

# Choosing a Proper Relay Amperage

## How to calculate for the Correct Relay

### Relay Ratings and Limits

Relays often have two ratings: AC and DC. These ratings indicate how much power can be switched through the relays. This does not necessarily tell you what the limits of the relay are. For instance, a 5 Amp relay rated at 125VAC can also switch 2.5 Amps at 250VAC. Similarly, a 5 Amp relay rated at 24VDC can switch 2.5 Amps at 48VDC, or even 10 Amps at 12VDC.

### Volts x Amps = Watts - Never Exceed Watts!

An easy way to determine the limit of a relay is to multiply the rated Volts times the rated Amps. This will give you the total watts a relay can switch. Every relay will have two ratings: AC and DC. You should determine the AC watts and the DC watts, and never exceed these ratings.

### Example Calculations

AC Volts x AC Amps = AC Watts	DC Volts x DC Amps = DC Watts
Example: A 5 Amp Relay is Rated at 250 Volts AC. $5 \times 250 = 1,250$ AC Watts	Example: A 5 Amp Relay is Rated at 24 Volts DC. $5 \times 24 = 120$ DC Watts
If you are switching AC Devices, Make Sure the AC Watts of the Device you are Switching DOES NOT Exceed 1,250 when using a 5A Relay.	If you are switching DC Devices, Make Sure the DC Watts of the Device you are Switching DOES NOT Exceed 120 when using a 5A Relay.

### Resistive and Inductive Loads

Relays are often rated for switching resistive loads. Inductive loads can be very hard on the contacts of a relay. A resistive load is a device that stays electrically quiet when powered up, such as an incandescent light bulb. An inductive load typically has a violent startup voltage or amperage requirement, such as a motor or a transformer.

### Startup and Runtime Loads

Inductive loads typically require 2-3 times the runtime voltage or amperage when power is first applied to the device. For instance, a motor rated at 5 Amps, 125 VAC will often require 10-15 amps just to get the shaft of the motor in motion. Once in motion, the motor may consume no more than 5 amps. When driving these types of loads, choose a relay that exceeds the initial requirement of the motor. In this case, a 20-30 Amp relay should be used for best relay life.



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