

Project Name:

Lafra Sub health center solar water power-fromR#1 up to R#2

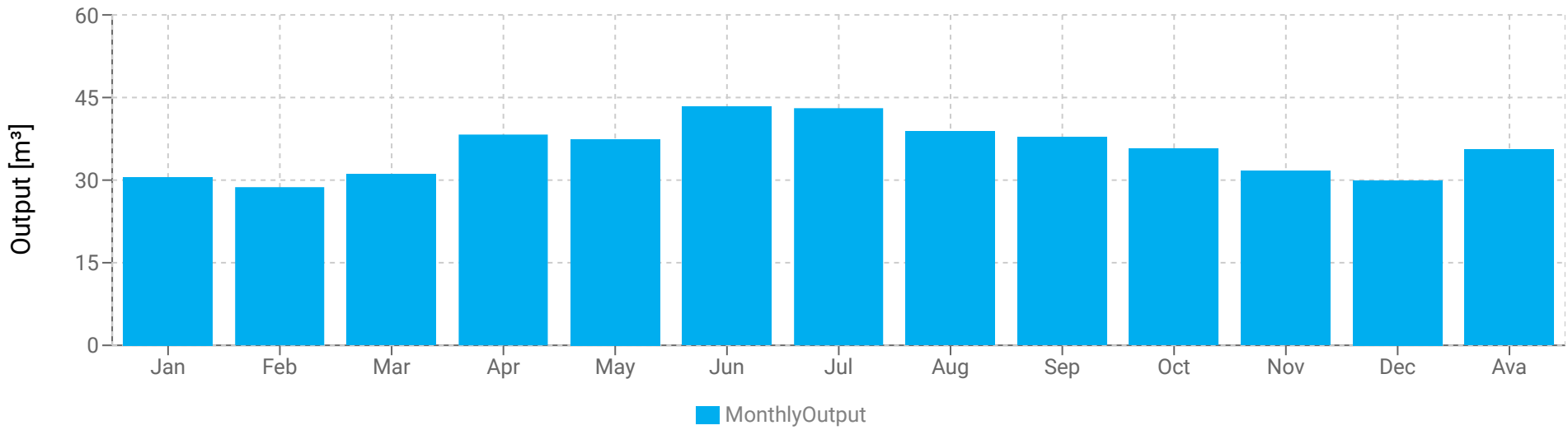
Input Summary		Monday, 10,June,2024
Location:	Afghanistan, Ghor(34°, 64°)	
GPS:	35 7'44 '°, 64 41'17"°	
Designer:	Farid Ahmad Qaderi	
Water Demand:	3.8(m³/h)	
Avg. Water Production:	24.6(m³/d) According to 6 hours pump operation during sunny days at STC (1000 w/m²) irradiation at 25C°	
Head (SWL+DD):	122(m)	
Pipe Friction losses:	68m (5%)	
Total Dynamic Head:	190 (m)	

Main Products	Description	Unite	Quantity
Solar	PROPSOLAR 270W Poly crystalline 37.9V 9.22A	panels	20
Pump	PEDROLLO 4SR4/46 5.5HP 4Kw 380V	pc	1
Controller	FRECON IP65 4kw 380V	pc	1
Structure	Fixed Structure	set	1
Motor Cable	4*4mm2	m	50
Solar Cable	2*6mm2	m	50
Pipeline	PE 2 Inch/63mm (PE100, PN16)	m	1352
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
Well probe sensors	Electronic	set	1
Cable 2*1.5mm2	For sensors	m	50
Earthing Cable	1*16mm2	m	50
Pump fittings	Poly ethylene	set	1

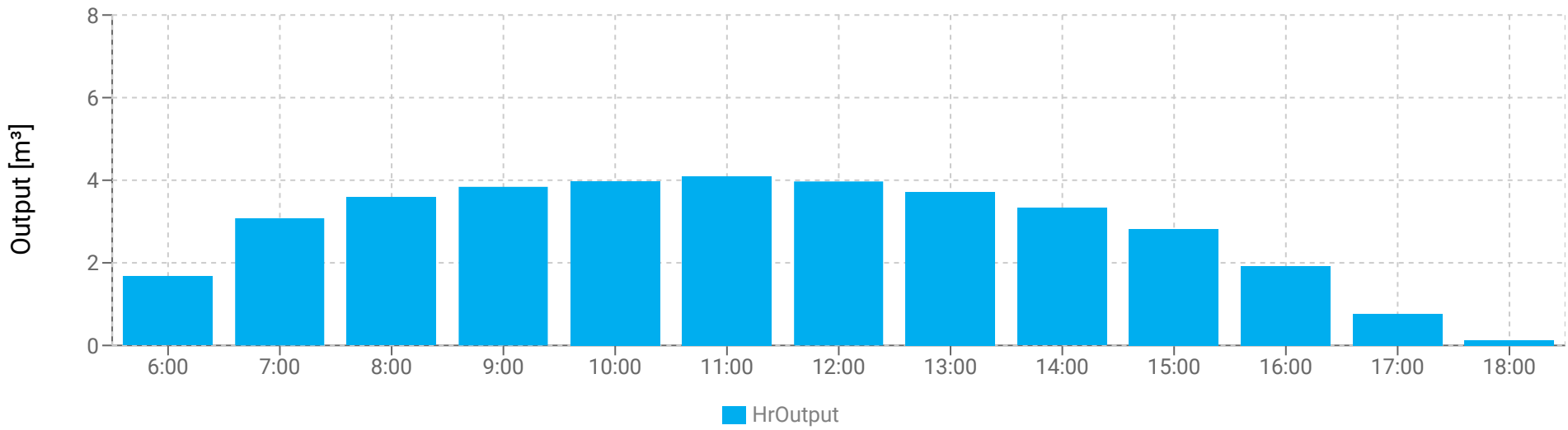
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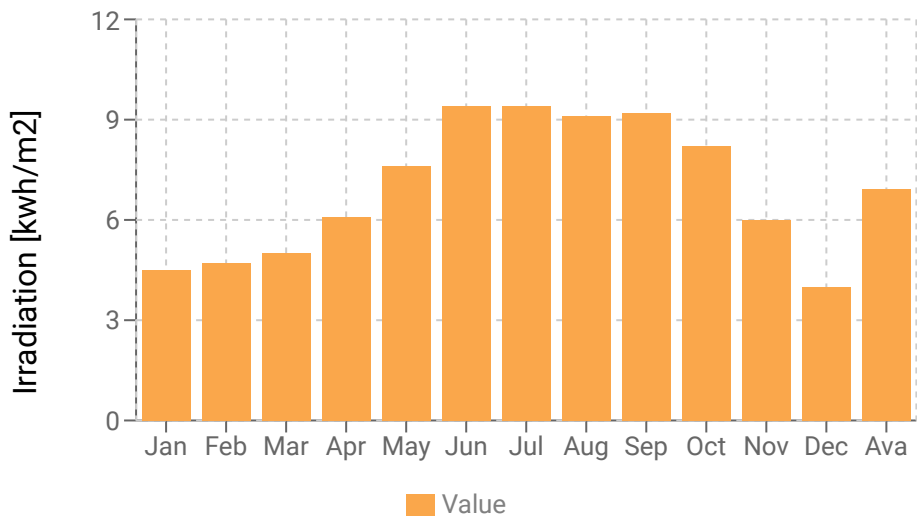
Daily Average output/month



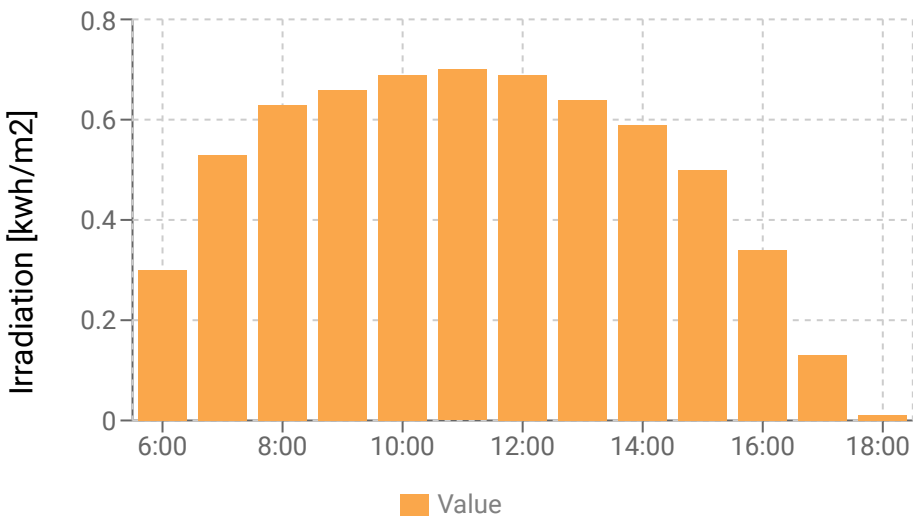
Hourly Output



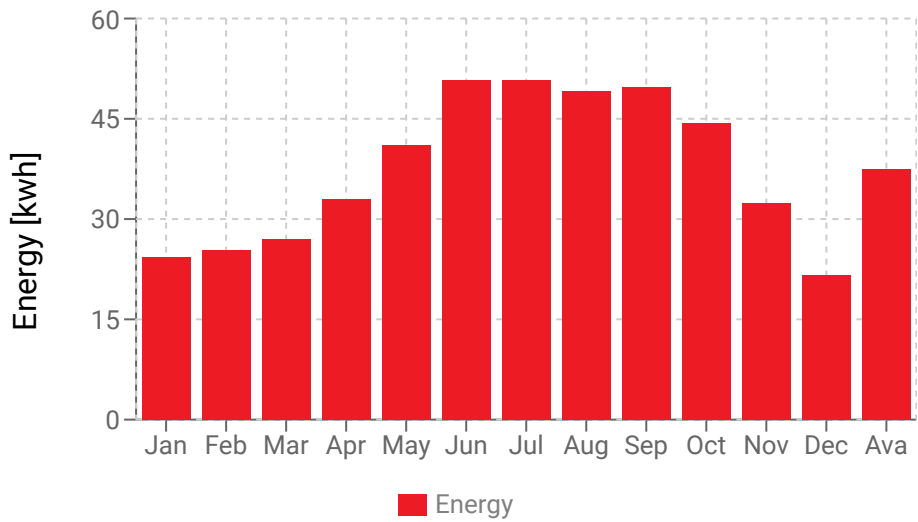
Irradiation value in deferent months of year



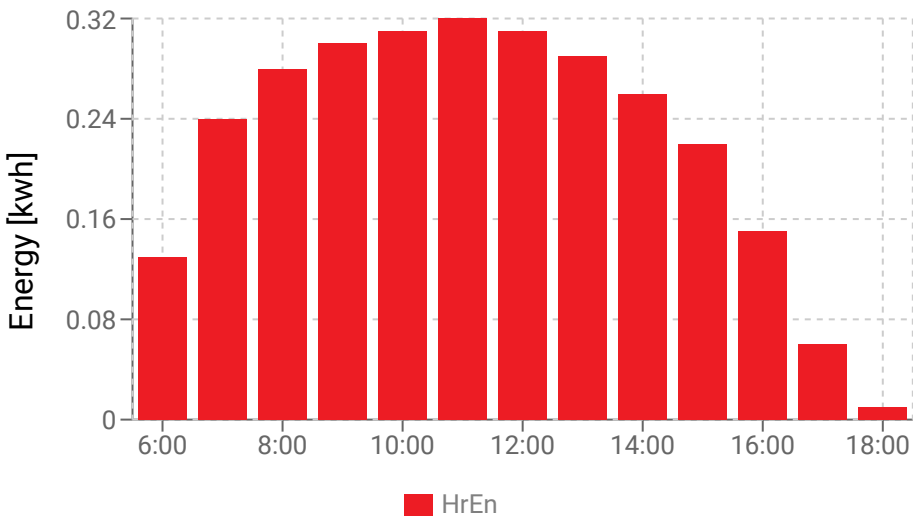
Hourly Values



Energy value in deferent months of year



Hourly Values

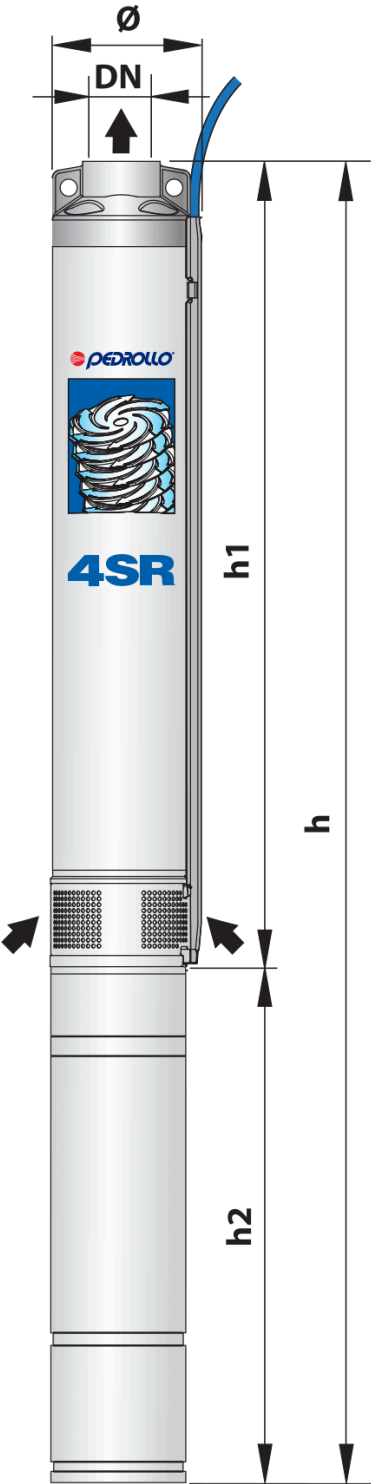
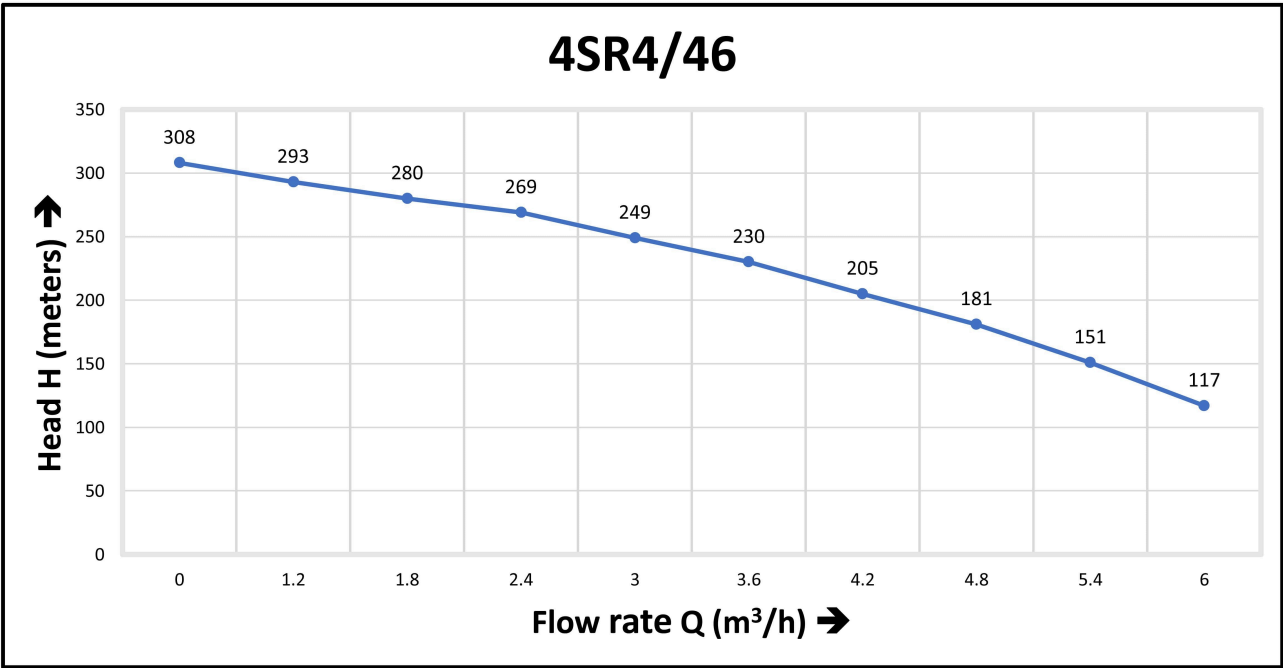


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Submersible pump specification:

Brand:	PEDROLLO
Model:	4SR4/46
Power:	4Kw
Hours power:	5.5HP
Current:	9.2A
OutLet:	1Inch
Voltage:	380V
Phase:	3Phase
Diameter:	4inch
Weight:	34.3kg
Made in:	Italy



Dimensions and weight

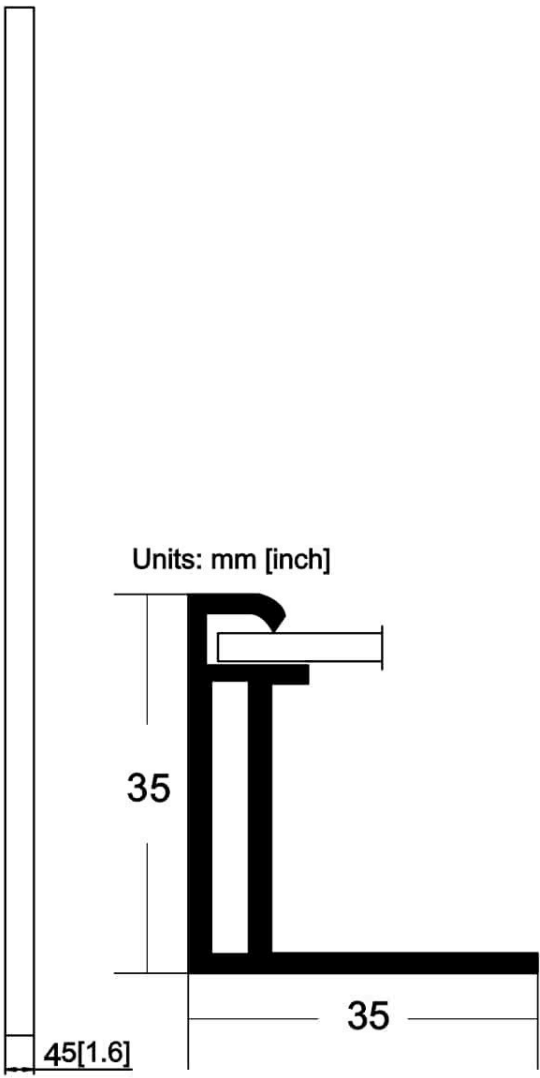
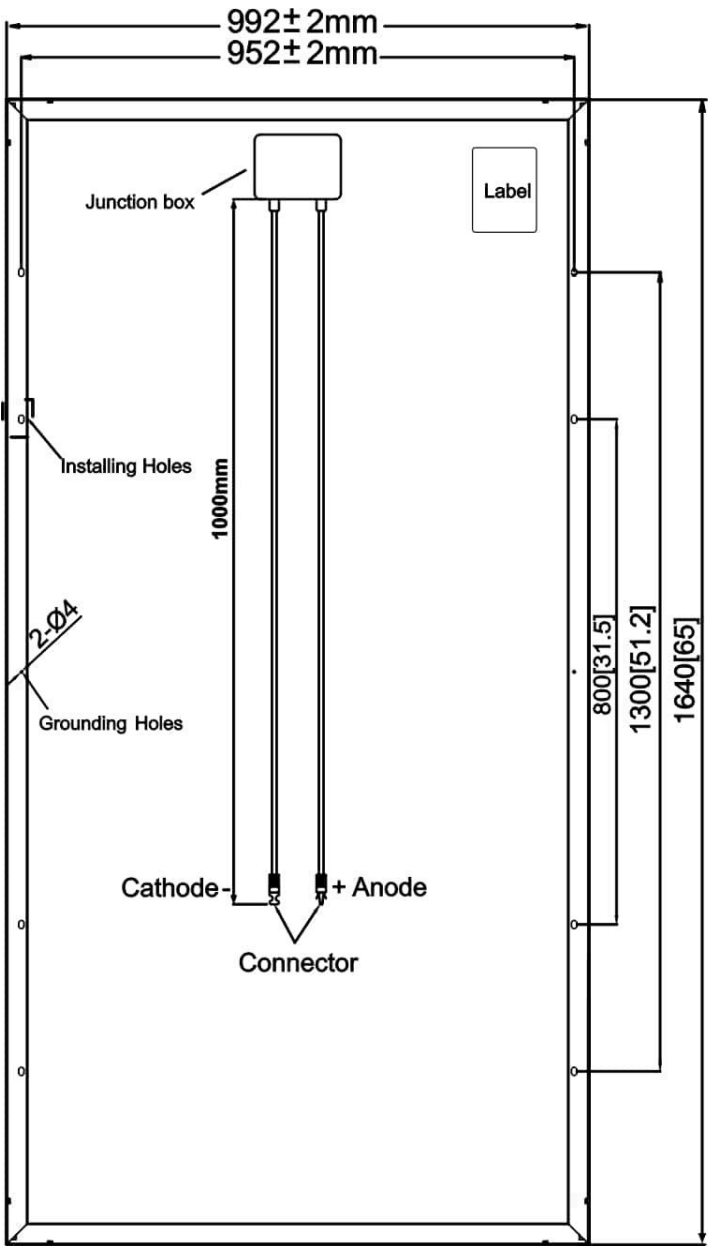
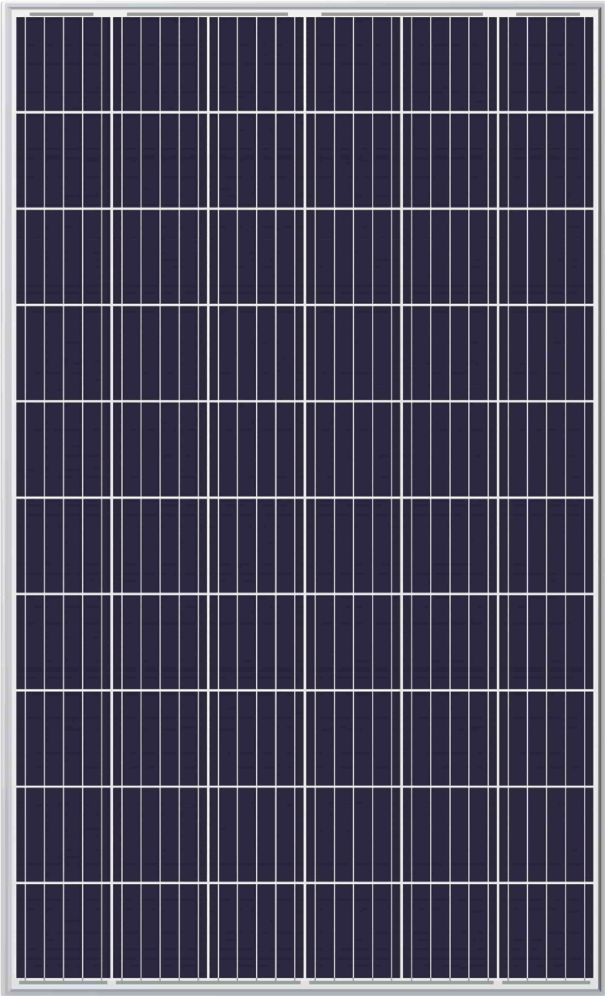
MODEL	PORT	DIMENSIONS mm				kg
		Ø	h1	h2	h	
Three-phase 4SR4/46 - PD	DN 1¼"	98	1295	587	1882	34.3

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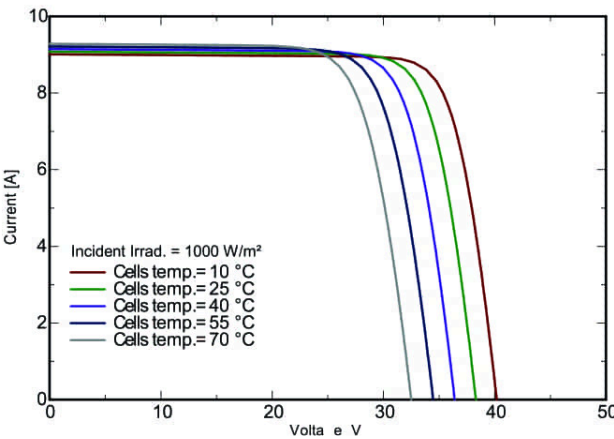
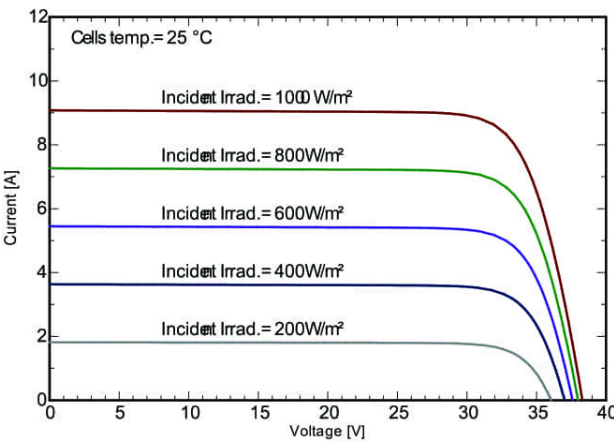
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Solar specification:

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

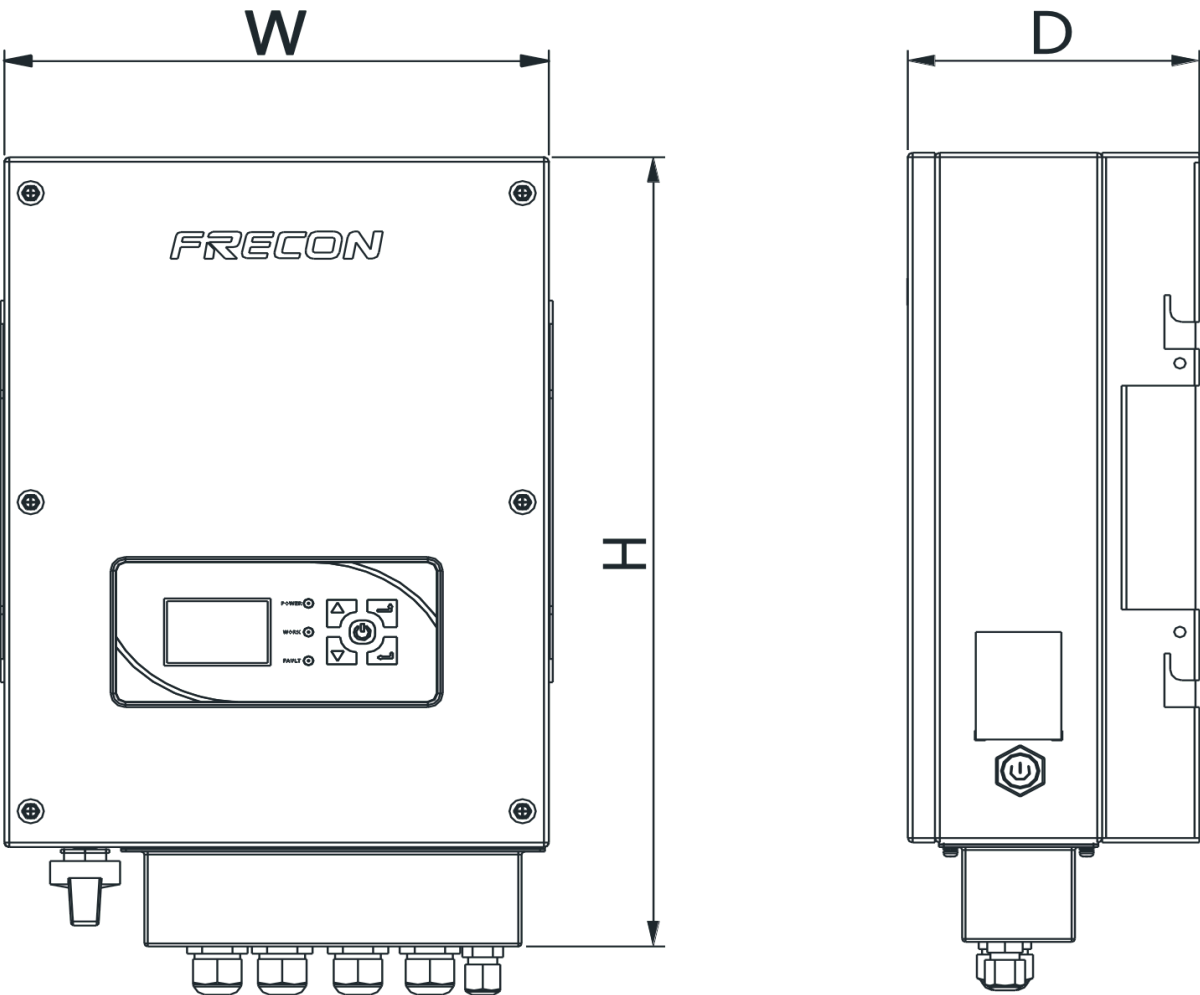


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Controller specification:

Brand:	FRECON IP65
Model:	PV580-4T-4.0
Power:	4 Kw
Hours power:	5.5 HP
Current:	9.5 A
Voltage(AC):	380 V
Voltage(DC):	450-850V
Weight:	11.4 kg
Made in:	China



Model	External and installation dimensions (mm)			N.W (kg)
	W	H	D	
PV580-4T-4.0B	280	440	150	11.4

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Strucuter specification:

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

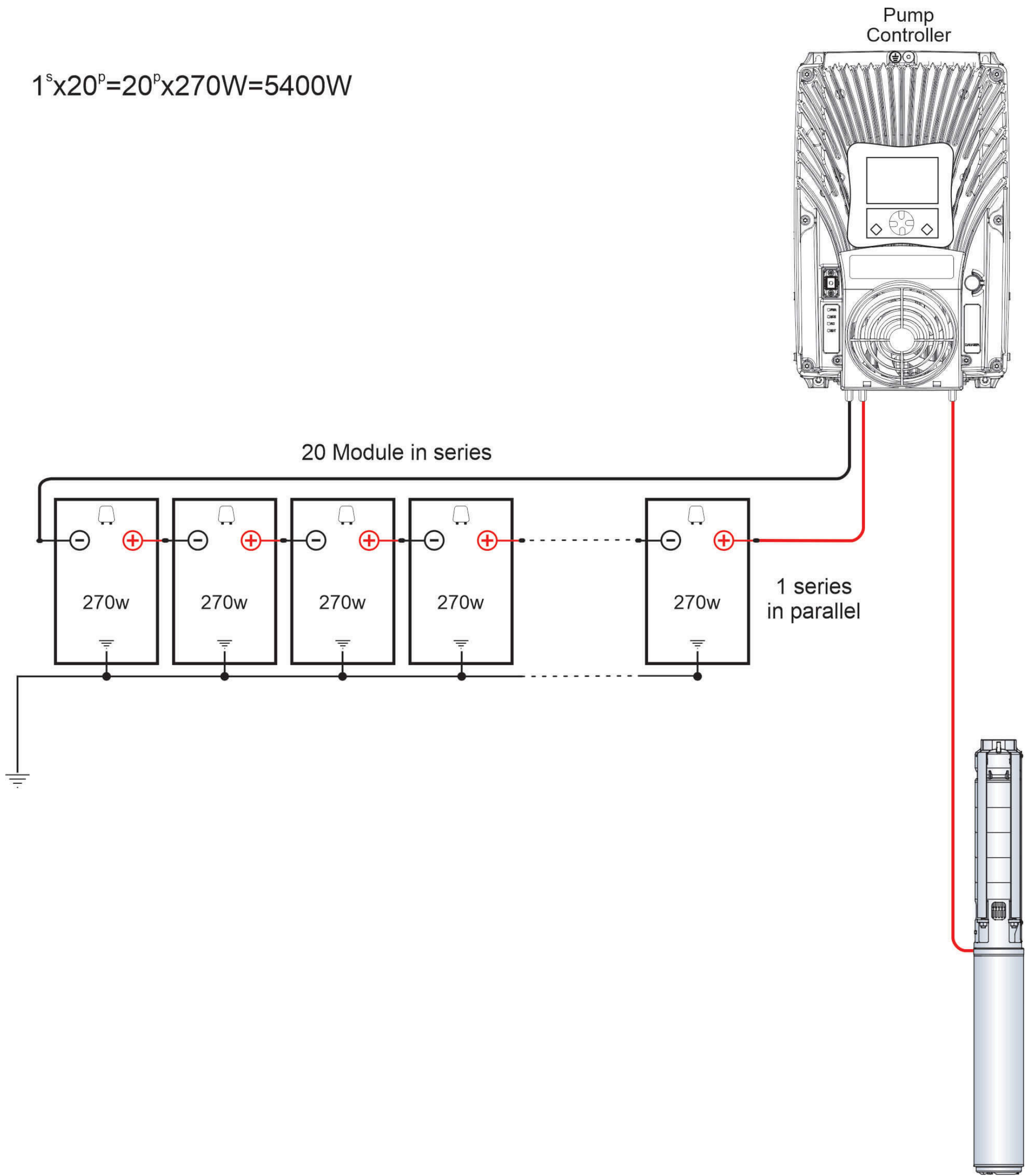


Note: Image may be deferent with actual product as this is a graphic design.



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Wiring Diagram



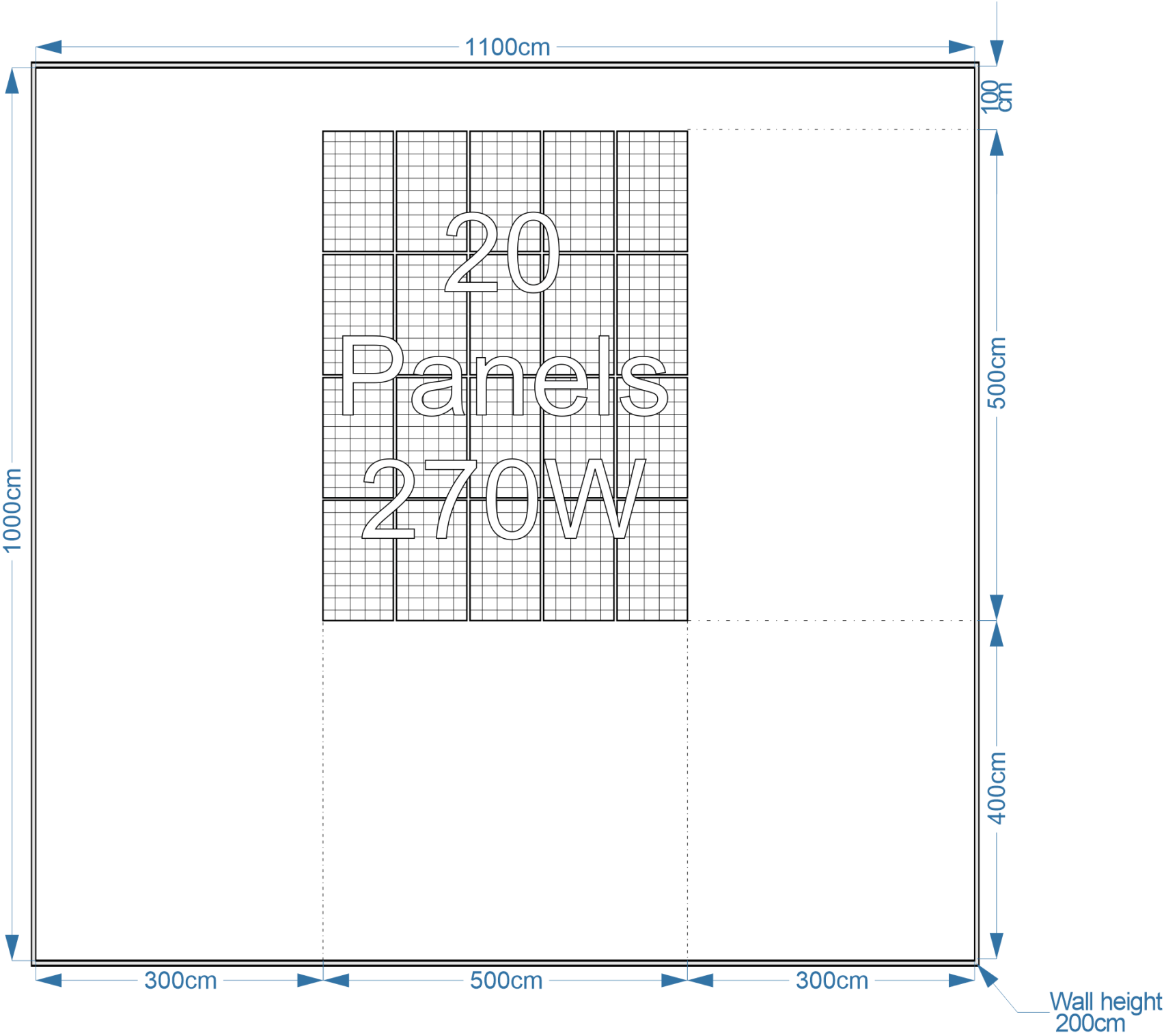
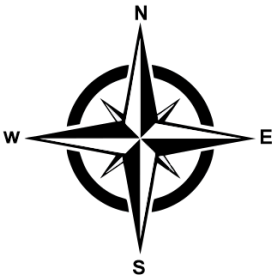
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Area Diagram

Required Area for this project:

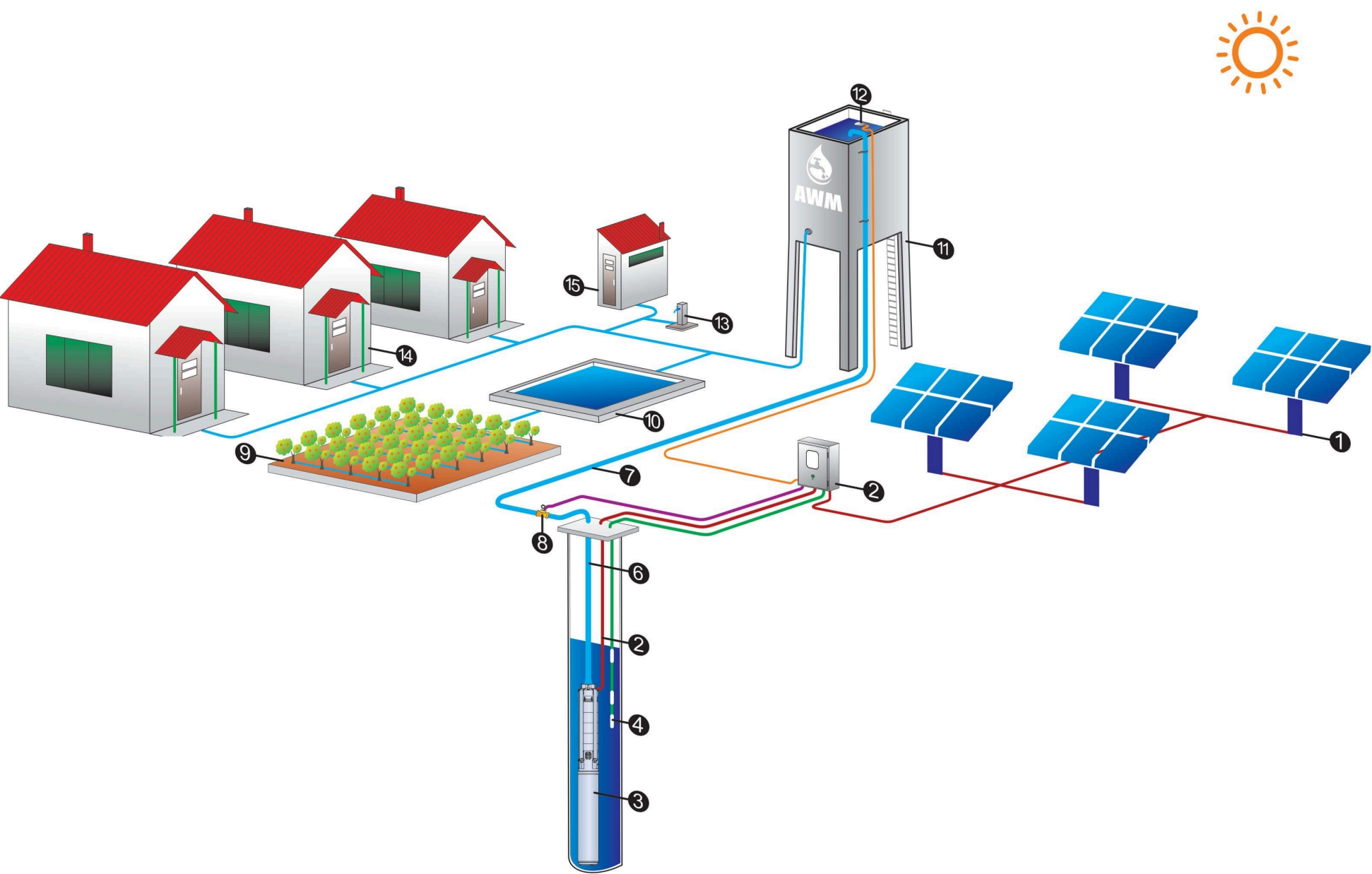
Minimum 110m<sup>2</sup>



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

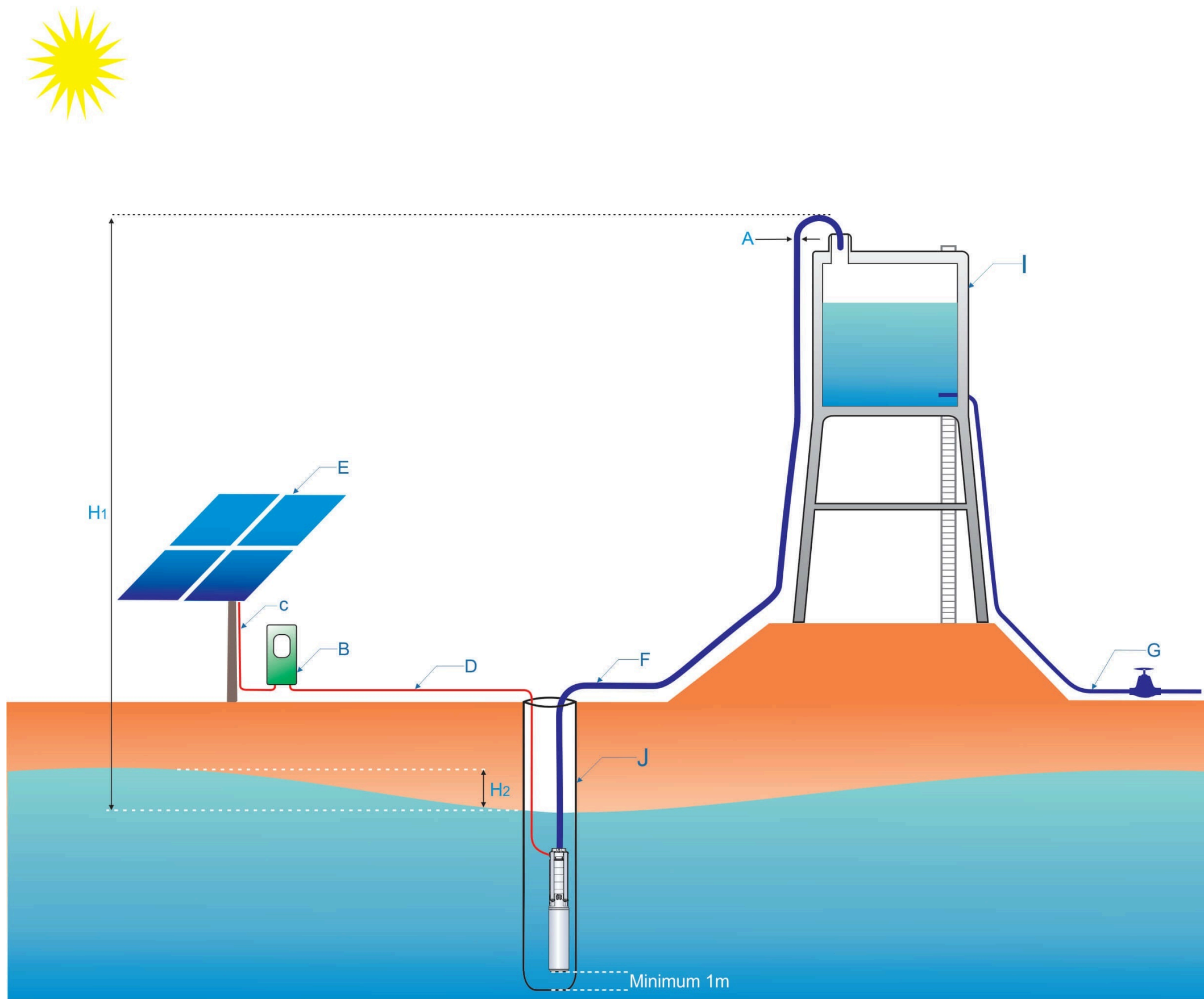
12- Flaut switch

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.
- H<sub>1</sub> (static head) virtical height from the lowest level to the highest point of delivery.
- H<sub>2</sub> (draw down) the dynamic water level of the well depending on the pump operation.