MULTICELL and MULTICOR® K
For pulverized coal feed system

- **Pulsation-free, gravimetric feeding**
- **High short-time feeding accuracy**
- **Sensitivity to external influences, highly accurate principle of measuring**
- **Long service 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 rotary valve feeder MULTICELL as a silo dispensing system and the mass flow meter MULTICOR® K. 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.

Primarily combustible dusts are fed with the system. All components therefore come in an explosion shock-pressure resistant construction, are suitable for use in an explosive atmosphere and have corresponding type approvals according to ATEX directive 2014/34/EU.

Equipment

The horizontal rotary valve feeder MULTICELL 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 mass flow meter MULTICOR® K according to the Coriolis principle.

The DISOCONT® Tersus control 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 MULTIFLOW with up to four feedings

Function

In MULTICOR® K 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.

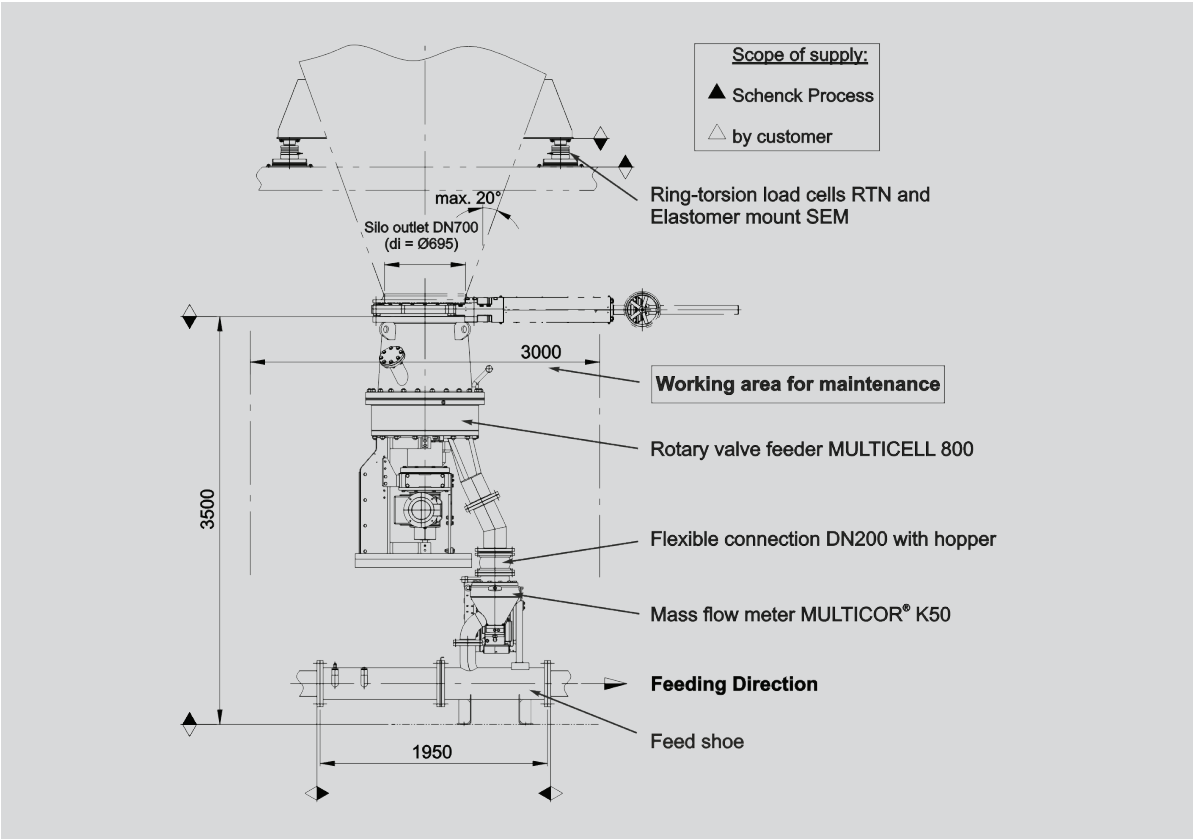
The force underlying the torque is measured by a conventional load cell and is converted into an electronic signal. The measurement is independent of mechanical properties of the bulk solids, such as grain particle size, flow behaviour, humidity and temperature.

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.

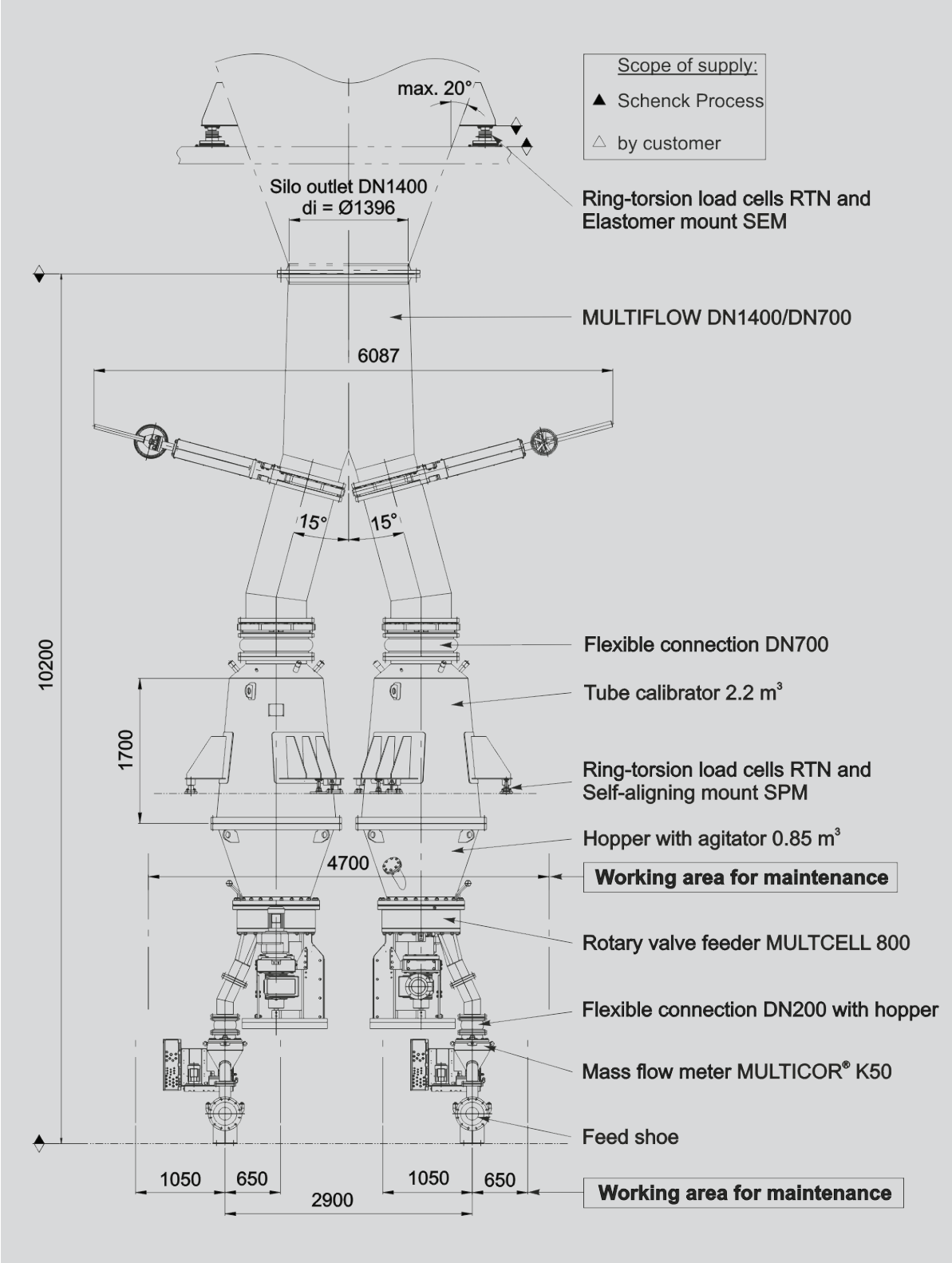
Online calibration

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.

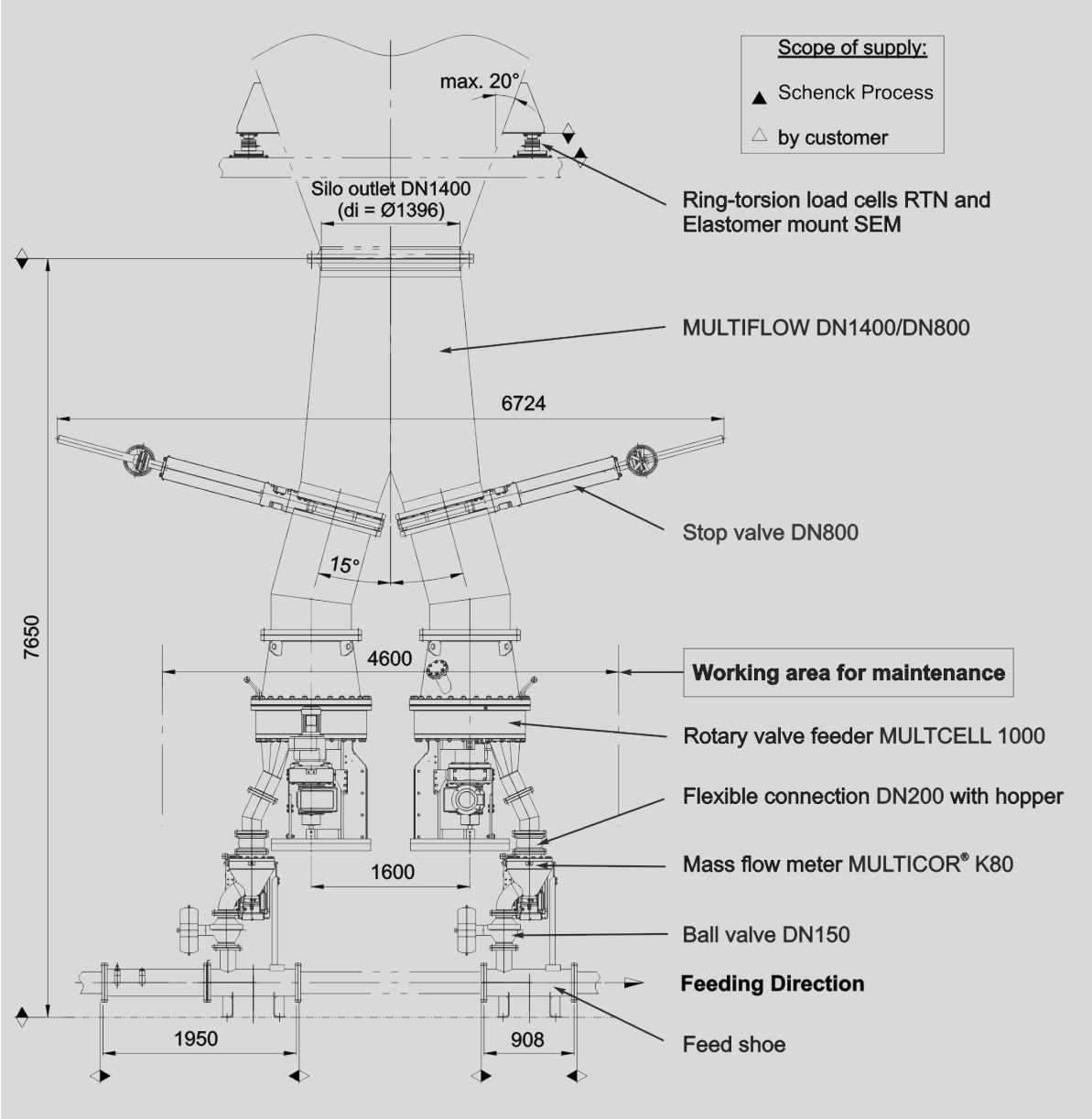
Single feeding with direct installation on the silo e.g. MULTICELL 800 with MULTICOR® K50



Multiple feeding with MULTIFLOW, tube calibrator 2.2 m^3, MULTICELL 800 with MULTICOR® K50



Multiple feeding, e.g. with MULTIFLOW, MULTICELL 1000 with MULTICOR® K80



The standard design of the MULTICELL has a starwheel, which has been developed for high conveying capacities and small device dimensions.

MULTICELL MIN 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.

MULTICELL and MULTICOR® K combinations

MULTICELL	640/20	640/34	800/50	800/70	1000/100	1000/165	MIN 640/20	MIN 640/34	MIN 800/50	MIN 800/70	MIN 1000/ 100
MULTICOR®	K50	K50	K50	K50	K80	K120	K50	K50	K50	K50	K80
Technology											
max. conveying capacity [t/h]	5.5	9	14	20	31	45	3.8	6	10	15	26
Characteristics											
Range of adjustment based on max. conveying capacity for stable furnace operation	1:10	1:10	1:10	1:10	1:10	1:10	1:20	1:20	1:20	1:20	1:20
Range of adjustment based on max. conveying capacity for feed constancy ±1 % (Definition according to BV-D2082)	1:5	1:5	1:5	1:5	1:5	1:5	1:10	1:10	1:10	1:10	1:10
Feeding accuracy ±0.5 % *) (Definition according to BV-D2082)	x	x	x	x	x	x	x	x	x	x	x
*) The respective MULTICOR® K measuring ranges must be observed!											
Single feeding **Multiple feeding** **Multiple filling**											
Interim hopper or tube calibrator with KME slide gate	x	x	x	x	x	x	x	x	x	x	x
Options											
Stop valve **Check measurement system** **Silo technology, blower, pneumatic conveying**	x	x	x	x	x	x	x	x	x	x	x

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