

CONSIDERING THE PROFILE OF A DROP-THRU ROTARY VALVE

There are many different suppliers of Rotary Valves with most manufacturers offering at least one type of Drop-Thru Rotary Valve. The definition of a Drop-Thru Rotary Valve is one that has its inlet and discharge on the same vertical center line. Drop-Thru Rotary Valves are offered with both round and rectangular inlet and discharge flanges. In the US Market the normal range of standard Drop-Thru Rotary Valves range from 4” through 12”, with most manufacturers offering additional sizes.

The very basic of how a Drop-Thru Rotary Valve operates is to say that the main component is a rotor which is incased in a housing. The rotor is supported by bearings and rotates at a controlled speed (RPM). Powder enters the valve through the top inlet connection and is metered by rotation of the rotor, discharging through the bottom discharge flange. Both the housing and rotor are machined to have tight internal clearances. This allows the rotor to rotate but minimize gas leakage if the valve is used in a situation where the pressure is different from the adjoining equipment connected to the Rotary Valve.

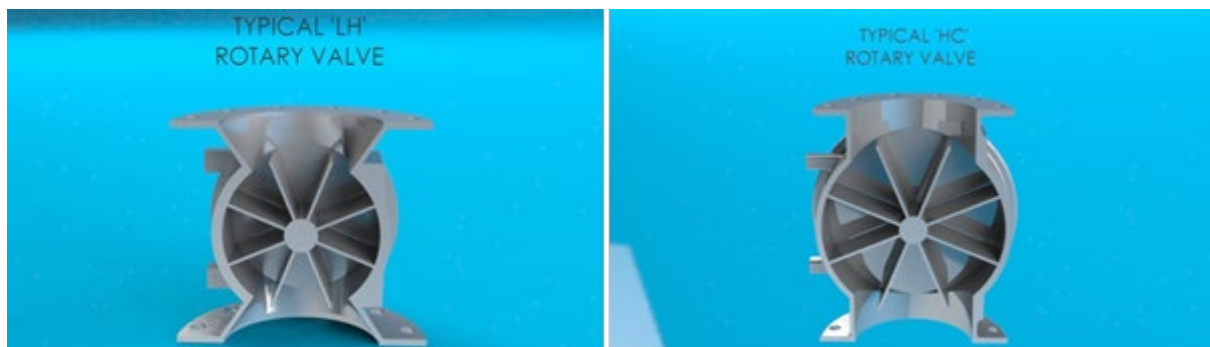
There are no “national standards” for Rotary Valves as it relates to volumetric capacity, height, flange dimensions etc. With that in mind it is important that when selecting a Drop-Thru Rotary Valve, the profile of the valve be considered.

ROTARY VALVE PROFILE

A Drop-thru rotary valve is normally designated based on the inlet and discharge flange size. The transition from the flange through the throat area into the rotor creates the profile of the valve. Since there are no standards for valve height and rotor diameters, the profile of the valve from one manufacturer to another will vary.

YOUNG INDUSTRIES MODEL- LH AND MODEL -HC ROTARY VALVES

Young Industries offers two different series of standard Drop-Thru Rotary Valves. The Model LH (Low headroom) and Model HC (High Capacity). Below is a cut-away view of the profile of both models as a comparison:



Model - LH

Model - HC

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To compare the difference for these valve models, let's compare the rotor diameter and the overall height for a Size 8”.

SIZE 8” ROTARY VALVES (for comparison)

<u>Model</u>	<u>Rotor Diameter</u>	<u>Valve O.A.H</u>	<u>Volumetric Cap</u>
LH	8” dia.	12” height	0.198 cu. ft. per revolution
HC	12” dia.	17” height	0.441 cu. ft. per revolution

PROFILE COMPARISON:

Comparing the profile cut-away view of each valve it is apparent that the **Model LH** has a tapered/transitioned inlet and discharge throat. While the Model LH offers lower height it also has lower capacity and the resulting tapered throats can result in problems with certain powders bridging or arching over the rotor. The 8” Model LH Rotary Valve is 8” diameter at the inlet flange but somewhat smaller at the entry point to the rotor. The Model LH Rotary Valve is comparable with the offerings from other manufacturers.

The **Model HC** has a straight vertical inlet and discharge to the rotor which requires a larger diameter rotor than the Model LH Rotary Valve. The Model HC is designed to give high capacity and provide optimum flow into and out of the valve. The Model HC is used in applications where the powder handled is cohesive or has poor flow characteristics. The straight vertical design is much preferred for metering applications handling poorly flowing powders.

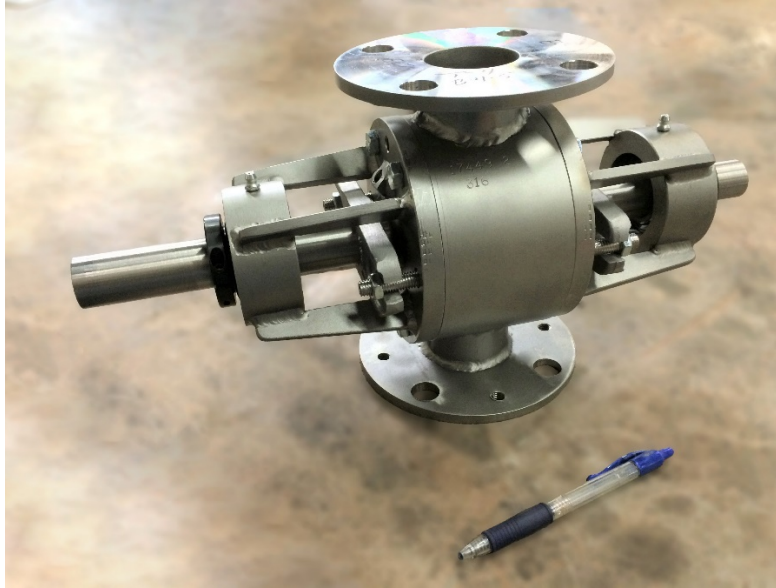
WHY TWO MODELS OF DROP THRU ROTARY VALVE?

When is consideration of the inlet throat design of a Rotary Valve most critical? If the Rotary Valve is to be used to meter a powder that tends to pack, arch or bridge then you should be looking more closely at the Rotary Valve inlet profile. When handling poor flowing powders, transitioning of any type may result in flow problems. This is especially true for metering applications where there is a column of material above the valve. The Model HC Straight Drop Thru design is the choice for these applications.

The Model LH Rotary Valve is a good choice for handling free flowing, powders and applications for non-metering airlocks. A good example is for the discharge of dust collectors where low volumes of powders are collected, yet an airlock is needed for the discharge. The Model LH Rotary Valve's smaller profile is usually sufficient for these applications and is preferred when available headroom is a consideration.

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Selecting the correct Rotary Valve for the application is critical for a process to operate correctly. Young Industries Model HC Rotary Valve is a clear choice for those applications handling powders with poor flow characteristics. The Model HC Rotary Valve is available in sizes 1” through 24” as standard, with larger sizes also available. The Model LH is available in sizes 4” through 24” as standard, with larger sizes also available.



2" Model HC Drop-Thru Rotary Valve



12"x24" Model HC Rotary Valve