

Wire Loss One Way for Copper Wire

Maximum distance one way in feet of various gauges 2 conductor copper wire from hydro to battery.

Table for 12V system, at 10% voltage drop; x 2 for 24V; x 4 for 48V; x 8 for 120V.

Use one size larger for Aluminum wire.

AMPS	#14	#12	#10	#8	#6	#4	#2	1/0	2/0	4/0
1	225	350	575	900	1450	2280	3600			
2	112	175	287	450	725	1140	1800	2900	3600	5300
4	50	87	137	225	362	570	900	1450	1800	2900
6	37	60	87	150	237	375	600	965	1215	1900
8	27	42	75	112	177	285	450	725	900	1450
10	22	35	60	90	142	227	362	575	725	1150
15	15	22	35	60	85	150	240	382	480	750
20		17	27	45	72	112	180	287	362	580
25			22	35	57	90	145	230	290	460
30			17	30	47	75	120	192	242	385

If properly sized, hydros can have a larger voltage drop, as they are not 'voltage limited' like solar panels. In some cases, a 50% or larger voltage drop is acceptable, **as long as the final power output matches your needs.** For example, having a 12V hydro 1000 feet away, will result in about 50% loss at 20A, using #2 wire. Meaning, the hydro will be running at 24V, producing 480W, while the battery is at 12V, receiving 240W.

Most systems are designed with a 5 - 30% loss, which is what you would expect to lose in high voltage transformers, etc. This means, you could go up to 3 times the distance suggested in the chart for 12V, 2 to 6 times for 24V, 4 to 12 times for 48V, and 8 to 24 times for 120V.