

Battery Systems

Battery System - Group 1

Model	SigenStor EC 20.0 + BAT 30.027.12kWh,(314Ah) (v1)
Manufacturer	Sigenergy
Quantity	1
Battery Inverter	
Type of coupling	DC intermediate circuit coupling
Nominal output	15 kW
Battery	
Manufacturer	Sigenergy
Model	SigenStor BAT 10.0 (314) (v1)
Quantity	3
Battery Energy	27.1 kWh
Battery Type	Lithium iron phosphate

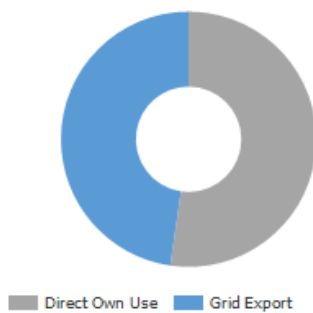
Simulation Results

Results Total System

PV System

PV Generator Output	30.71 kWp
Spec. Annual Yield	1,009.20 kWh/kWp
Performance Ratio (PR)	87.95 %
Yield Reduction due to Shading	0.3 %
PV Generator Energy (AC grid) with battery	30,578 kWh/Year
Direct Own Use	15,994 kWh/Year
Grid Export	14,584 kWh/Year
Own Power Consumption	52.3 %
CO ₂ Emissions avoided	11,443 kg / year

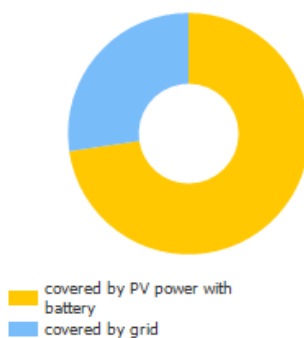
PV Generator Energy (AC grid) with battery



Appliances

Appliances	22,000 kWh/Year
Standby Consumption (Inverter)	11 kWh/Year
Total Consumption	22,011 kWh/Year
covered by PV power with battery	15,994 kWh/Year
covered by grid	6,017 kWh/Year
Solar Fraction	72.7 %

Total Consumption



Battery System

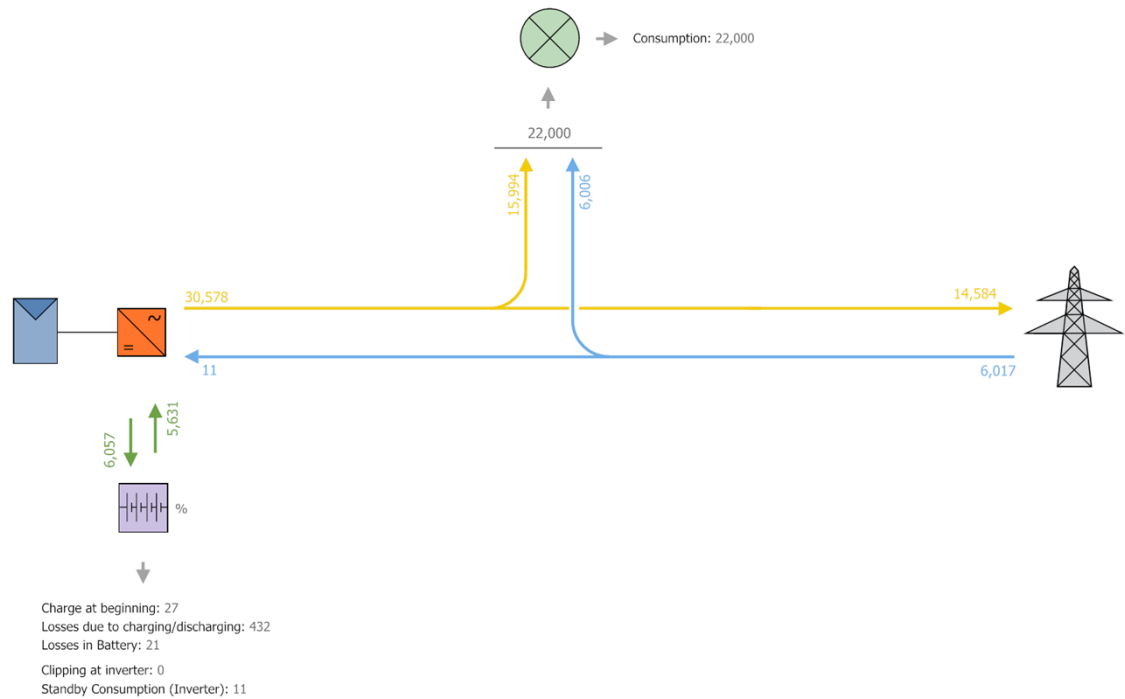
Charge at beginning	27 kWh
Battery Charge (PV System)	6,057 kWh/Year
Battery Energy for the Covering of Consumption	5,631 kWh/Year
Battery discharge into the grid	0 kWh/Year
Losses due to charging/discharging	432 kWh/Year
Losses in Battery	21 kWh/Year
Cycle Load	2.8 %
Service Life	>20 Years

Level of Self-sufficiency

Total Consumption	22,011 kWh/Year
covered by grid	6,017 kWh/Year
Level of Self-sufficiency	72.7 %

Energy Flow Graph

Project: Hugh-30.71kWp-Aiko490-540-Sig20kWTP-3xSig10



All values in kWh
Small deviations in the totals can occur due to rounding
created with PV*SOL

Figure: Energy flow

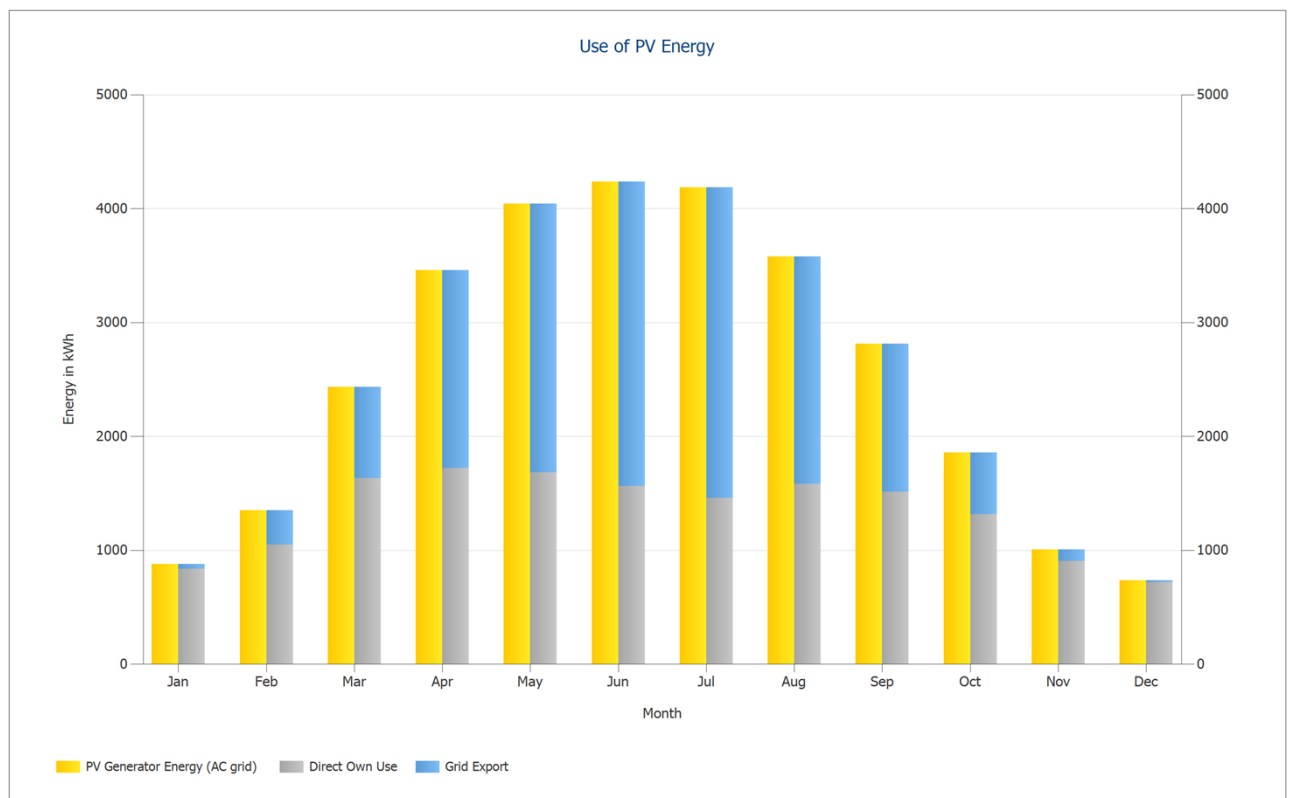


Figure: Use of PV Energy

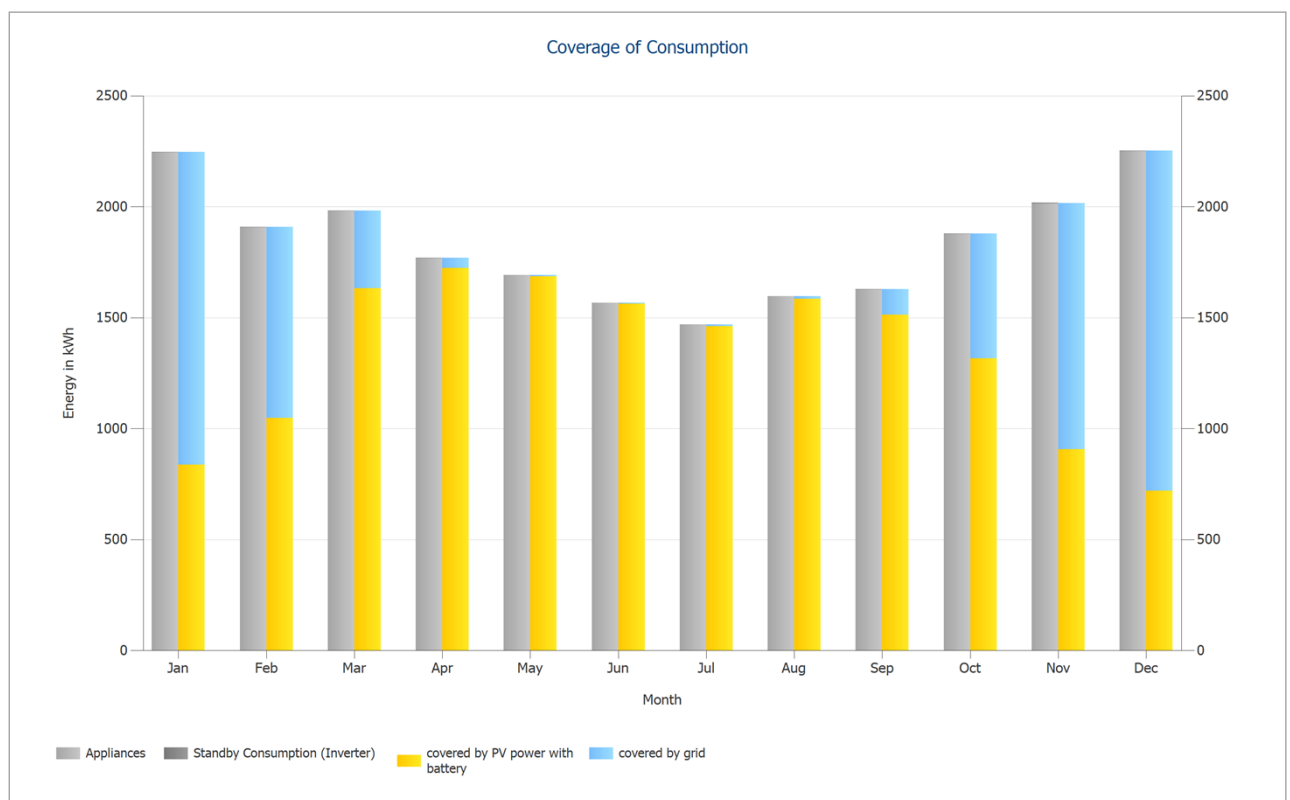


Figure: Coverage of Consumption

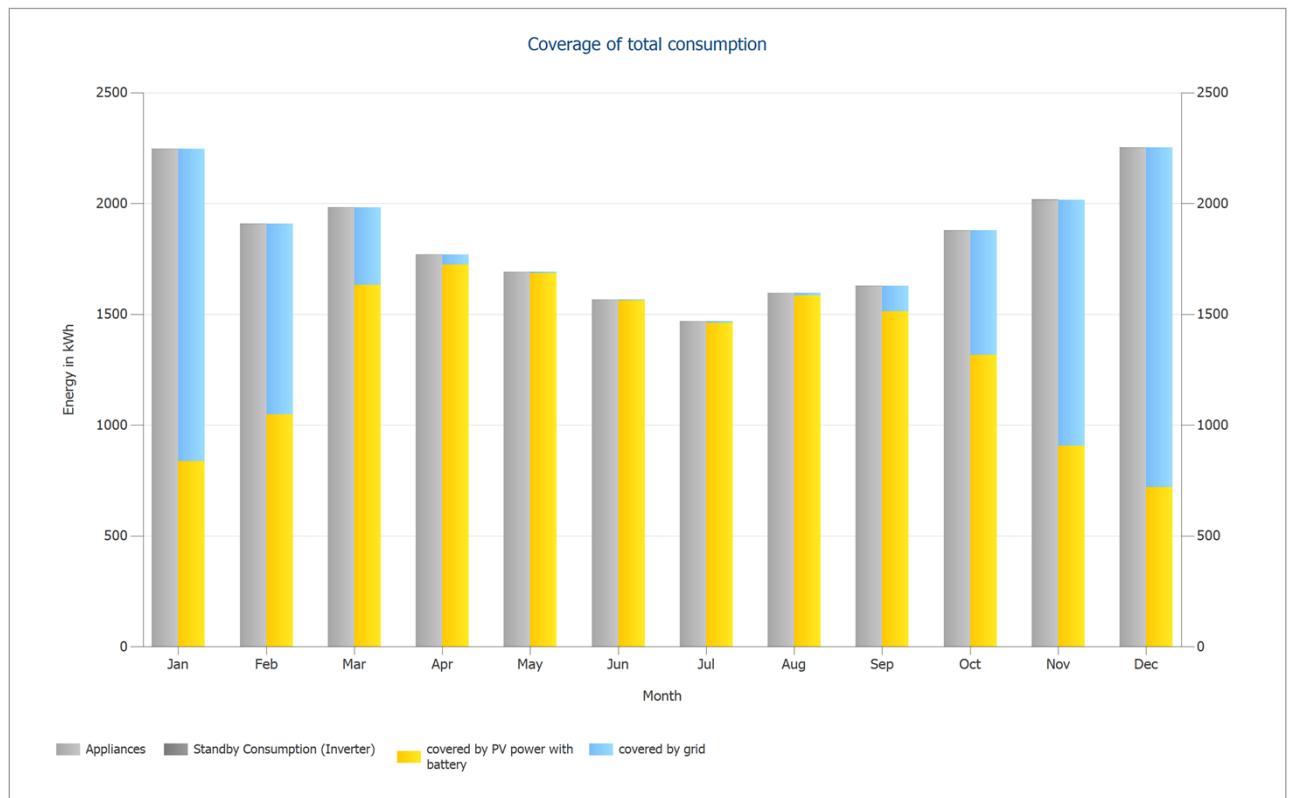


Figure: Coverage of total consumption

Plans and parts list

Circuit Diagram

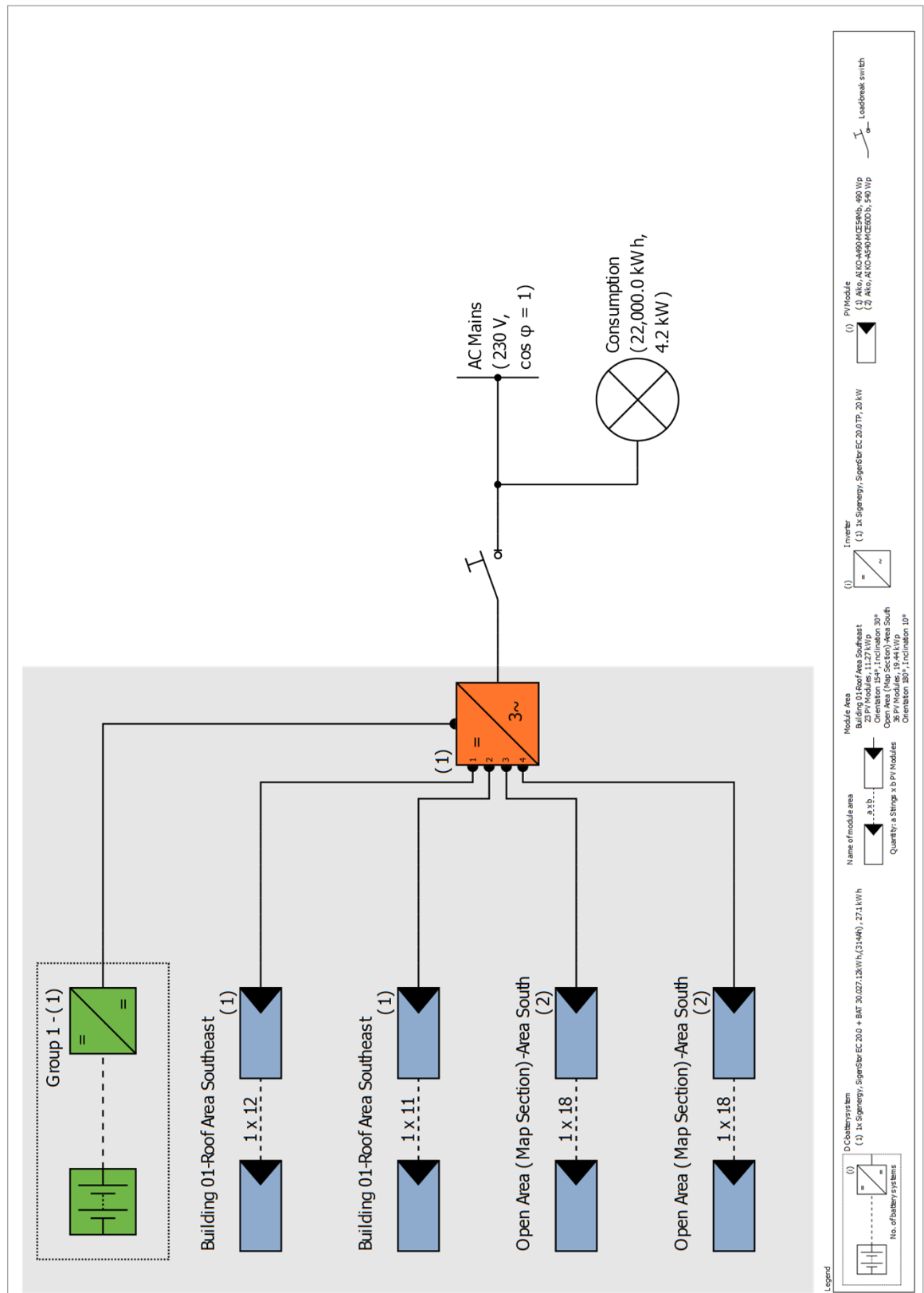


Figure: Circuit Diagram

Overview plan

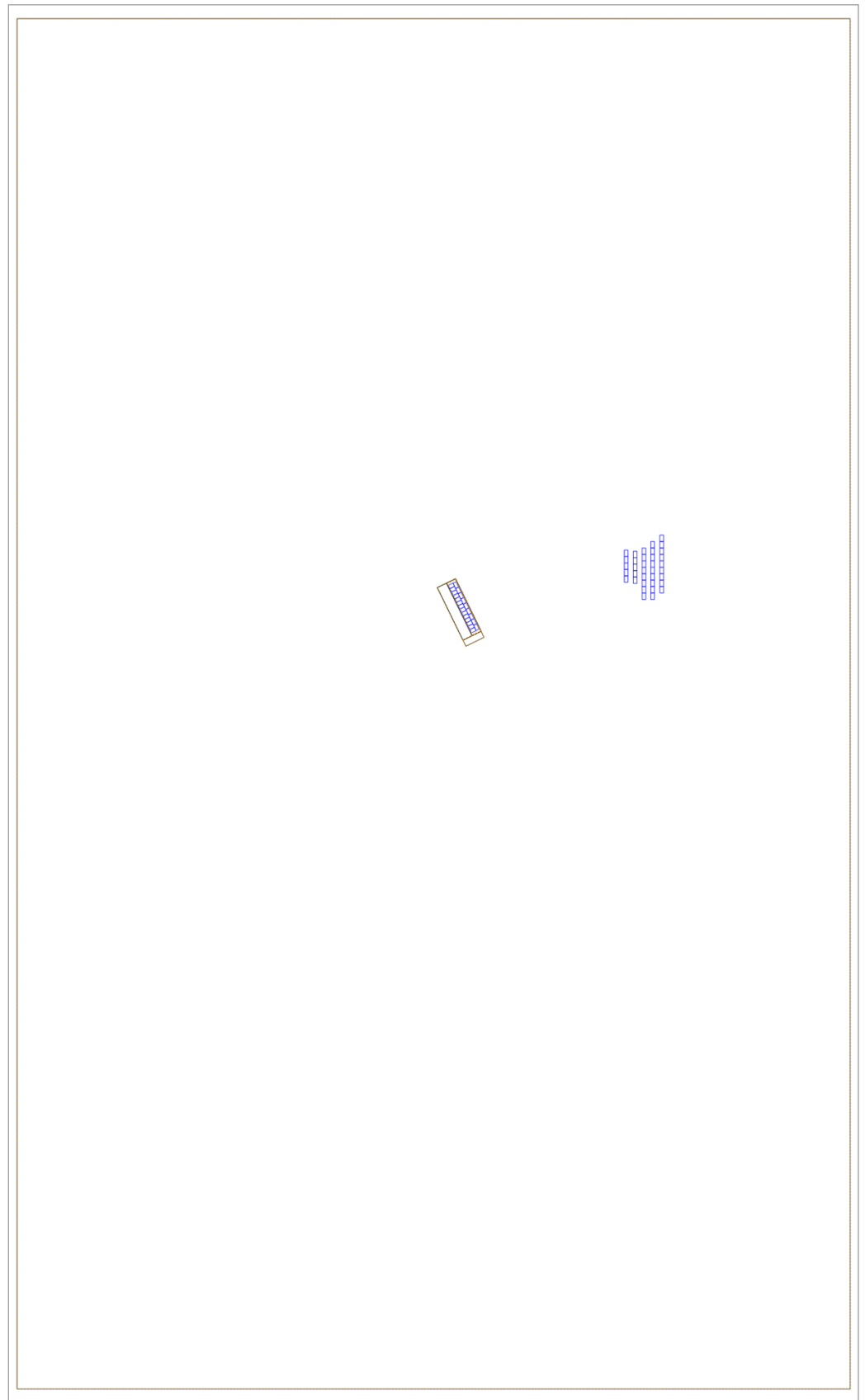


Figure: Overview plan

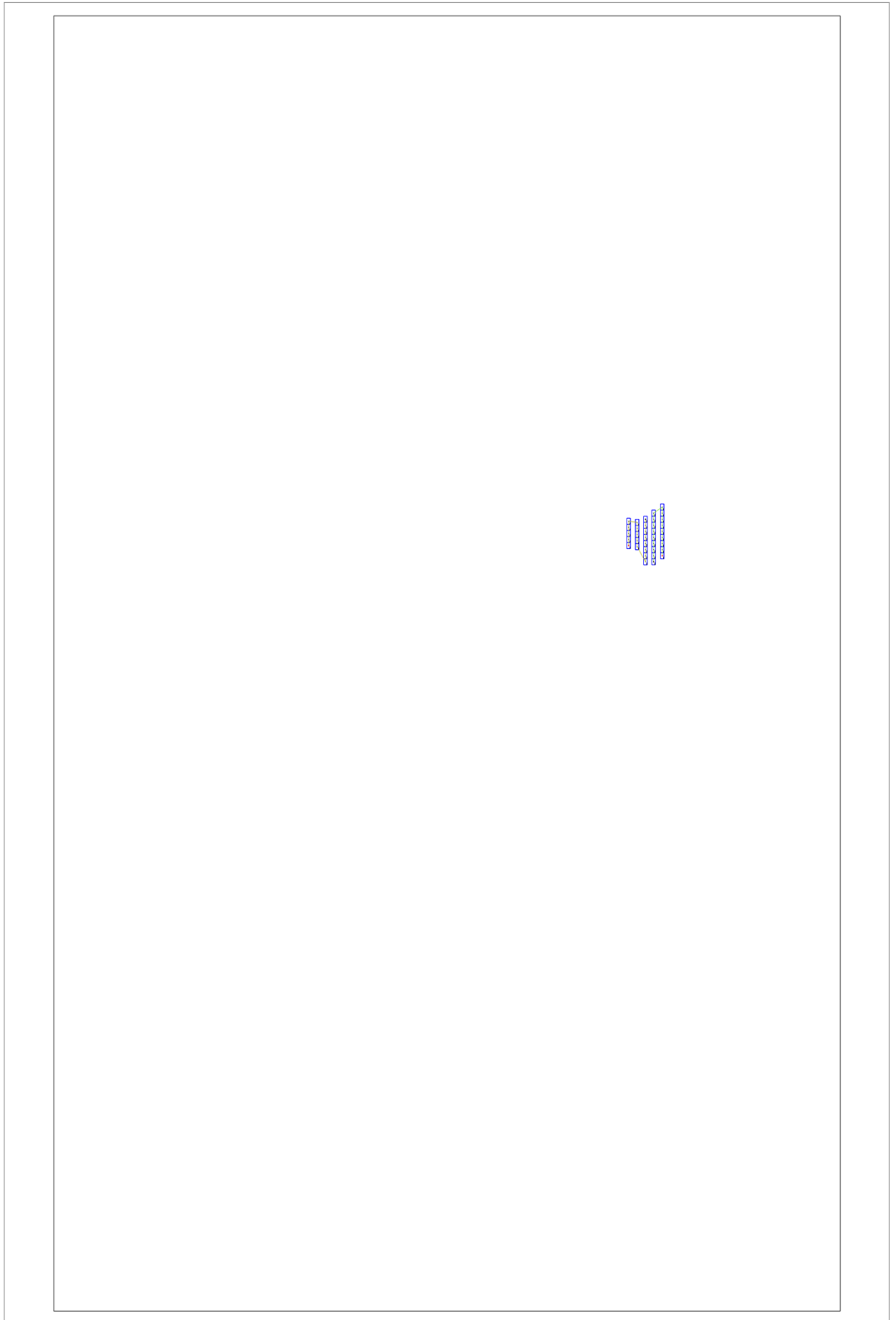


Figure: Open Area (Map Section) - Area South

Parts list

Parts list

#	Type	Item number	Manufacturer	Name	Quantity	Unit
1	PV Module		Aiko	AIKO-A490-MCE54Mb	23	Piece
2	PV Module		Aiko	AIKO-A540-MCE60Db	36	Piece
3	Inverter		Sigenergy	SigenStor EC 20.0 TP	1	Piece
4	Battery System		Sigenergy	SigenStor EC 20.0 + BAT 30.027.12kWh,(314Ah)	1	Piece
5	Components			Load-break switch	1	Piece

Screenshots, 3D Design Environment



Figure: Screenshot04

Configuration



Figure: Screenshot02

NEOSTAR

3S+60 Dual-Glass Module

530W-550W

Technical Features :

 Partial Shading Optimisation

 Better Temperature Coefficient

 High Temperature Restriction

 Micro-crack Resistance

 Higher Power

 Lower BOS

 More Aesthetic Values

 Infinite Technology



red dot winner 2023



Product
Warranty



Performance
Warranty



Warranty partner

Munich RE

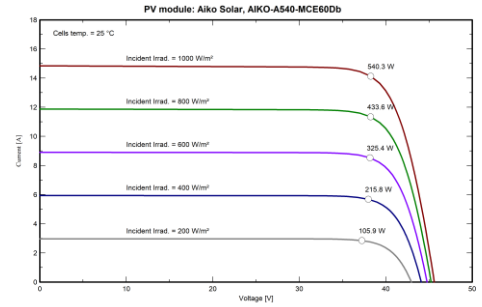
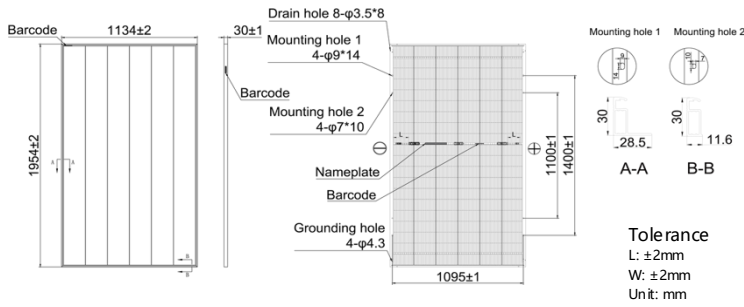


550W
Output

24.8%
Efficiency

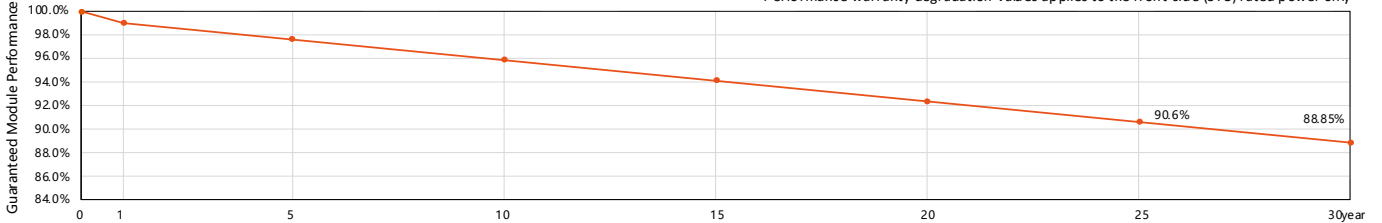
≤1%
First-year Degradation

≤0.35%
Annual Degradation from Year 2-30



30-year Linear Performance Warranty

*Performance warranty degradation values applies to the front-side (STC) rated power only



Electrical Characteristics (STC: AM1.5 1000W/m² 25°C NOCT: AM1.5 800W/m² 20°C 1m/s BNPI: front 1000W/m² + rear 135W/m²)

Module Type	AIKO-A530-MCE60Db			AIKO-A535-MCE60Db			AIKO-A540-MCE60Db			AIKO-A545-MCE60Db			AIKO-A550-MCE60Db		
	STC	NOCT	BNPI	STC	NOCT	BNPI	STC	NOCT	BNPI	STC	NOCT	BNPI	STC	NOCT	BNPI
P _{max} [W]	530	402	560	535	405	565	540	409	570	545	413	575	550	417	580
V _{oc} [V]	45.40	43.07	45.40	45.50	43.17	45.50	45.60	43.26	45.60	45.70	43.36	45.70	45.80	43.45	45.80
V _{mp} [V]	38.20	36.24	38.20	38.30	36.34	38.30	38.40	36.43	38.40	38.50	36.53	38.50	38.60	36.62	38.60
I _{sc} [A]	14.76	11.93	15.56	14.80	11.96	15.60	14.84	11.99	15.64	14.88	12.02	15.68	14.92	12.06	15.72
I _{mp} [A]	13.88	11.10	14.67	13.97	11.17	14.76	14.07	11.25	14.85	14.16	11.32	14.94	14.25	11.40	15.03
Module Efficiency	23.9%			24.1%			24.4%			24.6%			24.8%		

Bifacial Gain Electrical Characteristics (5% & 10%)

Module Type	AIKO-A530-MCE60Db		AIKO-A535-MCE60Db		AIKO-A540-MCE60Db		AIKO-A545-MCE60Db		AIKO-A550-MCE60Db	
	5%	10%	5%	10%	5%	10%	5%	10%	5%	10%
P _{max} [W]	557	583	562	589	567	594	572	600	578	605
V _{oc} [V]	45.40	45.40	45.50	45.50	45.60	45.60	45.70	45.70	45.80	45.80
V _{mp} [V]	38.20	38.20	38.30	38.30	38.40	38.40	38.50	38.50	38.60	38.60
I _{sc} [A]	15.50	16.24	15.54	16.28	15.58	16.32	15.62	16.37	15.67	16.41
I _{mp} [A]	14.57	15.27	14.67	15.37	14.77	15.48	14.87	15.58	14.96	15.68

Short Circuit Current @ BS1: 16.48±3% (BS1 Test condition: front irradiance 1000 W/m², rear irradiance 300 W/m²)

Product Specification

Cell Type	N-Type ABC
Glass	Dual glass, 2.0+2.0mm coated semi tempered glass
Frame	Black Anodized aluminum
Cable	4mm²(IEC) 12AWG(UL) ±1200mm
No. of Cells	120(6*20)
Junction Box	IP68, 3 bypass diodes
Connector	Staubli Electrical Connectors AG – MC4 EVO2 Series PV-KST4-EVO 2/xy_UR (Male), PV-KBT4-EVO 2/xy_UR (Female)
Weight	27.1kg±3%
Dimension	1954*1134*30mm
Package Detail	37pcs per pallet / 185pcs per 20'GP / 888pcs per 40'HC

Temperature Ratings (STC)

Temperature Coefficient of I _{sc}	+ 0.05%/ °C
Temperature Coefficient of V _{oc}	- 0.22%/ °C
Temperature Coefficient of P _{max}	- 0.26%/ °C

Installation Guide

T ₉₈ max	70°C
Operation Temperature	-40°C to +70°C
Maximum Series Fuse Rating	30A
Protection Class	Class II
Maximum System Voltage	DC1500V
Maximum Static Loading	Front +5400Pa Back -2400Pa
Hail Test	35 mm diameter hail at 27.2 m/s
Fire Rating	IEC Class A

*AIKO reserves right to update the specification without notice
*Optional Munich Re coverage is available upon request
202602_V4.1_BN





Sigen Energy Controller

5.0 – 25.0 kW Three Phase

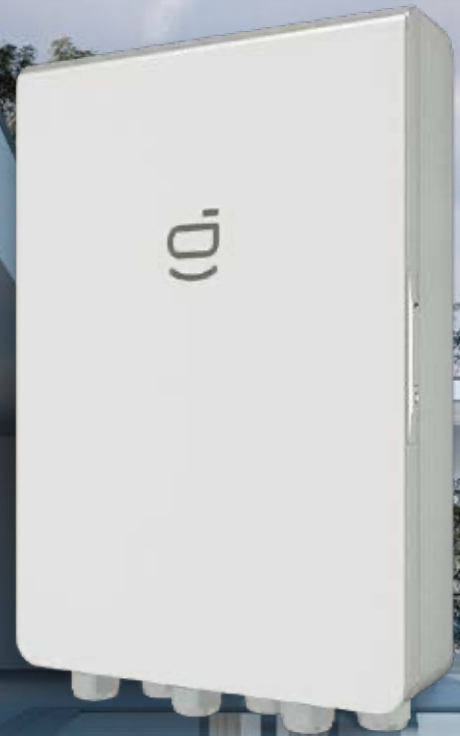
- EMS inside for precise control
- On & off-grid compatibility
- DC ground-fault protection
- DC/AC ratio up to 1.6
- Multi-source black start
- IP66 system protection rating

Sigen Energy Controller 5.0-25.0 kW Three Phase

SigenStor EC	5.0 TP	6.0 TP	8.0 TP	10.0 TP	12.0 TP	15.0 TP	17.0 TP	20.0 TP	25.0 TP	Units
Max PV power	5000	6500	12800	16000	16200	24000	27200	32000	40000	W
Max DC input voltage					1100					V
Nominal DC input voltage					600					V
Start-up voltage					180					V
MPPT voltage range					150 - 1000					V
Number of MPPT trackers		2			3			4		
Number of PV strings per MPPT					1					
Max input current per MPPT					16					A
Max short-circuit current per MPPT					20					A
Nominal output power	5000	6000	8000	10000	12000	15000	17000	20000	25000	W
Max output apparent power	5500	6500	8800	11000	13200	16500	18700	22000	27500	V.A
Nominal output current	7.6	9.1	12.2	16.2	18.2	22.8	25.8	30.4	38.0	A
Max output current	9.4	10.0	13.4	16.7	20.1	25.1	28.4	33.4	41.6	A
Nominal output voltage					380 / 400					V
Nominal grid frequency					50 / 60					Hz
Power factor				0.8 leading - 0.8 lagging						
Total current harmonic distortion				THDi < 3%						
Max efficiency	98.1%	98.2%	98.3%	98.3%	98.3%	98.3%	98.3%	98.3%	98.3%	
European efficiency	95.1%	95.6%	97.1%	97.5%	97.7%	97.9%	97.9%	97.9%	98.0%	
Peak output power (10 seconds)	7500	9000	12000	15000	18000	22500	25500	30000	30000	W
Nominal output voltage					380 / 400					V
Nominal output frequency					50 / 60					Hz
Power factor				0.8 leading - 0.8 lagging						
Total voltage harmonic distortion				THDv < 2%						
Disruption time of backup switch ¹				0						ms
Battery module models				SigenStor BAT 5.0 / 8.0						
Number of modules per controller				1 - 5						pcs
Battery module voltage range				600 - 900						V
Safety protection feature	DC ground fault protection, Arc fault circuit interrupter, DC reverse polarity protection, Insulation monitoring, Residual current monitoring, Type II DC/AC surge protection, Anti-islanding protection, AC overcurrent/overvoltage/short-circuit protection									
Dimensions (W / H / D)				180 / 300 / 260						mm
Weight				36						kg
Storage temperature range				-40 - 70						°C
Operating temperature range				0 - 60						°C
Relative humidity range				0% - 95%						
Max operating altitude				4000						m
Cooling				Smart air cooling						
System ingress protection rating				IP65						
Communication				WLAN / Fast Ethernet / RS485 / Sigen CommMod (4G/3G/2G)						
Standards ²				IEC/EN 62109-1, IEC/EN 62109-2, IEC/EN 61300-5-1, IEC/EN 61000-6-2						

1. This refers to the load-side disruption time, to achieve this functionality Sigen Energy Gateway needs to be used together with Sigen Energy Controller and Sigen Battery. Test conditions: In the open-circuit state of the power grid, the nominal power of the Sigen Energy Controller is higher than the total power of the home loads.

2. For all standards refer to the certificates category in the Sigenergy website.



Sigen Energy Gateway

- Multiple breaker positions reserved for SigenStor or other loads
- Seamless switch to backup mode, worry-free energy usage
- Ready for generator, heat pump or other controllable loads
- Support both whole home backup & partial home backup
- 350 ms reverse power flow protection of grid & generator
- Uninterrupted power supply through PV+ESS/grid/generator



Sigen Energy Gateway Single / Three Phase

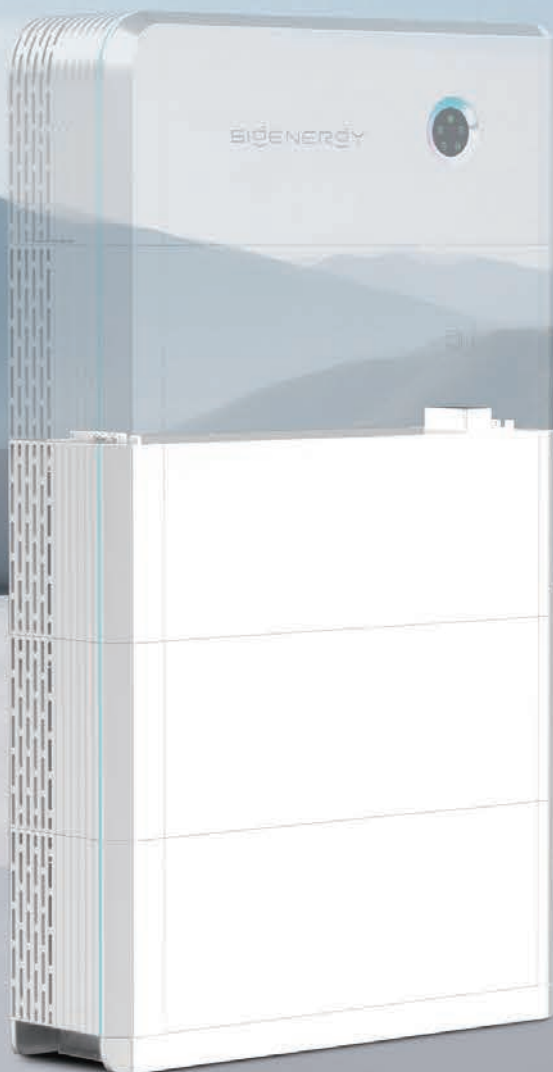
Preliminary

Sigen Gateway	HomeMax SP 12K	HomeMax TP	Units
Grid Connection			
Grid connection type	Single phase	Three phase	
Nominal AC voltage	220 / 230 / 240	380 / 400	V
Nominal AC current	100	76	A
Nominal AC power	22 / 23 / 24	50 / 52.6	kW
Nominal AC frequency	50 / 60		Hz
Disruption time of backup switch ¹	0		ms
AC Output to Backup Port			
Nominal AC voltage	220 / 230 / 240	380 / 400	V
Nominal AC current	100	76	A
Nominal AC power	22 / 23 / 24	50 / 52.6	kW
Nominal AC frequency	50 / 60		Hz
Overvoltage category	III		
Inverter Connection / EV Charger Port (optional)			
Max. number of connection	3	2	
Nominal AC voltage	220 / 230 / 240	380 / 400	V
Nominal AC current	55 (INV1), 32 (INV2), 32 (INV3) ²	38	A
Compatible EV charger power	7	11 / 22	kW
Smart Port Connection			
Generator output voltage	220 / 230 / 240	380 / 400	
Nominal current	63	76	A
Nominal AC power	13.8 / 14.5 / 15.1	50 / 52.6	kW
Generator 2-wire start	Supported		
General Data			
Dimensions (W / H / D)	455 / 660 / 179	510 / 750 / 179	mm
Weight	19	23	kg
Storage temperature range	-40 ~ 70		°C
Operating temperature range	-30 ~ 55 (Power derating when >35°C in on-grid mode)		°C
Relative humidity range	0% ~ 95%		
Max. operation altitude	4000 (Power derating when >2000m)		m
Cooling	Natural convection		
Ingress protection rating	IP54		
Communication	Fast Ethernet, RS485, dry contact		
Installation method	Wall mounted		

1. This refers to the load-side disruption time, to achieve this functionality Sigen Energy Gateway needs to be used together with Sigen Energy Controller and Sigen Battery. Test conditions: In the open-circuit state of the power grid, the nominal power of the Sigen Energy Controller is higher than the total power of the backup loads.
2. For Sigen single phase inverter products, 8.0-12.0 kW inverters should be connected to the INV1 port, 3.0-6.0 kW inverters should be connected to the INV2/INV3 port.

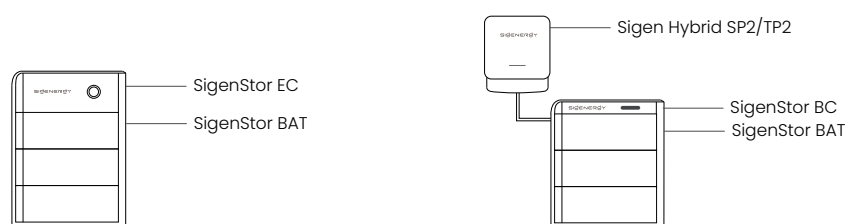
Sigen Battery

- Premium 314Ah cells with 10,000 cycles, long-lasting & reliable
- 5-layer battery safety protection to define the safety standard
- Battery optimizer inside, mix old and new, upgrade with ease
- Higher energy density, efficient storage, compact design
- 100% depth of discharge, maximum energy utilization



Sigen Battery 6.0 / 10.0

SigenStor BAT	6.0	10.0	Units
Performance Specification			
Battery type	LiFePO4		
Cell capacity	314		Ah
Cycle life ¹	10000		
Total energy capacity	6.02	9.04	kWh
Usable energy capacity ²	5.84	8.76	kWh
Depth of discharge ³	100%		
Max. charge / discharge power	3000	4600	W
Peak charge / discharge power (10 seconds)	4500	6900	W
General Data			
Weight	62	78	kg
Dimensions (W / H / D)	767 / 270 / 265		mm
Storage temperature range	-25 ~ 60		°C
Operating temperature range	-20 ~ 55		°C
Relative humidity range	5% ~ 95%		
Max. operating altitude	4000		m
Cooling	Natural convection		
System ingress protection rating	IP66		
Installation method	Floor standing / Wall-mounted		
Number of modules per controller	1 ~ 6		pcs
Compatible inverters	SigenStor EC series, Sigen Hybrid SP2/TP2 series ⁴		
Standard Compliance			
Standard ⁵	IEC/EN 60730-1, UN 38.3, IEC/EN 62619, IEC/EN 63056, IEC/EN 62477		
	SigenStor BC		
Operating voltage range (Single Phase)	300 ~ 600		V
Operating voltage range (Three Phase)	600 ~ 900		V
Weight	8		kg
Dimensions (W / H / D)	765 / 109 / 260 (without decorative cover)		mm
Compatible battery	SigenStor BAT series		
Compatible inverter	Sigen Hybrid SP2/TP2 series		
Communication	CAN		



1. This is provided by the battery cell manufacturer. Based on cell test condition of 25±2°C 0.5C charge and discharge rate and SOH=60%.
2. Test conditions: 100% depth of discharge, 0.2C rate charge & discharge averagely at 25°C, at the beginning of life.
3. Refers to the usable energy capacity. Battery must be recharged within 7 days after being fully discharged to keep battery healthy.
4. SigenStor BC must be used if Sigen Hybrid SP2/TP2 is to be connected to the Sigen Battery.
5. For all standards refer to the certificates category on the Sigenenergy website.

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