Loss-in-weight scale

Varion P

For continuous
dosing & weighing
of powdery products

Innovations for a **better world.**

BÜHLER

Make a difference in weighing & dosing

Varion P – Loss-in-weight scale for powdery products

Control and define process streams

Weighing and dosing applications are extremely important in all food and feed processing lines. Scales and dosers are technically taking over these functions and are installed during process steps which are critical for process and quality. The Varion P perfectly copes with these requirements and provides operation modes for weighing and dosing.

Dosing – Defines product streams for downstream processes by running them under the most effective conditions as well as blending requirements, thereby achieving the desired product composition.

Weighing – Provides transparency on the most relevant process streams, ensuring maximum yield on raw materials and controlling incoming and outgoing product flows.

Sustainability

Proven energy cost reduction of up to 64% thanks to the designed-for-purpose **DriveX** module with an integrated **power management system.**

Quality

Uniquely high and repeatable accuracy down to ±0.2% thanks to a perfect combination of **process logic**, super-efficient **differential pressure compensation** and high-precision load cells.

Availability

Maximized up-time thanks to the powerful and extremely easy to operate **bUnify control system**, with a modern and intuitive user interface.

Safety and ease of use

Easy and safe to operate and maintain thanks to its uniquely ergonomic, robust and hygienic design.

Digitalization

Unlimited connectivity with Bühler Insights and any plant control system ensures full transparency and utilization of the **Scales Monitoring System.**

Key elements
Designed for purpose

1. Inlet housing with incorporated inlet segment gate, actuated by DriveX module
2. Flexible connection to decouple weighing hopper
3. Weighing hopper
4. High-precision load cells
5. Outlet housing with incorporated inlet segment gate, actuated by DriveX module
6. Discharge screw, driven by servo motor
7. bUnify machine controller with web panel
8. Installation structure

Commodities:

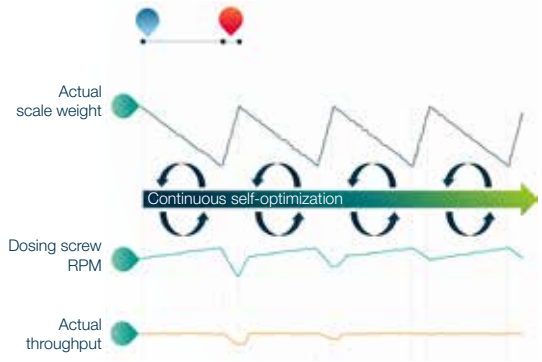
- Wheat flour
- Semolina
- Bran
- Crystal sugar
- Starch
- Salt
- Maize flour
- Milk powder
- Other powdery products

Varion P at a glance

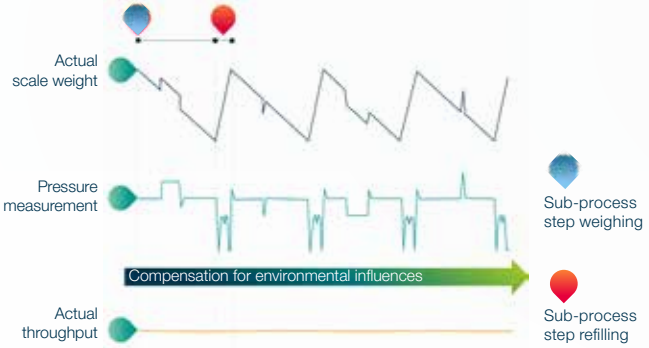
Turning leadership in innovation into benefits for operation and maintenance

Continuous self-optimization

Example: Use case continuous dosing



Compensation for environmental influences



Best accuracy of down to ± 0.2%*

- Self-learning process algorithm continuously optimizes the weighing process
- Smart differential pressure measurement system actively compensates and monitors internal pressure differences
- Separately connected high-precision load cells allow individual analysis of the measuring signals

DriveX saves energy of up to 64%

- Designed-to-purpose servo drive and gearbox ensure not only significantly reduced energy requirements but also increases the life-time of the drive system
- Power management system buffer restores energy and ensures the safety of the machines in case of power cuts

*Mentioned accuracy to be understood as best-case scenario and depending on operation point, product properties, environmental influences, line integration, maintenance quality, etc.

Maximized up-time thanks to bUnify control system

- Intuitive and modern user interface enables fast and high-quality interaction when required
- Full transparency on process and machine parameters thanks to trending charts and event management
- Support-wizards ensure the most effective root cause analysis and user guidance e.g. calibrations
- Highly flexible integration into the processing line thanks to various interface options

Unmatched safety thanks to outstanding design

- Operational – no product build-ups in the process zone thanks to the avoidance of complex and inaccessible areas
- Maintenance – sufficient openings for cleaning and maintenance to comfortably reach all relevant parts and sections
- Equipment – product zone free of screws and bolts protects downstream equipment
- Food – minimal accumulations of product and dust thanks to first-class hygienic design

Scales Monitoring System provides solid ground for various improvements

- Improved performance and process stability thanks to full transparency on critical machine and process parameters
- Long-term monitoring of the incoming product flow leads to maximized and uniform overall processing line efficiency
- Smart Bühler Insights dashboards ensure transparency across all organizational levels

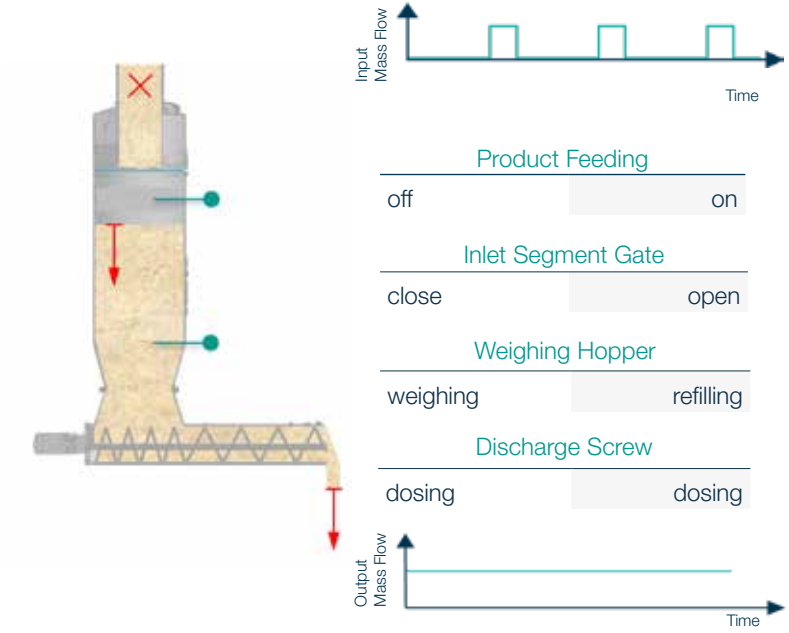
Use case: Continuous dosing
Ensure maximal quality and efficiency

In the operation mode FlowControl, the Varion P continuously doses the product with the desired process flow rate to the down stream process steps. Key performance parameters such as highest dosing accuracy, and possibly even more importantly, precise repeatability are given throughout the operation. The desired throughput can be freely selected, optionally in combination with a total weight of a production lot. As an additional feature, the current total weight of a production lot is provided automatically.

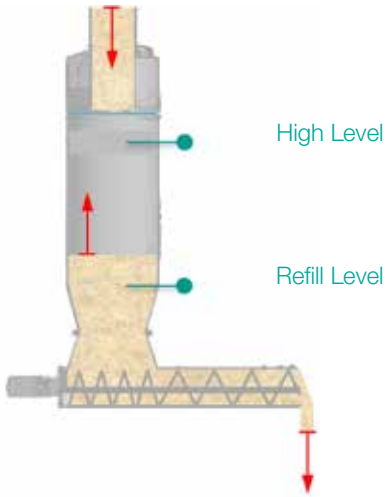
Insights into the Varion P process

The continuous dosing is provided by two sub-process steps: weighing and refilling. The product level in the weighing hopper is always between high and refill level.

Sub-process weighing



Sub-process refilling



Exemplary use cases:

- Dosing product to a continuously operated core machine such as single and double screw extruder, pasta press, etc, ensuring highest performance in the core process
- Dosing product to a continuously operated blending system such as flour blending, etc. ensuring the desired compositions of raw materials

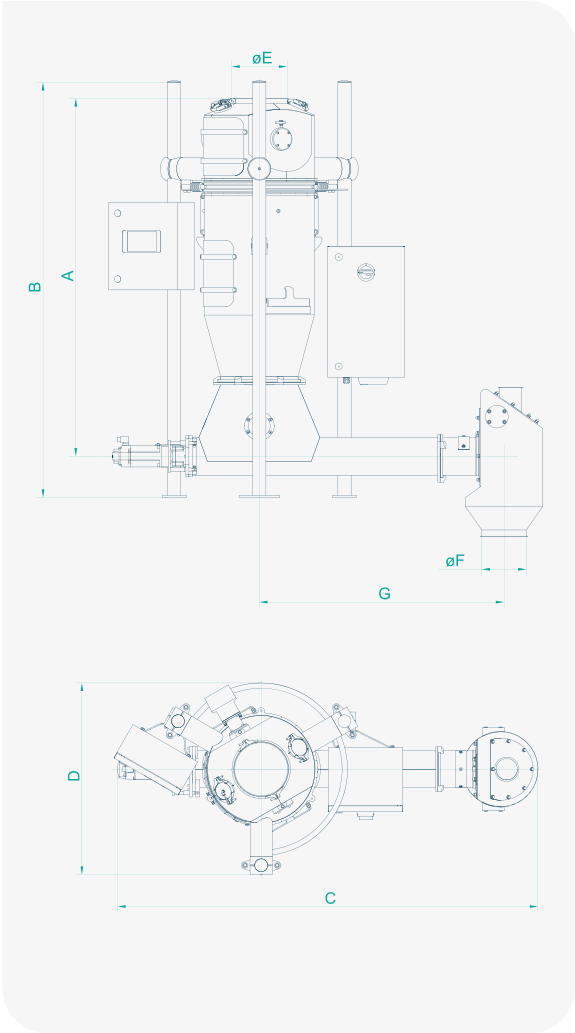
Efficiency
Most accurate and consistent feeding of core processes

Quality
Transparency in the factory and repeatability in the process

Self optimization
Availability of relevant data as basis for smart process interlocks

Technical specifications and capacities

Use case: Continuous dosing



Dimensions

Model	A	B	C	D	E	F	G
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
100/100	1578	1800-2300	2141	897	ø250	ø200	1120
100/125	1529	1800-2300	2048	897	ø250	ø200	1120
140/160	1638	1900-2300	1969	897	ø250	ø200	1120
280/200	2076	2400	2296	998	ø300	ø300	1306
350/250	2230	2500	2223	998	ø300	ø300	1306

Dimension may vary for different machine configurations

Volume flow & capacities

Model	Volume flow	Flour	Semolina	Bran
		0.5 t/m³	0.2 t/m³	0.2 t/m³
	[m³/h]	[t/h]	[t/h]	[t/h]
100/100	up to 6	up to 3	up to 3.6	—
100/125	up to 9	up to 4.5	up to 5.4	—
140/160	up to 30	up to 15	up to 18	up to 6.6
280/200	up to 60	up to 30	up to 36	up to 13.2
350/250	up to 90	up to 45	up to 54	up to 19.8

Alternatives to dose powdery products:

Batch scale
Akrivis

Loss-in-weight for additives
Varion A

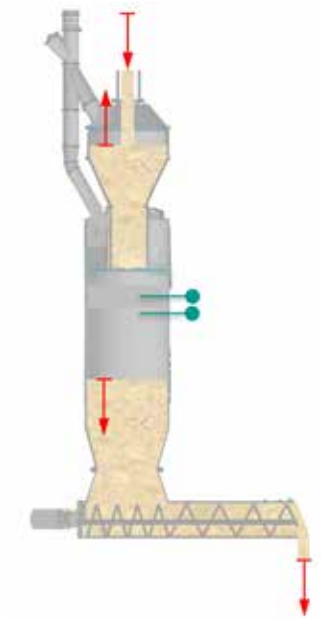
Use case: Continuous weighing
Ensure maximal quality and efficiency

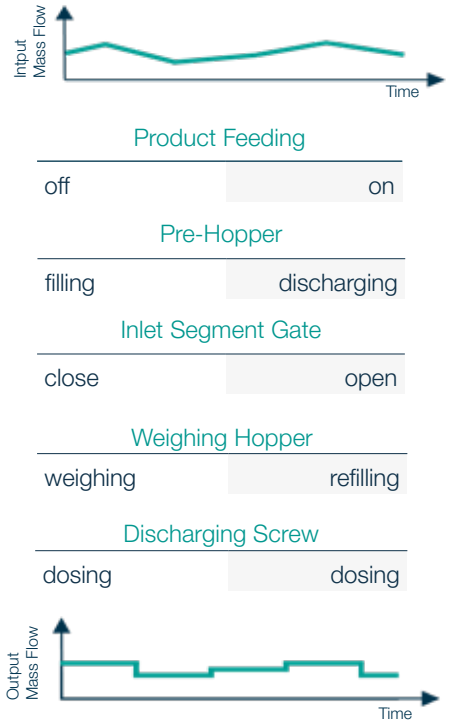
In the operation mode FlowMeter, the Varion P is providing the mass flow of a process stream with a given throughput. Key performance parameters such as high weight accuracy with maximal consistencies in the weight measurement process are given throughout the operation. The actual mass flow rate is calculated and provided at any time.

Insights into the Varion P process

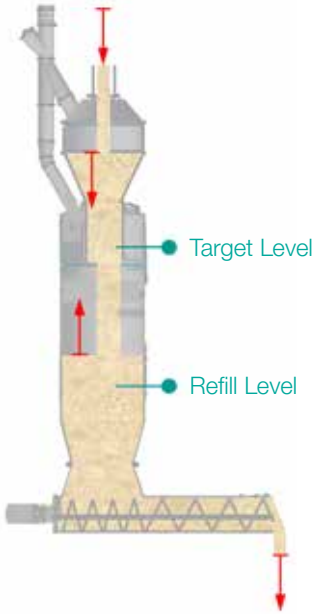
The continuous weighing is provided by two sub-process steps: weighing and refilling. During refilling the weighing hopper is filled until the target level. The weighing is done based on time.

Sub-process weighing





Sub-process refilling



Exemplary use case:

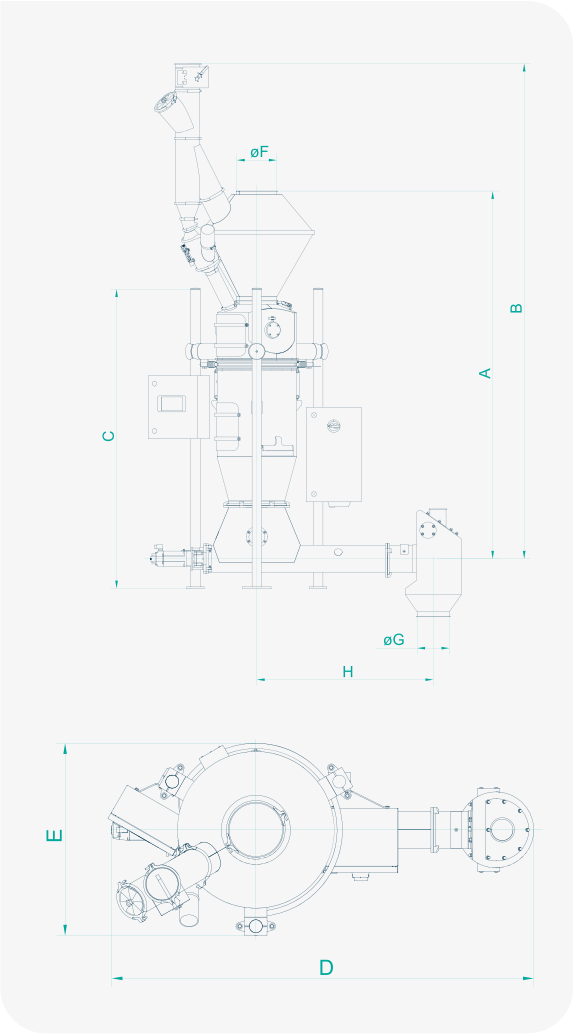
– Measuring a product flow at various positions throughout the processing line providing transparency and process control

Transparency
Transparent measurements of the mass flows on all relevant positions in the

Yield management
Accurate measurements of the incoming and outgoing product streams

Technical specifications and capacities

Use case: Continuous weighing



Dimensions

Model	A	B	C	D	E	F	G	H
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
100/100	2274	3090	1800-2300	2141	897	ø250	ø200	1120
100/125	2225	3041	1800-2300	2048	897	ø250	ø200	1120
140/160	2334	3150	1900-2300	1969	897	ø250	ø200	1120
280/200	2915	3731	2400	2296	998	ø250	ø300	1306
350/250	3569	4385	2500	2223	998	ø250	ø300	1306

Dimension may vary for different machine configurations

Volume flow & capacities

Model	Volume flow	Flour	Semolina	Bran
	[m^3/h]	0.5 t/m^3 [t/h]	0.2 t/m^3 [t/h]	0.2 t/m^3 [t/h]
100/100	up to 4.4	up to 2.2	up to 2.7	—
100/125	up to 6.6	up to 3.3	up to 4	—
140/160	up to 22	up to 11	up to 13.2	up to 4.8
280/200	up to 60	up to 30	up to 36	up to 13.2
350/250	up to 90	up to 45	up to 54	up to 19.8

Alternatives to weigh powdery products:

Batch scale
Akrivis

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