

Solar or battery-operated Submersible Pump System 4” Helical Rotor (HR) or Centrifugal (C) Pump Unit

Submersible solar pumps | Technical data

Lorentz PS600 HR/C

| Performance

- | Lift up to 600 feet
- | Flow rate up to 43 GPM
- | Simple installation
- | Maintenance-free
- | High reliability and life expectancy
- | Cost-effective pumping solution

| Application

- | Livestock watering
- | Drinking water
- | Pond management
- | Irrigation systems

| PS600 Controller

- | PV direct or battery powered operation
- | Electronics all above ground
- | Two Separate control inputs for dry run protection and tank float switch
- | Automatic reset after low water protection engages
- | Protected against reverse polarity, overload and temperature
- | Speed control, maximum pump speed adjustable to reduce flow rate to approximately 30%
- | Solar operation: integrated MPPT (Maximum Power Point Tracking)
- | Battery operation: low voltage disconnect and restart after battery has recovered
- | Maximum efficiency 92% (motor + controller)
- | Enclosure: IP 54 (sealed and weatherproof)

| Pump End (PE)

- | High life expectancy
- | Non-return check valve
- | Dry running protection (optional)
- | Material: stainless steel (AISI 316),rubber

| For HR Pumps only

- | Helical rotor pump (positive displacement pump)
- | Field Serviceable
- | More resistant to damage by sand than other pumps
- | Self-cleaning design



SOLAR PUMPING SYSTEM

| Motor EC Drive 600 H/C

- | Brushless DC motor, 3-Phase (PWM)
- | No electronics inside motor
- | Water filled
- | IP 68, pressure balanced, max. submersion unlimited
- | Dynamic slide bearings, material: carbon/ceramic
- | Wetted material: stainless steel (AISI 316), POM, rubber, cable drinking water approved



Lorentz PS600 HR/C

System Voltage: 48-72 VDC nominal, VOC 150VDC Max.

Lift Limits: The systems above are selected for optimum performance. To allow unexpected draw down, each system can handle an additional 15% drawdown.

How daily water volume is calculated.

Daily water volume is calculated by integrating real flow vs. realistic solar (PV) output though the day. (Peak sun hours/day = kWh/sq.m./day)

Calculations include a 10% PV output degradation (heat, dirt etc.) Cable losses are included at maximum allowable length. The solar array is fixed at tilt angle = latitude of location. For central USA, seasonal adjustment of the tilt angle increases daily volume by about 8% summer, 5% winter. Flow rates may vary +/- 10%. Specifications are subject to change.

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VERTICAL LIFT	16 Feet 5 m		33 Feet 10 m		50 Feet 15 m		65 Feet 20 m		100 Feet 30 m		133 Feet 40 m		165 Feet 50 m		200 Feet 60 m		230 feet 70 m		
	Fixed	Tracked	Fixed	Tracked	Fixed	Tracked	Fixed	Tracked	Fixed	Tracked	Fixed	Tracked	Fixed	Tracked	Fixed	Tracked	Fixed	Tracked	
US Gallons per day																			
PEAK SUN	7.5 hrs/day	11888	17171	5000	7130	5000	6870	3960	5710	1980	2510	1640	2300	1590	2090	1240	1800	1000	1400
	6 hrs/day	10038	13737	4090	5710	3950	5410	2910	4110	1650	2160	1420	1950	1260	1670	990	1400	800	1100
	4.5 hrs/day	7660	10039	3170	4280	2900	3940	1850	2500	1320	1800	1190	1590	920	1240	7400	1000	600	800
300 Wp		C-SJ8-5		HR-14						HR-04						HR-03			
Gallons Per Minute		29.0		12.3		10.6		9.5		3.6		3.5		3.3		2.9		1.8	
Wire size/max. length		#10 / 150 ft																	
PEAK SUN	7.5 hrs/day	13737	20605	5800	7900	6000	7700	4700	6900	3700	5300	1800	2300	1600	2200	1500	2100	1300	1800
	6 hrs/day	11360	16379	5000	6900	4800	6300	4000	5200	2600	3700	1700	2200	1500	2000	1300	1800	1100	1500
	4.5 hrs/day	8700	11600	4200	5800	3700	5000	2600	3600	1600	2100	1600	2100	1200	1600	1100	1500	900	1300
350 Wp		C-SJ8-5		HR-14						HR-04									
Gallons Per Minute		33.0		12.3		10.6		9.5		7.9		3.5		3.3		2.9		2.6	
Wire size/max. length		#10 / 150 ft																	
PEAK SUN	7.5 hrs/day	15800	23700	6900	8300	6300	8000	5300	7700	4200	6100	2300	3300	1800	2300	1600	2200	1500	2000
	6 hrs/day	13200	19000	5800	7100	5200	6700	4500	6300	3200	4500	2000	2800	1600	2100	1400	1900	1300	1700
	4.5 hrs/day	10300	14000	4600	6200	4000	5400	3700	5000	2100	2900	1700	2300	1300	1900	1200	1600	1100	1400
420 Wp		C-SJ8-5		HR-14						HR-07		HR-04							
Gallons Per Minute		35.7		11.4		11.0		10.0		9.0		5.3		3.4		3.0		2.7	
Wire size/max. length		#10 / 150 ft																	
PEAK SUN	7.5 hrs/day	17400	25000	8900	12950	7900	11300	5800	8000	4800	6900	3700	4200	2900	4100	2300	3300	1600	2300
	6 hrs/day	14800	21100	7400	10000	6300	8500	5000	7100	4000	4900	2600	3700	2300	3200	1900	2600	1500	2000
	4.5 hrs/day	11600	15800	5800	7400	4700	6300	4000	5600	3200	4200	1900	2500	1500	2000	1300	1700	1200	1600
480 Wp		C-SJ8-5		C-SJ8-5				HR-14				HR-07				use HR-04 with # 10/230 ft		HR-04	
Gallons Per Minute		38.3		21.1		19.8		11.1		9.5		7.4		5.3		5.0		3.4	
Wire size/max. length		#10 / 130 ft																	
PEAK SUN	7.5 hrs/day	21600	29500	15800	22700	10000	15000	7000	8000	5700	7600	4500	6500	3600	5000	2600	3800	2300	3300
	6 hrs/day	18700	25800	13200	18400	8400	12000	6000	7500	4700	6300	3600	5000	2800	3800	2300	3200	1900	2800
	4.5 hrs/day	14800	19500	9500	12400	6300	8700	5000	6600	3700	5000	2600	3600	2100	2600	1900	2500	1600	2300
660 Wp		C-SJ8-5		C-SJ8-5				HR-14				HR-07							
Gallons Per Minute		43.6		35.7		23.8		11.4		11.0		10.5		10.0		5.3		5.2	
Wire size/max. length		#10 / 85 ft																	
PEAK SUN	7.5 hrs/day	23000	33000	17400	24500	11000	16100	8700	12400	6300	8000	5300	7700	4700	6800	2900	3800	2700	3800
	6 hrs/day	20000	28000	14200	20600	9200	13200	6800	9500	5400	7000	4800	6600	3700	5000	2600	3700	2400	3400
	4.5 hrs/day	15500	21000	10300	14000	6600	8900	5800	7900	4500	6000	4100	5600	2400	3200	2400	3300	2100	2900
720 Wp		C-SJ8-5		C-SJ8-5				HR-14				HR-07							
Gallons Per Minute		46.2		38.3		25.0		19.8		11.5		11.4		10.2		5.4		5.3	

Solar-Powered Submersible Pump System 4” Helical Rotor (HR) or Centrifugal (C) Pump Unit

Submersible solar pumps | Technical data



Wire Sizes

Cable layout is calculated to stay within 5% power loss. Select PS1200 system to save \$ on cable!
 Pump Cable, Example: #10/250ft. = maximum allowable length (controller to pump) for that wire size.

Variations

Greater Length: for each 150% increase, the next larger wire size is required. Shorter Length: for each 33% decrease, the next smaller wire is allowed. Array to controller: if <20ft.—#10 Controller to Low Water Probe: #18 minimum, 2-Wire Controller to Float Switch: #18 minimum, 2-Wire

Pump Outlet Type:
 HR-03H,04H,04,07=1" NPT
 HR-14,20=1-1/4" NPT
 C-BF-04=1-1/2" NPT
 C-BF-03=2" NPT

265 Feet 80 m		300 Feet		330 Feet 100m		400 Feet 120m		460 Feet 140m		530 Feet 160m		600 Feet 180m		660 Feet 200m		760 Feet 230m		VERTICAL LIFT		
Fixed	Tracked	Fixed	Tracked	Fixed	Tracked	Fixed	Tracked	Fixed	Tracked	Fixed	Tracked	Fixed	Tracked	Fixed	Tracked	Fixed	Tracked			
US Gallons per day																			PEAK SUN	7.5 hrs/day
850	1250	700	1100	650	1000	600	900	500	720	INSTRUCTIONS (1) Find the LIFT you require and read the column below it.										6 hrs/day
680	970	550	830	480	710	430	620	340	490											4.5 hrs/day
500	680	400	550	300	410	250.00	340	180	250	Attention: WIRE SIZING \$\$\$ Especially for Lifts greater 100m / 330ft compare wire sizes with PS 1200 system. Due to higher system voltage lots of \$ can be saved on the pump										300 Wp
1.7		1.6		1.5		1.4		1.3												Gallons Per Minute
#10 / 330 ft				#8 / 450 ft						Wire size/max. length										
1000	1350	900	1320	850	1240	790	1140	710	1060	PEAK SUN	7.5 hrs/day									
870	1160	790	1060	710	1030	660	870	530	770		6 hrs/day									
740	1000	690	920	580	790	450	610	340	480	4.5 hrs/day										
More Lift ? Choose PS1200 System for greater lift applications and lower cable cost																			350 Wp	
2.2		2.0		1.9		1.8		1.7		Gallons Per Minute										
#10 / 330 ft				#8 / 450 ft						Wire size/max. length										
1240	1820	1190	1420	1060	1320	980	1320	790	1110	PEAK SUN	7.5 hrs/day									
1020	1440	980	1240	850	1100	790	1080	660	910		6 hrs/day									
790	1060	770	1030	630	870	610	850	530	710	4.5 hrs/day										
HR-04H		HR-03						HR-03H				420 Wp								
2.5		2.1		2.0		1.9		1.8		1.6		1.4		Gallons Per Minute						
#10 / 330 ft				#8 / 450 ft						#6 / 600 ft					Wire size/max. length					
1510	2170	1450	2110	1320	1850	1190	1720	870	1190	PEAK SUN	7.5 hrs/day									
1270	1770	1160	1720	1000	1400	900	1270	790	1060		6 hrs/day									
1030	1370	870	1190	690	920	580	790	690	920	4.5 hrs/day										
HR-04H		HR-03						HR-03H				480 Wp								
3.2		3.0		2.7		2.5		1.9		1.7		1.5		Gallons Per Minute						
#6 / 420 ft				#8 / 450 ft						#6 / 600 ft					Wire size/max. length					
2110	3040	1720	2300	1450	2060	1350	1960	1190	1690	PEAK SUN	7.5 hrs/day									
1720	2440	1450	1960	1290	1760	1070	1530	920	1310		6 hrs/day									
1320	1850	1190	1590	1140	1450	790	1110	660	920	4.5 hrs/day										
HR-07		HR-04H						660 Wp												
5.0		3.4		3.3		3.2		3.1		Gallons Per Minute										
#8 / 265 ft				#6 / 420 ft						Wire size/max. length										
2500	3600	2300	3300	1590	2300	1510	2170	1400	1850	PEAK SUN	7.5 hrs/day									
2200	3000	2000	2800	1530	2110	1320	1800	1160	1590		6 hrs/day									
1900	2500	1600	2100	1450	1960	1060	1430	920	1240	4.5 hrs/day										
HR-07		HR-04H						720 Wp												
5.2		5.0		3.3		3.3		3.2		Gallons Per Minute										
#8 / 300 ft				#6 / 500 ft						Wire size/max. length										
2600	3700	2500	3600	1800	2000	1700	2000	1590	1980	PEAK SUN	7.5 hrs/day									
2400	3200	2200	3100	1600	1800	1500	1700	1370	1850		6 hrs/day									
2100	2800	1900	2600	1400	1700	1300	1600	1160	1590	4.5 hrs/day										
HR-07		HR-04H						840 Wp												
5.2		5.0		3.3		3.3		3.2		Gallons Per Minute										
#8 / 300 ft				#6 / 500 ft						Wire size/max. length										

MORE WATER

(2) Find the DAILY VOLUME you require
 at 7.5 peak sun hrs/day
 at 6.0 peak sun hrs/day
 at 4.5 peak sun hrs/day

(3) Use the PEAK FLOW RATE for pipe sizing.

(4) Wire size / max. length (see below)

Daily solar radiation:
 7.5 = moderately dry

Solar or battery-operated Submersible Pump System 4” Helical Rotor (HR) or Centrifugal (C) Pump Unit

Submersible solar pumps | Technical data

Lorentz PS600 HR/C

| Sand and Silt Tolerance

- | The pump (HR) has a higher resistance to wear from sand and clay than any other pump type. In properly constructed wells the amount of sand and clay is within the tolerance of the pump.
- | 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 the pump to clean out a dirty well.

| Pump Cable and Splice

- | Standard submersible cable, 3-wire + ground (total)
- | 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 the pump to clean out a dirty well.

| Drop Pipe

- | 1-1/4”, 1-1/2” or 2” NPT pump 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.

| Temperature Limits

- | Pump: Specify temperature class on order
 - Class 1 46° F to 72° F
 - Class 2 64° F to 90° F
 - Class 3 82° F to 108° F
- Controller: ambient temperature -22° F to +131° F

| Warranty

- | 2 Years manufacturer’s warranty against defects in material and workmanship.

Technical data Lorentz PS600:									
	HR-03	HR-03H	HR-04	HR-04H	HR-07	HR-14	HR-20	C-BF-04	C-DF-03
Lift [ft]	230-460	530-600	100-230	265-460	133-300	0-165	100	50	16
Max. Flow Rate [gpm]	2.2	1.7	3.6	3.4	7.4	12.3	15	32	43
Max. Efficiency [%]	60	64	60	65	64	65	64	40	40
Solar Operation	nominal voltage 48-72 V DC open circuit voltage max. 150 V DC								
Solar Generator [Wp]	300-480	420-900	300-480	420-900	420-900	300-900	420-900	300-900	720-900
Battery Operation	nominal voltage 48 V DC								
Pump & Motor									
Diameter	3.78" (96mm)								
Height	20"-32" (500-800mm) depending on model								
Weight	25 lbs (11.5 kg) or less, depending on model								
Controller									
Dimension	17" x 7" x 6" (425 x 175 x 150mm)								
3 Conduit Holes	1/2", 3/4" and 1 1/4" KO								
Weight	11 lbs (4.8 kg)								