



Type 447

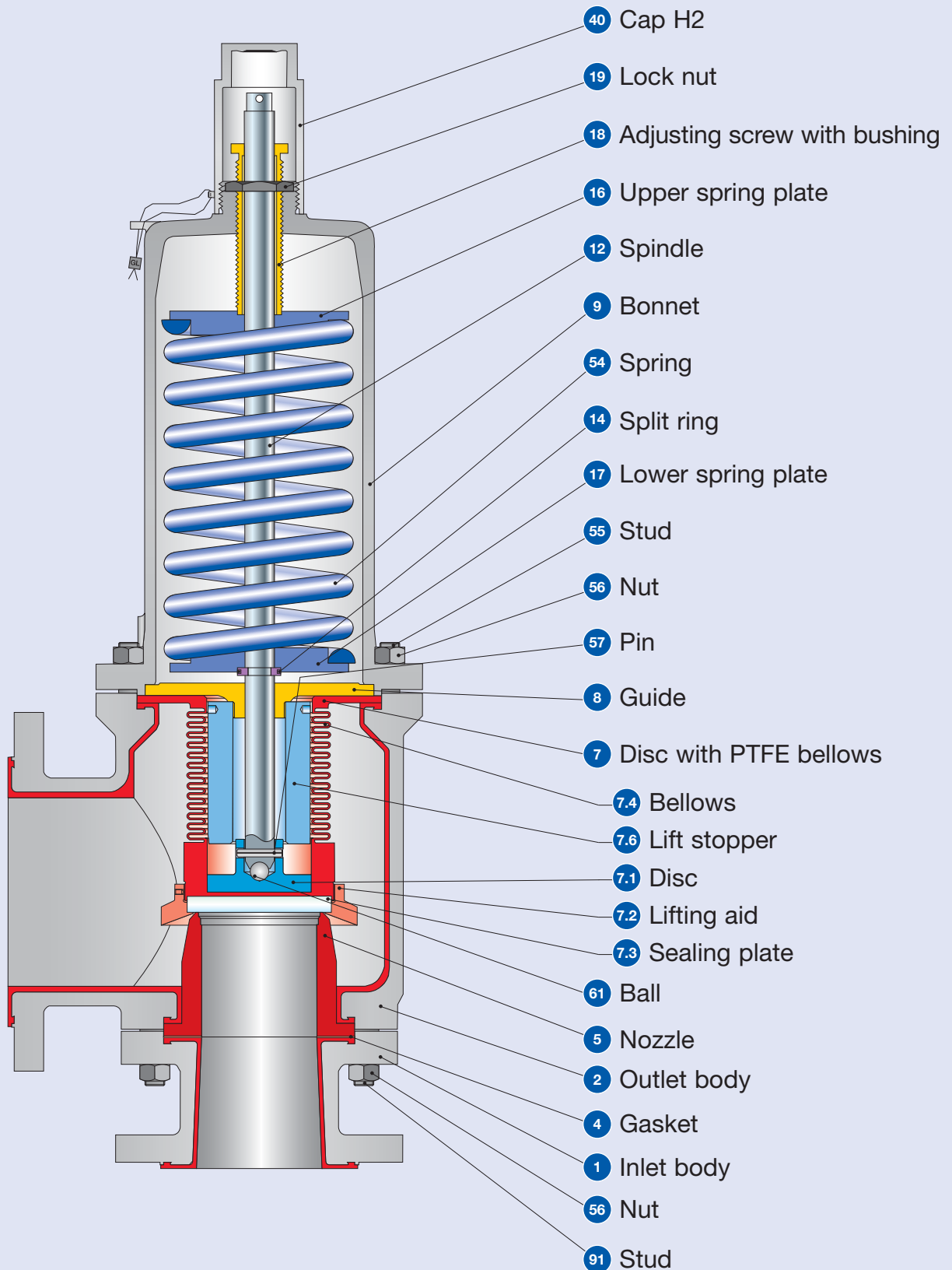
Flange Safety Relief Valves – spring loaded

Contents	Page
Material	
• Conventional design – Level 3	22
• Chlorine application – Level 3	24
How to order	
• Numbering system	26
• Article numbers	28
Dimension and weights	
• Metric and US units	29
Pressure temperature ratings	
• Metric and US units	30
Order information	
• Flange drillings	31
• Spare parts	31
Available options	32
Approvals	33
Capacities – Metric units	
• Steam, Air, Water	34
Capacities – US units	
• Steam, Air, Water	35
Determination of coefficient of discharge K_{dr}/α_w	36

Type 447
PTFE-lined
Packed lever H4
Closed bonnet
Bellows design

Conventional design – Level 3

Type 447



Conventional design – Level 3

Materials		
Item	Components	Type 447
1	Inlet body	1.0460 + Virgin PTFE-TF Steel + Virgin PTFE-TF
2	Outlet body	1.0619 + Virgin PTFE-TF SA 216 WCB + Virgin PTFE-TF
4	Gasket	Gylon®
5	Nozzle	PTFE-TFM + 25 % glass
7	Disc with PTFE bellows	1.4404 + PTFE 316L + PTFE
7.1	Disc	1.4404 316L
7.2	Lifting aid	PTFE-TFM + 25 % glass
7.3	Sealing plate	BOROFLOAT glass
7.4	Bellows	PTFE-TFM
7.6	Lift stopper	1.4404 316L
8	Guide	1.4404 316L
9	Bonnet	0.7040 Ductile Gr. 60-40-18
12	Spindle	1.4404 Stainless steel
14	Split ring	1.4104 Chrome steel
16/17	Spring plate	1.0718 Steel
18	Adjusting screw with bushing	1.4104 PTFE Chrome steel PTFE
19	Lock nut	1.0718 Steel
40	Cap H2	1.0460 SA 105
54	Spring, standard	1.1200, 1.8159 Steel
	Spring, optional	1.4310 Stainless steel
55	Stud	1.1181 Steel
56	Nut	1.0501 2H
57	Pin	1.4310 Stainless steel
61	Ball	1.3541 Hardened stainless steel
91	Stud	1.1181 Steel

Please observe:

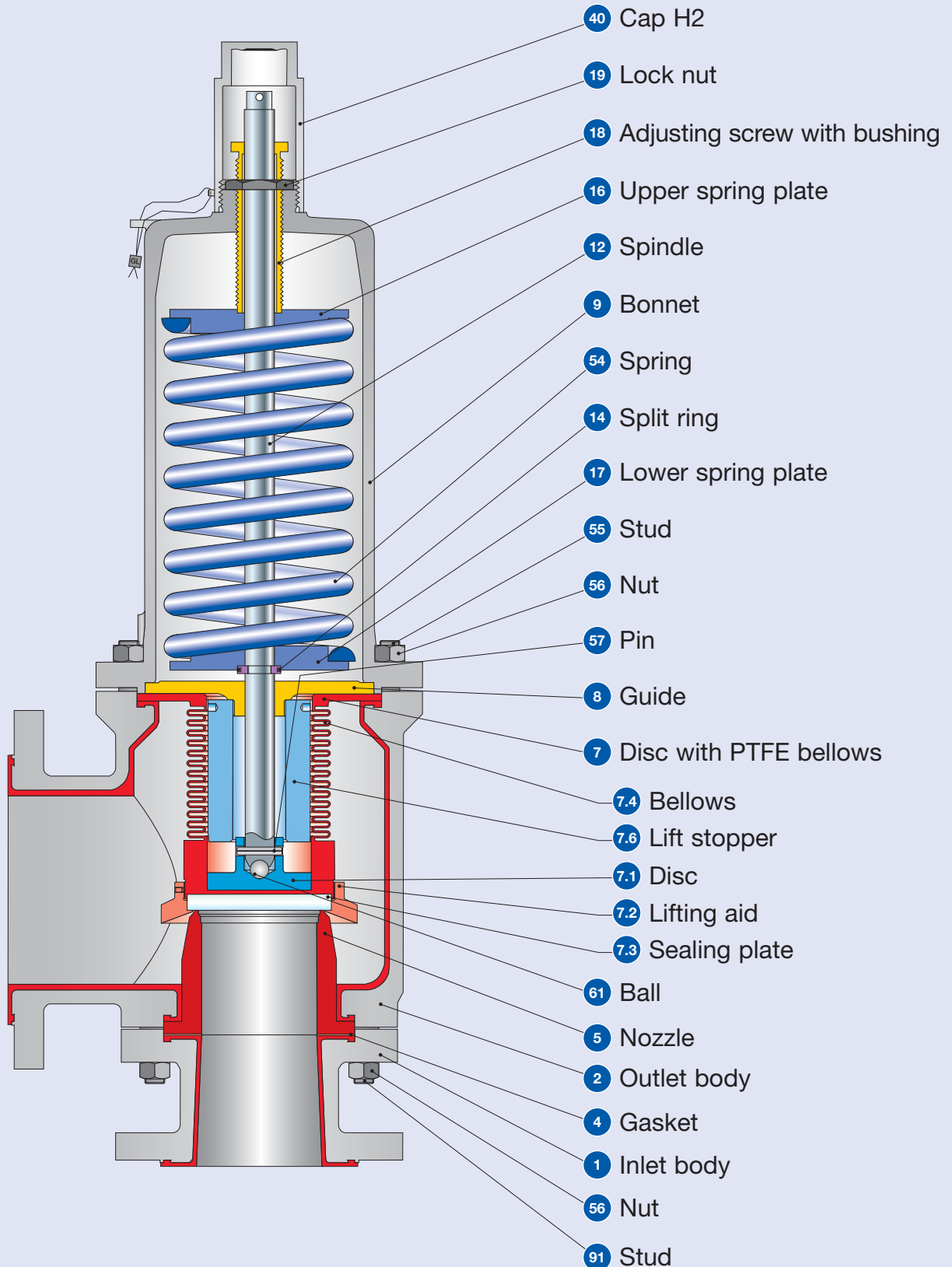
- LESER reserves the right to make changes.
- LESER may use higher quality materials without giving prior notice.
- Each component can be replaced by another material according to the customer's specification.
- All components exposed to pressure are highlighted in bold.

Chlorine application – Level 3

For applications with chlorine, there must be differentiation made between the states of the chlorine. If the application uses chlorine in a gaseous state, then the standard version of a LESER Critical Service Safety Valve Type 447 can be used. Chlorine takes the form of gas if no water-dissolved

chlorine is present or the chlorine gas does not come into contact with moisture. The reducing effect of chlorine is amplified when water-dissolved chlorine exists. Hydrochloric acid (HCl) with a highly corrosive effect is formed even when chlorine is exposed only to atmospheric humidity (wet

Type 447



Chlorine application – Level 3

chlorine). Because a diffusion in the bonnet space cannot be entirely eliminated when long-term exposure to humid chlorine exists, LESER recommends the use of Type 447 chlorine. Also with applications using gaseous chlorine, it should be ascertained whether chlorine may possibly come into contact

with atmospheric humidity, for example at the outlet of the safety valve. If this is the case, LESER also recommends the use of Type 447 chlorine for this instance.

Materials		
Item	Components	Type 447 Chlorine
1	Inlet body	1.0570 + Virgin PTFE SA105 + PTFE-TF
2	Outlet body	1.0619 + Virgin PTFE WCB + PTFE-TF
4	Gasket	Gylon®
5	Nozzle	PTFE-TFM + 25% glass
7	Disc with PTFE bellows	2.4610 / PTFE
7.1	Disc	2.4610 Hastelloy C-4
7.2	Lifting aid	PTFE-TFM + 25% glass
7.3	Sealing plate	BOROFLOAT glass
7.4	PTFE bellows	PTFE-TFM
7.6	Lift stopper	PTFE-TFM + 25% glass
8	Guide with bushing	1.4404 + 2.4610 316L + Hastelloy C-4
9	Bonnet	0.7040 Duktil Gr. 60-40-18 Interior is coated with chlorine-resistant vinyl ester resin coating, with SGL Carbon CEILCOTE 232 Flakeline, coating thickness 160 µm
12	Spindle	2.4610 Hastelloy C-4
14	Split ring	2.4610 Hastelloy C-4
16/17	Spring plate	1.4404 316L
18	Adjusting screw with bushing	1.4404 + PTFE-TF 316L + PTFE-TF
19	Lock nut	1.0718 Steel
40	Cap H2	1.0460 SA 105
54	Spring	1.4310 Stainless steel
55	Stud	1.1181 Steel
56	Nut	1.0501 2H
57	Pin	2.4610 Hastelloy C-4
61	Ball	2.4610 machined on the spindle Hastelloy C-4 machined on the spindle
91	Stud	1.1181 Steel

Please observe:

LESER reserves the right to make changes. LESER may use higher quality materials without giving prior notice. Each component can be replaced by another material according to the customer's specification. All components exposed to pressure are highlighted in bold.

How to order – Numbering system

1

Article number

4472.3872

2

Set pressure

10 bar_g

3

Connections

H64

1	2	3	4
447	2	387	2

1 Valve Type 447

Type	Page
447 – Lining: virgin PTFE	28
546 – with PTFE-Nozzle	45
5466 – with PTFE-Carbon-Nozzle	45
449 – with bore system for gasmasking	57

2 Material code

Code	Body material
2	1.0619 (WCB)
4	1.4571 (316Ti)
5	0.7043 (ductile Gr. 60-40-80)

3 Valve code

Identifies valve size and body material

4

Code	Lifting device	
2	Screwed cap	H2
4	Packed lever	H4

Please state unit (in gauge)!

Please do not exceed the pressure range defined in the spring charts.

See tablet „Flange drillings“ on page 31.

Please state one option code for each, inlet **and** outlet.

4 Options

J51

Type 447, 546, 449	Option code
• PTFE-TF lining, virginal	Standard
• PTFE-TFM lining, conductive	Please specify when ordering
• Stainless steel spring	X04
• Lift restriction	J51
• Connection for lift indicator H4	J39
• Lift indicator	J93
• Test gag	
- Cap	H2 J70
- Packed lever	H4 J69
• Free of oil and grease	J85
• Chlor applications	Please specify when ordering
- Dry chlorine	
- Chlorine, wet	
Option code applies only if not standard	

5 Documentation

H01 L30

Please select the necessary documentation:

Tests, Certifications:	Option code
DIN EN 10204-3.2: TÜV-Nord Certification for set pressure	M33
LESER Certificate for Global Application	H03
- Acceptance test certificate 3.1 as per DIN EN 10204	
- Declaration of conformity as per pressure equipment directive 97/23/EC	
Material quality certificate: DIN EN 10204-3.1	
Component	Option code
Inlet body	H01
Outlet body	L34
Bonnet	L30
Cap / lever cover	L31
Disc with bellows	L23
Studs	N07
Nuts	N08
Quality of coating: Sparc test DIN 28055-2, DIN EN 10204 2.2	

6 Code and Medium

2.0

1	2
2	0
1	Rules and regulations
	1. ASME Section VIII
	2. CE / VdTUEV
	3. ASME Section VIII + CE / VdTUEV
2	Medium
	.1 Gases
	.2 Liquids
	.0 steam / gases / liquids
	(only applicable for CE / VdTUEV)

Article numbers

Type 447						
DN _i	25	50	80	100		
DN _o	50	80	100	150		
Valve size	1" x 2"	2" x 3"	3" x 4"	4" x 6"		
Actual Orifice diameter d ₀ [mm]	23	46	60	92		
Actual Orifice area A ₀ [mm ²]	415	1662	2827	6648		
Body material: 1.0619 + virgin PTFE-TF (WCB + PTFE-TF)						
PTFE fully lined						
Bonnet closed	H2	Art.-No. 4472.	3872	3882	3892	3902
	H4	Art.-No. 4472.	3874	3884	3894	3904

Note on export restrictions see page 71



Type 447
Cap H2
Closed bonnet
Conventional design



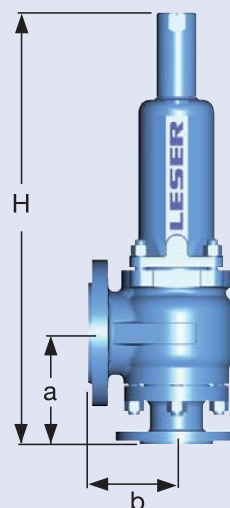
Type 447
Packed lever H4
Closed bonnet
Conventional design

Dimensions and weights

Metric units					
	DN _i	25	50	80	100
	DN _o	50	80	100	150
	Valve size	1" x 2"	2" x 3"	3" x 4"	4" x 6"
	Actual Orifice diameter d ₀ [mm]	23	46	60	92
	Actual Orifice area A ₀ [mm ²]	416	1662	2827	6648
Weight [kg]					
		15	29	50	105
Centre to face [mm]					
	Inlet a	105	152	155	220
	Outlet b	100	120	155	200
Height (H4) [mm]					
		468	604	786	943
Body material: 1.0619 + virgin PTFE-TF (WCB + PTFE-TF)					
DIN Flange¹⁾					
	Inlet			PN 16	
	Outlet			PN 16	
US units					
	DN _E	25	50	80	100
	DN _A	50	80	100	150
	Valve size	1" x 2"	2" x 3"	3" x 4"	4" x 6"
	Actual Orifice diameter d ₀ [inch]	0,91	1,81	2,36	3,62
	Actual Orifice area A ₀ [inch ²]	0,645	2,576	4,382	10,304
Weight [lbs]					
		33	64	110	231
Centre to face [inch]					
	Inlet a	4 ¹ / ₄	6	6 ¹ / ₈	8 ³ / ₄
	Outlet b	3 ⁷ / ₈	4 ³ / ₄	6 ¹ / ₈	7 ¹ / ₈
Height (H4) [inch]					
		18 ¹ / ₄	23 ³ / ₄	30 ¹⁵ / ₁₆	37 ¹ / ₈
Body material: 1.0619 + virgin PTFE-TF (WCB + PTFE-TF)					
DIN Flange¹⁾					
	Inlet			PN 16	
	Outlet			PN 16	
ASME Flange¹⁾					
	Inlet			Class 150	
	Outlet			Class 150	

¹⁾ Standard flange class. For other flange drillings, see page 31.

Conventional design



Pressure temperature ratings

Metric units

DN _i	25	50	80	100
DN _o	50	80	100	150
Valve size	1" x 2"	2" x 3"	3" x 4"	4" x 6"
Actual Orifice diameter d _o [mm]	23	46	60	92
Actual Orifice area A ₀ [mm ²]	416	1662	2827	6648

Body material: 1.0619 + virgin PTFE (WCB + PTFE-TF)

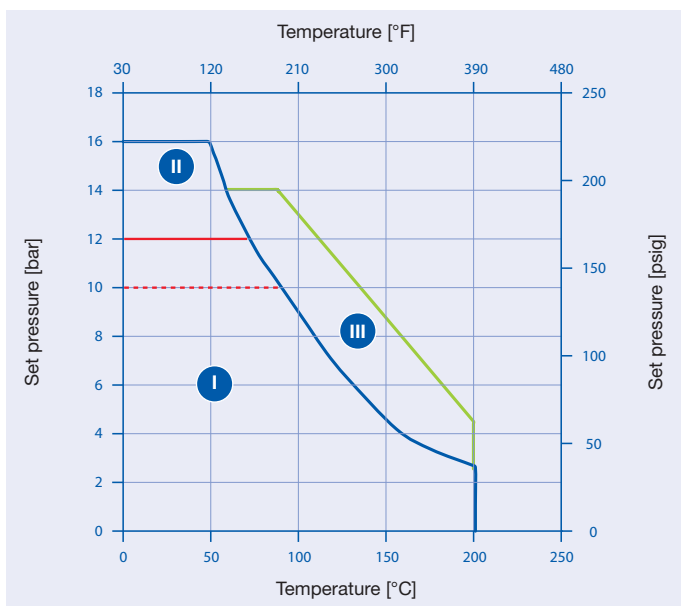
DIN Flange	Inlet	PN 16		
	Outlet	PN 16		
Min. set pressure	p [bar _g] S/G/L	0,1		
Max. set pressure with special spring ¹⁾	p [bar _g] S/G/L	16	10	10
		16	16	16
Temperature ¹⁾ acc. to DIN EN	min. [°C]	-85		
	max. [°C]	+200		

US units

DN _i	25	50	80	100
DN _o	50	80	100	150
Valve size	1" x 2"	2" x 3"	3" x 4"	4" x 6"
Actual Orifice diameter d _o [inch]	0,91	1,81	2,36	3,62
Actual Orifice area A ₀ [inch ²]	0,645	2,576	4,382	10,304

Body material: 1.0619 + virgin PTFE (WCB + PTFE-TF)

ASME Flange	Inlet	Class 150		
	Outlet	Class 150		
Min. set pressure	p [psig] S/G/L	1,45		
Max. set pressure with special spring ¹⁾	p [psig] S/G/L	232	145	145
		232	232	232
Temperature ¹⁾ acc. to DIN EN	min. [°F]	-121		
	max. [°F]	+392		



Pressure temperature ratings

¹⁾ The pressure / temperature functional ranges of Type 447 are dependent on the PTFE components in the safety valve. The chart shows the application ranges for:

- I Standard safety valve with PTFE nozzle and sealing plate made of BOROFLOAT glass
- II Design for pressures above 10 bar or 12 bar: Safety valve with metallic nozzle and sealing plate of Hastelloy®, nickel-base alloys, etc.
- III Safety valve with metallic nozzle, sealing plate and lifting aid of Hastelloy®, nickel-base alloys, etc.

Additional order codes are required for ordering

Nominal diameter	Set pressure [bar]	Option code
DN 25	12,01 – 16	S05 + S07
DN 50	10,01 – 16	S05 + S07 + S54
DN 80	10,01 – 16	S05 + S07 + S54
DN 100	10,01 – 16	S05 + S07 + S54

Order informationen – Flange drillings and Spare parts

Flange drillings					
	DN _i	25	50	80	100
	DN _o	50	80	100	150
	Valve size	1" x 2"	2" x 3"	3" x 4"	4" x 6"
	Actual Orifice diameter d _o [mm]	23	46	60	92
	Actual Orifice area A _o [mm ²]	415	1662	2827	6648
Body material: 1.0619 (WCB)					
Inlet	DIN EN 1092	PN 10	H44	H44	H44
		PN 16	*	*	*
Outlet	DIN EN 1092	PN 10	H50	H50	H50
		PN 16	*	*	*
Inlet	ASME B16.5	CL150	H64	H64	H64
Outlet	ASME B16.5	CL150	H79	H79	H79

Spare parts					
	DN _i	25	50	80	100
	DN _o	50	80	100	150
	Valve size	1" x 2"	2" x 3"	3" x 4"	4" x 6"
	Actual Orifice diameter d _o [mm]	23	46	60	92
	Actual Orifice area A _o [mm ²]	416	1662	2827	6648
Material-No. / Art.-No.					
Gasket (Item 4)	Gylon®	500.4205.0000	500.4305.0000	500.4405.0000	500.4505.0000
Nozzle (Item 5)	PTFE-TFM + 25 % glass	207.0659.0000	207.1159.0000	207.1659.0000	207.0359.0000
Disc (Item 7.1)	1.4404	212.1649.0000	212.1749.0000	212.3649.0000	212.1849.0000
Lifting aid (Item 7.2)	PTFE-TFM + 25 % glass	341.5759.0000	341.5859.0000	341.2859.0000	341.5659.0000
Sealing plate (Item 7.3)	BOROFLOAT glass	236.2459.0000	236.2559.0000	236.1859.0000	236.2359.0000
Bellows (Item 7.4)	PTFE-TFM	224.1659.0000	224.1759.0000	224.2259.0000	224.1559.0000
Set screw (Item 7.5)	PTFE + 25% glass	2 x 453.0208.0000	2 x 453.0208.0000	2 x 453.0208.0000	2 x 453.0208.0000
Ball (Item 61)	Ball Ø [mm]	9	9	12	15
	1.4401	510.0204.0000	510.0204.0000	510.0304.0000	510.0404.0000
Split ring (Item 14)	Spindle Ø [mm]	16	16	24	24
	1.4404	251.0249.0000	251.0249.0000	251.0449.0000	251.0449.0000
Pin (Item 57)	1.4310	480.0605.0000	480.0705.0000	480.2605.0000	480.2605.0000

Available options

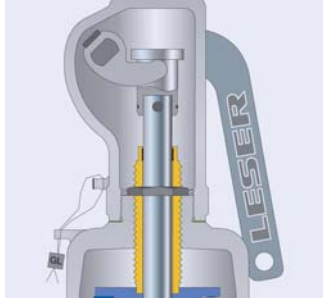
For further information, refer to "Accessories and options", page 61

Type 447

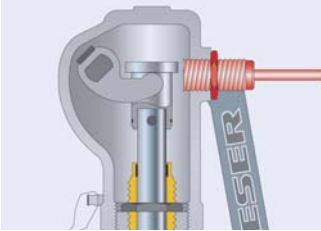
Screwed cap H2
H2



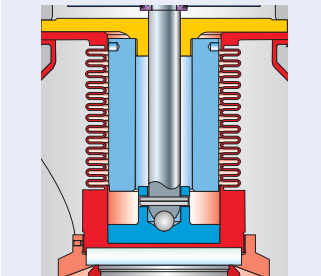
Packed lever H4
H4



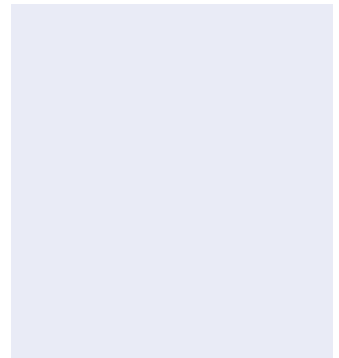
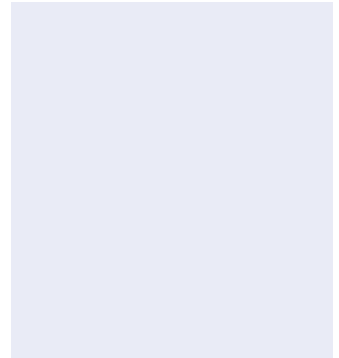
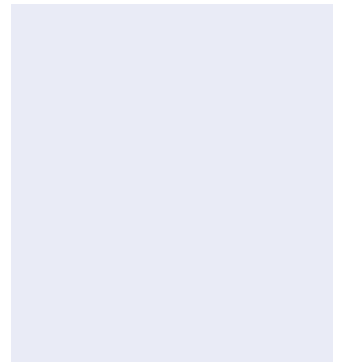
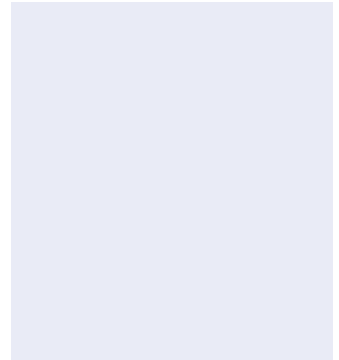
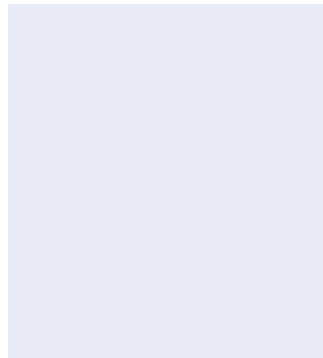
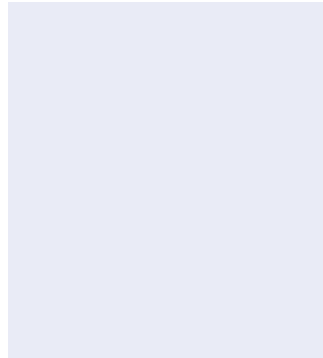
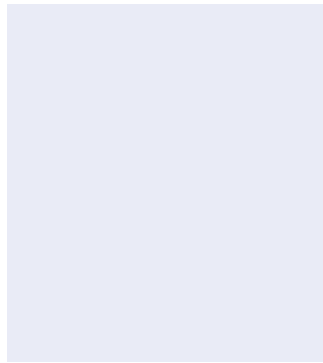
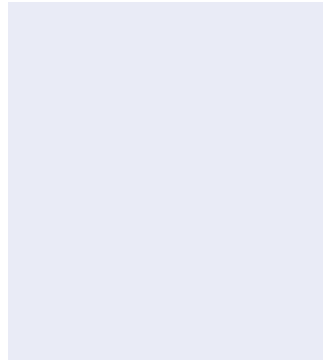
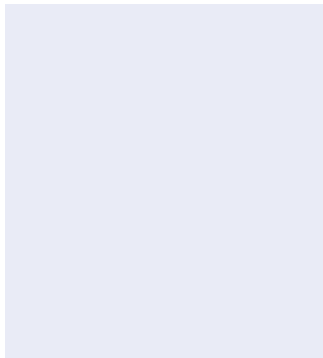
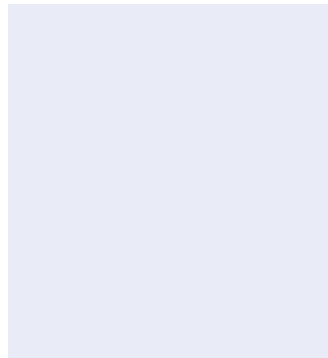
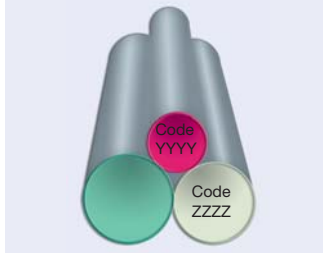
Lift indicator
J39: Connection H4
J93: Lift indicator



Lift stopper
J51



Special materials
2.4610 Hastelloy® C4
2.4360 Monel® 400
1.4462 Duplex



Approvals

Approvals					
	DN _i	25	50	80	100
	DN _o	50	80	100	150
	Valve size	1" x 2"	2" x 3"	3" x 4"	4" x 6"
	Actual Orifice diameter d ₀ [mm]	23	46	60	92
	Actual Orifice area A ₀ [mm ²]	416	1662	2827	6648
Europe		Coefficient of discharge K_{dr}			
PED /	Approval No.	072020111Z0008/0/09			
DIN EN ISO 4126-1	S/G	0,70	0,72	0,70	0,65
	L	0,48	0,47	0,51	0,42
Germany		Coefficient of discharge C_w			
PED /	Approval No.	SV05-979			
AD 2000-Merkblatt A2	S/G	0,70	0,72	0,70	0,65
	L	0,48	0,47	0,51	0,42
United States		Coefficient of discharge K			
ASME Sec. VIII	Approval No.	M37123			
	G	0,617			
	Approval No.	M37134			
	L	0,431			
Canada		Coefficient of discharge K			
CRN	Approval No.	For current approval no. see www.leser.com			
	G	0,617			
	L	0,431			
China		Coefficient of discharge C_w			
AQSIQ	Approval No.	For current approval no. see www.leser.com			
	S/G	0,70	0,72	0,70	0,65
	L	0,48	0,47	0,51	0,42
Eurasian Custom Union		Coefficient of discharge C_w			
EAC	Approval No.	For current approval no. see www.leser.com			
	S/G	0,70	0,72	0,70	0,65
	L	0,48	0,47	0,51	0,42
Classification societies		on request			

Capacities acc. to AD 2000-Merkblatt A2

Calculation of the capacity for steam, air and water acc. to. AD 2000-Merkblatt A2 with 10% overpressure at 0 °C and 1013 mbar (air) or alternatively 20 °C (water). Capacities at 1 bar and lower are calculated at 0,1 bar overpressure.

Metric units		AD 2000-Merkblatt A2											
		Steam				Air				Water			
DN _E		25	50	80	100	25	50	80	100	25	50	80	100
DN _A		50	80	100	150	50	80	100	150	50	80	100	150
Actual Orifice diameter d ₀ [mm]		23	46	60	92	23	46	60	92	23	46	60	92
Actual Orifice area A ₀ [mm ²]		415	1662	2827	6648	415	1662	2827	6648	415	1662	2827	6648
LEO _{S/G/L} ^{*)} [inch ²]		0,408	1,630	2,773	6,048	0,408	1,630	2,773	6,048	0,285	1,139	1,937	4,555
Set pressure [bar]	Capacity [kg/h]	Capacity [m ³ /h]				Capacity [10 ³ kg/h]							
0,1	115	450	826	1649	133	518	950	1898	4,5	17,8	32,9	63,5	
0,2	146	571	1051	2132	169	661	1216	2467	5,6	21,8	40,3	77,8	
0,3	173	679	1249	2563	202	790	1452	2981	6,4	25,1	46,5	89,8	
0,4	198	777	1424	2950	231	908	1665	3447	7,2	28,1	52,0	100,4	
0,5	220	867	1584	3305	259	1018	1859	3880	7,9	30,8	56,9	110,0	
0,6	241	952	1729	3631	284	1122	2039	4281	8,5	33,2	61,5	118,8	
0,7	260	1030	1862	3931	308	1219	2204	4652	9,1	35,5	65,7	127,0	
0,8	279	1104	1987	4212	331	1311	2359	2002	9,6	37,7	69,7	134,7	
0,9	297	1178	2109	4490	353	1401	2509	5341	10,1	39,7	73,5	142,0	
1,0	315	1252	2230	4763	375	1491	2657	5675	10,6	41,7	77,1	148,9	
1,1	335	1332	2361	5058	399	1590	2818	6037	11,2	43,7	80,8	156,2	
1,2	354	1413	2491	5353	424	1689	2978	6400	11,7	45,7	84,4	163,2	
1,3	374	1492	2620	5643	448	1787	3137	6757	12,1	47,5	87,9	169,8	
1,4	393	1573	2748	5933	472	1886	3295	7115	12,6	49,3	91,2	176,2	
1,5	413	1653	2875	6221	496	1985	3453	7471	13,0	51,0	94,4	182,4	
1,6	432	1733	3001	6505	520	2084	3609	7825	13,5	52,7	97,5	188,4	
1,7	452	1812	3127	6790	544	2183	3765	8177	13,9	54,3	100,5	194,2	
1,8	471	1891	3251	7070	568	2280	3920	8525	14,3	55,9	103,4	199,8	
1,9	490	1971	3375	7351	592	2379	4075	8874	14,7	57,4	106,3	205,3	
2,0	510	2051	3500	7633	616	2479	4230	9225	15,1	58,9	109,0	210,6	
2,1	529	2129	3623	4353	640	2577	4383	9572	15,4	60,4	111,7	215,8	
2,2	548	2209	3746	8189	664	2676	4537	9919	15,8	61,8	114,3	220,9	
2,3	567	2288	3868	8465	688	2774	4691	10265	16,1	63,2	116,9	225,9	
2,4	587	2367	3991	8742	712	2873	4844	10611	16,5	64,6	119,4	230,7	
2,5	606	2367	4112	9017	736	2972	4997	10956	16,8	65,9	121,9	235,5	
2,6	625	2524	4233	9289	760	3069	5148	11298	17,2	67,2	124,3	240,2	
2,7	644	2603	4355	9565	784	3169	5301	11644	17,5	68,5	126,7	244,7	
2,8	663	2681	4475	9882	807	3266	5453	12041	17,8	69,7	129,0	249,2	
2,9	682	2760	4596	10139	832	3366	5605	12365	18,1	71,0	131,3	253,6	
3	701	2838	4716	10396	855	3464	5757	12688	18,4	72,2	133,5	258,0	
4					1072	4410	7294	15924	21,3	83,3	154,2	297,9	
5					1290	5306	8776	19160	23,8	93,2	172,4	333,0	
6					1507	6202	10258	22396	26,1	102,7	188,8	364,8	
7					1725	7098	11741	25632	28,2	110,2	203,9	394,1	
8					1943	7994	13223	28868	30,1	117,9	218,0	421,3	
9					2161	8890	14705	32104	31,9	125,0	231,2	446,8	
10					2379	9786	16187	35340	33,6	131,8	243,7	471,0	
11					2596	10682	17669	38575	35,3	138,2	255,4	494,0	
12					2814	11579	19152	41811	36,9	144,3	267,0	515,9	
13					3032	12475	20634	45074	38,4	150,2	277,9	537,0	
14					3250	13371	22116	48283	39,8	155,9	288,4	557,3	
15					3468	14267	23598	51519	41,2	161,4	298,5	576,8	
16					3685	15163	25080	54755	42,6	166,7	308,3	595,8	

^{*)} LEO_{S/G/L} = LESER Effective Orifice steam/gases/liquids see page 18/19. "How to use" capacity tables, see page 16.

Capacities acc. to ASME Section VIII

Calculation of the capacity for steam, air and water according to ASME Section VIII (UV) with 10% pressure increase at 60° F (air) or 70 °F (water). Capacities at 30 psig and lower are calculated at 3 psig overpressure.

US units		ASME Section VIII											
		Steam				Air				Water			
DN _i		25	50	80	100	25	50	80	100	25	50	80	100
DN _o		50	80	100	150	50	80	100	150	50	80	100	150
Actual Orifice diameter d _o [inch]		0,91	1,81	2,36	3,62	0,91	1,81	2,36	3,62	0,91	1,81	2,36	3,62
Actual Orifice area A _o [inch ²]		0,645	2,576	4,382	10,304	0,645	2,576	4,382	10,304	0,645	2,576	4,382	10,304
LEO _{S/G/L} ^{*)} [inch ²]		0,408	1,630	2,773	6,048	0,408	1,630	2,773	6,048	0,285	1,139	1,937	4,555
Set pressure [psig]	Capacity [lb/h]	Capacity [S.C.F.M.]				Capacity [US-G.P.M]							
5													
10						202	679	1256	2868	38,0	152,1	258,8	608,5
15						217	839	1528	3529	44,7	179,0	304,5	716,0
20						257	1000	1794	4175	50,6	202,3	344,2	809,3
25						297	1160	2055	4810	55,8	223,2	379,8	893,0
30						338	1321	2314	5439	60,6	242,4	412,3	969,4
35						382	1498	2596	6124	65,4	261,8	445,4	1047,1
40						426	1674	2876	6806	70,0	279,9	476,1	1119,4
45						468	1850	3155	7484	74,2	296,8	505,0	1187,3
50						508	2026	3433	8125	78,2	312,9	532,3	1251,5
55						548	2192	3728	8766	82,0	328,2	558,3	1312,6
60						588	2352	4001	9407	85,7	342,7	583,1	1371,0
65						628	2512	4274	10048	89,2	356,7	606,9	1427,0
70						668	2672	4547	10689	92,6	370,2	629,8	1480,8
75						708	2833	4819	11331	95,8	383,2	651,9	1532,8
80						748	2993	5092	11972	98,9	395,8	673,3	1583,1
85						788	3153	5365	12613	102,0	408,0	694,1	1631,8
90						828	3314	5637	13254	104,9	419,8	714,2	1679,1
95						868	3474	5910	13895	107,8	431,3	733,7	1725,1
100						909	3634	6183	14536	110,6	442,5	752,8	1769,9
110						989	3955	6728	15819	116,0	464,1	789,5	1856,3
120						1069	4275	7274	17101	121,2	484,7	824,7	1938,9
130						1149	4596	7819	18383	126,1	504,5	858,3	2018,0
140						1229	4916	8364	19666	130,9	523,6	890,7	2094,2
150						1309	5237	8910	20948	135,5	541,9	922,0	2167,7
160						1389	5558	9455	22230	139,9	559,7	952,2	2238,8
170						1470	5878	10001	23513	144,2	576,9	981,5	2307,7
180						1550	6199	10546	24795	148,4	593,7	1010,0	2374,6
190						1630	6519	11091	26077	152,5	609,9	1037,7	2439,7
200						1710	6840	11637	27359	156,4	625,8	1064,6	2503,1
210						1790	7160	12182	28642	160,3	641,2	1090,9	2564,9
220						1870	7481	12728	29924	164,1	656,3	1116,6	2625,2
230						1950	7802	13273	31206	167,8	671,1	1141,7	2684,2

Currently no ASME approval for saturated steam applications

*) LEO_{S/G/L} = LESER Effective Orifice steam/gases/liquids see page 18/19. "How to use" capacity tables, see page 16.

Determination of coefficient of discharge in case of lift restriction or back pressure

Legend

h	= Lift [mm]
d_0	= Actual Orifice diameter [mm] of the selected safety valve, see „Article numbers“ table
h/d_0	= Ratio of lift / narrowest flow diameter
p_{a0}	= Back pressure [bar _a]
p_0	= Set pressure [bar _a]
p_{a0}/p_0	= Ratio of absolute back pressure / absolute set pressure
K_{dr}	= Coefficient of discharge acc. to DIN EN ISO 4126-1
α_w	= Coefficient of discharge acc. to AD 2000-Merkblatt A2
K_b	= Correction for back pressure acc. to API 520 Section 3.3

Diagram for evaluation of ratio of lift / flow diameter (h/d_0) in reference to the coefficient of discharge (K_{dr}/α_w)

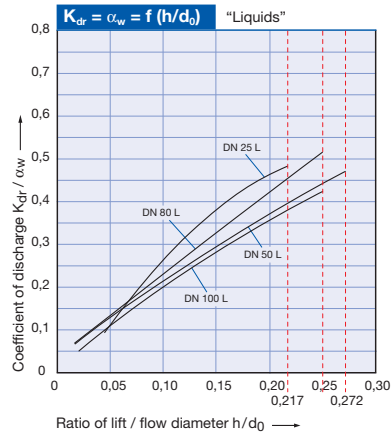
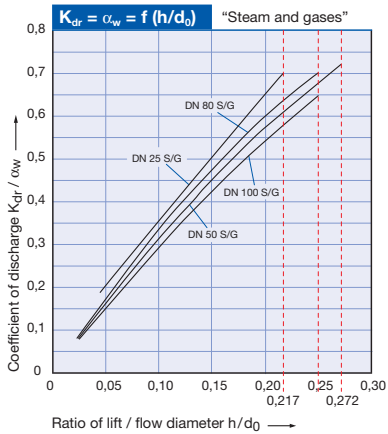


Diagram for evaluation of the coefficient of discharge (K_{dr}/α_w) or K_b in reference with the ratio of absolute back pressure/set pressure (p_{a0}/p_0)

