



Motor Vibration

Detect Mechanical & Electrical Motor Faults with Vibration Monitoring Instrumentation



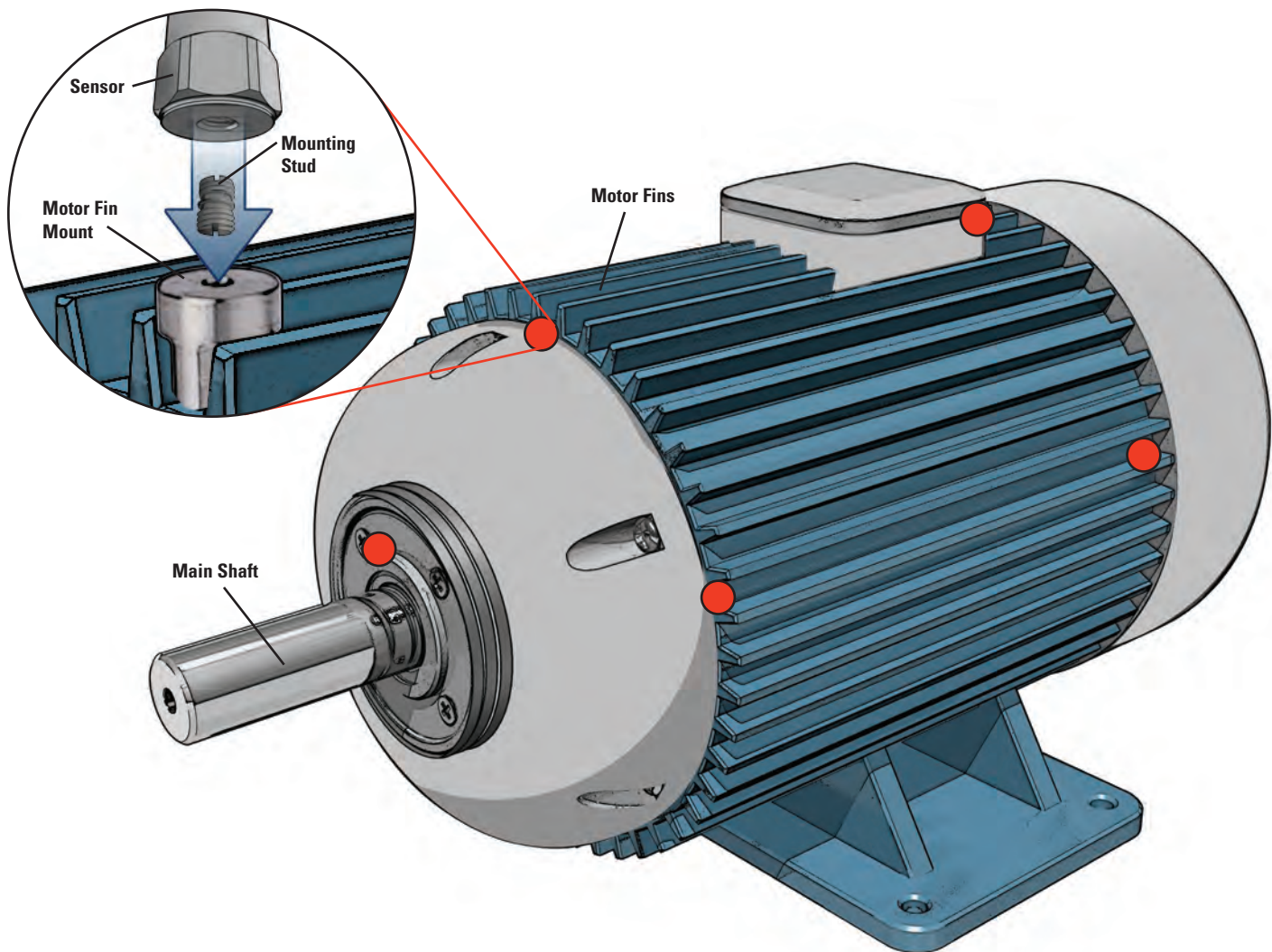
 **IMI SENSORS**
A PCB PIEZOTRONICS DIV.

Predictive Maintenance

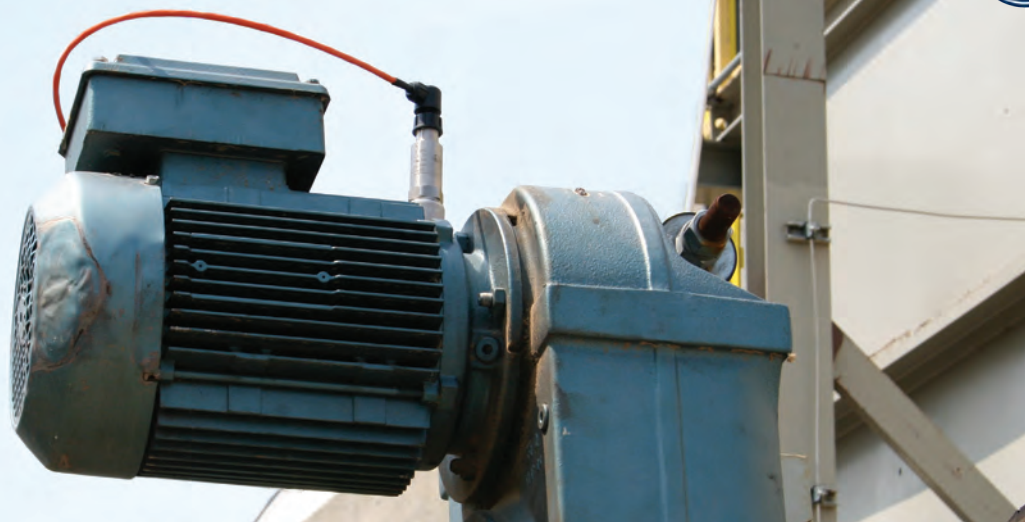
Motor Vibration

Monitoring vibration on induction motors is at the core of any predictive maintenance program. Typical applications demand vibration measurements in the horizontal, vertical and axial direction on both the inboard and outboard motor bearings. Aside from typical mechanical issues, such as misaligned couplings and unbalance, the vibration analyst can also detect electrical issues that cause mechanical vibrations. Some common electrical faults include air gap variation, broken rotor bars and bearing fluting.

Vibration analysts can use one accelerometer, mounted magnetically and rotate it around the motor to capture various data collection points. In some cases the motor is in an inaccessible location and thus permanent mount sensors are used and routed to a junction box for walk up data collection. Accelerometers are permanently mounted by drilling and tapping into the motor housing or they can be adhesively affixed or welded using a mounting pad.



● Suggested Sensor Placement



ICP® Accelerometers - Predictive Maintenance



Low Cost ICP® Accelerometer
Models 602D01 and M602D01

- Easy installation in tight spaces
- Through-bolt aides in cable orientation
- Low profile, less than 1 in. height
- M12 connector version available

Low Cost ICP® Accelerometer
Models 603C01 and M603C01

- General purpose, hermetically sealed
- IMI's most popular accelerometer
- Small footprint
- M12 connector version available

Precision Accelerometer
Models 622B01 and M622B01

- Full frequency sweep calibration: 5% sensitivity deviation tolerance
- 15 kHz high frequency response ideal for early detection of bearing fluting conditions
- Ideal for route-based data collection

Product Spotlight

Triaxial Accelerometers

Monitor motor bearing vibration in all three axes with a single accelerometer



Low Cost Triaxial Accelerometer
Models 604B31 and M604B31

- General purpose, hermetically sealed accelerometer
- Perfect for permanent mount applications



Precision Triaxial Accelerometer
Model 629A31

- Ideal for route-based data collection, magnet mount
- Full frequency sweep calibration, superior frequency response

Process Monitoring & Protection

Motor Vibration

Electric motors driving capital machinery and ancillary equipment are critical plant processes. Unscheduled shutdowns or failures result in costly downtime, equipment damage and possible safety hazards for personnel. Although your maintenance engineers can't be everywhere at once, IMI® vibration and fault transmitters provide continuous protection and early detection of issues such as soft foot, imbalance, bearing faults, bearing fluting and misalignment. Using a 4-20 mA signal, our transmitters directly communicate with customer PLC, PI, SCADA, or DCS systems and data can be easily trended, managed, with proper alerts and notifications to keep your process up and running.

4-20 mA Transmitters - Process Monitoring & Protection



Vibration Transmitter Model 682C03

- Outputs 4-20 mA signal proportional to acceleration, velocity, or displacement
- ICP® accelerometer input
- Analog vibration output via front BNC



4-20 mA Output Sensor Models 640B01 and M640B01

- Peak velocity
- Side exit housing available
- Intrinsically safe/explosion proof versions available



24 VDC Power Supply Model 682A01

- 120 to 230 VAC powered
- 1.3 A maximum

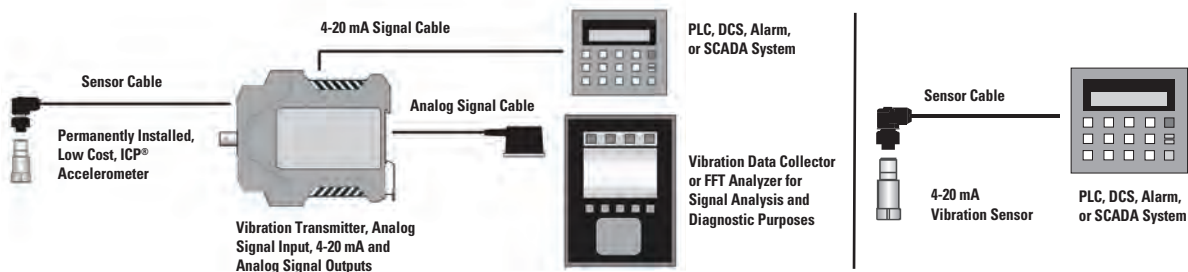


DIN Rail Enclosure Model 682A00

- Strong fiberglass construction
- NEMA 4X rating

Tips From Techs

Recommended Components for a Typical Installation





Bearing Fault Detectors - Process Monitoring & Protection



Bearing Fault Detector
Model 682C05

- Provides early warning of bearing and gear faults
- Operates with PLC, DCS, SCADA, alarm and control systems
- Outputs 4-20 mA signals for peak acceleration and overall vibration

Bearing Fault Detector PLUS
Model 649A03

- Combination 4-20 mA Sensor PLUS vibration transmitter
- USB Programmable: Fine tune transmitter to your specific machine parameters
- Various output options: Integrates with your PLC system
- Output specifically tuned for sensing early faults/failures in rolling element bearings

Tips From Techs

Bearing Fluting in Electric Motors

Bearing fluting occurs when current is passed through the motor bearing instead of a grounded source. PWM (Pulse Width Modulated) drive switching frequencies result in undesirable motor shaft currents, a side effect that causes bearing damage including pitting and fluting. The pitting and fluting will result in undesirable bearing vibration. Because the Bearing Fault Detector's additional fault output is extremely sensitive to high frequency impacting, it provides an early indication that pitting or fluting has occurred. This will allow your motor to be serviced before catastrophic damage occurs.

Motor Vibration Accessories

Cables & Connectors



Polyurethane Cabling with Right Angle MIL-Style Connector
508BQXXXBZ



Polyurethane Cabling with MIL-Style Connector
508BRXXXBZ



PTFE Jacketed Cabling with Right Angle MIL-Style Connector
053BQXXXBZ



PTFE Jacketed Cabling with MIL-Style Connector
053BRXXXBZ

XXX = Denote cable length, 010 = 10 feet (Metric lengths available)

Mounting Hardware



Sensor Mounting Pad
Model 080A93: Ø0.75"
Model 080A118: Ø1.0"



Curved Surface Magnet
Model 080A131: Ø1.0"
Model 080A132: Ø1.5"

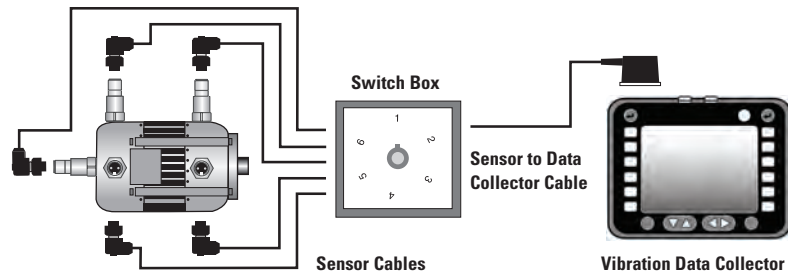


Small Adhesive Kit
Model 075A05

Tips From Techs

Typical Inaccessible Motor Monitoring System

Permanently Installed, Low cost ICP® Accelerometers for Axial and Radial Vibration Monitoring



Product Spotlight

BNC Switch Boxes & Termination Enclosures

Safe, Convenient, Centralized Access for Efficient Data Collection

- Consolidate up to 48 channels of outputs into one enclosure
- Switch boxes save time and extend cable life; connect once, change the channel
- Factory installed cord grips provide simple, quick and convenient installation





Industrial Vibration Measurements?

We Do! We do it all - sensors to measure vibration, acoustics, force, pressure, load, strain, shock and torque - Sure we do!





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- Shock Monitoring

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