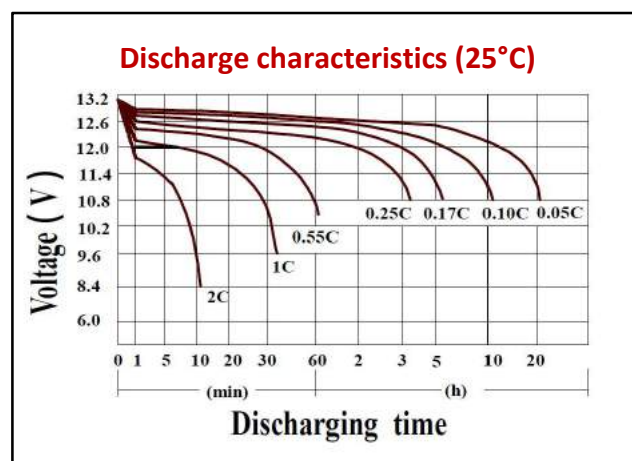
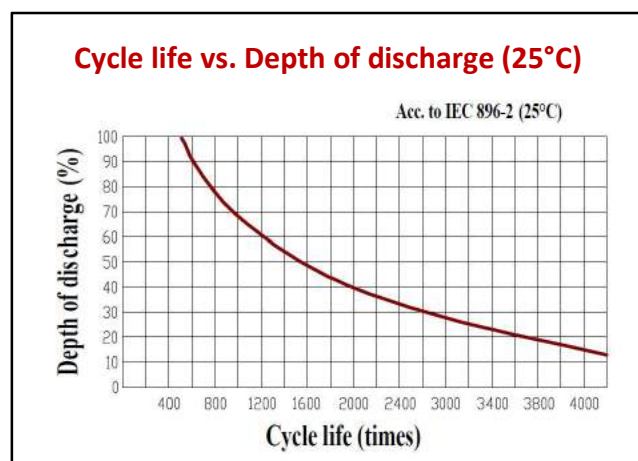
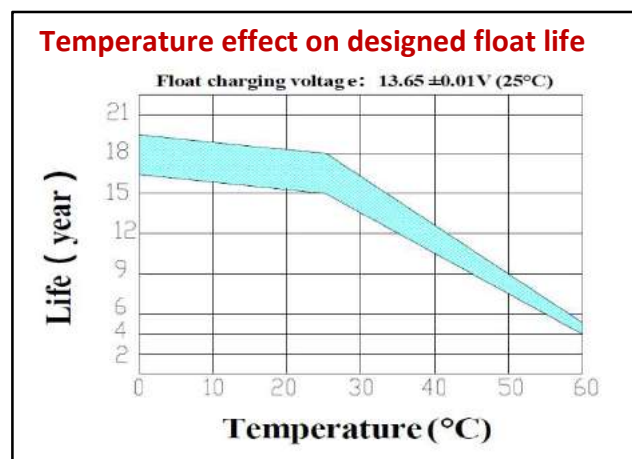
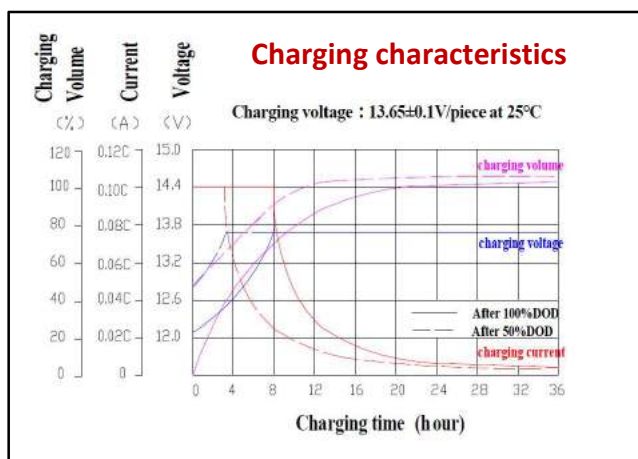
F.V/Time	15min	30min	45min	1h	2h	3h	5h	8h	10h	20h	100h
1.60V	601.4	357.9	254.1	222.3	135.7	95.3	64.8	42.8	38.1	20.8	4.62
1.65V	590.4	351.4	249.5	218.3	133.3	93.6	63.6	42.0	37.4	20.4	4.53
1.70V	579.5	344.8	244.9	214.3	130.8	91.8	62.4	41.2	36.7	20.0	4.44
1.75V	568.6	338.3	240.2	210.2	128.3	90.1	61.3	40.4	36.0	19.6	4.36
1.80V	546.7	325.3	231.0	202.1	123.4	86.6	58.9	38.9	34.7	19.3	4.27

Note The above data are average values, and can be obtained within 3 charge/discharge cycles. These are not minimum values. Cell and battery designs/specifications are subject to modification without notice. Contact **IPSU** for the latest information.

High Temperature Deep Cycle GEL Battery

HTL6-200

PERFORMANCE CHARACTERISTICS



BATTERY CONSTRUCTION

Component	Positive plate	Negative plate	Container & Cover	Safety valve	Terminal	Separator	Electrolyte	Pillar seal
Features	Thick high Sn low Ca grid with special paste	Balanced Pb-Ca grid for improved recombination efficiency	Fire resistance ABS (UL94-V0 optional)	Flame Si-Rubber and aging resistance	Female Copper Insert M8	Advanced PVC/AGM separator for high pressure cell design	Silicon Gel import from Germany	Two layers epoxy resin seal

High Temperature Deep Cycle GEL Battery

HTL6-420

The HTL deep cycle gel battery adopts the advanced developed nano gel electrolyte with super-C additive plus heavy duty plates design inside. It has a longer service life even deep cycle discharge use and can provide optimum and reliable service under extreme condition such as high temperature and frequent power failure, thus it is highly suited for tropical area in outdoor applications such as Telecom BTS stations and Off-grid PV system.

GENERAL FEATURES

- Able to operate at 40-60°C
- Integrated design to ensure the best uniformity and reliability
- Longer life and higher stability under high temp. environment (no air-con needed)
- Super-C additives: Deep discharge recovery capability, 1600cycles @50%DOD

APPLICATIONS

- BTS Stations
- Solar & Wind energy system
- UPS system
- Telecom systems
- Wheel chair, Golf cart

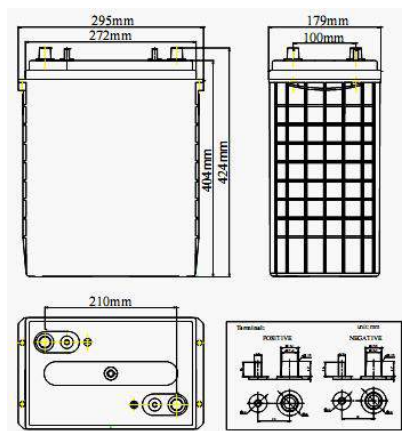


COMPLIED STANDARDS

IEC 60896-21/22 JIS C8704
IEC61427 BS6290 part4
GB/T 19638 CE/ISO

DIMENSIONS & WEIGHT

Length (mm)	295±1
Width (mm)	178±1
Height (mm)	404±1
Total Height (mm)	424±1
Weight (kg)	57±3%



TECHNICAL SPECIFICATIONS

Nominal Voltage		6V (3 cells per unit)
Design Floating Life @25°C		20 Years
Nominal Capacity @25°C (20 hour rate@21.0A, 5.4V)		420Ah
Capacity @25°C	10 hour rate (37.8A, 5.4V)	378Ah
	5 hour rate (66.8A, 5.25V)	334Ah
	1 hour rate (233.3A, 4.8V)	233.3Ah
Internal Resistance	Full Charged Battery@25°C	≤1.5mΩ
Ambient Temperature	Discharge	-25°C~60°C
	Charge	-25°C~60°C
	Storage	-25°C~60°C
Max.Discharge Current@25°C		1260A(5s)
Capacity affected by Temperature (10 hour)	40°C	108%
	25°C	100%
	0°C	90%
	-15°C	70%
Self-Discharge@25°C per Month		3%
Charge (Constant Voltage) @25°C	Standby Use	Initial Charging Current Less than 84A Voltage 6.8-6.9V
	Cycle Use	Initial Charging Current Less than 84A Voltage 7.2-7.45V

BATTERY DISCHARGE TABEL

Discharge Constant Current per Cell (Amperes at 25°C)

F.V/Time	15min	30min	45min	1h	2h	3h	5h	8h	10h	20h	100h
1.60V	540.5	344.2	254.1	233.3	148.1	104.0	70.7	46.7	41.6	22.6	5.03
1.65V	530.7	337.9	249.5	229.1	145.4	102.1	69.4	45.8	40.8	22.2	4.94
1.70V	520.9	331.7	244.9	224.8	142.7	100.2	68.1	45.0	40.1	21.8	4.85
1.75V	511.1	325.4	240.2	220.6	140.0	98.3	66.8	44.1	39.3	21.4	4.76
1.80V	491.4	312.9	231.0	212.1	134.6	94.5	64.3	42.4	37.8	21.0	4.66

Discharge Constant Power per Cell (Watts at 25°C)

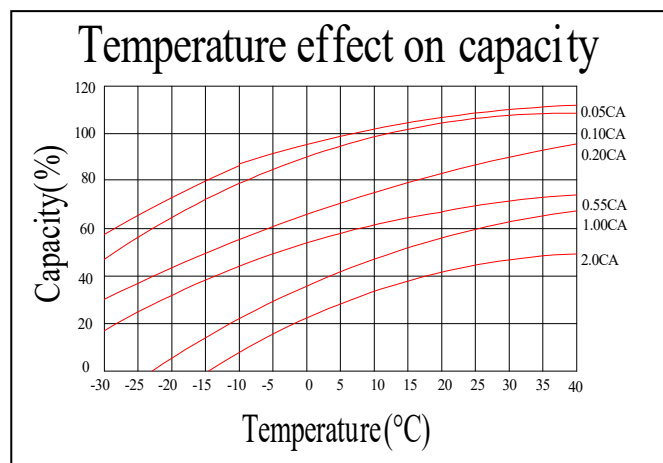
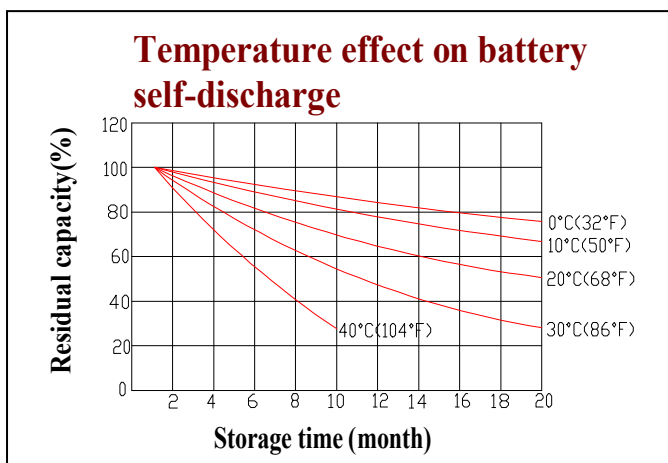
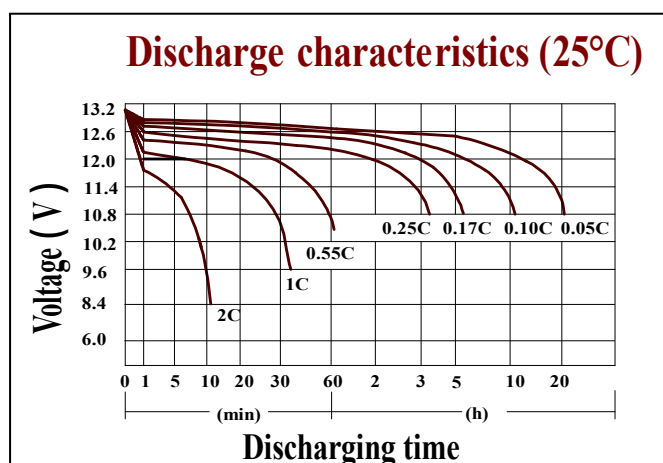
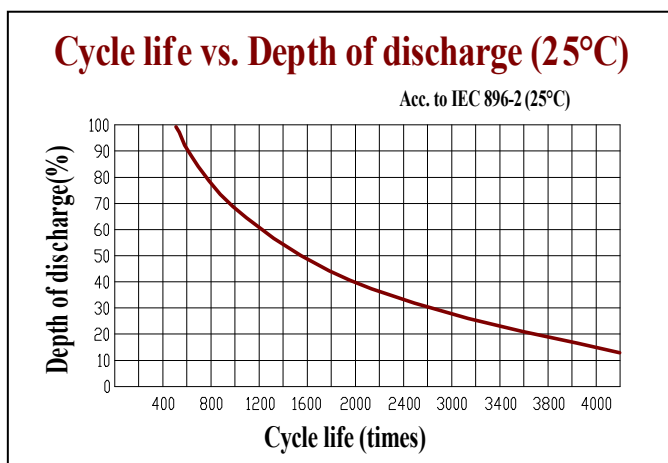
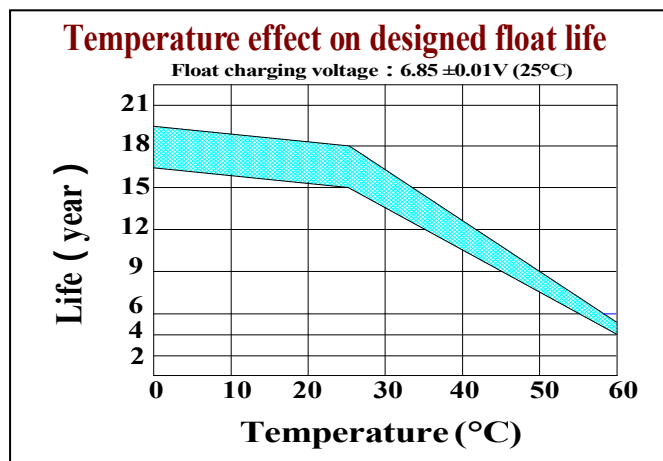
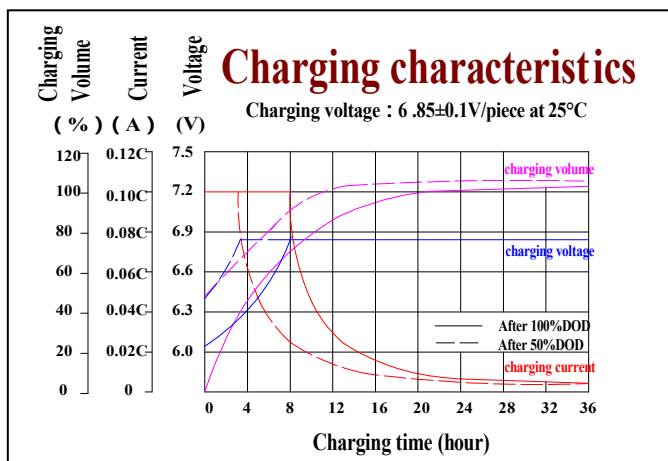
F.V/Time	15min	30min	45min	1h	2h	3h	5h	8h	10h	20h	100h
1.60V	1040.5	662.6	489.1	449.1	285.0	200.1	136.1	89.8	80.0	43.7	9.69
1.65V	1021.6	650.5	480.2	441.0	279.9	196.5	133.6	88.2	78.6	42.9	9.51
1.70V	1002.7	638.5	471.4	432.8	274.7	192.8	131.1	86.6	77.1	42.0	9.33
1.75V	983.8	626.4	462.5	424.6	269.5	189.2	128.6	84.9	75.7	41.2	9.15
1.80V	945.9	602.3	444.7	408.3	259.1	181.9	123.7	81.7	72.8	40.4	8.97

Note The above data are average values, and can be obtained within 3 charge/discharge cycles. These are not minimum values. Cell and battery designs/specifications are subject to modification without notice. Contact **IPSU** for the latest information.

High Temperature Deep Cycle GEL Battery

HTL6-420

PERFORMANCE CHARACTERISTICS



BATTERY CONSTRUCTION

Component	Positive plate	Negative plate	Container & Cover	Safety valve	Terminal	Separator	Electrolyte	Pillar seal
Features	Thick high Sn low Ca grid with special paste	Balanced Pb-Ca grid for improved recombination efficiency	Fire resistant ABS (UL94-V0 optional)	Flame Si-Rubber and aging resistance	Female Copper Insert M8	Advanced PVC /AGM separator for high pressure cell design	Silicon Gel	Two layers epoxy resin seal

High Temperature Deep Cycle GEL Battery

HTL12-300

The HTL deep cycle gel battery adopts the advanced developed nano gel electrolyte with super-C additive plus heavy duty plates design inside. It has a longer service life even deep cycle discharge use and can provide optimum and reliable service under extreme condition such as high temperature and frequent power failure, thus it is highly suited for tropical area in outdoor applications such as Telecom BTS stations and Off-grid PV system.

12V
Voltage

300Ah
Capacity

Gel
Technology

Deep
Cycle


GENERAL FEATURES

- Able to operate at 40-60°C
- Integrated design to ensure the best uniformity and reliability
- Longer life and higher stability under high temp. environment (no air-con needed)
- Super-C additives: Deep discharge recovery capability, 1600cycles @50%DOD

APPLICATIONS

- BTS Stations
- Solar & Wind energy system
- UPS system
- Telecom systems
- Wheel chair, Golf cart

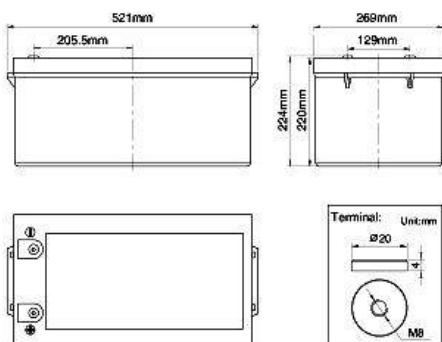


COMPLIED STANDARDS

IEC 60896-21/22 JIS C8704
IEC61427 BS6290 part4
GB/T 19638 CE/ISO

DIMENSIONS & WEIGHT

Length (mm)	520±1
Width (mm)	269±1
Height (mm)	220±1
Total Height (mm)	226±1
Weight (kg)	77.3±3%



TECHNICAL SPECIFICATIONS

Nominal Voltage		12V (6 cells per unit)
Design Floating Life @25°C		20 Years
Nominal Capacity @25°C (20 hour rate@15.0A,10.8V)		300Ah
Capacity @25°C	10hour rate (27.0A,10.8V)	270Ah
	5 hour rate (47.8A,10.5V)	239Ah
	1 hour rate (173.3A,9.6V)	173.3Ah
Internal Resistance	Full Charged Battery@25°C	≤1.6mΩ
Ambient Temperature	Discharge	-25°C~60°C
	Charge	-25°C~60°C
	Storage	-25°C~60°C
Max.Discharge Current@25°C		1800A(5s)
Capacity affected by Temperature (10 hour)	40°C	108%
	25°C	100%
	0°C	90%
	-15°C	70%
Self-Discharge@25°C per Month		3%
Charge (Constant Voltage) @25°C	Standby Use	Initial Charging Current Less than 65.0A Voltage 13.6-13.8V
	Cycle Use	Initial Charging Current Less than 65.0A Voltage 14.4-14.9V

BATTERY DISCHARGE TABEL

Discharge Constant Current per Cell (Amperes at 25°C)

F.V/Time	15min	30min	45min	1h	2h	3h	5h	8h	10h	20h	100h
1.60V	468.6	278.9	198.0	173.3	105.8	74.3	50.5	33.4	29.7	16.2	3.6
1.65V	460.1	273.8	194.4	170.1	103.9	72.9	49.6	32.8	29.2	15.8	3.5
1.70V	451.7	268.8	190.9	167.0	101.9	71.5	48.7	32.1	28.6	15.6	3.5
1.75V	443.1	263.7	187.2	163.9	100.1	70.2	47.8	31.5	28.0	15.2	3.4
1.80V	426.1	253.5	180.0	157.5	96.1	67.5	45.9	30.4	27.0	15.0	3.3

Discharge Constant Power per Cell (Watts at 25°C)

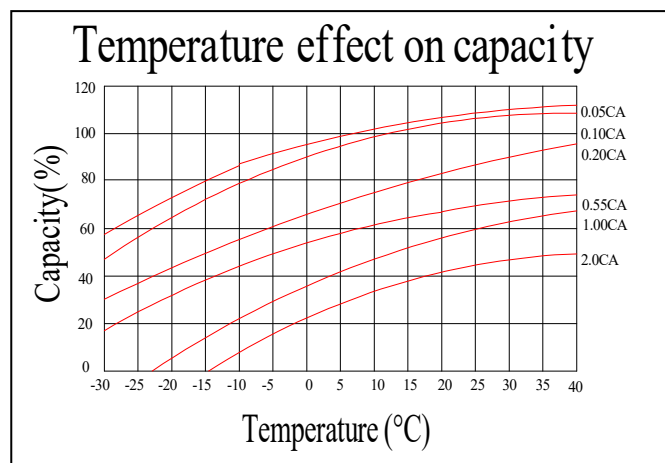
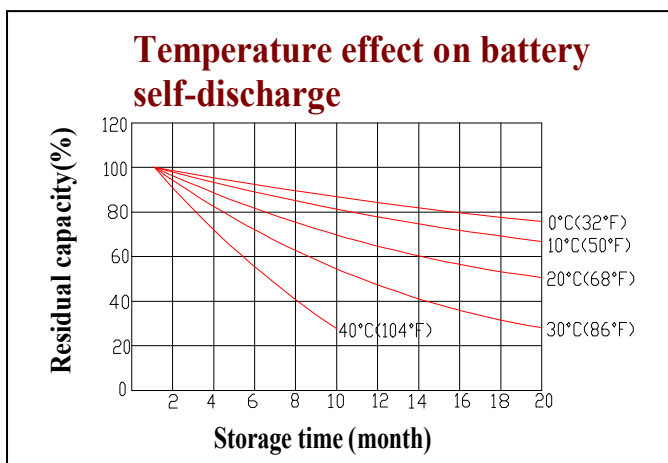
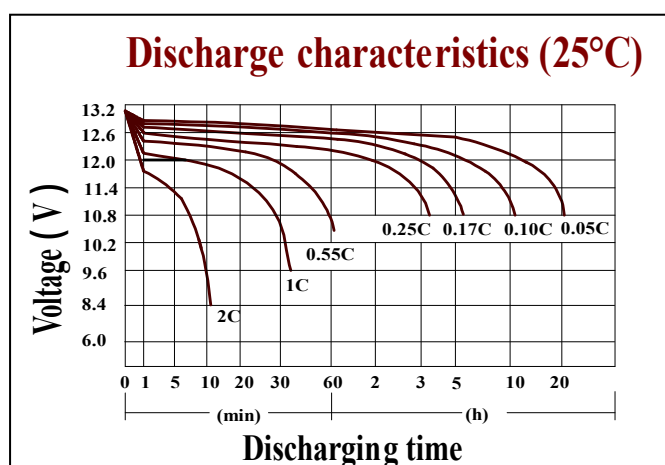
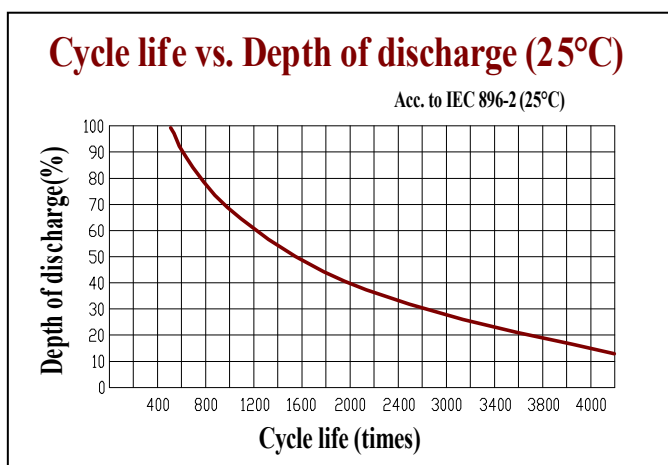
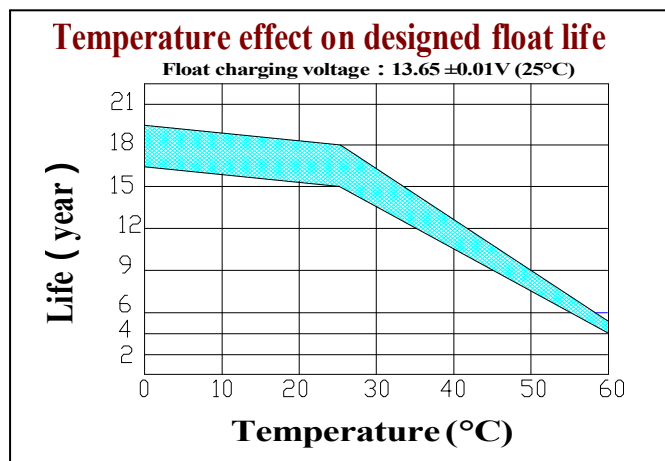
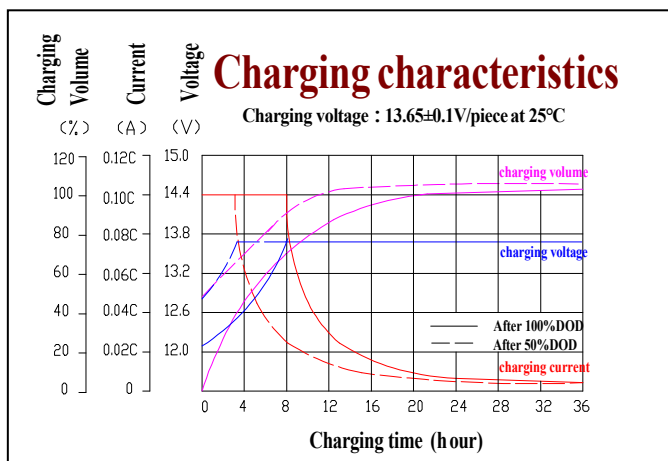
F.V/Time	15min	30min	45min	1h	2h	3h	5h	8h	10h	20h	100h
1.60V	902.2	536.8	381.2	333.5	203.7	143.0	97.2	64.2	57.1	31.2	6.9
1.65V	885.8	527.1	374.2	327.5	199.9	140.3	95.4	63.0	56.1	30.6	6.8
1.70V	869.4	517.3	367.3	321.4	196.2	137.8	93.7	61.9	55.0	30.0	6.7
1.75V	852.9	507.5	360.4	315.4	192.5	135.1	91.9	60.7	54.0	29.4	6.5
1.80V	820.1	488.0	346.5	303.3	185.1	129.9	88.4	58.4	51.9	28.9	6.4

Note The above data are average values, and can be obtained within 3 charge/discharge cycles. These are not minimum values. Cell and battery designs/specifications are subject to modification without notice. Contact **IPSU** for the latest information.

High Temperature Deep Cycle GEL Battery

HTL12-300

PERFORMANCE CHARACTERISTICS



BATTERY CONSTRUCTION

Component	Positive plate	Negative plate	Container & Cover	Safety valve	Terminal	Separator	Electrolyte	Pillar seal
Features	Thick high Sn low Ca grid with special paste	Balanced Pb-Ca grid for improved recombination efficiency	Fire resistant ABS (UL94-V0 optional)	Flame Si-Rubber and aging resistance	Female Copper Insert M8	Advanced PVC /AGM separator for high pressure cell design	Silicon Gel import from Germany	Two layers epoxy resin seal

OPzV Tubular GEL Battery

OPzV2-1000

IPSU OPzV series Tubular GEL battery is with 25 years floating design life, it is a Valve Regulated Tubular Gel battery that adopts immobilized GEL and Tubular Plate technology to offer high reliability and performance. The Battery is designed and manufactured according to DIN standards and with die-casting positive grid and patent formula of active material. OPzV series exceeds DIN standard values with more than 25 years floating design life at 25°C and is even more suitable for cyclic use under extreme operating conditions.

2V
Voltage

1000Ah
Capacity

Tubular
Technology

GEL
Battery



GENERAL FEATURES

- It can discharge at -40°C-70°C, Charge at 0-50°C
- Long life expectancy of 20+ years in floating condition
- Adopts quality silicon nano gel electrolyte
- Excellent deep discharge recovery capability
- Deep cycle performance: up to 3300 cycles @50% DOD

APPLICATIONS

- Solar & Wind Power system
- Nuclear power station
- Telecom backup power supply
- energy saving requirements
- Emergency Power Systems

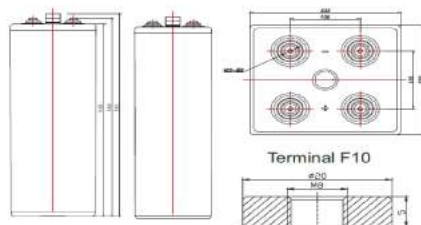
COMPLIED STANDARDS



DIMENSIONS & WEIGHT

Length(mm/inch)	233/9.17
Width(mm/inch)	210/8.27
Height(mm/inch)	666/26.2
Total Height(mm/inch)	681/26.8
Weight(kg/lbs)(±3%)	74/163.6

Unit: mm Dimension: 233(L) × 210(W) × 681(H)



TECHNICAL SPECIFICATIONS

Nominal Voltage		2V(Single Cell)
Design Floating Life @25°C		25 Years
Nominal Capacity @25°C(10 hour rate@100.0A,1.8V)		1000Ah
Capacity @25°C	20hour rate (52.5A,1.8V)	1050Ah
	5 hour rate (170A,1.75V)	850Ah
	1 hour rate (632A,1.6V)	632Ah
Internal Resistance	Full Charged Battery@25°C	≤0.27mΩ
Ambient Temperature	Discharge	-40°C~70°C
	Charge	-0°C~50°C
	Storage	-20°C~60°C
Max.Discharge Current@25°C		3800A (5s)
Capacity affected by Temperature (10 hour)	40°C	105%
	25°C	100%
	0°C	89%
	-15°C	79%
Self-Discharge@25°C per Month		2%
Charge (Constant Voltage) @25°C	Standby Use	Initial Charging Current Less than 200.0A Voltage 2.25-2.3V
	Cycle Use	Initial Charging Current Less than 200.0A Voltage 2.37-2.4V

BATTERY DISCHARGE TABEL

Discharge Constant Current per Cell (Amperes at 25°C)

F.V/ Time	30min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.90	492.00	390.00	275.00	208.60	171.00	147.80	133.00	103.80	89.00	46.73
1.87	550.00	430.00	295.00	221.20	180.50	155.40	141.00	108.60	93.00	48.83
1.83	630.00	480.00	320.00	235.70	190.00	162.20	146.00	113.50	97.00	50.93
1.80	700.00	520.00	332.00	242.50	193.80	166.00	150.00	116.40	100.00	52.50
1.75	780.00	557.00	347.00	252.20	197.00	170.00	153.00	118.30	102.00	53.55
1.70	860.00	575.00	357.00	257.10	200.50	172.00	155.00	119.30	103.00	54.08
1.65	887.00	611.00	369.00	264.00	203.30	174.00	157.00	120.30	104.00	54.60
1.60	925.00	632.00	383.00	275.00	209.00	177.00	159.00	121.30	105.00	55.13

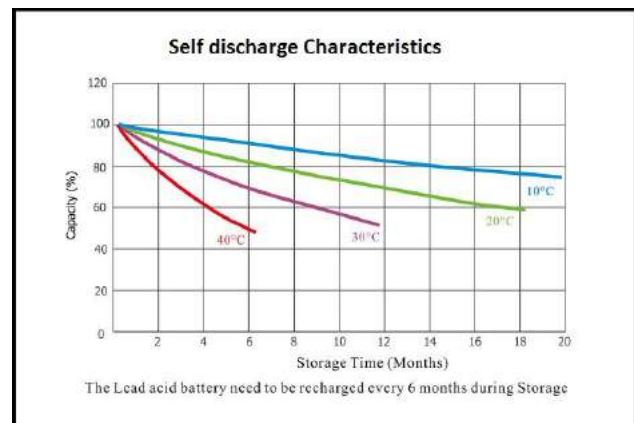
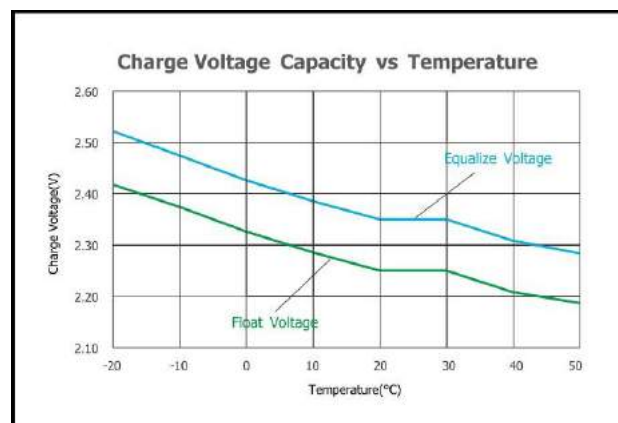
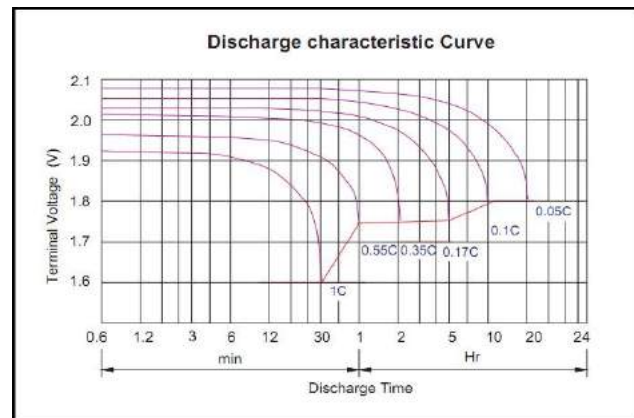
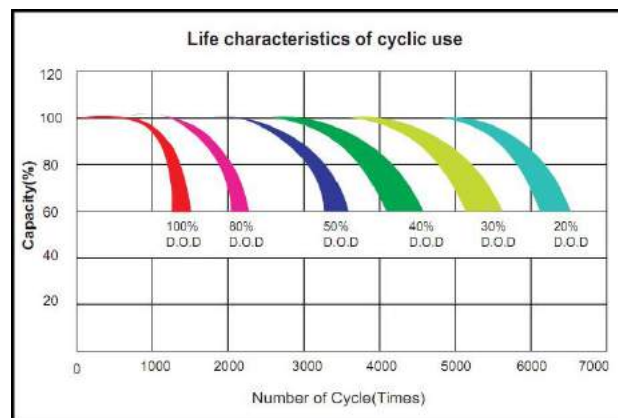
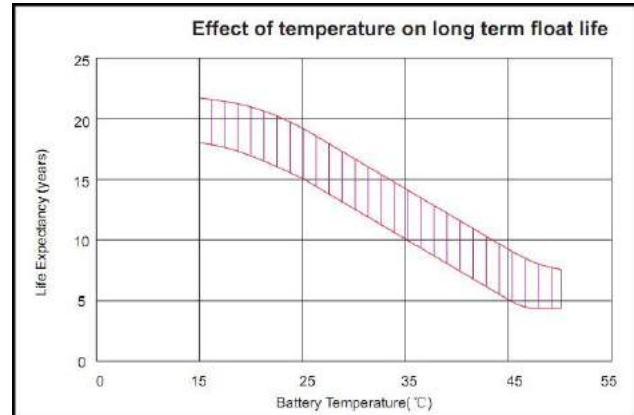
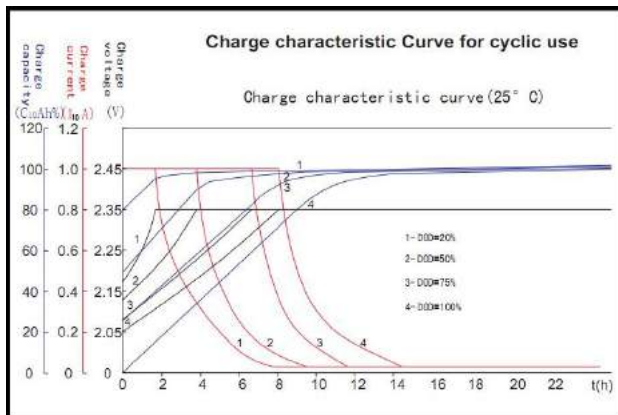
Discharge Constant Power per Cell (Watts at 25°C)

F.V/ Time	30min	1h	2h	3h	4h	5h	6h	8h	10h	20h
1.90	941.70	748.70	531.60	404.00	334.70	291.00	263.00	207.60	181.40	95.23
1.87	1036.00	813.00	563.80	423.10	352.80	305.00	278.00	216.30	189.20	99.30
1.83	1161.00	886.40	600.00	445.20	369.80	317.00	287.00	224.10	195.90	102.90
1.80	1268.00	945.70	620.10	455.30	376.90	324.00	294.00	228.90	200.80	105.40
1.75	1376.00	987.90	640.20	469.30	381.90	332.00	299.00	231.80	203.70	106.90
1.70	1475.00	998.00	656.30	477.40	387.90	335.00	302.00	233.80	205.60	108.00
1.65	1500.00	1042.00	674.40	487.40	393.00	338.00	305.00	235.70	206.60	108.50
1.60	1519.00	1074.00	690.40	503.50	403.00	341.00	307.00	236.70	207.60	109.00

OPzV Tubular GEL Battery

OPzV2-1000

PERFORMANCE CHARACTERISTICS



Battery Discharge Capacity

Long time discharge capacity for solar/wind application						
Capacity	C24 (Ah)	C48 (Ah)	C72 (Ah)	C100 (Ah)	C120 (Ah)	C240 (Ah)
Model	F.V=1.85VPC					
OPzV2-1000	1113	1250	1258	1275	1296	1318

Note: The above data are average values, and can be obtained within 3 charge/discharge cycles. These are not minimum values. Cell and battery designs/specifications are subject to modification without notice. Contact **IPSU** for the latest information.



®



IPSU HTL custom GEL batteries are comparably priced as AGM batteries, but they present a longer life span and offer bigger bursts of amps when needed. These batteries work best in high-power usage, with **NEW Anti-vibration Technology**, and HTL (high temperature long life) technology for such as Sports vehicles, and motorcycles.

EIGHTEEN MONTH WARRANTY

IPSU / M12V- 4AH / 6.5AH / 7AH / 9AH

Applications

- Motorcycle starter and lighting.
- Auxiliary power supply of automobile, lawn mower.
- Terrain vehicle, motorcycles, water scooter, Jet ski, ATV.
- Outdoor motility products.



Performance Features

- Low self-discharging ratio. 1-year shelf life.
- Cycle life is 15% higher than normal VRLA type.
- Better heat runaway resisting capability.
- Wide operation temperature range -30 °C~ 60 °C.
- Better capacity recover-ability.
- High rate discharging.
- Excellent vibration resistant technology, safe and reliable.

Configuration Features

- Maintenance free Pb-Ca high Tin alloy grid.
- Higher discharging capability grid structure.
- Higher performance GEL paste recipe.
- Special HTL Technology made up of Super GEL
- Higher strength ABS container and cover.
- COS,TTP and tightly compressed assembly technology.
- Valve regulated maintenance free.



IPSU ENERGY & TECHNOLOGIES LLC / S.R.L.

► GEL vs AGM Batteries

Two categories under Sealed Lead-Acid Batteries, AGM (Absorbent Glass Matt) Battery and Gel Battery and IPSU HTL GEL are often mistaken to be the same.

Both batteries possess similar traits such as having deep-cycle capabilities, non-spill able design and both can be used in different orientations.

The two battery types are also known for their low self-discharge, low-maintenance and vibration-resistant characteristics.

However, AGM and IPSU HTL CUSTOM Gel are two distinctly different types of batteries.

Differences

AGM batteries make use of a special glass mat made up of thin glass fibers. This is designed to absorb the electrolytes between the battery plates.

Gel batteries, on the other hand, utilize a special type of silica gel that holds electrolytes together. The thick consistency of the material allows electrons to flow freely from the plates.

IPSU HTL custom batteries, has NEW anti vibration technology, HTL technology (high temperature long life) with extended warranty and support.

Comparing the Two Battery Types

AGM batteries tend to lose power faster than HTL GEL batteries.

HTL GEL batteries work in extreme weather, making them suitable for power-hungry winter utilities and motorcycles.

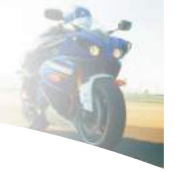
When it comes to Depth of Discharge (DoD), HTL GEL batteries make use of acid better than AGM batteries.

HTL GEL batteries are comparably prices with AGM batteries, but they present a longer life span and offer bigger bursts of amps when needed. These batteries work best in high-power usage, such as sports vehicles, rough terrain, and difficult road conditions because of its enhanced vibration technology and custom IPSU HTL technology.

Conclusion

IPSU HTL custom GEL batteries outsell other types of GEL and AGM batteries when it comes to durability, long life and charging. They are comparably priced and work in different weather conditions, and offers at a minimum, an

EIGHTEEN MONTH WARRANTY



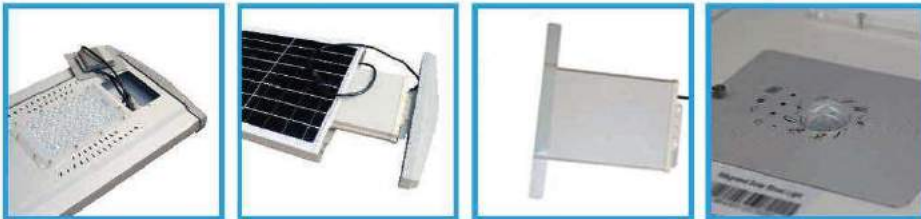
Integrated solar street light

IPSU DIAMOND SERIES

- * 7 days more continuous lighting even in rainy days
- * 3 lighting modes to fit different working environment
- * Upgraded intelligent controller
- * Easy to replace controller and battery
- * Solar panel: High efficiency silicon
- * Battery: LiFePO4 battery with more than 2000 recycle times



Easy to replace controller
Battery pack, protect battery from high temperature
Intelligence controller system



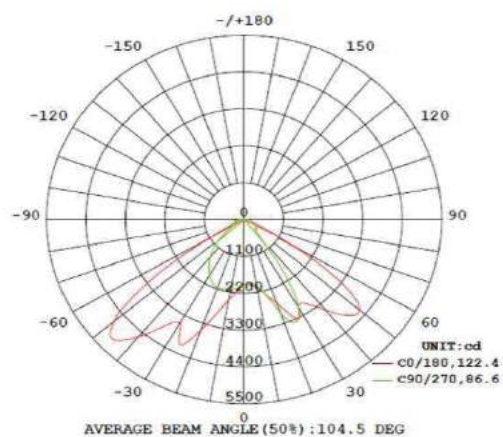
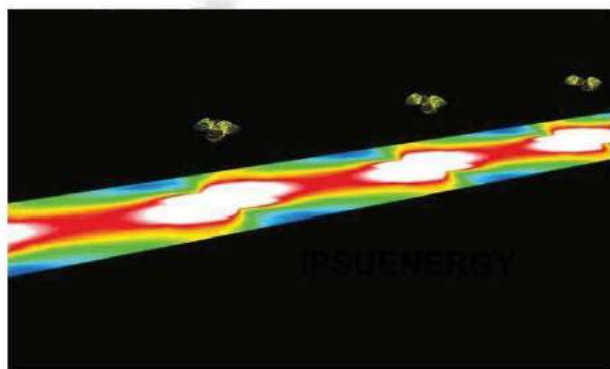


Model	Lumen	Colour temperature	Mounting height	Installing distance	Net weight
DM820	2400lm	6000-7000K	4-5m	12-15m	7.55kg
DM830	3600lm	6000-7000K	5-6m	15-18m	9.80kg
DM840	4800lm	6000-7000K	6-7m	18-20m	11.15kg
DM850	6000lm	6000-7000K	6-7m	20-25m	12.20kg
DM860	7200lm	6000-7000K	7-8m	25-28m	13.65kg
DM880	9600lm	6000-7000K	9-10m	28-30m	14.90kg

SOLAR STREET LIGHTING



IPSU-DM880 6M POLE



IPSU-DM820

IPSU-DM830

IPSU-DM840

IPSU-DM850

IPSU-DM860

IPSU-DM880

Integrated solar street light IPSU CAM -DM SERIES

- * 7 days more continuous lighting even in rainy days
- * 3 lighting modes to fit different working environment
- * HD camera
- * 4G & WIFI function
- * Upgraded intelligent controller



HD camera
4G & WIFI function support
Intelligence controller system



IPSU DM CAM SERIES



Model	Lumen	Colour temperature	Mounting height	Installing distance	Net weight
DM-815C	1650lm	6000-7000K	4-5m	15-18m	10.90kg
DM-830C	3600lm	6000-7000K	5-6m	18-20m	13.55kg
DM-860C	6000lm	6000-7000K	6-8m	20-25m	16.45kg



CAM-DM815



CAM-DM830



CAM-DM860

VERTICAL AXIS WIND TURBINE

Products Brochure

Model: GV-1KW

Version 2018.1.1



150
rpm

Low rated speed

2.8
m/s

Low start wind speed

< 30db

Low noise

CE

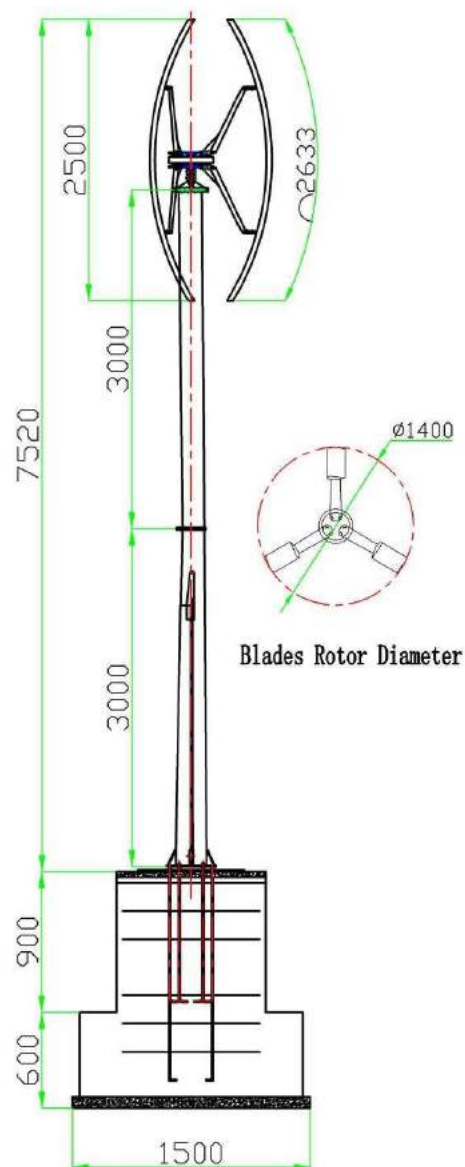
IEC61400-2
IEC61400-12

3
years

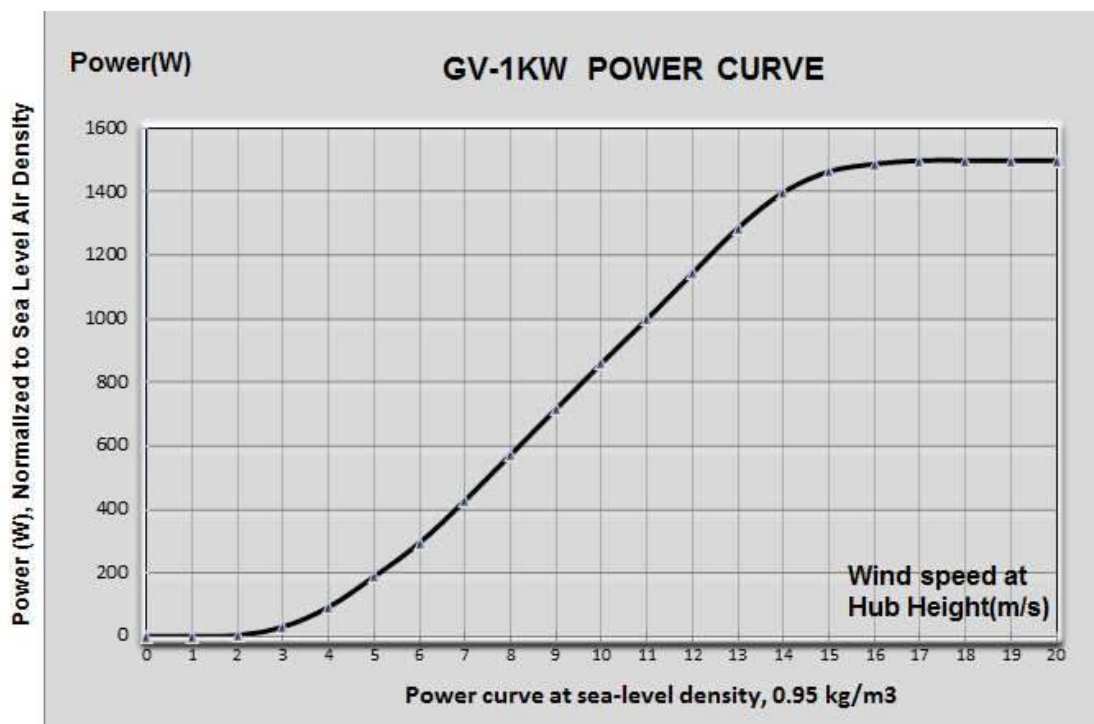
Products warranty

Technical specification

Model	GV-1KW
Performance	
Rated Power	1kW
Max Power	1.5kW
Start Wind Speed	2.8m/s (6.27mph)
Rated Wind Speed	11m/s(24.64mph)
Working Wind Speed	3-25m/s (6.72-56 mph)
Safety Wind Speed	50m/s(112mph)
Physical Parameters	
Blades Length	2.65M(8.69ft)
Blades Rotor Diameter	1.4M(4.59ft)
Blades Material &Quantity	FRP /3PCS
Mill Weight	175kg
Swept Area	3.71 m ²
Tower Height	6m(19.68ft.)
Generator Parameters	
Generator Type	Axial Flux Coreless outer rotor disc permanent magnet direct drive generator
Rated Speed	150RPM
Start Torque	<0.3N.M
Option Voltage	24-220V
Protection Method	Electromagnetic Brake +PWM
Protection Grade	IP54
Working Temperature	-40-50℃
Life time	20 Years



Power Curve



Annual Energy Production

Annual Wind Speed(m/s)	3	4	5	6	7	8	9
Production (kWH)	350	875	1660	2628	3680	5060	6300
Annual Wind Speed(m/s)	10	11	12	13	14	15	16
Production(kWH)	7445	8760	9800	11380	12250	12790	13100

This data will have $\pm 10\%$ difference according to local condition.

Sound Data

Test position: At 15m away from generator (average value of 3 point-rears, left, right)

Wind Speed (m/s)	3	4	5	6	7	8	9	10	11
Sound(dB)	1.31	3.02	6.20	9.43	13.42	22.08	32.54	36.45	37.22
Wind Speed (m/s)	12	13	14	15	16	17	18	19	20
Sound(dB)	45.11	45.20	45.25	45.33	45.44	45.52	45.62	45.85	46.00

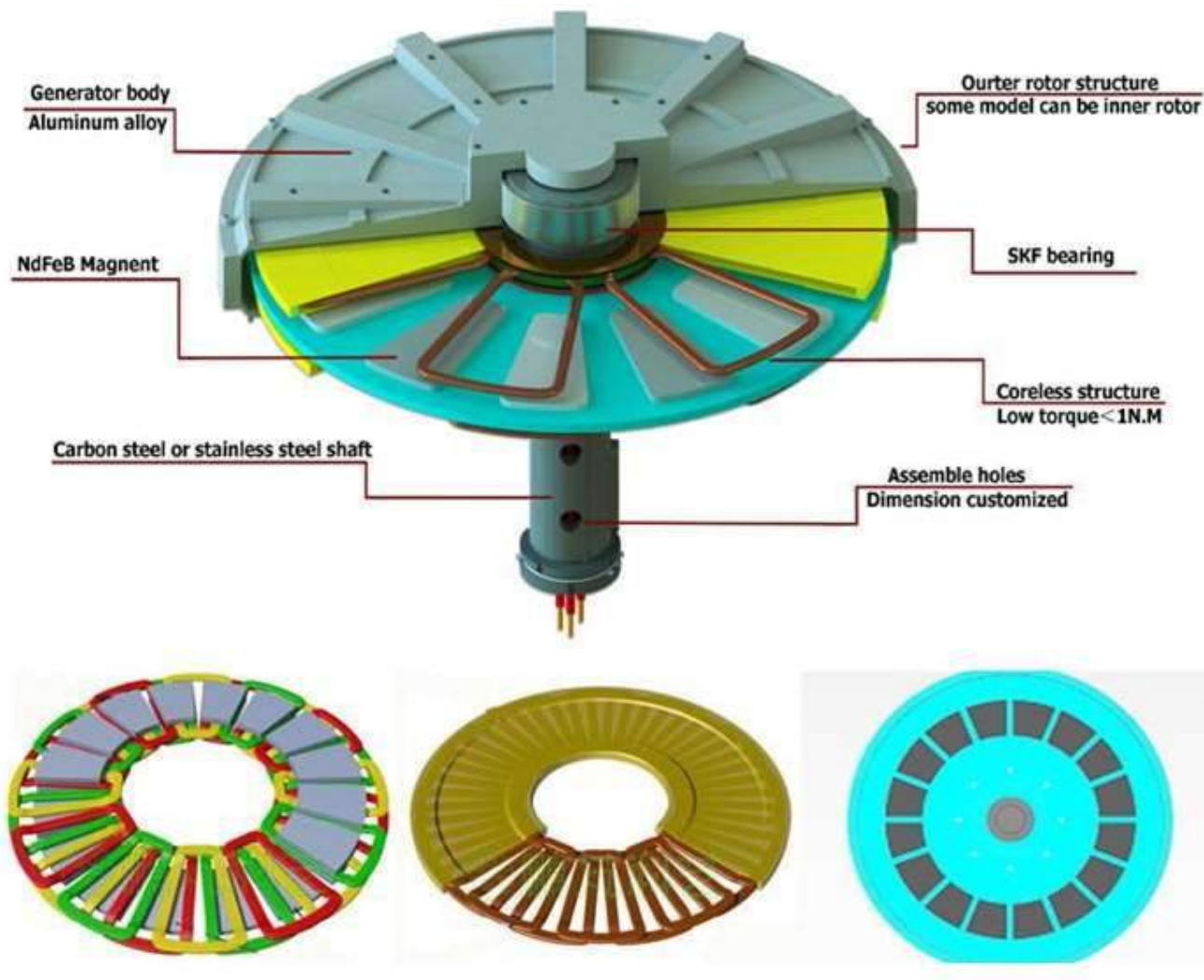
Note: The sound value includes wind noise.

Why choose GV-1KW wind turbine?

● Especial Generator ---- coreless disc generator

Advantage:

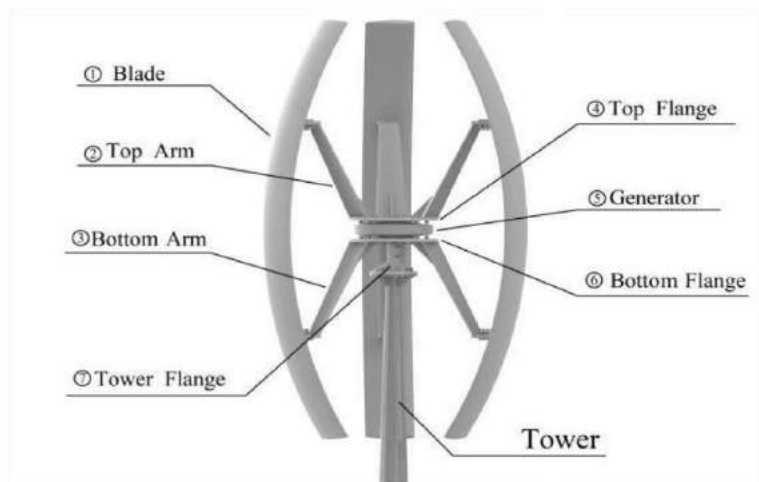
1. Torque Patent Technology: use newest "Precise Coil" technology.
2. No hysteresis and gear notches effect make the start torque very low $<1\text{N.M}$, it can make the wind turbine have **low start wind speed**.
3. Original Structure: use disc coreless motor to take place traditional motor makes it less drag
4. Higher Reliability: special structure make it bigger ratio of power to volume, power to weight and have long life of 8 times longer than traditional motor.



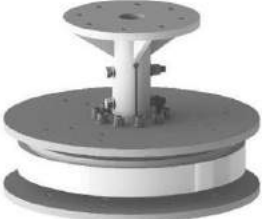
Why choose GV-1KW wind turbine ?

● Simple structure ,1hour installation

1.Parts Name:



2.Product packing list:

No.	Name	Components pictures	Quantity	Packing method
1	Blades	① 	3	Packed in one box
2	Support Arms (Top/Bottom)	②  ③	6	Packed in one box
	Carton (Bolt,Screw etc)		1	
3	Top Flange	④ 	1	Packed in one box
	AC Generator	⑤ 		
	Bottom Flange	⑥ 		
	Tower Flange	⑦ 		
		 Delivery as a whole		

Why choose GV-1KW wind turbine?

● Power Curve Tracking Function

- For off-grid system –Marching MPPT Charge controller
- For on-grid system –Marching MPPT Wind Invertor
- Wind turbine MPPT track point adjustable by yourself
- Off-grid system wind turbine low cut in wind speed charge
- Complete protection function
- Several functions are optional, such as PV control function, wind speed measure function, rotational speed control function and temperature compensation function.
- RS232/RS485/RJ45/GPRS/WIFI/Bluetooth/Zigbee optional. (It can be monitored by app for those with GPRS/WIFI/Bluetooth/RJ45 connection)



MPPT Charge Controller with dump load
(off-grid)



Pure sine wave Invertor
(off-grid)

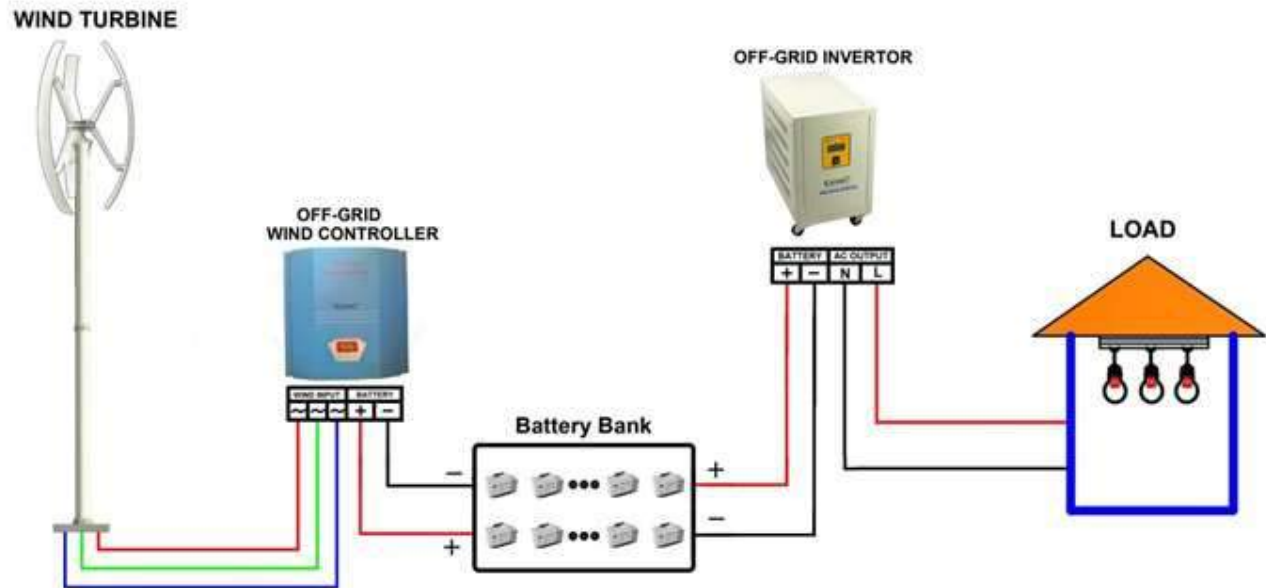


On-grid Controller
On-grid

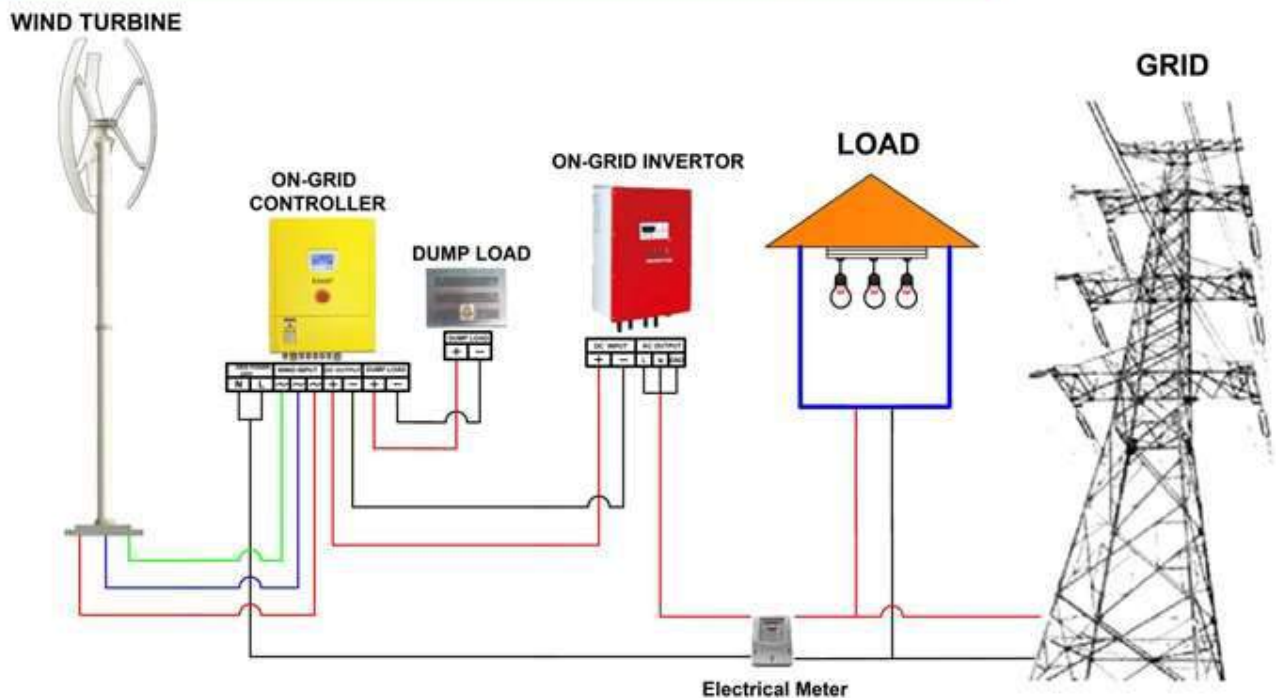


On-grid MPPT Invertor
On-grid

OFF-GRID WIND POWER GENERATOR SYSTEM



ON-GRID WIND POWER GENERATOR SYSTEM





<https://ipsuenergy.com>

Dr. Derek Frezzell Psy.D

President & CEO

derek@ipsuenergy.com

ADD: 8400 N.W.25th Street, Miami, FL USA

TEL: (786) 868-0707

ADD: Costambar, Puerto Plata R.D.

TEL: (829) 537-2308

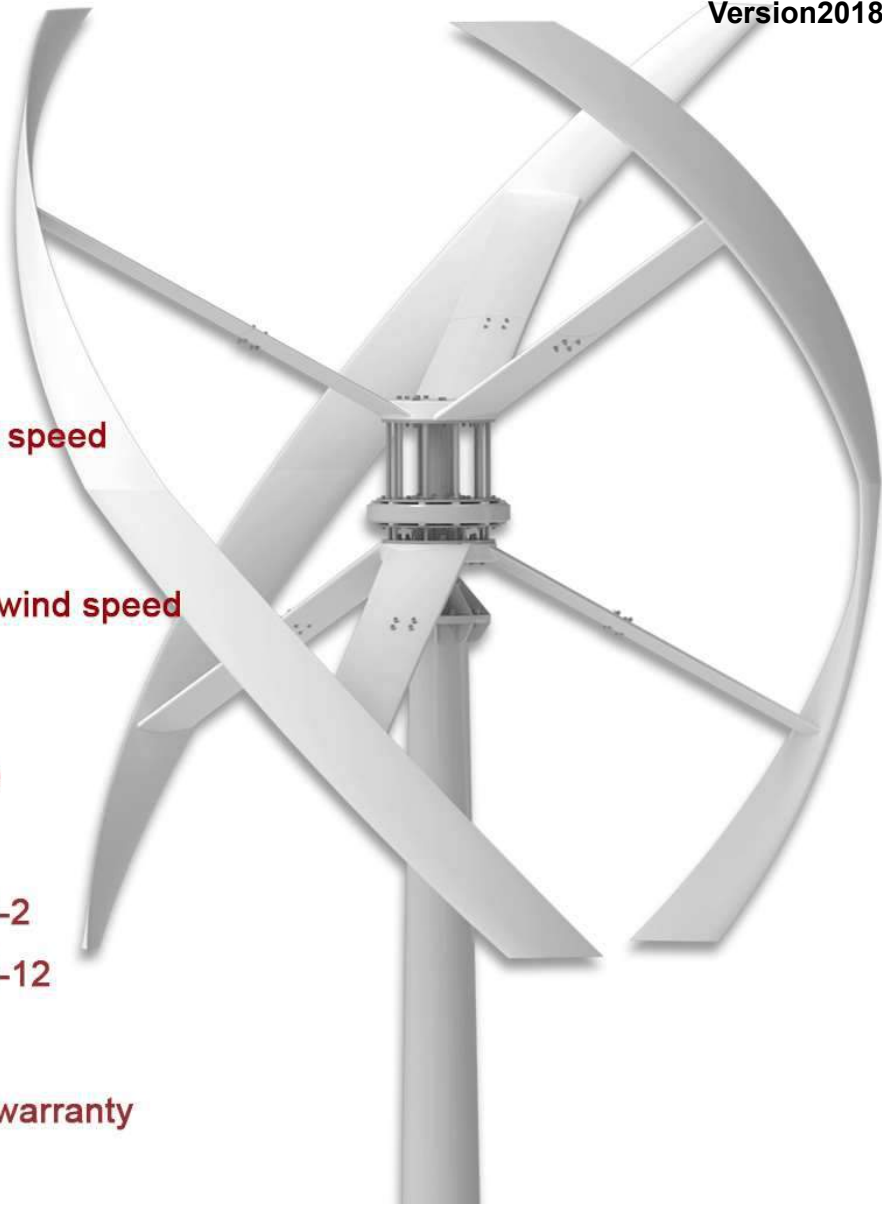


VERTICAL AXIS WIND TURBINE

Products Brochure

Model: GS-5KW

Version 2018.1.2

- 
- 100**
rpm Low rated speed
 - 2.8**
m/s Low start wind speed
 - < 30db** Low noise
 - CE** IEC61400-2
IEC61400-12
 - 3**
years Products warranty

Technical specification

Model	GS-5KW
-------	--------

Performance

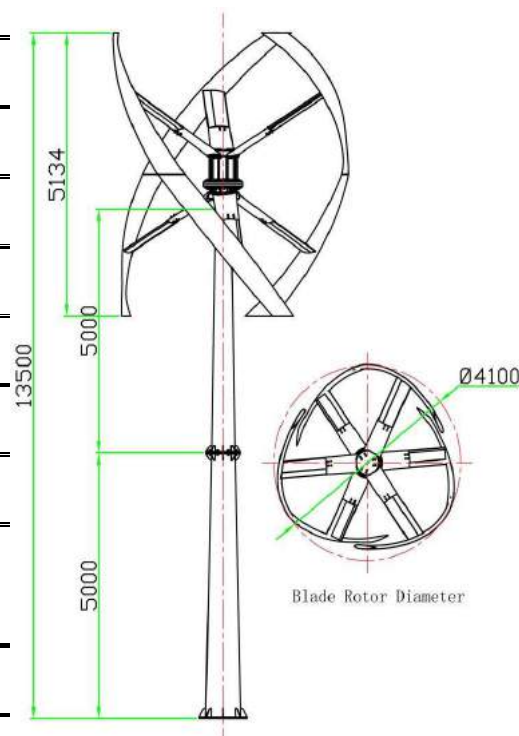
Rated Power	5kW
Max Power	6kW
Start Wind Speed	2.8m/s (6.27mph)
Rated Wind Speed	11m/s(24.64mph)
Working Wind Speed	3-25m/s (6.72-56 mph)
Safety Wind Speed	50m/s(112mph)

Physical Parameters

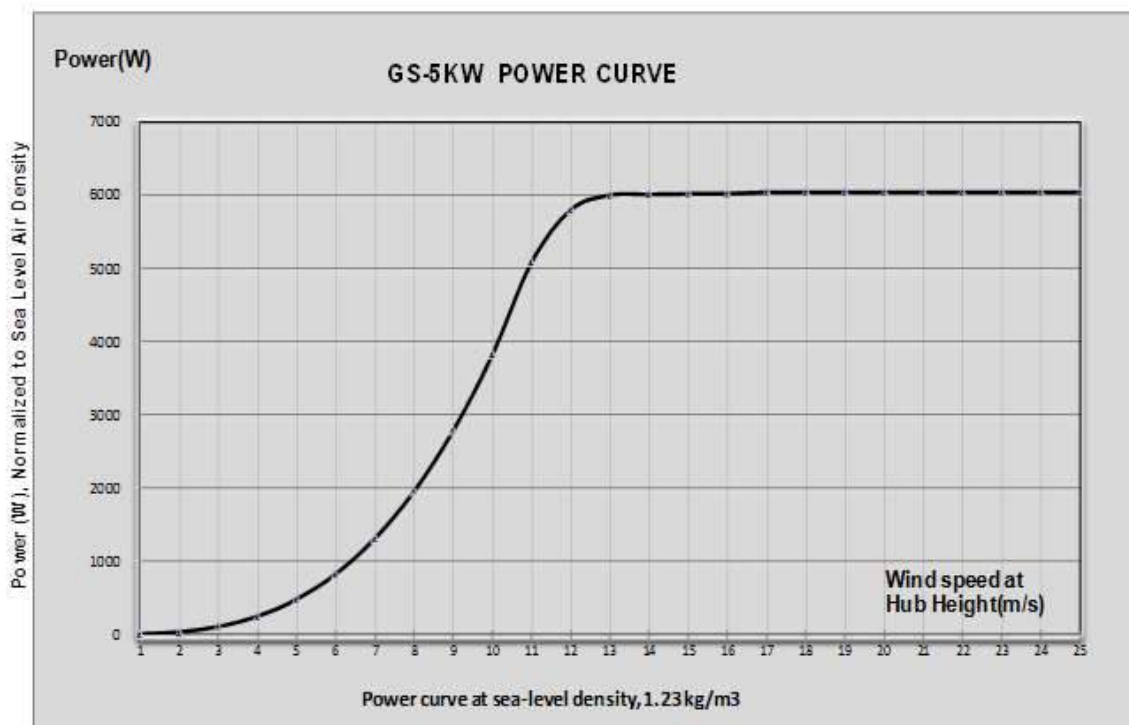
Blades Length	5.2M(17.06ft)
Blades Rotor Diameter	4.0M(13.12ft)
Blades Material /Quantity	FRP /3PCS
Mill Weight	530kg
Swept Area	20.8 m ²
Tower Height	10m(32.8ft.)

Generator Parameters

Generator Type	Axial Flux Coreless outer rotor disc permanent magnet direct drive generator
Rated Speed	100RPM
Start Torque	<1N.M
Option Voltage	48-500V
Protection Method	Electromagnetic Brake +PWM
Protection Grade	IP54
Working Temperature	-40-50℃
Life time	20 Years



Power Curve



Annual Energy Production

Annual Wind Speed(m/s)	3	4	5	6	7	8	9
Production (kWH)	1300	2610	4380	7420	11300	16620	24500
Annual Wind Speed(m/s)	10	11	12	13	14	15	16
Production(kWH)	33250	43800	50300	51800	52500	52500	52500

This data will have $\pm 10\%$ difference according to local condition.

Sound Data

Test position: At 15m away from generator (average value of 3 point-rears, left, right)

Wind Speed (m/s)	3	4	5	6	7	8	9	10	11
Sound(dB)	1.40	3.17	6.46	9.47	14.13	22.60	33.61	37.64	38.12
Wind Speed (m/s)	12	13	14	15	16	17	18	19	20
Sound(dB)	38.90	38.97	39.06	39.12	39.03	39.08	40	43	44

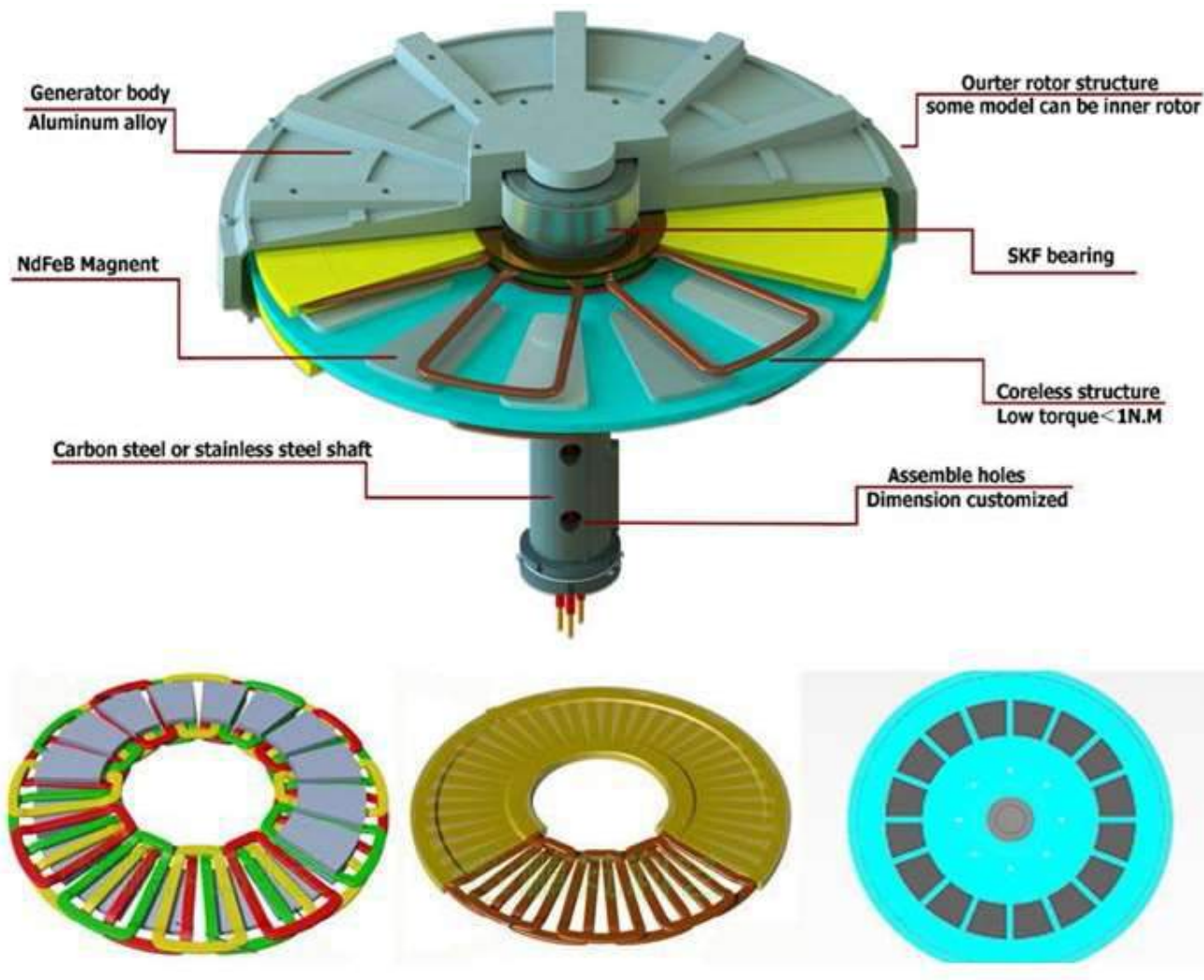
Note: The sound value includes wind noise.

Why choose GS-5KW wind turbine?

● Especial Generator ---- coreless disc generator

Advantage:

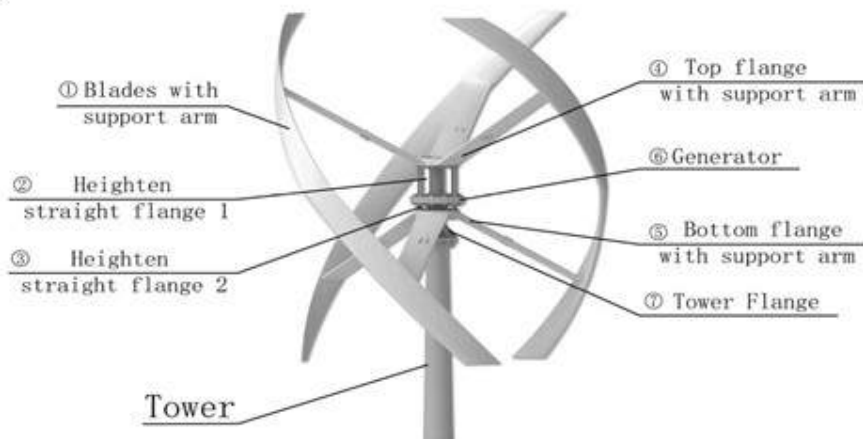
1. Torque Patent Technology: use newest "Precise Coil" technology.
2. No hysteresis and gear notches effect make the start torque very low $<1\text{N.M}$, it can make the wind turbine have **low start wind speed**.
3. Original Structure: use disc coreless motor to take place traditional motor makes it less drag
4. Higher Reliability: special structure make it bigger ratio of power to volume, power to weight and have long life of 8 times longer than traditional motor.



Why choose GS-5KW wind turbine ?

● Simple structure ,2 hour installation

1.Parts Name:



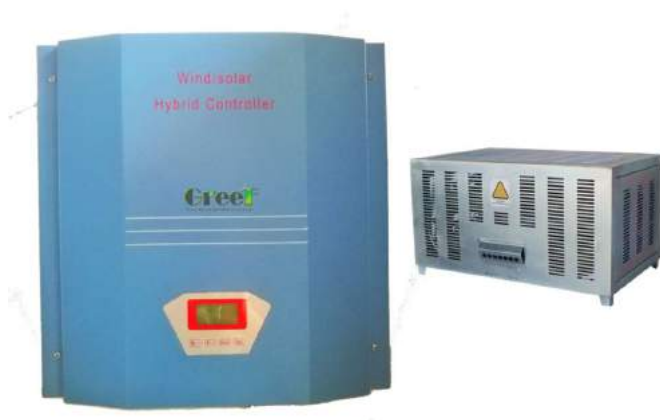
2.Product packing list:

No.	Name	Components pictures	Quantity	Packing method
1	Blades with support arm	①	3	Each blade is wrapped separately
2	Heighten straight flange 1 and 2	② ③	1	Packed in one box
3	Top flange with support arm	④	1	Separate packing
4	Bottom flange with support arm	⑤	1	Separate packing
5	AC Generator	⑥	1	Packed in one box
6	Tower Flange	⑦	1	Packed in one box
	Carton(Bolt,Screw etc)		1	

Why choose GS-5KW wind turbine?

● Power Curve Tracking Function

- For off-grid system –Marching MPPT Charge controller
- For on-grid system –Marching MPPT Wind Invertor
- Wind turbine MPPT track point adjustable by yourself
- Off-grid system wind turbine low cut in wind speed charge
- Complete protection function
- Several functions are optional, such as PV control function, wind speed measure function, rotational speed control function and temperature compensation function.
- RS232/RS485/RJ45/GPRS/WIFI/Bluetooth/Zigbee optional. (It can be monitored by app for those with GPRS/WIFI/Bluetooth/RJ45 connection)



MPPT Charge Controller with dump load
(off-grid)



Pure sine wave Invertor
(off-grid)



On-grid Controller
On-grid

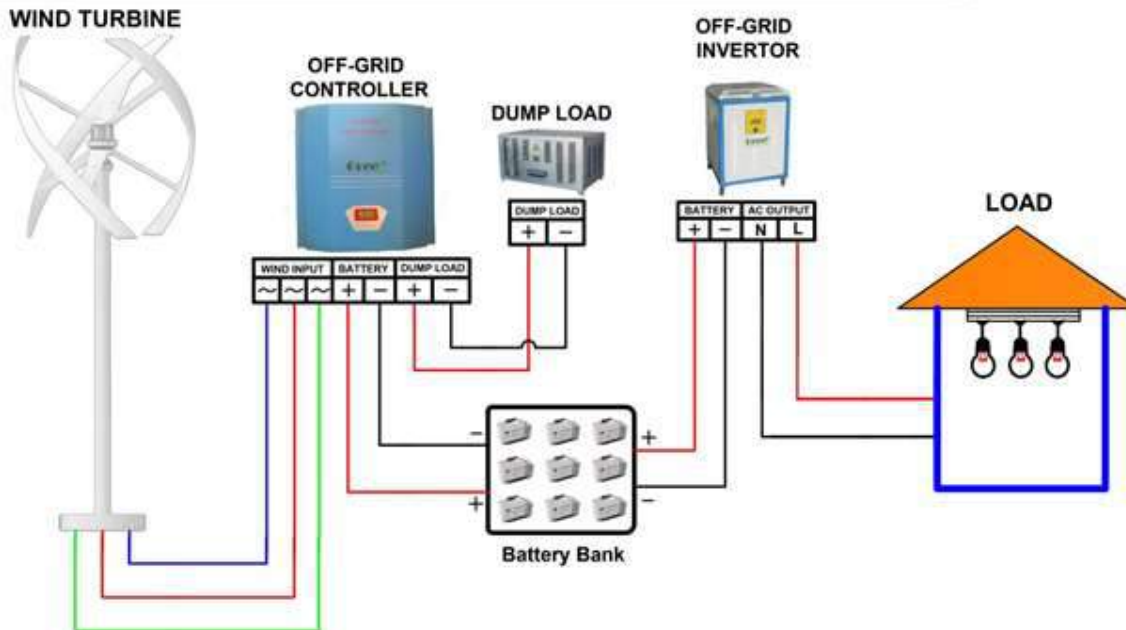


On-grid MPPT Invertor
On-grid

SYSTEM SOLUTION

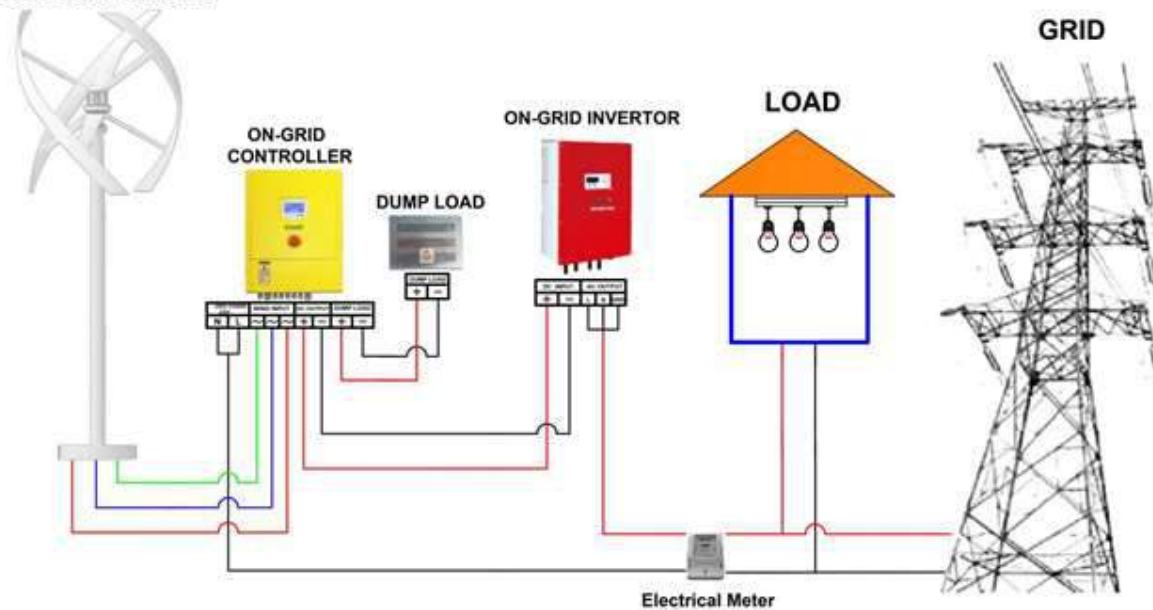
Off-grid system

OFF-GRID WIND POWER GENERATOR SYSTEM



ON-GRID WIND POWER GENERATOR SYSTEM

5KW WIND TURBINE





Dr. Derek Frezzell Psy.D

President & CEO

derek@ipsuenergy.com

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TEL: (786) 868-0707

ADD: Costambar, Puerto Plata R.D.

TEL: (829) 537-2308

<https://ipsuenergy.com>





Features:

- Fuel gas type:
Natural gas, Biogas, LPG
- Genset working condition:
- Digital control system with LCD display
- Maintenance-free battery with isolator switch
- Equipped with an industrial class muffler
- Customization Gas engine, designed for generators
- Genset run at rated power on the conditions:
Atmospheric Pressure: 100kPa, Ambient Temp: 20 °C, Relative Humidity: 30%
- Working conditions: Ambient temperature : 0°C~+40 °C Relative humidity: lower 90%(20° C)

The fuel consumption is calculate base on the natural gas whose heat value is 35.8MJ/Nm³ usual use biogas fuel, Genset power only 80% output

Genset Ratings and Performance Data

Open type	NG-688		
Silent type (Soundproof)	NG-688S		
Engine Brand	GAS ENGINE		
Engine Make & Model:	LYK38G-G550		
Alternator Model:	JET544F Self-		
Excitation Mode	excitation		
Control System:	Digital Panel HGM6120		
Noise Level@7m:	75-85db		
Frequency & Phase:	50Hz / 60Hz & 3 Phase		
Power Factor:	0.8		
Rated speed:/r/min	1500 / 1800 (Optional)		
100% Load Natural gas consumption (m ³ /h)	Prime Output	146	m ³ /h

Standard
ISO 8528



The genset desgin complies with ISO 8528 and GB/T2820-2009

This genset is manufactured pass ISO 9001 certification. The generator is CE certified.

Output Rating: 50Hz / 60Hz

Genset Model	Prime		Standby	
	KVA	KW	KVA	KW
NG-688/S	625	500	688	550

3-phase ratings at 0.8 power factor.

1-phase ratings at 1.0 power factor.

Rated Voltage (V)	Rated Current (A)
380	949.6
400	902.1
415	869.5
440	820.1

Also available in the following voltages: 415/240V-380/220V-

220/127V-200/115V; or other optional voltage;

ESP: Standby: Continuous running at variable load for duration of an emergency. No overload is permitted on these ratings.

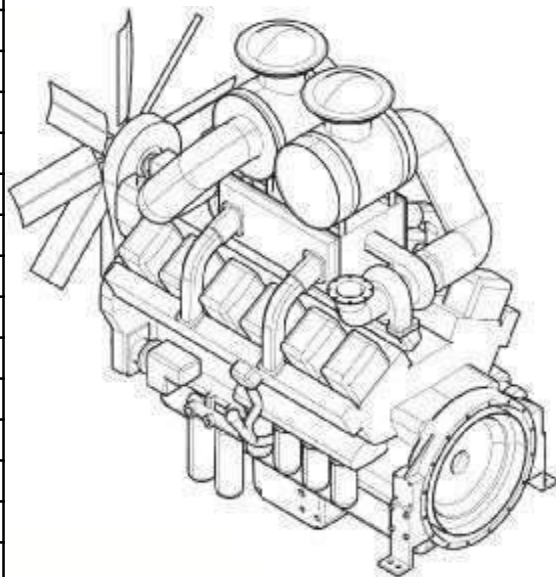
In accordance with ISO 3046 .

PRP: Prime: Continuous running at variable load for unlimited periods with 10% overload available for 1 hour in any 12 hour period.

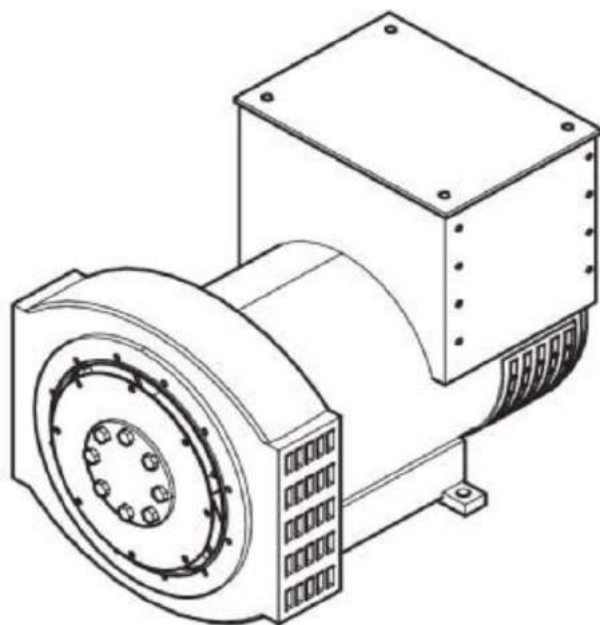
In accordance with ISO 8528, ISO 3046

Engine specific at ion:

Engine Manufacturer/Brand	GAS ENGINE
Model	LYK38G-G550
Continuous Power (KW)	550
Standby Power (KW)	605
Engine Technology	Cummins Technology
Engine type	12 cylinder, V type, Water Cooled
Aspiration	Turbo-charged, Air-air intercooling
Rotating speed	1500 / 1800
rpm	
Engine cooling system	Water Cooled
Starting method	24V DC
Displacement (L)	37.7
Bore×Stroke(mm)	159x159
Compression ratio	11.0 : 1
Type of Fuel	Natural Gas / Biogas
Fuel Consumption (m³/hr) 100% Load	146 m³/hr (Natural gas)
Ignition System (Germany Tech.)	Specialized Gas Ignition System
NG Pressure / Pressure fluctuation	≥ 3 kPa / ≤ 0.2kPa
Impco Mixing Method	Premixing Before Supercharging



Alternator specification:



Alternator manufacturer/Brand	JET POWER
Alternator technology	Stamford Technology
Alternator model	JET544F
Alternator prime power (KW)	536
Alternator prime power (KVA)	670
Voltage V (optional)	120/230/240/380/400/415/440/480
Alternator frequency (Hz)	50/60
Excitation Mode	Brushless with AVR
Cooling fan	Cast alloy aluminum
Windings	100% copper
Insulation class	H Class
Winding pitch	2/3
Connect terminals	12
Drip proof	IP23
Altitude / Ambient temperature	≤ 1000m / ≤ 40℃
Overspeed	2250 RPM
Voltage regulation	±1.0%
Total harmonic	TGH / THCat no load < 1.5 % - on load < 5%
Telephone Interference	THF<2%;TIF<50
	GB755, VDE0530, NEMA ,MG1-

Control System HGM6120

HGM6120 series automatic controller, integrating digital, intelligent and network techniques, is used for automatic control and monitoring system of genset. It can carry out functions of automatic start/stop, data measurement, alarm protection and three “remote” (remote control, remote measure and remote communication). The controller uses LCD display, multi-language display interface including Chinese, English, Spanish, Russian, Portuguese, Turkey, Polish and French with easy and reliable operation.

FEATURES

Microprocessor control, with high stability and credibility
 Monitoring and measuring operational parameters of the mains supply and genset
 Indicating operation status, fault conditions, all parameters and alarms
 Multiple protections; multiple parameters display, like pressure, temp. etc.
 Manual, automatic and remote work mode selectable
 Real time clock for time and date display, overall runtime display, 250 log entries
 Overall power output display
 Integral speed/frequency detecting, telling status of start, rated operation, overspeed etc.
 Communication with PC via RS485 OR RS232 interface, using MODBUS protocol

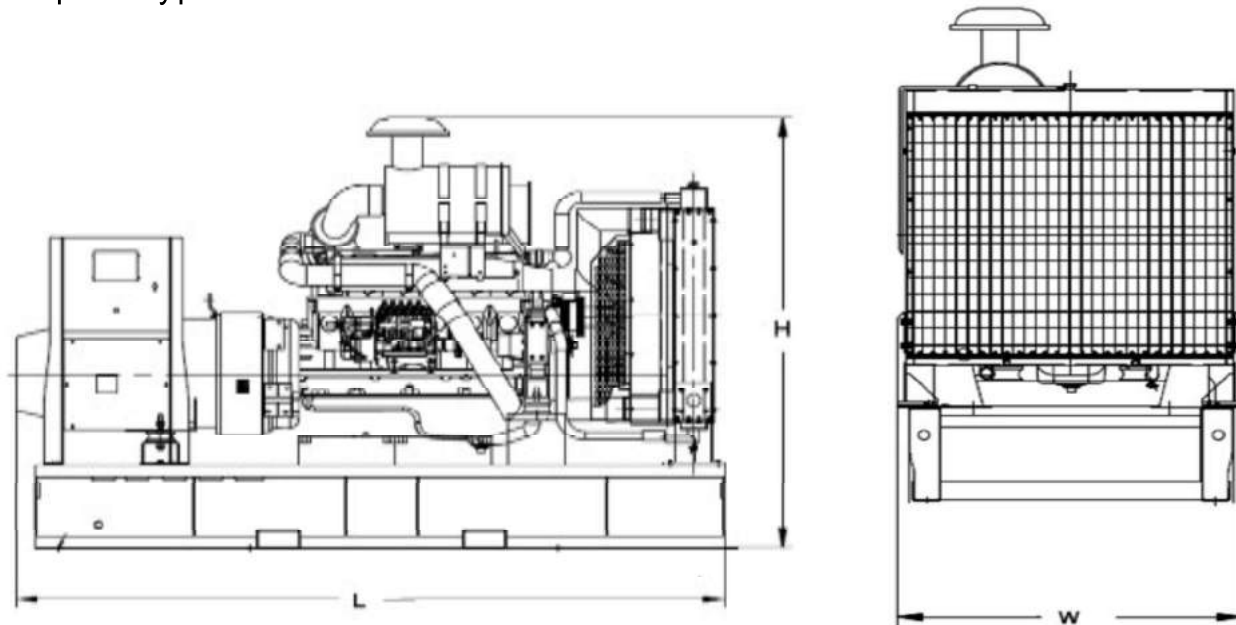


Digital, intelligent control system allows easier operation

- ◆ 132×64 LCD display with backlight, push-button operation
- ◆ Optional language interface (Chinese, English, Spanish, Russian, Portuguese, Turkey, Polish and French)
- ◆ Acrylic screen, improved wearable and scratch resistance property;
- ◆ Silica-gel panel and keys can well adapt to higher and lower temperature;
- ◆ Optional RS485 communication port, can achieve three remote " functions via MODBUS protocol;
- ◆ Adapt to 3P4W, 3P3W, 1P2W and 2P3W (120V/240V), 50Hz/60Hz AC power system;
- ◆ Can measure and display 3 phase voltage, 3 phase current, frequency, power parameter of mains/gens;
- ◆ Mains have functions of over/under voltage and lack of phase; Gens have functions of over/under voltage, over/under frequency and over current;
- ◆ Precision measure and display of parameters about engine;
- ◆ Control protection: Automatic start/stop of genset, load transfer(ATS control) and perfect failure display and protection;
- ◆ With ETS, idle speed control, pre-heat control, speed droop/raising control, all of them are relay output;
- ◆ Parameter setting: Allow user to modify setting and store them in internal FLASH memory. The parameters cannot be lost even when power off. All of parameters can be set not only from the front panel, but also use programmable interface (or RS485 interface) to adjust them via PC.
- ◆ Multi sensors of temperature, pressure and fuel level can be used directly, parameters can be defined by user;
- ◆ Multi conditions of crank disconnect (speed sensor, oil pressure, generator) can be selected;
- ◆ Power supply range: (8~35)VDC, accommodating to different starting battery volts;
- ◆ All parameters use digital modulation, instead of analog modulation using conventional potentiometer, having improved reliability and stability;
- ◆ Add rubber gasket between shell and controller screen, the waterproof can reach IP55;
- ◆ Controller is fixed by metal fixing clips;

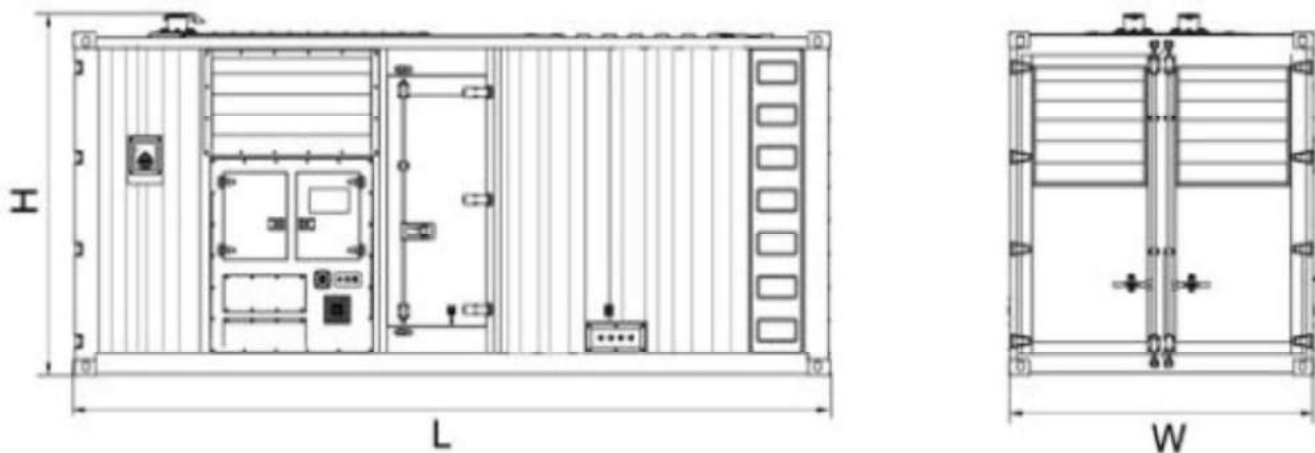
Dimensions and Weights:

Open Type



Genset Model	Length (L) mm	Width (W) mm	Height (H) mm	Weights Kg
NG-688	4500	1850	2300	7300

Silent Type



Genset Model	Length (L) mm	Width (W) mm	Height (H) mm	Weights Kg
NG-688S	6050	2435	2589	9300

Dry = With Lube Oil Wet = With Lube Oil and Coolant

The weights are approximate and without fuel, only for your reference