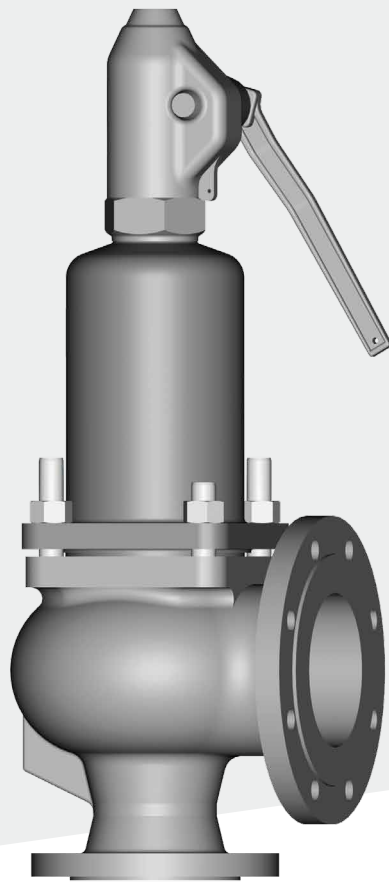


Si 6301



*Engineering
GREAT Solutions*

**Process and steam safety valves
to PED and DIN/EN standards**

Si 6301

Features

Cost-efficient IMI Bopp & Reuther low pressure safety valve:

- > Semi nozzle design
- > Cast iron body with stainless steel inner parts (except for spring and spring washer)

Inlet sizes

DN 20 to DN 150

Inlet pressure rating

PN 10 to PN 16

Set pressures

0.45 bar g up to 16 bar g

Temperature range

-10 °C to + 300 °C

Overpressure

| | |
|-----------------|-----|
| Vapours / gases | 5% |
| Liquid | 10% |

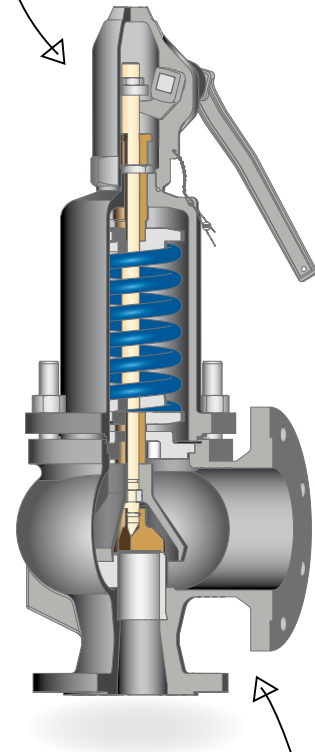
Blow down

| | |
|-----------------|-----|
| Vapours / gases | 10% |
| Liquids | 20% |

Allowable built-up back pressure

15% of the set pressure

*Basic valve for
low pressure*



*Economic for
Heating system
and water use*

Applications

- > For vapours, gases and liquids
- > Hot water from heat generation plants in full acc. to TRD 721, EN 12828 with admissible supply temperatures up to 120 °C (acc. to TÜV certification 660)
- > Steam applications up to PN 16
- > Potable water

Approvals and standards

EC type examination

- Pressure Equipment Directive 97 / 23 / EC
- DIN EN ISO 4126-1
- AD 2000-Merkblatt A2
- VdTÜV Merkblatt "Sicherheitsventil 100"

VdTÜV type approval acc. to

TÜV.SV.12-1134.d₀.D/G/F.α_w.p
 TÜV.SV.12-660.d₀.D/G/H.α_w.p
 TÜV.SV.13-701.d₀.F.α_w.p

IMI Bopp & Reuther will not renew the existing VdTÜV type approvals. The requirements by VdTÜV and applicable standards are completely considered by the EC type examination.

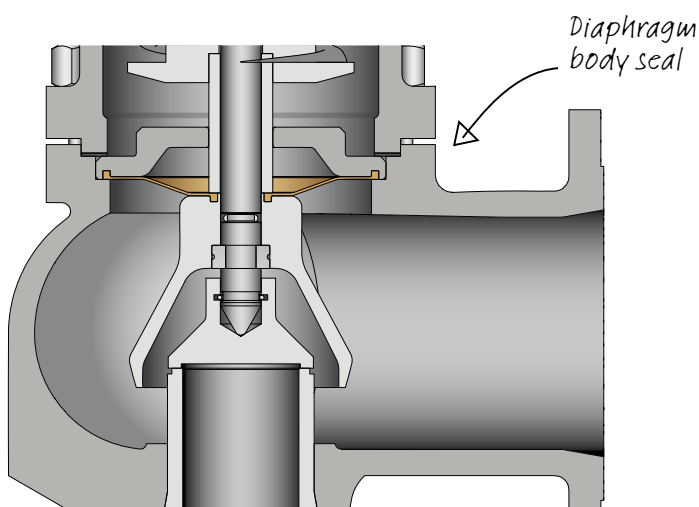
The design, manufacture, testing and labelling meet the requirements of DIN EN ISO 4126-7, DIN EN 12266-1 / -2 (insofar as applicable to safety valves), DIN EN 1092 parts I and II Flanges, AD 2000-Merkblatt A4, AD 2000-Merkblatt HP0, technical rules for steam boiler TRD 108, TRD 110, TRD 421

Si 6301

Type code

| Type code | | | | Order example |
|-----------|----------------|------|---|---------------|
| 1 | Series | Si 6 | DIN/EN valve | Si 6 |
| 2 | Design | 3 | Conventional, closed bonnet | 3 |
| 3 | Characteristic | 0 | High capacity "High Flow" | 0 |
| | | 1 | Proportional acting "Proportional Flow" | |
| 4 | Pressure class | 1 | Up to PN 16 | 1 |
| 5 | Cap | A | Packed lifting lever | A |
| | | AB | Packed lifting lever with test gag | |
| 6 | Material code | 05 | EN-GJL-250 / 5.1301 GG25 / 0.6025 / EN-JL 1040 | 05 |
| 7 | Options | .09 | Locking sleeve (government ring) | .11a |
| | | .11a | Disc with soft seal EPDM | |
| | | .35 | Lift restriction ring | |
| | | .57 | Weight loading | |
| | | .58 | Diaphragm seal | |

| | | |
|----------------|--------------------------|-------------------|
| Type ▶ | Si 6301 A 05 .11a | |
| Please state ▶ | Set pressure | 8.0 bar g |
| | Fluid temp. | 80 °C |
| | Fluid and State | Water, Liquid |
| | Inlet | DN 50, PN 16, B1 |
| | Outlet | DN 80, PN 10, B1 |
| | Flow diameter | 40 mm |
| | Approval | 97 / 23 / EG (CE) |



The special design with diaphragm seal (option .58) serves to tightly seal the spring chamber and guides, as well as protecting the sliding parts. The spring bonnet is equipped with a 10 mm diameter vent opening. Option .58 is usually selected for safety valves in heating technologies.

Si 6301

Coefficients of discharge

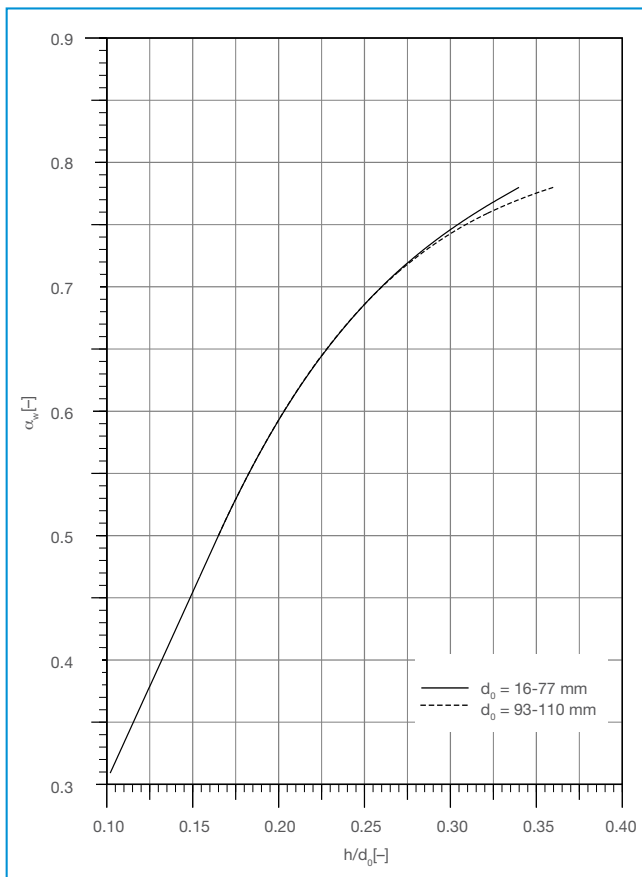
| Fluid group | Inlet size | Flow diameter | $h/d_0 \geq$ | $p_b/p_0 \leq$ | α_w |
|-------------------------|------------------|-----------------|--------------|----------------|------------|
| Vapours / gases (D / G) | DN 20 to DN 100 | 16 mm to 77 mm | 0.34 | 0.25 | 0.78 |
| | DN 125 to DN 150 | 93 mm to 110 mm | 0.36 | 0.25 | 0.78 |
| Liquids (F) | DN 20 to DN 80 | 16 mm to 63 mm | 0.34 | - | 0.6 |
| | DN 100 | 77 mm | 0.36 | - | 0.6 |
| | DN 125 to DN 150 | 93 mm to 110 mm | 0.36 | - | 0.52 |

The coefficient of discharge for gases / vapours in a pressure ratio of $p_b/p_0 > 0.25$ is shown in the diagram below.

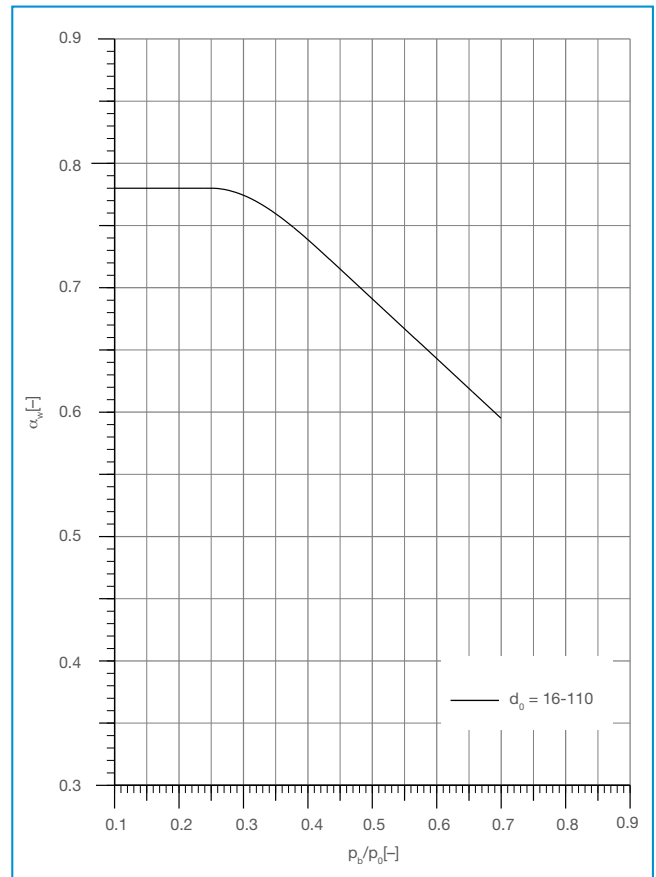
The capacity of the selected safety valves can be adjusted to the required capacity by reducing the lift, thus reducing undesirable extra performance. The following applies:

$$\alpha_{w(\text{reduced})} = \alpha_w \times q_m / q_{mc}$$

The required ratio h/d_0 is shown in the diagram below, and the reduced lift calculated with $h_{(\text{reduced})} = d_0 \times (h/d_0)$.



Si 6301 coefficient of discharge α_w depending on h/d_0 for gases and vapours



Si 6301 coefficient of discharge α_w depending on p_b/p_0 for gases and vapours

Si 6301

The safety valve type Si 6x11 is designed for liquid service with the specific requirement of a “proportional opening characteristic”. This specification is certified by a particular EC approval. With the lift / flow diameter ratio of $h/d_0 > 0.16$; the corresponding coefficient of discharge is α_w 0.36.

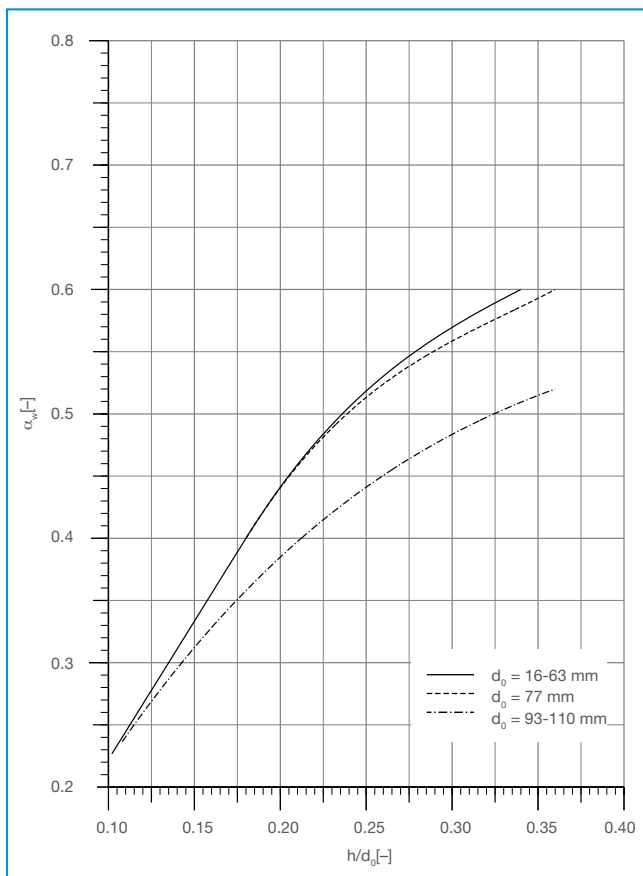
The coefficients of discharge K_{cr} acc. to DIN EN ISO 4126-1 for this valve series are identical with above coefficients of discharges α_w and the values in the diagrams.

Safety valves intended for discharging hot water from heat generation units or plants are approved in a separate EC type examination. The coefficients of discharge are given in the below table. The set pressure is limited to a 1 bar g to 10 bar g range.

Coefficient of discharge for hot water applications

| Set Pressure [bar g] | Coefficient of discharge α_w |
|----------------------|-------------------------------------|
| 1.0 | 0.69 |
| 1.5 | 0.74 |
| 2.0 | 0.76 |
| 2.5 to 10 | 0.78 |

The corresponding interim values for the set pressure range from 1 bar to < 2.5 bar need to be interpolated. Applicable for $h/d_0 \geq 0.36$.

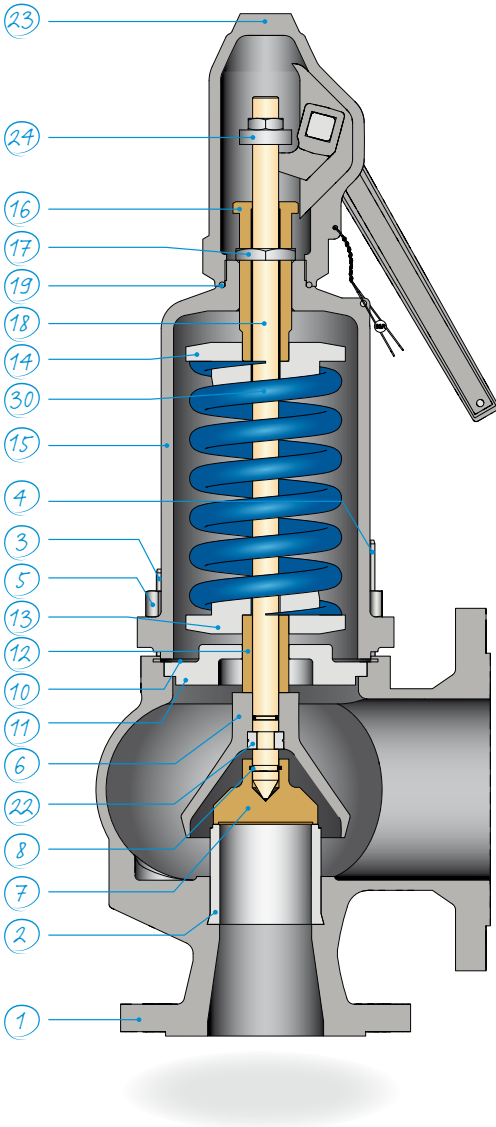


Si 6301 coefficient of discharge α_w depending on h/d_0 for liquid

- h = Lift [mm]
- d_0 = Flow diameter of the selected safety valve [mm]
- h/d_0 = Lift / Flow diameter ratio
- p_b = Absolute back pressure [bar a]
- p_0 = Absolute relieving pressure [bar a]
- p_b/p_0 = Absolute back pressure/absolute relieving pressure ratio
- α_w = Coefficient of discharge acc. to AD 2000-Merkblatt A2
- q_m = Required mass flow [kg/hr]
- q_{mc} = Certified mass flow [kg/hr]

Si 6301

Material code



| | | |
|--------------------------------------|--|--|
| Material code | 05 | |
| Temperature application range | -10 °C to +300 °C | |
| Part | Name | Material |
| 1 | Body | EN-GJL-250 / 5.1301 GG25 / 0.6025 / EN-JL 1040 |
| 2 | Seat bushing | 1.4122 |
| 3 | Stud, short | 5.6 |
| 4 | Stud, long | 5.6 |
| 5 | Hexagon nut | 5 |
| 6 | Disc holder | 0.7040 |
| 7 | Disc ³⁾ | 1.4122 |
| 8 | Disc retainer | 1.4571 |
| 10 | Flat gasket | 1.4401 / graphite |
| 11 | Intermediate cover ¹⁾ | 1.4122 1.4059 |
| 12 | Pressure sleeve | 1.4122 |
| 13 | Spring washer, bottom | 1.0038 |
| 14 | Spring washer, top | 1.0038 |
| 15 | Bonnet | EN-GJL-250 / 5.1301 GG25 / 0.6025 / EN-JL 1040 |
| 16 | Adjusting screw | 1.4104 |
| 17 | Lock nut | 5 |
| 18 | Spindle | 1.4021 |
| 19 | Flat gasket | 1.4401 / graphite |
| 22 | Pressure ring | 1.4122 |
| 23 | Packed lifting lever (cap) ²⁾ | 0.7040 |
| 24 | Lifting nut | 1.4021 |
| 30 | Spring ⁴⁾ | 1.1200 1.8159 |

¹⁾ Intermediate cover for DN 80 made from 1.4122, above that made from 1.4059

²⁾ Packed lifting lever (cap) from DN 150 flanged

³⁾ Disc material may be upgraded to stellated 1.4571 upon request for safety valves in saturated steam service

⁴⁾ The spring material selection depends on the valve size and set pressure.

IMI Bopp & Reuther reserve the right to technical changes or application of higher quality materials without prior notice. The material design can be tailored to customer specifications at any time upon request.

Si 6301

Sizes, pressure ranges and dimensions

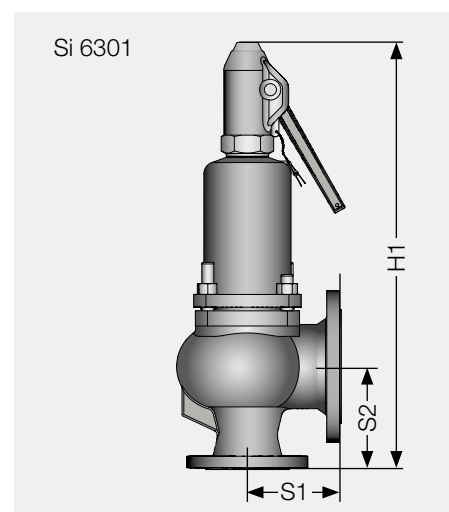
| | | | | | | | | | | | |
|---|-----------------|-------|------|------|------------------|------|------------------|------|------|------|------|
| Size | DN _E | 20 | 25 | 32 | 40 | 50 | 65 ⁴⁾ | 80 | 100 | 125 | 150 |
| | DN _A | 32 | 40 | 50 | 65 ⁴⁾ | 80 | 100 | 125 | 150 | 200 | 250 |
| Flow diameter [mm] d ₀ | | 16 | 20 | 25 | 32 | 40 | 50 | 63 | 77 | 93 | 110 |
| Flow area [mm ²] A ₀ | | 201 | 314 | 491 | 804 | 1257 | 1964 | 3117 | 4657 | 6793 | 9503 |
| Min. set pressure [bar g] | | 0.45 | 0.45 | 0.45 | 0.45 | 0.45 | 0.45 | 0.45 | 0.45 | 0.45 | 0.45 |
| Max. set pressure ¹⁾ [bar g] | | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 12.5 | 10 |
| Max. back pressure [bar g] | | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 2.5 |
| Inlet flange DIN EN ²⁾ | | PN 10 | | | | | | | | | |
| | | PN 16 | | | | | | | | | |
| Outlet flange DIN EN ²⁾ | | PN 10 | | | | | | | | | |
| | | PN 16 | | | | | | | | | |
| Centre to face dimension S1 [mm] | 85 | 95 | 100 | 115 | 125 | 140 | 155 | 175 | 215 | 225 | |
| Centre to face dimension S2 [mm] | 95 | 105 | 110 | 130 | 145 | 150 | 170 | 180 | 220 | 245 | |
| Height H1 [mm] | 355 | 405 | 430 | 510 | 565 | 675 | 725 | 825 | 875 | 1020 | |
| Drain size E ³⁾ | G¼ | G¼ | G¼ | G¼ | G¼ | G¾ | G¾ | G¾ | G½ | G½ | |
| Weight [kg] | 8 | 10 | 13 | 19 | 25 | 37 | 50 | 74 | 95 | 140 | |

¹⁾ Stated values are maximum values corresponding to the spring forces. The component strength may need to be reviewed depending on the material and temperature.

²⁾ Flanges PN 10/16 acc. to DIN EN 1092-2; flange facing Type B1

³⁾ Drain E is only drilled into the body if condensate formation is to be expected.

⁴⁾ 4-hole flange drilling for DN 65 PN 10/16



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