

D-SERIES CONTROL VALVE

SIZES 2" – 16" (PN 50 - 400)
ANSI CLASS 150# to 1500# (PN 16 - 250)

- **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
- **Temperature Rating** up to 1,000F (538°C)
- **Ultra Compact Actuators** install in tight spaces
- **Yoke Lock Nut** guarantees easy disassembly

MATERIALS

- Carbon Steel - Standard WCC, -20°F to +800°F (-28.9°C to +426.7°C), Optional LCC, -50°F to 800°F (-45.5°C to +427°C)
- 316 Stainless Steel (CF8M)
- Chrome Moly Steel (WC9)

APPLICABLE INDUSTRY STANDARDS

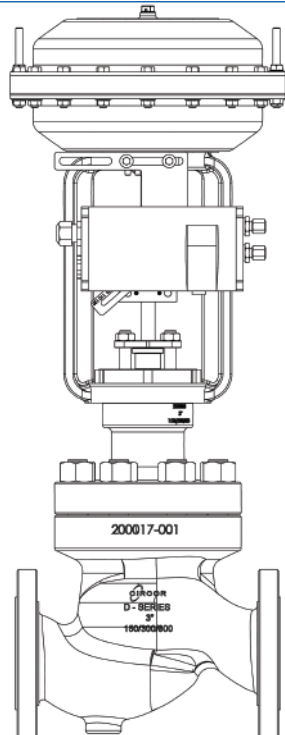
See Control Valve Handbook - Reference Section on Page 195

APPLICATION DATA

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

OPTIONS

- Multi-Spring, Single-Spring, & Piston Actuators Available
- Threaded, Socketweld, Flanged, Butt weld End, and RTJ Connections
- Positioners (Pneumatic/Electronic/Digital)
- Two-Stage Noise and Cavitation Reducing Trim
- Reduced Flow Cages (0.8, 0.6, 0.4 Factor)
- Alternate Packing sets for Severe Service
- High Temperature Trim



D-SERIES CONTROL VALVE

Dimensions & Weights

"A", "B" and "C" DIMENSIONS inches (mm)⁽¹⁾

Size	THD	Raised Face (A)					B					C		
	NPT	150	300	600	900	1500	150	300	600	900	1500	150 ~ 1500		
2 (50)	11.26 (286.0)	10.0 (254)	10.51 (267)	11.26 (286)	14.76 (375)	14.76 (375)	2.76 (70)	2.76 (70)	2.76 (70)	2.87 (73)	2.87 (73)	8.84 (224.5)		
2½ (65)	-	-	-	-	-	-	-	-	-	-	-	-		
3 (80)	-	11.732 (298)	12.52 (318)	13.27 (337)	17.36 (441)	18.11 (460)	3.54 (90)	3.54 (90)	3.54 (90)	30.54 (90)	3.77 (96)	11.14 (283)		
4 (100)	-	13.86 (352)	14.49 (368)	15.51 (394)	20.11 (511)	20.86 (530)	3.94 (100)	3.94 (100)	3.94 (100)	4.64 (118)	5.31 (135)	11.89 (302)		
6 (150)	-	17.76 (451)	18.62 (473)	20.0 (508)	28.11 (714)	30.23 (768)	5.91 (150)	5.91 (150)	5.91 (150)	6.77 (172)	7.28 (185)	14.10 (358)		
8 (200)	-	21.34 (543)	22.36 (568)	24.02 (610)	35.98 (914)	38.26 (972)	7.60 (193)	7.60 (193)	7.60 (193)	8.66 (220)	9.50 (241)	16.78 (426)		
	Raised Face (A)						B						C	
												150 ~ 300	600	
10 (254)	-	26.5 (673)	27.9 (708)	29.6 (752)	-	-	9.7 (245)		9.3 (235)	-	-	22.7 (576)	23.0 (586)	
12 (305)	-	29.0 (737)	30.5 (775)	32.2 (819)	-	-	10.6 (270)			-	-	23.9 (606)	24.0 (611)	
16 (406)	-	40.0 (1016)	41.6 (1057)	43.6 (1108)	-	-	13.2 (334)	13.6 (344.5)	13.8 (350)	-	-	23.5 (599)		

⁽¹⁾NPT Available in 2" only.

"A", "B" and "C" DIMENSIONS inches (mm)

Size	Butt Weld End (A)						B					C	
	NPT	150	300	600	900	1500	150	300	600	900	1500	150 ~ 1500	
2 (50)		11.25 (286)			14.80 (375)		2.76 (70)	2.76 (70)	2.76 (70)	2.87 (73)	2.87 (73)	8.84 (224.5)	
2½ (65)	-	-	-	-	-	-	-	-	-	-	-	-	
3 (80)	-	13.26 (337)			18.11 (460)		3.54 (90)	3.54 (90)	3.54 (90)	30.54 (90)	3.77 (96)	11.14 (283)	
4 (100)	-	15.50 (394)			20.90 (530)		3.94 (100)	3.94 (100)	3.94 (100)	4.64 (118)	5.31 (135)	11.89 (302)	
6 (150)	-	20.00 (508)			30.23 (768)		5.91 (150)	5.91 (150)	5.91 (150)	6.77 (172)	7.28 (185)	14.10 (358)	
8 (200)	-	24.00 (610)			32.75 (832)		7.60 (193)	7.60 (193)	7.60 (193)	8.66 (220)	9.50 (241)	16.78 (426)	
	Butt Weld End (A)						B					C	
												150 ~ 300	600
10 (254)	-	29.6 (752)		29.6 (752)	-	-	9.7* (245)		9.3 (235)	-	-	22.7 (576)	23.0 (586)
12 (305)	-	32.2 (819)		32.2 (819)	-	-	10.6* (270)			-	-	23.9 (606)	24.0 (611)
16 (406)	-	43.6 (1108)		43.6 (1108)	-	-	13.6 (344.5)		13.8 (350)	-	-	23.5 (599)	

*Designs vary to meet required Cv's

D-SERIES CONTROL VALVE

Dimensions & Weights

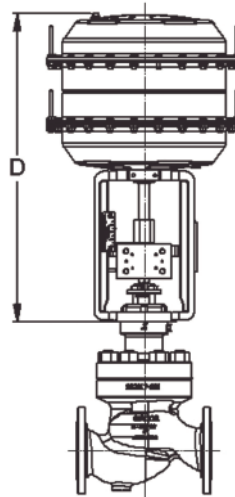
LINEAR

"A", "B" and "C" DIMENSIONS inches (mm)

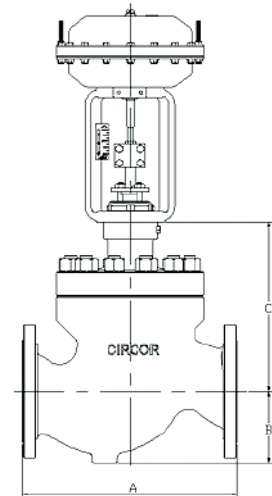
Size	Ring type joint (A)						B					C		
	NPT	150	300	600	900	1500	150	300	600	900	1500	150~300	600	150 ~ 1500
2 (50)		10.50 (267)	11.14 (283)	11.37 (289)	14.88 (378)	14.88 (378)	2.76 (70)	2.76 (70)	2.76 (70)	2.87 (73)	2.87 (73)	-	-	8.84 (224.5)
2½ (65)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3 (80)	-	12.244 (311)	13.12 (334)	13.40 (340)	17.50 (444)	18.22 (463)	3.54 (90)	3.54 (90)	3.54 (90)	30.54 (90)	3.77 (96)	-	-	11.14 (283)
4 (100)	-	14.37 (365)	15.10 (384)	15.62 (397)	20.23 (514)	21.00 (533)	3.94 (100)	3.94 (100)	3.94 (100)	4.64 (118)	5.31 (135)	-	-	11.89 (302)
6 (150)	-	18.26 (464)	19.25 (489)	20.11 (511)	28.22 (717)	30.50 (774)	5.91 (150)	5.91 (150)	5.91 (150)	6.77 (172)	7.28 (185)	-	-	14.10 (358)
8 (200)	-	21.90 (556)	23.00 (584)	24.13 (613)	36.10 (917)	38.70 (982)	7.60 (193)	7.60 (193)	7.60 (193)	8.66 (220)	9.50 (241)	-	-	16.78 (426)
10 (254)	-	27.0 (686)	28.5 (724)	29.7 (755)	-	-	9.7 (245)		9.3 (235)	-	-	22.7 (576)	23.0 (586)	-
12 (305)	-	29.5 (750)	31.1 (791)	32.4 (822)	-	-	10.5 (270)			-	-	23.9 (606)	24.0 (611)	-
16 (406)	-	40.5 (1029)	42.2 (1073)	43.7 (1111)	-	-	13.2 (344)	13.6 (344.5)	13.8 (350)	-	-	23.5 (599)		-

"D" DIMENSIONS inches (mm)

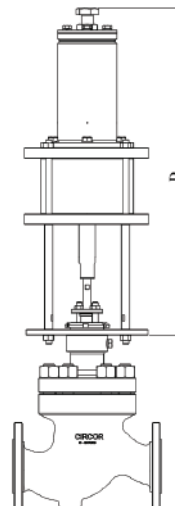
Size	M42 (ST 6135)	M82 (ST 6160)			M155 (ST 6175)	
	STROKE 1.4" (35 mm)	STROKE 1.6" (40 mm)	STROKE 2.4" (60 mm)	STROKE 2.4" (60 mm)	STROKE 4" (100 mm)	
2 (50)	14.8 (376)	16.0 (406)	16.8 (426)	19.2 (489)	TBD	
2½ (65)	-	-	-	-	-	
3 (80)	-	-	14.5 (446)	19.2 (489)	TBD	
4 (100)	-	-	14.5 (446)	19.2 (489)	TBD	
6 (150)	-	-	-	-	TBD	
8 (200)	-	-	-	-	26.6 (675)	
10 (254)	-	-	-	-	26.6 (675)	
12 (305)	-	-	-	-	26.6 (675)	
16 (406)	-	-	-	-	26.6 (675)	
Weight Pounds (Kg)	11.0 (5)	27.5 (12.5)	33.0 (15)	122.0 (55)	165.0 (75)	



Multi-Spring Actuator
M155 100 mm Stroke



Multi-Spring Actuator
Standard



Piston Actuator

"D" DIMENSIONS inches (mm)

Sl.No	Actuator model	Dimesion 'D' mm (Inch)	Weight Kg (lbs)
1	P25	561 (22.1)	28 (61.7)
2	P50	777.5 (30.6)	57 (125.6)
3	P75	1014 (39.9)	107 (235.9)
4	P150	1098 (43.2)	205 (451.9)
5	P200	1139 (44.8)	328 (723.1)

1. Weights are approximate
2. Weights are only for actuator-assembly

D-SERIES CONTROL VALVE

Dimensions & Weights⁽¹⁾ - Pounds (kg)⁽²⁾⁽³⁾

Size	THD	Raised Face Body				
	NPT ⁽¹⁾	150	300	600	900	1500
2 (50)	50.7 (23.0)	50.7 (23.0)	58.2 (26.4)	61.7 (28.0)	119.0 (54.0)	119.0 (54.0)
2½ (65)	-	-	-	-	-	-
3 (80)	-	105.4 (47.8)	117.3 (53.2)	123.0 (55.8)	204.2 (92.6)	243.6 (110.5)
4 (100)	-	158.7 (72)	176.4 (80)	201.7 (91.5)	333.75 (151.4)	403.0 (182.8)
6 (150)	-	275.6 (125)	326.3 (148)	395.1 (179.2)	577.4 (261.9)	843.9 (382.8)
8 (200)	-	553.8 (251.2)	603.6 (273.8)	816.8 (370.5)	1021.6 (463.4)	1469.4 (666.5)
10 (254)	-	683 (310)	877 (398)	1281 (581)	-	-
12 (305)	-	1032 (468)	1327 (602)	1847 (838)	-	-
16 (406)	-	1656 (751)	2277 (1033)	3084 (1399)	-	-

Size	Ring Type Joint Body				
	150	300	600	900	1500
2 (50)	51.6 (23.4)	59.5 (27.0)	62.2 (28.2)	120.2 (54.5)	120.2 (54.5)
2½ (65)	-	-	-	-	-
3 (80)	107.6 (48.8)	120.6 (54.7)	124.1 (56.3)	205.7 (93.3)	245.8 (111.5)
4 (100)	161.6 (73.3)	182.3 (82.7)	202.6 (91.9)	335.5 (152.2)	405.4 (183.9)
6 (150)	277.8 (126.0)	332.6 (150.9)	397.0 (180.1)	578.7 (262.5)	848.1 (384.7)
8 (200)	558.2 (253.2)	612.9 (278.0)	820.1 (372.0)	1026.3 (465.5)	1480.2 (671.4)
10 (254)	690 (313)	888 (403)	1285 (583)	-	-
12 (305)	1043 (473)	1343 (609)	1852 (840)	-	-
16 (406)	1669 (757)	2299 (1043)	3093 (1403)	-	-

Size	Butt Weld End Body				
	150	300	600	900	1500
2 (50)	51.4 (23.3)			86.6 (39.3)	
2½ (65)	-	-	-	-	-
3 (80)	98.3 (44.6)			185.2 (84.0)	
4 (100)	148.2 (67.2)			316.1 (143.4)	
6 (150)	298.7 (135.5)			647.5 (293.7)	
8 (200)	704.8 (319.7)			1015.0 (460.4)	
10 (254)	807 (366)	-		1049 (476)	-
12 (305)	1199 (544)	-		1572 (713)	-
16 (406)	2044 (927)	-		2635 (1195)	-

1. NPT available in 2" only

2. Weights are approximate

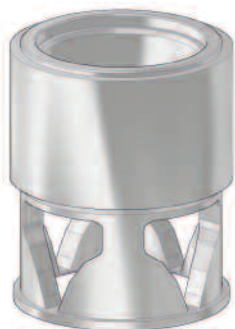
3. Weights are only for body sub-assembly

D-SERIES 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 conditions.
- 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.

LINEAR



STANDARD CAGE

The full ported, standard cage provides maximum flow with minimum pressure drop. The inherent linear or equal percent flow characteristic provides excellent low 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.



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.



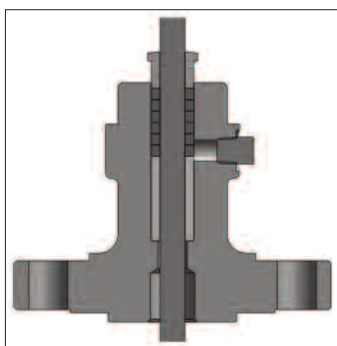
NOISE REDUCING CAGE

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.

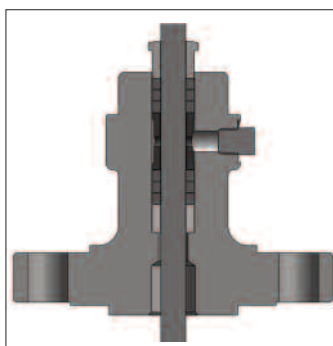


Single Stage / 2 Stages

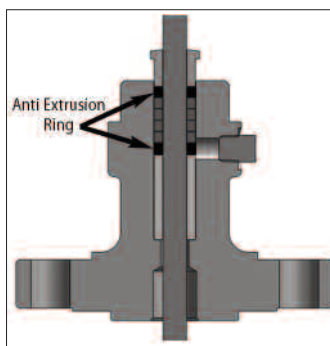
PACKING CONFIGURATIONS



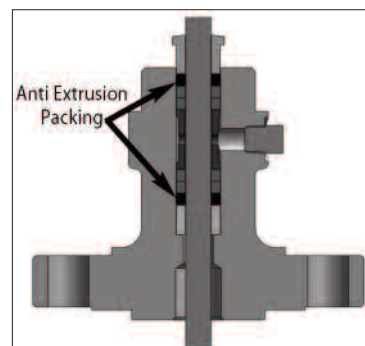
SINGLE PTFE



DOUBLE PTFE



SINGLE LAMINATED GRAPHITE



DOUBLE LAMINATED GRAPHITE

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).

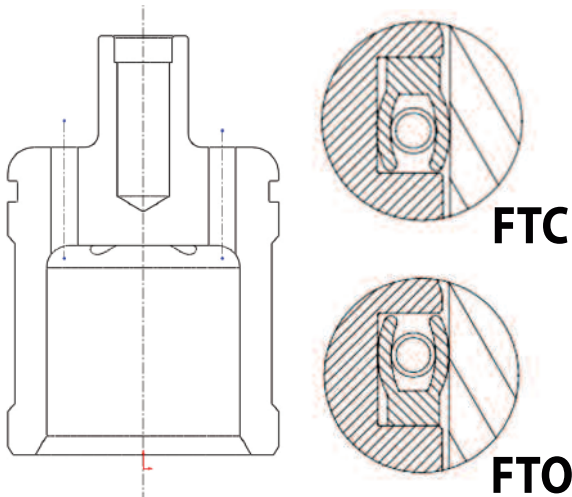
Precision die-cut laminated graphite rings provide a reliable, tight stem seal to operating temperatures of 1000°F (538°C)

D-SERIES 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 or V shutoff can be provided.

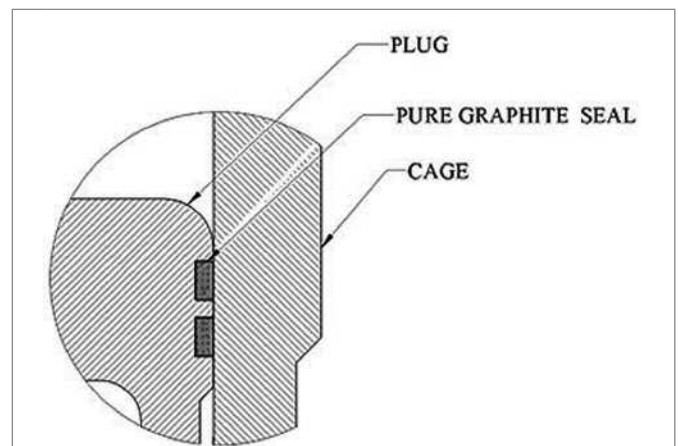
TRIM MATERIAL COMBINATIONS:

Trim Type	Trim	Maximum 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 Stellite	A351 CF8M Stellite	A479 TY316	C300 spring loaded seal 572°F/300°C - Flex Graph. 800°F/427°C	V or IV
High Temp	CA6NM HI-TEMP	1000°F/538°C	ASTM A487 CA6NM (Nitrided)	ASTM A487 CA6NM	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).

D-SERIES 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 8", Class 150, 300, 600, 900, 1500 RF, RTJ, BWE
10" thru 16" Class 150, 300, 600, RF, BWE, RTJ

BODY/BONNET MATERIALS:

Carbon Steel, A216 Gr WCC,
-20 to 800°F (-29°C to 427°C)
Low-Temp Carbon Steel A352 Gr. LCC,
-50 to 800°F (-46°C to 427°C)
316 Stainless Steel, A351 Gr CF8M,
-50 to 1000°F (-46°C to 538°C)
Chrome-Moly Steel A217 Gr WC9
-20 to 1000°F (-29°C to 538°C)

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

STEM PACKING:

Braided PTFE with Kevlar filaments
Temp. -20.2°F to 446°F (-29°C to 230°C)
Graphite - 2 Anti-Extrusion Ring Graphoil
Temp. -20.2°F to 1050.8°F (-29°C to 566°C)

PACKING STUDS, NUTS & FOLLOWER:

300 Series Stainless Steel

GASKETS:

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 or 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 572°F (-18 to 300°C) = Class V
to 800°F (427°C) - Class IV
High-temp trim, To 1000°F (538°C), Class IV

ACTUATORS:

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

SIZING COEFFICIENTS

CASE TYPE	LIQUID		GAS
	F _L	K _C	X _T
Standard	.8	.65	.7
Les Cav	.9	.79	N/A
Les Sonic	N/A	N/A	.65

D-SERIES SPECIFICATIONS

D-SERIES C_v TABLE

Valve Size	Rating	Linear Full	=% ^{††} Full	Les Sonic I	Les Sonic II	Les Cav I	Les Cav II
2(50)	150-1500	24	68	60	33	60	24
3(80)	150-1500	84	140	124	105	124	84
4(100)	150-1500	113	216	192	143	192	113
6(150)	150-1500	200	400	340	209	340	200
8(200)	150-600	336	756	672	330	672	336
8(200)	900-1500	302	680	604	297	604	302
10(250)	150-600	452	1100	816	528	816	452
12(300)	150-600	672	1440	924	798	924	672
16(400)	150-600	1047	2300	1785	1012	1785	1047

[†]Trim for Les Sonic II

^{††}.8, .6, .4 factors available

MATERIAL SPECIFICATIONS

(Other Options - See Page 6)

“D” SERIES Material Specification - Standard, Balanced, Normal Temp

Item	Description	Material	Material Specification
1	Body/Bonnet	Carbon Steel	ASTM A216 GR WCC
2	Valve Plug	Stainless Steel	ASTM A487 GR CA 15 W/PTFE C300 spring loaded seal
3	Valve Stem	Stainless Steel	ASTM A479 TY 316
4	¼" NPT, Hex Head, Plug in Bonnet	Carbon Steel	ASTM A105
5	SWG Gasket - Body Bonnet	Graphite / Stainless Steel	GRAPHITE + AISI 316L
6	SWG Gasket - Seat Ring	Graphite / Stainless Steel	GRAPHITE + AISI 316L
7	Stud - Body / Bonnet	Alloy Steel	ASTM A193 GR B7
8	Heavy Hex Nut - Body / Bonnet	Steel	ASTM A194 GR 2H
9	Cage	Stainless Steel	ASTM A351 CF8M
10	Seat Ring	Stainless Steel	ASTM A351 CF8M
11	Packing Ring	PTFE / Stainless Steel	Live Loaded PRFE V-Ring w/304 Stainless Steel Spring
12	Guide Bush in Bonnet	Stainless Steel	ASTM A276 TY 440C
13	Packing Follower	Stainless Steel	ASTM A479 TY 304
14	Packing Flange	Carbon Steel	ASTM A36, Zinc plated, Yellow passivation
15	Stud Packing	Stainless Steel	ASTM A193 GR B8
16	Hex Nut - Packing	Stainless Steel	ASTM A194 GR 8
17	Lock Nut Actuator	Carbon Steel	ASTM A36, Zinc plated, Yellow passivation
18	Plug Pin	Stainless Steel	ASTM A479 TY 316
19	Jam Nut	Stainless Steel	ASTM A194 GR 8
20	Seal Ring	PTFE / Optional Graphite	PTFE + 25% CARBON GRAPHITE + FLUOROLOY/ CARBON-GRAPHITE C300 spring loaded seal

NOTE: Common to all trim modules including Les-Cav/Les -Sonic unless otherwise listed

INCONEL® is a trademark of the Inco Family of Companies

NITRONIC 60® is a trademark of Armco, Inc.

STELLITE® is a trademark of Stoodly Deloro Stellite, Inc.

NACE Material available upon request

D-SERIES ORDER CODE (Rev. 6)

Class	Body Style	Valve Size	Valve Rating	End Conn.	Bonnet Packing	Trim Mat'l	Cage Type	Rated Cv	Actuator Type		Actuator Spring	Leakage Class	Accessories	Compliance	
D	A	1	1	A	1	A	A	1	A	0	A	C	E	C	E
1	2	3	0	5	6	7	8	9	10	11	12	13	14	15	16

Class - Position 1* D or M
Body Style - Position 2 A = Globe - WCC B = Globe - WC9 C = Globe - CF8M D = Globe - LCC E = Angle - WCC F = Angle - WC9 G = Angle - CF8M H = Angle - LCC
Valve Size - Position 3 1 = 2" 6 = 8" 2 = 2 1/2" 7 = 10" 3 = 3" 8 = 12" 4 = 4" 9 = 16" 5 = 6"
Valve Rating - Position 4 0 = ANSI 150 3 = ANSI 300 6 = ANSI 600 9 = ANSI 900 1 = ANSI 1500
End Connection - Position 5 A = RF Flange B = RTJ C = BWE 40 D = BWE 60 E = BWE 80 F = BWE XS G = BWE XXS H = SWE 40 I = SWE 60 J = SWE 80 K = SWE XS L = SWE XS M = SWE XXS N = THD X = Other
Bonnet & Packing - Position 6 1 = Std.-PTFE 2 = Std.-Graph 3 = Std.-DBL PTFE 4 = Std.-DBL Graph 5 = Ext.-PTFE 6 = Ext.-Graph 7 = Ext.-DBL PTFE 8 = Ext.-DBL Graph
Trim Material - Position 7 A = Std. (410 SST) w/ C300 spring loaded seal B = 316 SST w/ C300 spring loaded seal C = 316/STELL w/ C300 spring loaded seal D = STD (410 SST) w/Graph-Seal E = 316 SST w/Graph-Seal F = 316/STELL w/Graph-Seal G = CA6NM w/Graph-Seal (HT) N = NACE (316 SST w/ C300 spring loaded seal

Cage Type - Position 8
A = STD - LIN (Flow over seat)
B = STD - EQQ (Flow over seat)
C = LES-CAV I (Flow over seat)
D = LES-CAV II (Flow over seat)
E = LES-Sonic I (Flow under seat)
F = LES-Sonic II (Flow under seat)

Rated Cv - Position 9
1 = 100%
8 = 80%
6 = 60%
4 = 40%

Actuator Type - Position 10 & 11

A0 = M42-D
A1 = M42-R
A2 = M82-D
A3 = M82-R
A4 = M155-D
A5 = M155-R
B0 = M42-D-HOD
B1 = M42-R-HOD
B2 = M82-D-HOD
B3 = M82-R-HOD
B4 = M155-D-HOD
B5 = M155-R-HOD
C0 = S55-D
C1 = S55-R
C2 = S85-D
C3 = S85-R
C4 = S135-D
C5 = S135-R
D0 = S55-D-HOD
D1 = S55-R-HOD
D2 = S85-D-HOD
D3 = S85-R-HOD
D4 = S135-D-HOD
D5 = S135-R-HOD
E0 = P25-DA-D
E1 = P25-DA-R
E2 = P25-DASR-D
E3 = P25-DASR-R
E4 = P25-SASR-D
E5 = P25-SASR-R
F0 = P25-DA-D-HOD
F1 = P25-DA-R-HOD
F2 = P25-DASR-D-HOD
F3 = P25-DASR-R-HOD
F4 = P25-SASR-D-HOD
F5 = P25-SASR-R-HOD
G0 = P50-DA-D
G1 = P50-DA-R
G2 = P50-DASR-D
G3 = P50-DASR-R
G4 = P50-SASR-D
G5 = P50-SASR-R
H0 = P50-DA-D-HOD
H1 = P50-DA-R-HOD
H2 = P50-DASR-D-HOD
H3 = P50-DASR-R-HOD
H4 = P50-SASR-D-HOD
H5 = P50-SASR-R-HOD
J0 = P75-DA-D
J1 = P75-DA-R
J2 = P75-DASR-D

J3 = P75-DASR-R
J4 = P75-SASR-D
J5 = P75-SASR-R
K0 = P75-DA-D-HOD
K1 = P75-DA-R-HOD
K2 = P75-DASR-D-HOD
K3 = P75-DASR-R-HOD
K4 = P75-SASR-D-HOD
K5 = P75-SASR-R-HOD
L0 = P150-DA-D
L1 = P150-DA-R
L2 = P150-DASR-D
L3 = P150-DASR-R
L4 = P150-SASR-D
L5 = P150-SASR-R
M0 = P150-DA-D-HOD
M1 = P150-DA-R-HOD
M2 = P150-DASR-D-HOD
M3 = P150-DASR-R-HOD
M4 = P150-SASR-D-HOD
M5 = P150-SASR-R-HOD
N0 = P200-DA-D
N1 = P200-DA-R
N2 = P200-DASR-D
N3 = P200-DASR-R
N4 = P200-SASR-D
N5 = P200-SASR-R
P0 = P200-DA-D-HOD
P1 = P200-DA-R-HOD
P2 = P200-DASR-D-HOD
P3 = P200-DASR-R-HOD
P4 = P200-SASR-D-HOD
P5 = P200-SASR-R-HOD
XX = OTHER
ZZ = NONE (MBSA)

Actuator Spring - Position 12

A = 3 - 15 (B6 - 2G)
B = 12 - 45 (B6 - 6G)
C = 12 - 40 (A6 - 6G)
D = 4 - 20 (C6 - 3G)
E = 10 - 45 (C6 - 7G)
G = 10 - 30 (B6 - 3D)
H = 17 - 50 (B6 - 5D)
J = 23 - 70 (B6 - 7D)
K = 12 - 30 (C6 - 3D)
L = 20 - 50 (C6 - 7D)
M = 28 - 68 (C6 - 7D)
N = 3-15 psig (piston)
P = 6-30 psig (piston)
R = 11-23 psig (piston)
S = 21-45 psig (piston)
X = NONE
Z = SEE ORDER

Leakage Class - Position 13

4 = Class IV
5 = Class V

No of Accessories - Position 14

No Accessories
1 = Accessory
2 = Accessories
3 = Accessories
4 = Accessories
5 = Accessories
6 = Accessories
7 = Accessories
8 = Accessories
9 = Accessories
A = **760P (Only)**
B = **760E (Only)**
C = **PS2 (Only)**
D = **760P + ASG-1**
E = **760E + ASG-1**
F = **PS2 + ASG-1**

Compliance - Position 15 & 16

NONE
CE = CE CERT.
NE = NACE

*Use D for Leslie/RTK Product Brands and M for Mallard Product Brand

	= Phase II release (not currently in Circor Select®)
	= TBD whether this will be released at all on D-Series
760P	= Leslie P/N A79104 (760P11AAAGNND6 - FM/CSA/ATEX/CE, NO LIMIT SWITCHES, NO FEEDBACK, SGL/DBL ACTING, 1/2" - 4" STK)
760E	= Leslie P/N A79105 (760E11AAAGNND6 - FM/CSA/ATEX/CE, NO LIMIT SWITCHES, NO FEEDBACK, SGL/DBL ACTING, 1/2" - 4" STK)
PS2	= Leslie P/N A87015 (6DR52200EN000AA4 - HART/EEEx ia/ib (CEN-ELEC /ATEX/FM/CSA), NO LIMIT SWITCHES, NO FEEDBACK. DBL ACTING 1.3" - 5" STK)
AASG-1	= Leslie P/N a801072 (0 - 100 psig)



D-SERIES APPLICATIONS

Applications

FEEDWATER CONTROL regulates level of water in boiler drum. A 1 - 3 drum design is commonly based on HP, IP & LP applications. Valve receives water flow from pump and supplies water to drum to make up for that used to produce steam.

FEEDWATER RECIRCULATION valve insures that adequate flow is maintained through feedwater pump. The pump manufacturer calculates minimum flow required to prevent risk of premature pump failure due to bearings overheating or excessive thermal expansion of impeller blades.

AUXILIARY STEAM PRESSURE REDUCTION

- 1) Soot Blowers increase thermal efficiencies. Valve controls steam supplied to header from super heated source. PRV sees high pressure drop, intermittent operation, and rapid load swings.
- 2) Building Heat, extraction steam control.
- 3) Pegging, Deaerators use super heated steam to heat and remove air from condensate. Normally closed against high differential pressure.


GLAND SEAL STEAM, valves are used to maintain constant steam pressure in gland to seal air from turbine. Application requires HP steam, throttling a low flow at high DP. Typically these valves operate in a split range mode. One pressure signal either loads or vents the gland.

ATTEMPERATOR SPRAY, SUPERHEAT, REHEAT - Spray Control valve, is used for controlling steam temperature to turbine. The purpose of valve is to maintain a tight temperature band resulting in maximum efficiency.

- 1) Superheat spray, low DP, turndown, and accuracy are important.
- 2) Reheat spray, high DP, with Cavitation and seat leakage concerns as the valve operates close to the seat.

D-SERIES - LINEAR VALVE SPECIFICATION FORM

LINEAR

 LESLIE CONTROLS, INC. <small>A subsidiary of CIRCOR International, Inc. 12501 Telecom Drive • Tampa, Florida 33637 (813) 978-1000 • FAX: (813)-978-0984</small>	Project/Job _____ Unit/Customer _____ P.O./LCO File # _____ Item _____ Contract _____ MFR Serial# _____		Data Sheet _____ of _____ Spec _____ Tag _____ Dwg _____ Service _____																																	
	CONTROL VALVE SPEC SHEET																																			
	Fluid <input type="checkbox"/> Steam <input type="checkbox"/> Water <input type="checkbox"/> Gas _____ <input type="checkbox"/> Liquid _____		Crit Pres PC																																	
	Service Conditions Flow <input type="checkbox"/> #/hr <input type="checkbox"/> gpm <input type="checkbox"/> scfh <input type="checkbox"/> _____ Inlet Pressure <input type="checkbox"/> psig <input type="checkbox"/> psia <input type="checkbox"/> _____ Outlet Pressure <input type="checkbox"/> psig <input type="checkbox"/> psia <input type="checkbox"/> _____ Temperature <input type="checkbox"/> °C <input type="checkbox"/> °F _____ Max Press/Temperature: _____ / _____ Density/MW/SG _____ / _____ / _____ Viscosity _____ CP Vapor Pressure <input type="checkbox"/> psia <input type="checkbox"/> _____ Required C _v _____ Noise (dBA) Allowable _____		<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:25%;">Max. Flow</th> <th style="width:25%;">Norm. Flow</th> <th style="width:25%;">Min. Flow</th> <th style="width:25%;">Shut-off Pressure</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>		Max. Flow	Norm. Flow	Min. Flow	Shut-off Pressure																												
	Max. Flow	Norm. Flow	Min. Flow	Shut-off Pressure																																
Line Info Pipe Size In _____ /Sch _____ Pipe Size Out _____ /Sch _____																																				
Valve, Body & Bonnet Body Size in. <input type="checkbox"/> 2 <input type="checkbox"/> 2½ <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 6 <input type="checkbox"/> 8 <input type="checkbox"/> 10 <input type="checkbox"/> 12 <input type="checkbox"/> 16 ANSI Class <input type="checkbox"/> 150 <input type="checkbox"/> 250 <input type="checkbox"/> 300 <input type="checkbox"/> 600 <input type="checkbox"/> 900 <input type="checkbox"/> 1500 <input type="checkbox"/> Other _____ Body/Bonnet Material: <input type="checkbox"/> Cast Steel WCC <input type="checkbox"/> Cr MoC9 <input type="checkbox"/> SS A351 CF8M _____ <input type="checkbox"/> Other _____ End Conn. Inlet/Outlet: <input type="checkbox"/> NPT <input type="checkbox"/> SWE <input type="checkbox"/> BWE Sch. _____ <input type="checkbox"/> Int. Flanges <input type="checkbox"/> RTJ <input type="checkbox"/> Other _____ Packing Material: <input type="checkbox"/> PTFE <input type="checkbox"/> Laminated Graphite <input type="checkbox"/> Other _____																																				
Trim Size <input type="checkbox"/> 100% <input type="checkbox"/> 80% <input type="checkbox"/> 60% <input type="checkbox"/> 40% <input type="checkbox"/> Les-Cav I <input type="checkbox"/> Les-Cav II <input type="checkbox"/> Les-sonic I <input type="checkbox"/> Les-sonic II <input type="checkbox"/> Other _____																																				
Actuator Spring Action: <input type="checkbox"/> Air to Open <input type="checkbox"/> Air to Close <input type="checkbox"/> Last Position <input type="checkbox"/> Other _____ <input type="checkbox"/> None Available Air Supply Pressure: Max. _____ Min. _____ <input type="checkbox"/> Other _____ Manual Override: <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Type _____ *Accessory Classification NEMA 4D, 7D, 9D <input type="checkbox"/> Other _____																																				
Solenoid <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Type _____ <input type="checkbox"/> Voltage _____																																				
*Positioner <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Type _____ <input type="checkbox"/> Pneu <input type="checkbox"/> E/P <input type="checkbox"/> Digital <input type="checkbox"/> Protocol _____																																				
*Switch <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Type _____ <input type="checkbox"/> Voltage _____ <input type="checkbox"/> Classification _____																																				
Air Set <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Type: _____ <input type="checkbox"/> Range: _____ Gage <input type="checkbox"/> Y <input type="checkbox"/> N																																				
Other Accessories <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Type _____																																				
Test ANSI/FCI Leakage Class: <input type="checkbox"/> III <input type="checkbox"/> IV <input type="checkbox"/> V <input type="checkbox"/> VI																																				

*Specify Protocol HART / FFB / Profi, etc.

QUESTIONS? CALL LESLIE CONTROLS @ 800.439.4485 • PLEASE FAX COMPLETED FORM TO: (813) 977-0174

NOTES: