



# INDUSTRIAL MONITORING INSTRUMENTATION



## PREDICTIVE MAINTENANCE

Predictive Maintenance (PdM) is a process by which a maintenance technician is alerted to a problem developing in a critical production machine. If a PdM program is run successfully, this alert gives enough warning not only to determine what the problem is but also to order the parts and schedule the people necessary to repair it. Ideally, this warning would also provide the luxury to schedule the maintenance during a planned outage rather than at an inopportune time. This, in a nutshell, is how Predictive Maintenance programs work and they have been used successfully in many industries for decades.

### HIGHLIGHTS

- Durable, stainless steel housing
- Welded, hermetic sealing
- Electrical case isolation
- 10 mV/g, 50 mV/g, 100 mV/g, 500 mV/g sensitivities available
- Integral, and armored integral, options available
- Hazardous area approved versions available

### APPLICATIONS

- Gearboxes
- Motors
- Bearings
- Machine Tools

## LOW COST ICP® ACCELEROMETERS

Higher sensitivity tolerance than precision accelerometers

NIST traceable, single-point calibration at 100 Hz



### LOW-PROFILE

MODEL 602D01

Most popular side-exit accelerometer

Low profile casing

Ceramic shear, hermetically sealed



### SMALL SIZE

MODEL 603C01

Our most popular accelerometer

Compact & low cost

0.5 to 10,000 Hz



### SMALL SIZE, LOW COST

MODEL 608A11

Excellent sensor for submersible applications

Small size (9/16" footprint)

Integral cable easily connects to boxes

## THE SWIVELER® & SPINDLER® ICP® ACCELEROMETERS



### THE SWIVELER®

MODEL 607A01, M607A01

Patented 360° swivel mount design

Frequency range: 0.5 to 10k Hz



### THE SWIVELER®

MODEL 607A11

Completely submersible Ideal for sub pumps & applications

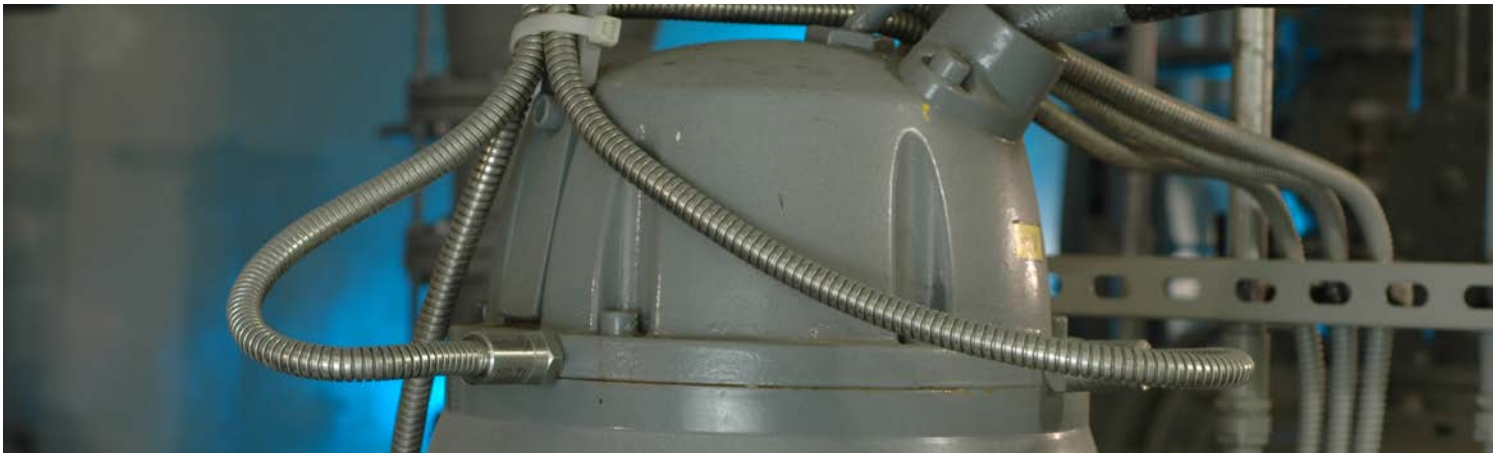
The world's smallest submersible industrial accelerometer



### THE SPINDLER®

MODEL 607A61

Armored integral cable is ideal for rugged applications



## PRECISION ICP® ACCELEROMETERS

Tighter sensitivity tolerances for effective machinery analysis & fault diagnostics

NIST traceable calibration through full frequency range locations



### CERAMIC, GENERAL PURPOSE

MODEL 625B01

5% sensitivity tolerance

Through-hole mounting

Intrinsically safe,  
velocity output versions



### QUARTZ, GENERAL PURPOSE

MODEL 628F01

5% sensitivity tolerance

Excellent for transient  
temperature applications

Intrinsically safe,  
velocity output versions



### CERAMIC, GENERAL PURPOSE

MODEL 622B01

5% sensitivity tolerance

Excellent high frequency energy  
(HFE) response

Intrinsically safe,  
velocity output versions

## ICP® ACCELEROMETERS WITH QUARTZ SENSING ELEMENT



### GENERAL PURPOSE

MODEL 624B01

Temperatures to 325 °F (163 °C)

Through-hole mounting



### SMALL SIZE

MODEL 627A01

Temperature stable

0.33 to 10,000 Hz



### PRECISION

MODEL 628F01

Frequency range: 0.3 to 12k Hz

Low temperature coefficient





## HIGH TEMPERATURE ICP® ACCELEROMETERS



### CERAMIC, GENERAL PURPOSE

MODEL HT602D01

Through-hole mounting

Temperatures to 325 °F (163 °C)

Ceramic sensing element



### CERAMIC, GENERAL PURPOSE

MODEL HT622B01

Low noise

Temperatures to 325 °F (163 °C)

Ceramic sensing element



### QUARTZ, GENERAL PURPOSE

MODEL HT628F01

Quartz sensing element

Temperatures to 325 °F (163 °C)

Welded hermetic sealing

## CRYOGENIC ICP® ACCELEROMETERS



### QUARTZ, GENERAL PURPOSE

MODEL 637A06

25 mV/g Sensitivity

Operates in temperatures down to -320 °F (-196 °C)

Low profile



### QUARTZ, GENERAL PURPOSE

MODEL 638A06

25 mV/g Sensitivity

Operates in temperatures down to -320 °F (-196 °C)

Top exit



## HIGH FREQUENCY ICP® ACCELEROMETERS



### CERAMIC, HIGH FREQUENCY

MODEL 623C01

10 mV/g or 100 mV/g sensitivities

±3 dB frequency response  
up to 15 kHz

Intrinsically safe options available



### VERY HIGH FREQUENCY

MODEL 621C40

10 mV/g sensitivity

±3 dB frequency response  
up to 30 kHz

Intrinsically safe options available



### CERAMIC, GENERAL PURPOSE

MODEL 635A01

100 mV/g sensitivity

±3 dB frequency response  
up to 15 kHz

1/4-28 thru bolt, 2-pin MIL connector

## LOW FREQUENCY ICP® ACCELEROMETERS



### CERAMIC, HIGH SENSITIVITY

MODEL 626B01

100 mV/g sensitivity

±3 dB frequency response  
down to 0.2 Hz



### CERAMIC, HIGH SENSITIVITY

MODEL 626B02

500 mV/g sensitivity

±3 dB frequency response  
down to 0.2 Hz

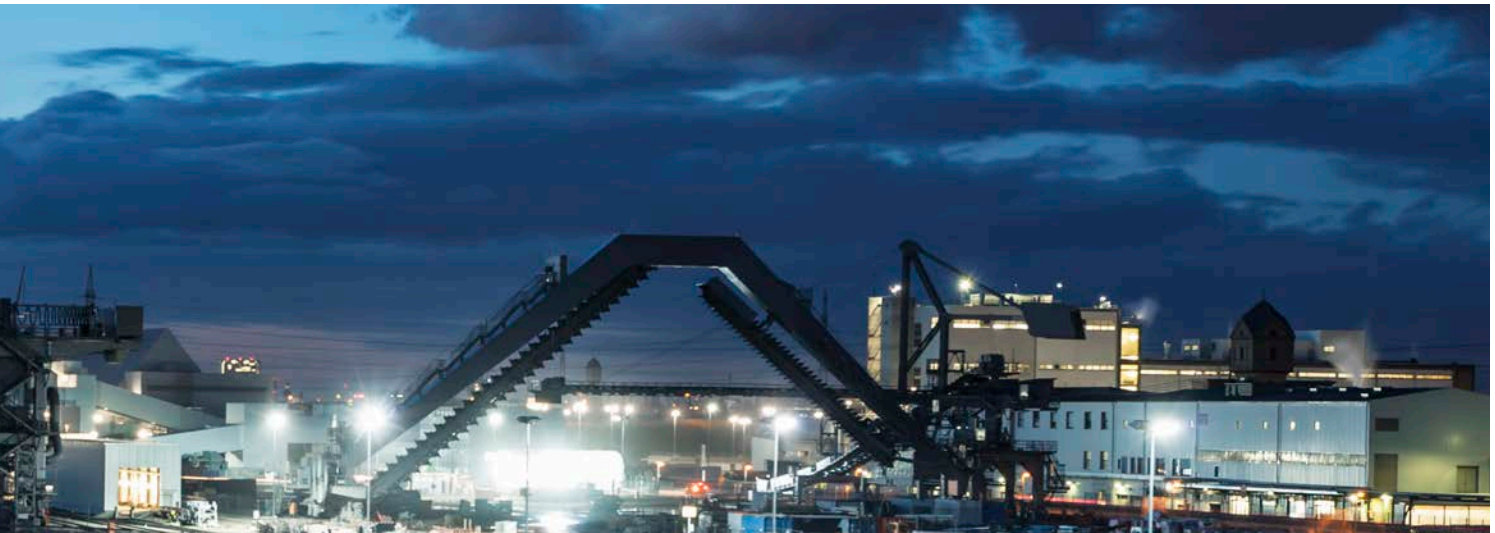


### CERAMIC, HIGH SENSITIVITY

MODEL 626A04

10 V/g sensitivity

±3 dB frequency response  
down to 0.04 Hz



## MULTI-AXIS INDUSTRIAL ICP® ACCELEROMETERS



### LOW COST TRIAXIAL

MODEL 604B31

±20% sensitivity tolerance

0.5 to 5000 Hz

Side exit, 4-pin connector



### STANDARD PROFILE TRIAXIAL

MODEL 629A31

±5% sensitivity tolerance

0.8 to 8000 Hz

4-pin bayonet connector



### STANDARD PROFILE TRIAXIAL

MODEL 639A91

±10% sensitivity tolerance

0.5 to 13000 Hz

M12 connector

## EMBEDDABLE ACCELEROMETERS

Mountable via adhesive or soldering and choice of either integral cable or solder pin electrical connections

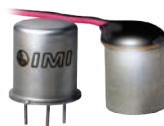
Variety of sensitivities to accommodate a wide range of applications

Charge output piezoelectric, voltage output ICP®, and 3-wire low power options



### LOW PROFILE

MODEL TO-5



### STANDARD PROFILE

MODEL TO-5



### STANDARD PROFILE

MODEL TO-8





## PROCESS MONITORING & PROTECTION

IMI's 4-20 mA industrial vibration sensors integrate an accelerometer and vibration transmitter within a standard, robust accelerometer housing. This provides a more compact and cost-effective solution than a conventional accelerometer with separate vibration transmitter. Scaled in velocity or acceleration output signals, these 4-20 mA industrial vibration sensors provide 24/7 online protection for critical plant machinery.

All IMI sensors and vibration switches are designed to withstand the rigors of harsh industrial environments.

### HIGHLIGHTS

- Cost effective
- Provides 24 / 7 protection
- Operates from loop power
- Outputs acceleration, velocity, or displacement
- Works with PLC, DCS, & SCADA systems
- Intrinsically safe versions available for all models

### APPLICATIONS

- Cooling Towers
- Pumps
- Reciprocating Machinery
- Bearing Condition
- Air separators



## 4-20 mA INDUSTRIAL VIBRATION SENSORS & TRANSMITTERS



### 4-20 MA VIBRATION SENSORS

SERIES (EX)64X

Available in top or side exit casings

Peak or RMS,  
acceleration or velocity



### ICP® IN-LINE TRANSMITTER

MODEL 682A09

Converts ICP® sensors to loop  
powered transmitters

Outputs 4-20 mA proportional  
to velocity plus analog raw  
vibration output



### ULTRA LOW FREQUENCY DISPLACEMENT SENSOR

MODEL 653A01

Ideal for slow rotating equipment

Measures absolute  
peak to peak displacement

## 4-20 mA USB PROGRAMMABLE VIBRATION TRANSMITTERS



### RECIPROCATING MACHINERY PROTECTOR

MODEL 649A01

Detects faults / mechanical  
looseness in reciprocating  
compressors

Outperforms impact transmitters



### BEARING CONDITION TRANSMITTER

MODEL 649A03

Provides early warning of Rolling  
Element Bearing faults

Works on constant & variable  
speed drives



### PROGRAMMABLE 4-20 MA OUTPUT SENSOR

MODEL 649A04

Outputs acceleration, velocity,  
or displacement

Selectable low & high pass filters



## 4-20 mA DIN RAIL MODULES



### BEARING FAULT DETECTOR

MODEL 682C05

- Powers ICP® accelerometers
- Dual 4-20 mA output



### UNIVERSAL TRANSMITTER

MODEL 682A06

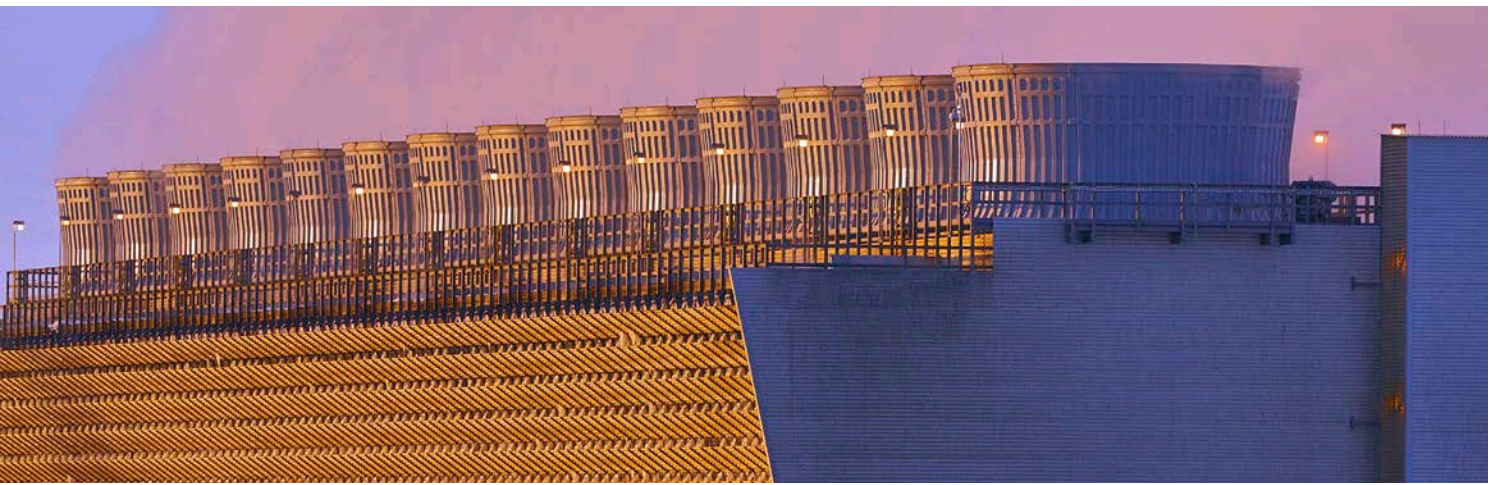
- 24 VDC loop power for 4-20 mA sensors (682A06)
- Shown with Display Programmer Model 070B80 (sold separately)



### VIBRATION TRANSMITTER

MODEL 682C03

- Outputs 4-20 mA signal proportional to acceleration, velocity, or displacement
- ICP® accelerometer input



### USB PROGRAMMABLE SMART SWITCH

SERIES 686

- Programmable delays eliminate false trips
- Competitive price compared to mechanical switches
- Explosion proof options available



### ELECTRONIC VIBRATION SWITCH

SERIES 685B

- Lower cost than competitive models
- Dual set points (relays)
- Explosion proof options available



### LINEAR ADJUST MECHANICAL VIBRATION SWITCH

SERIES 685AX9

- Patented spring-loaded, magnetically coupled mechanism
- Cost effective protection for less-critical applications
- Better control over trip sensitivity

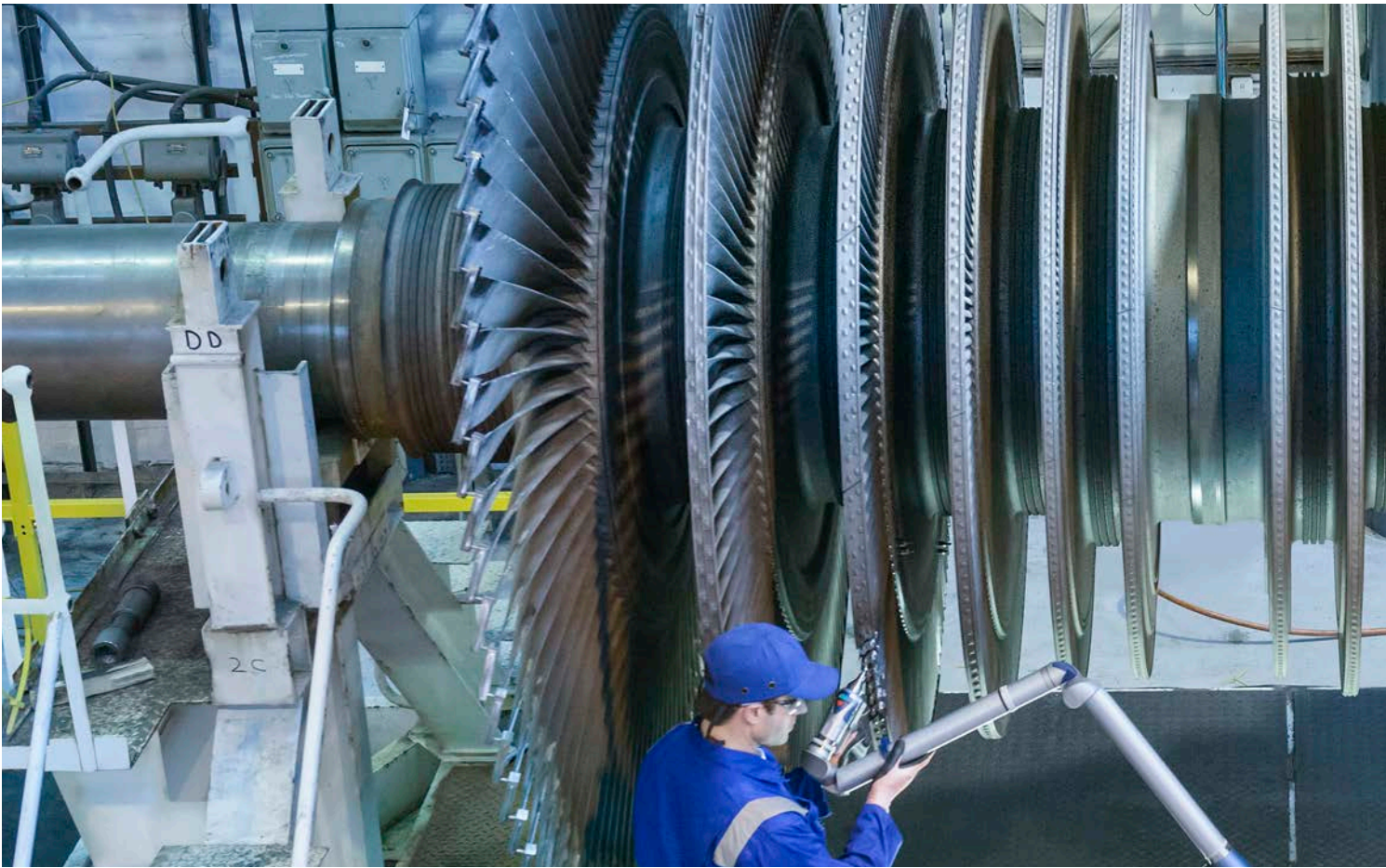


### MECHANICAL VIBRATION SWITCH

SERIES 685A08

- Weatherproof & CSA/UL approved, explosions proof
- Cost effective protection for less-critical applications
- Requires no power





## ENERGY & POWER GENERATION

IMI Sensors specializes in the design and manufacture of innovative sensors and associated signal conditioning instrumentation to meet the demanding requirements of the energy, power generation, reciprocating equipment, oil & gas, and petrochemical industries. Whether involved with design evaluations, field testing, critical component or process monitoring, IMI provides comprehensive condition monitoring solutions for all rotating machinery applications.

## APPLICATIONS

- Gas Turbines
- Compressors
- Oil & Gas
- Wind Turbines



## ACCELEROMETERS FOR GAS TURBINE MONITORING



### HIGH TEMPERATURE ACCELEROMETER

MODEL EX615A42

100 pC/g sensitivity

Temperatures up to 500 °F (260 °C)



### HIGH TEMPERATURE ACCELEROMETER

MODEL EX600B13

100 pC/g sensitivity

Temperatures up to 500 °F (260 °C)



### VERY HIGH TEMPERATURE ACCELEROMETER

SERIES EX619A11

50 pC/g sensitivity

Temperatures up to 900 °F (482 °C)



### HIGH TEMPERATURE CHARGE OUTPUT ACCELEROMETER

MODEL 357B63

.53 pC/g sensitivity

Temperatures up to 900 °F (482 °C)

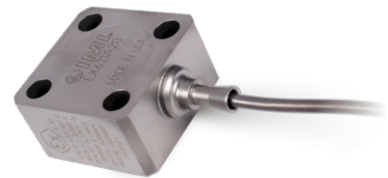


### EXTREME TEMP CHARGE OUTPUT ACCELEROMETER

SERIES EX357E9X

5 pC/g sensitivity

Temperatures up to 1200 °F (649 °C)



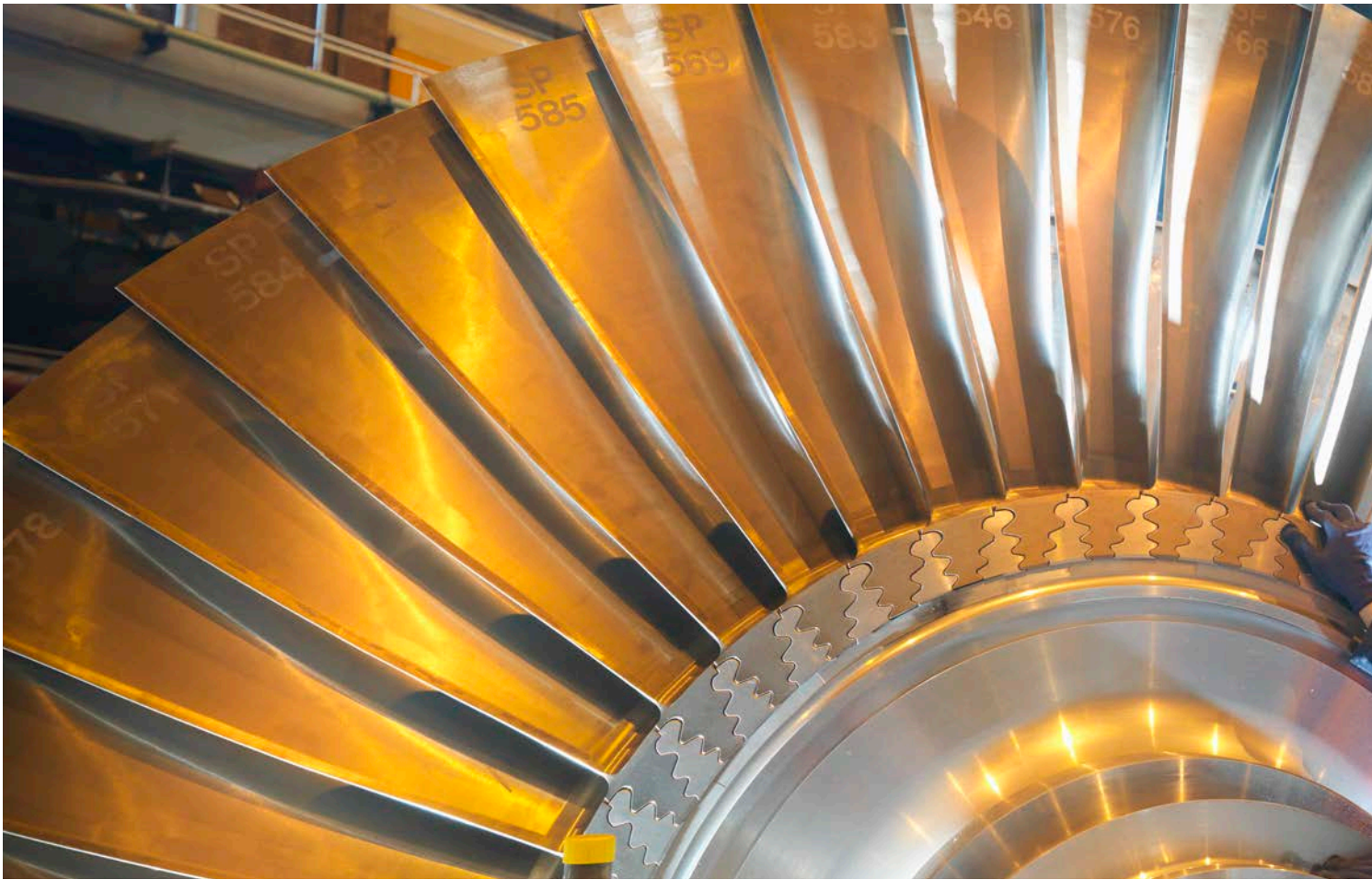
### EXTREME TEMP CHARGE OUTPUT ACCELEROMETER

MODEL EX611A00

Featuring shear mode sensing element vs. compression mode

Temperatures to 1200 °F (649 °C)





## COMBUSTION INSTABILITY PRESSURE SENSORS



### EXTREME TEMPERATURE PRESSURE SENSOR

MODEL 176A02

Sensitivity: 6pC/psi

Measurement Range: 725 psi pk

Frequency Range: Up to 20 kHz



### EXTREME TEMPERATURE PRESSURE SENSOR

MODEL 176A03

Sensitivity: 16 pC/psi

Measurement Range: 290 psi pk

Frequency Range: Up to 10 kHz



### HIGH TEMPERATURE PRESSURE SENSOR

MODEL 176A04

Sensitivity: 15.5 pC/psi

Measurement Range: 300 psi pk

Frequency Range: Up to 10 kHz





**VERY HIGH TEMPERATURE  
PRESSURE SENSOR**

MODEL 176A05

Sensitivity: 52 pC/psi

Measurement Range: 725 psi pk

Frequency Range: Up to 8 kHz



**VERY HIGH TEMPERATURE  
PRESSURE SENSOR**

MODELS 176M03 and 176M09

Sensitivity: 17 pC/psi

Measurement Range: 20 psi pk

Frequency Range: Up to 10 kHz



**VERY HIGH TEMPERATURE  
PRESSURE SENSOR**

MODELS 176M07 and 176M12

Sensitivity: 17 pC/psi

Measurement Range: 20 psi pk

Frequency Range: Up to 6 kHz



## SENSORS FOR GAS PIPELINE PUMPS & REFINERIES



**4-20 MA VIBRATION SENSOR**  
MODEL EX64XB71

Available in velocity or acceleration output

ATEX / CSA approved with explosion proof conduit



**ICP® PRESSURE SENSOR**  
SERIES 121A4X

Mounts on well head & supply lines

Rugged, case isolated sensor

1/4" NPT process fitting



**4-20 MA PRESSURE SENSOR**  
SERIES 1503

Mounts on the compressor

Withstands sourgas environments

1/2" NPT fitting

# CABLES & CONNECTORS



## POLYURETHANE JACKETED

SERIES 052

2-conductor twisted pair with drain, shielded (-50 to +121 °F), with BNC connector to 2-pin MIL



## ARMOR JACKETED

SERIES 048

High temp FEP Cable, Armor Jacketed, 2-conductor twisted pair w/ drain, shielded (90 to +392 °F), with Right Angle 2-Pin MIL connector



## FEP JACKETED

SERIES 053

High temp FEP cable, 2-conductor twister pair, shielded (-85 to +392 °F), with 2-pin MIL connector



## POLYURETHANE JACKETED, COILED

MODEL 050

Coiled Polyurethane cable, 2-conductor twister pair, with 7-pin connector

## BREAKAWAY SAFETY CABLE



## SAFETY BREAKAWAY CABLE ASSEMBLY

MODEL 050LQ006LU

6 ft coiled 2-conductor polyurethane cable, with 2-socket MIL to 3-pin half breakaway connector



## SAFETY BREAKAWAY CABLE ASSEMBLY

MODEL 052LV001AC

1 ft 2-conductor polyurethane cable, with 3-socket half breakaway connector to BNC plug



# DATA COLLECTION ACCESSORIES

## ENCLOSURES

- Consolidate up to 48 channels of outputs into a convenient, centralized location
- Helps extend cable life by reducing number of connections needed for measurements
- Improve efficiency with temperature & vibration outputs in the same enclosure



### BNC TERMINATION BOX

SERIES 691A5X

For use with data collectors that supply ICP® sensor power

1 to 4 input channels via terminal strip

1 to 4 output channels via BNC



### SWITCH BOX

SERIES 691C4X

For use with data collectors that supply ICP® sensor power

Available with 6 or 12 input options.

BNC output connectors for switched vibration & temperature signal



### PORTABLE REFERENCE SHAKER

MODEL 699B02

Conveniently calibrates permanently mounted accelerometers at the machine

Verifies system performance

Confirms operation of cables, switching devices & monitoring systems

Outputs 1g pk or rms; operates at 159.2 Hz

Can perform up to 1,600 operating cycles without loss of battery power



## MOUNTING ACCESSORIES



### EPOXY KITS

- Industrial grade adhesive for installing mounting pads
- Proven to withstand the demands of factory uses
- Applicator syringe helps decrease mess around measurement point



### SPOT FACE TOOLS

- Do-it-yourself installation method to help keep costs low
- Multiple end-mill diameters to suit your specific application
- Easily use with any standard drill



### MAGNETIC BASES & MOUNTING PADS

- Magnetic temporary installations during route data collection
- Mounting pads for permanent installation
- Styles for flat or curved surface mounting



### MOTOR FIN MOUNTS

- Easily take accurate measurements even in narrow spaces
- For use in both portable & permanent monitoring applications
- Multiple widths & lengths to fit your specific application





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