



# Pumps & Submersible Pumps

Highlighting Hermetic Sensors for Pump Cavitation, Recirculation & Resonance



 **IMI SENSORS**  
A PCB PIEZOTRONICS DIV.

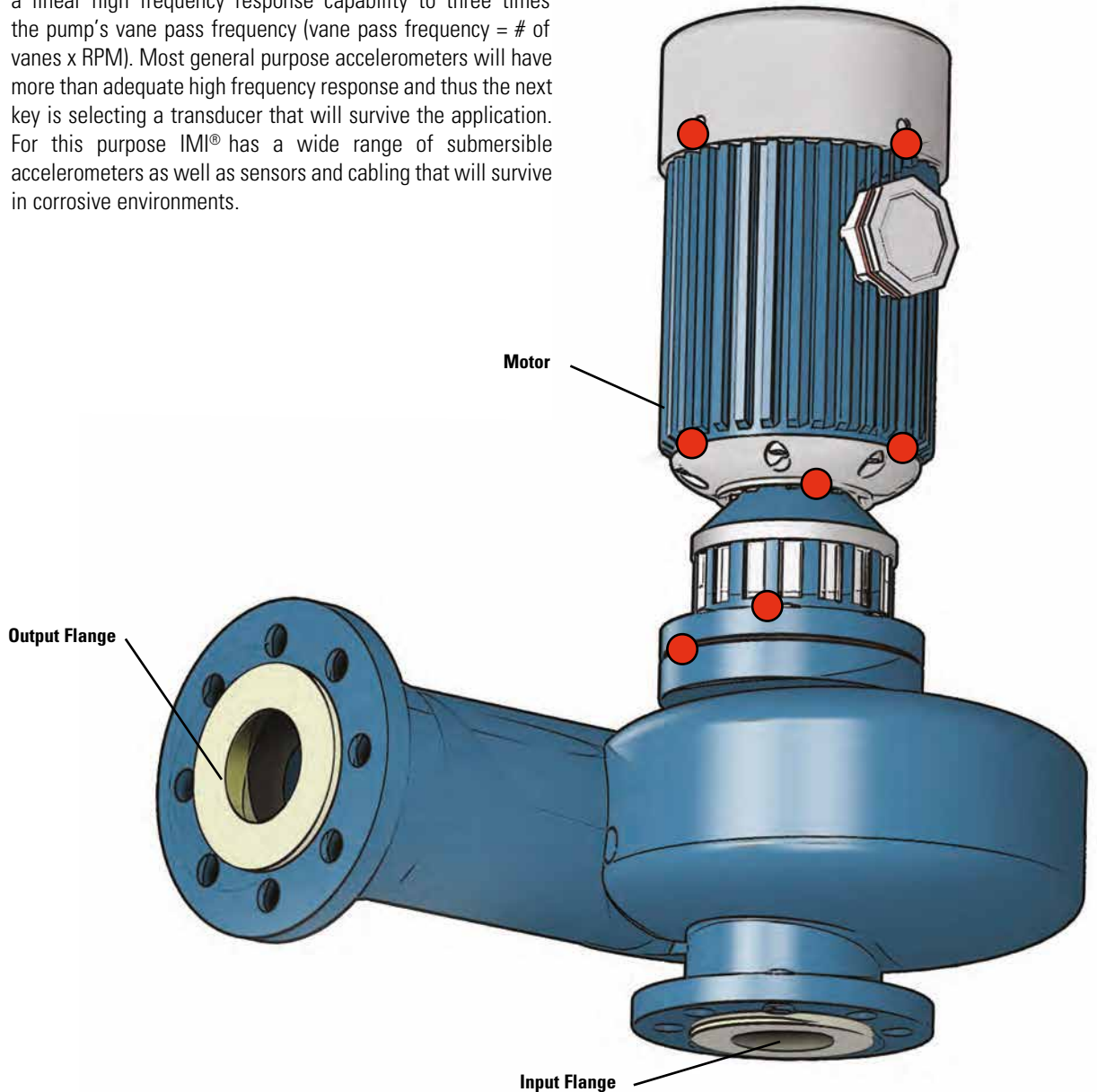
visit us at [www.pcb.com/imi-sensors](http://www.pcb.com/imi-sensors)

## Predictive Maintenance

# Pumps & Submersible Pumps

There are dozens of different types of pumps and a seemingly endless list of applications but industrial accelerometers can often help the maintenance professional to diagnose sometimes tricky issues with pump operation. Using vibration monitoring in your predictive maintenance program can help identify pump problems such as cavitation, recirculation and resonance.

A good rule of thumb is to select an accelerometer that has a linear high frequency response capability to three times the pump's vane pass frequency (vane pass frequency = # of vanes x RPM). Most general purpose accelerometers will have more than adequate high frequency response and thus the next key is selecting a transducer that will survive the application. For this purpose IMI® has a wide range of submersible accelerometers as well as sensors and cabling that will survive in corrosive environments.



### ● Suggested Sensor Placement



**ICP® Accelerometers - Predictive Maintenance**



**Low Cost ICP® Accelerometer**  
Models (M)607A11

- Ideal for submersible applications
- Smallest true industrial accelerometer on the market
- Armored integral cable options available



**Low Cost ICP® Accelerometer**  
Models (M)608A11

- Ideal for submersible applications
- Small installation footprint
- Stock integral cable lengths of 10 ft, 20 ft, 30 ft and 50 ft



**Tips From Techs**

**Corrosive Applications**

In some cases accelerometers installed on pumps must survive in acidic applications. In these situations it's best to use FEP jacketed cables. Special attention should be given to materials used to make the cable connector. For example, polyurethane cable and a connector that uses a silicone boot will degrade rapidly in most corrosive applications. Connectors made out of ryton or viton are generally recommended for corrosive applications. Please contact an IMI® Applications Engineer for a proper chemical compatibility study.

**Sensors for Corrosive Environments - PdM**



**Low Cost ICP® Accelerometer**  
Models (M)603C01

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



**Accessories for Corrosive Environments**



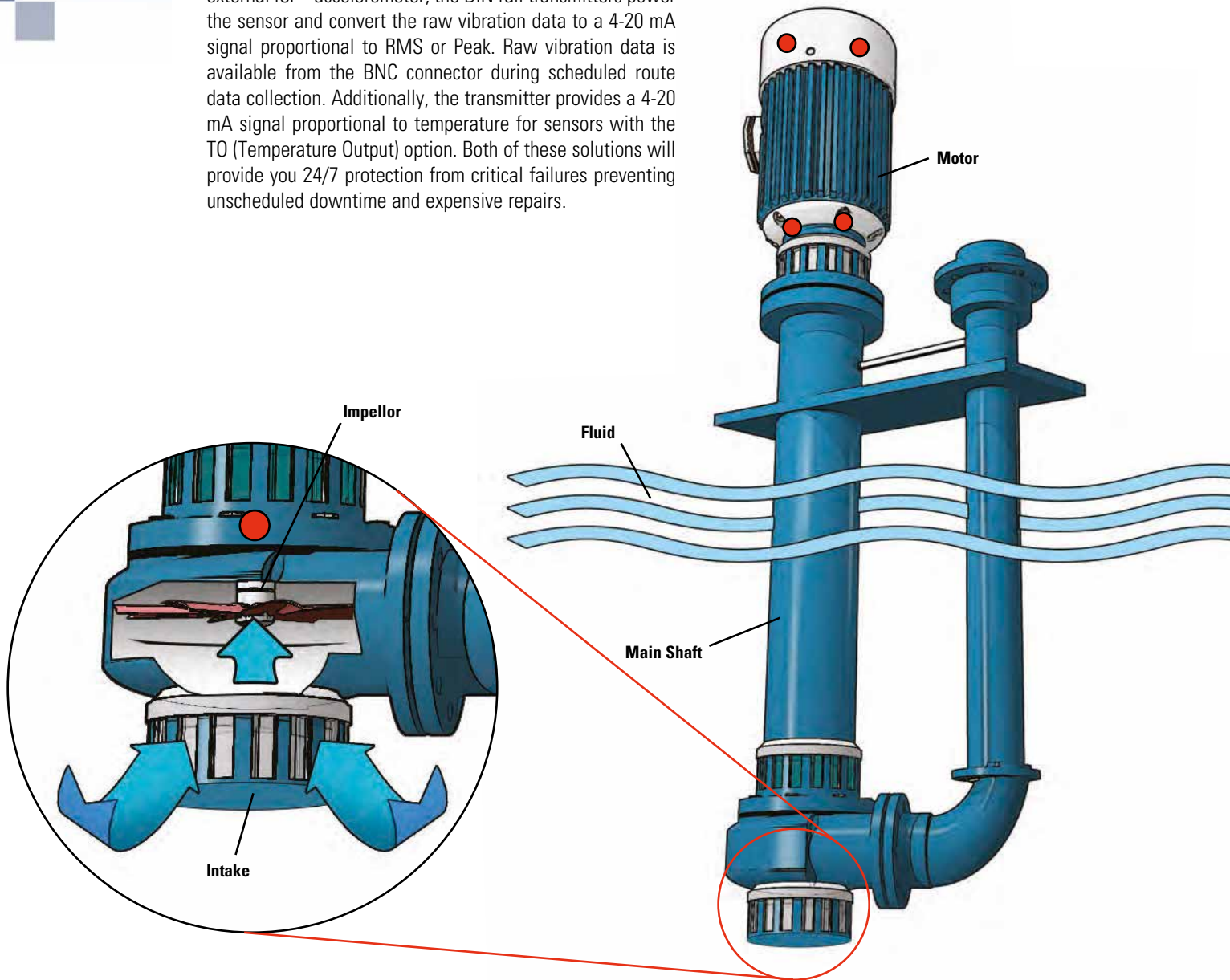
**FEP Jacketed Cable with Right Angle Polymer 2-pin MIL-style Connector**  
055PBXXXBZ

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

## Process Monitoring & Protection

# Pumps & Submersible Pumps

Pump failure can lead to costly unexpected shutdowns and expensive damage to plant processes and equipment. IMI's low cost current output (mA) transmitters offer continuous protection to critical equipment and provide maintenance professionals information between scheduled walk-around data collection. IMI's 4-20 mA loop powered transmitters provide an easy and low cost continuous monitoring solution and are directly compatible with PLC, DCS, SCADA and PI systems. External DIN rail transmitters are an excellent solution for customers interested in both Predictive Maintenance and Continuous Monitoring. Using an external ICP® accelerometer, the DIN rail transmitters power the sensor and convert the raw vibration data to a 4-20 mA signal proportional to RMS or Peak. Raw vibration data is available from the BNC connector during scheduled route data collection. Additionally, the transmitter provides a 4-20 mA signal proportional to temperature for sensors with the TO (Temperature Output) option. Both of these solutions will provide you 24/7 protection from critical failures preventing unscheduled downtime and expensive repairs.



● **Suggested Sensor Placement**



**4-20 mA Sensors - Process Monitoring & Protection**



CE  
SIL  
Ex



**4-20 mA Output Transmitter**  
Models (M)640B00, (M)640B01, (M)640B02, (M)641B01

- Multiple ranges available
- Peak or RMS, acceleration or velocity
- Intrinsically safe / explosion proof versions available
- Temperature output and raw vibration output options available
- 24 volt loop-powered

**ICP® DIN Rail Transmitters - Process Monitoring & Protection**



**DIN Rail Enclosure**  
Model 682A00



**Vibration Transmitter**  
Model 682C03

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

CE



**Low Cost ICP® Accelerometer**  
Series 607Axx

CE  
SIL  
Ex

**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



**Low Cost ICP® Accelerometer**  
Models (M)608A11

CE



Industry Exclusive!

USB PROGRAMMABLE

CE

## Process Monitoring & Protection

# Pumps & Submersible Pumps

### ICP® Accelerometers for Cryogenic Pumps

Cryogenic centrifugal and reciprocating pumps transferring industrial gases (argon, helium, hydrogen, nitrogen and oxygen) and fuels (liquid natural gas and liquid propane gas) whose boiling point is below -292F (-180C) require ICP accelerometers with built-in cryogenic circuitry and quartz shear sensing technology to withstand the cold environment.



**Top-Exit Cryogenic ICP® Accelerometer**  
Model 637A06

- Sensitivity: 25 mV/g
- Frequency Response: 4-1500 Hz
- Operating Temperature Range: -320 to +250 °F



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## Pump & Submersible Pumps Accessories

### Mounting Hardware



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



**1.25" Spot Face Tool**  
Model 080A128

### Cables & Connectors



**Polyurethane Cabling with Right Angle MIL-Style Connector**  
508BQXXXBZ



**Polyurethane Cabling with MIL-Style Connector**  
508BRXXXBZ

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



**Enclosures**



**BNC Termination Enclosure**  
Model 691A51/04



**BNC Termination Enclosure**  
Model 691A50/12



**BNC Switch Box**  
Model 691C42



## Corporate Headquarters - Depew, NY



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- Vibration Screens & Feeders
- Reciprocating Machinery
- Machine Tool Spindles
- Steel Rolling & Annealing
- Rotary Screw Compressors
- Nuclear Power Instrumentation
- Shock Monitoring

**IMI Sensors Platinum Stock Products** represent some of our most popular models and can be used in a wide range of applications. As you browse this brochure, you will find Platinum Products indicated with the "Platinum Shield" icon (right).



Visit [www.pcb.com/imi-sensors](http://www.pcb.com/imi-sensors) for complete details.



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