SonicScan™ Fault Isolation System

- Uncovers commonly missed equipment faults
- Accurately characterizes faults using multiple isolated analysis ranges
- Performs in-field application-specific diagnostics
- Delivers consistent and quantifiable sound analysis
- Provides PdM software tools to manage equipment monitoring programs
- Generates detailed reporting and cost justification
- Integrates seamlessly with other PdM technologies

Setting The Standard with Fault Isolation

The CSI SonicScan Fault Isolation System gives you multiple application diagnostic capabilities, allowing you to easily and confidently detect, analyze, and report common industrial equipment problems. It generates a quick return on investment by finding costly valve, steam trap, and air leaks. It can reduce unexpected downtime by early identification of mechanical and lubrication problems.

Equipment produces unique sound patterns within specific sonic and ultrasonic frequency ranges that change as equipment condition deteriorates. SonicScan’s new Fault Isolation technology allows you to hear, analyze, and differentiate between normal and failure sounds.

Applications

- **Bearing Lubrication and Mechanical Failure**
  75 percent of bearing faults are lubricant-related

- **Steam Trap and Valve Malfunction**
  A single 1/4” orifice blowing trap costs $6,300 per year

- **Air and Steam Leaks**
  Eliminate losses typical of $75,000 per year

- **Electrical Discharge**
  Eliminate safety hazards and early electrical failures

- **Vessel Integrity**
  Quickly find boiler and condenser leaks.
SonicRoute and SonicView use Fault Isolation to automatically diagnose, report, and integrate data with other condition monitoring technologies.

The SonicScan Fault Isolation System integrates the SonicScan Analyzer with a SonicRoute data collector and RBMware SonicView software to build the most advanced and comprehensive, yet easy-to-use, ultrasound analysis system available.

SonicScan's technology accurately detects and distinguishes faults by isolating the specific frequencies where the faults are known to occur. With the Range Isolator contact or magnet mount sensors, use the low range to hear mechanical defects and then switch to mid range to hear lubrication problems. High range is optimized to isolate steam traps and valve problems.

To ensure ease-of-use and thorough data collection, SonicScan's application-specific menu allows you to select an application such as leak detection, steam trap analysis, valve inspection, mechanical analysis, or electrical inspections. SonicScan then automatically configures itself for the application, ensuring that proper sensor and signal processing parameters are used. Additionally, SonicScan will prompt you through the collection process and present you with the results. For example, when inspecting a steam trap, SonicScan will prompt the user to take readings on the input and output sides of the trap and then use the information to automatically diagnose its condition.

SonicScan 7100 Fault Isolation Kit

- Multiple isolated analysis ranges
- Automatic application-specific setup
- Audio auto-ranging ensures critical sounds aren’t lost
- Simultaneous sound and temperature measurement
- Digital dB readout increases repeatability and precision
- Calibrated sensors enable meaningful trending
- Firmware upgradeable for access to new features

The SonicScan 7100 Fault Isolation Kit provides advanced problem detection, analysis, diagnostics, and alarming. The kit consists of the SonicScan analyzer, three airborne and contact sensors, all necessary accessories, and a 40-minute instructional video.

The SonicScan 7100 analyzes three distinct frequency ranges where specific type of faults are known to occur.

SonicScan envelope waveform collected with a CSI Model 2120 Machinery Analyzer
Unique to SonicScan, audio auto-ranging optimizes the volume level to isolate defects and minimize background noise to ensure that critical sound components are not lost. In addition, the Range Isolator contact sensor simultaneously measures sound and temperature. This is useful when monitoring steam traps, valves, and bearings, as both sound and temperature data are valuable in diagnosing potential problems.

CSI has further enhanced the technology by creating a separate digital path with advanced processing to deliver instant, repeatable, and exact dB measurements. While monitoring equipment, SonicScan displays the real-time dB level of one of four sound analysis parameters: peak, peak hold, average, and peak factor. When using the airborne sensor, SonicScan provides a dB level calibrated to traceable standards. The Range Isolator sensors are calibrated at each listening range to ensure consistency and accuracy.

**SonicRoute Data Collector**
- On and off route-based data collection
- Wireless communication with SonicScan
- Air Leak cost analysis
- Advanced steam trap diagnostics
- Comparison with previous reading
- Automatic SonicScan setup for proper alarming and sound analysis
- Automatic database creation and download of results to RBMware

SonicRoute software resides on a handheld portable computer (H/PC) and serves as the data collection unit for the SonicScan. For the thorough analysis of a single point, SonicRoute may instruct the SonicScan to collect up to 26 different analysis parameters via wireless communication. SonicRoute capabilities extend far beyond data collection as it facilitates the inspection process with application-specific diagnostics and advanced information management, all while in the field.

SonicRoute stores multiple routes of equipment to be inspected on a periodic basis. While in “On-route” mode, SonicRoute automatically loads the next point in the route to the SonicScan when the current point is complete. In the “Off-route” mode, SonicRoute will lead the user through the proper setup and definition of new equipment and points. When analyzing steam traps, SonicRoute has built-in diagnostics that use visual, temperature, and sound data to determine the trap status and severity.

The SonicRoute software that resides on the hand-held portable computer (H/PC) enables efficient in-field management and features a valuable leak cost estimation program.
RMBware Sonic View

- Application specific reporting
- Advanced trending
- PdM integration for advanced diagnostics
- Performance metrics
- Cost reporting
- Problem management
- Route management
- Wizard database setup

SonicView performs advanced management of the information that is automatically downloaded to it from SonicRoute. New equipment, points, and routes will be added to the database. Problems found in the field will be assigned to case histories for work order creation and comparison with problems found using other technologies. Application-specific cost analysis, status, and general data reports are ready for printing.

SonicView is powerful, yet designed for ease-of-use, as it provides the necessary tools to setup and manage a comprehensive monitoring program for applications such as steam traps, compressed air systems, valves, and grease points.

SonicView is the work manager for surveys. Survey routes can be built and scheduled based on equipment location, type, or importance. It tracks route status as due, in progress, or incomplete.

SonicScan Fault Isolation System: Part #A710030

1. SonicScan Analyzer
2. OSHA compliant headphones designed to work with hardhat
3. Airborne sensor
4. Range Isolation (RI) contact probe
5. Range Isolation Magnet (RIM) mount sensor
6. Flexible focus cone to help isolate sounds
7. Ultrasonic tone generator for testing vessels
8. SonicScan Holster
9. Industrial H/PC with color display
10. Extension rods with tip set
11. RBMware SonicView and SonicRoute Software
12. H/PC Carrying Pouch

Not Shown: Carrying case, instructional video, and manuals, battery chargers, communication cables
Machinery Health Management

Sonic Scan 7100 Analyzer

- Housing: Extruded aluminum/composite materials
- Battery: Rechargeable nickel/cadmium. 6-9 hours continuous battery life. 12 hours typical. Continuous battery level indicator with low battery warning and auto-shutdown.
- Charger: 110-240 VAC, auto-switching. Recharges in less than 3 hours.
- Dimensions: 7x6.5x2.5 in. (175x165x65mm)
- Weight: Approx 2lb. (1kg)
- Dynamic Range: Greater than 100dB

- Ultrasonic Signal Analog: Heterodyne with digitally controlled frequency range and display; frequency range user-definable from 2-250kHz. Digital: Selectable processing modes at fixed frequency for trending are peak, peak hold, average, and peak factor.
- Optimum ranges: RI and RIM sensors 2-8kHz, 25-35kHz, 35-45kHz Airborne Sensor 35-45kHz
- Temperature: Built-in contact probe, upper limit of 500˚F continuous (800˚F for intermittent exposure)
- Display Type: 2x12 character backlit LCD display. Bar graph with instantaneous reading. Digital output with dB signal value and degree F or C.
- Output: Audio 8 Ohm impedance for connection to headphones or speaker. Digital envelope waveform to machinery analyzer.
- Alarm Limits: User-definable limits for both ultrasonic signal and temperature.
- Volume: User-definable for 0-100%
- Communication: Either direct serial cable connection or cableless IR communication