

# VOLTAGE DROP TABLES

The National Electrical Code limits voltage drop to a maximum of 5% of nominal. Circuit runs must be of sufficient capacity to maintain operating voltage when remote fixtures and/or exit signs are connected to the emergency lighting

TECHNICAL DATA

**TABLE A – IMPORTANT ELECTRICAL INSTALLATION INFORMATION**

TOTAL WATTS ON WIRE RUN	12 VOLT SYSTEM				TOTAL WATTS ON WIRE RUN	6 VOLT SYSTEM			
	WIRE GAUGE					WIRE GAUGE			
	#12	#10	#8	#6		#12	#10	#8	#6
	MAX. LENGTH OF WIRE RUN (FEET)					MAX. LENGTH OF WIRE RUN (FEET)			
6	378	600	955	1518	6	94	150	238	379
7	324	515	818	1301	7	81	129	204	325
8	283	450	716	1138	8	70	112	179	284
10	226	360	570	910	10	56	90	143	227
12	178	283	450	715	12	44	70	112	178
14	162	257	409	650	14	40	64	102	162
16	133	212	338	538	16	33	53	84	134
18	119	189	300	477	18	30	47	75	119
20	113	180	286	455	20	28	45	71	114
21	108	171	273	434	21	27	43	68	108
24	89	141	225	357	24	24	38	60	95
25	86	136	216	344	25	21	34	54	86
30	75	120	190	303	30	19	30	48	76
35	65	103	164	260	35	15	25	39	63
40	53	85	135	214	40	13	21	33	53
48	44	70	112	178	48	11	17	28	44
50	43	68	108	172	50	11	17	27	43
75	28	45	72	115	75	7	11	18	29
100	21	34	54	86	100	5	8	14	21
125	17	27	43	69	125	4	7	11	17
150	14	23	36	57	150	3	5	9	14
175	12	19	31	49	175	3	5	8	12
200	10	16	27	42	200	2	4	6	10
225	10	16	25	40	225	2	4	6	10
250	9	14	22	36	250	2	3	5	9

Values not shown in Table A may be calculated using the following formulas:

I. Maximum Length (Feet) =  $\frac{\text{Table B Constant Value}}{\text{Maximum Load (Watts)}}$

Example: Find the maximum circuit length for #8 wire on a 24 volt system with an 80 watt load.  
 Maximum Length (Feet) =  $21613 \div 80 = 270$  feet.

II. Maximum Load (Watts) =  $\frac{\text{Table B Constant Value}}{\text{Maximum Length (Feet)}}$

Example: Find the maximum circuit load for 540 feet of #12 wire on a 32 volt system.  
 Maximum Load (Watts) =  $15197 \div 540 = 28$  watts.

**TABLE B – CONSTANT VALUES PER VOLTAGE SYSTEM WIRE SIZE (MAXIMUM VOLTAGE DROP 5%)**

SYSTEM	6 VOLT				12 VOLT				24 VOLT					
WIRE SIZE	#12	#10	#8	#6	#12	#10	#8	#6	#4	#12	#10	#8	#6	#4
CONSTANT	534	849	350	2148	2137	3397	5403	8590	13660	8548	13588	21613	34363	54641

  

SYSTEM	32 VOLT					48 VOLT					110 VOLT					
WIRE SIZE	#12	#10	#8	#6	#4	#12	#10	#8	#6	#4	#12	#10	#8	#6	#4	#2
CONSTANT	15197	24157	38423	61090	97140	34193	54353	86452	137454	218565	179575	285450	454025	721875	1147850	1824900

**Uniform Loads**

The maximum circuit length data in Table A (and derived from Table B) assumes that 100% of the load is concentrated at the end of the run. If equally sized loads can be equally spaced along the run, maximum circuit length can be increased by the multipliers shown in Table C.

**TABLE C – MULTIPLIERS FOR EQUALLY SIZED, EQUALLY SPACED LOADS (MAXIMUM VOLTAGE DROP 5%)**

NUMBER OF FIXTURES	2	3	4	5	6	7	8	9	10	N
MULTIPLY DISTANCE BY	1.333	1.500	1.600	1.670	1.714	1.750	1.777	1.800	1.818	2N/(N+1)



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