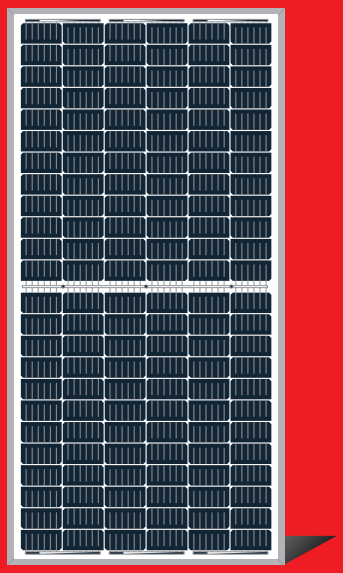
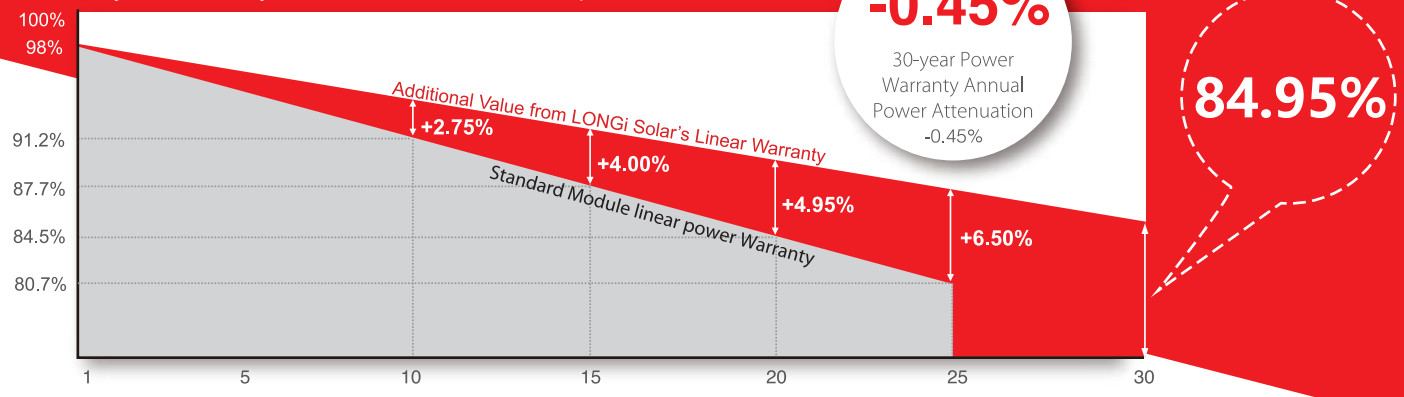
LR4-72HBD
425~455M

Hi-MO 4
NEW

High Efficiency Low LID Bifacial PERC with Half-cut Technology



12-year Warranty for Materials and Processing;
30-year Warranty for Extra Linear Power Output



Complete System and Product Certifications

IEC 61215, IEC 61730, UL 61730

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. LONGi Solar reserves the right of interpretation.

Front side performance equivalent to conventional low LID mono PERC:
- High module conversion efficiency (up to 20.9%)
- Better energy yield with excellent low irradiance performance and temperature coefficient
- First year power degradation <2%

Bifacial technology enables additional energy harvesting from rear side (up to 25%)

Glass/glass lamination ensures 30 year product lifetime, with annual power degradation < 0.45%, 1500V compatible to reduce BOS cost

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

LONGi

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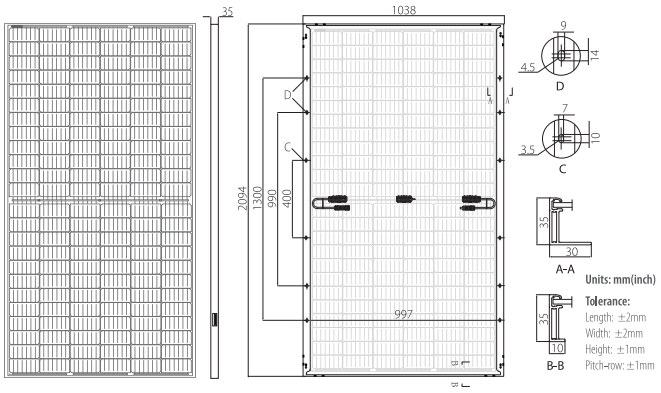
Tel: +86-21-80162606 E-mail: module@longi-silicon.com Facebook: www.facebook.com/LONGi Solar

20200410V11 for US

LR4-72HBD 425~455M

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: Dual glass
2.0mm coated tempered glass
Frame: Anodized aluminum alloy frame
Weight: 27.5kg
Dimension: 2094×1038×35mm
Packaging: 30pcs per pallet
150pcs per 20'GP
660pcs per 40'HC

Operating Parameters

Operational Temperature: -40℃~+85℃
Power Output Tolerance: 0~+5 W
Voc and Isc Tolerance: ±3%
Maximum System Voltage: DC1500V (IEC/UL)
Maximum Series Fuse Rating: 25A
Nominal Operating Cell Temperature: 45±2℃
Safety Class: Class Ⅱ
Fire Rating: UL type 3
Bifaciality: 70±5%

Electrical Characteristics

Test uncertainty for Pmax: ±3%

Model Number	LR4-72HBD-425M		LR4-72HBD-430M		LR4-72HBD-435M		LR4-72HBD-440M		LR4-72HBD-445M		LR4-72HBD-450M		LR4-72HBD-455M	
Testing Condition	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT
Maximum Power (Pmax/W)	425	317.4	430	321.1	435	324.9	440	328.6	445	332.3	450	336.1	455	339.8
Open Circuit Voltage (Voc/V)	48.7	45.6	48.9	45.8	49.1	45.9	49.2	46.0	49.4	46.2	49.6	46.4	49.8	46.6
Short Circuit Current (Isc/A)	11.22	9.06	11.30	9.13	11.36	9.18	11.45	9.25	11.52	9.30	11.58	9.36	11.65	9.41
Voltage at Maximum Power (Vmp/V)	40.4	37.7	40.6	37.9	40.8	38.0	41.0	38.2	41.2	38.4	41.4	38.6	41.6	38.8
Current at Maximum Power (Imp/A)	10.52	8.42	10.60	8.49	10.66	8.54	10.73	8.60	10.80	8.65	10.87	8.70	10.93	8.76
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

Electrical characteristics with different rear side power gain (reference to 445W front)

Pmax /W	Voc/V	Isc /A	Vmp/V	Imp /A	Pmax gain
467	49.4	12.09	41.2	11.34	5%
490	49.4	12.67	41.2	11.88	10%
512	49.5	13.24	41.3	12.42	15%
534	49.5	13.82	41.3	12.96	20%
556	49.5	14.40	41.3	13.50	25%

Temperature Ratings (STC)

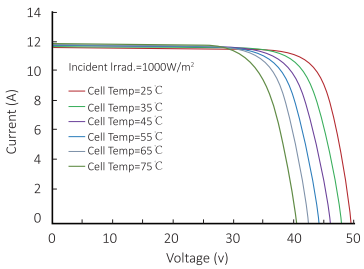
Temperature Coefficient of Isc	+0.050%/℃
Temperature Coefficient of Voc	-0.284%/℃
Temperature Coefficient of Pmax	-0.350%/℃

Mechanical Loading

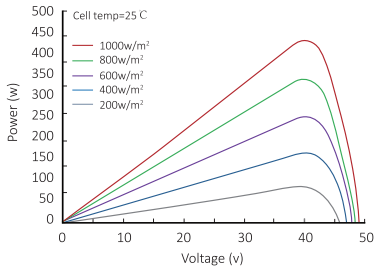
Front Side Maximum Static Loading	5400Pa
Rear Side Maximum Static Loading	2400Pa
Hailstone Test	25mm Hailstone at the speed of 23m/s

I-V Curve

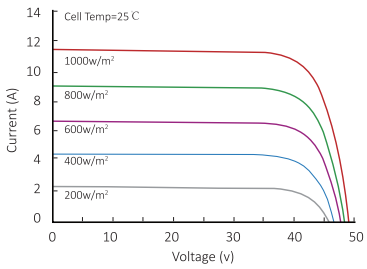
Current-Voltage Curve (LR4-72HBD-440M)



Power-Voltage Curve (LR4-72HBD-440M)



Current-Voltage Curve (LR4-72HBD-440M)



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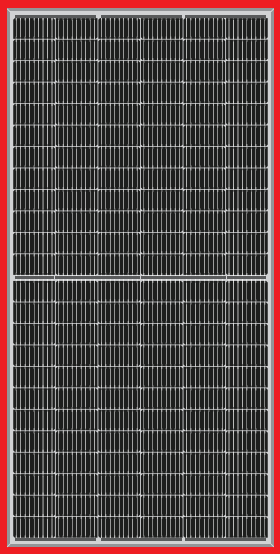
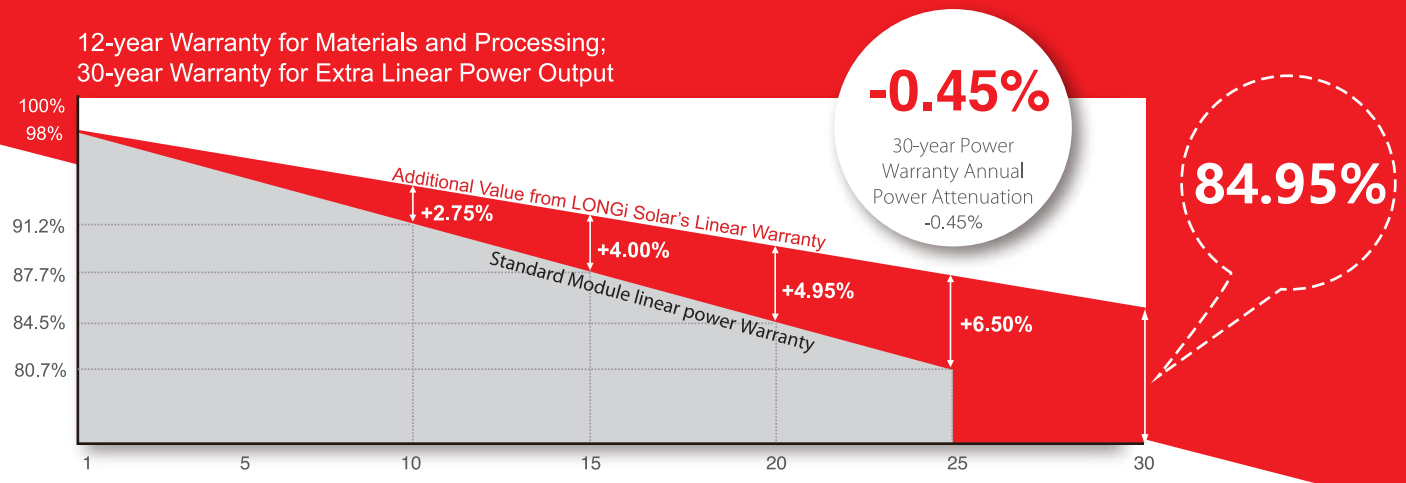
LR5-72HBD
520~540M

Hi-MO 5



High Efficiency Low LID Bifacial PERC with Half-cut Technology

12-year Warranty for Materials and Processing;
30-year Warranty for Extra Linear Power Output



Complete System and Product Certifications

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* Specifications subject to technical changes and tests. LONGi Solar reserves the right of interpretation.

Front side performance equivalent to conventional low LID mono PERC:
- High module conversion efficiency (up to 21.1%)
- Better energy yield with excellent low irradiance performance and temperature coefficient
- First year power degradation <2%

Bifacial technology enables additional energy harvesting from rear side (up to 25%)

Glass/glass lamination ensures 30 year product lifetime, with annual power degradation < 0.45%, 1500V compatible to reduce BOS cost

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

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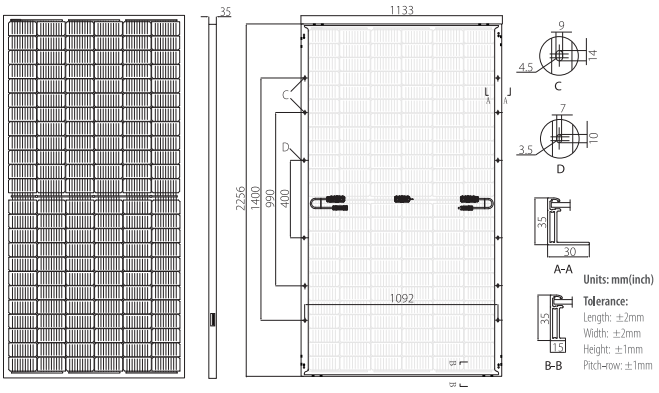
20200708-Draft V03

LR5-72HBD 520~540M

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: Dual glass
2.0mm coated tempered glass
Frame: Anodized aluminum alloy frame
Weight: 32.3kg
Dimension: 2256×1133×35mm
Packaging: 31pcs per pallet
155pcs per 20'GP
620pcs per 40'HC

Operating Parameters

Operational Temperature: -40℃~+85℃
Power Output Tolerance: 0~+5 W
Voc and Isc Tolerance: ±3%
Maximum System Voltage: DC1500V (IEC/UL)
Maximum Series Fuse Rating: 30A
Nominal Operating Cell Temperature: 45±2℃
Safety Protection Class: Class II
Fire Rating: UL type 3
Bifaciality: 70±5%

Electrical Characteristics

Test uncertainty for Pmax: ±3%

Model Number	LR5-72HBD-520M		LR5-72HBD-525M		LR5-72HBD-530M		LR5-72HBD-535M		LR5-72HBD-540M	
Testing Condition	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT
Maximum Power (Pmax/W)	520	388.3	525	392.1	530	395.8	535	399.5	540	403.3
Open Circuit Voltage (Voc/V)	48.90	45.75	49.05	45.89	49.20	46.03	49.35	46.17	49.50	46.31
Short Circuit Current (Isc/A)	13.57	10.97	13.65	11.03	13.71	11.08	13.78	11.14	13.85	11.19
Voltage at Maximum Power (Vmp/V)	41.05	38.27	41.20	38.41	41.35	38.55	41.50	38.69	41.65	38.83
Current at Maximum Power (Imp/A)	12.67	10.15	12.75	10.21	12.82	10.27	12.90	10.33	12.97	10.39
Module Efficiency(%)	20.3		20.5		20.7		20.9		21.1	

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

Electrical characteristics with different rear side power gain (reference to 530W front)

Pmax /W	Voc/V	Isc /A	Vmp/V	Imp /A	Pmax gain
557	49.20	14.40	41.35	13.46	5%
583	49.20	15.08	41.35	14.10	10%
610	49.30	15.77	41.45	14.74	15%
636	49.30	16.46	41.45	15.38	20%
663	49.30	17.14	41.45	16.02	25%

Temperature Ratings (STC)

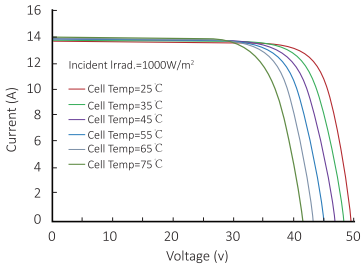
Temperature Coefficient of Isc	+0.050%/℃
Temperature Coefficient of Voc	-0.284%/℃
Temperature Coefficient of Pmax	-0.350%/℃

Mechanical Loading

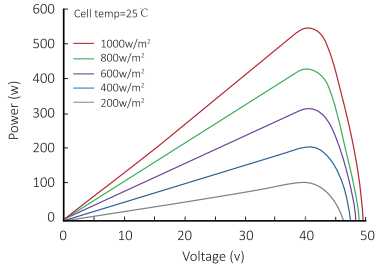
Front Side Maximum Static Loading	5400Pa
Rear Side Maximum Static Loading	2400Pa
Hailstone Test	25mm Hailstone at the speed of 23m/s

I-V Curve

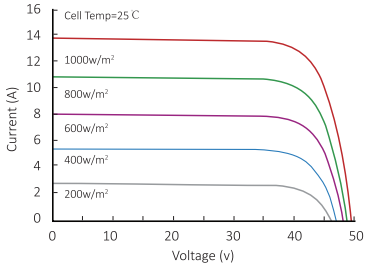
Current-Voltage Curve (LR5-72HBD-530M)



Power-Voltage Curve (LR5-72HBD-530M)



Current-Voltage Curve (LR5-72HBD-530M)



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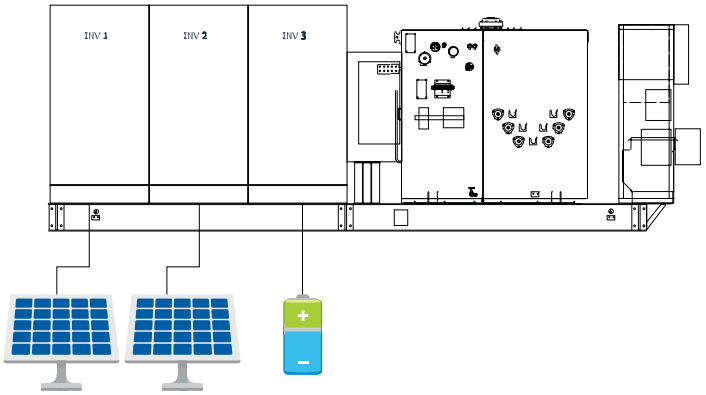
20200708-Draft V03

Solar Ware Ninja™

Multiple Configurations for Maximum Flexibility

TMEIC's Solar Ware Ninja is the latest evolution of the highly successful Solar Ware family of inverters, joining over 14GW of TMEIC's globally installed photovoltaic inverters. Continuing the legacy of high efficiency, cutting-edge features, and unmatched reliability, the new Ninja modular inverter system is the culmination of input from utilities, developers, and technicians.

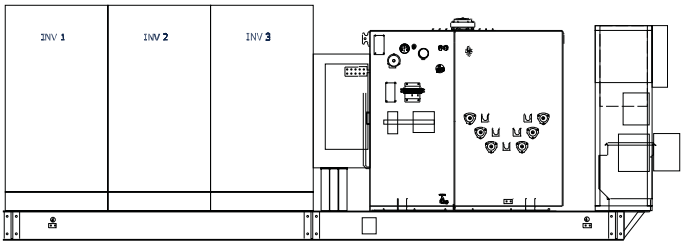
The Ninja is a global product, performing the duties of both generation and energy storage. The modular system introduces multiple layers of flexibility to allow designers an almost unlimited number of options for every project. The advanced controls system is packed with features to meet not only today's smart inverter requirements, but also new requirements as they are introduced. Like the award-winning Samurai series of inverters, the Ninja utilizes the same highly reliable IGBT based power conversion system.



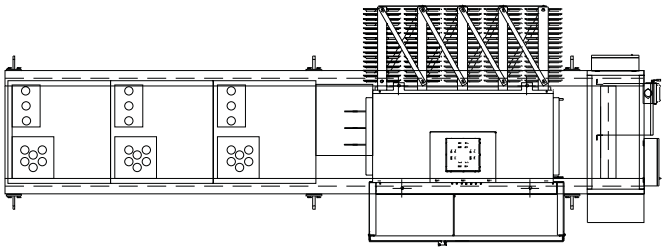
Customizable Block

Up to 6 Ninja units on the same skid. Able to combine PV and ESS inverters in the same lineup. A skid controller will manage output of the Ninja power station.

- Fully Modular design means:
  - Completely independent inverters for increased availability
  - Individual MPPT for greater energy yield
  - Latest generation of Smart Inverter controls platform
  - Multiple output options with various MPPT ranges
- DC Zone monitoring is standard
- UL or IEC certified global design
- PV or Energy Storage (bi-directional)
- Outdoor rated enclosure



SKID SIDE VIEW


PLAN VIEW PRELIMINARY CONCEPT

TMEIC is Bankable

- Stable, with multi billion $USD revenue
- Diversified, with decades of power electronics experience in a variety of heavy industries, including metals, oil & gas, mining, and container cranes industries
- Manufacturing in the US and several other locations

TMEIC is Reliable

- Over 14GW of PV and ESS inverters globally
- Own exclusive use of Mitsubishi Electric's 3 level NPS technology
- Industry leading fleet availability

TMEIC is Support

- Award winning service
- 24/7 US based hot line
- Over 30 years PV inverter manufacturing and R&D experience
- Comprehensive customer training programs
- Authorized Service Provider program available

Solar Ware Ninja™

		PV-PCS			
Type		PVU-L0800GR	PVU-L0840GR	PVU-L0880GR	PVU-L0920GR
Output side (AC)	Rated Power@25°C	800kW	840kW	880kW	920kW
	Rated Power@50°C	730kW	765kW	800kW	840kW
	Rated Voltage	600V +10%, -12%	630V +10%, -12%	660V +10%, -12%	690V +10%, -12%
	Rated Frequency	50Hz / 60Hz (+0.5Hz, -0.7Hz)			
	Rated Power Factor	>0.99			
	Reactive Capability	+/- 421 kVAR	+/- 442 kVAR	+/- 464 kVAR	+/- 485 kVAR
	Rated Current	702 Arms @50 °C			
	Maximum Current	770 Arms @25 °C			
	Maximum Efficiency	98.9% *Tentative			
	CEC Efficiency	98.5% *Tentative			
Input side (DC)	Maximum Voltage	1500 Vdc			
	MPPT Operation Range	875-1300VDC	915-1300VDC	960-1300VDC	1005–1300VDC
Environ. Conditions	Ingress Protection Ratings	IP54 / NEMA3R			
	Installation	Outdoor			
	Ambient Temperature Range	-25° to 50°C			
	Maximum Altitude	>2000 m power derating (Max. 4000m)			
Protective Functions	Input (DC) Side	DC Protection: Fuses Ground Fault, DC Reverse Current, Over Voltage, Over Current			
	Grid (AC) Side	AC Protection: MCCB and Fuse Anti-islanding, Over/Under Voltage, Over/Under Frequency, Over Current			
	Grid Assistance	Reactive/Active Power Control, Power Factor Control, Fault Ride Through (optional)			
Harmonic Distortion of AC Current		≦ 3% THD (at rated power)			
Communication		Modbus/TCP			
Fault Analysis		Fault Event Log, Waveform Acquisition via memory card			
Compliance		UL1741, UL174SA / IEEE1547 / NEC2017 / IEC62109-1,2 / IEC61000-6-2,4 / IEC61727, IEC62116 / IEC61400, BDEW / IEC61683 / IEC60068 *Tentative			
Cooling Method		Forced Air Cooling			
Number of Inputs		Standard 6 inputs for PV (maximum 8 per inverter)			
Standard Control Power Supply		Control Power Supply from Inverter output and Capacitor backup circuit (3 sec. compensation)			
Weight		<1000kgs *Tentative			
Dimensions (H x W x D)		1100 X 1100 X 1900 mm (L x W x H)			
Floor Space		1875.5 sq. in. (1.21 m^2)			
Color		Cabinet: Sand White #Dic583			

WWW.TMEIC.COM

All specifications in this document are subject to change without notice.
For specifications not mentioned here, contact TMEIC
D-6006, Revised March 2019