



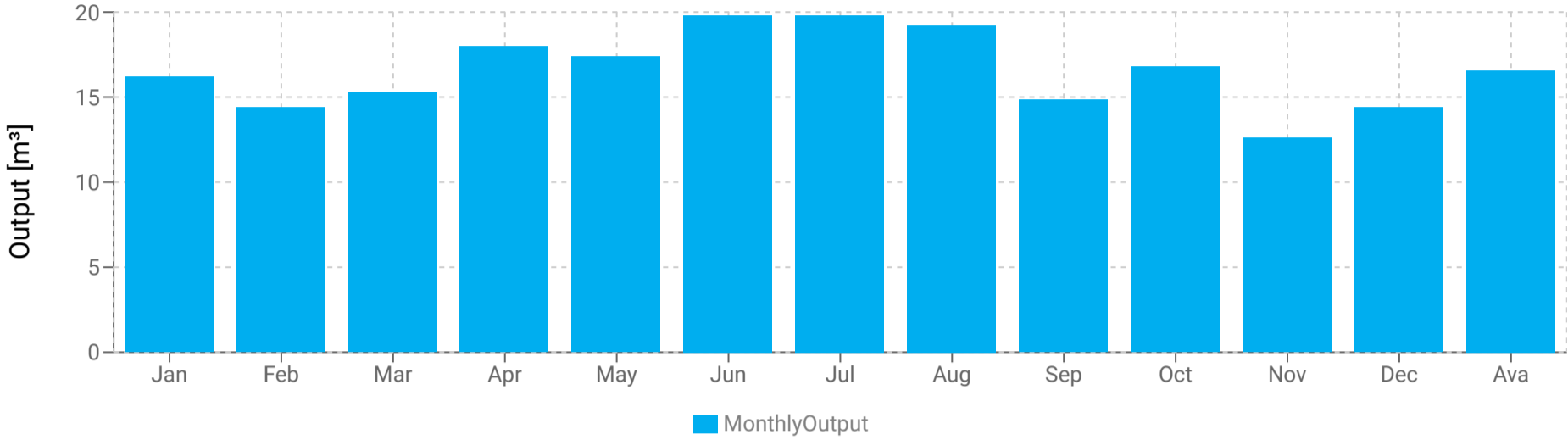
Project Name: Zartalay HCF water solar power system

Input Summary		Wednesday, 29,May,2024	
Location:	Afghanistan, Ghor(34°, 64°)		
GPS:	34 19'26.88"°, 65 24"50.028"°		
Designer:	Farid Ahmad Qaderi		
Water Demand:	1.2(m³/h)		
Avg. Water Production:	10.8(m³/d) According to 6 hours pump operation during sunny days at STC (1000 w/m²) irradiation at 25C°		
Head (SWL+DD):	60(m)		
Pipe Friction losses:	4m (5%)		
Total Dynamic Head:	64 (m)		
Main Products	Description	Unite	Quantity
Solar	PROPSOLAR 270W Poly crystalline 37.9V 9.22A	panels	4
Pump	PEDROLLO 4SR2/13 1HP 0.75Kw 110V	pc	1
Controller	FRECON IP65 1.5kw 220V	pc	1
Structure	Fixed Structure	set	1
Motor Cable	4*2.5mm2	m	80
Solar Cable	2*6mm2	m	80
Pipline	PE 1 Inch/32mm (PE100, PN10)	m	80
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
Pump fittings	Poly ethylene	set	1
Well probe sensors	Electronic	set	1
Safety rope	Plastic	m	90
Cable 2*1.5mm2	For sensors	m	80
Earthing Cable	1*16mm2	m	20

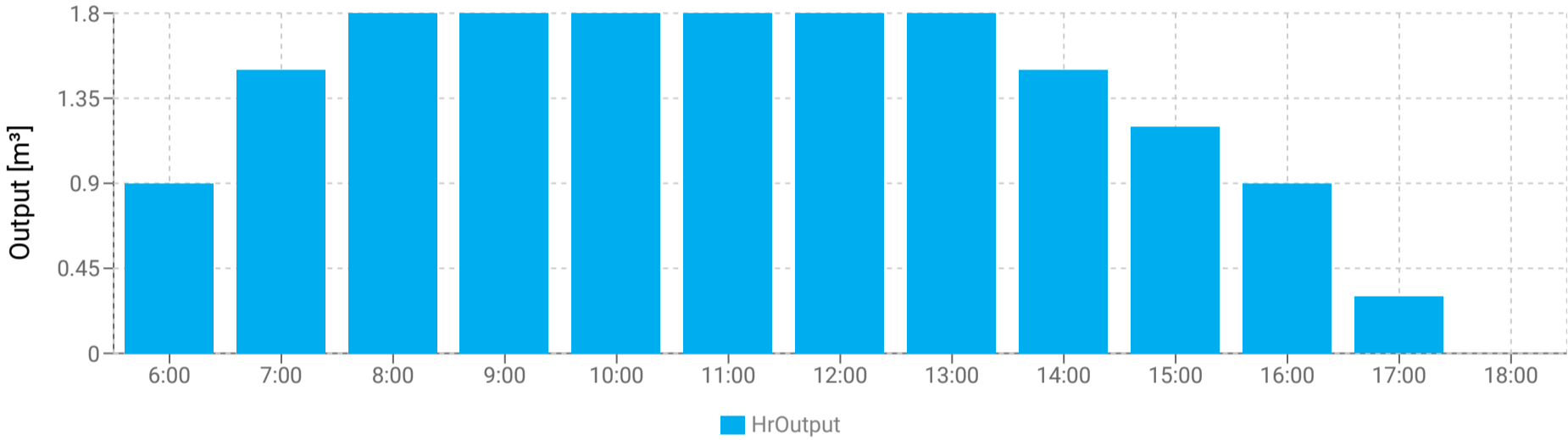
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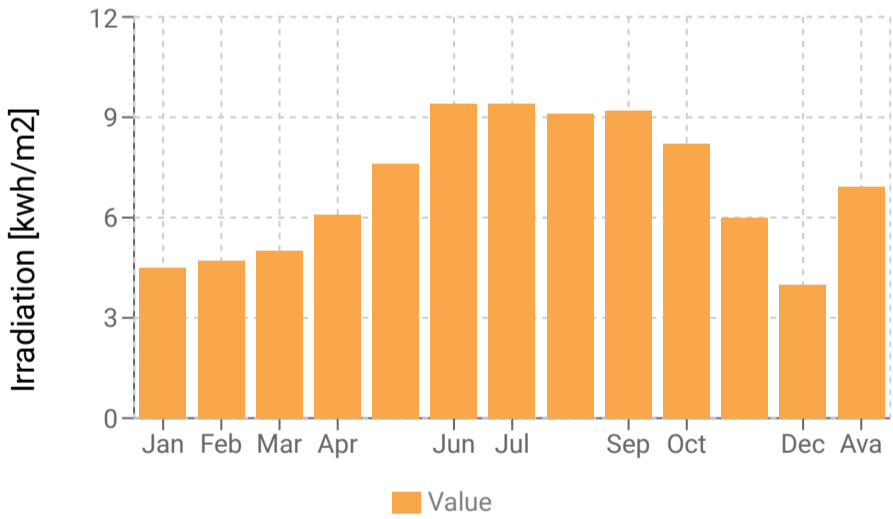
Daily Average output/month



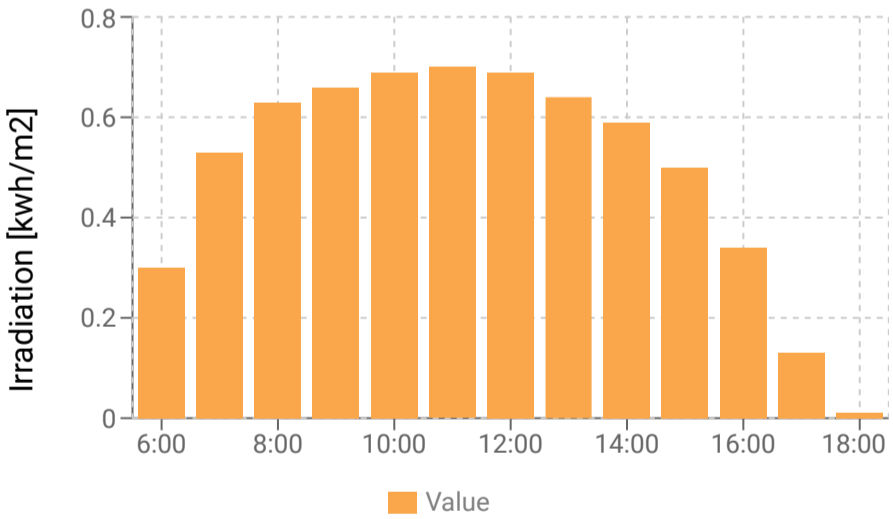
Hourly Output



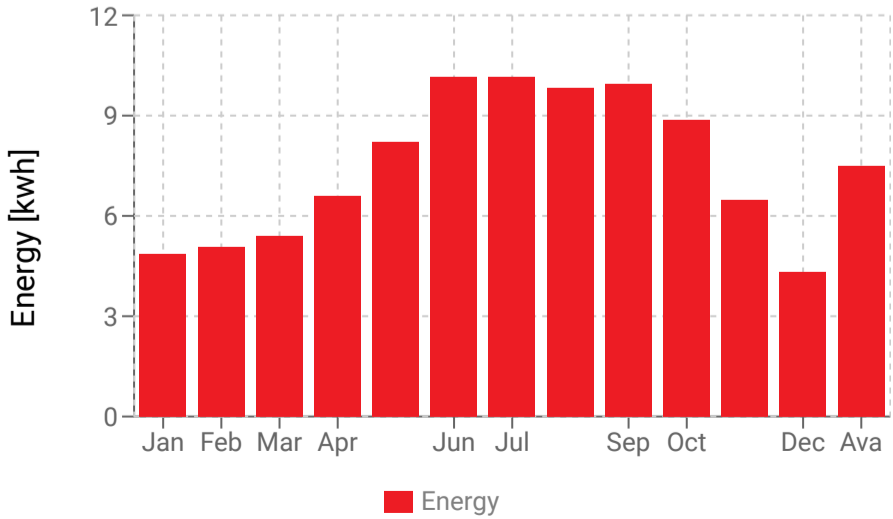
Irradiation value in deferent months of year



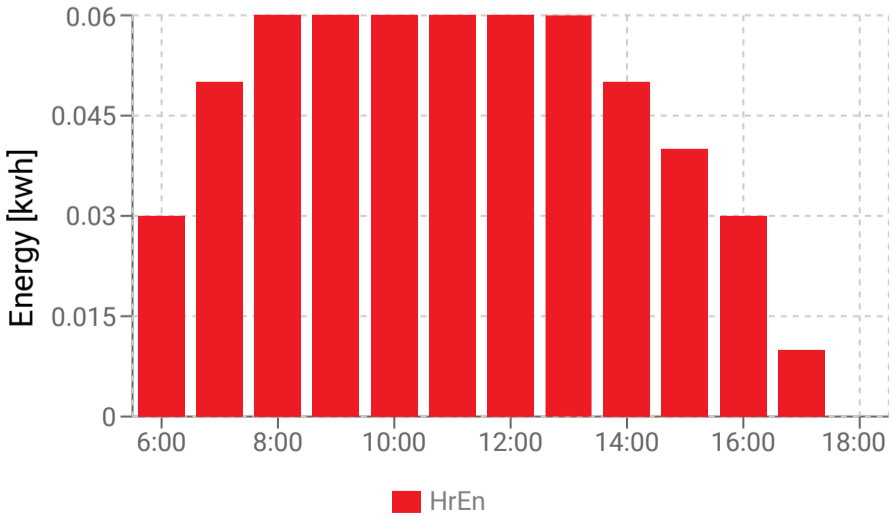
Hourly Values



Energy value in deferent months of year



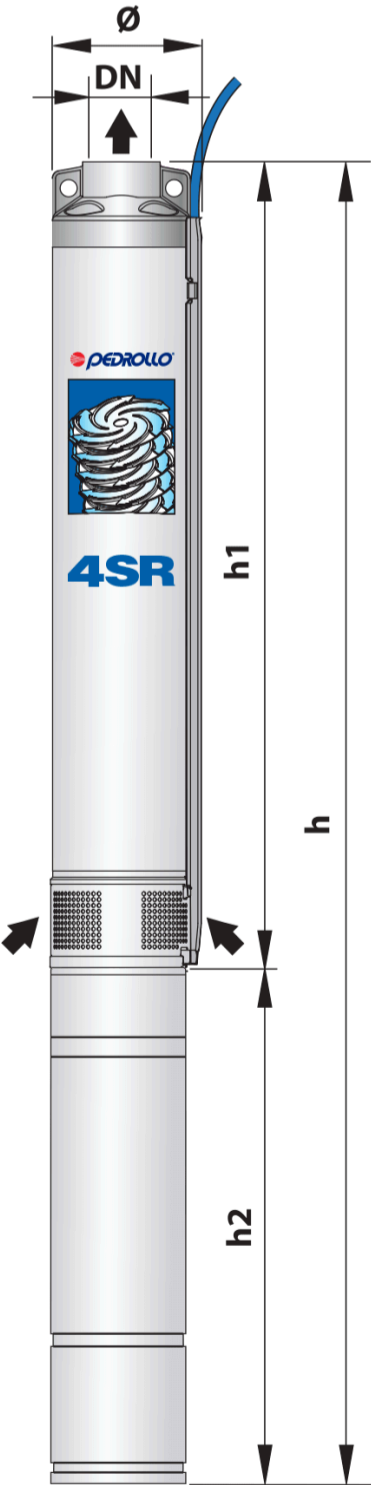
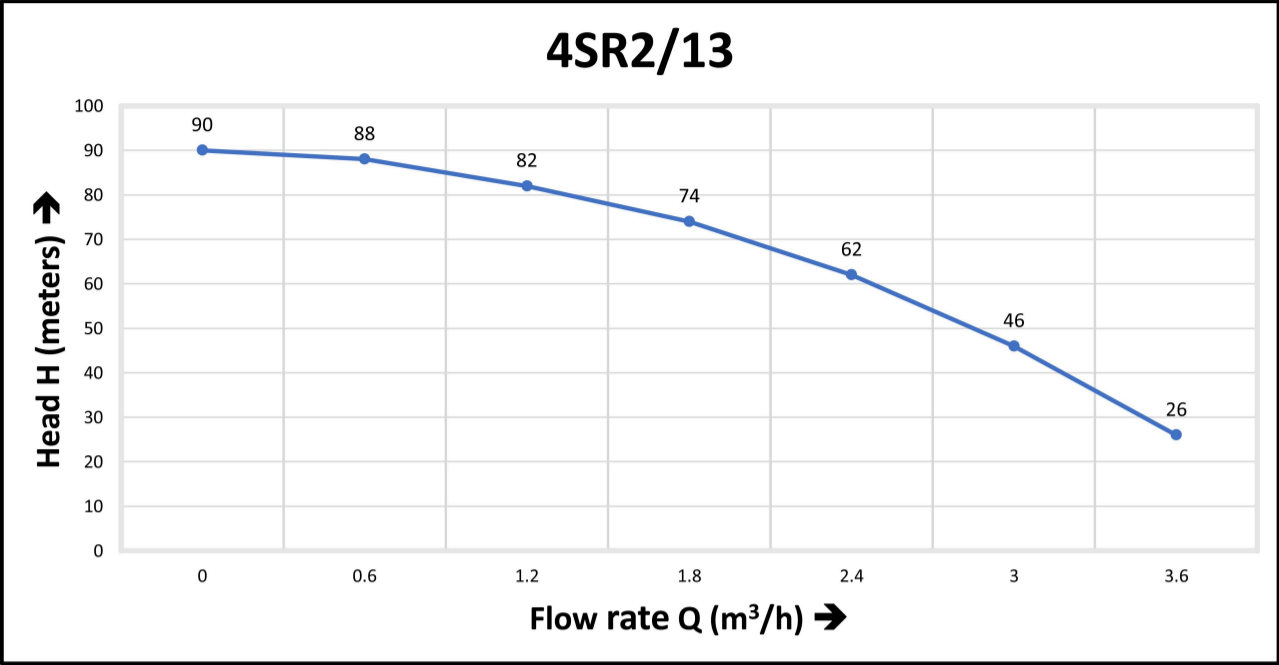
Hourly Values



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Submersible pump specification:

Brand:	PEDROLLO
Model:	4SR2/13
Power:	0.75Kw
Hours power:	1HP
Current:	8.6A
OutLet:	1Inch
Voltage:	110V
Phase:	3Phase
Diameter:	4inch
Weight:	13.3kg
Made in:	Italy



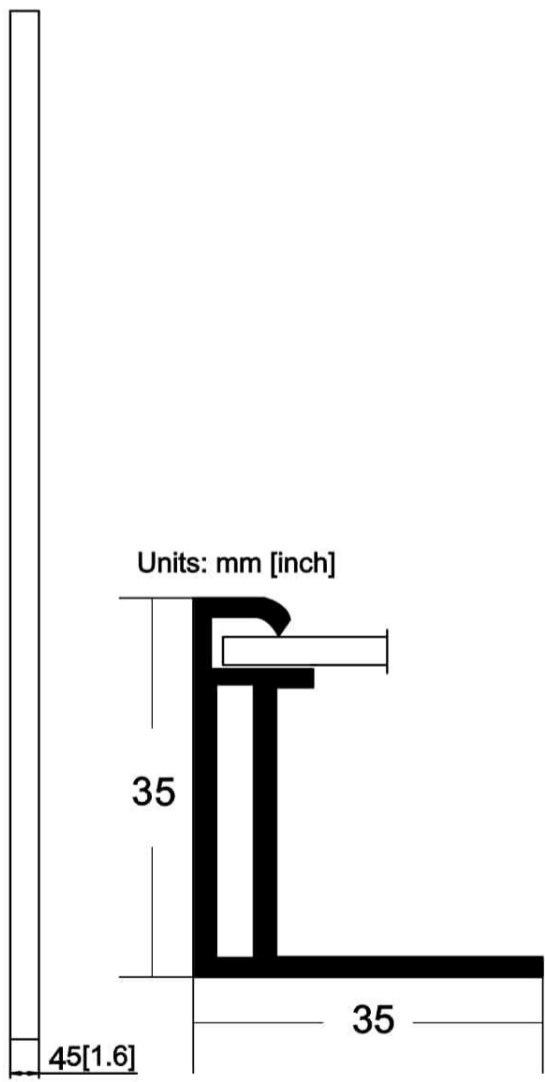
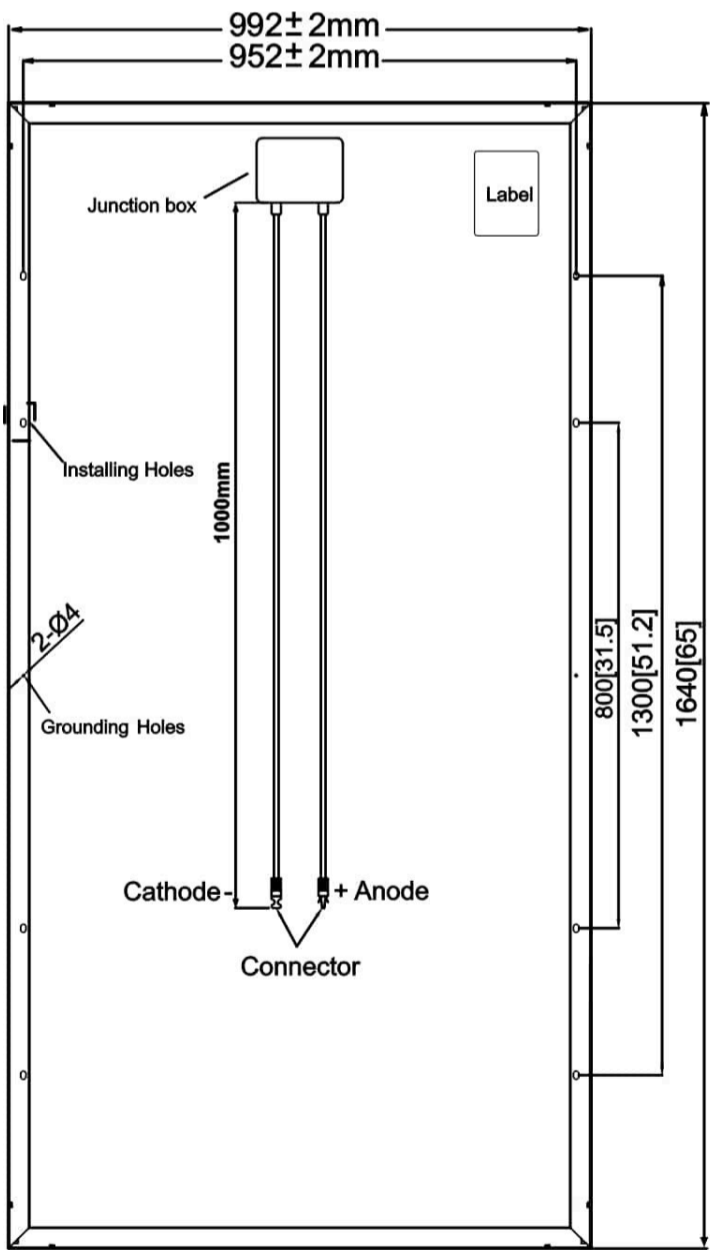
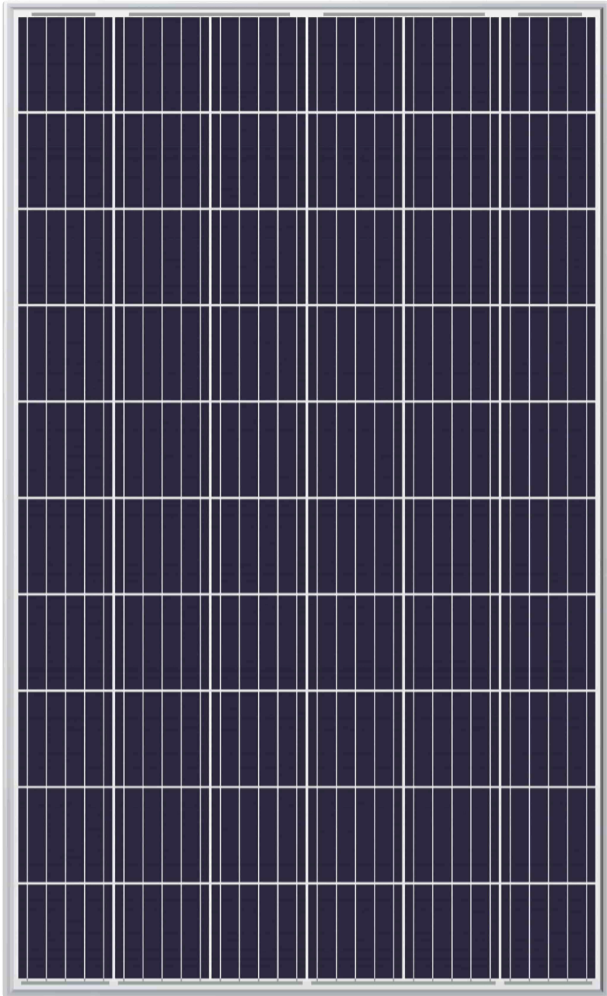
Dimensions and weight

MODEL	PORT	DIMENSIONS mm				kg
		Ø	h1	h2	h	
Three-phase 4SR2/13 - PD	DN 1¼"	98	400	329	729	13.3

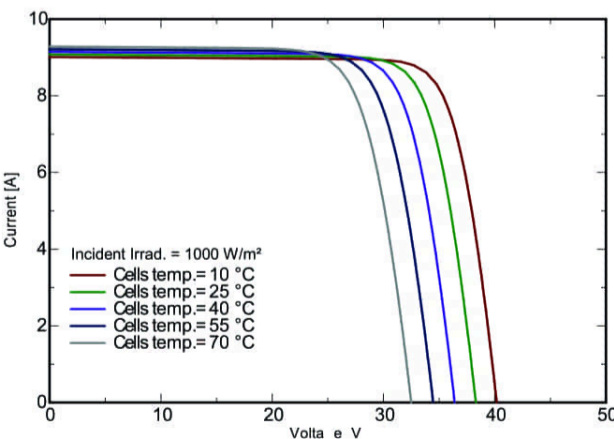
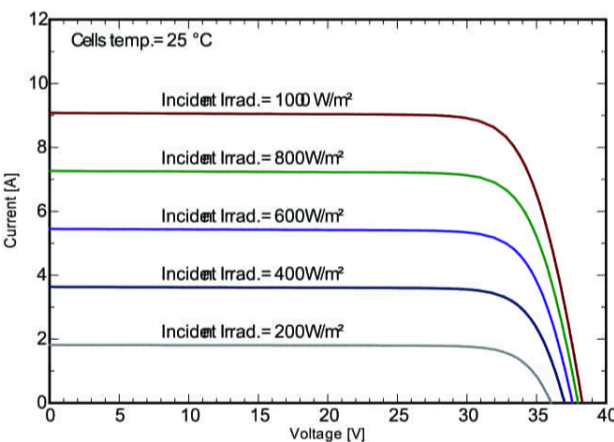
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Solar specification:

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

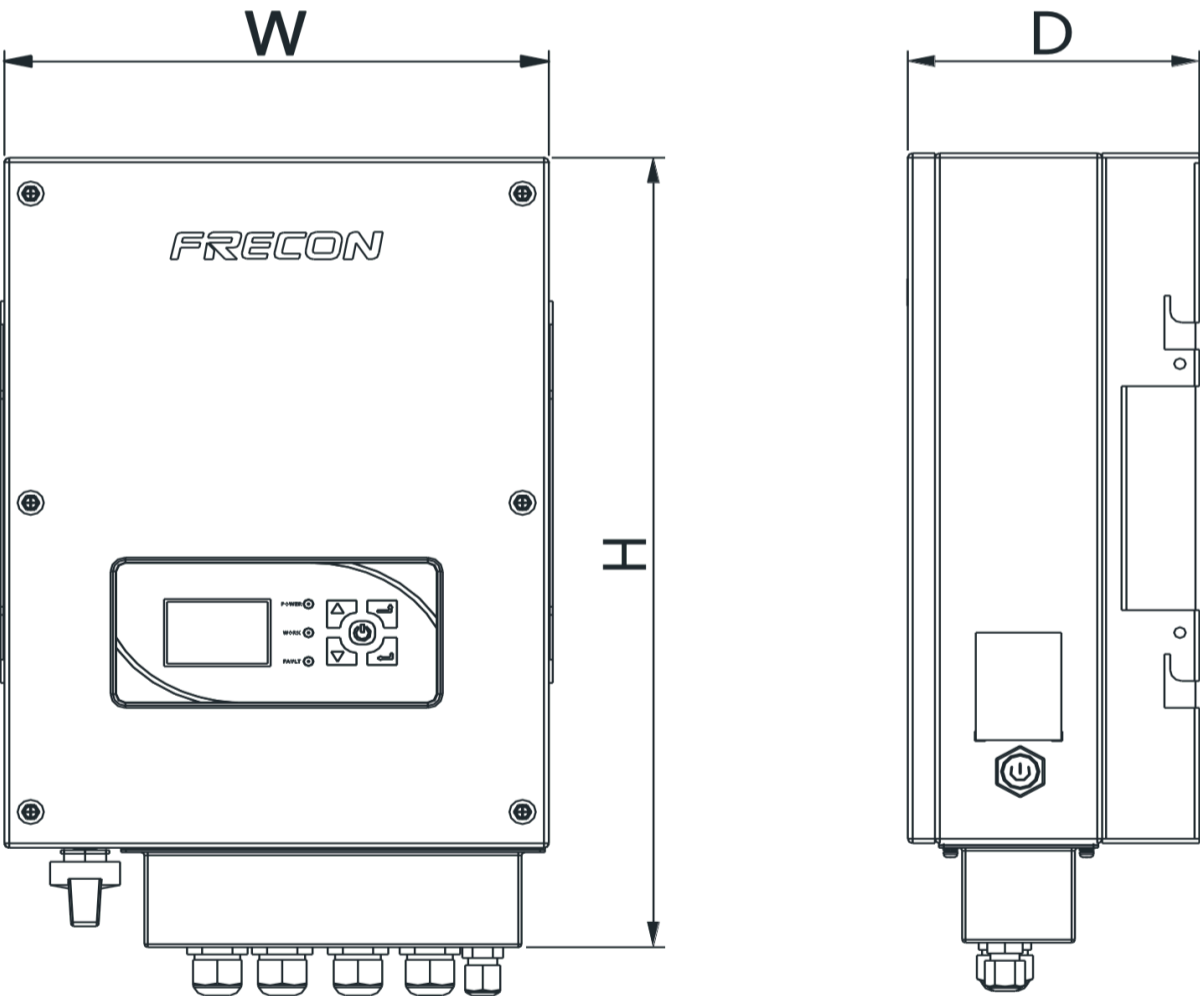


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Controller specification:

Brand:	FRECON IP65
Model:	PV580-2S-1.5
Power:	1.5 Kw
Hours power:	2 HP
Current:	10.5 A
Voltage(AC):	220 V
Voltage(DC):	200-260V
Weight:	11.4 kg
Made in:	China



Model	External and installation dimensions (mm)			N.W (kg)
	W	H	D	
PV580-2S-1.5B	280	440	150	11.4

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Strucuter specification:

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

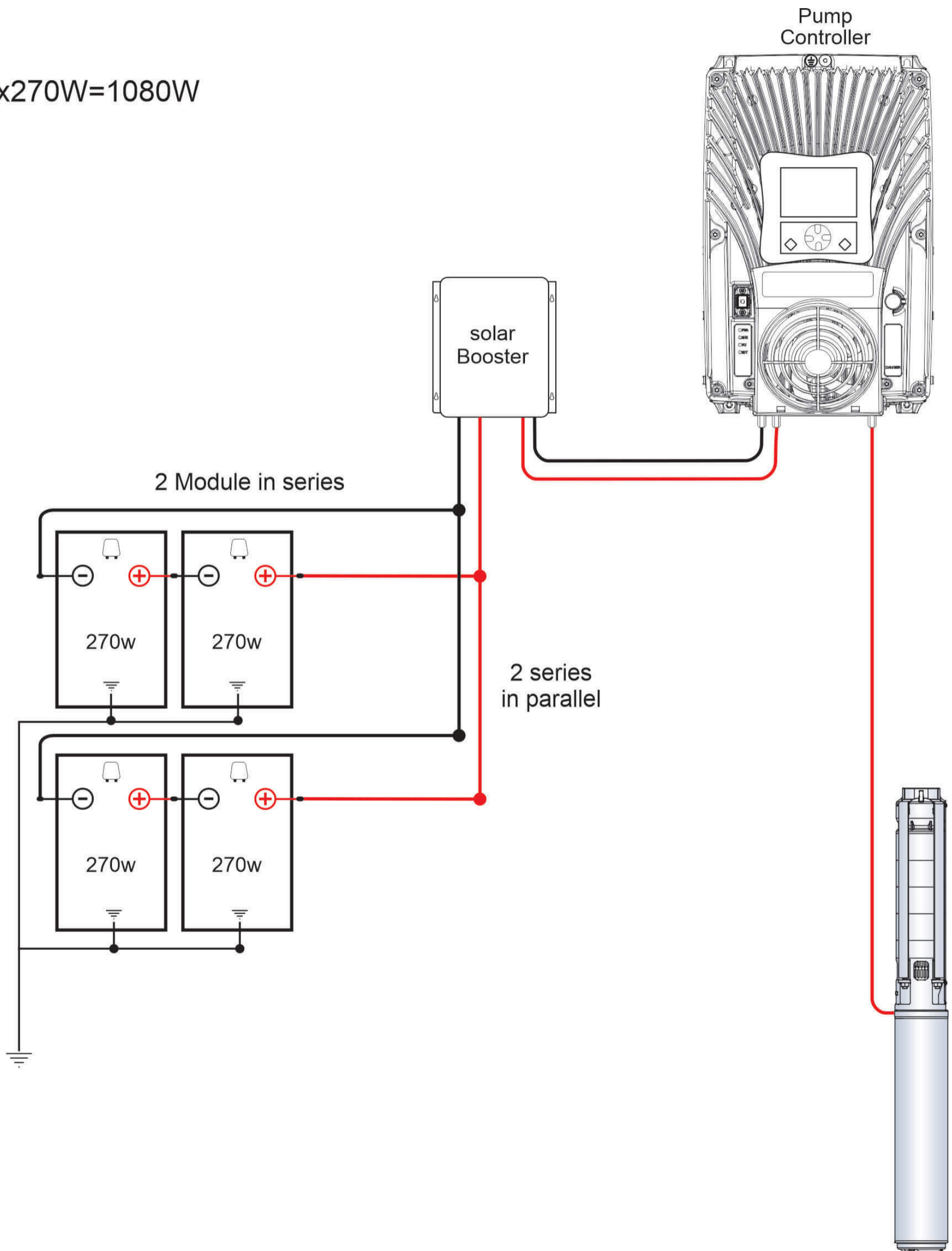


Note: Image may be deferent with actual product as this is a graphic design.

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Wiring Diagram

$$2^s \times 2^p = 4^p \times 270W = 1080W$$



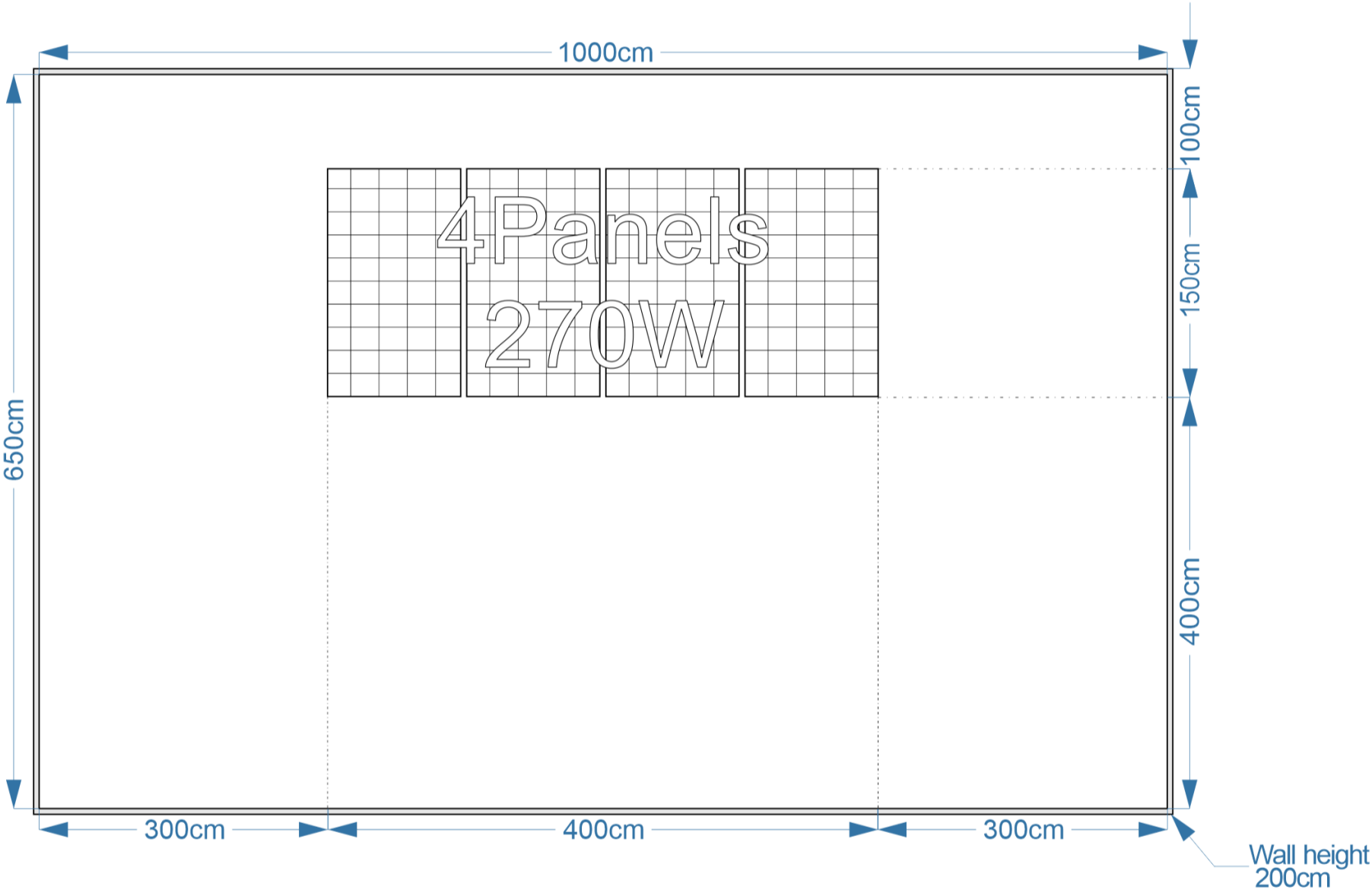
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Area Diagram

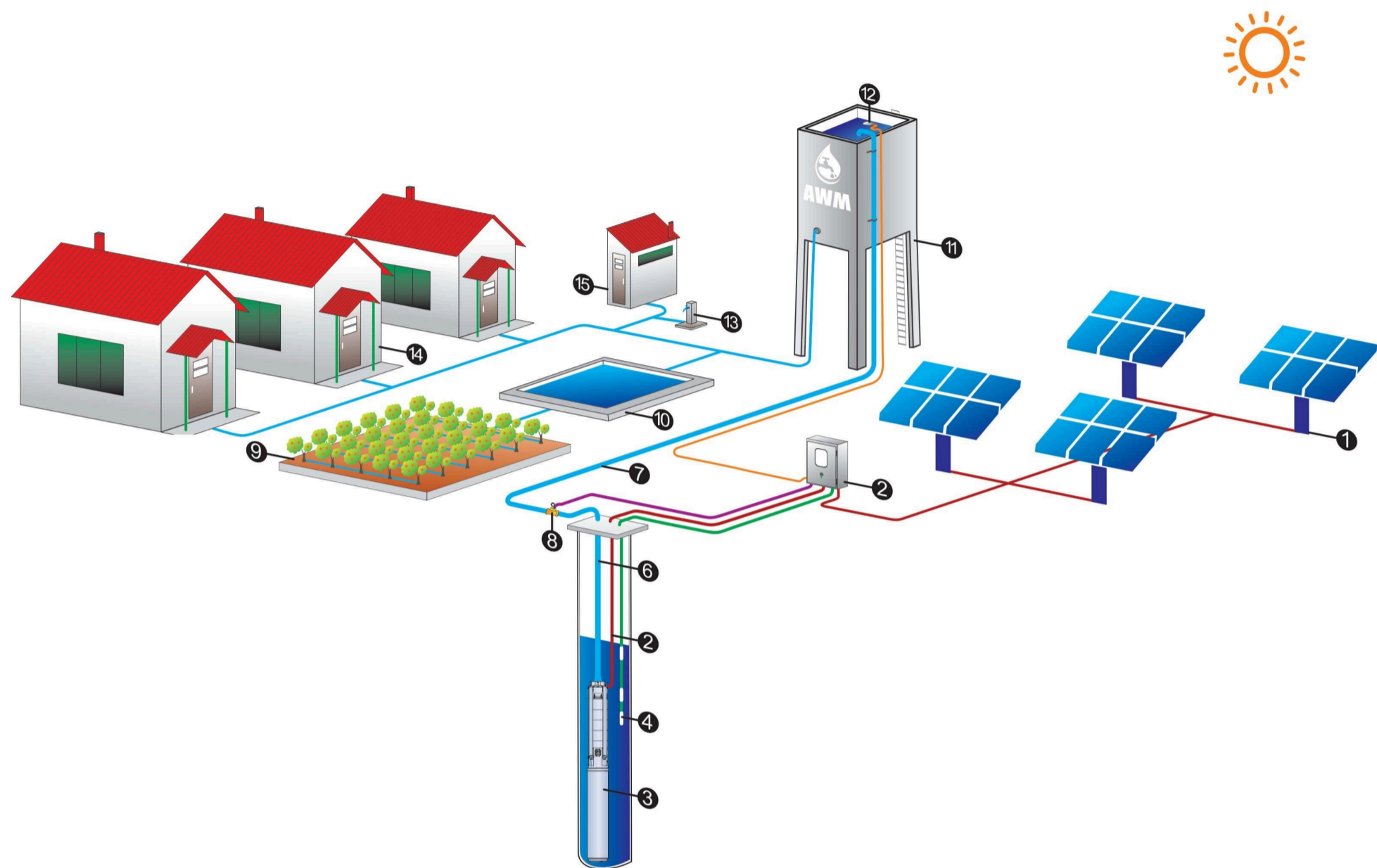
Required Area for this project:

Minimum 65m²



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

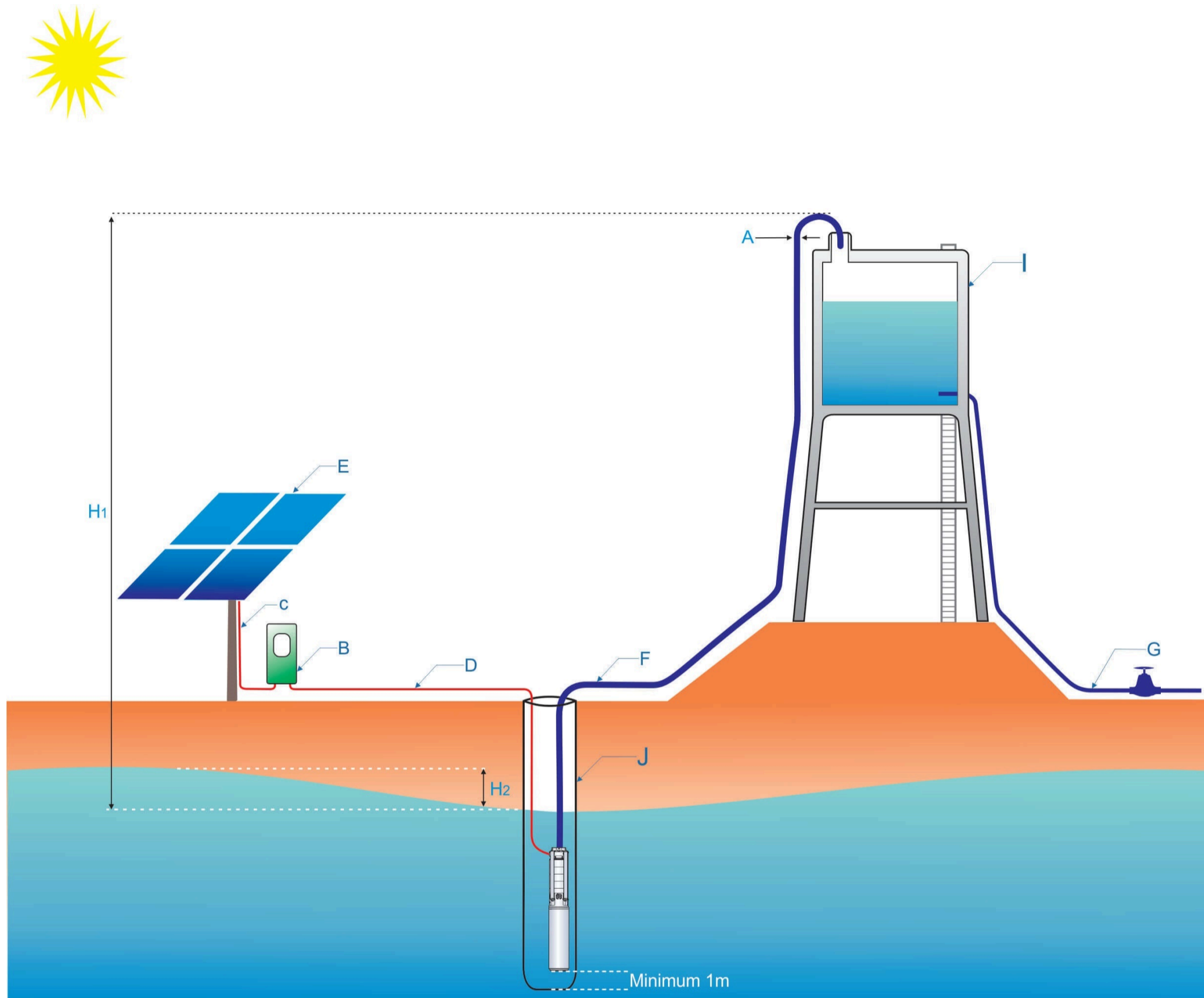
12- Flaut switch

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.