

# Wire Size & Current Rating (A) Guide

Current carrying capacity is defined as the amperage (A) of which a conductor can carry before melting either the conductor or the insulation. Heat caused by an electrical current flowing through the conductor will determine the amount of current a wire will handle.

Theoretically, the amount of current that can be passed through a single bare copper wire can be increased until the heat generated reaches the melting temperature of the copper. However, there are many factors that will limit the amount of current that can be passed through a wire, of which the key ones are detailed below;

- **Conductor Size:**

The larger the circular mil area, the greater the current carrying capacity. The amount of heat generated should never exceed the maximum temperature rating of the insulation.

- **Ambient Temperature:**

The higher the ambient temperature, the less heat required to reach the maximum temperature rating of the insulation.

- **Conductor Number:**

Heat dissipation is lessened as the number of individually insulated conductors, bundled together, is increased.

- **Installation Conductors:**

Restricting the heat dissipation by installing the conductors in conduit, duct, trays or raceways lessens the current carrying capacity. This restriction can be alleviated somewhat by using proper ventilation methods, forced air cooling, etc.

Taking into account all the variables involved, no simple chart of current ratings can be developed and used as the final word when designing a system where amperage ratings can become critical.

Conductor Size					Current Rating
This chart shows the current required to raise the temperatures of stranded insulated (Rubber/Vinyl) conductors in free air (30°C ambient).					
A.W.G.	C.M.A.	Diameter (mm)	mm <sup>2</sup>	Size	
#32	63	0.20	0.03	•	0.3A
#30	101	0.26	0.05	•	0.5A
#28	160	0.32	0.08	•	0.7A
#26	254	0.41	0.13	•	1.0A
#24	404	0.51	0.20	•	2.0A
#22	643	0.64	0.33	•	3.0A
#20	1,020	0.81	0.52	•	5.0A
#18	1,624	1.02	0.82	•	7.0A
#16	2,583	1.29	1.31	•	10.0A
#14	4,106	1.63	2.08	•	20.0A
#12	6,530	2.05	3.31	•	30.0A
#10	10,384	2.59	5.26	•	50.0A

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