

# Managing and monitoring motors, pumps, and compressors so that they don't let you down when you need them most

Motors, pumps, and compressors form a large part of the farming tool kit that we depend on to keep our operations running, our products in the right condition and to power our activities. At the heart of this equipment whether it be a cooling compressor, a biomass feed auger, or a well lift pump will be an electric motor. If that motor fails then the repercussions for your business can be significant in terms of lost product, deferring activity and costly replacement/repairs. There is a way of getting ahead of the game, preventing that catastrophic failure, and spotting changes in performance.

All electric motors and rotating equipment vibrate as they operate. You will hear this all the time when you are near the equipment. You will also know that, like any engine, when you change the load that sound changes. Some of us even do that as part of our day-to-day inspection routine and in extreme circumstances can hear when something is wrong. For the human ear to pick up these "sounds of distress" they have to be pretty far gone, but with technology today it is now possible to get devices to attach to your key motors that constantly listen and analyse the most subtle of sounds to tell you when something starts to go wrong.

The technology at the core of this has been used in many other industries for decades, especially around complex and expensive equipment like power turbines. Here they monitor a wide range of parameters around the turbine, to understand the equipment's performance and all the input factors that affect it. All this data is then used by a computer to build a picture of what is normal at various loads and operating conditions, so that when it starts to become 'abnormal' they can spot it before it becomes a problem and respond accordingly. This enables smart maintenance schedules, targeting what is needed and only when it is needed to maximise time and performance.

Whilst these industrial units are much more complex than any of us are likely to see on farm, the underlying principles are the same – monitoring our key equipment to know that it is working properly, to spot any issues before they become problematic and only to maintain when we need to. Those of us with modern combines will already know about vendor maintenance services and how they know before we do.



The big breakthrough is that this technology is now available in a hand sized, battery powered device, that attaches via a magnet, does the smart stuff on board, and sends alarms when it detects anything abnormal. The device learns about the operation of your motor and the system around it, building up a library of normal vibration pictures for the motor's performance at various loads and performance conditions. It then stores this onboard to compare with ongoing operations to spot when something is going wrong.

What can be "wrong" can be the motor itself or something in the system. Examples of the latter would be a blockage of the inlet filter in an irrigation lift pump requiring cleaning; blockage in the biomass hopper meaning that the furnace feed auger has no product to transfer; a downstream burst in an irrigation system or bulk milk transfer line removing back pressure; air filter fouling etc. All these examples are preventable before they become problems/failures meaning greater uptime and productivity and the avoidance of losses.