

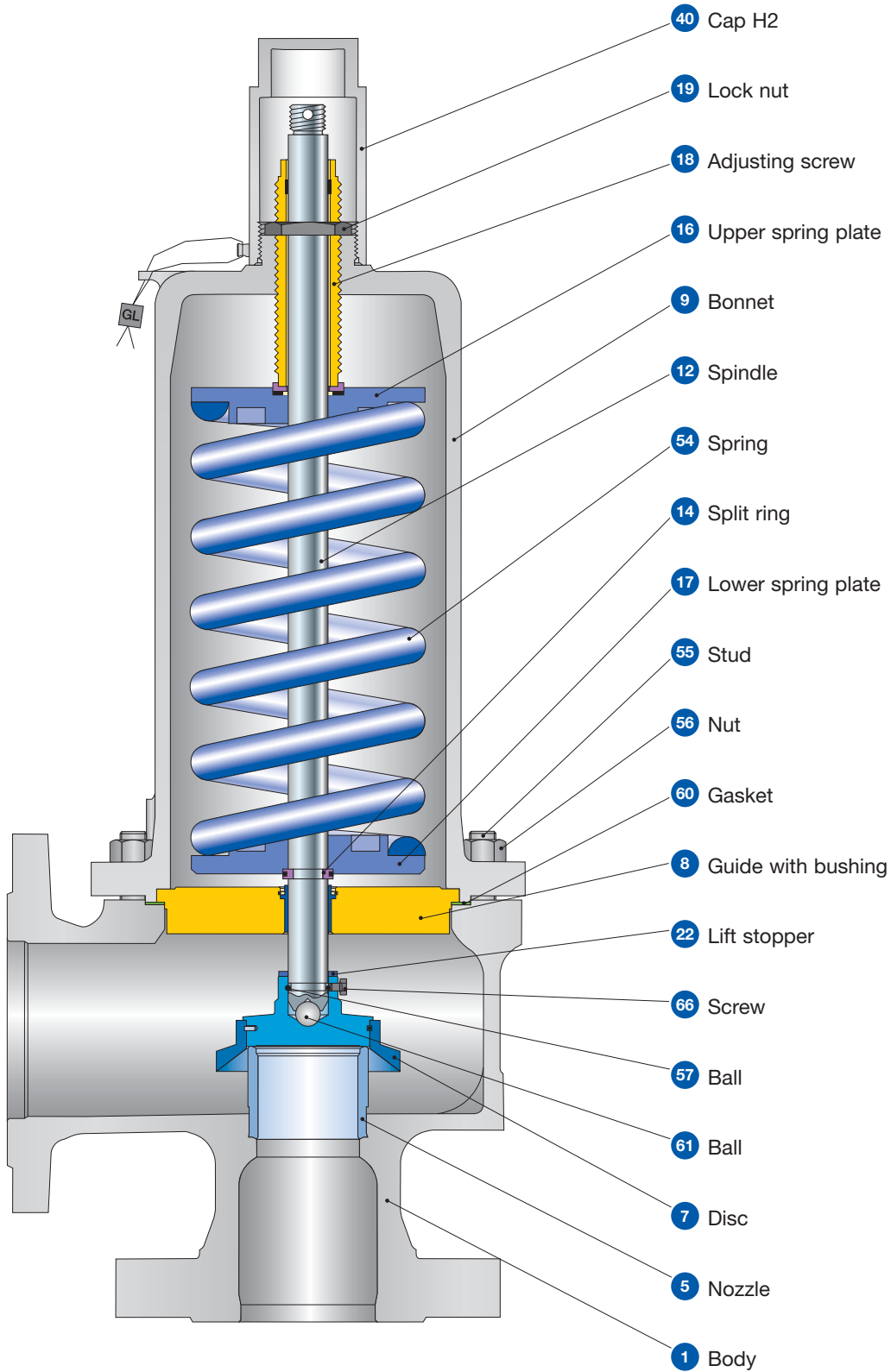


Type 456
 Packed lever H4
 Closed bonnet
 Conventional design

Type 455, 456
Flanged Safety Relief Valves

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Type 455, 456
Conventional design



Type 455, 456

Type 455, 456

Conventional design

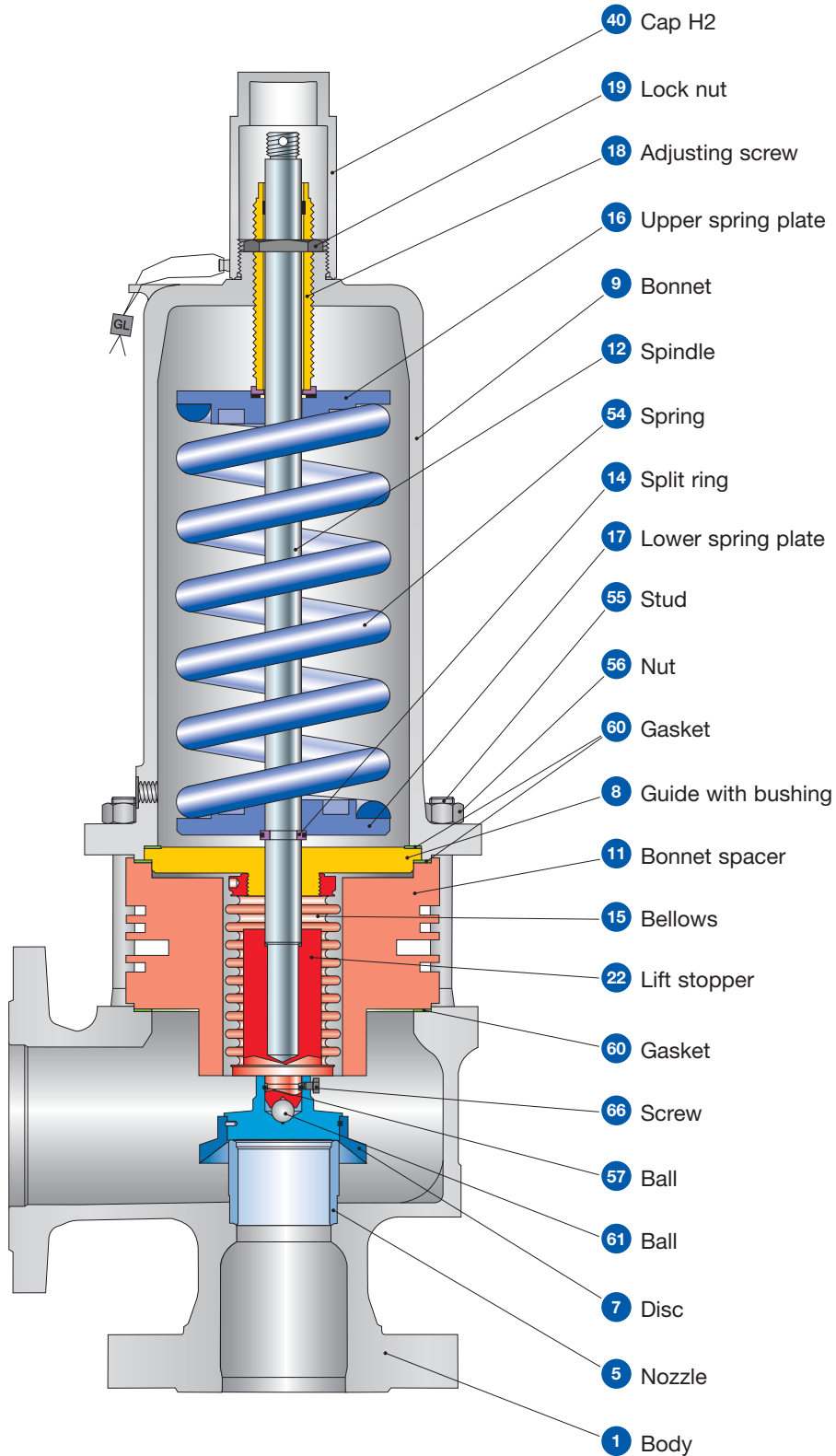
Materials

Item	Component	Type 4552 / 4562	Type 4564
1	Body	1.0619	1.4581
		SA 216 WCB	SA 351 CF10M
5	Seat	1.4404	1.4404
		316L	316L
7	Disc	1.4122	1.4404
		Hardened stainless steel	316L
8	Guide with bushing	1.0501, 0.7040	1.4404
		Chrome or carbon steel	316L
		1.4104 tenifer	-
		Chrome steel	-
9	Bonnet	0.7043 (Open bonnet 0.7040), 1.0619	1.4408, 1.4404, 1.4571
		Ductile Gr. 60-40-18, SA 216 WCB	SA 351 CF8M, SA 479 316L, 316Ti
12	Spindle	1.4404	1.4404
		316L	316L
14	Split ring	1.4104	1.4404
		Chrome steel	316L
16 / 17	Spring plate	1.0718	1.4404
		Steel	316L
18	Adjusting screw with bushing	1.4104 PTFE	1.4404 PTFE
		Chrome steel PTFE	316L PTFE
19	Lock nut	1.0718	1.4404
		Steel	316L
22	Lift stopper	1.4404	1.4404
		316L	316L
40	Cap H2	1.0460	1.4404
		SA 105	316L
54	Spring standard	1.1200, 1.8159, 1.7102	1.4310
		Carbon steel	Stainless steel
	Spring optional	1.4310	-
		Stainless steel	-
55	Stud	1.4401	1.4401
		B8M	B8M
56	Nut	1.4401	1.4401
		8M	8M
57	Ball	1.4401	1.4401
		316	316
60	Gasket	Graphite / 1.4401	Graphite / 1.4401
		Graphite / 316	Graphite / 316
61	Ball	1.3541	1.4401
		Hardened stainless steel	316
66	Screw	1.4401	1.4401
		B8M	B8M

Please notice:

- Modifications reserved by LESER.
- LESER can upgrade materials without notice.
- Every part can be replaced by other material acc. to customer specification.

Type 455, 456
Balanced bellows design



Type 455, 456

Balanced bellows design

Materials

Item	Component	Type 4552 / 4562	Type 4564
1	Body	1.0619	1.4581
		SA 216 WCB	SA 351 CF10M
5	Nozzle	1.4404	1.4404
		316L	316L
7	Disc	1.4122	1.4404
		Hardened stainless steel	316L
8	Guide with bushing	1.0501, 0.7040	1.4404
		Chrome or carbon steel	316L
		1.4104 tenifer	-
		Chrome steel	-
9	Bonnet	0.7043 or 1.0619	1.4408, 1.4404, 1.4571
		Ductile Gr. 60-40-18 or SA 216 WCB	SA 351 CF8M, SA 479 316L, 316Ti
11	Bonnet spacer	1.0460	1.4404
		Carbon steel	316L
12	Spindle	1.4404	1.4404
		316L	316L
14	Split ring	1.4104	1.4404
		Chrome steel	316L
15	Bellows	1.4571	1.4571
		316Ti	316Ti
16 / 17	Spring plate	1.0718	1.4404
		Steel	316L
18	Adjusting screw with bushing	1.4104 PTFE	1.4404 PTFE
		Chrome steel PTFE	316L PTFE
19	Lock nut	1.0718	1.4404
		Steel	316L
22	Lift stopper	1.4404	1.4404
		316L	316L
40	Cap H2	1.0460	1.4404
		SA 105	316L
54	Spring Standard	1.1200, 1.8159, 1.7102	1.4310
		Carbon steel	Stainless steel
55	Stud	1.7709	1.4401
		B16	B8M
56	Nut	1.7258	1.4401
		7M	8M
57	Ball	1.4401	1.4401
		316	316
60	Gasket	Graphite / 1.4401	Graphite / 1.4401
		Graphite / 316	Graphite / 316
61	Ball	1.3541	1.4401
		Hardened stainless steel	316
66	Screw	1.4401	1.4401
		B8M	B8M

Please notice:

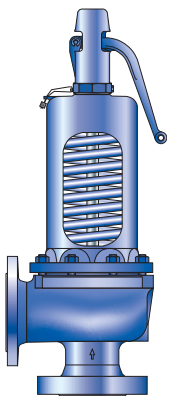
- Modifications reserved by LESER.
- LESER can upgrade materials without notice.
- Every part can be replaced by other material acc. to customer specification.

Type 455, 456

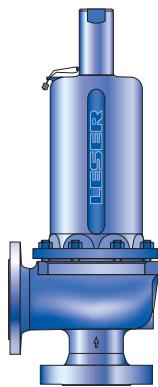
Article numbers

	DN _{I+O}	25 x 50	50 x 80	80 x 100	100 x 150	
Valve size		1" x 2"	2" x 3"	3" x 4"	4" x 6"	
Actual Orifice diameter d ₀ [mm]		20	40	60	74	
Actual Orifice area A ₀ [mm ²]		314	1257	2827	4301	
Body material: 1.0619 (WCB)						
Bonnet	H2	Art. No. 4562.	6012	6022	6032	6042
closed	H3	Art. No. 4562.	6013	6023	6033	-
	H4	Art. No. 4562.	6014	6024	6034	6044
open	H3	Art. No. 4552.	6015	6025	6035	6045
Body material: 1.4581 (CF10M)						
Bonnet	H2	Art. No. 4564.	6052	6062	6072	6082
closed	H4	Art. No. 4564.	6054	6064	6074	6084

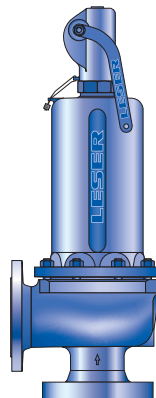
Type 455, 456



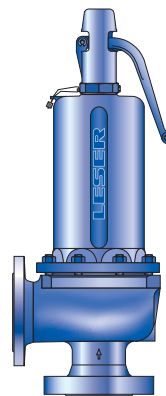
Type 455
Plain lever H3
Open bonnet
Conventional design



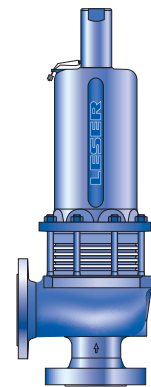
Type 456
Cap H2
Closed bonnet
Conventional design



Type 456
Packed lever H4
Closed bonnet
Conventional design



Type 456
Plain lever H3
Closed bonnet
Conventional design



Type 456
Cap H2
Closed bonnet
Balanced bellows design

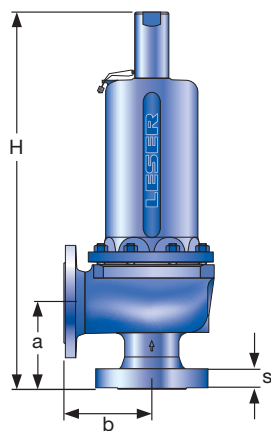
Type 455, 456

Dimensions and weights

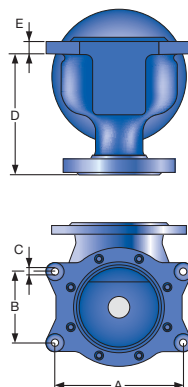
Metric Units

DN _{I+O}		25 x 50	50 x 80	80 x 100	100 x 150
Valve size		1" x 2"	2" x 3"	3" x 4"	4" x 6"
Actual Orifice diameter d ₀ [mm]		20	40	60	74
Actual Orifice area A ₀ [mm ²]		314	1257	2827	4301
Weight					
[kg]		18	43	85	154
with bellows		20	46	102	185
Center to face					
[mm]					
Inlet a		122	155	175	210
Outlet b (PN 40)		120	145	180	235
Outlet b (PN 63)		120	145	205	265
Measure					
Used to find bolt length for inlet flange [mm]		s			
		28	38	38	45
Height (H4)					
[mm]					
Standard H max.		493	684	807	1059
Bellows H max.		528	764	905	1150
Support brackets					
[mm]					
A		140	184	278	364
B		-	110	160	210
C		Ø 14	Ø 14	Ø 18	Ø 18
D		149	194	225	288
E		18	18	27	32
Body material: 1.0619 (WCB)					
DIN Flange¹⁾					
Inlet		PN 63 – 160			
Outlet		PN 40 – 63	PN 40		
Body material: 1.4581 (CF10M)					
DIN Flange¹⁾					
Inlet		PN 63 – 160			
Outlet		PN 40 – 63	PN 40		

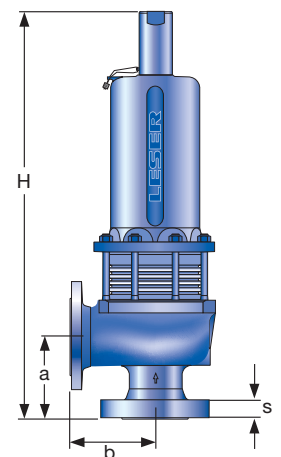
¹⁾ Standard flange rating. For other flange drillings please refer to page 83.



Conventional design



Support brackets



Balanced bellows design

Type 455, 456

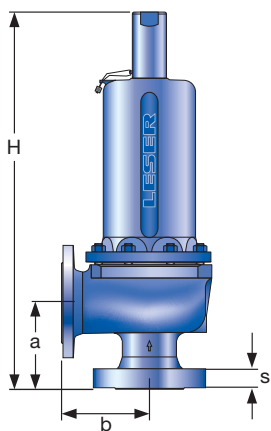
Dimensions and weights

US Units

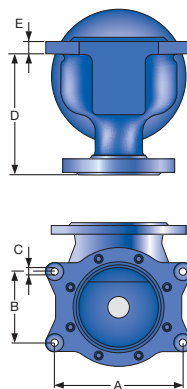
	DN _{I+O}	25 x 50	50 x 80	80 x 100	100 x 150
Valve size		1" x 2"	2" x 3"	3" x 4"	4" x 6"
Actual Orifice diameter d ₀ [inch]		0.79	1.57	2.36	2.91
Actual Orifice area A ₀ [inch ²]		0.487	1.948	4.383	6.666
Weight [lbs]		40	95	187	340
	with bellows	44	101	225	408
Center to face [inch]	Inlet a	4 ¹³ / ₁₆	6 ³ / ₃₂	6 ⁷ / ₈	8 ¹ / ₄
	Outlet b (PN 40)	4 ²³ / ₃₂	5 ²³ / ₃₂	7 ³ / ₃₂	9 ¹ / ₄
	Outlet b (PN 63)	4 ²³ / ₃₂	5 ²³ / ₃₂	8 ¹ / ₁₆	10 ⁷ / ₁₆
Measure [inch]	Used to find bolt length for inlet flange s	1 ³ / ₃₂	1 ¹ / ₂	1 ¹ / ₂	1 ²⁵ / ₃₂
Height (H4) [inch]	Standard H max.	19 ²³ / ₃₂	26 ¹⁵ / ₁₆	31 ²⁵ / ₃₂	41 ¹¹ / ₁₆
	Bellows H max.	20 ²⁵ / ₃₂	30 ³ / ₃₂	35 ⁵ / ₈	45 ¹ / ₄
Support brackets [inch]	A	5 ¹ / ₂	7 ¹ / ₄	10 ⁵ / ₁₆	4 ¹¹ / ₃₂
	B	–	4 ¹¹ / ₃₂	6 ⁵ / ₁₆	8 ⁹ / ₃₂
	C	Ø ⁹ / ₁₆	Ø ⁹ / ₁₆	Ø ²³ / ₃₂	Ø ²³ / ₃₂
	D	5 ⁷ / ₈	7 ⁵ / ₈	8 ²⁷ / ₃₂	11 ¹¹ / ₃₂
	E	²³ / ₃₂	²³ / ₃₂	1 ¹ / ₁₆	1 ¹ / ₄
Body material: 1.0619 (WCB)					
ANSI Flange	Inlet	CL300 – 600			
Class¹⁾	Outlet	CL150 – 300			CL150
Body material: 1.4581 (CF10M)					
ANSI Flange	Inlet	CL300 – 600			
Class¹⁾	Outlet	CL150 – 300			CL150

¹⁾ Standard flange rating. For other flange drillings please refer to page 83.

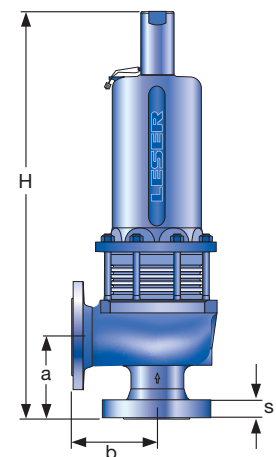
Type 455, 456



Conventional design



Support brackets



Balanced bellows design

Type 455, 456

Pressure temperature ratings

Metric Units

	DN _{I+O}	25 x 50	50 x 80	80 x 100	100 x 150
	Valve size	1" x 2"	2" x 3"	3" x 4"	4" x 6"
	Actual Orifice diameter d ₀ [mm]	20	40	60	74
	Actual Orifice area A ₀ [mm ²]	314	1257	2827	4301
Body material: 1.0619 (WCB)					
DIN Flange	Inlet	PN 63 – 100			
	Outlet	PN 40 – 63		PN 40	
Minimum set pressure	p [bar _g] S/G/L	2.5	2.5	2.5	2.5
Min. set pressure¹⁾ standard bellows	p [bar _g] S/G/L	13.5	2.5	10	5
Min. set pressure low press. bellows	p [bar _g] S/G/L		on request		
Maximum set pressure	p [bar _g] S/G/L	100	98	63	53
Max. set pressure with special spring	p [bar _g] S/G/L	100	100	63	63
Temperature acc. to DIN EN	min. [°C]	-85			
	max. [°C]	+450			
Temperature acc. to ASME	min. [°C]	-29			
	max. [°C]	+427			

Body material: 1.4581 (CF10M)					
DIN Flange	Inlet	PN 63 – 100			
	Outlet	PN 40 – 63		PN 40	
Minimum set pressure	p [bar _g] S/G/L	2.5	2.5	2.5	2.5
Min. set pressure¹⁾ standard bellows	p [bar _g] S/G/L	13.5	2.5	10	5
Min. set pressure low press. bellows	p [bar _g] S/G/L		on request		
Maximum set pressure	p [bar _g] S/G/L	100	61	35	16.9
Max. set pressure with special spring	p [bar _g] S/G/L	100	65	43	43
Temperature acc. to DIN EN	min. [°C]	-85			
	max. [°C]	+450, > 450 °C → Please use Type 457/458			
Temperature acc. to ASME	min. [°C]	-29			
	max. [°C]	+450, > 450 °C → Please use Type 457/458			

¹⁾ Min. set pressure standard bellows = Max. set pressure low pressure bellows.

Type 455, 456

Pressure temperature ratings

US Units

	DN _{I+O}	25 x 50	50 x 80	80 x 100	100 x 150
Valve size		1" x 2"	2" x 3"	3" x 4"	4" x 6"
Actual Orifice diameter d ₀ [inch]		0.79	1.57	2.36	2.91
Actual Orifice area A ₀ [inch ²]		0.487	1.948	4.383	6.666
Body material: 1.0619 (WCB)					
ANSI Flange Class¹⁾	Inlet	CL300 – 600			
	Outlet	CL150 – 300		CL150	
Minimum set pressure	p [psig] S/G/L	36	36	36	36
Min. set pressure²⁾ standard bellows	p [psig] S/G/L	196	36	145	73
Min. set pressure low press. bellows	p [psig] S/G/L		on request		
Maximum set pressure	p [psig] S/G/L	1450	1421	914	769
Max. set pressure with special spring	p [psig] S/G/L	1450	1450	914	914
Temperature acc. to DIN EN	min. [°F]	-121			
	max. [°F]	+842			
Temperature acc. to ASME	min. [°F]	-20			
	max. [°F]	+800			

Body material: 1.4581 (CF10M)					
ANSI Flange Class¹⁾	Inlet	CL300 – 600			
	Outlet	CL150 – 300		CL150	
Minimum set pressure	p [psig] S/G/L	36	36	36	36
Min. set pressure²⁾ standard bellows	p [psig] S/G/L	196	36	145	73
Min. set pressure low press. bellows	p [psig] S/G/L		on request		
Maximum set pressure	p [psig] S/G/L	1450	885	508	245
Max. set pressure with special spring	p [psig] S/G/L	1450	943	624	624
Temperature acc. to DIN EN	min. [°F]	-121			
	max. [°F]	+842, > 842 °F → Please use Type 457/458			
Temperature acc. to ASME	min. [°F]	-20			
	max. [°F]	+842, > 842 °F → Please use Type 457/458			

¹⁾ For flange rating class 150 the pressure temperature ratings according to ASME ANSI B16.34 apply.

²⁾ Min. set pressure standard bellows = Max. set pressure low pressure bellows.

Type 455, 456

Flange drillings

	DN _{I+O}	25 x 50	50 x 80	80 x 100	100 x 150	
	Valve size	1" x 2"	2" x 3"	3" x 4"	4" x 6"	
	Actual Orifice diameter d ₀ [mm]	20	40	60	74	
	Actual Orifice area A ₀ [mm ²]	314	1257	2827	4301	
Body material: 1.0619 (WCB), 1.4581 (CF10M)						
Inlet	DIN EN 1092	PN 16	H47	H47	H47	H47
		PN 25	H47	H47	H47	H47
		PN 40	H47	H47	H47	H47
		PN 63	*	H10	H10	H10
		PN 100	*	*	*	*
		PN 160	*	*	*	*
		PN 250	-	-	-	-
		PN 320	-	-	-	-
	PN 400	-	-	-	-	
	ASME B16.5	CL150	-	-	-	-
		CL300	H65	H65	H65	H65
		CL600	H67	H67	H67	H67
		CL900	H69	H69	-	-
		CL1500	H69	H69	-	-
		CL2500	-	-	-	-
	Outlet	DIN EN 1092	PN 10	*	*	H51
PN 16			*	*	H51	H51
PN 25			*	*	*	*
PN 40			*	*	*	*
PN 63			H16	H16	-	-
ASME B16.5		CL150	H79	H79	H79	H79
		CL300	H80	H80	-	-

Type 455, 456

Flange facings

Indication	Standard	Inlet		Outlet		Remark				
General										
Flange undrilled	–	H38		H39						
Linde-V-Nut, Type V48	Linde Standard 420-08 LDeS 3313.36	J07		J08		Groove: Rz 16				
Linde-V-Nut, Type V48A		J05		J06		Groove: Rz 4, e.g. with hydrogen				
Lens seal form L (without sealing lens)	DIN 2696 LDeS 3313.35	J11		J12						
Acc. to DIN EN 1092										
Flange facing (see LDeS 3313.40)		Inlet		Outlet		Remark				
		PN 10 – PN 40	PN 63	PN 10 – PN 40	PN 63	Rz-data according to DIN EN 1092 in µm				
Raised face	Type B1	*	–	*	–	Facing: Rz = 12.5 – 50				
	Type B2	L36	*	L38	*	Facing: Rz = 3.2 – 12.5				
Tongue face C ¹⁾		H94		H92		Steel flange only				
Groove face D ¹⁾		H93		H91						
Male face E		H96		H98						
Female face F		H97		H99						
O-ring male face G		J01		J02						
O-ring female face H		J03		J04						
Acc. to ASME B16.5										
Body material	Inlet	Outlet	Smooth finish ²⁾		Serrated finish		RTJ-groove			
			Inlet	Outlet	Inlet	Outlet	Inlet		Outlet	
			Option code		Option code		RTJ- Class	Option code	RTJ- Class	Option code
1.0619, 1.4581	all	all	L52	L53	*	*	CL300 – 1500	H62	CL150	H63
							CL2500	–	CL300	H63

¹⁾ LESER manufactures the groove at flanged valves by milling. If a customer demands a turned surface in the soil of the groove according to DIN EN 1092-1 an additional option code is necessary: "S01: soil of the groove drilled".

²⁾ Smooth finish is not defined in the effective standards.

Note: Flange drillings and facings meet always the requirements of mentioned flange standards.
Flange thickness and outer diameter may vary from flange standard.

Type 455, 456

Approvals

	DN _{I+O}	25 x 50	50 x 80	80 x 100	100 x 150
	Valve size	1" x 2"	2" x 3"	3" x 4"	4" x 6"
	Actual Orifice diameter d ₀ [mm]	20	40	60	74
	Actual Orifice area A ₀ [mm ²]	314	1257	2827	4301
Europe		Coefficient of discharge K_{dr}			
PED / DIN EN ISO 4126-1 12/2013	Approval No.	072020111Z0008/0/11			
	S/G	0.8	0.8	0.75	0.8
	L	0.6	0.54	0.5	0.56
Germany		Coefficient of discharge α_w			
PED / AD 2000-Merkblatt A2 07/2012	Approval No.	TÜV SV 934			
	S/G	0.8	0.8	0.75	0.8
	L	0.6	0.54	0.5	0.56
United States		Coefficient of discharge K			
ASME Sec. VIII	Approval No.	M37066	M37066	M37088	M37066
	S/G	0.798	0.798	0.754	0.798
	Approval No.	M37077	M37077	M37099	M37077
	L	0.572	0.572	0.479	0.572
Canada		Coefficient of discharge K			
CRN	Approval No.	-			
	S/G	0.798	0.798	0.754	0.798
	L	0.572	0.572	0.479	0.572
China		Coefficient of discharge α_w			
AQSIQ	Approval No.	For current approval no. see www.leser.com			
	S/G	0.8	0.8	0.75	0.8
	L	0.6	0.54	0.5	0.56
Eurasian Custom Union		Coefficient of discharge α_w			
EAC	Approval No.	For current approval no. see www.leser.com			
	S/G	0.8	0.8	0.75	0.8
	L	0.6	0.54	0.5	0.56
Classification societies		on request			

Type 455, 456

Available Options

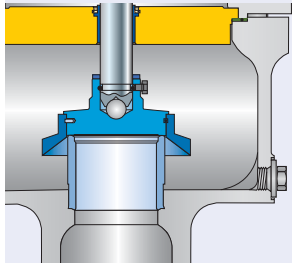
Heating jacket

H29, H30: Couplings G $\frac{3}{8}$, G $\frac{3}{4}$
 H31, H32: Flanges DN 15, DN 25



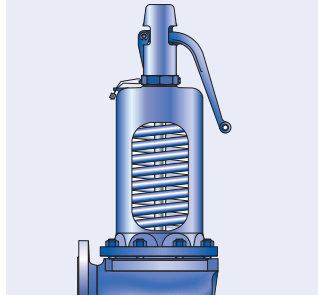
Drain hole

J18: G $\frac{1}{4}$
 J19: G $\frac{1}{2}$



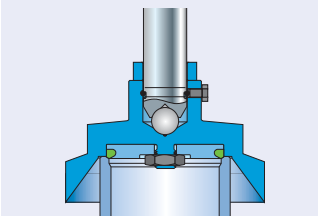
Open bonnet

See article number



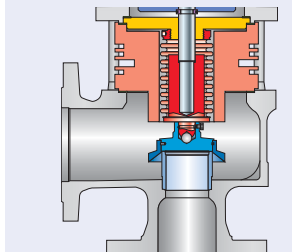
O-ring disc

J20: FFKM "C"
 J21: CR "K"
 J22: EPDM "D"
 J23: FKM "L"

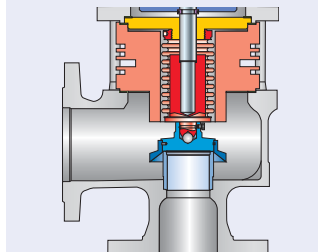


Stainless steel bellows

J68: Open bonnet
 J78: Closed bonnet

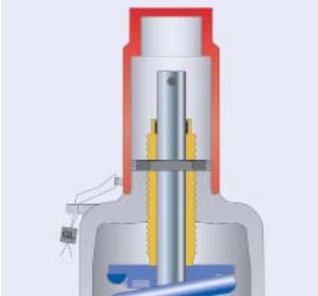


Conversion kit for stainless steel bellows on request



Screwed cap H2

H2



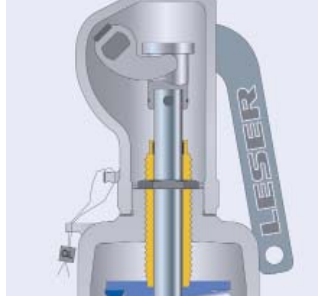
Plain lever H3

H3



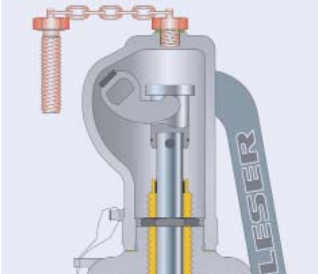
Packed lever H4

H4



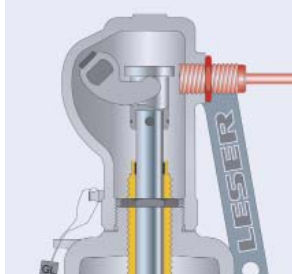
Test gag

J69: H4
 J70: H2



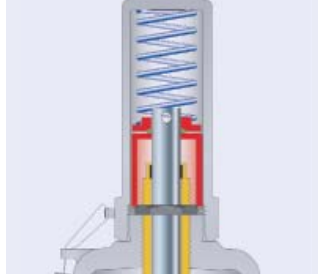
Lift indicator

J39: Adaptor H4
 J93: Lift indicator



O-ring damper H2

J65



O-ring damper H4

J66

