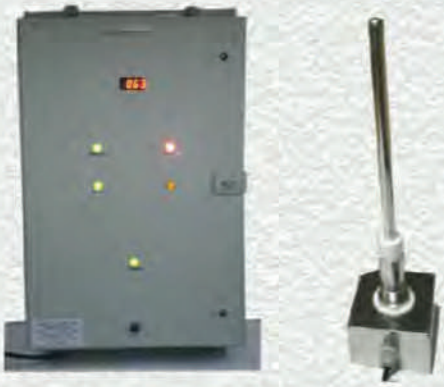
CONTINUOUS EMISSION MONITORING SYSTEM



AAXIS NANO
TECHNOLOGIES PVT. LTD.
SOLUTIONS FOR A SUSTAINABLE ENVIRONMENT

MOST EFFECTIVE & ADVANCED TECHNIQUE FOR STACK / DUCT / CHIMNEY / E.S.P. / BAGHOUSE EMISSION MONITORING.

Stack Monitoring for **Suspended Particulate Matter (S.P.M.)** is greatly simplified and improved by the use of **"CONTINUOUS EMISSION MONITORING SYSTEMS (CEMS) / STACK MONITORS".** The Sensor of the CEMS / Stack Monitor is mounted on the stack / duct and the existing S.P.M. level is determined using **Thimble / Iso-Kinetic Process.** The CEMS / Stack Monitor is then calibrated to continuously display the S.P.M. or Emission level in terms of **mg/nm3 in an** on-line manner. **A 4 to 20 mA DC Analog Output** is also provided for recording or control purposes & integration with the **Central Control Room**.

Our CEMS / Stack Monitors are indigenously manufactured and based on the internationally accepted & widely approved **"TRIBOFLOW"** principle. This principle is accepted by all International Environment Agencies like US, Europe etc. These instruments give a CONTINUOUS digital display in mg/nm3 of the emissions / suspended particulate matter in the stacks / ducts / chimneys which are being monitored. The instrument readings will closely match those obtained by the conventional iso-kinetic / thimble process measurement.

These products are manufactured indigenously and hence have a **significant price advantage** over competitors. **Good, prompt and competent After Sales Service** and **reasonably priced spare-parts** are also assured. Inspite of prices being much lower than that of competition, feature-wise – these CEMS are equal to the best among competition. The CEMS are based on **advanced Micro-processor technology, which ensures accurate performance and user-friendliness.**

WHAT IS "TRIBOFLOW" ?

The Triboflow principle is an impact principle, where a Sensor is placed in the path of the emissions which are to be monitored. **As the emission particles come in contact with the Sensor, a Triboflow signal is generated which is directly proportional to the emissions.** When the Sensor is inserted in a stream of particles and since an electrical path to earth ground is provided, a small continuous signal is produced and no voltage exists at the Sensor. The advantage of this principle is that it works only for **Solid particles**. Since this principle is not affected by Liquid (Moisture) or Gas particles, it is **particularly suitable for emission or stack monitoring.**

The Triboflow Signal depends upon the emission particles and where they are located in the "Triboflow Series" of material. This signal correlates very closely with the actual mass flow rate and when amplified and converted to a standard 4 - 20 mA signal, is proportional to the flow of solids in the duct or pipe. The signal can be calibrated to give particle concentrations in a emission rate (eg. Mg/nm3). This Triboflow Signal is processed using Sophisticated Electronics to generate the final digital output.

TRIBOFLOW PRINCIPLE has been internationally and universally approved by all Environment Agencies including USA (EPA i.e. Environment Protection Agency) and Germany (TUV).

THE BASIC OPERATION OF THE CEMS IS AS FOLLOWS :-

The CEMS is highly accurate and reliable. It consists of a rugged, passive **Sensor** with special **shielded coaxial cable** and a remote **Electronic Control Unit**. The Sensor is usually of 316 Stainless Steel (other materials like Hastalloy may be used for corrosive applications) with Teflon Insulation. The entire length of the Sensor is used for sensing the signal. The Sensor is installed in the duct / stack where the emission particles are to be monitored / measured, as shown in **Figure 1**. As the emission particles flow in the duct / stack and strike the Sensor, a Tribo-electric current and a Tribo-electric voltage are generated. These signals are then conditioned, amplified & processed through sophisticated electronic circuitry and micro-processors and an **Output Signal is generated which is directly proportional to the emissions** flowing in the duct / stack

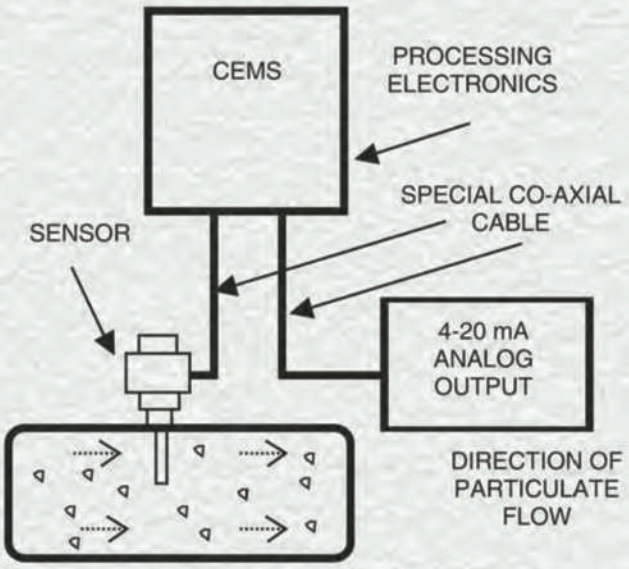


FIGURE 1 - TYPICAL INSTALLATION OF CEMS / STACK MONITOR

CEMS / Stack Monitors are available in several models, catering to different applications and industries.

KEY FEATURES OF THE CEMS :-

- Accurate and Reliable Readings, directly in mg/nm3.
- Facility to display instantaneous emissions as well as average emissions.
- Time period for averaging emissions is user determined.
- 4-20mA Output available for interface with Central Control Room Systems for Charting / Tabulating / Recording etc.
- User Determined Alarm Set Points to indicate high emissions.
- Minimal Maintenance Required.
- No Moving Parts or Consumables.
- Long Life of Instrument.
- Frequent calibration / setting / alignment is not required.
- Easy to use and operate.
- Sophisticated since it is micro-processor based.
- Not affected by Moisture.
- Low Cost and High Quality.
- Only principle which uses Direct Measurement of emission flow.
- Minimum Detection Limit is 0.1 mg/nm3 with no upper limit
- Detection of all particles of size larger than 0.1 micron.

The APPLICATIONS / Benefits of CEMS include :

- **Continuously Monitoring the Emissions** in any units of measurement for **Better pollution control and monitoring.**
- **Ensuring Compliance with Pollution Control Board and environment norms.**
- **Monitoring the performance of Pollution Controlling equipments** like ESPs, Bag Houses, Incinerators, Dust Collectors, Cyclones, Scrubbers etc. and to check whether they are working efficiently or not.

- **Giving Early Alarm & Indication of increase in emissions** which will help in timely redressal of problems before they become severe, **ensure smoother production & prevent damage to downstream equipments like** ID Fans, Vacuum Pumps etc. and ensuring optimal and long life of ID Fan / Vacuum Pump / other Downstream Equipment.

- **Monitoring product loss** and ensuring maximum product recovery.

- **ONLINE DUST MONITORING.** In Pneumatic Flyash conveying systems, often Vacuum Pumps are used with a Filter Bag. As soon as the Filter Bag tears, the CEMS gives an alarm to ensure that the Vacuum Pump does not get damaged.

- **ENERGY SAVING BY MONITORING / CONTROLLING OF ESPs.** With increasing SPM emission, more power has to be supplied to the ESPs to maintain the SPM emission level within permissible limits. Due to changes in the process or production conditions / parameters, the SPM level may fall, but the ESP continues to consume the same amount of power. The CEMS detects this, and its 4 to 20 mA DC Analog Output can be used to reduce the power supplied to the ESP or even cut out an ESP stage, ensuring at all times that the emission levels are within acceptable limits and optimal power consumed.

- **BROKEN BAG DETECTOR FOR FILTER BAG HOUSE.** Our Broken Bag Detector can not only give an alarm AS SOON AS a Bag Tear occurs in the Filter Bag House, it can also provide you with an "ADVANCE WARNING SIGNAL" before the Bag Tear actually occurs. The 4-20mA Output of this instrument will give an early warning when the filter bags develop small cracks / tears – giving an advance warning of an impending bag tear. Necessary preventive maintenance action can then be taken. The System will also give an indication of the occurrence of Bag Choking. Apart from giving an immediate indication of a Bag Tear, the System will also help isolate which Bag Section contains the Broken Bag or Bags. Other techniques can then be used to isolate the exact bags which are torn and which need to be replaced.

- **Pre ESP and Post ESP Comparison can be done to check ESP efficiency.**

- Automated Activation of Dust Suppression Systems like Sprinklers can be done using CEMS, when the dust levels rise above a pre-determined level.

- Enabling plant personnel to understand the production process better – for Eg., if the quality of coal supplied to the burner has changed & subsequently there are greater emissions for the same process conditions, the CEMS will indicate that this supply of coal is inferior to the earlier one.

As you are aware, the **Pollution Control Board** has made it **mandatory** to install such continuous monitoring equipment for SPM **in all stacks**. Our equipments will not only help you in **ensuring compliance** with Pollution Control norms and **better environment conditions**; they will also **result in financial gains** resulting out of better production management, lower power consumption due to more efficient plant operations, more controlled product wastage into the atmosphere and longer life for downstream equipments.

TRIBO v/s OPACITY

- **No Lenses to Clean or Align.**
- **No effect of Moisture or Vibration**
- No Moving Part or Consumable
- **Low Cost and Long Life**
- **Virtually No Maintenance**

INDUSTRIES WHERE CEMS ARE USED

- POWER - Thermal Power Stations, Captive Power Plants, Cogeneration Power Plants.
- STEEL & NON-FERROUS METAL PROCESSING INDUSTRIES
- CEMENT
- CHEMICAL, FERTILISERS & PETROCHEMICAL
- PHARMA
- SUGAR, CERAMIC, PAPER
- BOILERS, INCINERATORS, SCRUBBERS
- DRY MATERIAL HANDLING, MONITORING OF CONVEYING LINES / FEEDERS / BLENDING OPERATIONS
- & SEVERAL OTHER PROCESS INDUSTRIES

Our instruments have been working successfully at several plants in the country, for various applications, in several industries. All our customers are extremely happy with their usefulness at such low cost. If you have any queries or require more information, please feel free to get in touch with us.

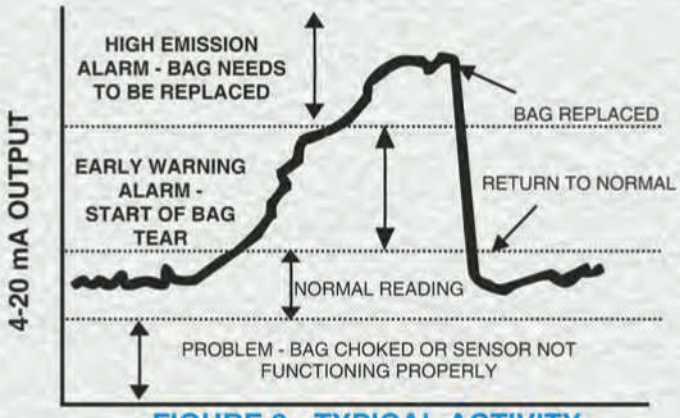


FIGURE 2 - TYPICAL ACTIVITY OF BROKEN BAG DETECTOR

TECHNICAL DATA

SENSOR

Material of construction	:	Stainless Steel 316 (other material available)
Diameter	:	14 mm (other dia. Available)
Insertion length	:	50 mm to 1500 mm. (Upto 5000mm available)
Temperature Rating	:	300°C (Higher temperature upto 1000°C available)
Pressure rating	:	30 p.s.i. standard (higher pressure rating available)
Hazardous rating	:	Intrinsically safe.

ELECTRONIC CONTROL UNIT

Power supply	:	240V AC (or 110V) ± 10%, 50 c/s ± 3% 1ph
Power consumption	:	Max. 50 VA
Response time	:	1 sec (Damping feature built-in)
Repeatability	:	Better than 2% F.S.
Housing	:	Dust Resistant housing designed for panel mounting.
Temperature Rating	:	-5° to + 50°C
Humidity Range	:	0 to 90% relative
Dimensions	:	Wall Mounted – 26h X 18w X 7d – in inches

Special add-on for flame proof requirement.

OUTPUT SIGNALS

- 1 N.O. + N.C. potential free rated at 0.5 Amp. 240V
- 4-20 mA dc, 2 wire, 500 ohms burden or 0-10V dc for continuous monitoring / recording / integration.
- Digital Display

For any further information / list of customers, please feel free to write / telephone / fax / e-mail to us.

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