



## Solar Centrifugal High Volume Surface Pump

Version 2.2 December 2000

The **Dankoff SunCentric™** uses solar-electric power to pump as much as 50,000 gallons (200 cu. m.) per day from shallow water sources. Applications include irrigation, livestock, domestic water, pond management, water treatment, swimming pools, solar water heating, hydronic space heating, fire protection, and more. These pumps have been in worldwide use since 1989. They can be used with or without batteries. No electronic pump controller is required. Maximum suction lift is 10 vertical feet (3 m).



Typical model shown here.  
Proportions and electrical connections vary.

### PV Array-Direct Application

- A PV-direct system uses water storage instead of batteries. This is the simplest and most durable system, and is easy to transport.
- No pump controller is required.
- A solar tracker (optional) will help to maintain optimum flow through the entire solar day.
- Storage of 3-7 days' water demand is recommended.
- Optimum for circulation of solar-heated water

### Battery Application

- A battery system is best where there is need for constant pressure or pressure on demand, where a tank is not feasible, or where a battery system is present for other power needs. Batteries can be charged by any power source.

### Selecting a Pump

- Select the appropriate chart of "PV Array-Direct Applications" or "Battery Applications".
- Total Dynamic Head = Vertical distance from surface of the water source to the discharge or top of storage tank + pipe friction losses.
- Use solid line grid for English units. Use broken line grid for metric units.
- Locate the coordinates for the required head and flow.
- Find the pump curve that is nearest to that point.
- If there is more than one curve to choose from, compare the power requirements. If PV-direct, the curve that goes higher will work better during low sun intensity.
- Multiple pumps can be used to provide greater flow.

### Sizing the PV Array (PV-Direct Systems Only)

- Chart specifies "Minimum Array Size". Minimum array will produce full pressure only when sunshine is at full intensity and within a 70° to 110° angle to the PV array.
- To improve performance in lower sun intensity, add more watts to the solar array and/or use a solar tracker. Solar tracking is most effective in a clear, dry climate.

### Suction Capacity

- Suction limit is 10 vertical feet (3 m) at sea level—subtract 1 foot for every 1000 ft. elevation (1 m per km).
- For best reliability, minimize or eliminate suction lift by placing the pump low and close to the water source. This will minimize the possibility of cavitation which causes excessive wear and loss of performance.

### Pump Installation

- Pump must be sheltered from rain and direct sunlight.
- Horizontal position: Place outlet at the top. It can be rotated to face horizontally or vertically upward.
- Vertical position: Place motor on top.

### Pipe and Wire Requirements

- Intake pipe: Pipe should be as direct and short as possible. Avoid any high point that can trap an air pocket.
- Refer to a pipe sizing chart (included with the pump instructions). Pipe may need to be larger than the pump ports. Undersized pipe will greatly decrease pump performance.
- Size the wire for less than 3% voltage drop. Undersized wire will greatly decrease pump performance. Refer to a low voltage wire sizing chart (available from Dankoff Solar).

### Overcurrent Protection

- Fuse or circuit breaker is required.
- Ampere rating = amps at the pump + 15-25%
- Minimum DC voltage rating = volts at the pump X 2. (Type FRN fuses are rated 125V DC)

### Maintenance

- No routine maintenance is required.
- Pump can be repaired in the field using ordinary tools and skills, without removing the pipes.
- Instruction manual shows illustrated repair details.
- Motor brushes: Typical brush life peak hours = working voltage X 800 / 3rd digit of model number. EXAMPLE: PV-Direct curve #60 is Model 7526 working at 30V. Typical brush life = 30 X 800 / 2 = 12,000 peak hours. This represents about 5-8 years of service.
- Shaft seal has a very long life under normal conditions. Purchase spare seals if water is loaded with abrasive silt or if pump can possibly run dry.

Liters Per Minute



**BATTERY APPLICATIONS**

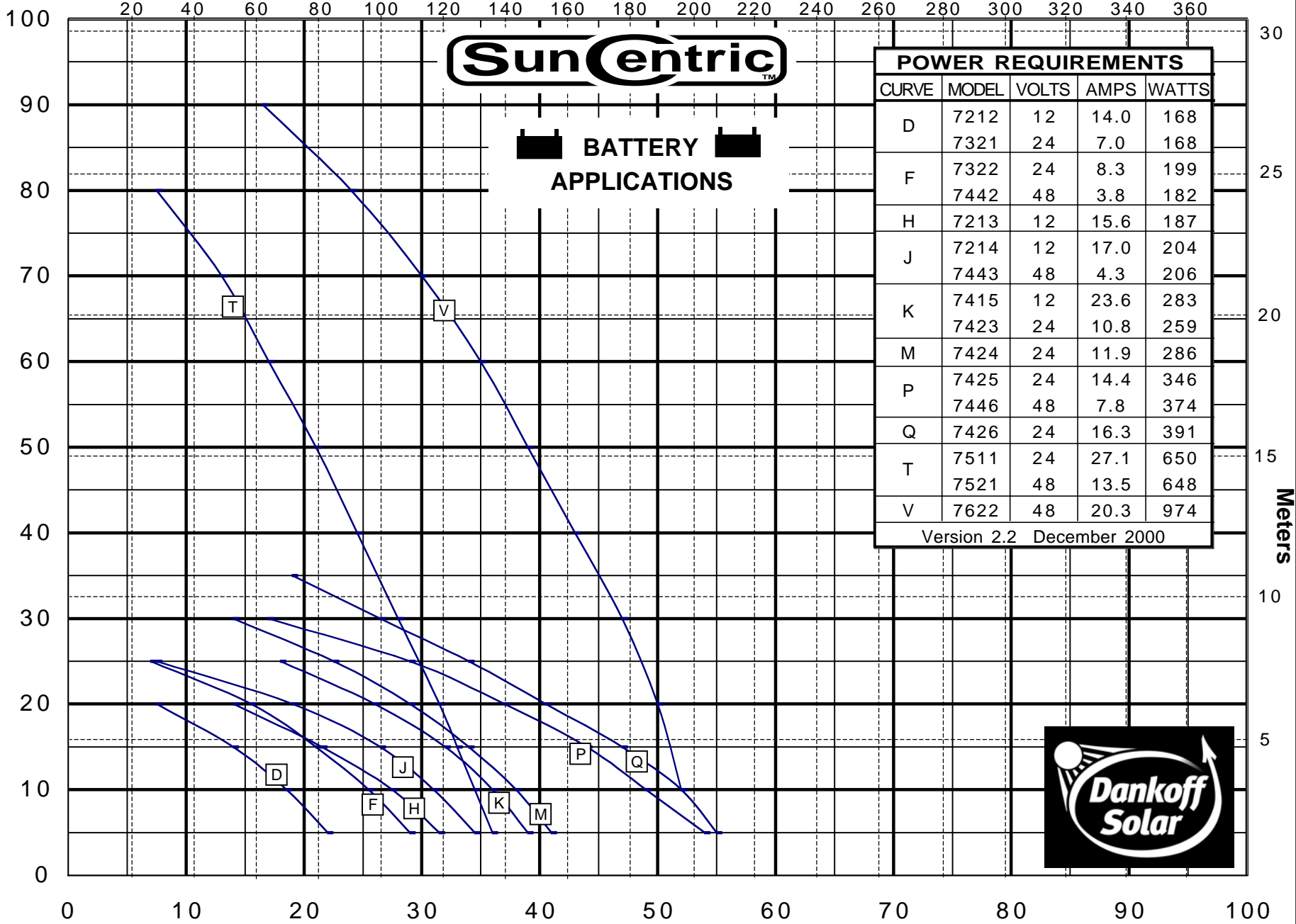
POWER REQUIREMENTS				
CURVE	MODEL	VOLTS	AMPS	WATTS
D	7212	12	14.0	168
	7321	24	7.0	168
F	7322	24	8.3	199
	7442	48	3.8	182
H	7213	12	15.6	187
J	7214	12	17.0	204
	7443	48	4.3	206
K	7415	12	23.6	283
	7423	24	10.8	259
M	7424	24	11.9	286
P	7425	24	14.4	346
	7446	48	7.8	374
Q	7426	24	16.3	391
	T	7511	24	27.1
T	7521	48	13.5	648
	V	7622	48	20.3

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Total Dynamic Head (Vertical Feet)

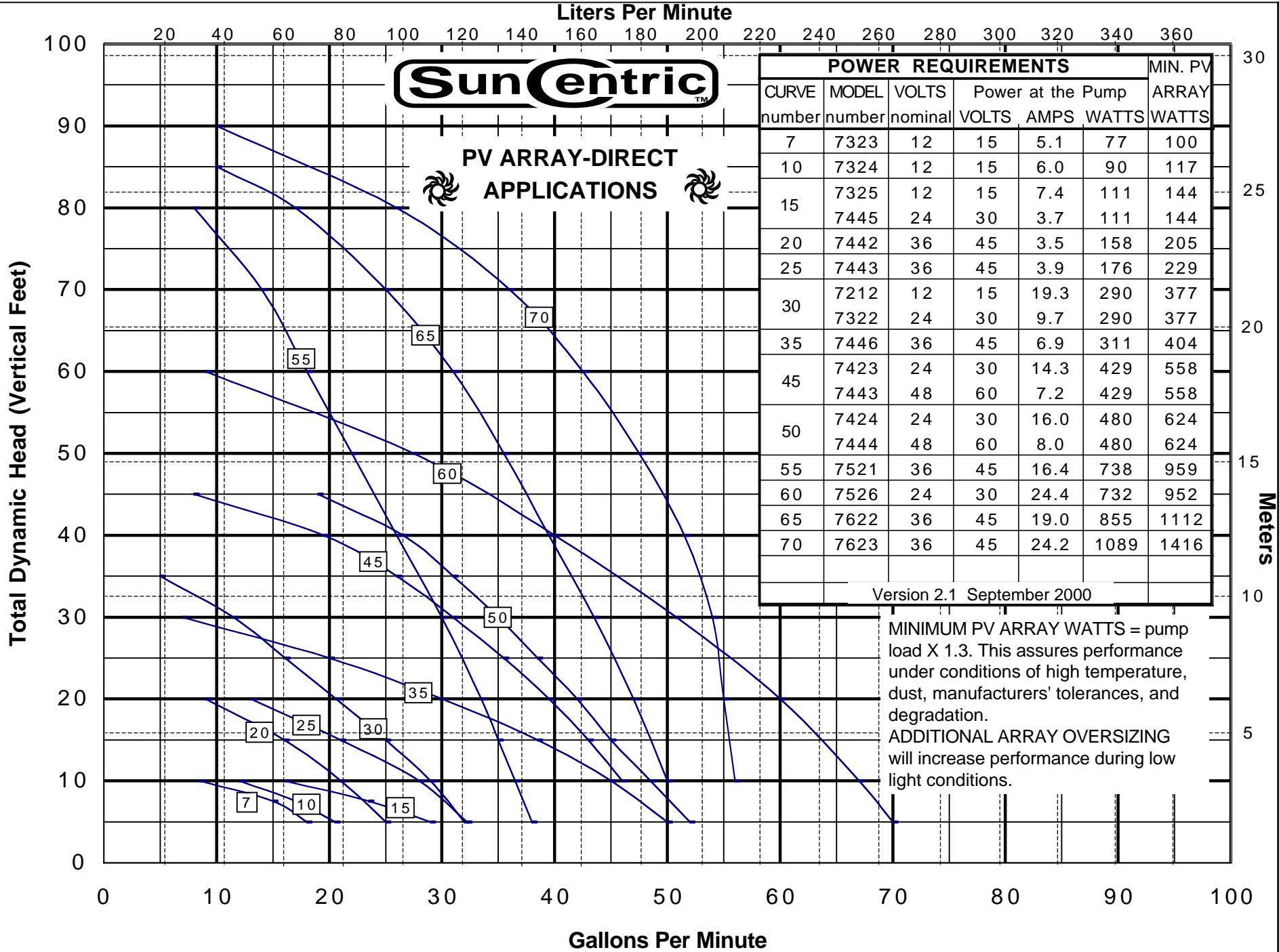
Meters

Gallons Per Minute





**PV ARRAY-DIRECT APPLICATIONS**



POWER REQUIREMENTS							MIN. PV ARRAY WATTS
CURVE number	MODEL number	VOLTS nominal	Power at the Pump				
			VOLTS	AMPS	WATTS		
7	7323	12	15	5.1	77	100	
10	7324	12	15	6.0	90	117	
15	7325	12	15	7.4	111	144	
	7445	24	30	3.7	111	144	
20	7442	36	45	3.5	158	205	
25	7443	36	45	3.9	176	229	
30	7212	12	15	19.3	290	377	
	7322	24	30	9.7	290	377	
35	7446	36	45	6.9	311	404	
45	7423	24	30	14.3	429	558	
	7443	48	60	7.2	429	558	
50	7424	24	30	16.0	480	624	
	7444	48	60	8.0	480	624	
55	7521	36	45	16.4	738	959	
60	7526	24	30	24.4	732	952	
65	7622	36	45	19.0	855	1112	
70	7623	36	45	24.2	1089	1416	

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MINIMUM PV ARRAY WATTS = pump load X 1.3. This assures performance under conditions of high temperature, dust, manufacturers' tolerances, and degradation.  
 ADDITIONAL ARRAY OVERSIZING will increase performance during low light conditions.



## Solar Centrifugal High Volume Surface Pump

### Materials

- Pump body: cast iron, ASTM A48-76
- Impeller: glass filled polycarbonate
- Seal: carbon/ceramic, industry standard
- Temperature limit: 140°F (60°C)

### High Temperature Option

- Temperature limit: 250°F (122°C)
- Impeller: brass
- Brass impeller reduces flow by about 15% (same watts)
- Order standard pump + "High Temp Option" Item #38275

### Accessories

- Foot Valve (for pump placed higher than water source) 1 1/4" (Item #37205) or 1 1/2" (#37206) or 2" (37207)
- Float switches: please inquire
- Basket Strainer: Swimming pool type, fits on pump inlet, easy cleanout. 1 1/4" in/out, Item #37685

### Spare Parts

- Seal & Gasket Kit: specify pump number, and if high temperature
- Motor Brush Kits: specify model number

### Warranty

- Two years against defects in materials and workmanship.

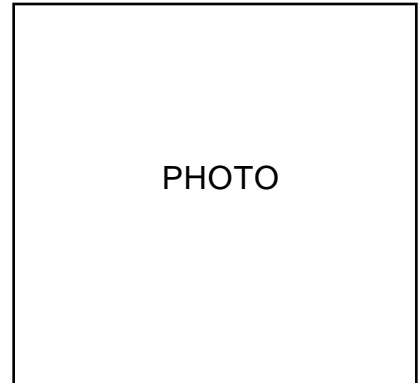
### SunCentric™ owners say ...

*"We are satisfied with the performance of the Dankoff [SunCentric] Solar Centrifugal pump. It runs cool and is noiseless. It has easy access for repair. The spring seals provided along with the pumps are also good. The pump starts at 40-50% of rated input to the motor. The pumps shipped so far are receiving good review and acceptance."*  
Sairam Solar Systems, New Delhi, India

*"We have 1000 trees on drip irrigation. [Our pump] has been running for 5 years. It's an amazing pump. I love that it runs directly on solar with no controller or batteries."*  
A.P., SunCentric owner, Longmont, Colorado, USA

*"The SunCentric circulating pump is perfect. It starts first thing in the morning and there is absolutely no vibration or sound."*  
Bob Ramlow, Midwest Renewable Energy Association, Wisconsin, USA • Application: Solar hydronic floor heating for a 4000 sq. foot (404 sq. m.) building.

PUMP MODEL NUMBER X = third digit	DIMENSIONS			PIPE SIZES		
	LENGTH in.	HEIGHT in.	SHIP WT lbs.	INLET NPT	OUTLET NPT	
72x1 72x2 72x3 72x4	15.5	9.1	49	1 1/4"	1"	
	72x5	17	10.5	54	1 1/2"	1 1/4"
	72x6	17	10.5	54	2"	1 1/2"
73x1 73x2 73x3 73x4	17	9.1	50	1 1/4"	1"	
	73x5	18	10.5	55	1 1/2"	1 1/4"
	73x6	18	10.5	55	2"	1 1/2"
74x1 74x2 74x3 74x4	17	9.1	58	1 1/4"	1"	
	74x5	18.5	10.5	63	1 1/2"	1 1/4"
	74x6	18.5	10.5	63	2"	1 1/2"
75x1 75x2 75x3 75x4	18	9.1	60	1 1/4"	1"	
	75x5	19.5	10.5	65	1 1/2"	1 1/4"
	75x6	19.5	10.5	65	2"	1 1/2"
76x1 76x2 76x3 76x4	19	9.1	65	1 1/4"	1"	
	76x5	20.5	10.5	70	1 1/2"	1 1/4"
	76x6	20.5	10.5	70	2"	1 1/2"



PHOTO

A SunCentric pump helps farmers in India

### Other Dankoff Solar Pumps™

For lift and pressurizing surface water:

- Solar Force™ Piston Pump*
- Full Blast™ Pressure Pump*
- Flowlight® Booster Pump*
- Solar Slowpump™*
- Solaram™ Surface Pump*

For deep wells:

- SunRise® Submersible*
- TSP-1000™ Submersible, and more*

### Available From:

