DSE SERIES

HIGH PERFORMANCE CONTROL VALVE SERIES



Armstrong®

EXPERIENCE MATTERS™

Innovative Technology for Critical Service Applications

DSE Series from Armstrong is the evolution of the reliable and proven DBOY control valve. The DSE Series is an all-purpose cage-guided, globe balanced control valve.

This product offers simplicity of design in a valve platform that is well suited for the needs of power, oil & gas, process, and general industry. A wider selection of valve sizes, materials, and noise / cavitation trims allows application across a broader range of flow rates, pressures and temperatures.

The DSE Series is suitable for a wide range of applications from mild temperature/pressure service to noise and cavitation service.



HARDENED STAINLESS STEEL TRIM

Standard valve trim consists of heat-treated and hardened 400 series stainless steel providing maximum hardness with excellent wear properties, in addition, 316 stainless steel is offered for superior corrosion resistance. Seating surfaces can be additionally armored with a nickel/cobalt overlay on the 316 Stainless steel base material providing significantly longer service life than 316 stainless steel trims.

CAGE OPTIONS

Interchangeable trim and cages offer maximum versatility in flow control applications.

Cage variations include:

- reduced trim which provides capacities from 80% to 40% of full trim capacity. This feature can be used to control valve body velocities, to plan for future flow expansion, or to correct for oversized conditions.
- Les-Cav cage effectively prevents any valve trim damage due to valve cavitation.
- Les-Sonic cage effectively reduces noise at the source in either a single-stage or two-stage construction.

BALANCED PLUG DESIGN

The balanced plug design of the DSE Series equalizes line pressure under the plug with pressure above the plug, effectively cancelling any unbalanced stem force due to pressure drop, to providing smooth, high-pressure control. Balanced plugs allow use of smaller, lighter, cost-effective actuators. Class IV o V shut off can be provided.

HIGH FLOW CAPACITIES

DSE Series flow capacities are greater than or equal to competing products. Optimized flow geometry reduces body velocities and pressure losses, maximizing valve body life.

CAGE RETAINED SEAT DESIGN

Unlike some competing designs, which use complicated seat retention methods, the DSE Series cage and seat ring are clamped in place between the bonnet and body. This design eliminates the maintenance problems associated with removal of screwed seat rings.

RUGGED PLUG SEAL

DSE Series heavy cupwasher style PTFE plug seal has three times the cross-sectional area and wear surface of competing designs with minimal friction for tightest resolution. Pressure energized to provide a tight seal at low and high pressures, DSE Series seal provides tight shut-off for longer than competitive designs.

RELIABLE ACTUATOR CONNECTION

DSE Series actuators are clamped in place with a simple and reliable yoke lock nut. Actuator mounting guarantees ease of disassembly no matter how corrosive the environment.

REDUCED SEAT WEAR / TIGHTER SHUT-OFF

DSE Series control valves are specifically designed for high pressure drop service. Pressure drop, high velocities and throttling occur only at the cage window and the plug, thereby protecting the seat ring and shut-off class of the valve.

Designs, materials, weights and performance ratings are approximate and subject to change without notice.
Visit **armstrong**international.eu for up-to-date information.

DSE SERIES CONTROL VALVES

SIZES 2" – 16"
ANSI CLASS 150 to 2500 (PN16 to 420)

- **High Flow Capacities** promote reduced body velocity and reduce pressure loss
- **Balanced Plug Design** provides smooth high pressure control
- **Multiple Cage Options** for maximum versatility
- **Cup Seal** with three times the wear surface of competitive valves for long-lasting leak tight seal
- **Hardened/Stainless Steel Trim** provides twice the service life of 316 stainless trim
- **Tighter Shutoff** design provides exceptional performance up to Class V metal seating
- **Temperature Rating** up to 1,000F (538°C)
- **Ultra Compact Actuators** install in tight spaces
- **Yoke Lock Nut** guarantees easy disassembly

APPLICATION DATA

- Control systems for Power, Oil & Gas, Chemical, Petrochemical, Pulp and Paper, Food, & other industries
- Feedwater and fuel system controls in boiler rooms
- Packaged systems (OEM) such as heat exchangers, water purification systems & vaporizers, metal cleaning and plating

MATERIALS

- Carbon steel WCC, WC9, Stainless Steel CF8M
- On request LCC, Chrome-Moly, Inconel, Duplex, Hastelloy, Monel, Alloy 20, most Alloys

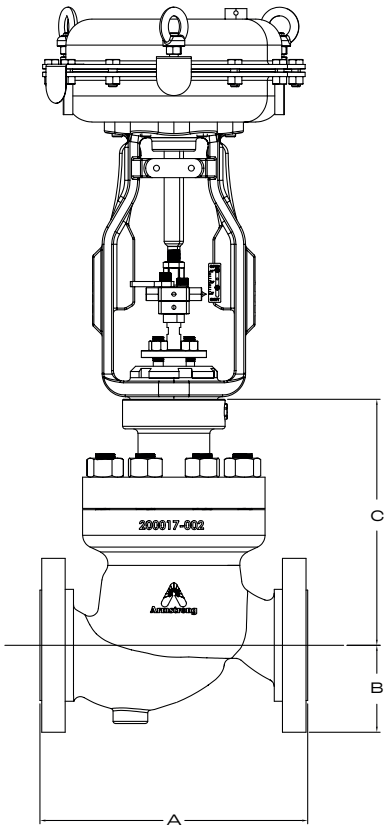
OPTIONS

- Multi-Spring & Piston Actuators Available
- Threaded, Socketweld, Buttweld End, Flanged RF and RTJ Connections
- Positioners (Pneumatic/ Electronic/Digital)
- Singe and double Stage Noise and Cavitation Reducing Trim
- Reduced Flow Cages (0.8, 0.6, 0.4 Factor)
- Alternate (double) Packing sets for Severe Service
- High Temperature Trim
- Labyrinth Trim available on request

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DSE SERIES CONTROL VALVES
Dimensions

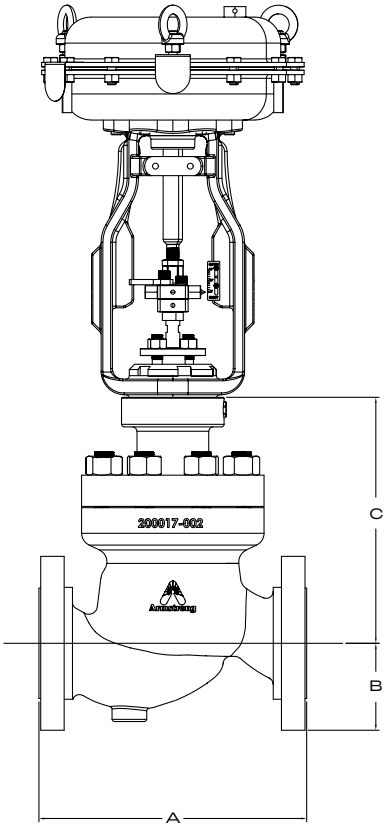
Raised Face Dimensions - inches (mm)							
Size		(A)					
	Threaded NPT	150	300	600	900	1500	2500
2 (50)	11.3 (286,0)	10.0 (254,0)	10.5 (267,0)	11.25 (286,0)	14.75 (375,0)	14.75 (375,0)	16.25 (400,0)
3 (80)	-	11.75 (298,0)	12.5 (318,0)	13.25 (337,0)	17.38 (441,0)	18.12 (460,0)	26.0 (660,0)
4 (100)	-	13.88 (352,0)	14.5 (368,0)	15.5 (394,0)	20.12 (511,0)	20.87 (530,0)	29.0 (737,0)
6 (150)	-	17.75 (451,0)	18.62 (473,0)	20.0 (508,0)	28.12 (714,0)	30.25 (768,0)	34.0 (864,0)
8 (200)	-	21.38 (543,0)	22.38 (568,0)	24.0 (610,0)	36.0 (914,0)	38.25 (972,0)	40.25 (1022,0)
10 (250)	-	26.5 (673,0)	27.88 (708,0)	29.62 (752,0)	39.0 (991,0)	42.0 (1.067,0)	50.0 (1.372,0)
12 (300)	-	29.0 (737,0)	30.5 (775,0)	32.25 (819,0)	44.5 (1.130,0)	48.0 (1.219,0)	62.0 (1.575,0)
16 (400)	-	40.0 (1.016,0)	41.62 (1.057,0)	43.62 (1.108,0)	56.0 (1.422,0)	56.0 (1.422,0)	-



Raised Face Dimensions - inches (mm)												
Size	(B)						(C)					
	150	300	600	900	1500	2500	150	300	600	900	1500	2500
2 (50)	2.8 (70,0)	2.8 (70,0)	2.8 (70,0)	2.9 (73,0)	2.9 (73,0)	3.3 (85,0)	8.8 (224,50)	8.8 (224,50)	8.8 (224,50)	8.8 (224,50)	8.8 (224,50)	10.3 (262,0)
3 (80)	3.5 (90,0)	3.5 (90,0)	3.5 (90,0)	30.5 (90,0)	3.8 (96,0)	4.3 (110,0)	11.1 (283,0)	11.1 (283,0)	11.1 (283,0)	11.1 (283,0)	11.1 (283,0)	14.1 (357,0)
4 (100)	3.9 (100,0)	3.9 (100,0)	3.9 (100,0)	4.6 (118,0)	5.3 (135,0)	5.9 (150,0)	11.9 (302,0)	11.9 (302,0)	11.9 (302,0)	11.9 (302,0)	11.9 (302,0)	14.8 (375,0)
6 (150)	5.9 (150,0)	3.9 (150,0)	5.9 (150,0)	6.8 (172,0)	7.3 (185,0)	8.1 (205,0)	14.1 (358,0)	14.1 (358,0)	14.1 (358,0)	14.1 (358,0)	14.1 (358,0)	15.4 (391,0)
8 (200)	7.6 (193,0)	7.6 (193,0)	7.6 (193,0)	8.7 (220,0)	9.5 (241,0)	10.4 (265,0)	16.8 (426,0)	16.8 (426,0)	16.8 (426,0)	16.8 (426,0)	16.8 (426,0)	21.3 (540,0)
10 (250)	9.3 (235,0)	9.7 (245,0)	9.7 (245,0)	9.8 (250,0)	10.6 (270,0)	11.4 (290,0)	21.7 (550,0)	21.7 (550,0)	21.7 (550,0)	22.4 (570,0)	22.4 (570,0)	24.2 (615,0)
12 (300)	10.6 (270,0)	10.6 (270,0)	10.6 (270,0)	11.2 (285,0)	12.0 (305,0)	13.0 (330,0)	24.4 (620,0)	24.4 (620,0)	24.4 (620,0)	24.6 (626,0)	24.6 (626,0)	24.9 (632,0)
16 (400)	13.2 (334,0)	13.6 (344,50)	13.8 (350,0)	14.2 (360,0)	15.2 (385,0)	-	27.3 (694,0)	27.3 (694,0)	27.3 (694,0)	31.7 (805,0)	31.7 (805,0)	-

DSE SERIES CONTROL VALVES
Dimensions

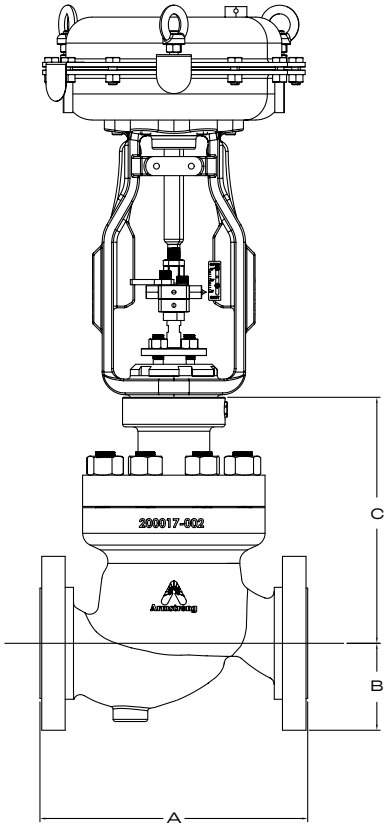
Butt Weld Dimensions - inches (mm)						
Size	(A)					
	150	300	600	900	1500	2500
2 (50)	11.25 (286,0)	11.25 (286,0)	11.25 (286,0)	14.8 (375,0)	14.8 (375,0)	15.7 (400,0)
3 (80)	13.25 (337,0)	13.25 (337,0)	13.25 (337,0)	18.1 (460,0)	18.1 (460,0)	19.6 (498,0)
4 (100)	15.5 (394,0)	15.5 (394,0)	15.5 (394,0)	20.9 (530,0)	20.9 (530,0)	22.6 (575,0)
6 (150)	20.0 (508,0)	20.0 (508,0)	20.0 (508,0)	30.2 (768,0)	30.2 (768,0)	32.2 (819,0)
8 (200)	24.0 (610,0)	24.0 (610,0)	24.0 (610,0)	32.8 (832,0)	32.8 (832,0)	40.5 (1.029,0)
10 (250)	29.62 (752,0)	29.62 (752,0)	29.62 (752,0)	39.0 (991,0)	39.0 (991,0)	50.0 (1.270,0)
12 (300)	32.35 (819,0)	32.35 (819,0)	32.35 (819,0)	44.5 (1.130,0)	44.5 (1.130,0)	56.0 (1.422,0)
16 (400)	43.62 (1.108,0)	43.62 (1.108,0)	43.62 (1.108,0)	56.00 (1.422,0)	56.00 (1.422,0)	72.40 (1.803,0)



Butt Weld Dimensions - inches (mm)												
Size	(B)						(C)					
	150	300	600	900	1500	2500	150	300	600	900	1500	2500
2 (50)	2.8 (70,0)	2.8 (70,0)	2.8 (70,0)	2.9 (73,0)	2.9 (73,0)	2.9 (73,0)	8.8 (224,5)	8.8 (224,5)	8.8 (224,5)	8.8 (224,5)	8.8 (224,5)	10.3 (262,0)
3 (80)	3.5 (90,0)	3.5 (90,0)	3.5 (90,0)	3.5 (90,0)	3.8 (96,0)	3.8 (96,0)	11.1 (283,0)	11.1 (283,0)	11.1 (283,0)	11.1 (283,0)	11.1 (283,0)	14.1 (357,0)
4 (100)	3.9 (100,0)	3.9 (100,0)	3.9 (100,0)	4.6 (118,0)	5.3 (135,0)	5.3 (135,0)	11.9 (302,0)	11.9 (302,0)	11.9 (302,0)	11.9 (302,0)	11.9 (302,0)	14.8 (375,0)
6 (150)	5.9 (150,0)	5.9 (150,0	5.9 (150,0)	6.8 (172,0)	7.3 (185,0)	7.3 (185,0)	14.1 (358,0)	14.1 (358,0)	14.1 (358,0)	14.1 (358,0)	14.1 (358,0)	15.4 (391,0)
8 (200)	7.6 (193,0)	7.6 (193,0)	7.6 (193,0)	8.7 (220,0	9.5 (241,0)	9.5 (241,0)	16.8 (426,0)	16.8 (426,0)	16.8 (426,0)	16.8 (426,0)	16.8 (426,0)	21.3 (540,0)
10 (250)	9.3 (235,0)	9.7 (245,0)	9.7 (245,0)	9.8 (250,0)	10.6 (270,0)	11.4 (290,0)	21.7 (550,0)	21.7 (550,0	21.7 (550,0)	22.4 (570,0)	22.4 (570,0)	24.2 (615,0)
12 (300)	10.6 (270,0)	10.6 (270,0)	10.6 (270,0)	11.2 (285,0)	12.0 (305,0)	13.0 (330,0)	24.4 (620,0)	24.4 (620,0	24.4 (620,0)	24.6 (626,0)	24.6 (626,0)	24.9 (632,0)
16 (400)	13.6 (344,5)	13.6 (344,5)	13.8 (350,0)	14.2 (360,0)	15.2 (385,0)	16.1 (410,0)	27.3 (694,0)	27.3 (694,0)	27.3 (694,0)	31.7 (805,0)	31.7 (805,0)	27.5 (699,0)

DSE SERIES CONTROL VALVES
Dimensions

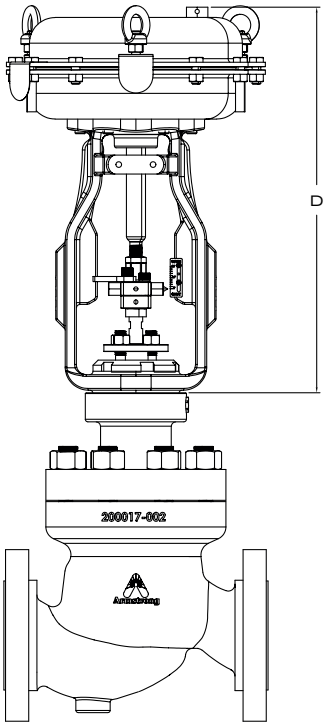
Ring Joint Dimensions - inches (mm)						
Size	(A)					
	150	300	600	900	1500	2500
2 (50)	10.5 (267,0)	11.1 (283,0)	11.4 (289,0)	14.9 (378,0)	14.9 (378,0)	15.9 (403,0)
3 (80)	12.2 (311,0)	13.1 (334,0)	13.4 (340,0)	17.5 (444,0)	18.2 (463,0)	26.2 (666,0)
4 (100)	14.4 (365,0)	15.1 (384,0)	15.6 (397,0)	20.2 (514,0)	21.0 (533,0)	29.4 (747,0)
6 (150)	18.3 (464,0)	19.3 (489,0)	20.1 (511,0)	28.2 (717,0)	30.5 (774,0)	34.45 (877,0)
8 (200)	21.9 (556,0)	23.0 (584,0)	24.1 (613,0)	36.1 (917,0)	38.7 (982,0)	40.9 (1.038,0)
10 (250)	27.0 (686,0)	28.5 (724,0)	29.7 (755,0)	39.1 (994,0)	42.4 (1.077,0)	54.9 (1.394,0)
12 (300)	29.5 (750,0	31.1 791,0	32.4 (822,0	44.6 (1.133,0)	48.6 (1.235,0)	62.9 (1.597,0)
16 (400)	40.5 (1.029,0)	42.2 (1.073,0)	43.7 (1.111,0)	56.4 (1.432,0)	56.9 (1.444,0)	-



Ring Joint Dimensions - inches (mm)												
Size	(B)						(C)					
	150	300	600	900	1500	2500	150	300	600	900	1500	2500
2 (50)	2.8 (70,0)	2.8 (70,0)	2.8 (70,0)	2.9 (73,0)	2.9 (73,0)	2.9 (73,0)	8.8 (234,5)	8.8 (234,5)	8.8 (234,5)	8.8 (234,5)	8.8 (234,5)	10.3 (262,0)
3 (80)	3.5 (90,0)	3.5 (90,0)	3.5 (90,0)	30.5 (90,0)	3.8 (96,0)	3.8 (96,0)	11.1 (283,0)	11.1 (283,0)	11.1 (283,0)	11.1 (283,0)	11.1 (283,0)	14.1 (357,0)
4 (100)	3.9 (100,0)	3.9 (100,0)	3.9 (100,0)	4.6 (118,0)	5.3 (135,0)	5.3 (135,0)	11.9 (302,0)	11.9 (302,0)	11.9 (302,0)	11.9 (302,0)	11.9 (302,0)	14.8 (375,0)
6 (150)	5.9 (150,0)	5.9 (150,0)	5.9 (150,0)	6.8 (172,0)	7.3 (185,0)	7.3 (185,0)	14.1 (358,0)	14.1 (358,0)	14.1 (358,0)	14.1 (358,0)	14.1 (358,0)	15.4 (391,0)
8 (200)	7.6 (193,0)	7.6 (193,0)	7.6 (193,0)	8.7 (220,0)	9.5 (241,0)	9.5 (241,0)	16.8 (426,0)	16.8 (426,0)	16.8 (426,0)	16.8 (426,0)	16.8 (426,0)	21.3 (540,0)
10 (250)	9.3 (235,0)	9.7 (245,0)	9.7 (245,0)	9.8 (250,0)	10.6 (270,0)	11.4 (290,0)	21.7 (550,0)	21.7 (550,0)	21.7 (550,0)	22.4 (570,0)	22.4 (570,0)	24.2 (615,0)
12 (300)	10.5 (270,0)	10.5 (270,0)	10.5 (270,0)	11.2 (285,0)	12.0 (305,0)	13.0 (330,0)	24.4 (620,0)	24.4 (620,0)	24.4 (620,0)	24.6 (626,0)	24.6 (626,0)	24.9 (632,0)
16 (400)	13.2 (344,0)	13.6 (344,5)	13.8 (350,0)	14.2 (360,0)	15.2 (385,0)	-	27.3 (694,0)	27.3 (694,0)	27.3 (694,0)	31.7 (805,0)	31.7 (805,0)	-

DSE SERIES CONTROL VALVES
Dimensions and Weights

D Dimensions - inches (mm)				
Size in (mm)	MS29 Stroke 1.5" (38)	MS37 Stroke 20" (51)	MS44 Stroke 3" (76)	MS44L Stroke 4" (100))
2 (50)	22.4 (569,0)	27.9 (709,0)	28.5 (726,0)	50.0 (1270,0)
3 (80)	- -	27.9 (709,0)	28.5 (726,0)	50.0 (1270,0)
4 (100)	- -	27.9 (709,0)	28.5 (726,0)	50.0 (1270,0)
6 (150)	- -	27.9 (709,0)	28.5 (726,0)	50.0 (1270,0)
8 (200)	- -	- -	28.5 (726,0)	50.0 (1270,0)
10 (250)	- -	- -	28.5 (726,0)	50.0 (1270,0)
12 (300)	- -	- -	- -	50.0 (1270,0)



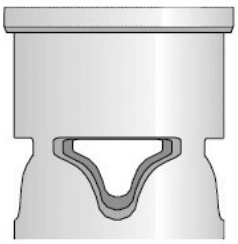
Weight - pounds (kg)													
Size		Flanged Body S/A						Butt Weld End Body S/A					
	Threaded NPT	150	300	600	900	1500	2500	150	300	600	900	1500	2500
2 (50)	50.7 (23,0)	51.6 (23,4)	59.5 (27,0)	62.2 (28,2)	120.2 (54,5)	120.2 (54,5)	146.6 (66,5)	51.4 (23,3)	51.4 (23,3)	51.4 (23,3)	86.6 (39,3)	86.6 (39,3)	105.8 (48,0)
3 (80)	- -	107.6 (48,8)	120.6 (54,7)	124.1 (56,3)	205.7 (93,3)	245.8 (111,5)	280.0 (127,0)	98.3 (44,6)	98.3 (44,6)	98.3 (44,6)	185.2 (84,0)	185.2 (84,0)	211.2 (95,8)
4 (100)	- -	161.6 (73,3)	182.3 (82,7)	202.6 (91,9)	335.5 (152,2)	405.4 (183,9)	449.8 (204,0)	148.2 (67,2)	148.2 (67,2)	148.2 (67,2)	316.1 (143,4)	316.1 (143,4)	347.7 (157,7)
6 (150)	- -	277.8 (126,0)	332.6 (150,9)	397.0 (180,1)	578.7 (262,5)	848.1 (384,7)	1030.0 (467,0)	298.7 (135,5)	298.7 (135,5)	298.7 (135,5)	647.5 (293,7)	647.5 (293,7)	778.1 (352.9)
8 (200)	- -	558.2 (253,2	612.9 (278,0)	820.1 (372,0)	1026.3 (465,5)	1480.2 (671,4)	1762.0 (799,0)	704.8 (319,2)	704.8 (319,2)	704.8 (319,2)	1015.0 (460,4)	1015.0 (460,4)	1198.0 (543,6)
10 (250)	- -	690.0 (313,0)	888.0 (403,0)	1285.0 (583,0)	1548.0 (702,0)	2009.0 (911,0)	4276.0 (1939,0)	807.0 (366.0)	807.0 (366.0)	825.0 (374.4)	1049.0 (476,0)	1354.0 (614,0)	2862.0 1298,0)
12 (300)	- -	1043.0 (473,0)	1343.0 (609,0)	1852.0 (840,0)	2304.0 (1045,0)	2838.0 (1287,0)	5239.0 (2376,0)	1199.0 (544,0)	1199.0 (544,0)	1350.0 (612,0)	1572.0 (713,0)	1918.0 (870,0)	3537.0 (1604,0)
16 (400)	- -	1669.0 (757,0)	2299.0 (1043,0)	3093.0 (1403,0)	3674.0 (1666,0)	4644.0 (2106,0)	- -	2044.0 (927,0)	2044.0 (927,0)	2112.0 (958,0)	2635.0 (1195,0)	3302.0 (1498,0)	6604.0 (2995,0)

Note: Weights are approximate.

DSE SERIES CONTROL VALVES
Cage Design Options

Interchangeable trim and cages offer maximum versatility in flow control applications.
Cage variations include:

- Reduced trim which provides capacities of 80%, 60% or 40% of full trim capacity. This feature can be used to control valves' body velocities, to plan for future flow expansion, or to correct for oversized condition.
- Les-Cav cage effectively prevents any valve trim damage due to valve cavitation in either a single-stage or two-stage construction.
- Les-Sonic cage effectively reduces noise at the source in either a single-stage or two-stage construction.



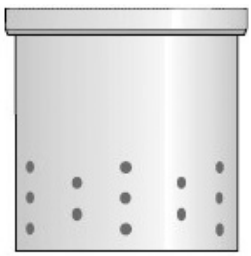
Standard Cage
The full ported, standard cage provides maximum flow with minimum pressure drop. The inherent linear or equal percent flow characteristic provides excellent flow control, high rangeability and maximum Cv per inch.

Reduced Trim Cage
This optional cage reduces the maximum Cv and flow to 80%, 60% or 40% of the normal, full port valve. Used to provide body velocity control, future flow expandability, or to correct for oversized valve conditions.



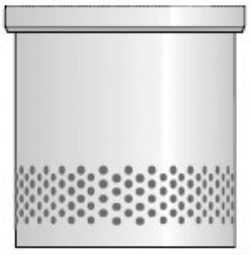


Labyrinth Cage
high technology labyrinth trim for super-critical pressure drops. The flow velocity is reduced through the multi-stage to obtain the maximum Noise Reduction and the smoothest Cavitation Indexes.



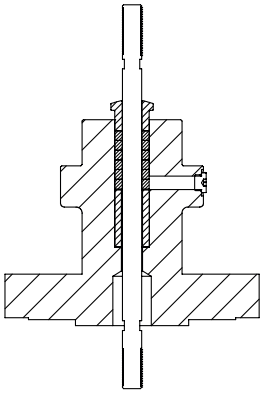
Anti-Cavitation Cage
The Les-Cav cage controls the effects of valve cavitation, with single or dual stages, providing a normal valve/trim life expectancy in cavitating conditions. Diametrically opposed holes increase the valves cavitation index (Kc) and direct impinging flow to the center of the cage, preventing mechanical trim/body damage.

Noise Reducing Cage
The Les-Sonic cage is designed to reduce fluid generated noise up to 15 - 20 dBA, with single or dual stages, in steam, gas or any compressible fluid service. When used in conjunction with a Les-Sonic silencing orifice, noise attenuation of greater than 20 dBA can be achieved.

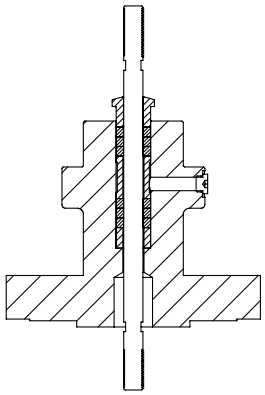


Single Stage / 2-Stage

Designs, materials, weights and performance ratings are approximate and subject to change without notice.
Visit **armstrong**international.eu for up-to-date information.

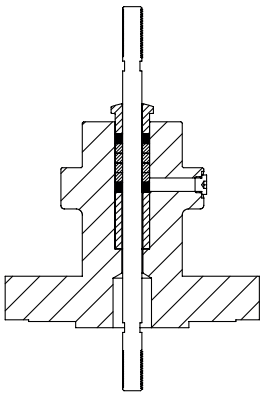


SINGLE PTFE

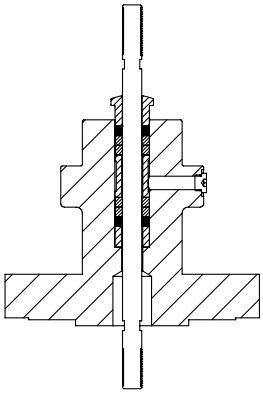


DOUBLE PTFE

Braided PTFE V-ring packing provides the most maintenance free stem seal manufactured from the purest PTFE yarns with an Aramid core. Maximum service temperature is 428°F (220°C).

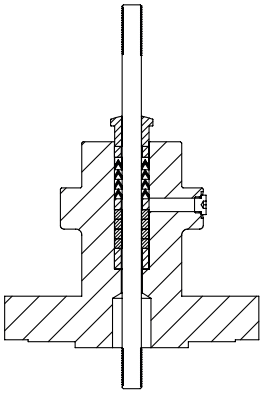


SINGLE LAMINATED GRAPHITE



DOUBLE LAMINATED GRAPHITE

Precision die-cut laminated graphite rings provide a reliable, tight stem seal to operating temperatures of 1000°F (538°C).



LOW EMISSION

Low Emission packing ISO 15848-1 available Grade BH with high-cycling operations and range of temperatures from room temperature till +200°C.

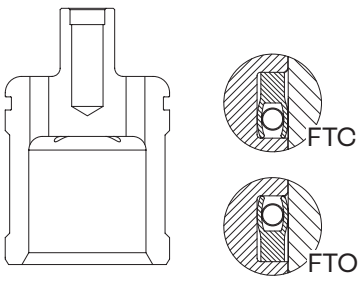
Designs, materials, weights and performance ratings are approximate and subject to change without notice.
Visit **armstrong**international.eu for up-to-date information.

DSE SERIES CONTROL VALVES
Trim Material Selection

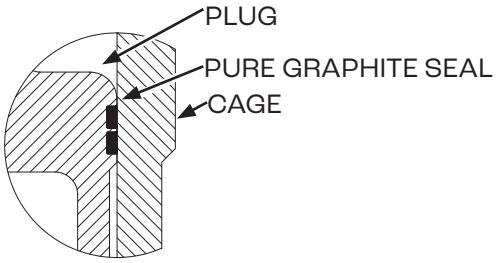
Balanced Plug design allows line pressure under the plug to build up above the plug, effectively cancelling out any unbalanced stem force due to pressure. In addition to providing smooth, high pressure control, balanced plugs allow use of small, light, cost effective actuators. Class IV, V or VI shutoff can be provided.

Trim Material Combinations

Trim Type	Trim	Max. Service Temp.	Plug	Seat Ring	Stem	Plug Seal	Shutoff
Standard Balanced	410 STD	800°F (427°C)	SS 410 Hardened	SS 410 Hardened	A479 TY316	C300 spring loaded seal 572°F (300°C) - Flex Graph. 800°F (427°C)	V or IV
	316 STD	800°F (427°C)	A351 CF8M	A351 CF8M	A479 TY316	C300 spring loaded seal 572°F (300°C) - Flex Graph. 800°F (427°C)	V or IV
	316 Errosive	800°F (427°C)	A351 CF8M Stelited	A351 CF8M Stelited	A479 TY316	C300 spring loaded seal 572°F (300°C) - Flex Graph. 800°F (427°C)	V or IV
High Temperature	CA6NM Hi-Temp	1000°F (538°C)	ASTM A487 CA6NMST (Nitrided)	ASTM A487 CA6NMST	ASTM A638 GR 660 / Inconel X750	Flex Graph.	IV



Standard Balanced Plug
Balanced plug design eliminates large stem forces allowing the use of small, responsive, cost-effective actuators. Provides smooth throttling control even at pressures to 1000 psi. Our C300 spring loaded seal utilizes a special alloy and inconel spring to provide ANSI class IV or V shutoff to temperatures of 572°F (300°C).



High-Temp Balanced Plug
Balanced plug with high-temp carbon seal rings provides ANSI Class IV shutoff at temperatures up to 1000°F (538°C).

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DSE SERIES CONTROL VALVES
Specifications

BODY ASSEMBLY
- Style: Single seated, top entry, bolted bonnet, globe style body (optional: angle-style), cage-guided balanced plug

SIZE, RATINGS & END CONNECTIONS:
- 2" thru 16", Class 150, 300, 600, 900, 1500, 2500 RF, RTJ, BWE

BODY/BONNET MATERIALS
- Carbon Steel, A216 Gr WCC, -20 to 800°F (-29°C to 427°C)
- 316 Stainless Steel, A351 Gr CF8M, -50 to 1000°F (-46°C to 538°C)
- On request: Low-Temp Carbon Steel A352 Gr. LCC, -50 to 800°F (-46°C to 427°C)
- Chrome-Moly Steel A217 Gr WC9 -20 to 1000°F (-29°C to 538°C)
- Other materials (Duplex, Alloy 20, Inconel, Hastelloy, Monel ...)

BODY/BONNET BOLTING
- Standard, -20 to 800°F (-28 to 427°C)
  ASTM A-193 GR B7 Studs
  ASTM A-194 GR 2H Nuts
- High Temp, 800-1000°F (427 to 538°C)
  ASTM A-193 GR B16 Studs
  ASTM A-194 GR 4 or 7 Nuts
- Low Temp -321 to -4°F (-196 to -20°C)
  ASTM A-193 GR B8 Studs
  ASTM A-194 GR 8 Nuts

STEM PACKING
- Braided PTFE with Kevlar filaments -20.2°F to 446°F (-29°C to 230°C)
- Graphite - 2 Anti-Extrusion Ring + Graphoil -20.2°F to 1050.8°F (-29°C to 566°C)
- Low Emission ISO 15848-1 Grade BH CC2

PACKING STUDS, NUTS & FOLLOWER
- 300 Series Stainless Steel

GASKET
- Body/Bonnet and Seat Ring/Body:
  For up to 6" sizes: Spiral Wound 316L/ Graphite 1000°F (+566°C) Max.
  Above 6" sizes: Spiral Wound 316L/ Graphite 449.6°F (232°C) Max.
  Flexible Graphite, 1000°F (538°C) Max.

TRIM SIZES
- Full Port, 80%, 60%, and 40% Reduced Port.
- Custom Cv: contact application Engineering

PLUG (PISTON) SEAL MATERIALS
- C300 spring loaded seal with Inconel Spring - Up to 572°F(300°C). Class IV, V
- Double Carbon-Graphite seal rings - Up to 1000°F(538°C). Class IV

FLOW CHARACTERISTICS
- Equal Percentage, Linear

SHUTOFF CLASS (FCI / 70-2)
- Standard trim
  -20 to 572ºF (-18 to 300°C) = Class V
  to 800°F (427°C) - Class IV
- High-temp trim
  to 1000°F(538ºC), Class IV

ACTUATORS
- Standard
  Multi-Spring and Diaphragm
- Optional
  Piston, Double Acting/Spring Return
  Hydraulic
  Electric
  Electro-Hydraulic

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CV TABLES – LINEAR CHARACTERISTICS

CV vs Travel 150-2500 ANSI / Flow Characteristics – Linear

Valve Size in/DN	Rating	Port Diameter		Travel		Percentage Travel									
		in	mm	in	mm	10	20	30	40	50	60	70	80	90	100
2 / 50	150-1500	2.5	63,5	1.5	38,1	8	15	23	30	38	45	53	60	68	75
		2.5	63,5	1.5	38,1	6	12	18	24	30	36	42	48	54	60
		2.5	63,5	1.5	38,1	5	9	14	18	23	27	32	36	41	45
		2.5	63,5	1.5	38,1	3	6	9	12	15	18	21	24	27	30
	2500	1.84	46,7	0.8	20,3	4	8	12	16	20	24	28	32	36	40
		1.84	46,7	0.8	20,3	2	3	5	6	8	10	11	13	14	16
3 / 80	150-1500	3.5	88,9	2	50,8	16	31	47	62	78	93	109	124	140	155
		3.5	88,9	2	50,8	12	25	37	50	62	74	87	99	112	124
		3.5	88,9	2	50,8	9	19	47	62	78	93	109	124	140	93
		3.5	88,9	2	50,8	6	12	47	62	78	93	109	124	140	62
	2500	2.5	63,5	1.5	38,1	8	15	23	30	38	45	53	60	68	75
		2.5	63,5	1.5	38,1	6	12	18	24	30	36	42	48	54	60
4 / 100	150-1500	4.4	111,1	2	50,8	24	48	72	96	120	144	168	192	216	240
		4.4	111,1	2	50,8	19	38	58	77	96	115	134	154	173	192
		4.4	111,1	2	50,8	14	29	43	58	72	86	101	115	130	144
		4.4	111,1	2	50,8	10	19	29	38	48	58	67	77	86	96
	2500	3.5	88,9	2	50,8	8	15	23	30	38	45	53	60	68	75
		3.5	88,9	2	50,8	6	12	18	24	30	36	42	48	54	60
6 / 150	150-1500	5.5	139,7	2.5	63,5	45	90	135	180	225	270	315	360	405	450
		5.5	139,7	2.5	63,5	36	72	108	144	180	216	252	288	324	360
		5.5	139,7	2.5	63,5	27	54	81	108	135	162	189	216	243	270
		5.5	139,7	2.5	63,5	18	36	54	72	90	108	126	144	162	180
	2500	4.4	111,1	2	50,8	24	48	72	96	120	144	168	192	216	240
		4.4	111,1	2	50,8	6	12	18	24	30	36	42	48	54	60
8 / 200	150-600	8	203,2	3	76,2	80	160	240	320	400	480	560	640	720	800
		8	203,2	3	76,2	64	128	192	256	320	384	448	512	576	640
		8	203,2	3	76,2	48	96	144	192	240	288	336	384	432	480
		8	203,2	3	76,2	32	64	96	128	160	192	224	256	288	320
	900-1500	7	177,8	3	76,2	72	144	216	288	360	432	504	576	648	720
		7	177,8	3	76,2	58	115	173	230	288	346	403	461	518	576
		7	177,8	3	76,2	43	86	130	173	216	259	302	346	389	432
		7	177,8	3	76,2	29	58	86	115	144	173	202	230	259	288
	2500	7	177,8	2.5	63,5	64	128	192	256	320	384	448	512	576	640
		7	177,8	1.5	38,1	42	83	125	166	208	250	291	333	374	416
10 / 250	150-600	10	254	4	101,6	130	260	390	520	650	780	910	1.040	1.170	1.300
		10	254	4	101,6	104	208	312	416	520	624	728	832	936	1.040
		10	254	4	101,6	78	156	234	312	390	468	546	624	702	780
		10	254	4	101,6	52	104	156	208	260	312	364	416	468	520
	900-1500	8	203,2	4	101,6	78	156	234	312	390	468	546	624	702	780
		8	203,2	4	101,6	52	104	156	208	260	312	364	416	468	520
	2500	7	177,8	2.5	63,5	64	128	192	256	320	384	448	512	576	640
		7	177,8	1.5	38,1	42	83	125	166	208	250	291	333	374	416

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CV TABLES – LINEAR CHARACTERISTICS

CV vs Travel 150-2500 ANSI / Flow Characteristics – Linear

Valve Size in/DN	Rating	Port Diameter		Travel		Percentage Travel									
		in	mm	in	mm	10	20	30	40	50	60	70	80	90	100
12 / 300	150-600	12	304,8	4	101,6	180	360	540	720	900	1.080	1.260	1.440	1.620	1.800
		12	304,8	4	101,6	144	288	432	576	720	864	1.008	1.152	1.296	1.440
		12	304,8	4	101,6	108	216	324	432	540	648	756	864	972	1.080
		12	304,8	4	101,6	72	144	216	288	360	432	504	576	648	720
	900-1500	10	254	4	101,6	108	216	324	432	540	648	756	864	972	1.080
		10	254	4	101,6	72	144	216	288	360	432	504	576	648	720
	2500	8	203,2	6	203,2	100	200	300	400	500	600	700	800	900	1.000
		8	203,2	6	203,2	51	102	153	204	255	306	357	408	459	510
16 / 400	150-600	14.7	373,4	5	127	310	620	930	1.240	1.550	1.860	2.170	2.480	2.790	3.100
		14.7	373,4	5	127	280	560	840	1.120	1.400	1.680	1.960	2.240	2.520	2.800
		14.7	373,4	5	127	186	372	558	744	930	1.116	1.302	1.488	1.674	1.860
		14.7	373,4	5	127	124	248	372	496	620	744	868	992	1.116	1.240
	900-1500	13	330,2	8	200	186	372	558	744	930	1.116	1.302	1.488	1.674	1.860
		13	330,2	8	200	124	248	372	496	620	744	868	992	1.116	1.240
	2500	10	254	9.75	247,65	140	280	420	560	700	840	980	1120	1260	1400
		10	254	9.75	247,65	77	154	231	308	385	462	539	616	693	770

Note: 20", 24" Please contact factory

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CV TABLES – EQUAL PERCENTAGES CHARACTERISTICS

CV vs Travel 150-2500 ANSI / Flow Characteristics – Equal Percentages

Valve Size in/DN	Rating	Port Diameter		Travel		Percentage Travel									
		in	mm	in	mm	10	20	30	40	50	60	70	80	90	100
2 / 50	150-1500	2.5	63,5	1.5	38,1	2	3	4	7	10	14	21	31	46	68
		2.5	63,5	1.5	38,1	2	2	4	5	8	11	17	25	37	54
		2.5	63,5	1.5	38,1	1	2	3	4	6	9	13	19	28	41
		2.5	63,5	1.5	38,1	1	1	2	3	4	6	8	12	18	27
	2500	1.84	46,7	0.8	20,3	1	2	2	3	5	7	11	16	24	35
		1.84	46,7	0.8	20,3	0	1	1	1	2	3	4	6	9	14
3 / 80	150-1500	2.5	63,5	2	50,8	4	6	9	13	20	29	43	64	95	140
		2.5	63,5	2	50,8	3	5	7	11	16	23	35	51	76	112
		2.5	63,5	2	50,8	2	4	5	8	12	18	26	38	57	84
		2.5	63,5	2	50,8	2	2	4	5	8	12	17	26	38	56
	2500	2.5	63,5	1.5	38,1	2	3	4	6	9	14	20	30	44	65
		2.5	63,5	1.5	38,1	1	1	2	2	4	5	8	12	18	26
4 / 100	150-1500	4.4	111,1	2	50,8	6	9	14	21	31	45	67	99	146	216
		4.4	111,1	2	50,8	5	8	11	17	24	36	53	79	117	173
		4.4	111,1	2	50,8	4	6	8	12	18	27	40	59	88	130
		4.4	111,1	2	50,8	3	4	6	8	12	18	27	40	58	86
	2500	3.5	88,9	2	50,8	4	6	9	13	20	29	43	64	95	140
		3.5	88,9	2	50,8	2	2	4	5	8	12	17	26	38	56
6 / 150	150-1500	5.5	139,7	2.5	63,5	12	17	26	38	57	84	124	183	270	400
		5.5	139,7	2.5	63,5	9	14	21	31	45	67	99	146	216	320
		5.5	139,7	2.5	63,5	7	10	16	23	34	50	74	110	162	240
		5.5	139,7	2.5	63,5	5	7	10	15	23	33	49	73	108	160
	2500	4.4	111,1	2	50,8	7	10	15	22	32	47	70	103	152	225
		4.4	111,1	2	50,8	3	4	6	9	13	19	28	41	61	90
8 / 200	150-600	8	203,2	3	76,2	22	33	49	72	107	158	234	346	511	756
		8	203,2	3	76,2	18	26	39	58	86	126	187	277	409	605
		8	203,2	3	76,2	13	20	29	43	64	95	140	207	307	454
		8	203,2	3	76,2	9	13	20	29	43	63	94	138	204	302
	900-1500	7	177,8	3	76,2	20	30	44	65	96	142	210	311	459	680
		7	177,8	3	76,2	16	24	35	52	77	114	168	249	368	544
		7	177,8	3	76,2	12	18	26	39	58	85	126	186	276	408
		7	177,8	3	76,2	8	12	18	26	38	57	84	124	184	272
	2500	6.5	165,1	2	50,8	11	16	23	34	51	75	111	165	243	360
		6.5	165,1	2	50,8	4	6	9	14	20	30	45	66	97	144
10 / 250	150-600	10	254	4	101,6	33	48	71	105	156	230	340	503	744	1.100
		10	254	4	101,6	26	38	57	84	124	184	272	402	595	880
		10	254	4	101,6	20	29	43	63	93	138	204	302	446	660
		10	254	4	101,6	13	19	28	42	62	92	136	201	298	440
	900-1500	8	203,2	3	76,2	22	33	49	72	107	158	234	346	511	756
		8	203,2	3	76,2	18	26	39	58	86	126	187	277	409	605
	2500	7	177,8	2.5	63,5	17	25	37	55	81	120	178	263	389	575
		7	177,8	2.5	63,5	7	10	15	22	33	48	71	105	156	230

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CV TABLES – EQUAL PERCENTAGES CHARACTERISTICS

CV vs Travel 150-2500 ANSI / Flow Characteristics – Equal Percentages

Valve Size in/DN	Rating	Port Diameter		Travel		Percentage Travel									
		in	mm	in	mm	10	20	30	40	50	60	70	80	90	100
12 / 300	150-600	12	304.8	4	101.6	43	63	93	138	204	301	445	659	974	1.440
		12	304.8	4	101.6	34	50	74	110	163	241	356	527	779	1.152
		12	304.8	4	101.6	26	38	56	83	122	181	267	395	584	864
		12	304.8	4	101.6	17	25	37	55	81	120	178	263	389	576
	900-1500	10	254	4	101.6	26	38	57	84	124	184	272	402	595	880
		10	254	4	101.6	20	29	43	63	93	138	204	302	446	660
	2500	8	203.2	3	76.2	27	39	58	86	127	188	278	412	609	900
		8	203.2	3	76.2	11	16	23	34	51	75	111	165	243	360
16 / 400	150-600	14.7	373.4	5	127	68	101	149	220	325	481	711	1.052	1.555	2.300
		14.7	373.4	5	127	54	80	119	176	260	385	569	841	1.244	1.840
		14.7	373.4	5	127	41	60	89	132	195	289	427	631	933	1.380
		14.7	373.4	5	127	27	40	59	88	130	192	284	421	622	920
	900-1500	13	330.2	5	127	43	63	93	138	204	301	445	659	974	1.440
		13	330.2	5	127	34	50	74	110	163	241	356	527	779	1.152
	2500	10	254	3.75	95.25	15	22	32	48	71	105	155	229	338	500
		10	254	3.75	95.25	37	55	81	121	178	263	390	576	852	1.260

Note: 20", 24" Please contact factory

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CV TABLES – SINGLE STAGE LES-CAV LINEAR CHARACTERISTICS

CV vs Travel 150-2500 ANSI / Flow Characteristics – Les-Cav Linear

Valve Size in/DN	Rating	Port Diameter		Travel		Percentage Travel									
		in	mm	in	mm	10	20	30	40	50	60	70	80	90	100
2 / 50	150-1500	2.5	63,5	1.5	38,1	8	17	25	34	42	50	59	67	76	84
		2.5	63,5	1.5	38,1	7	14	20	27	34	41	48	54	61	68
		2.5	63,5	1.5	38,1	5	10	15	20	26	31	36	41	46	51
		2.5	63,5	1.5	38,1	3	7	10	14	17	20	24	27	31	34
	2500	1.84	46,7	0.8	20,32	3	6	9	12	15	18	21	24	27	30
		1.84	46,7	0.8	20,32	2	3	5	7	9	10	12	14	15	17
		1.84	46,7	0.8	20,32	2	5	7	9	12	14	16	18	21	23
		1.84	46,7	0.8	20,32	1	3	4	5	7	8	9	10	12	13
		1.84	46,7	0.8	20,32	1	2	3	4	5	6	7	8	9	10
3 / 80	150-1500	3.5	88,9	2	50,8	15	30	46	61	76	91	106	122	137	152
		3.5	88,9	2	50,8	12	24	37	49	61	73	85	98	110	122
		3.5	88,9	2	50,8	9	18	27	36	46	55	64	73	82	91
		3.5	88,9	2	50,8	6	12	18	24	31	37	43	49	55	61
	2500	2.5	63,5	1.5	38,1	7	14	22	29	36	43	50	58	65	72
		2.5	63,5	1.5	38,1	6	12	17	23	29	35	41	46	52	58
		2.5	63,5	1.5	38,1	4	9	13	17	22	26	30	34	39	43
		2.5	63,5	1.5	38,1	3	6	10	13	16	19	22	26	29	32
		2.5	63,5	1.5	38,1	3	5	8	10	13	15	18	20	23	25
4 / 100	150-1500	4.4	111,1	2	50,8	19	39	58	77	97	116	135	154	174	193
		4.4	111,1	2	50,8	15	30	46	61	76	91	106	122	137	152
		4.4	111,1	2	50,8	11	22	34	45	56	67	78	90	101	112
		4.4	111,1	2	50,8	7	14	21	28	36	43	50	57	64	71
	2500	3.5	88,9	2	50,8	13	25	38	50	63	75	88	100	113	125
		3.5	88,9	2	50,8	10	19	29	38	48	57	67	76	86	95
		3.5	88,9	2	50,8	7	14	22	29	36	43	50	58	65	72
		3.5	88,9	2	50,8	5	11	16	22	27	32	38	43	49	54
		3.5	88,9	2	50,8	4	8	12	16	20	24	28	32	36	40
6 / 150	150-1500	5.5	139,7	2.5	63,5	41	81	122	162	203	244	284	325	365	406
		5.5	139,7	2.5	63,5	32	65	97	130	162	194	227	259	292	324
		5.5	139,7	2.5	63,5	24	49	73	97	122	146	170	194	219	243
		5.5	139,7	2.5	63,5	16	32	49	65	81	97	113	130	146	162
	2500	4.4	111,1	2	50,8	20	39	59	78	98	117	137	156	176	195
		4.4	111,1	2	50,8	15	30	45	60	75	90	105	120	135	150
		4.4	111,1	2	50,8	11	22	33	44	55	66	77	88	99	110
		4.4	111,1	2	50,8	9	17	26	34	43	51	60	68	77	85
		4.4	111,1	2	50,8	7	13	20	26	33	39	46	52	59	65

Designs, materials, weights and performance ratings are approximate and subject to change without notice.
Visit **armstrong**international.eu for up-to-date information.

CV TABLES – SINGLE STAGE LES-CAV LINEAR CHARACTERISTICS

CV vs Travel 150-2500 ANSI / Flow Characteristics – Les-Cav Linear

Valve Size in/DN	Rating	Port Diameter		Travel		Percentage Travel									
		in	mm	in	mm	10	20	30	40	50	60	70	80	90	100
8 / 200	150-600	8	203,2	3	76,2	58	116	173	231	289	347	405	462	520	578
		8	203,2	3	76,2	47	94	141	188	236	283	330	377	424	471
		8	203,2	3	76,2	35	70	105	140	175	210	245	280	315	350
		8	203,2	3	76,2	24	49	73	97	122	146	170	194	219	243
	900-1500	7	177,8	3	76,2	50	100	151	201	251	301	351	402	452	502
		7	177,8	3	76,2	41	82	123	164	206	247	288	329	370	411
		7	177,8	3	76,2	30	61	91	122	152	182	213	243	274	304
		7	177,8	3	76,2	21	43	64	85	107	128	149	170	192	213
	2500	6.5	165,1	2.5	63,5	30	60	90	120	150	180	210	240	270	300
		6.5	165,1	2.5	63,5	23	46	69	92	115	138	161	184	207	230
		6.5	165,1	2.5	63,5	18	35	53	70	88	105	123	140	158	175
		6.5	165,1	2.5	63,5	13	26	39	52	65	78	91	104	117	130
		6.5	165,1	2.5	63,5	10	20	30	40	50	60	70	80	90	100
10 / 250	150-600	10	254	4	101,6	95	191	286	381	477	572	667	762	858	953
		10	254	4	101,6	75	150	225	300	375	450	525	600	675	750
		10	254	4	101,6	55	109	164	219	274	328	383	438	492	547
		10	254	4	101,6	37	73	110	146	183	219	256	292	329	365
	900-1500	8	203,2	3	76,2	22	33	49	72	107	158	234	346	511	756
		8	203,2	3	76,2	18	26	39	58	86	126	187	277	409	605
	2500	7	177,8	3	76,2	50	100	150	200	250	300	350	400	450	500
		7	177,8	2.5	63,5	36	72	108	144	180	216	252	288	324	360
		7	177,8	2.5	63,5	27	54	81	108	135	162	189	216	243	270
		7	177,8	2.5	63,5	16	32	48	64	80	96	112	128	144	160
12 / 300	150-600	12	304,8	4	101,6	110	219	329	438	548	657	767	876	986	1.095
		12	304,8	4	101,6	83	166	249	332	416	499	582	665	748	831
		12	304,8	4	101,6	63	126	189	252	315	377	440	503	566	629
		12	304,8	4	101,6	43	85	128	170	213	256	298	341	383	426
	900-1500	10	254	4	101,6	26	38	57	84	124	184	272	402	595	880
		10	254	4	101,6	20	29	43	63	93	138	204	302	446	660
	2500	8	203,2	3.5	88,9	65	130	195	260	325	390	455	520	585	650
		8	203,2	3.5	88,9	50	100	150	200	250	300	350	400	450	500
		8	203,2	2.5	63,5	36	72	108	144	180	216	252	288	324	360
		8	203,2	2.5	63,5	20	40	60	80	100	120	140	160	180	200
16 / 400	150-600	14.7	373,4	5	127	175	350	525	700	875	1.049	1.224	1.399	1.574	1.749
		14.7	373,4	5	127	147	294	441	588	735	882	1.029	1.176	1.323	1.470
		14.7	373,4	5	127	112	223	335	446	558	669	781	892	1.004	1.115
		14.7	373,4	5	127	74	147	221	294	368	441	515	588	662	735
	900-1500	13	330,2	5	127	43	63	93	138	204	301	445	659	974	1.440
		13	330,2	5	127	34	50	74	110	163	241	356	527	779	1.152
	2500	10	254	7	177,8	243	486	729	972	1.215	1.458	1.701	1.944	2.187	2.430
		10	254	5	127	185	370	555	740	925	1.110	1.295	1.480	1.665	1.850
		10	254	5	127	110	220	330	440	550	660	770	880	990	1.100
		10	254	4	101,6	81	162	243	324	405	486	567	648	729	810
		10	254	2.5	63,5	45	90	135	180	225	270	315	360	405	450

Note: 20", 24" Please contact factory

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CV TABLES – SINGLE STAGE LES-SONIC LINEAR CHARACTERISTICS

CV vs Travel 150-2500 ANSI / Flow Characteristics – Les-Sonic Linear

Valve Size in/DN	Rating	Port Diameter		Travel		Percentage Travel									
		in	mm	in	mm	10	20	30	40	50	60	70	80	90	100
2 / 50	150-1500	2.5	63,5	1.5	38,1	7	14	20	27	34	41	48	54	61	68
		2.5	63,5	1.5	38,1	5	10	15	20	26	31	36	41	46	51
		2.5	63,5	1.5	38,1	4	9	13	17	22	26	30	34	39	43
		2.5	63,5	1.5	38,1	3	5	8	10	13	16	18	21	23	26
	2500	1.84	46,7	0.8	20,32	3	6	9	12	15	18	21	24	27	30
		1.84	46,7	0.8	20,32	2	5	7	9	12	14	16	18	21	23
		1.84	46,7	0.8	20,32	2	3	5	7	9	10	12	14	15	17
		1.84	46,7	0.8	20,32	1	3	4	5	7	8	9	10	12	13
		1.84	46,7	0.8	20,32	1	2	3	4	5	6	7	8	9	10
3 / 80	150-1500	3.5	88,9	2	50,8	14	27	41	54	68	81	95	108	122	135
		3.5	88,9	2	50,8	11	22	33	44	55	66	77	88	99	110
		3.5	88,9	2	50,8	9	17	26	34	43	52	60	69	77	86
		3.5	88,9	2	50,8	6	11	17	22	28	33	39	44	50	55
	2500	2.5	63,5	1.5	38,1	7	14	22	29	36	43	50	58	65	72
		2.5	63,5	1.5	38,1	6	12	17	23	29	35	41	46	52	58
		2.5	63,5	1.5	38,1	4	9	13	17	22	26	30	34	39	43
		2.5	63,5	1.5	38,1	3	6	10	13	16	19	22	26	29	32
		2.5	63,5	1.5	38,1	3	5	8	10	13	15	18	20	23	25
4 / 100	150-1500	4.4	111,1	2	50,8	21	42	62	83	104	125	146	166	187	208
		4.4	111,1	2	50,8	17	34	51	68	86	103	120	137	154	171
		4.4	111,1	2	50,8	12	24	37	49	61	73	85	98	110	122
		4.4	111,1	2	50,8	9	17	26	34	43	52	60	69	77	86
	2500	3.5	88,9	2	50,8	13	25	38	50	63	75	88	100	113	125
		3.5	88,9	2	50,8	10	19	29	38	48	57	67	76	86	95
		3.5	88,9	2	50,8	7	14	22	29	36	43	50	58	65	72
		3.5	88,9	2	50,8	5	11	16	22	27	32	38	43	49	54
		3.5	88,9	2	50,8	4	8	12	16	20	24	28	32	36	40
6 / 150	150-1500	5.5	139,7	2.5	63,5	37	73	110	146	183	220	256	293	329	366
		5.5	139,7	2.5	63,5	30	61	91	121	152	182	212	242	273	303
		5.5	139,7	2.5	63,5	22	45	67	89	112	134	156	178	201	223
		5.5	139,7	2.5	63,5	16	32	48	64	80	95	111	127	143	159
	2500	4.4	111,1	2	50,8	20	39	59	78	98	117	137	156	176	195
		4.4	111,1	2	50,8	15	30	45	60	75	90	105	120	135	150
		4.4	111,1	2	50,8	11	22	33	44	55	66	77	88	99	110
		4.4	111,1	2	50,8	9	17	26	34	43	51	60	68	77	85
		4.4	111,1	2	50,8	7	13	20	26	33	39	46	52	59	65
8 / 200	150-600	8	203,2	3	76,2	70	140	209	279	349	419	489	558	628	698
		8	203,2	3	76,2	55	110	165	220	276	331	386	441	496	551
		8	203,2	3	76,2	42	85	127	169	212	254	296	338	381	423
		8	203,2	3	76,2	28	55	83	110	138	166	193	221	248	276
	900-1500	7	177,8	3	76,2	71	142	214	285	356	427	498	570	641	712
		7	177,8	3	76,2	57	113	170	226	283	340	396	453	509	566
		7	177,8	3	76,2	44	88	132	176	220	264	308	352	396	440
		7	177,8	3	76,2	29	59	88	117	147	176	205	234	264	293
	2500	6.5	165,1	2.5	63,5	30	60	90	120	150	180	210	240	270	300
		6.5	165,1	2.5	63,5	23	46	69	92	115	138	161	184	207	230
		6.5	165,1	2.5	63,5	18	35	53	70	88	105	123	140	158	175
		6.5	165,1	2.5	63,5	13	26	39	52	65	78	91	104	117	130
		6.5	165,1	2.5	63,5	10	20	30	40	50	60	70	80	90	100

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CV TABLES – SINGLE STAGE LES-SONIC LINEAR CHARACTERISTICS

CV vs Travel 150-2500 ANSI / Flow Characteristics – Les-Sonic Linear

Valve Size in/DN	Rating	Port Diameter		Travel		Percentage Travel									
		in	mm	in	mm	10	20	30	40	50	60	70	80	90	100
10 / 250	150-600	10	254	4	101,6	100	199	299	399	499	598	698	798	897	997
		10	254	4	101,6	79	158	238	317	396	475	554	634	713	792
		10	254	4	101,6	62	123	185	246	308	370	431	493	554	616
		10	254	4	101,6	41	82	123	164	206	247	288	329	370	411
	900-1500	10	254	4	101,6	82	163	245	326	408	490	571	653	734	816
		10	254	4	101,6	65	131	196	261	327	392	457	522	588	653
		10	254	4	101,6	49	98	147	196	245	294	343	392	441	490
		10	254	4	101,6	33	65	98	130	163	196	228	261	293	326
	2500	7	177,8	3	76,2	50	100	150	200	250	300	350	400	450	500
		7	177,8	3	76,2	36	72	108	144	180	216	252	288	324	360
		7	177,8	3	76,2	27	54	81	108	135	162	189	216	243	270
		7	177,8	3	76,2	21	42	63	84	105	126	147	168	189	210
		7	177,8	3	76,2	16	32	48	64	80	96	112	128	144	160
12 / 300	150-600	12	304,8	4	101,6	111	223	334	446	557	668	780	891	1.003	1.114
		12	304,8	4	101,6	91	182	273	364	455	545	636	727	818	909
		12	304,8	4	101,6	68	135	203	270	338	405	473	540	608	675
		12	304,8	4	101,6	47	94	141	188	235	281	328	375	422	469
	900-1500	10	254	4	101,6	92	185	277	370	462	554	647	739	832	924
		10	254	4	101,6	74	148	222	296	370	443	517	591	665	739
		10	254	4	101,6	55	111	166	222	277	332	388	443	499	554
		10	254	4	101,6	37	74	111	148	185	222	259	296	333	370
	2500	8	203,2	3.5	88,9	65	130	195	260	325	390	455	520	585	650
		8	203,2	3.5	88,9	50	100	150	200	250	300	350	400	450	500
		8	203,2	3.5	88,9	36	72	108	144	180	216	252	288	324	360
		8	203,2	2.5	63,5	26	52	78	104	130	156	182	208	234	260
		8	203,2	2.5	63,5	20	40	60	80	100	120	140	160	180	200
16 / 400	150-600	14.7	373,4	5	127	232	464	697	929	1.161	1.393	1.625	1.858	2.090	2.322
		14.7	373,4	5	127	171	341	512	683	854	1.024	1.195	1.366	1.536	1.707
		14.7	373,4	5	127	127	254	381	508	636	763	890	1.017	1.144	1.271
		14.7	373,4	5	127	87	174	261	348	436	523	610	697	784	871
	900-1500	14.7	373,4	5	127	178,5	357,0	535,5	714,0	892,5	1071,0	1249,5	1428,0	1606,5	1785
		14.7	373,4	5	127	142,8	285,6	428,4	571,2	714,0	856,8	999,6	1142,4	1285,2	1428
		14.7	373,4	5	127	107,1	214,2	321,3	428,4	535,5	642,6	749,7	856,8	963,9	1071
		14.7	373,4	5	127	71,4	142,8	214,2	285,6	357,0	428,4	499,8	571,2	642,6	714
	2500	10	254	5	127	110,0	220,0	330,0	440,0	550,0	660,0	770,0	880,0	990,0	1100
		10	254	5	127	81,0	162,0	243,0	324,0	405,0	486,0	567,0	648,0	729,0	810
		10	254	5	127	60,0	120,0	180,0	240,0	300,0	360,0	420,0	480,0	540,0	600
		10	254	5	127	45,0	90,0	135,0	180,0	225,0	270,0	315,0	360,0	405,0	450

Note : 20" ,24" Please contact factory

CV TABLES – TWO-STAGE LES-SONIC LINEAR CHARACTERISTICS

CV vs Travel 150-2500 ANSI / Flow Characteristics – Two-stage Les-Sonic Linear

Valve Size in/DN	Rating	Port Diameter		Travel		Percentage Travel									
		in	mm	in	mm	10	20	30	40	50	60	70	80	90	100
2 / 50	150-1500	2.5	63,5	1.5	38,1	4	8	13	17	21	25	29	34	38	42
		2.5	63,5	1.5	38,1	3	7	10	13	17	20	23	26	30	33
	2500	1.84	46,7	0.8	20,32	2	5	7	10	12	14	17	19	22	24
		1.84	46,7	0.8	20,32	2	4	6	8	10	11	13	15	17	19
		1.84	46,7	0.8	20,32	1	2	4	5	6	7	8	10	11	12
3 / 80	150-1500	3.5	88,9	2	50,8	13	26	39	52	65	77	90	103	116	129
		3.5	88,9	2	50,8	11	21	32	42	53	64	74	85	95	106
	2500	2.5	63,5	1.5	38,1	5	11	16	21	27	32	37	42	48	53
		2.5	63,5	1.5	38,1	4	9	13	17	22	26	30	34	39	43
		2.5	63,5	1.5	38,1	3	6	9	12	15	18	21	24	27	30
4 / 100	150-1500	4.4	111,1	2	50,8	18	35	53	71	89	106	124	142	159	177
		4.4	111,1	2	50,8	14	29	43	57	72	86	100	114	129	143
	2500	3.5	88,9	2	50,8	10	19	29	38	48	57	67	76	86	95
		3.5	88,9	2	50,8	8	15	23	30	38	45	53	60	68	75
		3.5	88,9	2	50,8	5	10	15	20	25	30	35	40	45	50
6 / 150	150-1500	5.5	139,7	2.5	63,5	25	51	76	101	127	152	177	202	228	253
		5.5	139,7	2.5	63,5	20	41	61	81	102	122	142	162	183	203
	2500	4.4	111,1	2	50,8	13	26	39	52	65	78	91	104	117	130
		4.4	111,1	2	50,8	11	21	32	42	53	63	74	84	95	105
		4.4	111,1	2	50,8	7	14	22	29	36	43	50	58	65	72
8 / 200	150-600	8	203,2	3	76,2	39	79	118	158	197	236	276	315	355	394
		8	203,2	3	76,2	31	63	94	126	157	188	220	251	283	314
	900-1500	7	177,8	3	76,2	35	70	104	139	174	209	244	278	313	348
		7	177,8	3	76,2	28	57	85	113	142	170	198	226	255	283
	2500	6.5	165,1	2.5	63,5	19	38	57	76	95	114	133	152	171	190
		6.5	165,1	2.5	63,5	15	30	45	60	75	90	105	120	135	150
		6.5	165,1	2.5	63,5	10	19	29	38	48	58	67	77	86	96
10 / 250	150-600	10	254	4	101,6	65	129	194	259	324	388	453	518	582	647
		10	254	4	101,6	51	103	154	205	257	308	359	410	462	513
	900-1500	10	254	4	101,6	53	106	158	211	264	317	370	422	475	528
		10	254	4	101,6	42	84	127	169	211	253	295	338	380	422
	2500	7	177,8	3	76,2	30	60	90	120	150	180	210	240	270	300
		7	177,8	2.5	63,5	25	50	75	100	125	150	175	200	225	250
		7	177,8	2.5	63,5	16	31	47	62	78	93	109	124	140	155
12 / 300	150-600	12	304,8	4	101,6	79	158	236	315	394	473	552	630	709	788
		12	304,8	4	101,6	64	129	193	257	322	386	450	514	579	643
	900-1500	12	304,8	4	101,6	65	129	194	258	323	387	452	516	581	645
		12	304,8	4	101,6	52	104	157	209	261	313	365	418	470	522
	2500	8	203,2	3.5	88,9	42	84	126	168	210	252	294	336	378	420
		8	203,2	2.5	63,5	35	70	105	140	175	210	245	280	315	350
		8	203,2	2.5	63,5	23	46	69	92	115	138	161	184	207	230
16 / 400	150-600	14.7	373,4	5	127	116	231	347	462	578	693	809	924	1.040	1.155
		14.7	373,4	5	127	96	193	289	385	482	578	674	770	867	963
	900-1500	14.7	373,4	5	127	101	202	304	405	506	607	708	810	911	1.012
		14.7	373,4	5	127	81	162	243	324	405	486	567	648	729	810
	2500	10	254	5	127	73	145	218	290	363	435	508	580	653	725
		10	254	4	101,6	60	120	180	240	300	360	420	480	540	600
		10	254	2.5	63,5	38	75	113	150	188	225	263	300	338	375

Note : 20" ,24" Please contact factory

Designs, materials, weights and performance ratings are approximate and subject to change without notice.
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