

Project Name: Arkh SHC solar water supply system

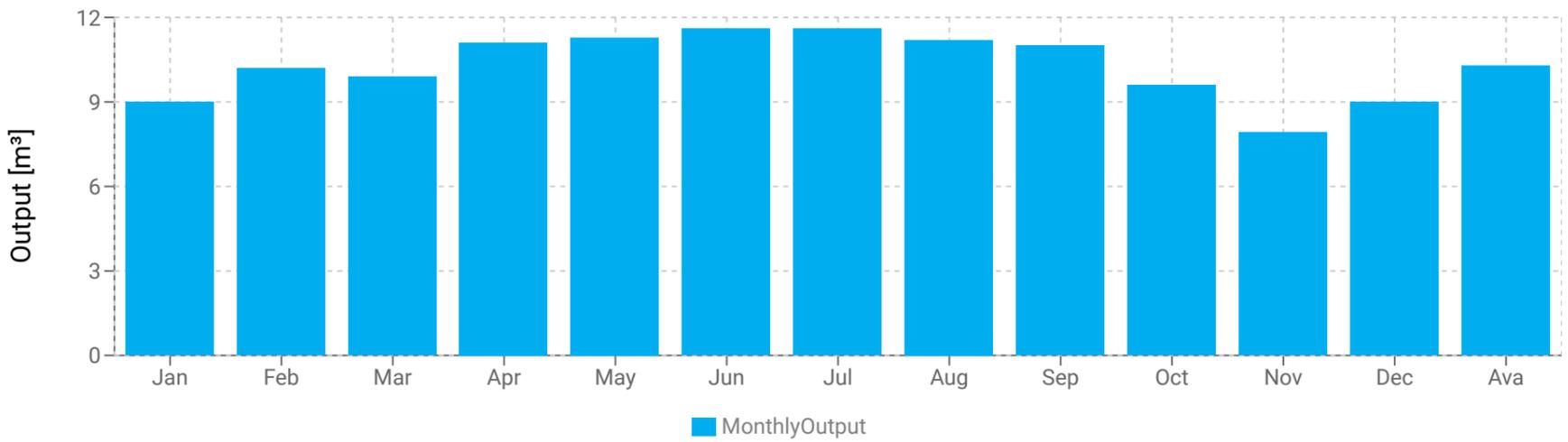
Input Summary

Tuesday, 13, August, 2024

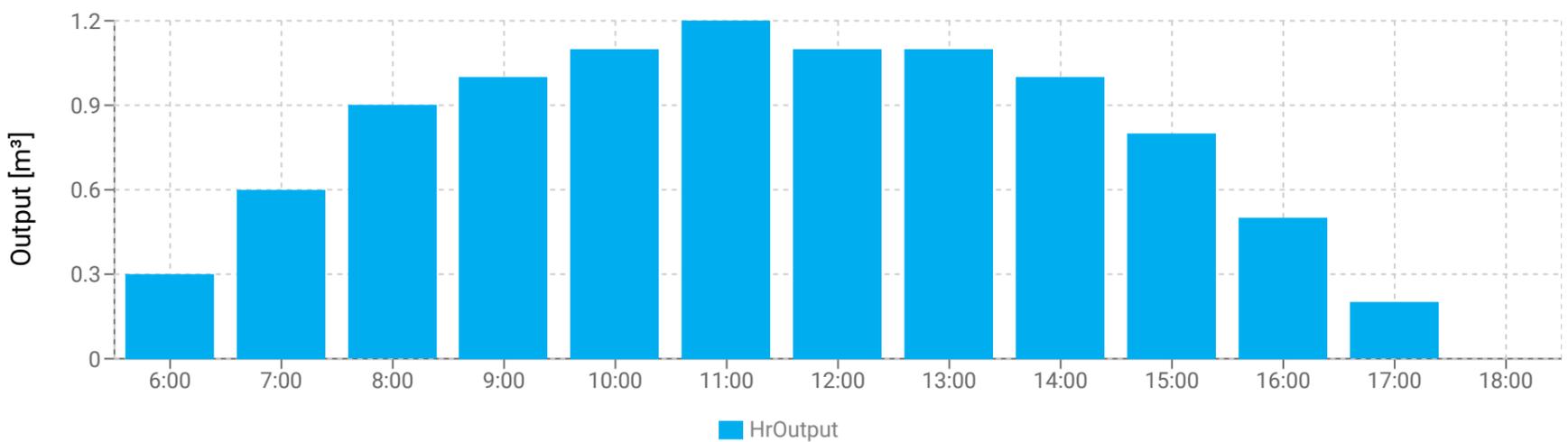
Location:	Afghanistan, Herat(34°, 62°)
GPS:	33,89364787°, 63,52910779°
Designer:	Farid Ahmad Qaderi
Water Demand:	1.1(m ³ /h)
Avg. Water Production:	7.2(m ³ /d) According to 6 hours pump operation during sunny days at STC (1000 w/m ²) irradiation at 25C°
Head (SWL+DD):	110(m)
Pipe Friction losses:	8m (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*4mm ²	m	140
Solar Cable	2*6mm ²	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*1.5mm ²	For sensors	m	140
Earthing Cable	1*16mm ²	m	30
Well probe sensors	Electronic	set	1
Safety rope	Plastic	m	190

Daily Average output/month



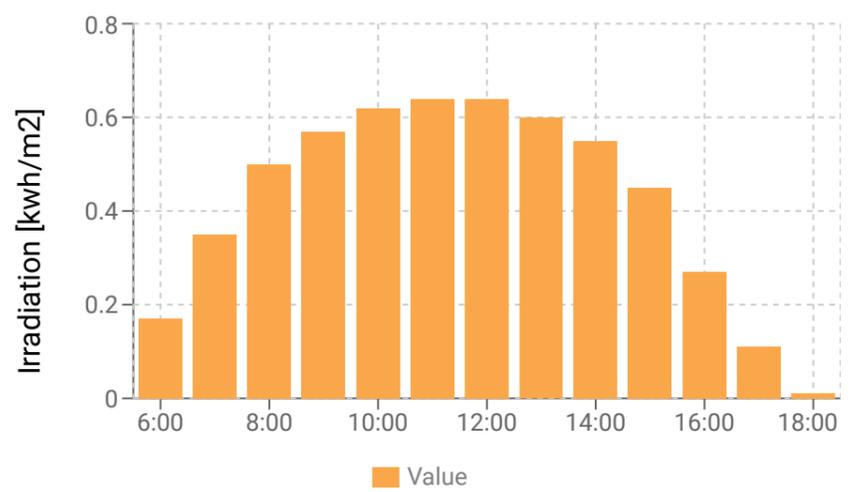
Hourly Output



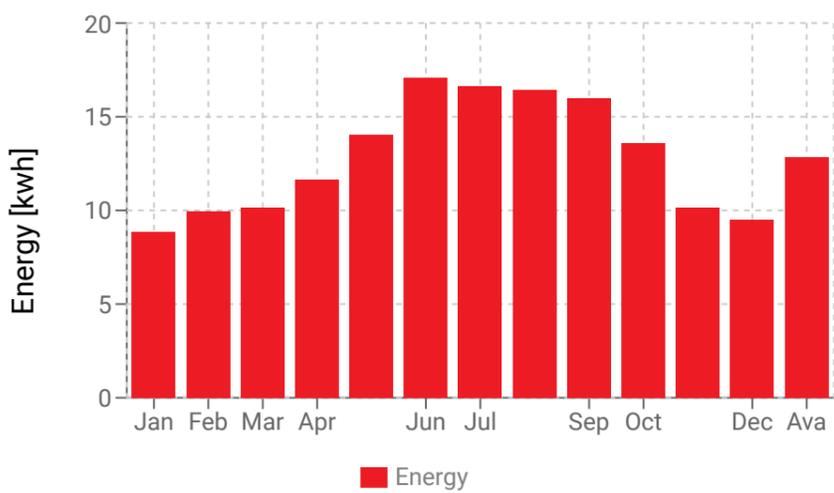
Irradiation value in deferent months of year



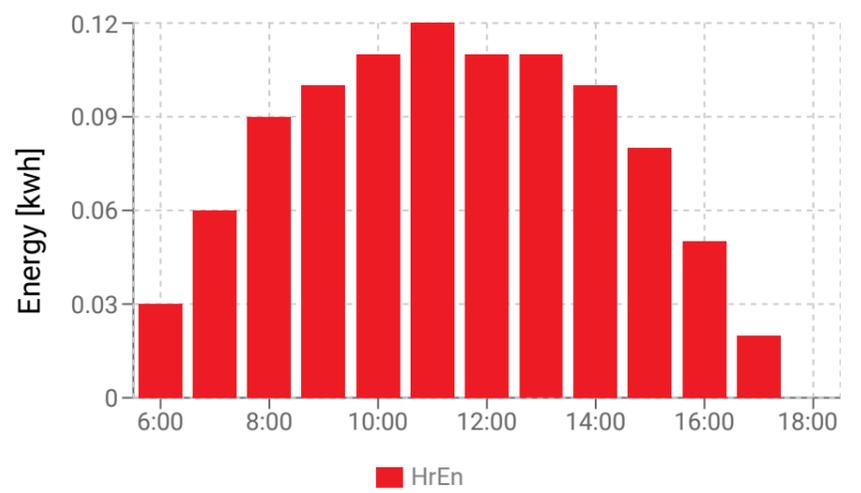
Hourly Values



Energy value in deferent months of year



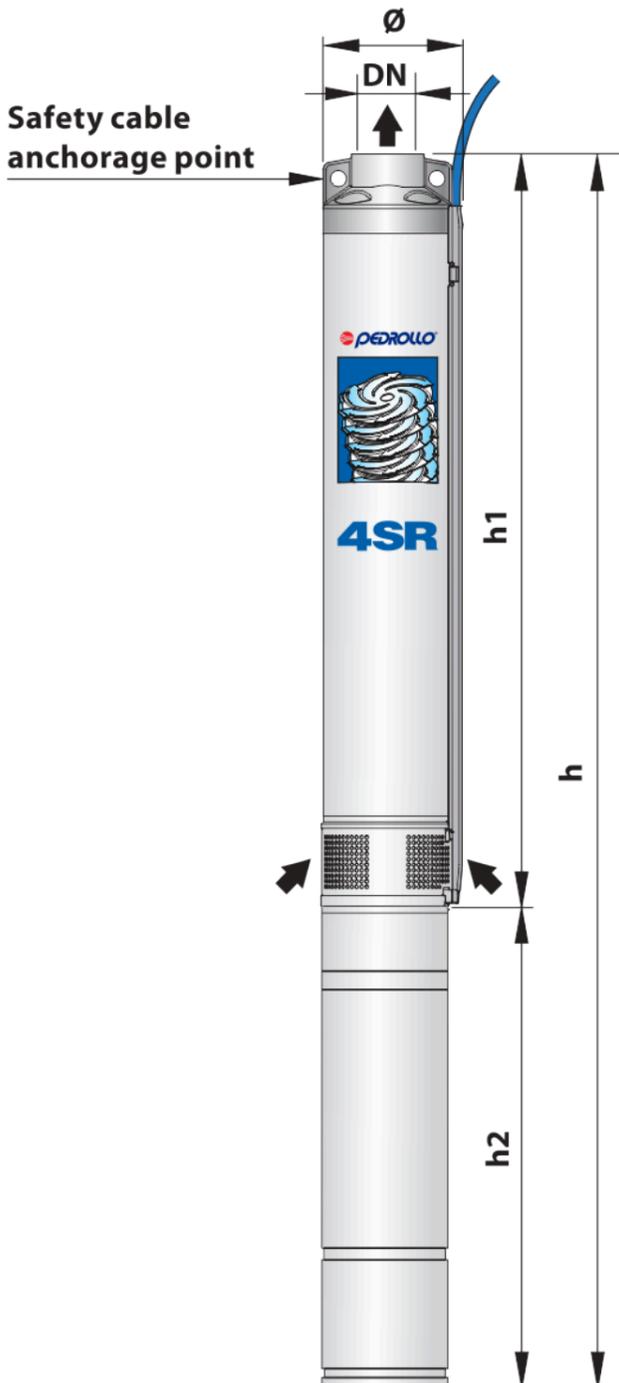
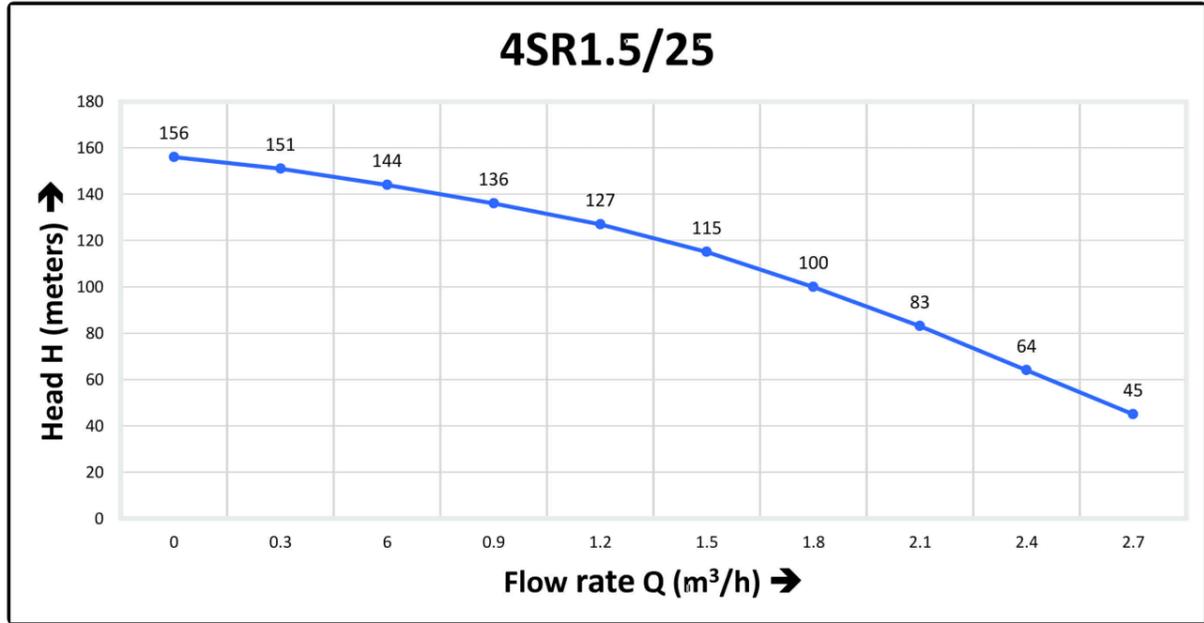
Hourly Values



Project Name: Arkh SHC solar water supply system

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

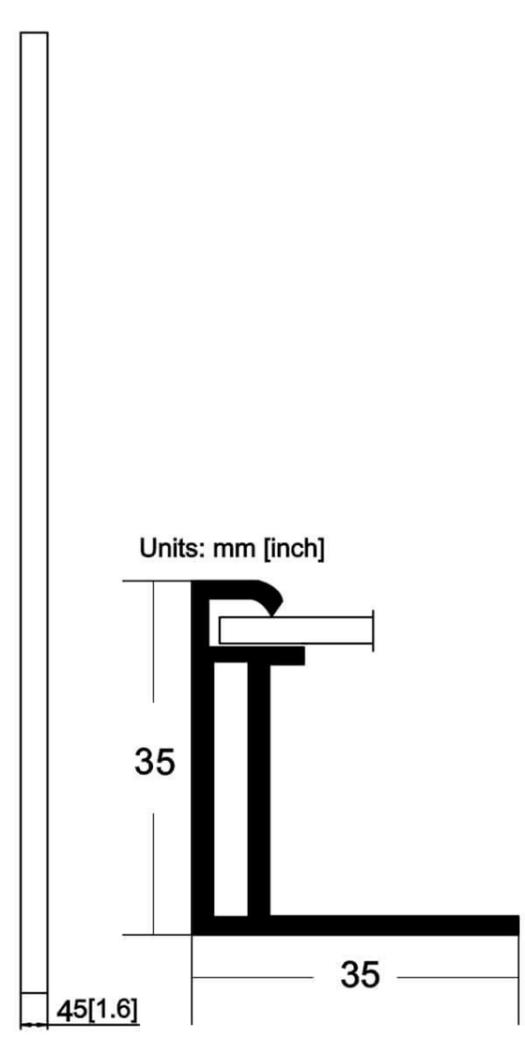
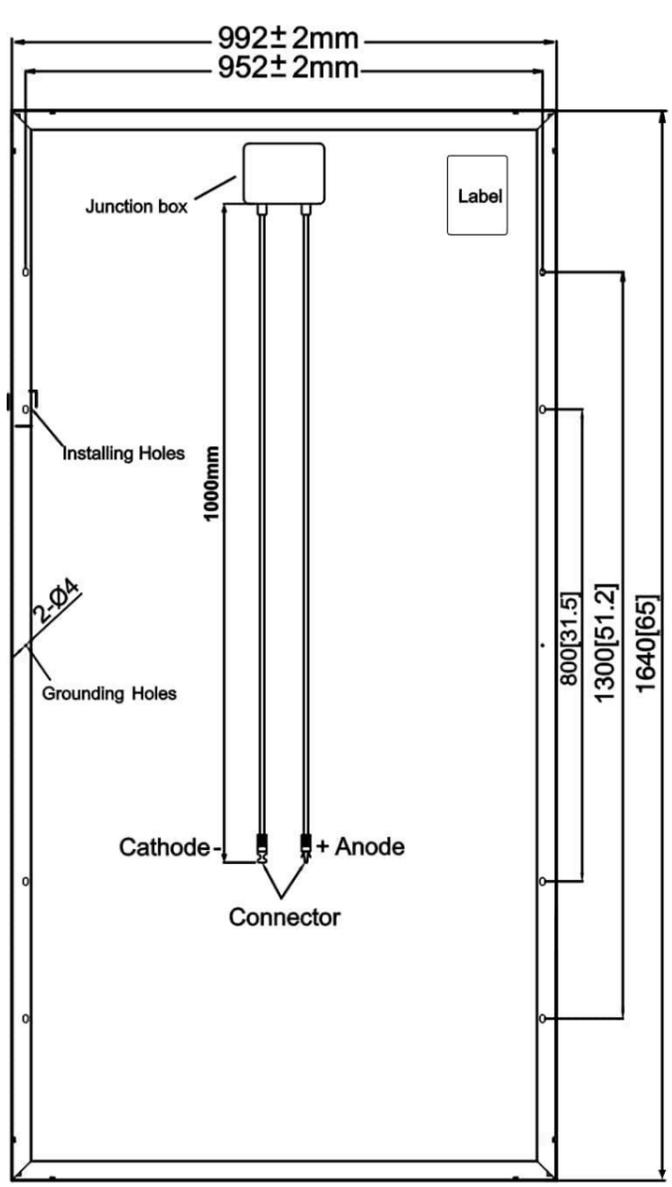
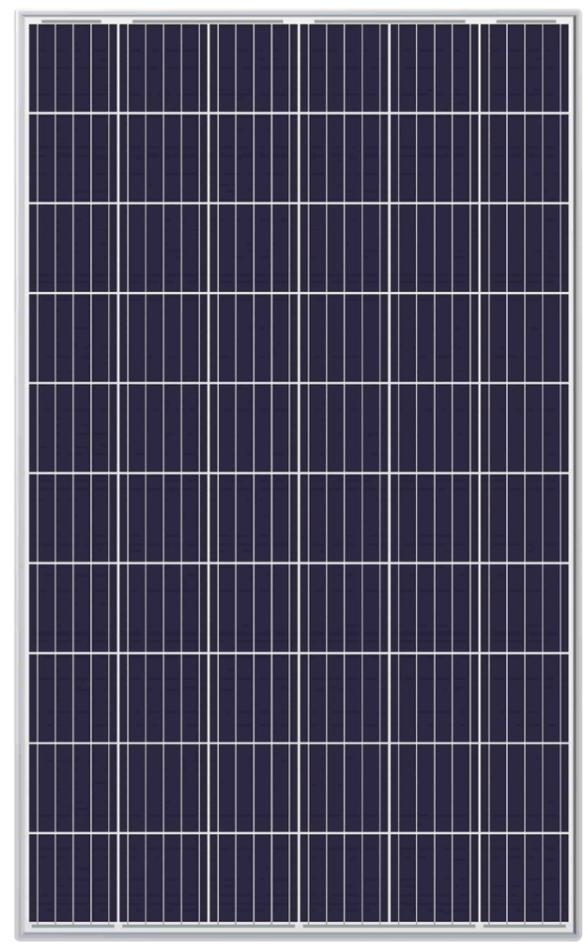


Dimensions and weight

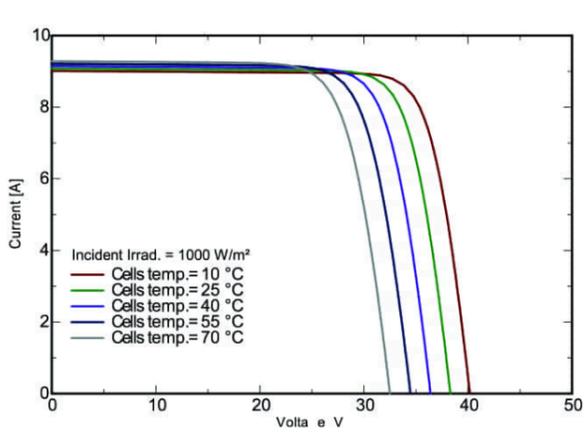
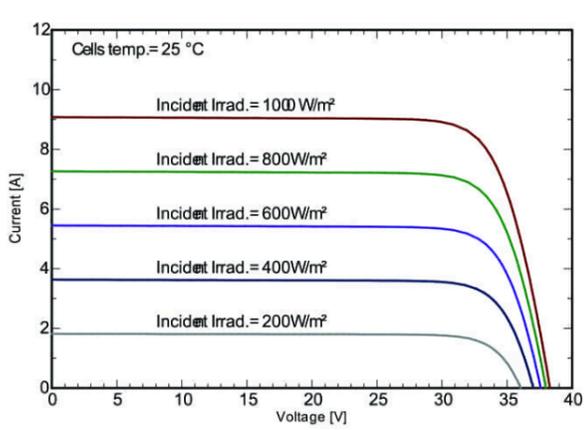
MODEL	PORT	DIMENSIONS mm				kg
		Ø	h1	h2	h	
Three-phase	DN					3~
4SR1.5/25 - PD	1¼"	98	646	371	1017	16.7

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

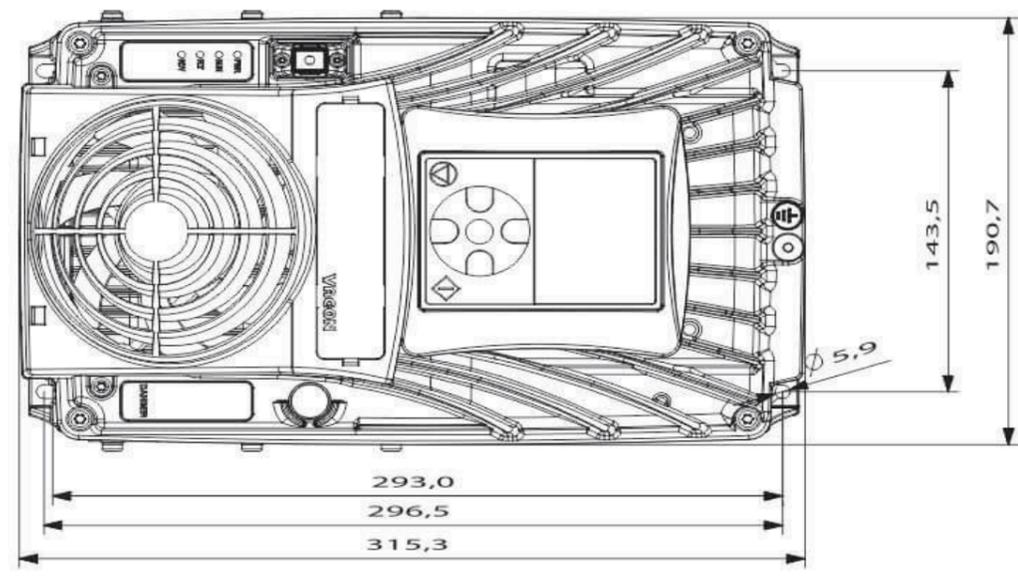
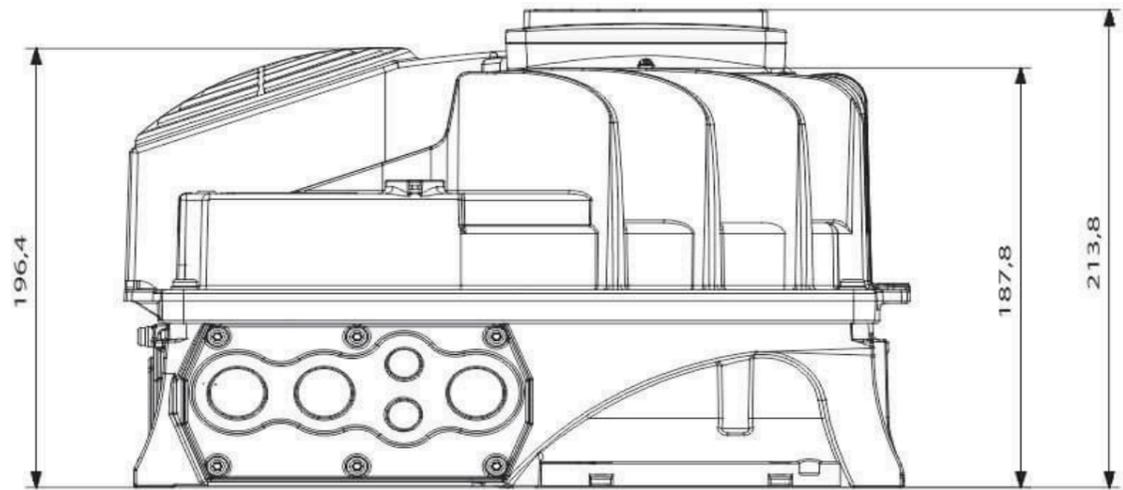


Controller specification:

Brand: 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

Project Name: Arkh SHC solar water supply system

Structure specification:

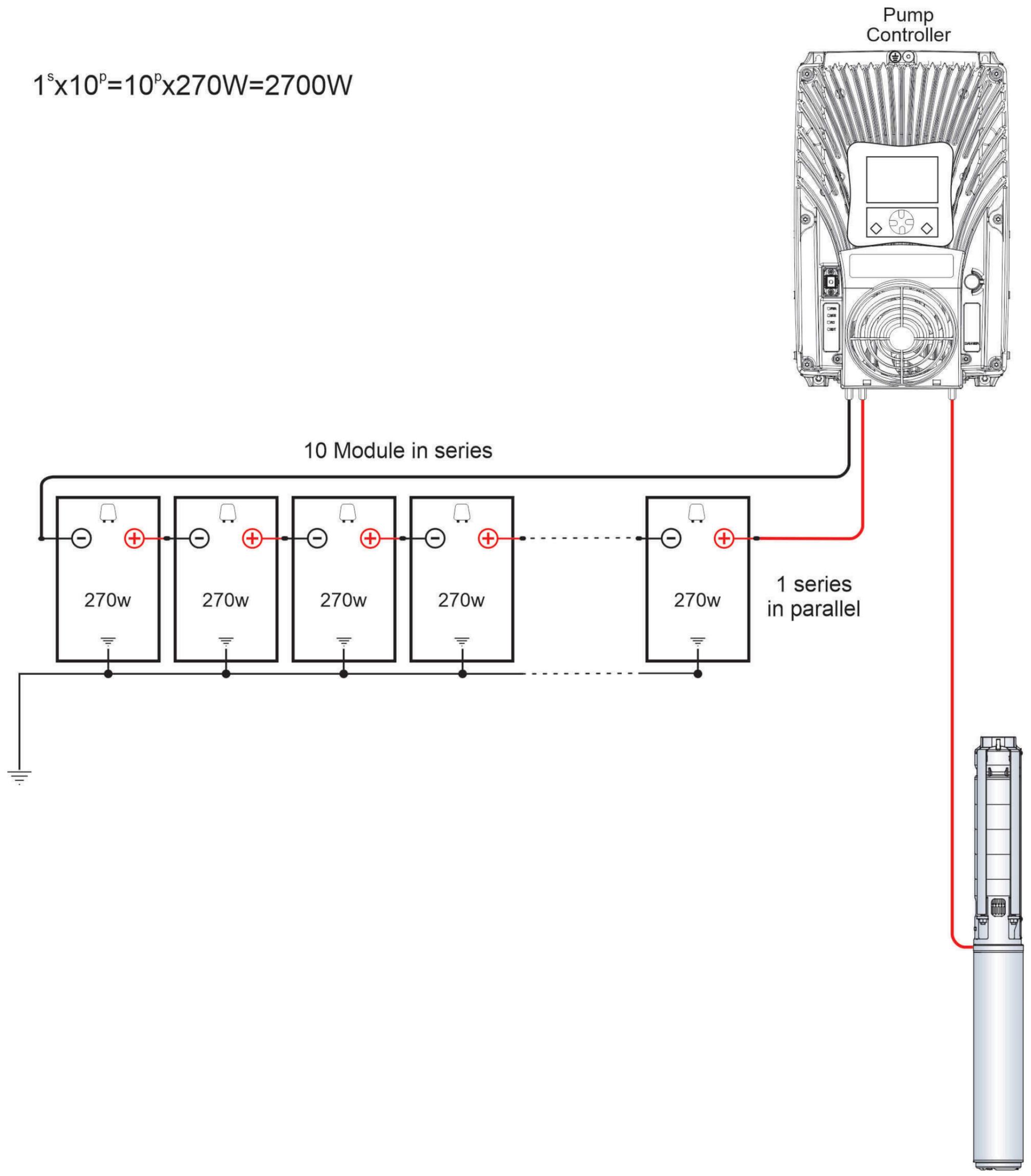
Brand: No
Model: Fixed Structure
Capacity: 4/6/8/10/12 panels



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

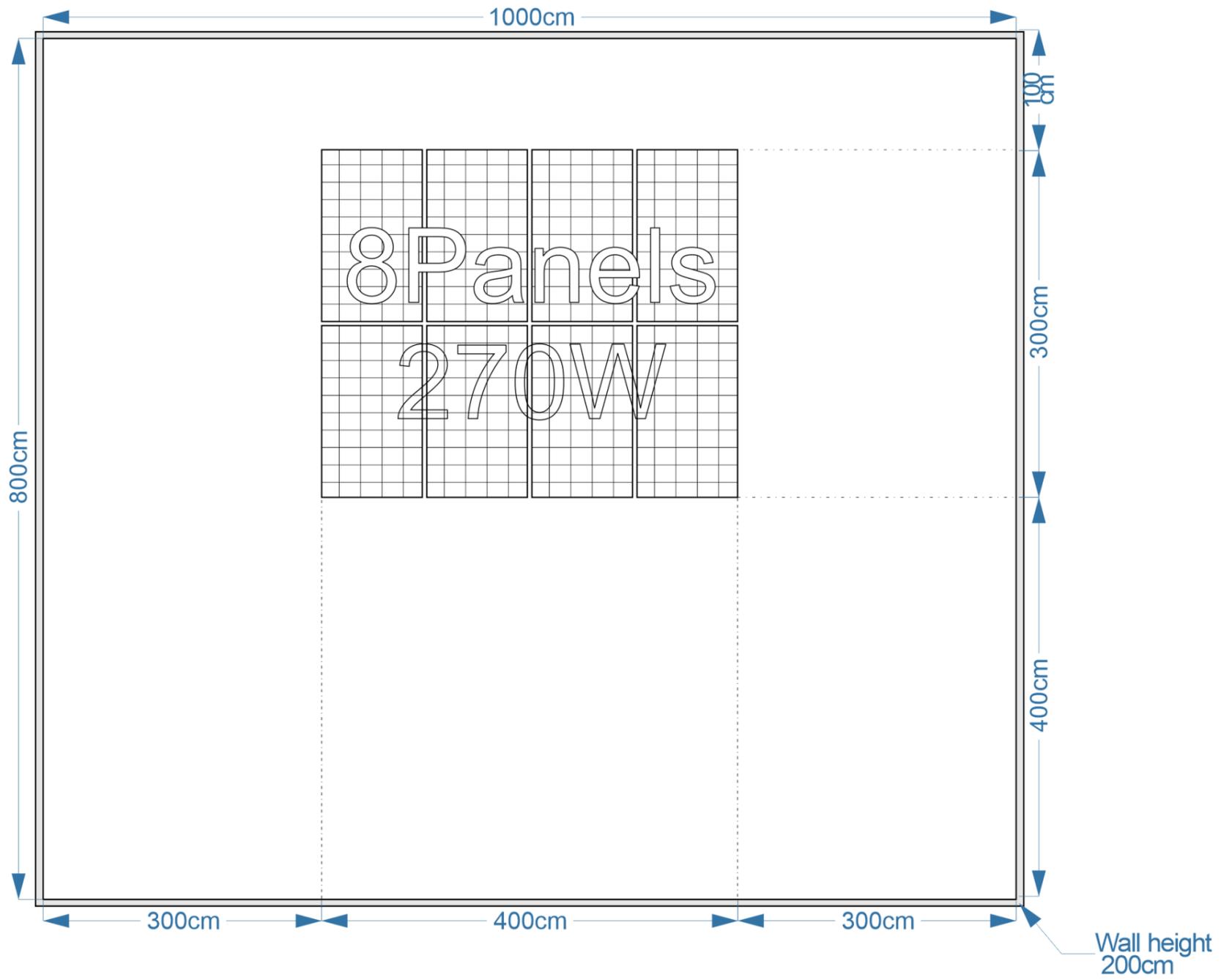
Wiring Diagram

$$1^s \times 10^p = 10^p \times 270W = 2700W$$



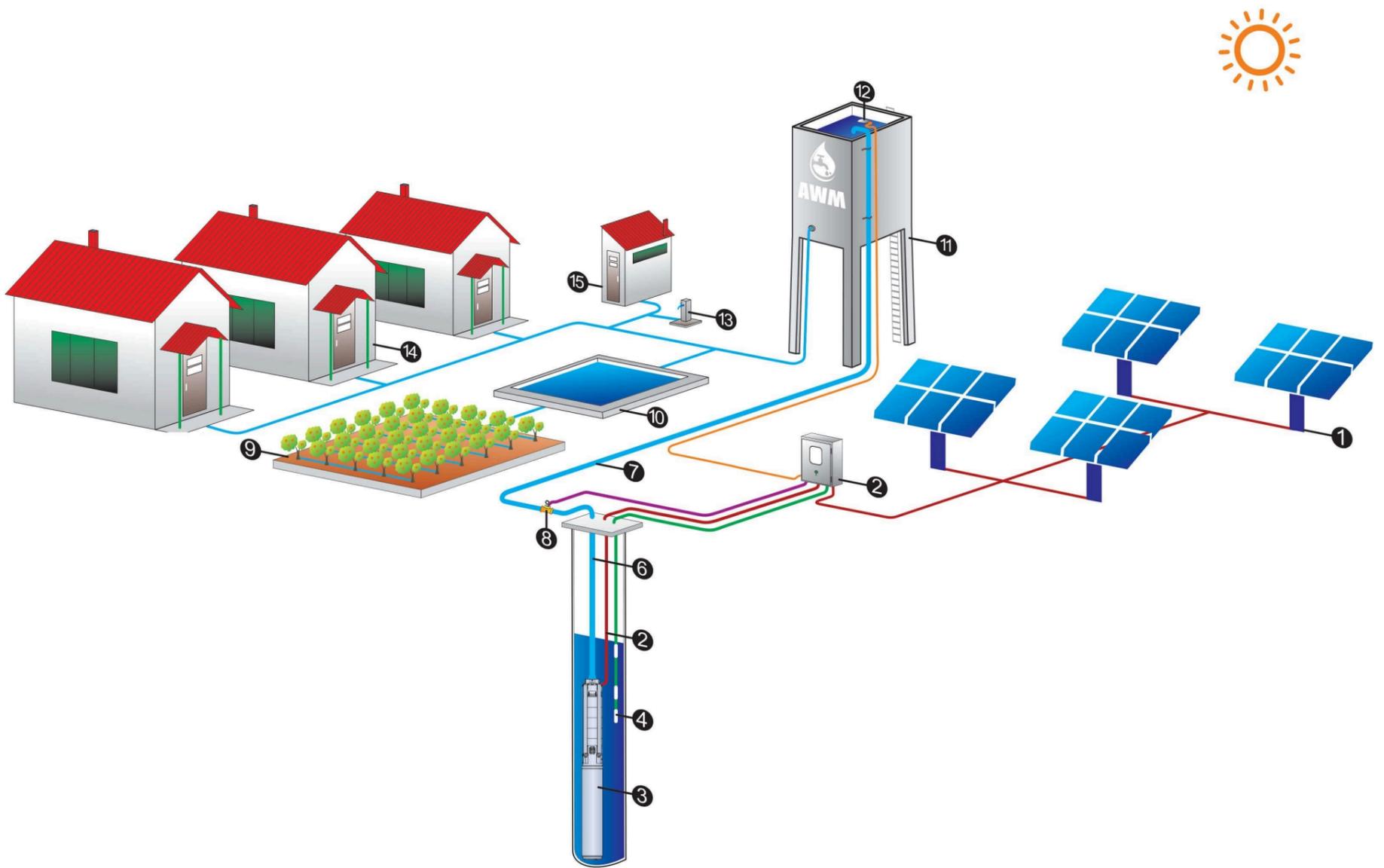
Area Diagram

Required Area for this project:
Minimum 80m²



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

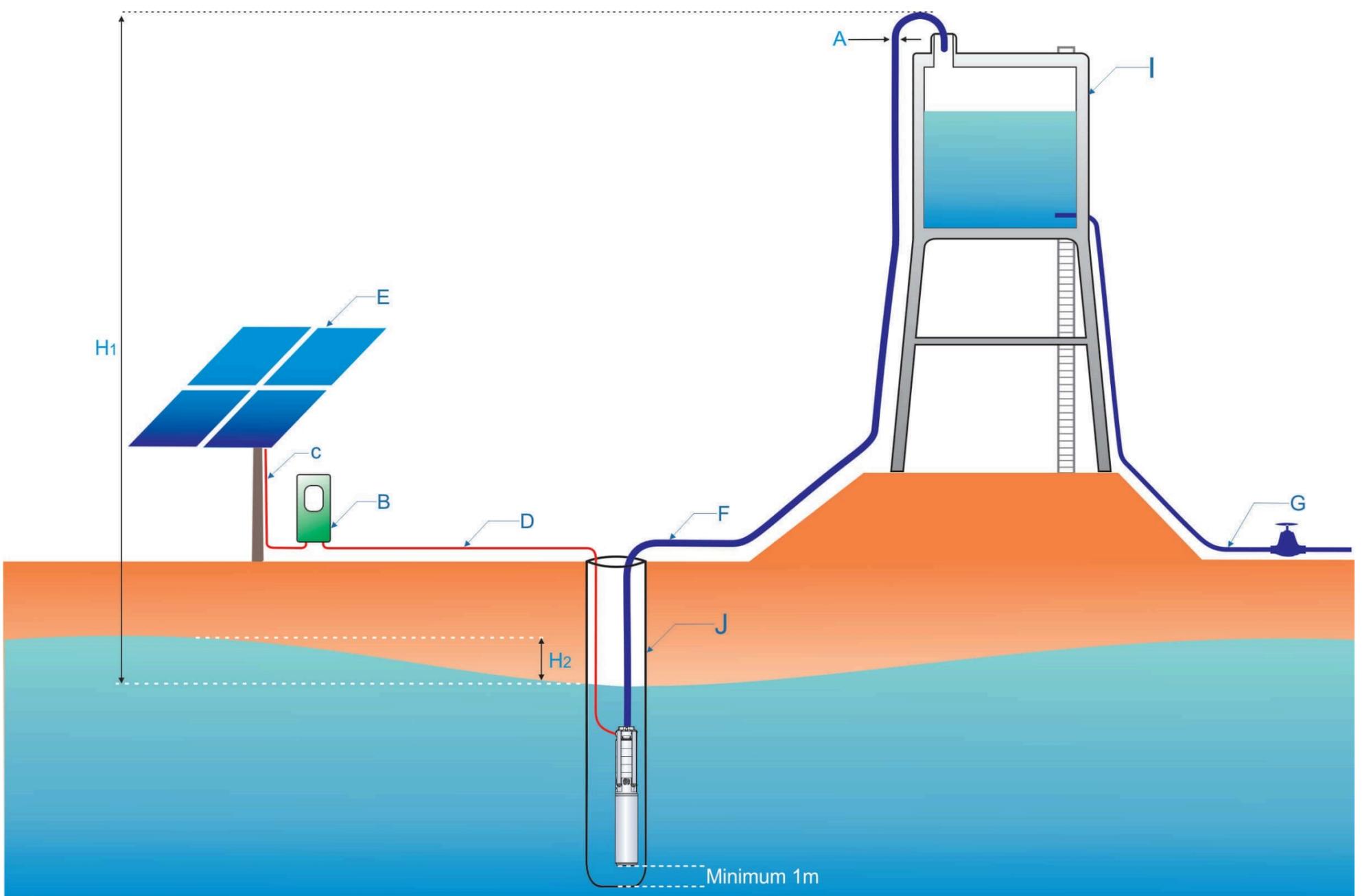
System General layout



- 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) 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.