

<b>BASIC OFFICE EQUIPMENT AMPERAGE CHART</b>	
<b>Office Equipment</b>	<b>Average Amp ratings at Maximum usage</b>
Adding Machine	0.1A
Coffee Maker	6.0A-9.0A
Coffee Mug Warmer	0.2A
Computer	1.0A-2.0A
Copier/ Stand Alone	8.0A- 20.0A
Lap top	2.5A-4.0A
Laser/ Ink Jet Printer	4.0A-8.0A
Monitor	1.5A-2.0A
Multi Function Printer/Copier /Scanner	5.0A
Clock Radio	1.0A-5.0A
Scanner	3.0A-5.0A
Space Heater	12.5A -15.0A
Task Lighting	1.0A

### **Calculating Circuit Load for Modular or Panel Systems**

An overloaded circuit can heat up to extreme temperatures creating a serious fire hazard to life and property. To protect against overload always know how much current is drawn on a circuit before adding a new outlet. To determine the load or amps drawn on a circuit, **add the load of all the devices on the circuit.**

First, **find the amps drawn from each device.** Above is an average chart that you can use for general office equipment. However, it is important to note what is going into each station or area. If they are using a printer or copier it is especially important to know the specific amps drawn. **To find the amps drawn by a device first look for a label with this information on it. The label is usually located on the back, or bottom of the equipment.** If a label isn't available you can calculate the load amperage by dividing the wattage rating for the device by the voltage of the circuit or:

$$\text{(Device Wattage / Circuit Voltage = Amps Drawn)}$$

Next, **add the amps drawn by each device. The total should not exceed 80% of the amp rating.** For example, a circuit with 2 task lights, a computer and a monitor and adding machine adds up to 7.1 amps if all these devices are running at the highest speed, all at the same time on the same circuit, that is 45% of the available capacity for a 15 amp/120 volt

circuit. **To protect against surge and overload the amp capacity of the circuit is always downgraded by 20%.** This means a 15 amp circuit can only hold approx. 12amps. Each circuit is rated for a maximum of 15amps of intermittent use or 12 amps of continuous load **(continuous load defined as three hours or more of constant use).** This only leaves you approx. 5 amps left in our example aloud on the same circuit. So anything that is plugged into the same circuit cannot add up to more than 12 amps. **Most panel manufacturers standard circuit outlet is rated at 15amps. Some Panel Manufacturers also make a 20 amp circuit (16 amps available) to handle equipment such as copiers and printers that draw excessive loads.** However, to avoid overload whenever possible it is better to specify a copier area that is drawing directly from the building supply and can be put on its own isolated circuit back at the breaker box. The National Electrical Code (NEC) restricts a 20 amp circuit to a maximum of 24 receptacles. In Canada, the national system is rated for 15 amps, and receptacle outlets are limited to 20.

When you have the above information you can determine how many circuits you will need, how to spread them out and how many areas are on a single direct connect. **It is important to note what type of electrical system is available for the modular system you are using. The most popular is a 4 circuit 8 wire system. All circuits require a hot, neutral and ground wire to be complete.** In a 4/8 system you have available 4 HOT circuits to spread out the amps. One of those circuits can be used as a **dedicated isolated circuit (having its own neutral and ground).** In most cases The dedicated Isolated circuit is used for computers. This being so that if there is an overload most likely the overload is caused by other equipment which has a separate ground and therefore doesn't affect the computers.

**The other thing that is important to note in determining how many circuits are needed is the building supply. If you only have a one phase building supply it is almost pointless to have an electrical system that is more than 1 circuit. You will not be able to have a dedicated isolated circuit** in this instance as the building supply really only allows for one ground, one neutral and one hot. However, there are still ways to spread out the amps so the circuits do not get overloaded but this is done more by the electrician back at the breaker box than with the electrical system of the panel. The electrical system of the panel at the direct connect will all be twisted together into one circuit at the wall or ceiling connection. If you think they will move in the future you can spread out the circuits so they will be able to utilize the full capacity in the future. **Most one phase supply is used in residential or older buildings. Luckily most commercial buildings are three phase supply being able to have an isolated ground so you can utilize the full capacity of the modular electrical systems.**

One thing that I cannot express enough in avoiding overload is the use of a space heater or fan. **Under NO circumstances is a space heater to be plugged in to an electrical system of a panel. This WILL trip the breaker and may cause extensive damage to your equipment.** This also voids the warranty and the system manufacturer will not cover the damage.

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