

SIMPLE STRING SIZING FOR THE T80HV CHARGE CONTROLLER & 48V BATTERIES

The proper number of PV modules for optimum operation of the T80HV Charge Controller is an easy exercise. The paper clarifies the series and parallel connection options for PV modules with 60, 72 and 96 cells each. 0 degrees and 70 degrees C are used as the min and max temperatures to determine the highest Voc and lowest Vmp. See our full White Paper for all the backup details.

Simply stated, for 48 volt batteries, the T80HV input range is 74.2 to 180 volts.

PV STRING COMBINATION OPTIONS:

60 CELL MODULES:

The tables to the right show the total PV array power for the possible combinations of series and parallel modules at 245 and 280 watts each. These sizes represent the ends of the range of the most popular sizes in the 60 cell class.

245 WATT, 60 CELL PV MODULES							
MODULES IN SERIES	NUMBER OF PARALLEL STRINGS						
	1	2	3	4	5	6	7
3	735	1470	2205	2940	3675	4410	5145
4	980	1960	2940	3920	4900	5880	6860
TOTAL PV ARRAY POWER IN WATTS							

The Apollo Solar Combiner Boxes can be arranged to take up to 8 strings and connect them in parallel. The T80HV will harvest up to 5000 watts, but it can handle over 5500 watts without any problem. When the combination of strings yields more power than that, the cell is in gray.

280 WATT, 60 CELL PV MODULES						
MODULES IN SERIES	NUMBER OF PARALLEL STRINGS					
	1	2	3	4	5	6
3	840	1680	2520	3360	4200	5040
4	1120	2240	3360	4480	5600	6720
TOTAL PV ARRAY POWER IN WATTS						

72 CELL MODULES:

These tables show the total PV array power for the possible number of parallel modules at 280 and 300 watts.

280 WATT, 72 CELL PV MODULES						
MODULES IN SERIES	NUMBER OF PARALLEL STRINGS					
	1	2	3	4	5	6
3	840	1680	2520	3360	4200	5040
TOTAL PV ARRAY POWER IN WATTS						

Note that the T80HV may be the only MPPT Charge Controller which can handle these very popular 72 cell PV modules.

300 WATT, 72 CELL PV MODULES						
MODULES IN SERIES	NUMBER OF PARALLEL STRINGS					
	1	2	3	4	5	6
3	900	1800	2700	3600	4500	5400
TOTAL PV ARRAY POWER IN WATTS						

96 CELL MODULES:

This table shows the total PV array power for the possible number of parallel modules at 320 watts average power with 2 module series strings.

Note that since just 2 of these higher voltage modules are used in each string, more strings will be required to achieve the maximum 5000 watts of input power for the T80HV. Note that multiple parallel strings are an advantage for reducing shading problems which cannot be avoided in equatorial region with cell towers on a small site.

320 WATT, 96 CELL PV MODULES								
MODULES IN SERIES	NUMBER OF PARALLEL STRINGS							
	1	2	3	4	5	6	7	8
2	640	1280	1920	2560	3200	3840	4480	5120
TOTAL PV ARRAY POWER IN WATTS								