

PhD Plus™ System

Reliable Vibration Monitoring

The *PhD Plus* system provides continuous monitoring of the FRICK® package to track the early stages of bearing failure over the long term while protecting the compressor from any sudden non-bearing related vibration events.

The Quantum HD controller will alert the user when any significant vibration changes occur, and will display and trend the vibration values in the same way as other input channels.

PhD Plus Advantages:

- **Precise Calculations**

The vibration module is configured based on the specific FRICK compressor model, ensuring precise vibration calculations.

- **Reliable Detection**

A 1x Rotational Speed calculation is used to quickly stop the compressor if a sudden vibration event is detected.

- **Fail-Safe Technology**

Sensor failure detection is built into the *PhD Plus* system. The Quantum HD will indicate if the sensor has failed or is not wired correctly.

- **Integrated Control**

Quantum™ HD Unity will display and trend vibration data in the same way as other input channels for a fully integrated controls system.

- **Consistent Readings**

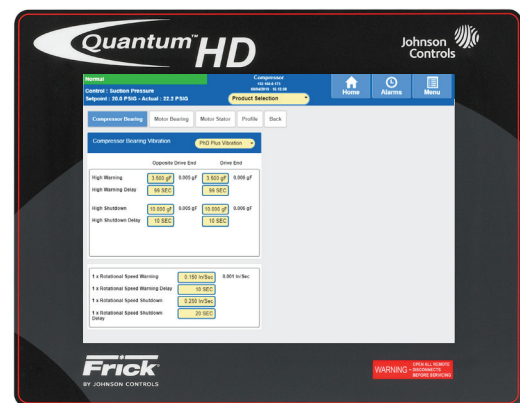
Because this system focuses on the bearing frequencies, it produces consistent readings across the FRICK compressor models and customer applications.

- **VSD Speed Input**

The motor speed is sent to the vibration module, and the motor and compressor vibration calculations adjust the monitoring window to match the actual bearing speed.



PhD Plus Vibration Module





Quantum™ HD Unity Panel

PhD Plus™ Retrofit Kit

Easily transform your existing system by upgrading to the latest in vibration monitoring technology.

In addition to offering the *PhD Plus* system on new equipment, a retrofit option is available for already-installed FRICK packages. For FRICK screw compressor packages that already have the PhD system, the *PhD Plus* Retrofit Kit can be purchased, and the existing sensors and cables can be wired to the new vibration module. For FRICK screw compressor packages that do not have the PhD system, both the *PhD Plus* Retrofit Kit and Accelerometers and Cables kit(s) can be purchased.

The *PhD Plus* Kits below are available through the [FRICK Parts Center](#):

KIT	ITEM	DESCRIPTION
	<i>PhD Plus</i> Retrofit Kit	A small enclosure that includes the <i>PhD Plus</i> vibration module and power supply rated for 110/220V, 60/50Hz.
	<i>PhD Plus</i> Accelerometers and Cables	Two accelerometers (MEMS, 4-wire) and two 32-foot (10m) sensor cables.



PhD Plus Retrofit Kit

Quantum™ HD Unity

A FRICK screw compressor with a Quantum HD controller can be upgraded to the new PhD Plus system with these retrofit kits. This upgrade extends the vibration monitoring capabilities of your Quantum HD to better protect the compressor and motor on your FRICK package.