



# ***MF 3000***

## ***MASS FLOW METER FOR SOLIDS***



Compact and Economical In-Line Measurement – No Scale Required

## Application and Function

The MF 3000 flow meter for solids is designed for measurements in metallic pipes ranging from pounds/h to tons/h. The system is suitable for on-line measurements of powders, dust, pellets, and granular ranging from 1 nm up to 20 mm (~1") particle size in pneumatic systems or free fall conditions.

The MF 3000 measurement principle is based on the physical Doppler effect, whereas the sensor generates a uniform electro-magnetic field in the microwave frequency range inside the pipe. Microwaves are being reflected by particles passing through the pipe. Calculation of frequency and amplitude changes allows for accurate determination of flow. Non-moving particles like dust accumulation are excluded from calculations.

Installation is simple and cost effective via a welding flange, through which the sensor is screwed in flush with the inside of the pipe.

The sensor is connected to a DIN-rail mounted transmitter via a 6 lead wire with a maximum distance of 1,200 m.

The transmitter features a RS 232 interface for set-up and calibration as well as analog 4...20 mA and digital RS485 output. Calibration is comfortable and easy with the included MF-SMART software and a reference flow amount.

A build-in heating cycle guarantees a stable environment which is essential for achieving high accuracy.



## Benefits

- For pneumatic conveyors and freefalling processes
- IN-LINE measuring without weighing
- Easy installation and commissioning
- Contact less and integral measuring
- Inside flush fitting
- Adjustable sensitivity
- Long-term stability
- Robust, compact, and abrasion-free
- DIN-Rail Transmitter with COM-Interface for direct Online-connection
- Galvanic separated RS485-Interface for PLC-Connection
- MF-Sensor supply for connections up to 1.200 m
- Limit alarm monitoring with alarm contact

## Applications

The MF 3000 mass flow meter is suitable for pneumatic systems and free falling processes. Diameter of the measured product should be between 1 mm and 20 mm (~1").

Moisture in the material can be up to 17%.

### **Materials:**

all dust, powders, granules, panels, threads also sticking or abrasive materials

### **Range of detection:**

from pounds/h to tons/h

### **Industries:**

animal feed industry  
building materials industry  
production of ceramics  
cement industry  
chemical industry  
detergent industry  
engineering companies  
food industry  
glass production

metal production  
pharmaceuticals  
pigment production  
plastic industry  
production of rubber goods  
recycling industry  
synthetic materials  
production of textiles  
tobacco industry  
detergent industry

## Technical Data

### **Process Data**

Measurement start free fall:

approx. 1 kg/h

Measur. start pneum. transport:

approx. 1 kg/h

Max. pipe diameter:

DN 300 (bigger diameter on request)

Grain size:

1 Nanometer up to 20 mm

Moisture:

depends on product

Pressure:

Up to 2 bar, optional up to 6 bar

Temperature:

-20 up to +95°C, optional up to +180°C

### **Electrical Data of evaluation unit:**

Construction:

DIN-Rail, 22.5mm

Power Supply:

24 V AC/DC

Power consumption:

3 W

Ambient temperature:

-10 up to +65°C

Form of protection:

IP 30

Output signal:

0/4-20 mA, Max. 750 Ohm, 0/2 – 10 Volt

Interfaces:

RS 232, RS 485

### **Technical Data of sensor**

Medium touched parts:

Stainless steel 1.4307 and PA 6.6

Process connection:

Welding flange

Housing material:

Stainless steel 1.4307

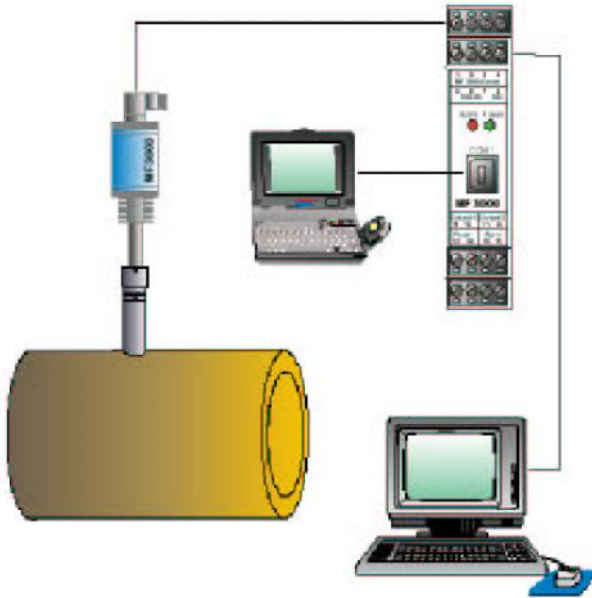
Form of protection:

IP 65

Power supply:

max. 20mA

## COMMISSIONING

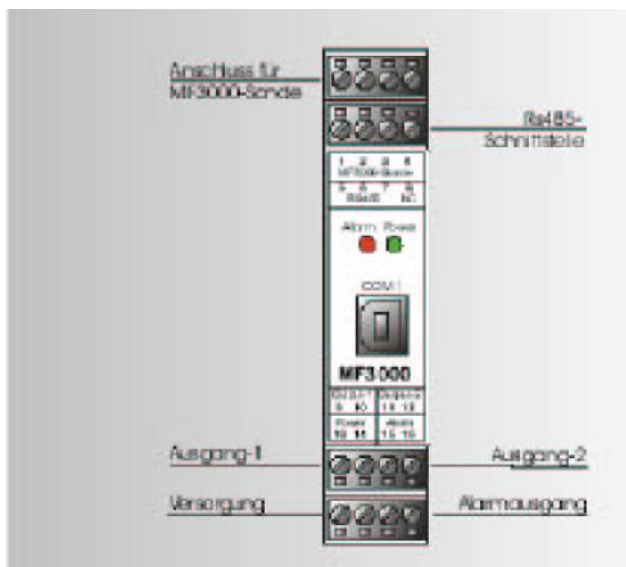


A stainless steel welding flange is welded onto the pipe. A 18 mm hole is drilled right through the welding flange. The sensor is inserted and adjusted to be flush with the inner diameter of the pipe.

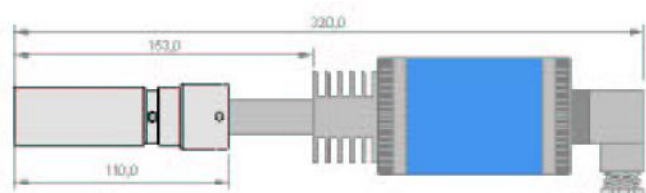
For set-up and calibration a notebook with our MF-SMART software is required. It connects to the front of the transmitter via a RS232 serial interface.

Calibration can be performed with either one or multiple reference flow amounts. Measurement values can be output either as analog 4...20mA or digital RS 485 signal for connection to a process control system.

## TRANSMITTER



## SENSOR



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