

# Connections

## SMV Frequency Inverters

Three phase power and motors requiring three phase power have been around in industry for a long time. Everyone knows it is more efficient, and can reverse a motor without the need for complicated electronics.



**“Electricity is really just organized lightning.”**

- George Carlin

As New England Drives & Controls constantly strives to become a better asset to our customers, our whitepaper series will feature new technologies or helpful insights that may be pertinent to the reader. It is our sincere hope that this information will be beneficial in both relating, and applying content to your industrial needs.

We hope you find this whitepaper series an enjoyable and informative read.

We always welcome your questions and comments.

At one point all three phases were brought to the factory via overhead lines and interfaced directly with motors directly through the mains circuits coming into the building. The “third leg” was not always quite as balanced as the other two “hot” inputs, and because of this, was sometimes said to be “off balance.” Most motors at the time did not discriminate and were happy to run with that sloppy third phase, but as motors improved, so did the need for proper balancing of all three

phases. As the electric grid expanded, many areas (especially residential) only would get two phases brought in on the utility poles. Any equipment requiring three phase power would either need to have a third phase brought in from the electric company, which was not an inexpensive option, or to manufacture a third phase locally, using a rotary converter. This option was more economical, but it still was expensive.



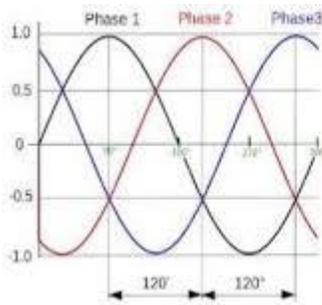
Variable frequency drives came about to control motors. Things like speed, acceleration, braking, and direction could now be precisely controlled. Motors designed for markets

with 50Hz power could be utilized, as well as 60Hz as prevalent in the U.S. Today those frequencies are often not used anymore as motors can become much more efficient at certain higher frequencies than normal mains power provides. Engineers now have full control over the drive frequency spectrum.

These inverters can now even be used to convert certain equipment from



being solely three phase to single phase. Not only that, but they are now efficient enough to convert standard 110VAC into 220VAC three phase independently at the machine. This is often seen in vending machines other equipment that need specialized power, but does not have the proper access to it at the receptacle. In some situations, the three-phase coming into the panel is unbalanced and the voltage across each phase can vary by several volts. Over time, this imbalance causes motors to overheat and prematurely fail, not to mention becoming safety hazards. Use of a VFD can mitigate these issues. It also prevents the need to buck or boost these phases at the panel. A true workhorse often seen in the field is the Lenze SMV VFD. They are economical, can provide power from .33HP up to 60HP, and are easy to commission and then simply work. ...and work. ...and work.



Depending on the application, inverters can be IP rated to handle wash down, and depending on what they are needed for, can send you down a rabbit hole of options. If there is a need for these, contact your friendly New England Drives & Controls, Inc. Representative and

we can assist you with exactly what you need to drive your variable speed / three phase / or high efficiency motors.

-Peter Lavole (Engineering Manager)

# Lenze



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