



Dankoff Solar Force Piston Pump draws water from a shallow well, spring, pond, river or tank. It can push water uphill and over long distances for home, village, irrigation or livestock uses. It can use power directly from a photovoltaic array or from storage batteries to fill a storage tank or to pressurize water.

### Ultra-efficient

Uses less power than any other pump in its range, starts pumping in low light conditions

### Economical

Reduces power system cost by 25-75% compared to centrifugal or AC pumps

### Solar-Direct Application

Starts pumping in low light conditions

### Pressurizing Application

DC version is most efficient. AC version uses a low-surge permanent magnet motor that greatly reduces starting surge, inverter size, and wire size requirements (when compared to conventional AC pumps).

### Rugged and Reliable

Proven design with a 20-year life expectancy, simple to maintain with common tools (5-10 yr. maintenance interval)

### Good Tolerance for Dirt and Dry Run

### Mechanical Drive

Allows engine or hand-lever backup

### Illustrated Instruction Manual

Makes it easy for anyone to install and service, with no previous experience

### Voltages Available

- 12, 24, 48 VDC

*Note: PV-Direct full working voltage is typically 20% higher than nominal (example: 29 V for a 24 V system)*

- 115 V or 230 V AC, 50-60 Hz

### Warranty

2 years against defects in materials and workmanship



### Construction

- Cast iron body
- Brass cylinder and valve seats
- Leather cup piston seals
- Neoprene valve seals
- Oil-bath crankcase
- Gear (timing) belt drive on PV models
- Standard V-belt on B models
- Pressure relief valve
- Permanent Magnet DC Motor
- Surge tank included (not in photo)

### Suction Capacity

25 vertical feet (7.6 m) at sea level. Subtract 1 foot for every 1000 ft. elevation (1 m for every 1,000 m).

Suction capacity may be further limited by intake pipe friction. Intake piping should be minimum 1" (3010, 3020 models) or minimum 1 1/4" (3040). For best reliability, place the pump as close to the water source as possible.

### Fittings

- Intake: 1 1/4" female pipe thread
- Outlet: 1" female pipe thread

### Dimensions

- 22 x 13 x 16" high (56 x 33 x 41 cm)
- With Surge Tank (not shown in photo), total height 26" (60 cm)
- Weight, max. 80 lbs (36 kg)

*Shipped in 2 or 3 boxes*

## System Requirements

- Solar-Direct Systems: Chart indicates power (w) required at the pump. The rated power of the PV array must exceed this number by 20 % or more. A pump controller (linear current booster) is required for the pump to start and run in varying light conditions. A solar tracker may be used to increase daily yield (40-55 % in summer).
- Pressurizing Systems: battery power system, pressure switch, and pressure tank of minimum 60 gallon (230 l) size (captive-air tank, available locally)

## Reading the Chart

**Total Lift** = vertical Distance from surface of the water source to the pipe outlet or top of storage tank

**GPM** = U.S. Gallons Per Minute

**LPM** = Liters Per Minute

Model Designation:

**V**=voltage, **B**=battery model, **PV**=PV array-direct model

Feet	Total Vertical Lift			Model #3010-V-B			V = Voltage -Specify 12, 24, 48, 115, 230 AC Model #3020-V-B or PV			Model #3040-V-B or PV		
	Meters	PSI	KG/sq. cm	GPM	LPM	Watts	GPM	LPM	Watts	GPM	LPM	Watts
20	6.1	8.7	0.61	5.9	22.3	77	5.2	19.7	110	9.3	35.2	168
40	12.2	17.4	1.22	5.6	21.3	104	5.2	19.7	132	9.3	35.2	207
60	18.3	26	1.83	5.3	20.2	123	5.1	19.3	154	9.2	34.9	252
80	24.4	35	2.44	5	19.7	152	5.1	19.3	162	9.2	34.9	286
100	30.5	43	3.05	5.1	19.2	171	5	18.9	202	9.1	34.5	322
120	36.6	52	3.66	4.9	19.2	200	5	18.9	224	9.1	34.5	364
140	42.7	60	4.27	4.9	18.7	226	5	18.9	252	9.1	34.5	403
160	48.8	70	4.88				4.9	18.6	269			
180	54.9	78	5.49				4.9	18.6	280			
200	61	87	6.1				4.8	18.2	308			
220	67.1	96	6.71				4.7	17.8	314			

Specifications may vary  $\pm$  10%

PV Models are measured at 14, 28, or 56V (array direct)

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330 8.11 60 6.11 4.7 17.8 314