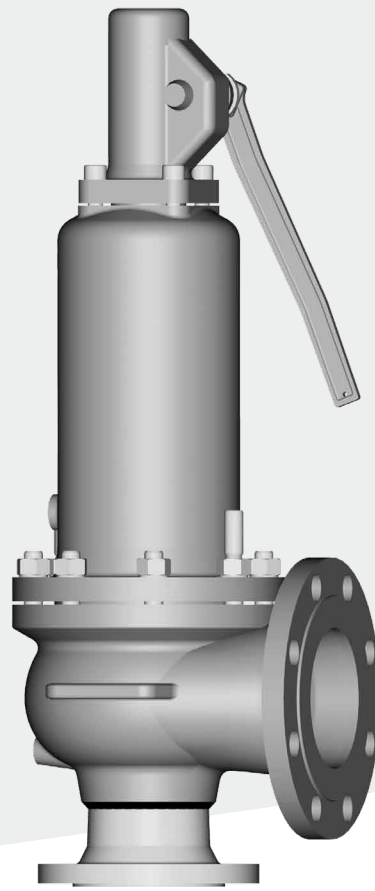



Si 6303/Si 6304/Si 6305



 Engineering
GREAT Solutions

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

Si 6303 / Si 6304 / Si 6305

Features

The proven quality IMI Bopp & Reuther high-pressure safety valve:

- > A reliable design with solid inlet nozzle, screwed in and welded
- > Available in material designs for high as well as low temperatures
- > With a great variety of sizes and options

Inlet sizes

DN 25 to DN 400

Inlet pressure rating

PN 10 to PN 400

Set pressures

0.45 bar g to 250 bar g

Temperature range

-270 °C to + 550 °C

Overpressure

Vapours / gases	5%
Liquids	10%

Blow down

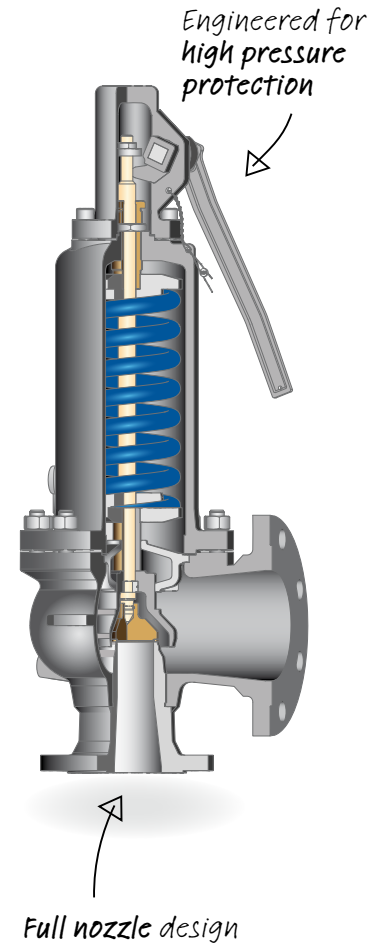
Vapours / gases	10%
Liquids	20%

Allowable built-up back pressure

15% of the set pressure

Applications

- > For vapours, gases and liquids
- > Protection of system components
- > Steam boiler
- > Air separator
- > Power plants and industrial steam generation
- > Paper factories
- > High-pressure chemical processes



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.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 110, TRD 421

Si 6303 / Si 6304 / Si 6305

Type code

Type code				Order example
1	Series	Si 6	DIN/EN Full lift valve	Si 6
2	Design	1	Conventional, open bonnet	1
		3	Conventional, closed bonnet	
		4	Bellows, closed bonnet	
		5	Bellows, open bonnet	
3	Characteristic	0	High capacity "High Flow"	0
		1	Proportional acting "Proportional Flow"	
4	Pressure class	3	max. PN 160 (up to 62 bar g)	4
		4	max. PN 160 (up to 95 bar g)	
		5	max. PN 400	
5	Cap	G	Gastight cap	AB
		GB	Gastight cap with test gag	
		A	Packed lifting lever	
		AB	Packed lifting lever with test gag	
		AK	Pneumatic actuator	
6	Material code ²⁾	00	GP240GH / 1.0619	00
		01	G17CrMo5-5 / 1.7357	
		04	GX5CrNiMo19-11-2 / 1.4408	
7	Options	.09	Locking sleeve (government ring)	.22a .60
		.11a	Disc with soft seal EPDM (pressure class 3 only)	
		.14a	Lift indication with inductive proximity switch in the cap	
		.14b	Lift indication with inductive proximity switch in the auxiliary housing	
		.14c	Lift indication with inductive proximity switch for exposed spindle with actuator AK	
		.15	Bonnet spacer for high and low temperatures	
		.18	Heating jacket	
		.22a ¹⁾	Weld end at inlet	
		.22b	Weld end at outlet	
		.25	Block body design	
		.28	Oil and grease free	
		.32	Purge connection	
		.35	Lift restriction ring	
		.38	Vibration damper	
		.59	Stellited disc	
		.60	Stellited seat	

¹⁾ For valves with weld ends, please state the pipe's outer diameter, wall thickness and joint type code in the order. See brochure "IMI Bopp & Reuther High Flow Safety Valves", page 39 for information on standard dimensions.

²⁾ The standard materials of the material codes can be changed by selecting trim codes. Please see brochure "IMI Bopp & Reuther High Flow Safety Valves", page 44 for information on the trim codes T1, T2, T3.

Type ►	Si 6104 AB 00 .22a .60
Please state ►	Set pressure 38 bar g
	Fluid temp. 360 °C
	Fluid and State Superheated steam, Steam
	Inlet DN 100, weld end
	Weld end dimensions ¹⁾ 117 x 5.6 mm
	Outlet DN 150, PN 40, B1
	Flow diameter 63 mm
	Approval 97 / 23 / EG (CE)

Si 6303 / Si 6304 / Si 6305

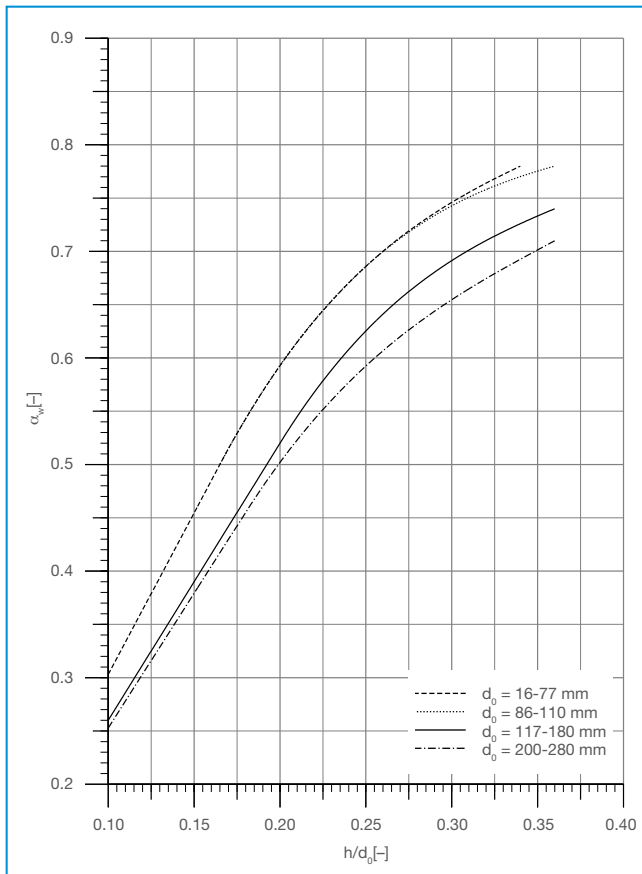
Coefficients of discharge

Fluid group	Inlet size	Flow diameter	$h/d_0 \geq$	$p_b/p_0 \leq$	α_w
Vapours / gases (D / G)	DN 25 to DN 150	16 mm to 77 mm	0.34	0.25	0.78
	DN 125 to DN 200	86 mm to 110 mm	0.36	0.25	0.78
	DN 200 to DN 300	117 mm to 180 mm	0.36	0.3	0.74
	DN 300 to DN 400	200 mm to 280 mm	0.36	0.3	0.71
Liquids (F)	DN 25 to DN 100	16 mm to 70 mm	0.34	-	0.6
	DN 100 to DN 150	77 mm	0.36	-	0.6
	DN 125 to DN 200	86 mm to 125 mm	0.36	-	0.52

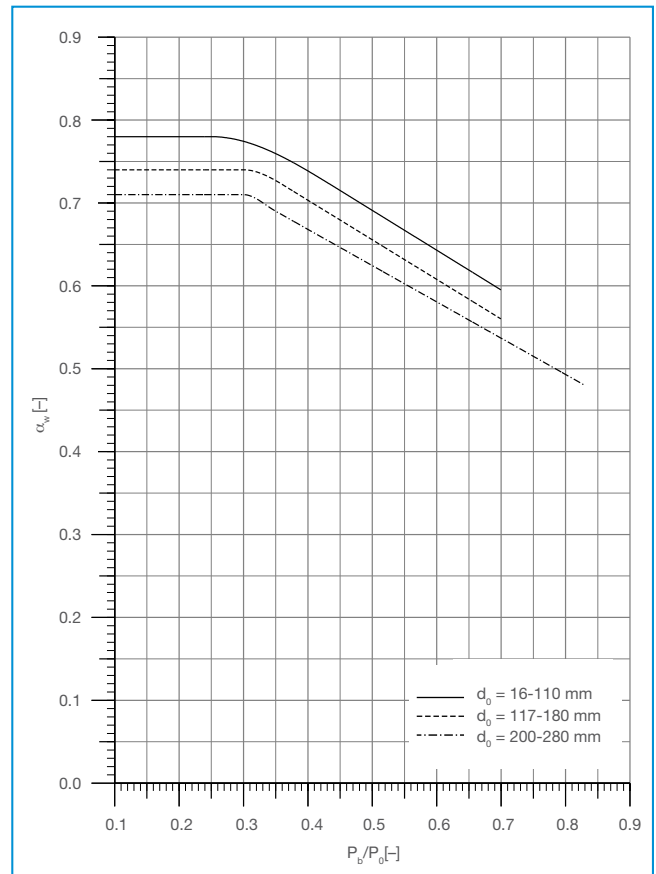
The coefficient of discharge for gases/vapours in a pressure ratio of $p_b/p_0 > 0.25$ and/or $p_b/p_0 > 0.3$ is shown in the diagram below.

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 $h_{(\text{reduced})} = d_0 \times (h/d_0)$.



Si6303/Si6304/Si6305 coefficient of discharge α_w depending on h/d_0 for gases and vapours



Si6303/Si6304/Si6305 coefficient of discharge α_w depending on p_b/p_0 for gases and vapours

Si 6303 / Si 6304 / Si 6305

Sample size calculation for a safety valve in liquid service acc. to DIN EN ISO 4126-7:

Fluid
oil

Density
700 kg/m³

Temperature T₀
56 °C = 329 K

Set pressure
48.0 bar g

Relieving pressure p₀ at 10% accumulation
(48 x 1.1) + 1 = 53.8 bar a

Back pressure p_b
15 bar a

Required capacity q_m
51.000 kg/hr

For rather small sizes, the coefficient of discharge K_{dr} = 0.6 can be derived from the table on page 4 for liquids.

As the viscosity is negligible in this example, k_v = 1.0 can be used in the calculation.

$$A = \frac{q_m}{1.61 K_{dr} k_v \sqrt{\frac{v}{p_0 - p_b}}}$$

is the required flow area.

The specific volume v = 1/density = 0.0014285

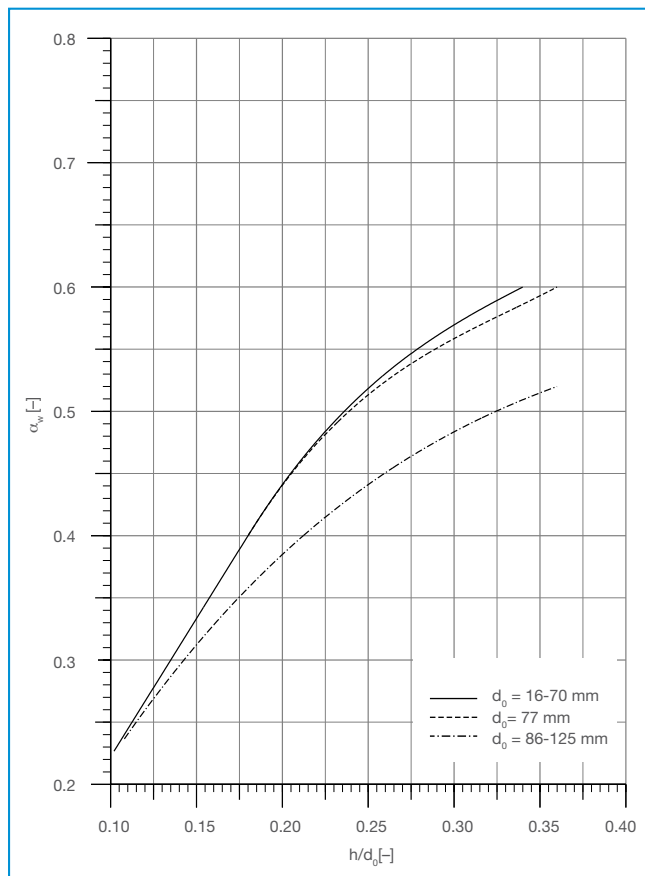
$$A = \frac{51000}{1.61 \times 0.6 \times 1.0 \sqrt{\frac{0.0014285}{53.8 - 15}}} = 320.35 \text{ mm}^2$$

With a flow area of A₀ = 491 mm², the safety valve Si 6303 G 00, DN 40 x 50, PN 63 x 16, d₀ 25.0 mm is suitable for this application (see page 8 for the size range).

The certified capacity q_{m,c} can be established as 78.146.9 kg/hr from above equation.

The lift can be restricted to reduce the undesirable extra performance (q_{m,c}/q_m) of 53%.

$\alpha_{w(\text{reduced})} = \alpha_w \times q_m / q_{m,c} = 0.6 \times 51.000 / 78.146.9 = 0.39$. The ratio h/d₀ can be derived from the diagram as 0.18, which makes the restricted lift h = 0.18 x 25 = 4.5 mm.



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

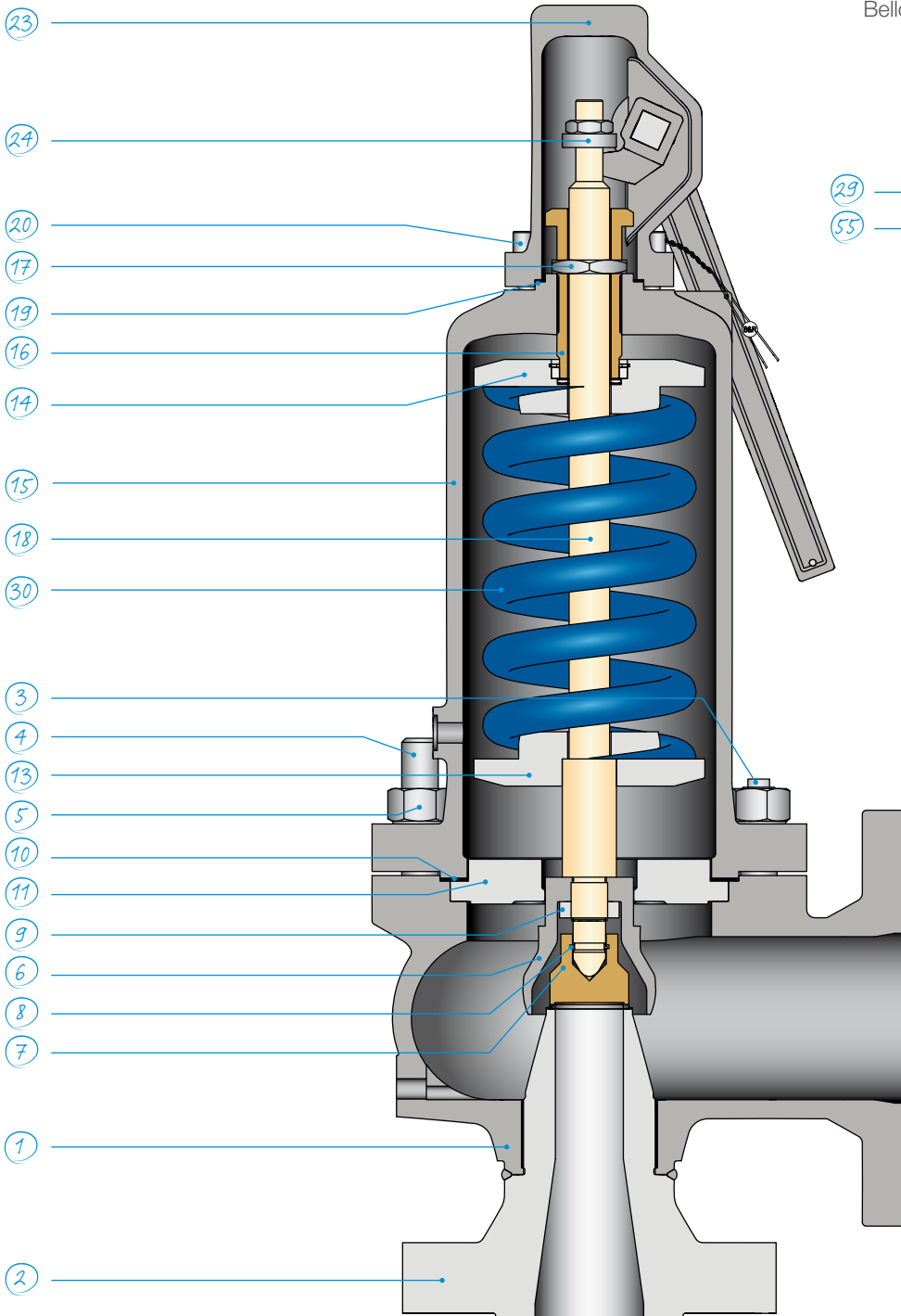
- h = Lift [mm]
- d₀ = Flow diameter of the selected safety valve [mm]
- h/d₀ = Lift/Flow diameter ratio
- p_b = Absolute back pressure [bar a]
- p₀ = Absolute relieving pressure [bar a]
- p_b/p₀ = Absolute back pressure/absolute relieving pressure ratio
- α_w = Coefficient of discharge acc. to AD 2000-Merkblatt A2
- q_m = Required mass flow [kg/hr]
- q_{m,c} = Certified mass flow [kg/hr]

The safety valve type Si 6x13/Si 6x14/Si 6x15 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/d₀ > 0.16; the corresponding coefficient of discharge is α_w 0.36.

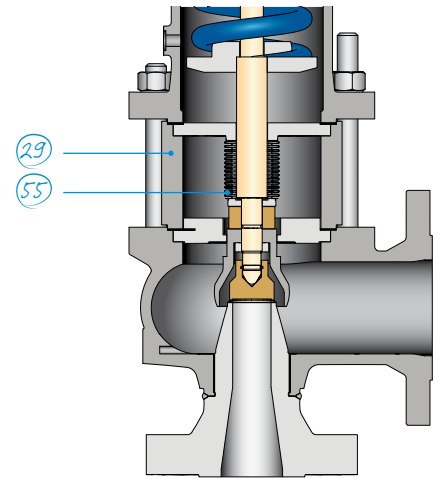
Si 6303/Si 6304/Si 6305 coefficient of discharge α_w depending on h/d₀ for Liquid

Si 6303

Material code



Bellows design Si 6403



Si 6303

Material code			00	01	04
Temperature application range			-10 to +450 °C ¹⁾	Max. 550 °C	-200 to +400 °C ²⁾
Part	Name	Spare part	Material	Material	Material
1	Body		GP240GH/1.0619	G17CrMo5-5/1.7357	GX5CrNi-Mo19-11-2/1.4408
2	Inlet nozzle ⁷⁾		1.0460 1.0619 Seat surface hard-faced with Stellite	1.7335 1.7357 Seat surface hard-faced with Stellite	1.4571 1.4408 Seat surface hard-faced with Stellite
3	Stud, short		1.7709	1.7709	A4-70
4	Stud, long		1.7709	1.7709	A4-70
5	Hexagon nut		04	04	04
6	Disc holder		1.0460 5.3106/GGG-40	1.4571 1.4408	1.4571 1.4408
7	Disc	*2, 3	1.4122 Hardened	1.4122 Hardened	1.4571 Seat surface hard-faced with Stellite
8	Disc retainer		1.4571	1.4571	1.4571
9	Groove nut		1.4571	1.4571	1.4571
10	Flat gasket	*1, 2, 3	1.4401/graphite	1.4401/graphite	1.4401/graphite
11	Intermediate cover ⁹⁾		1.4122	1.4122	1.4571 1.4408
13	Spring washer, bottom		1.0460	1.4571	1.4571
14	Spring washer, top		1.0460	1.4571	1.4571
15	Bonnet ^{4) 6)}		GP240GH/1.0619	G17CrMo5-5/1.7357 ⁵⁾	GX5CrNi-Mo19-11-2/1.4408
16	Adjusting screw		1.4122	1.4571	1.4571
17	Lock nut		1.7258	1.7258	1.4571
18	Spindle		1.4122	1.4122	1.4571
19	Flat gasket	*1, 2, 3	1.4401/graphite	1.4401/graphite	1.4401/graphite
20	Cylinder bolt		8.8	8.8	A4-70
23	Packed lifting lever (cap) ³⁾		1.0619	1.0619	1.4408
24	Lifting nut		1.4401	1.4401	1.4401
29	Bonnet spacer		1.0460	1.7335	1.4571
30	Spring ⁸⁾	*3	1.1200 1.8159	1.1200 1.8159	1.4310 1.8159, chem. nickel plated
55	Bellows	*3	1.4571	1.4571	1.4571

¹⁾ Material may be used in temperatures down to -85 °C if the specification of AD 2000-Merkblatt W10 is complied with.

²⁾ Material may be used in temperatures down to -273 °C if the specification of AD 2000-Merkblatt W10 is complied with.

³⁾ Packed lifting lever (cap) from DN 50 x 80 flanged

⁴⁾ Design Si 61 with open bonnet only for valves acc. to material code „00“ and „01“.

⁵⁾ Bonnet in GP240GH/1.0619 for valves Si 61 with open bonnet, Si 64 with bellows or with design option .15.

⁶⁾ Si 63 type valves with closed bonnet with design option .15 above 400 °C.

⁷⁾ Inlet nozzle up to seat ø 77 mm and with weld end option .22a is always manufactured in forging, flow diameter ø 93 mm and above in casting

⁸⁾ The spring material selection depends on the valve size and set pressure as well as the temperature. Other spring materials are available for special operating conditions, e.g. temperatures > 400 °C or < -170 °C, and if the customer specifies this.

⁹⁾ Intermediate cover for valves acc. to material code 00 and 01 up to DN 125 x 200 made from 1.4122, above this made from 1.4408.

Spare Parts:

*1 For start-up

*2 For 2 years of operation

*3 After several years of operation

All safety valves in pressure class 5 are equipped with a needle bearing between the adjusting screw and upper spring washer.

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 6303

Sizes, pressure ranges and dimensions

Size	DN _E	25	25	32	40	40	40	50	65 ³⁾	80	80	80	100	125	150	150	200	200	250	300	400
	DN _A	32	40	50	50	65 ³⁾	80	80	100	100	125	150	150	200	200	250	250	300	350	400	500
Flow diameter [mm] d ₀		16	20	25	25	32	32	40	50	50	63	63	77	93	93	110	125	155	180	220	280
Flow area [mm ²] A ₀		201	314	491	491	804	804	1257	1964	1964	3117	3117	4657	6793	6793	9503	12270	18870	25450	38010	61575
Min. set pressure [bar g]	Si 61/ Si 63	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45
	Si 64/ Si 65	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Max. set pressure ¹⁾ [bar g]		62	62	62	62	62	62	62	62	62	50	50	40	25	25	20	12.5	10	8	7	6
Max. back pressure ²⁾ [bar g]		25	24	24	24	24	24	24	24	24	20	20	15	10	10	8	5	4	2.5	2.5	1.25
Inlet flange DIN EN ⁴⁾		PN 10 - 40						PN 25/40										PN 10 - 40			
		PN 63																			
		PN 100																			
		PN 160																			
Outlet flange DIN EN ⁴⁾		PN 10/16/25																			
		PN 40																			
Centre to face dimension S1 [mm]		95	100	110	110	130	130	145	155	155	190	190	210	215	215	225	240	265	300	335	375
Centre to face dimension S2 [mm]		110	110	115	115	140	140	150	160	175	180	180	200	220	220	245	270	290	340	370	415
Height H1 [mm]		400	420	475	475	535	535	650	685	685	790	790	920	960	960	1020	1125	1210	1400	1480	1650
Height H2 [mm]		475	505	590	590	645	645	765	820	820	940	940	1040	1040	1040	1180	1295	1380	1580	1700	1835
Additional height H3 f. actuator AK [mm]		222	222	205	205	205	205	267	267	267	267	267	394	394	394	394	310	310	490	490	490
Drain size E ⁵⁾		G ¹ / ₄	G ¹ / ₄	G ¹ / ₄	G ¹ / ₄	G ¹ / ₄	G ¹ / ₄	G ³ / ₈	G ³ / ₈	G ³ / ₈	G ³ / ₈	G ³ / ₈	G ³ / ₈	G ³ / ₈	G ¹ / ₂	G ¹ / ₂	G ¹ / ₂	G ³ / ₄	G ³ / ₄	G ³ / ₄	G ³ / ₄
Weight Si 61/63 [kg]		12	14	19	20	28	35	40	50	52	80	85	126	135	155	170	230	270	370	480	660
Weight Si 64/65 and Si 61/63.15 [kg]		15	17	22	24	32	39	44	55	57	88	93	140	165	185	200	270	320	325	550	745
Additional weight actuator AK [kg]		12	12	22	12	12	12	37	37	37	37	37	76	76	76	76	76	76	175	175	175

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

²⁾ Or in accordance with the pressure rating at the outlet.

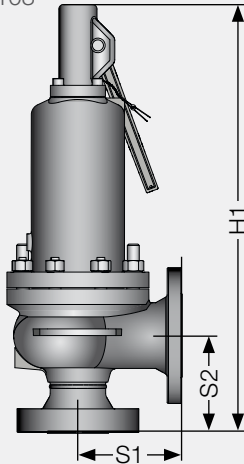
³⁾ 4-hole flange drilling with DN 65 PN 10/16

⁴⁾ Drain E is only drilled into the body if condensate formation is to be expected.

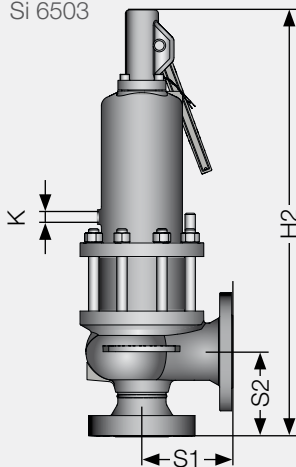
⁵⁾ Flanges PN 10 - 40 acc. to DIN E 1092 x 2; facing type B1, from PN 63 facing type B2

Si 6303

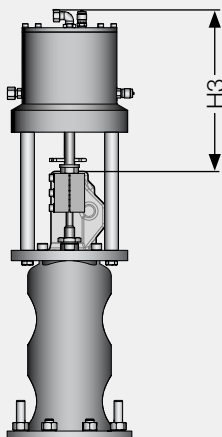
Si 6303
Si 6103



Si 6403
Si 6503



Actuator AK



Support brackets

Size DN _E × DN _A	A	B	C	D	E	L	Support bracket thickness	Number of screws
40 x 65	186	93	140	70	156	14	12	4 x M 12
50 x 80	210	95	165	70	180	14	12	4 x M 12
65 x 100	250	95	205	70	220	14	12	4 x M 12
80 x 125	295	120	240	90	260	18	15	4 x M 16
100 x 150	320	120	265	90	285	18	15	4 x M 16
125 x 200	365	120	300	90	330	18	15	4 x M 16
150 x 250	415	150	360	120	380	18	15	4 x M 16
200 x 250	455	180	400	150	420	18	15	4 x M 16
200 x 300	510	180	450	150	470	23	20	4 x M 20
250 x 350	620	190	560	160	580	23	20	4 x M 20
300 x 400	695	210	600	180	655	23	20	4 x M 20
400 x 500	800	230	715	200	760	23	20	4 x M 20

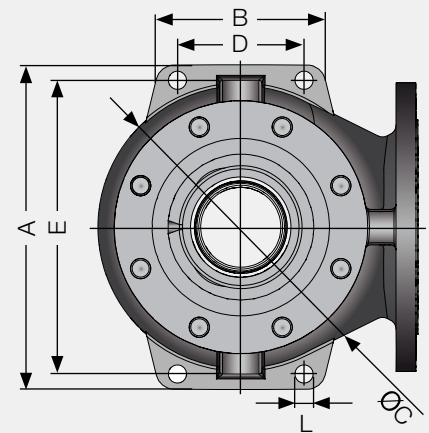
Dimensions in mm

The height from the inlet to the lower edge of the support bracket is identical with the centre to face dimension S2.

Support brackets will only be drilled if specified by the customer.

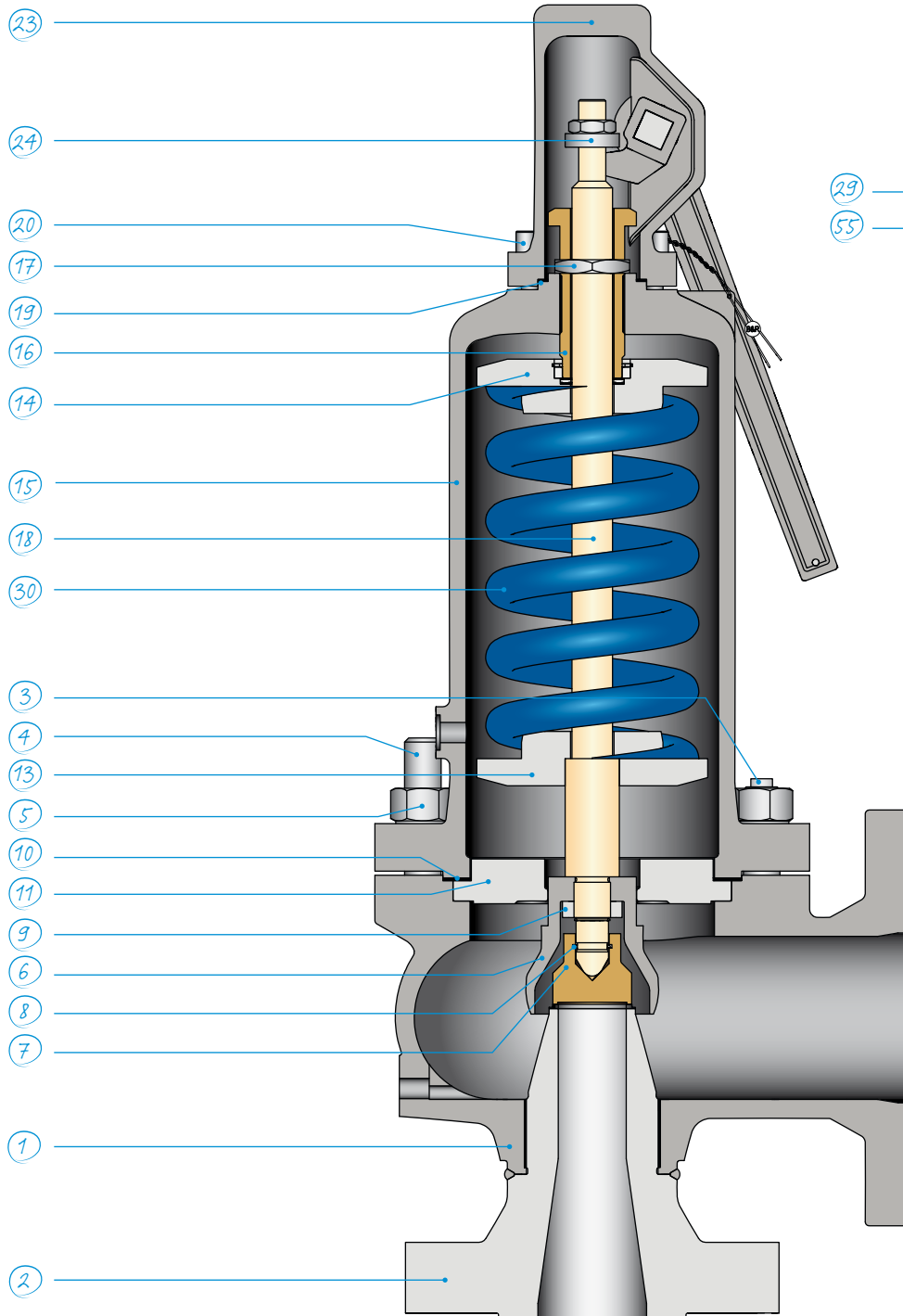
The bonnet for bellows seal design is provided with the test connection K. K up to DN 50 x 80 – G $\frac{1}{4}$ ", above G $\frac{3}{8}$ ".

Support brackets

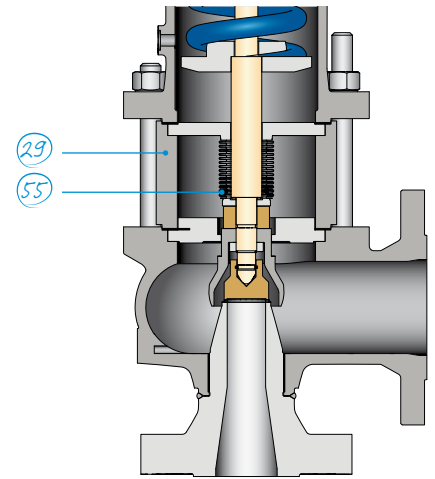


Si 6304

Material code



Bellows design Si 6404



Si 6304

Material code			00	01	04
Temperature application range			-10 to +450 °C ¹⁾	Max. 550 °C	-200 to +400 °C ²⁾
Part	Name	Spare part	Material	Material	Material
1	Body		GP240GH / 1.0619	G17CrMo5-5 / 1.7357	GX5CrNi-Mo19-11-2 / 1.4408
2	Inlet nozzle ⁷⁾		1.0460 1.0619 Seat surface hard-faced with Stellite	1.7335 1.7357 Seat surface hard-faced with Stellite	1.4571 1.4408 Seat surface hard-faced with Stellite
3	Stud, short		1.7709	1.7709	A4-70
4	Stud, long		1.7709	1.7709	A4-70
5	Hexagon nut		04	04	04
6	Disc holder		1.0460 5.3106 / GGG-40	1.4571 1.4408	1.4571 1.4408
7	Disc	*2, 3	1.4122 Hardened	1.4122 Hardened	1.4571 Seat surface hard-faced with Stellite
8	Disc retainer		1.4571	1.4571	1.4571
9	Groove nut		1.4571	1.4571	1.4571
10	Flat gasket	*1, 2, 3	1.4401 / graphite	1.4401 / graphite	1.4401 / graphite
11	Intermediate cover ⁹⁾		1.4122	1.4122	1.4571 1.4408
13	Spring washer, bottom		1.0460	1.4571	1.4571
14	Spring washer, top		1.0460	1.4571	1.4571
15	Bonnet ^{4) 6)}		GP240GH / 1.0619	G17CrMo5-5 / 1.7357 ⁵⁾	GX5CrNi-Mo19-11-2 / 1.4408
16	Adjusting screw		1.4122	1.4571	1.4571
17	Lock nut		1.7258	1.7258	1.4571
18	Spindle		1.4122	1.4122	1.4571
19	Flat gasket	*1, 2, 3	1.4401 / graphite	1.4401 / graphite	1.4401 / graphite
20	Cylinder bolt		8.8	8.8	A4-70
23	Packed lifting lever (cap) ³⁾		1.0619	1.0619	1.4408
24	Lifting nut		1.4401	1.4401	1.4401
29	Bonnet spacer		1.0460	1.7335	1.4571
30	Spring ⁸⁾	*3	1.1200 1.8159	1.1200 1.8159	1.4310 1.8159, chem. nickel plated
55	Bellows	*3	1.4571	1.4571	1.4571

¹⁾ Material may be used in temperatures down to -85 °C if the specification of AD 2000-Merkblatt W10 is complied with.

²⁾ Material may be used in temperatures down to -273 °C if the specification of AD 2000-Merkblatt W10 is complied with.

³⁾ Packed lifting lever (cap) from DN 50 x 80 flanged Si 61 design with open bonnet only for valves acc. to material code "00" and "01".

⁵⁾ Bonnet in GP240GH / 1.0619 for valves with open bonnet Si 61, Si 64 with bellows or with design option .15.

⁶⁾ Si 63 type valves with closed bonnet with design option .15 above 400 °C.

⁷⁾ Inlet nozzle up to seat ø 77 mm and with weld end always in forged steel, flow diameter ø 93 mm and above in cast steel.

⁸⁾ The spring material selection depends on the valve size and set pressure as well as the temperature. Other spring materials are available for special operating conditions, e.g. temperatures > 400 °C or < -170 °C, and if the customer specifies this.

⁹⁾ Intermediate cover for valves acc. to material code 00 and 01 up to DN 125 x 200 made from 1.4122, above this made from 1.4408.

Spare Parts:

*1 For start-up

*2 For 2 years of operation

*3 After several years of operation

All safety valves in pressure class 5 are equipped with a needle bearing between the adjusting screw and upper spring washer.

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 6304

Sizes, pressure ranges and dimensions

Size	DN _E	25	32	40	40	40	50	65 ³⁾	80	80	80	100	125	150	150	200	200	250	300
	DN _A	40	50	50	65 ³⁾	80	80	100	100	125	150	150	200	200	250	250	300	350	400
Flow diameter [mm] d ₀		16	20	20	25	25	32	40	40	50	50	63	77	77	93	110	125	155	180
Flow area [mm ²] A ₀		201	314	314	491	491	804	1257	1257	1964	1964	3117	4657	4657	6793	9503	12270	18870	25450
Min. set pressure [bar g]	Si 61/ Si 63	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45
	Si 65/ Si 64	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Max. set pressure ¹⁾ [bar g]		95	95	95	95	95	95	95	95	78	78	62	40	40	32	20	16	12	10
Max. back pressure ²⁾ [bar g]		24	24	24	24	24	24	24	24	20	20	15	10	10	8	5	4	3	3
Inlet flange DIN EN ⁴⁾		PN 63													PN 25/40			PN 25	
		PN 100																	
		PN 160	PN 160																
Outlet flange DIN EN ⁴⁾		PN 25/40											PN 10/16						
													PN 25						
Centre to face dimension S1 [mm]		100	110	110	130	130	145	155	155	190	190	210	215	215	225	240	265	300	335
Centre to face dimension S2 [mm]		120	125	125	140	140	150	165	175	185	185	200	220	260	245	270	290	340	370
Height H1 [mm]		430	485	485	535	535	650	680	680	795	795	940	960	960	1020	1125	1210	1210	1480
Height H2 [mm]		515	580	580	645	645	765	815	815	945	945	1060	1080	1080	1180	1295	1380	1580	1700
Additional height H3 f. actuator AK [mm]		222	205	205	205	205	267	267	267	267	267	394	394	394	394	310	310	490	490
Drain size E ⁵⁾		G ¹ / ₄	G ¹ / ₄	G ¹ / ₄	G ¹ / ₄	G ¹ / ₄	G ¹ / ₄	G ³ / ₈	G ³ / ₈	G ³ / ₈	G ³ / ₈	G ³ / ₈	G ¹ / ₂	G ¹ / ₂	G ¹ / ₂	G ³ / ₄	G ³ / ₄	G ³ / ₄	G ³ / ₄
Weight Si 61/63 [kg]		14	19	20	28	30	40	50	52	80	85	126	135	140	170	230	270	370	480
Weight Si 64/65 and Si 61/63.15 [kg]		17	22	24	32	34	44	55	57	88	93	140	165	170	200	270	320	425	550
Additional weight actuator AK [kg]		12	12	12	12	12	37	37	37	37	37	76	76	76	76	76	76	175	175

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

²⁾ Or in accordance with the pressure rating at the outlet.

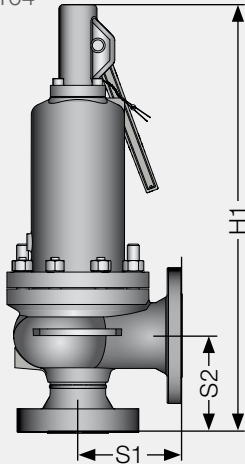
³⁾ 4-hole flange drilling with DN 65 PN 10/16

⁴⁾ Drain E is only drilled into the body if condensate formation is to be expected.

⁵⁾ Flanges acc. to DIN EN 1092-1; facings up to PN 40 type B 1, from PN 63 type B 2

Si 6304

Si 6304
Si 6104



Support brackets

Size DN _E × DN _A	A	B	C	D	E	L	Support bracket thickness	Number of screws
40 x 65	186	93	140	70	156	14	12	4 x M 12
50 x 80	210	95	165	70	180	14	12	4 x M 12
65 x 100	250	95	205	70	220	14	12	4 x M 12
80 x 125	295	120	240	90	260	18	15	4 x M 16
100 x 150	320	120	265	90	285	18	15	4 x M 16
125 x 200	365	120	300	90	330	18	15	4 x M 16
150 x 250	415	150	360	120	380	18	15	4 x M 16
200 x 250	455	180	400	150	420	18	15	4 x M 16
200 x 300	510	180	450	150	470	23	20	4 x M 20
250 x 350	620	190	560	160	580	23	20	4 x M 20
300 x 400	695	210	600	180	655	23	20	4 x M 20

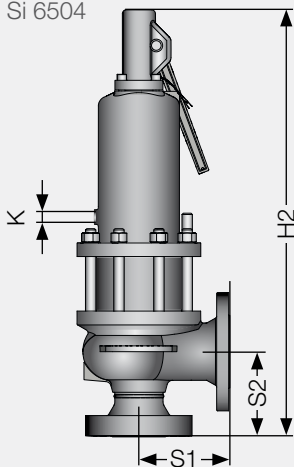
Dimensions in mm

The height from the inlet to the lower edge of the support bracket is identical with the centre to face dimension S2.

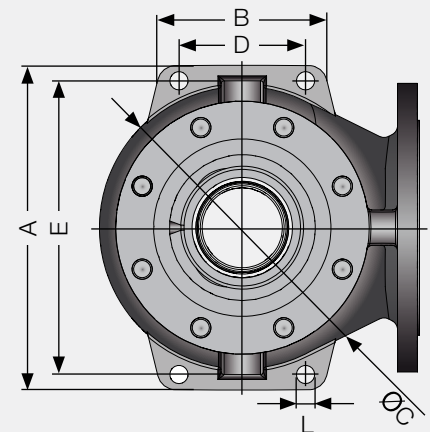
Support brackets will only be drilled if specified by the customer.

The bonnet for bellows seal design is provided with the test connection K. K up to DN 50 x 80 – G1/4", above G3/8".

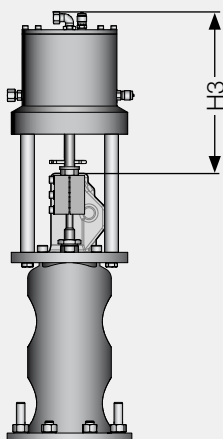
Si 6404
Si 6504



Support brackets

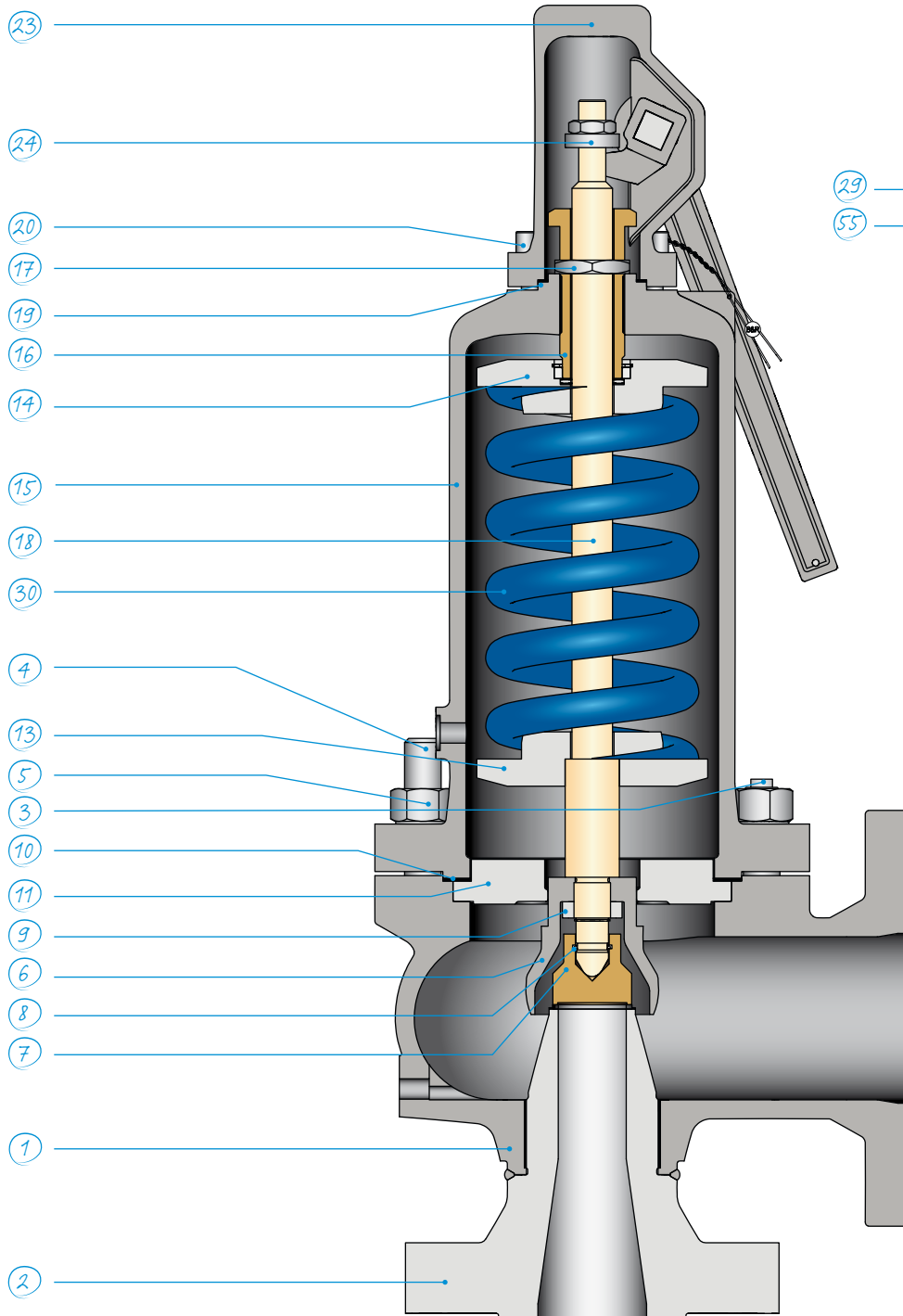


Actuator AK

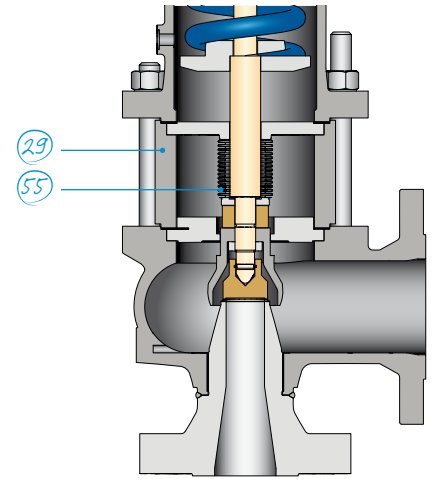


Si 6305

Material code



Bellows design Si 6405



Si 6305

Material code		00	01
Temperature application range		-10 to + 450 °C ¹⁾	Max. 550 °C
Part	Name	Spare part	Material
1	Body		GP240GH/ 1.0619
2	Inlet nozzle ⁵⁾		1.0460 1.0619 Seat surface hard-faced with Stellite
3	Stud, short		1.7709
4	Stud, long		1.7709
5	Hexagon nut		04
6	Disc holder		1.0460 5.3106 / GGG-40
7	Disc	*2, 3	1.4122 Hardened
8	Disc retainer		1.4571
9	Groove nut		1.4571
10	Flat gasket	*1, 2, 3	1.4401 / graphite
11	Intermediate cover ⁷⁾		1.4122
13	Spring washer, bottom		1.0460
14	Spring washer, top		1.0460
15	Bonnet ⁴⁾		GP240GH/ 1.0619
16	Adjusting screw		1.4122
17	Locknut		1.7258
18	Spindle		1.4122
19	Flat gasket	*1, 2, 3	1.4401 / graphite
20	Cylinder bolt		8.8
23	Packed lifting lever (cap) ²⁾		1.0619
24	Lifting nut		1.4401
29	Intermediate spacer		1.0460
30	Spring ⁶⁾	*3	1.1200 1.8159
55	Bellows	*3	1.4571

¹⁾ Material may be used in temperatures down to -85 °C if the specification of AD 2000-Merkblatt W10 is complied with.

²⁾ Packed lifting lever (cap) from DN 50 x 80 flanged

³⁾ Bonnet in GP240GH/ 1.0619 for valves with open bonnet Si 61, with bellows Si 64 or with design option .15.

⁴⁾ Si 63 type valves with closed bonnet require design option .15 above 400 °C.

⁵⁾ Inlet nozzle up to seat ø 77 mm and with weld end option .22a is always manufactured in forging, flow diameter ø 93 mm and above in casting.

⁶⁾ The spring material selection depends on the valve size and set pressure as well as the temperature.
Other spring materials are available for special operating conditions, e.g. temperatures > 400 °C or < -170 °C, and if the customer specifies this.

⁷⁾ Intermediate cover for valves acc. to material code 00 and 01 up to DN 125 x 200 from 1.4122, above this from 1.4408.

Spare Parts:

*1 For start-up

*2 For 2 years of operation

*3 After several years of operation

All safety valves in pressure class 5 are equipped with a needle bearing between the adjusting screw and upper spring washer.

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 6305

Sizes, pressure ranges and dimensions

Size	DN _E	25	40	40	50	65 ³⁾	80	100	125	150	200	200	250	300	350	400
	DN _A	40	50	65 ³⁾	80	100	125	150	200	250	250	300	350	400	500	500
Flow diameter [mm] d ₀		16	20	25	32	40	50	63	77	93	110	125	155	180	220	255
				28	36	46	56	70	86	98	117	140	168	200	235	280
Flow area [mm ²] A ₀		201	314	491	804	1257	1964	3117	4657	6793	9503	12270	1887	25450	38010	51070
				615	1018	1662	2463	3848	5809	7543	10750	15390	22170	31420	43370	61575
Min. set pressure [bar g]	Si 61 / Si 63	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45
	Si 64 / Si 65	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Max. set pressure ¹⁾ [bar g]		250	250	230	220	180	145	115	77	53	43	33	23	18	12	10
				220	200	160	130	93	62	48	38	26	20	14	10	8
Max. back pressure ²⁾ [bar g]		40	40	40	40	40	40	24	16	12	10	8	6	4	3	2
								35								
Inlet flange DIN EN ⁴⁾		PN 63 - 160										PN 25/40		PN 25		PN 10 - 25
		PN 250								PN 63 / 100		PN 63	PN 40			
		PN 320														
		PN 400														
Outlet flange DIN EN ⁴⁾		PN 25 / 40								PN 10 - 25			PN 10 / 16	PN 10		
		PN 63														
		PN 100														
Centre to face dimension S1 [mm]	150	160	190	225	235	235	245	260	260	265	265	300	335	375	375	
Centre to face dimension S2 [mm]	150	160	170	190	220	220	220	260	290	300	340	355	370	415	415	
Height H1 [mm]	640	660	760	910	950	970	1040	1100	1150	1210	1260	1415	1480	1640	1640	
Height H2 [mm]	755	795	910	1060	1090	1110	1185	1230	1280	1380	1430	1595	1695	1825	1825	
Additional height H3 f. actuator AK [mm]	267	267	267	324	324	324	240	240	240	490	490	490	490	490	490	
Drain size E ⁵⁾	G ³ / ₄	G ³ / ₄	G ³ / ₄	G ³ / ₄	G ³ / ₈	G ³ / ₈	G ³ / ₈	G ³ / ₈	G ³ / ₈	G ¹ / ₂	G ¹ / ₂	G ³ / ₄	G ³ / ₄	G ³ / ₄	G ³ / ₄	G ³ / ₄
Weight Si 61/63 [kg]	42	57	83	110	120	175	205	230	245	280	320	400	500	630	680	
Weight Si 64/65 and Si 61/63.15 [kg]	46	62	88	115	127	185	222	263	281	330	385	478	590	735	785	
Additional weight actuator AK [kg]	37	37	37	80	80	80	80	80	80	175	175	175	175	175	175	

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

²⁾ Or in accordance with the pressure rating of the outlet.

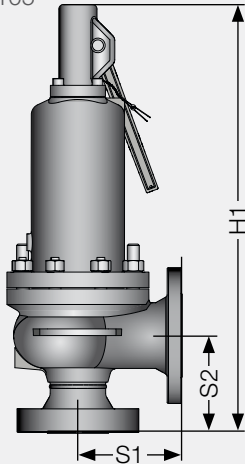
³⁾ 4-hole flange drilling with DN 65 PN 10/16

⁴⁾ Drain E is only drilled into the body if condensate formation is to be expected.

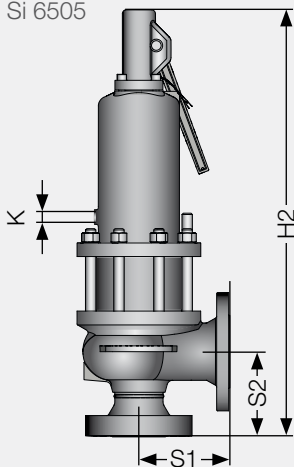
⁵⁾ Flanges acc. to DIN EN 1092-1; facings up to PN 40 type B 1, from PN 63 type B 2.

Si 6305

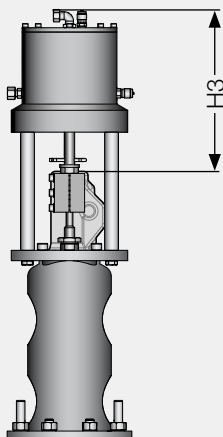
Si 6305
Si 6105



Si 6405
Si 6505



Actuator AK



Support brackets

Size DN _E x DN _A	A	B	C	D	E	L	Support bracket thickness	Number of screws
40 x 65	250	70	175	45	220	14	13	4 x M 12
50 x 80	315	80	230	55	280	18	13	4 x M 16
65 x 100	346	165	285	140	310	18	15	4 x M 16
80 x 125	355	165	290	140	320	18	15	4 x M 16
100 x 150	365	165	300	140	330	18	15	4 x M 16
125 x 200	400	170	340	135	360	18	15	4 x M 16
150 x 250	472	180	410	150	434	18	15	4 x M 16
200 x 250	516	180	460	150	480	18	15	4 x M 16
200 x 300	510	180	450	145	465	22	20	4 x M 20
250 x 350	620	190	560	160	580	22	20	4 x M 20
300 x 400	695	210	600	180	655	22	20	4 x M 20
400 x 500	800	230	715	200	760	22	20	4 x M 20

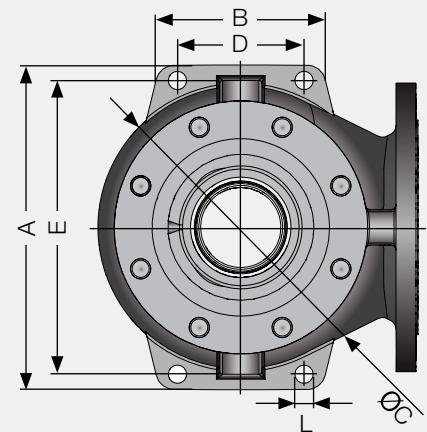
Dimensions in mm

The height from the inlet to the lower edge of the support bracket is identical with the centre to face dimension S2.

Support brackets will only be drilled if specified by the customer.

The bonnet for bellows seal design is provided with the test connection K. K up to DN 50 x 80 – G¼", above G¾".

Support brackets



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