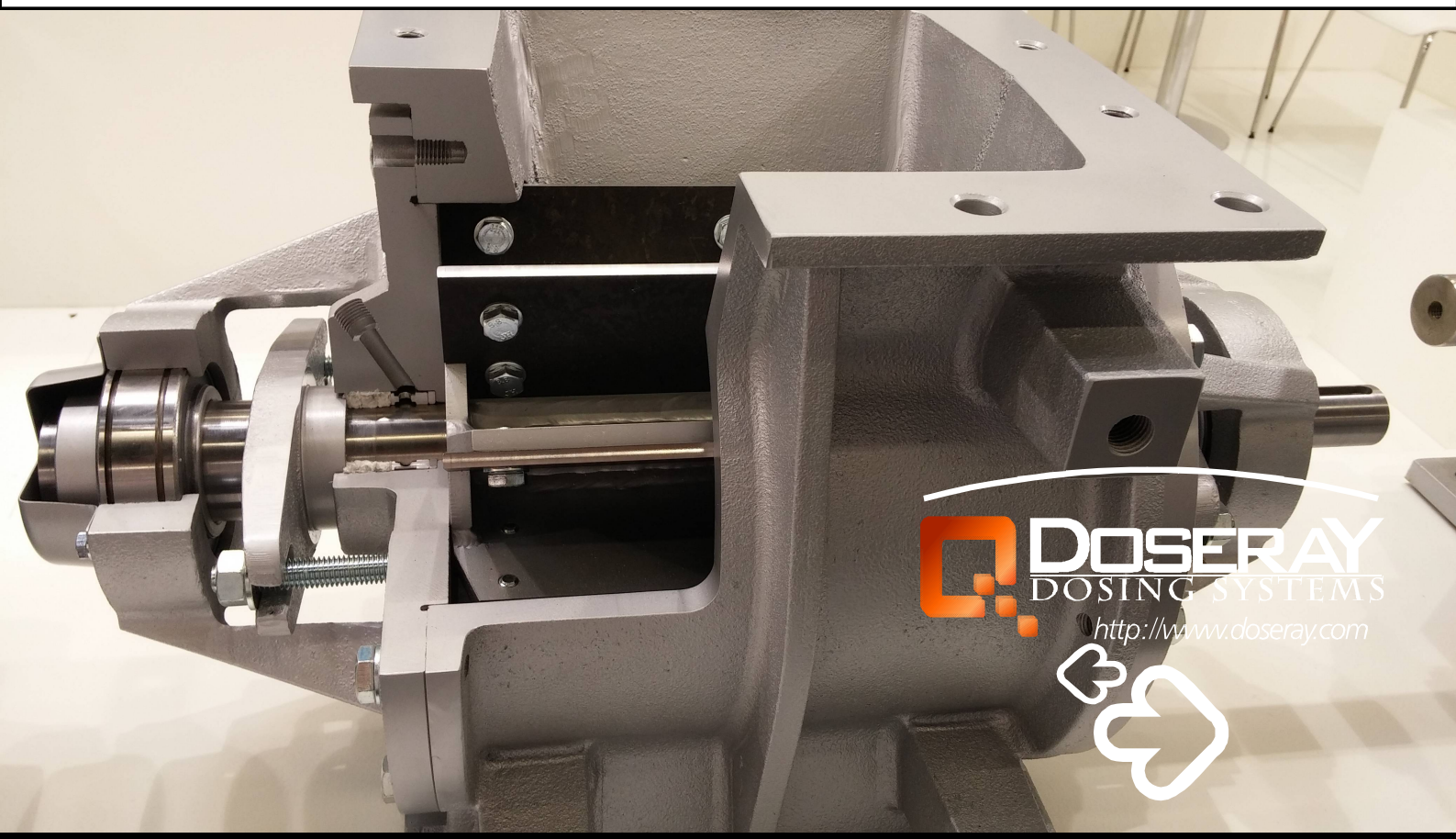
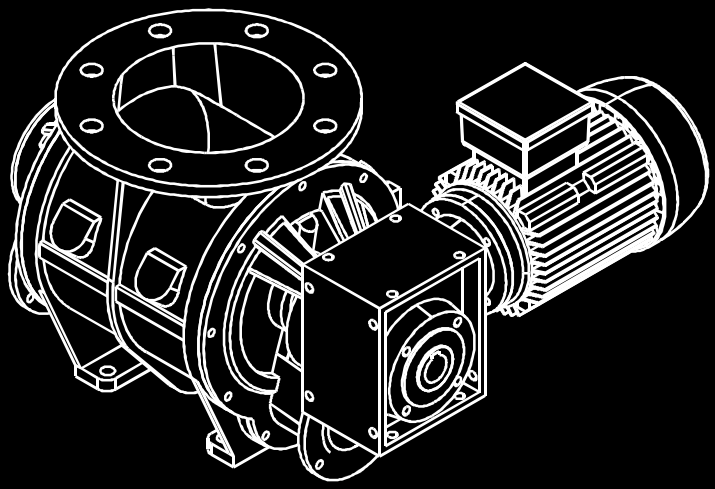
# RD Series

We are continually upgrading and refining our airlocks, which now include more than 100 models and sizes. This broad scope and variety of Rotary Valve sizes and models enables DOSERAY to provide the most appropriate airlocks and rotary valves for applications in the milling and baking, food, pharmaceutical, plastics and chemical process industries.




## 0.2-200m3/hour



# RD Series

# Rotary Valve-Airlock

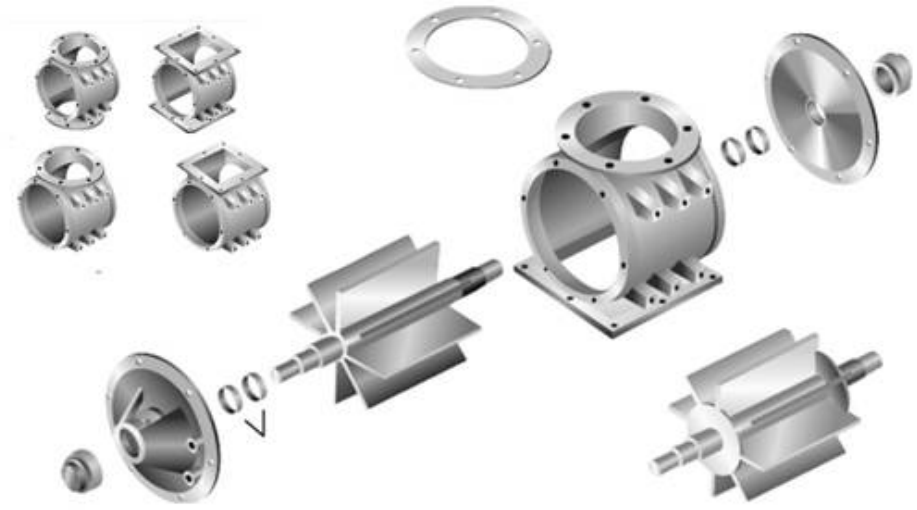
Rotary Valves are one of the most common means of feeding pneumatic conveying systems, both pressure and vacuum types. There are many other applications where they are used simply for metering of a controlled feed rate. Given the great numbers of these items in use, it may be tempting to think that the selection of Rotary Valves would be a straightforward and widely understood process.

## Why do so many troubles come from these apparently simple components?

This document seeks to explain the apparent mystery surrounding the selection of the right valve for the job, and warn of the pitfalls awaiting the unwary.Commonly thought of as a ‘commodity’ product it is hoped that with a little understanding of thefactors that affect the correct selection of a Rotary Valve, it will recognized that the choice of typeand features to be included from the apparently bewildering variety available is often vital if satisfactory performance for a given duty is to achieved.

## Wide range of rotary valve sizes

Airlocks are available in round or square inlet/outlet configurations providing 80 mm through 600 mm [3 openings. Displacements range from 0.25 to 200 $dm^3$.
Selecting the right size at the correct speed can yield any throughput desired up to over 100 tons per hour.



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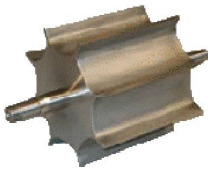
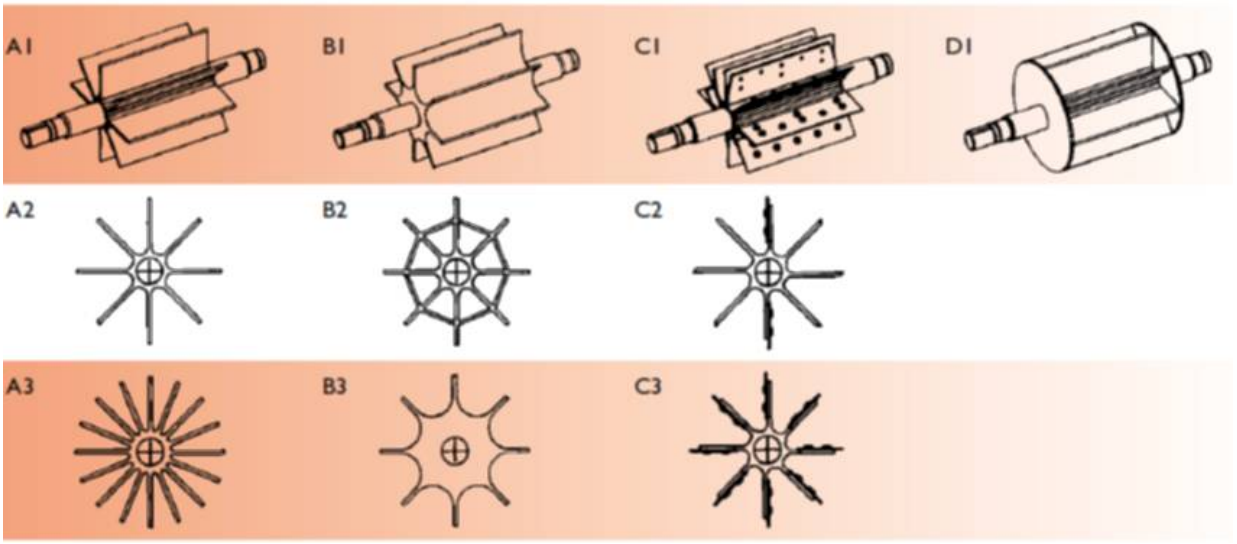
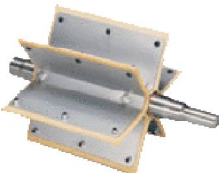
# RD Series

# Rotor Type





Rotors are the most variable component and come in a wide range of alternative features. Most rotors are fabricated to give manufacturing flexibility to incorporate alternative features. Some manufacturers use castings for cheapness but their use is very limiting.

## SOME COMMON ROTOR FEATURES

The basic Rotor is normally a fabricated open type with fixed vanes. Detail designs differ between manufacturer but will be mounted such that it is held centrally so that running clearances are not compromised between the rotor and end cover faces.Replaceable Blades These are by nature adjustable on assembly but should not be considered as being supplied to be able to adjust for wear as wear is never even, neither is it confined to the blades. It is however an economic way of introducing alternative materials of construction that may be required to satisfy the duty.

# Common examples include

• Hardened steel; or alloy steel; or hard faced: for abrasion resistance
• Scraper: to control product build-up on the housing bore and end cover faces when
Necessary
• Flexible: (usually polyurethane or natural rubber) for fibrous or products containing large
non friable particles
• Plastic: product compatible or non-stick
• Bronze or bronze tipped: for ultra close clearances
If replaceable blades are not practical or not permissible then fixed vane rotors can have their tips hard or bronze faced.

Because gravity is relied on to discharge product from the rotor pockets, provision has to be made to resist the tendency of sticky material to hang-up. In this case the rotor is normally

manufactured with 'scalloped' pockets; this may be enhanced by coating from one of a range of non-stick coatings such as PTFE, 'Zylon' etc. Unfortunately such coatings are subject to wear and if contamination is an issue then manufacturing the rotor in stainless steel and polishing the surfaces is a suitable but more expensive alternative

In extreme cases the product may need to be encouraged to discharge through air purging where pulses of air is injected laterally at a suitable point at the end covers.

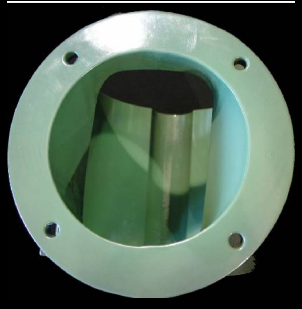
Limitations:
When designing systems incorporating Rotary Valves, and considering the choice of unit, especially
when acting under a pressure differential, it is important to recognise that:
• A Rotary Valve does not create product flow; it can only pass such product that can fall into
it and out of it under gravity.
• All Rotary Valves leak air (or gas) when the system is operating (regardless of whether there is a pressure differential or not) and this can affect product flow and system performance, especially where the gas pressure below the valve is the greater.
• The faster the rotor speed the lower and more erratic the filling efficiency.
• The greater the pressure differential across the Rotor the less predictable and less stable the filling efficiency.
These factors mean that:-
• The performance of a Rotary Valve is affected by the design and performance of the system, and vice versa.
• The selection of Valve speed and size is not a precise science. They are selected by taking
into account the various factors that may negatively affect Valve performance from the
theoretical maximum.

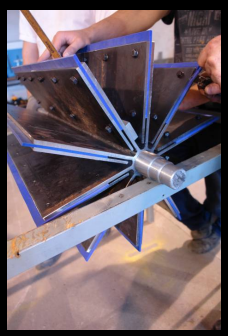
## Housing Body & End Covers

Generally the manufacture of Rotary Valves follows good general precision engineering practices with materials of construction selected according to the duty needs or occasionally customer preferences. The Housing is normally of cast construction for rigidity and cost, however fabrications are occasionally used for non standard configurations and ‘one-off’ large valves that cannot be satisfied from cast patterns.
Fabrications or machined from solid are increasingly used for critical pharmaceutical use where guaranteed flaw-free validation is essential.

Body Design

The vide variety of different body configurations offered by different suppliers and simple appearance belie the fact that the detail design is an integral part of the performance of Rotary Valves. In an ideal world the body would be designed to suit each application but as that is not practical they are a compromise in specific areas to encompass as many application needs as possible.
The inlet throat design can be critical as it is a very dynamic area and can influence the product flow into the Rotor Pocket, drive torque levels and the effective dispersion of leakage air. The latter in particular can influence rate and consistency of product flow and can also result in the difference



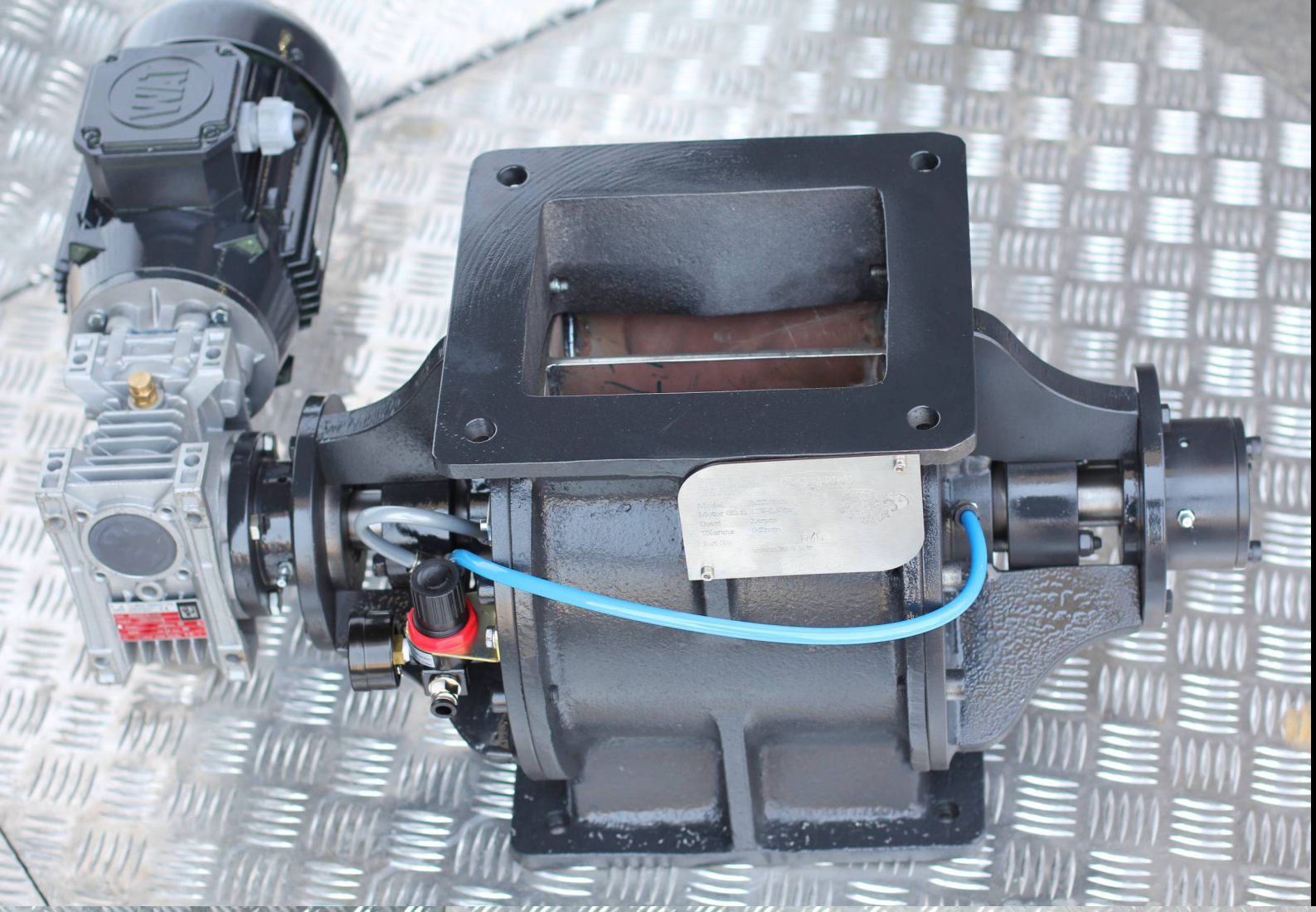


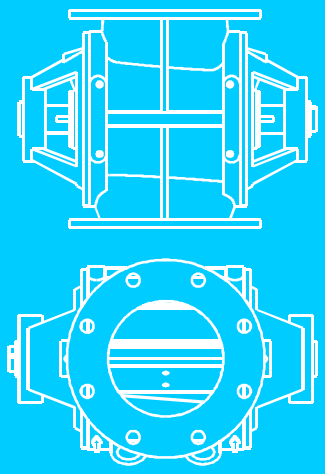
These fall into two categories; those with inboard mounted bearings and those mounted on outrigger extensions. The use of inboard bearings is generally confined to low cost, low duty valves and are typically offered for low pressure differential applications, filter/cyclone and general discharge duties where the product does not exhibit difficult handling characteristics.
The use of outboard mounting if often believed to protect the bearings from direct product contamination, however, there is only limited benefit in this regard as any seal failure usually results in product 'jetting' along the shaft directly at the bearing. The primary reason for outboard mounting is to provide space for accommodating a wide range of alternative shaft sealing arrangements. There is the added benefit for more demanding applications as they are inherently larger and will accommodate the larger rotor shaft diameters necessary to limit rotor deflection under high operating loads.

Air purge connections can be included if necessary to provide an injection of air either sequentially pulsed or continuously to dislodge products at the valve outlet that tend to 'hang' in the rotor pockets. These connections may also be used to pressurise the void that exists between the end cover and end discs when using closed rotors to prevent product entry.

## Blowing Seals

This is the common designation for rotary valves that are designed for direct connection into pneumatic conveying blowlines. They can be designed for true blow through of the rotor pocket, often referred to as direct purge, or can be arranged to have an entrainment trough whereby the conveying air passes partly along the trough and partly through the rotor and referred as semi direct purge.The direct purge design is the most efficient and covers a wider range of materials. It suffers from severely restricting the drive arrangements that can be fitted, due to the closeness of the pipe connections to the rotor shaft, and consequently the semi-direct is the more common.

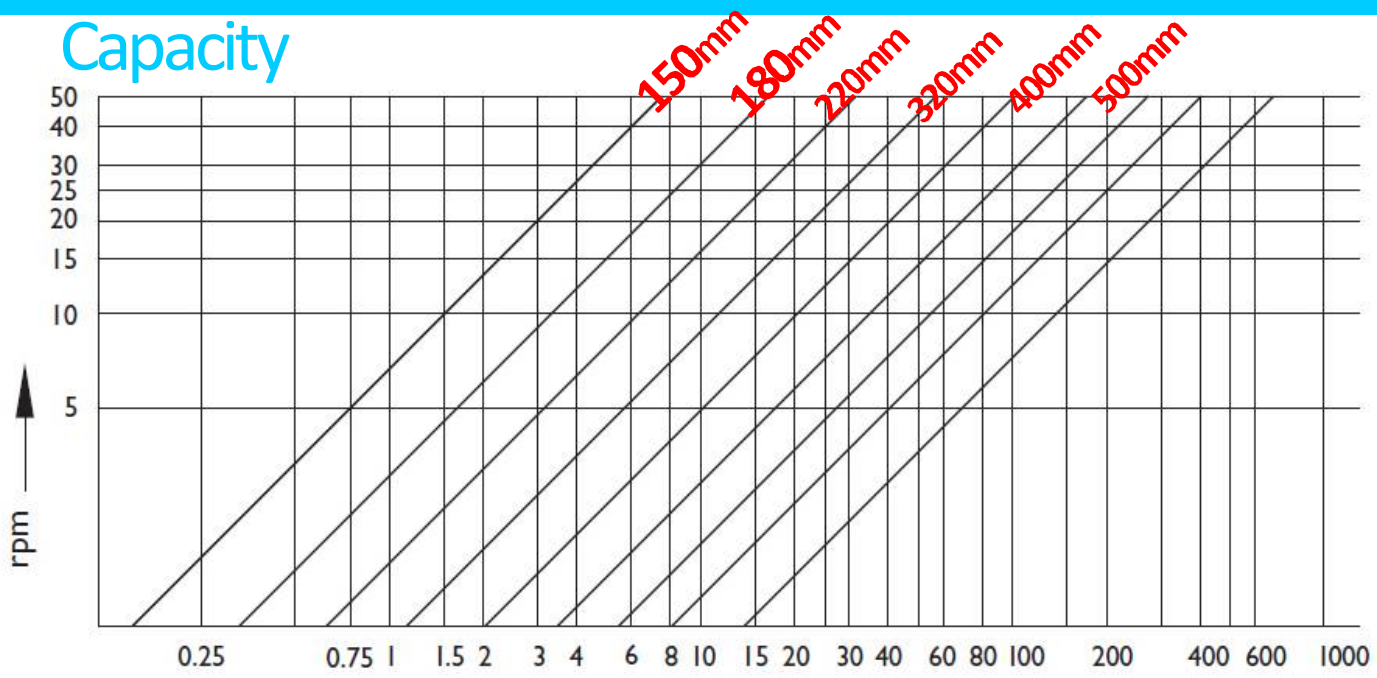




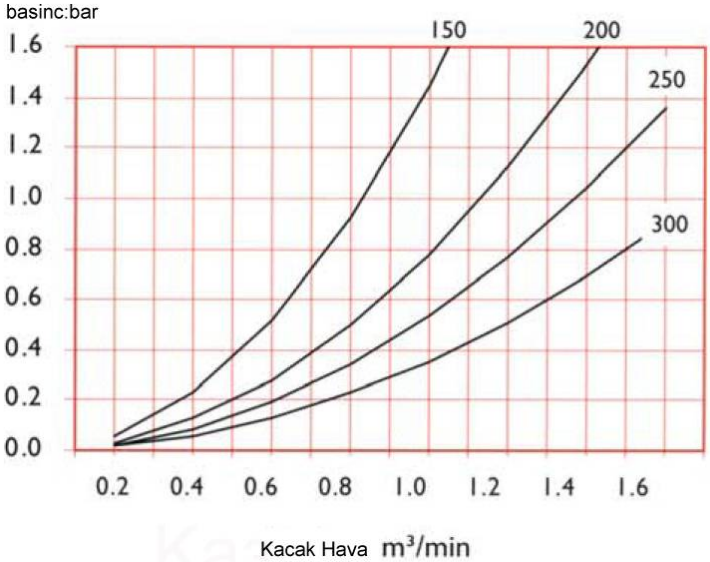
## Capacity

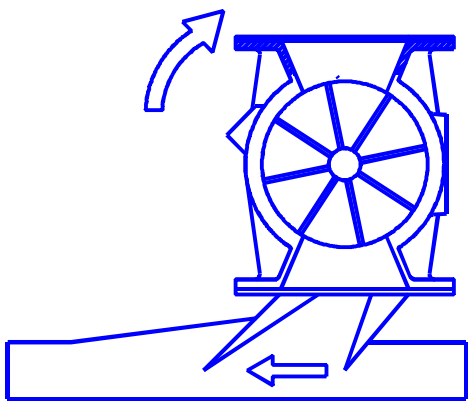
| Diameter | 28rpm | 32rpm | 36rpm | 40rpm | Power |
|---|---|---|---|---|---|
| 220mm | 6m3/h | 7m3/h | 8m3/h | 9m3/h | 0.55kw |
| 320mm | 18m3/h | 21m3/h | 24m3/h | 27m3/h | 1.1kw |
| 400mm | 32m3/h | 37m3/h | 43m3/h | 48m3/h | 1.5kw |
| 500mm | 50m3/h | 58m3/h | 70m3/h | 80m3/h | 2.2kw |

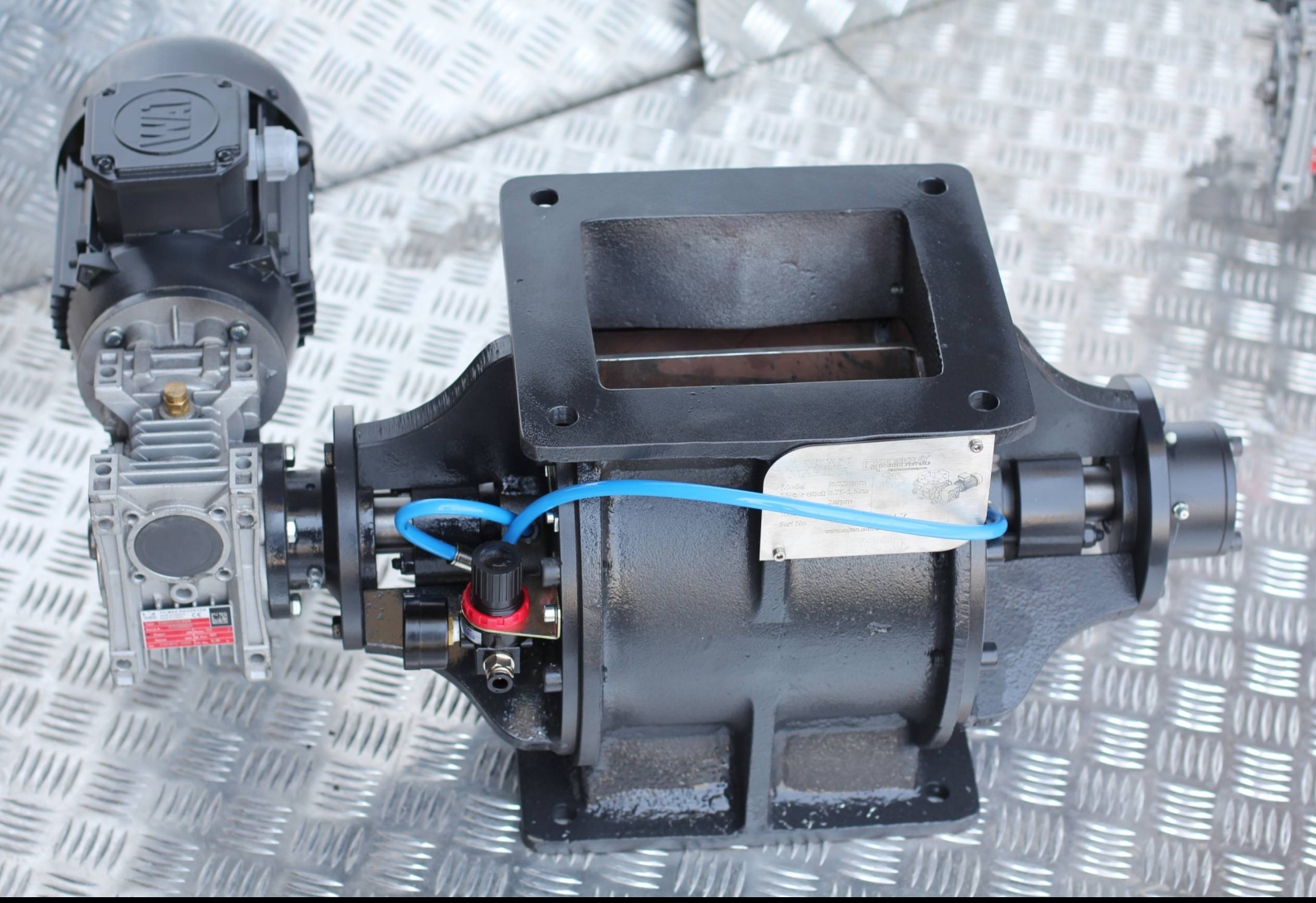
## Capacity




## Air leake





## Accessories

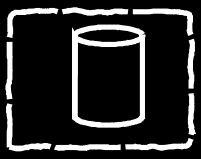
Common additions to rotary valves include:

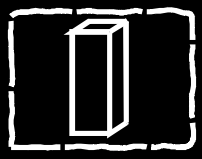
- Positive Overload protection (shear pin or proprietary torque limiting devices)
- Non Rotation detection
- Speed monitors
- Safety switches on Easy Clean valves
- Variable speed controls
- Pressure regulators and flow meters for air purge seals

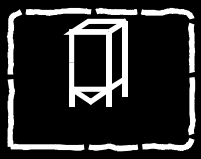
Araştırma ve Geliştirme

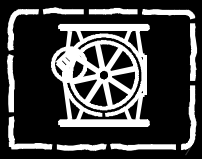
Proses Diyagramı

Mühendislik ve Projelendirme


Silindirik Silo


Multigon Silo


Flexible Silo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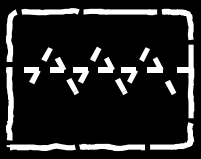
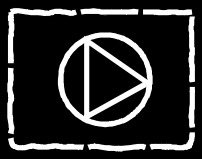
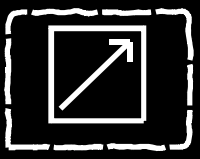
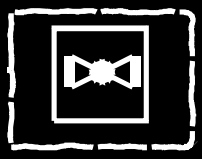
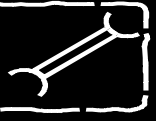

Konveyor Sistemleri


Pnömatik Taşıma Fazları


Kontrol Sistemleri


Enstrüman & Ekipmanlar

Devreye Alma-Servis Faaliyetleri



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http://www.doseray.com

Taşköprü san.Sitesi 1.Yol 82-84 Yalova / TURKEY
Tel: +9 0 226 353 21 21 Fax: + 9 0 226 813 75 20
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