

RADIATION SOLUTIONS INC.

RS-725

BAGHOUSE DUST SPECTROMETER SYSTEM



Unique features

- New technology design utilizes Sodium-Iodide detectors for maximum performance
- 1024 channel high resolution spectrometer permits spectral analysis
- Unique NASVD spectral analysis gives high sensitivity performance with essentially no false alarms
- 2 detector sizes permits optimization to the application
- Control box supports up to four detector systems
- Local audio visual alarm support where required
- Control box fully integrated into plants LAN to permit easy RSO alarm/performance overview of ALL units
- RSI-Service direct connection via the Internet permits fast technical support for alarm analysis or errors
- Data analysis and display screens essentially identical to entrance / gate monitor displays for easy RSO training



RS-725 BAGHOUSE DUST SPECTROMETER SYSTEM

System Specifications

The RS-725 System

The system comprises two components - the **DETECTOR** and the **CONTROL BOX**. In some applications a small detector is recommended but in other applications larger volume detectors are required. For this reason the RS-725 system can be used with 2 different detector models.



The **RS-725/21** system is a 3"x3" (21 cu ins) Sodium-Iodide detector mounted in a square housing. Normally the face of the detector is mounted as close as possible (4-6") from the measurement point and installed in a 1" steel collimator during installation. This collimator reduces local

background effects and "focuses" the detector in order to improve system sensitivity. The installation is arranged so that the collimator stays in place and the detector assembly can be lifted out for easy service.



The **RS-725/128** system is a 4 x 2 x 16" (128 cu in) Sodium-Iodide detector with internal 0.5" lead shielding to reduce background and "focus" the detector. Mounting of the detector is recommended to be located 4-6" from the monitoring point depending on local conditions. Since the detector is internally collimated only a basic mounting structure is required to position the detector where required.

System Electronics

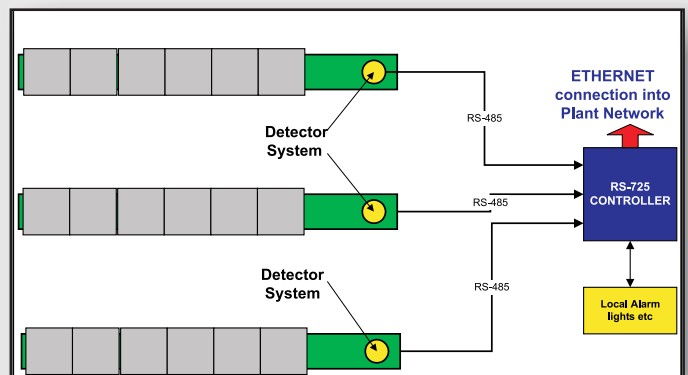
The detector is coupled to the RSI Advanced Digital Spectrometer (ADS) board. This ADS board scans the incoming pulses from the detector and converts them into a 1024 channel linearized spectrum for data analysis.



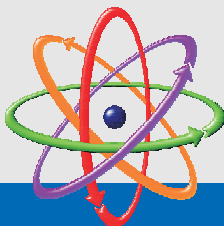
The ADS board is fully digital thus has minimum parts count for high reliability and has a signal throughput of 1,000,000cps. As a result all significant pulses are counted. The spectrometer output is buffered by an interface board to isolate the signal output to prevent noise and electromagnetic interference (EMI) on long cable runs. Data is output at 10/second rate on an RS-485 port to the system controller. The RS-725 controller contains a high power computer system and supports up to FOUR (4) detectors. The controller carries out sophisticated NASVD spectral analysis of the spectra from each detector and determines if an alarm is present.

The system has 4 contact outputs that are programmable and can be used to drive external lights, horns and conveyor controls to suit the application.

Top view of Baghouse Dust Collection System

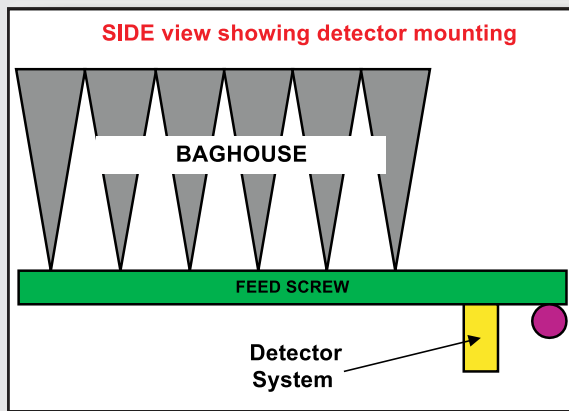


The RS-725 Controller is connected directly to the Plant Network via the Ethernet port giving the RSO direct access to alarm data.



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Applications

Normally the best place to mount this system is on the end of the screw conveyor before the dust is moved to the storage silo. To facilitate maintenance, mounting below the augur is recommended as long as the detector is in as close a coupling as is possible to the dust pipe.

In some locations detectors may be placed on the pneumatic buffer hopper if dust volume is sufficient for adequate sensitivity.

Detector selection for any of these applications depends on local logistics.

The illustration above depicts a typical installation. Cable lengths between detector and controller is typically max 300ft however longer lengths can be used if required. The RS-725 controller supports up to 4 independent detector systems for locations where multiple detectors are used.

NOTE: In some Baghouse applications local logistics favor large detector PVT systems mounted on the Baghouse incoming EAF exhaust duct — these type of systems may deploy RS-300 systems. Inquire with your RSI representative for more information.



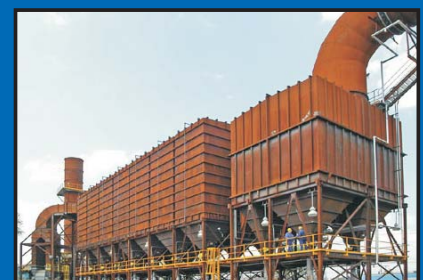
Highly Accurate Radiation Detection & Analysis of Baghouse Dust

The RS-725 is a spectrometer based system designed for the monitoring of baghouse dust for radiation. RSI's use of advanced spectral analysis techniques provides a measurement immune to local background radiation changes. This results in greater sensitivity without false alarms.

The difference

Older systems use a total count analysis that are influenced by changes in local background radiation levels. To prevent false alarms, total count systems operate with very high alarm thresholds reducing sensitivity such that they alarm only when radioactive concentrations are very high. These systems are prone to missing the relatively small levels of radiation present when Cesium sources are melted. Many times contaminated dust is only detected on outgoing dust trucks or following shipment to outside processors.

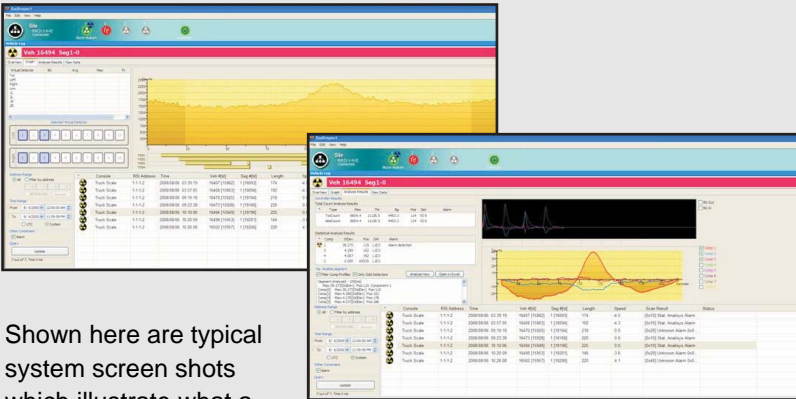
The RS-725 Baghouse Dust systems provide tighter alarm thresholds which result in the earliest detection of small amounts of radiation allowing the RSO to properly handle the incident in a more timely manner thus reducing the costs associated with the remediation process.



RSO data access

The RS-725 system allows the RSO to have real-time data access via the plant network. In most cases there is no special training required as the data is delivered in a format the same as entrance / gate monitoring systems.

Local alarms are annunciated using horns, strobes, and lights etc., When an alarm occurs the RSO can access the system alarms via the network using RSI supplied software.



Shown here are typical system screen shots which illustrate what a total count alarm looks like as well as the spectral analysis of this alarm. In addition, Internet connection to the RSI Service Center gives the RSO outside technical support capability for problem alarms.

With the Internet connectivity of the RS-725 RSI can trouble shoot remotely and advise local staff on service and maintenance issues. This capability eases the burden on plant service personnel and ensures the system is operating properly with minimum downtime.



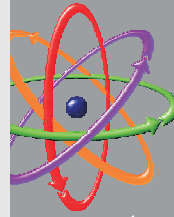
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At RSI our corporate goal is to always provide the highest possible quality product coupled by superior customer support.

RSI's research and development team offers unprecedented expertise in the science of radiation detection with over 100 combined years of applied design experience and extensive field implementation.

Systems manufactured by RSI address the challenges presented by the need to measure ultra low levels of radiation.

RSI's cutting edge radiation detection technology incorporates fully digital systems with advanced spectral analysis and data processing. Systems support local area networking and remote monitoring via the Internet.

All systems are backed by fast, responsive and extensive service support.

Products include:

- Airborne and mobile systems for geophysical applications
- Airborne and mobile systems for recovery of orphan sources
- Vehicle entrance / gate systems for scrap metal monitoring
- Portable and handheld equipment for assessment, search and identification purposes
- Distributed systems for perimeter monitoring
- Various specialty / custom applications