CONTINUOUS EMISSION MONITORING SYSTEM

MOST EFFECTIVE & ADVANCED TECHNIQUE FOR STACK / DUCT / CHIMNEY / E.S.P. / BAG-HOUSE 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 / chimney / duct and the existing S.P.M. level is determined using conventional **Thimble / Iso-Kinetic Process.** The CEMS / Stack Monitor is then calibrated to directly and 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 Continuous Emission Monitoring Systems (CEMS) / Stack Monitors are indigenously manufactured and based on the internationally accepted & widely approved **"TRIBOFLOW"** principle. 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.

These products are manufactured indigenously and hence have a **significant price advantage** over competitors. **Good 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, they are equal to the best among competition. The CEMS are based on **Micro-processor technology**.

What is "TRIBOFLOW" ?

The Triboflow principle is an impact principle of operation, 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**. This principle works only for **Solid particles**. Since this principle is not affected by Liquid or Gas particles, it is **particularly suitable for emission or stack monitoring**, since it is not affected by the presence of moisture.

TRIBOFLOW PRINCIPLE has been internationally approved and universally accepted by several 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 **Sensor** with **shielded cable** and a remote **Electronic Control Unit**. The Sensor is a 316 stainless steel rod with Teflon Insulator. The entire length of the rod acts as a Sensor. 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.

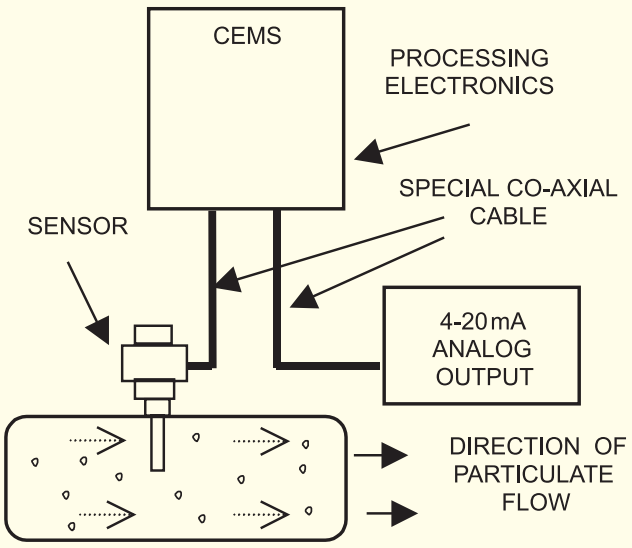

FIGURE 1 - TYPICAL INSTALLATION OF SOLID FLOW MONITOR

KEY FEATURES OF THE CEMS :-

CEMS / Solids Flow Monitors are available in several models, catering to different applications & industries.

- 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 presence of Moisture.
- Low Cost and High Quality.

The Benefits of CEMS include :-

- **Better pollution control and monitoring.**
- **Ensuring Compliance with Pollution Control Board norms.**
- **Monitoring the performance of Pollution Controlling equipments** like ESPs, Bag Houses, Incinerators, Dust Collectors, Cyclones etc. and to check whether they are working efficiently or not.
- Ensuring optimal and long life of **ID Fan and other downstream equipment**.

- **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, Blowers etc.
- Monitoring product loss and ensuring maximum possible product recovery.
- Ensuring that Health and Safety Standards are maintained.
- **Ensuring effective dust removal** from dusty environments by monitoring the exhaust duct.
- 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.
- **ENERGY SAVING BY MONITORING / CONTROLLING OF E.S.P.s.** With increasing SPM emission, more power has to be supplied to the E.S.P.s 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 E.S.P. 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 E.S.P. or even cut out an E.S.P. stage, ensuring at all times that the emission levels are within acceptable limits and optimal power consumed.
- **BROKEN BAG DETECTOR FOR FILTER BAG HOUSE.** CEMS can also be used as a Broken Bag Detector. The Broken Bag Detector not only gives 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.

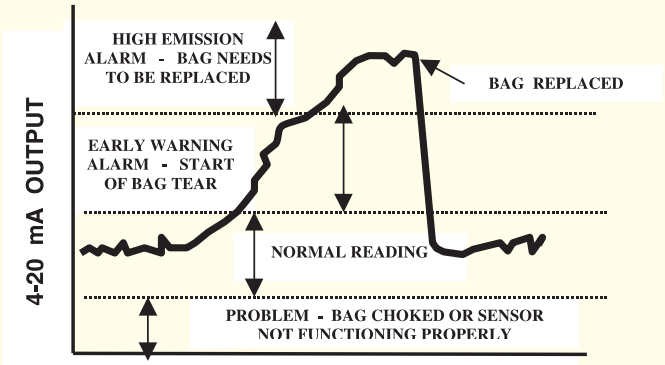

FIGURE 2 - TYPICAL ACTIVITY OF BROKEN BAG DETECTOR

As you are aware, the **Pollution Control Board** has made it **mandatory** to install 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.

INDUSTRIES WHERE CEMS ARE USED

- **POWER** - Thermal Power Stations, Cogeneration Power Plants.
- **STEEL** & NON-FERROUS METAL PROCESSING INDUSTRIES
- **CEMENT**
- **CHEMICAL, FERTILISERS & PETROCHEMICAL**
- **PHARMA**
- **BOILERS and INCINERATORS**
- **PAPER & SEVERAL OTHERS**

Our instruments have been working successfully at several plant locations in the country, for various applications, in several industries. All our customers are extremely happy with their usefulness at such low cost.

TECHNICAL DATA

SENSOR

Material of construction	: Stainless Steel 316
Diameter	: 14 mm (other dia. Available)
Insertion length	: 50 mm to 1000 mm. (Other lengths available)
Temperature withstand capability	: 300^{0}C (Higher temperature upto 1000^{0}C available)
Pressure rating	: 30 p.s.i. standard (higher pressure rating available)
Hazardous rating	: Intrinsically safe.

ELECTRONIC CONTROL UNIT

Power supply	: 240V AC ± 10%, 110V AC ± 10% 50 c/s ± 3% 1 ph
Power consumption	: Max. 50 VA
Response time	: 1 sec (Damping feature built-in)
Repeatability	: Better than 2% F.S.
Housing	: 316 Stainless Steel Metal housing, dust and vermin proof, designed for panel mounting.
Temperature	: -5^{0}C to + 250^{0}C
Humidity Range	: 0 to 90% relative

Special add-on for flame proof requirement.

OUTPUT SIGNALS

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

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

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