

OFERTĂ DE PREȚ

Oferta Nr. 1208/01

Data: 12.08.2024

Valabil până la: 14.10.2024

Beneficiar:

IMSP Spitalul Clinic Republican „Timofei Moșneaga”, (mun.Chișinău, str.N.Testemițanu 29)

Sistem fotovoltaic trifazat On-Grid 590 kW

Activitate	Cantitate	Suma (incl.TVA)
Panouri fotovoltaice Longi LR5-72HTD 580W (590 kW)	1018	
Invertor (puterea totală 562 kwp)		
- Huawei SUN2000-50KTL-M0	5	
- Huawei SUN2000-40KTL-M0	6	
- Huawei SUN2000-36KTL-M0	2	
- Monitorizare ShineWiFi-X		
- Complex protecții (inclus)		
- Switch (inclus)		
Structură metalică, cabluri și accesorii: pentru 4654,53		
- Balast de beton		
- Profil zincat 41*41mm		
- Echipament de curent DC		
- Clemă de capat 35 mm		
- Clemă intermediară mijloc		
- Cabluri și conectori:		
- Cablu PV1 F 6mm2		
- Conectori MC4		
- Echipament de curent AC		
Lucrări de proiectare și dare în exploatare		
Manopera		
Total		6 404 457,83 Lei

Toate lucrările se vor executa conform Devizului Local și Proiectului de Execuție.

Notă!

În preț se includ toate cheltuielile ce țin de : proiectare, documentare, utilaj pentru montare pe acoperiș a sistemului (panouri, invertor, contor bilateral, partea de protecție și siguranțe electrice etc.), inclusiv și darea în exploatare, contract cu Premier Energy.

Achitarea se face în moneda națională (MDL) la cursul Băncii Naționale a Moldovei la data semnării contractului, prin transferul mijloacelor financiare la contul companiei.

Obligațiuni și termeni de execuție a Executorului:

- Realizarea și implementarea Proiectului până la etapa de 100% funcționare într-un termen rezonabil cca 2-3 luni (de la data semnării Contractului), în condiții climatice favorabile;
- Asumarea răspunderii cu privire la întocmirea persoanei (electrician autorizat gr.V sec.elect.) ca responsabil pe gospodărie electrică în cadrul Companiei Dvs. și cu acordul obligatoriu al Administrației Companiei Dvs. prin Ordin de angajare a persoanei respective;
- Verificarea, transmiterea și predarea întregului Sistem Electric Fotovoltaic;
- Oferirea întregului set de documentație Beneficiarului (Deviz Local, Procese Verbale, Act Primire-Predare, Talon de Garanție);
- Instalarea unui soft special de evidență și monitorizare pe dispozitivele Beneficiarului (mobil, tableta, PC, Laptop etc.);
- Monitoring a întregului Sistem Electric Fotovoltaic pe toată durata exploatarei (de la distanță);
- Oferirea unui Ghid Practic de Întreținere, Curățare și Spălare a Panourilor Fotovoltaice.

Graficul de implementare a proiectului:

- Lucrări de construcție
- Lucrări de montarea modulelor fotovoltaice
- Lucrări de conectare a echipamentului electric

Numărul de contracte similare, executate în ultimii ani – peste 200 (inclusiv proiecte de Stat)

Puterea totală a proiectelor executate în ultimii ani – peste 28 MW

Numărul de persoane care va fi încadrat în realizarea proiectului – 6 + personal la tehnică specială

Perioada de executare a proiectului de la data semnării contractului – 1- 2 luni (în condiții climatice favorabile)

Condiții de achitare:

0% la momentul livrării panourilor.

0% la începerea lucrărilor de instalare.

0% la darea în exploatare.

Elena GUZUN
Director



Elaborat de *Nicu Vulpe*
+373 60 88 43 88

SUN2000-30/36/40KTL-M3 Smart PV Controller



Smart

8 strings intelligent monitoring



Efficient

Max. efficiency 98.7%



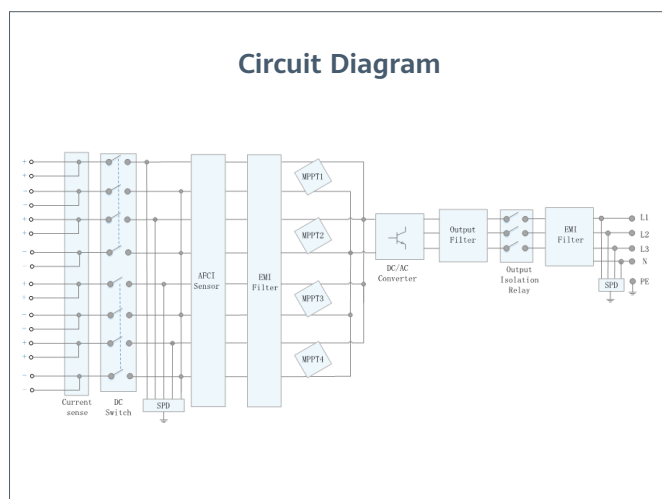
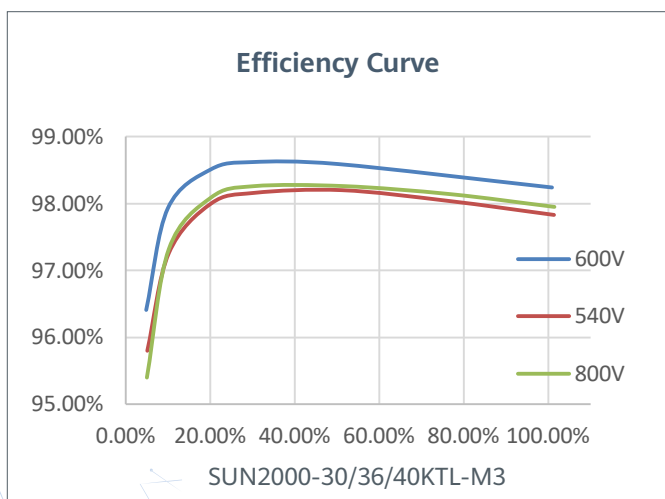
Safe

Fuse free design



Reliable

Type II surge arresters for DC & AC



SUN2000-30/36/40KTL-M3
Technical Specification

Technical Specification	SUN2000-30KTL-M3	SUN2000-36KTL-M3	SUN2000-40KTL-M3
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Efficiency	
Max. Efficiency	98.7%
European Efficiency	98.4%

Input	
Max. Input Voltage ¹	1,100 V
Max. Current per MPPT	26 A
Max. Short Circuit Current per MPPT	40 A
Start Voltage	200 V
MPPT Operating Voltage Range ²	200 V ~ 1000 V
Rated Input Voltage	600 V
Number of Inputs	8
Number of MPP Trackers	4

Output			
Rated AC Active Power	30,000 W	36,000 W	40,000 W
Max. AC Apparent Power	33,000 VA ³	40,000 VA	44,000 VA
Rated Output Voltage	230 Vac / 400 Vac / 480 Vac, 3W/N+PE		
Rated AC Grid Frequency	50 Hz / 60 Hz		
Rated Output Current	43.3 A	52.0 A	57.8 A
Max. Output Current	47.9 A	58.0 A	63.8 A
Adjustable Power Factor Range	0.8 LG ... 0.8 LD		
Max. Total Harmonic Distortion	< 3%		

Protection	
Input-side Disconnection Device	Yes
Anti-islanding Protection	Yes
AC Overcurrent Protection	Yes
DC Reverse-polarity Protection	Yes
PV-array String Fault Monitoring	Yes
DC Surge Arrester	Yes
AC Surge Arrester	Yes
DC Insulation Resistance Detection	Yes
Residual Current Monitoring Unit	Yes
Arc Fault Protection	Yes
Ripple Receiver Control	Yes
Integrated PID Recovery ⁴	Yes

Communication	
Display	LED Indicators, Integrated WLAN + FusionSolar APP
RS485	Yes
Smart Dongle	WLAN/Ethernet via Smart Dongle-WLAN-FE (Optional) 4G / 3G / 2G via Smart Dongle-4G (Optional)
Monitoring BUS (MBUS)	Yes (Isolation Transformer required)

General Data	
Dimensions (W x H x D)	640 x 530 x 270 mm (25.2 x 20.9 x 10.6 inch)
Weight (with mounting plate)	43 kg (94.8 lb)
Operating Temperature Range	-25 ~ + 60 °C (-13 °F ~ 140 °F)
Cooling Method	Natural Convection
Max. Operating Altitude	4,000 m (13,123 ft.) (Derating above 2000 m)
Relative Humidity	0% RH ~ 100% RH
DC Connector	Staubli MC4
AC Connector	Waterproof Connector + OT/DT Terminal
Protection Degree	IP 66
Topology	Transformerless
Nighttime Power Consumption	≤ 5.5W

Optimizer Compatibility	
DC MBUS Compatible Optimizer	SUN2000-450W-P

Standard Compliance (more available upon request)	
Safety	EN 62109-1/-2, IEC 62109-1/-2, EN 50530, IEC 62116, IEC 60068, IEC 61683
Grid Connection Standards	IEC 61727, VDE-AR-N4105, VDE 0126-1-1, BDEW, G59/3, UTE C 15-712-1, CEI 0-16, CEI 0-21, RD 661, RD 1699, P.O. 12.3, RD 413, EN-50438-Turkey, EN-50438-Ireland, C10/11, MEA, Resolution No.7, NRS 097-2-1, AS/NZS 4777.2, DEWA

1. The maximum input voltage is the upper limit of the DC voltage. Any higher input DC voltage would probably damage inverter.
2. Any DC input voltage beyond the operating voltage range may result in inverter improper operating.
3. For Austria, German, Belgium & Ukraine the Max. AC Apparent Power will not exceed 30,000 VA (with regard to grid code: VDE-AR-N-4105, C10/11 & Austria)
4. SUN2000-30~40KTL-M3 raises potential between PV- and ground to above zero through integrated PID recovery function to recover module degradation from PID. Supported module types include: P-type (mono, poly), N-type (nPERT, HIT)

SUN2000-50KTL-M0 Smart String Inverter



Smart

Smart I-V Curve Diagnosis supported



Efficient

Max. efficiency 98.7%



Safe

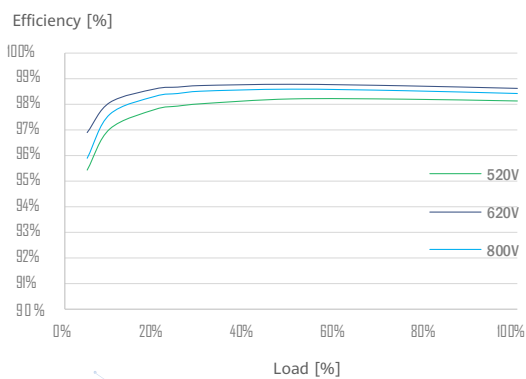
Fuse free design



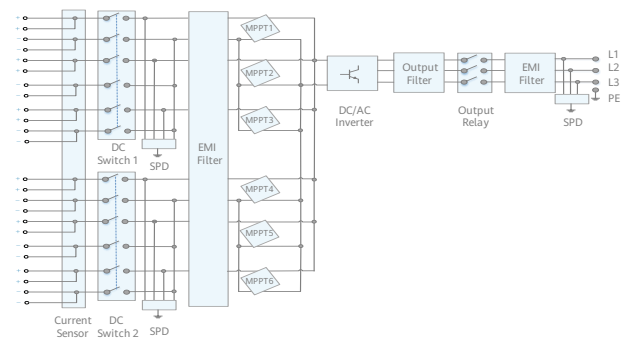
Reliable

Type II surge arresters for DC & AC

Efficiency Curve



Circuit Diagram



SUN2000-50KTL-M0

Technical Specification

Technical Specification	SUN2000-50KTL-M0
Efficiency	
Max. Efficiency	98.7%
European Efficiency	98.5%
Input	
Max. Input Voltage	1,100 V
Max. Current per MPPT	22 A
Max. Short Circuit Current per MPPT	30 A
Start Voltage	200 V
MPPT Operating Voltage Range	200 V ~ 1,000 V
Rated Input Voltage	600 V
Number of Inputs	12
Number of MPP Trackers	6
Output	
Rated AC Active Power	50,000 W
Max. AC Apparent Power	55,000 VA
Max. AC Active Power ($\cos\phi=1$)	55,000 W
Rated Output Voltage	220 V / 380 V, 230 V / 400 V, default 3W + N + PE; 3W + PE optional in settings
Rated AC Grid Frequency	50 Hz / 60 Hz
Rated Output Current	76 A @380 V / 72.2 A @400 V
Max. Output Current	83.6 A @380 V / 79.4 A @400 V
Adjustable Power Factor Range	0.8 LG ... 0.8 LD
Max. Total Harmonic Distortion	<3%
Protection	
Input-side Disconnection Device	Yes
Anti-islanding Protection	Yes
AC Overcurrent Protection	Yes
DC Reverse-polarity Protection	Yes
PV-array String Fault Monitoring	Yes
DC Surge Arrester	Type II
AC Surge Arrester	Type II
DC Insulation Resistance Detection	Yes
Residual Current Monitoring Unit	Yes
Communication	
Display	LED Indicators, Bluetooth + APP
RS485	Yes
USB	Yes
Monitoring BUS (MBUS)	Yes
General Data	
Dimensions (W x H x D)	1,075 x 555 x 300 mm (42.3 x 21.9 x 11.8 inch)
Weight (with mounting plate)	74 kg (163.1 lb.)
Operating Temperature Range	-25°C ~ 60°C (-13°F ~ 140°F)
Cooling Method	Natural Convection
Max. Operating Altitude	4,000 m (13,123 ft.)
Relative Humidity	0 ~ 100%
DC Connector	Amphenol Helios H4
AC Connector	Waterproof PG Terminal + OT Connector
Protection Degree	IP65
Topology	Transformerless
Standard Compliance (more available upon request)	
Certificate	EN 62109-1/-2, IEC 62109-1/-2, EN 50530, IEC 62116, IEC 62910, IEC 60068, IEC 61683, IRR-DCC-MV, G99
Grid Code	IEC 61727, G59/3, DEWA, NRS 097-2-1, IEEE 1547, SASO, DEWA

Hi-MO X6 Explorer

LR5-72HTD

560~585M

- Suitable for Distribution Market
- Simple design embodies modern style
- Better energy generation performance
- High-quality module guarantees long-term reliability



15-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

ISO9001:2015: ISO Quality Management System

ISO14001: 2015: ISO Environment Management System

ISO45001: 2018: Occupational Health and Safety

IEC62941: Guideline for module design qualification and type approval

LONGI



22.6%
MAX MODULE
EFFICIENCY

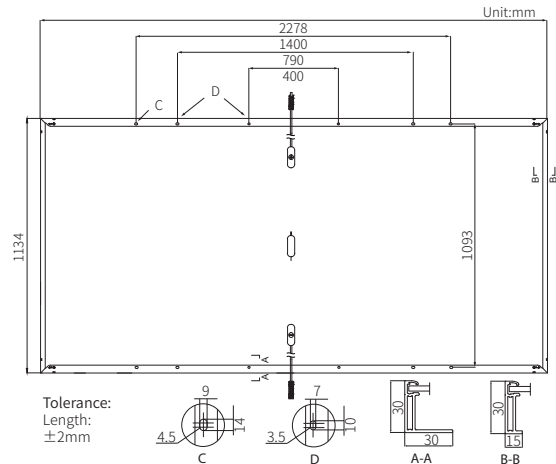
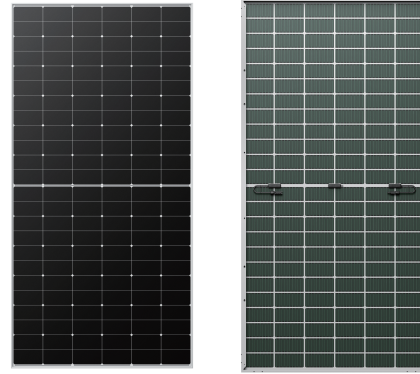
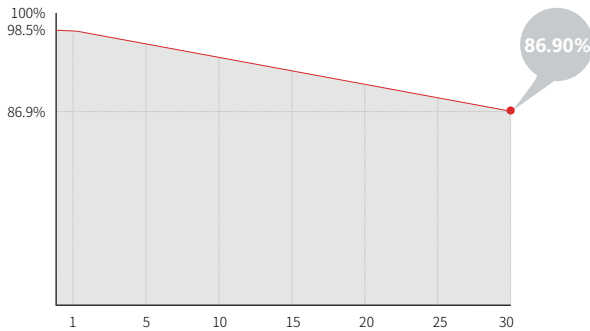
0~3%
POWER
TOLERANCE

<1.5%
FIRST YEAR
POWER DEGRADATION

0.40%
YEAR 2-30
POWER DEGRADATION

Additional Value

30-Year Power Warranty



Mechanical Parameters

Cell Orientation	144 (6×24)
Junction Box	IP68
Output Cable	4mm ² , +400, -200mm/±1400mm length can be customized
Glass	Dual glass, 2.0mm semi-tempered glass
Frame	Anodized aluminum alloy frame
Weight	31.8kg
Dimension	2278×1134×30mm
Packaging	36pcs per pallet / 180pcs per 20' GP / 720pcs per 40' HC

Electrical Characteristics

STC : AM1.5 1000W/m² 25°C

NOCT : AM1.5 800W/m² 20°C 1m/s

Test uncertainty for Pmax: ±3%

Module Type	LR5-72HTD-560M		LR5-72HTD-565M		LR5-72HTD-570M		LR5-72HTD-575M		LR5-72HTD-580M		LR5-72HTD-585M	
	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT
Maximum Power (Pmax/W)	560	418	565	422	570	426	575	430	580	433	585	437
Open Circuit Voltage (Voc/V)	51.70	48.54	51.85	48.68	52.00	48.82	52.15	48.96	52.30	49.10	52.45	49.25
Short Circuit Current (Isc/A)	13.87	11.20	13.93	11.25	14.00	11.31	14.06	11.36	14.13	11.41	14.19	11.46
Voltage at Maximum Power (Vmp/V)	43.25	39.47	43.40	39.60	43.55	39.74	43.70	39.88	43.85	40.01	44.00	40.15
Current at Maximum Power (Imp/A)	12.95	10.60	13.02	10.66	13.09	10.72	13.16	10.77	13.23	10.83	13.30	10.89
Module Efficiency(%)	21.7		21.9		22.1		22.3		22.5		22.6	

Electrical characteristics with different rear side power gain (reference to 575W front)

Pmax /W	Voc/V	Isc /A	Vmp/V	Imp /A	Pmax gain
604	52.15	14.76	43.70	13.82	5%
633	52.15	15.47	43.70	14.48	10%
661	52.25	16.17	43.80	15.13	15%
690	52.25	16.87	43.80	15.79	20%
719	52.25	17.58	43.80	16.45	25%

Operating Parameters

Operational Temperature	-40°C ~ +85°C
Power Output Tolerance	0 ~ 3%
Maximum System Voltage	DC1500V (IEC/UL)
Maximum Series Fuse Rating	30A
Nominal Operating Cell Temperature	45±2°C
Protection Class	Class II
Bifaciality	60±5%
Fire Rating	IEC Class C

Mechanical Loading

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

Temperature Ratings (STC)

Temperature Coefficient of Isc	+0.050%/°C
Temperature Coefficient of Voc	-0.230%/°C
Temperature Coefficient of Pmax	-0.290%/°C

Megawatt.md
Drumul Viilor 38
2021
Moldova

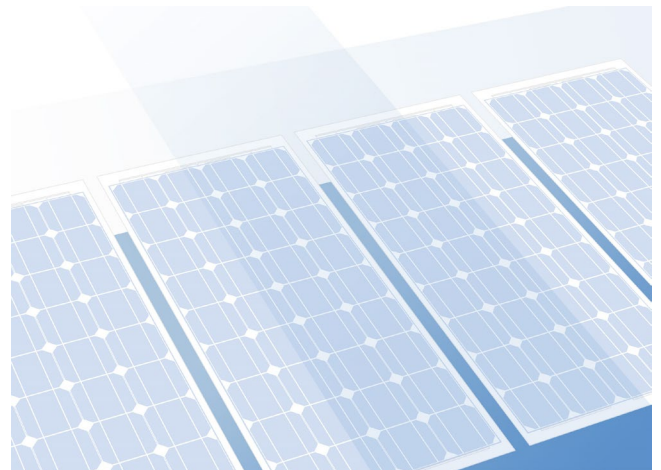
Contact person:
SHARLLY S.R.L.
Phone: +37360884388
E-Mail: megawatt.nv@gmail.com

13.08.2024

Your PV system from Megawatt.md

Address of Installation

IMSP Spitalul Clinic Republican „Timofei Moşneaga”,
(mun.Chişinău, str.N.Testemişanu 29)



Project Overview

PV System

Grid-connected PV System

Climate Data	Chisinau, MDA (1991 - 2010)	
PV Generator Output	590,44	kWp
PV Generator Surface	2 629,8	m ²
Number of PV Modules	1018	
Number of Inverters	12	

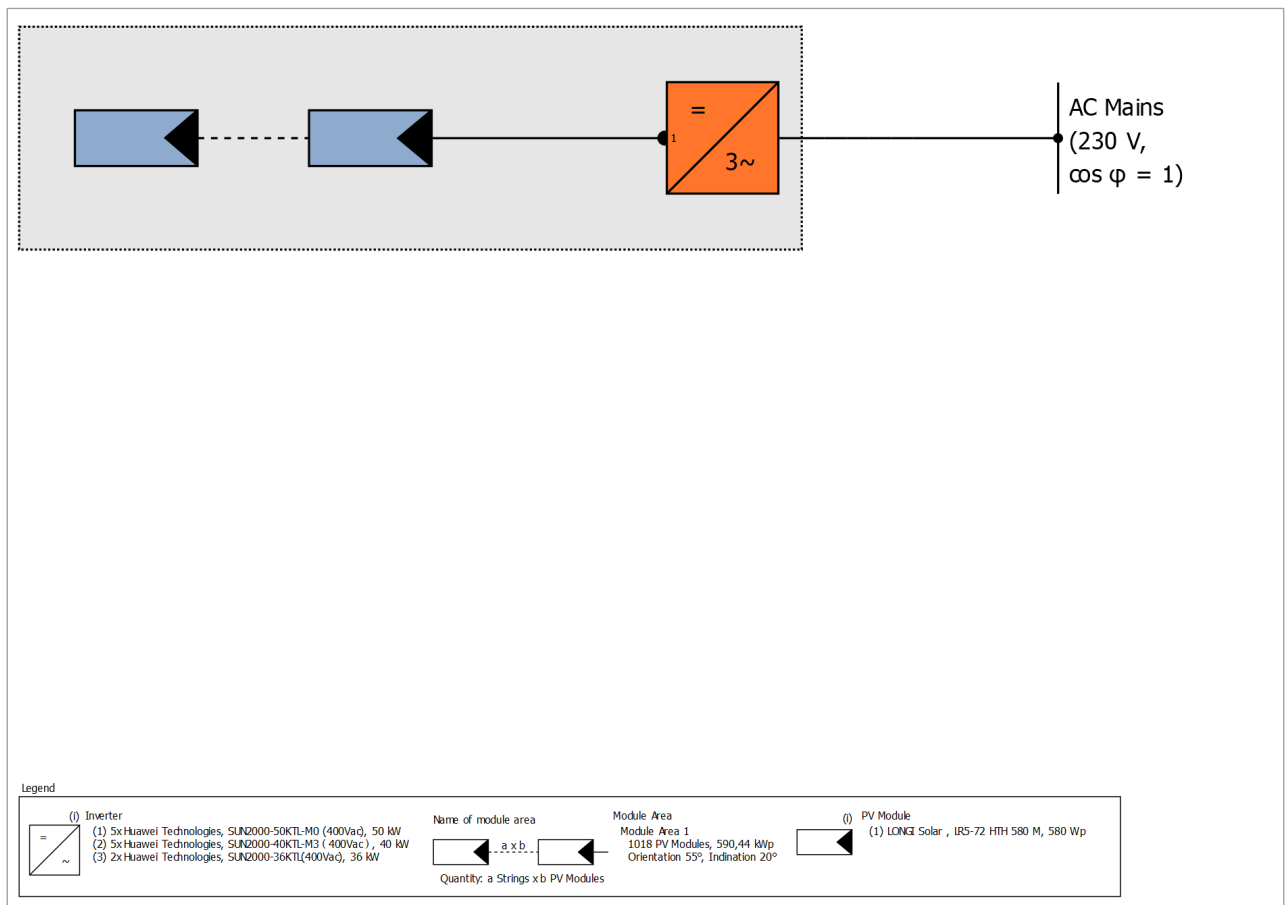


Figure: Schematic diagram

The yield

The yield

PV Generator Energy (AC grid)	622 141	kWh
Grid Feed-in	622 140	kWh
Down-regulation at Feed-in Point	0	kWh
Own Power Consumption	0,0	%
Solar Fraction	0,0	%
Spec. Annual Yield	1 053,27	kWh/kWp
Performance Ratio (PR)	94,5	%
CO ₂ Emissions avoided	292 290	kg / year

Financial Analysis

Your Gain

Total investment costs	334 821,23 €
Return on Assets	16,17 %
Amortization Period	6,1 Years
Electricity Production Costs	0,02 €/kWh
Energy Balance/Feed-in Concept	Full Feed-in

The results have been calculated with a mathematical model calculation from Valentin Software GmbH (PV*SOL algorithms). The actual yields from the solar power system may differ as a result of weather variations, the efficiency of the modules and inverter, and other factors.

Set-up of the System

Overview

System Data

Type of System	Grid-connected PV System
Start of Operation	13.08.2024

Climate Data

Location	Chisinau, MDA (1991 - 2010)
Resolution of the data	1 h
Simulation models used:	
- Diffuse Irradiation onto Horizontal Plane	Hofmann
- Irradiance onto tilted surface	Hay & Davies

Module Areas

1. Module Area - Module Area 1

PV Generator, 1. Module Area - Module Area 1

Name	Module Area 1
PV Modules	1018 x LR5-72 HTH 580 M (v3)
Manufacturer	LONGI Solar
Inclination	20 °
Orientation	Northeast 55 °
Installation Type	Mounted - Roof
PV Generator Surface	2 629,8 m ²

Inverter configuration

Configuration 1

Module Area	Module Area 1
Inverter 1	
Model	SUN2000-50KTL-M0 (400Vac) (v1)
Manufacturer	Huawei Technologies
Quantity	5
Sizing Factor	118,3 %
Configuration	MPP 1: 1 x 17
	MPP 2: 1 x 17
	MPP 3: 1 x 17
	MPP 4: 1 x 17
	MPP 5: 1 x 17
	MPP 6: 1 x 17
Inverter 2	
Model	SUN2000-40KTL-M3 (400Vac) (v3)
Manufacturer	Huawei Technologies
Quantity	5
Sizing Factor	104,4 %
Configuration	MPP 1: 1 x 18
	MPP 2: 1 x 18
	MPP 3: 1 x 18
	MPP 4: 1 x 18
Inverter 3	
Model	SUN2000-36KTL(400Vac) (v1)
Manufacturer	Huawei Technologies
Quantity	2
Sizing Factor	119,2 %
Configuration	MPP 1: 1 x 18
	MPP 2: 1 x 18
	MPP 3: 1 x 19
	MPP 4: 1 x 19

AC Mains

AC Mains

Number of Phases	3
Mains Voltage (1-phase)	230 V
Displacement Power Factor (cos phi)	+/- 1

Simulation Results

Results Total System

PV System

PV Generator Output	590,4 kWp
Spec. Annual Yield	1 053,27 kWh/kWp
Performance Ratio (PR)	94,5 %
Grid Feed-in	622 140 kWh/Year
Grid Feed-in in the first year (incl. module degradation)	622 140 kWh/Year
Standby Consumption (Inverter)	248 kWh/Year
CO ₂ Emissions avoided	292 290 kg / year

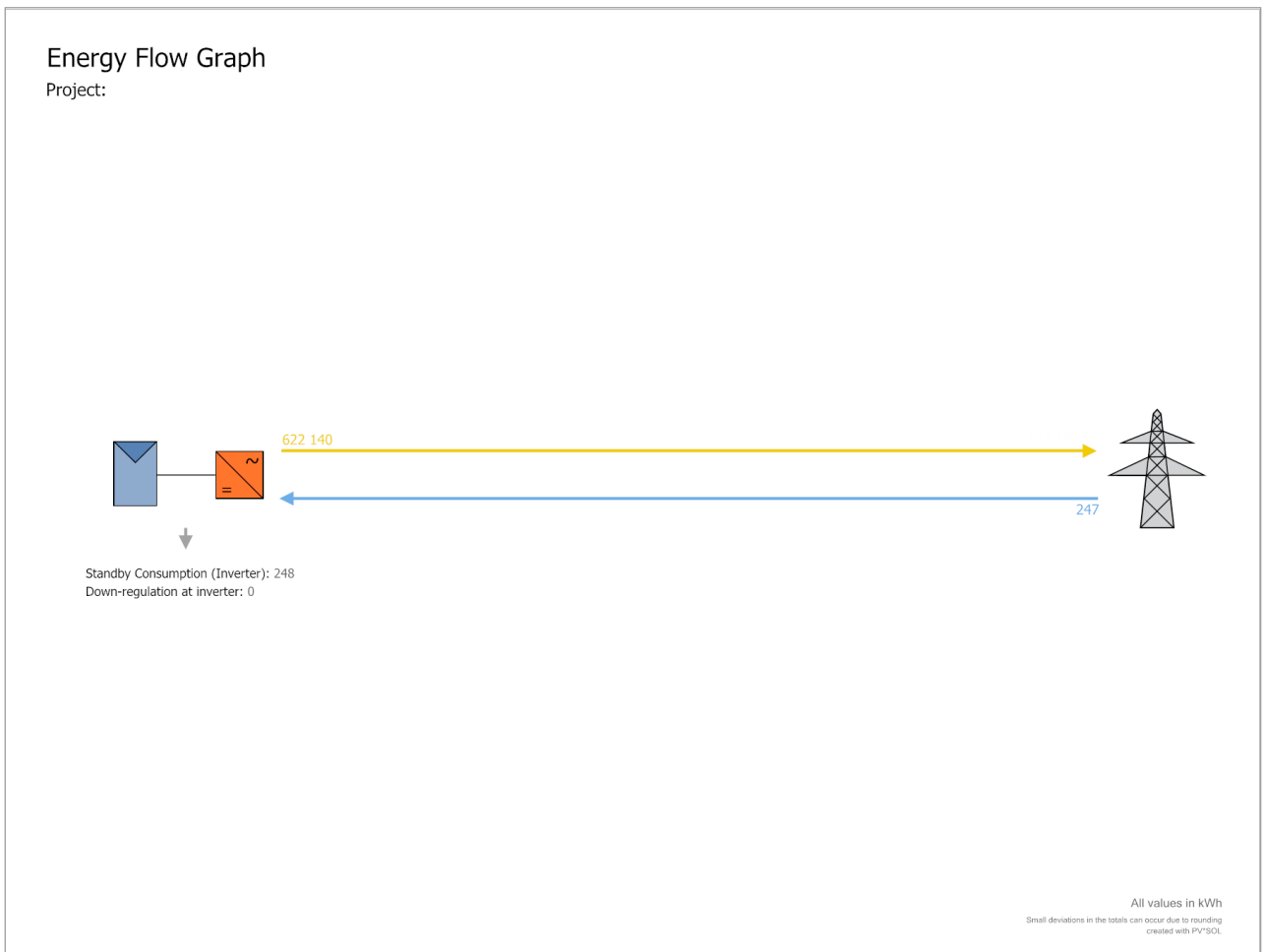


Figure: Energy Flow Graph

Financial Analysis

Overview

System Data

Grid Feed-in in the first year (incl. module degradation)	622 140 kWh/Year
PV Generator Output	590,4 kWp
Start of Operation of the System	13.08.2024
Assessment Period	25 Years
Interest on Capital	1 %

Economic Parameters

Return on Assets	16,17 %
Accrued Cash Flow (Cash Balance)	715 743,75 €
Amortization Period	6,1 Years
Electricity Production Costs	0,02 €/kWh

Payment Overview

Specific Investment Costs	567,07 €/kWp
Investment Costs	334 821,23 €
One-off Payments	0,00 €
Incoming Subsidies	0,00 €
Annual Costs	0,00 €/Year
Other Revenue or Savings	0,00 €/Year

Remuneration and Savings

Total Payment from Utility in First Year	57 575,64 €/Year
EEG 2015 (Mai) - Gebäudeanlage	
Validity	13.08.2024 - 31.12.2044
Specific feed-in / export Remuneration	0,0925 €/kWh
Feed-in / Export Tariff	57 575,64 €/Year

Cash flow

Cashflow Table

	Year 1	Year 2	Year 3	Year 4	Year 5
Investments	-334 821,23 €	0,00 €	0,00 €	0,00 €	0,00 €
Feed-in / Export Tariff	54 143,18 €	56 441,17 €	55 882,35 €	55 329,06 €	54 781,25 €
Annual Cash Flow	-280 678,05 €	56 441,17 €	55 882,35 €	55 329,06 €	54 781,25 €
Accrued Cash Flow (Cash Balance)	-280 678,05 €	-224 236,88 €	-168 354,53 €	-113 025,47 €	-58 244,22 €

	Year 6	Year 7	Year 8	Year 9	Year 10
Investments	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Feed-in / Export Tariff	54 238,86 €	53 701,84 €	53 170,14 €	52 643,70 €	52 122,48 €
Annual Cash Flow	54 238,86 €	53 701,84 €	53 170,14 €	52 643,70 €	52 122,48 €
Accrued Cash Flow (Cash Balance)	-4 005,36 €	49 696,48 €	102 866,61 €	155 510,31 €	207 632,79 €

	Year 11	Year 12	Year 13	Year 14	Year 15
Investments	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Feed-in / Export Tariff	51 606,41 €	51 095,46 €	50 589,56 €	50 088,68 €	49 592,75 €
Annual Cash Flow	51 606,41 €	51 095,46 €	50 589,56 €	50 088,68 €	49 592,75 €
Accrued Cash Flow (Cash Balance)	259 239,20 €	310 334,66 €	360 924,22 €	411 012,90 €	460 605,64 €

	Year 16	Year 17	Year 18	Year 19	Year 20
Investments	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Feed-in / Export Tariff	49 101,73 €	48 615,57 €	48 134,23 €	47 657,66 €	47 185,80 €
Annual Cash Flow	49 101,73 €	48 615,57 €	48 134,23 €	47 657,66 €	47 185,80 €
Accrued Cash Flow (Cash Balance)	509 707,37 €	558 322,95 €	606 457,18 €	654 114,84 €	701 300,63 €

	Year 21	Year 22	Year 23	Year 24	Year 25
Investments	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Feed-in / Export Tariff	14 443,12 €	0,00 €	0,00 €	0,00 €	0,00 €
Annual Cash Flow	14 443,12 €	0,00 €	0,00 €	0,00 €	0,00 €
Accrued Cash Flow (Cash Balance)	715 743,75 €	715 743,75 €	715 743,75 €	715 743,75 €	715 743,75 €

	Year 26
Investments	0,00 €
Feed-in / Export Tariff	0,00 €
Annual Cash Flow	0,00 €
Accrued Cash Flow (Cash Balance)	715 743,75 €

Degradation and inflation rates are applied on a monthly basis over the entire observation period. This is done in the first year.

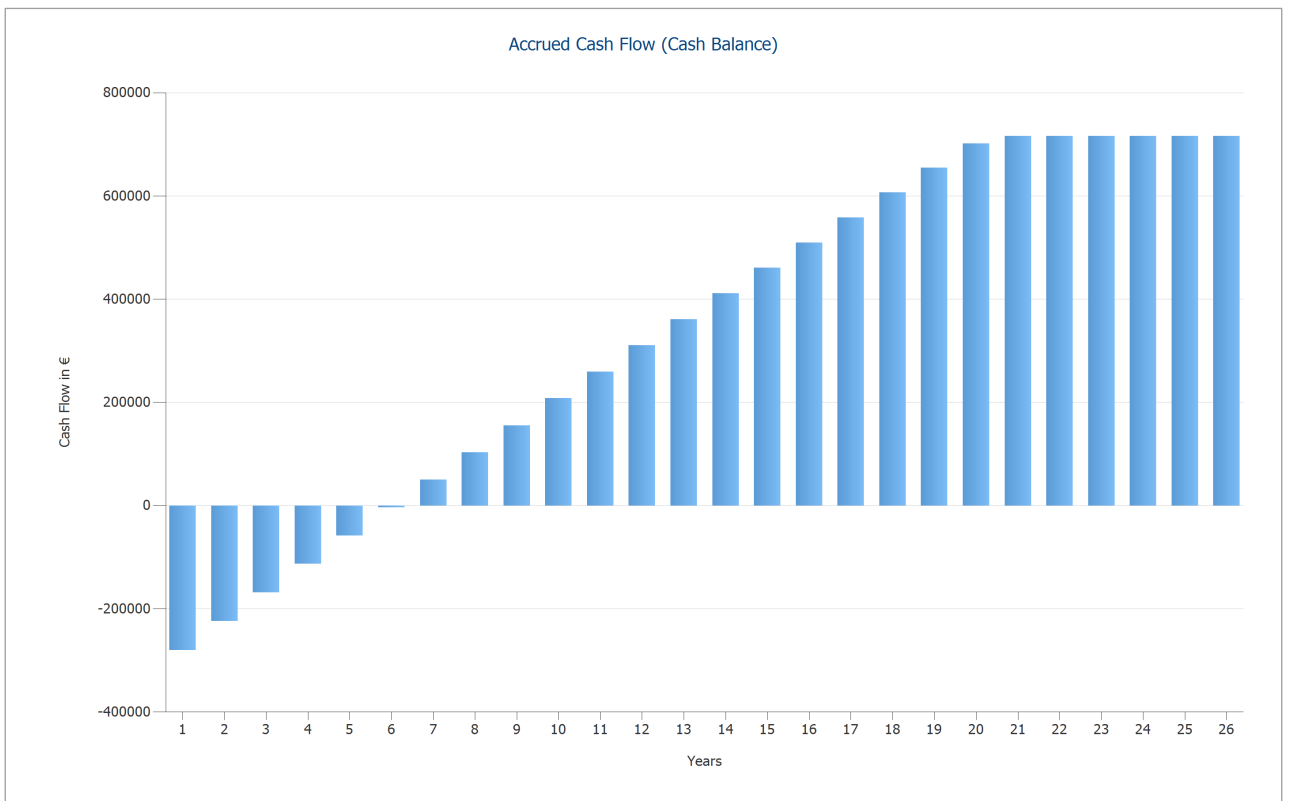
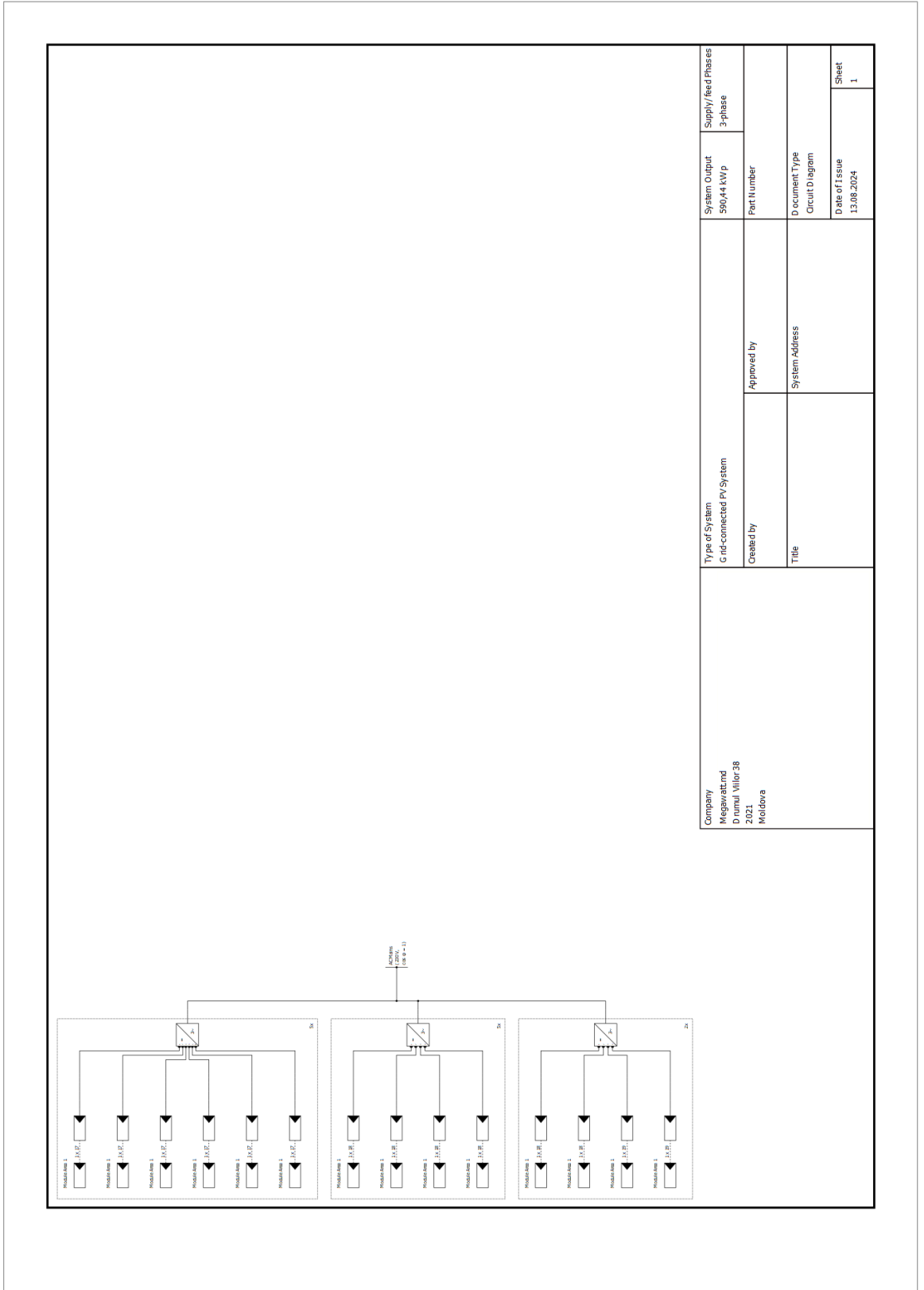


Figure: Accrued Cash Flow (Cash Balance)

Plans and parts list

Circuit Diagram



Company Megawatt.md D numul Villor 38 2021 Moldova	Type of System Grid-connected PV System		System Output 590,44 kWp	Supply/Feed Phases 3-phase
	Created by	Approved by	Part Number	
Title		System Address		Document Type Circuit Diagram
				Date of Issue 13.08.2024
				Sheet 1

Figure: Circuit Diagram

Parts list

Parts list

#	Type	Item number	Manufacturer	Name	Quantity	Unit
1	PV Module		LONGI Solar	LR5-72 HTH 580 M	1018	Piece
2	Inverter		Huawei Technologies	SUN2000-50KTL-M0 (400Vac)	5	Piece
3	Inverter		Huawei Technologies	SUN2000-40KTL-M3 (400Vac)	5	Piece
4	Inverter		Huawei Technologies	SUN2000-36KTL(400Vac)	2	Piece