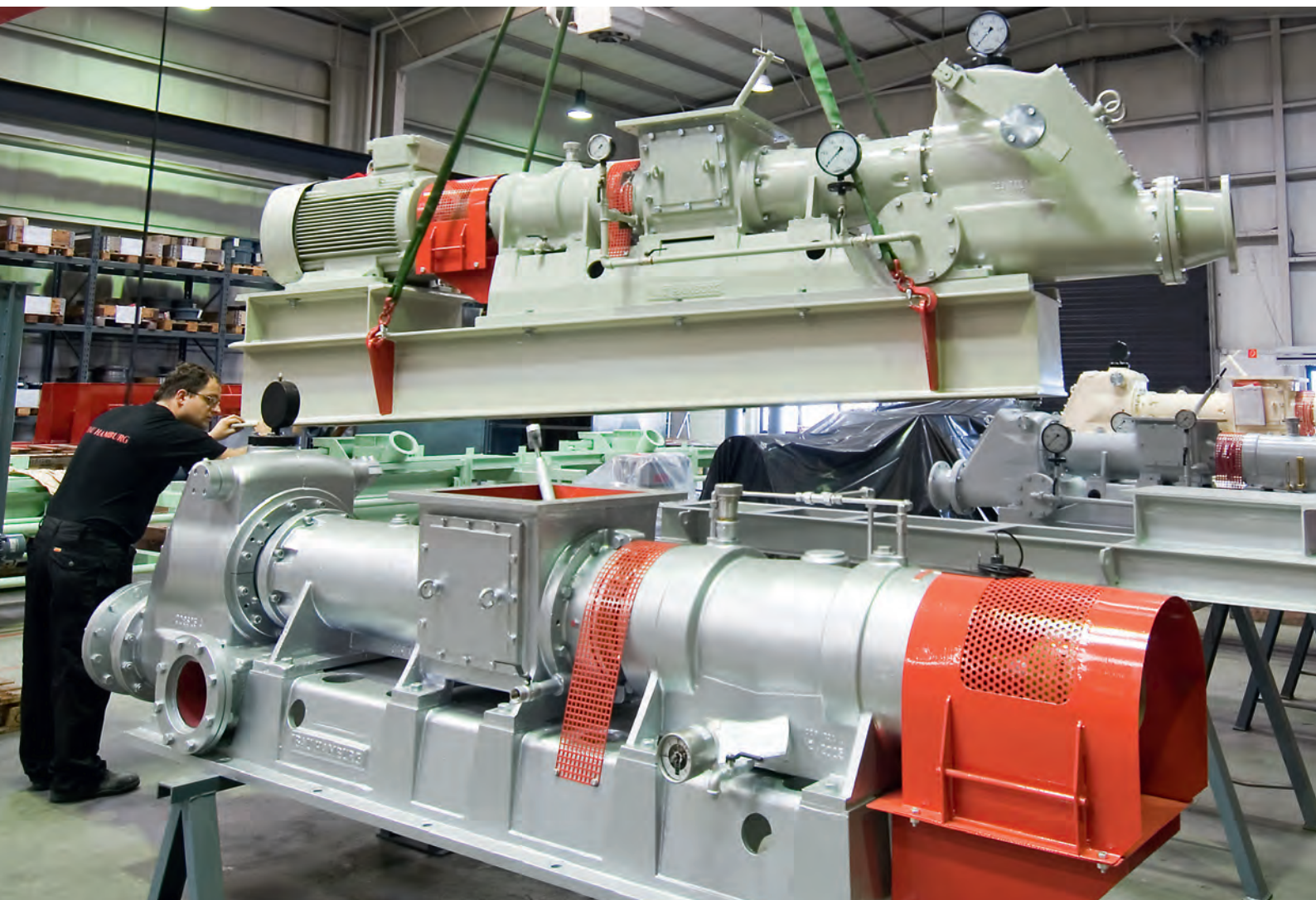




IBAU
HAMBURG

ORIGINAL COMPONENTS



Original Components

IBAU HAMBURG.

The giant store in Allermöhe near Hamburg –
a Warehouse and assembly shop on more
than 5.000 sqm pre-assembled components
for fast delivery:

THE REAL JUST-IN-TIME SOLUTION



CONTENT

IBAU 6
Screw pump



IBAU 8
Flow-through mixers



IBAU 10
Flow-control gate



IBAU 12
Loader



IBAU 14
Loading chutes



IBAU 16
Lump crusher



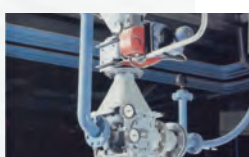
IBAU 18
Two-way valve



IBAU 20
Roller-type discharger



IBAU 22
Jet conveyor



Competence and Innovation

This brochure shows a selection of IBAU key components.

A trouble-free operation of silo plants and of either mechanical or pneumatic transport systems depends significantly on the reliability of its single components. Components engineered by IBAU HAMBURG in connection with the IBAU plant engineering are the key for a well functioning plant.

Our scope of supply includes the planning of complex plants up to the development and construction of single components such as the IBAU Screw pump, IBAU Flow-control gate, IBAU Loading devices and IBAU Roller-type dischargers.

References make differences

IBAU HAMBURG has more than 40 years of experience in storage and transport of bulk material and is one of the world's leading companies.

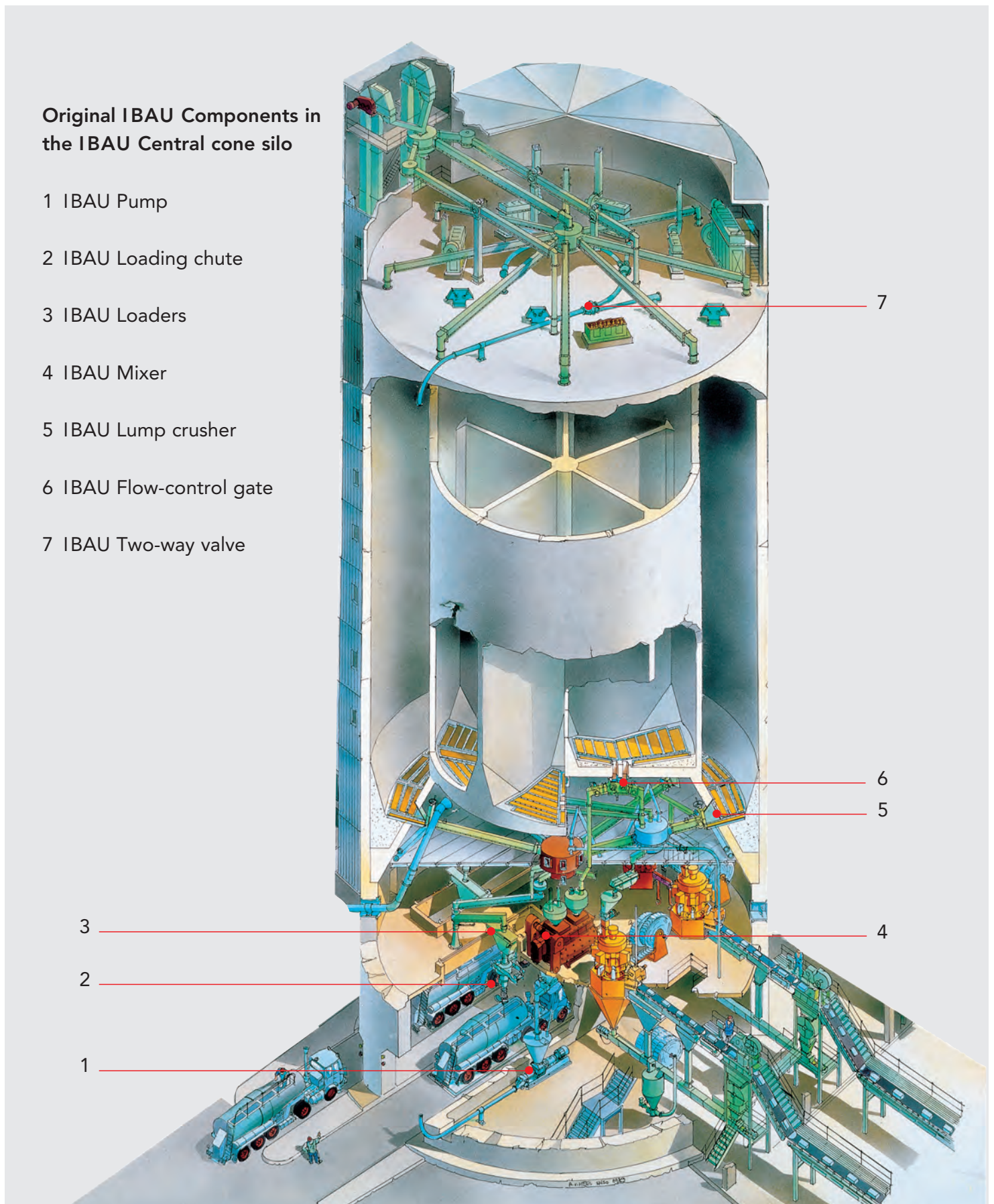
These years of experience help us to support our customers in implementing their projects by developing and applying customized systems and concepts of the highest quality.

As an innovative company, IBAU HAMBURG continually develops its products and components and undergoes continuous quality improvements.



**Original IBAU Components in
the IBAU Central cone silo**

- 1 IBAU Pump
- 2 IBAU Loading chute
- 3 IBAU Loaders
- 4 IBAU Mixer
- 5 IBAU Lump crusher
- 6 IBAU Flow-control gate
- 7 IBAU Two-way valve





The IBAU Screw pump

The following design features distinguish the IBAU Pump in practical use.

Operation

The standard compression screw seals the non-pressurized material feeding area against the conveying line back pressure under all operating conditions.

For particularly fine materials such as filter dust, the standard sealing can be improved by an additional plug.

At conveyed goods temperatures exceeding 130 °C the oil-lubricated bearings of the pump are protected against overheating by the additional attachment of an air or water-cooled oil cooler.

Design

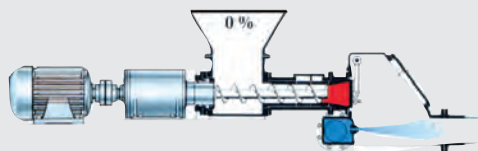
The screw is balanced in our factory so that it runs without vibration and without contact even when not conveying material.

A second bearing of the screw in the area of the pressurized pump discharge box, with all its disadvantages, is thus technically unnecessary. The bearing unit contains the stable shaft bushing with the movable and fixed bearing. The conical seat of the shaft bushing serves the secure and backlash-free mounting of the screw. It is thus possible to exchange the screw without disassembling the bearings.

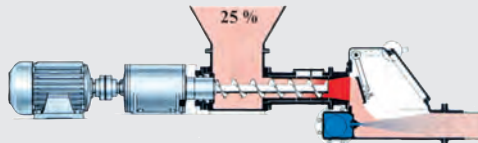
The front part of the screw, the so-called endflight, is a separate part and can be removed without the disassembly of the complete screw if it is worn.

The IBAU Pump has a thick-walled screw pipe with an exchangeable wear bushing in the front area.

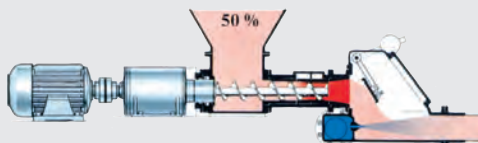
In case of wear this enables the fast and cost-effective replacement of the wear bushing.



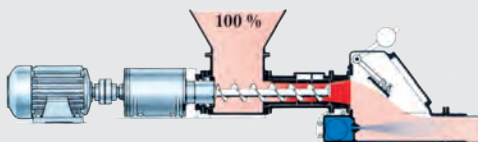
Pump feeding is stopped. The material plug remains unchanged while the screw is rotating.



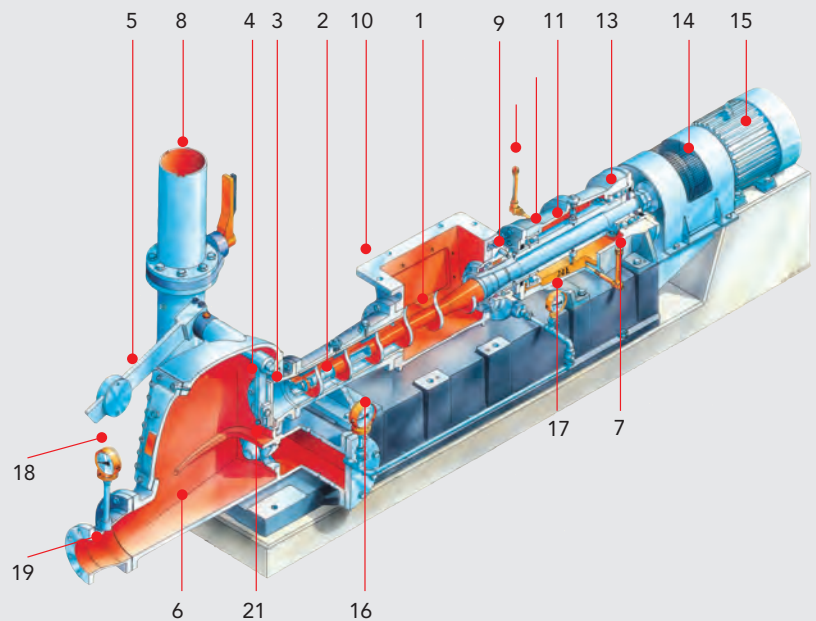
Pump feeding is 25% of the pump capacity. The material plug still remains unchanged.



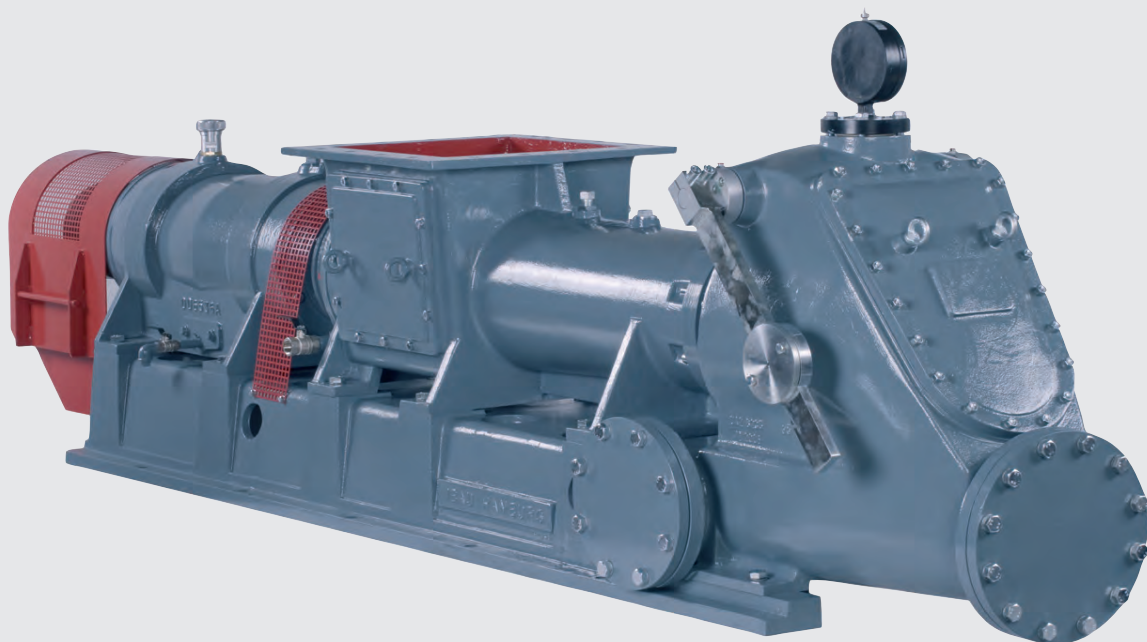
Pump feeding is 50% of the pump capacity. The material plug remains unchanged.



Pump feeding is 100% of the pump capacity. The material plug remains unchanged and the screw does not rotate in the heavily compressed material.



- | | |
|---|----------------------------------|
| 1 Pump screw | 10 Pump feeding box |
| 2 Exchangeable wear bushes | 11 Heavy shaft barrel |
| 3 Flare-shaped chamber for plug formation | 12 Cylindrical roller bearing |
| 4 Non-return valve | 13 Roller bearing |
| 5 Lever with adjustable counter weight for non-return valve | 14 Coupling |
| 6 Pump discharge box | 15 Electric motor |
| 7 Oil-level gauge | 16 Gauge for compressed air |
| 8 Air supply connection | 17 Gauge with cock for purge air |
| 9 Stuffing box with purge air | 18 Gauge for conveying line |
| | 19 Conveying line |
| | 20 Thermometer |
| | 21 Compressed air nozzles |



The IBAU Mixer

Continuous mixing system with IBAU Flow-through mixers

For cement production with a maximum of 2 to 3 main components, where the mixture is not changed over a lengthy production period, the use of a flow-through mixer is recommended for the following reasons:

- The main components can be separately ground with optimum use of energy
- Individual adaptation of the grain sizes of individual main components is possible at any time
- More flexible adaptation of the mixture to market requirements

This way raw materials requiring no further grinding, such as fly ash, can be processed together with the other components into a mixture in the flow-through mixer.

Discontinuous mixing system with IBAU Batch-type mixers

Discontinuous mixing systems are used for the production of blended cements and special binding agents containing a high percentage by mass of basic components such as cement,

limestone powder, ground granulated blast furnace slag, fly ash, etc., which are then mixed with a low quantity of auxiliary components such as anhydrite, hydrated lime, microsilica, pigments, etc. to form a mixture.

Discontinuous mixing systems are suitable for the just-in-time production of special or frequently changing recipes and small sales quantities of a certain mixture.

Distinction is made between two types of mixer:

- The batch-type mixer with a hydraulically actuated bottom flap extending over the full length of the mixer housing.
- The batch-type mixer with discharge connectors. The discharge connectors are closed off by pneumatically actuated vertical IBAU Flow-control.

Use of optional agitators in mixers

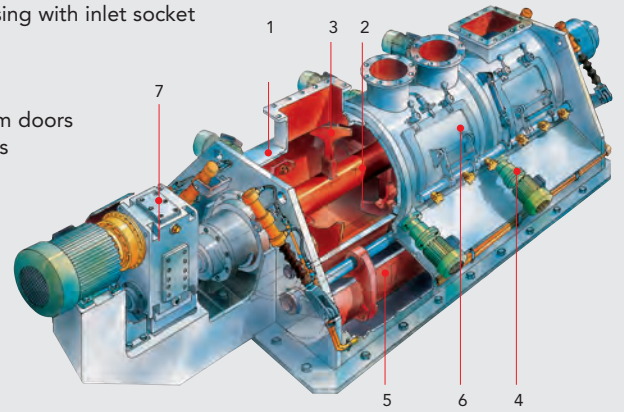
The use of separately driven, high-speed rotary agitators increases the mixing effect, since agglomerates in the mixture are broken up.

The use of agitators is indispensable if there are large differences in the densities of the components.



The IBAU Single-shaft batch-type mixer type IB-M

- 1 Mixing housing with inlet socket
- 2 Mixer shaft
- 3 Agitator
- 4 Rotors
- 5 Drop bottom doors
- 6 Control flaps
- 7 Drive unit



The IBAU Flow-control gate

The IBAU Flow-control gates unite the design advantages required for robust, trouble-free and almost completely maintenance-free operation in bulk material plants.

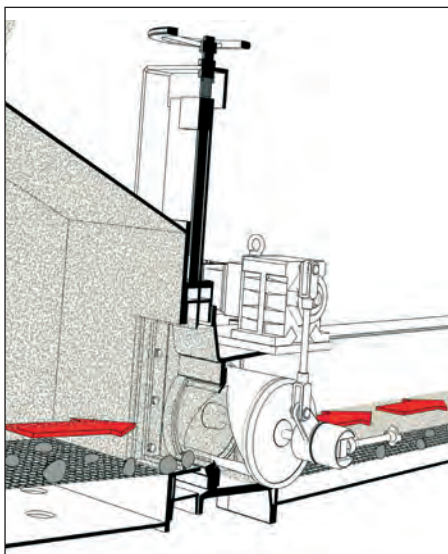
The flow of materials out of silos and bulk material containers can be reproducibly controlled using flow-control gates.

Different roller cut-outs and types of drive such as gear motors, pneumatic actuators and variable speed drives are available for different applications.

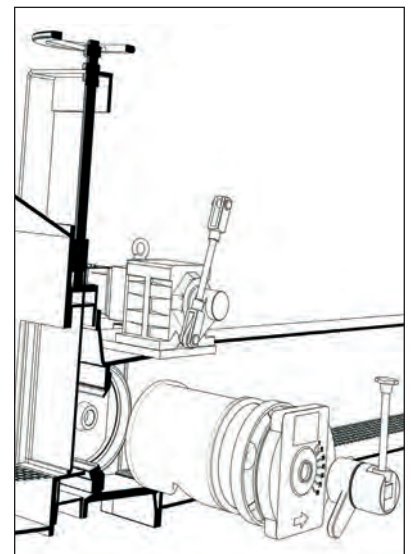
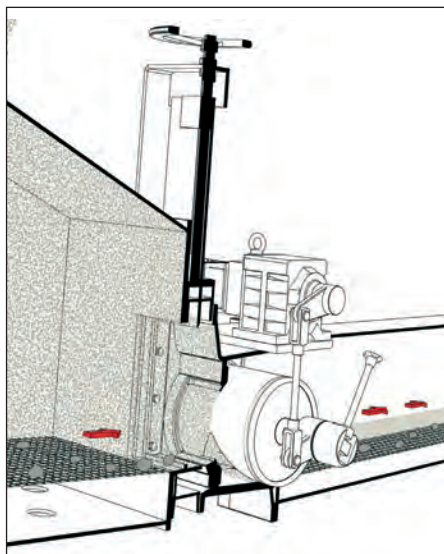
The advantage of the IBAU Flow-control gate becomes apparent when replacing the roller gaskets.

The dismantling of the lateral plates allows the roller to be removed without having to remove the housing of the flow-control gate from the conveying line.

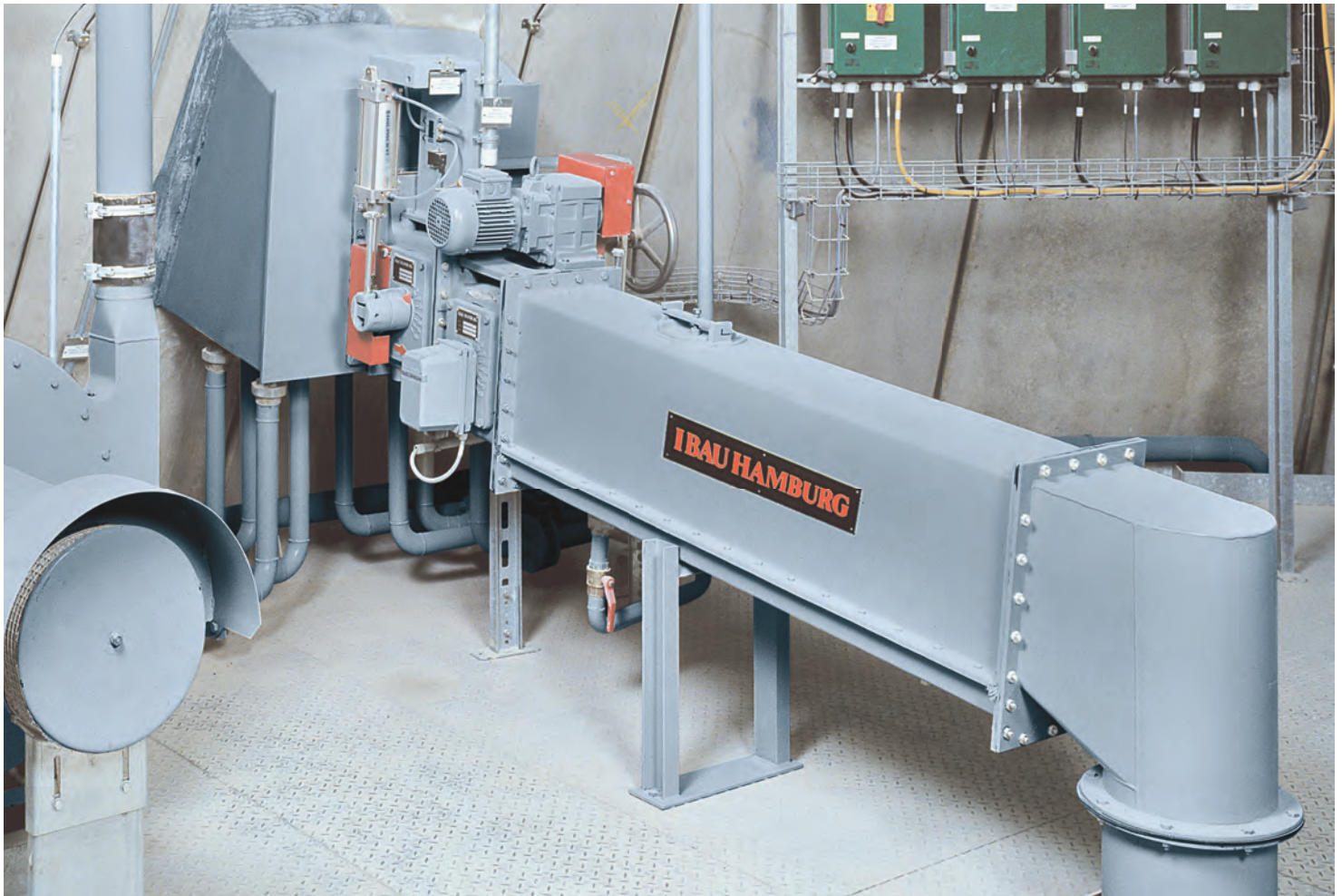
The roller gaskets are thus easily accessible and can be replaced if necessary.



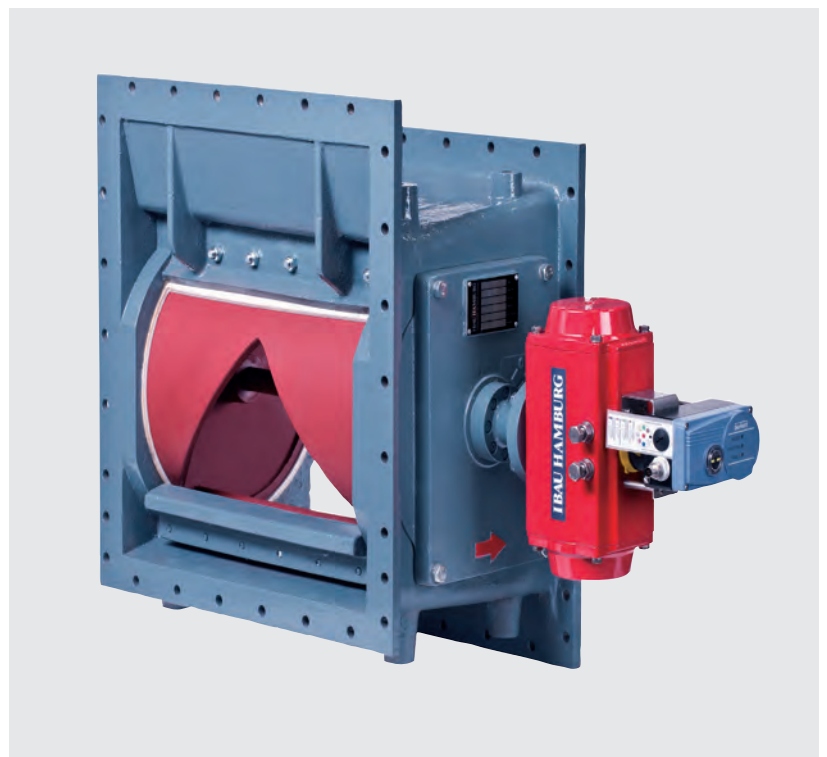
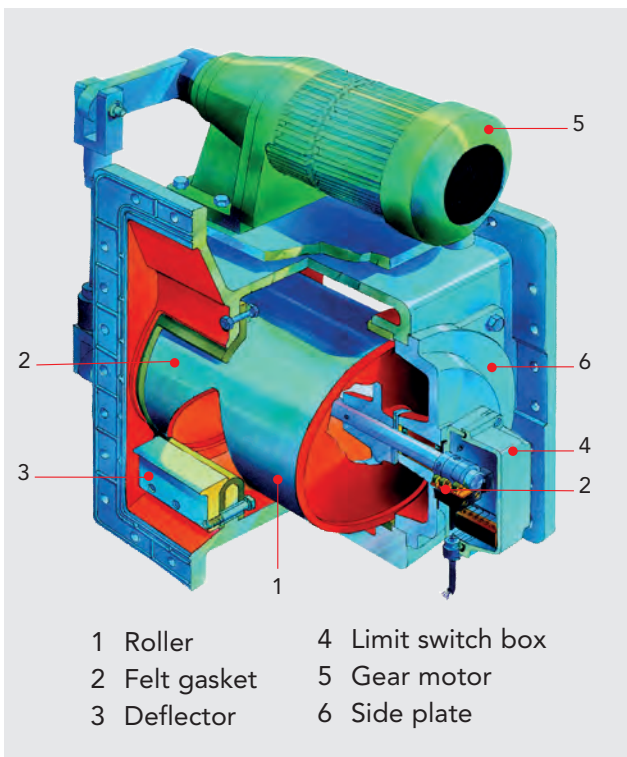
Silo discharge with the IBAU Flow-control gate



Gasket exchange



Silo discharge with motor-actuated IBAU Flow-control gate



The IBAU Flow-control gate in open position

The IBAU Loader

In conjunction with the IBAU Loading chute, the various types of IBAU Loader are used for the dust-free loading of fine bulk materials such as cement, lime, fly ash, limestone powder and alumina onto road and rail silo vehicles.

Using the IBAU Loader the IBAU Loading chute positioned below it can be moved in the longitudinal direction over the silo truck in order to feed all filling connections with material without having to move the vehicle.

The necessary travel and the installation conditions in the plant determine the respective version of the loader:

- IBAU Chute loader with small movement range
- IBAU Simplex loader with medium to large movement range
- IBAU Mobile loader with large movement range

In conjunction with crosswise travel capability, the flexibility of the loaders listed above is increased with regard to precise positioning of the IBAU Loading chute, even with a lateral offset of the filling connections.

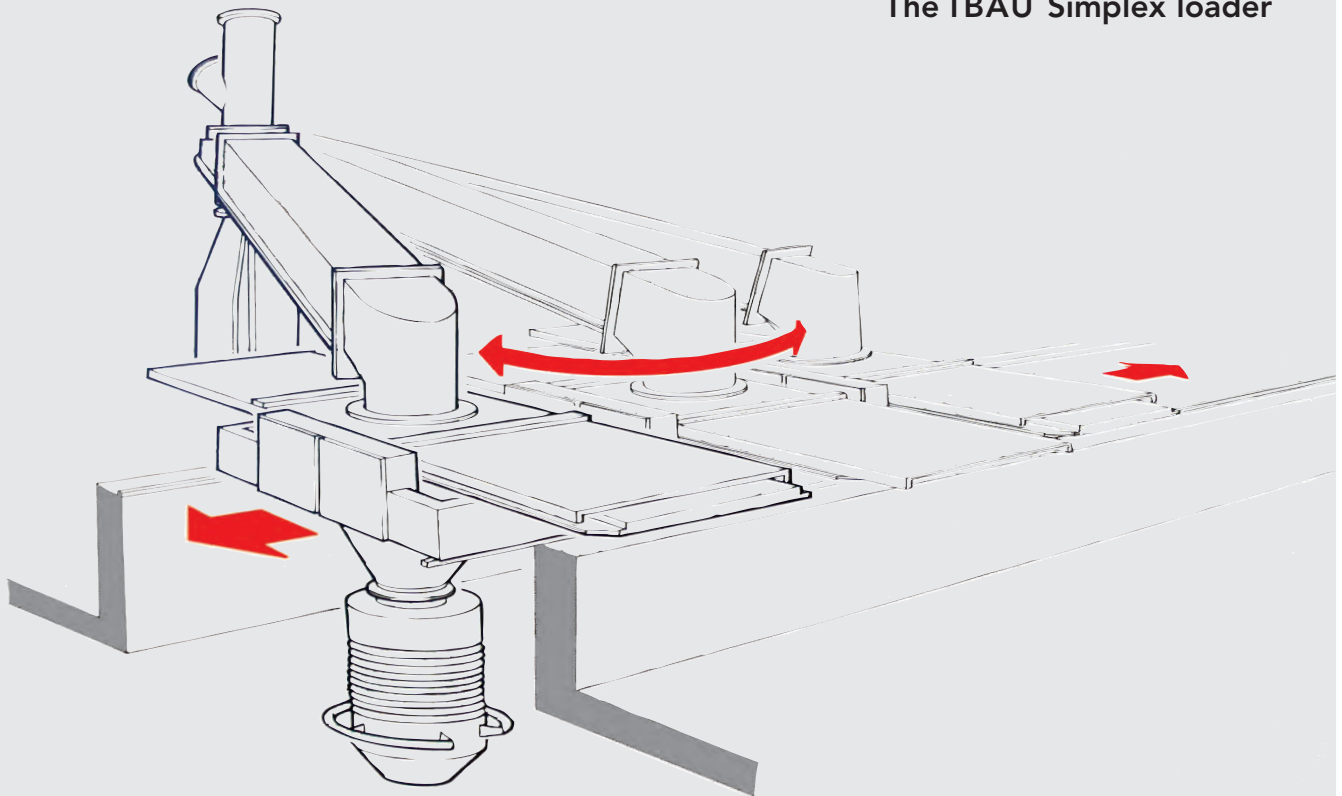


Bulk loading with IBAU Simplex loader



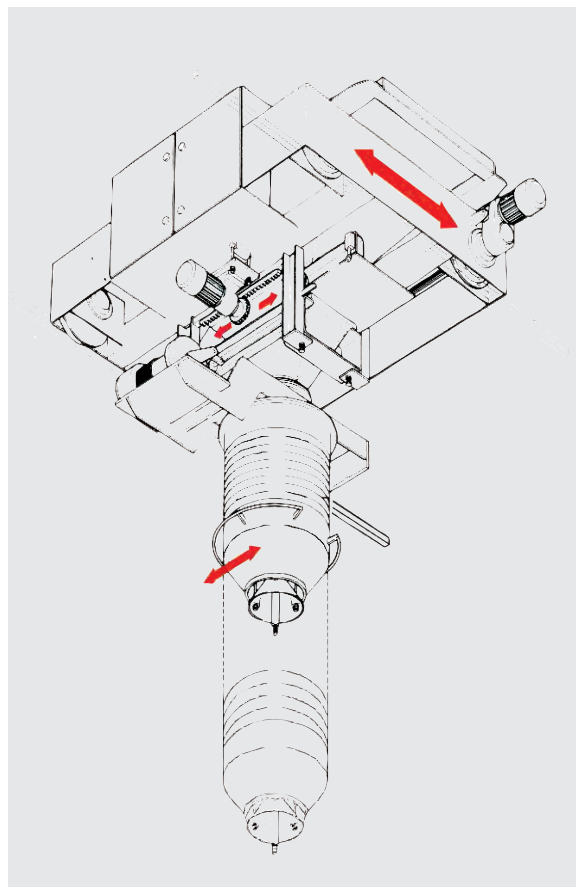
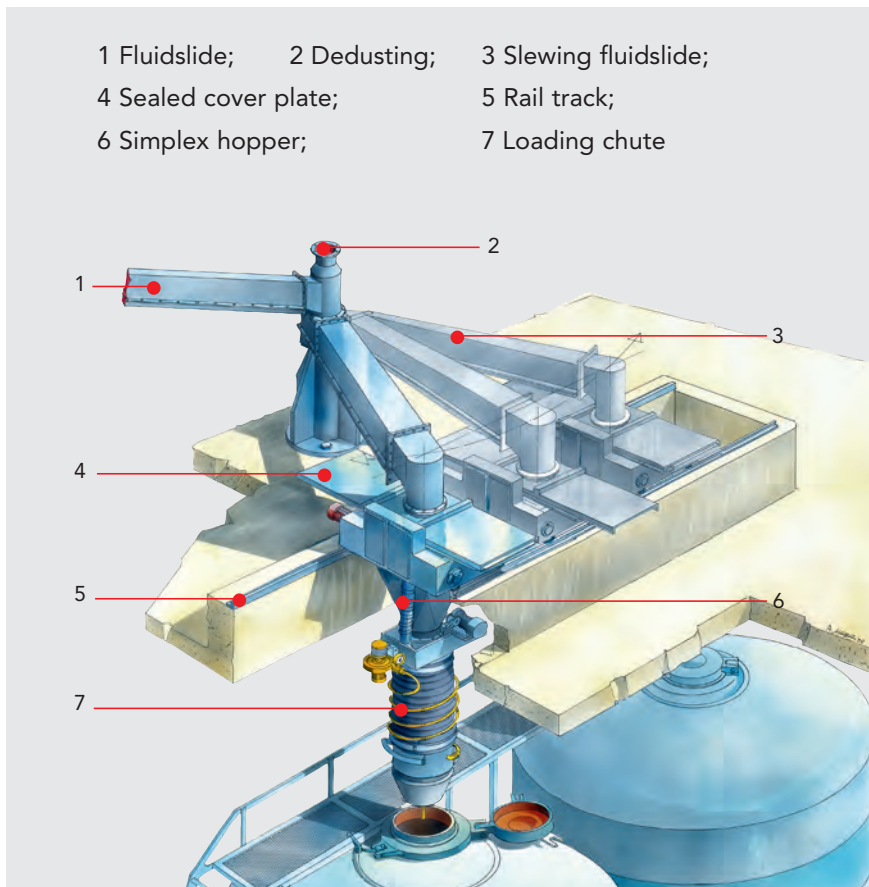
IBA Mobile loader

The IBAU Simplex loader



This picture demonstrates the principle of the IBAU Simplex loader

- | | | |
|-----------------------|-----------------|-----------------------|
| 1 Fluidslide; | 2 Dedusting; | 3 Slewing fluidslide; |
| 4 Sealed cover plate; | 5 Rail track; | |
| 6 Simplex hopper; | 7 Loading chute | |



Loader with cross travel device

The IBAU Loading chutes

A height-adjustable loading device – the IBAU Loading chute – is required in order to load dusty, fine-grained bulk materials such as cement, lime, fly ash, limestone powder and alumina into road and rail silo vehicles with different heights of filling connection.

As a stationary IBAU Loading chute, or in conjunction with an IBAU Loader, it establishes the connection between the material feeding device and the filling connection of the silo truck.

The design of the IBAU Loading chute depends on the maximum loading performance and the necessary extension length. The following loading performances can be achieved:

- max. 300 m³/h
- max. 420 m³/h

The loading chute is lowered and raised by the lifting winch with 3-rope guidance developed by IBAU.

To load the silo truck the rubber coated outer cone of the loading chute is set down on the filling connection, while the sealing cone is lowered further to its stop and opens the filling pipe.

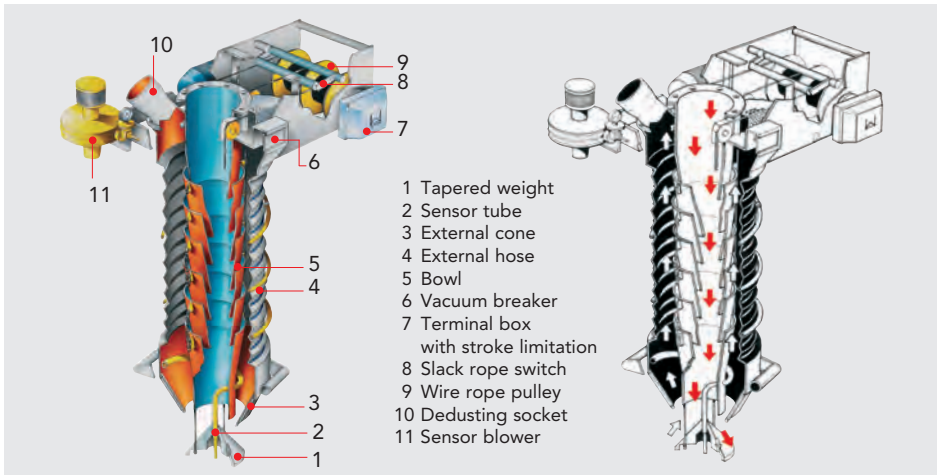
In connection with the plant controller, the slack rope switch activated by setting the loading chute down provides for automatic lowering during loading. The dust-free connection is thus ensured continuously.

The material flows through the conical bowls, which are flexibly connected to one another with round-steel chains, while the air displaced from the silo truck flows between the outer hose and the bowls to the loading chute's dedusting socket.

After completion of filling, the loading chute is raised. In doing so the sealing cone first seals the filling pipe and then the dedusting cross-section between the filling pipe and the outer cone. This prevents caked-on material from escaping during lifting.

The following sensors can be selected for monitoring the level in the loading chute:

- Pneumatic level monitoring by means of pressure sensor
- Capacitive level monitoring
- Vibration limit switch
- Rotating paddle switch



Truck loading with IBAU Loading chute

The IBAU Lump crusher

The material stored in silos may tend to form lumps under the following circumstances:

- Chemical relationships
- Climatic zone with high air humidity
- Penetration of moisture into the silo
- Material encrustation due to obsolete silo fluidization equipment

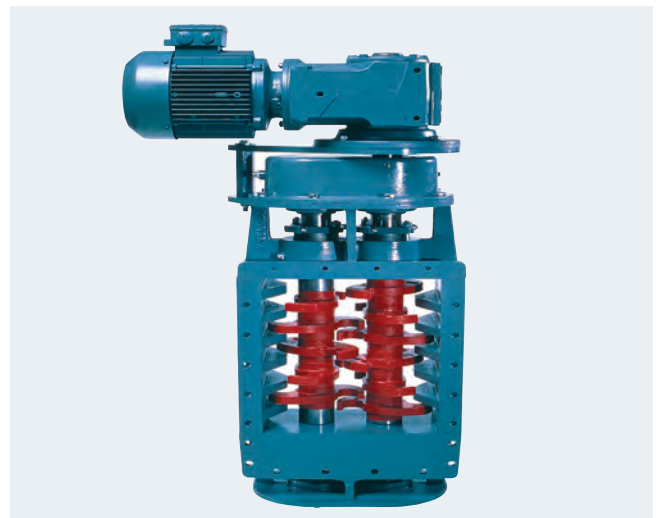
Lumps lead to discharge problems at the silo discharge, since an accumulation of lumps in front of the flow-control gate will restrict its throughput.

Accumulations of lumps can also lead to disruptions in the downstream transport fluidslides, surge tanks and loading chutes, or in pneumatic transport systems.

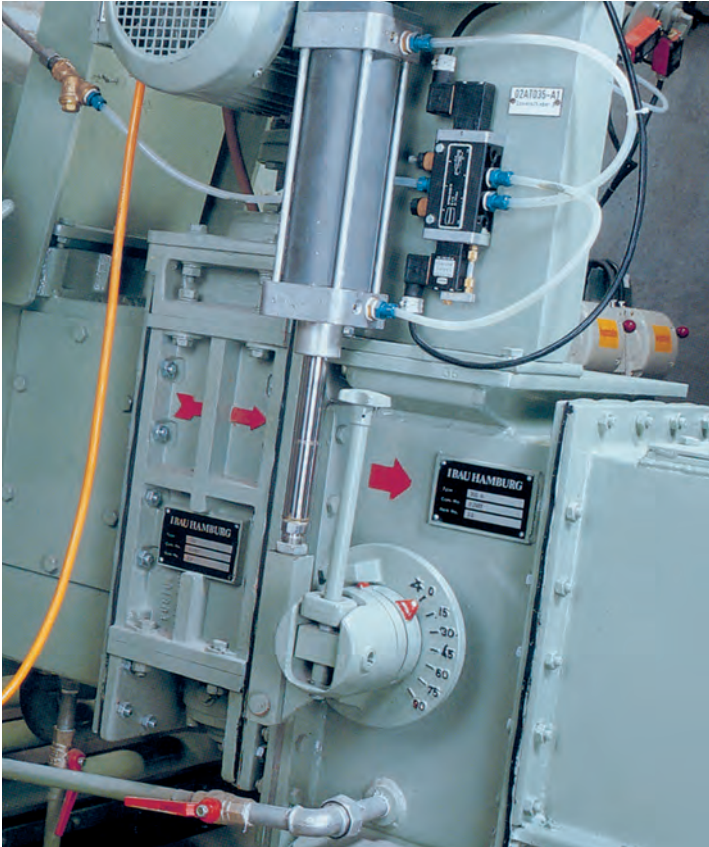
By means of the robust IBAU Lump crusher these lumps are crushed to a size where they can easily be transported onwards in the downstream systems with the help of the predominantly fine-grained material.



View from inside the silo to the lump crusher



Lump crusher type H for horizontal flow-through



The installation of lump crushers ensures a trouble-free discharge



The lumps shown on the silo wall can cause problems at the silo discharge

The IBAU Two-way valve

The IBAU Two-way valve is an essential component for switching pneumatic conveying pipes for powdery bulk materials, such as cement, raw meal, limestone powder, lime, fly ash, etc., to different plants sections or receiving silos.

The two-way valve consists of a cast housing with an inlet flange and the distributor head with two outlet connectors, where one of the outlets is arranged at an angle of 30°.

The two-way valve is switched over by actuating the drive shaft, which is connected to the valve plate via a lever. The valve plate seals the unselected outlet by spring pressure and thus enables the switching of the conveying direction.

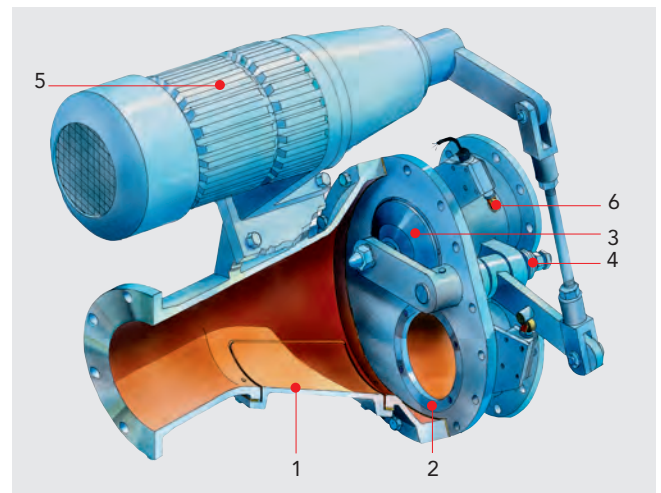
The two-way valve can be driven by a gear motor with brake, or by a pneumatic cylinder with a bistable pilot valve.

The two-way valve can optionally be equipped with mechanical or inductive limit switches for monitoring the end positions.

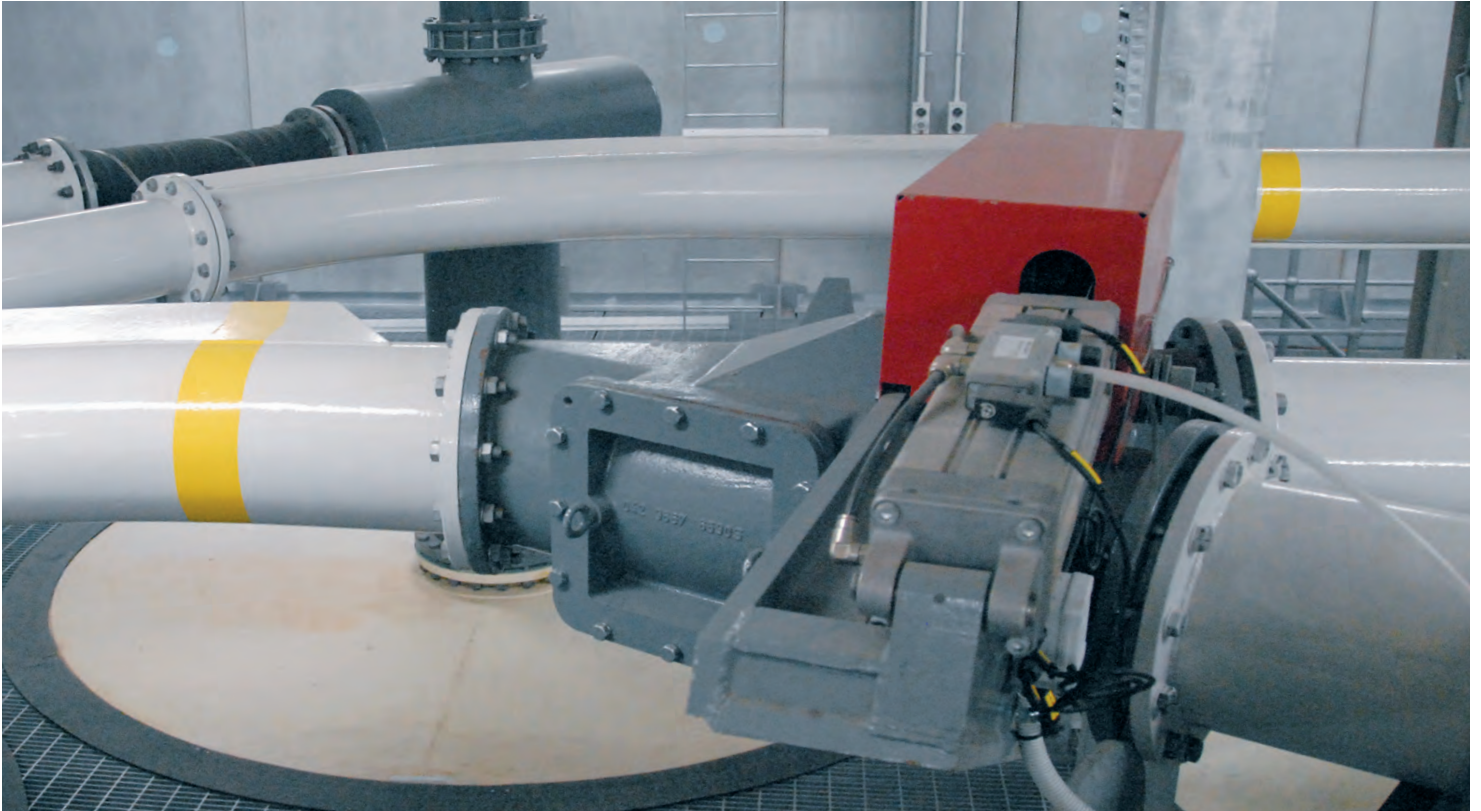
There is an inspection cover on the housing of the two-way valve for checking the valve plate and the exchangeable wear ring.



The IBAU Two-way valve



1 Inspection cover; 2 Wear ring; 3 Movable disc; 4 Plate spring; 5 Gear motor; 6 Limit switch



Two-way valve in a pneumatic conveying line for cement



Material distribution via two-way valves into different silos

The IBAU Roller-type discharger

The IBAU Roller-type dischargers are essential components when the material is to be distributed to individual silos or compartments when feeding several silos or multicompartiment silos by means of a fluidslide.

Through a 90° rotation of the roller, the material is discharged via the roller-type bottom discharger in a downward direction or via the roller-type side discharger in a sideways direction. Both of these components can be switched over during the conveying of material.

The roller-type discharger can be driven by a gear motor with brake, or by a pneumatic rotary actuator with a bistable pilot valve.

Dust-tight sealing is achieved through the chosen sealing concept, which is similar to that of the IBAU Flow-control gate, and therefore the mixing of sorts due to leaks is prevented.

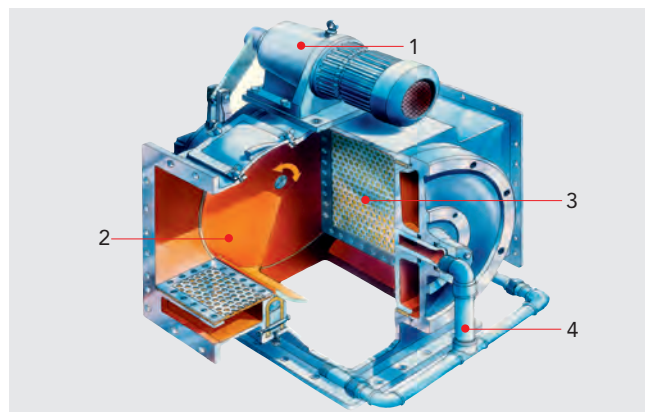
The advantage of this concept becomes apparent when replacing the roller gaskets.

The dismantling of the lateral plates allows the roller to be removed without having to remove the housing of the roller-type discharger from the conveying line.

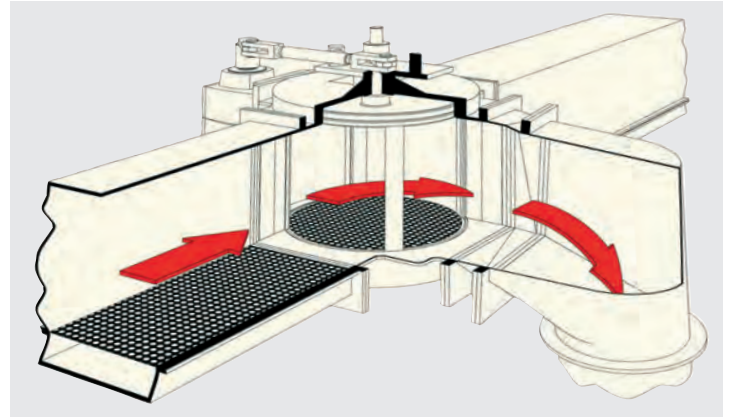
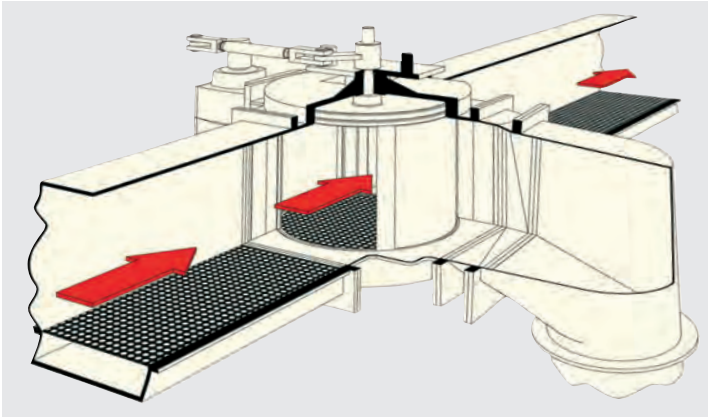
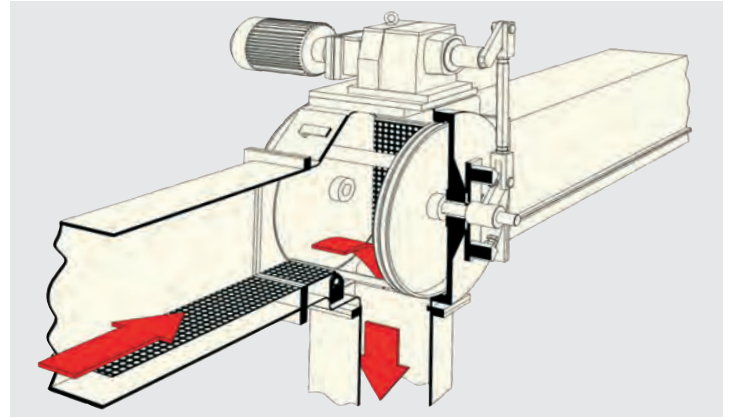
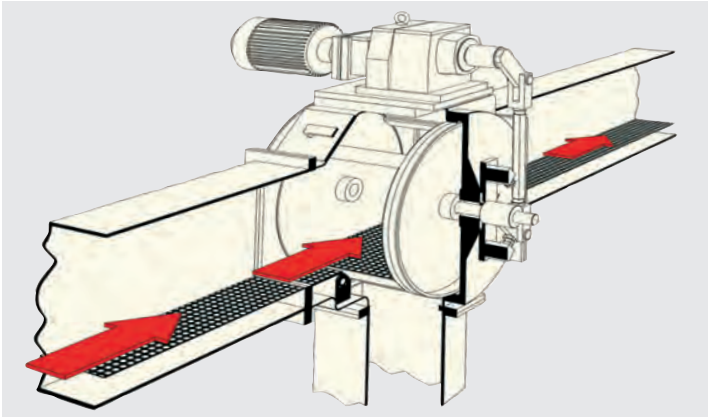
The roller gaskets are thus easily accessible and can be replaced if necessary.



The IBAU Bottom discharger



1 Gear motor; 2 Roller; 3 Aeration pad; 4 Aeration air



Roller-type discharger in „straight“...

... and „discharge“ position



Bottom discharger for feeding different silos in a cement terminal



The IBAU Jet conveyor

The IBAU Jet conveyor is used for the pneumatic conveying of small quantities of fine-grained bulk materials such as cement, lime, fly ash, limestone powder and alumina over short distances up to 100 m equivalent.

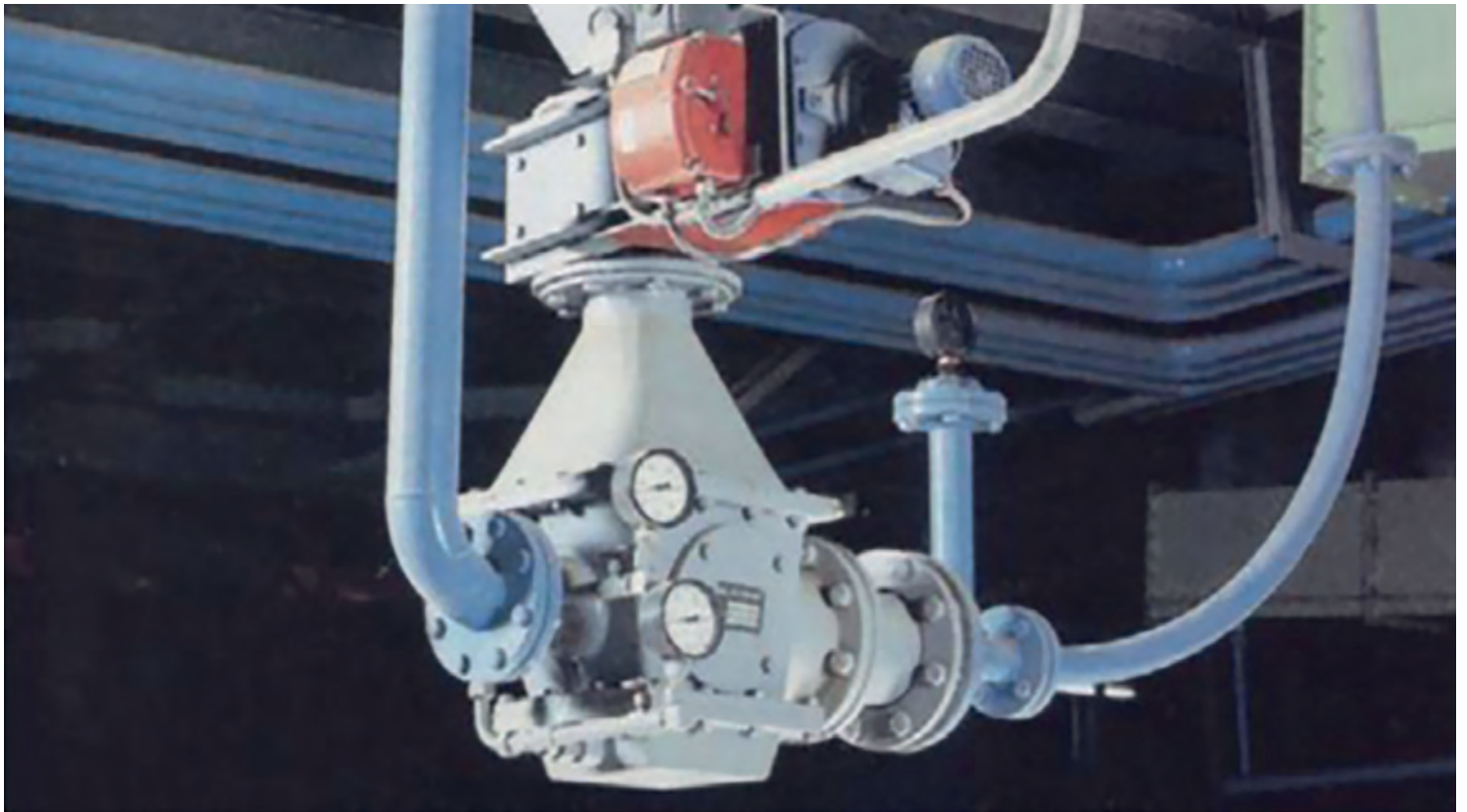
The Jet conveyor contains no moving parts and is thus maintenance-free and very well suited in particular for the conveying of abrasive bulk materials.

The diffuser, which is subject to high wear, is manufactured for this reason from cast basalt or alternative wear-resistant materials.

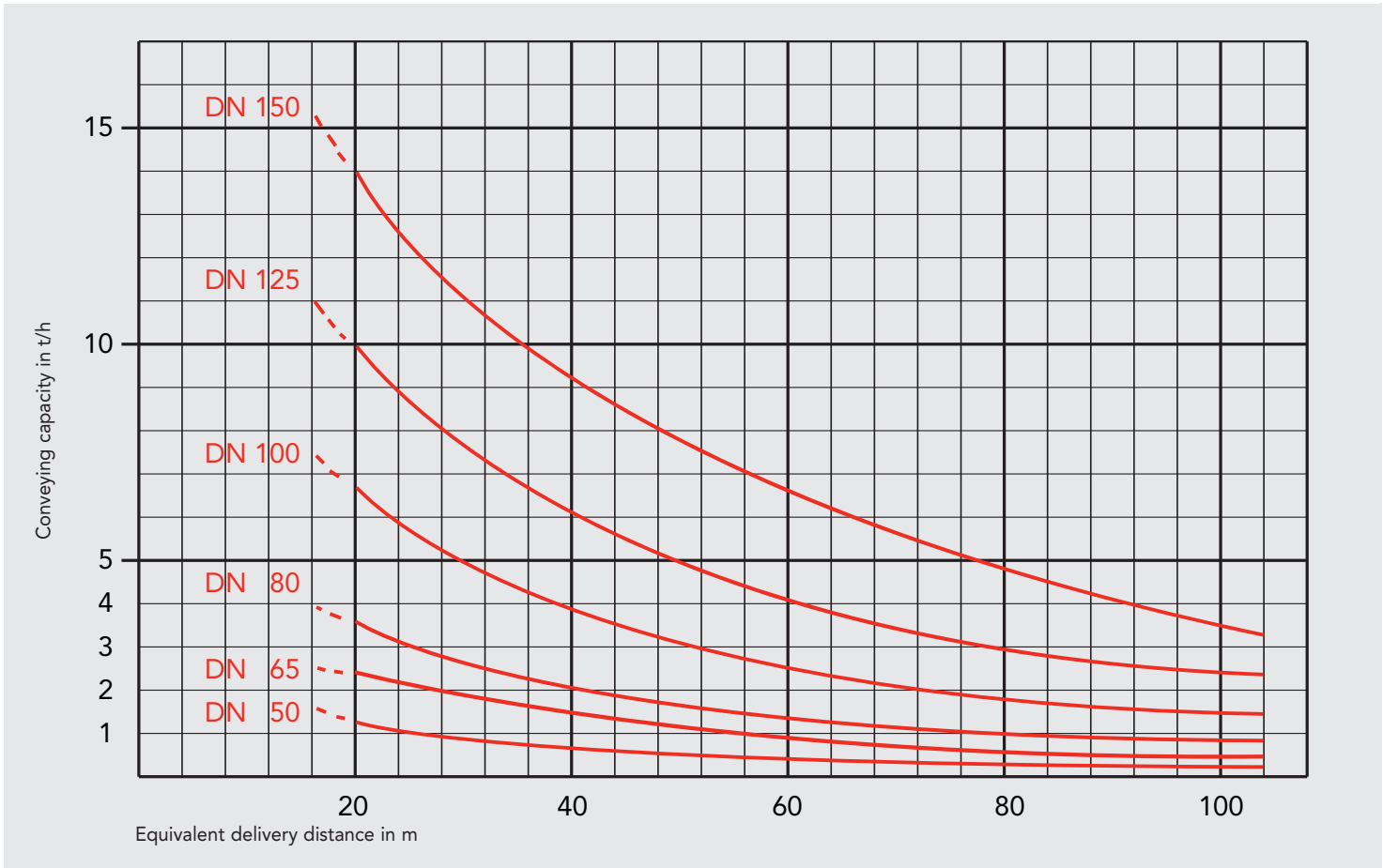
The jet conveyor requires no dosed material feed, since it draws into the jet stream only as much material as the pneumatic conveying is designed for.

The maximum conveying capacity of the jet conveyor depends on the equivalent conveying distance and can be taken from the adjacent diagram.

A rotary piston blower is used to generate the required conveying air quantity for pneumatic transport with the jet conveyor.



The IBAU Jet conveyor for spillage return



Performance diagram for the IBAU jet conveyor

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