

VERSIL
PUMPS & MOTORS

Innovation For Better Future...

DC MNRE series



Solar Products With Best Efficiency

COMPANY PROFILE

VERSIL Pumps is a prime manufacturer of pump sets based in Rajkot. We are having a modern pumps and motors manufacturing set up, with our own in house research and development set up. It is backed by a tool room and a manufacturing set up of high precision machines. Having ISO-9001 accreditation, our focus is on continuous and consistent quality pump manufacturing. Our product range include self priming pumps, centrifugal pumps, open well submersible pumps and bore well submersible pumps. We also have a set up for manufacturing of fully stainless steel fabricated bore well submersible pump sets.

We have developed a special **Permanent Magnet Synchronous Motor (PMSM)** for solar application. These motors with our fully stainless steel pumps are used for solar application. These PMSM pumps are far more superior in terms of work performance, life, low voltage working and efficiency than regular pumps. These pumps work on lowest radiation of sun, hence start early and stop late in a day giving higher daily water out put. These pumps are low in maintenance cost with negligible breakdown possibility because of its sturdy designs. PMSM work on wider voltage bands than any regular motors.

We have also designed and developed controller drives for these pump sets which are so tuned to enhance the efficiency of the entire solar system through our pumps. These drives are hybrid in nature and can help the pump run on solar as well as other source of power like electricity or generator supply. These drives protect the PMS motors from over loading, dry running and extreme low or higher voltages. These drives can be used to monitor the pump functioning remotely from any location and any basic support can be provided for any distant location through GPS system. These controller drives are manufactured at our main plant in Rajkot.

A state of the art testing facility is installed at our plant using a sun radiation simulator. With the help of this simulator we test the products at any condition, of any state, any country, any location specific which make our products readily adaptable to different sun radiation conditions. It is our endeavor to get this PMSM technology in centrifugal as well as openwell pump designs to enable the use of solar technology in these products also, more effectively and efficiently.

VERSIL PMSM solar products are revolutionary in the solar pumping field. Our focus is to make the benefits of these products available to the society as a whole, in India and Abroad.

PERFORMANCE COMPARISON

	PMSM Motor	BLDC Motor	Induction Motor
Rotation	0-3600 RPM Speed, Constant Speed	0-3600 RPM Speed, Constant Speed	0-3420 RPM Speed, decrease with load increment
Power Source	50/60 Hz AC, DC and Solar Power	50/60 Hz AC, DC and Solar Power	Only 50 or 60 Hz Single / Three Phase AC or Solar Power
Voltage Level	Low and High voltage both are possible	Low Voltage Only	High Voltage Only
Operating Voltage Range	50% to 110% of rated voltage (wide range)	80% to 110% of rated voltage (moderate range)	90% to 110% of rated voltage (narrow range)
Current Require for same Load	Less due to high voltage and vector control	High due to less voltage	High due to less efficiency
Pump Motor	Permanent magnet synchronous motor	Brushless DC Motor	AC Single / Three Phase asynchronous motor
Frequency	0 to 250 Hz	0 to 250 Hz	0 to 50 Hz
Motor Efficiency	83 to 92%	80 to 90%	Single Phase = 63%, Three Phase = 75%
Good Performance Zone	Wide, 50% to 125% of rated load	Moderate, 70% to 110% of rated load	Narrow, 90% to 110% of rated load
Overload Capacity	150%	120%	120%
Unit Efficiency (Motor and Pump Combine Efficiency)	2-10% higher than Induction Motor Pump (include controller)	2-8% higher than induction motor pump (include controller)	2-10% lower than PMSM pump (include controller)
Torque Ripple	Less	More	Less
Volume	20% to 50% Smaller	20% to 50% Smaller	Larger
Weight	20% to 50% Lighter	20% to 50% Lighter	Heavier
Functionally	Multi functional and automatic	Multi Functional and automatic	Unitary



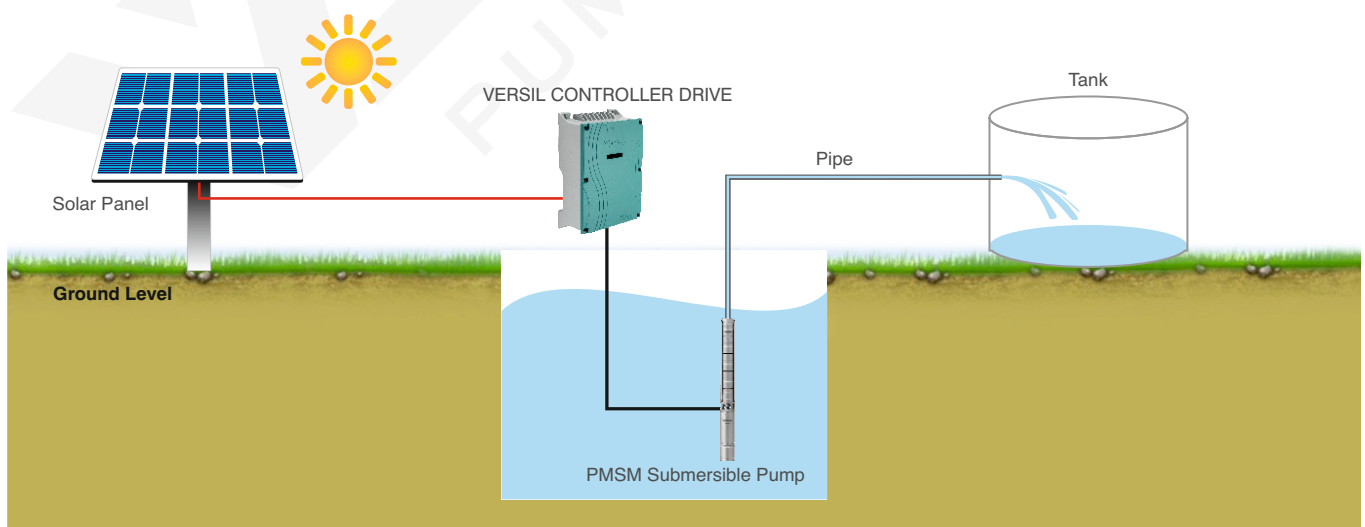
FEATURES OF PMSM

The permanent magnet synchronous motor is cross between an Induction motor and brushless DC motor. Like a brushless DC motor, it has a permanent magnet rotor and windings on the stator. However, the stator structure with windings constructed to produce a sinusoidal flux in the air gap of the machine resembles that of an induction motor. Permanent magnet synchronous motor's power density is higher than induction motors with the same ratings. Today, these motors are more powerful while having a lower mass and lower moment of inertia.

- High-efficiency permanent magnet motor requires less solar arrays.
- Motors are in Smaller Size, lighter weight still gives longer service life, Higher Efficiency.
- Wider speed range (0-3600rpm)
- Permanent Magnet Synchronous Motor give more output @ +25% to 35%.
- Can be used in AC & DC supply.
- With the technology of DC to AC conversion, It owns the advantage of low noise and can start under low voltage and low radiation.
- Soft start : Motor starts with high torque and smooth acceleration.
- The Motor Structure is made up of stainless steel with imported Alloy mechanical seal which is durable in use.
- Can be used with centrifugal pump for big flow or a helical rotor pump for high lift.

CONTROLLER DRIVE

- New Design, Smart / Intelligent controller Drive.
- MPPT function that is maximum solar power point tracking will adjust work speed automatically. So motor can extract maximum power from panels and provides maximum water output according to solar radiation.
- Intelligent control provides dry run protection, if there is no water in sump for 1 minute, solar pump will stop working automatically. In addition, it has intelligent overload protection when the abnormal situation appeared during the work, the pump automatically shut down.
- It offers Protection from high-voltage, low-voltage, single phasing, over current and overload.
- It also offers automatic ON / OFF.
- Remote monitoring System : RMS will keep record of operational data and provides access to it remotely through mobile phone or computer, for maintenance support.



Motor & Controller General Details

	Motor Capacity	1HP	2HP	3HP	5HP	7.5HP	10 HP
Motor	Type	PMSM	PMSM	PMSM	PMSM	PMSM	PMSM
	Voltage	70 V	120 V	200 V	350 V	220V	350 V
	Current	9A	9A	9A	9A	21A	21 A
	Motor RPM	3300	3300	3300	3300	3300	3300
	Motor OD (mm)	97 mm	97 mm	97 mm	97 mm	97 mm / 148 mm	148 mm
	Pump Controller Model No.	1SPRT85-125/10A	2SPRT170-250/10A	3SPRT290-380/10A	5SPRT430-600/10A	75SPRT300-600/21A	10SPRT300-600/21A
Controller	Pump Controller Rating	0.75Kw	1.5Kw	2.2Kw	3.7Kw	5.5Kw	7.5Kw
	MPPT Range	85-125V	170 - 250	290-380V	430 - 600V	300 - 450	300 - 600V
	Controller I/P Voc (Max)	150 V	300 V	500 V	750 V	550 V	750 V
	Controller O/P Current	10 A	10 A	10 A	10 A	21 A	21A
	Controller O/P Voltage	70 V	150 V	220 V	380 V	250 V	380 V
	Enclosure IP Protection	IP65	IP65	IP65	IP65	IP65	IP65
	Operating Temp	0 - 50	0 - 50	0 - 50	0 - 50	0 - 50	0 - 50
	Remote Monitoring	Provided					
	Protection	Dry Running					
		Reverse Polarity Protection					
Short Circuit							
Open Phase							

MNRE DC Solar Submersible Pump Set

HP	Head	Pump Model	Array Power	LPD@7.15Kw/m2 irradiation
1 HP Drinking Application	30	VF900/30	975	22100
	60	VF900/60	975	11050
	90	VF900/90	975	5525
1	30	VF1200/30	1300	50388
2	30	VF1800/30	1950	75582
3	30	VF3000/30	3250	125970
	50	VF3000/50	3250	76245
	70	VF3000/70	3250	49725
5	50	VF4800/50	4875	114368
	70	VF4800/70	4875	74588
	100	VF4800/100	4875	52211
7.5	50	VF7000/50	7150	167739
	70	VF7000/70	7150	109395
	100	VF7000/100	7150	76577
10	50	VF9000/50	9100	213486
	70	VF9000/70	9100	139230
	100	VF9000/100	9100	97461

4" (100 mm) Stainless Steel Submersible pumps

General Data

Versil VF 4" range of submersible pumps are made of corrosion and abrasion resistant stainless –steel and have been developed in accordance with state of art technology. The VF 4" pumps are manufactured to highest standard for energy efficiency, dependable performance, rugged construction, and long service life.

Capacity (m³/h) min 0.8 max 10.8

Total Head: 218m

Application

- Portable water supply from deep well
- Agricultural-irrigation, Livestock watering. Etc.
- Municipal and industrial
- Pressure boosting
- Fountains, etc.

Pumped Liquids

Clean, non-corrosive and non-abrasive liquids

Operating Condition

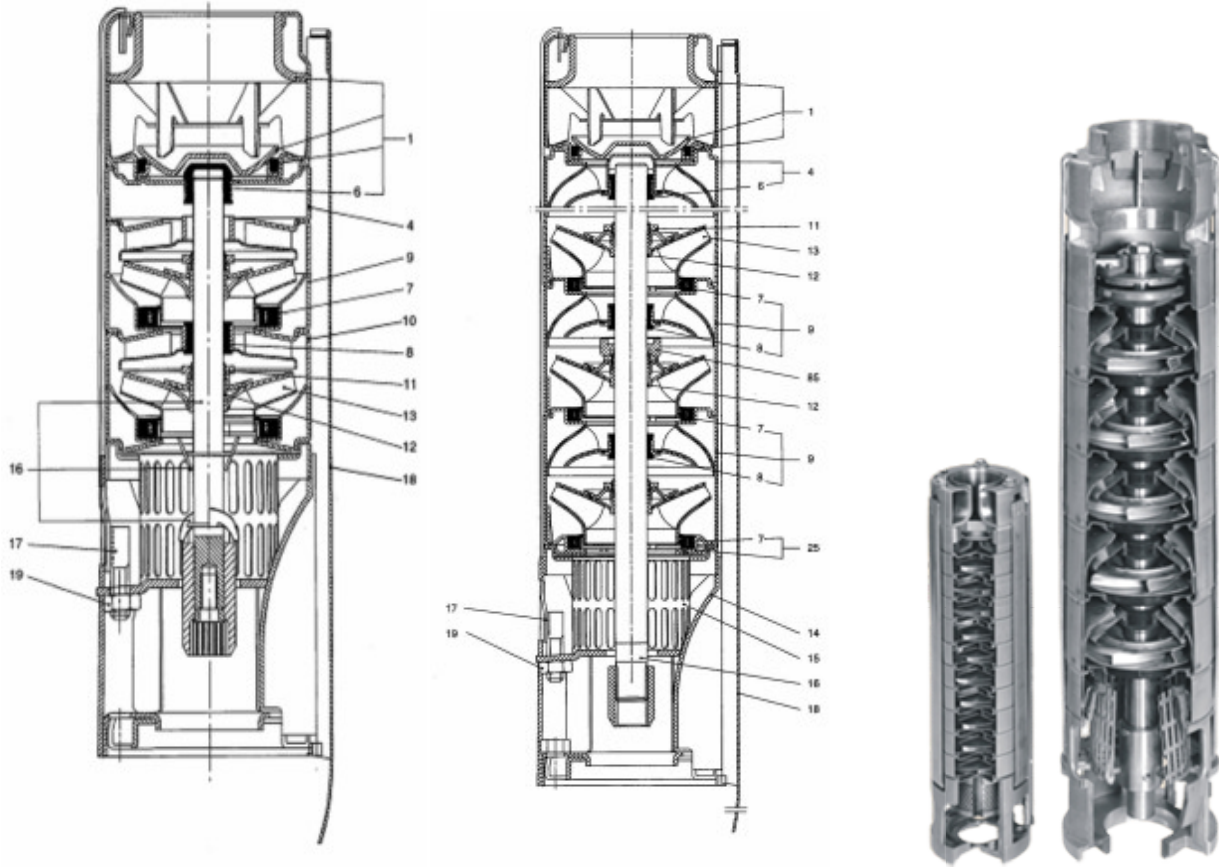
Max. ambient temperature liquid 30C

Sand Content: max 50g/m³

Features

- Stainless steel construction designed and built for year of trouble free operation
- All metal parts are made of 304 stainless steel, except for the shaft which is made of 410 stainless steel
- Heavy duty stainless steel discharge head with built in check valve for long life and ease of installation
- Smooth safety hook
- Mounting specification according to NEMA standards
- High quality shaft bearing providing low friction and high wear resistance
- Heavy duty stainless steel impellers & diffusers ensuring optimal performance
- Stainless steel strainer to restrict the entry of sand and other extraneous material

**Material Of Construction 4" (100 mm)
Sectional View**



1	Valve casing	SS-304
4	Top diffuser cup	SS-304
6	Top bearing bush	NBR
7	Neckring	NBR + SS-304
8	Stage bearing bush	NBR
9	Diffuser cup	SS-304
10	Ist stage cup	SS-304
11	Split cone nut	SS-304
12	Split cone	SS-304
13	Impeller	SS-304
14	Suc.case	SS-304
15	Strainer	SS-304
16	Pump Shaft Comp.	SS-304
17	Strap	SS-304
18	Cable guard	SS-304
19	Nut	SS-304
19a	Nut	SS-304

6" (150 mm) Stainless Steel Submersible pumps

General Data

Versil VF 6" range of submersible pumps are made of corrosion and abrasion resistant stainless –steel and have been developed in accordance with state of art technology. The VF 6" pumps are manufactured to highest standard for energy efficiency, dependable performance, rugged construction, and long service life.

Capacity (m³/h) min 8.4 max 84

Total Head: 700m

Application

- Portable water supply from deep well
- Agricultural-irrigation, Livestock watering. Etc.
- Municipal and industrial
- Pressure boosting
- Fountains, etc.

Pumped Liquids

Clean, non-corrosive and non-abrasive liquids

Operating Condition

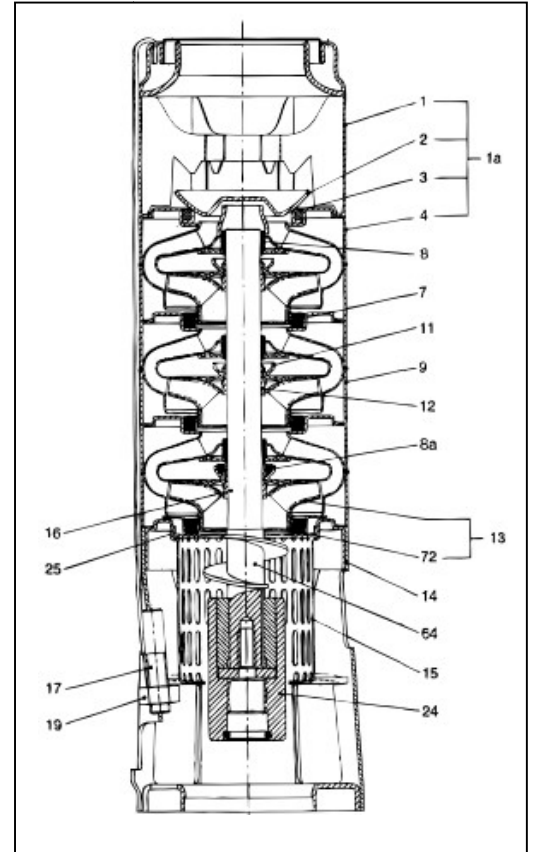
Max. ambient temperature liquid 30C

Sand Content: max 50g/m³

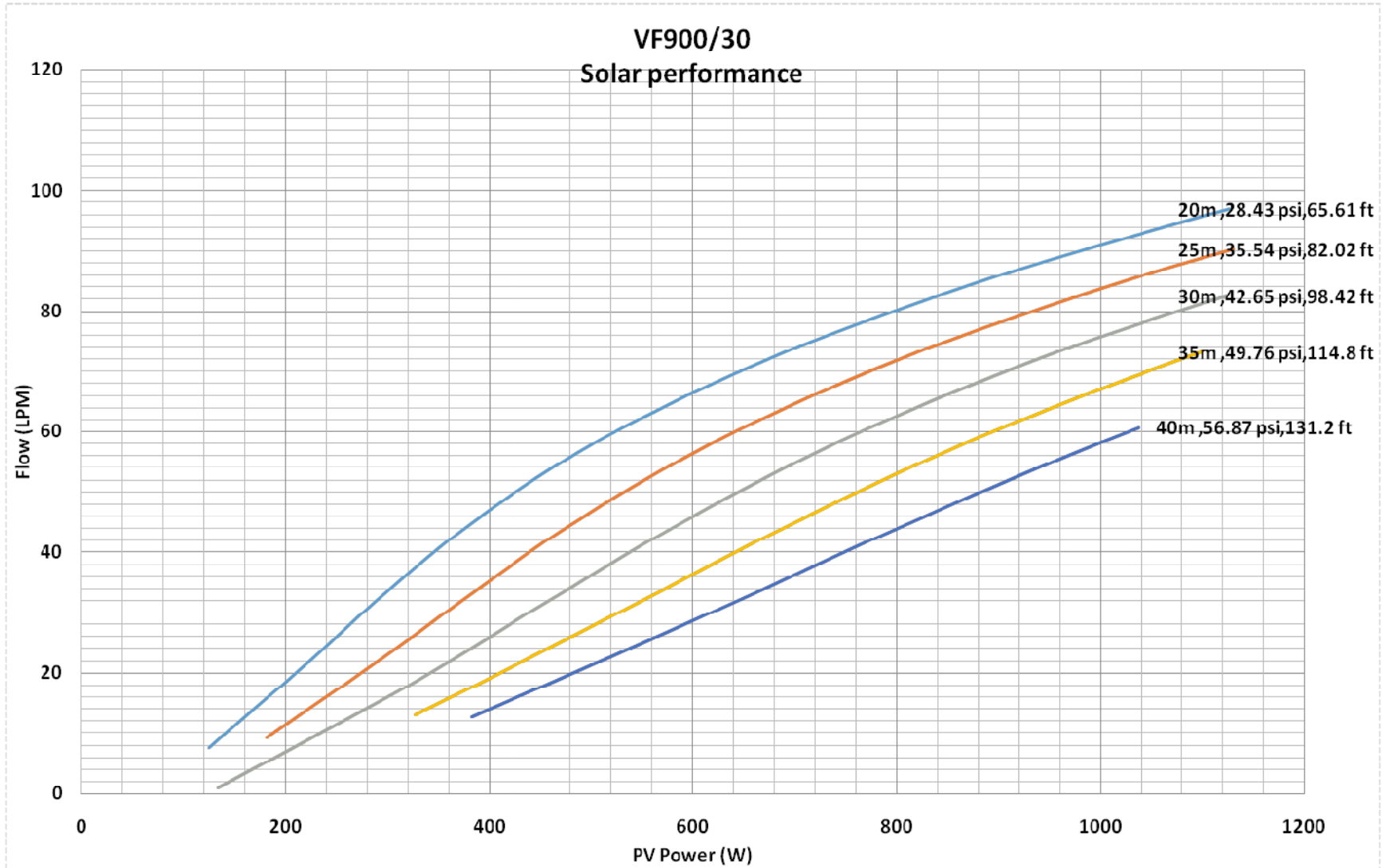
Features

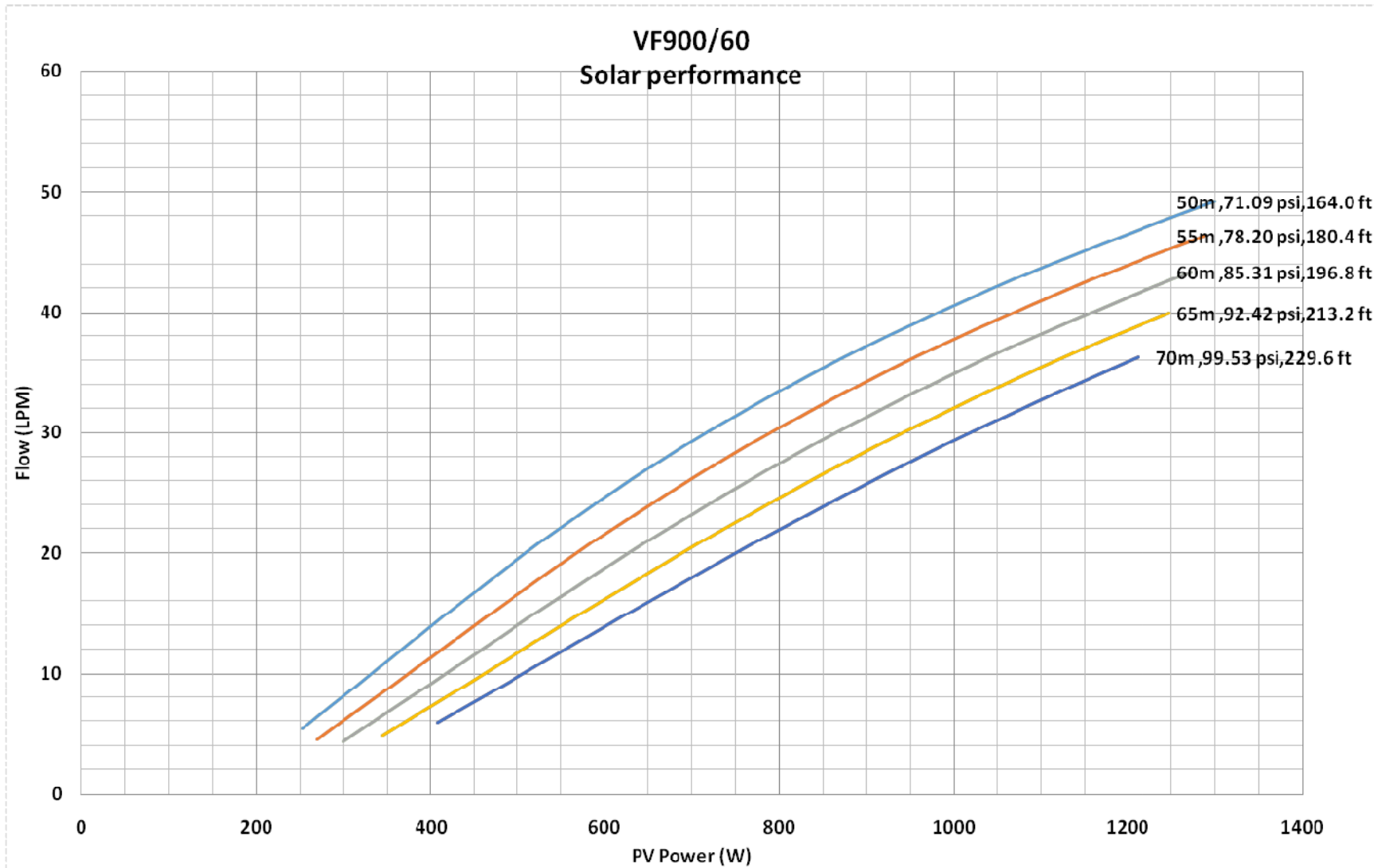
- Stainless steel construction designed and built for year of trouble free operation
- Heavy duty stainless steel discharge head with built in check valve for long life and ease of installation
- Mounting specification according to NEMA standards
- High quality shaft bearing providing low friction and high wear resistance
- Heavy duty stainless steel impellers & diffusers ensuring optimal performance
- Stainless steel strainer to restrict the entry of sand and other extraneous material

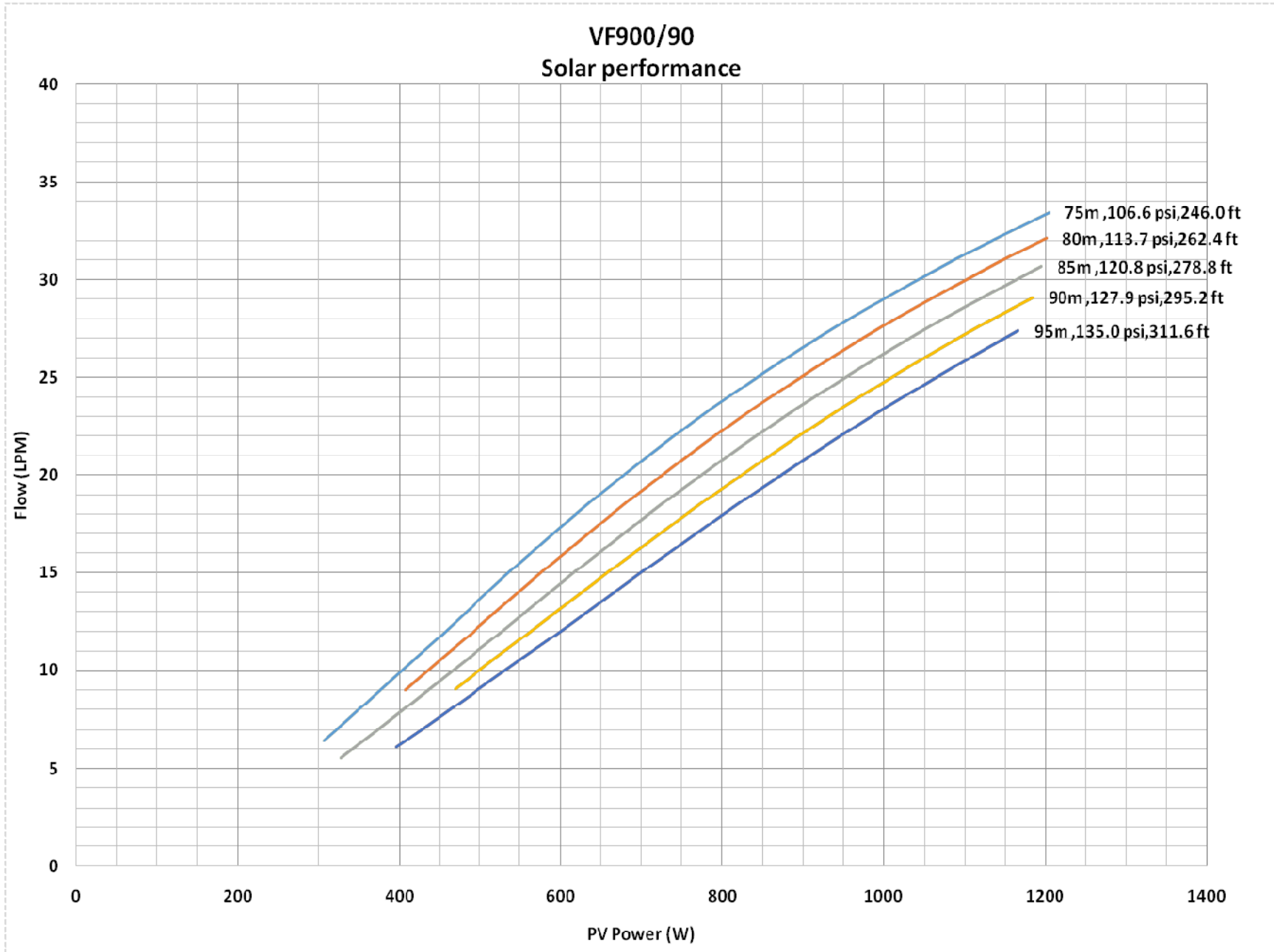
**Material Of Construction 6" (150 mm)
Sectional View**

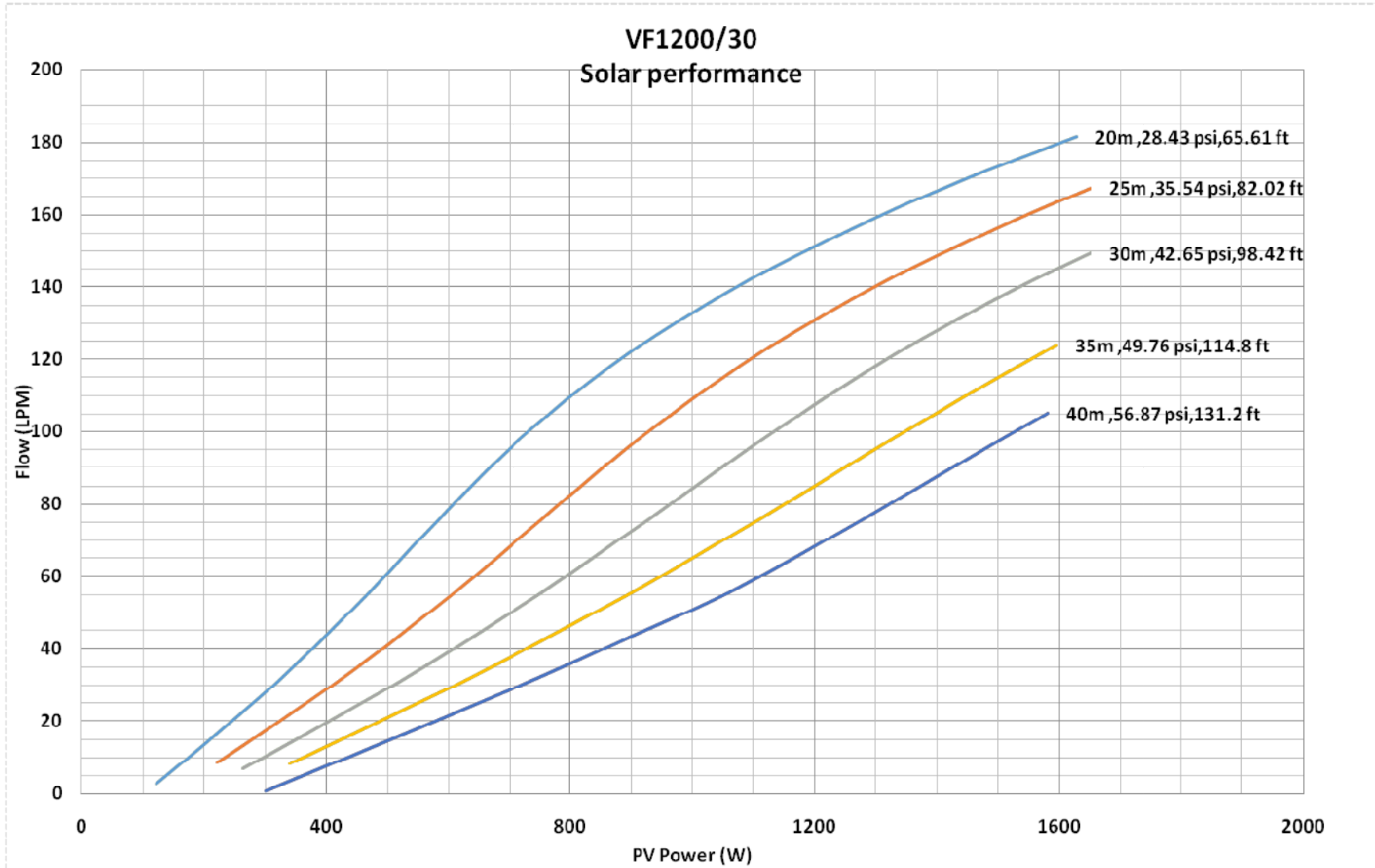


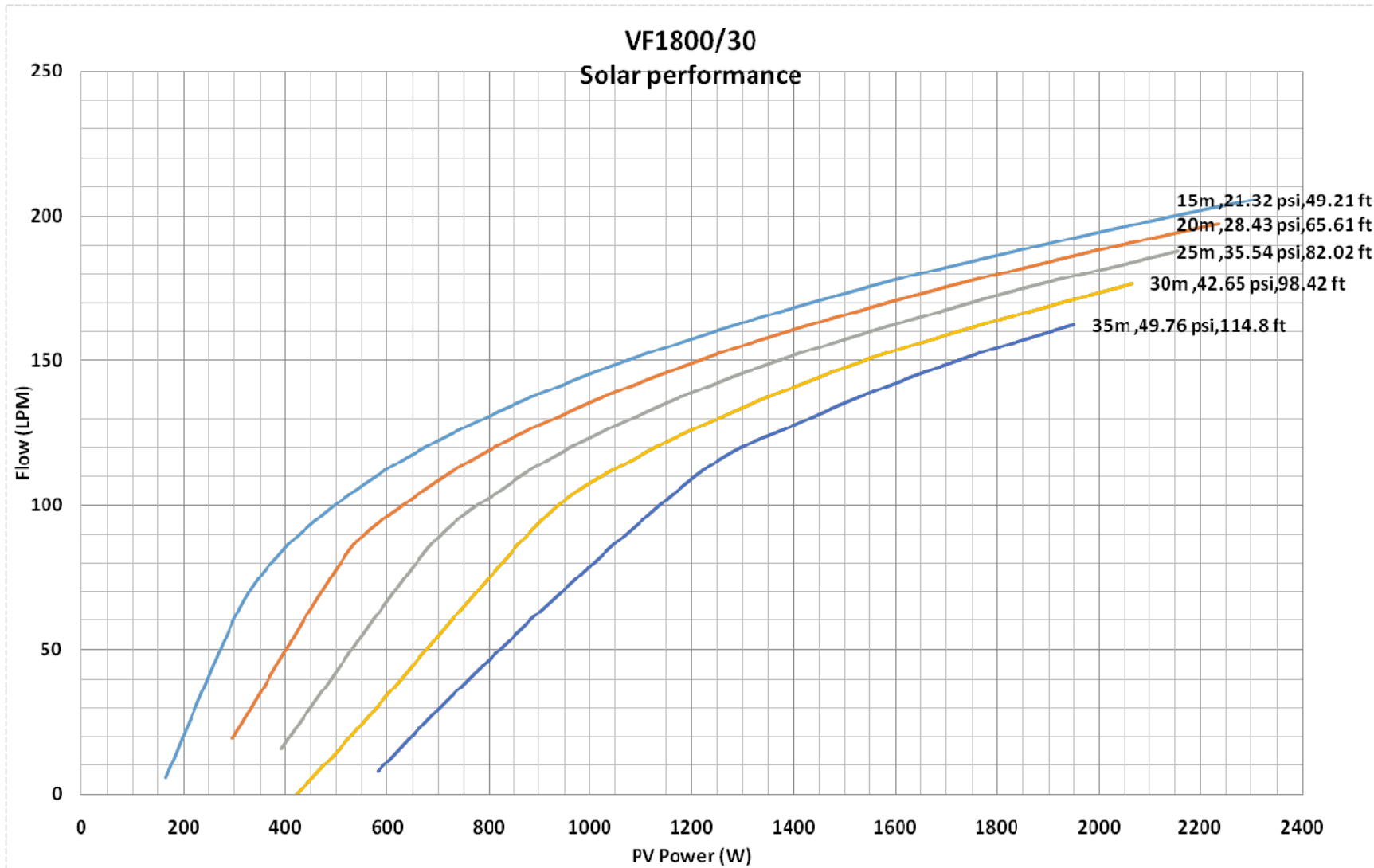
S.No.	Components	Material	Standard
1	Valve casing	Stainless steel	304
1a	Discharge chamber complete	Stainless steel	304
2	Valve cup	Stainless steel	304
3	Valve seat	Stainless steel	
4	Top intermediate chamber	Stainless steel	304
7	Neck ring	NBR/PPS	
8	Intermediate bearing	NBR	
9	Spacing washer	Cabron /graphite Hy 22 in PTFE mass	
8a	Intermediate chamber	Stainless steel	304
11	Split cone nut	Stainless steel	304
12	Split cone	Stainless steel	304
13	Impeller	Stainless steel	304
14	Suction interconnector	Stainless steel	304
15	Strainer	Stainless steel	304
16	Pump shaft	Stainless steel	431
17	Strap	Stainless steel	304
18	Cable guard	Stainless steel	304
72	Wear ring	Stainless steel	304
75	Spacer ring	Stainless steel	304
78	Nameplate	Stainless steel	304

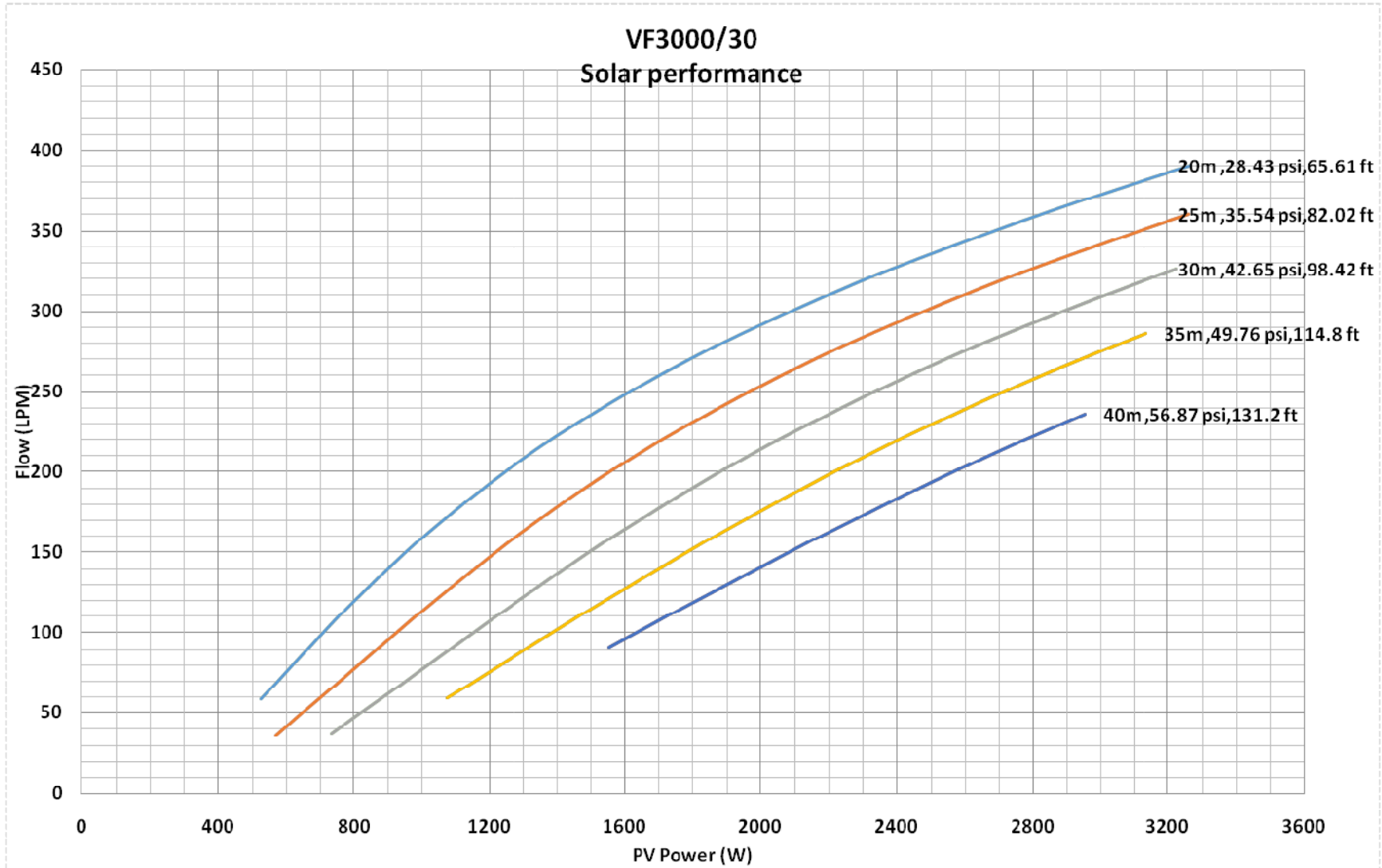


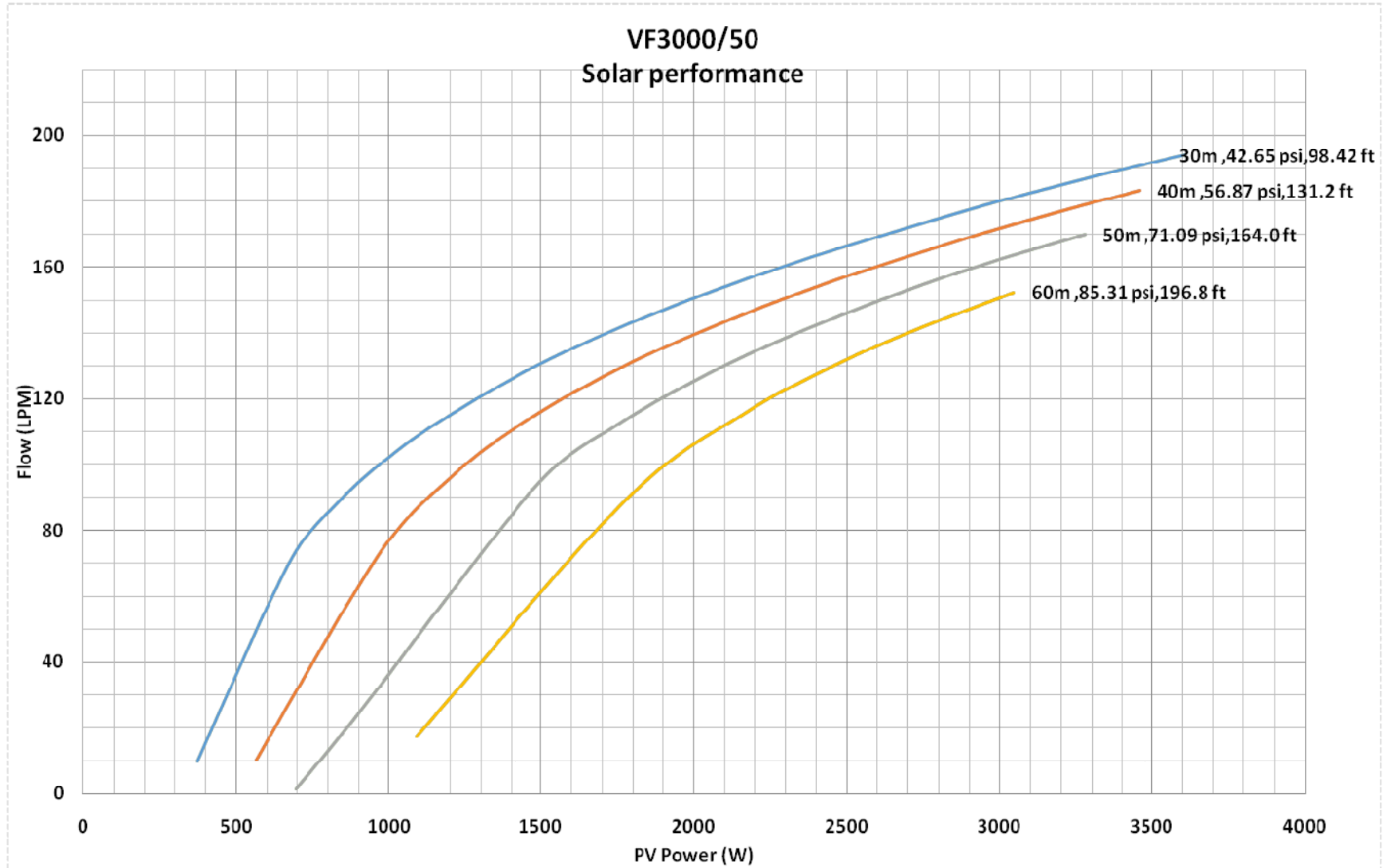


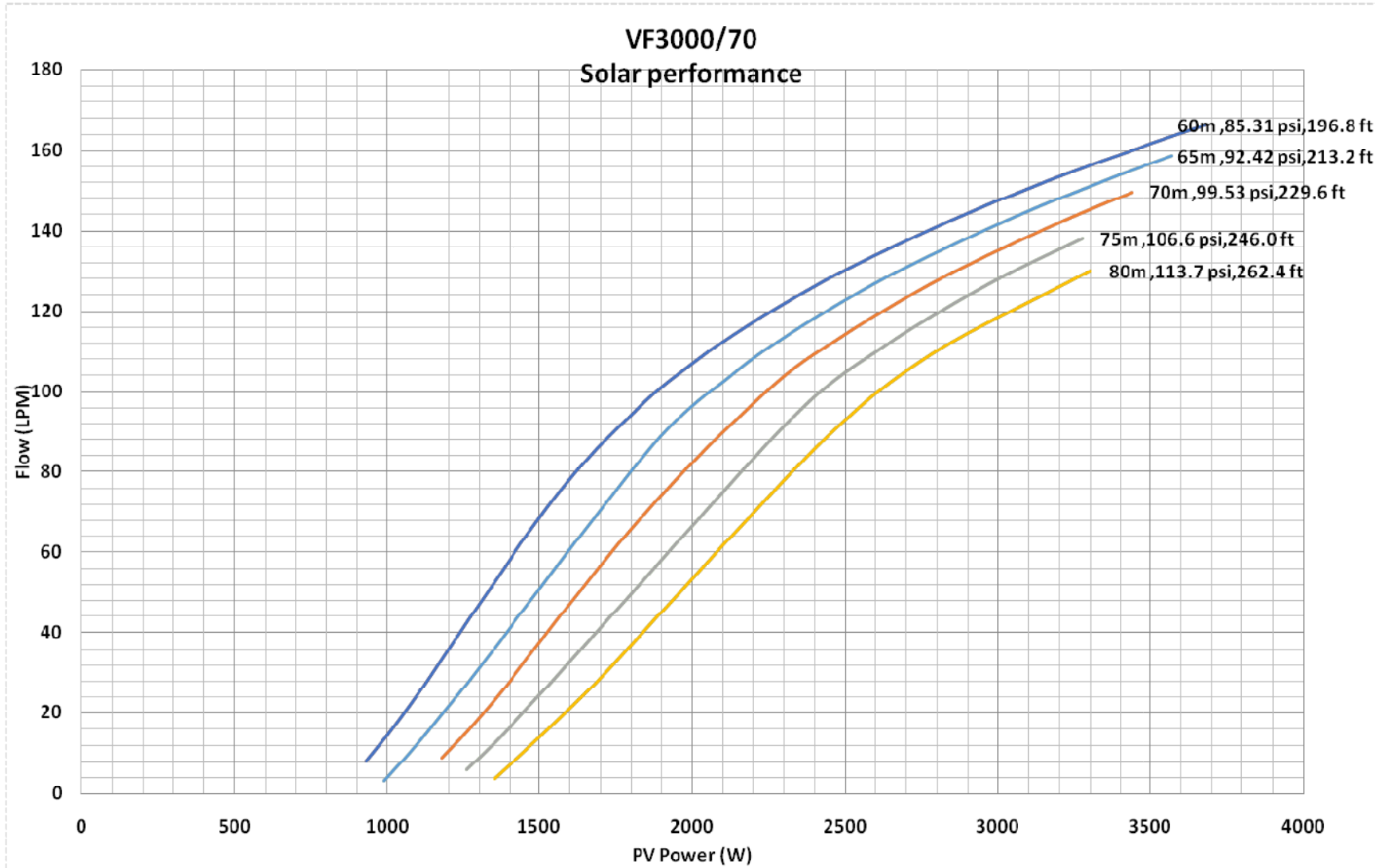


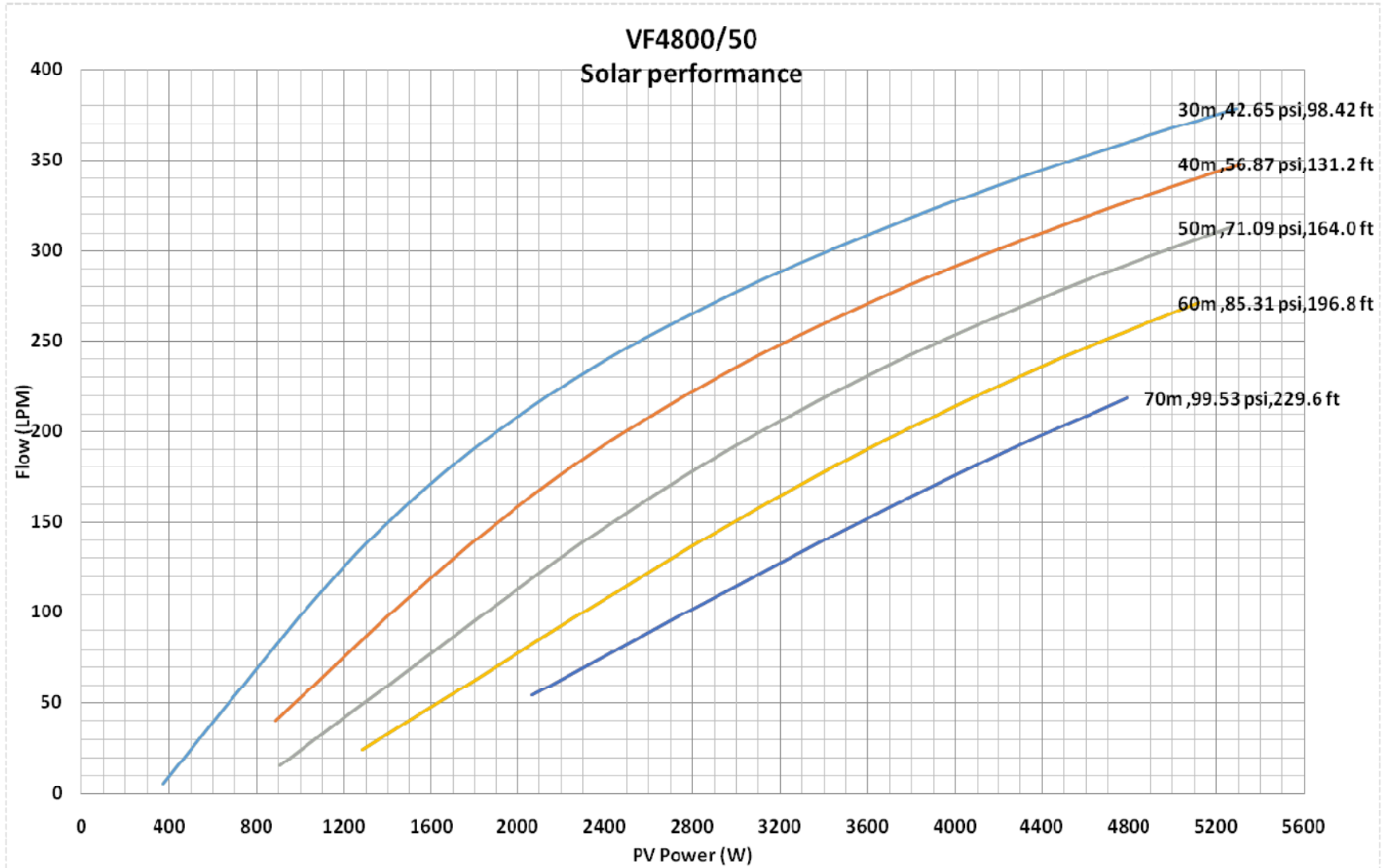


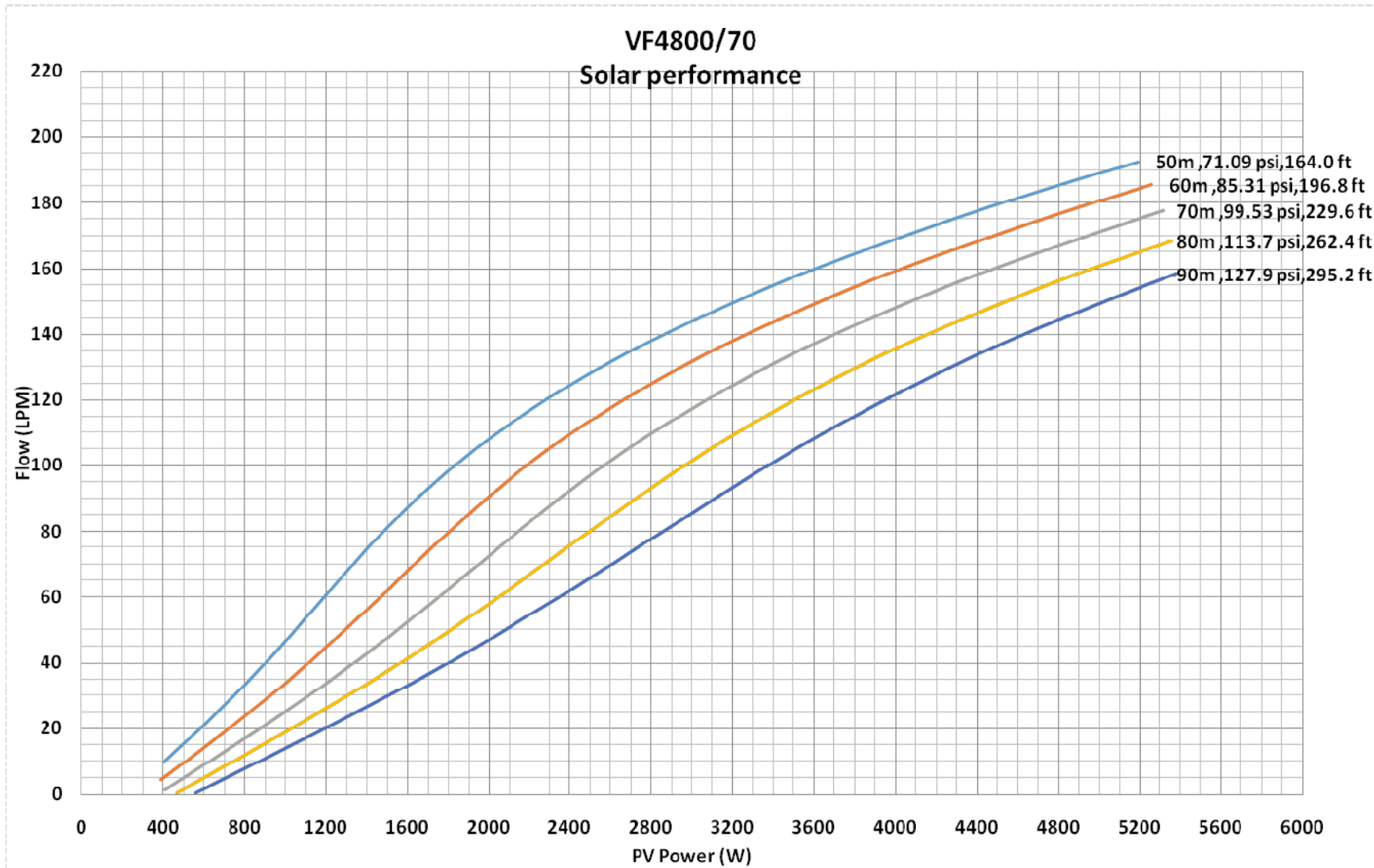


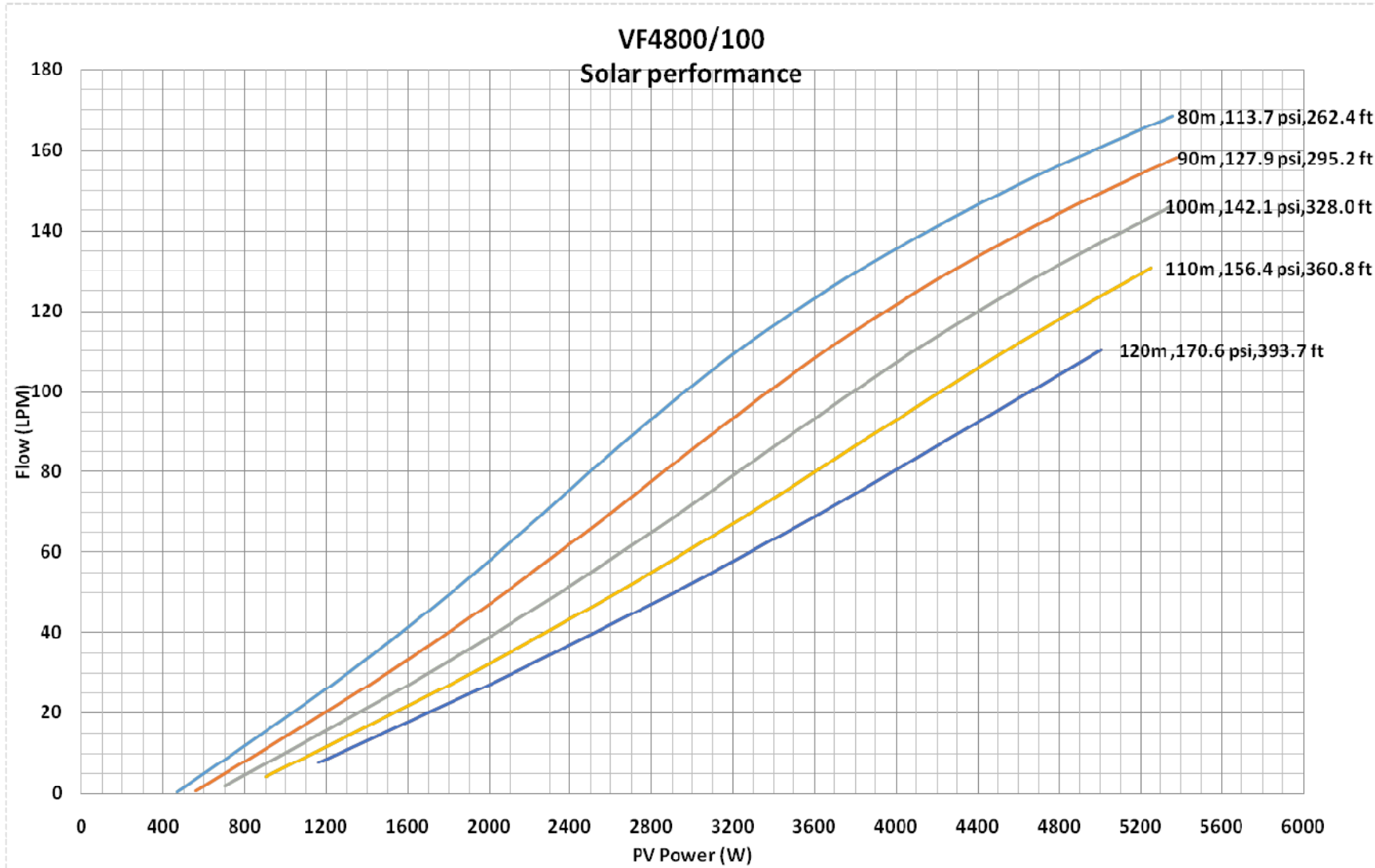


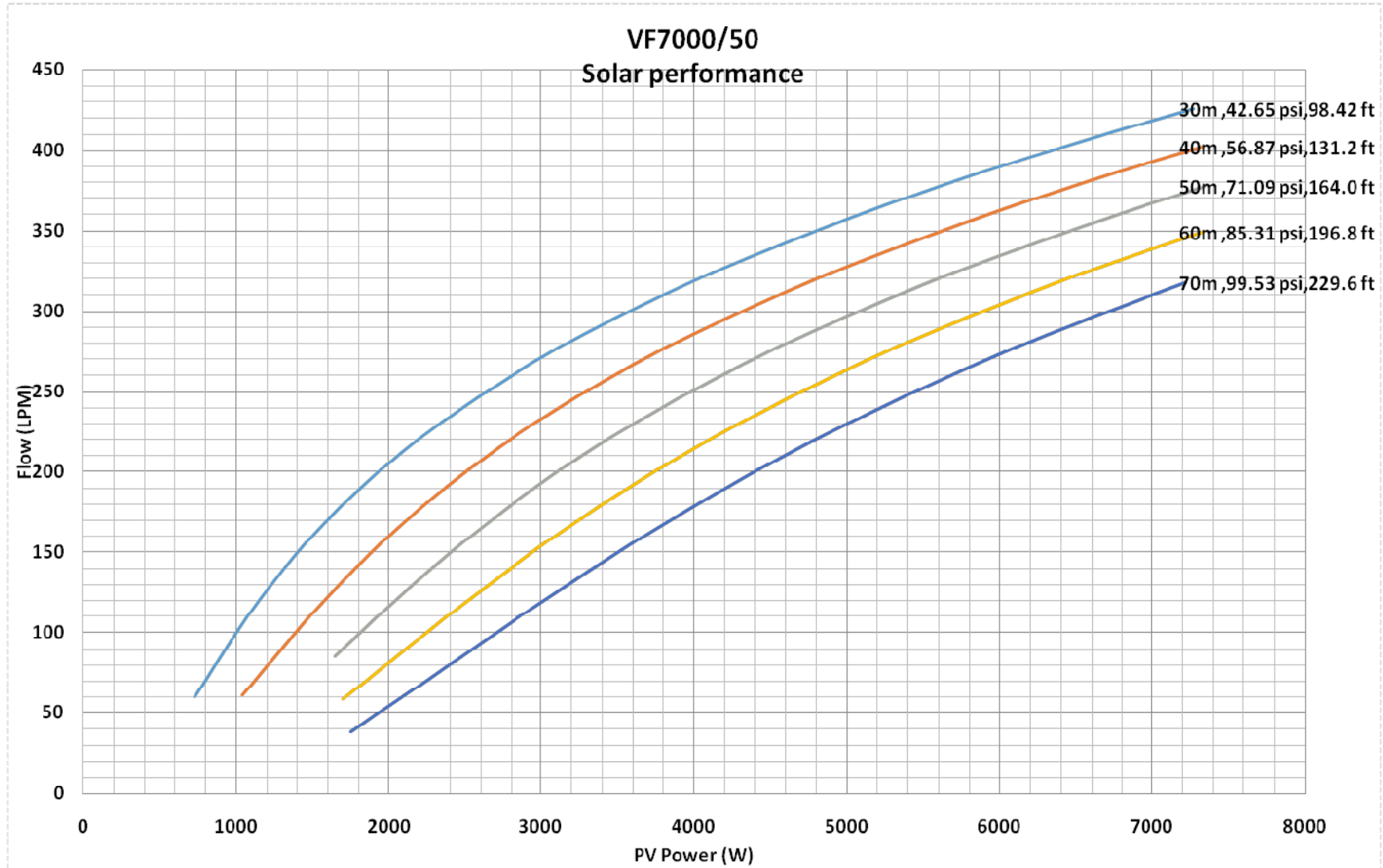


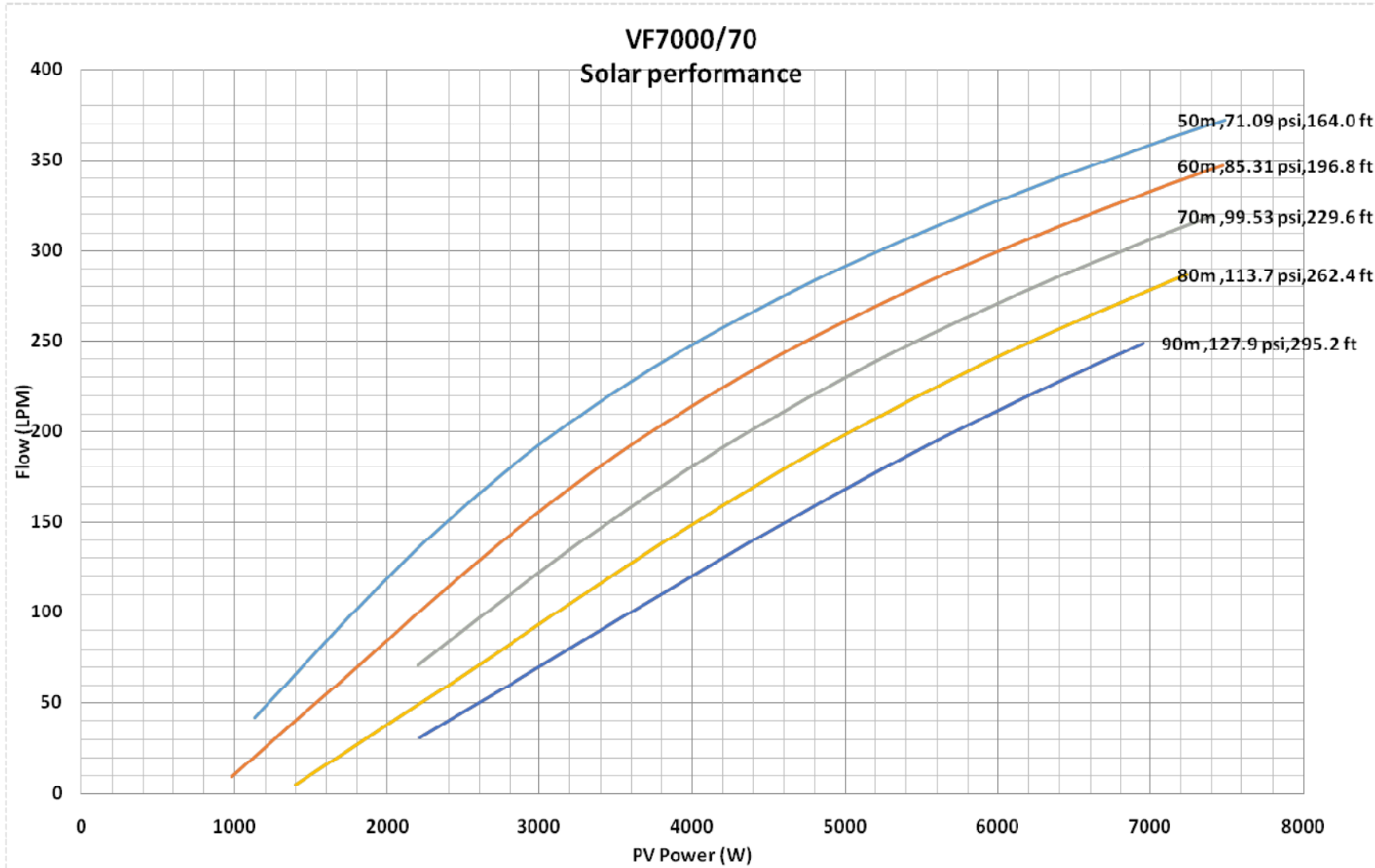


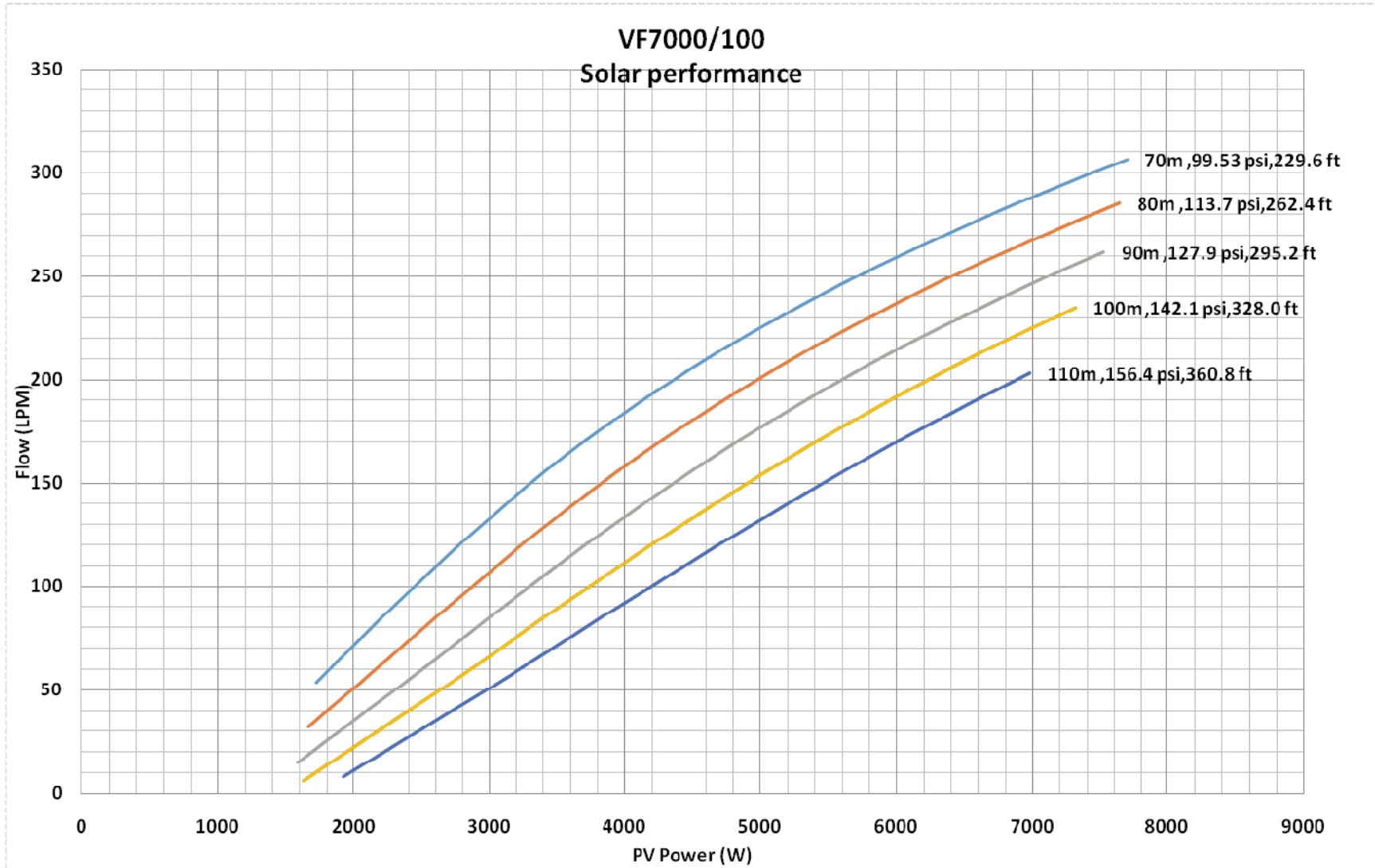


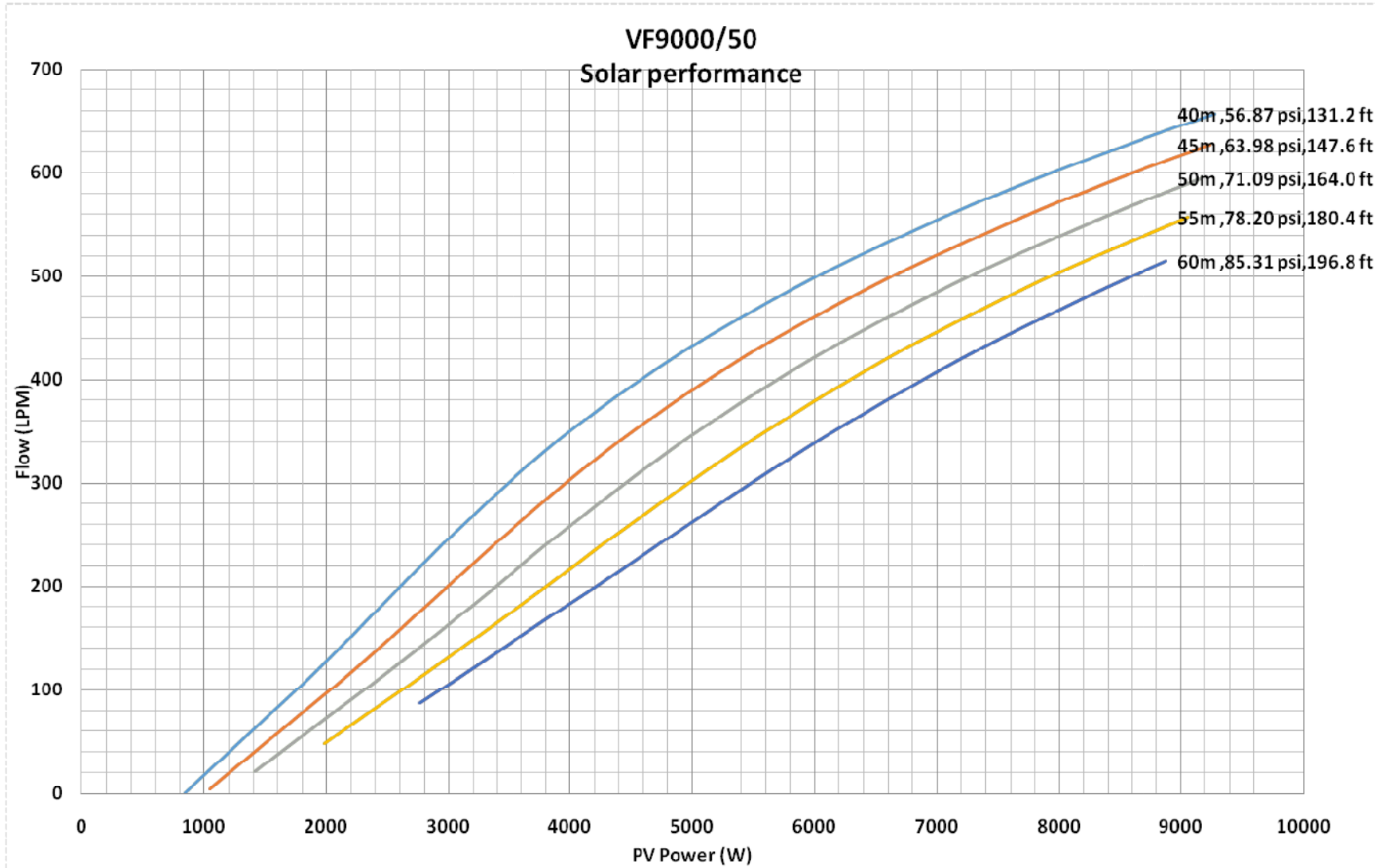


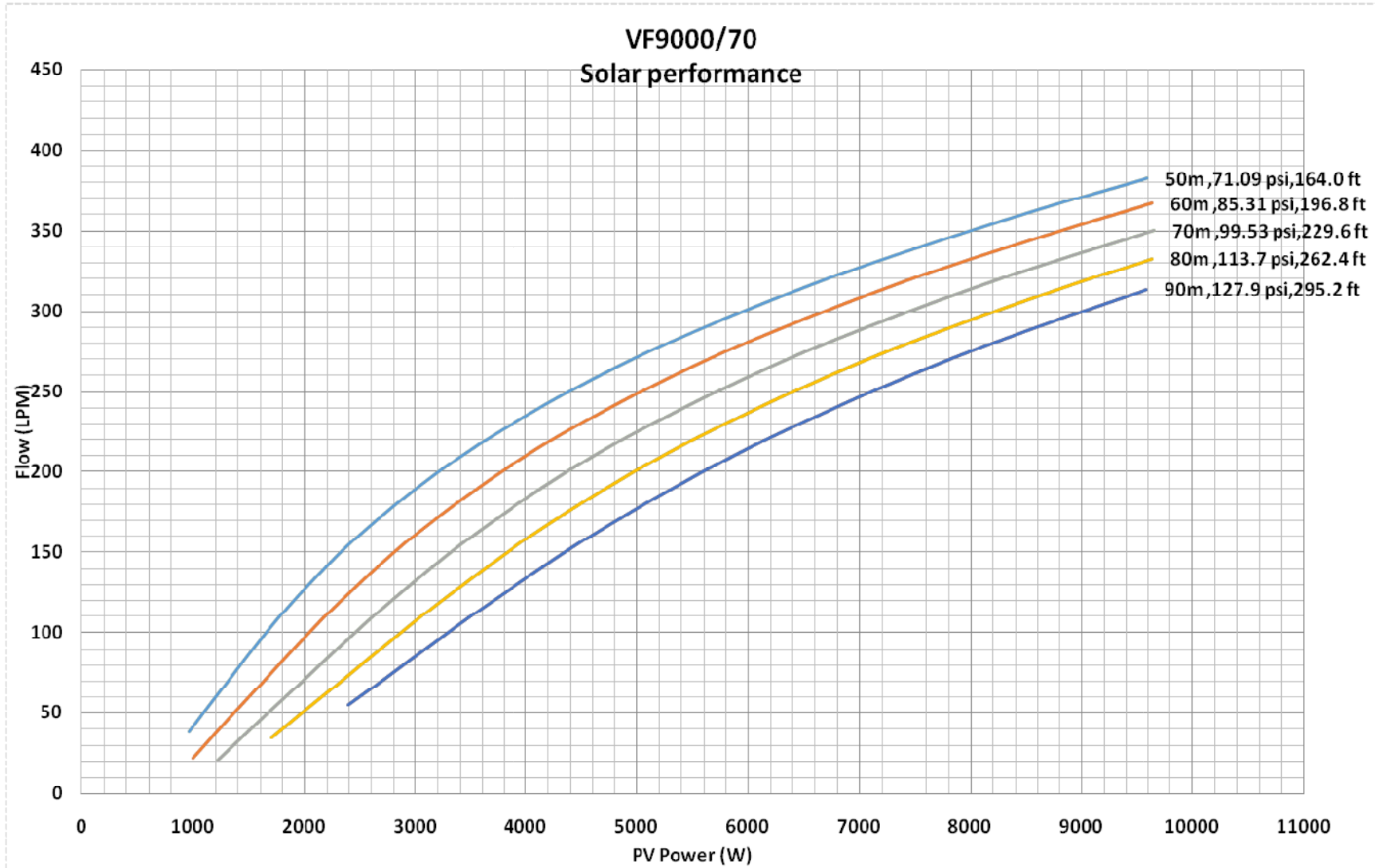


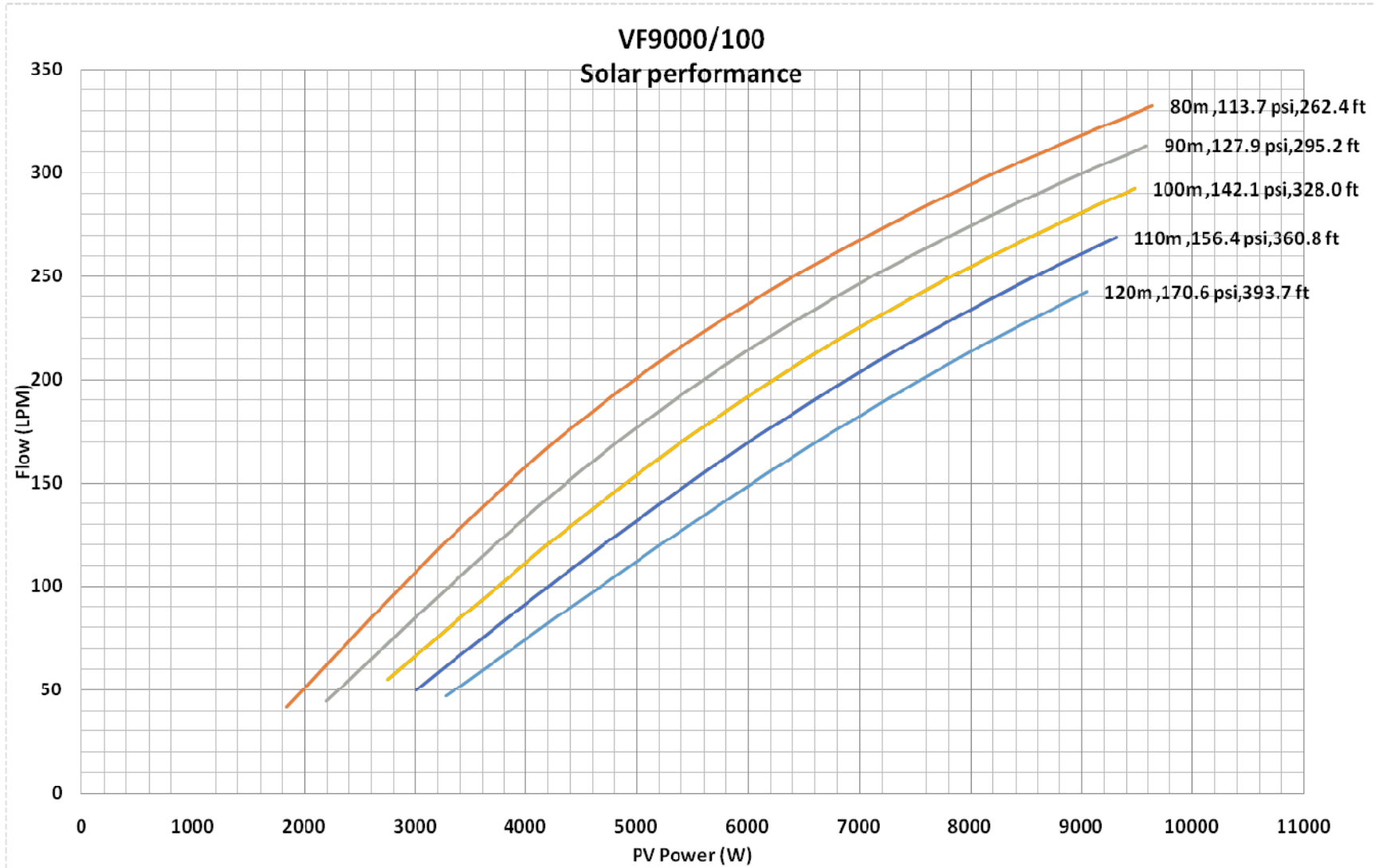












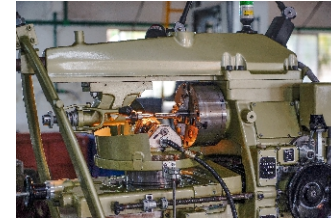
ASSEMBLY LINE



STAINLESS STEEL PUMP SECTION



TOOL ROOM



WINDING AREA

