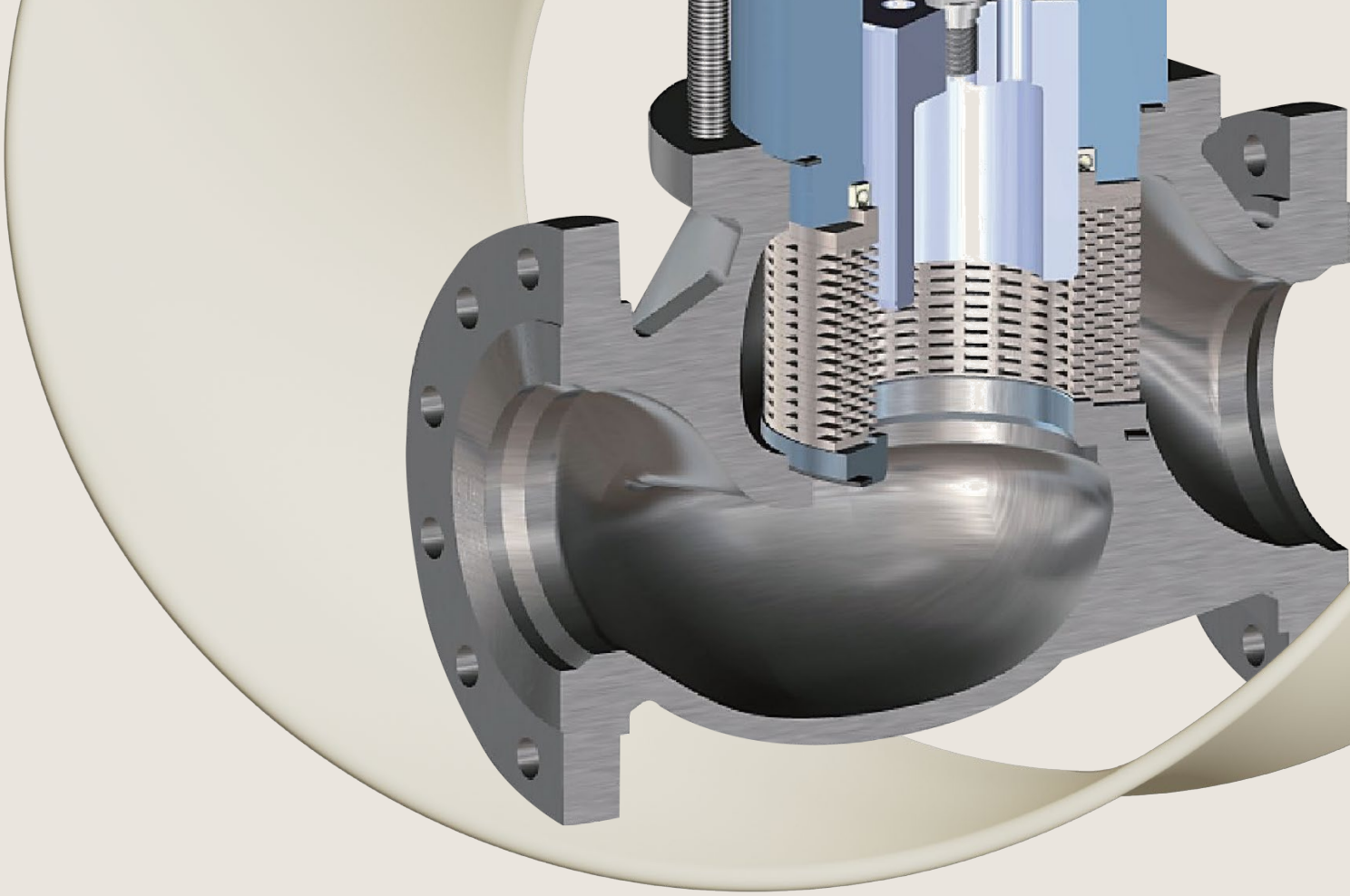
Process Automation

IMI CCI

900D Control Valve

Breakthrough engineering for a better world



900D

DRAG® Control Valve

IMI CCI's DRAG® technology, pioneered in 1961, is the industry's leading solution for handling demanding service conditions. The 900D is designed to deliver peak process performance with superior control while minimising losses caused by valve leakage.

The DRAG® technology reduces your equipment and maintenance costs through dramatic reductions in cavitation and vibration - the root cause of damage to trim, adjacent equipment and piping. Supported by world class technical expertise of The Valve Doctor® programme, the 900D is a continuation of IMI CCI's industry-leading critical application solutions that customers trust.

Key features

Multi-path, multi-stage DRAG®
Eliminates cavitation, noise, and vibration with up to 24 stages, increasing equipment life and reducing maintenance costs

Tight shutoff
Reduces leakage, with options available in Class IV, V and VI with soft seat

Top entry design
Offers Teflon and graphite seals for enhanced sealing performance

Trim characterisation
Provides linear, equal percentage, and custom options to meet specific process requirements

Quick change trim
Enables easy maintenance with no screwed or welded internal components

Optimised packing system
Reduces Fugitive Emission using packing system qualified by an authorised third party

Benefits

Control and reliability

The 900D continues IMI CCI's tradition of customising valve performance to meet the exacting requirements of your application. In addition to linear and equal percentage characterisation, the 900D can be custom characterised for applications that require critical control.

Solves cavitation

- Maintains the fluid velocity at minimum levels so that local pressures are unlikely to drop below the fluids vapour pressure
- Should gas bubbles form, DRAG® reduces the energy to a safe level by dividing the flow into many small channels
- The 900D adheres to ISA guidelines on trim exit velocity

Solves noise

IMI CCI's philosophy on noise control is to avoid the creation of noise as opposed to trying to muffle it once it's produced. With the 900D, the amount of noise that must be absorbed by the pipe wall or insulation is reduced drastically, and the noise sensed in the vicinity of the valve is at acceptable levels:

- DRAG® operates <85 dBA
- Eliminates worker safety concerns
- Eliminates additional insulation & acoustic barriers
- Maximises process flow rates

Solves vibration

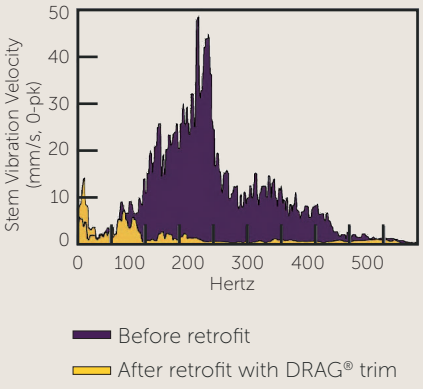
IMI CCI has extensive experience in helping customers eliminate the damage caused by vibration. The chart shows the dramatic results of applying DRAG® technology and kinetic energy control. Customers typically experience a 90% decrease in peak vibration with the application of DRAG®, and that enables them to:

- Eliminate valve and piping damage
- Minimise system trips
- Minimise downtime and maintenance costs
- Eliminate additional piping supports

Technical support

Whether you are starting up a new plant or improving your current process, IMI CCI can offer world-class technical expertise to ensure optimum process performance. The Valve Doctor® experts evaluate your specific process conditions, identify potential problems before they happen and recommend the correct control valve solution to avoid costly mistakes during installation and operation.
IMI CCI's expertise extends beyond control valve design to actuation, noise reduction, system piping and system operation. The Valve Doctor® experts can impact your bottom line operational performance.

Stem vibration velocity for a conventional valve



Applications

Power

- HP Heater Emergency Drains
- Feedwater Regulators
- Startup Feed Regulators
- Soot Blowing
- General Turbine Island BOP
- Condensate Pump Recirculation
- Supercritical Startup Valve
- Deaerator Level Control
- DA Pegging
- Auxiliary Steam PCV

Nuclear

- Atmospheric Dump
- Feedwater Pump Recirculation
- Auxiliary Steam to Deaerator
- Blow Down
- Condensate Drain
- Deaerator Level Control
- Feedwater Heater Drains
- Steam Bypass
- Condenser Dump (Turbine Bypass)
- Feedwater Regulator
- Condensate Pump Recirculation

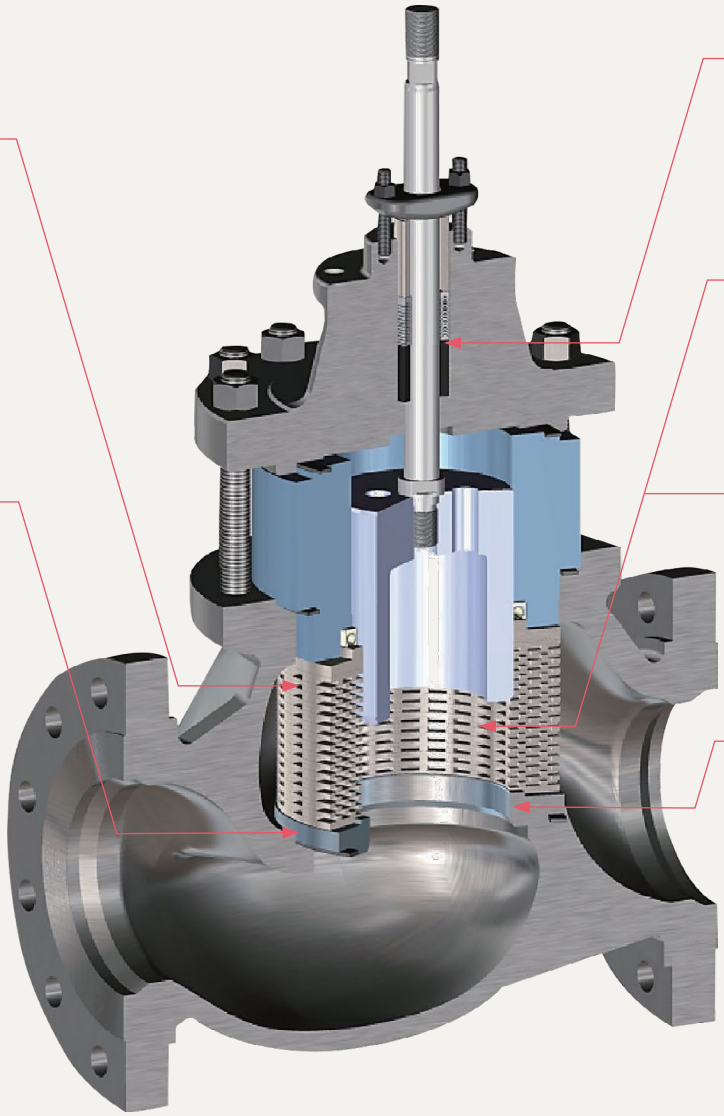
Oil & Gas

- Extraction Steam Control
- Fire Water Pump Recirculation
- Fire Water Pump Discharge
- Gas Injection
- Gas Withdrawal (Clean)
- Emergency and Service Vents
- Fuel Gas Regulation Valves
- Compressor Anti-surge
- Hot Gas Bypass
- Process gas to vent/flare
- Expander Bypass (JT Valves) (noncryogenic)
- Feedstock Flow/Pressure Control
- Passivation Valve
- Feedgas Regulator
- Lean Amine Pump
- Recirculation Control
- Produced Water Injection (Clean)
- Refinery and Petrochemicals
- Other applications in various industries

Design features

Multi-stage DRAG®
Control Element
Eliminates cavitation, noise, and vibration. Increases life and reduces maintenance costs.

Tight shutoff
Reduces leakage by optimised seal packing system.
Available in Class IV, V & VI with soft seat.



Top entry design
Teflon and graphite seals available.

Trim characterisation
Linear and equal percentage custom characterisation available to match specific process requirements.

Reduced noise
Max. 24 trim stage enables to meet noise requirements.

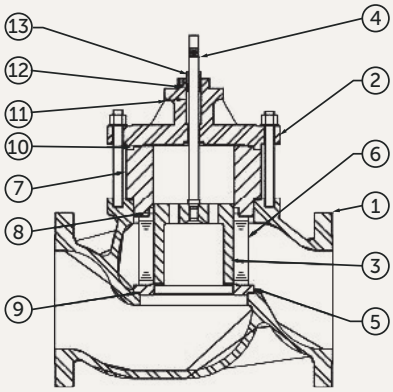
Easy maintenance
Quick change trim allows for ease of maintenance, no internal components are screwed or welded into valve body or bonnet.

Product specification

Body type		Globe / Angle
Valve size	Body	1" to 16" (25mm to 400mm)
	Trim	1" to 14" (25mm to 356mm) with one or two step smaller size
Trim type		DRAG® multi-path, multi-stage trim with up to 24 stages
Trim characteristics		Linear, Equal percentage, Custom characterisation
Pressure rating		Class 150, 300, 600, 900, 1500, 2500 ASME B16.34 standard pressure rating
Temperature range		-320 to 1076°F (-196 to 580°C)
Face-to-Face		ISA 75.08 - 2002 (except where noted)
Shut-off class		ANSI/FCI 70.2 Leakage Class IV, V, VI (soft seat)
Flow direction		Flow-To-Closed (OTP, Liquids), Flow-To-Open (UTP, Gas)
End connection		Raised Face Flange, RTJ Flange, Butt Weld End (BWE or SWE)
Stem packing		PTFE Chevron V-Rings or graphite (optional FET and Live Loading)
Balance seal		PTFE spring-energized U-cup or Graphite
Actuator type		IMI CCI spring diaphragm, IMI CCI double acting piston
Fail mode		Open, Close, In-Place
Stroke time		Standard stoke: < 30 sec Fast stroke: < 1 sec to open, < 5 sec to close (lower stroking times available upon request)

Materials

No.	Component	Material Options
1	Body	Carbon Steel, Chrome-Moly Steel, Stainless Steel, other
2	Bonnet	
3	Plug	316SS Chr Plt or Stellite, 410 SS HT. Inconel 625, UNS S31803 Chr Plt or Stellite, F11 Stellite, F22 Stellite
4	Stem	316 SS Chr Plt, UNS S31803 Chr Plt, 410 SS Heat Treated, Inconel 718, 17-4PH H1150M
5	Seat	316 SS, 316 SS with Stellite, 410 SS Heat Treated, Inconel 718. UNS S31803, UNS S31803+Stellite, F11+Stellite, F22+Stellite
6	Disk Stack	316 SS, 410 SS, Inconel718, S31803
7	Balance Cylinder	Carbon Steel, Chrome-Moly Steel, Stainless Steel, other
8	Balance Seal	PTFE+316 SS, Graphite
9	Seat Gasket	347 SS with Graphite Filler
10	Body / Bonnet Gaskets	347 SS with Graphite Filler
11	Packing Spacer	316 SS
12	Packing Set	Glass Filled PTFE, Graphite
13	Packing Follower	316 SS



Cv ratings

Inch (mm)		Globe Body				Angle Body			
		Linear Trim		EQ % Trim		Linear Trim		EQ % Trim	
Valve Size NPS	Port Size	FTC	FTO	FTC	FTO	FTC	FTO	FTC	FTO
1 (25)	1 (25)	11	11	8	9	12	13	8	10
1.5 (40)	1.5 (40)	25	25	15	19	29	29	15	21
2 (50)	2 (50)	45	46	25	32	52	53	26	34
3 (80)	2 (50)	50	54	37	43	59	66	41	49
3 (80)	2.5 (65)	72	73	56	68	112	112	84	90
4 (100)	2.5 (65)	69	77	48	56	79	92	50	61
4 (100)	3 (80)	101	105	72	91	145	146	121	128
6 (150)	3 (80)	139	141	86	103	187	192	94	119
6 (150)	4 (100)	188	187	138	174	259	272	160	198
6 (150)	5 (125)	291	291	185	233	326	377	225	299
8 (200)	5 (125)	337	363	221	254	414	466	239	282
8 (200)	6 (150)	417	419	258	324	477	561	407	322
10 (250)	6 (150)	469	499	341	427	569	623	387	512
10 (250)	8 (200)	714	746	467	594	872	983	615	767
12 (300)	8 (200)	803	883	596	724	957	1,102	651	830
12 (300)	10 (250)	1,166	1,166	722	848	1,317	1,549	922	1,148
14 (350)	12 (300)	1,674	1,679	913	1,082	N/A	N/A	N/A	N/A
16 (400)	14 (350)	2,277	2,285	1,254	1,450	N/A	N/A	N/A	N/A

* All Cv values in the above table refer to maximum rated Cv, but not limited.
** Please note that all Cv values are for reference only.

Valve sizing

Inch (mm)		ANSI Class					
Valve Size NPS	Port Size	150	300	600	900	1500	2500
1 (25)	1 (25)	Globe / Angle	Globe / Angle	Globe / Angle	N/A	N/A	N/A
1.5 (40)	1.5 (40)	Globe / Angle	Globe / Angle	Globe / Angle	N/A	N/A	N/A
2 (50)	2 (50)	Globe / Angle	Globe / Angle	Globe / Angle	N/A	N/A	N/A
3 (80)	2 (50)	Globe / Angle	Globe / Angle	Globe / Angle	Globe / Angle	Globe / Angle	Globe / Angle
3 (80)	2.5 (65)	Globe / Angle	Globe / Angle	Globe / Angle	Globe / Angle	Globe / Angle	Globe / Angle
4 (100)	2.5 (65)	Globe / Angle	Globe / Angle	Globe / Angle	Globe / Angle	Globe / Angle	Globe / Angle
4 (100)	3 (80)	Globe / Angle	Globe / Angle	Globe / Angle	Globe / Angle	Globe / Angle	Globe / Angle
6 (150)	3 (80)	Globe / Angle	Globe / Angle	Globe / Angle	Globe / Angle	Globe / Angle	Globe / Angle
6 (150)	4 (100)	Globe / Angle	Globe / Angle	Globe / Angle	Globe / Angle	Globe / Angle	Globe / Angle
6 (150)	5 (125)	Globe / Angle	Globe / Angle	Globe / Angle	Globe / Angle	Globe / Angle	Globe / Angle
8 (200)	5 (125)	Globe / Angle	Globe / Angle	Globe / Angle	Globe	Globe	Globe / Angle
8 (200)	6 (150)	Globe / Angle	Globe / Angle	Globe / Angle	Globe	Globe	Globe / Angle
10 (250)	6 (150)	Globe / Angle	Globe / Angle	Globe / Angle	Globe	Globe	N/A
10 (250)	8 (200)	Globe / Angle	Globe / Angle	Globe / Angle	Globe	Globe	N/A
12 (300)	8 (200)	Globe	Globe	Globe	Globe / Angle	Globe / Angle	N/A
12 (300)	10 (250)	Globe	Globe	Globe	Globe / Angle	Globe / Angle	N/A
14 (350)	12 (300)	Globe	Globe	Globe	N/A	N/A	N/A
16 (400)	14 (350)	Globe	Globe	Globe	N/A	N/A	N/A

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