



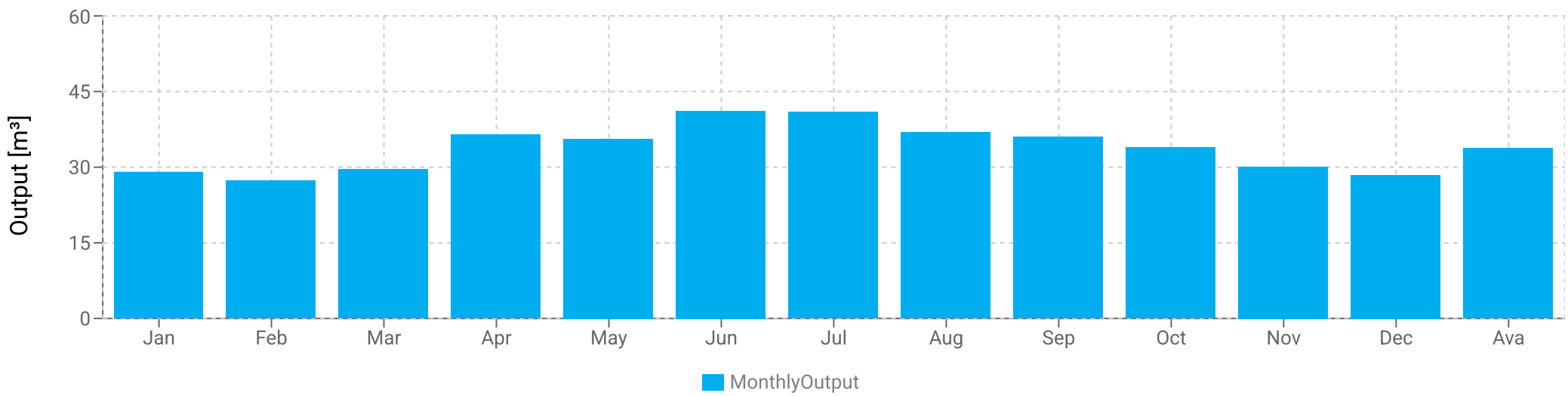
Project Name: Lafrac SHC pump #1

Input Summary		Tuesday, 29, April, 2025
Location:	Afghanistan, Ghor(34°, 64°)	
Designer:	Farid Ahmad Qaderi	
Water Demand:	4.1(m³/h)	
Avg. Water Production:	23.4(m³/d) According to 6 hours pump operation during sunny days at STC (1000 w/m²) irradiation at 25C°	
Head (SWL+DD):	200(m)	
Pipe Friction losses:	21m (5%)	
Total Dynamic Head:	221 (m)	

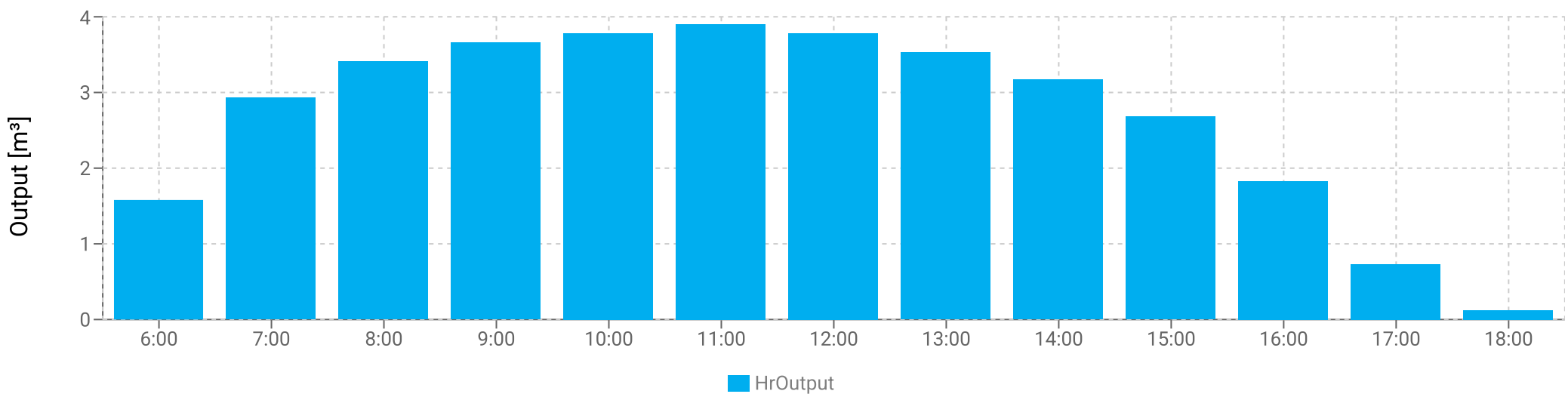
Main Products	Description	Unite	Quantity
Solar	PROPSOLAR 270W Poly crystalline 37.9V 9.22A	panels	20
Pump	PEDROLLO 4SR4/46 5.5HP 4Kw 380V	pc	1
Controller	FRECON IP65 4kw 380V	pc	1
Structure	Fixed Structure	set	1
Motor Cable	4*10mm2	m	220
Solar Cable	2*6mm2	m	30
Pipline	PE 1.25 Inch/40mm (PE100, PN16)	m	420
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
Flexible Conduct pipe	Flexible	m	220
Cable splice kit	IP68	set	1
Pipe clip	For well	Pairs	1
Safety rope	Plastic	m	250
Earthing Cable	1*16mm2	m	50
Well probe sensors	Electronic	set	1
Cable 2*1.5mm2	For sensors	m	200
Pump fittings	Poly ethylene	set	1

Project Name: **Lafrah SHC pump #1**

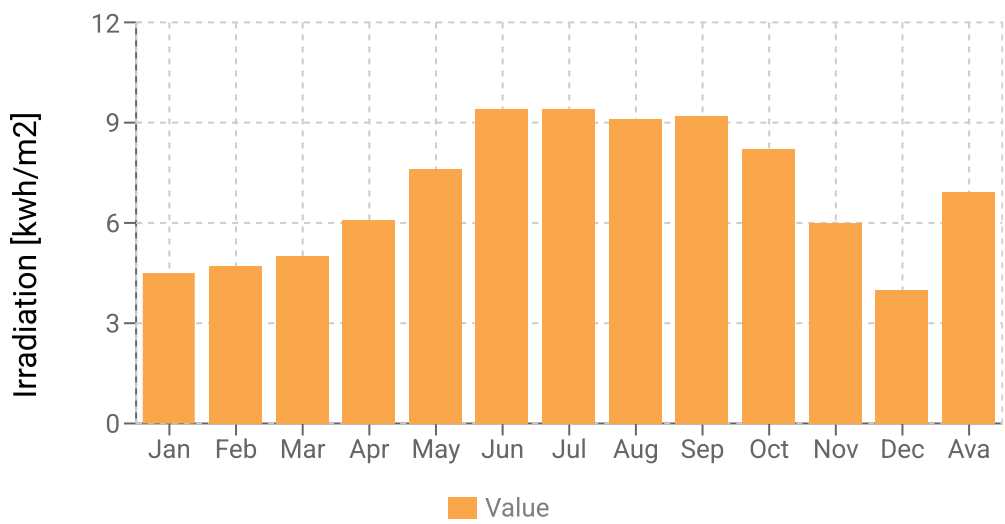
Daily Average output/month



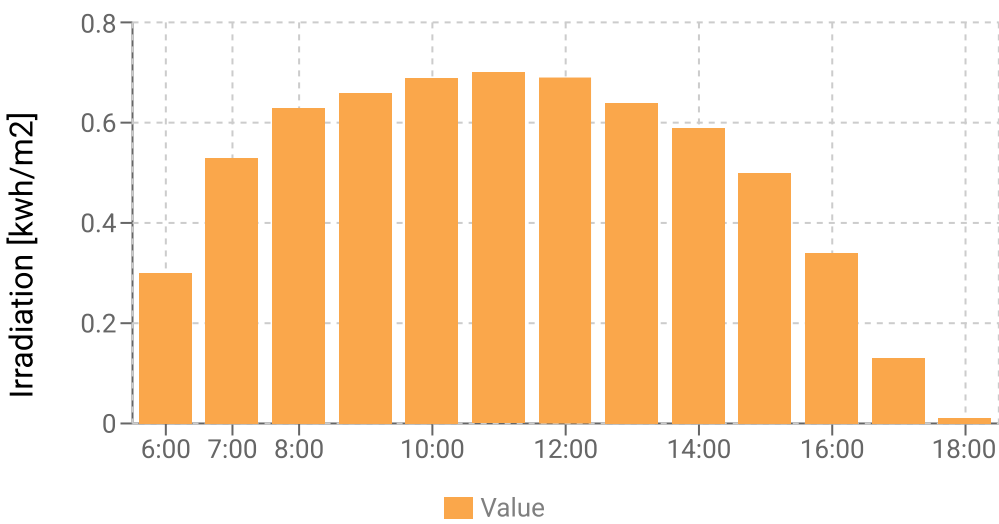
Hourly Output



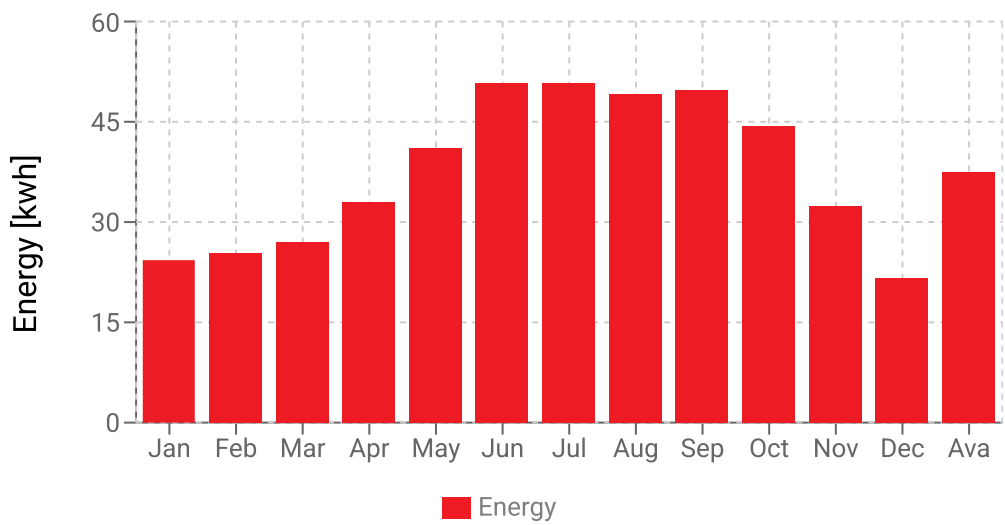
Irradiation value in deferent months of year



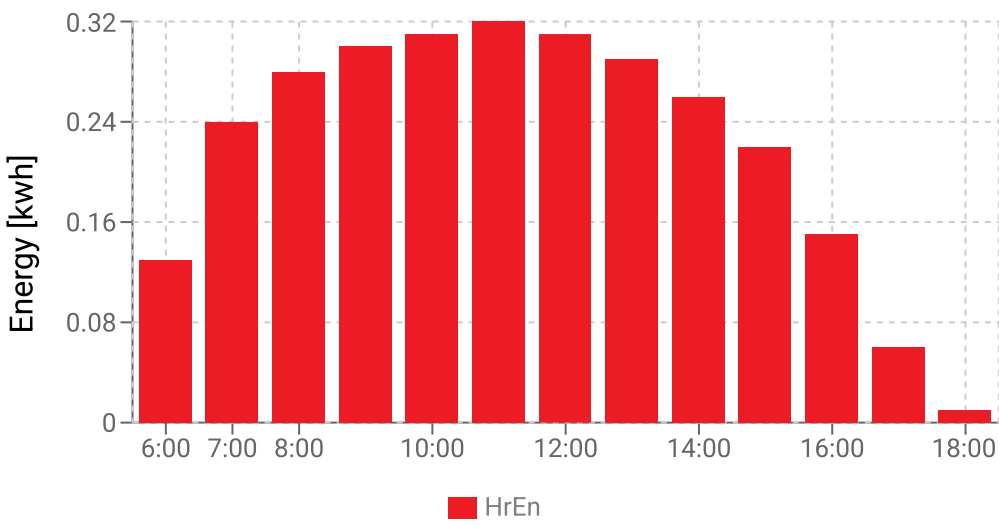
Hourly Values



Energy value in deferent months of year



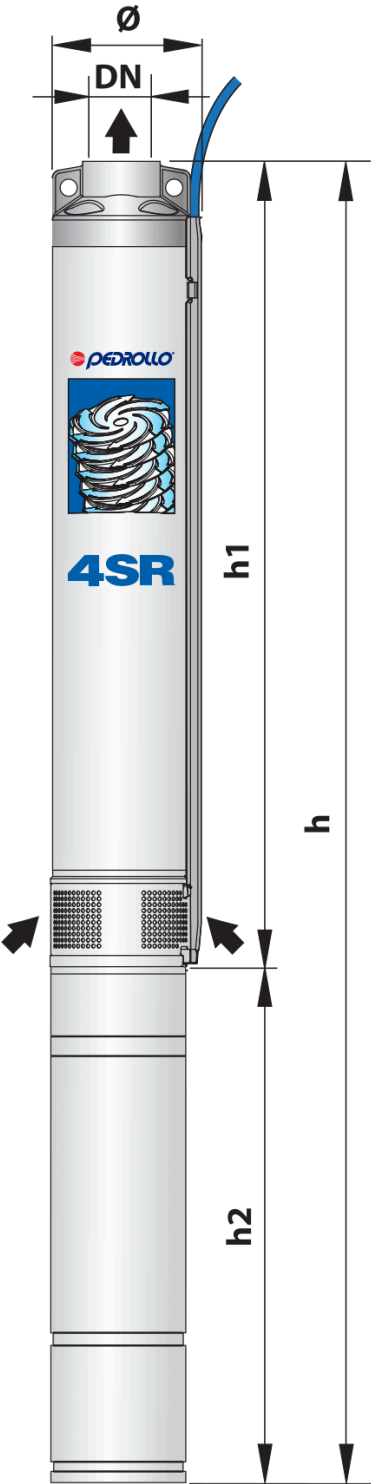
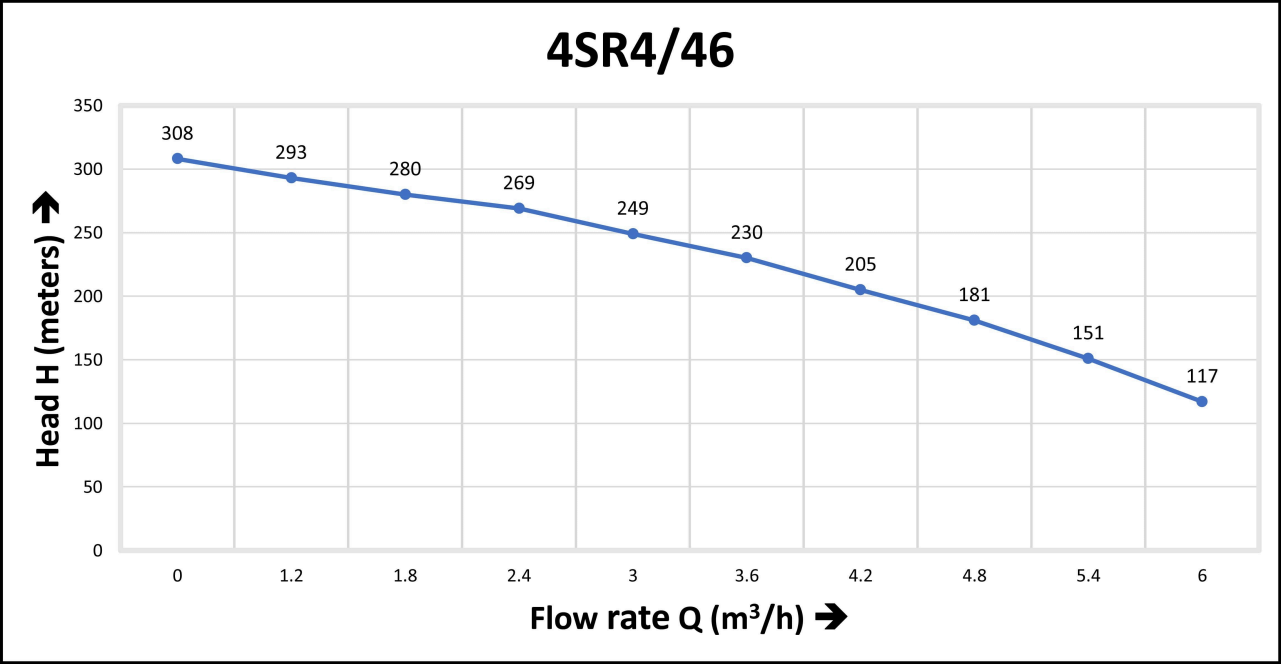
Hourly Values



Project Name: Lafrah SHC pump #1

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

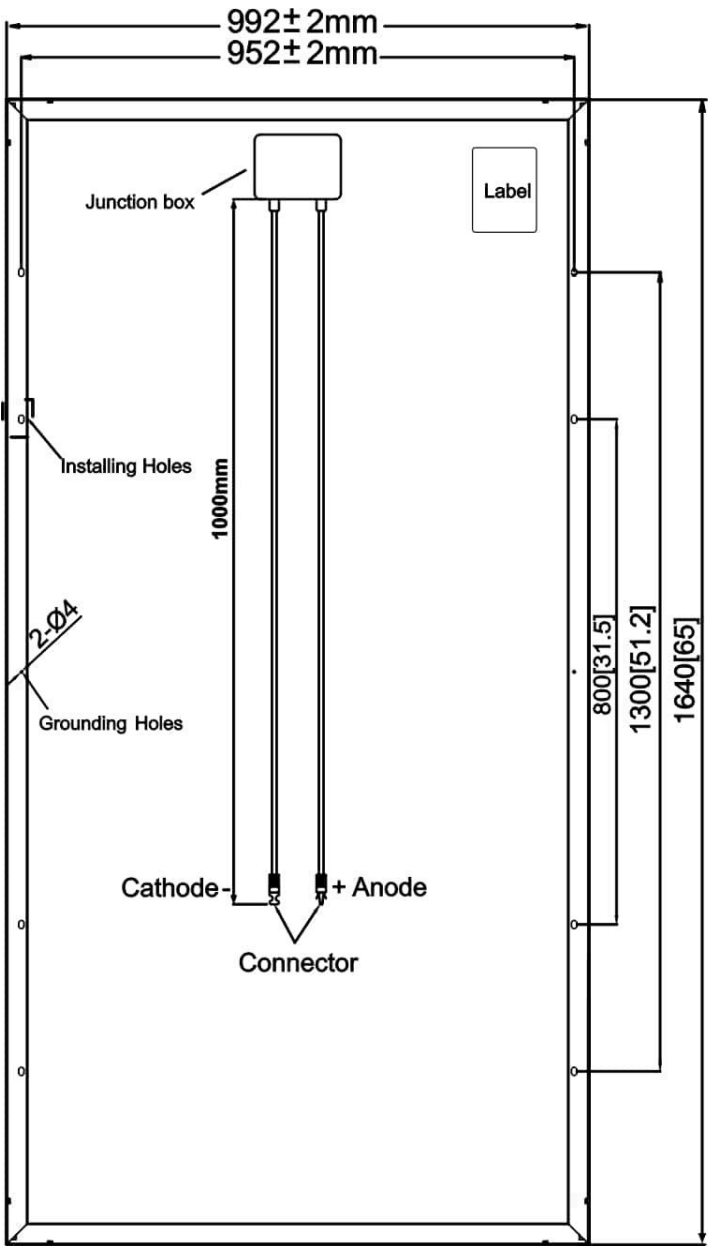
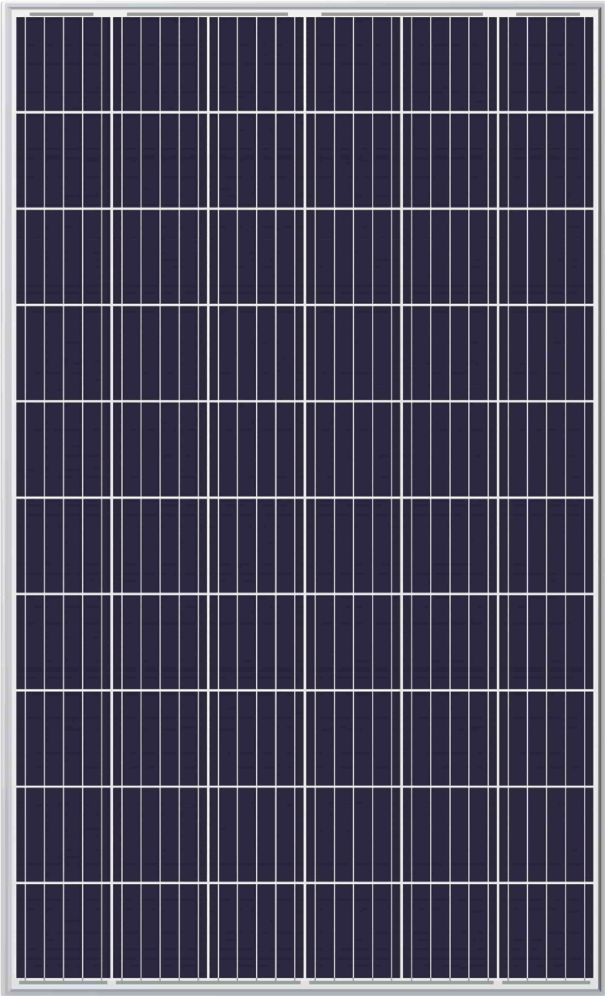
MODEL	PORT	DIMENSIONS mm				kg
		Ø	h1	h2	h	
Three-phase 4SR4/46 - PD	DN 1¼"	98	1295	587	1882	34.3

Project Name:

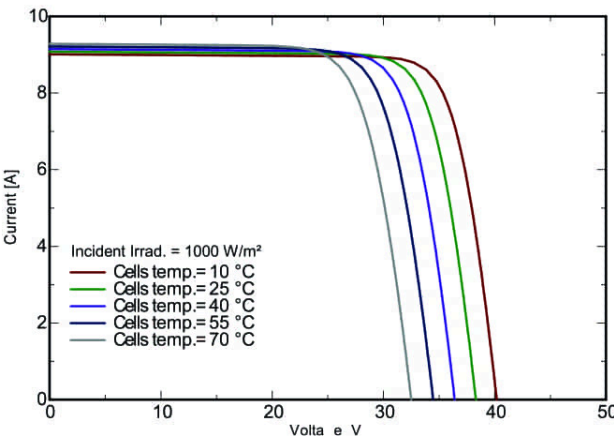
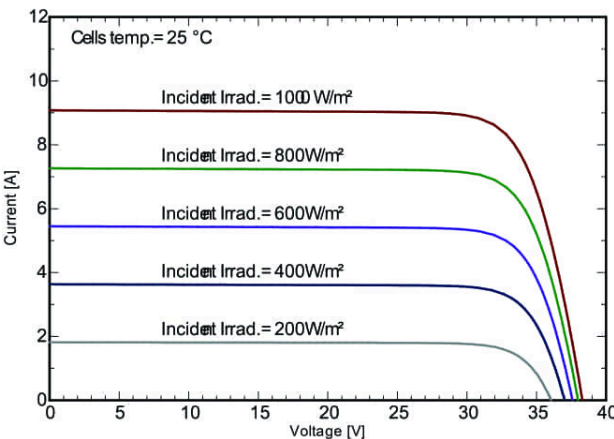
Lafrah SHC pump #1

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



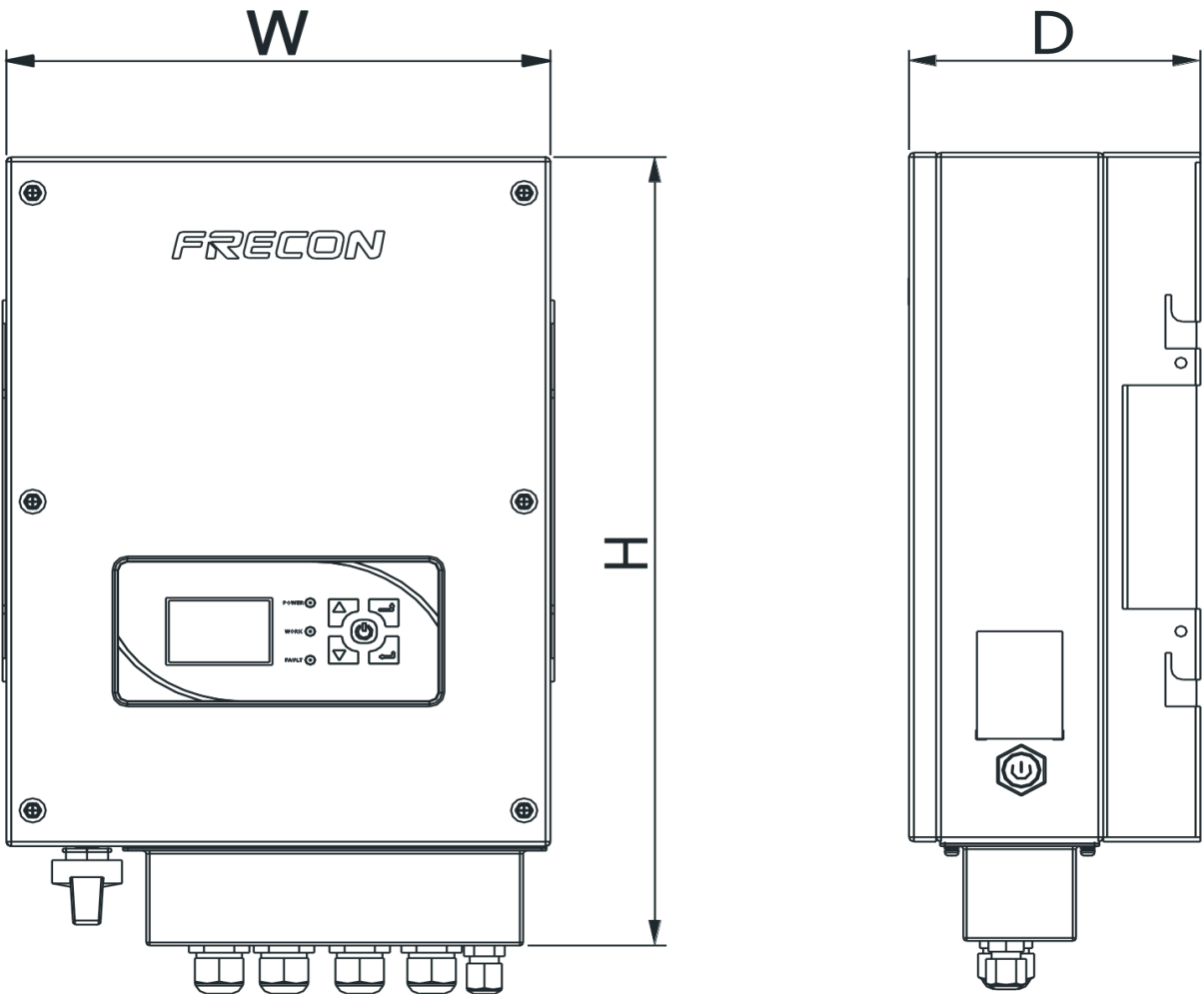
I-V CURVE



Project Name: Lafrah SHC pump #1

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

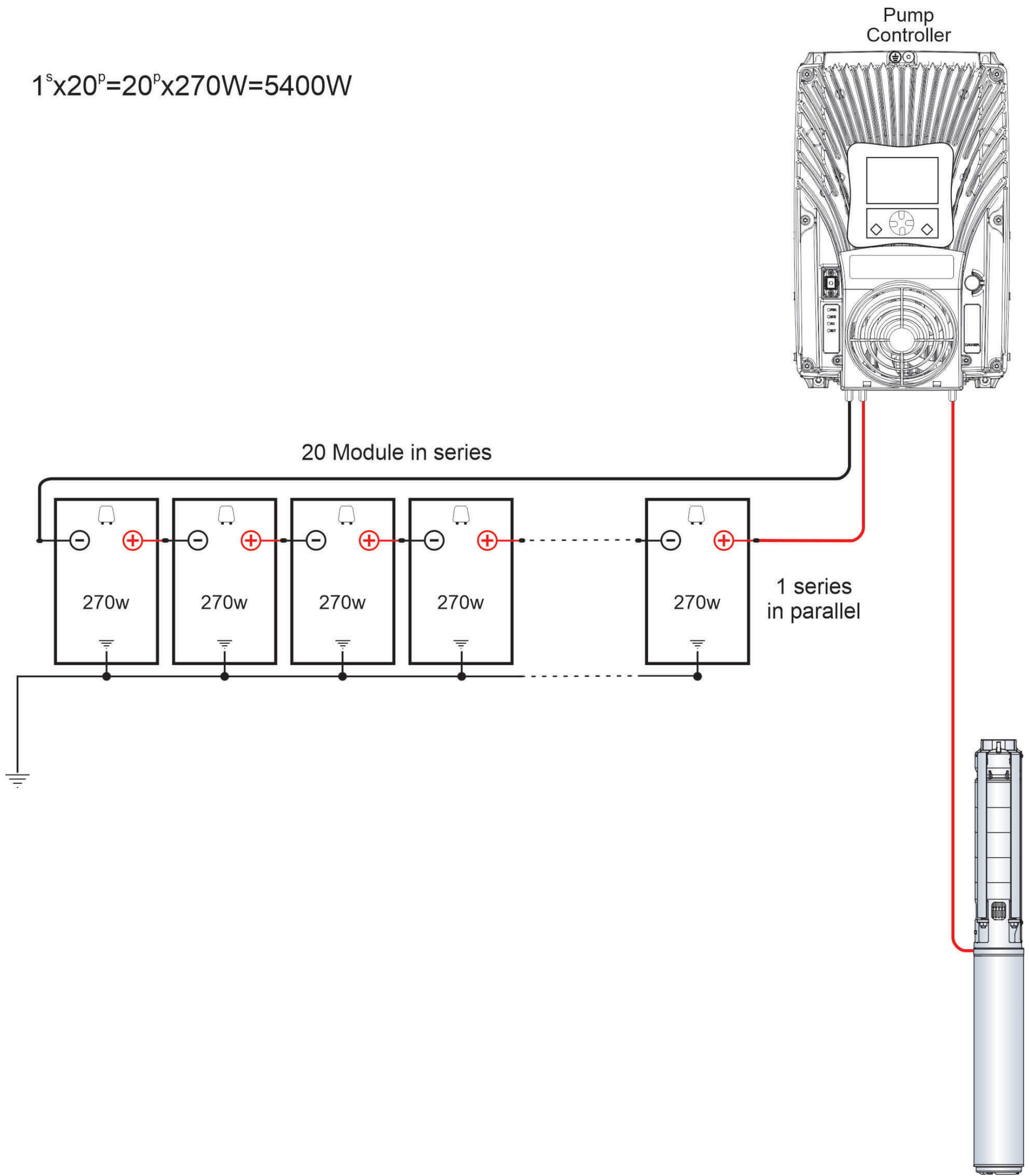


Note: Image may be deferent with actual product as this is a graphic design.

Project Name: Lafrah SHC pump #1

Wiring Diagram

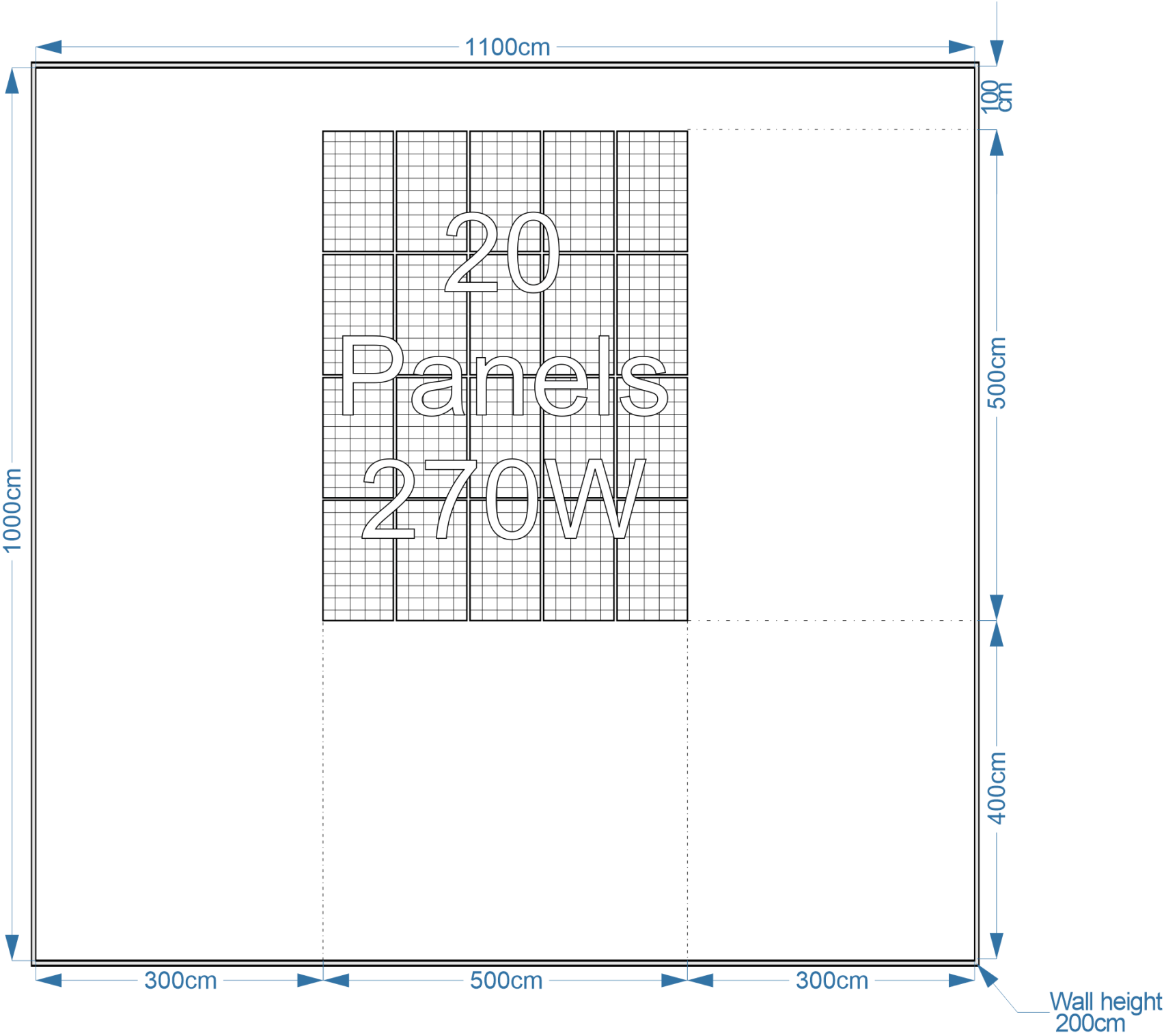
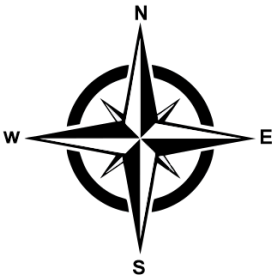
$$1^s \times 20^p = 20^p \times 270W = 5400W$$



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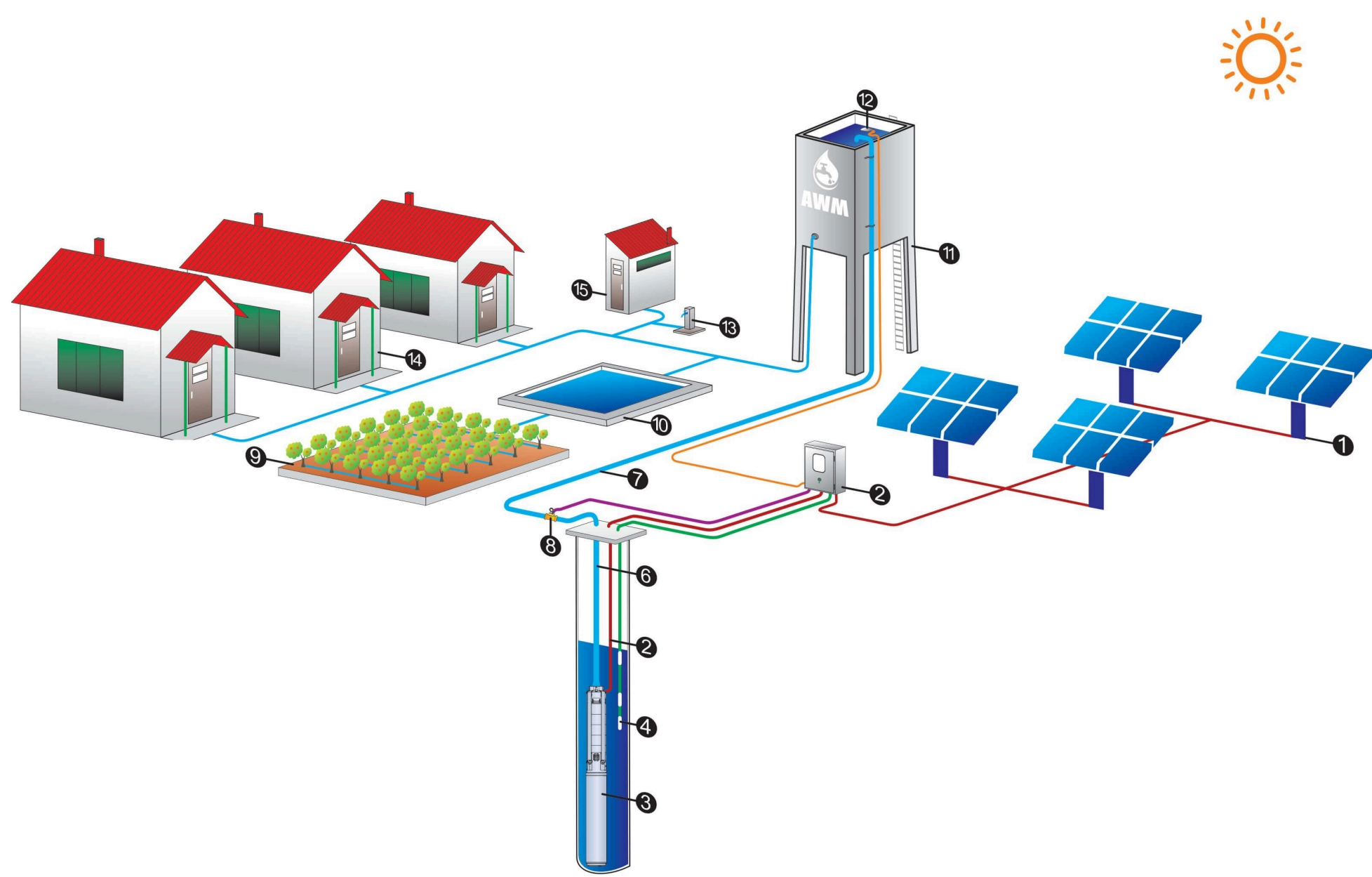
Area Diagram

Required Area for this project:
Minimum 110m²



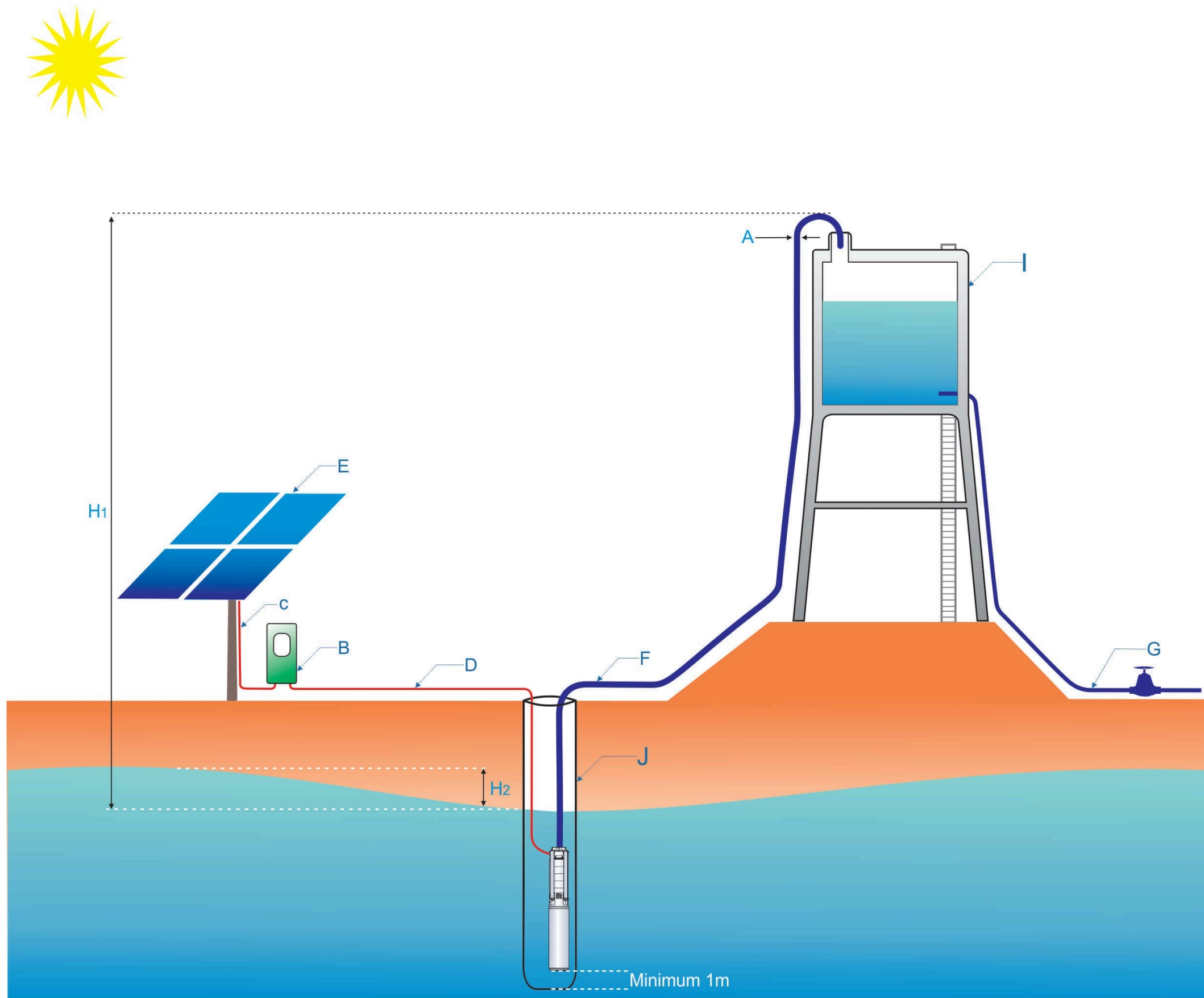
Note: The area which the panels will install must be south face.

System General layout



- | | |
|--------------------------|-----------------------------|
| 1- Solar panels | 9- Garden |
| 2- Pump controller | 10- Swimming pool |
| 3- Submersible | 11- Water reservoir |
| 4- well probe sensors | 12- Flaut switch |
| 5- Pump electrical cable | 13- Flaut switch Ele. cable |
| 6- Non return valve | 14- Residential Houses |
| 7- Pressure Gauge | 15- Toilet |
| 8- Water meter | |

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.