

# MONITORING SOLUTIONS

## MOTOR / PUMP / REPAIR SHOPS

### SUPPLEMENTING CUSTOMERS WALK-AROUND DATA COLLECTION PROGRAMS

#### SOLUTION #1 - FIN MOUNT PROBES

Installed in-between motor cooling fins, Wilcoxon's fin mount probes provide a convenient flat surface for superior magnetic coupling for an analyst's accelerometer / magnet; consistent data collection for the clients PdM program is achieved



#### BILL OF MATERIAL

1 per bearing...Wilcoxon Model FM101, FM102, FM103 or FM104 (depending on fin gap and depth)  
1 x SIL-MH109-2A Spectrum / Devcon Plastic Welder 2-part epoxy (adhesive for 5 – 20 probes)

#### SOLUTION #2 - ZERKOMETER MOUNTING BASES

Wilcoxon's Zerokometer Mounting Bases replace existing Zerk fittings already installed in machines. Zerk fittings are used in the bearing lubricating process. The Zerokometer Mounting Base provides a replacement zerk fitting allowing lubrication while at the same time providing a convenient flat surface for superior magnetic coupling for an analyst's accelerometer / magnet; consistent data collection for the client's PdM program is achieved. See Page 127 of Wilcoxon's W-15 Catalog for photos.

#### BILL OF MATERIAL

1 per bearing...Wilcoxon Model ZB14 or ZB18 (thread dependent)

#### SOLUTION #3 – ACCELEROMETER WITH GREASE FITTING MOUNT

Wilcoxon's Model 222A Zerokometer combines the zerk grease fitting with an accelerometer. The zerk fitting provides a grease channel through the accelerometer's body and replaces the existing Zerk fittings already installed in the machine. The integral accelerometer can be wired to a local machine mounted signal access box where the vibration analyst can easily connect to AND safely measure & store the current vibration level of the bearing



#### BILL OF MATERIAL

1 per bearing...Wilcoxon Model 222a Zerokometer  
1 per Zerokometer...Wilcoxon Model R6W-0-J10-16\*\* Cable (connects Zerokometer to signal access box)  
1 Signal Access Box...Wilcoxon Model CB2, or CB4 or VL Series  
1 x 5.3 oz Tube...Wilcoxon Silgrease ( treating 2-pin mil connector)

#### SOLUTION #4 – GENERAL PURPOSE ACCELEROMETERS

Wilcoxon offers a broad offering of general purpose and specialty accelerometers for most applications including slow speed machines (<60 rpm), conventional machines (1800 & 3600 rpm), as well as high speed machines (>3600 rpm) (contact Spectrum if you need help selecting the best sensor for the application).



General purpose accelerometers are mounted on the bearing pillow using a 1/4-28 stud. This requires drilling and spot facing the bearing pillow prior to taping the hole.



Alternatively, an adhesive (epoxy) mounting pad can be attached to the bearing pillow and the sensor then threaded into the mounting pad. The sensor is wired to signal access box as in SOLUTION #3.



This is the most common solution one will normally encounter as most large critical machines do not have zerk fittings - they are usually supported by auto-lube systems provided by the customer. As before, vibration analysts can easily AND safely connect to the signal access box to measure and store the current vibration level of the bearing for trending.



#### BILL OF MATERIAL

1 per bearing...Wilcoxon Model 786A-IS, 787A-IS accelerometer (are the most common, however there are many more configurations available to meet exact machine requirements and customer budgets)  
1 per Accelerometer...Wilcoxon Model R6W-0-J10-16\*\* Cable for general purpose environments, R6QI-0-J9T2A-16 for harsh or wet applications (connects accelerometer to signal access box)  
1 Signal Access Box...Wilcoxon Model CB2, or CB4 or VL Series  
1 Sensor Install Kit...Spectrum SIL-IK-1 Kit (incl. spot facing tool, epoxy, mounting pads, Silgrease and installation guide)

#### NOTES

\*\* - 16 foot cable lengths have been suggested; other cable lengths are available – see price list for details

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### SUPPLEMENTING CUSTOMERS EXISTING CONTINUOUS MONITORING SYSTEMS

#### SOLUTION #5 – 2-WIRE VIBRATION TRANSMITTERS

Wilcoxon's PC42X Series 2-wire vibration transmitters provide a continuous 4-20 ma output proportional to overall machine vibration. They can be calibrated in units of acceleration or velocity as may be required by the customer. Calibration requirements must be determined at time of order. PC42X Series Transmitters mount the same way accelerometers do with either a ¼-28 stud or an adhesive mounting pad...and like accelerometers the output connection is the same 2-pin mil connector (except for explosion proof and multifunction versions) and 2-conductor cable. These transmitters can be connected to monitors that provide continuous display and/or alarm function, while providing loop power (24 VDC nominal). This is the simplest and cleanest configuration providing the user with a relative indication of real-time machine condition; for bearing temperatures >85 deg C, see **SOLUTION #6** General purpose, explosion proof and intrinsically safe approved transmitters are offered.



#### BILL OF MATERIAL

- 1 per bearing...Wilcoxon Model PC42X Transmitter
- 1 per transmitter...Wilcoxon Model R6W-0-J10-16\*\* Cable  
(connects transmitters to wire splice box by others)
- 1 Sensor Install Kit...Spectrum SIL-IK-1 Kit (incl. spot facing tool, epoxy, mounting pads, Silgrease and installation guide)

*PM Alert TIC Temperature Monitor – its what you want It to be – a switch, a transmitter or a monitor. ...Its all in how you configure it ! This solution is ideal for the most basic rotor or customer application. It is cost effective too.*



#### SOLUTION #6 – VIBRATION INTERFACE MODULES



When mounting space is limited, or when temperatures exceed 85 Deg C, or when a client requires access to dynamic data for advanced machine analysis, Wilcoxon offers a two-part solution that is comprised of an accelerometer such as those used in **SOLUTION #4** and a Wilcoxon Model 'iT' DIN Rail mounted interface module. The machine mounted accelerometer sends a continuous dynamic signal via cable to the Wilcoxon 'iT' Module – the 'iT' Module converts the signal to a 4-20 ma signal which is then wired to a remote monitoring. The 'iT' Module also buffers the dynamic signal to allow local access to dynamic data to the vibration analyst. Other models are available in this series that provide local alarm and shutdown on high vibration, digital communication and more. Enclosures with integral DIN Rails are also available to complete the line.



#### BILL OF MATERIAL

- 1 per bearing...Wilcoxon Model 786A-IS, 787A-IS accelerometer  
(are the most common, however there are many more configurations available to meet exact machine requirements and customer budgets)
- 1 per Accelerometer...Wilcoxon Model R6W-0-J10-16\*\* Cable for general purpose environments, R6QI-0-J9T2A-16 for harsh or wet applications  
(connectors accelerometer to signal access box)
- 1 x iT1XX Interface Module (configured to match connected sensor)
- 1 Sensor Install Kit...Spectrum SIL-IK-1 Kit (incl. spot facing tool, epoxy, mounting pads, Silgrease and installation guide)

*Azima is the leading provider of web-based, wireless-monitoring and diagnostic services for critical industrial equipment. They collect the machine data to a web based database. Alarms are sent to the customer, or their service provider for action. This is a service contracted annually. Contact Spectrum for more details and to discuss your application.*



## MOTOR / PUMP / FAN REPAIR SHOPS

### STAND-ALONE CONTINUOUS PROTECTION SYSTEMS (ALARM & SHUTDOWN)

#### SOLUTION #7 – MACHINE MOUNTED VIBRATION SWITCH



The Pro vibTech Model PT580 Digital Electronic Vibration Switch is designed to be the “one-stop-shop” for all vibration switch applications. The PT580’s unique and rugged design is programmable, suitable for harsh environments and hazardous areas. It has a universal mounting fixture, wide

temperature range, dual relays, 4-20 ma output, Modbus communication, with either a remote or internal accelerometer sensor.

#### BILL OF MATERIAL

1 per bearing...Pro vibTech Model PT580 Vibration Switch (an economical Model VS101 and a PT500 mechanical vibration switch round out our vibration switch monitoring line)

#### SOLUTION #8 – VIBRATION MONITORING WITH ‘IT’

It is a simple upgrade for the Wilcoxon’s ‘iT’ module configuration shown in **SOLUTION #6** to include a DIN Rail Module that can provide alarm and shutdown features. Daisy-chained to the interface module, the alarm module provides two alarm relays and a shutdown relay that can be tied into a machines control circuit. The machine mounted accelerometer sends a continuous dynamic signal via cable to the Wilcoxon ‘iT’ Module – the ‘iT’ Module converts the signal to a 4-20 ma signal for

remote monitoring AND buffers the dynamic signal to allow local access to dynamic data for the vibration analyst. The signal is daisy-chained to the alarm module thus reducing the need for extra or external wiring. Multiple modules can be mounted in a weatherproof enclosure with front window. An integral LED display and LED lights provide the operator with key information such as current vibration level, alarm & shutdown status as well as the health of the module and the sensor connected to it.



Many modules can be mounted to monitor numerous measurement points or multiple machines as needed.

#### BILL OF MATERIAL

1 per bearing...Wilcoxon Model 786A-IS, 787A-IS accelerometer (are the most common, however there are many more configurations available to meet exact machine requirements and customer budgets)

1 per Accelerometer...Wilcoxon Model R6W-0-J10-16\*\* Cable for general purpose environments, R6QI-0-J9T2A-16 for harsh or wet applications (connects accelerometer to signal access box)

1 x iT1XX Interface Module (configured to match connected sensor)

1 x iT401 Wilcoxon Alarm Module (alternatively, if a Modbus high level connection is required, consider the Pro vibTech DTM Series monitor modules)

1 Sensor Install Kit...Spectrum SIL-IK-1 Kit (incl. spot facing tool, epoxy, mounting pads, Silgrease and installation guide)

#### SOLUTION #9 – DUAL CHANNEL MONITORING



Upgrade **SOLUTION #6** to include a full featured 2-channel vibration monitor such as the Pro vibTech 1200 Series. This monitor series can be mounted in a local panel, or in its own weatherproof enclosure. The monitor series works with machine mounted

accelerometer which sends a continuous dynamic signal via cable to the Pro vibTech 1200 Series Monitor. The stand-alone monitor includes an operator display (c/w engineering units), alarm and shutdown user configurable relay set-points and buffered dynamic signal outputs for the vibration analyst. Where more than 2 measurement points are involved, or more than one machine, consider the PT2060 Rack Style Monitoring System..

#### BILL OF MATERIAL

1 per bearing...Wilcoxon Model 786A-IS, 787A-IS accelerometer (are the most common, however there are many more configurations available to meet exact machine requirements and customer budgets)

1 per Accelerometer...Wilcoxon Model R6W-0-J10-16\*\* Cable for general purpose environments, R6QI-0-J9T2A-16 for harsh or wet applications (connects accelerometer to signal access box)

1 x Pro vibTech Series 1200 Monitor w or w/o housing

1 Sensor Install Kit...Spectrum SIL-IK-1 Kit (incl. spot facing tool, epoxy, mounting pads, Silgrease and installation guide)

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### DATA ACQUISITION SOLUTIONS FOR LONG TERM CONDITION TRENDING

#### SOLUTION #10 – SLOW SCAN RATE SYSTEM

General purpose rotating equipment do not normally justify the cost or the complexity of high scan rate systems – failures tend to happen over the course of several days, often weeks and sometimes months. Our labour reducing Riotech solution provides a low cost yet effective means of automatically collecting dynamic machine data over long periods of time.



The Riotech system still requires the accelerometers and cables as covered under **SOLUTION #3** AND **SOLUTION #4**, however the sensor cables are terminated on a 5 channel weatherproof (or Class 1 Div 2) input module with companion wireless transmitter. Vibration data is wirelessly transmitted

to a receiving module which is connected to the client's computer running Riotech RioServer Software.

The client can view the dynamic data from each sensor and store it for future reference. When alarms occur, an email is sent to the client, or his 3<sup>rd</sup> party service provider, or the motor repair shop (as a valued added service), indicating a problem. Where distance between the transmitter and receiver is an issue, a DIN Rail mount version of the transmitter can connect the 5 channel input box directly to the plant's LAN allow communication to any PC in the plant.



A portable 5-channel kit is also available which can be used as a repair shop field service tool to aid in trouble shooting of rotating equipment problems in the field or in the shop – improving both service quality and generating new revenue sources.



Contact Spectrum to assist with configuration of a system.

#### BILL OF MATERIAL

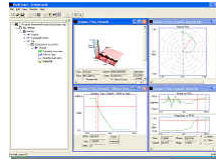
- 1 per bearing...Wilcoxon Model 786A-IS, 787A-IS accelerometer (are the most common, however there are many more configurations available to meet exact machine requirements and customer budgets)
- 1 per Accelerometer...Wilcoxon Model R6W-2-J10-16\*\* Cable for general purpose environments, R6QI-2-J9T2A-16 for harsh or wet applications (connects accelerometer to input module)
- 1 x RioTech VDK-500R (contact Spectrum for best configuration)
- 1 Sensor Install Kit...Spectrum SIL-IK-1 Kit (incl. spot facing tool, epoxy, mounting pads, Silgrease and installation guide)

#### SOLUTION #11 – HIGH SPEED SCAN RATE SYSTEM

High speed or very critical rotating equipment easily justify the cost and complexity of high scan rate systems – such failures tend to happen in just seconds, with the failures being quite catastrophic. Our MAARS solution provides a cost-effective means of automatically collecting dynamic machine data over short OR long periods of time.



The MAARS 3000 System still requires the accelerometers and cables as covered under **SOLUTION #3** AND **SOLUTION #4**, however the sensor cables are terminated on either an 8 or 16 channel Windows based data acquisition package. Vibration data is conditioned, stored, displayed and alarmed within this stand alone device. An Ethernet connection allows remote archiving of data and remote analysis using MAARS 'Pathfinder' software – a wireless connection is optional. Input channel to channel comparison of dynamic data can be done for advanced analysis purposes since all inputs are being updated every micro-second.



This system is reserved for very special or costly rotating equipment and is not cost effective for general purpose machinery; as an example we have had good success with monitoring overhead crane drives during normal operating conditions which require only collecting machine data on 'lift' or 'lower' mode of the crane.

A portable 8 or 16 channel analyzer is also available for advanced trouble shooting.

#### BILL OF MATERIAL

- 1 per bearing...Wilcoxon Model 786A-IS, 787A-IS accelerometer (are the most common, however there are many more configurations available to meet exact machine requirements and customer budgets)
- 1 per Accelerometer...Wilcoxon Model R6W-0-J10-16\*\* Cable for general purpose environments, R6QI-0-J9T2A-16 for harsh or wet applications (connects accelerometer to MAARS 3000)
- 1 x MAARS 3000 System, c/w appropriate input modules
- 1 x MAARS Smart Monitor Software (Pathfinder software optional)
- 1 Sensor Install Kit...Spectrum SIL-IK-1 Kit (incl. spot facing tool, epoxy, mounting pads, Silgrease and installation guide)