

2024 DRAGON SYMPOSIUM



WELCOME





GROUND RULES

- Let's learn from each other
- Let's respect each other's opinions
- Let's have fun
- Let's leave energized to develop and deploy effective vibration monitoring solutions
- Please turn off your phone ringer and minimize unnecessary distractions



TUESDAY’S AGENDA, BALLROOM B

Time	Topic	Presenter
8:00 – 8:15	Arrive, check in	Entry table
8:15 – 8:30	Welcome and introduction, agenda review	Chris Kramm
8:30 – 10:00	Video greeting from General Manager Chris McLean, factory tour video Wilcoxon introduction	Chris Kramm
10:00 – 10:15	Break	
10:15 – 11:00	Participant introductions	Chris Kramm
11:00 – 12:00	2024 innovations and strategy, roadmap	Tom LaRocque Chris Kramm
12:00 – 13:00	Lunch in 57th Street restaurant, lobby floor	
13:00 – 14:00	New products	Tom LaRocque Peter Eitnier
14:00 – 15:00	Technical training: installation considerations	Tom LaRocque Peter Eitnier
15:00 – 16:00	Reseller awards Q&A, open discussion	Chris Kramm
16:00 – 17:30	Break	
17:30 – 20:30	Dinner, Ballroom A	



WEDNESDAY’S AGENDA, THE SETHI ROOM, 3RD FLOOR

Time	Topic	Presenter
8:00 – 9:00	Wilcoxon growth strategy, sales organization, regional sales goals, market trends	Chris Kramm
9:00 – 10:00	Case study presentations from each company	Participants
10:00 – 10:15	Break	
10:15 – 12:15	Case study presentations from each company	Participants
12:15 – 13:00	Lunch in 57th Street restaurant, lobby floor	Chris Kramm
13:00 – 20:00	Team building outing and dinner, meet in the lobby	



THURSDAY’S AGENDA, THE SETHI ROOM

Time	Topic	Presenter
8:30 – 9:45	Wilcoxon value proposition and key selling points	Chris Kramm Courtney Sturniolo
9:45 – 10:00	Break	
10:00 – 10:45	Marketing 2024 overview, opportunities and regional support	Courtney Sturniolo
10:45 – 11:45	Breakout group #1: CBM	Tom LaRocque
	Breakout group #2: T&M	Peter Eitnier
11:45-12:00	Meeting wrap-up	Chris Kramm
12:00 – 13:00	Lunch in 57th Street restaurant, lobby floor	



VIRTUAL WELCOME

DR. CHRISTOPHER MCLEAN, PRESIDENT & GENERAL MANAGER OF WILCOXON



VIRTUAL FACTORY TOUR

BILL IMES, PRODUCTION MANAGER AT WILCOXON

2024 DRAGON SYMPOSIUM



WILCOXON INTRODUCTION





WHY WILCOXON?

VIBRATION SENSORS WITH TOTAL LOWER COST OF OWNERSHIP

Quality & Reliability

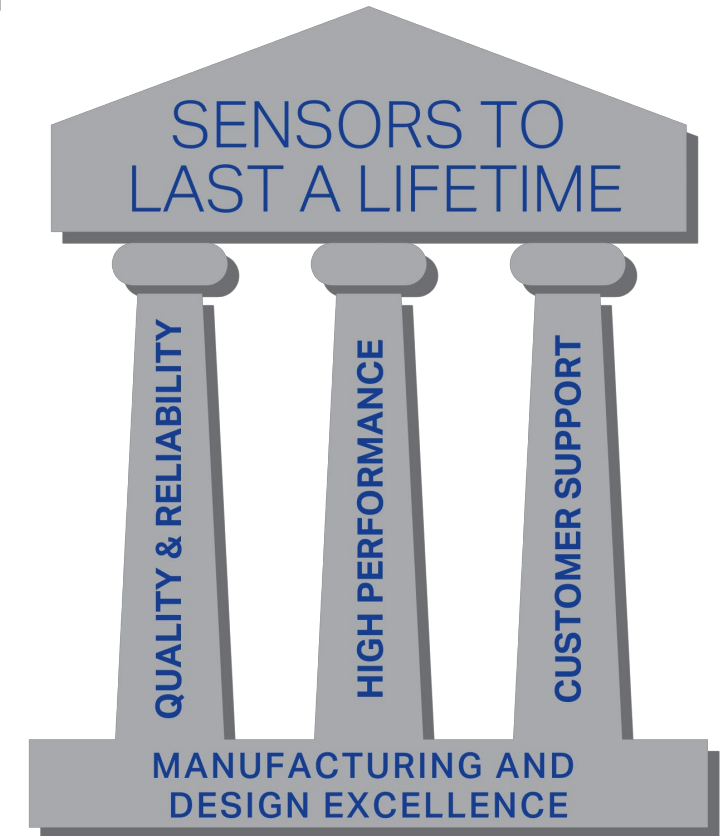
- The longest vibration sensor life – the industry-best mean time between failures – because the true cost of replacing a sensor dwarfs the cost of the sensor itself

High Performance

- Guaranteed to perform to your demanding specifications, even in the most challenging environments and applications

Customer Support & Service

- Our global network of vibration monitoring experts ensures you get the right solution, the first time, on time





QUALITY AND RELIABILITY

ACCURATE MEASUREMENTS OVER THE LONGEST SENSOR LIFE IN THE INDUSTRY

- **Highest MTBF** (mean time between failures) in the industry – **25 years!**
- **Contamination-free sensors** for reliable readings for years to come
 - Final weld is completed in an inert atmosphere inside a dry box
 - True hermetic seal, backed by helium leak testing of sensors to 1×10^{-8} cc He/sec, compared to competitors' bubble test that allow 10,000 times more leakage
- **Consistent product performance** from piezoelectric crystal stabilization, ensuring accelerometer sensitivity does not drift over time, <1% sensitivity drift over 10 years
- **Lifetime warranty** on most products, but you won't have to use it
- **Total Lower Cost of Ownership**, because the true cost of replacing a sensor dwarfs the cost of the sensor itself



Two sensors removed after more than 10 years of operation in a cooling tower and being subjected to sulfuric acid, water spray, dirt and grime. The left sensor has been rubbed clean of most contaminants. The sensor on the right appears as it did when it was removed from operation. Both sensors still performed as they did at commissioning.



HIGH PERFORMANCE

FOR MEASUREMENTS YOU CAN TRUST, SENSORS ARE JUST THE BEGINNING

- Engineered for performance, using FEA to achieve the highest performance specifications
- Meet or exceed advertised specifications for sensors, cable assemblies and hardware
 - Check the specs on low-cost cables and sensors, which are often delivered below advertised performance specifications
- Guaranteed technical performance across a wide range of operating conditions and environments
 - Extended temperature range sensors
 - Hazardous area certifications
 - Market leader in electromagnetic interference (EMI) resistance
- High performance products across the measurement chain – sensors, mounting hardware, cabling, junction boxes and instrumentation – ensure high-fidelity data





CUSTOMER SUPPORT & SERVICE

THE RIGHT SOLUTION, THE FIRST TIME, ON TIME

- Two-day turnaround on standard quotes to keep your project on schedule
- Global network of expert partners to assist you in your language and your time zone
- Expert support to ensure the ideal technical and product solution for your application
- Dedicated inside sales representatives provide personal attention to each order
- 98% on time delivery and the shortest lead times in the industry
- Guaranteed-in-stock program to offer next-day shipping on our most popular products





INDUSTRIES

SOLUTIONS FOR A WIDE RANGE OF INDUSTRIAL, SPECIALIZED, AND UNDERWATER APPLICATIONS



Cement



Condition monitoring



Food and beverage



Machine tool



Water and wastewater



Wind power



Metals processing



Mining



Nuclear



Oil and gas



Defense



Pharmaceutical



Power generation



Pulp and paper



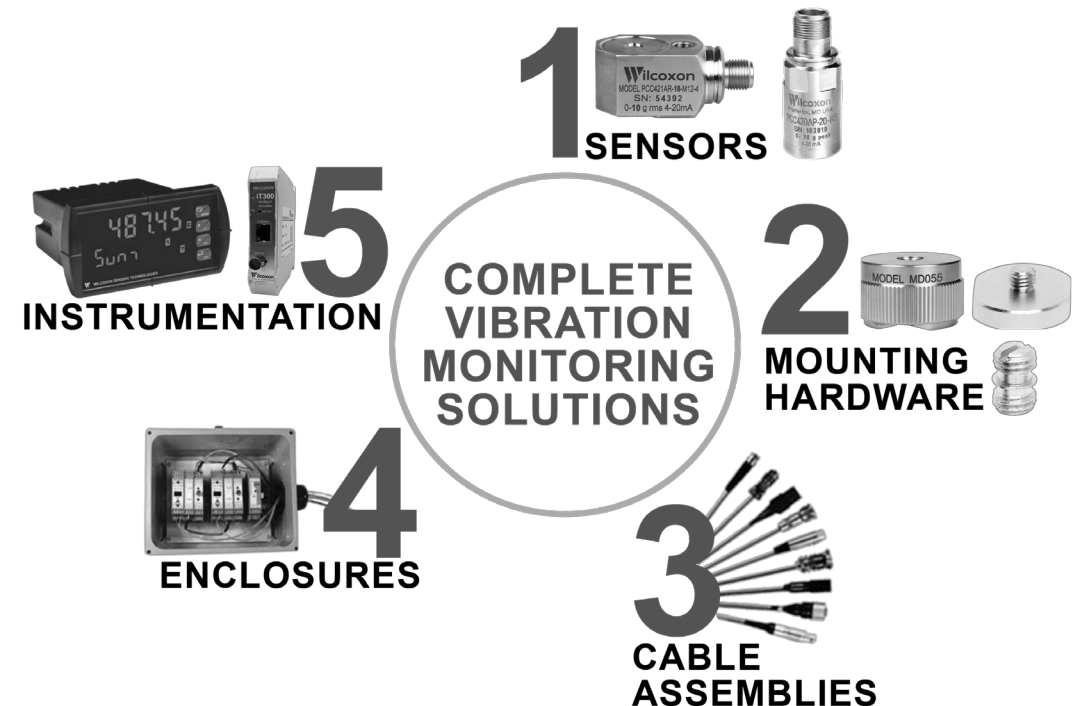
Rail



COMPLETE THE SENSOR CHAIN

EVERYTHING YOU NEED, FROM ONE SOURCE

- **Sensors** – start with the right sensor for your application, we'll help
- **Mounting hardware** – a range of studs, cementing, pads, and magnet mounts, to permanently or temporarily attach the sensor to the machine
- **Cable assemblies** – carry the signal from the sensor
- **Enclosures** – a safe and fast central data collection point for up to 48 sensors
- **Instrumentation** – useful tools for analysts, in both permanent and portable installations





PRODUCTS

HIGH-QUALITY, HIGH-PERFORMANCE PRODUCTS ACROSS THE SENSOR VALUE CHAIN



General purpose
accelerometers



4-20 mA vibration sensors



Digital sensors



Specialty sensors



Hazardous area sensors



Mounting hardware



Cable assemblies



Enclosures



Vibration transmitters



Panel meters



Handheld vibration meters



Reference source



APPLICATIONS

ROTATING AND PROCESS EQUIPMENT

- ✓ General machines | motors, pumps, gearboxes, generators, fans, compressors, air handlers
- ✓ High-speed machines | CNC machining, grinding, turbomachinery, spindles
- ✓ Low-speed machines | extruders, conveyors
- ✓ High vibration applications | mills, aggregate processing machines, recip compressors
- ✓ High temperature environments | dryers, boilers, turbomachinery, paper machines
- ✓ Underwater & washdown applications | submersible pumps, mixers
- ✓ Hazardous area applications | oil & gas processing machines, nuclear, cooling towers
- ✓ High electromagnetic interference (EMI) environments | wind turbines, power generators
- ✓ Low-frequency applications | towers, cranes, structural applications

FAULT DETECTION

- Imbalance
- Misalignment
- Bent shaft
- Mechanical looseness
- Casing / foundation distortion
- Bearing faults
- Motor faults
- Resonance
- Gear mesh
- Universal joints
- Couplings
- Cavitation

2024 DRAGON SYMPOSIUM | WILCOXON INTRODUCTION



Industrial condition monitoring

- Accelerometers
 - General purpose
 - Low power, low voltage
 - Tri-axial
 - High temp
- Hand-held instruments
- Mounting accessories
- Cable assemblies
- Enclosures



Wind and power gen monitoring

- Accelerometers
 - Low-frequency
 - EMI resistant
 - Radiation resistant
 - Hazardous area certified
- Velocity sensors



Process automation

- 4-20 mA loop powered vibration sensors
- HART vibration sensors
- Vibration transmitters
- MODBUS vibration transmitters
- Panel meters
- Cable assemblies



Underwater sensing

- Hydrophones
- Seismic sensors
- Acoustic vector sensors
- Tonpilz



Test & Measurement

- Piezoelectric shakers
- Electromagnetic shakers
- Impedance heads
- Matching networks
- Power amplifiers
- Seismic sensors



2024 DRAGON SYMPOSIUM



ROADMAP & STRATEGY





NEW PRODUCTS TO HELP YOU GROW WITH WILCOXON

2024 AND 2025 FOCUS

- Expand offering of complementary Condition Based Maintenance products
 - **Ultrasound Receiver** – bearing health and lubrication monitoring, leak detection for all gases, electrical safety inspection, valve and steam trap monitoring
 - Oil analysis products – oil debris & oil quality monitoring
 - Thermography and temperature monitoring products
 - Electrical signatures analysis products – voltage and current monitoring
- Economy sensors
 - **78x Integral Cable Sensors**
 - **Injection molded sensors**
- Data connectivity products
 - **Data gateways** – wired and wireless gateways, 1CH and 4CH versions, MMQT connectivity to Cloud servers
 - **Digital sensors** – HART, Modbus, and other protocols

2024 DRAGON SYMPOSIUM



NEW PRODUCTS





NEW PRODUCTS



Ultra-low power
embeddable
accelerometers



Next generation
hydrophones



PCC420 vibration
sensors



Ultrasound
detection kits

2024 DRAGON SYMPOSIUM



LVEP ULTRA-LOW POWER EMBEDDABLE ACCELEROMETER



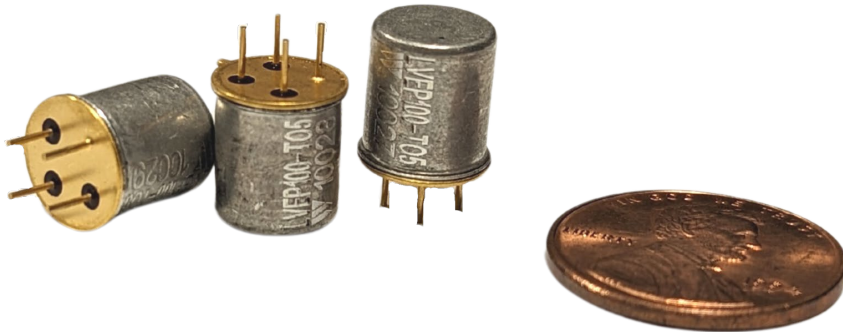


LVEP ULTRA LOW POWER EMBEDDABLE ACCELEROMETERS

HIGH-PERFORMANCE PIEZOELECTRIC ACCELEROMETER DESIGNED FOR ULTRA-LOW POWER CONSUMPTION AND EASY INTEGRATION

Easy integration

- TO-5 standard transistor packaging for easy integration
- Hermetically sealed
- Small, lightweight



Ultra-low power consumption

- 180 μW power consumption
- 60 μA very low current draw for battery-powered applications
- Operates down to 3 VDC
- Fast BOV settling time, typically 350 μs

High-performance

- High sensitivity for better resolution, more detailed vibration data
- $\pm 5\%$ sensitivity tolerance
- Low noise: 12 $\mu\text{g}/\sqrt{\text{Hz}}$ at 100 Hz (700 μg broadband)



APPLICATIONS



WIRELESS
SENSORS



BATTERY POWERED AND
ENERGY HARVESTING



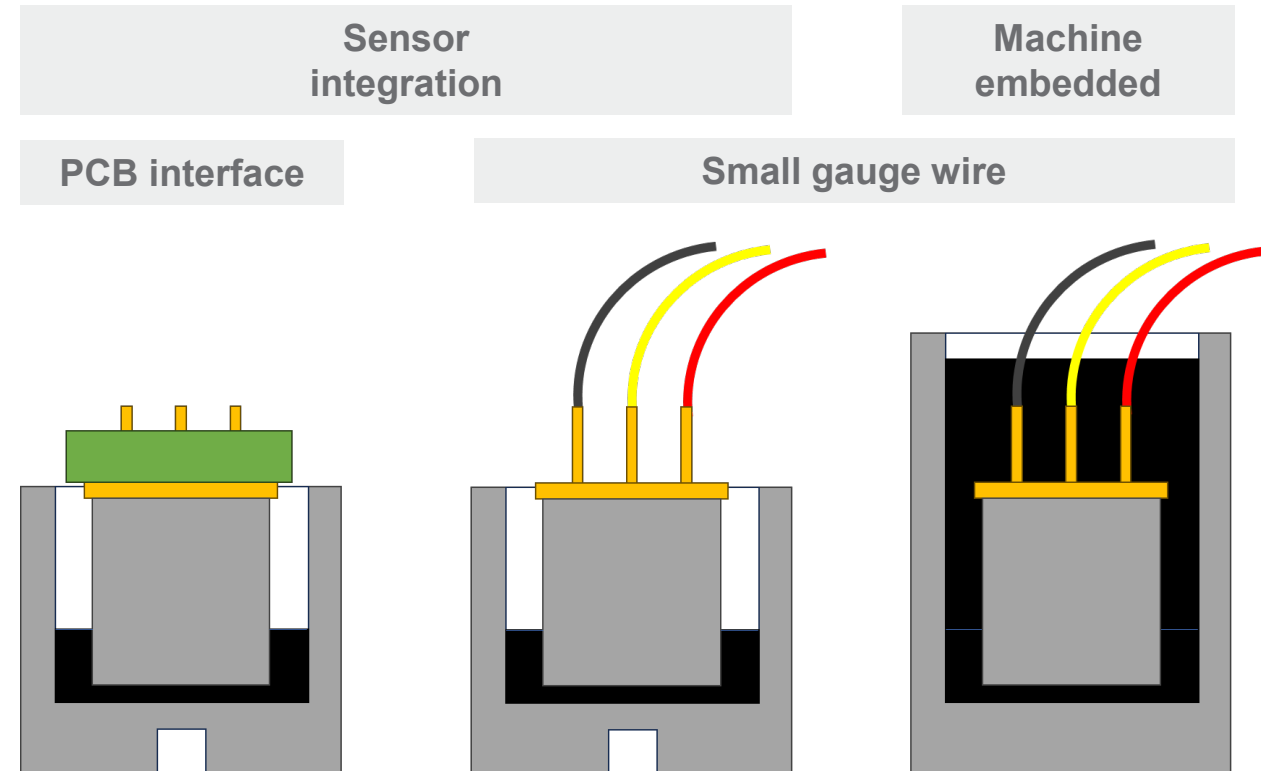
INTEGRATED MACHINERY
HEALTH MONITORING



BENEFITS OF TO-5 PACKAGING

EASY INTEGRATION INTO FINAL DESIGN

- Good vibration coupling from cannister base into vibration pellet
- Lightweight to preserve usable measurement bandwidth
- Hermetic sealing to prevent contaminants and moisture from entering the sensor, to ensure stable measurements over a long operational lifetime
- Small size enables three-axis sensor designs

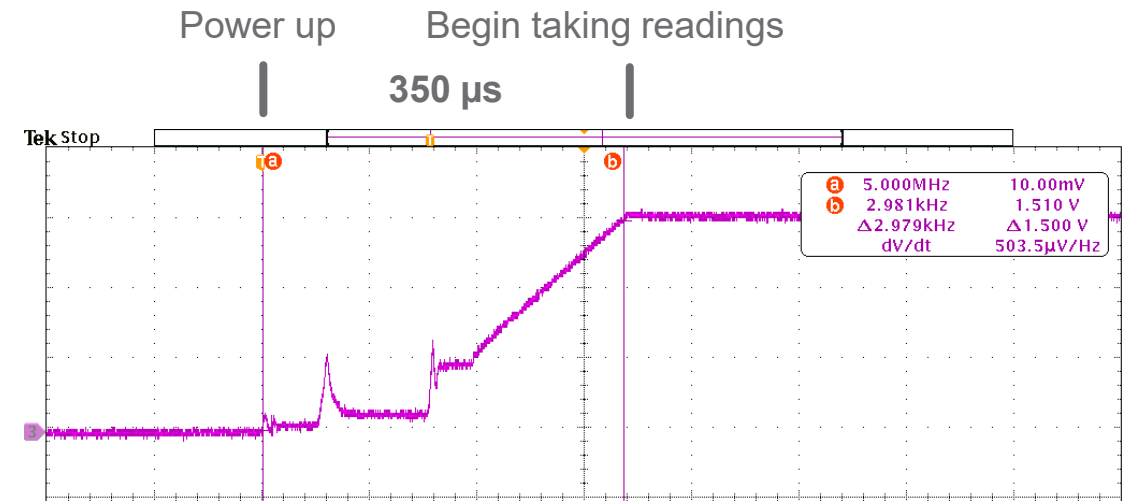




ULTRA LOW POWER CONSUMPTION

TAKE MORE MEASUREMENTS USING LESS BATTERY

- 180 μW power consumption
- 60 μA very low current draw
 - 0 μA current draw in power-down mode
- Operates down to 3 VDC
- Ready to take measurements in 350 μs of power-up
- Use power only when taking a measurement





KEY SPECIFICATIONS

LVEP050-TO5

- **Sensitivity:** 50 mV/g, $\pm 5\%$
- **Acceleration range:** 25 g
- **Frequency response:**

$\pm 5\%$	3 - 5,000 Hz
$\pm 10\%$	2 - 7,000 Hz
$\pm 3\text{ dB}$	1 – 12,500 Hz
- **Resonance frequency:** 17 kHz
- **Electrical noise:**
 - Broadband 2.5 Hz to 25 kHz 700 μg
 - Spectral

10 Hz	35 $\mu\text{g}/\sqrt{\text{Hz}}$
100 Hz	12 $\mu\text{g}/\sqrt{\text{Hz}}$
1,000 Hz	6 $\mu\text{g}/\sqrt{\text{Hz}}$

LVEP100-TO5

- **Sensitivity:** 100 mV/g, $\pm 5\%$
- **Acceleration range:** 14 g
- **Frequency response:**

$\pm 5\%$	6 - 5,000 Hz
$\pm 10\%$	4 - 7,000 Hz
$\pm 3\text{ dB}$	2 – 12,500 Hz
- **Resonance frequency:** 17 kHz
- **Electrical noise:**
 - Broadband 2.5 Hz to 25 kHz 600 μg
 - Spectral

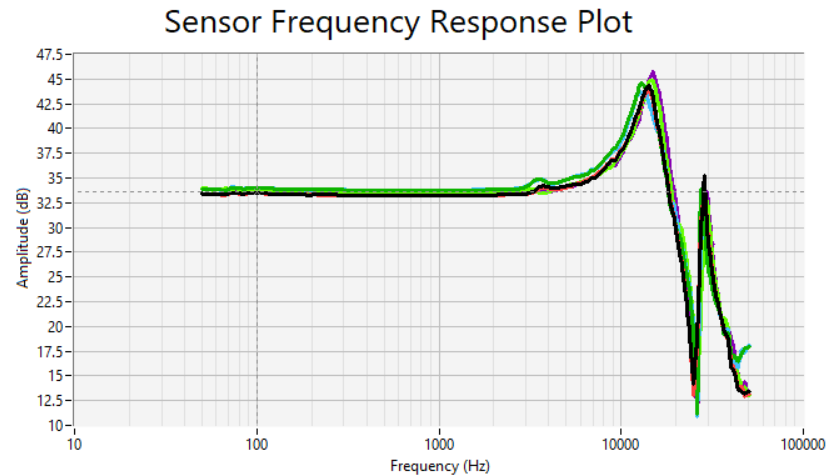
10 Hz	24 $\mu\text{g}/\sqrt{\text{Hz}}$
100 Hz	8 $\mu\text{g}/\sqrt{\text{Hz}}$
1,000 Hz	4 $\mu\text{g}/\sqrt{\text{Hz}}$



PERFORMANCE MATCHING AN INDUSTRIAL ACCELEROMETER

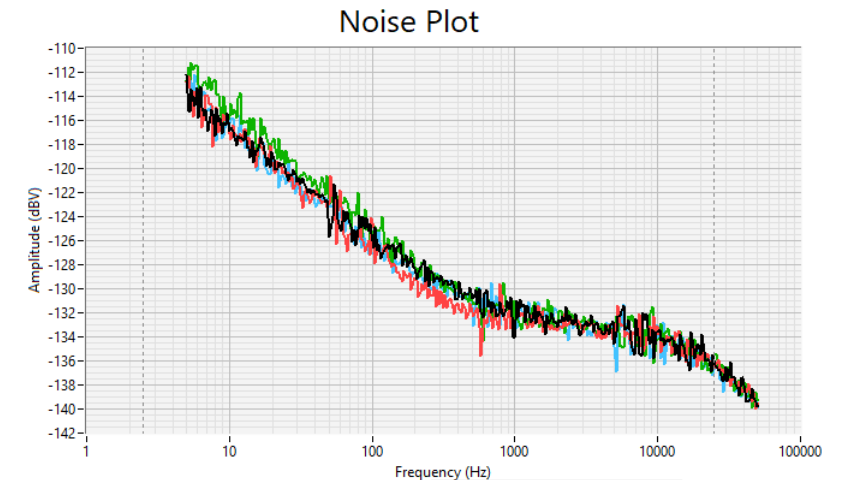
WIDE BANDWIDTH AND FLAT RESPONSE

- Reliable measurements >6kHz to detect bearing issues earlier
- Flat response, no filtering required for sensor-induced in-band resonances
- $\pm 5\%$ sensitivity tolerance for minimal measurement variation between sensors



LOW NOISE AND HIGH DYNAMIC RANGE

- Detect bearing and gearing issues earlier
- See what's happening below the noise floor of non-piezo-based sensing technologies





EVOLUTION

To scale

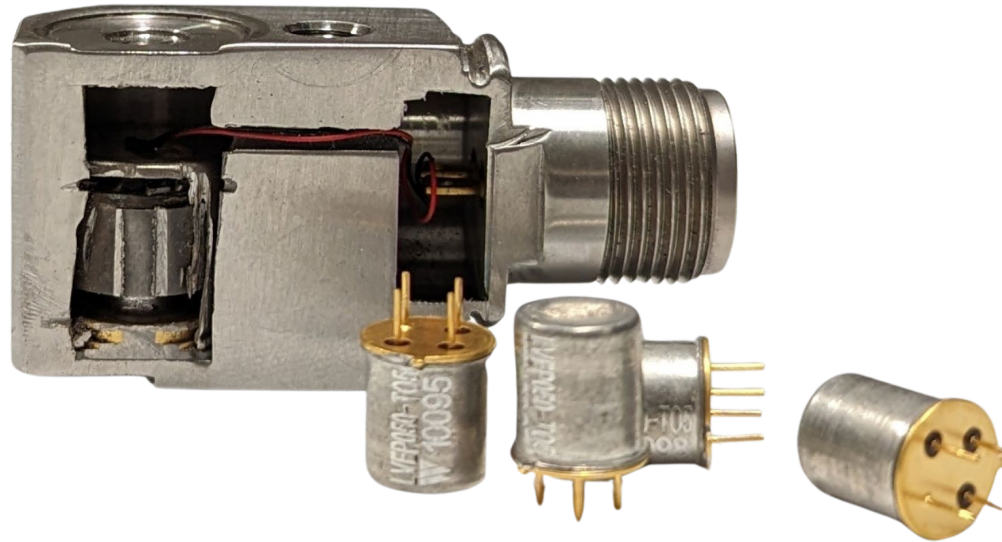


	786A	LPA100T	LVEP	LVEP-TO5
Form factor	Industrial sensor package limits mounting and configuration	Industrial sensor package limits mounting and configuration	Embeddable, small, not standardize transistor package	TO-5 package is small and standardized for embedding
Cost	Cost includes sensing functionality plus housing	Cost includes sensing functionality plus housing	Costs less than fully packaged sensor	More affordable sensing element
Temperature sensor	X	✓	✓	X
Low-power	X	✓	✓	✓



LINKS

- [Series overview](#)
- [LVEP-TO5 infographic](#)
- [LVEP-TO5 product presentation](#)
- [LVEP050-TO5 specifications](#)
- [LVEP050-TO5 product page](#)
- [LVEP100-TO5 specifications](#)
- [LVEP100-TO5 product page](#)
- [Press release](#)
- [Request a sample](#)



2024 DRAGON SYMPOSIUM



H23 HYDROPHONES





H23 HYDROPHONES OVERVIEW

UNDERWATER ACOUSTIC MEASUREMENTS FOR LAB AND OCEAN RESEARCH

- 80 kHz, 100 kHz, and 130 kHz versions
- Ultra low noise internal amplifier
- Underwater operation to 680 meters, 2230 feet, 1000 PSI
- Underwater sound measurements over the frequency range 5 Hz to 150 kHz (+6/-10 dB)
- Integral cable
- Rugged construction
- Low cost



H23-080



H23-100



H23-130



APPLICATIONS

OCEANIC AND LAB RESEARCH

- Calibration reference standards
- Ultrasonic measurements in liquids
- Cavitation measurements
- Laboratory and industrial measurements in liquids, gases
- Military surveillance
- Underwater biological studies
- Ship noise studies
- Pump and machinery studies
- Monitoring of underwater ordnance



APPLICATIONS:



MILITARY
STUDIES AND
SURVEILLANCE






UNDERWATER
STUDIES DOWN TO
2230 FEET, 1000 PSI



PUMP CAVITATION
AND MACHINERY
STUDIES



KEY SPECIFICATIONS

	 H23-080	 H23-100	 H23-130
Nominal sensitivity	-174 dB re 1 V/ μ Pa	-178 dB re 1 V/ μ Pa	-182 dB re 1 V/ μ Pa
Frequency response (re 100 Hz)			
± 2 dB	15 Hz to 10 kHz	15 Hz to 10 kHz	15 Hz to 10 kHz
± 4 dB	10 Hz to 50 kHz	10 Hz to 70 kHz	10 Hz to 100 kHz
+6/-10 dB	5 Hz to 100 kHz	5 Hz to 120 kHz	5 Hz to 150 kHz
Horizontal directivity (radial, XY plane)		± 2 dB at 20 kHz	
	± 4 dB at 80 kHz	± 4 dB at 100 kHz	± 4 dB at 130 kHz
Vertical directivity (axial, XZ plane)		± 3 dB at 20 kHz	
Noise ³ , nominal @23°C, re 1 μ Pa/ $\sqrt{\text{Hz}}$:			
1 kHz	28 dB	33 dB	36 dB
10 kHz	15 dB	21 dB	25 dB
100 kHz	12 dB	17 dB	22 dB
Max operating static pressure	1000 PSI (680m / 2230ft sea water depth)		
Integral cable	0.14" dia., twisted shielded pair, 10 ft standard length, polyurethane jacket		



LINKS

- [Series overview](#)
- [Series 1-page overview](#)
- [H23 series specifications](#)
- [H23-080 product page](#)
- [H23-100 product page](#)
- [H23-130 product page](#)
- [H23 series presentation](#)



2024 DRAGON SYMPOSIUM



UPGRADED PCC420 SENSORS





PCC420 SERIES NEXT-GENERATION 4-20 MA VIBRATION SENSORS

UPGRADES VS. PC420S

- More compact size
- Lighter weight
- Available with 2-pin MIL-C-5015 or 4-pin M12 output connector
- Metric scaling options for velocity versions
 - 10mm = 10 mm/sec
 - 20mm = 20 mm/sec
 - 25mm = 25 mm/sec
 - 50mm = 50 mm/sec
- Lower cost, budget-friendly option without loss of reliability or performance – 35% price reduction
- Shorter lead time



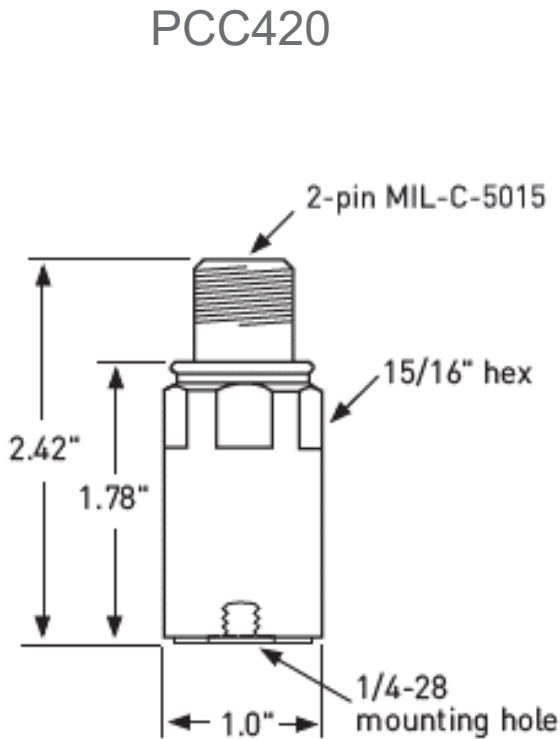
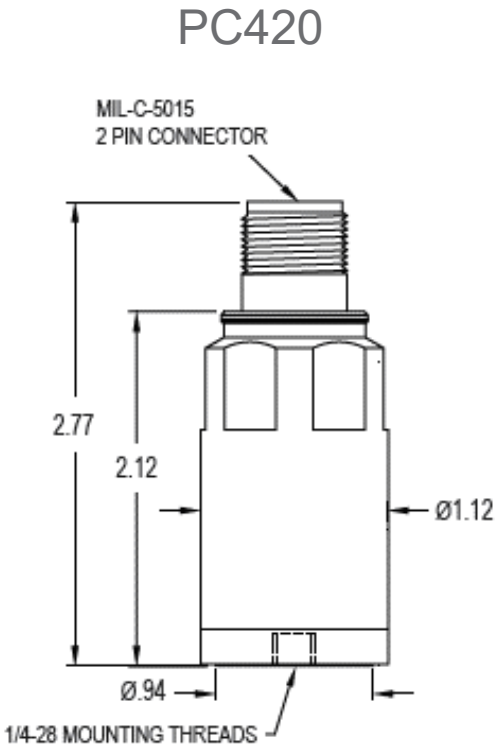
IN COMMON WITH PC420 SERIES

- 4-20mA output proportional to acceleration (PCC420A) or velocity (PCC420V)
 - Provides overall trend data on machine vibration to simplify vibration trending
 - Signal readily accepted by common process systems such as PLC, DCS, SCADA for cost effective 24/7 monitoring
- Available in top-exit (PCC420), side-exit (PCC421), and side-exit integral cable (PCC423) versions



SPECIFICATIONS COMPARISON

4-20mA Acceleration Sensor Comparison		
Specification	PC420A	PCC420A
Full scale (20mA) tolerance	5%	5%
Frequency response (±10%, Hz)	10 - 1,000	10 - 1,000
Frequency response (±3dB, Hz)	1 - 2,000	1 - 2,000
Repeatability	±2%	±2%
Transverse sensitivity, max	5%	5%
Loop resistance at 24 VDC (Ω)	700	700
Turn-on time (seconds)	30	30
Temperature range, max (°C)	105	105
Temperature range, min (°C)	-40	-40
Vibration limit (g)	250	250
Shock limit (g)	2,500	2,500
Weight (grams)	160	120
Case material	316L SS	316L SS





LINKS

- [PCC420 overview](#)
- [PCC420 series features & benefits](#)
- [PCC420A series data sheet](#)
- [PCC420V series data sheet](#)
- [PCC421 series data sheet](#)
- [PCC423 series data sheet](#)
- [Process monitoring solutions overview](#)



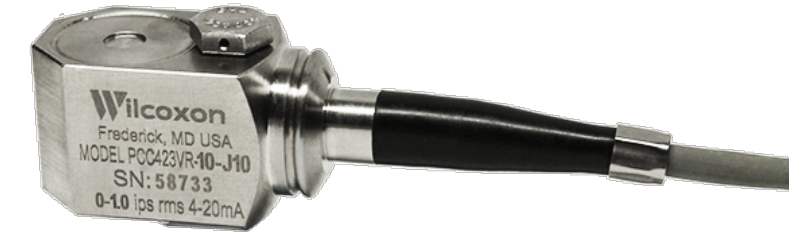
PCC420V



PCC420A



PCC421



PCC423

2024 DRAGON SYMPOSIUM



ULTRASOUND MONITORING KITS





ULTRASOUND EXPERIENCE

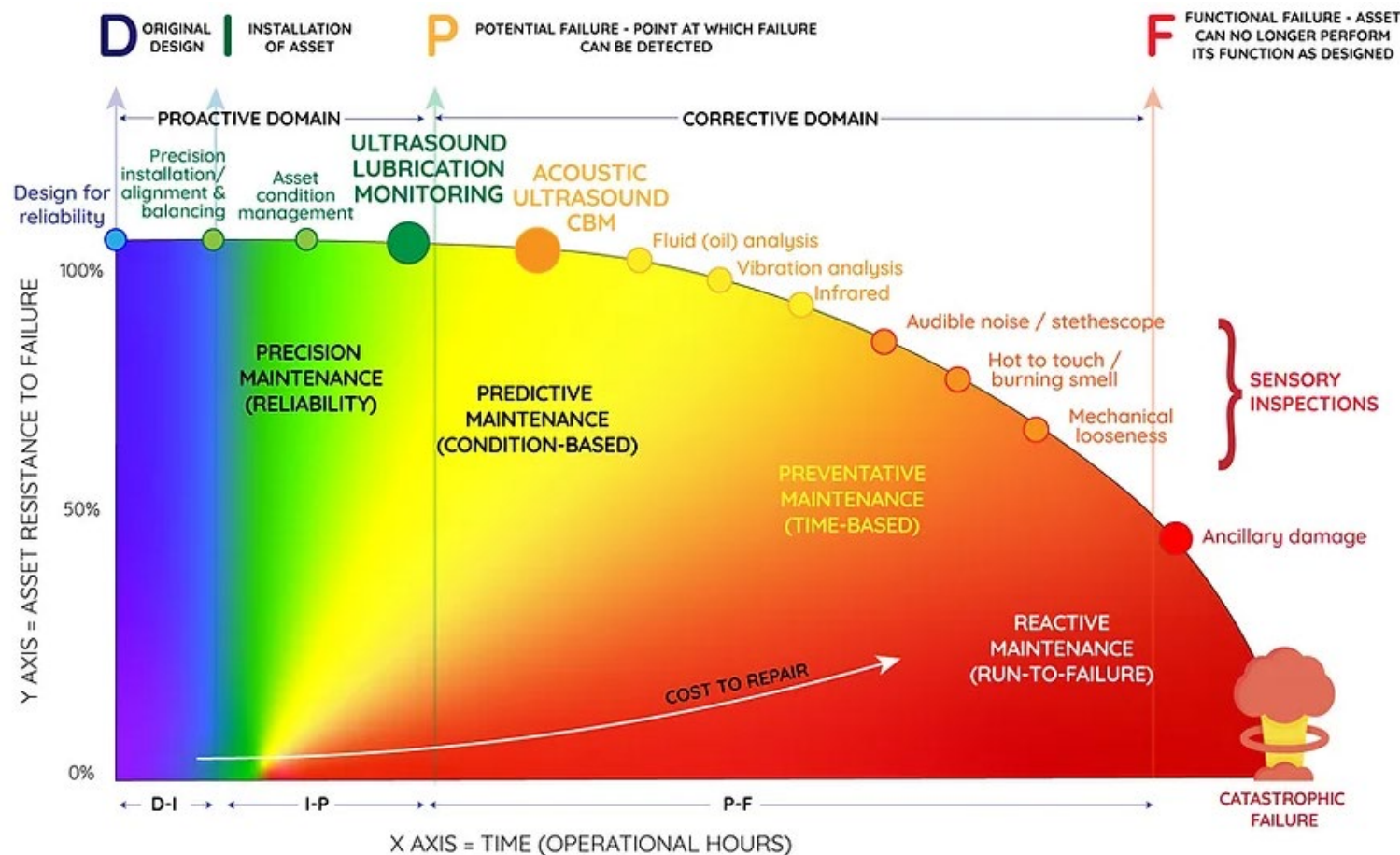
HAS ANYONE HERE...

- Practiced ultrasound detection?
- Been trained or certified in ultrasound?
- Sold ultrasound products?





COMPLIMENTARY TECHNOLOGY TO VIBRATION ANALYSIS

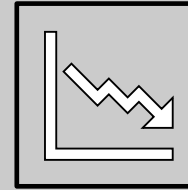




ULTRASOUND CONDITION MONITORING BENEFITS



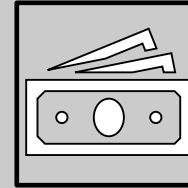
Improve safety



Minimize unplanned downtime
and maximize machinery
lifetime



Optimize maintenance
activities and reduce reactive
maintenance

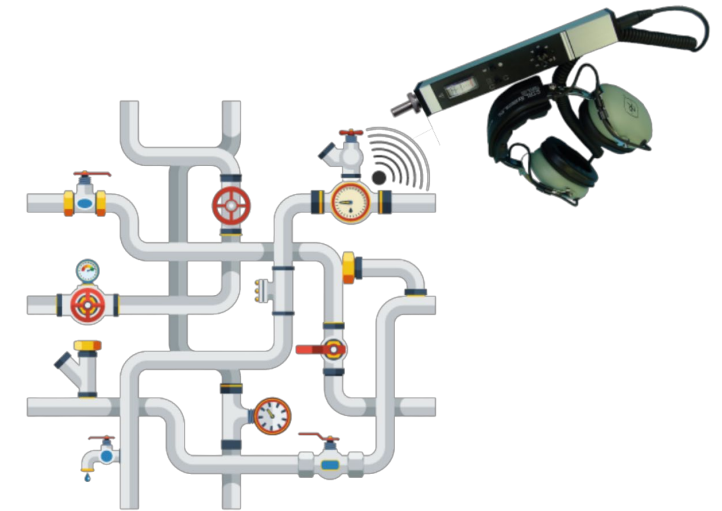


Reduce energy costs with leak
detection



ULTRASOUND TECHNOLOGY

- Ultrasonic (>20 kHz) noise emitted by mechanical, pneumatic, hydraulic and electrical systems
- Uses a piezoelectric sensing element (like accelerometers) to receive signals
 - Instead of covering a wide bandwidth frequency response, focus is on specific area (40 kHz)
- Instrument translates high-frequency signal down to audible range to hear through headphones
 - RMS values, waveforms, trending and more available through mobile devices
- Friction, turbulence, cavitation cause most ultrasonic emissions
- Structure-borne and airborne transmission methods
- Benefits include
 - Emissions/detection is directional
 - Ultrasound tends to be highly localized
 - Provides early warning of impending mechanical failure
 - Can be used in loud and noisy environments





ULTRASOUND DETECTION KITS

- Ease of use, “point and shoot”
 - Can detect all leaks with no frequency tuning – tuning can lead to missed leaks not within the limited frequency range
- Leak detection not specific to a kind of gas – detects turbulent flow
 - Finds more leaks than any competitive system
 - Most “leak detectors” sense a characteristic of a specific gas
- Competitively priced
- Signal to noise ratio minimizes white noise





APPLICATIONS

Mechanical systems

- Bearings and gearboxes
- Condition-based maintenance
- Lubrication inspection
- Pumps and motors

Air, fluid, and steam systems

- Compressed gas leaks
- Container / tightness testing
- Distributions lines
- Hydraulics
- Steam leaks
- Steam trap inspections
- Vacuum leaks
- Valve inspection

Electrical systems

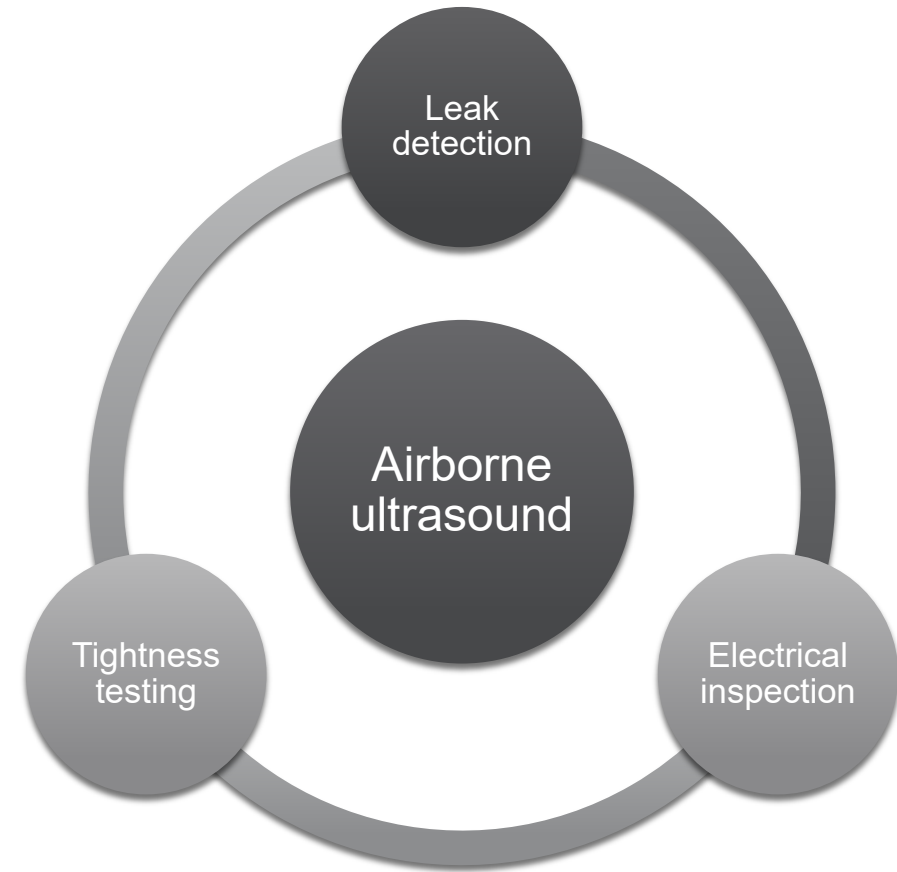
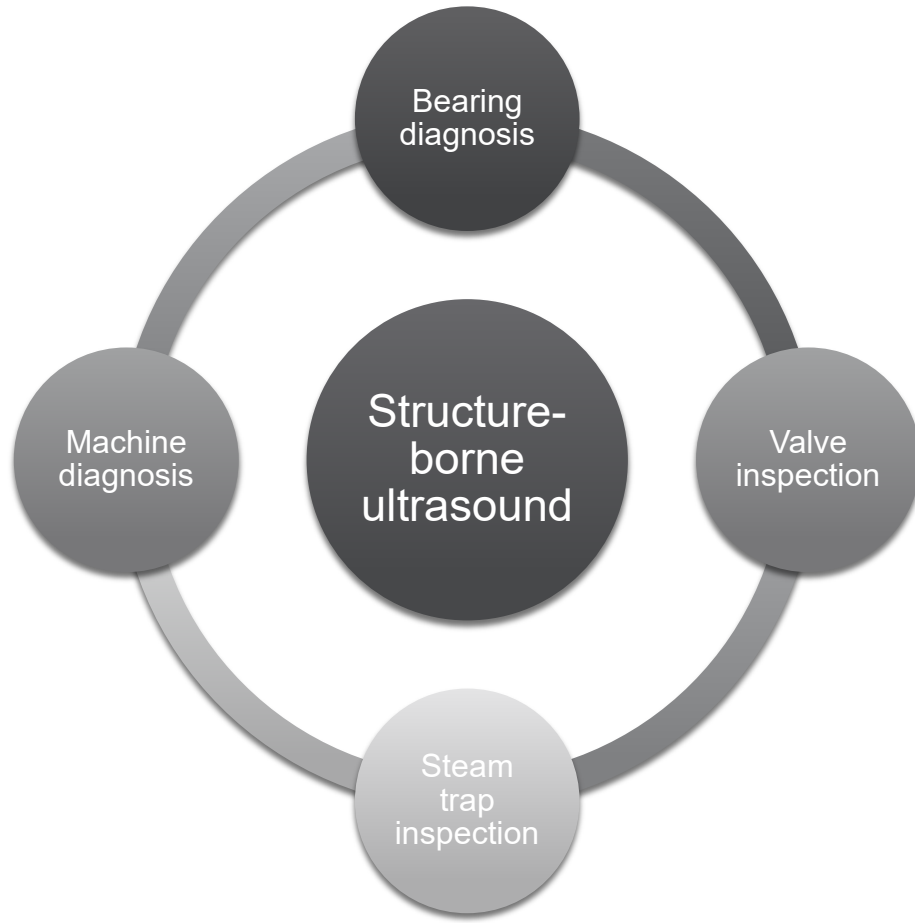
- Arcing
- Corona discharge
- Electrical panel inspection
- High voltage systems
- Medium / low voltage systems
- Transformer inspection
- Transmission line inspection

Departments

- Engineering
- Facilities maintenance
- Production reliability
- Quality control
- Safety
- Transportation



MAINTENANCE APPLICATIONS

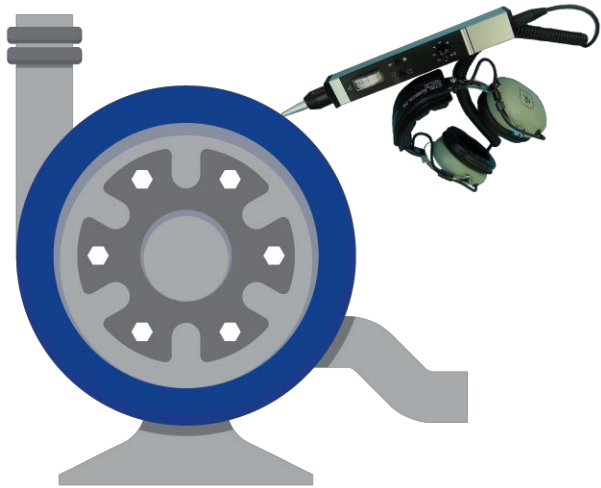




UDK-CM CONDITION MONITORING KIT

STRUCTURE-BORNE ULTRASOUND DETECTION

- Hear, monitor and diagnose bearings, gears, pumps, valves, and cylinders
- Cloud-based application analyzes, trends, and reports the condition of critical production equipment.



Receiver (optional Intrinsically Safe certification)

Head set

Solid probe set: 3", 5", 8", 13"

1-year subscription, cloud-based condition monitoring app

Heavy duty carrying case

- The Condition Monitoring Ultrasound Detection Kit includes all components of the Valve and Steam Trap Monitoring Kit



CONDITION BASED MAINTENANCE AND LUBRICATION

- Bearings and gearboxes
 - Under / over lubrication
 - Excess wear
 - Can detect prior to vibration or temperature
- Grms levels sent to mobile device for tracking, alerts
- FFT available for diagnostics

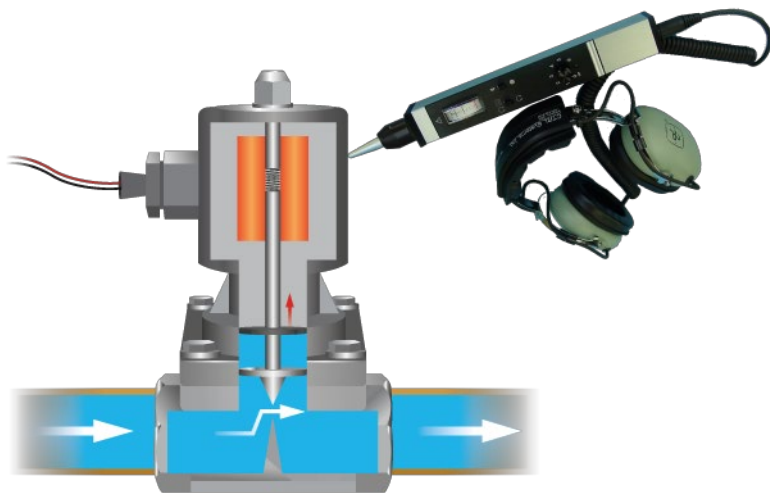




UDK-VL VALVE AND STEAM TRAP MONITORING KIT

STRUCTURE-BORNE ULTRASOUND DETECTION

- Save money by detecting internal by-pass leaks with a single point inspection



Receiver (optional Intrinsically Safe certification)

Head set

Solid probe set: 3", 5", 8", 13"

Heavy duty carrying case

- The Condition Monitoring Kit includes all components of the Valve and Steam Trap Monitoring Kit



STEAM TRAPS AND VALVES

- Detect internal by-pass leaks
- Reduce inspection time for hydraulic lines/systems
- Ensure proper operation of device

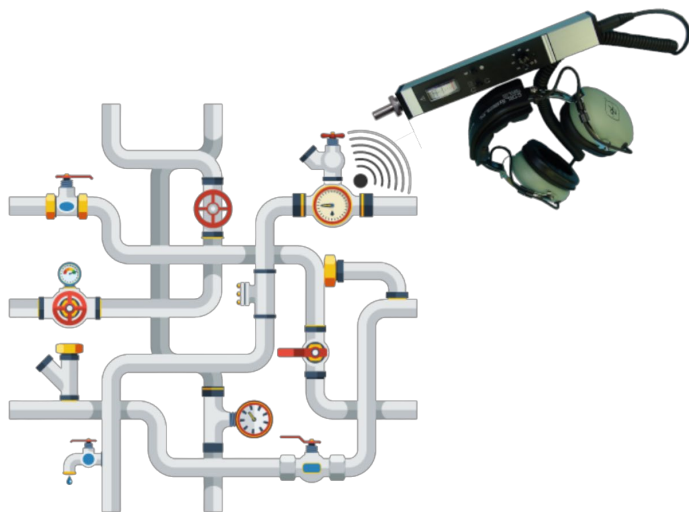




UDK-LK LEAK DETECTION KIT

AIRBORNE ULTRASOUND DETECTION

- Detect leaks of any type of gas from vacuums, valves, steam traps, and HVAC systems



Receiver (optional Intrinsically Safe certification)

Headset

Concentrator set: large and mini concentrators, acoustic tip

Acoustic extension probe set: 12" double-end threaded metal probe (2), 12" single threaded metal probe, 12" polycarbonate probe, adapter

Heavy duty carrying case

- The Leak Detection Kit includes all components of the Electrical Safety Inspection Kit



LEAK DETECTION

- Pressurized and non-pressurized system leaks of any gas type
- Cabins / containers that need to be sealed
- HVAC (outdoor environment does not impact detection)
- Expensive gas leaks bring immediate ROI (nitrogen, oxygen, etc)
- Compressed air leaks account for 25-30% of compressor energy demand
 - Repairing one compressed air leak can save \$250-\$18,500 per year
- Improve steam system efficiencies





UDK-EI ELECTRICAL SAFETY INSPECTION KIT

AIRBORNE ULTRASOUND DETECTION

- Detect corona discharge, tracking, and arcing from a safe distance, with no need to remove panels

Receiver (optional Intrinsically Safe certification)

Head set

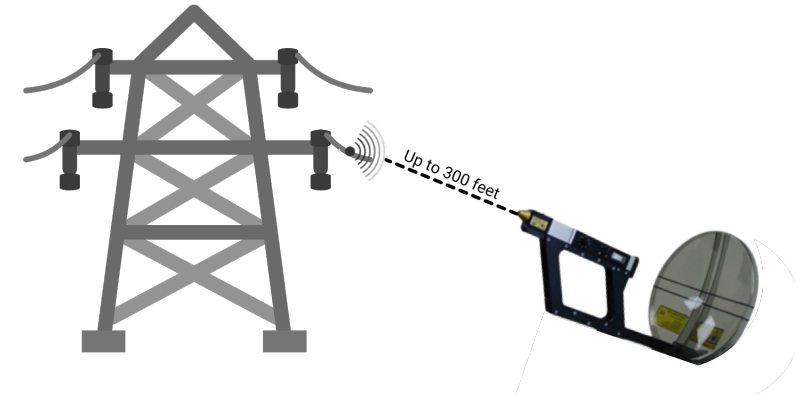
Concentrator set: large and mini concentrators, acoustic tip

Polycarbonate acoustic probe, 12"

Heavy duty carrying case

Optional range extender (300 feet)

- The Leak Detection Kit includes all components of the Electrical Safety Inspection Kit





PARABOLIC RANGE EXTENDER

ADD-ON TO THE ELECTRICAL INSPECTION KIT

- Non-contact, airborne ultrasound detection
- Electrical safety inspection
- Detects corona discharge, tracking, and arcing from up to 300 feet





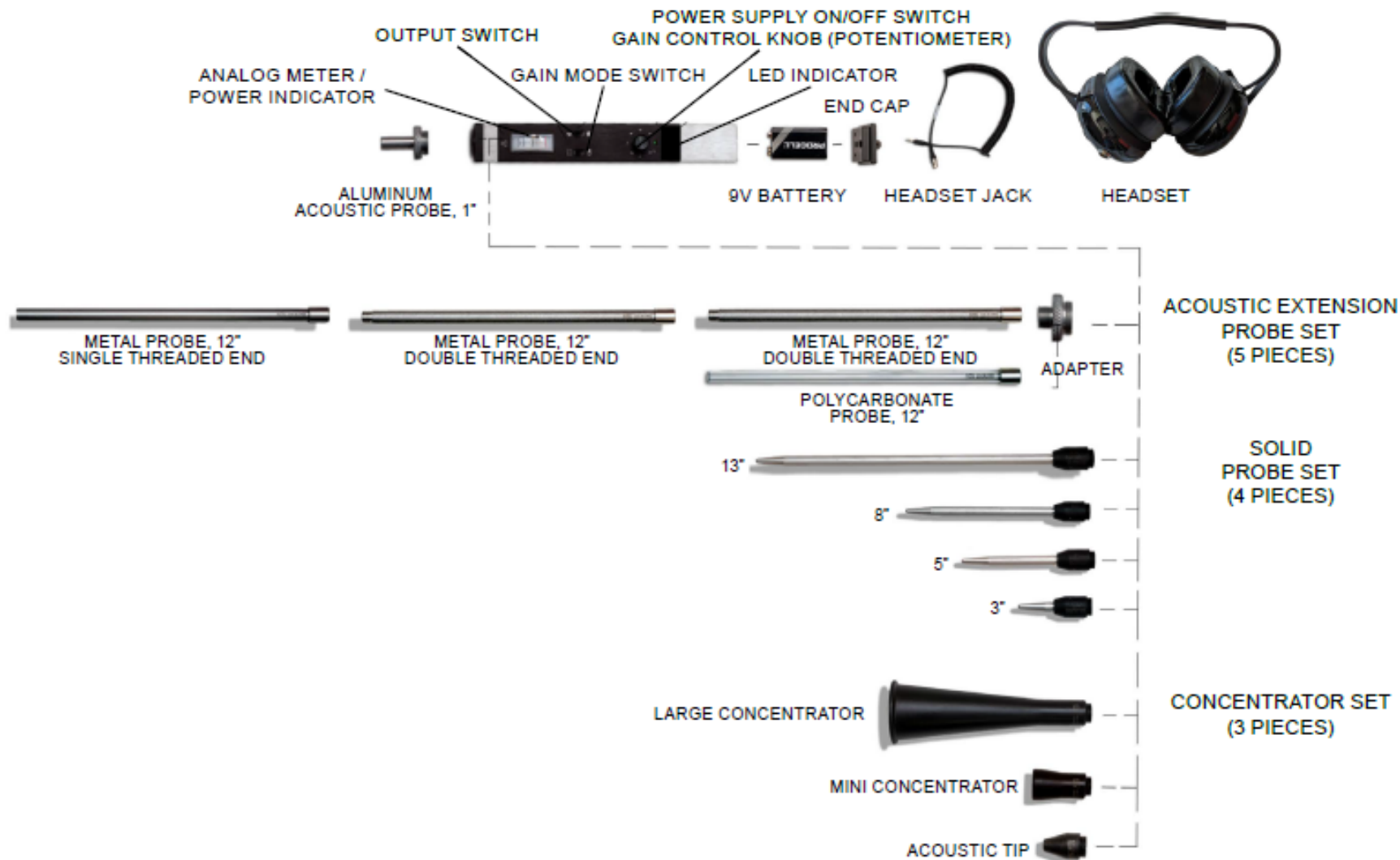
ELECTRICAL DISCHARGE

- Electricity escaping in high-voltage lines or jumping across gaps in electrical connections
 - Arcing
 - Tracking
 - Corona discharge (contributes to energy loss and RFI)
 - Arc flash
- Safe electrical panel and transformer inspection from distance
- Can identify loose connections, insulation loss
- With/without thermal (infrared)
- High-, medium- and low-voltage
- Immune to EMI





COMPLETE PRODUCT RANGE





SPECIFICATIONS

RECEIVER

Receiver specifications	
Sensitivity threshold: Minimum intensity Minimum ultrasonic pressure	10 ⁻¹² W/m ² (0 dB SPL) 2.0 x 10 ⁻⁵ PA @ 40 kHz
Frequency bandwidth	1.8 - 2.2 kHz @ level 0.7 (or -3 dB SPL)
Working resonance frequency	40 kHz ±1.5 kHz
Reception distance, max	150 feet using source 300 feet using range extender
Power supply	9-Volt alkaline
Battery lifetime	>45 hours
Operating temperature range	-4° to +130° F (-20° to +54° C)
Dimensions	8.75" x 1.26" x 1.26" (222 x 32 x 32 mm)
Weight	11.6 oz (330 g)
Housing material	Extruded aluminum



Ultrasound Detection Kits

For condition monitoring and leak detection

Wilcoxon

SENSING TECHNOLOGIES

Powered by

CTRL

SYSTEMS

RECEIVER SPECIFICATIONS

Sensitivity threshold:	10 ⁻¹² W/m ² (0 dB SPL)
Minimum intensity	2.0 x 10 ⁻⁵ PA @ 40 kHz
Minimum ultrasonic pressure	2.0 x 10 ⁻⁵ PA @ 40 kHz
Frequency bandwidth	1.8 - 2.2 kHz @ level 0.7 (or -3 dB SPL)
Working resonance frequency	40 kHz ±1.5 kHz
Reception distance, max	150 feet using UC003 large concentrator 300 feet using optional UC300 range extender
Power supply	9-Volt alkaline
Battery lifetime	>45 hours
Operating temperature range	-4° to +130° F (-20° to +54° C)
Dimensions	8.75" x 1.26" x 1.26" (222 x 32 x 32 mm)
Weight	11.6 oz (330 g)
Housing material	Extruded aluminum

HEADSET SPECIFICATIONS

Impedance	32 Ω ±15% @1 kHz
Sensitivity	95 dB ±10%
Frequency response	Up to 5 kHz
Maximum input power	1.5 W
Volume control	Knob tuning
Material	Stainless steel behind-the-headband, velcro over-the-head band, gel earpads
Dimensions	9.8 x 8.03 x 4.09 in
Weight	1.39 lbs

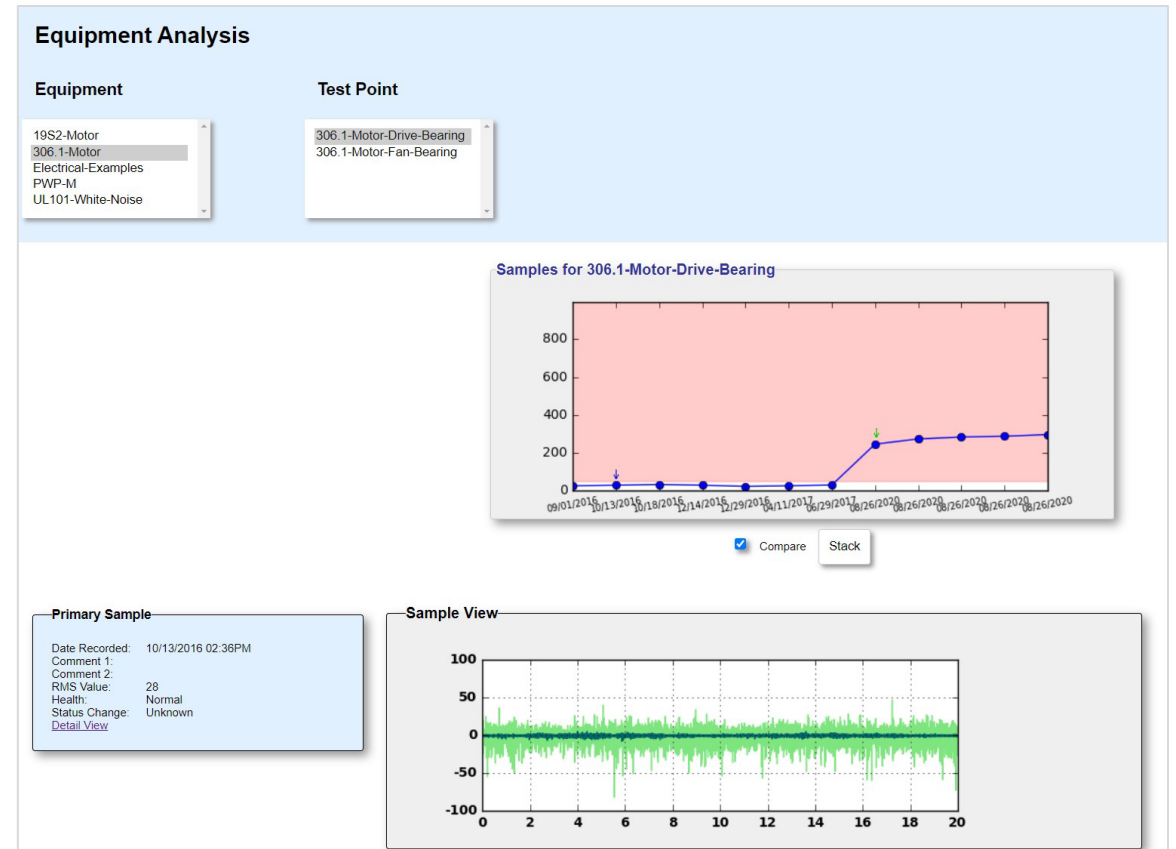
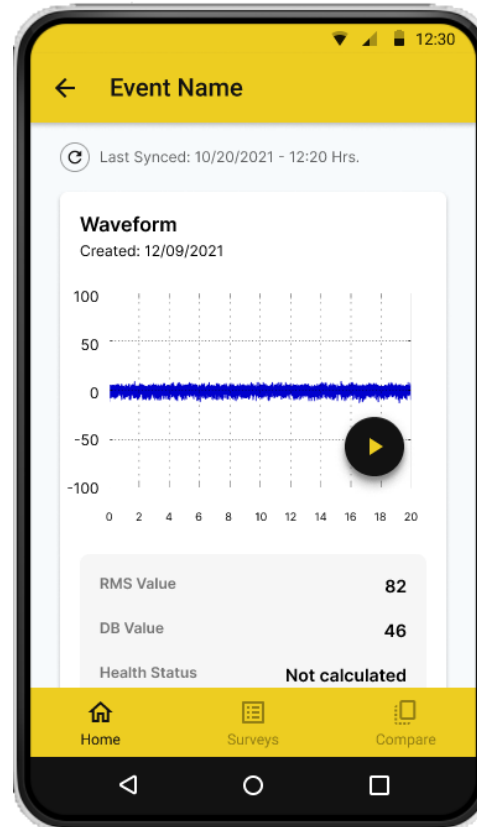




CBM APP

InCTRL

- Mobile phone-based, multi-user platform
- Organizes, locates, and analyzes audio files
 - Functionality of the mobile phone ads recording audios, text, photos, etc.
- Synchronizes data to the cloud in real time
- Automatic sound analysis indicates significant changes and bearing fault frequencies
- Unlimited assets and monitoring points
- Stores records of repairs





LINKS

- [Series overview](#)
- [Specifications](#)
- [UDK-CM Condition Monitoring Kit](#)
- [UDK-LK Leak Detection Kit](#)
- [UDK-EI Electrical Safety Inspection Kit](#)
- [UDK-VL Valve and Steam Trap Monitoring Kit](#)
- [Ultrasound monitoring overview](#)
- [Ultrasound ordering guide](#)



2024 DRAGON SYMPOSIUM



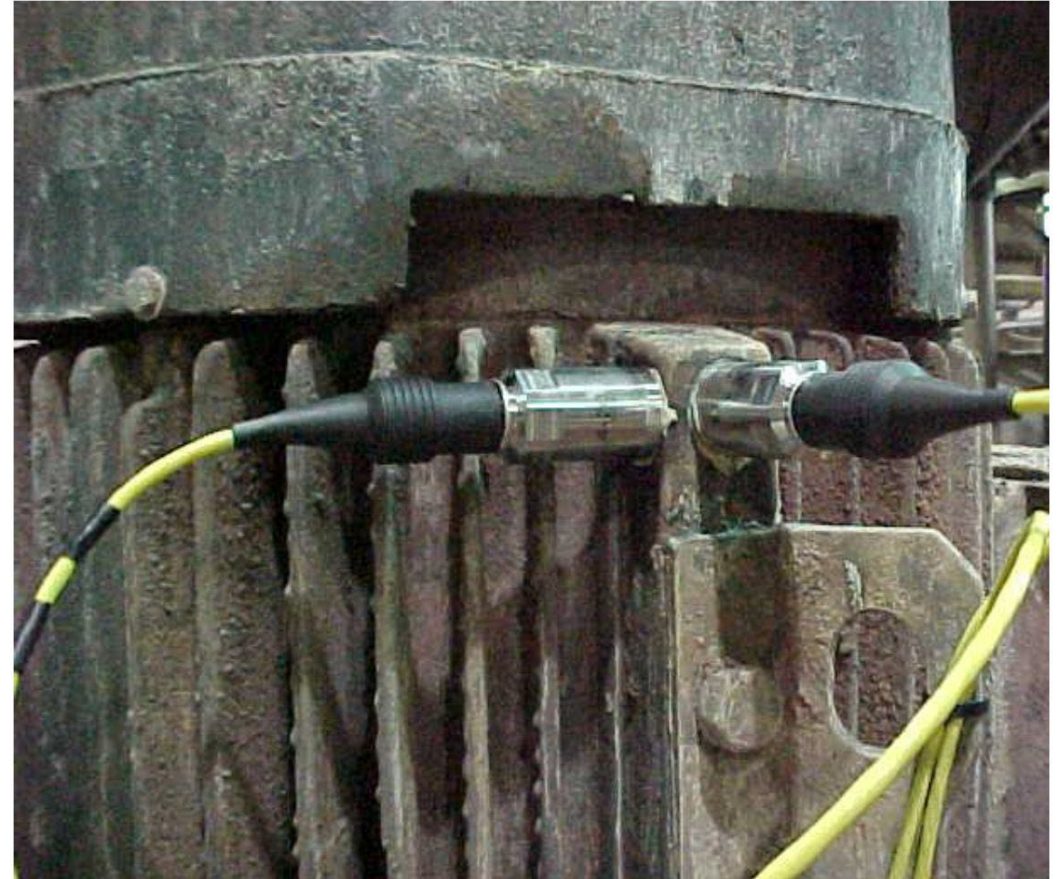
TECHNICAL TRAINING: VIBRATION SENSOR INSTALLATION AND TROUBLESHOOTING





AGENDA

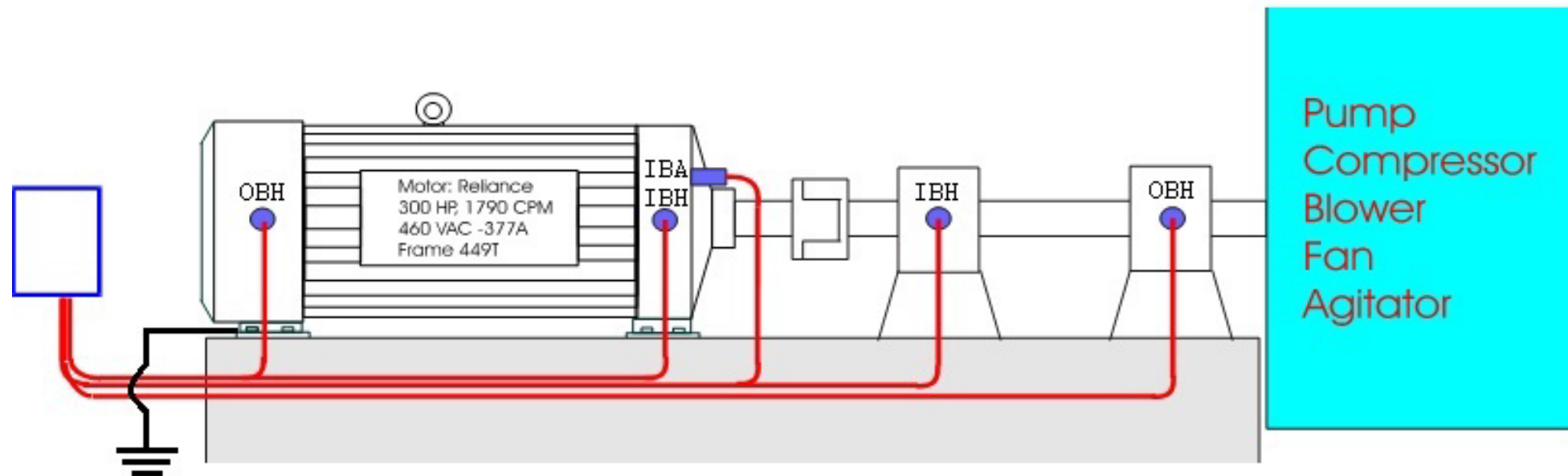
- Where and how to mount vibration sensors
- Cabling considerations
- Powering
- 4-20 mA vibration sensors
- Installation verification and troubleshooting





SENSOR PLACEMENT

MOUNT VIBRATION SENSORS AS CLOSE AS POSSIBLE TO THE BEARINGS





MOUNTING MISTAKES

AVOID MOUNTING THE SENSOR ON THIN SECTIONS, GUARDS, CANTILEVERS, AND VIBRATION-FREE AREAS (ANTINODES)





TOP EXIT VS. SIDE EXIT

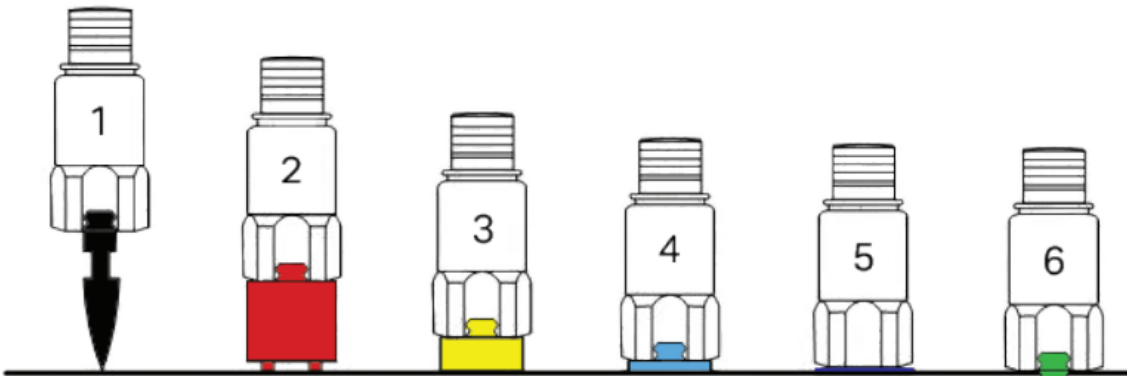
IF MOUNTING SPACE IS NOT LIMITED, TOP-EXIT SENSORS ARE COMMON



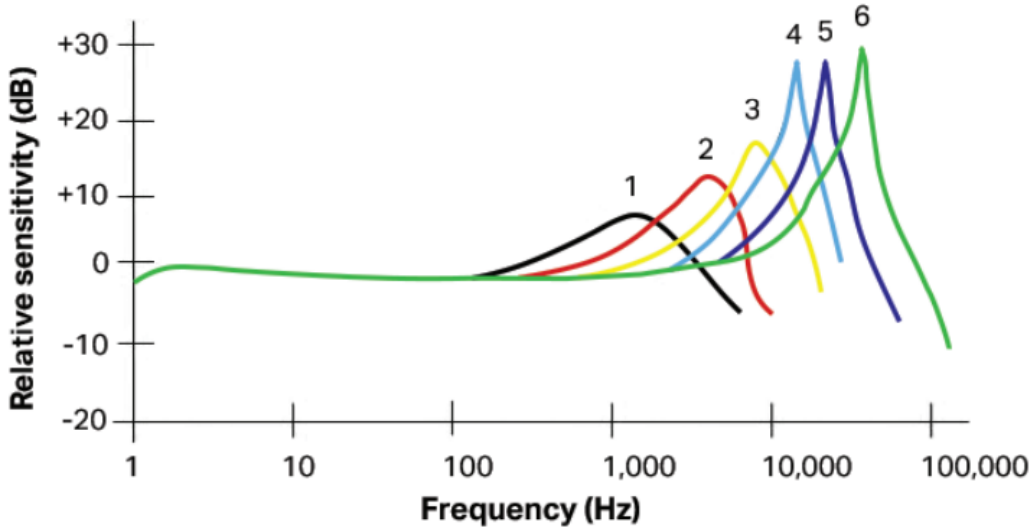


SENSOR MOUNTING METHODS

EVERY MOUNTING METHOD IS NOT SUITABLE FOR EVERY APPLICATION



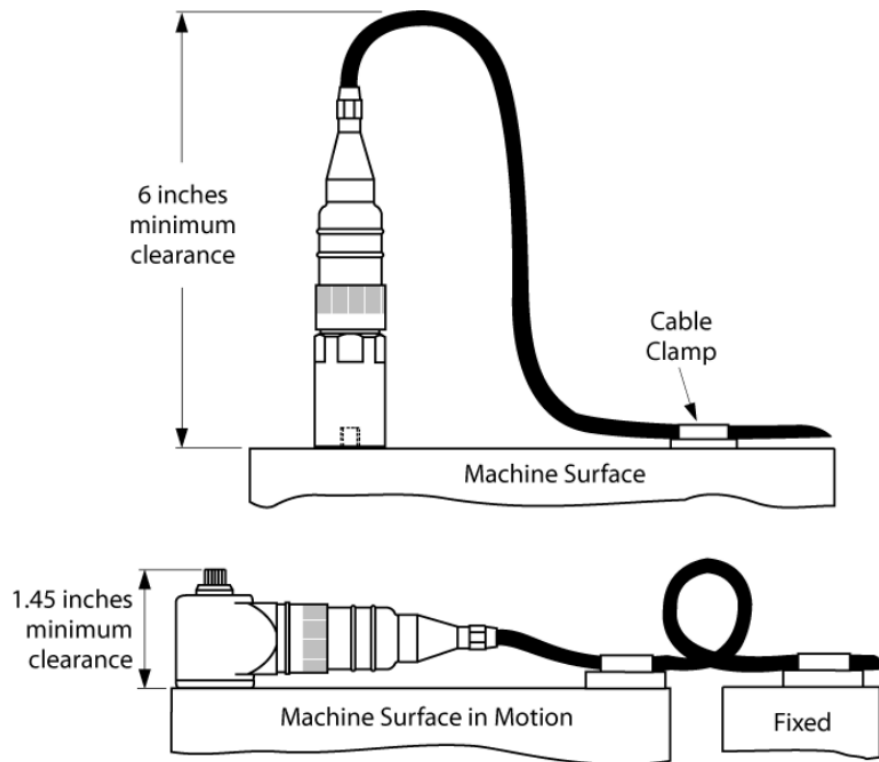
	Probe tip	Curved surface magnet	Flat magnet	Cement mounting pad	Adhesive	Stud
Frequency range (Hz)	500 - 1,000	2,000 - 5,000	5,000 - 7,000	10,000 - 15,000	10,000 - 15,000	Sensor max
	Acceptable		Good	Best		





CABLE ROUTING AND CABLE LENGTH CONSIDERATIONS

MIND THE BEND RADIUS AND TOTAL CABLE LENGTH



- ~100-150ft of cable can be run before signal loss needs to be considered

$$F_{\max} = \frac{10^9}{2\pi(C)(V)/(I_{\text{ccd}} - 1 \text{ mA})}$$

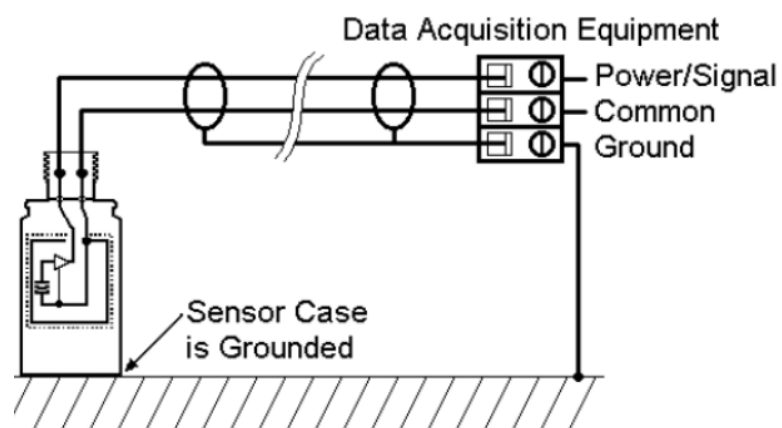
where

- fmax = maximum frequency (Hz)
- C = cable capacitance (pF)
- V = peak signal output from sensor (volts)
- Iccd = constant current from signal conditioner
- 109 is the scaling factor to equate units

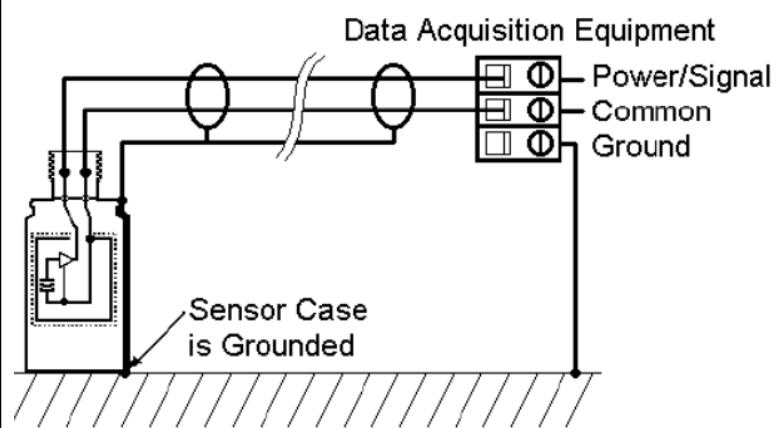


GROUNDING

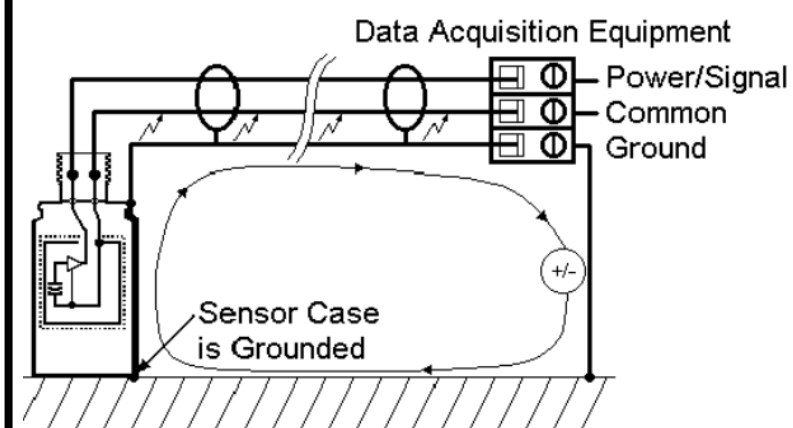
GROUND THE SHIELD AT JUST ONE END TO PREVENT GROUND LOOPS



✓ Grounded at the instrumentation
Isolated at the accelerometer



✓ Isolated at the instrumentation
Grounded at the accelerometer

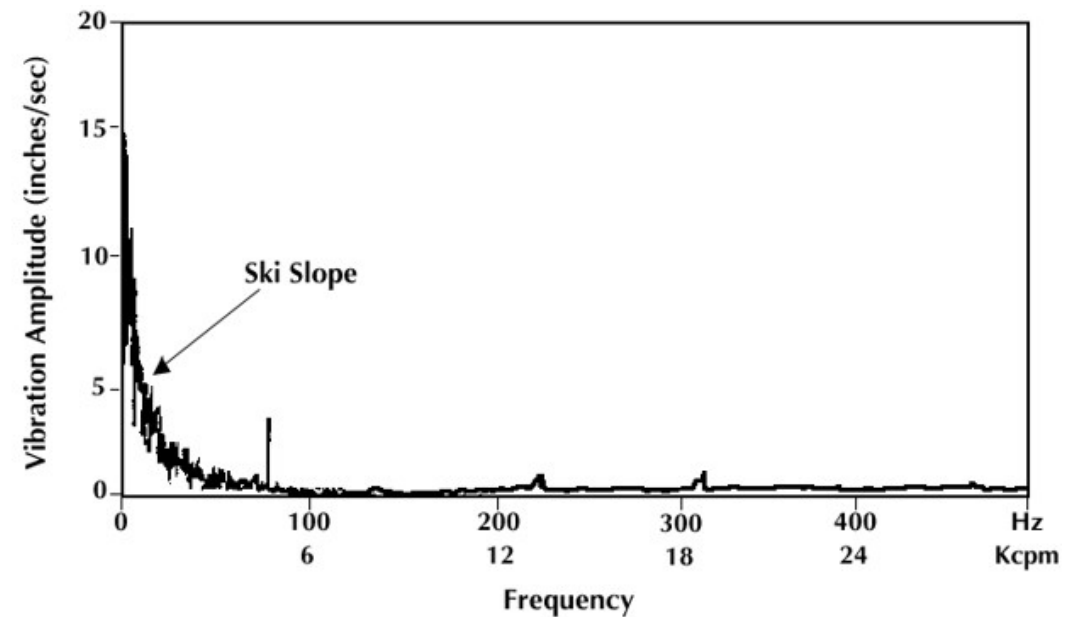
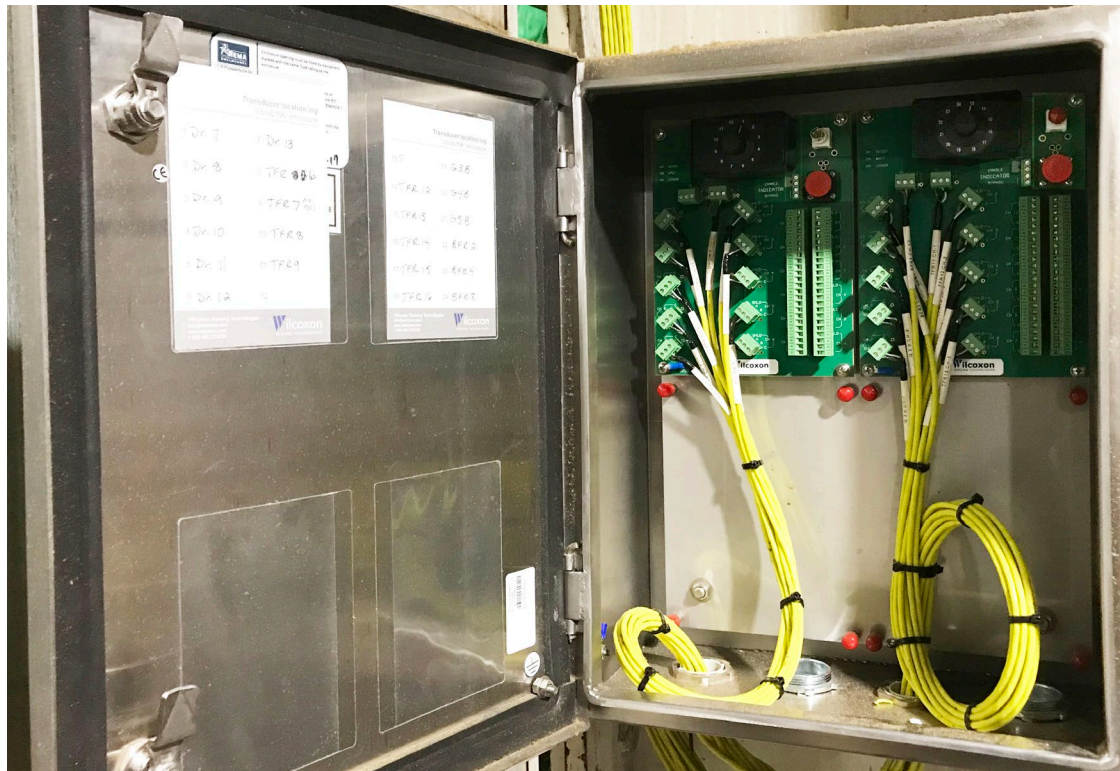


✗ Grounded at the instrumentation
Grounded at the accelerometer



POWERING IEPE ACCELEROMETERS

MOST MODERN DATA COLLECTORS POWER THE ACCELEROMETER DIRECTLY

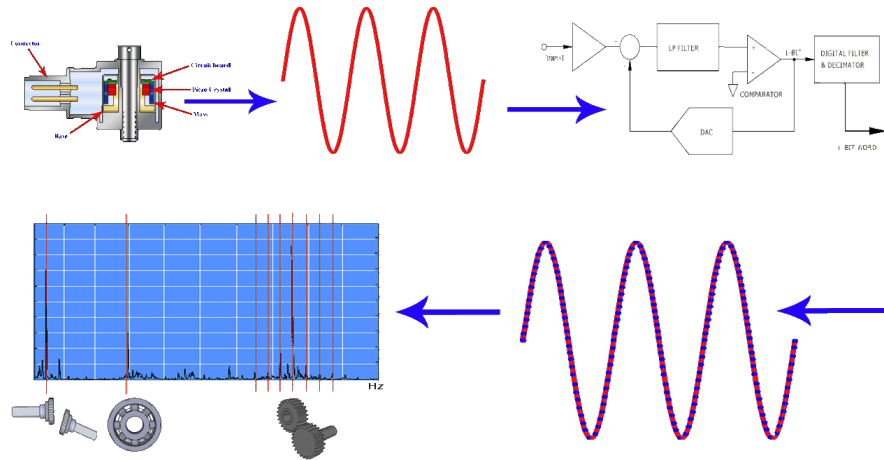


- Ensure the sensor is powered and settled before collecting data to avoid erroneous readings like “ski slopes”



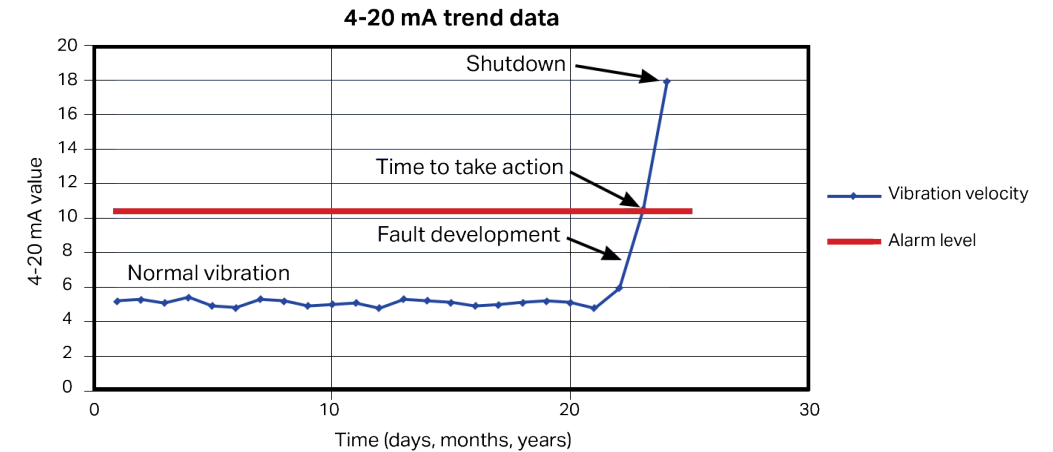
IEPE VS. 4-20 MA VIBRATION SENSORS

IEPE ACCELEROMETERS AND VELOCITY SENSORS



- Time waveform
- Spectral analysis
- BOV

4-20 mA VIBRATION SENSORS

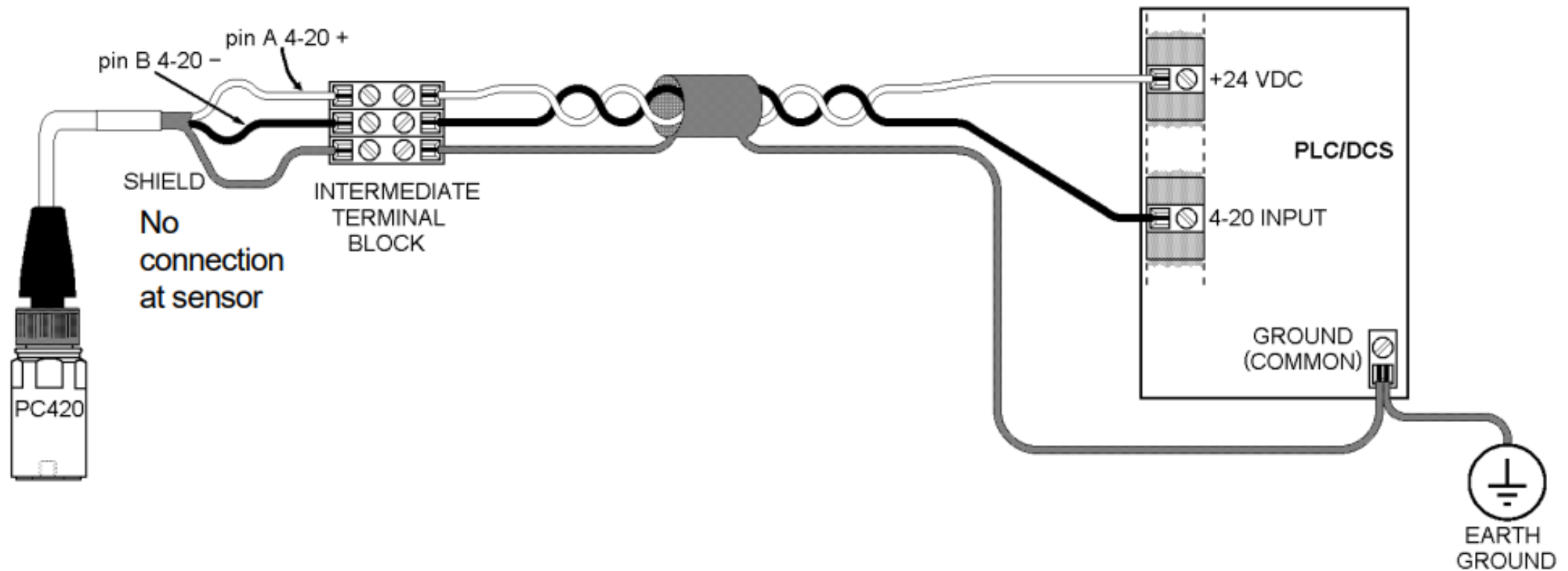


- Overall output
- No frequency content
- Lengthy cable runs



4-20 mA VIBRATION SENSOR INSTALLATION

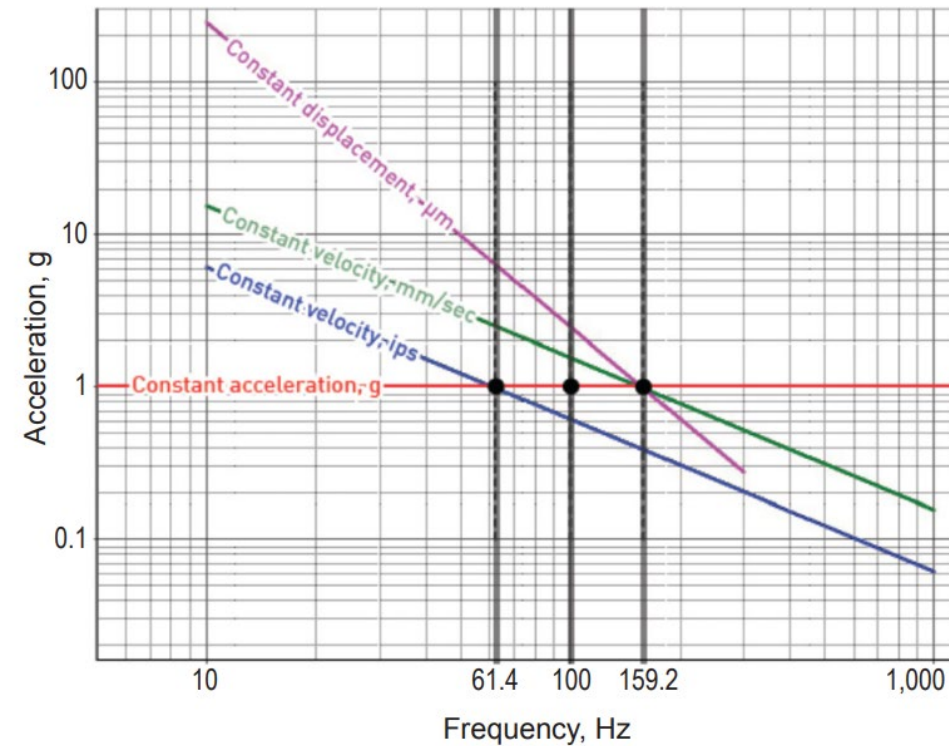
POWERED BY THE PLANT CONTROL SYSTEM





TROUBLESHOOTING SENSOR INSTALLATIONS

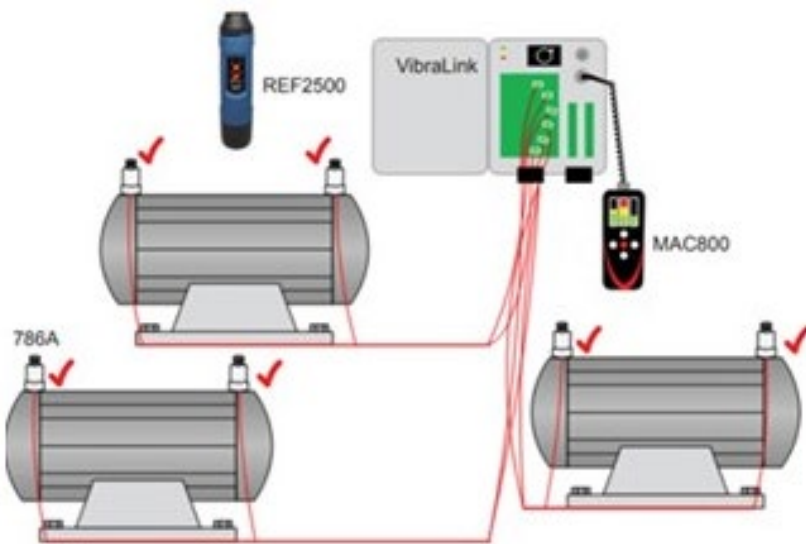
A VIBRATION REFERENCE SOURCE CAN VALIDATE OR INDICATE A FAULT IN THE MEASUREMENT CHAIN





TROUBLESHOOTING IEPE SENSORS

- Handheld data collectors can assist in pinpointing installation faults



BOV	Spectrum	Time waveform	Fault condition	Action
0 V	No signal	No signal	No power or cable/ connector short	<ul style="list-style-type: none">• Test/turn on power• Test cable isolation• Repair/replace cable
2.5 – 5.0 V	No signal	No signal	Damaged amplifier	<ul style="list-style-type: none">• Replace sensor
10.0 – 14.0 V Stable	High low frequency ski slope	High amplitude high frequency noise	High frequency over- load (steam release, air leak, cavitation, etc.)	<ul style="list-style-type: none">• Repair steam leak/dump• Use less sensitive sensor• Place rubber pad under sensor
10.0 – 14.0 V Stable	Very high low frequency ski slope No high frequency signal	Choppy	Damaged amplifier	<ul style="list-style-type: none">• Replace sensor
10.0 – 14.0 V Stable	Good signal, strong 50/60 Hz	50/60 Hz	Inadequate shielding	<ul style="list-style-type: none">• Connect ground/cable
10.0 – 14.0 V Stable	High low frequency noise	High frequency spikes	ESD Arcing impacts	<ul style="list-style-type: none">• Reroute cable• Use less sensitive sensor• Place rubber pad under sensor
10.0 – 14.0 V Stable	High low frequency noise	Jumpy/choppy	Intermittent connection	<ul style="list-style-type: none">• Repair connection
18.0 – 30.0 V	No signal	No signal	Reversed powering	<ul style="list-style-type: none">• Reverse leads
18.0 – 30.0 V	No signal 50/60 Hz	No signal	Open cable connections	<ul style="list-style-type: none">• Repair connection

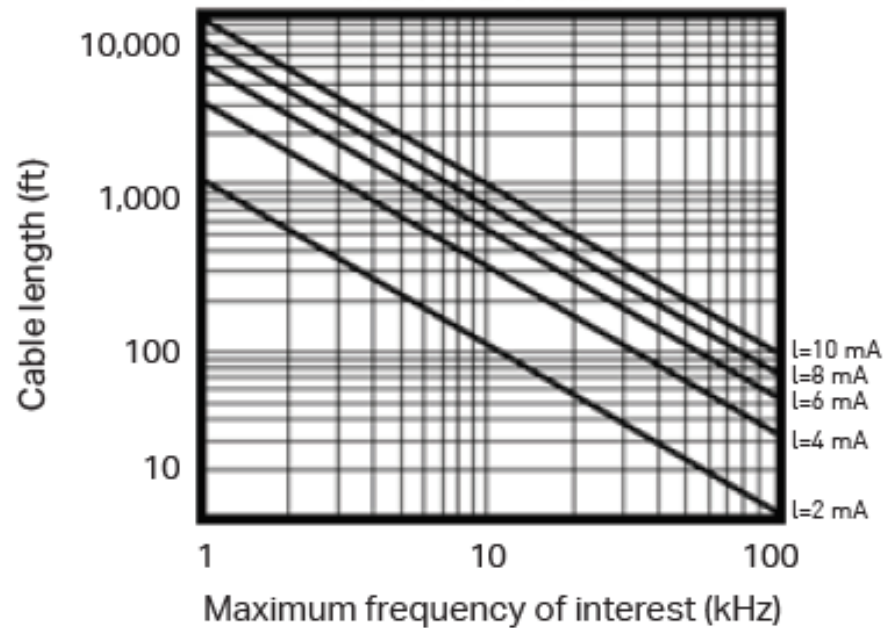


SUMMARY

TOM LAROCQUE

PETER EITNIER

Maximum cable length vs.
Frequency and supply current



2024 DRAGON SYMPOSIUM



2023 RESELLER AWARDS



2024 DRAGON SYMPOSIUM | RESELLER AWARDS



2023 BRONZE RESELLERS



2024 DRAGON SYMPOSIUM | RESELLER AWARDS



2023 SILVER RESELLERS



Keydevice
New Value Technologies
株式会社 キーデバイス



2023 GOLD RESELLERS



2024 DRAGON SYMPOSIUM



Q&A SESSION





WEDNESDAY’S AGENDA, THE SETHI ROOM, 3RD FLOOR

Time	Topic	Presenter
8:00 – 9:00	Wilcoxon growth strategy, sales organization, regional sales goals, market trends	Chris Kramm
9:00 – 10:00	Case study presentations from each company	Participants
10:00 – 10:15	Break	
10:15 – 12:15	Case study presentations from each company	Participants
12:15 – 13:00	Lunch and Reseller awards	Chris Kramm
13:00 – 20:00	Team building outing and dinner	

2024 DRAGON SYMPOSIUM | TOMORROW



TEAM BUILDING ACTIVITY

WEDNESDAY, MARCH 27, DEPARTING THE LOBBY AT 13:00

Half-Day Royal Grand Palace and Bangkok Temples Tour

- We will visit the massive solid gold Buddha at Wat Trimit, the 46-meter-long reclining Buddha at Wat Po, and the opulent Royal Grand Palace, home to the Temple of the Emerald Buddha. All entrance fees and transportation are arranged.
- **Please wear long pants and a shirt with sleeves to the meeting. Tank tops, shorts, leggings, and skirts above the knee are not permitted. We will leave immediately after lunch.**



Wonderful Pearl Cruise riverboat

- A sleek cruise on the Chao Phraya River, including dinner and nighttime views of the Wat Arun, Wat Phra Kaew and the Grand Palace all lit up, or just sit back and enjoy a cultural performance and live music while you eat. Return transportation to the hotel has been arranged.

