

BROKEN BAG DETECTOR

(SOLIDS FLOW MONITOR)

MOST EFFECTIVE & ADVANCED TECHNIQUE FOR

- A) DETECTION OF A BROKEN BAG in Fluid Bed Drier (FBD) / Processor (FBP) / Rotary Vacuum Dryer (RVD), resulting in saving of product losses.**
- B) DETECTION OF A BROKEN BAG in Filter Bag House, resulting in efficient pollution and emission monitoring / saving of product losses / prevention of contamination of production line / preventing damage to downstream equipment.**

In all Process Industries where Filter Bags are used, frequent problems are encountered due to BROKEN OR TORN FILTER BAGS. Some of the problems are :-

- **Product losses due to broken / torn filter bags;**
- **Emission of solids at levels higher than that permitted by pollution control / environment / health and safety standards;**
- **Damage to downstream equipment like Fans / Blowers / Pumps etc.;**
- **Contamination of production line;**
- **Increased production / process downtime;**
- **Inefficient operations of E.S.P.s, Filter Bag Houses etc.**

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 (OEM) 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 product is being dried in the Dryer (or in any other production process before the Filter Bags), product losses often occur due to ruptured filter bags. Significant product losses can occur by the time the filter bag rupture is detected & the Dryer is stopped. The Broken Bag Detector is used along with the Dryer for **preventing product losses due to ruptured filter bags (or broken sieves)** by immediately sensing the leakage & stopping the Dryer motor and shutting the damper.

Similarly, it is used in Filter Bag Houses where **products are being recycled or emissions are being controlled.** The Broken Bag Detector is calibrated so that emissions, which occur during normal operating conditions, are taken to be as normal. When filter bags break or tear, the emissions will increase and this will be detected.

It has been observed that often the filter bags are replaced every two to three months to avoid leakages and the occurrence of Bag Tears. Broken Bag Detector can also serve as an **early warning system** indicating possible failure of

bag in the near future by detecting higher emission levels (caused due to small cracks or tears in the bags) enabling the bag to be replaced in time. Choking of filter bags can also be detected by the instrument. This is possible by using an **analog output** (optional feature) which would be **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).

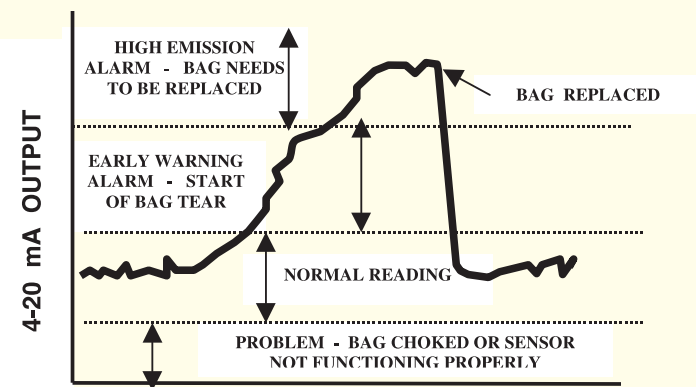


FIGURE 1 - TYPICAL ACTIVITY OF BROKEN BAG DETECTOR

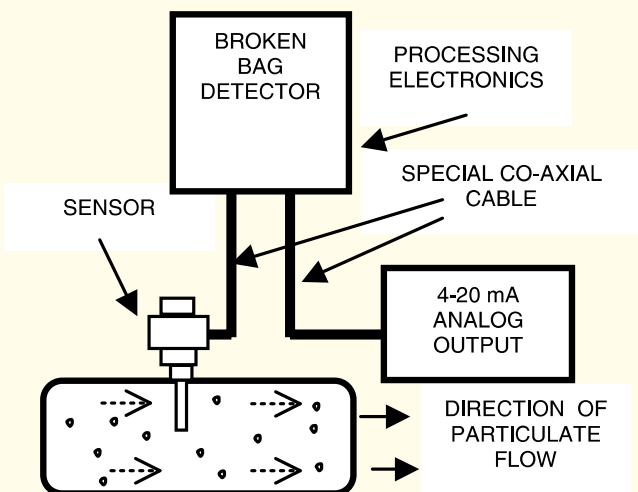


FIGURE 2 - TYPICAL INSTALLATION OF BROKEN BAG DETECTOR

Maintenance costs are reduced since the **downstream equipment such as blowers, fans etc., are protected** from spilling powder and damage / contamination is prevented. Labour required for cleaning operations after bag ruptures is also saved. Contamination of production process is also prevented. 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 after the Dryer 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 which is 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 Dryer and shut the dampers of the exhaust duct, thereby preventing product losses.

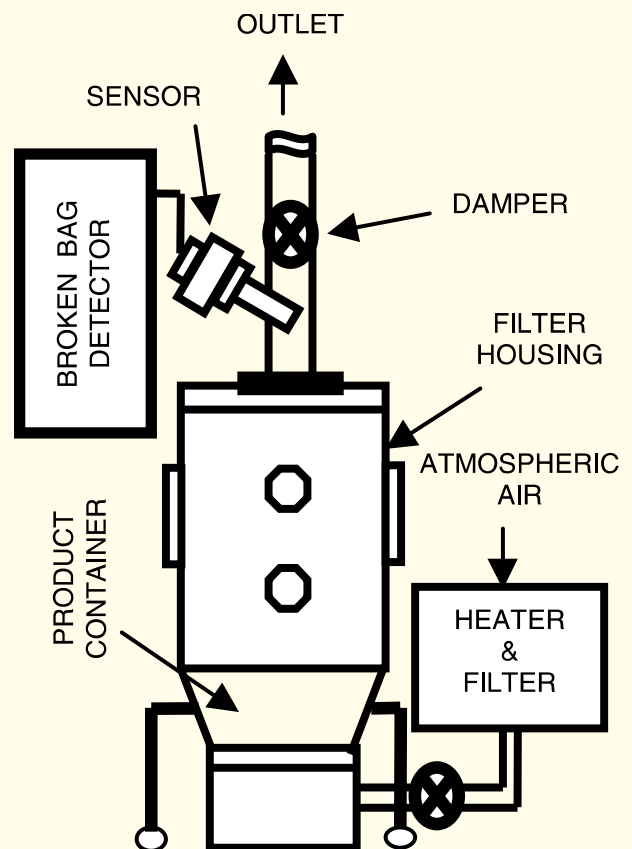


FIGURE 3 - FBD WITH BROKEN BAG DETECTOR

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 product losses**.
- **It 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**.
- Provides indication of possible **Bag Choking**.
- **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 meager investment, the device can enable you to **prevent production loss, down time & penalties arising out of atmospheric contamination**.
- Helps in ensuring optimal recycling of the product.

AREAS OF APPLICATIONS & ADVANTAGES

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

- ◆ Instantaneous Detection of broken / torn filter or bag or sieve.
- ◆ Detection of bag choking.
- ◆ Detection of the Bag House Section in Bag House which contains the broken / torn bags.
- ◆ Monitoring efficiency of all types of powder / dust filters.
- ◆ Minimising costly product losses due to excessive emission from process / machinery which could occur due to leakages, breakages of seals, process disturbances.
- ◆ Measuring and monitoring pollution levels in stacks / vents / chimneys.
- ◆ Protection of expensive downstream equipment like industrial fans, vacuum pumps, blowers, air lift pumps etc., due to failure of bags when there is excessive flow of solids (higher than that permitted).
- ◆ Monitoring of factory environments from viewpoint of human health and safety, like in case of drug / paint / special chemical manufacturing units.
- ◆ Extending working life of filter bags which are fairly expensive as in case of fluidised bed driers in Pharmaceuticals/Chemicals manufacturing units.
- ◆ Monitoring the performance of coating machines and detecting leakage of coating polymer.

INDUSTRIES WHERE THE BROKEN BAG DETECTOR IS A MUST

- Pharmaceuticals
- Chemicals
- Cement
- Thermal Power Stations and Coal fired Boilers
- Oxygen Plants
- 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%, 110V 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 withstand Capability	: -5 [°] to + 250 [°] 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.

If you would like any further information or would like to see our list of customers, please feel free to write / telephone / fax / e-mail to us.

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