

## Material Flow Monitor with Blockage Detector

PROCESS MONITORING SYSTEMS FOR SOLIDS

### Product Information



#### FEATURES:

- rapid detection of material movement (Flow/NoFlow)
- additional function „Detection of blockage“ or „Material flow interruption“
- operates without contact using microwaves
- a particularly reliable device since microwaves can pass through material accumulations
- Measurement can be taken from outside all non-metallic tank walls, housings, hose lines or pipelines
- can be used even in difficult conditions, in other words high operating temperatures and pressures and in version for ATEX zones (with the help of a processadapter)



certificated  
according to **ATEX**

# TECHNOLOGY

## USE

The FlowJam *Plus* is a logical development of the established FlowJam sensor which has proved its worth in thousands of applications. In addition to the rapid detection of material movement (Flow/NoFlow), the FlowJam *Plus* also provides an additional "Detection of blockage" or "Material flow interruption" function.

Therefore it also can provide additional information about, if the pipe develops a plugging and Flow/No-Flow indications. The system operates without contact using microwaves with the material movement being detected using the Doppler effect.

FlowJam *Plus* is a particularly reliable device since microwaves can pass through material accumulations on the sensor and still detect material movements beyond them.

The measurements can take place as well outside of non-conductive containers such as bins, tanks, silos or hoses and conveying lines.

It is also possible to measure at high-temperature, pressures or dust Ex-Zones. Therefore ENVEA - SWR engineering can provide special adapters.

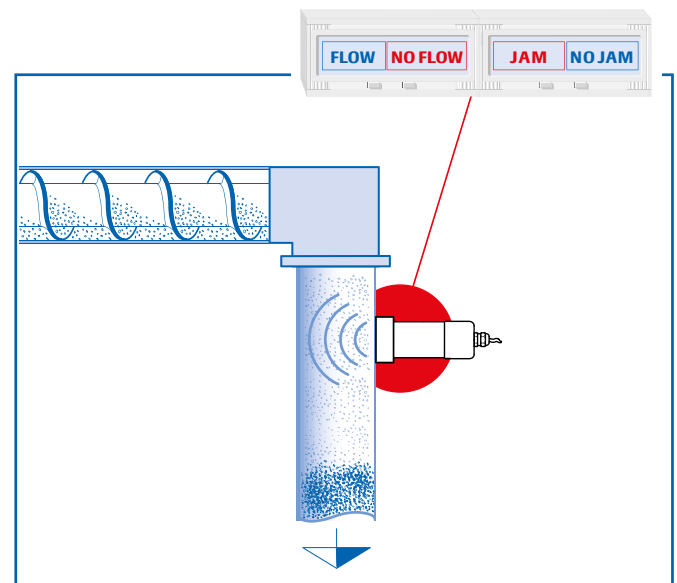
## FUNCTION

The FlowJam *Plus* sends microwaves into the pipeline in which the material flows. This may be a freefall pipeline or a pneumatic transport system.

The microwave signals are reflected by the moving solid particles. The Doppler effect is used to distinguish if the material is in motion or not.

A frequency shift of the emitted pulses indicates a "Flow". If this Doppler shift does not take place, there is no material movement and the sensor indicates a "NoFlow".

In the case of a material flow interruption, it is now possible to detect quickly whether there is a problem because the lower screw no longer removes any material or the feed screw no longer supplies material.



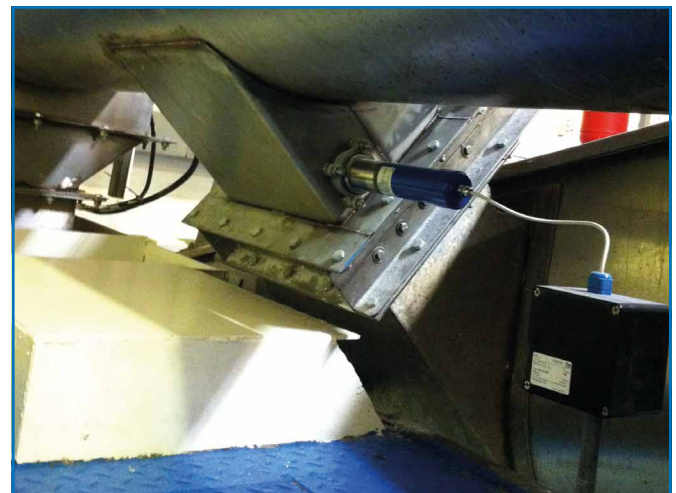
## APPLICATION EXAMPLES

### • Transfer point

Chips of wood are transported by two screw conveyors in a biomass plant.

At the transfer point between the screw conveyors, FlowJam *Plus* monitors the flow of material.

If the material flow stops, it can quickly detect with the problem exists because the bottom screw conveyor is not discharging material or the supply screw conveyor is not supplying material.



## APPLICATION EXAMPLES

### • Material infeed to a rotary feeder

In a lime plant, lime is conveyed into the inlet of a rotary feeder via a vertical downpipe.

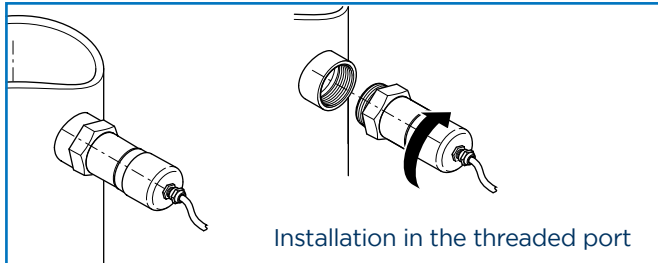
At this point, it should be ensured that there is always a sufficient material flow.

When the material column reaches the sensor position in the fall line, the FlowJam *Plus* signals exactly this state.

With this information, the material feed can be controlled better.

## INSTALLATION

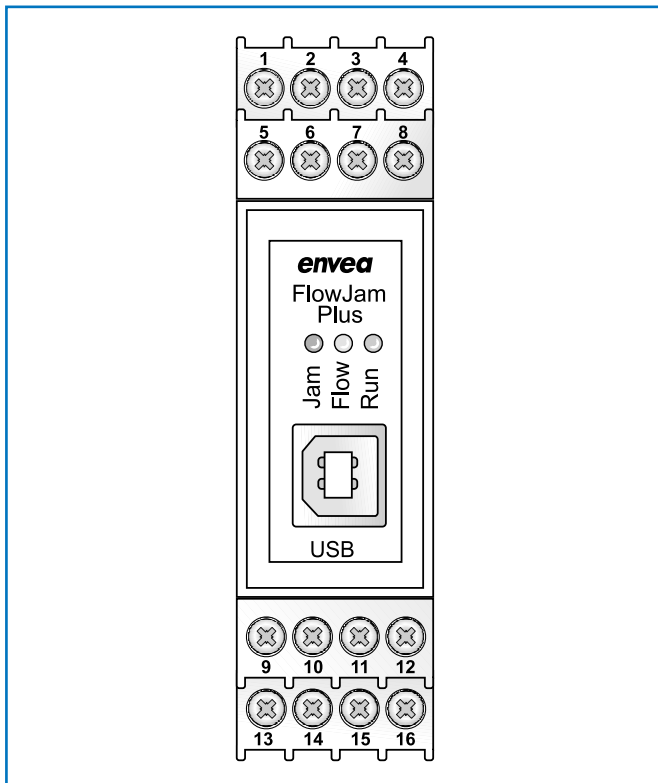
The FlowJam *Plus* sensor is installed on the line using a G 1½-inch threaded port.



## SYSTEM

A complete measuring point consists of the following components:

- FlowJam *Plus* sensor
- DIN Rail connector



## TECHNICAL DATA

### Sensor

Housing material	Stainless steel 1.4571
Protection type	IP65
Using in Ex-zones	Outside pipe: Cat. 3D Inside pipe: Cat. 1/3D (only with process adapter)
Process temperature	-20 ... +80 °C -20 ... +220 °C (with process adapter) Up to 1000 °C (with ceramic flange)
Ambient temperature	-20 ... +60 °C
Working pressure	Max. 1 bar Max. 20 bar (with process adapter)
Measuring frequency	24.125 GHz; ±100 MHz
Transmitting power	Max. 5 mW
Weight	Approx. 560 g
Dimensions	Housing: Length 107 mm / Diameter 52 mm Thread: Length 30 mm / Diameter G 1½"

### Transmitter (DIN Rail)

Power supply	24 V DC ± 10 %
Power consumption	Approx. 3.5 W
Ambient temperature	-20 ... +60 °C
Relay contact	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)
Communication	USB
Weight	Approx. 172 g

## SPECIFICATIONS

### USE AS PRESSURE ADAPTER / TEMPERATURE ADAPTER

The FlowJam Plus 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 Plus is screwed into the internal thread of the adapter.

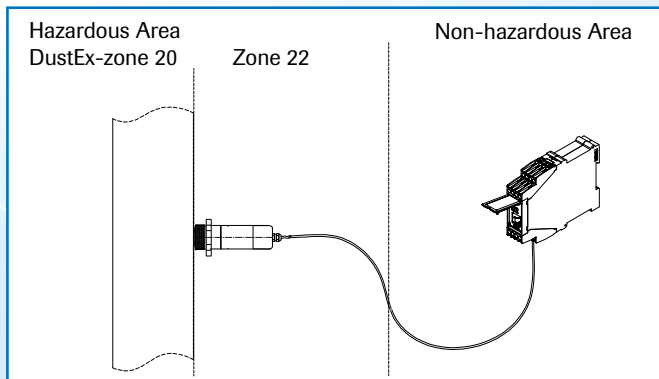
### TECHNICAL DATA

	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" on both sides	G 1½" on both sides	G 1½" on both sides	G 1½" 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 to 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 to DIN EN 13463-1 is:

- Cat. 1: dust Ex-zone 20 (250 cm<sup>2</sup>)
- Cat. 2: dust Ex-zone 21 (500 cm<sup>2</sup>)
- Cat. 3: dust Ex-zone 22 (no limit)

With a non-conductive surface of the process adapter of 10.75 cm<sup>2</sup> 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 dust explosion areas, if there is at most a dust Ex-zone 22 outside of the conveying pipe or hopper.

