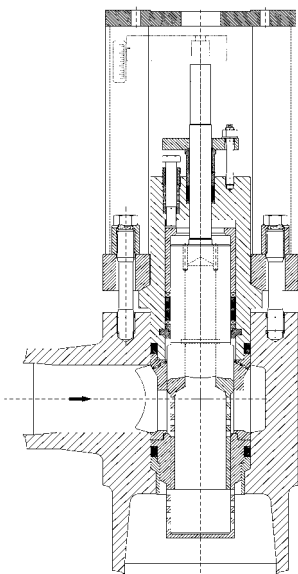
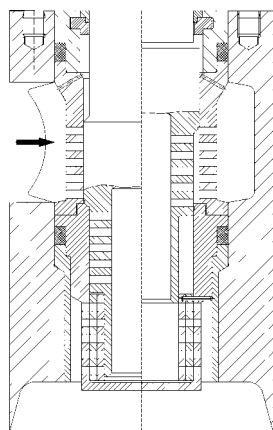


Control Valves ZK with Radial Stage Nozzle ZK Range 600



2-stage expansion with balanced pressure for ZK 613



Throttling unit A1/A2 with 4-stage expansion

Application

For large flowrates; used as

- Feedwater control valve
- Heating steam valve
- Start-up vessel drain valve

Features

- Excellent sealing and control characteristics
- Extremely wear resistant

- Valve designed on modular assembly principle
- Low sound level
- Easy assembly and inspection of nozzle insert
- Variable valve characteristics (linear \leftrightarrow equal-percentage)
- k_{vs} range from 18 to 969 m^3/h
- Leakage-free pressure-balanced design

Technical Data

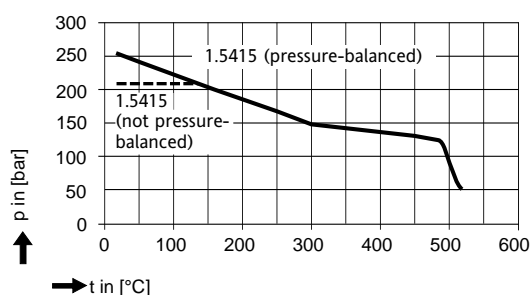
Max. k_{vs} values [m^3/h], designs, pressure/temperature ratings

		ZK 610/ZK 613									
		Throttling unit A1/A2 ¹⁾					Throttling unit B ¹⁾				
Δp (bar)	DN	40/50 1-stage	80 2-stage	120 3-stage	150 4-stage	> 150 5-stage	40 1-stage	80 2-stage	120 3-stage	150 4-stage	> 150 5-stage
100	100	98/89	54/42	44/41	19/18	18/18	59	54	48	21	20
125	125	154/140	84/66	69/64	30/27	28/27	92	84	76	32	31
150	150	243/221	132/104	108/100	47/42	43/42	145	133	120	50	49
200	200	385/350	208/164	170/157	73/66	68/65	229	210	189	78	77
250	250	611/555	330/260	270/249	116/105	108/104	363	333	300	124	123
300	300	969/880	524/413	428/395	184/167	172/165	576	528	476	197	195

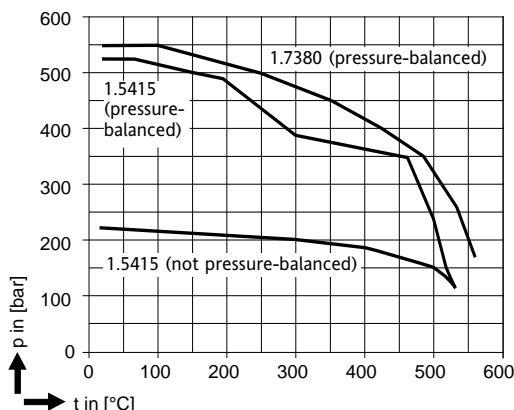
Angle/Z pattern

¹⁾ Throttling units: A1 for liquids, A2 for steam, B for 2-phase flow

ZK 610

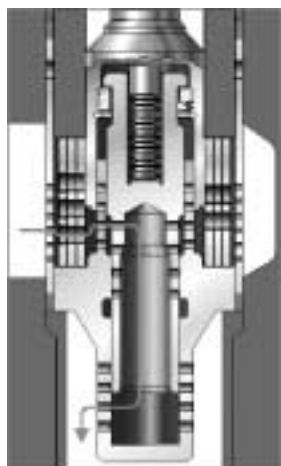


ZK 613





Radial stage nozzle as control unit of ZK 29



Radial stage nozzle with tandem shut-off for ZK 213

Application

For the decrease of high pressure drops in industrial plants and power stations as:

- Injection cooling valve
- Warm-up valve
- Drain valve
- Feedwater control valve
- Leak-off valve
- Start-up pot drain valve
- Level control valve

Features

- Excellent sealing and control characteristic
- Extremely wear resistant
- Low sound level
- Easy assembly and inspection of nozzle insert
- Variable valve characteristics (linear \longleftrightarrow equal-percentage)
- Tandem shut-off for ZK 313 and ZK 213
- Different actuators available

Materials

Type	Body ¹⁾		
ZK 29, DN 25, 50	Forged alloy steel	13 CrMo 4 4	(1.7335)
ZK 29, DN 80, 100, 150	Cast steel	GS-17 CrMo 5 5	(1.7357)
ZK 210	Forged alloy steel	13 CrMo 4 4	(1.7335)
ZK 412	Forged alloy steel	15 Mo 3	(1.5415)
		10 CrMo 9 10	(1.7380)
ZK 313	Forged alloy steel	15 Mo 3	(1.5415)
		10 CrMo 9 10	(1.7380)
		X 10 CrMo VNb 9 1 (P 91)	(1.4903)
ZK 513	Forged alloy steel	15 Mo 3	(1.5415)
		WB 36	(1.6368)
ZK 213	Forged alloy steel	15 Mo 3	(1.5415)
		WB 36	(1.6368)

¹⁾ Butt-weld ends of other material by welding of pipe ends possible.

Actuators

Type	ZK 29	ZK 210	ZK 412	ZK 313	ZK 513	ZK 213
Handwheel	●	●	●	●	–	–
Electric rotary actuator	●	●	●	●	●	●
Electric linear actuator	●	●	●	●	●	●
Electro-hydraulic linear actuator	–	–	–	●	●	●
Pneumatic actuator	●	●	●	●	–	–
Part-turn actuator	●	–	–	●	–	●

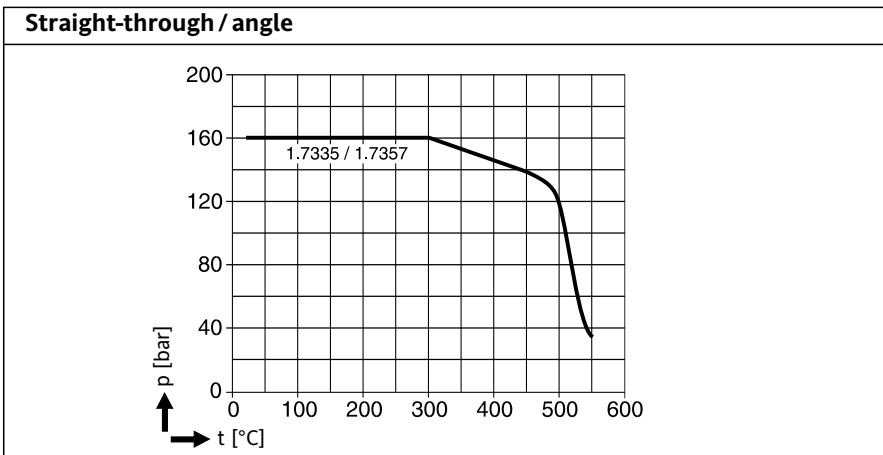
Control Valves ZK with Radial Stage Nozzle



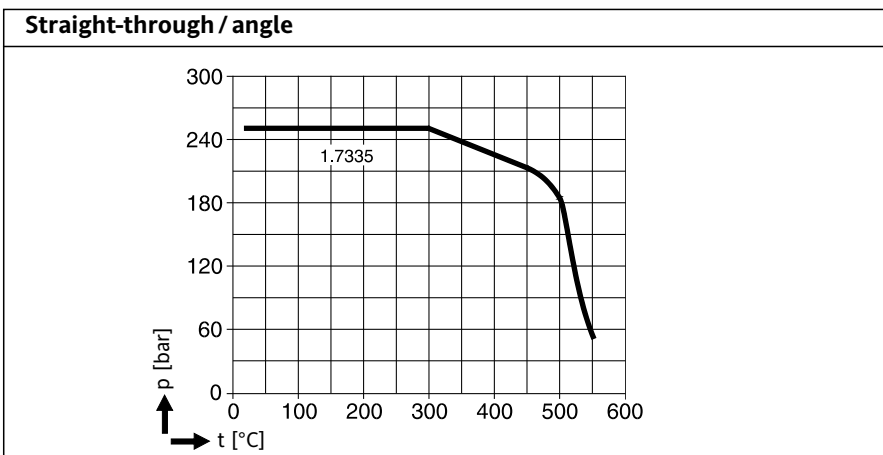
Technical Data

K_{VS} -values [m³/h] (linear characteristics), design, pressure/temperature ratings

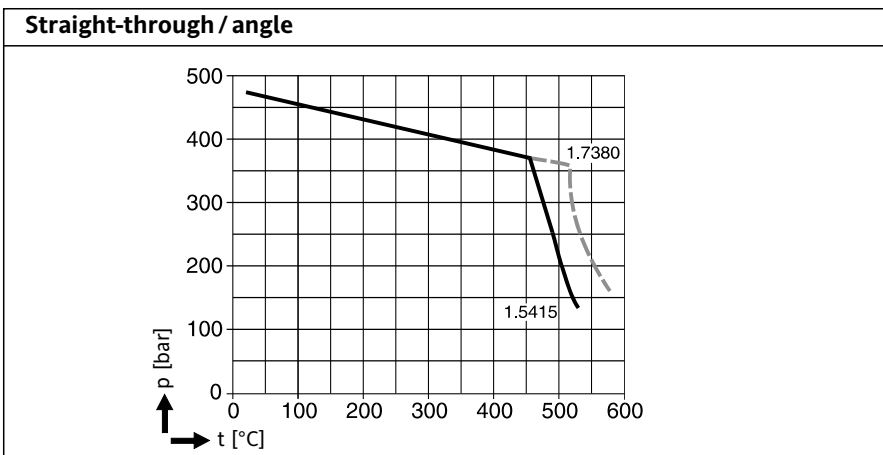
ZK 29				
DN	Δp 100 bar			
25	0.7	1.4	2.1	
50	3	6	9	
65				
80	14	21	28	
100	20	33	46	
125				
150	70	100	130	
200				
250				
300				
350				
400				



ZK 210				
DN	Δp 100 bar			Δp 180 bar
25	0.8	1.5	2.3	0.5
50	3.3	6.5	10	2
65				
80	9.5	18	28	5
100				
125				
150				
200				
250				
300				
350				
400				



ZK 412					
DN	Δp 100 bar		Δp 180 bar		Shut-off valve
25	1	1.5	2	0.5	13
50	4	6	8	2	16
65					
80					
100					
125					
150					
200					
250					
300					
350					
400					



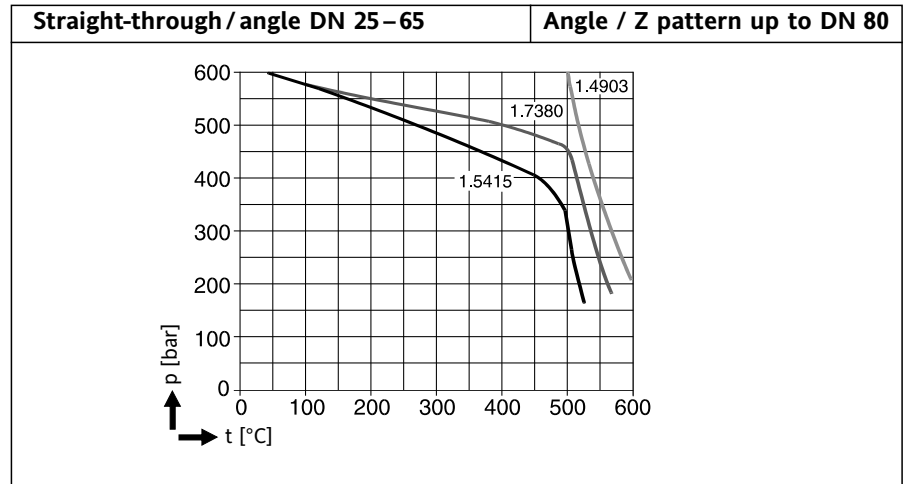
Control Valves ZK with Radial Stage Nozzle



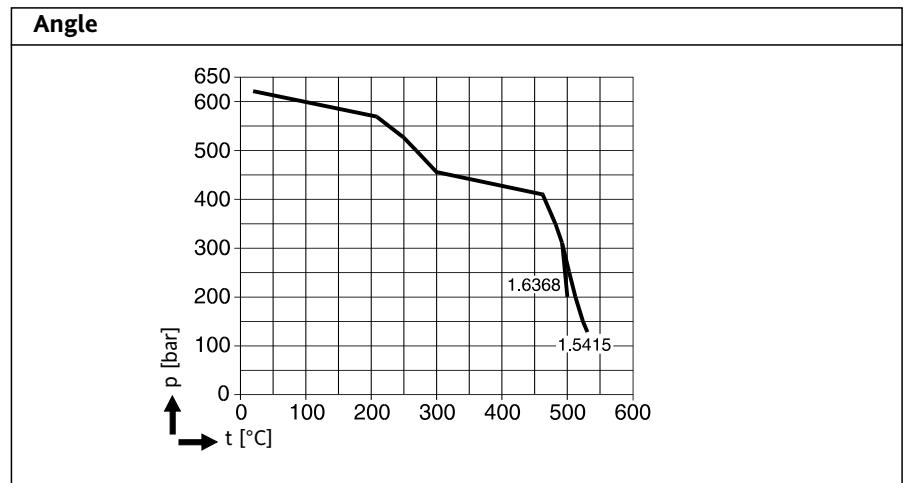
Technical Data

K_{Vs} -values [m³/h] (linear characteristics), design, pressure/temperature ratings

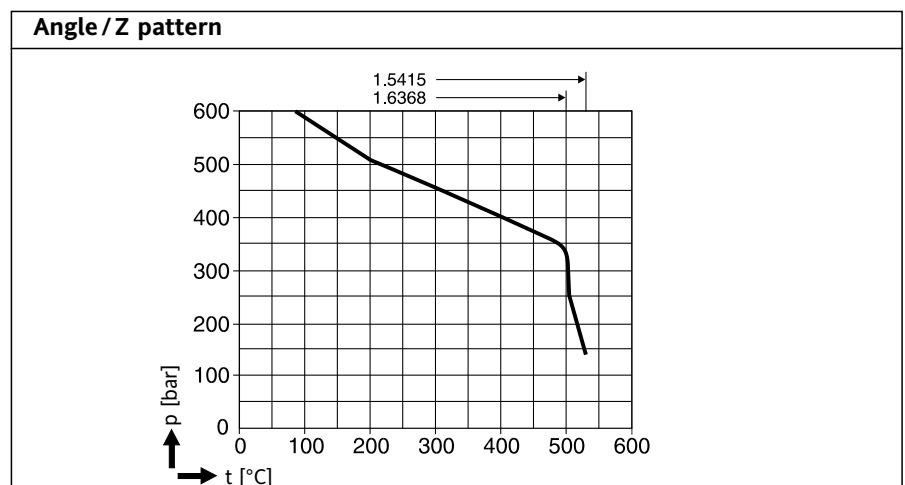
ZK 313										
DN	Δ p 300 bar								Δ p 370 bar	
	25	1	1.5	2.3	3.6	5.5	8	11	13	4.5
50	1	1.5	2.3	3.6	5.5	8	11	13	4.5	9.5
65	1	1.5	2.3	3.6	5.5	8	11	13	4.5	9.5
80						11	14.5	17	9.5	
100						11	14.5	17	9.5	
125						11	14.5	17	9.5	
150										
200										
250										
300										
350										
400										



ZK 513 sizes 1-3										
DN	Δ p 560 bar									
	Bg.	1	2	3						
25										
50	3	5								
65	3	5	9							
80	3	5	9	12						
100		5	9	12	20					
125			9	12	20	30				
150				12	20	30				
200					20	30				
250										
300										
350										
400										



ZK 213 sizes 1-5											
DN	Δ p 300 bar					Δ p 560 bar					
	Bg.	1	2	3	4	5	1	2	3	4	5
25											
50											
65											
80	13					10					
100	13	26				10	20				
125	13	26	39			10	20	30			
150		26	39	60			20	30	46		
200			39	60	90			30	46	70	
250				60	90				46	70	
300					90					70	
350											
400											



Adaptation of nominal sizes is possible