

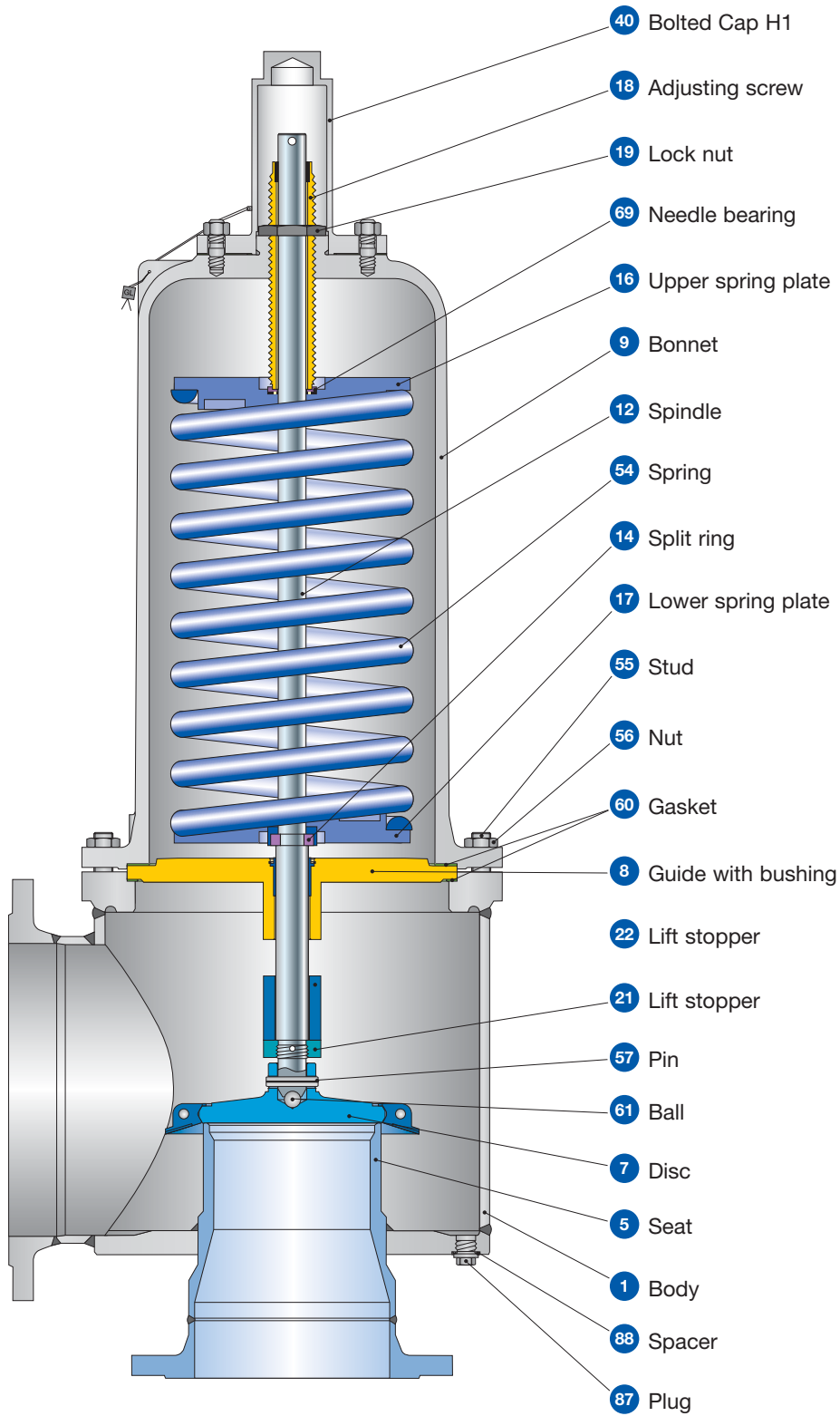


Type 441 XXL
 Packed lever H4
 Closed bonnet
 Conventional and
 balanced bellows design

Type 441, 442 XXL
Flanged Safety Relief Valves

Contents	Page
Materials	
• Conventional design	52
• Balanced bellows design	54
Article numbers	56
Dimensions and weights	
• Metric Units	57
• US Units	58
Pressure temperature ratings	
• Metric Units	59
• US Units	60
Flange drillings and facings	61
Approvals	62
Available options	63

Type 441, 442 XXL
Conventional design



Type 441, 442
 XXL

Type 441, 442 XXL

Conventional design

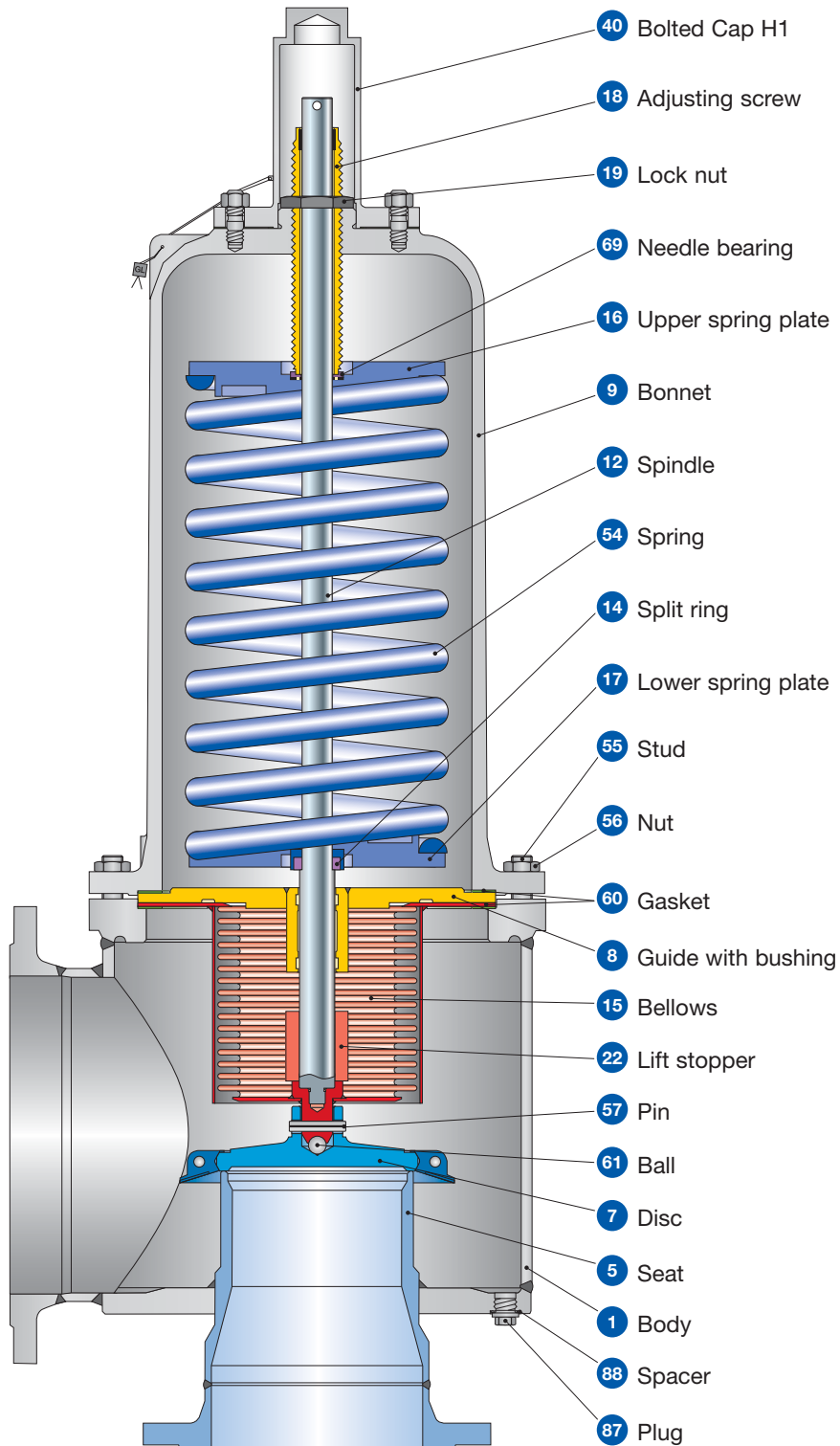
Materials

Please notice:

- Modifications reserved by LESER. If several materials are specified LESER defines the material.
- LESER can upgrade materials without notice.
- Every part can be replaced by other material acc. to customer specification.
- ¹⁾ Bolted cap H1 only available for DN 200 and DN 250.

Item	Component	Type 4412 XXL / 4422 XXL		Type 4414 XXL	
1	Body	Inlet: 1.4571	Outlet: 1.0460 / 1.0425	1.4571	
		Inlet: 316Ti	Outlet: Carbon steel	316Ti	
5	Seat	1.0305 stellite, 1.0460 stellite		1.4571	
		Carbon steel, stellite		316Ti	
7	Disc	1.4404		1.4404	
		316L		316L	
8	DN 200 – 250: Guide with bushing	0.7040		1.4404	
		Ductile Gr. 60-40-18 / Chrome steel		316L	
	DN 300 – 400: Guide	1.4404		1.4404	
		316L		316L	
9	Bonnet casted	0.7043		-	
		Ductile Gr. 60-40-18		-	
	Bonnet welded	DN 200 / DN 250: 1.4404(316L) / 1.4571(316Ti) / 1.0305 (Steel)		1.4571 / 1.4404	
DN 300 / DN 400: 1.0254 / 1.4571(316Ti) / 1.0345 (Steel) The welded construction may consist of additional materials		316Ti / 316L			
12	Spindle	1.4021		1.4404	
		420		316L	
14	Split ring	1.4104		1.4404	
		Chrome steel		316L	
16 / 17	Spring plate	1.0570 or 1.4404		1.4404	
		Steel or 316L		316L	
18	Adjusting screw with bushing	1.4104 PTFE		1.4404 PTFE	
		Chrome steel PTFE		316L PTFE	
19	Lock nut	1.4404		1.4404	
		316L		316L	
21 / 22	Lift stopper	1.4404		1.4404	
		316L		316L	
40	Bolted cap H1 ¹⁾	DN 200 + DN 250: 0.7040, Flange 1.0460	DN 300 + DN 400: 1.4408	DN 200 + DN 250: 1.4404	DN 300 + DN 400: 1.4408
		Ductil Gr. 60-40-18, Flange SA 105	CF8M	316L	CF8M
54	Spring standard	1.1200, 1.8159, 1.7102		1.4310	
		Carbon steel		Stainless steel	
54	Spring optional	1.4310		-	
		Stainless steel		-	
55	Stud	1.4401		1.4401	
		B8M		B8M	
56	Nut	1.4401		1.4401	
		8M		8M	
57	Pin	1.4310		1.4310	
		Stainless steel		Stainless steel	
60	Gasket	Graphit e/ 1.4401		Graphite / 1.4401	
		Graphite / 316		Graphite / 316	
61	Ball	1.3541		1.4401	
		Hardened stainless steel		316	
69	Needle bearing	1.4401		1.4401	
		316		316	
87 / 88	Plug / Spacer	1.4401 / 1.4571		1.4401 / 1.4571	
		316 / 316Ti		316 / 316Ti	

Type 441, 442 XXL
Balanced bellows design



Type 441, 442
 XXL

Type 441, 442 XXL

Balanced bellows design

Materials

Please notice:

- Modifications reserved by LESER. If several materials are specified LESER defines the material.
- LESER can upgrade materials without notice.
- Every part can be replaced by other material acc. to customer specification.
- ¹⁾ Bolted cap H1 only available for DN 200 and DN 250.

Item	Component	Type 4412 XXL / 4422 XXL		Type 4414 XXL	
1	Body	Inlet: 1.4571	Outlet: 1.0460 / 1.0425	1.4571	
		Inlet: 316Ti	Outlet: Carbon steel	316Ti	
5	Seat DN 200 – 250	1.0305 stellite		1.4571	
		Carbon steel, stellite		316Ti	
	DN 300 – 400	1.0460 stellite		1.4571	
		Carbon steel, stellite		316Ti	
7	Disc	1.4404		1.4404	
		316L		316L	
8	Guide	1.4571		1.4571	
		316Ti		316Ti	
9	Bonnet casted	0.7043		-	
		Ductile Gr. 60-40-18		-	
	Bonnet welded	DN 200 / DN 250: 1.4404(316L) / 1.4571(316Ti) / 1.0305 (Steel)		1.4571 / 1.4404	
		DN 300 / DN 400: 1.0254 / 1.4571(316Ti) / 1.0345 (Steel) The welded construction may consist of additional materials		316Ti / 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	1.0570 or 1.4404		1.4404	
		Steel or 316L		316L	
18	Adjusting screw with bushing	1.4104 PTFE		1.4404 PTFE	
		Chrome steel PTFE		316L PTFE	
19	Lock nut	1.4404		1.4404	
		316L		316L	
22	Lift stopper	1.4404		1.4404	
		316L		316L	
40	Bolted cap H1 ¹⁾	DN 200 + DN 250: 0.7040, Flange 1.0460	DN 300 + DN 400: 1.4408	DN 200 + DN 250: 1.4404	DN 300 + DN 400: 1.4408
		Ductil Gr. 60-40-18, Flange SA 105	CF8M	316L	CF8M
54	Spring standard	1.1200, 1.8159, 1.7102		1.4310	
		Carbon steel		Stainless steel	
	Spring optional	1.4310		-	
55	Stud	1.4401		1.4401	
		B8M		B8M	
56	Nut	1.4401		1.4401	
		8M		8M	
57	Pin	1.4310		1.4310	
		Stainless steel		Stainless steel	
60	Gasket	Graphite / 1.4401		Graphite / 1.4401	
		Graphite / 316		Graphite / 316	
61	Ball	1.3541		1.4401	
		Hardened stainless steel		316	
69	Needle bearing	1.4401		1.4401	
		316		316	
87 / 88	Plug / Spacer	1.4401 / 1.4571		1.4401 / 1.4571	
		316 / 316Ti		316 / 316Ti	

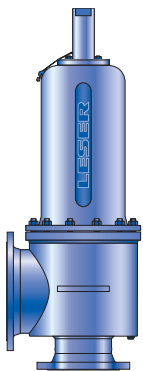
Type 441, 442 XXL

Article numbers

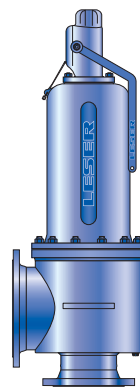
	DN _{I+O}	200 x 300	250 x 350	300 x 400	400 x 500	
Valve size		8" x 12"	10" x 14"	12" x 16"	16" x 20"	
Actual Orifice diameter d ₀ [mm]		165	200	235	295	
Actual Orifice area A ₀ [mm ²]		21382	31416	43374	68349	
Body material: 1.0460 / 1.0425 (Carbon steel)						
Bonnet	H1¹⁾	Art. No. 4412.	4752	4762	4772	4782
closed	H3	Art. No. 4412.	-	-	-	-
	H6¹⁾	Art. No. 4412.	4754	4764	4774	4784
open	H6¹⁾	Art. No. 4422.	4755	4765	4775	4785
Body material: 1.4571 (316Ti)						
Bonnet	H1¹⁾	Art. No. 4414.	4792	4802	4902	4912
closed	H6¹⁾	Art. No. 4414.	4794	4804	4904	4914

¹⁾ Bolted cap H1 and bolted lifting device H6 only available for DN 200 and DN 250.
DN 300 and DN 400 available with cap H2 and lifting device H4.

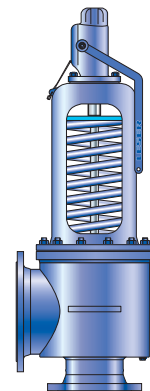
Type 441, 442
XXL



Type 441 XXL
Bolted cap H1
Closed bonnet
Conventional and
balanced bellows design



Type 441 XXL
Bolted lifting device H6
Closed bonnet
Conventional and
balanced bellows design



Type 441 XXL
Bolted lifting device H6
Open bonnet
Conventional and
balanced bellows design

Type 441, 442 XXL

Dimensions and weights

Metric Units

	DN _{I+O}	200 x 300	250 x 350	300 x 400	400 x 500
	Valve size	8" x 12"	10" x 14"	12" x 16"	16" x 20"
	Actual Orifice diameter d ₀ [mm]	165	200	235	295
	Actual Orifice area A ₀ [mm ²]	21382	31416	43374	68349
Weight					
[kg]		285	335	384	588
	with bellows	289	340	390	595
Center to face					
[mm]	Inlet a	305	330	330	400
	Outlet b	300	407	394 ¹⁾	477 ¹⁾
Height (H6)					
[mm]	Standard H max.	1473	1518	1633	1953
	Bellows H max.	1473	1518	1633	1953
Support brackets					
[mm]	A	470	514	640	800
	B	150	150	180	220
(drilled only on request, Option code H42)	C	Ø 18	Ø 18	Ø 24	Ø 28
	D	305	340	330	400
	E	20	20	20	20

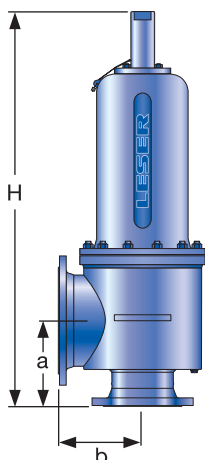
Body material: 1.0460 / 1.0425 (Carbon steel)

DIN Flange ²⁾	Inlet	PN 25	PN 16
	Outlet	PN 10	PN 16

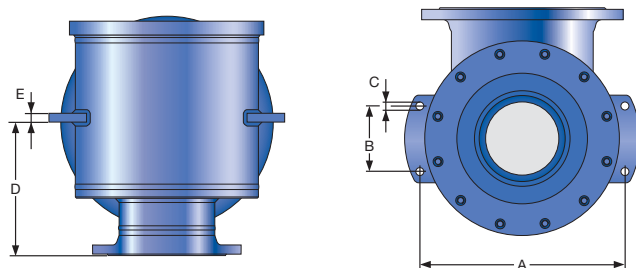
Body material: 1.4571 (316Ti)

DIN Flange ²⁾	Inlet	PN 25	PN 16
	Outlet	PN 10	PN 16

- ¹⁾ For pressure rating outlet higher than PN 10 centre to face dimension will change
²⁾ Standard flange rating. For other flange drillings and facings please refer to page 61.



Conventional and balanced bellows design



Support brackets

Type 441, 442 XXL

Dimensions and weights

US Units

	DN _{I+O}	200 x 300	250 x 350	300 x 400	400 x 500
Valve size		8" x 12"	10" x 14"	12" x 16"	16" x 20"
Actual Orifice diameter d ₀ [inch]		6.5	7.87	9.25	11.61
Actual Orifice area A ₀ [inch ²]		33.143	48.695	67.229	105.942
Weight [lbs]		628	739	847	1297
	with bellows	637	750	860	1312
Center to face [inch]	Inlet a	12	13 ³ / ₈	13 (CL300: 13 ³ / ₄)	15 ³ / ₄ (CL300: 16 ⁵ / ₃₂)
	Outlet b	11 ¹³ / ₁₆	12 ¹³ / ₁₆	15 ¹ / ₂	18 ²⁵ / ₃₂
Height (H6) [inch]	Standard H max.	58	59 ³ / ₄	64 ⁵ / ₁₆	76 ⁷ / ₈
	Bellows H max.	58	59 ³ / ₄	64 ⁵ / ₁₆	76 ⁷ / ₈
Support brackets [inch]	A	18 ¹ / ₂	20 ¹ / ₄	25 ³ / ₁₆	31 ¹ / ₂
	B	5 ²⁹ / ₃₂	5 ²⁹ / ₃₂	7 ³ / ₃₂	8 ²¹ / ₃₂
(drilled only on request, Option code H42)	C	Ø ²⁹ / ₃₂	Ø ²³ / ₃₂	Ø ¹⁵ / ₁₆	Ø ³ / ₃₂
	D	12	13 ³ / ₈	13	15 ³ / ₄
	E	²⁵ / ₃₂	²⁵ / ₃₂	²⁵ / ₃₂	²⁵ / ₃₂

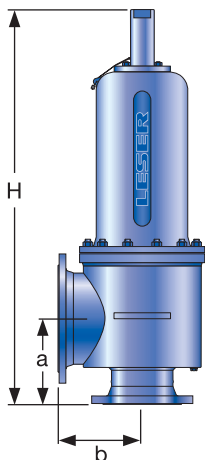
Body material: 1.0460 / 1.0425 (Carbon steel)

ANSI Flange Class¹⁾	Inlet	CL150 or CL300
	Outlet	CL150 or CL300

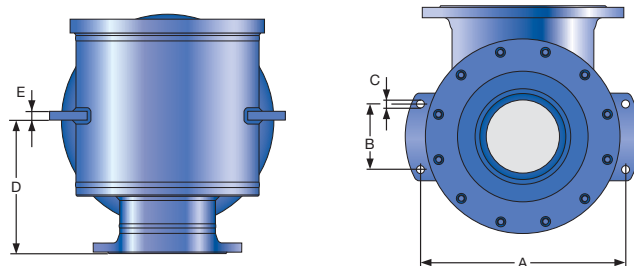
Body material: 1.4571 (316Ti)

ANSI Flange Class¹⁾	Inlet	CL150 or CL300
	Outlet	CL150 or CL300

¹⁾ Standard flange rating. For other flange drillings and facings please refer to page 61.



Conventional and balanced bellows design



Support brackets

Type 441, 442 XXL

Pressure temperature ratings

Metric Units

	DN _{I+O}	200 x 300	250 x 350	300 x 400	400 x 500
Valve size		8" x 12"	10" x 14"	12" x 16"	16" x 20"
Actual Orifice diameter d ₀ [mm]		165	200	235	295
Actual Orifice area A ₀ [mm ²]		21382	31416	43374	68349
Body material: 1.0460 / 1.0425 (Carbon steel)					
DIN Flange	Inlet	PN 25		PN 16	
	Outlet	PN 10			
Minimum set pressure	p [bar _g] S/G/L	0.2	0.2	0.2	0.2
Min. set pressure¹⁾ standard bellows	p [bar _g] S/G/L	0.2	0.2	0.2	0.2
Min. set pressure low press. bellows	p [bar _g] S/G/L	-	-	-	-
Maximum set pressure	p [bar _g] S/G/L	20	13.4	9.25	1.25
Max. set pressure with special spring	p [bar _g] S/G/L	25	16	16	8
Temperature acc. to DIN EN	min. [°C]	-85			
	max. [°C]	+420			
Temperature acc. to ASME	min. [°C]	-29			
	max. [°C]	+427			

Body material: 1.4571 (316Ti)					
DIN Flange	Inlet	PN 25		PN 16	
	Outlet	PN 10			
Minimum set pressure	p [bar _g] S/G/L	0.2	0.2	0.2	0.2
Min. set pressure¹⁾ standard bellows	p [bar _g] S/G/L	0.2	0.2	0.2	0.2
Min. set pressure low press. bellows	p [bar _g] S/G/L	-	-	-	-
Maximum set pressure	p [bar _g] S/G/L	1.45	0	0	0
Max. set pressure with special spring	p [bar _g] S/G/L	10	6	3.57	2.3
Temperature acc. to DIN EN	min. [°C]	-196			
	max. [°C]	+550			
Temperature acc. to ASME	min. [°C]	-184			
	max. [°C]	+427			

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

Type 441, 442 XXL

Pressure temperature ratings

US Units

	DN _{I+O}	200 x 300	250 x 350	300 x 400	400 x 500
Valve size		8" x 12"	10" x 14"	12" x 16"	16" x 20"
Actual Orifice diameter d ₀ [inch]		6.5	7.87	9.25	11.61
Actual Orifice area A ₀ [inch ²]		33.143	48.695	67.229	105.942

Body material: 1.0460 / 1.0425 (Carbon steel)

ANSI Flange Class ¹⁾	Inlet		CL150 oder CL300			
	Outlet		CL150			
Minimum set pressure	p [psig]	S/G/L	2.9	2.9	2.9	2.9
Min. set pressure²⁾ standard bellows	p [psig]	S/G/L	2.9	2.9	2.9	2.9
Min. set pressure low press. bellows	p [psig]	S/G/L	-	-	-	-
Maximum set pressure	p [psig]	S/G/L	290	194	134	18
Max. set pressure with special spring	p [psig]	S/G/L	363	232	232	116
Temperature acc. to DIN EN	min. [°F]		-121			
	max. [°F]		+788			
Temperature acc. to ASME	min. [°F]		-300			
	max. [°F]		+800			

Body material: 1.4571 (316Ti)

ANSI Flange Class ¹⁾	Inlet		CL150 oder CL300			
	Outlet		CL150			
Minimum set pressure	p [psig]	S/G/L	2.9	2.9	2.9	2.9
Min. set pressure²⁾ standard bellows	p [psig]	S/G/L	2.9	2.9	2.9	2.9
Min. set pressure low press. bellows	p [psig]	S/G/L	-	-	-	-
Maximum set pressure	p [psig]	S/G/L	21	0	0	0
Max. set pressure with special spring	p [psig]	S/G/L	145	87	52	33
Temperature acc. to DIN EN	min. [°F]		-321			
	max. [°F]		+1022			
Temperature acc. to ASME	min. [°F]		-300			
	max. [°F]		+800			

¹⁾ For flange rating class 150 the pressure temperature ratings according to ASME ANSI B 16.34 apply.

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

Type 441, 442
XXL

Type 441, 442 XXL

Flange drillings

	DN _{I+O}	200 x 300	250 x 350	300 x 400	400 x 500	
	Valve size	8" x 12"	10" x 14"	12" x 16"	16" x 20"	
	Actual Orifice diameter d ₀ [mm]	165	200	235	295	
	Actual Orifice area A ₀ [mm ²]	21382	31416	43374	68349	
Body material: 1.0460 / 1.0425 (Carbon steel), 1.4571 (316Ti)						
Inlet	DIN EN 1092	PN 10	H44	H44	H44	H44
		PN 16	H45	H45	*	*
		PN 25	*	*	H46	H46
		PN 40	–	–	–	–
	ASME B16.5	CL150	H64	H64	H64	H64
		CL300	H65	–	–	–
Outlet	DIN EN 1092	PN 10	*	*	*	*
		PN 16	H51	H51	H51	H51
		PN 25	–	–	–	–
		PN 40	–	–	–	–
	ASME B16.5	CL150	H79	H79	H79	H79
		CL300	–	–	–	–

Flange facings

Indication	Standard	Inlet	Outlet	Remark						
General										
Flange undrilled	–	H38	H39							
Linde-V-Nut, Form V48	Linde Standard 420-08	J07	J08	Groove: Rz 16						
Linde-V-Nut, Form V48A	LDeS 3313.36	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										
		Inlet	Outlet	Remark						
Flange facing (see also LDeS 3313.40)		PN 10 – PN 40	PN 10 – PN 40	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 flanges 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, 1.4408	all	all	L52	L53	*	*	CL150	H62	CL150	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.

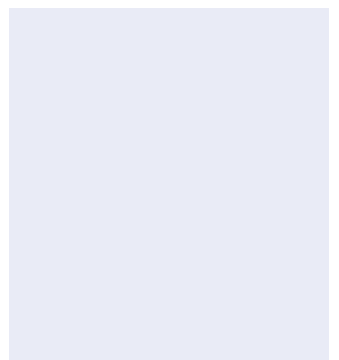
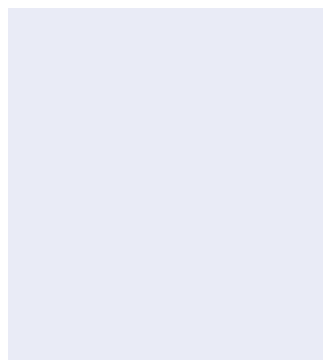
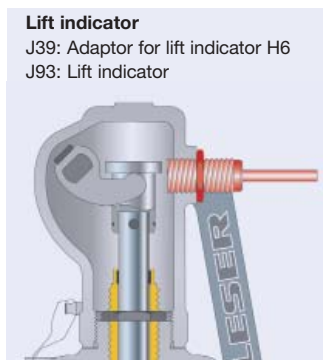
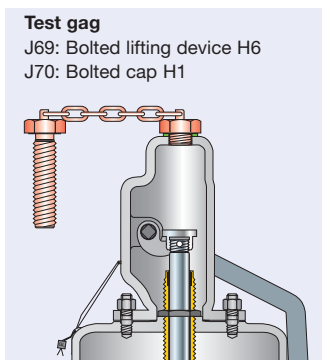
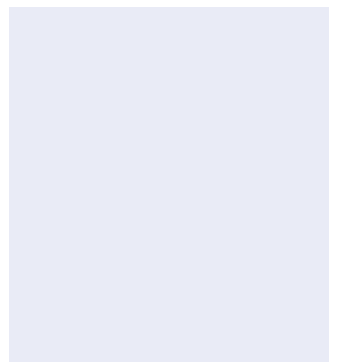
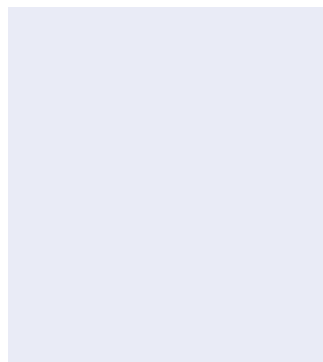
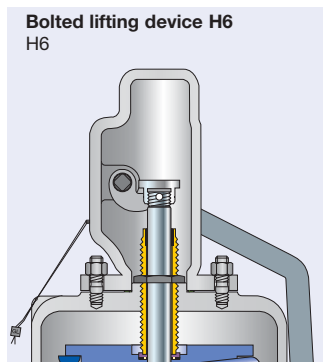
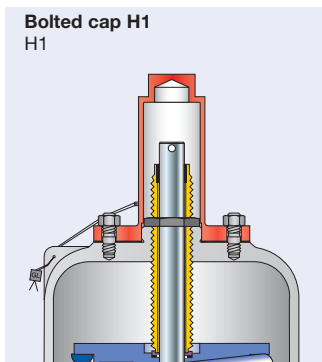
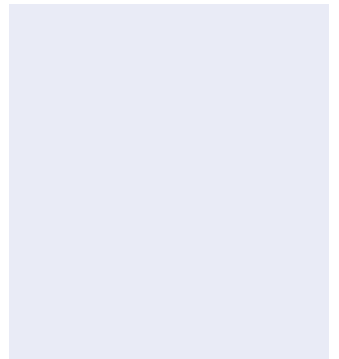
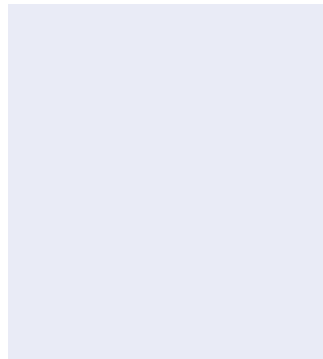
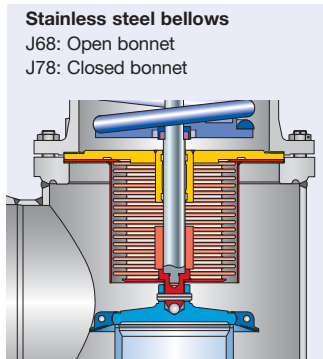
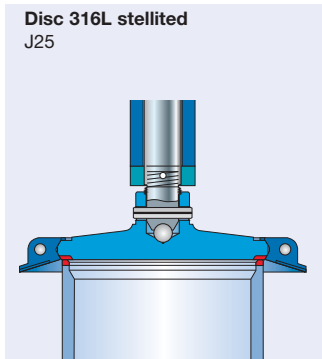
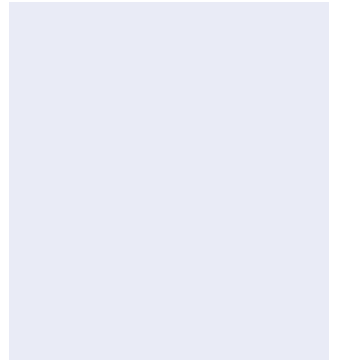
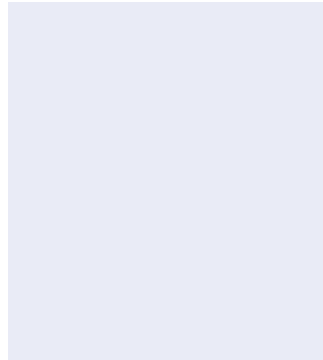
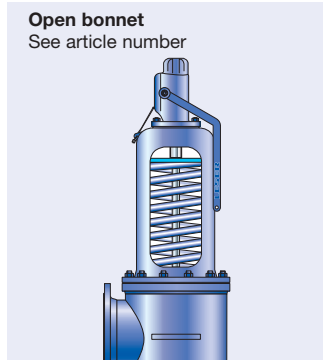
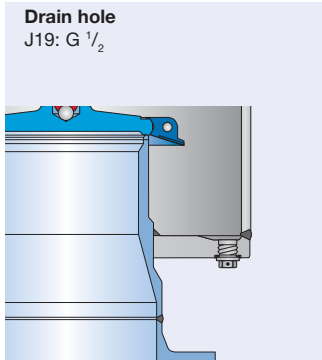
Type 441, 442 XXL

Approvals

	DN _{I+O}	200 x 300	250 x 350	300 x 400	400 x 500
	Valve size	8" x 12"	10" x 14"	12" x 16"	16" x 20"
	Actual Orifice diameter d ₀ [mm]	1665	200	235	295
	Actual Orifice area A ₀ [mm ²]	21382	31416	43374	68349
Europe		Coefficient of discharge K_{dr}			
PED / DIN EN ISO 4126-1 12/2013	Approval No.	072020111Z0008/0/08 Rev.3			
	S/G	0.75	0.7	0.7	0.7
	L	0.56	0.52	0.52	0.52
Germany		Coefficient of discharge α_w			
PED / AD 2000-Merkblatt A2 07/2012	Approval No.	TÜV SV 576			
	S/G	0.75	0.7	0.7	0.7
	L	0.56	0.52	0.52	0.52
United States		Coefficient of discharge K			
ASME Sec. VIII Div. 1	Approval No.	M37044			
	S/G	0.699			
	Approval No.	M37055			
	L	0.521			
Canada		Coefficient of discharge K			
CRN	Approval No.	For current approval no. see www.leser.com			
	S/G	0.699			
	L	0.521			
China		Coefficient of discharge α_w			
AQSIQ	Approval No.	For current approval no. see www.leser.com			
	S/G	0.75	0.7	0.7	0.7
	L	0.56	0.52	0.52	0.52
Eurasian Custom Union		Coefficient of discharge α_w			
EAC	Approval No.	For current approval no. see www.leser.com			
	S/G	0.75	0.7	0.7	0.7
	L	0.56	0.52	0.52	0.52
Classification societies		Homepage			
Bureau Veritas	BV	www.bureauveritas.com		The valid certification number is changed with every renewal.	
DNV GL		www.dnvgl.com			
Lloyd' s Register EMEA	LREMEA	www.lr.org		For a sample certificate including the valid certification number see www.leser.com	
Registro Italiano Navale	RINA	www.rina.org			

 Type 441, 442
XXL

Type 441, 442 XXL
Available options



Type 441, 442
 XXL