

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

Submersible solar pumps | Technical data

Lorentz PS1200 HR/C

| Performance

- | Lift up to 760 feet
- | Flow rate up to 45 GPM
- | Simple installation
- | Maintenance-free
- | High reliability and life expectancy
- | Cost-effective pumping solution

| Application

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

| PS1200 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 1200 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 PS1200 HR/C

System Voltage: 72-96 VDC nominal, VOC 200VDC Max.

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)

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

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.

M O R E W A T E R

VERTICAL LIFT	16 Feet 5m		33 Feet 10m		50 Feet 15m		65 Feet 20m		100 Feet 30m		133 Feet 40m		165 Feet 50m		200 Feet 60m		230 Feet 70m		
	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	13700	20600	5800	7900	6000	7700	4700	6900	3700	5300	1800	2300	1600	2200	1500	2100	1300	1800
	6 hrs/day	11300	16300	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	
fire size/max. Leng		#12 / 200 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		35.5		11.4		11.0		10.0		9.0		5.3		3.4		3.0		2.7	
fire size/max. Leng		#12 / 150 ft																	
PEAK SUN	7.5 hrs/day	17400	25000	8975	12900	7900	11300	5800	7900	4800	6900	3700	5300	2900	3800	2300	3300	1600	2300
	6 hrs/day	14700	21100	7300	10000	6300	8400	5000	7100	4000	4900	2600	3700	2300	3200	1900	2600	1500	2000
	4.5 hrs/day	11600	15800	5800	7300	4700	6300	3900	5500	3200	4200	1900	2500	1500	2000	1300	1700	1200	1600
480 Wp		C-SJ8-5				C-SJ8-5				HR-14				HR-07					
Gallons Per Minute		38.0		21.0		19.8		11.1		9.5		7.4		5.3		5.0		4.4	
fire size/max. Leng		#12 / 150 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	14700	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		43.5		35.5		23.5		11.4		11.0		10.5		10.0		5.3		5.2	
fire size/max. Leng		#12 / 150 ft																	
PEAK SUN	7.5 hrs/day	22900	33000	17400	24500	11000	16100	8700	12400	6600	9500	5300	7700	4700	6800	2900	3800	2700	3800
	6 hrs/day	20000	28000	14200	20600	9200	13200	6800	9500	5800	7900	4800	6600	3700	5000	2600	3700	2400	3400
	4.5 hrs/day	15500	21000	10300	14000	6600	8900	5800	7900	4600	6300	4100	5600	2400	3200	2400	3300	2100	2900
720 Wp		C-SJ8-5				C-SJ8-5				HR-14				HR-07					
Gallons Per Minute		46.0		38.0		25.0		19.8		14.0		11.4		10.2		5.4		5.3	
fire size/max. Leng		#10 / 250 ft																	
PEAK SUN	7.5 hrs/day	25300	35000	19500	29000	15000	22400	10500	15800	6300	7900	5800	7900	5000	7100	3600	5200	2700	3800
	6 hrs/day	22000	29000	16600	24000	11800	17000	8700	12400	5800	7600	5500	7300	4200	6000	3100	4400	2600	3700
	4.5 hrs/day	17900	24300	12000	16300	7900	10800	6600	8900	5200	6800	4700	6300	3400	4700	2640	3600	2400	3400
840 Wp		C-SJ8-5				C-SJ8-5				HR-14				HR-10		HR-07			
Gallons Per Minute		48.0		38.0		25.0		19.8		14.0		11.4		10.2		5.4		5.3	
fire size/max. Leng		#10 / 250 ft																	
PEAK SUN	7.5 hrs/day	38000	54000	22000	33000	17000	20600	11300	15800	8900	12600	6600	9500	5500	7700	4400	6600	3650	5200
	6 hrs/day	34300	48800	19200	27700	14500	20600	8900	11800	7100	9500	5800	7900	4800	6600	3700	5600	3150	4450
	4.5 hrs/day	27200	36000	12400	17000	10300	13400	6800	8700	6000	81	4800	6300	4000	5300	3000	4200	2600	3650
1000 Wp		C-SJ12-3				C-SJ8-5				C-SJ8-5				HR-14				HR-10	
Gallons Per Minute		81.0		47.5		42.0		26.0		23		13.8		10.4		10.0		5.3	
fire size/max. Leng		#10 / 250 ft																	
PEAK SUN	7.5 hrs/day	42200	59400	31700	47500	20600	29000	15800	23000	11000	15800	8450	11800	5800	7900	4700	6800	3900	5500
	6 hrs/day	39600	50100	25300	35300									5300	7100	4200	6100		
	4.5 hrs/day													4800	6300	3700	5000		
1200 Wp		C-SJ12-3				C-SJ8-5				C-SJ8-5 (max. 40m)				HR-14				HR-10	
Gallons Per Minute		89.0		75.0		43.5		38.0		23		17.5		10.4		10.0		5.3	
fire size/max. Leng		#10 / 250 ft																	

Solar-Powered Submersible Pump System 4"

Submersible solar pumps | Technical data

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

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

265 Feet 80m		300 Feet 90m		330 Feet 100m		400 Feet 120m		460 Feet 120m		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	Fixed	Tracked	PEAK SUN	Gallons Per Minute fire size/max. Leng
US Gallons per day																		INSTRUCTIONS (1) Find the Lift you require, and read the column below it.		7.5 hrs/day	
1000	1350	900	1320	850	1240	790	1140	710	1060											6 hrs/day	
870	1160	790	1060	710	1030	660	870	530	770											4.5 hrs/day	
740	1000	690	920	580	790	450	610	340	480									350 Wp			
2.2		2.0		1.9		1.8		1.7										Gallons Per Minute fire size/max. Leng			
#10 / 500 ft																					
420 Wp																					
1240	1820	1190	1420	1060	1320	980	1320	790	1110	610	850	450	630							7.5 hrs/day	
1020	1440	980	1240	850	1100	790	1080	660	910	530	710	360	500							6 hrs/day	
790	1060	770	1030	630	870	610	850	530	710	450	580	260	370							4.5 hrs/day	
HR-04H		HR-03		HR-03H		HR-03H		HR-03H		HR-03H		HR-03H								420 Wp	
23.0		2.0		2.0		1.9		1.7		1.6		1.6								Gallons Per Minute fire size/max. Leng	
#10 / 400 ft		#10 / 500 ft		#8 / 750 ft																	
480 Wp																					
1510	2170	1450	2110	1320	1850	1190	1720	870	1190	740	1060	610	790	500	710	420	610			7.5 hrs/day	
1270	1770	1160	1720	1000	1400	900	1270	790	1060	630	870	500	660	420	580	340	480			6 hrs/day	
1030	1370	870	1190	690	920	580	790	690	920	500	660	400	530	320	420	260	340			4.5 hrs/day	
HR-04H		HR-03		HR-03H		HR-03H		HR-03H		HR-03H		HR-03H		HR-03H		HR-03H				480 Wp	
3.2		3.0		2.7		2.5		1.9		1.7		1.6		1.6		1.5				Gallons Per Minute fire size/max. Leng	
#10 / 450 ft		#10 / 500 ft		#8 / 750 ft																	
660 Wp																					
2110	3040	1720	2320	1450	2060	1350	1960	1190	1690	870	1220	850	1140	790	1080	550	980			7.5 hrs/day	
1720	2440	1450	1960	1290	1760	1070	1530	920	1310	790	1100	740	990	660	870	480	750			6 hrs/day	
1320	1850	1190	1590	1140	1450	790	1110	660	920	710	980	630	850	530	660	400	530			4.5 hrs/day	
HR-07		HR-04H		HR-04H		HR-04H		HR-04H		HR-03H		HR-03H		HR-03H		HR-03H				660 Wp	
5.0		3.4		3.3		3.2		3.1		1.8		1.8		1.8		1.7				Gallons Per Minute fire size/max. Leng	
#10 / 300 ft		#10 / 450 ft		#8 / 750 ft																	
720 Wp																					
2500	3600	2300	3300	1590	2300	1510	2170	1400	1850	980	1320	920	1240	870	1110	790	1060			7.5 hrs/day	
2200	3000	2000	2800	1530	2110	1320	1800	1160	1590	920	1250	870	1150	790	1030	660	900			6 hrs/day	
1900	2500	1600	2100	1450	1960	1060	1430	920	1240	870	1190	790	1060	710	950	530	710			4.5 hrs/day	
HR-07		HR-04H		HR-04H		HR-04H		HR-04H		HR-03H		HR-03H		HR-03H		HR-03H				720 Wp	
5.2		5.0		3.3		3.3		3.2		1.8		1.8		1.8		1.7				Gallons Per Minute fire size/max. Leng	
#10 / 350 ft		#10 / 500 ft		#8 / 750 ft																	
840 Wp																					
2600	3700	2500	3600	2100	3200	1900	2800	1590	1980	1110	1370	1060	1320	980	1160	870	1110			7.5 hrs/day	
2400	3200	2200	3100	1900	2800	1700	2400	1370	1850	1020	1310	950	1230	890	1120	810	1050			6 hrs/day	
2100	2800	1900	2600	1700	2300	1500	2000	1160	1590	920	1240	850	1140	790	1080	740	1000			4.5 hrs/day	
HR-07		HR-04H		HR-04H		HR-04H		HR-04H		HR-03H		HR-03H		HR-03H		HR-03H				840 Wp	
5.2		5.0		4.8		4.6		3.2		1.8		1.8		1.8		1.7				Gallons Per Minute fire size/max. Leng	
#10 / 400 ft		#10 / 500 ft		#8 / 750 ft																	
1000 Wp																					
3400	4700	2600	3600	2400	3300	2300	3200	1720	2110									7.5 hrs/day			
2900	3900	2400	3300	2100	2900	2000	2800	1530	1960									6 hrs/day			
2300	3100	2100	2900	1900	2500	1800	2400	1320	1800									4.5 hrs/day			
HR-10		HR-07		HR-04H		HR-04H		HR-04H										1000 Wp			
7.9		5.0		4.8		4.6		3.2										Gallons Per Minute fire size/max. Leng			
#10 / 300 ft		#10 / 400 ft																			
1200 Wp																					
3600	5200	2900	3600	2600	3300	2500	3200	1850	2300									7.5 hrs/day			
3400	4400	2600	3400	2400	3100	2300	2900	1690	2250									6 hrs/day			
2900	3900	2400	3300	2100	2900	2000	2600	1510	2030									4.5 hrs/day			
HR-10		HR-07		HR-04H		HR-04H		HR-04H										1200 Wp			
7.5		5.0		4.8		4.6		3.2										Gallons Per Minute Wire size/max. Length			
#10 / 300 ft		#10 / 400 ft																			

(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 (For more water, look further down the volume.)

(3) Use the PEAK FLOW RATE for pipe sizing

Daily solar radiation: 7.5 = moderately dry summer weathcr

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

MORE WATER

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

Submersible solar pumps | Technical data

Lorentz PS1200 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.

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

- | 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.

| 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

| Drop Pipe

- | 1-1/4”, 1-1/2” or 2” NPT pump outlet, If water is dirty, consider

| Warranty

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

Technical data Lorentz PS1200:

	HR-03	HR-03H	HR-04	HR-04H	HR-07	HR-14	HR-20	C-BF-04	C-DF-03
Lift [ft]	265-460	530-760	133-230	265-460	133-400	0-200	0-133	0-65	0-33
Max. Flow Rate [gpm]	2.2	1.8	3.5	3.4	1.2	12.3	15	32	45
Max. Efficiency [%]	60	64	60	65	64	65	64	40	40
Solar Operation	nominal voltage 72-96 V DC								
	open circuit voltage max. 200 V DC								
Solar Generator [Wp]	350-480	420-900	350-420	420-1,200	420-1,200	350-1,200	480-1,200	350-1,200	840-1,200
Battery Operation	nominal voltage 72-96 V DC								
Pump & Motor									
Diameter	3.78” (96 mm)								
Height	20”-32” (500-800 mm) 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 150 mm)								
3 Conduit Holes	1/2”, 3/4” and 1 1/4” KO								
Weight	11 lbs (4.8 kg)								