

Coriolis Coal Dust Feeding System

- Pulsation-free, gravimetric feeding
- High short-time feeding accuracy
- Insensitivity to external influences, highly accurate principle of measuring
- High tool life through high quality materials of the product contact parts
- Explosion shock-pressure resistant construction
- Direct feed into the pneumatic conveying



Application

The pulverized coal feed system comprises the horizontal AF Blow-Through Rotary Valve feeder as a silo dispensing system and the Coriolis Mass Flow Meter. It is ideal for the continuous feeding of pulverized fuels (hard coal, lignite, petroleum coke, alternative fuels, fly ash and any mixtures of these substances), as are primarily used to fire rotary kilns for the production of cement.

Applications with smaller feedrates can also be used, for example for hot gas generation, in the steel industry and for power plant firing.

Typically, feeding takes place from a depressurized supply bin directly into a pneumatic conveyor line.

Equipment

The horizontal AF Blow-Through Rotary Valve feeder has a large inlet cross-section and two independent drives for the speed-controlled starwheel and the dispersing

agitator. This ensures that the bulk solids in the inlet area are fully activated and guarantees high feed constancy. The discharged quantity of fuel is precisely measured by the downstream Coriolis Mass Flow Meter according to the Coriolis principle.

The controller unit evaluates the measuring signal and regulates the rotary valve feeder at the prescribed setpoint. All feed operation parameters can be called through the on-site control loop.

The feed operation takes place directly into a pneumatic conveyor line, the pressure differential that normally occurs between the pressureless silo and the conveyor line can therefore be resolved without problem. Material movement, low gap dimensions and long sealing lengths from the material infeed to the material outlet minimize flows of leaking gas.

Numerous variations are possible:

- Single feeding
- Multiple feedings onto a common conveyor line (also in order to mix fuels)
- Multiple feeding beneath a silo with the discharge system with up to four feedings

Function

In Coriolis Mass Flow Meter measuring devices, the principle of Coriolis force measurement is used to determine the mass flow rate. The bulk solids flow being measured hits a measuring wheel in the device that is rotating at a constant speed. The bulk solids are caught by the blades of the measuring wheel and accelerated to the circumferential speed of the measuring wheel. A torque is required for the acceleration, which directly corresponds to the feedrate.

The force underlying the torque is measured by a conventional load cell and is converted into an electronic signal. The measurement is independent

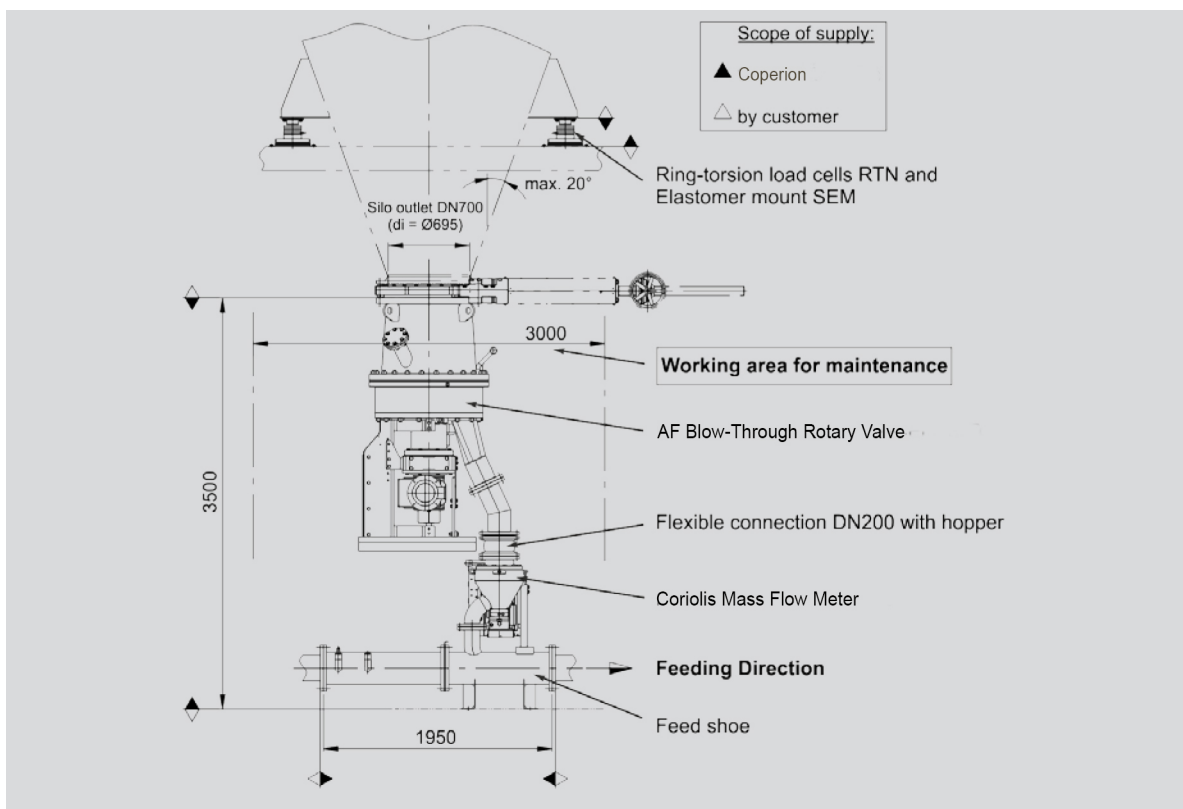
of mechanical properties of the bulk solids, such as grain spectrum, flow behaviour, humidity and temperature.

The force of the bulk solids on the measuring wheel and changes in the flow speed in the measuring device do not affect the measuring signal.

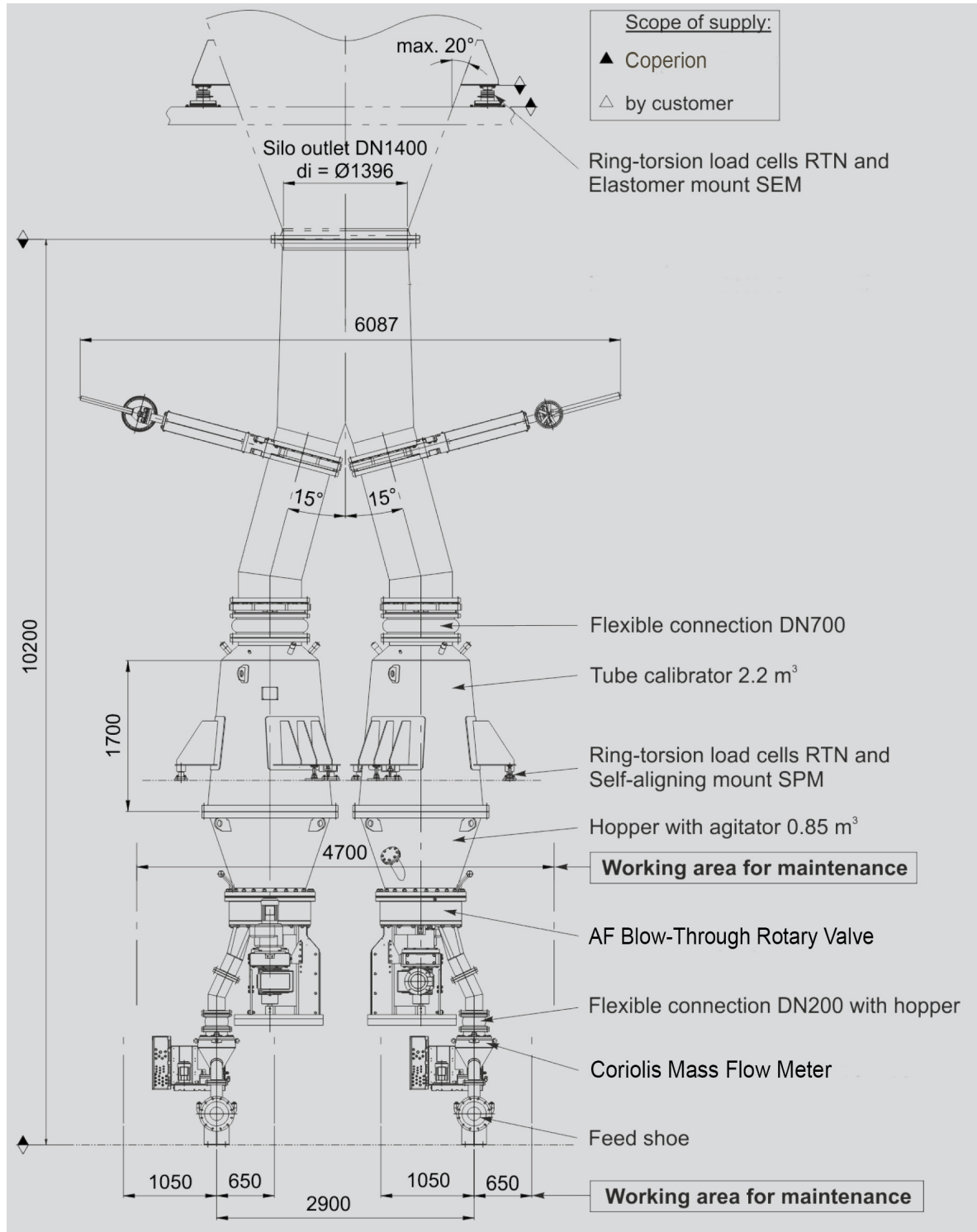
Online calibration

Online calibration can be performed via the weighing of the pulverized coal silo – with the Loss-In-Weight principle. Alternatively, the arrangements specified above can be supplemented with the compact tube calibrator. The calibration process is performed during running production and at any feedrate. The continuous feeding into the pneumatic conveyor line is not interrupted - the coal mill and refilling into the storage bin can continue to be operated. The tube calibrator is a component of the silo during normal operation and is operated without rotary valve feeder and without a filter.

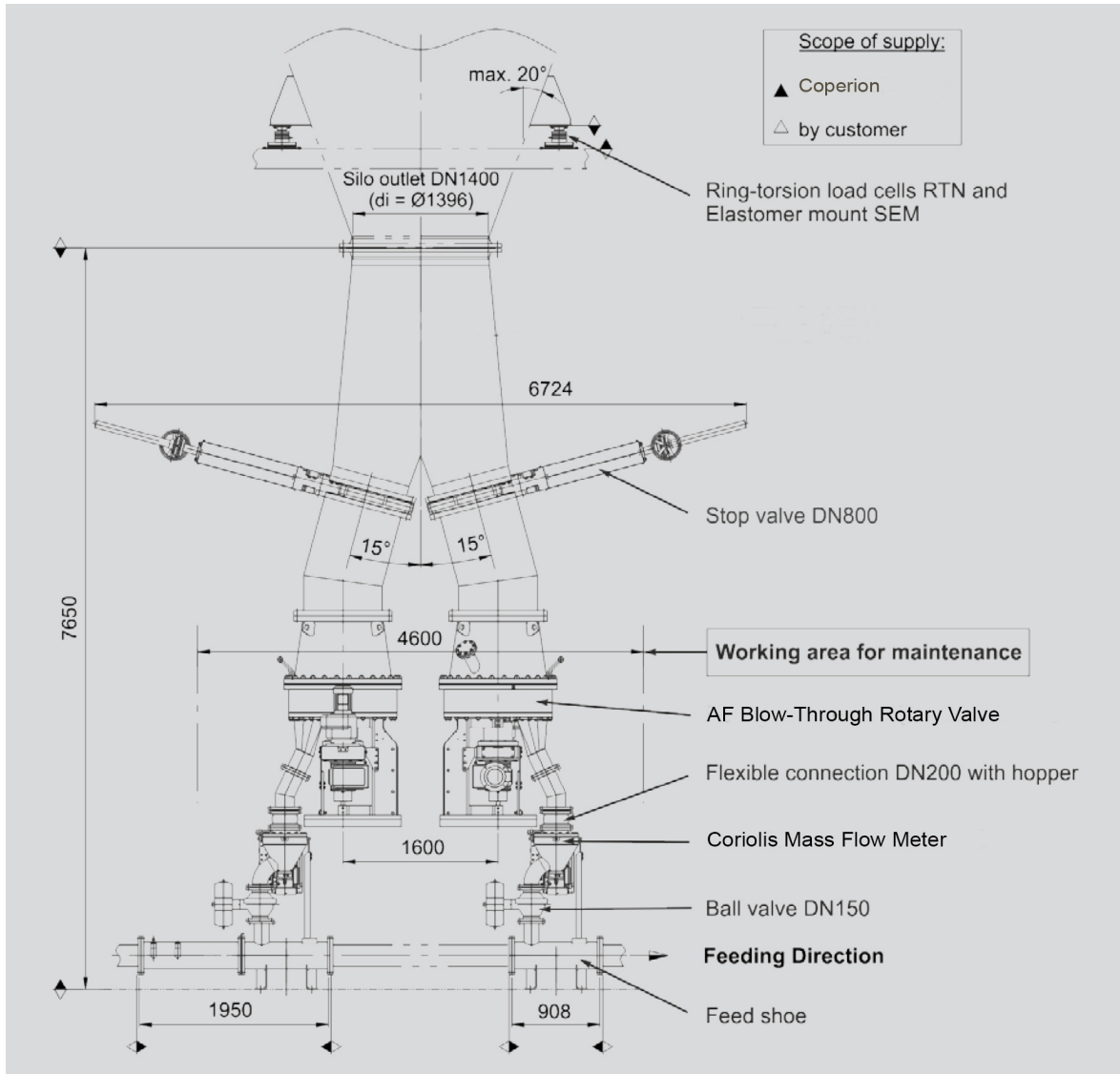
Single feeding with direct installation on the silo



Multiple feeding with tube calibrator 2.2 m³, AF Blow-Through Rotary Valve with Coriolis Mass Flow Meter



Multiple feeding, e.g. with AF Blow-Through Rotary Valve with Coriolis Mass Flow Meter



The standard design of the AF Blow-Through Rotary Valve has a starwheel, which has been developed for high conveying capacities and small device dimensions.

AF Blow-Through Rotary Valve has a starwheel, which is optimized for high feed constancy in a broad range of adjustments and is therefore ideal both for permanently low feedrates and high feed constancy, as well as for a large range of adjustments, such as for high pulverized coal substitution rates through the additional use of alternative fuels necessary for a stable furnace operation.

The feeding quality is determined by the feeding accuracy and feed constancy.

The feeding accuracy is critical for the balance of the process and describes the behavior over a longer period. The feed constancy, on the other hand, defines the consistency of the feed in short periods and therefore is important, for example, for the flame pattern.

Technical Data

AF Blow-Through Rotary Valve and Coriolis Mass Flow Meter combinations														
AF Blow-Through Rotary Valve	640/20	640/34	800/50	800/70	1000/100	1000/165	1200/190	1200/225	MIN 640/14	MIN 640/20	MIN 640/34	MIN 800/50	MIN 800/70	MIN 1000/100
Coriolis Mass Flow Meter	K50	K50	K50	K50	K80	K120	K120	K180	K50	K50	K50	K50	K50	K80
Technology														
Max. conveying capacity [t/h]	5.5	9	14	20	31	45	52	65	3.0	3.8	6	10	15	26
Characteristics														
Range of adjustment based on max. feed rate	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:10	1:20	1:20	1:20	1:20	1:20	1:20
Range of adjustment based on max. conveying capacity For feed constancy $\pm 1\%$ (Definition as per BV-D2082)	1:5	1:5	1:5	1:5	1:5	1:5	1:5	1:5	1:10	1:10	1:10	1:10	1:10	1:10
Feeding accuracy $\pm 0.5\%$ *) (Definition according to BV-D2082)	x	x	x	x	x	x	x	x	x	x	x	x	x	x
*) The respective Coriolis Mass Flow Meter measuring ranges must be observed!														
Application														
Single feeding														
Multiple feeding	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Multiple filling														
Surge tank or Tube Calibrator with KME slide gate	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Options														
Stop valve														
Check measurement system	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Silo technology, blower, pneumatic conveying														

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