EN

Competence in Solids

SWR engineering

FlowJam

Bulk Flow Detection

Product Information

SWR engineering Messtechnik GmbH

Using / Function

The FlowJam detects all kinds of bulk solid flows with regard to material movement. The FlowJam distinguishes between the following switching conditions

- material flow
- material jam/standstill resp. empty pipe

The system works contactless by using microwaves, whereby the material movement is detected by means of the Doppler's principle.

The FlowJam is definitely a very reliable device because the use of its microwaves guarantees a penetration of material build-up on the sensor, and therewith a proof detection of material flow behind it. Hence it's also possible to detect through non-metallic box walls, casings or conduits.

Even at difficult conditions like high process temperatures or pressures as well as Ex-zones the FlowJam can be used by means of a process adapter (see page 4).

Applications – practical examples

- **Monitoring of raw meal cyclones in cement plants**

The FlowJam monitors the cyclone through special ceramic fittings, used for high temperature isolation, in order to prevent jams inside the cyclone.

- Temperature inside the cyclone: 600 °C
- Mass flow rate: ca. 50 t/h

- **Monitoring of screw-conveyors in gypsum plants**

The FlowJam is installed in the discharge part of the screw to monitor the continuity of the material flow. As soon as the material flow gets interrupted, the FlowJam signals it by switching the relays, so that the operator can react appropriately.

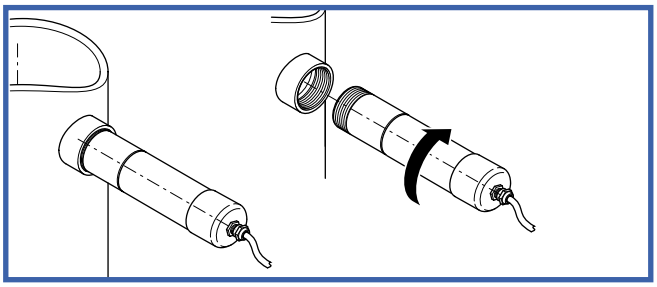
- **Monitoring of plastic injection in steel plants**

Plastic as fuel is injected via several lances in the blast furnace. It's very important for a constant quality of the burning process that the even fuel distribution around the blast furnace is guaranteed.
It is for this reason that every lance is monitored by the FlowJam, so that every jam can be detected instantly, by which the process can be stopped automatically and the concerned lances freed by injecting of nitrogen.

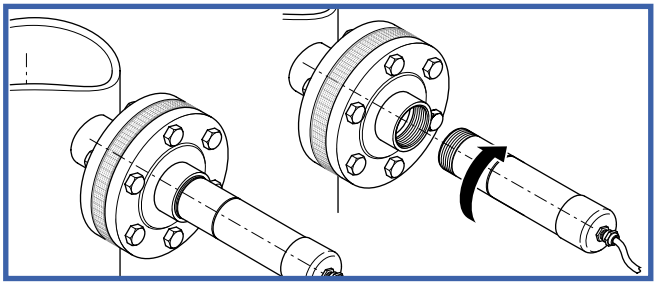
Installation

The installation of the FlowJam is easily made by the following ways

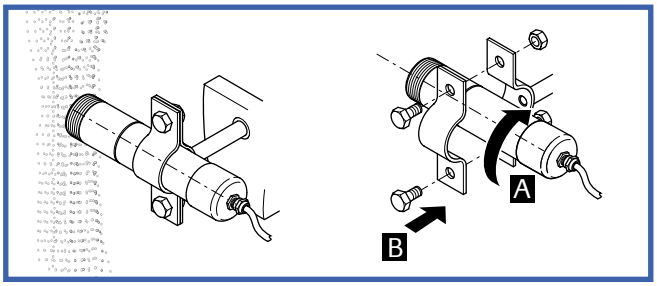
- screwing it into a G 1½-inch-srew neck
- by means of a DN 40 flange
- by means of a pipe clip or an other mounting



Thread mounting



Mounting with separating flange



Mounting with pipe clamp

Commissioning

Operating elements for the commissioning are located in the accessible FlowJam casing. It's possible to adjust both the switch sensibility and the response delay. As a consequence there is no need for an extra evaluation unit.

Technical Data

Housing material	Stainless steel 1.4541
Protective system	IP 65
Using in Ex-zones	Cat. 3 GD Cat. 1/3 GD (with Process-Adapter)
Process temperature	-20…+80 °C -20…+220 °C (with Process-Adapter) Max. 1000 °C (with ceramic flange)
Ambient temperature	-20…+60 °C
Working pressure	Max. 1 bar Max. 20 bar (with Process-Adapter)
Power supply	12…30 VDC (-0/+15%) 12…24 VAC (-0/+15%)
Relay output	42 V AC/DC 2 A AC/DC 50 W/60 VA
Response time	1…15 s (continuously adjustable)
Measuring frequency	24.125 GHz; ± 100 MHz
Transmitting Power	Max. 5 mW
Weight	1.0 kg
Dimensions	Casing: length of 216 mm / diameter of ca. 52 mm Thread: length of 30 mm / diameter of G 1½"

certificated according to ATEX

Fields of application of the Pressure-Adapter

Use as Pressure-Adapter

The FlowJam sensor itself can be used at pressures of up to 1 bar.
In case of higher process pressures in the conveyor pipe or in hoppers the Pressure-Adapter can be used at pressures of up to max. 20 bar.

Mounting

The Pressure-Adapter is screwed into a welded G 1½ inch thread neck, provided by the customer. Then the FlowJam sensor is screwed into the G 1½ inch female thread of the Pressure-Adapter.

Technical Data

Material	Stainless steel 1.4301, POM diaphragm
Temperature	-20…+80 °C
Pressure	Max 20 bar
Thread	G 1½ inch on both sides
Wrench Width	55 mm

Use as Temperature-Adapter

The FlowJam sensor itself can be used at temperatures of up to 80 °C.
In case of higher process temperatures in the conveyor pipe or in hoppers the Temperature-Adapter can be used at temperatures of up to 220 °C.

Mounting

The Temperature-Adapter is screwed into a welded G 1½ inch thread neck, provided by the customer. Then the FlowJam sensor is screwed into the G 1½ inch female thread of the Pressure-Adapter.

Technical Data

Material	Stainless steel 1.4301, Tecapeek diaphragm
Temperature	Max. +220 °C
Pressure	Max. 20 bar
Thread	G 1½ inch on both sides
Wrench Width	55 mm

Use for Separation of Explosion-Areas

Both types of adapters can be used for the separation of explosion areas (dust/gas).
According the European DIN EN 13463-1 devices of class II D have to be constructed that way, that under application conditions, it is impossible to create an ignition.

This can be achieved by a limited surface of the non-conductive part of the Process-Adapter (diaphragm made out of POM or Tecapeek).
The maximum allowed surface area of the non-conductive part according DIN EN 13463-1 is:

- Cat. 1: dust Ex-zone 20 (250 cm^2); gas Ex-zone 0 (50 cm^2)
- Cat. 2: dust Ex-zone 21 (500 cm^2); gas Ex-zone 1 (100 cm^2)
- Cat. 3: dust Ex-zone 22 (no limit); gas Ex-zone 2 (no limit)

With a non-conductive surface of the Process-Adapter of 10,75 cm^2 the allowed limits are not being crossed. Therefore with use of the Process-Adapter in combination with FlowJam sensors it can be measured from outside into all explosion areas, if there is at most a dust Ex-zone 22 outside of the conveying pipe or hopper.

SWR engineering Messtechnik GmbH
Gutedelstraße 31 · 79418 Schliengen (Germany)
Fon +49 7635 82 72 48-0 · Fax +49 7635 82 72 48-48 · www.swr-engineering.com