

BROKEN BAG DETECTOR

(SOLIDS FLOW MONITOR)

MOST EFFECTIVE & ADVANCED TECHNIQUE FOR

- A) DETECTION OF A BROKEN BAG in a Fluid Bed Drier (FBD) / Processor (FBP), resulting in saving of product losses.**
- B) DETECTION OF A BROKEN BAG in a Filter Bag House, resulting in efficient pollution / emission monitoring.**
- C) Monitoring the performance of Coating machines and detecting leakage of coating polymer.**

In all Process Industries and Thermal Power Stations, frequent problems are encountered due to

- **Product losses due to broken / torn filter bags,**
- **Emission of fine solid particles at levels higher than that permitted by pollution control norms / health and safety standards;**
- **Inefficient operations of E.S.P.s, Filter Bag Houses, Coating Machines etc.**

In all the above applications, flow measurement of solids is imperatively required, however the same cannot be implemented in the absence of a reliable measuring device. The Solids Flow Monitor (FM-10) is a unique device which can solve all of the above problems at an extremely economical cost.

Our equipments are being extensively used in the **Pharmaceutical, Chemical, Fertiliser, Petrochemical, Metal Processing, Cement, Thermal Power Generation & several other industries** since last several years. All user companies are thoroughly satisfied with the benefits they are achieving by installing Broken Bag Detectors / Solids Flow Monitors in their systems. **Several Machinery Manufacturers too appreciate the utility and importance of this product and have made our equipment a standard feature in their supplies.**

The principal on which our **Broken Bag (or Sieve) Detector** works is as follows -

When the drug is being dried in the FBD, product losses often occur due to ruptured filter bags. Significant product losses can occur by the time the filter bag rupture is detected & the FBD is stopped. The Broken Bag Detector is used along with the FBD for **preventing product losses due to ruptured filter bags (or broken sieves)** by immediately sensing the leakage & stopping the FBD motor.

It has been observed that often, the filter bags are replaced every two to three months to avoid leakages. Broken Bag Detector can also serve as an **early warning system** indicating possible failure of bags in the near future by detecting higher emission levels, enabling the bag to be replaced in time. This is possible by using an

analog output (optional feature) which is **proportional to the mass flow of solids / particulates**. This analog signal can be connected to an alarm indicator or recorder in the control room or to the **PLC of the FBD** (as shown in Figure 1 & 2).

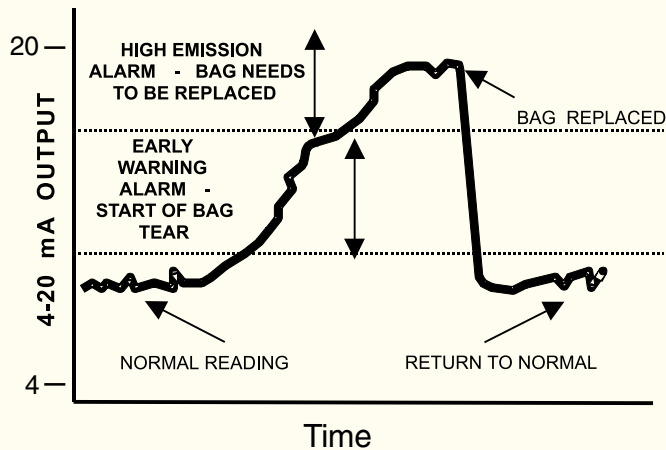


FIGURE 1 - TYPICAL ACTIVITY TIME OF BROKEN BAG DETECTOR

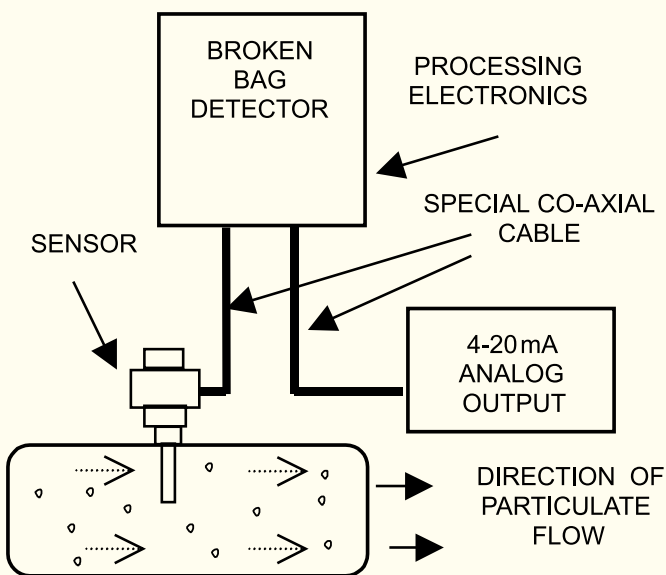


FIGURE 2 - TYPICAL INSTALLATION OF BROKEN BAG DETECTOR

Maintenance costs are reduced since the downstream equipment such as blowers, fans etc., are protected from spilling powder. Labour required for cleaning operations after bag ruptures is also saved. Above all, bag ruptures

may lead to **batch losses**, forward sections of the plant remaining idle, **production targets not being met**, penalty clauses / order cancellation and lowering of corporate image which could be avoided by installing the Broken Bag Detector.

The Broken Bag Detector is highly sensitive and reliable. It consists of a sensor with shielded cable and an Electronic Control Unit. The sensor is a 316 stainless steel rod with Teflon Insulator. The sensor is installed in the duct of the FBD as shown in **Figure 3**. When the leakage of the product takes place through the ruptured filter bags (or broken sieves), the product strikes the sensor. This results in the generation of an analog electric signal directly proportional to the mass flow of the colliding solid particles. This signal is then conditioned, amplified & processed through sophisticated electronic circuitry and then used to give an alarm and finally to stop the motor of the FBD thereby preventing product losses.

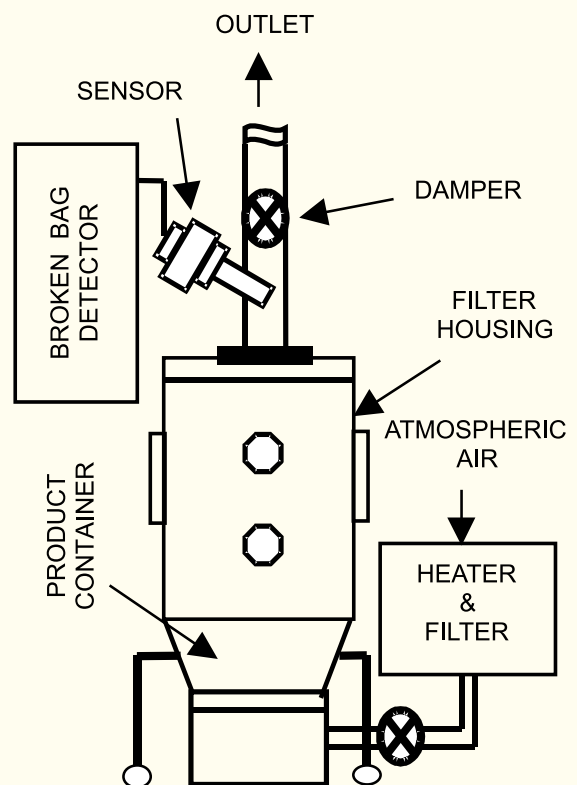


FIGURE 3 - FBD WITH BROKEN BAG DETECTOR

The Broken Bag Detector is not only used in the **Pharma industry**, but is also used wherever a FBD with Filter Bags is used - **Chemicals, Fertilisers** & other such industries. The Broken Bag Detector is also used in all industries which use Filter Bag Houses.

The Broken Bag detector can also be used in Coating machines to monitor the performance of the machine and to ensure that there is no leakage of the coating polymer.

THE BROKEN BAG DETECTOR HAS SEVERAL INHERENT ADVANTAGES -

- The only device based upon **direct measurement of quantity** of solids / particulates.
- Price wise it is the most **economical** device.
- It has no moving parts & thus, it is very **versatile, robust & maintenance free**.
- It helps **prevent costly drug losses** and also **saves time & labour required for cleaning operations** which are required after any bag rupture.
- Provides "**Advance Warning System**" to prevent bag ruptures & avoid product loss.
- **Prevents atmospheric contamination** and helps ensure compliance with **Pollution Control Board norms** for emission and exhaust from the Filter Bag House.
- **Permits online monitoring of the Filter Bag House performance.**

- With a small investment, the device can help **prevent production loss, down time & penalties arising out of atmospheric contamination.**

AREAS OF APPLICATIONS & ADVANTAGES

The Broken Bag Detector is the most efficient and economical instrument for:

- Detection of broken / torn filter or bag.
- Monitoring efficiency of all types of powder / dust filters.
- Mass flow measurements of solids in process pipes / ducts.
- Minimising costly product losses due to excessive emission from process / machinery which could occur due to leakages, breakages of seals, process disturbances.
- Monitoring of blockage / arching of solids in hopper / bins / silos / chutes.
- Monitoring of electro-filter (ESPs) efficiency.
- Measuring and monitoring pollution levels in stacks / vents / chimneys.
- Saving of electrical energy for ESPs & its fans, dust / bag filters and their fans.
- Monitoring of flow / no flow conditions in screw conveyors, air slides, bucket elevators, belt conveyors etc.,
- Monitoring the performance of Coating machines.

INDUSTRIES WHERE THE BROKEN BAG DETECTOR IS A MUST

- Pharmaceuticals
- Chemicals
- Cement
- Thermal Power Stations and Coal fired Boilers
- Petrochemicals, Fertilizers and Allied Industries
- Pulp & Paper, Sugar and similar Industries.
- Ferrous & Non-Ferrous Metal Processing industries
- Food processing & dairy
- Foundries
- Mining & Minerals

TECHNICAL DATA

SENSOR

Material of construction	: Stainless Steel 316
Diameter	: 14 mm (other dia. Available)
Length	: 50 mm to 1000 mm. (Other lengths available)
Temperature	: 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 \pm 10%, 50 c/s \pm 3% 1 phase
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° to + 70°C
Humidity Range	: 0 to 90% relative
Hazardous rating	: Intrinsically safe.

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.

Shree TECS Pvt. Ltd.

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