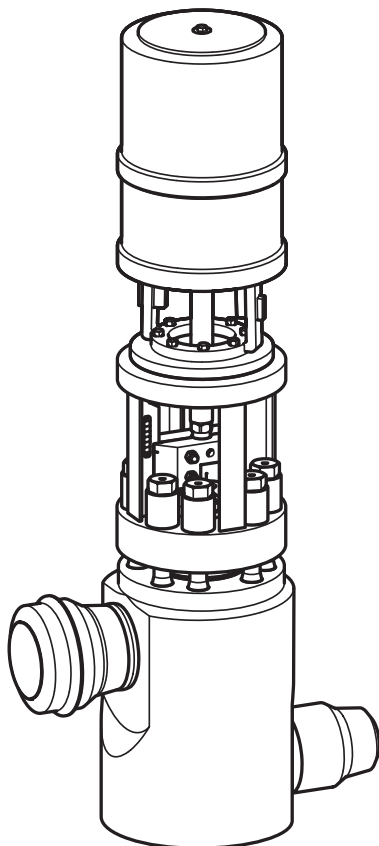


ZK 613-E3/14



ZK 613-Z2/20

Control Valve with ZK Radial Stage Nozzle

ZK 610/613

DN100 - DN300

Description

The ZK 610/613 control valve with radial stage nozzle is designed for reducing high differential pressures in industrial installations and power plants and used as:

- Warm-up valve
- Drain valve
- Steam control valve
- Feedwater control valve
- Boiler vent valve
- Boiler blowdown valve

All internals are exchangeable. Leakage rate A acc. to EN 12266-1. Available body styles: Z-type or angle pattern. Version with or without pressure compensation.

Actuator and operation

The following actuators are available:

- 14: Electric rotary actuator
- 20: Pneumatically operated diaphragm actuator or piston actuator
- 13: Electric linear actuator
- 40: Hydraulic cylinder

Available end connections

- Butt-weld ends
- Optional flanged ends

Pressure and temperature ratings

Admissible service pressure [barg] for valve body made from EN materials (calculated to EN12516-2)

| Temperature [°C] | 1.5415 | 1.7383 |
|------------------|--------|--------|
| 100 | 546 | 610 |
| 150 | 512 | 603 |
| 200 | 477 | 566 |
| 250 | 455 | 553 |
| 300 | 395 | 526 |
| 350 | 382 | 487 |
| 400 | 368 | 461 |
| 450 | 355 | 434 |
| 500 | 239 | 358 |
| 530 | 114 | 239 |
| 560 | — | 154 |

The indicated values are for guidance only and depend on the equipment version.

Materials of construction

| Component part | EN |
|--------------------|--------|
| Body | 1.5415 |
| | 1.7383 |
| Upper part of body | 1.4903 |
| | 1.4922 |
| Threaded bolt | 1.4980 |
| | 1.7709 |
| Nuts | 1.4980 |
| | 1.7709 |

Further EN / ASME materials available on request.

Max. admissible differential pressure ΔPMX

| | Water A1 | Steam A2 | Two-phase outlet B |
|--------------|----------|----------|--------------------|
| | [barg] | | |
| Single stage | 40 | 50 | 40 |
| Two stages | 80 | 100 | 80 |
| Three stages | 120 | 150 | 120 |

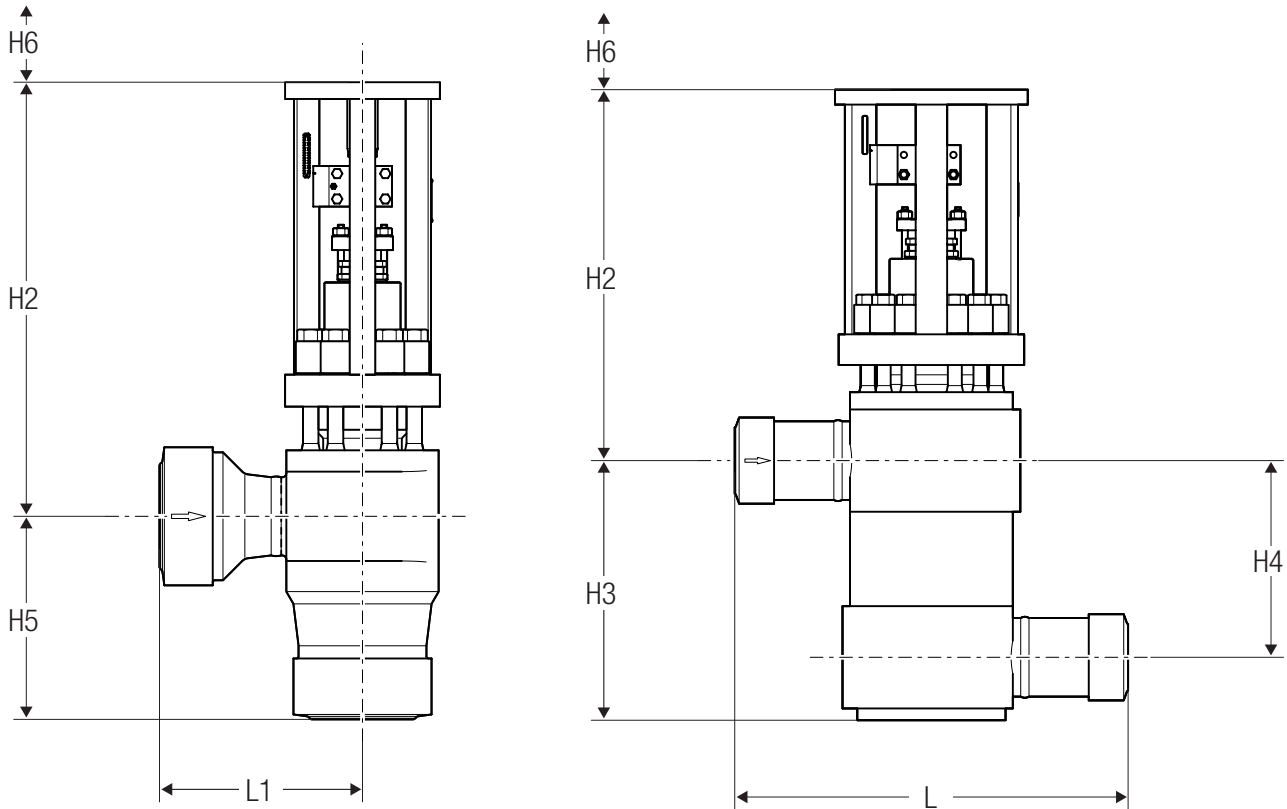
Flow Characteristics Kvs Values

| Size | Kvs linear [m ³ /h] | | | | | | | | | Lift [mm] | \varnothing Stem [mm] |
|-----------------|----------------------------------|-----|-----|------------|-----|-----|--------------|-----|-----|-----------|-------------------------|
| | Single stage | | | Two stages | | | Three stages | | | | |
| | A1 | A2 | B | A1 | A2 | B | A1 | A2 | B | | |
| 1 | 98 | 89 | 61 | 54 | 52 | 54 | 44 | 47 | 47 | 50 | 30 |
| 2 | 154 | 140 | 96 | 84 | 82 | 85 | 69 | 74 | 74 | 62 | 35 |
| 3 | 243 | 221 | 152 | 132 | 129 | 134 | 110 | 117 | 117 | 78 | 40 |
| 4 | 385 | 350 | 241 | 208 | 204 | 212 | 174 | 185 | 185 | 98 | 50 |
| 5 | 611 | 555 | 382 | 330 | 324 | 336 | 276 | 294 | 294 | 123 | 63 |
| 6 ¹⁾ | 969 | 880 | 606 | 524 | 513 | 533 | 437 | 465 | 465 | 155 | 80 |

| Size | Kvs equal-percentage [m ³ /h] | | | | | | | | | Lift [mm] | \varnothing Stem [mm] |
|-----------------|--|-----|-----|------------|-----|-----|--------------|-----|-----|-----------|-------------------------|
| | Single stage | | | Two stages | | | Three stages | | | | |
| | A1 | A2 | B | A1 | A2 | B | A1 | A2 | B | | |
| 1 | 84 | 77 | 52 | 46 | 45 | 46 | 38 | 40 | 40 | 50 | 30 |
| 2 | 132 | 120 | 83 | 72 | 70 | 73 | 59 | 64 | 64 | 62 | 35 |
| 3 | 209 | 190 | 130 | 114 | 111 | 115 | 94 | 100 | 100 | 78 | 40 |
| 4 | 330 | 300 | 207 | 179 | 175 | 182 | 149 | 159 | 159 | 98 | 50 |
| 5 | 524 | 476 | 328 | 283 | 278 | 288 | 237 | 252 | 252 | 123 | 63 |
| 6 ¹⁾ | 931 | 755 | 520 | 449 | 440 | 457 | 375 | 399 | 399 | 155 | 80 |

¹⁾ only ZK610

Dimensions and weights



The following values are intended for guidance only. The equipment is made to order, which means that the size, connections and weight will be in accordance with the customer's specification.

Dimensions [mm]

| Size | 1 | 2 | 3 | 4 | 5 | 6 ¹⁾ |
|-----------------------------------|-----|-----|-----|-----|------|-----------------|
| H2 max. | 470 | 850 | 860 | 880 | 1130 | 1000 |
| H4 | 150 | 300 | 350 | 400 | 450 | 450 |
| H3 | 220 | 400 | 450 | 520 | 600 | 600 |
| H6 (space required for servicing) | 100 | 180 | 200 | 250 | 270 | 250 |
| L | 600 | 700 | 800 | 900 | 1000 | 1000 |
| L1 | 300 | 350 | 400 | 500 | 600 | 600 |
| H5 | 320 | 350 | 400 | 450 | 550 | 690 |

¹⁾ only ZK610

Weight [kg], without actuator

| Size approx.kg | 1 | 2 | 3 | 4 | 5 | 6 ¹⁾ |
|----------------|-----|-----|-----|-----|------|-----------------|
| Angle pattern | 120 | 340 | 570 | 650 | 1700 | 1700 |
| Z-type | 215 | 390 | 620 | 750 | 1900 | 1900 |

¹⁾ only ZK610

Function

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

This system consists of several sleeves nesting within one another, containing radial orifices drilled in them.

The flowrate through the ZK radial stage nozzle is set by means of the valve plug. Depending on its position, this valve plug opens up the individual orifices partially or completely, thus producing different flowrates.

As a result of this design, the pressure drop is reduced in steps and the medium flowing through is split up into many partial flows. This ensures high resistance to wear and reduces the noise level.

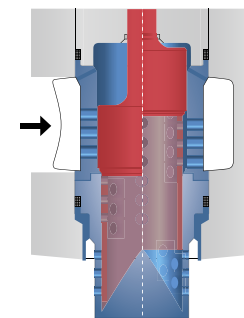
Function of the control edge

The valve plug is provided with a control edge arranged above the sealing surface. The control edge lowers until it covers the lowest orifice of the radial stage nozzle, while the seating surface remains above the seat. As a result, wear is prevented on the surface of the seat.

Because of the multiple, step-by-step expansion, the pressure drop in the region of the seat is minimized.

Modular system of the ZK Radial Stage Nozzle® for ZK610, ZK 613

The multi-stage pressure reduction is exactly adapted to the operating conditions.



eg pressure reduction in three stages

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