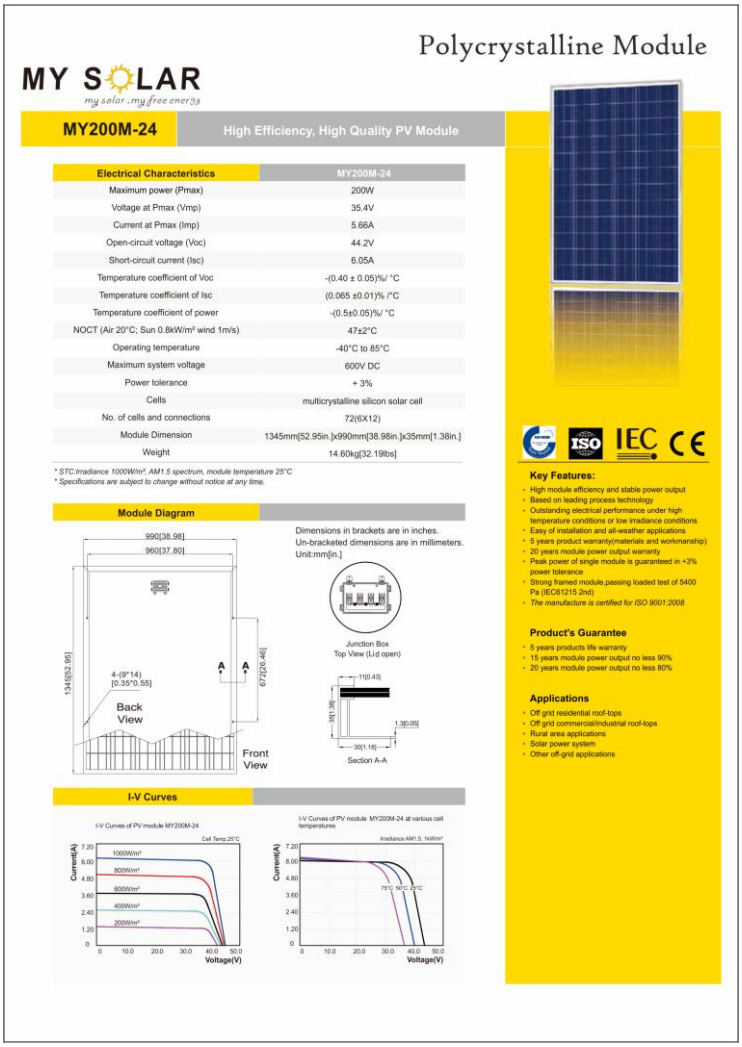
LAMPIRAN



Polycrystalline Module

MY SOLAR
my solar . my free energy

MY200M-24 — High Efficiency, High Quality PV Module

Electrical Characteristics	MY200M-24
Maximum power (Pmax)	200W
Voltage at Pmax (Vmp)	35.4V
Current at Pmax (Imp)	5.66A
Open-circuit voltage (Voc)	44.2V
Short-circuit current (Isc)	6.05A
Temperature coefficient of Voc	-(0.40 ± 0.05)%/ °C
Temperature coefficient of Isc	(0.065 ±0.01)% /°C
Temperature coefficient of power	-(0.5±0.05)%/ °C
NOCT (Air 20°C; Sun 0.8kW/m² wind 1m/s)	47±2°C
Operating temperature	-40°C to 85°C
Maximum system voltage	600V DC
Power tolerance	+ 3%
Cells	multicrystalline silicon solar cell
No. of cells and connections	72(6X12)
Module Dimension	1345mm[52.95in.]x990mm[38.98in.]x35mm[1.38in.]
Weight	14.60kg[32.19lbs]

* STC:Irradiance 1000W/m², AM1.5 spectrum, module temperature 25°C
* Specifications are subject to change without notice at any time.

Module Diagram

I-V Curves

Key Features:

- High module efficiency and stable power output
- Based on leading process technology
- Outstanding electrical performance under high temperature conditions or low irradiance conditions
- Easy of installation and all-weather applications
- 5 years product warranty(materials and workmanship)
- 20 years module power output warranty
- Peak power of single module is guaranteed in +3% power tolerance
- Strong framed module,passing loaded test of 5400 Pa (IEC61215 2nd)
- *The manufacture is certified for ISO 9001:2008*

Product's Guarantee

- 5 years products life warranty
- 15 years module power output no less 90%
- 20 years module power output no less 80%

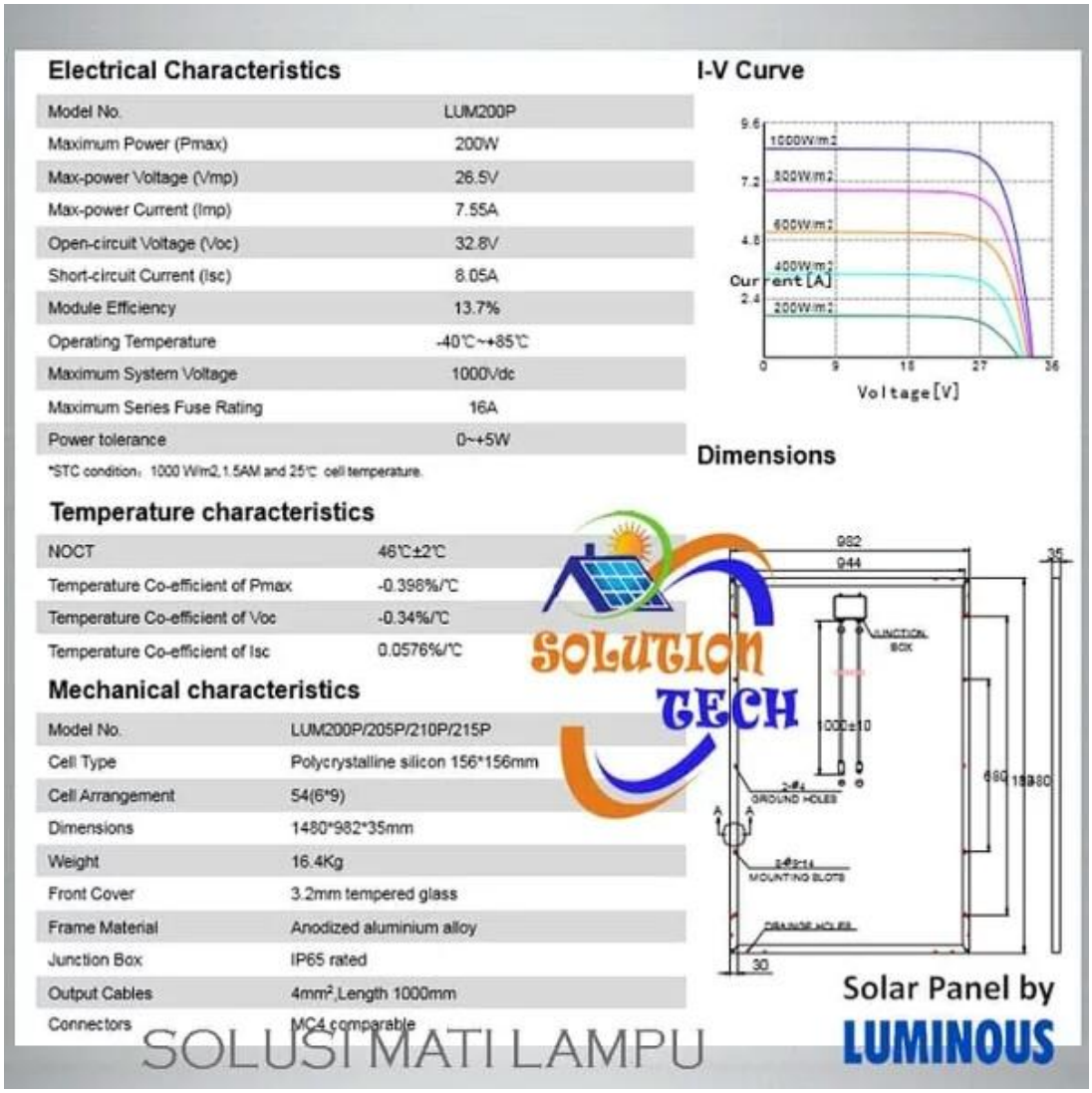
Applications

- Off grid residential roof-tops
- Off grid commercial/industrial roof-tops
- Rural area applications
- Solar power system
- Other off-grid applications

Lampiran 1: Data sheet My solar 200 Wp

Spesifikasi	Keterangan
Max. Power (Pmax)	200W
Max. Power Voltage (Vmp)	26.9V
Max. Power Current (Imp)	7.43A
Open Circuit Voltage (Voc)	32.3V
Short Circuit Current (Isc)	8.33A
Nominal Operating Cell Temp (NOCT)	45±2°C
Max. System Voltage	1000V
Max. Series Fuse	16A
Weight	15.45Kg
Dimension	1482 x 992 x 35 mm

Lampiran 2: Data sheet panel surya Shinyoku

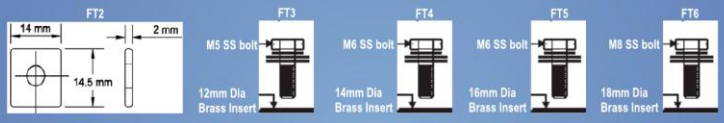


Lampiran 3: Data sheet panel surya Luminous

General Specification

Model No.	Outline Dimensions(mm)			Capacity 1.75/CELL AH			Terminal type	Weight Kg
	Length	Width	Height	10 hours rate	20 hours rate	100 hours rate		
12V18AH	181	76	168	15AH	16AH	19AH	FT3	5.8
12V26AH	165	126	175	24AH	26AH	33AH	FT3	10.0
12V33AH	196	131	151	28AH	31AH	35AH	FT5	11.0
12V40AH	196	165	175	36AH	40AH	44AH	FT5	14.8
12V55AH	229	138	208	50AH	55AH	60AH	FT5	19.0
12V70AH	259	169	208	65AH	70AH	76AH	FT5	25.5
12V80AH	259	169	208	70AH	80AH	85AH	FT5	26.5
12V90AH	307	169	208	81AH	90AH	100AH	FT5	30.5
12V100AH	307	169	208	90AH	100AH	110AH	FT5	31.5
12V120AH	339	173	212	110AH	120AH	130AH	FT6	36.0
12V135AH	341	173	281	120AH	135AH	140AH	FT6	42.5
12V150AH	483	170	240	135AH	150AH	165AH	FT6	48.5
12V200AH	520	240	223	180AH	200AH	220AH	FT6	66.0
12V250AH	520	268	220	220AH	250AH	260AH	FT6	80.5

Please note: The actual battery dimension may vary 1%



Insert Terminal

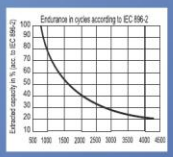
Typical Insert type terminal with Insert standing 3mm above the top of the battery case

Constant Voltage Charging

It is recommended to use Constant Voltage method of charging for Valve Regulated lead acid (VRLA) batteries.Charging voltages must be regularly checked and to optimize the battery performance it is necessary to ensure that the voltage is kept within the following limits.
Float Service 2.25 ± 1% VoltsPer Cell at20/25°C.
Cycle Service2.35 ± 1 % Volts Per Cell at20/25°C.

Temperature Effects

Temperature affects the battery in a number of different ways. The battery will operate in extreme temperature ranges from below Zero to over 40°C. However the Valve Regulated (VRLA) Battery nominal capacity, and optimum performance are based on operating temperature of 20°C.
Above this temperature the Battery capacity will increase slightly. However the life will decrease at the higher temperature. When designing your battery system the different discharge and recharge performance at different temperature should be taken into account, details of both listed below.



Temperature Compensation is the process where by the change voltage is changed as function of the battery temperature. For the higher or lower temperatures outside the table range use temperature correction factor of 0.003±0.01 per volt / per cell / °.C

Battery Floating Charging (Temperature Compensation)	
Temperature Deg.	Float Charge Volt/Cell
5	2.31
10	2.29
15	2.27
20	2.25
25	2.25
30	2.23
35	2.21

Lampiran 4: Data sheet Luminos VRLA 12v 200ah

UPLUS
NEW TECHNOLOGY BATTERY

■ Telecom Battery
□ UPS Battery
□ Renewable Energy Battery

Long Float Life and High Temperature series

PLH-200FT(12V200AH)

Specification

Nomial Voltage	12V	
Rated Capacity (Ah)	10hr 200Ah	@25℃ to 1.80V/cell
	8hr 190Ah	@25℃ to 1.75V/cell
	10hr 210Ah	@35℃ to 1.80V/cell
	8hr 199Ah	@35℃ to 1.75V/cell
Dimension	Length	562±3mm
	Width	125±2mm
	Height	320±3mm
	Total Height	320±3mm
Approx Weight	Approx 61.0Kg	
Terminal	T11	
Container Material	ABS	
Max. Discharge Current	1500A (5s)	
Internal Resistance	Approx 3.0mΩ	
Operating Temp.Range	Discharge : -40～65℃ Charge : 0～40℃ Storage : -20～40℃	
Capacity affected by Temperature	40℃	106%
	35℃	105%
	25℃	100%
	0℃	86%
Self Discharge	PLH series batteries can be stored up to 24 months at 25℃ and then a freshening charge is required. For higher temperatures the time interval will be shorter.	

Performance - 25 ℃

Constant Current Discharge (Amperes) at 25℃

F.V/Time	15min	20min	30min	45min	1h	2h	3h	4h	5h	8h	10h	20h
1.85V/cell	311.2	267.5	202.3	149.2	118.1	70.8	49.1	38.6	32.2	22.5	20.0	10.4
1.80V/cell	347.1	295.7	218.3	158.8	124.7	78.1	51.0	39.9	33.3	23.2	20.3	10.6
1.75V/cell	369.5	315.4	231.8	166.7	130.7	78.6	52.1	41.0	34.1	23.6	20.5	10.7
1.70V/cell	388.6	329.2	243.0	174.0	135.0	79.3	53.2	41.8	34.8	24.0	20.6	10.8
1.67V/cell	401.2	342.3	251.6	179.6	139.7	79.9	53.9	42.1	35.2	24.5	20.7	10.9
1.60V/cell	418.4	351.3	259.1	184.6	142.8	81.4	54.2	42.5	35.5	24.6	20.8	11.0

Constant Power Discharge (Watts) at 25℃

F.V/Time	15min	20min	30min	45min	1h	2h	3h	4h	5h	8h	10h	20h
1.85V/cell	600.9	520.7	396.5	295.2	234.4	137.4	98.4	77.6	64.9	45.7	40.5	21.2
1.80V/cell	666.9	571.7	425.0	311.9	245.8	141.4	101.6	79.8	66.8	46.7	41.1	21.5
1.75V/cell	705.3	604.3	447.6	325.2	255.9	143.9	103.3	81.4	68.0	47.6	41.4	21.7
1.70V/cell	734.6	624.8	465.5	337.1	263.0	147.1	105.2	82.8	69.1	48.4	41.5	21.8
1.67V/cell	750.8	643.0	483.0	346.0	270.4	149.1	106.1	83.3	69.8	48.9	41.8	21.9
1.60V/cell	756.0	652.7	498.8	352.2	274.4	150.5	106.1	83.7	70.1	49.0	41.7	21.8

Lampiran 5: Data sheet uplus VRLA 12v 200ah

battery is completely sealed and is, therefore, maintenance-free, leak proof and usable in any position.

General purpose application

VISION FM series are designed for general purpose applications, such as UPS, telecom, electrical utilities.

With 10 years design life, the batteries comply to the most popular international standards, such as IEC896-2, BS6290-4, Eurobat Guide.

The battery container and cover are available both in VO class flame retardant ABS or HBO ABS plastics.

Shenzhen Center Power Tech Co., Ltd. has come to obtain wide recognition from customers all over the world. This is not only due to the fact that our products are featured by reliable stability in quality, but also because we attach great importance to our communication with customers and our perfect understanding of customers' requirements as well.

Shenzhen Center Power Tech. Co., Ltd

	SI Units	English Units
Length	522mm	20.6inch
Width	238mm	9.37inch
Height	218mm	8.58inch
Total Height	223mm	8.78inch
Approx. Weight	65.5 Kg	144.5 lbs

Performance Characteristics

- Nominal Voltage 12V
- Number of cell 6
- Nominal Capacity 77ºF (25ºC)
  - 10 hour rate (20.0A, 10.8V) 200Ah
  - 5 hour rate (36.0A, 10.5V) 180Ah
  - 1 hour rate (128A, 9.60V) 128Ah
- Internal Resistance
  - Fully Charged battery 77ºF(25ºC) 3.5mOhms
- Self-Discharge
  - 3% of capacity declined per month at 20ºC(average)
- Operating Temperature Range
  - Discharge -20~60ºC
  - Charge -10~60ºC
  - Storage -20~60ºC
- Max. Discharge Current 77ºF(25ºC) 1000A(5s)
- Short Circuit Current 3300A
- Charge Methods: Constant Voltage Charge 77ºF(25ºC)
  - Cycle use 14.4-14.7V
  - Maximum charging current 60A
  - Temperature compensation -30mV/ºC
- Standby use 13.6-13.8V
  - Temperature compensation -20mV/ºC

Battery Construction

Component	Positive plate	Negative plate	Container	Cover	Safety valve	Terminal	Separator	Electrolyte
Raw material	Lead dioxide	Lead	ABS	ABS	Rubber	Copper	Fiberglass	Sulfuric acid

VISION Rechargeable Products
Sealed Lead Acid Battery
www.vision-batt.com

6FM200S-X 12V 200AH

Discharge Data

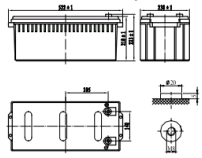
Constant Current Discharge Data (Amperes at 25ºC)

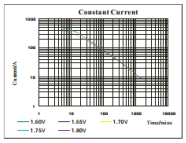
End Voltage Per cell / V	10min	15min	20min	25min	30min	35min	40min	45min	50min	55min	1h	1.5h	2h	2.5h	3h	4h	5h	6h	7h	8h	9h	10h	12h	24h
1.60	440	360	290	248	220	194	174	159	147	136	128	92.8	75.2	64.6	57.6	45.5	38.2	32.3	28.0	24.9	22.4	20.4	17.5	9.34
1.65	419	350	281	240	212	187	168	153	141	132	124	89.8	72.7	62.4	55.6	44.1	37.2	31.6	27.5	24.5	22.2	20.3	17.3	9.29
1.70	400	337	271	232	206	182	163	149	137	128	120	87.5	71.3	61.5	55.0	43.5	36.6	31.1	27.2	24.3	22.0	20.2	17.2	9.25
1.75	382	319	260	224	200	177	159	145	134	125	117	85.2	69.3	59.8	53.4	42.5	36.0	30.7	26.9	24.1	21.9	20.1	17.1	9.20
1.80	331	269	228	203	187	167	152	140	130	121	114	82.5	66.8	57.3	51.0	41.3	35.4	30.3	26.6	23.9	21.7	20.0	17.0	9.16

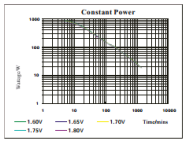
Constant Power Discharge Data (Watts per cell at 25ºC)

End Voltage Per cell / V	10min	15min	20min	25min	30min	35min	40min	45min	50min	55min	1h	1.5h	2h	2.5h	3h	4h	5h	6h	7h	8h	9h	10h	12h	24h
1.60	756	625	514	447	402	356	321	294	268	247	230	170	139	121	109	86.5	73.0	62.1	54.3	48.4	43.8	40.2	34.2	18.4
1.65	729	604	497	433	390	345	312	286	262	242	225	166	137	119	107	85.1	72.0	61.1	53.3	47.4	42.8	39.2	33.3	17.9
1.70	704	586	484	423	382	338	305	279	256	237	221	163	134	117	105	83.9	71.2	60.3	52.5	46.6	42.0	38.4	32.6	17.6
1.75	679	578	475	413	372	330	299	274	251	233	217	159	130	113	101	81.8	70.2	59.3	51.6	45.8	41.2	37.6	31.9	17.2
1.80	644	554	459	402	364	324	294	270	248	230	215	157	127	110	98.0	80.1	69.3	58.4	50.7	44.9	40.3	36.7	31.2	16.8

(Note)The above characteristics data are average values obtained within three charge/discharge cycles not the minimum values.







Shenzhen Center Power Tech. Co., Ltd
Center Power Industrial Park, Tongfu Industrial District Dapeng Town, 518120 Shenzhen, China
Tel: 86 755 84318088 Fax: 86 755 84318038 E-mail: sales@vision-batt.com
Website: http://www.vision-batt.com

VISION Rechargeable Products
Sealed Lead Acid Battery
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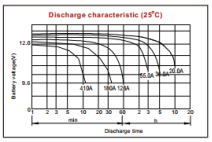
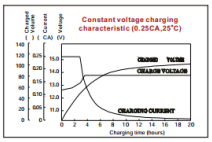
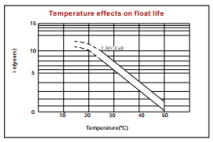
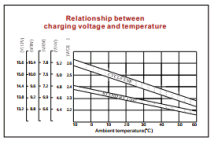
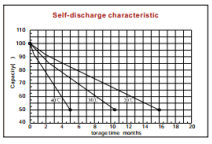
6FM200S-X 12V 200AH

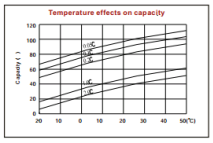


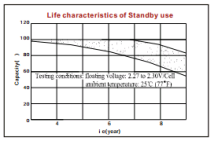


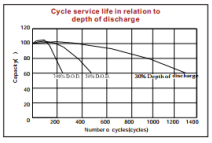












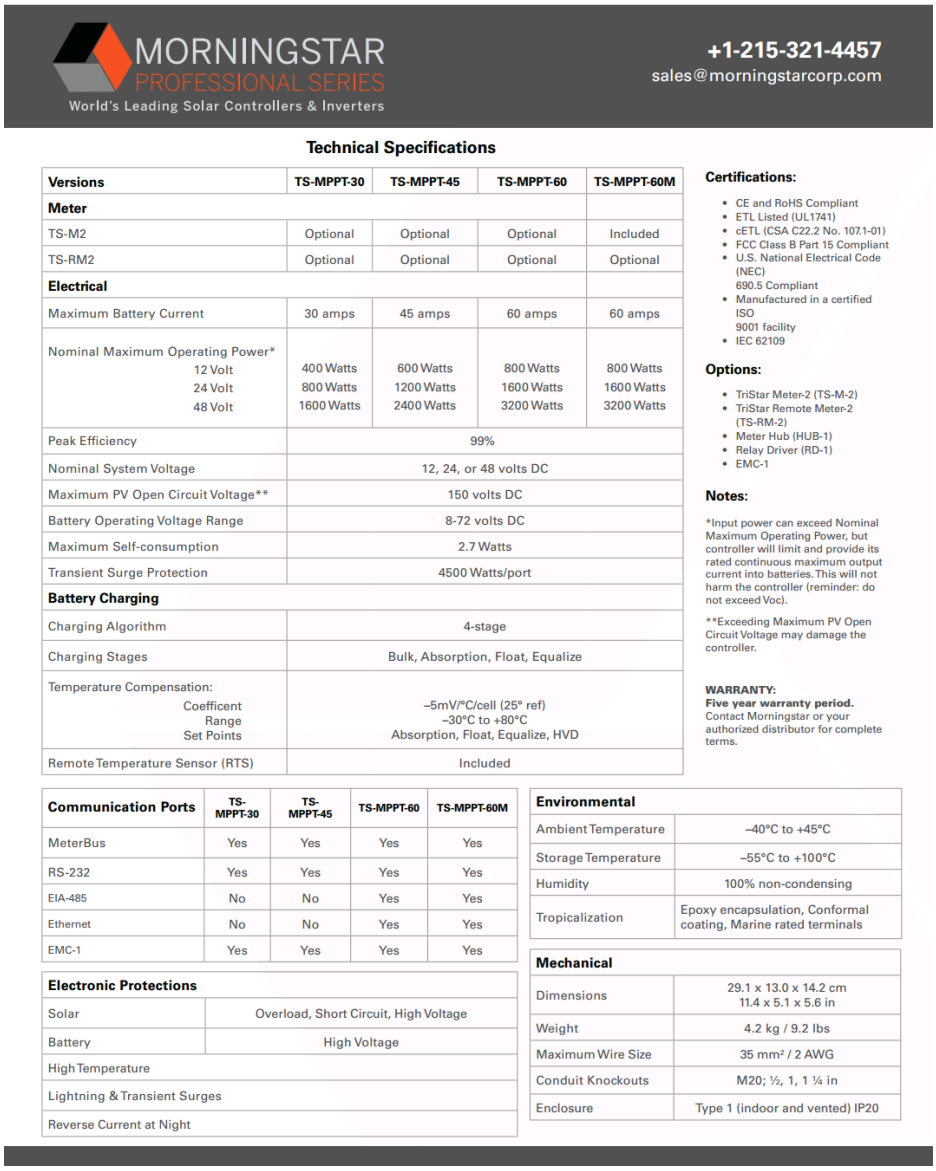
Lampiran 6: Data sheet Vision VRLA 12v 200ah

Conext MPPT 60 150 solar charge controller

Device short name	MPPT 60 150
Electrical specifications	
Nominal battery voltage	12, 24, 36, 48, 60 V
Battery voltage operating range	0 Vdc to 80 Vdc
Max. PV array voltage (operating)	140 V
Max. PV array open circuit voltage	150 V including temperature correction factor
Max. array short-circuit current	60 A (48 A @ STC)
Max. charge current	60 A (for all battery voltages except 60 V)
Max. and min. wire size in conduit	#6 AWG to #14 AWG (10 to 2.5 mm²)
Max. output power	3500 W
Charger regulation method	Three-stage (bulk, absorption, float) plus manual equalization Two-stage (bulk, absorption) plus manual equalization
Supported battery types	Flooded, GEL, AGM, Custom
Efficiency	
Max. power conversion efficiency	93% (nominal 12 V), 96% (nominal 24 V), 97% (nominal 36 V), 98% (nominal 48 V), 99% (nominal 60 V)
General specifications	
Power consumption, night time	2.5 W
Battery temperature sensor	Included
Auxiliary output	5 - 13 V, up to 200 mA
Enclosure material	Indoor, ventilated, sheet metal chassis with 2.2 cm and 2.8 cm (7/8 in and 1 in) knockouts and aluminium heat-sink
IP degree of protection	IP20
Product weight	4.8 kg (10.8 lb)
Shipping weight	8.0 kg (17.6 lb)
Product dimensions (H x W x D)	36.8 x 14.6 x 13.8 cm (14.5 × 5.8 × 5.5 in)
Shipping dimensions (H x W x D)	48.3 x 22.9 x 35 cm (19.0 × 9.0 × 9.8 in)
Device mounting	Vertical wall mount
Ambient air temperature for operation	-20°C to 45°C (-4°F to 113°F)
Storage temperature range	-40°C to 85°C (-40°F to 185°F) full power, power derating above 45°C
Operating altitude	Sea level to 2000 m (6562 ft)
System network and remote monitoring	Available
Warranty	Five-year standard
Part number	865-1030-1
Features	
Display type	LCD, 2 lines 16 digits
Regulatory approval	
Safety	CSA Certified (UL1741, CSA 107.1) and CE Marked for the Low Voltage Directive (EN50178)
EMC	FCC and Industry Canada (Class B), CE Marked for the EMC Directive (EN61000-6-1, -6-3), C-Tick compliant

Specifications are subject to change without notice.

Lampiran 7: Data sheet Scheneider XW MPPT 60 150



MORNINGSTAR
PROFESSIONAL SERIES
World's Leading Solar Controllers & Inverters

+1-215-321-4457
sales@morningstarcorp.com

Technical Specifications

Versions	TS-MPPT-30	TS-MPPT-45	TS-MPPT-60	TS-MPPT-60M
Meter				
TS-M2	Optional	Optional	Optional	Included
TS-RM2	Optional	Optional	Optional	Optional
Electrical				
Maximum Battery Current	30 amps	45 amps	60 amps	60 amps
Nominal Maximum Operating Power* 12 Volt 24 Volt 48 Volt	 400 Watts 800 Watts 1600 Watts	 600 Watts 1200 Watts 2400 Watts	 800 Watts 1600 Watts 3200 Watts	 800 Watts 1600 Watts 3200 Watts
Peak Efficiency	99%			
Nominal System Voltage	12, 24, or 48 volts DC			
Maximum PV Open Circuit Voltage**	150 volts DC			
Battery Operating Voltage Range	8-72 volts DC			
Maximum Self-consumption	2.7 Watts			
Transient Surge Protection	4500 Watts/port			
Battery Charging				
Charging Algorithm	4-stage			
Charging Stages	Bulk, Absorption, Float, Equalize			
Temperature Compensation: Coefficent Range Set Points	 –5mV/°C/cell (25° ref) –30°C to +80°C Absorption, Float, Equalize, HVD			
Remote Temperature Sensor (RTS)	Included			

Certifications:

- CE and RoHS Compliant
- ETL Listed (UL1741)
- cETL (CSA C22.2 No. 107.1-01)
- FCC Class B Part 15 Compliant
- U.S. National Electrical Code (NEC) 690.5 Compliant
- Manufactured in a certified ISO 9001 facility
- IEC 62109

Options:

- TriStar Meter-2 (TS-M-2)
- TriStar Remote Meter-2 (TS-RM-2)
- Meter Hub (HUB-1)
- Relay Driver (RD-1)
- EMC-1

Notes:

*Input power can exceed Nominal Maximum Operating Power, but controller will limit and provide its rated continuous maximum output current into batteries. This will not harm the controller (reminder: do not exceed Voc).

**Exceeding Maximum PV Open Circuit Voltage may damage the controller.

WARRANTY:
Five year warranty period.
Contact Morningstar or your authorized distributor for complete terms.

Communication Ports	TS-MPPT-30	TS-MPPT-45	TS-MPPT-60	TS-MPPT-60M
MeterBus	Yes	Yes	Yes	Yes
RS-232	Yes	Yes	Yes	Yes
EIA-485	No	No	Yes	Yes
Ethernet	No	No	Yes	Yes
EMC-1	Yes	Yes	Yes	Yes

Electronic Protections	
Solar	Overload, Short Circuit, High Voltage
Battery	High Voltage
High Temperature	
Lightning & Transient Surges	
Reverse Current at Night	

Environmental	
Ambient Temperature	–40°C to +45°C
Storage Temperature	–55°C to +100°C
Humidity	100% non-condensing
Tropicalization	Epoxy encapsulation, Conformal coating, Marine rated terminals

Mechanical	
Dimensions	29.1 x 13.0 x 14.2 cm 11.4 x 5.1 x 5.6 in
Weight	4.2 kg / 9.2 lbs
Maximum Wire Size	35 mm² / 2 AWG
Conduit Knockouts	M20; ½, 1, 1 ¼ in
Enclosure	Type 1 (indoor and vented) IP20

Lampiran 8: Data sheet Tristar TS-MPPT-60M

Type		NB48-15KDZ	NB96-15KDZ	NB110-15KDZ	NB220-15KDZ
DC input	Input rated voltage	48 VDC	96 VDC	110 VDC	220 VDC
	Input rated current	312 A	156 A	136 A	68 A
	Input DC voltage range	40-60 VDC	75-135 VDC	80-145 VDC	180-300 VDC
AC input	Allow input voltage range	110 VAC / 120 VAC / 220 VAC / 240 VAC ± 15% VAC			
	Input rated current	136A / 125A / 68A / 62.5A			
	Bypass transfer time	less than 4 ms			
AC output	Rated capacity	15KW			
	Output rated power	15KW			
	Output rated voltage and frequency	110 VAC / 120 VAC / 220 VAC / 240 VAC,50Hz / 60Hz			
	Output rated current	136A / 125A / 68A / 62.5A			
	Output voltage accuracy	110 VAC / 120 VAC / 220 VAC / 240 VAC ± 2%			
	Output frequency accuracy	50Hz / 60Hz ± 0.05%			
	Waveform distortion (THD). (Linear load)	less than 3%			
	Dynamic response time (Load 0←→100%)	5%			
	Power factor (PF)	0.8			
	Overload capacity	120%,3minutes,150%,10second			
	Crest factor (CF)	3:1			
	Inverter efficiency	90%			
Working Environment	Dielectric strength	1500VAC,1minute			
	Noise (1m)	less than 50dB			
	Ambient temperature	-10℃~+50℃			
	Humidity	0~90%, No condensation			
	Altitude	less than 5000 m			
Pure Sine Wave		Yes			
AC Charger		Available, which is customized according to battery ban k info			
Equipped with Isolated copper transformer		Yes, keep the system safe and stable			

Lampiran 9. Data sheet Inverter Deming NB48-15KDZ

Model	1KW	1.5 KW	2KW	3.KW	4KW	5KW	6KW	8KW	10KW	12KW	15KW
kContinuous Output Power	1KW	1.5 KW	2KW	3KW	4KW	5KW	6KW	8KW	10KW	12KW	15KW
Surge Rating (20Secs)	3KW	4.5 KW	6KW	9KW	12KW	15KW	18KW	24KW	30KW	36KW	45KW
Output Waveform	Pure Sine wave/Same as input(Bypass Mode)										
Nominal Efficiency	>88%(Peak)										
Line Mode Efficiency	>95%										
Power Factor	0.9-1.0										
Nominal Output Voltage rms	100-110-120Vac / 220-230-240Vac										
Output Voltage Regulation	±10% RMS										
Output Frequency	50Hz ± 0.3Hz/60Hz ± 0.3Hz										
Short Circuit Protection	Yes(1sec after fault)										
Typical transfer Time	10ms(Max)										
THD	< 10%										
Nominal Input Voltage	12.0Vdc/24.0Vdc/48.0Vdc					24.0Vdc/ 48.0Vdc			48.0Vdc		
Minimum Start Voltage	10.0Vdc/ 10.5Vdc for 12Vdc Mode					*2 for 24Vdc, *4 for 48Vdc ;					
Low Battery Alarm	10.5Vdc/ 11.0Vdc for 12Vdc Mode										
Low Battery Trip	10.0Vdc/ 10.5Vdc for 12Vdc Mode										
High Voltage Alarm	16.0Vdc for 12Vdc Mode										
Low Battery Voltage Recover	15.5Vdc for 12Vdc Mode										
dle Consumption-Search Mode	< 25 W when Power Saver On.										
Output Voltage	Depends on battery type										
Charger Breaker Rating	20A	20A	20A	25A	32A	40A	40A	50A	80A	80A	80A

Lampiran 10: Data sheet inverter YIY/Eyen HP-15KW