



**INSTRUMENTATION LIMITED  
PALAKKAD**

# **VSD**

**DISC STACK VALVE**

**SEVERE SERVICE  
CONTROL VALVE**



# INSTRUMENTATION LIMITED

Instrumentation Limited, Palakkad (ILP) started in 1974 started operations in collaboration with M/s Yamatake Honeywell co.Ltd., Japan (YH) the world renowned leader in process control instrumentation including final control elements like control valves.

ILP has achieved self reliance in the field of final control elements and has gone on to earn a fair name as a leader in valve industry not only to the Indian industry, but also to the overseas market.

Today, Instrumentation Ltd. Palakkad, plays a vital support role for a very wide spectrum of industrial enterprises - ranging from Nuclear applications, core sector establishments such as steel, power, cement and oil refineries, to large medium and even small scale industries.

Advancements in computer simulations and modernization of manufacturing technology have opened up new dimensions in industry. The customer expects personalized, simple, and optimized solutions. ILP, with its access to the latest CAD, CAM, CAE, and modern manufacturing facilities can deliver solutions for the most complex and diverse flow control problems and can meet customer expectations.

# VSD

VSD is a control valve with a continuous resistance flow path specially designed for severe service applications. Fluid is allowed to flow through small passages with tortuous paths to achieve pressure drop with controlled velocity. Pressure drop is achieved through several stages, thereby preventing the chance for sudden pressure reduction which can cause cavitation and flashing. Each turn in the tortuous path acts as a stage of pressure drop. Flow through the stacked disc creates a combined effect of staged drop and controlled velocity, resulting in Noise reduction also.

## APPLICATIONS

CAVITATION SERVICES | HIGH NOISE APPLICATIONS | SOOT BLOWER APPLICATIONS | FLASHING SERVICES  
ANTI SURGE | STEAM CONDITIONING | METHANOL INJECTION | DEAERATOR LEVEL CONTROL | TURBINE BYPASS  
SUPER HEATER SPRAY CONTROL APPLICATIONS | HIGH PRESSURE DROP STEAM AND WATER SERVICES  
REHEAT VALVES | BOILER FEED CONTROL VALVES | SEPARATOR LEVEL CONTROL  
FEED WATER REGULATION | STEAM HEADER PRESSURE CONTROL



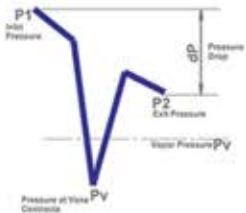
## VELOCITY CONTROL TECHNOLOGY

Customized solutions can be provided with controlled velocity. Erosion and trim material damage varies directly with the flow velocity. VSD is equipped with paths of continuous resistance, which results in low flow velocity. For high-pressure drop steam applications with a controlled noise level, VSD is the best choice.

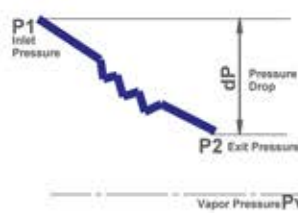
VSD Trim consists of a flow path that reduces pressure in different stages. Velocity at each stage is controlled. Noise and erosion are a function of fluid velocity. By the use of advanced computer technology and modern-day CFD tools, ILP can provide customized flow control solutions in severe service applications.

For better trim life, velocity is limited to the following values according to design guidelines

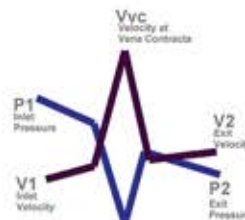
SERVICE CONDITIONS	COMPRESSIBLE FLOW		INCOMPRESSIBLE FLOW	
	EXIT VELOCITY HEAD	MAXIMUM VELOCITY HEAD	EXIT VELOCITY	MAXIMUM VELOCITY
	KPa	KPa	m/s	m/s
Continuous service single phase fluid	480	1200	30	75
Multi phase fluid at outlet	275	688	23	58



Pressure profile of a conventional valve experiencing cavitation



Pressure profile on a disc stack valve which controls cavitation

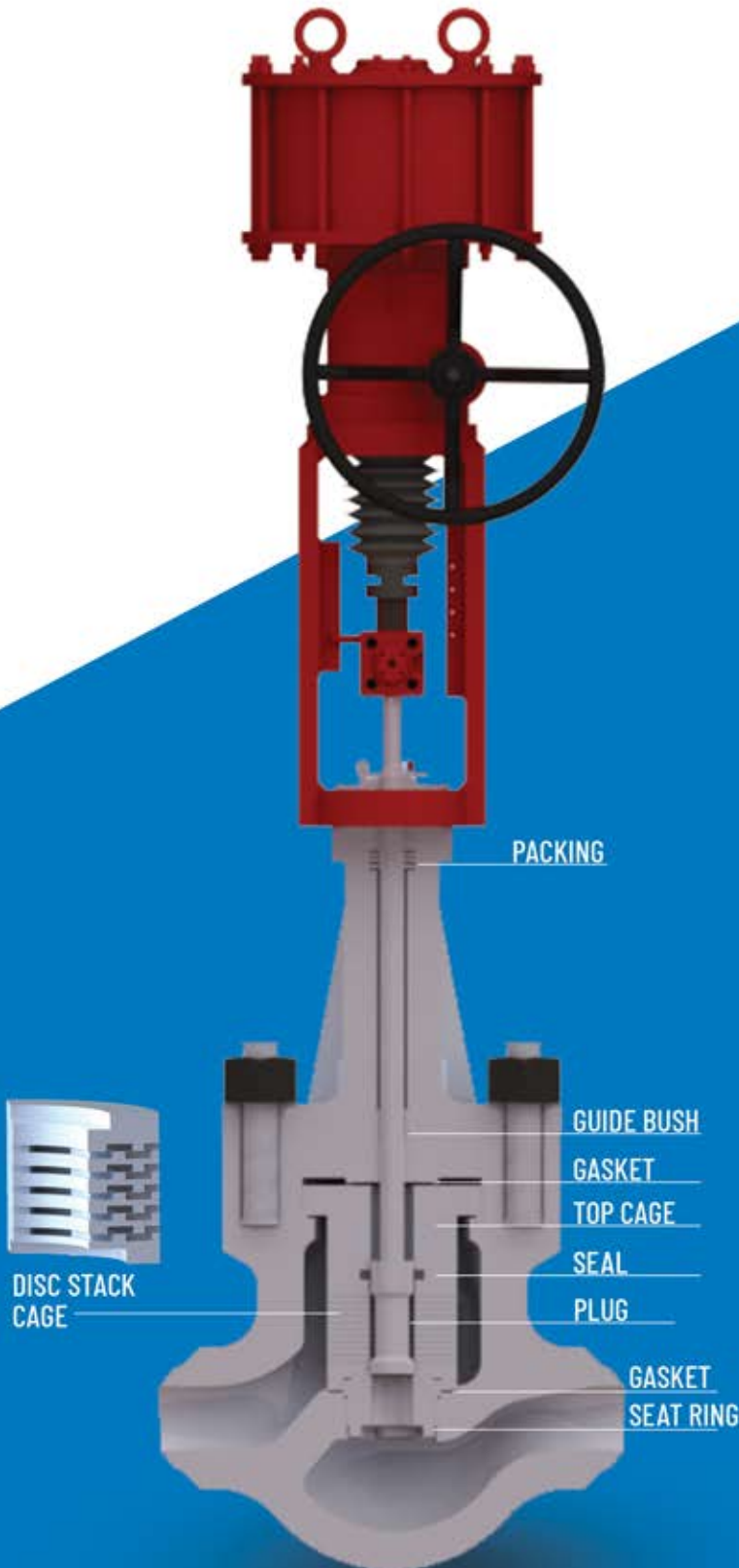


Pressure and velocity profile on conventional valve in steam servi



Pressure and velocity profile on Disc stack valve to reduce noise

By allowing the flow to pass through multiple smaller flow paths instead of a large orifice, noise generated during valve operation is strategically shifted to higher frequencies. These higher frequencies will not cause serious problems to human hearing and pipework. In addition to this, staged pressure drop through a specially designed flow path will reduce the velocity peak at vena contracta. This will also contribute to noise reduction.



## FEATURES

- Each disc is tailor-made for the particular flow condition
- 3 Dimensional flow paths and better space utilization
- Tortuous path trim design
- Ensures complete control, reliability and stability
- Multi staged pressure reduction
- Controlled noise and velocity levels
- Flow path design verified in CFD and lab tests
- Custom built trim for site conditions
- Expanding flow path to control flow velocity
- Pressure recovery factor up to 0.998
- Vibration free operation
- Wide rangeability
- Economic design and manufacturing with high quality

## PRODUCT SPECIFICATION

Sizes	1/2 in. to 16 in.
Pressure rating	ASME B 16.34, Rating 150 to 4500
Body types	Globe, Angle and Z type
Pressure reducing stages	Upto 30 and higher on large size valves
Fluid temperature range	-30deg C to 580 deg C
Bonnet style	Bolted bonnet: Plain, Finned, Extended
End Connection	Flanged End(RF,RJ) Socket weld Butt weld Special available
Seat design	Metallic seat, soft seat
Plug design	Balanced and unbalanced
Guiding	Disc stack cage
Characteristic	Linear, Mod-Linear, Mod-Equal , Quick open and customized Characteristic on request
Rangeability	30:1(Higher rangeabilities available on specific request)
Shutoff capabilities	Class IV, Class V, Class VI (with soft seat)
Body material	Carbon steel ASTM A 216 WCB Stainless steel ASTM A351 CF8, CF8M Alloy steel A217 WC6 WC Hastelloy & Alloy 20 Other materials against specific request
Trim material	SS304L,SS440C MONEL, Hastelloy, Titanium, Alloy 20, SS420C, Inconel 718, 17-4-PH,CA6NM, Other materials against specific request





**INDIA'S NO.1 VALVE MANUFACTURER**



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