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Lampiran 1 Data Pengamatan (Isolar Cloud)

1.1 Data energi Bulan Februari 2024

Waktu	Hasil Hari(kWh)	Beban Motor Selama 12 jam(kWh)	Yang Disuplay PLN
2024-02-01	51.7	76.8	25.1
2024-02-02	47.2	76.8	29.6
2024-02-03	44.2	76.8	32.6
2024-02-04	47.6	76.8	29.2
2024-02-05	53.3	76.8	23.5
2024-02-06	55	76.8	21.8
2024-02-07	55.6	76.8	21.2
2024-02-08	51.6	76.8	25.2
2024-02-09	40.5	76.8	36.3
2024-02-10	58.5	76.8	18.3
2024-02-11	50.2	76.8	26.6
2024-02-12	59.4	76.8	17.4
2024-02-13	40.2	76.8	36.6
2024-02-14	49.7	76.8	27.1
2024-02-15	48,9	76.8	27.9
2024-02-16	37	76.8	39.8
2024-02-17	49.2	76.8	27.6
2024-02-18	47.9	76.8	28.9
2024-02-19	42.1	76.8	34.7
2-20	54.9	76.8	21.9
2-21	65.6	76.8	11.2



2024-02-22	43.6	76.8	33.2
2024-02-23	49	76.8	27.8
2024-02-24	44.8	76.8	32
2024-02-25	45.6	76.8	31.2
2024-02-26	36.8	76.8	40
2024-02-27	53.9	76.8	22.9
2024-02-28	48	76.8	28.8
2024-02-29	49.3	76.8	27.5

1.2 Data daya aktif dan daya DC bulan Februari 2024

Waktu	Total Daya DC(kW)	Total Daya Aktif(kW)
2024-02-01	7098	7321
2024-02-02	10990	11265
2024-02-03	9813	10125
2024-02-04	10515	10754
2024-02-05	10976	11410
2024-02-06	11007	11285
2024-02-07	11034	11302
2024-02-08	7587	7730
2024-02-09	7372	7577
2024-02-10	5524	5642
2024-02-11	7554	7927
2024-02-12	7813	7913
2024-02-13	2228	2274
2024-02-14	9723	9735
2024-02-15	6412	6528
2024-02-16	11042	11288
2024-02-17	11007	11267
2024-02-18	11008	11325
2024-02-19	11035	11371
2024-02-20	11035	11470
2024-02-21	9408	9464
2024-02-22	11001	11265
2024-02-23	8149	8327



2024-02-24	11028	11360
2024-02-25	11024	11296
2024-02-26	6518	6599
2024-02-27	11038	11368
2024-02-28	10997	11215
2024-02-29	10732	11008

1.3 Data tegangan 3 fasa & Frekuensi Grid

Waktu	Tegangan Fasa C(V)	Tegangan Fasa B(V)	Tegangan Fasa A(V)	Tegangan 3 Fasa	Frekuensi Grid
2024-02-01	232	231.1	230.4	231	50.05
2024-02-02	230.4	229.6	228.8	229	50.07
2024-02-03	228.8	228	227.3	228	50.03
2024-02-04	226.7	226.4	225.6	226	50.05
2024-02-05	226.4	226	224.8	225	50.16
2024-02-06	228.8	227.8	227.2	227	50.13
2024-02-07	228.8	228	227.1	228	50.23
2024-02-08	229.4	228.8	227.9	228	50.06
2024-02-09	231.1	230.4	229.6	230	50.07
2024-02-10	230.1	229.6	228.2	229	50.06
2024-02-11	228.8	228	227.2	228	50.11
2024-02-12	230.4	230.4	228.9	229	50.07
2024-02-13	230.4	230.4	229	229	50.09
2024-02-14	228.4	228	227.2	227	50.08
2024-02-15	228.1	228	227.2	227	50.1
16	229.6	228.8	228.8	229	50.06
17	230.4	230.4	229.6	230	50.1



2024-02-18	231.2	230.4	229.6	230	50.04
2024-02-19	228	228	226.4	227	50.21
2024-02-20	228.8	228	227.2	228	50.07
2024-02-21	231.2	230.4	228.9	230	50.07
2024-02-22	228	227.6	226.4	227	50.12
2024-02-23	231	229.8	229.6	230	50.05
2024-02-24	230.4	229.6	228.8	229	50.08
2024-02-25	228.8	228.8	227.2	228	50.02
2024-02-26	229.6	229.6	228.6	229	50.18
2024-02-27	228.9	228.8	228	228	50.1
2024-02-28	228.8	228.8	227.2	228	50.28
2024-02-29	225.6	224	224	224	50.08

Lampiran 2 Data Hasil Perhitungan

Tabel 2.1 Faktor kapasitas PLTS pada unit Packer

Hari	2024	
	CF Perhari	CF Perpekan
2024-02-01	6%	6%
2024-02-02	6%	
2024-02-03	6%	
2024-02-04	6%	
2024-02-05	5%	
2024-02-06	5%	
2024-02-07	5%	
08	6%	6%
09	7%	
10	5%	
11	6%	



2024-02-12	5%	
2024-02-13	7%	
2024-02-14	6%	
2024-02-15	6%	6%
2024-02-16	8%	
2024-02-17	6%	
2024-02-18	6%	
2024-02-19	7%	
2024-02-20	5%	
2024-02-21	4%	
2024-02-22	6%	6%
2024-02-23	6%	
2024-02-24	6%	
2024-02-25	6%	
2024-02-26	8%	
2024-02-27	5%	
2024-02-28	6%	
2024-02-29	6%	

Tabel 2.4 Efisiensi Inverter PLTS pada unit Packer

waktu	Inverter perhari
2024-02-01	97%
2024-02-02	98%
2024-02-03	97%
2024-02-04	98%
2024-02-05	96%
2024-02-06	97%
2024-02-07	98%
2024-02-08	98%
2024-02-09	97%
2024-02-10	98%
2024-02-11	95%
2024-02-12	98%
2024-02-13	98%
2024-02-14	99%
2024-02-15	98%
2024-02-16	97%
17	97%
18	97%
19	97%
20	96%



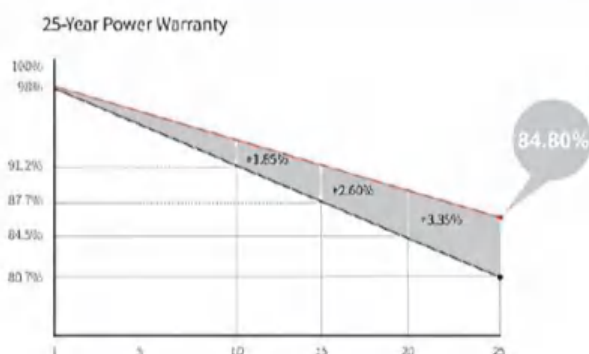
2024-02-21	99%
2024-02-22	97%
2024-02-23	97%
2024-02-24	97%
2024-02-25	97%
2024-02-26	98%
2024-02-27	97%
2024-02-28	98%
2024-02-29	97%



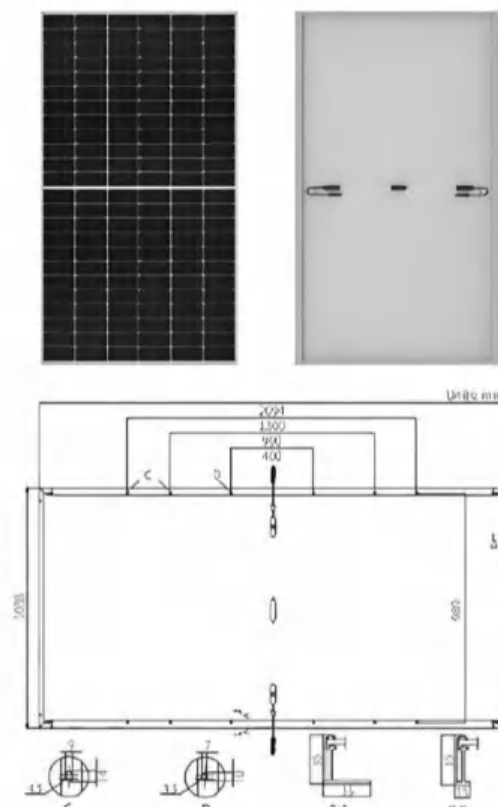
Lampiran 2 Spesifikasi Komponen PLTS

Hi-MO 4m**LR4-72HPH 430~460M****21.2%**MAX MODULE
EFFICIENCY**0~+5W**POWER
TOLERANCE**<2%**FIRST YEAR
POWER DEGRADATION**0.55%**YEAR 2-25
POWER DEGRADATION**HALF-CELL**

Lower operating temperature

Additional Value**Mechanical Parameters**

Cell Orientation	144 (6 × 24)
Junction Box	IP68, three diodes
Output Cable	4mm ² , +400, -200mm/±1400mm length can be customized
Glass	Single glass, 3.2mm coated tempered glass
Frame	Anodized aluminum alloy frame
Weight	23.3kg
Dimension	2094 × 1038 × 35mm
Packaging	30pcs per pallet / 150pcs per 20' GP / 660pcs per 40' HC

**Electrical Characteristics**STC: AM1.5 1000W/m² 25°CNOCT: AM1.5 800W/m² 20°C 1m/s

Test uncertainty for Product B: 3%

Module Type	LR4-72HPH-430M		LR4-72HPH-435M		LR4-72HPH-440M		LR4-72HPH-445M		LR4-72HPH-450M		LR4-72HPH-455M		LR4-72HPH-460M	
Testing Condition	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT
Maximum Power (P _{max} /W)	430	321.1	435	324.9	440	328.6	445	332.3	450	336.1	455	339.8	460	343.5
Open Circuit Voltage (V _{oc} /V)	48.5	45.5	48.7	45.7	48.9	45.8	49.1	46.0	49.3	46.2	49.5	46.4	49.7	46.6
Short Circuit Current (I _{sc} /A)	11.31	9.15	11.39	9.21	11.46	9.27	11.53	9.33	11.60	9.38	11.66	9.43	11.73	9.48
Voltage at Maximum Power (V _{mp} /V)	40.7	37.9	40.9	38.1	41.1	38.3	41.3	38.5	41.5	38.6	41.7	38.8	41.9	39.0
Current at Maximum Power (I _{mp} /A)	10.57	8.47	10.61	8.53	10.71	8.59	10.78	8.64	10.85	8.70	10.92	8.75	10.99	8.80
Module Efficiency(%)	19.8		20.0		20.2		20.6		20.7		20.9		21.2	

Operating Parameters

Operational Temperature	-40°C ~ +85°C
Power	0 ~ +5 W
Efficiency	±3%
Input Voltage (V _{in} /V)	DC1500V (IEC/UL)
Current (I _{sc} /A)	20A
Temperature	45 ± 2°C
Class	Class II
UL type	UL type 1 or 2

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 I _{sc}	+0.048%/°C
Temperature Coefficient of V _{oc}	-0.270%/°C
Temperature Coefficient of P _{max}	-0.350%/°C

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Web: en.longi-solar.com

Specifications included in this datasheet
are subject to change without notice.
LONGI reserves the right of final
interpretation. (20210508V1.3)

Lampiran 3 Inverter PLTS

SG5.0RT/SG7.0RT/SG10RT/ SG15RT/SG20RT **New**

SUNGROW
Clean power for all

Multi-MPPT String Inverter for 1000 Vdc System



HIGH YIELD

- Lower startup & wider MPPT voltage
- Compatible with bifacial modules
- Built-in PID recovery function

SMART MANAGEMENT

- Smart IV curve scanning
- 24/7 Live monitoring
- Over-the-air firmware updates

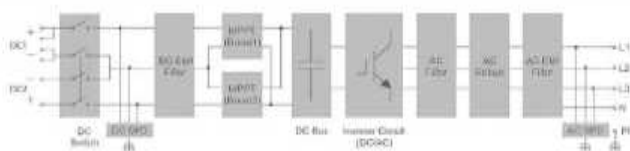
SAFE AND DURABLE

- Quick arc fault circuit interrupter
- Built-in Type II DC & AC SPD
- High anti-corrosion rating at C5

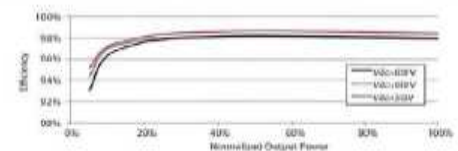
EASY AND USER FRIENDLY

- 18 kg compact design
- Unique push-in connectors
- Fast and easy commissioning via App

CIRCUIT DIAGRAM



EFFICIENCY CURVE



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SG5.0RT/SG7.0RT/SG10RT/SG15RT/SG20RT

Type designation	SG5.0RT	SG7.0RT	SG10RT	SG15RT	SG20RT
Input (DC)					
Recommended max. PV input power	7.5 kW	10.5 kW	15 kW	22.5 kW	30 kW
Max. PV input voltage			1100 V		
Min. PV input voltage / Start-up input voltage			160 V		
Nominal input voltage			600 V		
MPP voltage range			160 V – 1000 V		
No. of independent MPP inputs			2		
No. of PV strings per MPPT	1/1	2/1	2/1	2/2	2/2
Max. PV input current	25 A (12.5 A / 12.5 A)	37.5 A (25 A / 12.5 A)	37.5 A (25 A / 12.5 A)	50 A (25 A / 25 A)	50 A (25 A / 25 A)
Max. current for input connector			30 A		
Max. DC short-circuit current	32 A (16 A / 16 A)	48 A (32 A / 16 A)	48 A (32 A / 16 A)	64 A (32 A / 32 A)	64 A (32 A / 32 A)
Output (AC)					
Nominal AC power (@230 V, 50 Hz)	5000 W	7000 W**	10000 W	15000 W	20000 W
Max. AC output power	5500 VA*	7700 VA**	11000 VA*	16500 VA*	22000 VA*
Max. AC output current	8.3 A	11.7 A	16.7 A	25 A	31.9 A
Nominal AC voltage			3 / N / PE, 220 / 380 V 3 / N / PE, 230 / 400 V 3 / N / PE, 240 / 415 V		
AC voltage range			180 V – 276 V		
Nominal grid frequency / Grid frequency range			50 Hz / 45 – 55 Hz 60 Hz / 55 – 65 Hz		
Harmonic (THD)			<3 % (at nominal power)		
Power factor at nominal power / Adjustable power factor			>0.99 / 0.8 leading – 0.8 lagging		
Feed-in phases / AC connection			3 / 3		
Efficiency					
Max. efficiency	98.40%	98.40%	98.50%	98.50%	98.50%
European efficiency	97.40%	97.70%	97.90%	98.10%	98.10%
Protection					
Grid monitoring			Yes		
DC reverse connection protection			Yes		
AC short-circuit protection			Yes		
Leakage current protection			Yes		
Surge Protection			DC Type II / AC Type II		
DC switch			Yes		
Arc fault circuit interrupter (AFCI)			Yes		
PID recovery function			Yes		
General Data					
Dimensions (W*H*D)			370 * 480 * 195 mm		
Mounting method			Wall-mounting bracket		
Weight	18 kg	18 kg	18 kg	21 kg	21 kg
Topology			Transformerless		
Degree of protection			IP65		
Operating ambient temperature range			-25 °C to 60 °C		
Allowable relative humidity range			0% – 100%		
Cooling method	Natural cooling	Natural cooling	Natural cooling	Smart forced air cooling	Smart forced air cooling
Max. operating altitude			4000 m (> 2000 m derating)		
Noise (Typical)	35dB (A)	35dB (A)	35dB (A)	45dB (A)	45dB (A)
Display			LED		
Communication			WLAN, Ethernet, RS485, DI, DO		
DC connection type			MC4		
AC connection type			Plug and play		
Compliance			EN 61000-6-1/-3, IEC62109-2, IEC 61727, IEC 62116, AS/NZS 4777.2:2015, VDE-AR-N-4105, DIN VDE0126-1-1, CEI 0-21, EN50549-1		



Lampiran 4 Jenis Motor& Name Plat

Motor Belt Loading



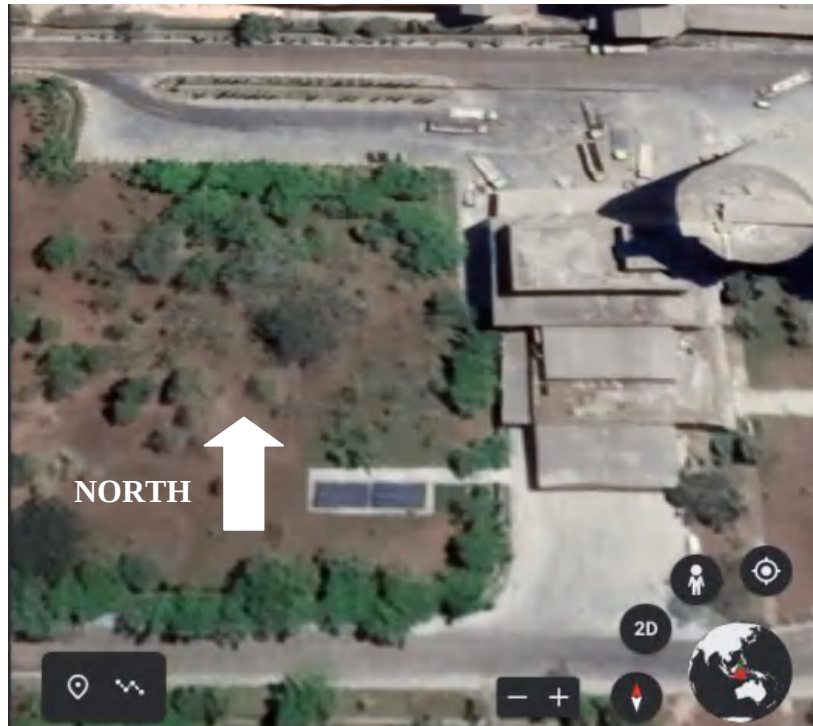
Motor Traveling



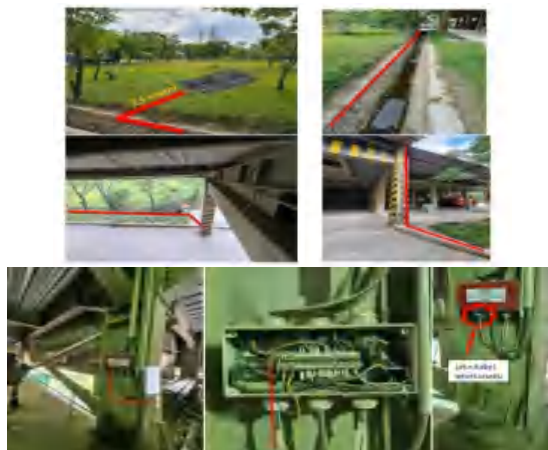
Motor Lifting



Lampiran 5 Arah PLTS



Lampiran 6 Jalur kabel PLTS



Lampiran 7 Tampilan iSolar Cloud PLTS PT Semen Tonasa

The screenshot displays the iSolarCloud web interface for PT Semen Tonasa. The interface is divided into a sidebar menu on the left and a main content area. The sidebar menu includes options such as Beranda, Gangguan, Laporan, Kurva, Lanjutan, Pembaruan Firmware, Data Langsung, Langganan Alarm, Pusat Pesan, Bantuan, Saya, and Beralih ke versi baru. The main content area features a header with search filters for 'Jenis Pembangkit List...', 'Nama Pembangkit Lis...', and 'Nomor Seri Perangkat', along with the 'SUNGROW' logo and a menu icon. The central part of the main content area displays the company name 'PT Semen Tonasa' with a green checkmark icon, and three key performance indicators: 'Hasil Hari Ini' (15.6 kWh), 'Daya Real-time' (3.814 kW), and 'Daya Terpasang' (10 kWp).



Lampiran 8 iSolar Cloud ketika penarikan data

