

# Never Lose Alignment Again

**HOW YOU CAN SAVE TIME & MONEY BY USING  
ELECTRIC PACKAGES WITH A MODULAR DESIGN**



## WHITE PAPER



Pump packages that are used for dewatering and bypass purposes often take a beating – from operation on a jobsite to getting transported to a jobsite in the first place. With labor costs rising and raw material availability pushing suppliers, reliable acquisition, operational durability and low maintenance remain critically important. These factors have raised concerns over pump vibration on electric-driven packages and the resulting problems it can cause, namely the loss of pump and motor alignment.

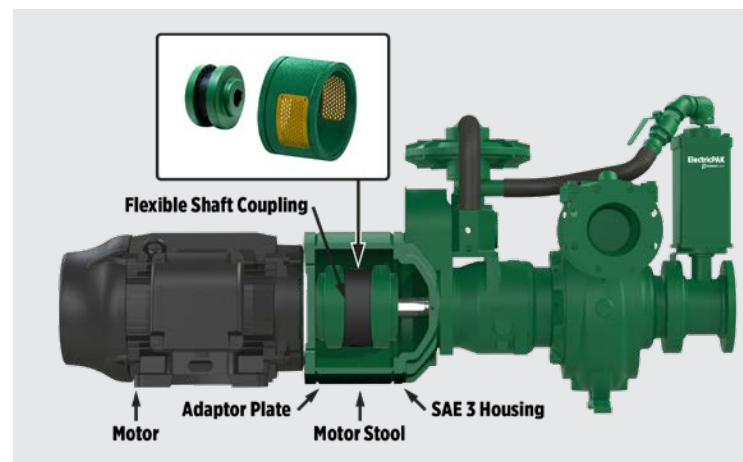
This whitepaper takes a closer look at solutions to this problem and how electric packages with a modular design can overcome many of the challenges associated with alignment.

### WHAT CAUSES VIBRATION?

Vibration occurs when a pump and electric motor assembly are not professionally aligned, and many times this process can be overlooked or not performed since it is labor-intensive, tedious and requires an experienced service professional. This process must also be repeated any time the pump is moved to a new location or shows signs of vibration. When it's not done properly, it can lead to long-term vibration-related maintenance issues, including seal failures, unexpected power losses and – in worst case scenario situations – a broken shaft. These issues can also cause pump users to completely rule out using an electric-driven pump, since they assume the cost and efficiency savings won't offset any alignment issues.

### THE SOLUTION TO VIBRATION: MOTOR STOOL DESIGN

The solution to the vibration challenge is permanent alignment, achieved using a bracket that rigidly connects the pump and motor together. This bracket, also known as a motor stool, is engineered to precise tolerances to ensure that the coupling remains permanently aligned and protected. It eliminates any concerns with shifting during transport or operation, saving countless hours of service time. If this method of assembly sounds familiar, it's because it takes its inspiration from a typical diesel coupling with a bell housing that's bolted to an engine. However, in the case of an electric pump package, users benefit from the energy efficiency that electric motors offer without sacrificing performance, power or alignment.



*The Pioneer Pump® ElectricPAK™ uses a proprietary bracket design that rigidly connects the pump and motor together. The bracket, also known as a motor stool, is engineered to precise tolerances to ensure that the coupling remains aligned and protected.*

## HOW DOES PERMANENT ALIGNMENT BENEFIT OWNERS AND OPERATORS?

In addition to the cost savings from the overall efficient operation that comes with an electric motor, owners benefit in several other ways, including time savings related to setup, maintenance and pump life:



*ElectricPAK units can be moved and transported freely without the need to perform a re-alignment and are designed specifically with heavy-duty, suction lift applications in mind.*

### **PUMPS CAN BE FULLY OPERATIONAL IN HOURS, NOT DAYS, AFTER TRANSPORT.**

A pump and motor system is typically large, heavy and bulky, weighing in at several tons. For their initial placement they may be shipped hundreds of miles, encountering bumps, stops and turns along the way. Once they arrive, they are unloaded by a forklift, jostled around and set on site. From there, they might be moved as mobile dewatering needs change within an area. If the unit is used as a rental asset, it will be sent back to a storage facility only to be transported again to its next job.

One example of this is a temporary municipal application, like a sewer bypass. In addition to the initial transport to the site, additional issues may occur: the ground may not be level, a suction pipe may not be fully supported, and the pumps frequently cavitate. In dewatering and bypass applications such as this, time is always valuable. Municipal installations in most cases have urgent pumping needs, and there is typically no time to spare to perform onsite alignment once the unit arrives – and alignment takes time. It requires exacting laser measurements that are not only time-consuming but also expensive. With a rigid motor stool design, the need for alignment or realignment is eliminated. A robust, modular design with a motor stool setup focused on portable rugged use is perfect for customers who need strong equipment operating quickly.

In fixed installations, the system designer may determine that grouting is not required due to the rigid alignment, opting instead to just secure the package to a rigid slab with anchors. This also saves ample time during the installation process.

### **OPERATIONAL DURABILITY & LOW MAINTENANCE.**

When an alignment isn't performed or is done too quickly, the misalignment will lead to vibration issues. In time, this vibration can result in seal failures, oil leaks, shortened bearing life and more. In extreme situations, this vibration can cause the coupling to fail and the shaft to break. Consistent vibration also leads to pumps that need to be rebuilt. Again, with a rigid motor stool design, vibration isn't a concern because misalignments will never be an issue.

Even permanently installed pump and motor packages that never move can suffer from misalignment over time. Despite their bulk, electric pump packages can be very sensitive to movement. Non-zero nozzle loads are unavoidable, and misalignment and the resulting vibration concerns can occur due to nozzle loads. Misalignment can also happen when regular maintenance is performed on a pump or motor. A motor stool protects against misalignment that may occur during the life of a pump.

Mining applications provide good examples of these vibration and maintenance concerns in action. Mines are often hazardous environments, and pump packages are usually at risk of being hit by trucks and other pieces of equipment. A rigid motor stool eliminates alignment concerns that result from everyday use of the unit itself or the environment it's operating in.

Pump packages used in mines are also frequently moved around the job site and have pipe and hose exerting loads on the pump and base. This makes a strong pump/motor connection even more important since the resulting vibration can cause misalignment otherwise.

These pump packages also offer streamlined maintenance since the modular design can be disassembled quickly, helping to reduce operating costs over the life of the system.

## RELIABLE ACQUISITION: MODULAR DESIGNS ARE EASY TO QUOTE & CAN HAVE FASTER LEAD TIMES

Systems that feature a rigid bracket assembly are designed to be modular, which can help users get an electric pump package onsite for operation more quickly and efficiently than custom-built units. The modular design is built using interchangeable parts, delivering upfront time savings for the system designer as well. Custom-built units take longer to engineer and often require specialized parts. A modular design makes the sizing and quoting process faster and the use of standard parts drives down lead time.

## HOW DOES QUOTING WORK?

Franklin Electric streamlines the ordering process with FE Select, a 24/7 online and mobile-friendly tool that instantly helps formalize deliverables with printable and downloadable quotes: no waiting for a callback.

Here's an example of how FE Select works, using the performance requirements of a processing application. Users input parameters, and the tool does the rest: fully specifying what products are recommended, including the necessary components, a list price quote for the system, and links to related product documentation and performance curves.

FE Select walks through the process from start to finish. Users can do either a basic search that requires only primary application data, such as flow and total dynamic head demands; or a more advanced selection that considers some additional performance requirements.

The user's application inputs generate several results, sorted by hydraulic efficiency. The list can easily be narrowed down based on the parameters that are most important to the user: suction/discharge size, power requirements, NPSHr and other relevant factors.

For electric pump packages, FE Select offers a configurator tool that provides users with clear visibility of product selection, price breakdown, available options and overall product performance on the performance curve.

Once a user finds the ideal pump and impeller size that fits their performance needs, they can easily continue from the pump curve page into the configurator tool. Here they can customize an electric pump package to meet their application requirements. This gives users the ability to build out their unique package quote with live line-item pricing updates; there is no need to wait on quote requests and responses to sales inquiries. After selecting and pricing an electric package, users can save their quote to either view later, or move their selection into the ordering process.

When thinking about these benefits, it's important to remember that often facilities and users may operate more than one pumping system. Worrying about alignment for a single unit is a big enough concern; consider



*Modular pump packages can alleviate supply challenges. Since the ElectricPAK uses a standard base design (available in three sizes) as well as other stocked parts, it can be specified, ordered and delivered onsite more quickly than custom-built units.*



**FE SELECT**



*Franklin Electric's FE Select is an online tool that streamlines the selection process and allow users to quickly configure and quote a pump package based on their application inputs.*

those alignment needs across three, six or more units, and the benefits of permanent alignment multiply.

Whether for mine dewatering, municipal bypass, industrial processing or another application entirely, alignment matters. Electric-driven pump packages that feature a rigid motor stool design reduce time-consuming alignment work, saving owners and operators on initial setup costs as well as maintenance costs down the road.