

# Single-phase Hybrid Inverter

 $\square$  3 kW  $\square$  3.68 kW  $\square$  4 kW  $\square$  4.6 kW  $\square$  5 kW  $\square$  6 kW



- Contents may be periodically updated or revised due to product development. The
  information in this guide is subject to change without notice. In no case shall this guide
  substitute for the user manual or related notes on the device.
- Make sure to read over, fully understand and strictly follow the detailed instructions of the user manual and other related regulations before installing the equipment. The user manual can be downloaded by visiting the website at https://yinergy-solar.com/; or it can be obtained by scanning the QR code on the side of the equipment or the back cover of this guide.
- 3. All installations must be performed by qualified personnel who should have training for installation and commissioning of electrical system, as well as dealing with hazards, have knowledge of the manual and of the local regulations and directives.
- Before installation, check that the package contents are intact and complete compared to the packing list. Contact YINERGY or the distributor in case of any damaged or missing components.
- 5. The cable used must be intact and well insulated. Operation personnel must wear proper personal protective equipment (PPE) all the time.
- Any violation could result in personal death or injury or device damage, and will void the warranty.

**Safety** Make Life Better

The inverter has been designed and tested strictly according to international safety regulations. Read all safety instructions carefully prior to any work and observe them at all times when working on or with the inverter. Incorrect operation or work may cause: Please follow the safety instructions related to the PV strings and the utility grid.

- · Injury or death to the operator or a third party;
- · Damage to the inverter and other properties.

#### **Descriptions of Labels**

Symbol	Description	Symbol	Description
C€	CE Mark.		Grounding point.
	Caution, hot surface.	A	Caution, risk of electric shock.
<u>^</u>	Caution, risk of danger.		Read the enclosed documentations.
\	Do not dispose of the invertor		Danger of high voltage.
	Do not dispose of the inverter together with household waste.	<b>A</b> C; ₅	Do not touch live parts for 5 minutes after disconnection from the power sources.



#### **DANGER!**

#### Lethal danger from electrical shock due to the inverter

- Only operate the inverter when it is technically faultless. Otherwise, electric shock or fire may occur.
- Do not open the enclosure in any case without authorization from YINERGY.
   Unauthorized opening will void the warranty and cause lethal danger or serious injury due to electric shock.



#### **DANGER!**

#### Lethal danger from electrical shock due to the PV

- When exposed to sunlight, high DC voltage will be generated by PV modules. Death or lethal injuries will occur due to electric shock.
- Never touch the positive or negative pole of PV connecting device. Touching both of them at the same time is prohibited as well.
- Do not ground the positive or negative pole of the PV modules.
- · Only qualified personnel can perform the wiring of the PV panels.



#### **WARNING!**

#### Risk of personnel injury or inverter damage

- During operation, do not touch any parts other than DC switch and LED panel of the inverter.
- · Never connect or disconnect the AC and DC connectors when the inverter is running.
- Turn off the AC and DC power and disconnect them from the inverter, wait for 5 minutes
  to fully discharge the voltage before attempting any maintenance, cleaning or working
  on any circuits connected.
- Make sure that the input DC voltage ≤ Maximum DC input voltage of the inverter.
   Overvoltage may cause permanent damage to the inverter, which is NOT covered by the warranty.



#### **CAUTION!**

- · Keep children away from the inverter.
- Pay attention to the weight of the inverter. Personal injuries may be caused if not handled properly.

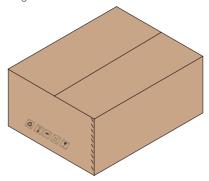
## (i) NOTICE

· All the product labels and nameplate on the inverter shall be maintained clearly visible.

If the inverter is not put into use immediately, the transportation and storage requirements needs to be met:

#### Transportation

- Observe the caution signs on the packaging of inverter before transportation.
- Pay attention to the weight of the inverter. Carry the inverters by the required number of personnel as specified by local regulations. (net weight of Single-phase Hybrid Inverter: 27 kg)
- Wear protective gloves when carrying the equipment by hand to prevent injuries.
- When lifting up the inverter, hold the bottom position of the carton. Keep the inverter horizontal in case of falling down.

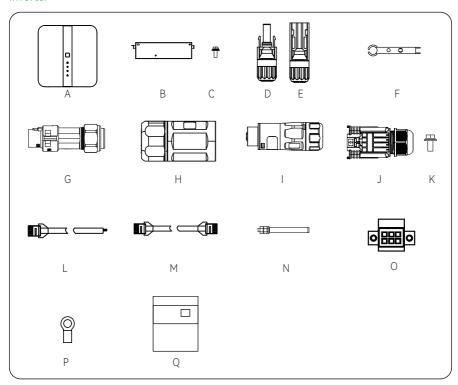


#### Storage

- · The inverter must be stored indoors.
- Do not remove the original packaging material and check the outer packaging material regularly.
- The storage temperature should be between -40 °C and +70 °C. The relative humidity should be between 0%RH and 100%RH.
- Stack the inverter in accordance with the caution signs on the inverter carton to prevent their falling down and device damage. Do not place it upside down.

## Packing Lists

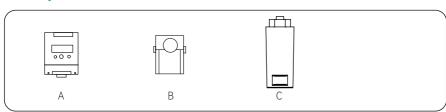
### Inverter



Item	Description	Quantity
А	Inverter	1 pc
В	Bracket	1 pc
С	M4 Setscrew	2 pcs
D	Positive PV Connector	2 pcs
Е	Negative PV Connector	2 pcs
F	PV Disassembly Tool	2 pcs
G	Grid Connector	1 pc
Н	RJ45 Connector	2 pcs

Item	Description	Quantity
I	Backup Connector	1 pc
J	BAT Connector	1 pc
K	M8 Setscrew	2 pcs
L	Meter Network Cable	1 pc
М	Battery Network Cable	1 pc
N	M6 Expansion Screws	3 pcs
0	Plug Flange	1 pc
Р	BAT Terminals	2 pcs
Q	Documents	/

### Accessory Box



Item	Description	Quantity
А	Smart Meter	1 pc
В	СТ	1 pc
С	DTS, Optional (Wi-Fi, Ethernet, 4G)	1 pc

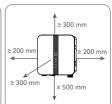
## **Installation Environment**

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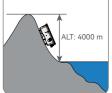












## **Installation Angle**

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Goggles



Safety shoes



Safety gloves



Dust mask



RJ45 crimping tool



Diagonal pliers



Wire stripper



Hammer drill





Vacuum cleaner





Level



Heat shrink tube



Cable tie



Rubber hammer



















No.	Cable	Туре	Outer Diameter	Cross Section
1	PV cable	Outdoor multi-core copper wire cable	4.5~7.8 mm	4~6 mm²
ı	r v cable	Complying with ≥600 V and 30 A standard	4.5*7.0 111111	4-011111
2	Battery cable	Complying with 48 V and 125 A standard	9.5~12.5 mm	20~35 mm²
	Communication	Shielded twisted pair	4.5~6 mm	2×(0.5~1.0) mm²
3	cable	CAT 5E outdoor shielded network cable	4.5~6 mm	8×0.2 mm²
4	AC cable *	Grid	13~22 mm	6~10 mm²
4	4 AC Cable	Backup	10-12 mm	4~6 mm²
5	Additional grounding cable *	Outdoor single-core copper wire cable	The same as that o	of the PE wire in the



### **NOTE**

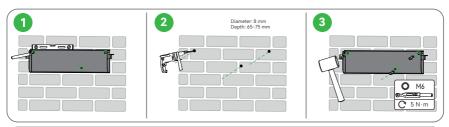
\* If local regulations have other requirements for cables, set the cable specification according to the local regulations.

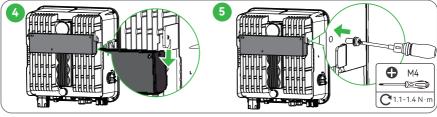
The factors that affect cable selection include rated current, cable type, routing mode, ambient temperature, and maximum expected line loss.

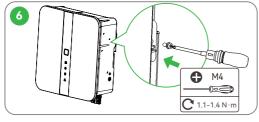
The cabling distance between the battery and the inverter should be less than 10 m. and within 5 m is recommended.

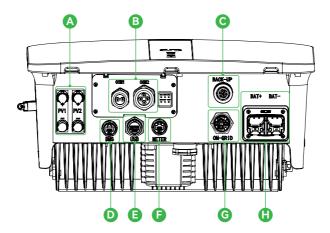
## **Mechnical Mounting**

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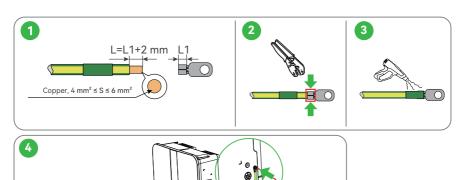




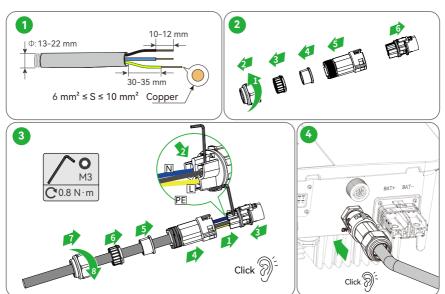
- A PV connection terminal
- **B** Communication terminal
- **C** Back-up terminal
- BMS terminal
- USB terminal
- Meter terminal
- G Grid connection terminal
- Battery connection terminal

## **Grounding Connections**

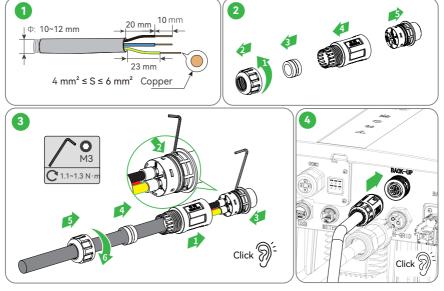
**⊕** M5 1.5~2 N·m Make Life Better



#### On Grid

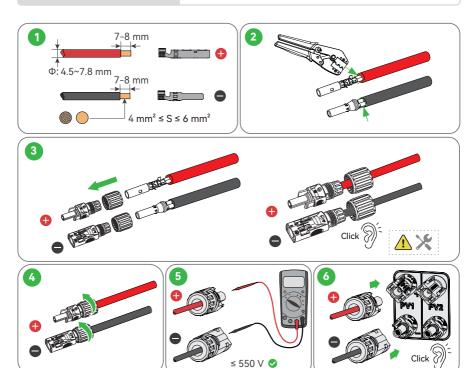


#### Off Grid



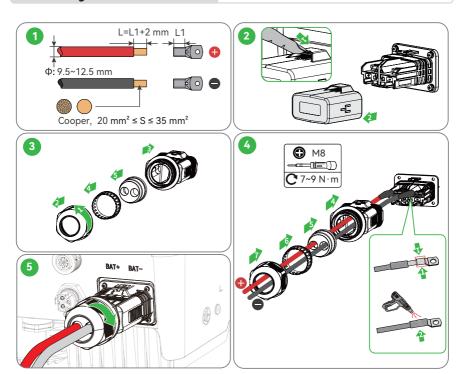
## **PV Connections**

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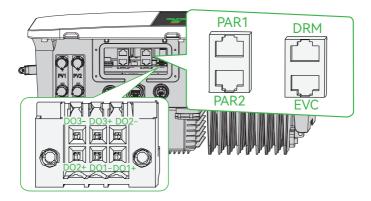
## **Battery Connections**

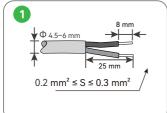
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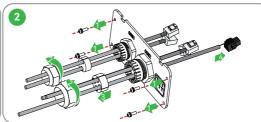


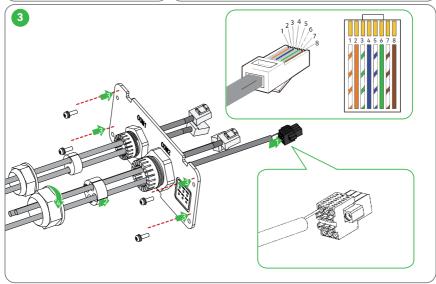
## **Communication Connections**

#### **COM2 Connection**





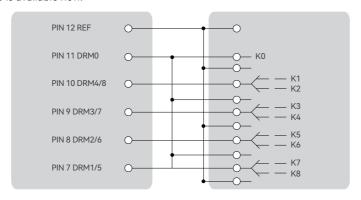




#### **DRM Connection**

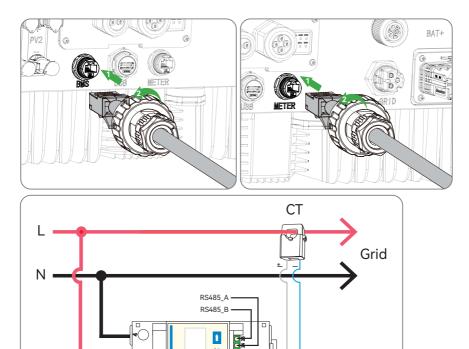
According to AS/NZS 4777.2, the inverter needs to support the function of demand response mode (DRM). With the use of an external control box, active or reactive power regulation can be realized in a timely and fast manner, and the inverter can be operated stably during the process of regulation.

#### DRM 0~8 is available now.



DRM Command	Switch	Function
DRM_MODE_0	K0	Power off
DRM_MODE_1	K7	No input power
DRM_MODE_2	K6	Input power less than 50% of rated power
DRM_MODE_3	K3	Input power less than 75% of rated power, release of maximum reactive power
DRM_MODE_5	K8	No output power
DRM_MODE_6	K5	Output power less than 50% of rated power
DRM_MODE_7	K4	Output power less than 75% of rated power, maximum reactive power absorption
DRM_MODE_1&2	K6, K7	Input power drops to 0 while not going off-grid
DRM_MODE_2&3	K3, K6	Input power less than 50% of rated power, release of maximum reactive power
DRM_MODE_5&6	K8, K5	Output power drops to 0 while not going off-grid
DRM_MODE_6&7	K5, K4	Output power less than 50% of rated power, maximum reactive power absorption
		· · · · · · · · · · · · · · · · · · ·

### BMS, Smart Meter and CT Connection



### (i) NOTICE

CT's arrow pointing to grid.

Terminal	Connector	PIN No.	PIN
		1	TEMP+
	_	2	NC
		3	TEMP-
BMS	RJ45 -	4	CAN_H
DIMO	K345 -	5	CAN_L
		6	NC
	_	7	RS485_A
	_	8	RS485_B

Meter

		1	NC
		2	NC
		3	NC
Matau	Meter RJ45	4	485A
Meter		5	485B
		6	NC
		7	NC
		8	NC

### **Check before Power On**

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Serial	Checklist
1	The inverter installed firmly that easily for operation and maintenance.
2	All lines, including PE, PV, Battery, AC and communication, are connected correctly and firmly.
3	The cable bundling complies with the wiring requirements, is properly distributed, and free from damage.
4	Ensure that a waterproof cover is installed for unused wire holes.
5	Ensure that the used wire holes have been sealed.
6	Verify that the voltage and frequency of installed location meet the grid-tied requirement.

### **Power On**

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Before turning on the AC switch between the inverter and the grid, use a multimeter to check that the AC voltage is within the allowed range.

- Step 1: Turn on the AC circuit breaker on the ON-GRID side of the inverter.
- **Step 2:** Turn on the AC circuit breaker on the BACK-UP side of the inverter.
- **Step 3:** Turn on the energy storage circuit breaker between the inverter and the battery.
- Step 4: Turn on the DC switch of the inverter.

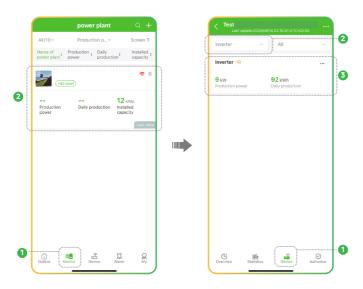
## (i) NOTICE

Please set the inverter parameters first via YiCloud app to ensure its normal operation. For details, please refer to **Set Parameters via YiCloud**.

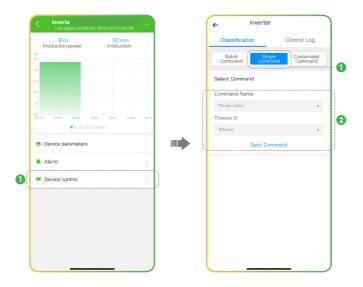
- **Step 5:** Send a system check command on the APP (optional).
- **Step 6:** Observe the LEDs to check the inverter operating status.

#### Set Parameters via YiCloud

- Step 1: Log in to the YiCloud app. On the Monitor screen, find your own power plant.
- **Step 2:** Select **Device**, choose **Inverter** in the drop-down list. Find your inverter in the table.



Step 3: Select certain Inverter, then Device Control > Single Command. The Command name is displayed.

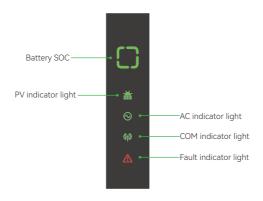


## **Step 4:** Select **Set Power Grid**, and select the corresponding Country's name or Country Code.

You can also **Set Battery Type** and **Set EMS Energy Management Mode** through selecting the corresponding commands in the list, and then set the **Inputs**.



Step 5: Click Send Command.



Item	Status		Description
<i>ه</i> ـه		Always on	PV is generating power
		Blink 1	PV power is low (≤30% rated power)
ΓV		Off	PV is not working
		Always on	Grid is active and connected
		Blink 1	Grid is disconnected but EPS is on
AC		Off	Grid is disconnected and EPS is off
		Always on	Both BMS and meter communication are OK
		Blink 1	Communication of BMS is OK; meter fails
COM		Blink 2	Communication of meter is OK; BMS fails
		Off	Both BMS and meter communications are fails
•		Always on	A fault has occurred
		Blink 1	RCM or IRD fault
FAULI		Off	No fault

Item	Status		Description
	$\Box$	Always on	Battery SOC is 75%~100%
		3/4 on	Battery SOC is 50%~75%
لگ		2/4 on	Battery SOC is 25%~50%
SOC		1/4 on	Battery SOC is 10%~25%
	00	1/4 blink 1	Battery SOC is below 10%
	$\Box$	Full off	Battery is disconnected / not active

## (i) NOTICE

• Blink 1 means on for 0.5 s and then off for 0.5 s, blink 2 means on for 0.5 s and then off for 1 s.

YiCloud provides customers with a platform that can monitor Yinergy inverter data and set it remotely. You can log in to your user account at any time through a personal computer, IOS or Android device to view real-time monitoring data or historical data, and perform remote settings as needed.

#### Operation on YiCloud Web

Open a browser and enter globalhome.yienergy.com to complete registration, login, add sites and other related operations according to the guidelines of user guide.



#### Downloading and Installing App

Select and scan the QR code below to download YiCloud APP. In addition, you can search with the key word YiCloud in Apple Store or Google Play to download it.



Android & IOS

### **Decommissioning the Product**

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#### Power-off



#### DANGER!

- While operating and maintaining the inverter, please turn it off for processing. Operating
  the equipment with power may cause damage to the inverter or cause a risk of electric
  shock
- After the inverter is powered off, it will take a certain amount of time for internal components to discharge. Please wait until the equipment is fully discharged according to the required label time requirements. Do not connect one PV array to multiple inverter, it may cause damage of inverter.
- Step 1: Send a shutdown command on the App.
- Step 2: Turn off the AC circuit breaker on the ON-GRID side of the inverter.
- Step 3: Turn off the AC circuit breaker on the BACK-UP side of the inverter.
- **Step 4:** Turn off the energy storage circuit breaker between the inverter and the battery.
- **Step 5**: Turn off the DC switch of the inverter.

#### Disconnecting the Inverter from Voltage Sources

Prior to performing any work on the product, always disconnect it from all voltage sources as described in this section. Always adhere to the prescribed sequence.

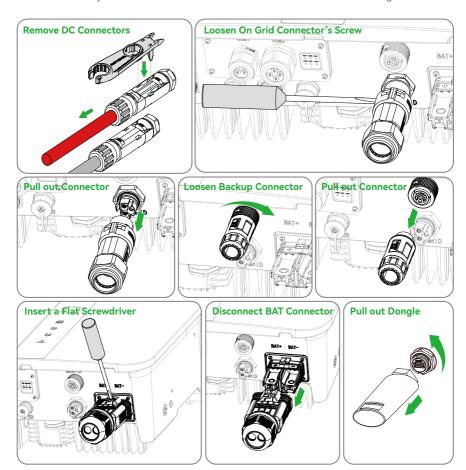


#### **WARNING!**

- Danger to life due to electric shock from destruction of the measuring device due to overvoltage!
- Overvoltage can damage a measuring device and result in voltage being present in the
  enclosure of the measuring device. Touching the live enclosure of the measuring device
  results in death or lethal injuries due to electric shock.
- Only use measuring devices with a DC input voltage range of 1100 V or higher.
- **Step 1:** Disconnect the miniature circuit breaker and secure against reconnection.
- **Step 2:** Disconnect the DC switch and secure against reconnection.
- Step 3: Wait until the LEDs have gone out.
- Step 4: Use a current clamp meter to ensure that no current is present in the DC cables.

## **DANGER!**

- Danger to life due to electric shock when touching exposed DC conductors or DC plug contacts if the DC connectors are damaged or loose!
- The DC connectors can break or become damaged, become free of the DC cables, or no longer be connected correctly if the DC connectors are released and disconnected incorrectly. This can result in the DC conductors or DC plug contacts being exposed. Touching live DC conductors or DC plug connectors will result in death or serious injury due to electric shock.
- Wear insulated gloves and use insulated tools when working on the DC connectors.
- Ensure that the DC connectors are in perfect condition and that none of the DC conductors or DC plug contacts are exposed.
- · Carefully release and remove the connectors as described in the following.



Maintenance

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Regular maintenance is required for the inverter. The table below lists the operational maintenance for expressing the optimum device performance. More frequent maintenance service is needed in the worse work environment. Please make records of the maintenance.



#### **WARNING!**

- Only qualified person can perform the maintenance for the inverter.
- Only use the spare parts and accessories approved by Yinergy for maintenance.

Maintaining Item	Maintaining Method	Maintaining Period
System Clean	Check the heat sink, air intake, and air outlet for foreign matter or dust.	Once 6-12 months
Electrical Connection	Check whether the cables are securely connected. Check whether the cables are broken or whether there is any exposed copper core.	Once 6-12 months
Sealing	Check whether all the terminals and ports are properly sealed. Reseal the cable hole if it is not sealed or too big.	Once a year
General status of	Check if there is any damage on the inverter.	
inverter	Check if there is any abnormal sound when the inverter is running.	Once 6 months

## **Technical Data**

### PV Input

Model	HI-1P3K-L-Y1	HI-1P3.68K-L-Y1	HI-1P4K-L-Y1	HI-1P4.6K-L-Y1	HI-1P5K-L-Y1	HI-1P6K-L-Y1
Max. Input Power [W]	4500	5500	6000	7000	7500	9000
Max. Input Voltage [V]			5	50		
Rated Input Voltage [V]			3	60		
Start-up Input Voltage [V]		90				
MPPT Operating Voltage Range [V]		90 - 520				
Max. Input Current [A]				16		
Max. Short-circuit Current [A]			:	23		
Max. Backfeed Current to Array [A]		0				
No. of MPP Trackers	1	1 2 2 2 2 2				
No. of Strings per MPP Tracker		1				

#### · AC Output (On Grid)

Model	HI-1P3K-L-Y1	HI-1P3.68K-L-Y1	HI-1P4K-L-Y1	HI-1P4.6K-L-Y1	HI-1P5K-L-Y1	HI-1P6K-L-Y1	
Rated Output Power [W]	3000	3680	4000	4600	5000	6000	
Rated Output Apparent Power [VA]	3000	3680	4000	4600	5000	6000	
Max. Output Apparent Power [VA]	3300	4048	4400	5060*	5500	6600	
Rated Output Current [A]	13	16	17.4	20	21.7	26.1	
Max. Output Current [A]	15	15 18.4** 20 22.8 25 30					
Power Factor		~1 (A	djustable from 0.8	B leading t o 0.8 lags	ging)		
Total Harmonic Distortion, THDi			<	3%			
Max. Output Fault Current [A]		90 @ 3 μs					
Max. Output Overcurrent Protection [A]			8	31			

st The value is 4600 under the grid regulation of Germany.

#### · AC Input (On Grid)

Model	HI-1P3K-L-Y1	HI-1P3.68K-L-Y1	HI-1P4K-L-Y1	HI-1P4.6K-L-Y1	HI-1P5K-L-Y1	HI-1P6K-L-Y1
Max. Input Apparent Power [VA]	6000	7300	8000	9200	10000	10000
Rated Grid Voltage [V]	L/N/PE, 220/230/240					
Rated Grid Frequency [Hz]		50 / 60				
Current (Inrush) [A]	90 @ 3 μs					
Max. Input Current [A]	27.3	33.2	36.4	41.9	45.5	45.5

#### Battery

Model	HI-1P3K-L-Y1	HI-1P3.68K-L-Y1	HI-1P4K-L-Y1	HI-1P4.6K-L-Y1	HI-1P5K-L-Y1	HI-1P6K-L-Y1	
Battery Type		Li-ion / Lead-acid					
Battery Voltage Range [V]			40	- 60			
Max. Charge / Discharge Current [A]	75	75	100	100	125	125	
Rated Power [W]	3000	3680	4000	4600	5000	6000	
Communication Interface	CAN, RS485						

#### • Backup Output (Off Grid)

Model	HI-1P3K-L-Y1	HI-1P3.68K-L-Y1	HI-1P4K-L-Y1	HI-1P4.6K-L-Y1	HI-1P5K-L-Y1	HI-1P6K-L-Y1
Rated Output Power [W]	3000	3680	4000	4600	5000	6000
Peak Output Apparent Power, 10s [VA]	6000	7300	8000	9200	10000	10000
Switch Time [ms]	< 10					
Rated Grid Voltage [V]	L/N/PE, 220/230/240					

<sup>\*\*</sup> The value limit in the United Kingdom is set to 16 A.

Model	HI-1P3K-L-Y1 HI-1P3.68K-L-Y1 HI-1P4K-L-Y1 HI-1P4.6K-L-Y1 HI-1P5K-L-Y1 HI-1P6K-L-Y1					
Rated Grid Frequency [Hz]		50 / 60				
Max. Output Current [A]	15	16.8	20	22.8	25	30
Total Harmonic Distortion, THDv			< 3% (Lir	near load)		
Max. Output Fault Current (Peak and Duration) [A]		90 @ 3 μs				
Inrush Current (Peak and Duration) [A]		90 @ 3 μs				
Max. Output Overcurrent Protection [A]			8	31		

### • Efficiency

Model	HI-1P3K-L-Y1	HI-1P3.68K-L-Y1	HI-1P4K-L-Y1	HI-1P4.6K-L-Y1	HI-1P5K-L-Y1	HI-1P6K-L-Y1
Max. Efficiency	98.0%					
Euro Weighted Efficiency		97.4%				
Max. Battery Discharge Efficiency		95.5%				

#### Protection & Feature

Model	HI-1P3K-L-Y1	HI-1P3.68K-L-Y1	HI-1P4K-L-Y1	HI-1P4.6K-L-Y1	HI-1P5K-L-Y1	HI-1P6K-L-Y1	
DC Reverse Polarity Protection			Υ	es es			
PV String Current Monitoring			Υ	es es			
Insulation Resistor Monitoring			Υ	es es			
Residual Current Monitoring			Υ	'es			
Anti-islanding Protection			Υ	es es			
Method of Active Anti-islanding			Freque	ncy Shift			
AC Overcurrent Protection			Υ	'es			
AC Short-circuit Protection			Υ	es es			
AC Overvoltage Protection			Υ	es es			
Overvoltage Category			DC II	/ AC III			
DC Switch		Yes					
Pollution Degree							
Surge Protection Device, SPD		DC Type II / AC Type II					
Rapid Shutdown, RSD			Opt	tional			

#### · General Data

Model	HI-1P3K-L-Y1	HI-1P3.68K-L-Y1	HI-1P4K-L-Y1	HI-1P4.6K-L-Y1	HI-1P5K-L-Y1	HI-1P6K-L-Y1	
Dimensions (W x H x D Bare Machine) [mm]	461 x 482 x 208						
Net Weight [kg]			:	27			
Installation			Wall-n	nounted			
Operation Temperature [°C]			-25 ~ +60 (>	· 45 Derating)			
Operation Humidity			0~95% RH, N	lo Condensing			
Protection Degree			IF	<sup>2</sup> 66			
Max. Operating Altitude [m]			4000 (> 20	00 Derating)			
Cooling Method			Natural (	Convection			
Noise Emission [dB]			<	40			
Topology	Non-isolated						
Display	LED Indicators; Integrated Wi-Fi / 4G + APP						
Signal Input and Output	DRM, 1 × DI, 3 × DO						
Standby Consumption [W]				: 5			

### • Standard Compliance

Model	HI-1P3K-L-Y1	HI-1P3.68K-L-Y1	HI-1P4K-L-Y1	HI-1P4.6K-L-Y1	HI-1P5K-L-Y1	HI-1P6K-L-Y1
Grid Regulation		EN 50549-10, 1	VDE-AR-N 4105,	G98, G99, CEI0-21, A	AS/NZS 4777.2	
Safety Regulation			IEC/EN 62109-	1, IEC/EN 62109-2		
EMC		I	EC/EN 61000-6-1	, IEC/EN 61000-6-3		

## Warranty Registration Form



### For Customer (Compulsory)

Name	Country	
Phone Number	Email	
Address		
State	Zip Code	
Product Serial Number		
Date of Commissioning		
Installation Company Name		
Installer Name Electrician License No.		

### For Installer

#### Module (If Any)

Module Brand	
Module Size (W)	
Number of String	Number of Panel Per String

#### Battery (If Any)

Battery Type	
Brand	
Number of Battery Attached	Number of Panel Per String
Date of Delivery	Signature

For more detailed warranty terms, please visit YINERGY official website: www.yinergy-solar.com to check it.





More information in the QR code or at http://vinergy-solar.com/



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