

# 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

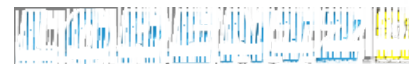
- | PV direct or battery powered operation
- | Electronics all above ground
- | Two Separate control inputs for dry run protection and tank float switch
- | Automatic reset after low water protection engages
- | Protected against reverse polarity, overload and temperature
- | Speed control, maximum pump 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	9250	13210	5000	7130	5000	6870	3960	5710	1980	2510	1640	2300	1590	2090	1240	1800	1000	1400
	hrs/day	7930	11100	4090	5710	3950	5410	2910	4110	1650	2160	1420	1950	1260	1670	990	1400	800	1100
	4.5 hrs/day	6600	8980	3170	4280	2900	3940	1850	2500	1320	1800	1190	1590	920	1240	7400	1000	600	800
300 Wp		C-BF-04		HR-14						HR-04						HR-03			
Gallons Per Minute		21.0		12.3		10.6		9.5		3.6		3.5		3.3		2.9		1.8	
Wire size/max. length		#10 / 150 ft										#10 / 250 ft							
PEAK SUN	7.5 hrs/day	11100	16100	5800	7900	6000	7700	4700	6900	3700	5300	1800	2300	1600	2200	1500	2100	1300	1800
	hrs/day	9800	14000	5000	6900	4800	6300	4000	5200	2600	3700	1700	2200	1500	2000	1300	1800	1100	1500
	4.5 hrs/day	8500	11600	4200	5800	3700	5000	2600	3600	1600	2100	1600	2100	1200	1600	1100	1500	900	1300
350 Wp		C-BF-04		HR-14						HR-04									
Gallons Per Minute		21.0		12.3		10.6		9.5		7.9		3.5		3.3		2.9		2.6	
Wire size/max. length		#10 / 150 ft										#10 / 250 ft							
PEAK SUN	7.5 hrs/day	12400	18000	6900	8300	6300	8000	5300	7700	4200	6100	2300	3300	1800	2300	1600	2200	1500	2000
	hrs/day	11000	15500	5800	7100	5200	6700	4500	6300	3200	4500	2000	2800	1600	2100	1400	1900	1300	1700
	4.5 hrs/day	9500	13000	4600	6200	4000	5400	3700	5000	2100	2900	1700	2300	1300	1900	1200	1600	1100	1400
420 Wp		C-BF-04		HR-14						HR-07			HR-04						
Gallons Per Minute		23.0		11.4		11.0		10.0		9.0		5.3		3.4		3.0		2.7	
Wire size/max. length		#10 / 150 ft										#10 / 300 ft							
PEAK SUN	7.5 hrs/day	13700	20000	7900	10000	7100	9200	5800	8000	4800	6900	3700	4200	2900	4100	2300	3300	1600	2300
	hrs/day	12200	17200	6500	8500	5800	7700	5000	7100	4000	4900	2600	3700	2300	3200	1900	2600	1500	2000
	4.5 hrs/day	10600	14500	5000	6900	4200	5800	4000	5600	3200	4200	1900	2500	1500	2000	1300	1700	1200	1600
480 Wp		C-BF-04		HR-20			HR-14			HR-07			HR-04 with #10/2		HR-04				
Gallons Per Minute		25.0		15.0		14.5		11.1		9.5		7.4		5.3		5.0		3.4	
Wire size/max. length		#10 / 130 ft										#8 / 230 ft				#10 / 300 ft			
PEAK SUN	7.5 hrs/day	17000	24500	11600	17000	8400	10300	7000	8000	5700	7600	4500	6500	3600	5000	2600	3800	2300	3300
	hrs/day	14800	21000	9500	13500	7100	9100	6000	7500	4700	6300	3600	5000	2800	3800	2300	3200	1900	2800
	4.5 hrs/day	12700	17400	7400	10000	5800	7900	5000	6600	3700	5000	2600	3600	2100	2600	1900	2500	1600	2300
660 Wp		C-BF-04			HR-20			HR-14						HR-07					
Gallons Per Minute		30.0		28.0		15.0		11.4		11.0		10.5		10.0		5.3		5.2	
Wire size/max. length		#10 / 85 ft						#10 / 130 ft						#8 / 230 ft					
PEAK SUN	7.5 hrs/day	18500	26400	13200	18800	9500	13500	7700	10600	6300	8000	5300	7700	4700	6800	2900	3800	2700	3800
	hrs/day	16400	23300	11400	15600	7400	10600	6900	9500	5400	7000	4800	6600	3700	5000	2600	3700	2400	3400
	4.5 hrs/day	14000	20000	9300	12400	5300	7400	6100	8500	4500	6000	4100	5600	3200	2400	3300	2100	2900	
720 Wp		C-BF-04			HR-20			HR-14						HR-07					
Gallons Per Minute		31.0		29.0		25.0		14.3		11.5		11.4		10.2		5.4		5.3	
Wire size/max. length		#10 / 85 ft						#10 / 130 ft						#8 / 230 ft					
PEAK SUN	7.5 hrs/day	20300	29300	14500	21100	10800	15800	8400	10600	7100	10000	5900	8000	5000	7100	2900	3800	2700	3900
	hrs/day	18500	26400	13000	18500	9500	13500	7900	10600	6600	9300	5600	7400	4200	6100	2700	3800	2600	3700
	4.5 hrs/day	16600	23300	11400	15600	7900	10800	7400	10000	6100	8200	4800	6300	3400	4800	2500	3500	2400	3400
840 Wp		C-DF-03		C-BF-04			HR-20			HR-14			HR-07						
Gallons Per Minute		43.0		32.0		29.5		14.5		14.2		11.4		10.3		5.4		5.3	
Wire size/max. length		#10 / 85 ft						#10 / 130 ft						#8 / 230 ft					

## 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																			
850	1250	700	1100	650	1000	600	900	500	720									PEAK SUN	7.5 hrs/day
680	970	550	830	480	710	430	620	340	490										6 hrs/day
500	680	400	550	300	410	250.00	340	180	250										4.5 hrs/day
INSTRUCTIONS (1) Find the LIFT you require and read the column below it.																			
HR-03																			
1.7		1.6		1.5		1.4		1.3											300 Wp
#10 / 330 ft																			Gallons Per Minute
																			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																			
HR-03																			
2.2		2.0		1.9		1.8		1.7											350 Wp
#10 / 330 ft																			Gallons Per Minute
																			Wire size/max. length
1240	1820	1190	1420	1060	1320	980	1320	790	1110	610	850	450	630					PEAK SUN	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																			
2.5		2.1		2.0		1.9		1.8		1.6		1.4							420 Wp
#10 / 330 ft																			Gallons Per Minute
																			Wire size/max. length
1510	2170	1450	2110	1320	1850	1190	1720	870	1190	740	1060	610	790					PEAK SUN	7.5 hrs/day
1270	1770	1160	1720	1000	1400	900	1270	790	1060	630	870	500	660						6 hrs/day
1030	1370	870	1190	690	920	580	790	690	920	500	660	400	530						4.5 hrs/day
HR-04H																			
3.2		3.0		2.7		2.5		1.9		1.7		1.5							480 Wp
#6 / 420 ft																			Gallons Per Minute
																			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
(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																			
HR-07																			
5.0		3.4		3.3		3.2		3.1											660 Wp
#8 / 265 ft																			Gallons Per Minute
																			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
(3) Use the PEAK FLOW RATE for pipe sizing.																			
HR-07																			
5.2		5.0		3.3		3.3		3.2											720 Wp
#8 / 300 ft																			Gallons Per Minute
																			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
Daily solar radiation: 7.5 = moderately dry																			
HR-07																			
5.2		5.0		3.3		3.3		3.2											840 Wp
#8 / 300 ft																			Gallons Per Minute
																			Wire size/max. length

MORE WATER

## 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								
<b>Pump &amp; Motor</b>									
Diameter	3.78" (96mm)								
Height	20"-32" (500-800mm) depending on model								
Weight	25 lbs (11.5 kg) or less, depending on model								
<b>Controller</b>									
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)								