Application

The K-TRON Smart Flow Meter is used in industries that need reliable metering, registering or monitoring bulk of material flows. For example: plastics, chemicals, animal feed, cement, coal, glass, aluminum, grain, etc. Particle size 0.02 mm up to 10 mm. Flow characteristics: very good to good. Angle of repose: smaller or equal to 40 degrees, measured from the horizontal line. The bulk material can consist either of granules, chips or fibers. Application examples: material flow control within a production line, measuring filling or discharge quantities, materials management and quantitative bulk goods measurement.

Design

The Smart Flow Meter has no moving parts. The bulk material flows through two force sensor stations that have no mechanical effect on the material whatsoever. Depending on the operating range, measuring channel A (narrow cross section) or measuring channel B (large cross section) is built in.

Function

The Smart Flow Meter uses the principles of Newtonian physics: F=ma. Bulk material flows by gravity into the upper measuring channel, an inclined chute mounted on a force transducer where the force FR acting perpendicularly on the chute is measured as mass. The bulk material then flows into the lower, vertical channel which determines velocity or acceleration rate (Force FP). From the signals of these two sensors the flow rate is determined per unit of time.

Operating range

<table>
<thead>
<tr>
<th>Operating range with measuring channel A</th>
<th>Operating range with measuring channel B</th>
</tr>
</thead>
<tbody>
<tr>
<td>min max</td>
<td>min max</td>
</tr>
<tr>
<td>≥ 5 t/h and ≥ 10 m³/h (350 ft³/h)</td>
<td>≥ 10 t/h and ≥ 20 m³/h (700 ft³/h)</td>
</tr>
<tr>
<td>without calibration</td>
<td>without calibration</td>
</tr>
<tr>
<td>≤ 300 t/h and ≤ 100 m³/h (3500 ft³/h)</td>
<td>≤ 200 m³/h</td>
</tr>
</tbody>
</table>

Installation examples

Directly on the silo (only for free flowing material)

In a conveyor system

As a control system in a custom application

KSU-II Operator Interface:
- Totalizer
- Actual mass flow value (analog or digital)

Servo actuator

Control circuit

* a = max. 500 mm without ext. bulk mat. conditioner; ensure continuous inlet stream
**Technical Data**

- **Measuring accuracy:** Better than ±0.5% or ±1% depending on application
- **Ambient temperature:** -10 ... 50 °C (14 ... 122 °F)
- **Product temperature range:** -10 ... 70 °C (14 ... 158 °F)
- **Max. humidity:** 95%
- **Pressure range:** ±0.05 bar (0.7 PSI)
- **Compressed air supply bypass flap:** Pressure 5-10 bar (72-145 PSI), filtered, lubricated or unlubricated
- **Degree of protection:** IP 65, NEMA 4
- **Material:** Stainless steel, DIN 1.4404/1.4435/AISI 316 L
- **Weight:** 305 kg (671 lb)

**Main features**

- No moving parts, i.e. the bulk material is handled gently
- Easy to service, i.e. easy accessibility
- Rugged and simple design
- Function largely independent of bulk material
- Reliable and accurate force transducer system
- Stable long term behaviour
- Cost effective solution for in-line weighing
- Low headroom solution

**Bypass channel**

A bypass channel allows the flow meter to be tared at any time during the measuring process. A bypass valve deverts the bulk material flow into a separate channel, allowing retaring without interruption of the process. The bypass device can either be operated manually or programmed through the controls.

**Options:**

- High-temperature version
  - Bulk mat. temp. max. 120 °C (250 °F)
- Polished weigh chutes and deflector
- Polished inlet chute
- Feeder stand
- Flex inlet & discharge set

**Hazardous Location Options:** (see sheet I-000002)

- NEC Class II, Div. 2, Groups F & G / Class II, Div. 1, Groups F & G
- ATEX 3D/3D, 3G/3G, 2GD/2GD (outside/inside)

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**Dimensions** [mm(in)]

- Ø 940 (37)
- Ø 560 (22)
- Ø 460 (18)
- Ø 385 (15)
- Ø 350 (14)
- Ø 13 (0.51)
- 771 (30.4)
- 1320 (52)
- 290 (11.4)
- 2215 (87)
- 431 (16.2)
- 600 (24)

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**Caution:** These measurements are for general reference only. Please consult dimensional drawing for exact measurements

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