

# Regular maintenance and wiring inspection are crucial for VFD health and longevity

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A regular maintenance schedule is important to keep a variable frequency drive (VFD) operating efficiently and effectively.

Cost-effective maintenance starts early in the design phase by ensuring that the right type of VFD is selected for the job. For outdoor applications such as oil and gas operations, irrigation, wastewater treatment and mineral extraction, the correct NEMA-rated enclosures should be specified to protect the VFD from dust, dirt and debris.

Once the VFD is installed, cleanliness is an important part of the maintenance routine, particularly in dusty outdoor environments. Some NEMA-rated enclosures require ventilation, and that means fans need to be kept clean and free to operate to avoid a potential fault that could damage the VFD. In addition, air filters need regular cleaning, and heaters need regular monitoring in cold-weather outdoor settings to ensure the VFD and its sensitive electronics remain at the correct temperature.

## Wiring considerations

Not to be overlooked is the VFD's wiring, including the wires that lead from the drive to the motor. In the case of wiring, it is critical to follow local electrical codes to the letter and rely on a qualified electrician or startup engineer to handle the task.

Failing to take proper precautions when working with wiring can lead to serious injury or death, and may also damage the VFD and the motor. Disruptions are always costly, so it is best to rely on a certified electrician to maintain and repair VFD wiring.

Four elements are particularly critical when looking at a VFD's power wiring.

First, the power wires and branch circuit protection going to the VFD should be sized to handle the system's load, voltage rating and full load amps of the motor being controlled. Wires going to the motor need to be sized based on that current and the voltage they will carry.

Second, when considering cable, be aware of the insulation level needed to prevent electromagnetic interference. Shielded power cable often is the preferred choice for both input and output cables.

Third, routing should be considered when looking at the drive's input and output interconnections. Input wires should be routed separately from output wires going to the motor. Common practice is for there to be at least 1 inch in between cables that are run in parallel. If cables must cross, the recommendation is for that crossing to take place at a 90° angle to prevent interference.

Fourth, for the input and output motor leads, have the shielding terminated on both ends to the ground location. Doing so will keep a common ground throughout the system. Running wiring in conduit will also provide protection if a shield wire is not provided.

Just how often to inspect the VFD wiring depends on the application. VFDs that are installed outdoors for use in oil and gas production may need to be inspected once a quarter. If the VFD is in a building where the environment is less harsh, then a twice-yearly inspection schedule may be enough.

Double-check the VFD's internal wiring connections prior to the first time startup. It is common for the VFD to be handled during installation in ways that might loosen connections. Be certain that the electrician or startup engineer checks the connections to minimize the possibility of a failed start.

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