



Balanced and Multi-stage Trim Options for Spira-trol™ Two-port Control Valves

Description

The Spira-trol™ range of two-port valves is available with alternative trim options to make it possible to select a valve configuration to suit an individual application. This Technical Information sheet covers balanced and multi-stage trim options and should be used in conjunction with the appropriate valve Technical Information sheet.

Pressure/temperature limits

Please see the product specific Technical Information (TI) sheet and Installation and Maintenance Instructions (IMI) for valve limitations.

TI-S24-71 (DN15-100 K and L Series - EN)

TI-S24-72 (½" to 4" K and L Series - ASME)

TI-S24-73 (DN125-300 K Series - EN and ASME)

TI-S24-60 (DN15-200 J Series - EN and ASME)

Please refer to IM-S24-42 and IM-S24-61 for safety information related to the installation, commissioning, operation, maintenance and disposal of the products identified in this document.

Seat options DN15 to DN300 (Diameter ½" to 12") Spira-trol™

Trim type	Trim balancing	Seat options					
		T	S	G	W	P	C
Standard parabolic	Un-Balanced	•	•	•	•	•	•
	Balanced (Full KV only)	•	•	•	•	•	
1-Stage Low Noise (P1)	Un-Balanced	•	•	•	•	•	
	Balanced (All KV)	•	•	•	•	•	
2-Stage Low Noise (P2)	Un-Balanced				•	•	
	Balanced (All KV)				•	•	
3-Stage Low Noise (P3)	Un-Balanced				•		
	Balanced (All KV)				•		
1-Stage Anti-Cavitation (A1)	Un-Balanced				•		
	Balanced (All KV)				•		
2-Stage Anti-Cavitation (A2)	Un-Balanced				•		
	Balanced (All KV)				•		

Trim option materials DN15 to DN300 (Diameter ½" to 12") Spira-trol™

Trim type	Trim component	Seat options					
		T	S	G	W	P	C
Standard parabolic	Seat Material	St.St. 431S29	St.St. 316L	PTFE	St.St. 316L + Stellite 6	PEEK	
	Plug Material			St.St. 431S29*		St.St. 316L	St.St. 431S29*
	Stem Material				St.St. 316L (CD ₄ MCuN for unbalanced version only)		
	Cage Material						
1-Stage Low Noise (P1)	Seat Material	St.St. 431S29	St.St. 316L	PTFE	St.St. 316L + Stellite 6	PEEK	
	Plug Material			St.St. 431S29*		St.St. 431S29*	
	Stem Material	St.St. 316L	St.St. 316L	St.St. 316L	St.St. 316L		
	Cage Material	St.St. 316L					
2-Stage Low Noise (P2)	Seat Material				316L + Stellite 6	PEEK	
	Plug Material				St.St. 316L + Stellite 6		
	Stem Material				St.St. 316L		
	Cage Material						
3-Stage Low Noise (P3)	Seat Material				St.St. 316L + Stellite 6		
	Plug Material				St.St.316L		
	Stem Material						
	Cage Material						
1-Stage Anti-Cavitation (A1)	Seat Material				St.St. 316L + Stellite 6		
	Plug Material				St.St. 316L		
	Stem Material						
	Cage Material						
2-Stage Anti-Cavitation (A2)	Seat Material				St.St. 316L + Stellite 6		
	Plug Material				St.St. 316L		
	Stem Material						
	Cage Material						

*316L for Stainless Steel valves

Trim type	Trim component	Seat options					
		T	S	G	W	P	C
All Balanced or Multi-Stage Variants	Gasket Material	Reinforced exfoliated graphite					
	Balance Seal Material	Graphite					

Trim Options DN15 to DN50 (Diameter ½" to 2") Spira-trol™

Trim type	Trim balancing	DN15-25 (Ø½" - Ø1")				DN32 (Ø1¼")			
		JE/JEA	KE/KEA	LEA	LE	JE/JEA	KE/KEA	LEA	LE
Standard parabolic	Un-Balanced	•	•	•	•	•	•		•
	Balanced (Full KV only)								
1-Stage Low Noise (P1)	Un-Balanced	•	•	•	•	•	•		•
	Balanced (All KV)					•			
2-Stage Low Noise (P2)	Un-Balanced					•	•		•
	Balanced (All KV)					•			
3-Stage Low Noise (P3)	Un-Balanced					•	•		•
	Balanced (All KV)					•			
1-Stage Anti-Cavitation (A1)	Un-Balanced	•	•	•	•	•	•		•
	Balanced (All KV)					•			
2-Stage Anti-Cavitation (A2)	Un-Balanced					•	•		•
	Balanced (All KV)					•			

Trim type	Trim balancing	DN40-50 (Ø1½" - Ø2")			
		JE/JEA	KE/KEA	LEA	LE
Standard parabolic	Un-Balanced	•	•		•
	Balanced (Full KV only)	•			
1-Stage Low Noise (P1)	Un-Balanced	•	•		•
	Balanced (All KV)	•			
2-Stage Low Noise (P2)	Un-Balanced	•	•		•
	Balanced (All KV)	•			
3-Stage Low Noise (P3)	Un-Balanced	•	•		•
	Balanced (All KV)	•			
1-Stage Anti-Cavitation (A1)	Un-Balanced	•	•		•
	Balanced (All KV)	•			
2-Stage Anti-Cavitation (A2)	Un-Balanced	•	•		•
	Balanced (All KV)	•			

Trim options DN65 to DN100 (Diameter 2½" to 4") Spira-trol™

Trim type	Trim balancing	DN65 (Ø2½")				DN80 (Ø3")			
		JE/JEA	KE/KEA	LEA	LE	JE/JEA	KE/KEA	LEA	LE
Standard parabolic	Un-Balanced	•	•	•	•	•	•	•	•
	Balanced (Full KV)	•	•	•		•	•	•	
	Balanced (Red1 KV)					•	•	•	
1-Stage Low Noise (P1)	Un-Balanced	•	•	•	•	•	•	•	•
	Balanced (All KV)	•	•	•		•	•	•	
2-Stage Low Noise (P2)	Un-Balanced	•	•	•	•	•	•	•	•
	Balanced (All KV)	•	•	•		•	•	•	
3-Stage Low Noise (P3)	Un-Balanced	•	•	•	•	•	•	•	•
	Balanced (All KV)	•	•	•		•	•	•	
1-Stage Anti-Cavitation (A1)	Un-Balanced	•	•	•	•	•	•	•	•
	Balanced (All KV)	•	•	•		•	•	•	
2-Stage Anti-Cavitation (A2)	Un-Balanced	•	•	•	•	•	•	•	•
	Balanced (All KV)	•	•	•		•	•	•	

Trim type	Trim balancing	DN100 (Ø4")			
		JE/JEA	KE/KEA	LEA	LE
Standard parabolic	Un-Balanced	•	•	•	•
	Balanced (Full KV)	•	•	•	
	Balanced (Red1 KV)				
1-Stage Low Noise (P1)	Un-Balanced	•	•	•	•
	Balanced (All KV)	•	•	•	
2-Stage Low Noise (P2)	Un-Balanced	•	•	•	•
	Balanced (All KV)	•	•	•	
3-Stage Low Noise (P3)	Un-Balanced	•	•	•	•
	Balanced (All KV)	•	•	•	
1-Stage Anti-Cavitation (A1)	Un-Balanced	•	•	•	•
	Balanced (All KV)	•	•	•	
2-Stage Anti-Cavitation (A2)	Un-Balanced	•	•	•	•
	Balanced (All KV)	•	•	•	

Trim options DN125+ (Diameter 5"+) Spira-trol™

Trim type	Trim balancing	DN125 to DN200 (Ø5" to Ø8")			DN250 to DN300 (Ø10" to Ø12")		
		JE/JEA	KE/KEA	LE/LEA	JE/JEA	KE/KEA	LE/LEA
Standard parabolic	Un-Balanced	•	•			•	
	Balanced (All KV)	•	•			•	
1-Stage Low Noise (P1)	Un-Balanced	•	•			•	
	Balanced (All KV)	•	•			•	
2-Stage Low Noise (P2)	Un-Balanced	•	•			•	
	Balanced (All KV)	•	•			•	
3-Stage Low Noise (P3)	Un-Balanced	•	•			•	
	Balanced (All KV)	•	•			•	
1-Stage Anti-Cavitation (A1)	Un-Balanced						
	Balanced (All KV)	•	•			•	
2-Stage Anti-Cavitation (A2)	Un-Balanced						
	Balanced (All KV)	•	•			•	

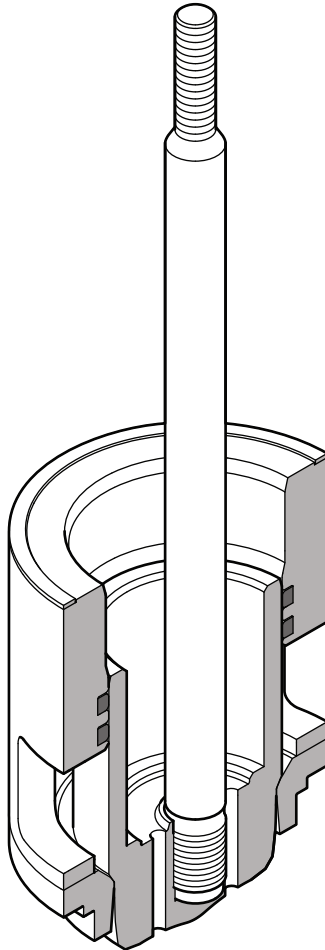
1 Stage Parabolic Balanced Trim

Model availability

DN40 to DN50 (Diameter 1½" to 2") option only available for Spira-trol™ J Series.

Technical data

Trim design	Parabolic	
Leakage	Metal-to-metal	Class IV
	Soft seal	Class IV
Rangeability	Equal %	50:1
	Linear	50:1
	Fast	10:1
Travel	DN40 to DN50 (1½" to 2")	20mm (0.8")
	DN65 to DN100 (2½" to 4")	30 mm (1.2")
	DN125 to DN300 (5" to 12")	70 mm (2.8")



1 Stage Parabolic Balanced Trim (continued)

Kv (Cv US) values

For conversion: Cv (UK) = Kv x 0.963

Trim		DN40 (1½")	DN50 (2")	DN65 (2½")	DN80 (3")	DN100 (4")	DN125 (5")	DN150 (6")	DN200 (8")	DN250 (10")	DN300 (12")
Full port	Equal percentage	25 (30)	36 (45)	63 (75)	100 (120)	160 (190)	245 (283)	370 (433)	580 (679)	700 (809)	1 000 (1 156)
	Linear	25 (30)	36 (45)	63 (75)	100 (120)	160 (190)	260 (300)	390 (456)	640 (749)	780 (902)	1 100 (1 272)
Reduction 1	Equal percentage		25 (33)		63 (85)		200 (231)	287 (336)	370 (433)	580 (670)	700 (809)
	Linear		25 (33)		63 (85)		200 (231)	287 (336)	550 (433)	640 (740)	780 (902)
Reduction 2	Equal percentage						100 (116)	132 (154)	232 (271)	370 (428)	580 (670)
	Linear						100 (116)	132 (154)	232 (271)	550 (636)	640 (740)
Reduction 3	Equal percentage						63 (73)	103 (120)	163 (191)	232 (268)	370 (428)
	Linear						63 (73)	103 (120)	163 (191)	232 (268)	550 (636)
Reduction 4	Equal percentage									163 (188)	232 (268)
	Linear									163 (188)	232 (268)
Reduction 5	Equal percentage										163 (188)
	Linear										163 (188)
Fast opening		28 (32)	50 (50)	85 (88)	117 (136)	180 (210)	260 (300)	390 (456)	640 (749)	780 (902)	1 100 (1 272)

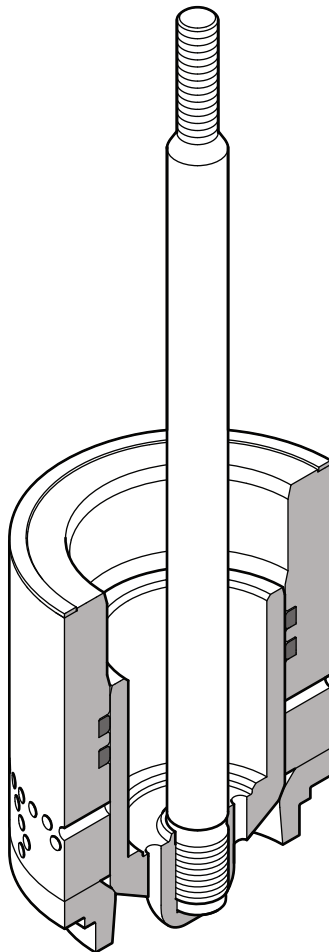
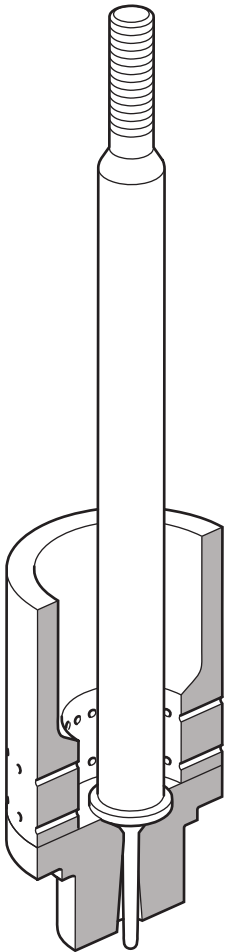
1 Stage Perforated Trim

Model availability

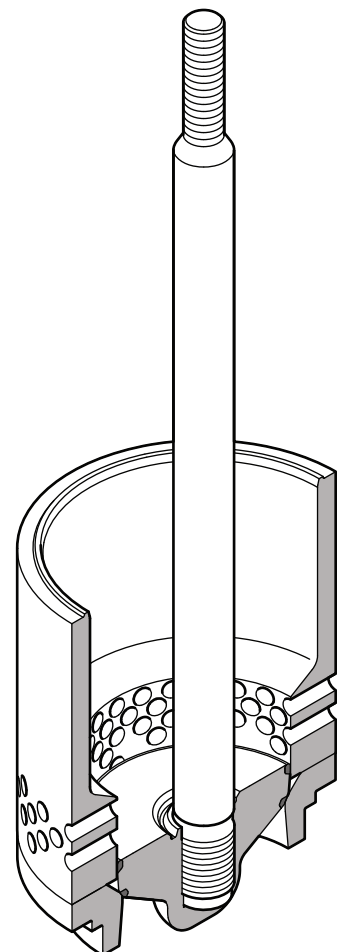
Balanced DN40 to DN50 (Diameter 1½" to 2") option only available for Spira-trol™ J Series.

Technical data

Trim design	Perforated		
	Metal-to-metal		Class IV
Leakage	Soft seal	Unbalanced	Class VI
		Balanced	Class IV
Rangeability	50:1		
	DN40 to DN50 (1½" to 2")		20mm (0.8")
Travel	DN65 to DN100 (2½" to 4")		30 mm (1.2")
	DN125 to DN300 (5" to 12")		70 mm (2.8")



1 stage low noise (P1)
balanced trim



1 stage low noise (P1)
unbalanced trim

1 Stage Perforated Trim (continued)

Kv (Cv US) values

For conversion: Cv (UK) = Kv x 0.963

Trim	DN15 (½")	DN20 (¾")	DN25 (1")	DN32 (1¼")	DN40 (1½")	DN50 (2")	DN65 (2½")	DN80 (3")	DN100 (4")	DN125 (5")	DN150 (6")	DN200 (8")	DN250 (10")	DN300 (12")
Full port Equal percentage	4 (4.6)	6.3 (7.3)	10 (11.6)	16 (18.5)	25 (29)	25 (29)	50 (58)		80 (92)				551 (637)	787 (909)
Full port Linear	4 (4.6)	6.3 (7.3)	10 (11.6)	16 (18.5)	25 (29)	36 (42)	63 (73)	70 (81)	90 (104)	245 (283)	300 (347)	516 (596)	622 (719)	890 (1028)
Reduction 1 Equal percentage	2.5 (2.9)	4 (4.6)	6.3 (7.3)	10 (11.6)	16 (18.5)	25 (29)	36 (42)	50 (58)	63 (73)	219 (253)	255 (295)	457 (528)		551 (637)
Reduction 1 Linear	2.5 (2.9)	4 (4.6)	6.3 (7.3)	10 (11.6)	16 (18.5)	25 (29)	36 (42)	63 (73)	63 (73)	219 (253)	255 (295)	457 (528)	516 (596)	622 (719)
Reduction 2 Equal percentage and Linear	1.6 (1.8)	2.5 (2.9)	4 (4.6)	6.3 (7.3)	10 (11.6)	16 (18.5)	25 (29)	36 (42)	50 (58)	115 (133)	200 (231)	350 (405)	457 (528)	
Reduction 2 Linear	1.6 (1.8)	2.5 (2.9)	4 (4.6)	6.3 (7.3)	10 (11.6)	16 (18.5)	25 (29)	36 (42)	50 (58)	115 (133)	200 (231)	350 (405)	457 (528)	
Reduction 3 Equal percentage and Linear	1.0 (1.2)*	1.6 (1.8)	2.5 (2.9)	4 (4.6)	6.3 (7.3)	10 (11.6)	16 (18.5)	25 (29)	36 (42)	75 (87)	152 (176)	265 (306)	350 (405)	457 (528)
Reduction 4 Equal percentage and Linear	0.5** (0.6)*	1.0 (1.2)*	1.6 (1.8)		4 (4.6)	6.3 (7.3)		16 (18.5)	16 (18.5)				265 (306)	457 (528)
Reduction 5 Equal percentage and Linear	0.2** (0.2)*	0.5** (0.6)*	1.0 (1.2)*			4 (4.6)							175 (203)	350 (405)
Reduction 6 Equal percentage and Linear	0.1** (0.1)*	0.2** (0.2)*	0.5** (0.6)*										100 (116)	265 (306)
Reduction 7 Equal percentage and Linear		0.1** (0.1)*	0.2** (0.2)*											175 (203)
Reduction 8 Equal percentage and Linear			0.1** (0.1)*											100 (116)

* Only available in Anti-cavitation

** Linear characteristic only

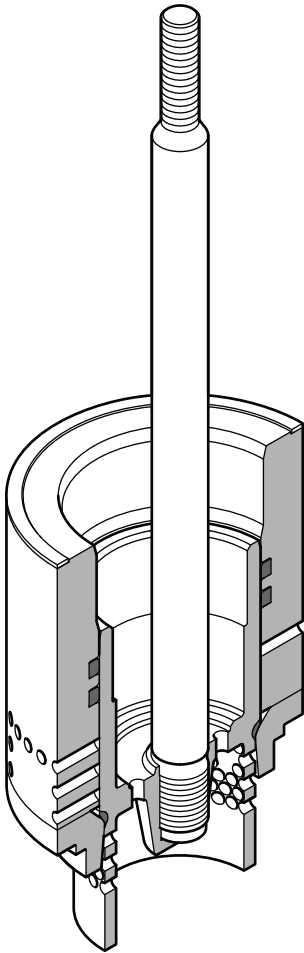
2 Stage Perforated Trim

Model availability

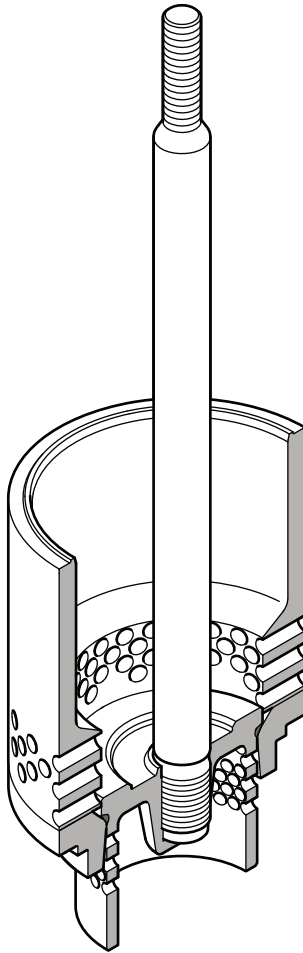
Balanced DN40 to DN50 (Diameter 1½" to 2") option only available for Spira-trol™ J Series

Technical data

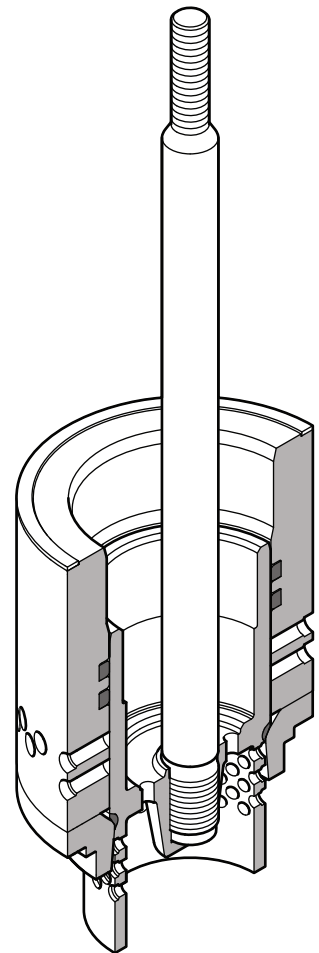
Trim design	Perforated	
Leakage	Hard facing	Class IV
Rangeability	50:1	
Travel	DN40 to DN50 (1½" to 2")	20mm (0.8")
	DN65 to DN100 (2½" to 4")	30 mm (1.2")
	DN125 to DN300 (5" to 12")	70 mm (2.8")



2 stage low noise (P2)
balanced trim



2 stage low noise (P2)
unbalanced trim



2 stage anti-cavitation (A2)
balanced trim

2 Stage Perforated Trim (continued)

Kv (Cv US) values

For conversion: Cv (UK) = Kv x 0.963

Trim	DN32 (1¼")	DN40 (1½")	DN50 (2")	DN65 (2½")	DN80 (3")	DN100 (4")	DN125 (5")	DN150 (6")	DN200 (8")	DN250 (10")	DN300 (12")
Full port Equal percentage	16 (18.5)	16 (18.5)	16 (18.5)	44 (51)	44 (51)	63 (73)	125 (145)	160 (185)	280 (324)	305 (353)	386 (446)
Full port Linear	16 (18.5)	16 (18.5)	16 (18.5)	50 (58)	50 (58)	63 (73)	125 (145)	160 (185)	280 (324)	305 (353)	436 (504)
Reduction 1 Equal percentage and Linear	10 (11.6)	10 (11.6)	10 (11.6)	36 (42)	36 (42)	36 (42)	100 (116)	100 (116)	160 (185)	280 (324)	305 (353)
Reduction 2 Equal percentage and Linear	6.3 (7.3)	6.3 (7.3)	6.3 (7.3)	25 (29)	25 (29)	25 (29)	63 (73)	63 (73)	100 (116)	160 (185)	280 (324)
Reduction 3 Equal percentage and Linear	4 (4.6)	4 (4.6)	4 (4.6)	16 (18.5)	16 (18.5)	16 (18.5)	36 (42)	36 (42)	63 (73)	100 (116)	160 (185)
Reduction 4 Equal percentage and Linear				10 (11.6)	10 (11.6)	10 (11.6)	25 (29)		36 (42)	63 (73)	100 (116)
Reduction 5 Equal percentage and Linear				6.3 (7.3)	6.3 (7.3)					36 (42)	63 (73)
Reduction 6 Equal percentage and Linear											36 (42)

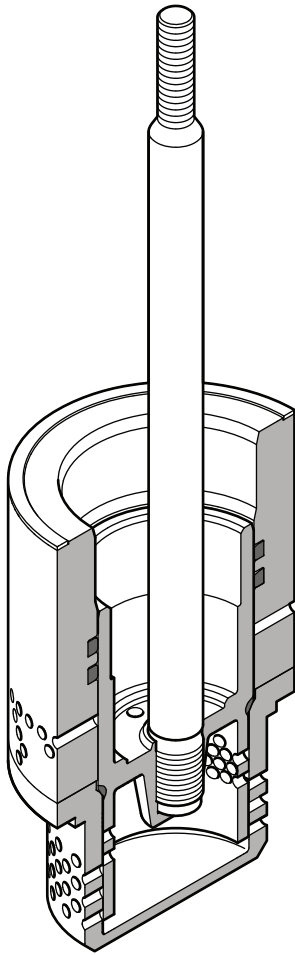
3 Stage Low Noise Trim

Model availability

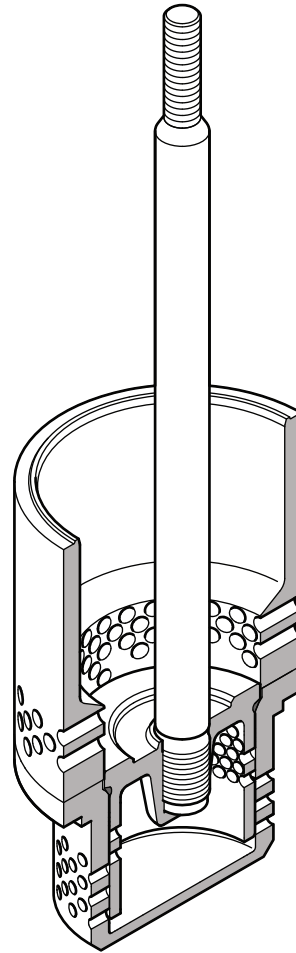
Balanced DN40 to DN50 (Diameter 1½" to 2") option only available for Spira-trol™ J Series

Technical data

Trim design	Perforated	
Leakage	Hard facing	Class IV
Rangeability	50:1	
Travel	DN40 to DN50 (1½" to 2")	20mm (0.8")
	DN65 to DN100 (2½" to 4")	30 mm (1.2")
	DN125 to DN300 (5" to 12")	70 mm (2.8")



**3 stage low noise (P3)
balanced trim**



**3 stage low noise (P3)
unbalanced trim**

3 Stage Low Noise Trim (continued)

Kv (Cv US) values

For conversion: Cv (UK) = Kv x 0.963

Trim	DN32 (1¼")	DN40 (1½")	DN50 (2")	DN65 (2½")	DN80 (3")	DN100 (4")	DN125 (5")	DN150 (6")	DN200 (8")	DN250 (10")	DN300 (12")
Full port Equal percentage	13 (15)	13 (15)	13 (15)	25 (29)	25 (29)	36 (42)	78 (90)	100 (116)	180 (208)	223 (258)	282 (326)
Full port Linear	13 (15)	13 (15)	13 (15)	25 (29)	25 (29)	36 (42)	78 (90)	100 (116)	180 (208)	282 (326)	319 (369)
Reduction 1 Equal percentage and Linear	10 (11.6)	10 (11.6)	10 (11.6)	16 (18.5)	16 (18.5)	25 (29)	63 (73)	63 (73)	160 (185)	180 (208)	223 (258)
Reduction 2 Equal percentage and Linear	6.3 (7.3)	6.3 (7.3)	6.3 (7.3)	10 (11.6)	10 (11.6)	16 (18.5)	36 (42)	36 (42)	100 (116)	160 (185)	180 (208)
Reduction 3 Equal percentage and Linear	4 (4.6)	4 (4.6)	4 (4.6)	6.3 (7.3)	6.3 (7.3)	10 (11.6)	25 (29)	25 (29)	36 (42)	100 (116)	160 (185)
Reduction 4 Equal percentage and Linear				4 (4.6)	4 (4.6)	6.3 (7.3)	16 (18.5)			36 (42)	100 (116)
Reduction 5 Equal percentage and Linear							10 (11.6)				36 (42)

Spira-trol™ selection guide

Valve size	DN15 to DN300	DN80
Valve series	J = J series 2-port control valve K = K series 2-port control valve L = L series 2-port control valve	K
Valve characteristic	E = Equal percentage F = Fast opening L = Linear	E
Type of flange	Blank = EN A = ASME (ANSI)	A
Flow	Blank = Flow under T = Flow over	
Body material	3 = Cast iron 4 = Carbon steel 6 = Stainless steel 7 = SG iron 8 = Alloy steel	4
Connections	1 = Screwed 2 = Socket Welded 3 = Flanged 4 = Butt Welded	3
Stem sealing	N = PTFE/Nitronic bush P = PTFE H = Graphite D = Bellows / Graphite secondary seals	D
Seating	T = 431 stainless steel P = Full PEEK seat G = PTFE soft seat S = 316L stainless steel W = 316L with stellite 6 facing C = Steam-Tight reversible PEEK seat	T
Type of trim	S = Standard trim P1 = Low noise cage 1 stage P2 = Low noise cage 2 stage P3 = Low noise cage 3 stage A1 = Anti-cavitation cage 1 stage A2 = Anti-cavitation cage 2 stage	P1
Trim balancing	U = Unbalanced B = Balanced	B
Bonnet type	S = Standard E = Extended high temperature	S
Bolting	S = Standard H = High temperature	S
Finish	Blank = Standard N = ENP coating	
Series	.2 = .2	.2
Kvs (Cv)	To be specified	Cv 58
Connection type	To be specified	Flanged ASME 300

Selection example:

DN80	-	K	E	A		4	3	D	T	P1	B	S	S		.2	-	Cv 58	-	Flanged ASME 300
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Available spares

Balanced gasket set Parts 1, 2