

Project Name: Arkh SHC solar water supply system

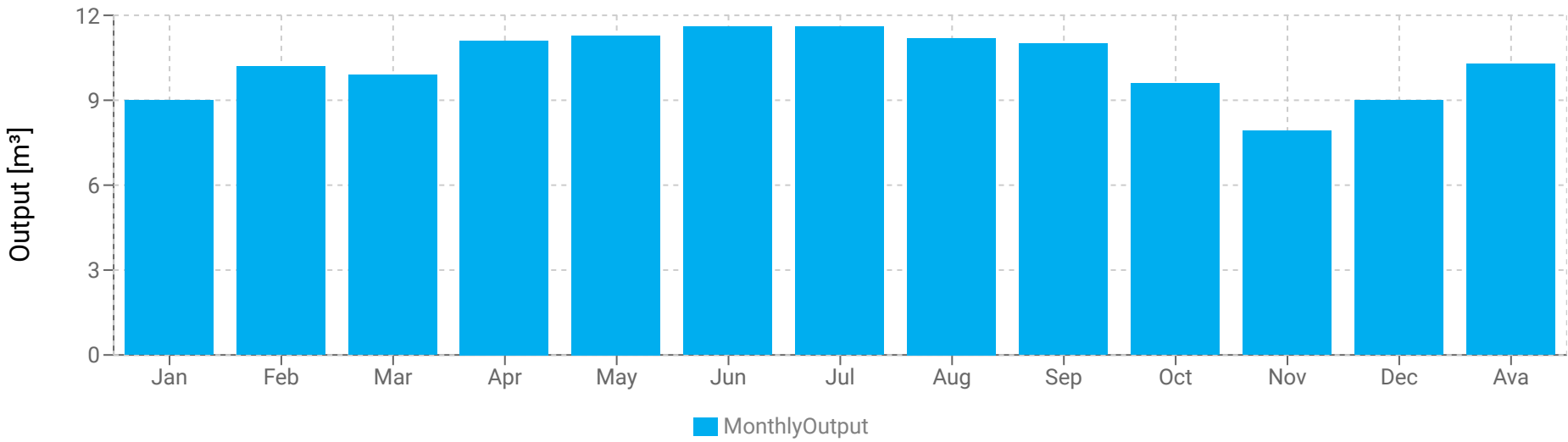
Input Summary		Tuesday, 13, August, 2024
Location:	Afghanistan, Herat(34°, 62°)	
GPS:	33,89364787°, 63,52910779°	
Designer:	Farid Ahmad Qaderi	
Water Demand:	1.1(m³/h)	
Avg. Water Production:	7.2(m³/d) According to 6 hours pump operation during sunny days at STC (1000 w/m²) irradiation at 25C°	
Head (SWL+DD):	110(m)	
Pipe Friction losses:	8m (5%)	
Total Dynamic Head:	118 (m)	

Main Products	Description	Unite	Quantity
Solar	PROPSOLAR 270W Poly crystalline 37.9V 9.22A	panels	8
Pump	PEDROLLO 4SR1.5/25 1.5HP 1.1Kw 220V	pc	1
Controller	Vacon IP66 2.2kw 220V	pc	1
Structure	Fixed Structure	set	1
Motor Cable	4*4mm2	m	140
Solar Cable	2*6mm2	m	30
Pipeline	PE 0.5 Inch/16mm (PE100, PN16)	m	150
Accessories	Description	Unite	Quantity
Float switch	Mechanical	pcs	1
PV disconnect switch	IP54	pcs	1
Inverter box	IP20	Box	1
Grounding rod	Copper	set	1
Cable splice kit	IP68	set	1
Flexible Conduct pipe	Flexible	m	50
Pump fittings	Poly ethylene	set	1
Cable 2*1.5mm2	For sensors	m	140
Earthing Cable	1*16mm2	m	30
Well probe sensors	Electronic	set	1
Safety rope	Plastic	m	190

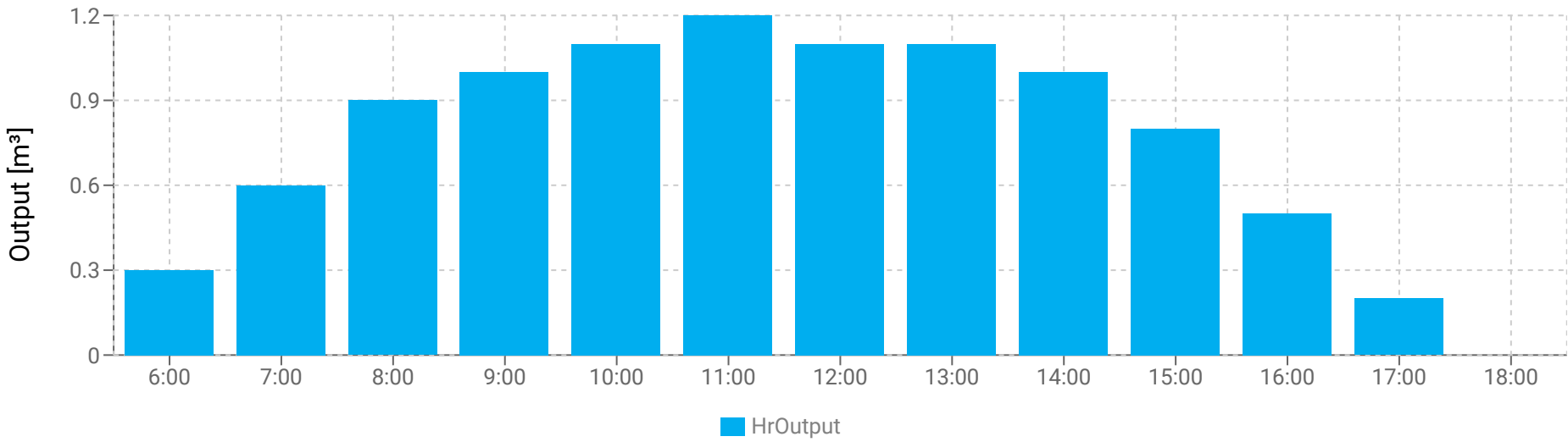
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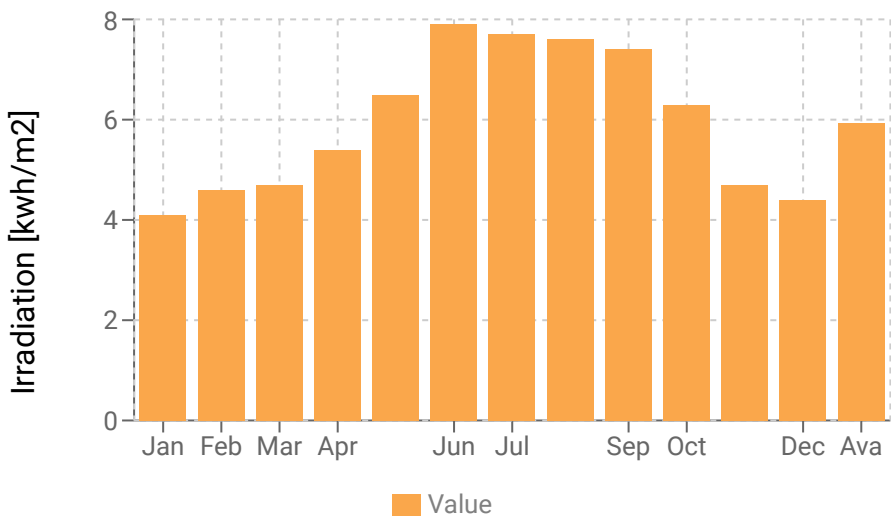
Daily Average output/month



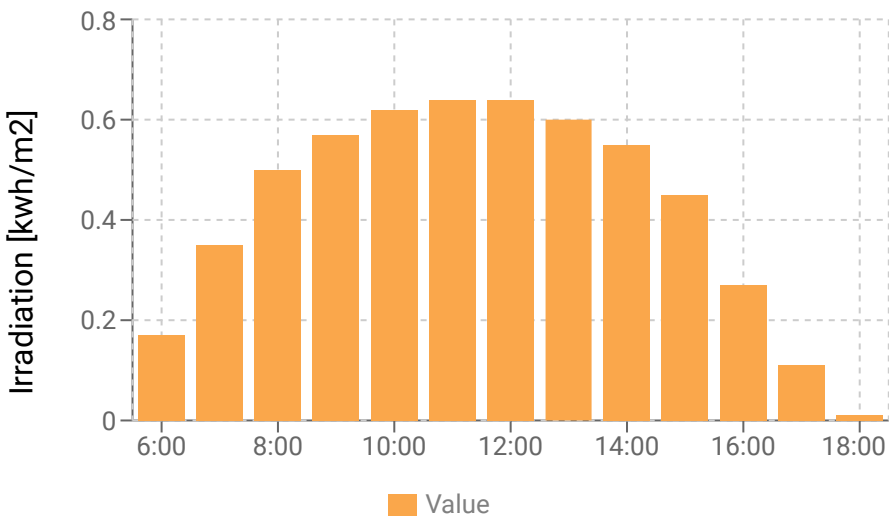
Hourly Output



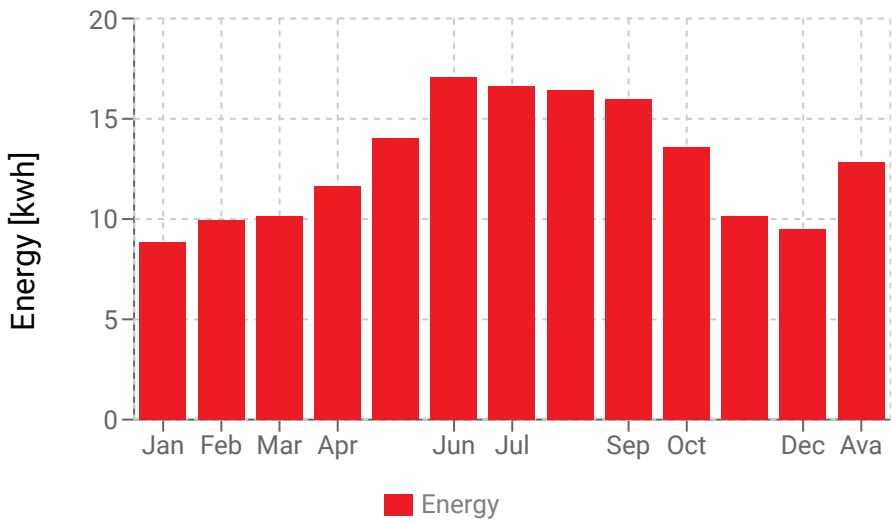
Irradiation value in deferent months of year



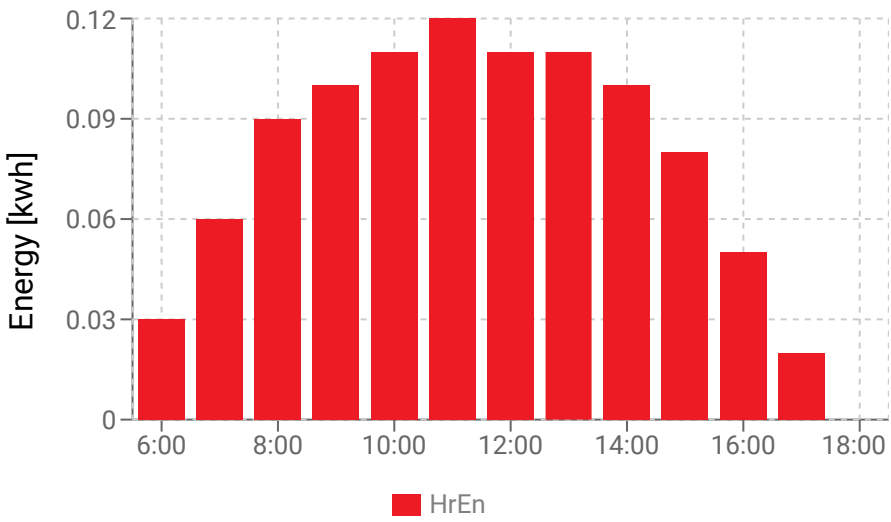
Hourly Values



Energy value in deferent months of year



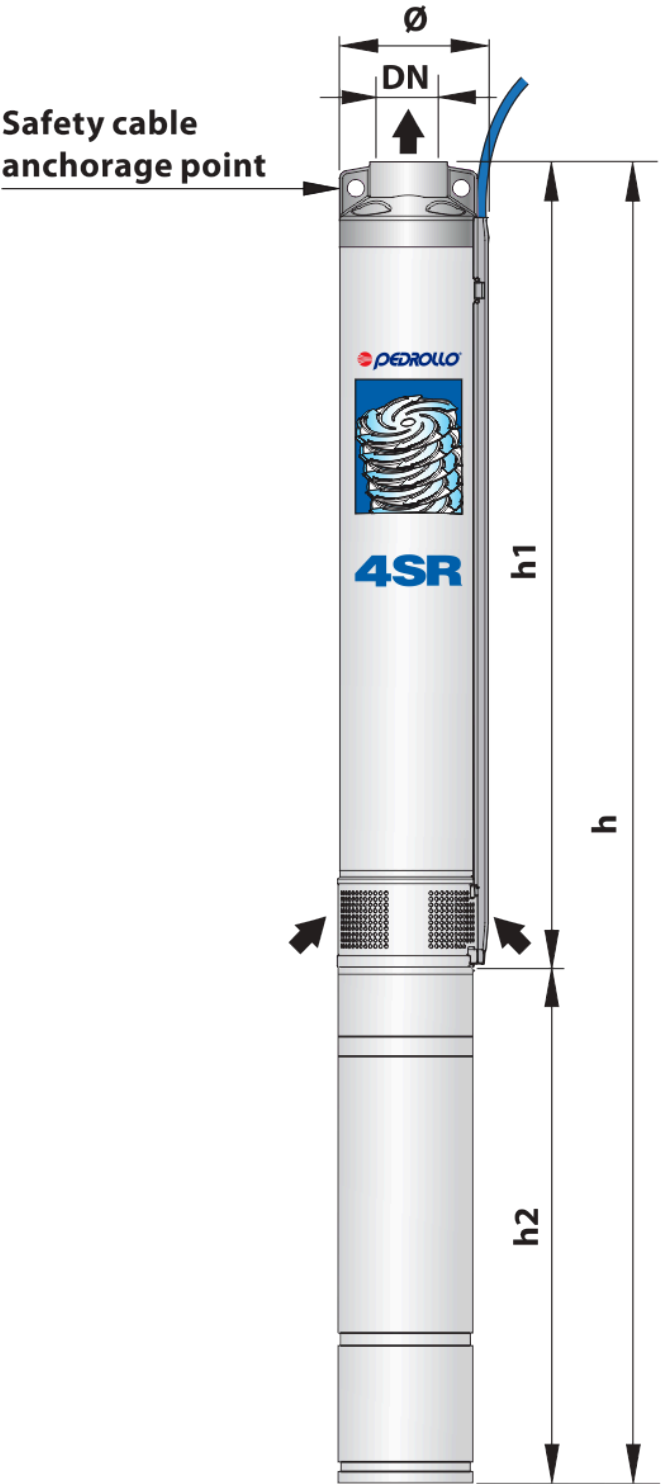
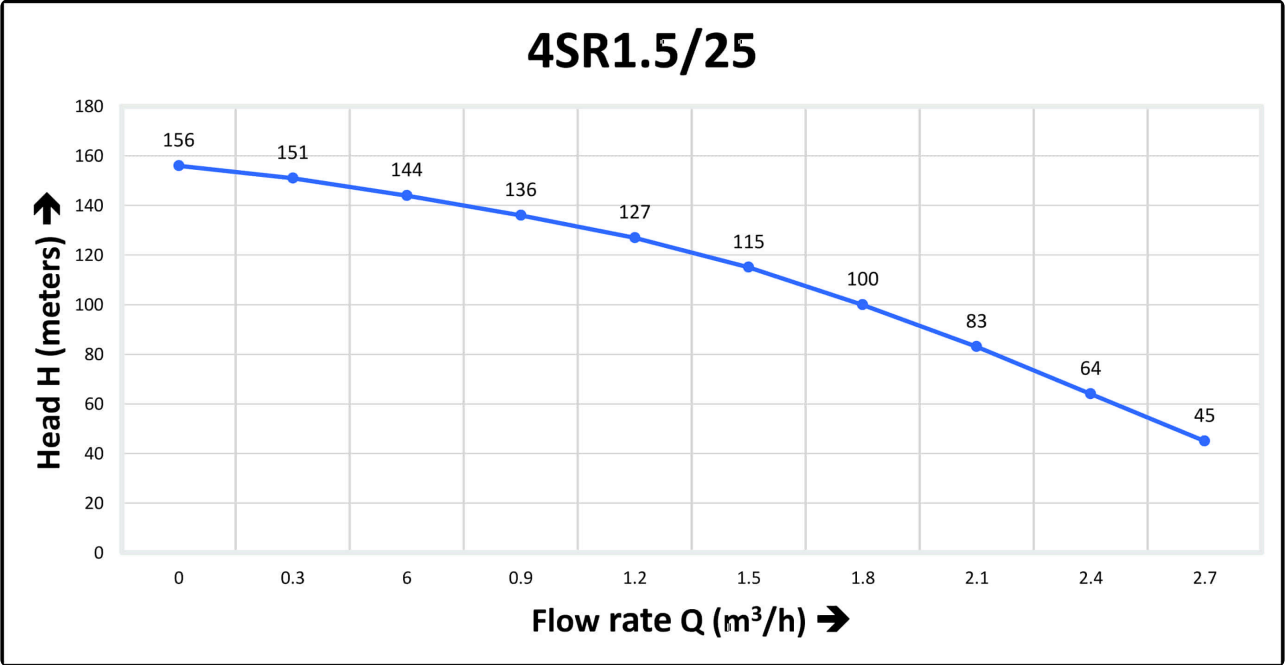
Hourly Values



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Submersible pump specification:

Brand:	PEDROLLO
Model:	4SR1.5/25
Power:	1.1Kw
Hours power:	1.5HP
Current:	5.9A
OutLet:	0.5Inch
Voltage:	220V
Phase:	3Phase
Diameter:	4inch
Weight:	17.8kg
Made in:	Italy



Dimensions and weight

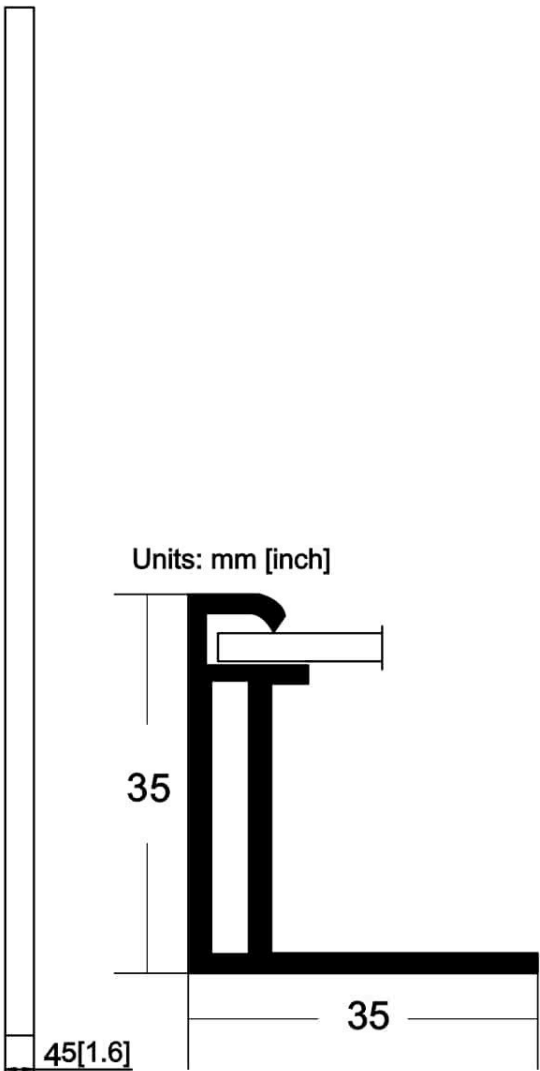
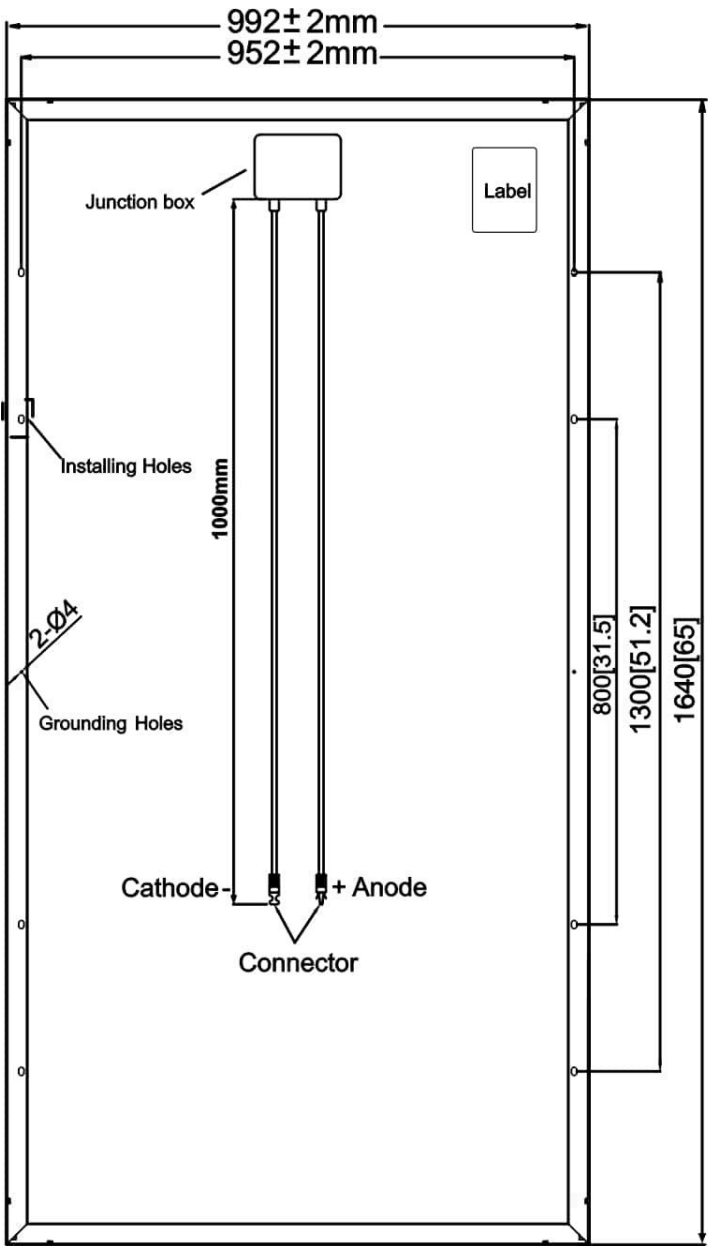
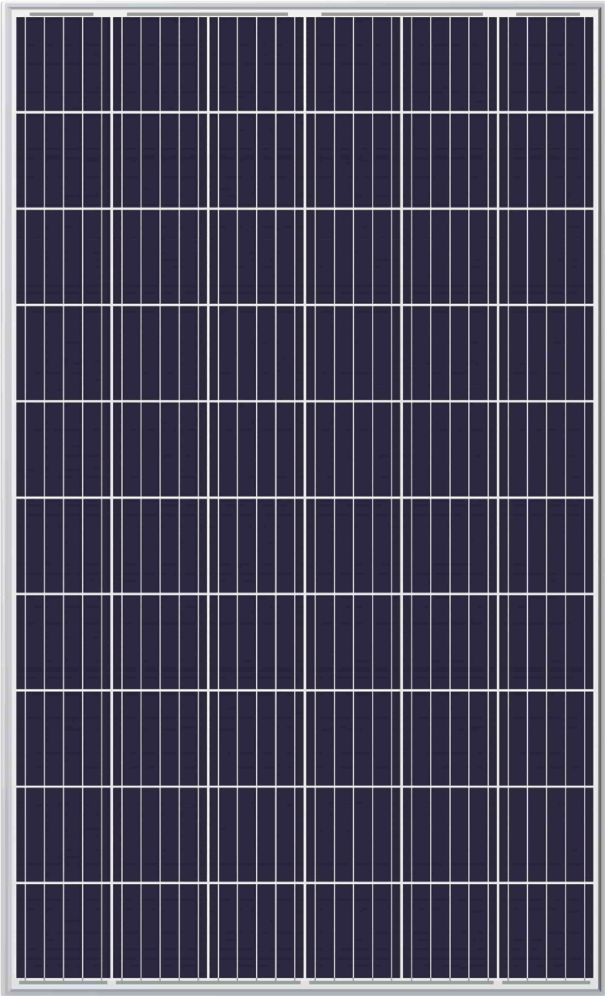
MODEL	PORT	DIMENSIONS mm				kg
		Ø	h1	h2	h	
Three-phase	DN					3~
4SR1.5/25 - PD	1¼"	98	646	371	1017	16.7

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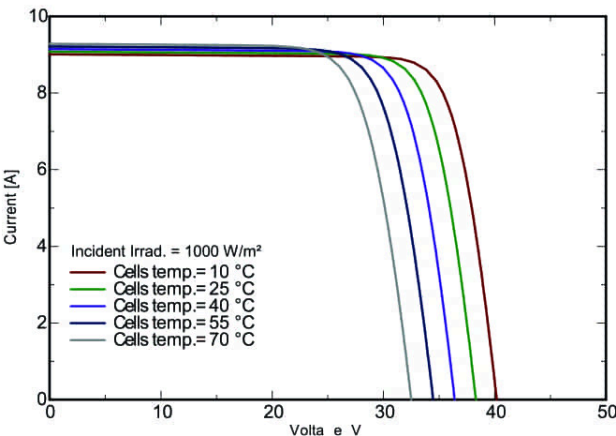
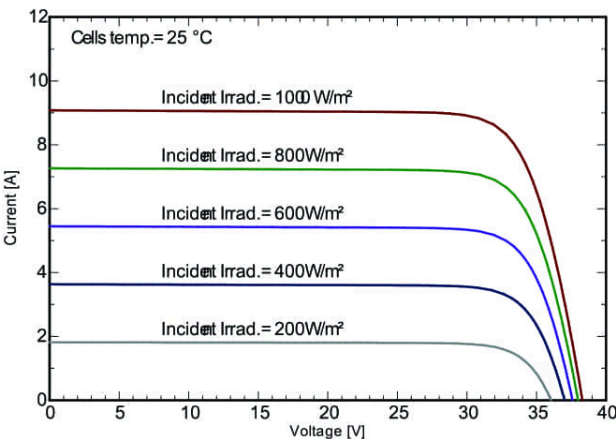
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Solar specification:

Brand:	PROPSOLAR
Model:	PS-660
Cell Technology:	Poly crystalline
Rated Maximum power (Pmax):	270 Wp
Voltage at Maximum power(Vmp):	30.9 V
Current at Maximum power(Imp):	8.73A
Open Circuit Voltage(Voc):	37.9V
Short Circuit Current (Isc):	9.22A
Mazimum System Voltage:	1000V
Weight:	18 kg
Made in:	China



I-V CURVE



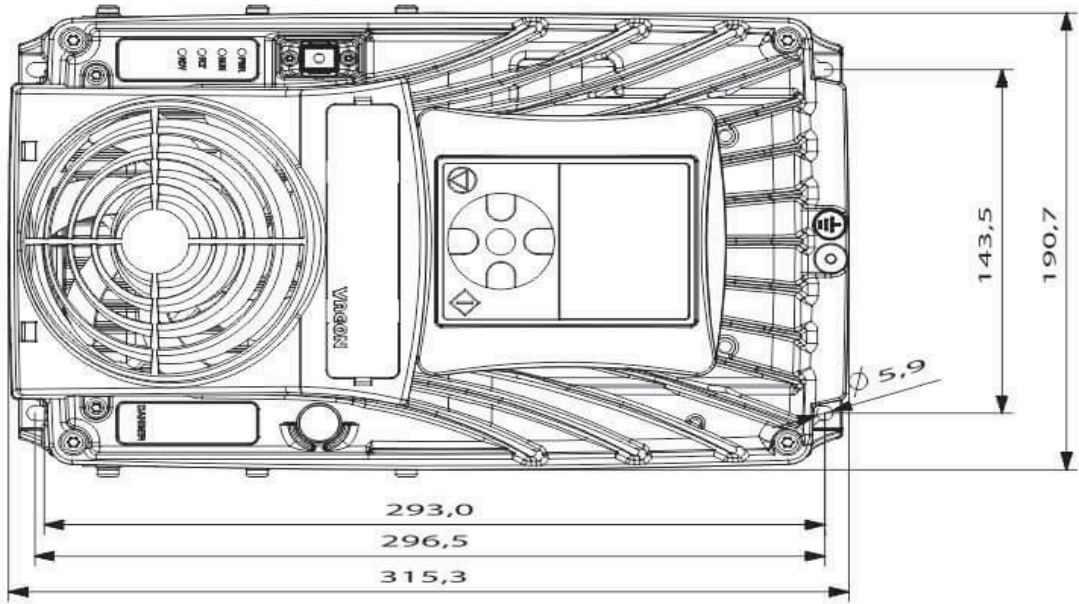
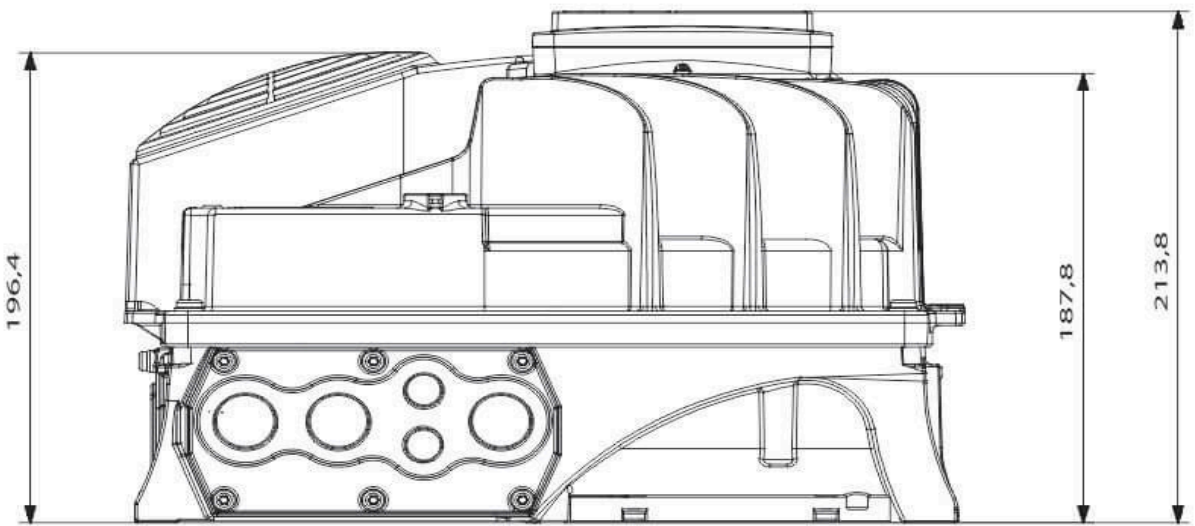
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Controller specification:

Brand:	Vacon IP66
Model:	100-3L-0011-2-X
Power:	2.2 Kw
Hours power:	3 HP
Current:	11 A
Voltage(AC):	220 V
Voltage(DC):	234-400V
Weight:	8.8 kg
Made in:	Italy



DIMENSIONS MM4



Enclosure size	Dimensions W x H x D	
	[mm]	[in]
MM4	190.7 x 315.3 x 196.4	7.51 x 12.41 x 7.73
MM4 +HMGR	190.7 x 315.3 x 213.8	7.51 x 12.41 x 8.42

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Strucuter specification:

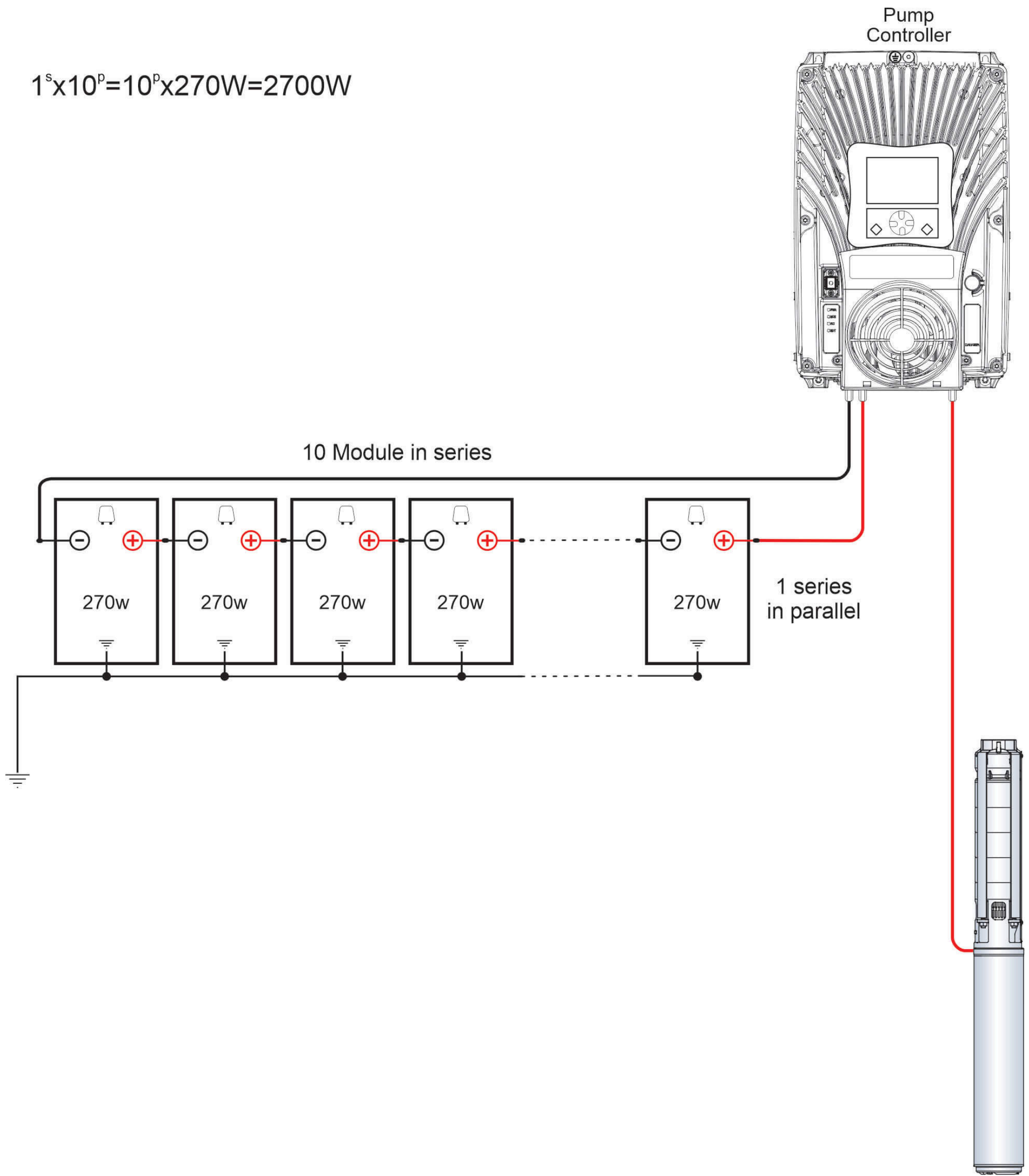
Brand:	No
Model:	Fixed Structure
Capacity:	4/6/8/10/12 panels



Note: Image may be deferent with actual product as this is a graphic design.

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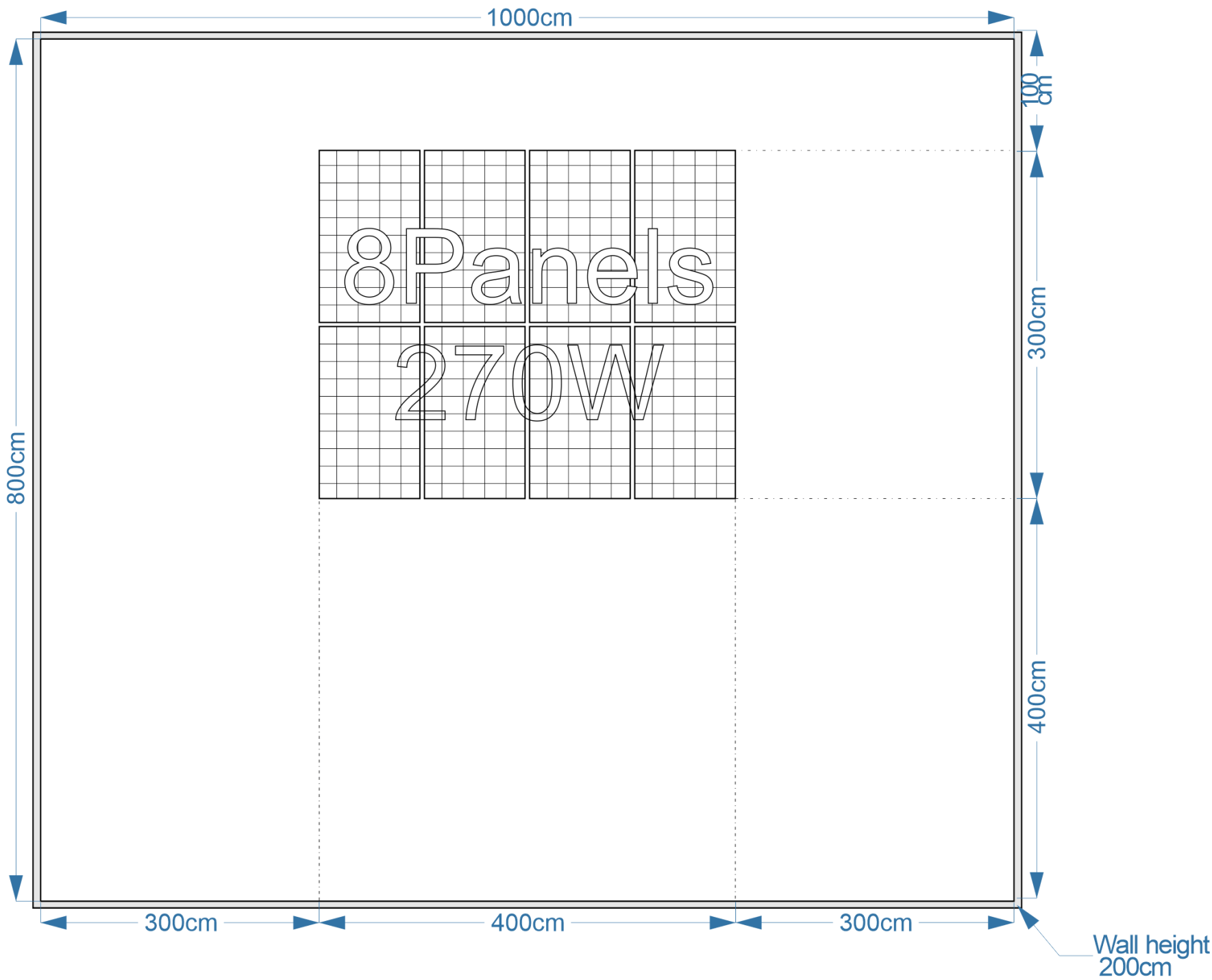
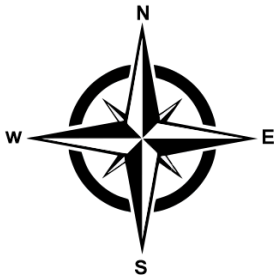
Wiring Diagram



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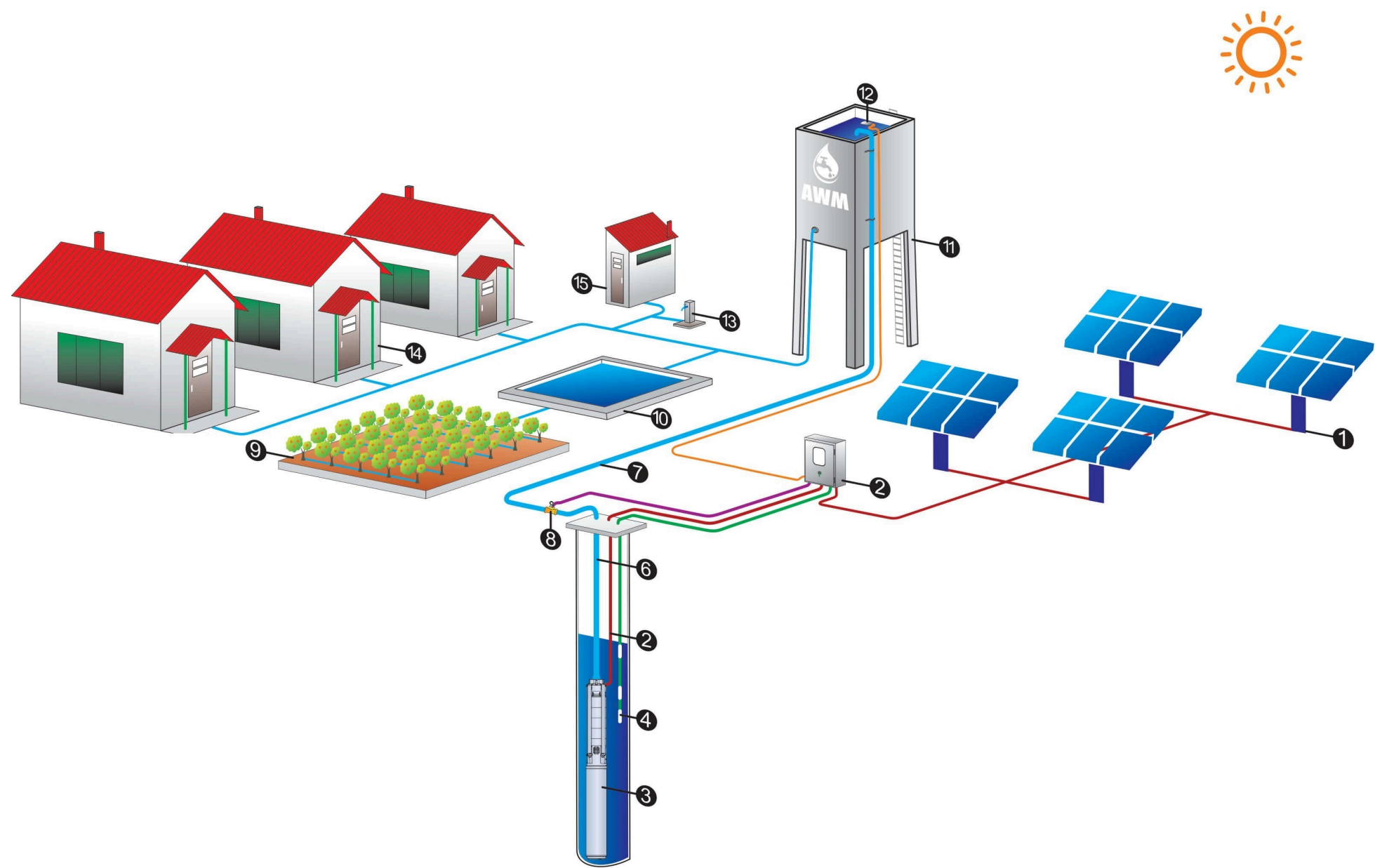
Area Diagram

Required Area for this project:
Minimum 80m²



Note: The area which the panels will install must be south face.

System General layout



- 1- Solar panels

2- Pump controller

3- Submersible

4- well probe sensors

5- Pump electrical cable

6- Non return valve

7- Pressure Gauge

8- Water meter
- 9- Garden

10- Swimming pool

11- Water reservoir

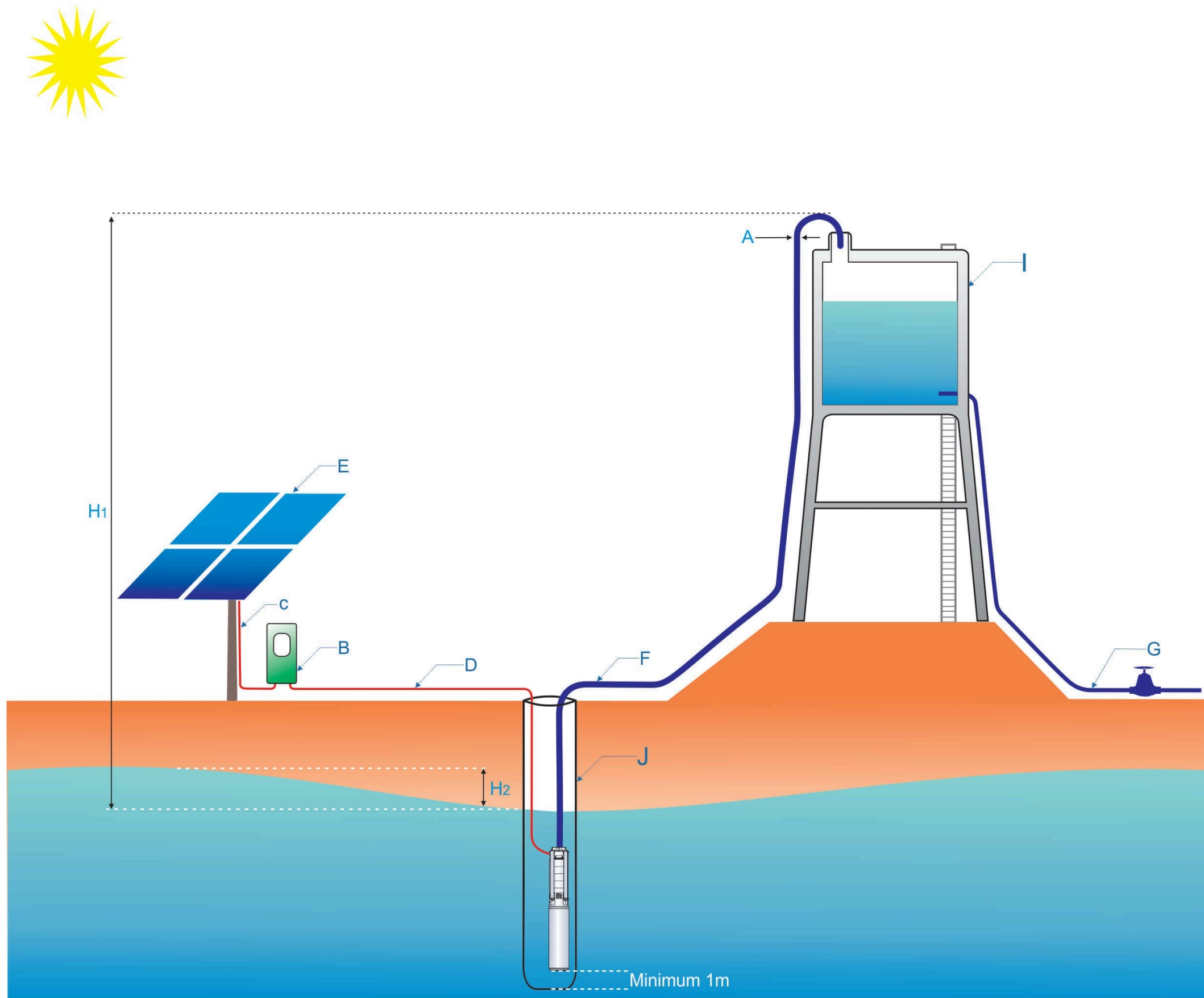
12- Flaut switch

13- Flaut switch Ele. cable

14- Residential Houses

15- Toilet

Sizing layout



- A (pipe diameter) pipeline inner diameter.
- B (controller) solar pump controller to drive the pump.
- C (cable) the electrical cable between solar and controller.
- D (cable) the electrical cable between controller and pump.
- E (solar) solar panels stand.
- F (pipeline) pipeline from the pump outlet to the reservoir.
- G (pipeline) water tank outlet.
- H₁ (static head) virtical height from the lowest level to the highest point of delivery.
- H₂ (draw down) the dynamic water level of the well depending on the pump operation.