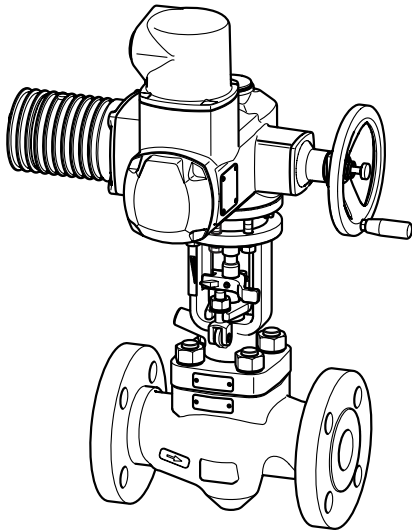
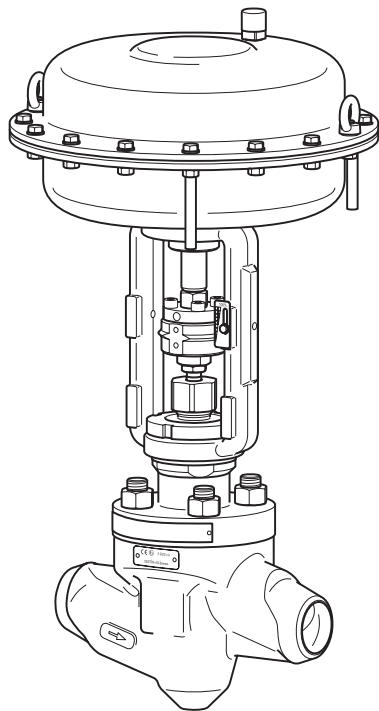




ZK 29/14, 2"



ZK 29/20, 2"

Control Valve with ZK Radial Stage Nozzle®

ZK 29 ASME

Class 900

1", 2", 3", 4", 6"

Description

Control valve ZK 29 with ZK radial stage nozzle® for reducing high differential pressures in industrial installations and power plants and used as follows:

- Injection control valve
- Drain valve
- Continuous blowdown valve
- Recirculation control valve (leak off valve)
- Warm-up valve
- Steam control valve
- Feedwater control valve

All internal parts are exchangeable. Leakage rating Class VI according to ANSI FCI 70-2 2003.

Optional extras:

- Connection for sealing fluid
- Adjustable stroke limitation in the closing direction
- Self-tightening stuffing box
- Sampling valve (on request)

Special angled designs are available for all equipment versions.

Types of actuator

The following actuators are available:

- 01: Handwheel (retrofitting an electric rotary actuator is not possible)
- 02: Handwheel (standard design, retrofitting an electric rotary actuator (with insert bush type B1 to EN ISO 5210) is possible)
- 12: Electric rotary actuator (with threaded bush type A to EN ISO 5210)
- 13: Electric thrust actuator
- 14: Electric rotary actuator (with insert bush type B1 to EN ISO 5210)
- 20: Pneumatic diaphragm actuator
- 30: Lever actuator without part-turn actuator attached
- 31: Lever actuator with part-turn actuator attached
- 40: Hydraulic cylinder

Pressure and temperature ratings

Admissible service pressure (bar) for a body made of ASME materials

(calculated to ASME B16.34, Class 900)

For higher pressure/temperature ratings, please contact the manufacturer.

Temperature °C	SA182 F12	SA217 WC6
20	155	155
200	138	143
300	128	128
400	109	109
500	64	77
550	36	38
575	26	26

Admissible service pressure (psi) for a body made of ASME materials

(calculated to ASME B16.34, Class 900)

Temperature °C	SA182 F12	SA217 WC6
100	2,250	2,250
400	2,005	2,080
600	1,815	1,815
800	1,525	1,525
950	825	955
1,022	595	650
1,100	290	290

Materials

Component	ASME
Body 1", 2"	SA182 F12 CL.2
Body 3", 4", 6"	SA217 WC6
Cap	SA217 WC6
Cover	SA182 F12 CL.2
Threaded bolt	(S)A193-B16
Nuts	(S)A194-7

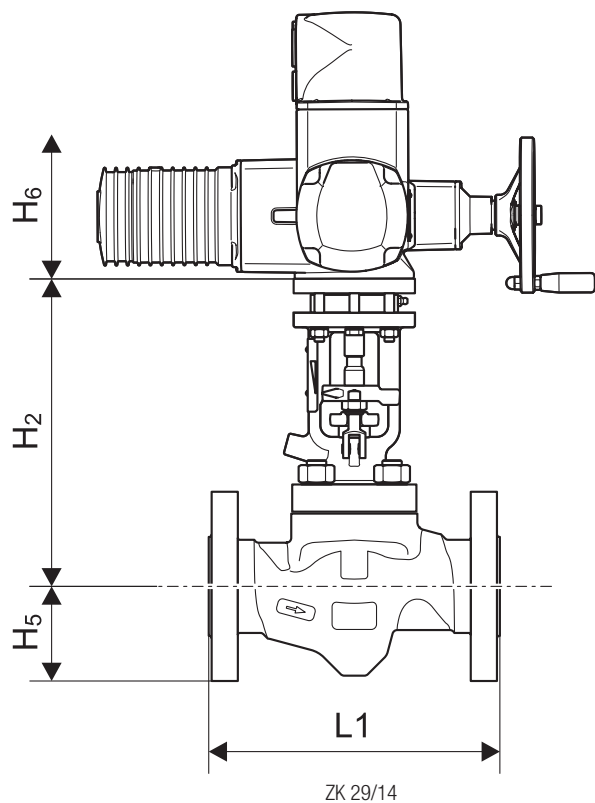
Admissible differential pressure ΔPMX

	bar	psi
Single-stage	40	580
Multi-stage	100	1,450

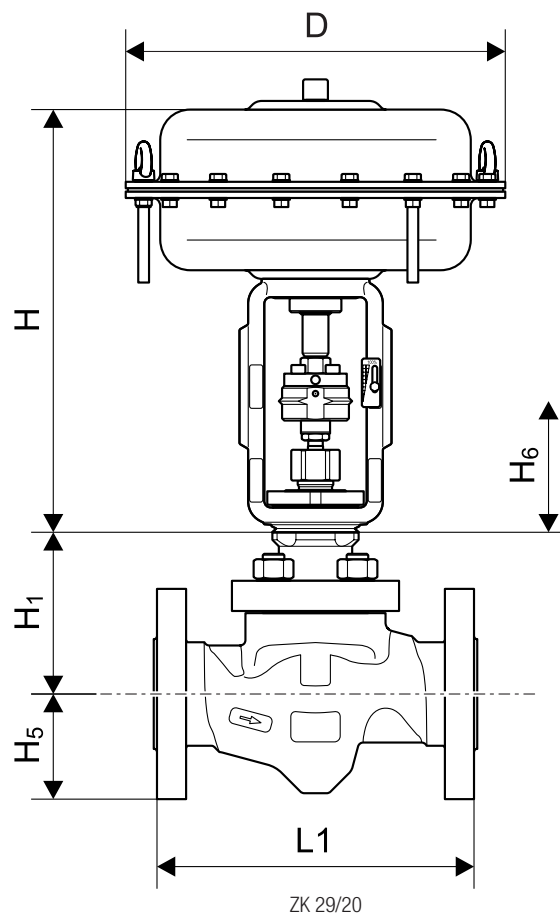
Types of end connection

- Flange Class 300, Class 600, Class 900
 - Butt-weld ends: Schedule 40, Schedule 80
 - Socket-weld ends: Class 3000, Class 6000
- Other sizes available on request

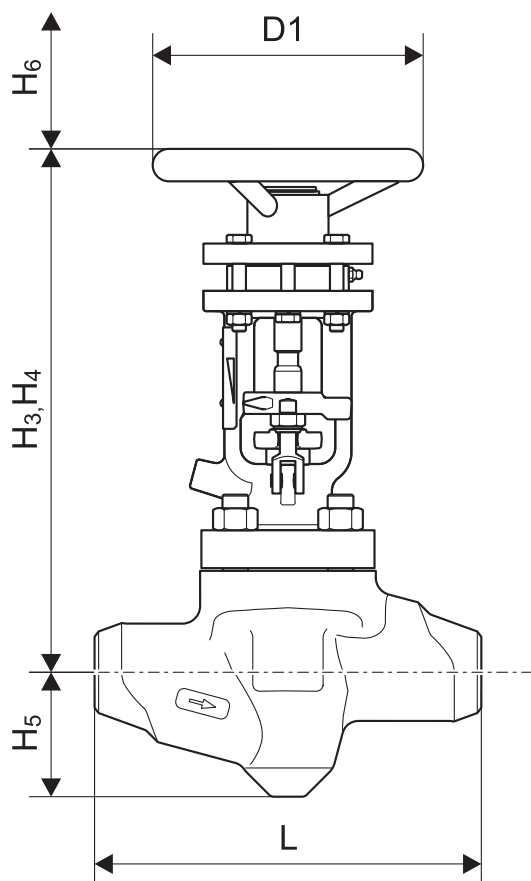
Dimensions and weights



ZK 29/14



ZK 29/20



ZK 29/01 and ZK 29/02

Dimensions

Valve size		1"	2"	3"	4"	6"
H1	mm	123	150	213	242	275
	in	4.8"	5.9"	8.4"	9.5"	10.8"
H2	mm	266	317	402	545	661
	in	10.5"	12.5"	15.8"	21.5"	26.0"
H3 (ZK 29/01)	mm	272	330	415	—	—
	in	10.7"	13.0"	16.3"	—	—
H4 (ZK 29/02)	mm	322	387	472	595	740
	in	12.7"	15.2"	18.6"	23.4"	29.1"
H5	mm	55	92	100	114	162
	in	2.2"	3.6"	3.9"	4.5"	6.4"
H6	mm	103	115	156	209	135
	in	4.1"	4.5"	6.1"	8.2"	5.3"
D1	mm	125	200	200	320	500
	in	4.9"	7.9"	7.9"	12.6"	19.7"
Overall length of flange L1						
CL300	mm	197	267	1)	1)	1)
	in	7.8"	10.5"	1)	1)	1)
CL600	mm	210	286	337	394	508
	in	8.3"	11.3"	13.3"	15.5"	20.0"
CL900	mm	292	375	387	511	714
	in	11.5"	14.8"	15.2"	20.1"	28.1"
Socket-weld end L (overall length CL3000, possible for CL6000 as an option)						
CL3000	mm	210	286	—	—	—
	in	8.3"	11.3"	—	—	—
CL6000	mm	279	375	—	—	—
	in	11.0"	14.8"	—	—	—
Butt-weld ends L (overall length CL600, possible for CL900 as an option)						
CL300	mm	210	286	337	394	508
	in	8.3"	11.3"	13.3"	15.5"	20.0"
CL600	mm	210	286	337	394	508
	in	8.3"	11.3"	13.3"	15.5"	20.0"
CL900	mm	279	375	460	530	768
	in	11.0"	14.8"	18.1"	20.9"	30.2"
Connection (e.g. Sched 80 pipe)	mm	33.4 × 4.5	60.3 × 5.5	88.9 × 7.6	114.3 × 8.6	168.3 × 11.0

1) Other dimensions available on request

Dimensions and weights continued

Weight, without actuator

Type	Nominal size	1"	2"	3"	4"	6"
ZK 29/01 FL	kg	18	44	69	—	—
	lb	40	97	152	—	—
ZK 29/01 SE	kg	15	25	54	—	—
	lb	33	55	119	—	—
ZK29/02 FL	kg	21	47	71	121	208
	lb	46	103	156	267	458
ZK29/02 SE	kg	14	26	50	82	162
	lb	31	57	110	181	357
ZK 29/14 FL	kg	20	45	69	115	193
	lb	44	99	152	254	425
ZK 29/14 SE	kg	13	24	48	76	147
	lb	29	53	106	168	324
ZK 29/20 FL	kg	16	45	67	103	183
	lb	35	99	148	227	403
ZK 29/20 SE	kg	9	24	46	64	137
	lb	20	53	101	141	302

FL: flange, BW: butt-weld end

Dimensions and weights of pneumatic diaphragm actuator

		PB 503	PB 701	PB 1502	PB 3002
D	mm	355	390	548	548
	in	13.8"	15.9"	21.5"	21.6"
H	mm	460	600	800	1,140
	in	18.1"	23.6"	31.5"	44.9"
Weight	kg	28	40	124	240
	lb	62	88	273	528

Flow characteristics

Kvs values

Valve size	Characteristic	Kvs m³/h				Stroke mm
		Δp 100 bar			Δp 40 bar	
1"	linear	0.7	1.4	2.1	2.5	16
	equal percentage				—	
2"	linear	3	6	9	12	33
	equal percentage		5.5	8	—	
3"	linear	14	21	28	35	45
	equal percentage	9	15	21	—	
4"	linear	20	33	46	55	60
	equal percentage	15	25	35	—	
6"	linear	70	100	130	158	90
	equal percentage	60	85	110	—	

Cv values

Valve size	Characteristic	Cv US gal/min				Stroke in
		Δp 1450 psi			Δp 580 psi	
1"	linear	0.8	1.6	2.4	2.9	0.63"
	equal percentage				—	
2"	linear	3.5	7.0	10.4	14.0	1.30"
	equal percentage		6.4	9.2	—	
3"	linear	14.0	24.3	32.4	41.0	1.77"
	equal percentage	9.0	17.3	24.3	—	
4"	linear	20.0	38.2	53.2	64.4	2.36"
	equal percentage	15.0	28.9	40.5	—	
6"	linear	70.0	115.6	150.3	184.9	3.54"
	equal percentage	60.0	98.3	127.2	—	

Function

The ZK radial stage nozzle® guarantees maximum wear resistance and an ultra-tight seal, combining the function of a control valve with a shut-off valve.

Each control valve is equipped with a ZK radial stage nozzle®.

The ZK radial stage nozzle® is a system consisting of several sleeves nesting inside one another, with radial orifices drilled in them. The rotation of the sleeves shifts the orifices relative to one another, forming a large number of throttling points in parallel, with turbulence (expansion) chambers between them.

The valve plug determines the flowrate through the radial stage nozzle®. Depending on its position, this valve plug opens the individual orifices partially or completely, producing different flowrates.

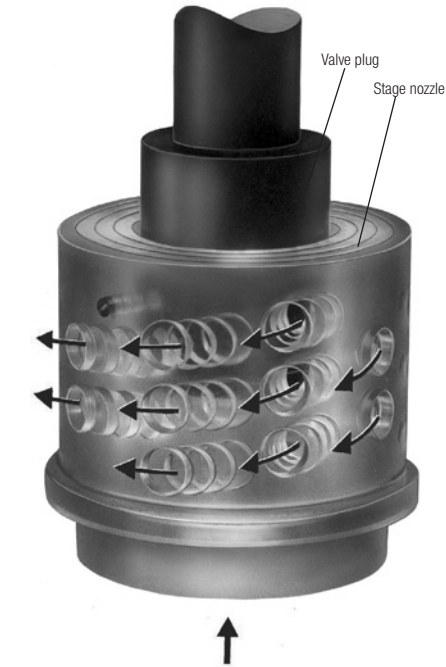
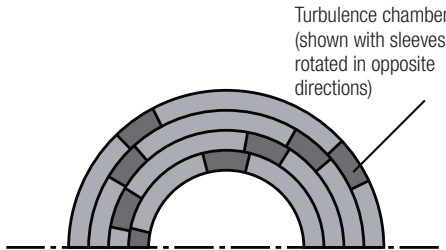
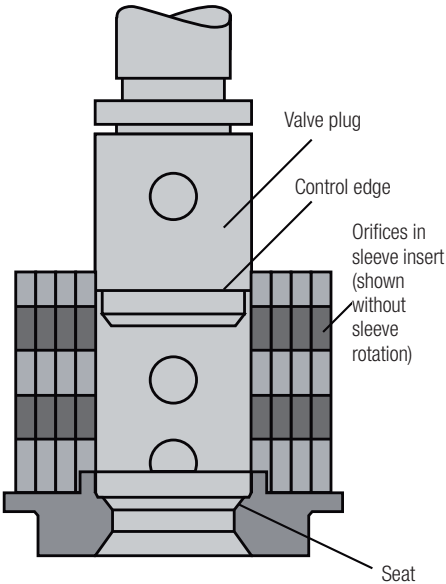
Thanks to this design, the pressure drop is reduced in stages and the fluid flowing through is split up into many partial flows. This ensures high wear resistance and reduces the noise level.

Function of the control edge

On the valve plug, there is a control edge that is separate from the seat surface and which closes the orifices in the sleeve insert before the valve plug fully comes to rest against the seat ring. This prevents wear to the seat surface.

The multiple, step-by-step expansion in the turbulence chambers minimises the pressure drop in the region of the seat.

Sectional view of ZK radial stage nozzle



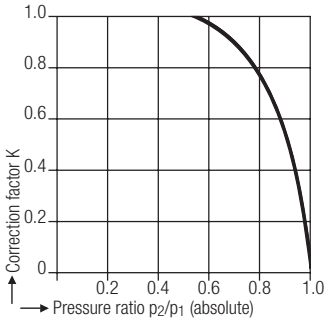
Flow through ZK 29 radial stage nozzle

Control Valve with ZK Radial Stage
Nozzle®
ZK 29 ASME
Class 900
1", 2", 3", 4", 6"

Capacity charts

The charts show the maximum flowrates of cold and hot water (condensate) at the extreme regulated position with linear characteristic curves and maximum Kv_s value in a multi-stage design.

Backpressure chart for hot water



How to order

GESTRA Control Valve with Radial Stage Nozzle® ZK 29
Design data: p = . . . barg/psig, t = . . . °C/°F or Class
Operation: load conditions (1 to 3)

	1	2	3
p ₁ barg/psia			
t ₁ °C/°F			
p ₂ barg/psia			
m kg/h/lb/h			

Please enter data here.

Fluid:
Actuation: Electric (make)
ON/OFF or MODULATING CONTROL
Voltage/Hz /
Pneumatic (make)
Spring to open: ☐
Spring to close: ☐
Handwheel: ☐
Positioner: ☐

Inspection and certification

Documentation regarding material tests and in-house examination with inspection certificate to EN 10204-3.1 or EN 10204-3.2 available for an additional charge.

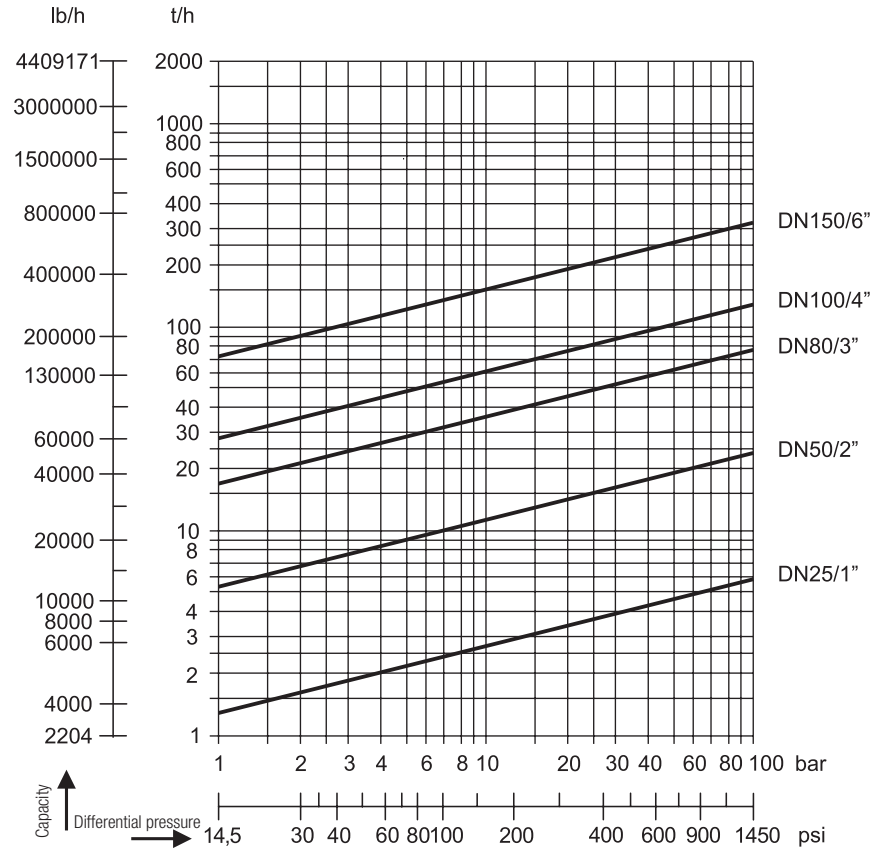
Please state your inspection and certification requirements in your enquiry or order. Certification cannot be issued after the equipment has been delivered.

For the standard scope of inspection and cost of inspection certificates, please refer to our price list *Test and Inspection Charges for Standard Equipment*.

If you require different inspections or certifications, please contact the manufacturer.

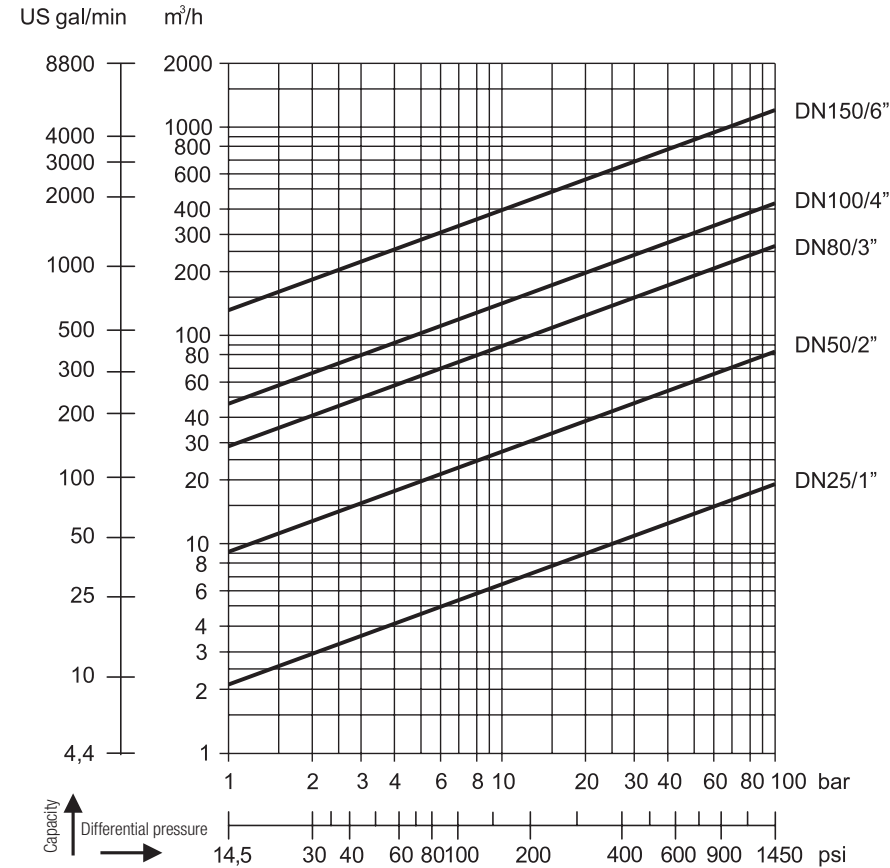
Please note our general terms of business.

Capacity chart for hot water t_s -5K



If $p_2/p_1 > 0.5$, multiply the capacity by the correction factor K taken from the backpressure chart.

Capacity chart for cold water



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