

### VOLTAGE DROP TABLE

#### 6 AND 12 VOLT SYSTEMS

The National Electrical Code limits voltage drop to a maximum of 5% of nominal. The table shows the maximum length of a given battery circuit, assuming that the total load is concentrated at the end of the load circuit. If loads are uniformly spaced (equal watts, equal distances) along the circuit path, all of these distances may be increased, based on the number of heads or fixtures on a given circuit. This may permit a savings by the use of a smaller wire size (see wiring distance formula table).

#### WIRING DISTANCE FORMULA TABLE

Number of Heads	2	3	4	5	6
Multiply Feet by	1.33	1.5	1.6	1.67	1.71

For example, a 36 foot long, 6 volt circuit has 7 watt heads spaced 12 feet apart. According to the voltage drop table, #10 wire must be used at 43 feet for a 5% voltage drop. But, multiplying the 27 feet for #12 wire by 1.5, a 40 1/2 foot wire run is acceptable. Therefore, #12 wire may be used and still meet the 5% voltage drop limitation.

Wire size determinations can be made for non-uniformly spaced loads. But for ease and safety, it would be advisable to use the voltage drop tables.

For a precise determination of the maximum length of wire run for a concentration load (before applying the adjustment for uniformly distributed loads), divide the total load in watts into the constant at the bottom of each row. (Example: the maximum wire run for #12 wire on a 12 volt system, with a 44 watt load, is 2267 — 44, or 51 feet.)

Conversely, the maximum load on a run of known length (before applying the adjustment) may be determined by dividing the length into the constant. (Example: On a 12 volt system, a 38 foot run of #12 wire can be loaded to 2267 — 38 = 59 watts; on #10 wire, 3604 — 38 = 94 watts.)

Total Watts on Wire Run	6 VOLT SYSTEM				12 VOLT SYSTEM			
	Wire Gauge (in feet)				Wire Gauge (in feet)			
	12	10	8	6	12	10	8	6
6	94	150	238	379	377	600	955	1518
7	81	128	204	325	323	515	818	1301
8	70	112	179	284	283	450	716	1138
10	56	90	143	227	226	360	573	911
12	47	75	119	189	189	300	477	759
14	40	64	102	162	162	257	409	650
16	35	56	89	142	141	225	358	569
18	31	50	79	126	126	200	318	506
20	28	45	71	113	113	180	286	455
21	27	43	68	108	108	171	272	433
24	23	37	59	94	94	150	238	379
25	22	36	57	91	90	144	229	364
28	20	32	51	81	81	128	204	325
30	19	30	47	76	75	120	191	303
32	17	28	44	71	70	112	179	284
35	16	25	41	65	64	103	163	260
36	15	25	39	63	63	100	159	253
40	14	22	35	57	56	90	143	227
42	13	21	34	54	54	86	136	217
48	11	18	29	47	47	75	119	189
49	11	18	29	46	46	73	117	186
50	11	18	28	45	45	72	114	182
54	10	16	26	42	42	66	106	168
56	10	16	25	40	40	64	102	162
60	9	15	23	38	37	60	95	151
64	8	14	22	35	35	56	89	142
70	8	12	20	32	32	51	82	130
72	7	12	19	31	31	50	79	126
75	7	12	19	30	30	48	76	121
80	7	11	18	28	28	45	71	113
84	6	10	17	27	27	43	68	108
88	6	10	16	25	25	41	65	103
90	6	10	16	25	25	40	63	101
96	6	9	15	23	23	37	59	95
100	5	9	14	22	22	36	57	91
104	5	8	13	21	21	34	55	87
108	5	8	13	21	21	33	53	84
112	5	8	12	20	20	32	51	81
120	4	7	11	19	18	30	47	76
125	4	7	11	18	18	28	45	72
126	4	7	11	18	18	28	45	72
128	4	7	11	17	17	28	44	71
132	4	6	10	17	17	27	43	69
136	4	6	10	16	16	26	42	67
144	4	6	10	15	15	25	39	63
150	3	6	9	15	15	24	38	60
152	3	6	9	15	15	23	37	60
156	3	5	9	14	14	23	36	58
160	3	5	9	14	14	22	35	57
162	3	5	8	14	14	22	35	56
168	3	5	8	13	13	21	34	54
175	3	5	8	13	13	20	32	52
176	3	5	8	12	12	20	32	51
180	3	5	8	12	12	20	31	50
184	3	4	7	12	12	19	31	49
192	3	4	7	11	11	18	29	47
198	2	4	7	11	11	18	29	46
200	2	4	7	11	11	18	28	45
Constant	567	901	1432	2277	2267	3604	5730	9109

Data subject to change without notice