

Solar Panels	Vertical Lift (Feet)	16 ft.		33 ft.		50 ft.		65 ft.		100 ft.		133 ft.		165 ft.		200 ft.		230 ft.		265 ft.		300 ft.		330 ft.		400 ft.		460 ft.		530 ft.		600 ft.		Vertical Lift (Feet)	Solar Panels														
	Array Mounting	Fixed	Tracker	Fixed	Tracker	Fixed	Tracker	Fixed	Tracker	Fixed	Tracker	Fixed	Tracker	Fixed	Tracker	Fixed	Tracker	Fixed	Tracker	Fixed	Tracker	Fixed	Tracker	Fixed	Tracker	Fixed	Tracker	Fixed	Tracker	Fixed	Tracker	Fixed	Tracker	Array Mounting	Panels														
Flow Rate Gallons Per Day																																																	
300 Wp	Irradiation kWh/m2/day	7.5	11,888	17,171	5,019	7,133	5,019	6,868	3,963	5,812	1,981	2,510	1,638	2,298	1,585	2,087	1,242	1,796	1,004	1,400	845	1,242	687	1,110	660	1,004	608	898	502	713					7.5	Irradiation kWh/m2/day	300 Wp												
		6	10,039	13,737	3,963	5,812	3,963	5,283	2,906	4,227	1,638	2,166	1,427	1,955	1,268	1,664	977	1,400	793	1,110	687	977	555	819	476	713	423	608	343	476					6														
		4.5	7,661	10,039	3,170	4,227	2,906	3,963	1,849	2,378	1,321	1,796	1,189	1,585	925	1,242	740	1,004	608	793	502	687	396	555	291	423	238	343	185	238					4.5														
	Pump Model	C-SJ8-5		HR-14				HR-04				HR-03				HR-03								Pump Model																									
	Peak Flow Rate - GPM	29.1		12.4		10.6		9.5		3.7		3.4		3.4		2.9		1.8		1.7		1.6		1.5		1.4		1.3		Peak Flow Rate - GPM																			
Wire Size/Max. Length	# 10 is good to 330 Ft.																																	# 8 is good to 330 Ft.				# 8 is good to 450 Ft.				Wire Size/Max. Length							
350 Wp	Irradiation kWh/m2/day	7.5	13,737	20,605	5,812	7,925	6,076	7,661	4,755	6,868	3,698	5,283	1,796	2,298	1,611	2,193	1,506	2,087	1,294	1,796	1,004	1,347	898	1,321	845	1,242	793	1,136	713	1,057					7.5	Irradiation kWh/m2/day	350 Wp												
		6	11,359	16,379	5,019	6,868	4,755	6,340	3,963	5,283	2,642	3,698	1,717	2,193	1,453	1,981	1,268	1,823	1,083	1,532	872	1,162	793	1,057	713	1,030	660	872	528	766					6														
		4.5	8,718	11,624	4,227	5,812	3,698	5,019	2,642	3,698	1,585	2,113	1,585	2,113	1,242	1,638	1,057	1,479	925	1,268	740	1,004	687	925	581	793	449	608	343	476					4.5														
	Pump Model	C-SJ8-5		HR-14				HR-04				HR-04				HR-03								Pump Model																									
	Peak Flow Rate - GPM	33.0		12.4		10.6		9.5		7.9		3.4		3.4		2.9		2.6		2.2		2.0		1.9		1.8		1.7		Peak Flow Rate - GPM																			
Wire Size/Max. Length	# 10 is good to 330 Ft.																																	# 10 is good to 330 Ft.				# 8 is good to 450 Ft.				Wire Size/Max. Length							
420 Wp	Irradiation kWh/m2/day	7.5	15,850	23,775	6,868	8,189	6,340	7,925	5,283	7,661	4,227	6,076	2,298	3,434	1,796	2,298	1,611	2,193	1,506	2,008	1,242	1,823	1,189	1,427	1,057	1,321	977	1,321	793	1,110	608	845	449	634			7.5	Irradiation kWh/m2/day	420 Wp										
		6	13,209	19,020	5,812	7,133	5,019	6,604	4,491	6,340	3,170	4,491	1,981	2,906	1,585	2,087	1,427	1,902	1,268	1,691	1,030	1,453	977	1,242	845	1,110	793	1,083	660	898	528	713	370	502			6												
		4.5	10,303	14,001	4,491	6,340	3,963	5,548	3,698	5,019	2,113	2,906	1,717	2,298	1,321	1,849	1,189	1,585	1,057	1,427	793	1,057	766	1,030	634	872	608	845	528	713	449	581	264	370			4.5												
	Pump Model	C-SJ8-5		HR-14				HR-07				HR-04				HR-04				HR-04H				HR-03				HR-03H				Pump Model																	
	Peak Flow Rate - GPM	35.7		11.4		11.1		10.0		9.0		5.3		3.4		2.9		2.6		2.5		2.1		2.0		1.9		1.8		1.6		1.4		Peak Flow Rate - GPM															
Wire Size/Max. Length	# 10 is good to 330 Ft.																																	# 10 is good to 330 Ft.				# 8 is good to 450 Ft.				# 6 is good to 600 Ft.				Wire Size/Max. Length			
480 Wp	Irradiation kWh/m2/day	7.5	17,435	25,096	8,982	12,944	7,925	11,359	5,812	7,925	4,755	6,868	3,698	4,227	2,906	4,227	2,298	3,434	1,611	2,298	1,506	2,166	1,453	2,113	1,321	1,849	1,189	1,717	872	1,189	740	1,057	608	793			7.5	Irradiation kWh/m2/day	480 Wp										
		6	14,794	21,134	7,397	10,039	6,340	8,454	5,019	7,133	3,963	5,019	2,642	3,698	2,245	3,170	1,849	2,642	1,453	1,955	1,268	1,770	1,162	1,717	1,004	1,400	898	1,268	793	1,057	634	872	502	660			6												
		4.5	11,624	15,850	5,812	7,397	4,755	6,340	3,963	5,548	3,170	4,227	1,849	2,510	1,453	1,981	1,321	1,717	1,189	1,585	1,030	1,374	872	1,189	687	925	581	793	687	925	502	660	396	528			4.5												
	Pump Model	C-SJ8-5		C-SJ5-8				HR-14				HR-07				HR-04 # 10 / 280Ft.				HR-04				HR-04H				HR-03				HR-03H				Pump Model													
	Peak Flow Rate - GPM	38.3		21.1		19.8		11.1		9.5		7.4		5.3		5.0		3.4		3.2		2.9		2.6		2.5		1.9		1.7		1.5		Peak Flow Rate - GPM															
Wire Size/Max. Length	# 10 is good to 130 Ft.																																	# 8 is good to 260 Ft.				# 8 is good to 260 Ft.				# 6 is good to 600 Ft.				Wire Size/Max. Length			
660 Wp	Irradiation kWh/m2/day	7.5	21,662	29,587	15,850	22,719	10,039	15,058	6,868	7,925	5,812	7,661	4,491	6,604	3,698	5,019	2,589	3,804	2,298	3,302	2,113	3,038	1,717	2,113	1,453	2,061	1,347	1,955	1,189	1,691					7.5	Irradiation kWh/m2/day	660 Wp												
		6	18,756	25,889	13,209	18,492	8,454	12,152	6,076	7,661	4,755	6,340	3,698	5,019	2,906	3,963	2,245	3,170	1,928	2,774	1,717	2,430	1,453	1,955	1,294	1,770	1,057	1,532	925	1,321					6														
		4.5	14,794	19,549	9,246	12,416	6,340	8,718	5,019	6,604	3,698	5,019	2,642	3,698	2,113	2,642	1,849	2,510	1,585	2,245	1,321	1,849	1,189	1,585	1,136	1,453	793	1,110	660	925					4.5														
	Pump Model	C-SJ8-5		C-SJ5-8				HR-14				HR-07				HR-07				HR-04H								Pump Model																					
	Peak Flow Rate - GPM	43.6		35.7		23.8		11.4		11.1		10.6		10.0		5.3		5.3		5.0		3.4		3.4		3.2		3.2		Peak Flow Rate - GPM																			
Wire Size/Max. Length	# 10 is good to 130 Ft.																																	# 8 is good to 265Ft.				# 8 is good to 265Ft.				# 6 is good to 420 Ft.				Wire Size/Max. Length			
720 Wp	Irradiation kWh/m2/day	7.5	22,983	33,022	17,435	24,568	11,095	16,114	8,718	12,416	6,340	7,925	5,283	7,661	4,755	6,868	2,906	3,698	2,642	3,698	2,483	3,698	2,298	3,434	1,585	2,113	1,506	2,113	1,400	1,849					7.5	Irradiation kWh/m2/day	720 Wp												
		6	20,077	28,002	14,265	20,605	9,246	13,209	6,868	9,510	5,283	6,868	4,755	6,604	3,698	5,019	2,642	3,698	2,378	3,434	2,166	3,170	1,955	2,906	1,532	1,849	1,321	1,717	1,162	1,559					6														
		4.5	15,586	21,134	10,303	14,001	6,604	8,982	5,812	7,925	4,491	6,076	4,227	5,548	2,378	3,170	2,378	3,170	2,113	2,906	1,849	2,510	1,585	2,140	1,453	1,611	1,057	1,427	925	1,242					4.5														
	Pump Model	C-SJ8-5		C-SJ5-8				HR-14				HR-07				HR-07				HR-04H								Pump Model																					
	Peak Flow Rate - GPM	46.2		38.3		25.1		19.8		11.6		11.4		10.3		5.3		5.3		5.3		5.0		3.4		3.4		3.2		Peak Flow Rate - GPM																			
Wire Size/Max. Length	# 10 is good to 130 Ft.																																	# 8 is good to 300 Ft.				# 8 is good to 300 Ft.				# 6 is good to 500 Ft.				Wire Size/Max. Length			
840 Wp	Irradiation kWh/m2/day	7.5	25,361	35,135	19,549	29,059	15,058	22,455	10,567	15,850	6,340	7,925	5,812	7,925	5,019	7,133	2,906	3,698	2,642	3,963	2,642	3,698	2,483	3,698	1,796	2,113	1,691	2,113	1,585	1,902					7.5	Irradiation kWh/m2/day	840 Wp												
		6	22,190	29,059	16,643	24,040	11,888	17,171	8,718	12,416	5,812	7,661	5,548	7,397	4,227	6,076	2,642	3,698	2,589	3,698	2,351	3,170	2,219	3,170	1,611	1,955	1,506	1,796	1,374	1,691					6														
		4.5	17,964	24,304	12,152	16,379	7,925	10,831	6,604	8,982	5,283	6,868	4,755	6,340	3,434	4,755	2,510	3,434	2,378	3,434	2,061	2,906	1,928	2,589	1,506	1,691	1,242	1,611	1,162	1,585					4.5														
	Pump Model	C-SJ8-5		C-SJ5-8				HR-14				HR-07				HR-07				HR-04H								Pump Model																					
	Peak Flow Rate - GPM	48.9		44.9		39.6		25.1		11.9		11.4		10.3		5.3		5.3		5.3		5.0		3.4		3.4		3.2		Peak Flow Rate - GPM																			
Wire Size/Max. Length	# 10 is good to 130 Ft.																																	# 8 is good to 300 Ft.				# 8 is good to 300 Ft.				# 6 is good to 500 Ft.				Wire Size/Max. Length			

Instructions

1. Lift: Find the lift you require and read the column below it.
2. Daily Volume: Find the daily volume you require at an irradiation of 4.5, 6, or 7.5 kWh/m2/day. 7.5 is a moderately dry summer weather. For more water add more watts or consider a tracker.
3. Pipe Sizing: Use peak flow rate for pipe sizing.
4. Wire Sizing - Max Length

System Voltage

48-72 Volts is nominal (Maximum Open Circuit Voltage is 150V DC)
 Example: 6) 90W-12V panels wired in series would be 540W at 72 Volts.

Lift Limits

These systems are selected for optimum performance. To allow for unexpected drawdown, each system can handle an additional 15% of lift.

Wire Sizes

Cable size is calculated to stay within 4% voltage loss.

Variations in Wire Length

Longer: For each 50% increase the next larger wire size is required.
 Shorter: For each 33% decrease the next smaller wire size is required.

Array to controller: # 10 is good to 20 Ft.

Controller to Dry Well Probe: # 18 is recommended.

Vertical Lifts higher than 330Ft.

For lifts that are higher than 330 Ft. please compare the wire sizes of the PS1200 system. Due to higher system voltage the use of smaller wire is possible and might reduce the overall system cost.

Calculations of Daily Water Volume

Daily volume is calculated by integrating real flow versus realistic solar output throughout the day. Calculations include a 10% PV output degradation to allow for losses due to heat, dirt, etc. Cable losses are included at maximum allowable length. The solar array is fixed at a tilted angle equal to the latitude of the location.

Irradiation: kWh/m2/day = peak sunlight hours/day
 Flow Rates may vary +/- 10%