

C series

cage design
control valves



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About the C series

The C series is a cage design control valve that conforms to the requirements laid down by ANSI B 16.34 and ASME VIII, and is compatible with all industry standard interface devices.

At its heart is a cage-guided plug that provides:

- Excellent control of the process over high differential pressures
- Quick and easy maintenance

Conceived specifically with erosive, cavitating and noisy applications in mind, the modular design concept of the valve means many control valve solutions may be achieved from a single valve envelope.

Pneumatic or electrically operated, the C series features:

- Standard valve sizes in 1" to 8" (DN25 to DN200)
- Body rating to ANSI Class 300 and 600
- A wide range of industry standard pipe connections
- Reduced flow capacities for load matching
- Characterised cage flow
- Perforated trims for noise and cavitation problems
- Wide range of materials to meet the varying demands from industry, including hard faced trims




The range at a glance

Valve type	Class rating	Valve sizes	Body materials	Connections	Flow type	Reduced flow options	Noise reduction and anti-cavitation trims	Hard facing for erosive duty	Manual handwheel
Unbalanced and balanced	ANSI 300	1" to 8" (DN25 to DN200) Larger sizes are available to order	Carbon steel (WCB)	Flanged	Equal %	Yes	Yes	Yes	Yes
	ANSI 600		Butt weld	Modified equal %					
	A higher rating is available to order		Socket weld	Linear					
			Ring type joint	Fast opening					
			Stainless steel (C8FM)						
			Alloy (WC6)						
			Other materials are available to order						


Available options

Extended bonnets for high and low temperature service and stainless steel bellows for low maintenance, high temperature and zero emission requirements

Bellows sealed bonnet





Extended bonnet



Valve stem sealing options include PTFE chevrons and high temperature graphite rings

Chevron

Graphite

Unbalanced plug




Balanced plug




Balanced plug option for high differential pressures

Cage design trim gives stable control with equal percentage, fast opening and linear flow characteristic for process load matching


Equal percentage




Fast opening




Linear




One stage cage



Two stage cage



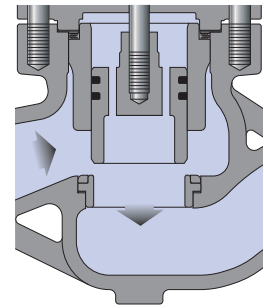
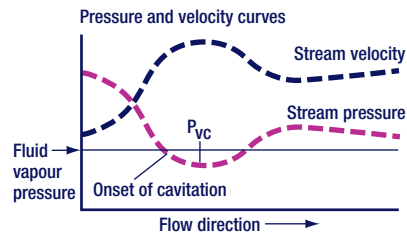
Three stage cage



One, two and three stage cage options for noise reduction and anti-cavitation applications

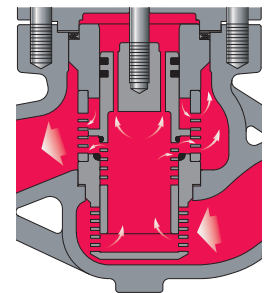
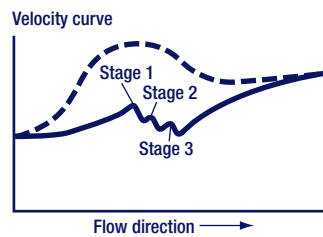
Fluid flow through a valve

When fluid flows through a valve the resistance to flow causes pressure to be dropped and velocity to increase by the same proportion. The more resistance the valve provides, the greater the pressure drop and the greater the increase in velocity. Depending on the flow conditions, this change in energy through the valve can create aerodynamic noise and cavitation.



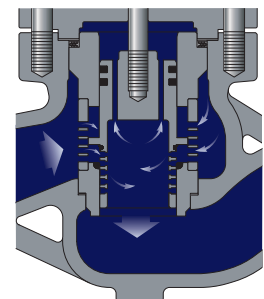
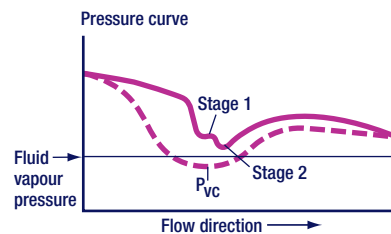
Aerodynamic - The solution

Controlling aerodynamic noise is a function of controlling the velocity through the valve. By employing a number of cages, which provide successive energy absorbing pressure drops, the velocity through the valve is controlled to acceptable levels. Where the conditions require further treatment, external devices such as baffle plates and silencers may be employed.



Cavitation - The solution

Controlling cavitation is a function of controlling the pressure at the vena contracta (P_{vc}). By employing a number of cages, which provide successive energy absorbing pressure drops, the resistance of the flow path increases and the P_{vc} is controlled. The result is that the onset of cavitation can be avoided. Where the conditions require further treatment, external devices such as baffle plates can be employed.



Industries, fluids and applications - Where the C series has been frequently used

Industries	Fluids	Applications
Pharmaceuticals	Saturated steam	Turbine bypass
Chemical plants	Superheated steam	Pressure reduction
Power generation	Feedwater	Temperature control
Co-generation	Water	Desuperheating
Oil and gas	Petroleum	Boiler level control
Shipyards	Natural gas	Backpressure control
Textiles	Methane	
Foods	Air	
Paper	Nitrogen	

Summary of key features and benefits

	Key features	Key reasons	Key benefits
	Excellent control	Cage guided internals minimise lateral deflection of the plug. Characterised cage windows give precise flow characteristics. Reduced flow options for load matching.	Guaranteed control performance over a wide range of process conditions.
	Wide range of process fluids and conditions	Balanced plug option for high differential pressures. Three stages of perforated cage for cavitation and noise problems. Hard facing for erosive duties. Bellows seal for high and low temperatures and low emissions. Extended bonnets for high and low temperatures. Many material options.	Common control valve range and spares for all your process needs, simplifies maintenance and reduces plant downtime.
	Long stem seal life	High quality machined stem finish minimises stem friction and seal wear. Wiper rings clean the valve stem during operation and prevent particles entering and damaging the stem seal. Caged internals and stem bushes ensure excellent alignment, even under high differential pressures.	Extended maintenance intervals.
	Long actuator life on a wide range of industry applications	Internally treated surfaces to protect against atmospheric corrosion. High strength cast steel yoke. Anti-rotation device preventing damage to the diaphragm. Rolling diaphragm design based on Spirax Sarco's proven actuator technology.	Low lifetime cost of ownership.
	Quick and easy maintenance	Valve internals, seat and cage, are clamped in place.	No special tools required to change the components. Minimal maintenance downtime.
	Worldwide traceability	A unique serial number is allocated to every valve.	The unique features of your valve and actuator can be identified for replacement and maintenance purposes, wherever you are in the world.
	Part of a total controls solution from Spirax Sarco	One of many controls and instrumentation products that may be acquired separately or as a complete one-stop-shop controls solution.	Peace of mind that your purchases are supported wherever you are in the world and that one single contact will fulfil your controls requirements, from design to after sales service.

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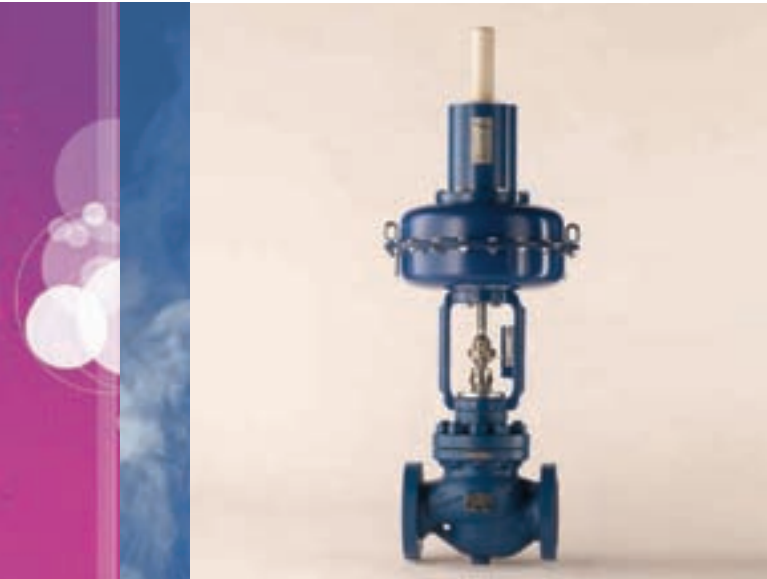
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