

HOW VOLTAGE DROP AFFECTS LED LIGHTING:

Voltage drop occurs as electrical current travels through wire resistance. Longer wire runs and higher loads increase voltage loss, which can cause LEDs to dim, flicker, or display uneven color and brightness

HOW TO USE THE CHART:

1. Calculate the total wattage of the LED lighting load.
2. Locate the load wattage in the left column.
3. Move across the row to determine the maximum allowable wire length for each wire gauge.
4. Select a wire gauge that supports the required installation distance

24V DC WIRE GAUGE AND WIRE LENGTH (FT.) DISTANCE CHART							
TOTAL LOAD (W)	#10 AWG	#12 AWG	#14 AWG	#16 AWG	#18 AWG	#22 AWG	#24 AWG
20W	433 ft	272 ft	171 ft	107 ft	68 ft	27 ft	17 ft
40W	216 ft	136 ft	86 ft	54 ft	34 ft	14 ft	8 ft
60W	144 ft	91 ft	57 ft	36 ft	23 ft	9 ft	6 ft
80W	108 ft	68 ft	43 ft	27 ft	17 ft	7 ft	4 ft
100W	87 ft	54 ft	34 ft	21 ft	14 ft	5 ft	3 ft
120W	72 ft	45 ft	29 ft	18 ft	11 ft	5 ft	3 ft
140W	62 ft	39 ft	25 ft	15 ft	10 ft	4 ft	2 ft
160W	54 ft	34 ft	21 ft	13 ft	8 ft	3 ft	2 ft
180W	48 ft	30 ft	19 ft	12 ft	8 ft	3 ft	2 ft
200W	43 ft	27 ft	17 ft	11 ft	7 ft	3 ft	2 ft
220W	39 ft	25 ft	15 ft	10 ft	6 ft	3 ft	2 ft
240W	36 ft	23 ft	14 ft	9 ft	6 ft	2 ft	1 ft
260W	33 ft	21 ft	13 ft	8 ft	5 ft	2 ft	1 ft
280W	31 ft	19 ft	12 ft	8 ft	5 ft	2 ft	1 ft
300W	29 ft	18 ft	11 ft	7 ft	5 ft	2 ft	1 ft

NOTES:

- System Voltage: 24VDC
- Maximum Allowable Voltage Drop: 3% (= 0.72V)
- Copper Conductors
- Lengths shown are maximum one-way wire lengths (feet)
- Based on total connected load wattage
- Formula includes round-trip conductor resistance
- Values are approximate engineering guidelines
- Environmental conditions, bundling, insulation type, and local code requirements may require larger conductors