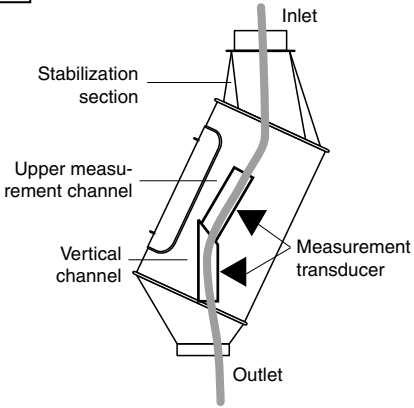
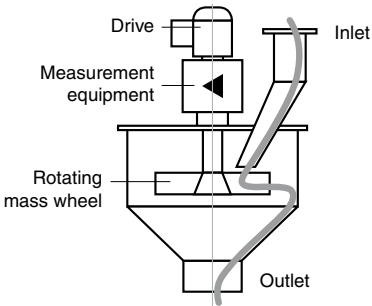
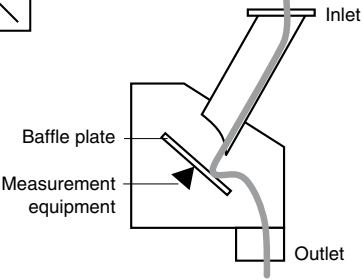
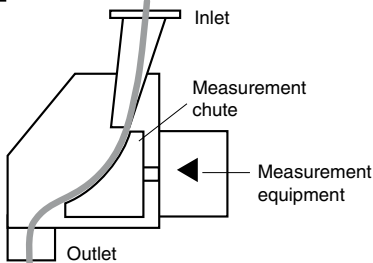


Process / Principle	Brief description	Characteristics
 Smart Flow Meter 	The bulk material flow to be measured is routed via a stabilization section into the upper measurement channel. This channel is part of the weighing system and the first measurement is taken here. Subsequently the bulk material flows through the vertical channel. Also this channel is part of a weighing system in which the second measurement is determined. From these two continually taken measurements the mass and the velocity are calculated. Remotely, this principle can be compared with an inclined weigh belt meter, except that in the latter the belt speed is fixed. This design allows free flow also when the measurement system is switched off. No additional forces act on the bulk material, that is, the material is not affected by the measurement system. The integrated "Bypass" allows the system to be tared without interrupting the bulk material flow (Autotare)	+ Continually free, undisturbed path (foreign bodies pass through). + Gentle bulk material handling; particles are not changed; formulation is preserved + Easy to clean + No power required for transporting the bulk density + Virtually no maintenance + Mass flow measurement, i.e independent of bulk weight + Integrated Autotare system - Dependent on infeed conditions
 Coriolis flowmeter 	Vertical feeding of the bulk material to a measurement wheel equipped with guide vanes that rotates at constant speed. The bulk material is caught by the vanes, accelerated in the radial direction of the measurement wheel where it is decelerated and leaves the equipment at the outlet. The Coriolis forces occurring at the guide vanes are measured indirectly via the retarding torque acting on the measurement wheel. The driving torque of the measurement wheel (=retarding torque through Coriolis forces) is directly proportional to the mass flow across the measurement wheel.	+ Insensitive to vibrations + Independent of the bulk weight - Calibration to product - High stress on the bulk material (see reverse page) - Elaborate cleaning - Noisy in operation - Material flow stops when measurement wheel stands still (interruption) - Increased dust content in the bulk material - Malfunctions caused by large foreign bodies
 Impact plate 	The bulk material flow to be measured is fed to a slanted impact plate. The resulting impact force is used as a measurement variable for determining the rate of flow. Satisfactory measurement results can only be achieved if the equipment is matched to the bulk material characteristics and infeed conditions. The friction conditions between the bulk material and the impact plate also play a role.	+ Free path + Easy to clean - Each bulk material type must be calibrated - Dependence on bulk material - Dependence on infeed conditions - Dependence on flow rate
 Diverting chute 	The bulk material is fed via a guide chute to a curved measurement chute. The reaction force is measured based on direction change of the material on the measurement chute. The measured reaction force is used to calculate the mass flow. This unit is available with horizontal and vertical force measurement.	+ Relatively gentle material handling + Low dust development + Free path + Easy to clean - Dependent on bulk material - Dependent on infeed conditions - Dependent on flow rate

Coperion K-Tron Product Information Comparison of measurement methods for bulk solids flow				FM
	Smart Flow Meter 	Coriolis flow- meter 	Impact plate 	Diverting chute 
Accuracy	< 1%	< 1%	< 4%	< 2%
Factors influencing the accuracy:				
• Bulk density	no	no	yes	yes
• Positive system pressure	no	no	no	no
• Temperature	no	no	no	no
• Flow rate	yes	yes	yes	yes
• Vibrations	limited	no	limited	limited
• Material build-up	no	yes	no	no
• Friction forces	no	no	yes	yes
• Drop height	no	no	yes	yes
Calibration	no	limited	yes	yes
Suitability for bulk materials with the following characteristics:				
• Free flowing	yes	yes	yes	yes
• Sensitive to degradation	yes	no	no	yes
• Lumpy	yes	no	yes	yes
• Fibrous	yes	no	yes	yes
• Fluidized	yes	yes	yes	yes
• Dusty	yes	yes	yes	yes
Integrated moving parts	none	rot. measure- ment wheel	none	none
Maintenance	none	required	low	low
Cleaning effort	low	significant	low	low
Maximum grain size	< 10 mm	< 5 mm	approx. 10 mm	approx. 10 mm
Bulk material stress	very low	very high	high	low
Noise emission	low	very high	high	low
Wear	very low	significant	low	low
Integrated Autotare system	yes	no	no	no
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