

## Power Cord Length Affects 1-Phase Vibrators!

By Rob Beiersdorfer

No matter the wire gauge of the power cord/cable you use, length matters. It's a bad idea to ever choose a cord longer than needed. Why? The longer the cord, the higher the voltage drop, and voltage drops are extremely hard on the life of a motor winding. Always select a cord as close as possible to the actual length you require.

Proper cord length is also safer because there is less resistance to the flow of current. Further, when you connect several cords, there is not only a higher electric resistance, but also a higher chance of faulty cord connections. If cost is your motivation for using a variety of shorter extension cords, remember the cost can escalate dramatically given the potential safety issues when making extra connections.



In addition to the cord length, it's important to keep in mind other electrical performance characteristics when choosing extension cords/cables for rotary electric vibrators. As an example, a 5-amp, full load current requirement using an 80' to 100' cord can cause a 10% voltage drop. A 10% voltage drop is the maximum a vibrator can safely handle. It's also important to note that a 5-amp vibratory motor sees a high momentary start-up amp load of about 7-amp to 10-amp. The cord must be capable of safely handling that momentary amp draw. The high start-up amp draw in the 80' to 100' cord will shorten the motor life over time.

To completely eliminate potential damage, never use a cord longer than 50'. At 50', there is only a 3% voltage drop – a better safety factor for the motors (a 50' cable has 3 times the safety factor of a 100' cable). A 100' cord is acceptable, but it's the maximum safe operational length and it provides no safety factor.

In addition to length, there is also the issue of the motor's start-up power requirements. When using high-power devices such as electric vibrators, it is best to use heavy-gauge cords. These more safely carry power and will not overload your electrical system. Always consider a vibrator's power usage when selecting an extension cord.

# PLANT MATTERS

When operating high-power vibratory motors, choose extension cord gauge based on the specific vibrator's power requirements. Consult with an AIRMATIC Product Specialist for the recommended wire gauge for the vibrator you intend to use. A primary consideration is checking the amp draw. The higher the draw, the heavier the wire gauge that will be required. If cord length and gauge relationship confuse, consult with an AIRMATIC Vibration Specialist or an experienced electrician.

Now that you have a general idea of what to expect or look out for when choosing extension cords, you need to decide which of the most popular gauges would work in your application. While 14-ga and 12-ga extension cords are the most regularly used cords, there are other gauges, including, for example, 16-ga and 10-ga wire. Each carries a different amp draw, depending on the length of the cord. For example, for a cord of 25'L to 50'L, a 14-ga cord will be great for 1-amp to 7-amp draw, while a 12-ga cord works best for 7-amp to 12-amp draw. For a 100' cord, the 12-ga cord is best suited for 5-amp to 10-amp, and a 14-ga is best for 1-amp to 5-amp. As you can see, the extension cord's length also plays a role in the power it can safely handle.

Finally, you should know that some extension cords work best in certain weather conditions. For instance, cords for cold weather use are generally more flexible and are rated to perform well at lower temperatures. This makes them easy to either stretch across the work area or coil for safe and proper storage.

In conclusion, the choice of an extension cord must be guided by the length, power load, and voltage drop that the cord can support so as to avoid overloading the cord and/or damaging the vibrator.

**Rob Beiersdorfer is Vibration Products Manager at AIRMATIC and has over 30 years of applied vibration experience in a wide range of industries.**

Thanks for reading our post. If you'd like to learn more about industrial rotary or linear electric vibrators, or vibratory motors and finishing equipment, please contact one of our Vibration Specialists at [infocenter@airmatic.com](mailto:infocenter@airmatic.com).