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For: Richard
Hawthorns, Therfield

Quote #: 4845867
Valid until: 8th August 2024



Solar Energy System Proposal

Dear Richard Burgess,

Thank you for the opportunity to present your Solar Energy System.

Best Regards,
Alicia Moersdorf
Home Energy Innovation

Recommended System Option

3.52 kW

System Size

95%

Self-consumption

7.0 kWh

Daily Solar Generation
(Year 1)

28%

Grid Independence



Your Solution

Tiger Neo N-type 54HL4R-B
420-440 Watt All Black

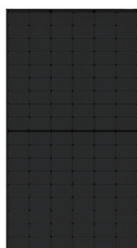
3.520

8 x JKM440N-54HL4R-B

440 Watt panels

25 Year Product Warranty & 30 Year Linear
Performance Warranty

2,559kWh per year



Inverter

Growatt New Energy Technology Co., Ltd.

3 kW Total Inverter Rating

1 x MIN 3000TL-XH

GivEnergy AIO AC-Coupled

13.5 kWh of Storage

12 Year Warranty



GivEnergy®

Warranties: 25 Year Panel Product Warranty, 30 Year Panel Performance Warranty, 10 Year Inverter Product Warranty, 12 Year Battery Product Warranty The performance of solar PV systems is impossible to predict with certainty due to the variability in the amount of solar radiation (sunlight) from location to location and from year to year. This estimate is based upon the standard MCS procedure is given as guidance only. It should not be considered as a guarantee of performance.

The solar PV self-consumption has been calculated in accordance with the most relevant methodology for your system. There are a number of external factors that can have a significant effect on the amount of energy that will be self-consumed.

Shading will be present on your system that will reduce its output to the factor stated. This factor was NOT calculated using the MCS shading methodology, but we can confirm that the system as quoted, taking into account the shading present, will deliver at least 90% of the energy (in kWh) as set out in this performance estimate.

This system performance calculation has been undertaken using estimated values for array orientation, inclination, or shading. Actual performance may be significantly lower or higher if the characteristics of the installed system vary from the estimated values.

Important Note: The energy performance and benefits of EESS is impossible to predict with certainty due to the numerous functions a system can be programmed to perform. This estimate is based upon the standard MCS procedure and is given as guidance only. It should not be considered as a guarantee of performance.

[EESS capacity not used for self consumption] Storage capacity of the battery - assumed usable capacity of battery [Total energy discharged per annum] (Previous value) x 730 [Additional self consumption] Estimated annual output (Section B) x self consumption rate with battery as a % (no higher than 95%) - Expected solar PV self-consumption (with EESS) (Section D)

A. Installation data		
Installed capacity of PV system - kWp (stc)	3.520	kWp
Orientation of the PV system - degrees from South	Group 1: 6 panels with Orientation: 100 ° Group 2: 2 panels with Orientation: 100 °	°
Inclination of system - degrees from horizontal	Group 1: 6 panels with Tilt: 30° Group 2: 2 panels with Tilt: 30°	°
Postcode region	1	
B. Performance calculations		
kWh/kWp (Kk) from table	Group 1: 760 Group 2: 760	kWh/kWp
Shade Factor (SF)	0.956	
Estimated annual output (kWp x Kk x SF)	2,559	kWh
C. Estimated PV self-consumption - PV Only		
Assumed occupancy archetype	Home All Day	
Assumed annual electricity consumption, kWh	8,630.00	kWh
Assumed annual electricity generation from solar PV system, kWh	2,559	kWh
Expected solar PV self-consumption (PV Only)	1,832.26	kWh
Grid electricity independence / Self-sufficiency (PV Only)	21.23	%

D. Estimated PV self-consumption - with EESS

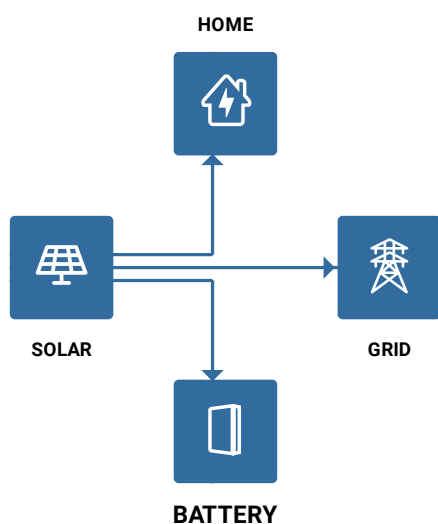
Assumed usable capacity of electricity energy storage device, which is used for self-consumption, kWh	13.50	kWh
Expected solar PV self-consumption (with EESS)	2,430.98	kWh
Grid electricity independence / Self-sufficiency (with EESS)	28.0%	%

E. Additional benefits from PV and EESS

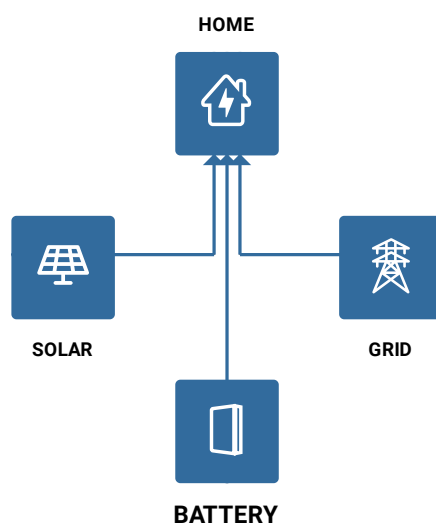
EESS capacity not used for self-consumption	0.00	kWh
Total energy discharged per annum	0.00	kWh
Additional self-consumption for EV, heat pumps, diverters (only when present)	0.07	kWh

How your system works

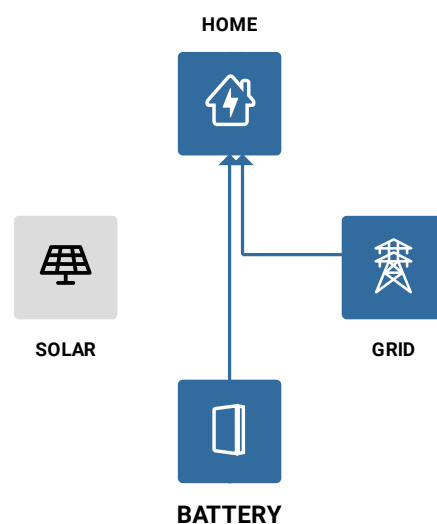
Generating Excess Solar



Partially Offset Usage



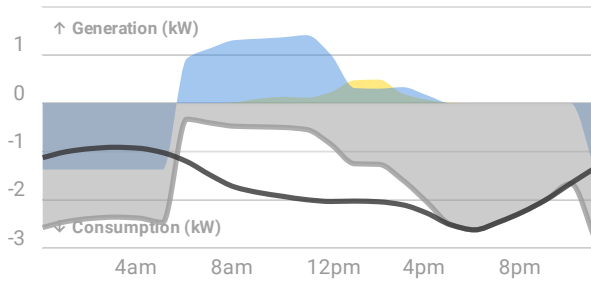
Night



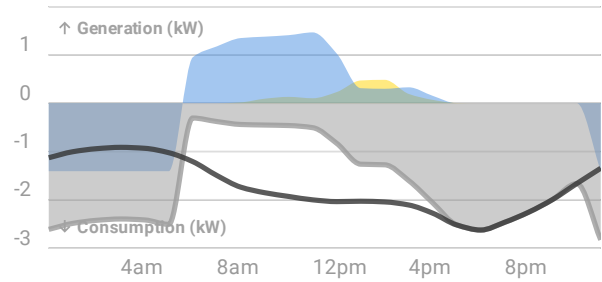
Daily Energy Flows

CONSUMPTION (kWh)
 GENERATION (kWh)
 BATTERY (kWh)
 NET CONSUMPTION (kWh)
 EXPORT TO GRID (kWh)

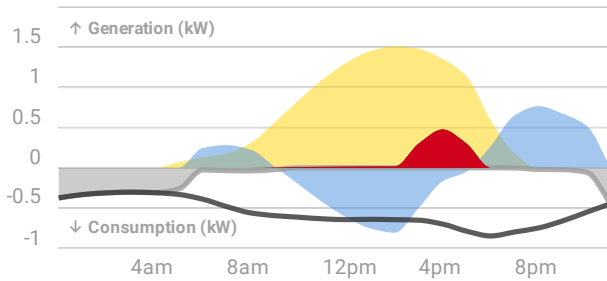
Winter Weekday



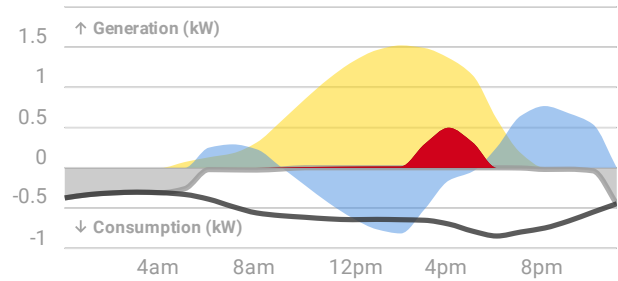
Winter Weekend



Summer Weekday

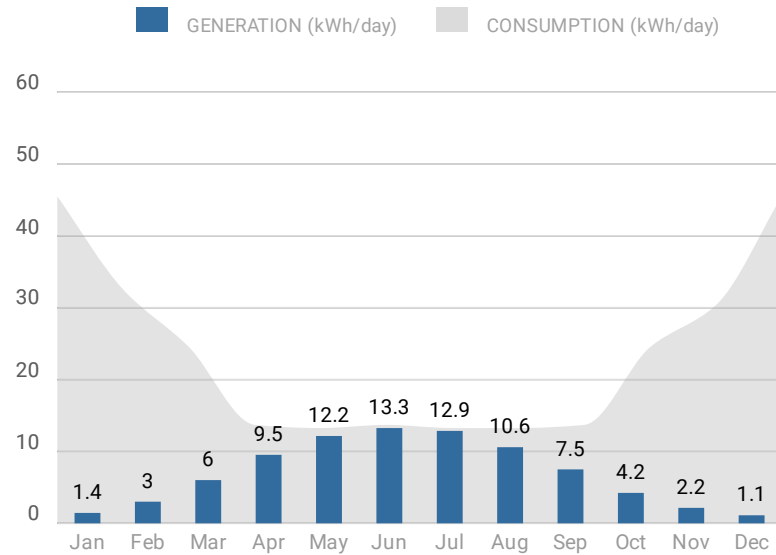


Summer Weekend



System Performance

30%
Energy From Solar



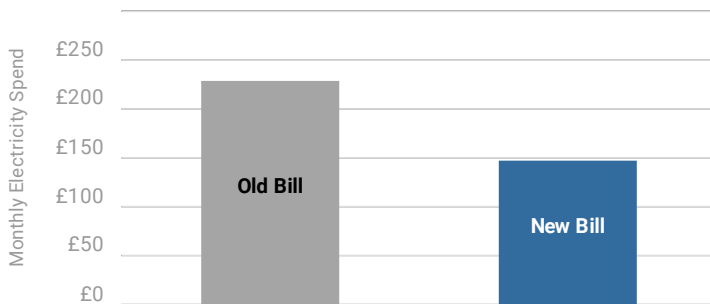
95%
Self-consumption

5%
Export to grid

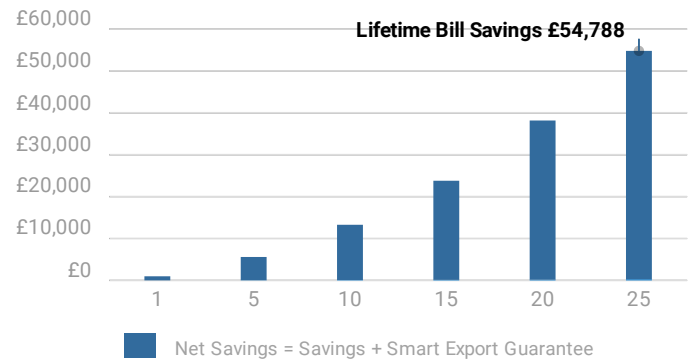
System Performance Assumptions: System Total losses: 0%, Inverter losses: 0%, Optimizer losses: 0%, Shading losses: 4.4%, Performance Adjustment: 0%, Output Calculator: MCS. Panel Orientations: 6 panels with Azimuth 278 and Slope 30, 2 panels with Azimuth 278 and Slope 30.

Electricity Bill Savings

First Year Monthly Bill Savings



Cumulative Bill Savings



Your projected energy cost is calculated by considering a 7% increase in energy cost each year, due to trends in the raising cost of energy. This estimate is based on your selected preferences, current energy costs and the position and orientation of your roof to calculate the efficiency of the system. Projections are based on estimated usage of 8630 kWh per year, assuming Economy 7 Electricity Tariff.

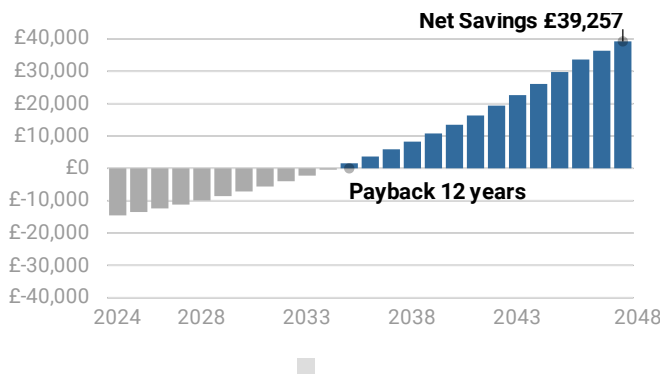
Your electricity tariff rates may change as a result of installing the system. You should contact your electricity retailer for further information.

Proposed Tariff Details - Ovo Economy 7	
Energy Charges	
Summer Peak Usage Charge <i>6am-11pm from 31 May to 30 Aug</i>	£0.31 / kWh
Summer Off-Peak Usage Charge <i>11pm-6am from 31 May to 30 Aug</i>	£0.19 / kWh
Winter Peak Usage Charge <i>6am-11pm from 31 Aug to 30 May</i>	£0.31 / kWh
Winter Off-Peak Usage Charge <i>11pm-6am from 31 Aug to 30 May</i>	£0.19 / kWh
Smart Export Guarantee	
Feed-In Credit <i>All Day</i>	£0.07 / kWh
Fixed Charges	
Fixed Charge	£11.58 / month

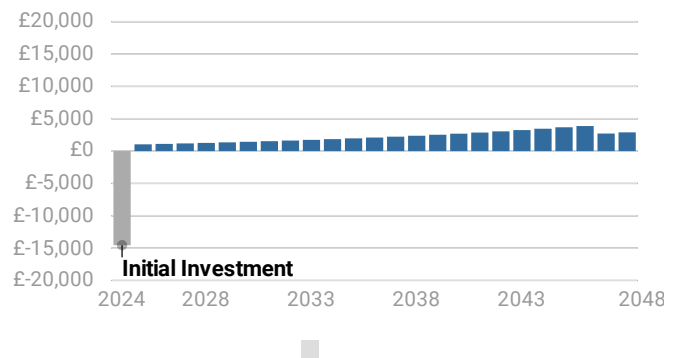
Net Financial Impact Cash

$$\text{Utility Bill Savings} - \text{Net System Cost} = \text{Estimated Net Savings}$$

Cumulative Savings From Going Solar



Annual Savings From Going Solar



Estimates do not include replacement costs of equipment not covered by a warranty. Components may need replacement after their warranty period. Financial discount rate assumed: 6.75%

Environmental Benefits

Solar has no emissions. It just silently generates pure, clean energy.



Each Year

30%
Of CO₂, SO_x & NO_x

648 kg
Avoided CO₂ per year

Over System Lifetime

19,370
Car km avoided

125
Trees planted

14
Long haul flights
avoided



This proposal has been prepared by Home Energy Innovation using tools from OpenSolar. Please visit www.opensolar.com/proposal-disclaimer for additional disclosures from OpenSolar.

Tiger Neo N-type 54HL4R-B 420-440 Watt ALL-BLACK MODULE

N-Type

Positive power tolerance of 0~+3%

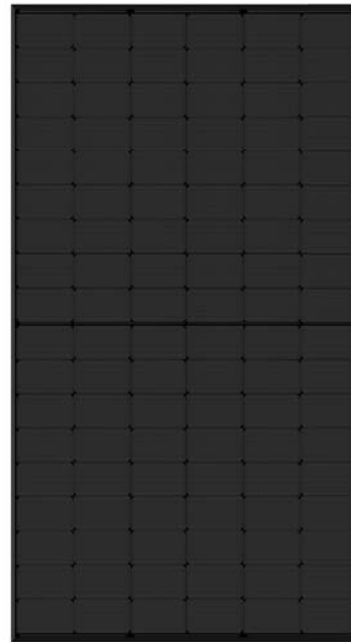
IEC61215(2016), IEC61730(2016)

ISO9001:2015: Quality Management System

ISO14001:2015: Environment Management System

ISO45001:2018

Occupational health and safety management systems



Key Features



SMBB Technology

Better light trapping and current collection to improve module power output and reliability.



Hot 2.0 Technology

The N-type module with Hot 2.0 technology has better reliability and lower LID/LETID.



PID Resistance

Excellent Anti-PID performance guarantee via optimized mass-production process and materials control.



Enhanced Mechanical Load

Certified to withstand: wind load (4000 Pascal) and snow load (6000 Pascal).



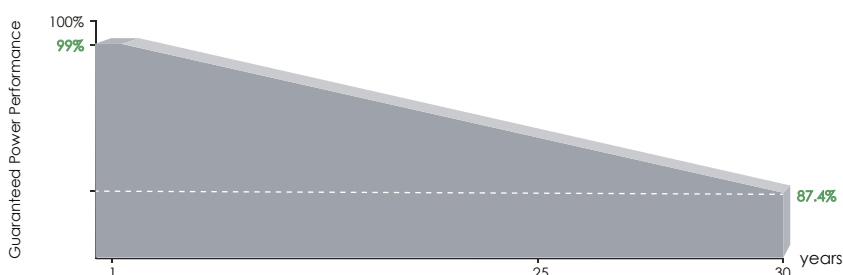
Durability Against Extreme Environmental Conditions

High salt mist and ammonia resistance.



POSITIVE QUALITY™
Continuous Quality Assurance

LINEAR PERFORMANCE WARRANTY

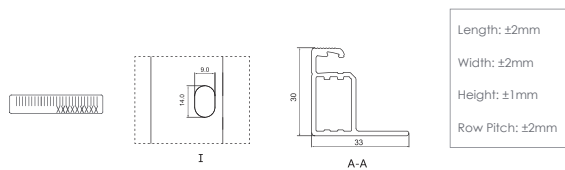
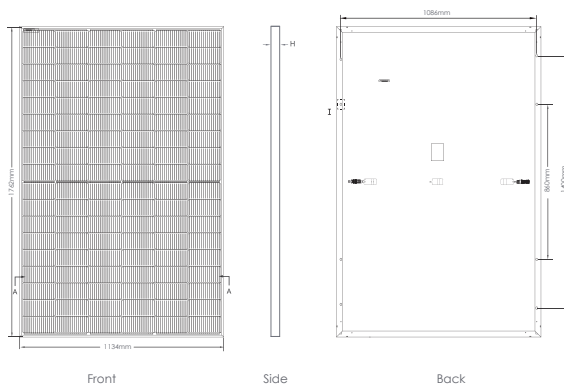


25 Year Product Warranty

30 Year Linear Power Warranty

0.40% Annual Degradation Over 30 years

Engineering Drawings



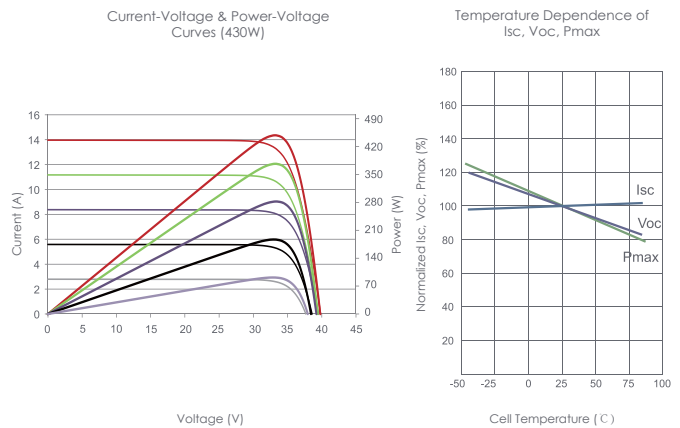
*This tolerance range applies only to the four-angle distance of the module as indicated above.

Packaging Configuration

(Two pallets = One stack)

36pcs/pallets, 72pcs/stack, 936pcs/ 40'HQ Container

Electrical Performance & Temperature Dependence



Mechanical Characteristics

Cell Type	N type Mono-crystalline
No. of cells	108 (6×18)
Dimensions	1762×1134×30mm (69.36×44.65×1.18 inch)
Weight	22 kg (48.50 lbs)
Front Glass	3.2mm, Anti-Reflection Coating, High Transmission, Low Iron, Tempered Glass
Frame	Anodized Aluminium Alloy
Junction Box	IP68 Rated
Output Cables	TUV 1×4.0mm ² (+): 400mm, (-): 200mm or Customized Length

SPECIFICATIONS

Module Type	JKM420N-54HL4R-B		JKM425N-54HL4R-B		JKM430N-54HL4R-B		JKM435N-54HL4R-B		JKM440N-54HL4R-B	
	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT
Maximum Power (Pmax)	420Wp	316Wp	425Wp	320Wp	430Wp	323Wp	435Wp	327Wp	440Wp	331Wp
Maximum Power Voltage (Vmp)	32.16V	29.95V	32.37V	30.19V	32.58V	30.30V	32.78V	30.50V	32.99V	30.73V
Maximum Power Current (Imp)	13.06A	10.55A	13.13A	10.60A	13.20A	10.66A	13.27V	10.72A	13.34A	10.77A
Open-circuit Voltage (Voc)	38.74V	36.80V	38.95V	37.00V	39.16V	37.20V	39.36V	37.39V	39.57V	37.59V
Short-circuit Current (Isc)	13.51A	10.91A	13.58A	10.96A	13.65A	11.02A	13.72A	11.08A	13.80A	11.14A
Module Efficiency STC (%)	21.02%		21.27%		21.52%		21.77%		22.02%	
Operating Temperature(°C)	-40°C~+85°C									
Maximum system voltage	1000VDC (IEC)									
Maximum series fuse rating	25A									
Power tolerance	0~+3%									
Temperature coefficients of Pmax	-0.29%/°C									
Temperature coefficients of Voc	-0.25%/°C									
Temperature coefficients of Isc	0.045%/°C									
Nominal operating cell temperature (NOCT)	45±2°C									

*STC: Irradiance 1000W/m² Cell Temperature 25°C AM=1.5
 NOCT: Irradiance 800W/m² Ambient Temperature 20°C AM=1.5 Wind Speed 1m/s



Primarily working as an on grid system, the All in One can deliver 7.2kW of peak power into the home on top of any solar generation.

Complete with a substantial 13.5kWh useable battery pack that stores excess generation. Featuring a modular design with 4 removable battery packs, allowing for ease of handling and installation.



Grid Services Ready

Some energy suppliers and aggregators are offering payments for end users that can reduce their electrical consumption at certain times.



Whole House Backup

When used with our Gateway, in the event of a grid failure, the system will continue to provide power into the home. This allows operation off-grid until grid supply is restored.



Flexible Rate Tariff

Charge the battery off-peak when it's cleaner, greener and less costly then discharge the battery during peak times for maximum saving.



Modular Design

Need a larger capacity? Modular design allows for multiple units to be installed in parallel.

All in One

AC Coupled | 13.5kWh

OUTPUT AC

Nominal AC Power	6000W
Peak Power	7.2kW peak/6.0kW continuous
Rated Grid Voltage (AC Voltage Range)	230 (180 to 270)
Rated Grid Frequency	50/60±5Hz
Nominal AC Current	26A
Maximum AC Current	32A
Displacement Power Factor	0.8 Leading to 0.8 Lagging
Number of Parallel Operation	6 (coming soon)
Total Harmonic Distortion (THDi, Rated Power)	<3%

BATTERY

Battery Voltage Range	260-346V
Maximum Charge/ Discharge Current	25A
Nominal Voltage	307V
Communication Interfaces	CAN
Battery Capacity	13.5kWh
Depth of Discharge	100%

ENVIRONMENT

Ingress Protection	IP65
Operating Temperature Range	-10°C - 50°C
Humidity	0~95%
Altitude	4000m (Derating above 2000m)
Noise Emission (Typical)	<30dB

GENERAL DATA

Dimensions (excl. feet)	1100H x 600W x 280D (mm)
Weight	173.7Kg
Cooling Concept	Natural
Topology	Transformerless
Communication	RS485/CAN/LoRa
Connectivity	WiFi, LAN and 4G
Warranty	12 Years
SKU	GIV-AIO-AC-13.5
Protection Class	IP65
Display LCD	LED and APP