

## **LA 202 ACOUSTIC BOILER STEAM LEAK DETECTION SYSTEM**

Greenbank Energy Solutions Inc., 185 Plumpton Ave. Washington PA 15301  
Tel (724) 229-1180 / Fax (724) 229-1185  
Email: greenbankenergy@aol.com Web Page: www.greenbankenergy.com

### **GREENBANK LA202 SYSTEM FEATURES & BENEFITS**

#### **Features:**

- True Air borne & Structure borne Sensors: contains a true microphone, which is totally insensitive to vibration
- Sensor contains a transducer test element, which simulates a steam leak for total system dynamic testing.
- Works on positive and negative pressure boilers and balance draft boilers.
- Logarithmic signal scale - greater dynamic range than linear scale measurements.
- Individual sensor calibration
- Modular design - easily expanded up to any number and combinations of sensors
- Optional air purge for wave-guide cleaning.
- Experience of over 250 installations worldwide with experience dating back to 1974.

#### **Benefits:**

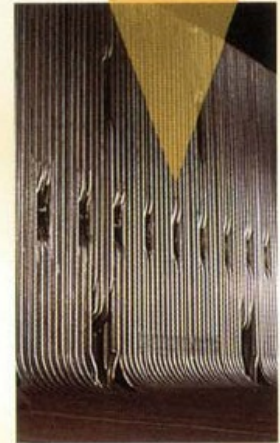
- Increase unit availability
- Increase operating profit
- Early detection of boiler tube steam leaks:
- Allows for planned outages to repair leaks
- Reduces risk of catastrophic failure
- Increase tube life
- Improve personnel safety
- Reduce outage time
- Reduce repair cost
- Reduce financial penalties
- Reduce insurance cost
- Earlier warning over traditional techniques
- Detect damaged fans
- Detect other mechanical damage causing noise
- Detect inspection ports or doors left open



Air borne Sensor Technology



Structure borne Sensor Technol-



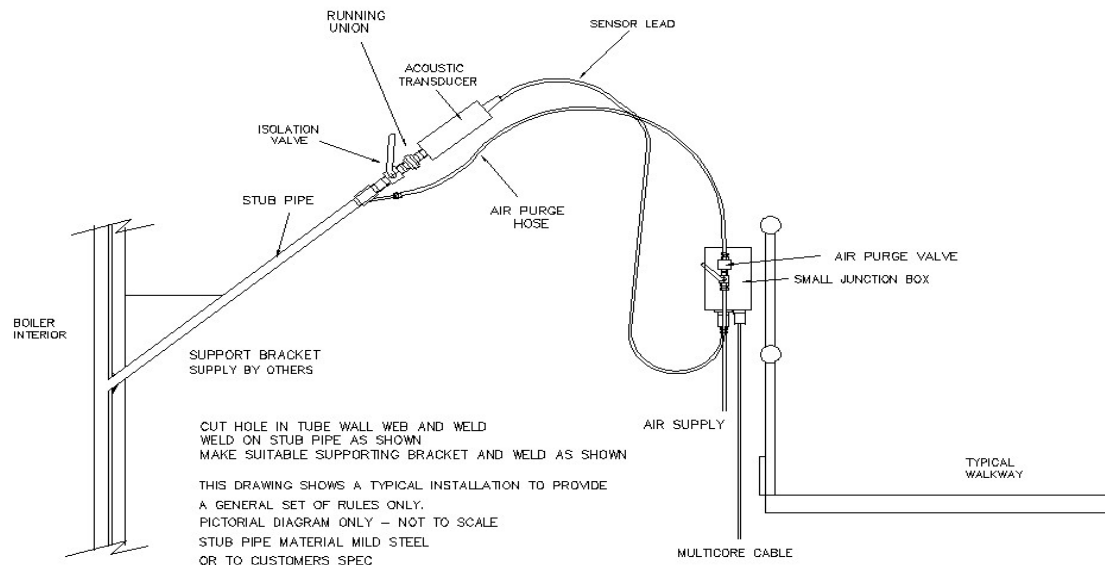
We offer both air-borne and structure-borne sensors depending on location in the boiler. where it is possible to do so based on its superior

Sensors are typically placed on both sides of a boiler in a box arrangement at a level in-between two rows of tube banks to allow comparison between absolute sound levels making the location of the leak relatively straight forward and our ability to pin-point the location of the leak by comparison of absolute intensity of multiple sensors. The noise from a steam leak invariably increases with time, while sounds from fans, sprays and mainly soot-blowers vary as they are brought into and out of service. Detecting a leak is a simple matter of monitoring the sound level of each sensor and trending the absolute sound level and observing the rate of change against time.

The normal background noise of a particular sensor location will be 70 – 85 dB (the dB level will vary in different areas of the boiler and will be boiler type dependent). Leaks will generate noise of 90 dB and over, and will continue to rise and can be easily distinguished in-between soot-blowing operations.

# BOILER STEAM LEAK DETECTION

## GREENBANK ENERGY SOLUTIONS INC. EARLY DETECTION OF BOILER STEAM LEAKS



### Fitting and location

The airborne sensor arrangement is as shown above, with a 3/4 inch (26 mm) 3 ft stub pipe with a 3/4 inch NPT fitting required to be fitted at a convenient point to get the full benefits of the airborne system.

Locations such as access doors, gaps in tubing around soot-blowers and often gaps in webbing by cutting fins can be advised by Greenbank for optimum leak coverage.

### Slag, fouling and purge air

An option exists, when deemed that areas are high fouling and slagging, to add air-purge to sensors which are sequentially timed by either optional PC system or plant PLC.

### Self test and outputs

Each sensor has a push button self test on the back, which drives the sensor in reverse and outputs a full scale signal.

The LED on the back is a sound level indicator which comes on at 74 dB and increases in intensity to around 94 dB, the level of a very probable leak.

Each sensor outputs an AC signal for listening to via remote loudspeaker if required, and a 4-20 mA—54-114 dB for input to a PLC for trending to determine leaks and their location.

### Optional PC system

An optional PC system requires only the AC signal and generates the Decibel signal inside the PC to save on cabling from sensors.

Self test, load-speaker, sequential air purge control, trending dB levels, boiler mimic displays and frequency analysis are all available.

### Structure borne sensors

The acoustic structure borne sensor can be applied to the outside of a boiler without the need for boiler penetration and air purge system, and detects leak type sounds that travel through air and then the 'local' boiler structure.

Although not as sensitive, we offer these transducers when there is absolutely no practical way that the superior airborne transducer can be applied to the specific local boiler area.

The dynamic range of the sensor is less than the airborne at 30 to 40 dB, with a typical range set to 74-114 dB. However, this sensor can sometimes be located closer to a 'difficult to access' area of interest on the boiler.

### Acoustic Sensors signal outputs

**LA202** : 54—114 dB (60dB) = 4- 20 mA DC

**Airborne** : Remote listening = 0-10 mA AC

**LA203** : 74—114 dB (40dB) = 4- 20 mA DC

**Structure** : Remote listening = 0-10 mA AC

LA22 & LA23 as above minus 4-20 mA for use only with computer based processor.

### Environmental

Sealed to IP68 in single enclosure.

Normal Temperature range : 0 to 85 deg C.

### Alarms set points and leak determination

Low/maintenance	< 70 dB (boiler dependent)
Possible leak	> 90 dB
Probable leak	> 110 dB

### Electrical requirements

110V for junction box if used to supply +24 VDC to sensors, or 240 V AC 50Hz for optional computer system.