Outdoor Vibrator Applications – Use Three-phase Power!

By Rob Beiersdorfer

There are four (4) reasons why three-phase Vibrators are superior to single-phase units in outdoor applications:

1. **The size limitation of single-phase Vibrators vs. three-phase Vibrators.** Typically, outdoor applications require larger sized Vibrators due to the elements and temperatures they encounter during operation. A few examples of these elements are frozen materials, damp or wet materials, and heat-affected materials that can make the materials sticky. All of these elements require Vibrators with a larger force output for efficient bulk material flow. Single-phase motors are limited to smaller force outputs (Max: 1690-ft/lb). This "force output limitation" has two causes. First is the amount of starting torque required to rotate a Vibrator's set of eccentric weights. As starting torque requirements increase with greater weight sizes, the electrical current required also increases. Second is that single-phase power quickly and dramatically increases the amperage required to overcome the starting torque requirements; it simply becomes inefficient to use single-phase power as Vibratory Motor size increases.

2. **The nature of single-phase electricity is not suited for higher amperage applications.** In order to use single-phase electric in a high amp situation, the conducting wire gauge become large quickly. Typically, for a single-phase motor, you require capacitors to increase the amperage needed to power the start-up. Again, it becomes very inefficient and expensive to use larger capacitors as the power consumption increases.

3. **The cost of single-phase electric power vs. three-phase electric power.** Single-phase power is more expensive to purchase than three-phase power.

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4. **Cold temperature starts are problematic for single-phase Vibrators.** Below freezing and near-freezing temperatures cause the motor to be very stiff during start-up rotation. Low temperatures cause both the grease to thicken and internal clearance tolerances to change as the temperature decreases—for example, cold causes bearings to tighten. In a single-phase Vibrator, as the cold motor struggles to rotate the weight sets, the torque requirement increases, and the current requirement rises quickly. The increased torque and amp-draw requirements overload the starter circuits, and the motor shuts off.

To be sure, single-phase Vibrators are ideal in specific applications, but they are limited by size and function. It is important to use them in applications best suited to their operational limitations.

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Thanks for reading this post. If you'd like to know more about the subject or have any questions about Linear Industrial Vibrators, or Vibratory Motors and Equipment for any of our experts, please **drop us a line.**