

PS200 *Mini*

SOLAR WATER PUMP

"The World's Most Economical Solar Pump"

- Lift from as deep as 50 m (165 ft)
- Maximum 10 m³ per day (3,785 US-Gal.)
- *Mini* eliminates the costs of fuel, delivery, engine maintenance, and pollution.
- In many cases it is **LESS COSTLY** than a conventional pump and generator installation
- Great reliability and life expectancy
- Helical Rotor wet end, brushless motor (maintenance free)
- High resistance to sand and corrosion
- Fits 4" and larger well casings
- Wide voltage range for 24 to 48V systems (2-4 solar modules in series) Only one controller for solar direct or battery systems

Pump:3-phase brushless DC-motor on bottom, helical-rotor pump head and check valve on top. Typical model shown.

Controller: Maximum power tracking, 3-phase variable speed controller in sealed plastic housing



>> HIGH EFFICIENCY = LOWER COST

Mini pumps more water per watt than other solar pumps and **KEEPS IT UP** year after year.

>> RELIABLE AND MAINTENANCE-FREE

Mini eliminates the weakest links in solar pumping by using a helical rotor (progressing cavity) pump and a brushless, water-filled motor – *No failure-prone diaphragms, no flooded-motor failures.*

JUST SAY NO!

- NO to annual diaphragm replacement**
- NO to motor brush replacement**
- NO to delicate plugs that fail**
- NO to pistons, cams, flapper valves**
- NO to plastic parts**
- NO to electronics in the wells**

>> DIRECT REPLACEMENT for SOLAR DIAPHRAGM PUMPS

Mini can replace less reliable diaphragm pumps, to eliminate frequent repairs, and to increase the water production, too. In most cases, you can use the existing solar array. Refer to the performance table, and compare the solar (minimum PV watts) requirement with the existing equipment.

>> *Mini* INCLUDES

- Pump
- Pump controller
- Submersible cable splice kit
- Low-water probe
- Complete illustrated instruction manual

>> DEEP WELL APPLICATIONS

Mini can be submersed as deep as necessary. Submersion depth does not affect the performance or place additional stress on the pump or motor.

>> SURFACE WATER APPLICATIONS

Mini can be installed in a stream, pond, tank or shallow well, in any position.

>> DRY RUN PROTECTION

A low water probe (included) turns pump off to prevent dry-run damage. Reset is automatic after 20 minutes. The EP200 Controller has an RPM limit adjustment to reduce the maximum flow rate to about 50 %, to help match a limited water source.

>> SAND AND SILT TOLERANCE

Mini has high resistance to wear from sand, clay, etc. that may occur in a properly constructed water well. However, a concentration of solids greater than 2 % (by volume) may cause blockage in the pump or the drop pipe, especially at low flow rates. Do not use *Mini* to clean out a dirty well.

>> CONTROLLER DISPLAY

Lights indicate: system on, pump on, tank full, water source low, overload, and battery low.

>> STORAGE REQUIREMENT

A storage tank (not included) should be sized to supply a minimum of 5-10 days' water supply, depending on climate and application. Water storage is generally more economical than energy storage in batteries.

>> BATTERY SYSTEMS

LOW-VOLTAGE DISCONNECT prevents battery damage from over-discharge. This feature is included in the controller. Disconnect 22V. Reconnect 26V

>> DROP PIPE

Pump has G1 ¼ (optionally 1" NPT) outlet. If water is dirty, consider a smaller size drop pipe to increase the flow velocity. This helps exhaust solid particles and prevent accumulation in the pipe. When considering reduced pipe size, consult a pipe sizing (friction loss) chart. Pipe can be of any standard material, rigid or flexible. A torque arrestor is NOT required.

>> PUMP CABLE and SPLICE

The pump requires standard submersible cable, 3-wire + ground (total 4 wires). Connection to the pump is made using industry-standard splicing methods. A splice kit is included.

>> DIMENSIONS & WEIGHTS

PUMP & MOTOR

- Diameter: 96 mm (3.78")
- Height: 500-800 mm (20" - 32") depending on model
- Weight: 11.5 kg (25 lbs) or less, depending on model

CONTROLLER

- Controller: 260 x 175 x 100 mm (10" x 7" x 4")
- 3 conduit holes: ½", ¾", and 1¼" nominal pipe
- Weight: 1.5 kg (3,6 lbs)
- Enclosure: gasket-sealed, weatherproof

>> WETTED MATERIALS

304 and 316 stainless steel, chromium, NBR rubber, natural rubber, POM, polyurethane (cable)

>> TEMPERATURE LIMITS

- **PUMP**
water temp. 13° C to 28° C (55° F to 82° F) Other ranges are available pls. indicate.
- **CONTROLLER EP200 (solar direct & battery)**
Ambient -30° C to 55° C (-22° F to 131°)

>> NEED MORE WATER or GREATER LIFT?

Consider the standard *System PS600* or *PS1200* the instead of the *PS200 Min system*. These systems use more power, to pump as high as 230m (750 ft) or to produce a maximum of 60 m³ per day (16,000 US gallons). They are also appropriate for pressurizing applications. Request separate specification sheets.

DOUBLE SYSTEM

Two pump systems can be installed in the same water source if the well casing is not less than 6" inside diameter. This doubles the daily water volume.

>> INSTALLATION

Install the pump by the same methods and materials used for conventional submersible pumps. The solar array requires nuts-and-bolts assembly and standard wiring practice. The *PS200 Mini* instruction manual is clearly illustrated. No special product training is required.

>> WARRANTY

TWO YEAR manufacturer's warranty against defects in materials and workmanship.



PS200 for 24V SOLAR-DIRECT

6 kWh/m ² /day solar radiation on tilted surface							
total lift [m] [ft]	Pump Model	peak LPM	PV Watts / [L / day]			cable size mm ²	
			80	120	150		
5 16	HR-04	7,2	3500	3800	4000	2,5	
	HR-07	13,0	4000	6000	7000		
10 33	HR-04	6,5	3300	3600	4000	2,5	
	HR-07	13,0	3900	5200	5400		
15 50	HR-04	6,0	2900	3500	4000	2,5	
	HR-07	12,0	3500	5000	5200		
20 65	HR-04	5,8	2500	3300	3900	2,5	
	HR-07	12,0	2400	3800	4900		
25 82	HR-04	5,7	2200	3000	3500	2,5	
30 100	HR-04	5,5	1900	2800	3100	2,5	
40 130	HR-04	5,1	2000	2000	2500	4,0	
50 165	HR-04	5,1	see 36-48V table			4,0	

PS200 for 36-48V SOLAR-DIRECT

6 kWh/m ² /day solar radiation on tilted surface							
total lift [m] [ft]	Pump Model	peak LPM	PV Watts / [L / day]			cable size mm ²	
			150	200	250		
5 16	HR-04	12,0	6300	6600	7300	2,5	
	HR-07	19,5	8500	9500	10500		
	HR-14	36,0	11000	15000	18000		
10 33	HR-04	11,8	6000	6500	7000	2,5	
	HR-07	19,0	8000	9000	10000		
	HR-14	34,0	9000	13000	16000		
15 50	HR-04	11,5	5500	6000	6800	2,5	
	HR-07	18,5	7000	8300	9500		
	HR-14	33,0	8000	11000	14000		
20 65	HR-04	11,5	5500	6200	6600	2,5	
	HR-07	18,0	6000	7500	9000		
25 82	HR-04	11,3	5000	5600	6200	2,5	
	HR-07	17,5	5000	6500	8000		
30 100	HR-04	11,0	4300	4900	5800	2,5	
40 130	HR-04	11,0	3000	4000	5000	4,0	
50 165	HR-04	10,5	2000	3000	4200	4,0	

PS200 for 24V SOLAR-DIRECT

4 kWh/m ² /day solar radiation on tilted surface							
total lift [m] [ft]	Pump Model	peak LPM	PV Watts / [L / day]			cable size mm ²	
			80	120	150		
5 16	HR-04	7,2	2200	2500	2800	2,5	
	HR-07	13,0	2000	3500	4700		
10 33	HR-04	6,5	2000	2300	2600	2,5	
	HR-07	13,0	1700	3000	4200		
15 50	HR-04	6,0	1800	2000	2400	2,5	
	HR-07	12,0	1500	2800	3900		
20 65	HR-04	5,8	1400	1600	2200	2,5	
	HR-07	12,0	1100	2500	3700		
25 82	HR-04	5,7	1100	1500	2100	2,5	
30 100	HR-04	5,5	800	1200	2000	2,5	
40 130	HR-04	5,1	1000	1000	1800	4,0	
50 165	HR-04	5,1	see 36-48V table			4,0	

PS200 for 36-48V SOLAR-DIRECT

4 kWh/m ² /day solar radiation on tilted surface							
total lift [m] [ft]	Pump Model	peak LPM	PV Watts / [L / day]			cable size mm ²	
			150	200	250		
5 16	HR-04	12,0	4800	5400	6400	2,5	
	HR-07	19,5	4700	7000	8500		
10 33	HR-04	11,8	4500	5000	6000	2,5	
	HR-07	19,0	4200	6000	7500		
15 50	HR-04	11,5	4000	4600	5700	2,5	
	HR-07	18,5	3900	6000	7400		
20 65	HR-04	11,5	3300	4200	5400	2,5	
	HR-07	18,0	4000	5500	7000		
25 82	HR-04	11,3	2600	3600	5100	2,5	
	HR-07	17,5	2500	2500	4000		
30 100	HR-04	11,0	2000	3000	4800	2,5	
40 130	HR-04	11,0	1700	2400	3500	4,0	
50 165	HR-04	10,5	1300	2000	3000	4,0	

>> NOTES FOR SOLAR-DIRECT APPLICATIONS

PV WATTS = The minimum solar (PV) array rating required. An array of less watts may be unable to start the pump satisfactorily. More PV watts will allow the pump to reach full flow rate in lower sunlight conditions. Up to 300 watts can be installed. To allow unexpected draw down, a pump can handle an additional 15 % lift beyond the specifications.

A smaller pump type that can produce the required flow will have better performance during low light periods, while the larger pump may be not able to start.

WIRE SIZES Cable Size = the minimum required wire size for the cable from the controller to the pump, based on a distance of vertical lift + 10m

Variations:

GREATER LENGTH: for each 150 % increase, the next larger wire size is required.

VERTICAL LIFT = total dynamic head = the vertical distance from the draw-down level of the water source, to the pipe outlet or top of storage tank + pipe friction losses.

>> NOTES FOR BATTERY APPLICATIONS

See separate Battery table for Models and performance

>> How To Order a PS200 Pump System

Item # 1007-X for a PS200 HR-04 system

Item # 1009-X for a PS200 HR-07 system

Item # 100

Above systems include:

- Controller PS200 (#1307),
- Pump Wet End HR-04 (#1430) or Wet End HR-07 (#1440)
- Motor ECDRIVE 600-HR (#1720)
- Well probe sensor (#1658)

PS200 *Mini*

A Revolution in Solar Pumping

We call it „*Mini*“ though it gives water for...



150 cattle

200 camels



650 pigs



1,000 sheep

or 32,000 chicken



That's what you can do with 6,000 litres of water on a summer day. Far away from the utility grid, PS200 *Mini* brings up more water for your live stock, irrigation, or your remote residence than any other pump of comparable size.

Thanks to its superior and reliable technology, the efficiency of PS200 *Mini* is higher than that of any other solar pump in the market. Compare yourself! The *Mini* Workhorse delivers 6,000 litres 15 m high with a 150 Wp array. With just 120 Wp PS200 *Mini* transports 2,200 litres of water from a depths of 30 m.

(*Figures based on 5.5 Peak Sun hours per day, array losses due to high temp. & dirt as well as cable losses included in our table)

You only want to install 80 Wp? PS200 *Mini* manages to push over 2,000 litres over 20 m vertical lift and through a 3000m (~2 Miles) long 1" pipeline !

Our helical rotor pump is known as a very simple and reliable pump. It just consists of a rotor and a stator. The motor is as simple as a conventional AC motor, water filled and without any brushes !

Choose Reliability – Choose LORENTZ

See overleaf for more detailed information!

www.LORENTZ.de

