Discharge and metering rotary valve, for discharge of silos and/or feed into pressure or vacuum conveying pipelines; even for dust explosion hazardous products

Advantages:
- Sturdy and less wear
- Cost-effective and low maintenance due to simple assembly
- Space-saving
- Gas-tight from outside
- Protection against spreading of dust explosions and effective flame trap
- Safety for operators, with a DMT certificate
Functions and operating modes of a rotary valve
Generally a rotary valve has two basic functions: Discharging and metering. Both the functions have an additional task to establish an air lock point between two sections of the system. Absolute air lock is however not possible at the given pressure difference. The flow of the leakage air can only be minimised.

Discharge
The basic function of pure discharging is executed by the well-known basic rotary valve: In the housing the rotor is revolving by constant speed. Due to gravity the product comes out from the container or the hopper from the top and falls in the chambers of the rotor. Due to the revolving rotor the product is transported to the discharge opening, from where it again moves down by gravity. The rotary valve itself does not affect the flow capacity of bulk solids. It depends on the chamber volume, filling ratio and rotation speed.

Metering
The rotary valve for metering is characterised by a variable speed, e.g. using a variable-pitch geared motor or a frequency converter drive. The metering is purely volumetric in such a case: A specific volumetric flow per time unit is set as the desired value in dm³/s or m³/h. It is however not measured so that there is an undefined deviation between the desired and actual values. The mass flow capacity is not measured and regulated, and therefore the term, "metering" is actually incorrect in the strict sense; a constant and reproducible volumetric flow can however be set.

The condition is, that
a) the density of bulk solids is always constant,
b) the rotor is always fed with the same filling ratio. This can be achieved, e.g. using an agitator or a pneumatic discharge aid in the pre-hopper over the rotary valve,
c) the chambers are emptied completely.
Volumetric metering using solids rotary valves

**Standard rotary valve, type ZRS:**

- Housing with inlet and outlet
- Horizontal rotor with chambers (see rotor versions)
- Filling the chambers at the inlet
- Downward transport by rotation
- Emptying due to gravity; free discharge at the outlet
- Setting the volumetric flow by changing the speed
- Sizes from entry-Ø 150 to 500 x 1000 mm
- Capacity range: from 100 dm³/h to 200 m³/h

**Conditions:**
The maximum particle size must be determined depending on the pressure difference and other product properties.

**Most important rotor versions:**

- **a) Basic version:**
  - Fixed bars
  - For non-wearing products

- **b) Replaceable, adjustable sealing strips**
  - made of elastomer or cutting strip
  - for moderately wearing products

- **c) Rounded chambers**
  - with/without replaceable sealing strips
  - for slightly accumulating products
  - with coated chamber surface

- **d) Towing vane made of elastomer**
  - for granular, sticky and fibrous products
solids Rotary Valves
Type ZRS

Characteristics (here as an example of a pressure-shock-resistant rotary valve):

- Cast housing; with pressure test on request
- Pressur-shock-resistant rotor
- Pressure-tight shaft seal
- Packing gland up to 200 °C
- External bearing
- Adjustable and replaceable rotor strips
- Solid rotor design
- Rounded chambers
- Rotor for dust explosion class ST1
- Rotor for dust explosion class ST3
- Optional: radial shaft sealing rings with a sealing gas connection

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Foodstuffs version:

- Rounded chambers
- Slip-on gear
- Complete with a leakage air collector and a blowing shoe:
Accessories:
Leakage air collector for optimised diversion of leakage air from the pressure conveying by the solids rotary valve; inclusive of the granulate inlet for granular products

Advantages:
- Space-saving
- Fail-safe; prevents coarse grains from clamping
- Cost-effective
- Increases the conveying capacity

Characteristics:
- Welded steel design; all commonly available steel and stainless steel qualities
- For pressure conveying
- Nominal widths 150 to 350 mm corresponding to the rotary valve
Blowing shoe below the metering equipment for filling a pneumatic conveying pipeline

Advantages:
- Space-saving
- Fail-safe
- Cost-effective
- Can be connected to all metering equipment

Characteristics:
- Welded steel design; all commonly available steel and stainless steel qualities
- Pressure-resistant
- For suction and pressure conveying
- Conveying pipe nominal widths 50 to 150 mm