



# 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.

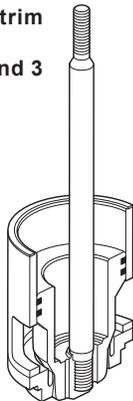
## Pressure/temperature limits

Please see the product specific Technical Information (TI) sheet for valve limitations.

## 1 stage

Parabolic balanced trim

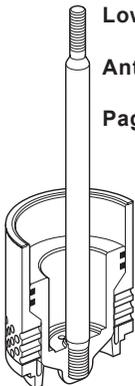
Pages 2 and 3



Low noise balanced trim

Anti-cavitation balanced trim

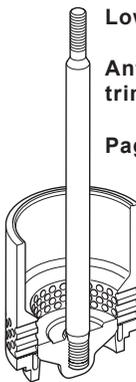
Pages 4 and 5



Low noise unbalanced trim

Anti-cavitation unbalanced trim

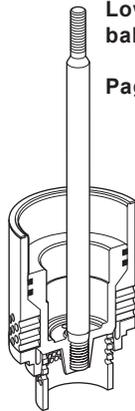
Pages 4 and 5



## 2 stage

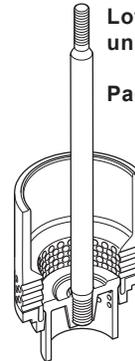
Low noise  
balanced trim

Page 4



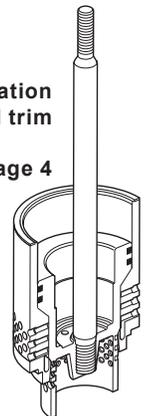
Low noise  
unbalanced trim

Pages 6 and 7



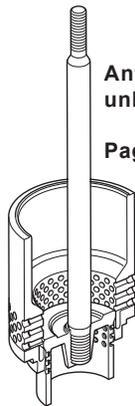
Anti-cavitation  
balanced trim

Page 4



Anti-cavitation  
unbalanced trim

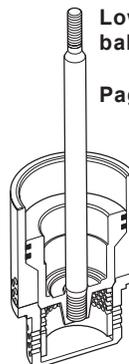
Pages 6 and 7



## 3 stage

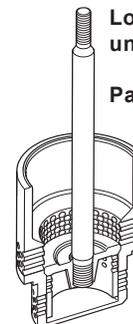
Low noise  
balanced trim

Page 8



Low noise  
unbalanced trim

Page 8



# 1 stage parabolic balanced trim

## Model availability

This trim is available for the Spira-trol™ JE, JEA, KE, KEA and LEA only.

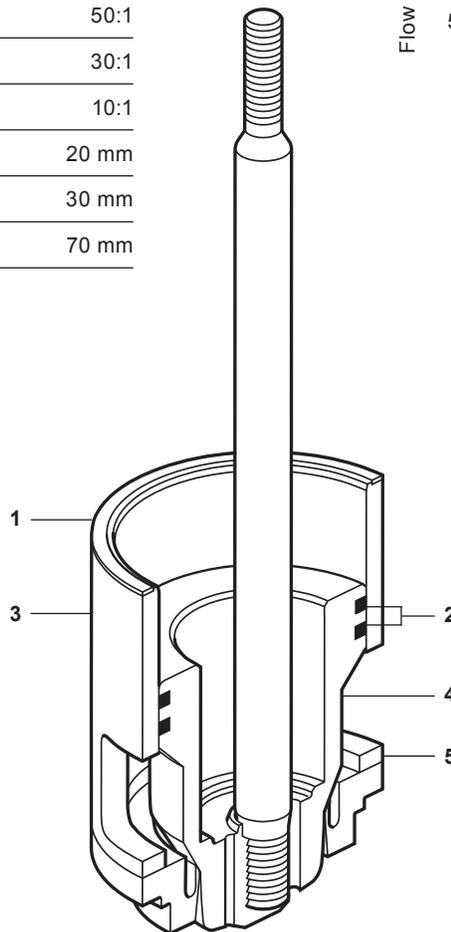
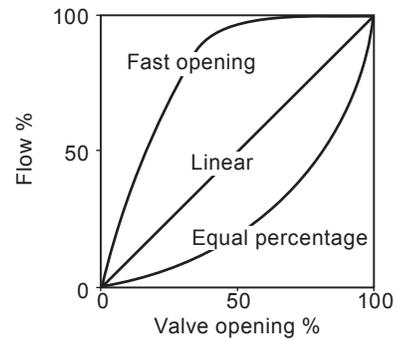
## Sizes

1½" to 8".

## Technical data

Trim design	Parabolic	
Leakage	Metal-to-metal	Class IV
	Soft seal	Class IV
Rangeability	Equal %	50:1
	Linear	30:1
	Fast	10:1
Travel	DN40 to DN50	20 mm
	DN65 to DN100	30 mm
	DN125 to DN300	70 mm

## Typical flow characteristic curves



## Materials

No.	Part	Material
1	Cage gasket	Reinforced exfoliated graphite
2	Plug seal	Graphite
3	Cage retainer	CF8M
4	Plug and stem	431 stainless steel/316L stainless steel/316L with stellite 6 facing
5	Seat ring	PTFE soft seat/PEEK soft seat/Full PEEK/431 stainless steel/316L stainless steel/316L with stellite facing

# 1 stage parabolic balanced trim (continued)

## $K_v$ ( $C_v$ US) values

For conversion:  $C_v$  (UK) =  $K_v \times 0.963$

Trim	DN40	DN50	DN65	DN80	DN100	DN150	DN200	
Full port	Equal percentage	25 (30)	36 (45)	63 (75)	100 (120)	160 (190)	370 (433)	580 (679)
	Linear	25 (30)	36 (45)	63 (75)	100 (120)	160 (190)	390 (456)	640 (749)
Reduction 1	Equal percentage		25 (33)	36 (48)	63 (85)	100 (130)	287 (336)	370 (433)
	Linear		25 (33)	36 (48)	63 (85)	100 (130)	287 (336)	550 (433)
Reduction 2	Equal percentage			25 (36)	36 (50)	63 (90)	132 (154)	232 (271)
	Linear			25 (36)	36 (50)	63 (90)	132 (154)	232 (271)
Reduction 3	Equal percentage				25 (38)	36 (53)	103 (120)	163 (191)
	Linear				25 (38)	36 (53)	103 (120)	163 (191)
Reduction 4	Equal percentage							
	Linear							
Reduction 5	Equal percentage							
	Linear							
Fast opening	28 (32)	50 (50)	85 (88)	117 (136)	180 (210)	390 (456)	640 (749)	

# 1 stage perforated trim

## Model availability

This trim is available for the Spira-trol™ JE, JEA, KE, KEA, LE and LEA.

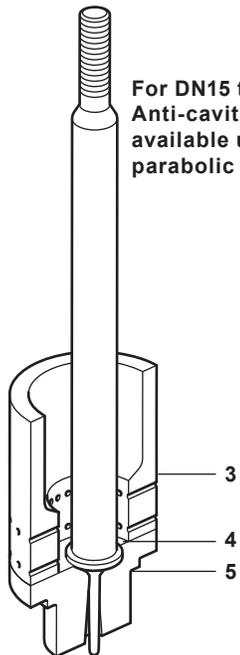
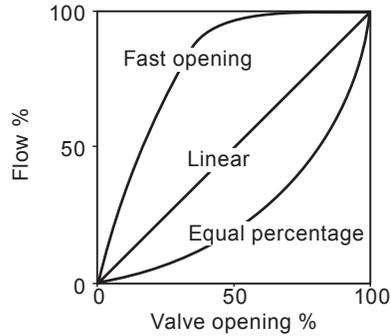
## Sizes

1½" to 8".

## Technical data

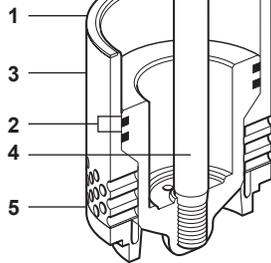
Trim design	Perforated		
	Metal-to-metal		Class IV
Leakage	Soft seal	Unbalanced	Class VI
		Balanced	Class IV
Rangeability	50:1		
	DN40 to DN50		20 mm
Travel	DN65 to DN100		30 mm
	DN125 to DN300		70 mm

## Typical flow characteristic curves

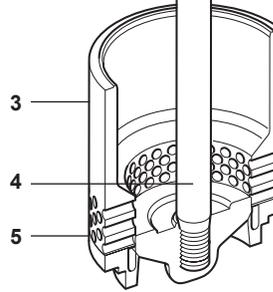


For DN15 to DN25  
Anti-cavitation are only  
available unbalanced with  
parabolic plug

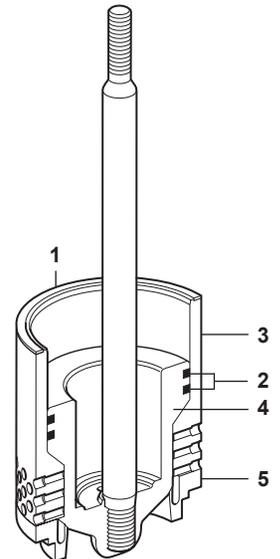
Low noise 1 stage  
balanced trim



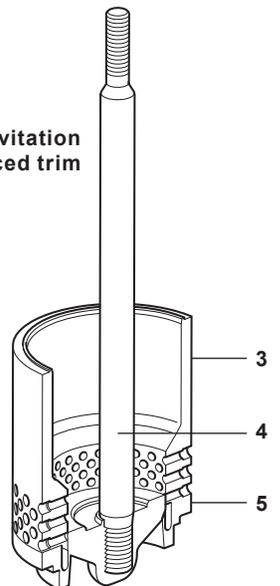
Low noise 1 stage  
unbalanced trim



Anti-cavitation 1  
stage balanced trim



Anti-cavitation  
1 stage unbalanced trim



## Materials

No.	Part	Material
1	Cage gasket	Reinforced exfoliated graphite
2	Plug seal	Graphite
3	Cage retainer	CF8M
4	Plug and stem	431 stainless steel/316L stainless steel/316L with stellite 6 facing
5	Seat ring	PTFE soft seat/PEEK soft seat/Full PEEK/431 stainless steel/316L stainless steel/316L with stellite facing

# 1 stage perforated trim (continued)

## $K_v$ ( $C_v$ US) values

For conversion:  $C_v$  (UK) =  $K_v \times 0.963$

Trim	DN15	DN20	DN25	DN32	DN40	DN50	DN65	DN80	DN100	DN150	DN200
<b>Full port</b> Equal percentage	4 (4.6)	6.3 (7.3)	10 (11.6)	16 (18.5)	25 (29)	25 (29)	50 (58)		80 (92)		
<b>Full port</b> Linear	4 (4.6)	6.3 (7.3)	10 (11.6)	16 (18.5)	25 (29)	36 (42)	63 (73)	70 (81)	90 (104)	300 (347)	516 (596)
<b>Reduction 1</b> 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)	255 (295)	457 (528)
<b>Reduction 1</b> 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)	255 (295)	457 (528)
<b>Reduction 2</b> 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)	200 (231)	350 (405)
<b>Reduction 2</b> 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)	200 (231)	350 (405)
<b>Reduction 3</b> 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)	152 (176)	265 (306)
<b>Reduction 4</b> 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)		
<b>Reduction 5</b> Equal percentage and Linear	0.2 (0.2)*	0.5 (0.6)*	1.0 (1.2)*			4 (4.6)					
<b>Reduction 6</b> Equal percentage and Linear	0.1 (0.1)*	0.2 (0.2)*	0.5 (0.6)*								
<b>Reduction 7</b> Equal percentage and Linear		0.1 (0.1)*	0.2 (0.2)*								
<b>Reduction 8</b> Equal percentage and Linear			0.1 (0.1)*								

\* Only available in Anti-cavitation

# 2 stage perforated trim

## Model availability

This trim is available for the Spira-trol™ JE, JEA, KE, KEA, LE and LEA.

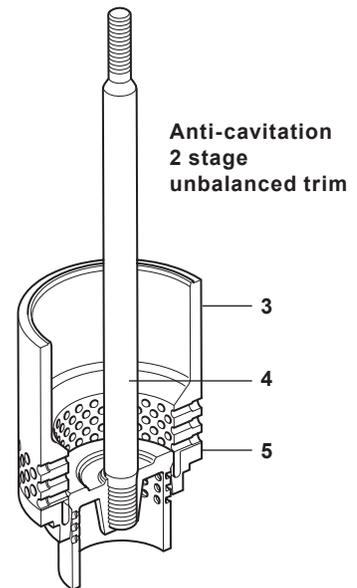
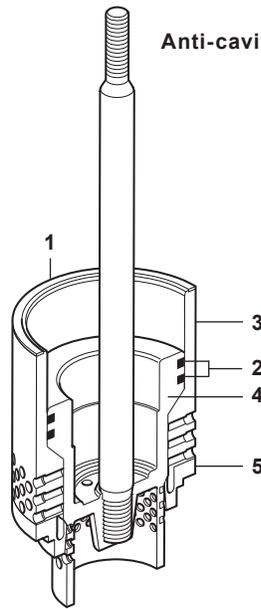
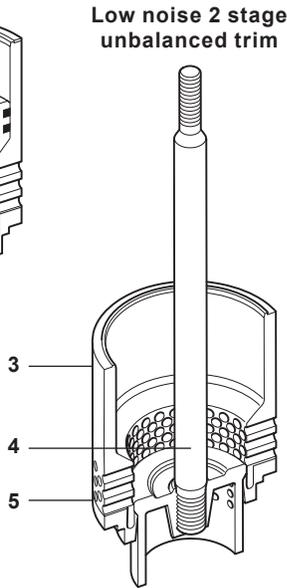
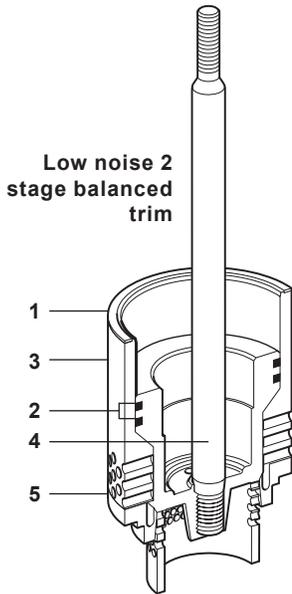
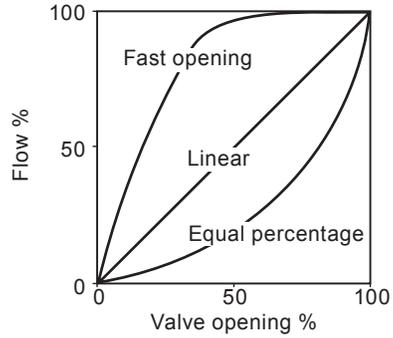
## Sizes

1¼" to 8".

## Technical data

Trim design	Perforated	
Leakage	Hard facing	Class IV
Rangeability	50:1	
Travel	DN40 to DN50	20 mm
	DN65 to DN100	30 mm
	DN125 to DN300	70 mm

## Typical flow characteristic curves



## Materials

No.	Part	Material
1	Cage gasket	Reinforced exfoliated graphite
2	Plug seal	Graphite
3	Cage retainer	CF8M
4	Plug and stem	431 stainless steel/316L with stellite 6 facing
5	Seat ring	316L with stellite 6 facing/Full PEEK

## 2 stage perforated trim (continued)

### K<sub>v</sub> (C<sub>v</sub> US) values

For conversion: C<sub>v</sub> (UK) = K<sub>v</sub> x 0.963

Trim	DN32	DN40	DN50	DN65	DN80	DN100	DN150	DN200
<b>Full port</b> Equal percentage	16 (18.5)	16 (18.5)	16 (18.5)	44 (51)	44 (51)	63 (73)	160 (185)	280 (324)
<b>Full port</b> Linear	16 (18.5)	16 (18.5)	16 (18.5)	50 (58)	50 (58)	63 (73)	160 (185)	280 (324)
<b>Reduction 1</b> Equal percentage and Linear	10 (11.6)	10 (11.6)	10 (11.6)	36 (42)	36 (42)	36 (42)	100 (116)	160 (185)
<b>Reduction 2</b> Equal percentage and Linear	6.3 (7.3)	6.3 (7.3)	6.3 (7.3)	25 (29)	25 (29)	25 (29)	63 (73)	100 (116)
<b>Reduction 3</b> Equal percentage and Linear	4 (4.6)	4 (4.6)	4 (4.6)	16 (18.5)	16 (18.5)	16 (18.5)	36 (42)	63 (73)
<b>Reduction 4</b> Equal percentage and Linear				10 (11.6)	10 (11.6)	10 (11.6)		36 (42)
<b>Reduction 5</b> Equal percentage and Linear				6.3 (7.3)	6.3 (7.3)			
<b>Reduction 6</b> Equal percentage and Linear								

# 3 stage low noise trim

## Model availability

This trim is available for the Spira-trol™ JE, JEA, KE, KEA, LE and LEA.

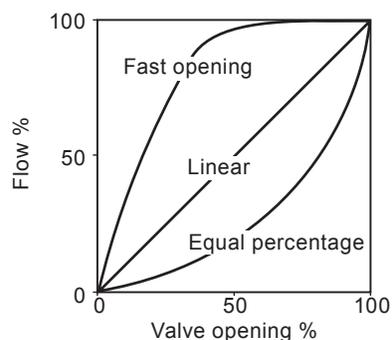
## Sizes

1¼" to 8".

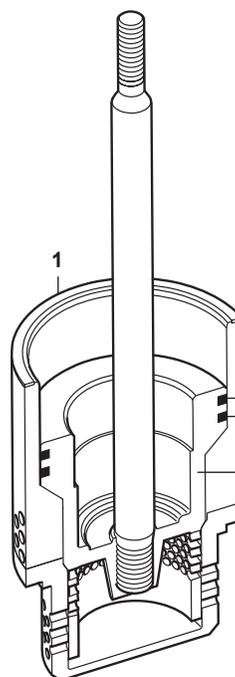
## Technical data

Trim design	Perforated	
Leakage	Hard facing	Class IV
Rangeability	50:1	
Travel	DN40 to DN50	20 mm
	DN65 to DN100	30 mm
	DN125 to DN300	70 mm

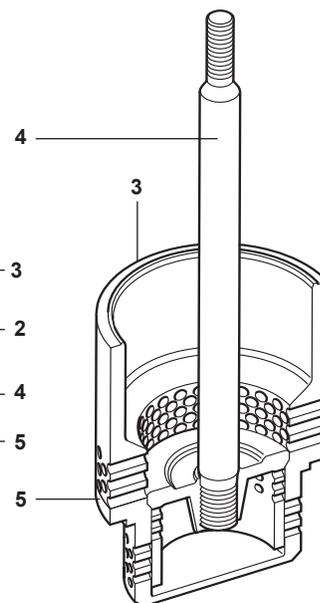
## Typical flow characteristic curves



## Low noise 3 stage balanced trim



## Low noise 3 stage unbalanced trim



## Materials

No.	Part	Material
1	Cage gasket	Reinforced exfoliated graphite
2	Plug seal	Graphite
3	Cage retainer	CF8M
4	Plug and stem	316L with stellite 6 facing
5	Seat ring	316L with stellite 6 facing/Full PEEK

## K<sub>v</sub> (C<sub>v</sub> US) values

For conversion: C<sub>v</sub> (UK) = K<sub>v</sub> x 0.963

Trim	DN32	DN40	DN50	DN65	DN80	DN100	DN150	DN200
<b>Full port</b> Equal percentage	13 (15)	13 (15)	13 (15)	25 (29)	25 (29)	36 (42)	100 (116)	180 (208)
<b>Full port</b> Linear	13 (15)	13 (15)	13 (15)	25 (29)	25 (29)	36 (42)	100 (116)	180 (208)
<b>Reduction 1</b> Equal percentage and Linear	10 (11.6)	10 (11.6)	10 (11.6)	16 (18.5)	16 (18.5)	25 (29)	63 (73)	160 (185)
<b>Reduction 2</b> 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)	100 (116)
<b>Reduction 3</b> 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)	36 (42)
<b>Reduction 4</b> Equal percentage and Linear				4 (4.6)	4 (4.6)	6.3 (7.3)		
<b>Reduction 5</b> Equal percentage and Linear								

# Spira-trol™ selection guide

<b>Valve size</b>	½" to 8"	1½"
<b>Valve series</b>	J = J series 2-port control valve K = K series 2-port control valve L = L series 2-port control valve	K
<b>Valve characteristic</b>	E = Equal percentage F = Fast opening L = Linear	E
<b>Type of flange</b>	Blank = EN A = ASME (ANSI)	A
<b>Flow</b>	Blank = Flow under T = Flow over	T
<b>Body material</b>	3 = Cast iron 4 = Carbon steel 6 = Stainless steel 7 = SG iron 8 = Alloy steel	4
<b>Connections</b>	1 = Screwed 2 = Socket Welded 3 = Flanged 4 = Butt Welded	3
<b>Stem sealing</b>	N = PTFE/Nitronic bush P = PTFE H = Graphite D = Bellows/Graphite secondary seals B = Bellows/PTFE chevron seals C = Bellows/Graphite seals	D
<b>Seating</b>	T = 431 stainless steel P = Full PEEK seat G = PTFE soft seat S = 316L stainless steel W = 316L with stellite 6 facing K = PEEK soft seat	K
<b>Type of trim</b>	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
<b>Trim balancing</b>	U = Unbalanced B = Balanced	B
<b>Bonnet type</b>	S = Standard E = Extended high temperature	S
<b>Bolting</b>	S = Standard H = High temperature	S
<b>Finish</b>	Blank = Standard N = ENP coating	
<b>Series</b>	.2 = .2	.2
<b>K<sub>vs</sub> (C<sub>v</sub>)</b>	To be specified	C <sub>v</sub> 30
<b>Connection type</b>	To be specified	Flanged ASME 300

## Selection example:

1½"	-	K	E	A	T	4	3	D	K	P1	B	S	S		.2	-	C <sub>v</sub> 30	-	Flanged ASME 300
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## Available spares

Balanced gasket set

Parts 1, 2