

Saddle Mounting Arrangements

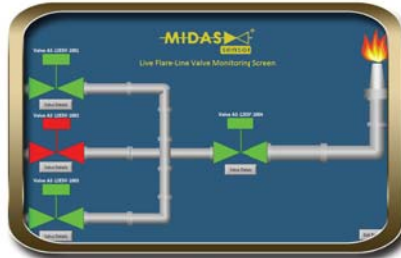
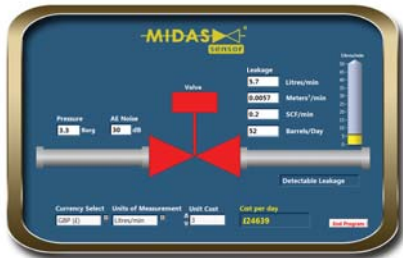
The MIDAS® Sensor saddle can be mounted in a variety of ways to the valve or pipe by the use of clamps, U bolts or stainless steel strapping.



MIDAS® Sensor Integration

MIDAS® Sensors are designed to non-invasively and continuously monitor the condition and performance of valves in service, whether that be relief valves on for example a flare gas line, or isolation valves in complex process control systems.

MIDAS® Sensors have also been designed to be seamlessly and easily integrated into Score's market leading V-MAP® G3 Valve Condition and Performance Monitoring system, for more critical valves, such as SIL 3 rated applications including emergency shutdown (ESDV's) or High Integrity Pressure Protection Systems (HIPPS) valves.



For further information or to request a quotation, please contact us at: midas.enquiries@score-group.com or go to www.midasvalvediagnostics.com

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Your pathway to valve condition monitoring:

MIDAS® SENSOR

Acoustic Emissions Valve Leakage Detector



The MIDAS[®] Sensor

The MIDAS[®] Sensor detects leaks within valves by the use of Acoustic Emission (AE) technology. Designed for permanent but non-intrusive installation to provide continuous on-line leakage monitoring in hazardous areas where intrinsically safe equipment is required. A 4 to 20 mA signal is provided for interface to the plant's automation system.

The MIDAS[®] Sensor uses the same technology as Score developed for its portable valve leak detection system the MIDAS Meter[®]. The MIDAS[®] Sensor and MIDAS Meter[®] systems can be used to provide targeted coverage for an entire plant. The MIDAS[®] Sensor permanently installed on critical valves whilst the portable MIDAS Meter[®] is used for surveys on less critical valves and for trouble shooting.

Valve Leakage

Valve leakage represents major risks to plant operations:

- Safety:** Loss of containment of process fluids presents a risk to personnel working on the plant, early detection of leaks therefore extremely important.
- Environmental:** Leaking valves represent a risk to the environment whether to drain or vent.
- Efficiency:** Lost production due to leakage and downtime due to poorly performing valves effects both plant efficiency and availability with consequential financial impact.

The MIDAS[®] Sensor detects the early onset of leakage so aiding Operations to identify, trend and quantify valve leakage and so enabling the appropriate operational and remedial actions to be put in place.

Principles of Operation

The flow from a gas or liquid leak generates turbulence in the surrounding media; the energy from this turbulence is converted in to AE when it meets any solid boundary such as the valve or pipe wall. The AE can be detected on the external side of the wall by a specially designed piezoelectric sensor developed from the Score-Dunegan range of AE sensors specifically for valve leak detection. Leakages as small as 0.1 litre/minute can be detected.

The sensor's performance is further enhanced by the selection of filters and amplifiers and the digital signal processor that minimise the effect of background noise, maximise the detection of the early stage of leakage growth, and to provide a deciBel (dB) reading in the form of a 4 to 20 mA output for use in the plant's control and monitoring system.

The dB reading can be used in two ways:

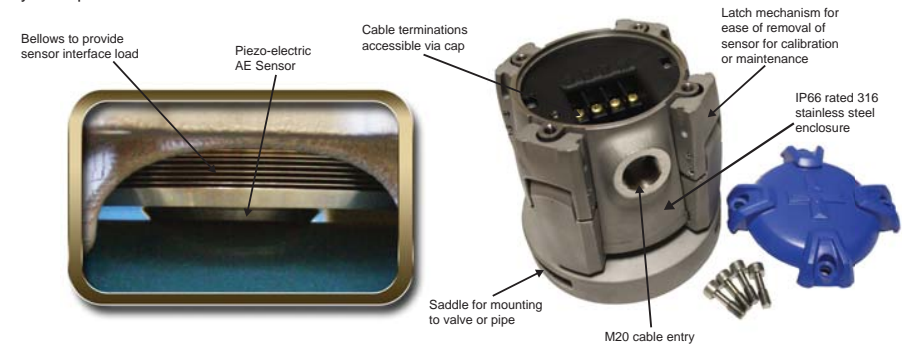
- Switch:** A threshold dB level can be set that will trigger an alarm to inform that a leak has been detected. Several switch levels can be set with progressively urgent alarm levels. Score can advise on the likely leakage rate each level would represent dependant on the valve and the process conditions.
- Quantification:** By use of a Score developed correlation the leakage can be estimated to provide an indication of its magnitude and so enabling better informed decisions to be made to the required remedial action and their timing. On-line quantification can be achieved by use of Score's V-MAP[™] system and by interfacing with the plant's automation system to access valve position and process pressure data. Contact Score for further information.



MIDAS[®] Sensor Design (Patents Pending)

The MIDAS[®] Sensor design integrates the piezoelectric sensors, filters, amplifiers and processors into a single self-contained housing that is easily mounted via a saddle arrangement on to the range of geometries presented by all shapes and sizes of valves and piping.

The specification and long term integrity of the interface of an AE sensor to its mounting surface is critical to the long term reliability and stability of the sensor output. The MIDAS[®] Sensor incorporates detail design features to ensure the long term reliability of its performance.



Applications

Valve through leakage

The principle application for the MIDAS[®] Sensor is through valve leak detection. This can be a stand alone application with the MIDAS[®] Sensor interfacing with the plant's data acquisition system or Site Automation System (SAS) or used as part of Score's V-MAP[™] system to provide a complete picture of a valve's condition by monitoring of valve and actuator operating characteristics of force or torque, pressure, position and speed of operation. Contact Score for further details.

For many valve applications a single MIDAS[®] Sensor can provide adequate coverage mounted on the valve or on the immediate piping on downstream or low pressure side of the valve. These applications are where the valve is small and the potential background AE noise from adjacent valves is minimised. Typical example would be PSVs and blowdown valves. In AE noisy location and/or for a large valve multiple sensors are required to provide the coverage and the inputs to a logic system that ensure that it is the valve that is leaking, and not a false result due to background AE noise. Score's V-MAP[™] system incorporates the logic to enable the analysis and subsequent quantification to be carried out. Contact Score for options for this logic to be incorporated into the plant SAS.

Valve external leakage

External leakage from valves will be detected by the MIDAS[®] Sensor, this will principally be from stem or body seals. No quantification is offered for this application.

PSV Monitoring

In addition to monitoring PSVs for through seat leakage the MIDAS[®] Sensor can be used to provide PSV lift detection monitoring. This function is via Score's V-MAP[™] System where analysis of the AE signal enables the distinction between leakage and lift thus providing a valuable input into Operation's management of their safety critical devices.

