

# Wire Size Guide

When remote fixtures and exit signs are connected to emergency lighting units of less than 50 volts, circuit runs must be sufficient size to maintain a proper operating voltage to all lamps. The maximum allowable voltage drop should not exceed 5%. Proper wire size can be selected from the following table or by use of the following formula:

$$CM = \frac{22 \times W \times L}{.05 \times E^2}$$

**CM=** Wire size in circular mills    **E=** Line Voltage  
**W=** Emergency load in watts        **22=** Constant  
**L=** Length of circuit in feet    **.05=** Factor for max. allowable voltage drop

**Length of Wire Run** (in feet)

	WIRE SIZE	WATTS													
		13	18	25	30	35	50	60	75	100	150	200	250	300	400
6 volts	12	41	30	21	18	15	11	9	8	6	4	—	—	—	—
	10	65	47	32	28	24	17	14	11	9	6	—	—	—	—
	8	110	75	54	45	39	27	22	18	14	9	7	—	—	—
	6	165	120	86	71	62	43	36	29	22	15	11	9	—	—
12 volts	12	165	110	85	71	61	42	35	29	21	14	10	8	—	—
	10	260	190	136	112	97	68	52	45	34	23	17	21	18	—
	8	415	300	215	180	154	108	90	72	54	36	27	21	18	—
	6	660	475	340	285	245	170	140	114	86	57	43	34	28	—
24 volts	12	660	440	340	284	244	168	140	116	84	56	40	32	26	21
	10	1040	760	544	448	388	272	208	180	136	92	68	52	44	34
	8	1668	1200	860	720	616	432	360	288	216	144	108	84	72	54
	6	24640	1900	1360	1140	1560	1100	900	728	548	364	272	220	180	100
32 volts	12	1160	840	600	500	435	300	250	200	150	100	75	60	50	42
	10	—	1340	960	800	690	480	400	32	24	160	120	96	80	63
	8	—	—	1540	1280	1110	770	640	510	385	255	192	154	128	100
	6	—	—	—	—	1740	1220	1020	815	610	405	305	240	200	163
48 volts	12	—	1899	1367	1139	949	680	—	455	341	227	170	136	113	68
	10	—	—	—	1811	1509	1085	—	724	543	362	271	217	181	108
	8	—	—	—	—	—	1729	—	1152	864	576	432	345	288	172
	6	—	—	—	—	—	—	—	1832	1374	926	687	549	458	274
120 volts	12	14964	—	7792	—	—	3896	—	—	1945	1300	977	720	650	608
	10	23787	—	12367	—	—	6193	—	—	3093	2067	1553	1238	1033	966
	8	37810	—	19705	—	—	9852	—	—	4820	3289	2471	1970	1644	1538
	6	60159	—	331327	—	—	15663	—	—	7822	5229	3929	3132	2614	2445