Swing Check Valve

# AKR/AKRS

## Type Series Booklet

## Legal information/Copyright

Type Series Booklet AKR/AKRS

# Contents

# Check Valves and Strainers

## Swing Check Valves to DIN/EN

# AKR/AKRS

### Main applications

- Fossil-fuelled power stations
- Process engineering
- Boiler feed applications
- Boiler recirculation
- Chemical industry
- Petrochemical industry
- Sugar industry
- Mining
- Descaling units
- Paper industry / pulp industry
- Shipbuilding
- Snow-making systems
- Nuclear power stations

### Fluids handled

- Water
- Steam
- Other non-aggressive fluids such as gas or oil on request.

### Operating data

**Table 1:** Operating properties

| Characteristic | Value |
|---|---|
| Nominal pressure | PN 63 - 160 |
| Nominal size | DN 80/80-300/250 |
| Max. permissible pressure [bar] | 160 |
| Min. permissible temperature [°C] | ≥ -10 |
| Max. permissible temperature [°C] | ≤ +550 |

Selection as per pressure/temperature ratings (⇨ Page 6)

### Valve body materials

**Table 2:** Overview of available materials

| Material | Material number | Temperature limit |
|---|---|---|
| P 250 GH | 1.0460 | ≤ 450 °C |
| 13 CrMo 4-5 | 1.7335 | ≤ 550 °C |

### Design details

### Design

- Body of forged or welded steel construction
- Pressure seal design
- Internally mounted hinge pin

### Variants

- Other butt weld end versions
- Inspections to technical codes such as AD2000 or to customer specification

### Product benefits

- Added safety due to pressure seal design providing increased sealing to atmosphere: The higher the pressure in the valve body, the tighter the cover joint. Very low risk of leakage, particularly at high pressures and temperatures. Compact design.
- Reliable, tight shut-off and service-friendly design due to flexibly mounted valve disc. Precise alignment of valve disc with body seat; valve disc is easy to replace.
- Hard-faced seat/disc interface made of wear-resistant and corrosion-proof 17 % chrome steel or Stellite for long service life and high functional reliability.

7373.1/16-EN

## Product information

### Product information as per Regulation No. 1907/2006 (REACH)

For information as per European chemicals regulation (EC) No. 1907/2006 (REACH) see https://www.ksb.com/en-global/company/corporate-responsibility/reach.

### Product information as per Directive 2014/34/EU (ATEX)

The valves do not have a potential internal source of ignition and can be used in potentially explosive atmospheres, Group II, category 2 (zones 1+21) and category 3 (zone 2+22) to ATEX 2014/34/EU.

### Product information as per Pressure Equipment Directive 2014/68/EU (PED)

The valves satisfy the safety requirements of Annex I of the European Pressure Equipment Directive 2014/68/EU (PED) for fluids in Groups 1 and 2.

### Product information as per UK Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations 2016

The valves do not have a potential internal source of ignition and can be used in accordance with the UK's Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations 2016 in potentially explosive atmospheres, Group II, category 2 (zones 1+21) and category 3 (zone 2+22).

### Product information as per UK Pressure Equipment (Safety) Regulations 2016

The valves satisfy the safety requirements of the UK Pressure Equipment (Safety) Regulations 2016 (PER) for fluids in Groups 1 and 2.

### Related documents

**Table 3:** Information/documents

| Document | Reference number |
|---|---|
| AKG-A/AKGS-A type series booklet (gate valve in pressure seal design) | 7338.1 |
| Operating manual | 0570.81 |

7373.1/16-EN

## Purchase order specifications

Please specify the following information in all enquiries or purchase orders:

1. Type
2. Nominal pressure
3. Nominal size
4. Operating pressure
5. Differential pressure
6. Operating temperature
7. Material
8. Fluid handled
9. Flow rate
10. Pipe connection
11. Variants
12. Reference number

Always indicate the original serial number and the year of construction when ordering spare parts.

## Pressure/temperature ratings

**Table 4:** Butt weld ends, machined, type AKRS
Permissible operating pressures [bar][1)]

| PN | Material | | [°C] | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Designation | Number | RT[2)] | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 460 | 470 | 480 | 490 | 500 | 510 | 520 | 530 | 540 | 550 |
| 63 | P 250 GH | 1.0460 | 63,0 | 58,5 | 55,5 | 52,5 | 48,0 | 43,5 | 40,5 | 37,5 | 20,7 | - | - | - | - | - | - | - | - | - | - |
| | 13 CrMo 4-5 | 1.7335 | 63,0 | 63,0 | 63,0 | 63,0 | 63,0 | 63,0 | 60,0 | 56,7 | 53,1 | 50,5 | 47,9 | 45,4 | 42,8 | 41,1 | 34,8 | 28,2 | 23,4 | 18,3 | 14,7 |
| 100 | P 250 GH | 1.0460 | 100,0 | 92,8 | 88,0 | 83,3 | 76,1 | 69,0 | 64,2 | 59,5 | 32,8 | - | - | - | - | - | - | - | - | - | - |
| | 13 CrMo 4-5 | 1.7335 | 100,0 | 100,0 | 100,0 | 100,0 | 100,0 | 100,0 | 95,2 | 90,0 | 84,2 | 80,2 | 76,1 | 72,0 | 68,0 | 65,2 | 55,2 | 44,7 | 37,1 | 29,0 | 23,3 |
| 160 | P 250 GH | 1.0460 | 160,0 | 148,5 | 140,9 | 133,3 | 121,9 | 110,4 | 102,8 | 95,2 | 52,5 | - | - | - | - | - | - | - | - | - | - |
| | 13 CrMo 4-5 | 1.7335 | 160,0 | 160,0 | 160,0 | 160,0 | 160,0 | 160,0 | 152,3 | 144,0 | 134,8 | 128,3 | 121,8 | 115,3 | 108,8 | 104,3 | 88,3 | 71,6 | 59,4 | 46,4 | 37,3 |

**Table 5:** Butt weld ends, unmachined, type AKRS
Permissible operating pressures [bar][1)]

| PN | Material | | [°C] | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Designation | Number | Up to 120 | 200 | 250 | 300 | 350 | 400 | 425 | 450 | 475 | 500 | 510 | 520 | 530 | 540 | 550 |
| 160 | P 250 GH | 1.0460 | 160 | 160 | 140 | 120 | 100 | 80 | 72 | 60 | - | - | - | - | - | - | - |
| | 13 CrMo 4-5 | 1.7335 | 160 | 160 | 160 | 160 | 160 | 150 | 147 | 145 | 140 | 118 | 100 | 80 | 67 | 52 | 42 |

7373.1/16-EN

1 Operating pressures to DIN 2401 are also permissible.
2 RT: room temperature (-10 °C to +50 °C)

## Materials

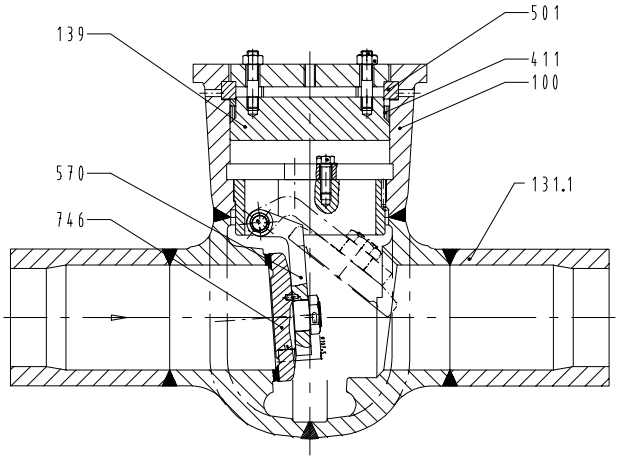


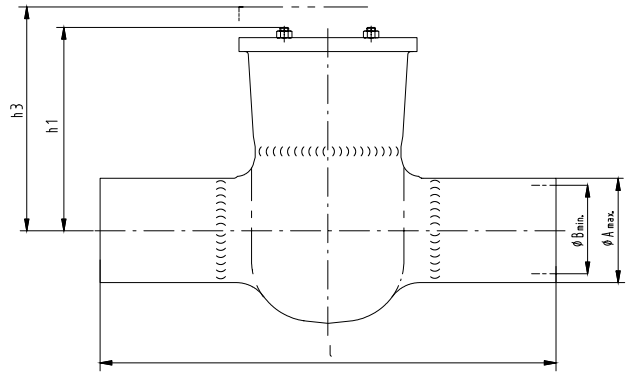

**Fig. 1:** Sectional drawing of AKRS

**Table 6:** Parts list

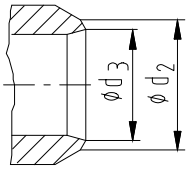
| Part No. | Description | Temperature [°C] | Material | Material number | Note |
|---|---|---|---|---|---|
| 100 | Body | ≤ 450 °C | P 250 GH | 1.0460 | Body die-forged and welded |
| | | ≤ 550 °C | 13 CrMo 4-5 | 1.7335 | |
| 131.1 | Connection branch | ≤ 450 °C | P 250 GH | 1.0460 | Material can be matched to piping material |
| | | ≤ 550 °C | 13 CrMo 4-5 | 1.7335 | |
| 746[3)] | Valve disc | ≤ 450 °C | P 250 GH | 1.0460 | - |
| | | ≤ 550 °C | 13 CrMo 4-5 | 1.7335 | |
| 139 | Bonnet | ≤ 450 °C | P 250 GH | 1.0460 | - |
| | | ≤ 550 °C | 13 CrMo 4-5 | 1.7335 | |
| Seat/disc interface | Body | ≤ 450 °C | Hard-faced | 1.4115 | Hard-faced |
| | | ≤ 550 °C | Stellite hard-faced | - | |
| | Valve disc | ≤ 550 °C | Stainless steel hard-faced | 1.4370 | |
| 411[3)] | Joint ring | ≤ 550 °C | Pure graphite | - | - |
| 501 | Segmental ring | | 13 CrMo 4-5 | 1.7335 | - |
| 570 | Hanger arm | | 13 CrMo 4-5 | 1.7335 | - |

3 Recommended spare parts

## Dimensions and weights




AKRS




Butt weld end

**Table 7:** Dimensions [mm] and weights [kg]

| PN | DN/S[4)5)] | l | Butt weld ends, unmachined | | Butt weld ends, machined | | | | | | | $h_1$ | $h_3$[6)] | [kg] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | ø $A_{max.}$ | ø $B_{min.}$ | ø $d_2$ | PN 63 | | PN 100 | | PN 160 | | | | |
| | | | | | | ø $d_3$ | Pipe dimensions | ø $d_3$ | Pipe dimensions | ø $d_3$ | Pipe dimensions | | | |
| 63/160 | 80/80 | 390 | 95 | 74 | 90 | 81 | 88,9 × 4,0 | 81 | 88,9 × 4,0 | 76,5 | 88,9 × 6,3 | 190 | 290 | 49 |
| | 100/80 | 450 | 120 | 92 | 115 | 104 | 114,3 × 5,0 | 104 | 114,3 × 5,0 | 98,5 | 114,3 × 8,0 | 190 | 290 | 53 |
| | 100/100 | 450 | 120 | 92 | 115 | 104 | 114,3 × 5,0 | 104 | 114,3 × 5,0 | 98,5 | 114,3 × 8,0 | 215 | 335 | 70 |
| | 125/100 | 525 | 145 | 105 | 141 | 130,5 | 139,7 × 4,5 | 127 | 139,7 × 6,3 | 120,5 | 139,7 × 10,0 | 215 | 335 | 83 |
| | 125/125 | 525 | 145 | 115 | 141 | 130,5 | 139,7 × 4,5 | 127 | 139,7 × 6,3 | 120,5 | 139,7 × 10,0 | 265 | 415 | 103 |
| | 150/125 | 600 | 175 | 138 | 170 | 156,5 | 168,3 × 5,6 | 154 | 168,3 × 7,1 | 144,5 | 168,3 × 12,5 | 265 | 415 | 108 |
| | 150/150 | 600 | 175 | 138 | 170 | 156,5 | 168,3 × 5,6 | 154 | 168,3 × 7,1 | 144,5 | 168,3 × 12,5 | 315 | 495 | 140 |
| | 175/150 | 675 | 195 | 160 | 195 | 180,5 | 193,7 × 6,3 | 176,5 | 193,7 × 8,8 | 167 | 193,7 × 14,2 | 315 | 495 | 155 |
| | 200/150 | 750 | 225 | 180 | 222 | 204,5 | 219,1 × 7,1 | 199,5 | 219,1 × 10,0 | 189 | 219,1 × 16,0 | 315 | 495 | 166 |
| | 200/200 | 750 | 225 | 180 | 222 | 204,5 | 219,1 × 7,1 | 199,5 | 219,1 × 10,0 | 189 | 219,1 × 16,0 | 410 | 635 | 210 |
| | 250/200 | 900 | 280 | 225 | 276 | 255 | 273,0 × 8,8 | 248,5 | 273,0 × 12,5 | 231,5 | 273,0 × 22,2 | 410 | 635 | 250 |
| | 250/250 | 900 | 280 | 225 | 276 | 255 | 273,0 × 8,8 | 248,5 | 273,0 × 12,5 | 231,5 | 273,0 × 22,2 | 585 | 825 | 520 |
| | 300/250 | 1050 | 330 | 260 | 325 | 301 | 323,9 × 11,0 | 295,5 | 323,9 × 14,2 | 276,5 | 323,9 × 25,0 | 585 | 825 | 560 |

### Mating dimensions as per standard

| | |
|---|---|
| Face-to-face lengths: | EN 12982/26 |
| Butt weld ends: | see table |
| Weld grooves: | DIN EN ISO 9692-1 (1.3 + 1.5) |

Different designs of butt weld ends and weld groove forms are possible, but only within the dimensions $A_{max.}$ and $B_{min.}$.
Butt weld ends to EN 12627 are possible.

7373.1/16-EN

4 Nominal size/seat diameter
5 Model with reduced bore on request
6 Vertical clearance for removal

2023-04-19

7373.1/16-EN

**KSB SE & Co. KGaA**
Bahnhofplatz 1 • 91257 Pegnitz (Germany)
Tel. +49 9241 71-0
www.ksb.com