

Wiring Reference Guide

When additional wiring is needed, refer to the following charts to determine correct sizing. Selecting the correct size and type of wire will enhance the performance and reliability of your PV system. The size of the wire must be large enough to carry the maximum current expected without undue voltage losses. All wire has a certain amount of resistance to the flow of current. This resistance causes a drop in the voltage from the source to the load. Voltage drops cause inefficiencies, especially in low voltage systems (12V or less). There are several different types of wire available depending on how and where it will be used. For example, there are wire types designed for resistance to sunlight exposure, high temperatures and direct burial. Specify wiring that will withstand the worst conditions.

The wire sizing guide below provides the minimum wire size needed to limit voltage drops to 5% at a given distance in a 12V or 24V system. If you want to limit your losses to 2%, simply divide the distance by 2.5. For a 48V system, multiply the distance taken from the 24V chart by 2. The dashes represent currents which cannot be handled by the wire size.

How charts work

1. — On the left, locate the current you will be dealing with (either array or load current.) 2. — Move across to locate distance to be traveled. 3. — Move up to locate size of wire to be used.

Wire Sizing Chart 12 Volt System

Maximum one-way distance (feet) for 5% voltage loss in 12 volt systems. Wire Size (AWG)

Amps	14	12	10	8	6	4	2	1	0	00	000	0000
1	106	169	269	427	679	1080	1717	2166	2730	3444	4342	5475
2	53	85	134	214	340	540	859	1083	1365	1722	2171	2738
4	27	42	67	107	170	270	429	542	682	861	1086	1369
6	18	28	45	71	113	180	286	361	455	574	724	913
8	13	21	34	53	85	135	215	271	341	430	543	684
10	11	17	27	43	68	108	172	217	273	344	434	548
15	7	11	18	28	45	72	114	144	182	230	289	365
20	—	8	13	21	34	54	86	108	136	172	217	274
25	—	—	11	17	27	43	69	87	109	138	174	219
30	—	—	9	14	23	36	57	72	91	115	145	183
35	—	—	—	12	19	31	49	62	78	98	124	156
40	—	—	—	—	17	27	43	54	68	86	109	137
45	—	—	—	—	15	24	38	48	61	77	96	122
50	—	—	—	—	14	22	34	43	55	69	87	110

Wire Sizing Chart 24 Volt System

Maximum one-way distance (feet) for 5% voltage loss in 24 volt systems. Wire Size (AWG)

Amps	14	12	10	8	6	4	2	1	0	00	000	0000
1	213	338	537	854	1359	2160	3434	4332	5460	6887	8684	10951
2	106	169	269	427	679	1080	1717	2166	2730	3444	4342	5475
4	53	85	134	214	340	540	859	1083	1365	1722	2171	2738
6	35	56	90	142	226	360	572	722	910	1148	1447	1825
8	27	42	67	107	170	270	429	542	682	861	1086	1369
10	21	34	54	85	136	216	343	433	546	689	868	1095
15	14	23	36	57	91	144	229	289	364	459	579	730
20	—	17	27	43	68	108	172	217	273	344	434	548
25	—	—	21	34	54	86	137	173	218	275	347	438
30	—	—	18	28	45	72	114	144	182	230	289	365
35	—	—	—	24	39	62	98	124	156	197	248	313
40	—	—	—	—	34	54	86	108	136	172	217	274
45	—	—	—	—	30	48	76	96	121	153	193	243
50	—	—	—	—	27	43	69	87	109	138	174	219