

FlowJam S

Bulk flow detection



Using / function

The FlowJam S detects all kinds of bulk solid flows with regard to material movement. The FlowJam S 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 S 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-version for hazardous areas the FlowJam S 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 S monitors the cyclone through special ceramic fittings, used for high temperature isolation, in order to prevent jams inside the cyclone.

- Temperature inside the cyclone: 880 °C
- Mass flow rate: ca. 50 t/h



▪ Monitoring of screw-conveyors in gypsum plants

The FlowJam S 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 S signals it by switching the relays, so that the operator can react appropriately.



▪ Monitoring of coal injection in steel plants

Coal 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.

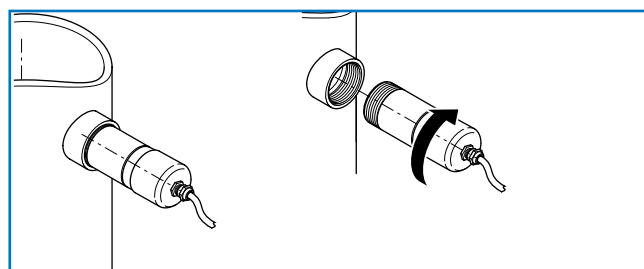
It is for this reason that every lance is monitored by the FlowJam S, so that every jam can be detected instantly, by which the process can be stopped automatically and the concerned lances freed by injecting of nitrogen.



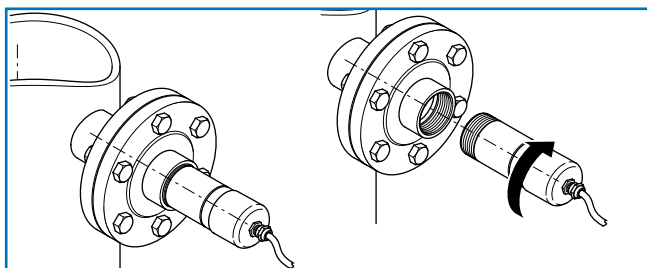
Installation

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

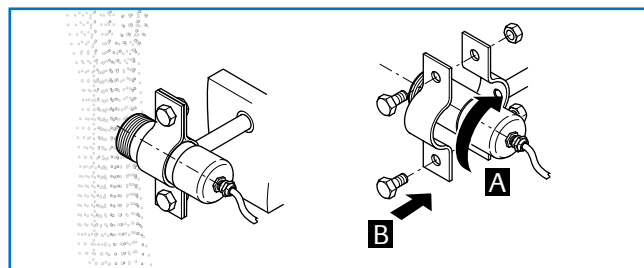
- screwing it into a G 1½-inch-screw neck
- by means of a DN 40 flange
- by means of a pipe clip or an other mounting



Thread mounting



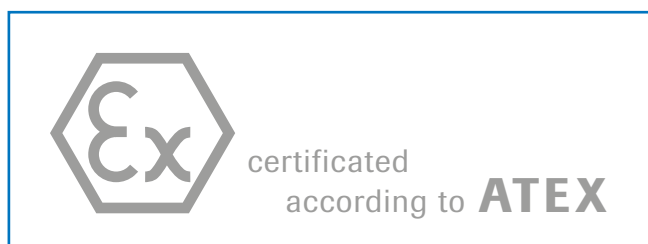
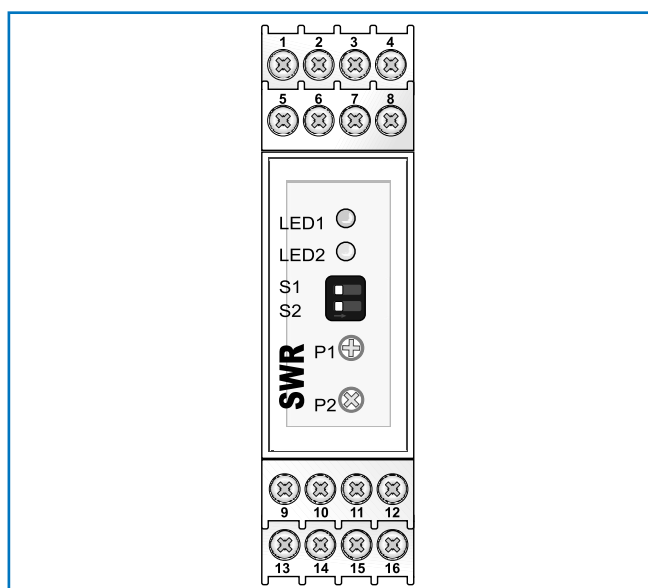
Mounting with separating flange



Mounting with pipe clamp

Commissioning

Operating elements for the commissioning are located in the accessible transmitter. It's possible to adjust both the switch sensibility and the response delay.



Sensor	
Voltage	12 V DC powered by transmitter
Power consumption	Approx. 1.5 W
Housing	Stainless steel 1.4571
Protection system	IP 65
Using in Ex-zones	Outside pipe: Cat. 3G/D Inside pipe: Cat. 1/3 G and Cat. 1/3 D (only with process adapter)
Process temperature	-20... +80 °C (standard) -20... +220 °C (with process adapter) -20... +1000 °C (with ceramic flange)
Ambient temperature	-20... +60 °C
Working pressure	Max. 20 bar (with process adapter)
Detection range	0 - 2 m (dependent on application)
Required material speed for detection	Min. 0.1 m/s
Measuring frequency	K-Band 24.125 GHz; ± 100 MHz
Transmitting power	Max. 5 mW
Dimension FlowJam S	Housing: L 103 mm / Ø 52 mm Thread: L 30 mm / Ø G 1½"
Dimension FlowJam S Ex	Housing: L 147 mm / Ø 60 mm Thread: L 15 mm / Ø G 1½"
Cable gland	M16 (Ø 5-10 mm)
Weight FlowJam S	Approx. 560 g
Weight FlowJam S Ex	Approx. 850 g

Transmitter (DIN Rail)	
Power supply	24 V DC ± 10 %
Power consumption	Approx. 3.5 W
Relay output	Max. rated load: 250 V AC Max. peak current: 6 A Max. rated load 230 V AC: 250 VA Max. breaking capacity DC1: 3/110/220 V: 3/0.35/0.2 A Min. switching load: 500 mW (10 V/5 mA)
Fall-delay time	250 ms... 15 s (continuously adjustable)
Weight	Approx. 172 g

Use as pressure adapter / temperature adapter

The FlowJam S sensor can be used at a pressure of 1 bar and process temperatures up to 80 °C. For higher pressures (up to 20 bar) a pressure adapter made of POM, for higher temperatures a Tecapeek adapter

(max 220 °C) and a ceramic adapter (max +1000 °C) are available.

A process adapter for applications in the food industry is also available.

Mounting of pressure adapter / temperature adapter

The mounting of the pressure adapter / temperature adapter is identical.

It is screwed into a welded G 1½ inch thread neck, provided by the customer.

Only the ceramic adapter is supplied as a flange and must be mounted separately.

The housing of the FlowJam S is screwed into the internal thread of the adapter.

Technical data

	Pressure adapter	Temperature adapter	Food adapter	High temperature adapter
Material	Stainless steel 1.4571, POM diaphragm	Stainless steel 1.4571, Tecapeek diaphragm	Stainless steel 1.4571, Tecapeek GF30 diaphragm	Steel Ceramic diaphragm
Temperature	-20...+80 °C	Max. +220 °C	Max. +220 °C	Max. 1000 °C
Pressure	Max. 20 bar	Max. 20 bar	Max. 20 bar	Max. 40 bar
Thread	G 1½ inch on both sides	G 1½ inch on both sides	G 1½ inch on both sides	G 1½ inch on sensor side
Wrench width	55 mm	55 mm	55 mm	17 mm

Use for separation of explosion areas

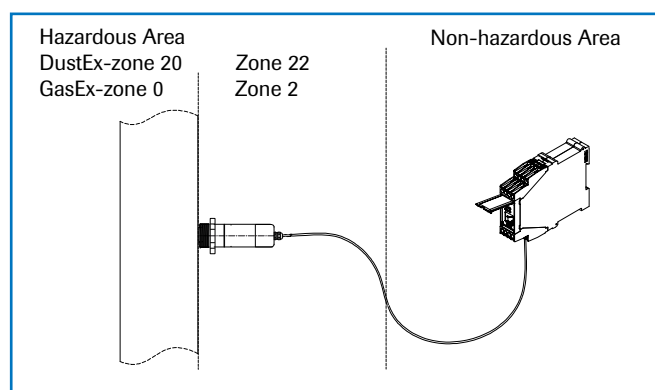
Both types of adapters can be used for the separation of explosion areas (dust).

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 cm²)
- Cat. 2: dust Ex-zone 21 (500 cm²)
- Cat. 3: dust Ex-zone 22 (no limit)



With a non-conductive surface of the process adapter of 10.75 cm² the allowed limits are not being crossed. Therefore with use of the process adapter in combination with FlowJam S Ex-sensor it can be measured from outside into all explosion areas, if there is at most a dustEx-zone 22 or gasEx-zone 2 outside of the conveying pipe or hopper.