

Project Name: Pay Hasar SHC water solar power system

Input Summary

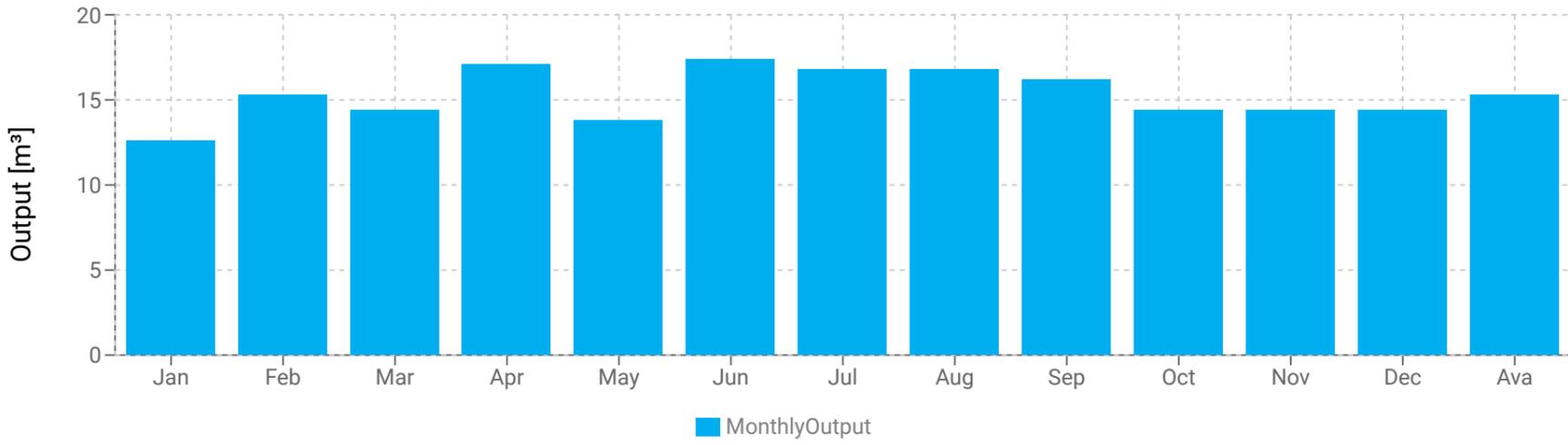
Saturday, 17, August, 2024

Location:	Afghanistan, Herat(34°, 62°)
GPS:	33.89987586°, 63.19689282°
Designer:	Farid Ahmad Qaderi
Water Demand:	1.2(m ³ /h)
Avg. Water Production:	10.8(m ³ /d) According to 6 hours pump operation during sunny days at STC (1000 w/m ²) irradiation at 25C°
Head (SWL+DD):	50(m)
Pipe Friction losses:	4m (5%)
Total Dynamic Head:	54 (m)

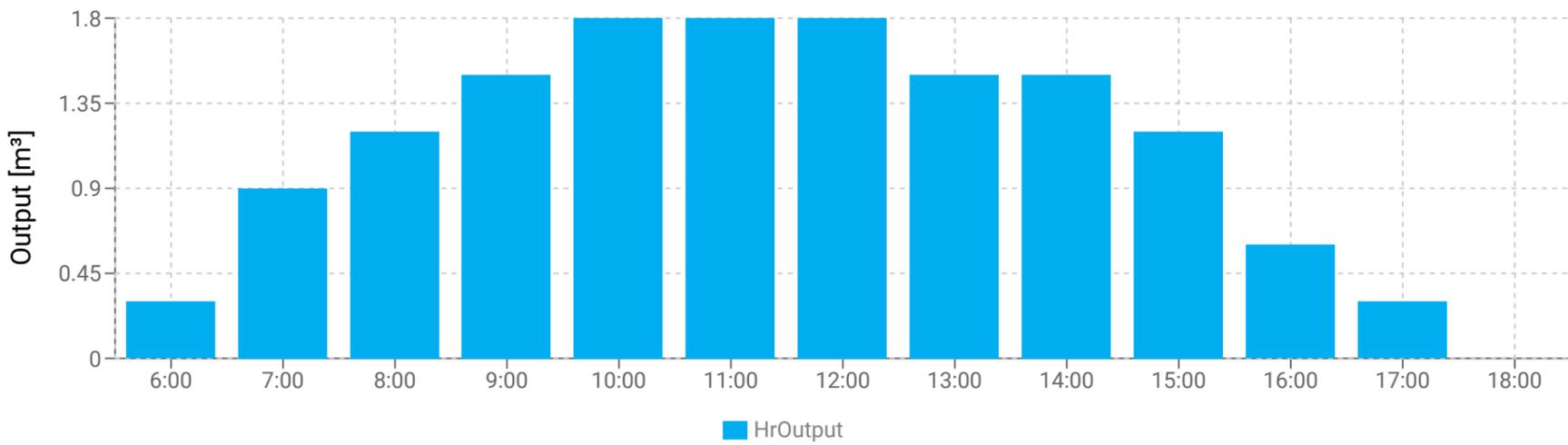
Main Products	Description	Unite	Quantity
Solar	PROPSOLAR 270W Poly crystalline 37.9V 9.22A	panels	4
Pump	PEDROLLO 4SR1.5/17 1HP 0.75Kw 220V	pc	1
Controller	FRECON IP65 1.5kw 220V	pc	1
Structure	Fixed Structure	set	1
Motor Cable	4*2.5mm ²	m	65
Solar Cable	2*6mm ²	m	15
Pipline	PE 0.5 Inch/16mm (PE100, PN10)	m	75

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	30
Cable splice kit	IP68	set	1
Safety rope	Plastic	m	90
Well probe sensors	Electronic	set	1
Earthing Cable	1*16mm ²	m	30
Cable 2*1.5mm ²	For sensors	m	65
Pump fittings	Poly ethylene	set	1

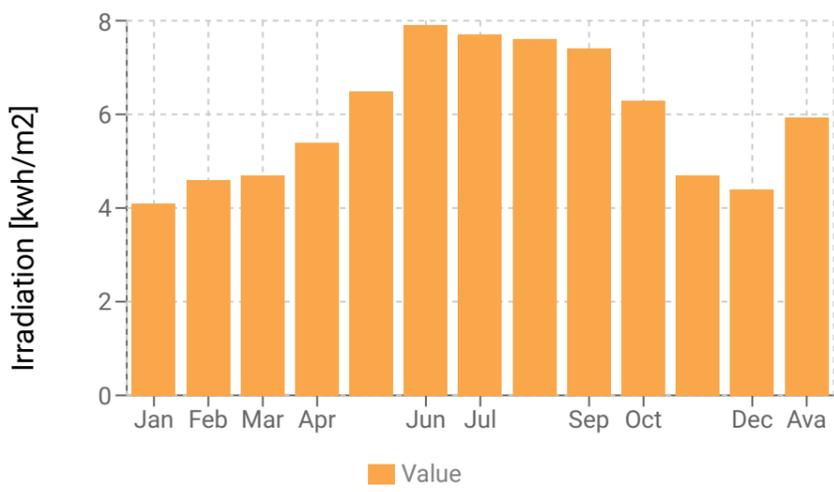
Daily Average output/month



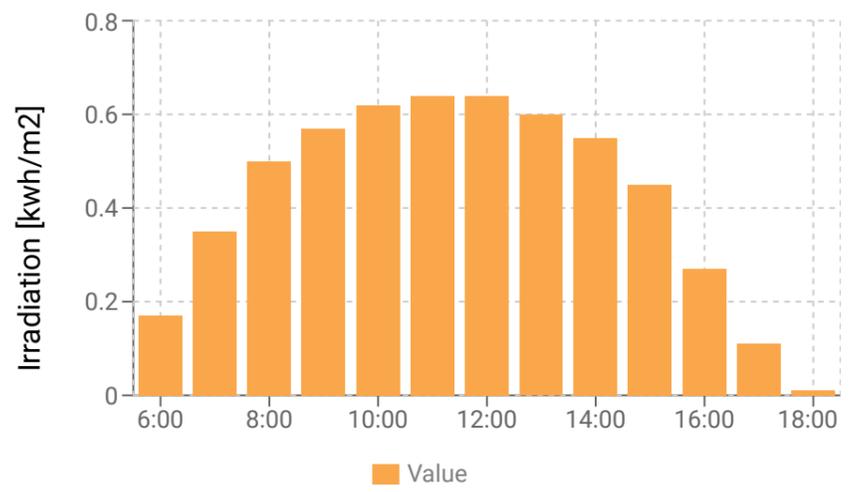
Hourly Output



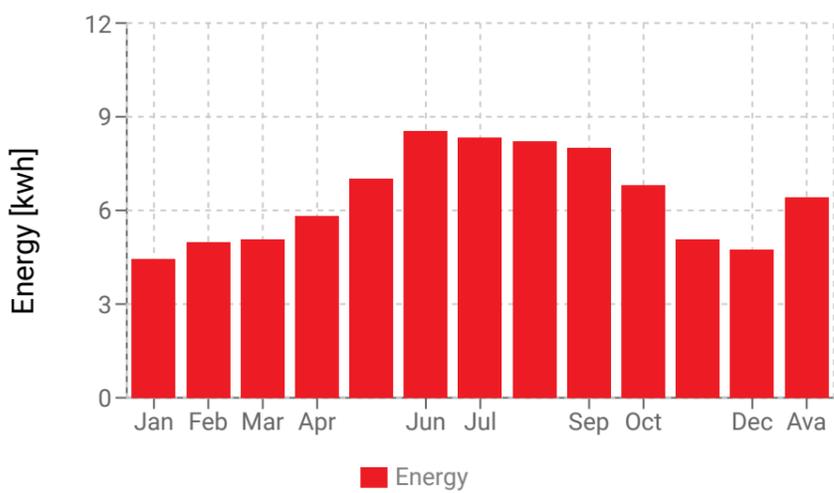
Irradiation value in deferent months of year



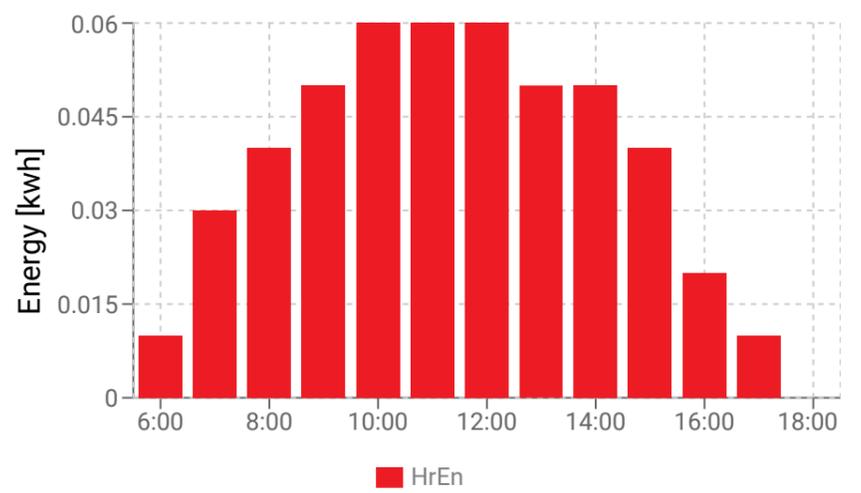
Hourly Values



Energy value in deferent months of year



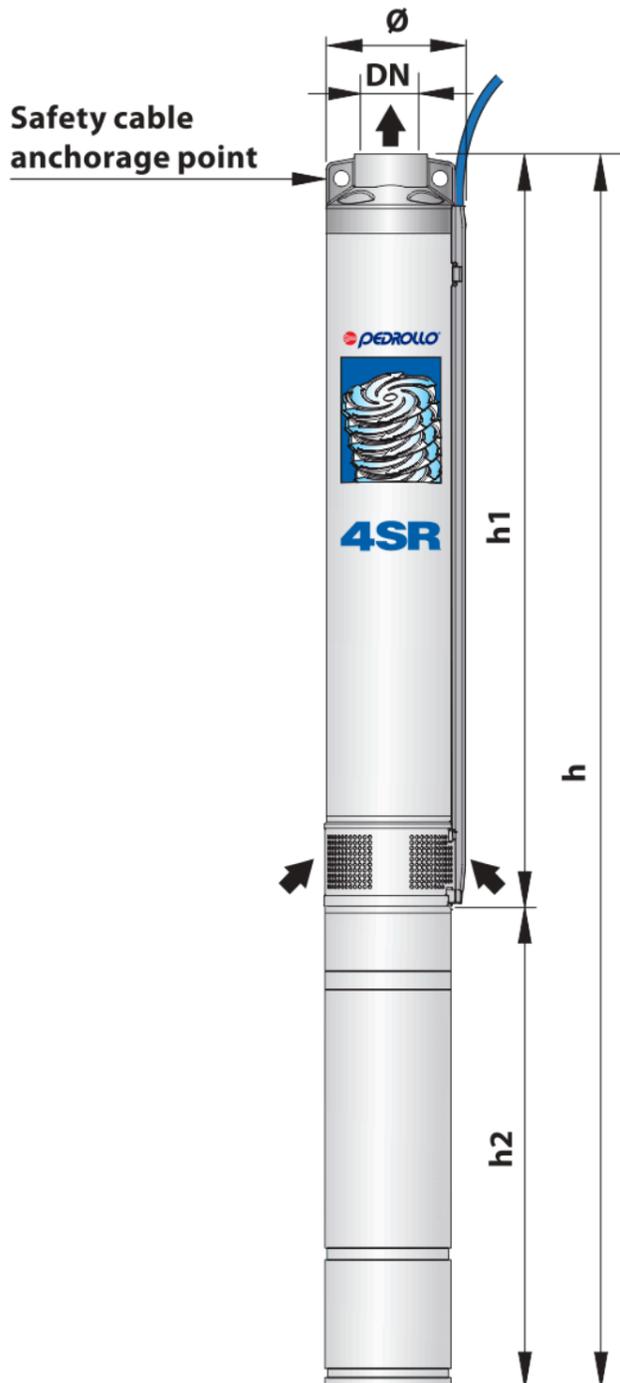
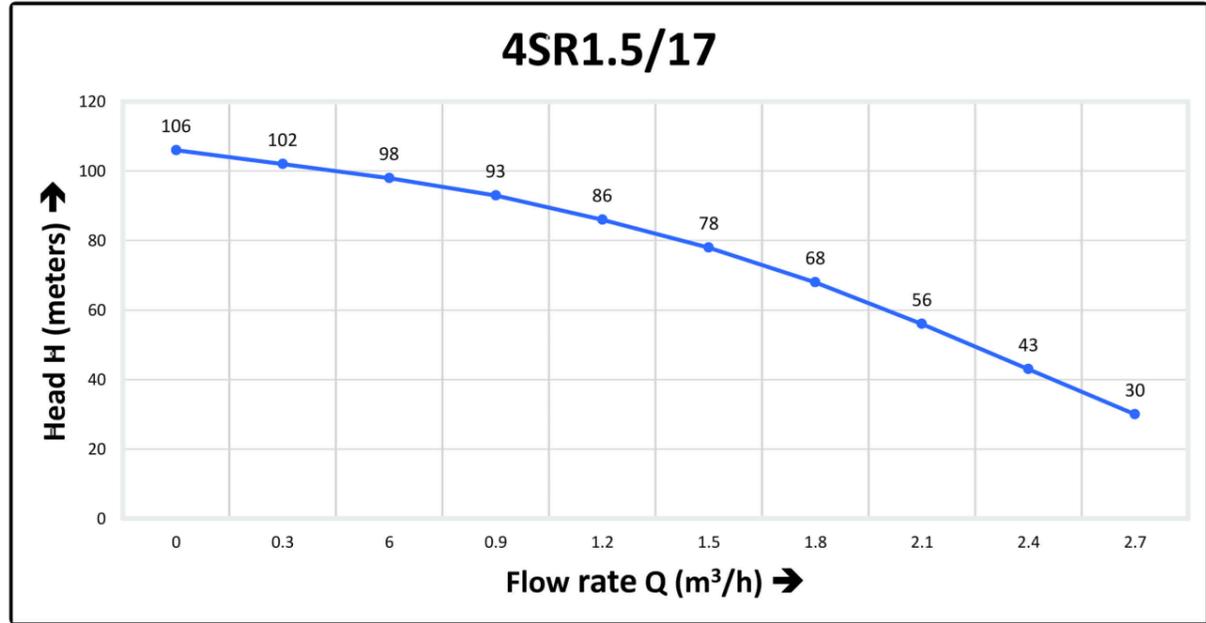
Hourly Values



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Submersible pump specification:

Brand: PEDROLLO
 Model: 4SR1.5/17
 Power: 0.75Kw
 Hours power: 1HP
 Current: 8.6A
 OutLet: 0.5Inch
 Voltage: 220V
 Phase: 3Phase
 Diameter: 4inch
 Weight: 14.3kg
 Made in: Italy

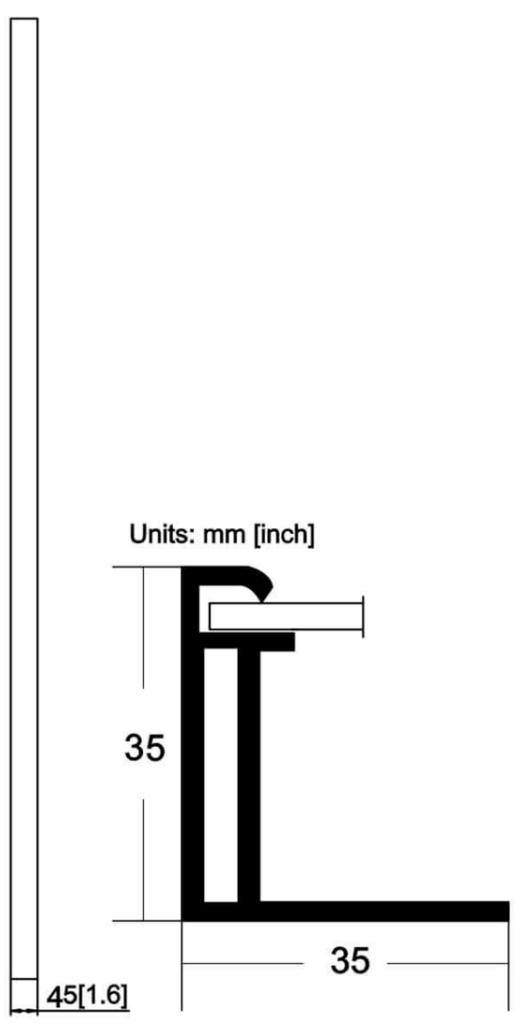
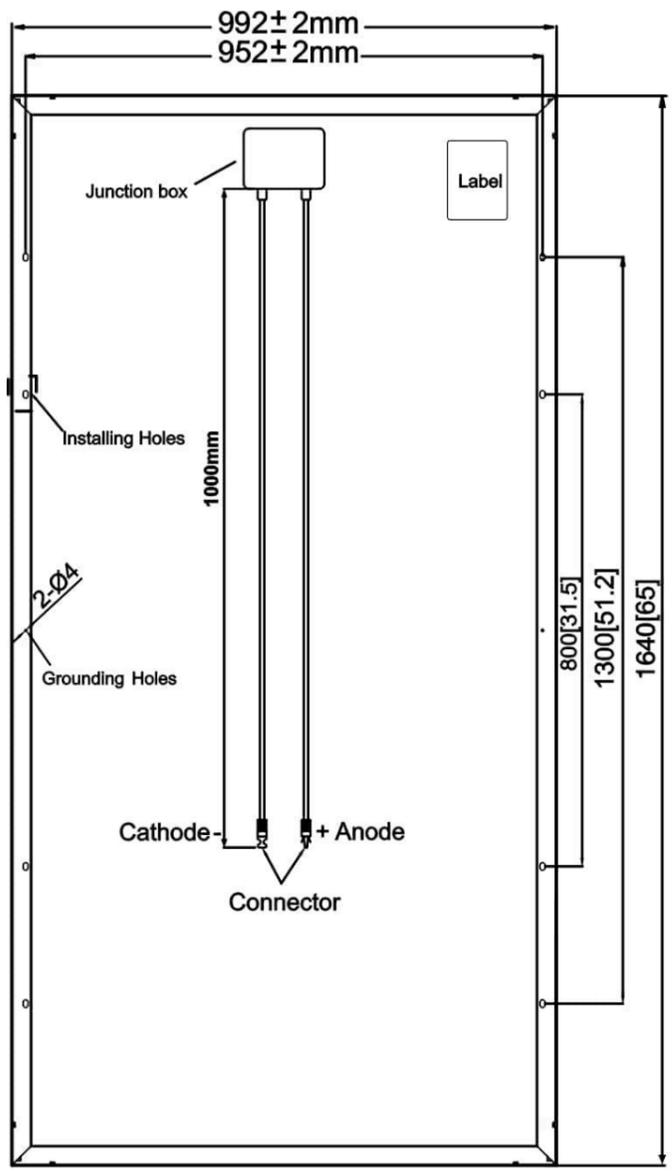
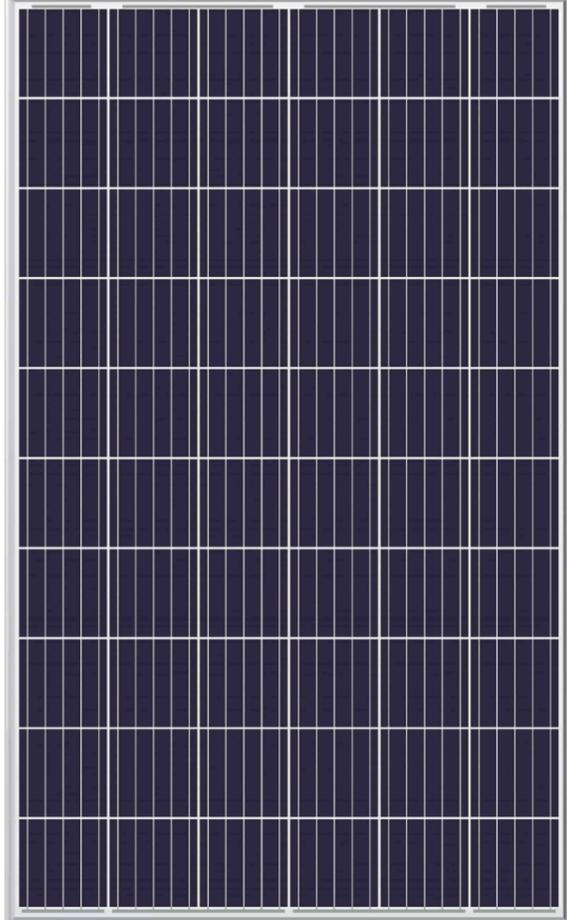


Dimensions and weight

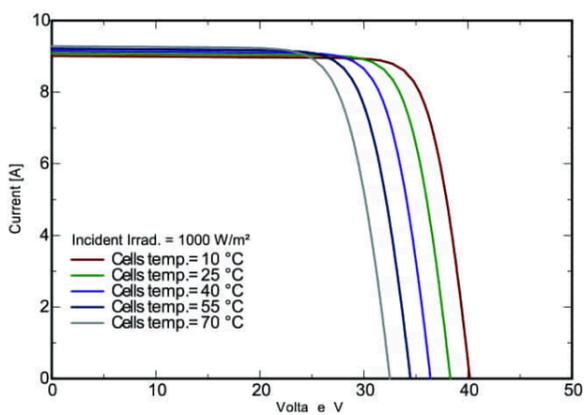
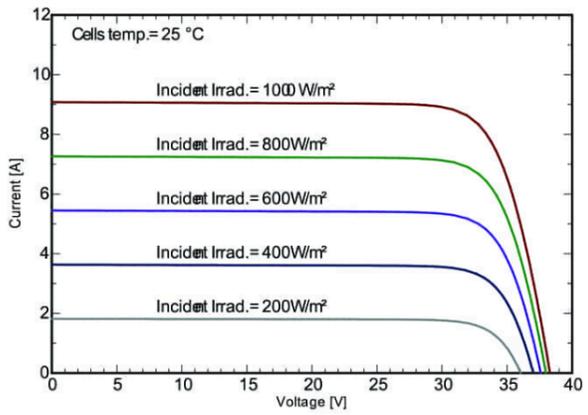
MODEL	PORT DN	DIMENSIONS mm				kg
		Ø	h1	h2	h	
Three-phase	DN					3~
4SR1.5/17 - PD	1¼"	98	499	356	855	14.2

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

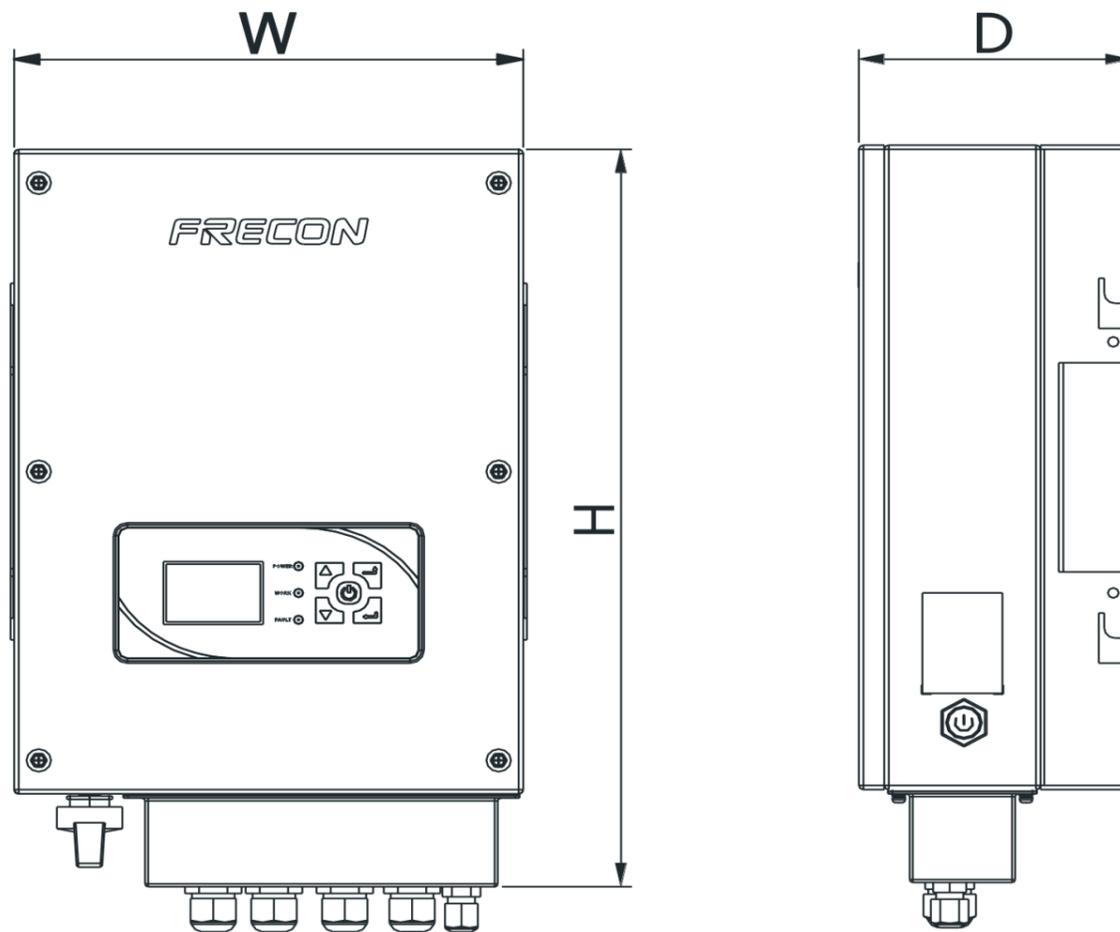


I-V CURVE



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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Structer specification:

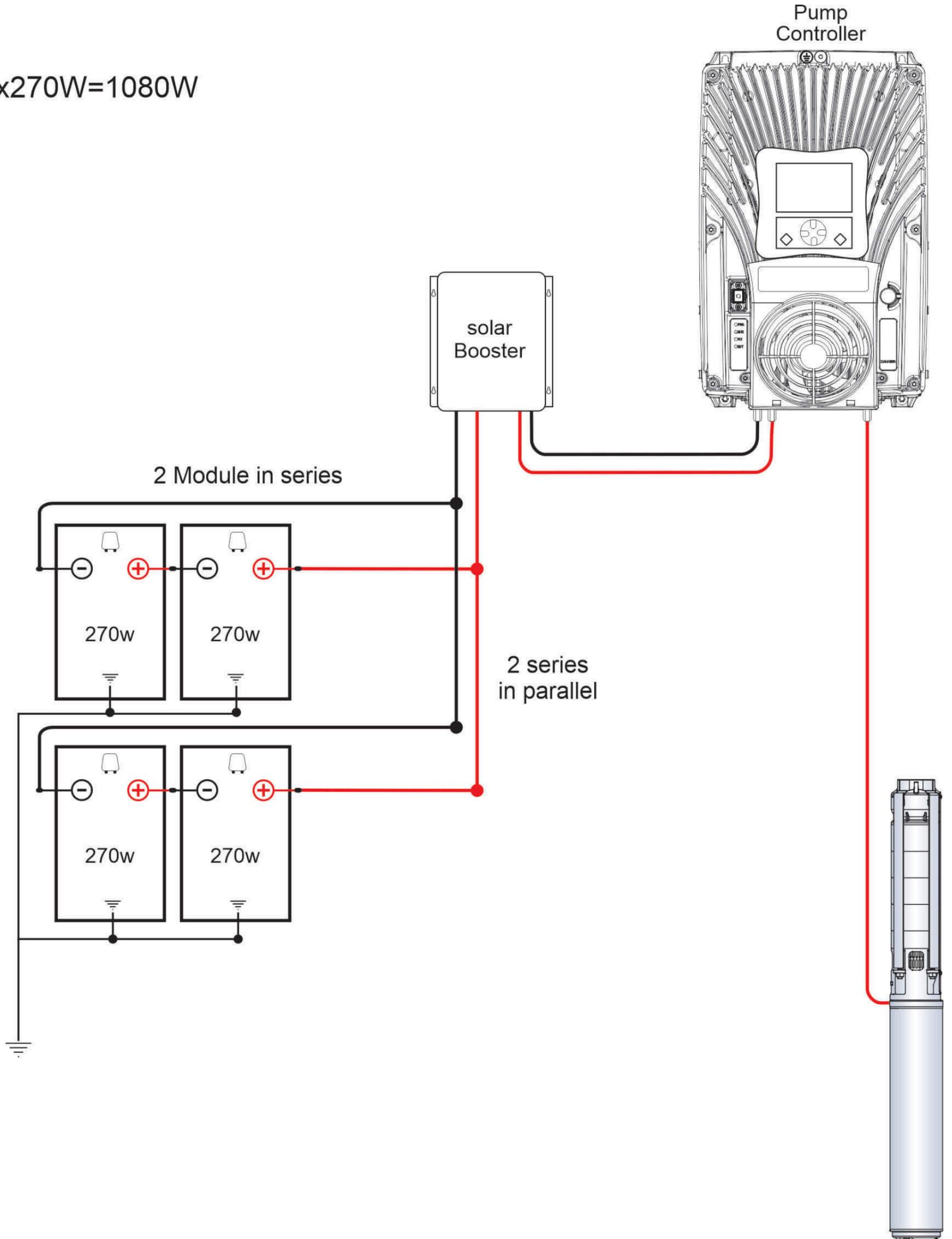
Brand: No
Model: Fixed Structure
Capacity: 4/6/8/10/12 panels



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

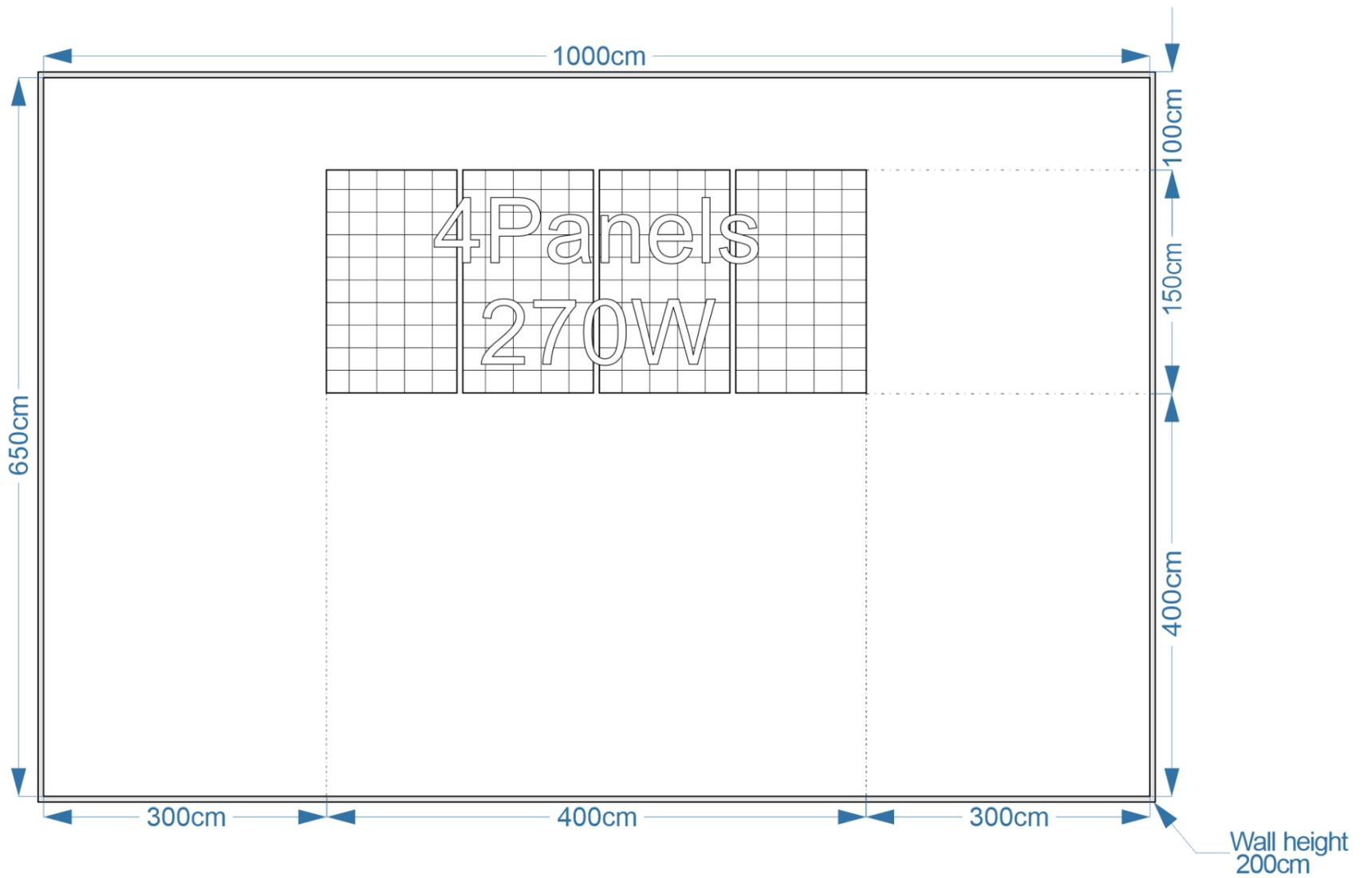
Wiring Diagram

$$2^S \times 2^P = 4^D \times 270W = 1080W$$



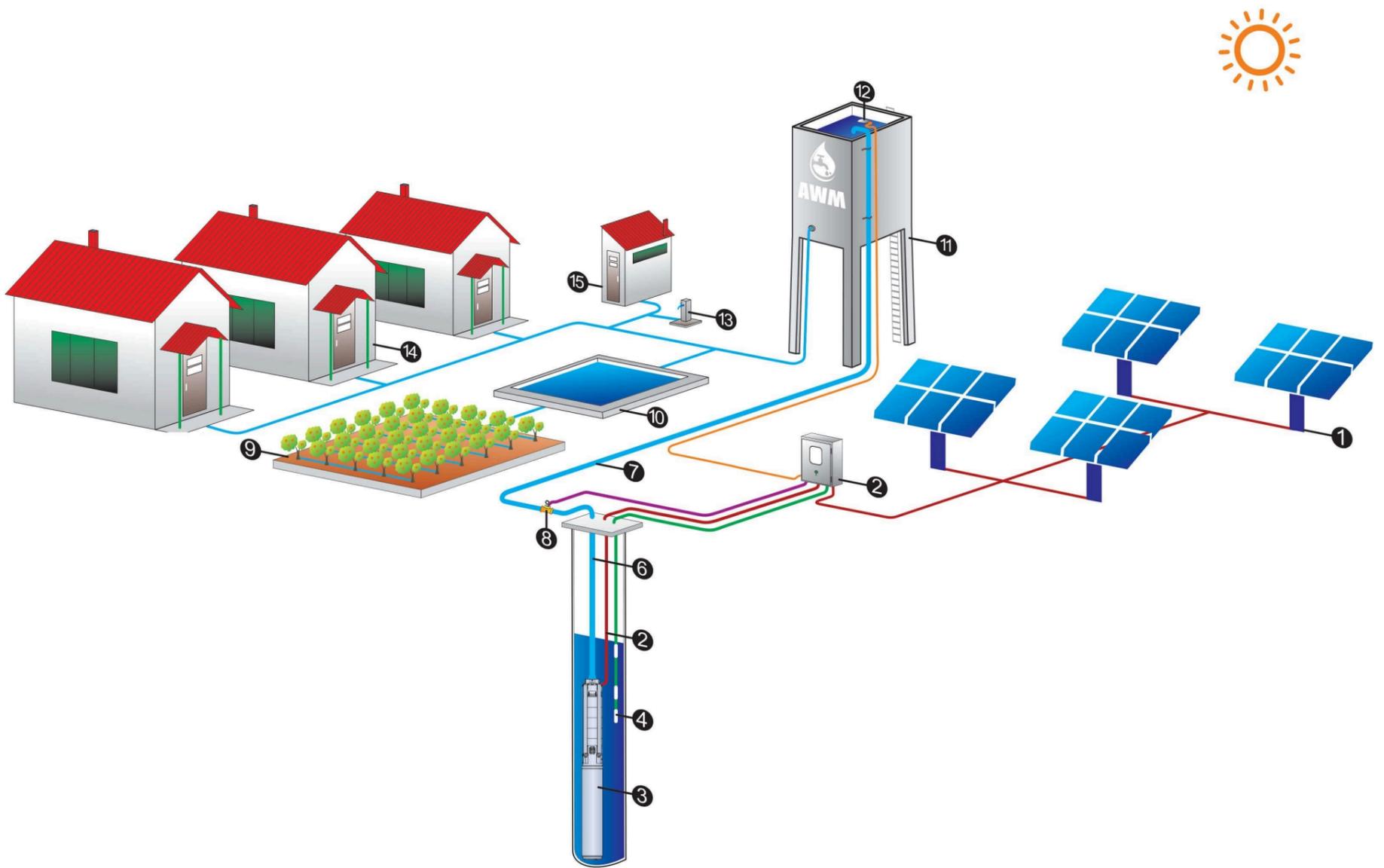
Area Diagram

Required Area for this project:
Minimum 65m²



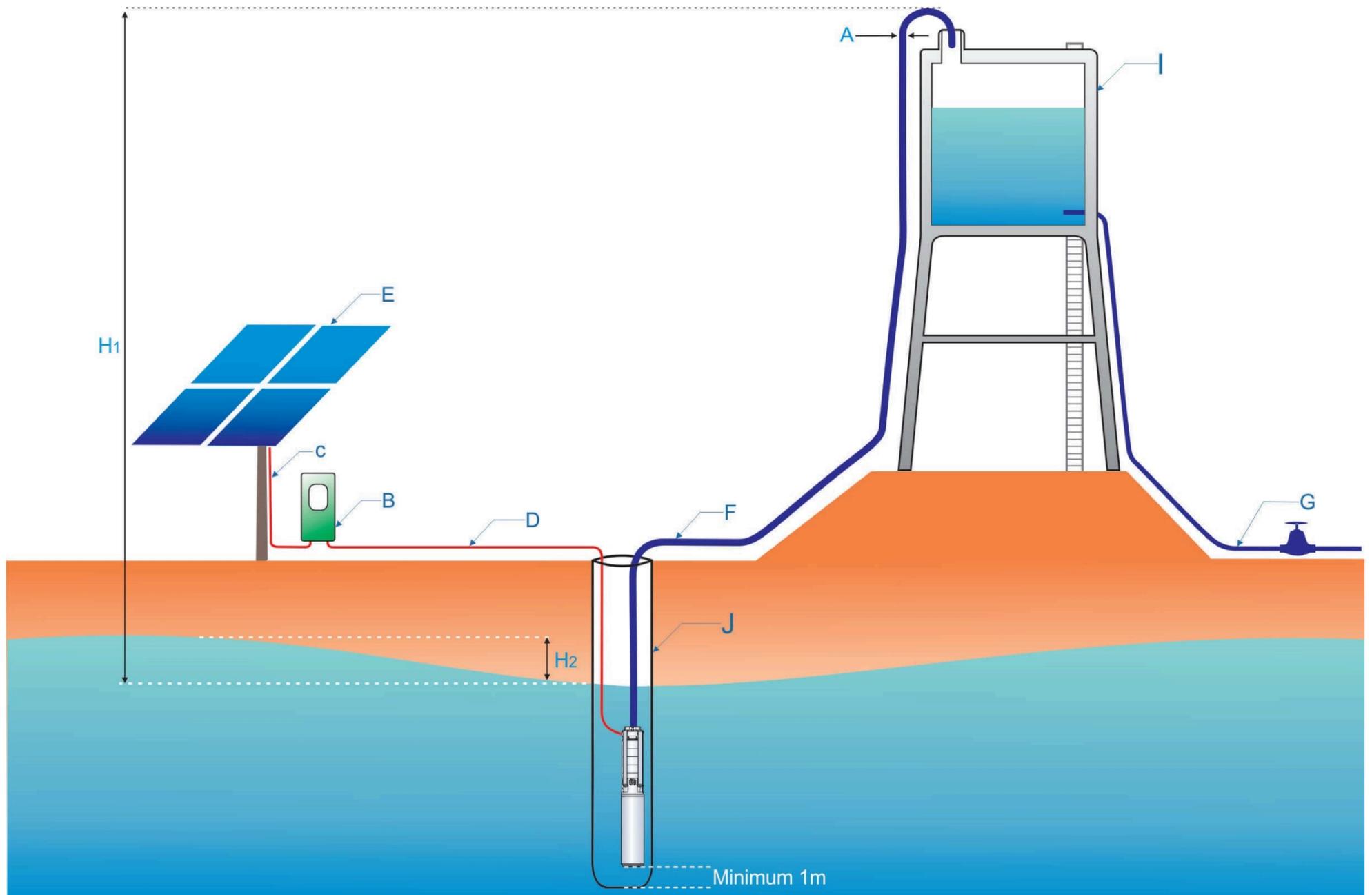
Note: The area which the panels will install must be south face.

System General layout



- | | |
|--------------------------|-----------------------------|
| 1- Solar panels | 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) vertical 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.