

Type 442 Full nozzle DIN
Plain lever H3
Open bonnet
Conventional design



Type 441 Full nozzle DIN
Packed lever H4
Closed bonnet
Conventional design

Type

441, 442

Full nozzle DIN

Type 441, 442 Full nozzle DIN

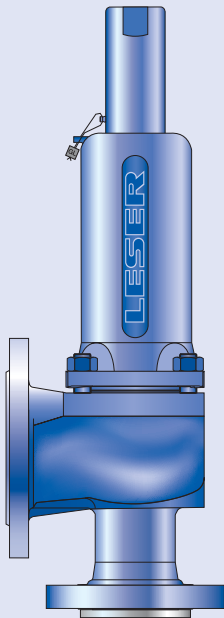
Flanged Safety Relief Valves – spring loaded

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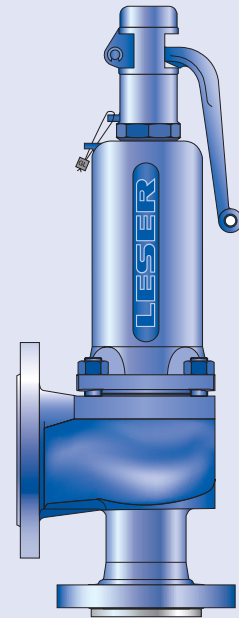
Type 441, 442 Full nozzle DIN **LESER**

How to order – Article numbers

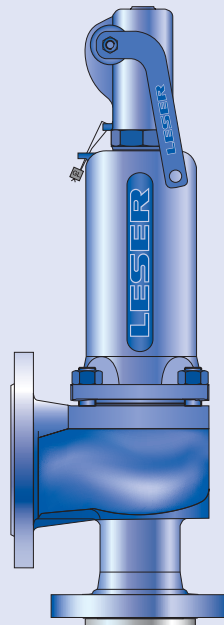
Type 441, 442 Full nozzle DIN



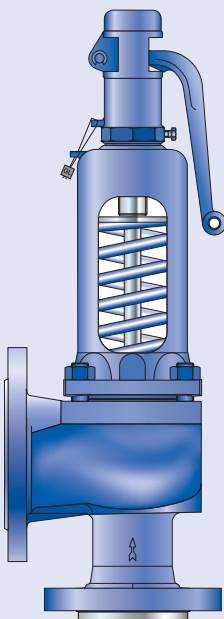
Type 441 Full nozzle
Cap H2
Closed bonnet
Conventional design



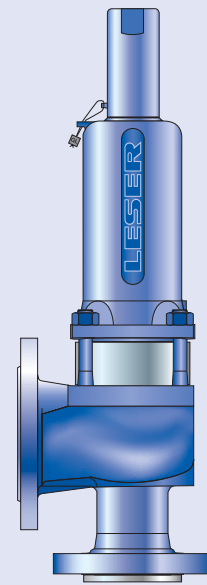
Type 441 Full nozzle
Plain lever H3
Closed bonnet
Conventional design



Type 441 Full nozzle
Packed lever H4
Closed bonnet
Conventional design



Type 442 Full nozzle
Plain lever H3
Open bonnet
Conventional design



Type 441 Full nozzle
Cap H2
Closed bonnet
Balanced bellows design

Type 441, 442 Full nozzle DIN **LESER**

How to order – Article numbers

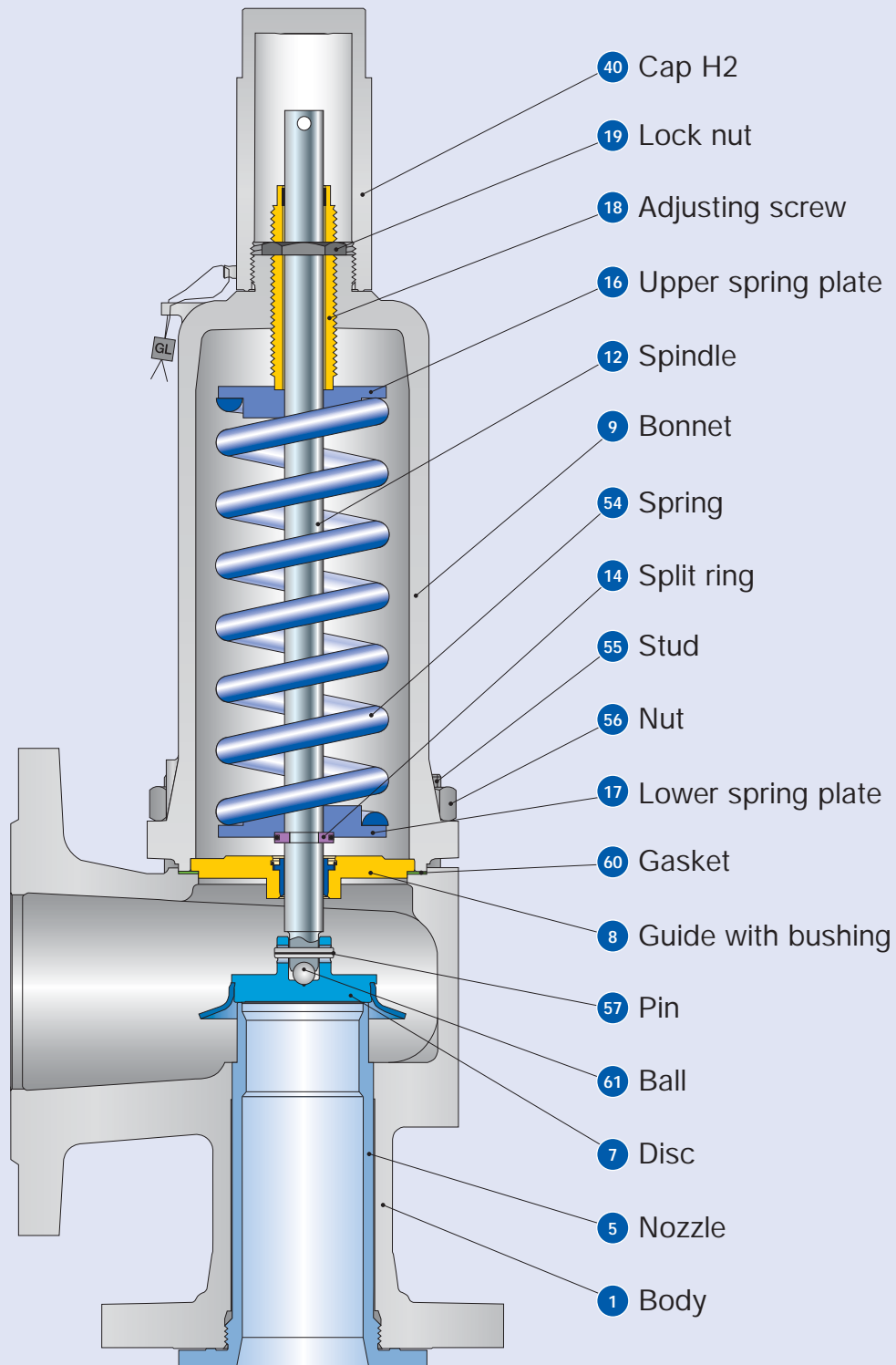
Article numbers					
	DN _i		25	40	50
	DN _o		50	65	80
	Actual Orifice diameter d ₀ [mm]		23	37	46
	Actual Orifice area A ₀ [mm ²]		416	1075	1662
Body material: 1.0619 (WCB)					
Bonnet	H2	Art.-No. 4412.	0572	0582	0592
closed	H3	Art.-No. 4412.	0573	0583	0593
	H4	Art.-No. 4412.	0574	0584	0594
open	H3	Art.-No. 4422.	0575	0585	0595
Body material: 1.4408 (CF8M)					
Bonnet	H2	Art.-No. 4422.	0952	0962	0972
closed	H2	Art.-No. 4422.	0954	0964	0974

For sizes DN 80/3" and above please select Series 526 valves, DIN drilled or 441 Full nozzle ANSI, DIN drilled.

Type 441, 442 Full Nozzle DIN **LESER**

Conventional design

Type 441, 442 Full nozzle DIN



Type 441, 442 Full Nozzle DIN **LESER**

Conventional design

Materials			
Item	Component	Type 4412 / 4422 Full nozzle DIN	Type 4414 Full nozzle DIN
1	Body	1.0619	1.4408
		SA 216 WCB	SA 351 CF8M
5	Nozzle	1.4404	1.4404
		316L	316L
7	Disc	1.4122	1.4404
		Hardened stainless steel	316L
8	Guide with bushing	1.0501	1.4404
		Carbon steel	316L
		1.4104 tenifer	-
		Chrome steel	-
9	Bonnet	0.7040, 0.7043, 1.0619	1.4408 or 1.4571
		Ductile Gr. 60-40-18, SA 216 WCB	SA CF8M or SA 479 316Ti
12	Spindle	1.4021	1.4404
		420	316L
14	Split ring	1.4104	1.4404
		Chrome steel	316L
16 / 17	Spring plate	1.0718	1.4404
		12L13	316L
18	Adjusting screw with bushing	1.4104 PTFE	1.4404
		Chrome steel PTFE	316L PTFE
19	Lock nut	1.0718	1.4404
		Steel	316L
40	Cap H2	1.0718	1.4404
		12L13	316L
54	Spring standard	1.1200, 1.8159, 1.7102	1.4310
		Carbon steel	Stainless steel
	Spring optional	1.4310	-
		Stainless steel	-
55	Stud	1.1181	1.4401
		Steel	B8M
56	Nut	1.0501	1.4401
		2H	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

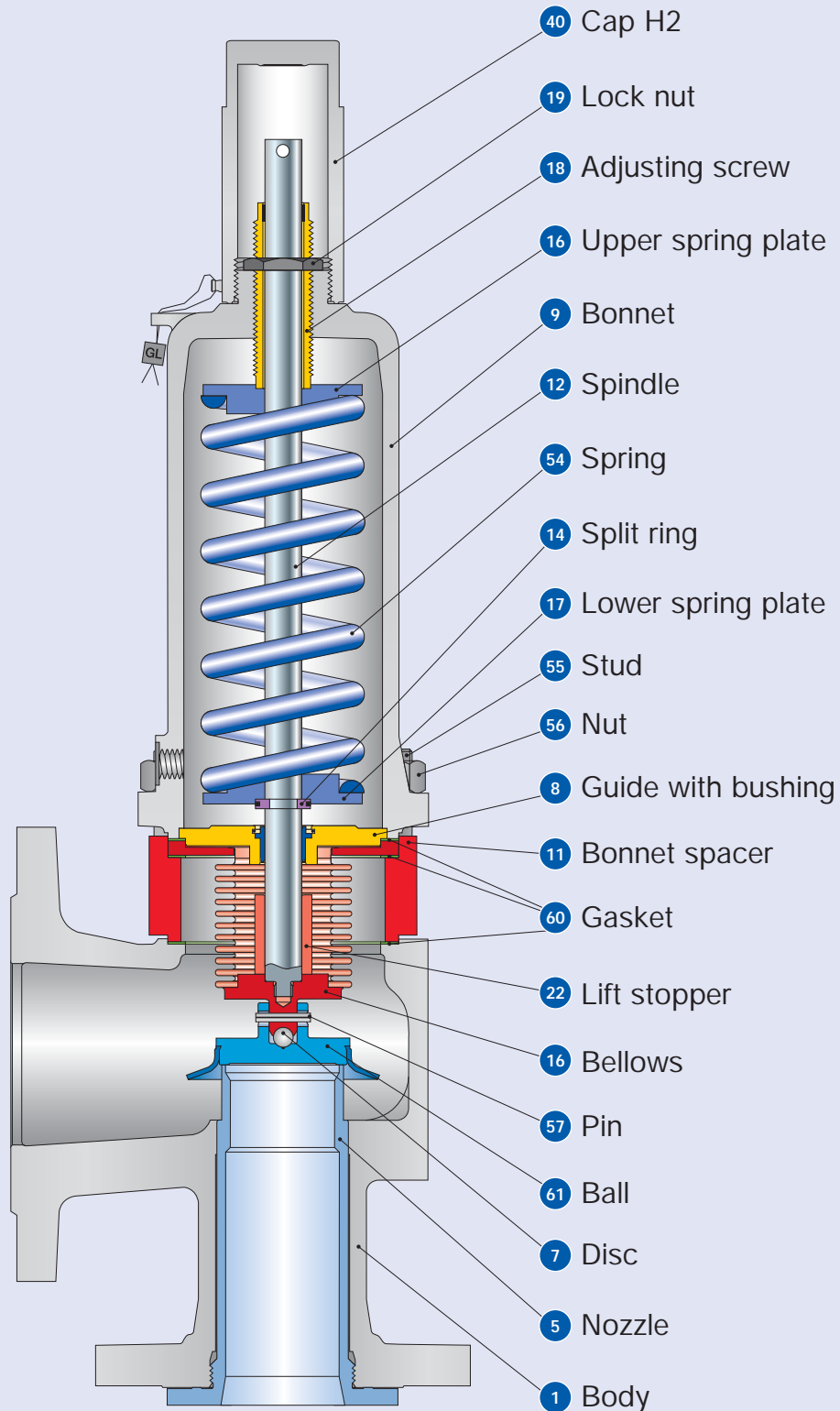
Please notice:

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

Type 441, 442 Full nozzle DIN **LESER**

Balanced bellows design

Type 441, 442 Full nozzle DIN



Type 441, 442 Full nozzle DIN **LESER**

Balanced bellows design

Materials			
Item	Component	Type 4412 / 4422 Full nozzle DIN	Type 4414 Full nozzle DIN
1	Body	1.0619	1.4408
		SA 216 WCB	SA 351 CF8M
5	Nozzle	1.4404	1.4404
		316L	316L
7	Disc	1.4122	1.4404
		Hardened stainless steel	316L
8	Guide with bushing	1.0501	1.4404
		Carbon steel	316L
		1.4104 tenifer	-
		Chrome steel	-
9	Bonnet	0.7040, 0.7043, 1.0619	1.4408 or 1.4571
		Ductile Gr. 60-40-18, SA 216 WCB	SA 351 CF8M or SA 479 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
		12L13	316L
18	Adjusting screw with bushing	1.4104 PTFE	1.4404
		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	1.0718	1.4404
		12L13	316L
54	Spring standard	1.1200, 1.8159, 1.7102	1.4310
		Carbon steel	Stainless steel
	Spring optional	1.4310	-
		Stainless steel	-
55	Stud	1.1181	1.4401
		Steel	B8M
56	Nut	1.0501	1.4401
		2H	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

Please notice:

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

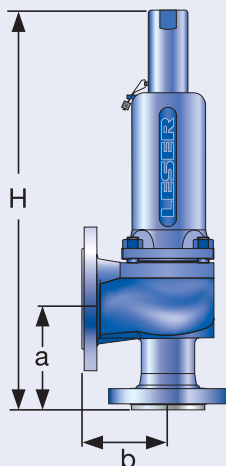
Type 441, 442 Full nozzle DIN **LESER**

Dimensions and weights

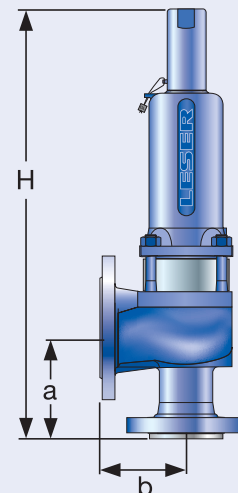
Metric Units

	DN _i	25	40	50
	DN _o	50	65	80
	Actual Orifice diameter d ₀ [mm]	23	37	46
	Actual Orifice area A ₀ [mm ²]	416	1075	1662
Weight [kg]		9	16	22
	with bellows	10	17	24
Center to face [mm]	Inlet a	111	143,5	154
	Outlet b	100	115	120
Height (H4) [mm]	Standard H max.	345	515,5	573
	Bellows H max.	384	553,5	619
Body material: 1.0619 (WCB)				
DIN Flange¹⁾	Inlet	PN 40 or 16		
	Outlet	PN 16		
Body material: 1.4408 (CF8M)				
DIN Flange¹⁾	Inlet	PN 40 or 16		
	Outlet	PN 16		

¹⁾ Standard flange rating. For other flange drillings and facings please refer to page 06/14.



Conventional design



Balanced bellows design

Type 441, 442 Full nozzle DIN **LESER**

Pressure temperature ratings

Metric Units

DN _i	25	40	50
DN _o	50	65	80
Actual Orifice diameter d ₀ [mm]	23	37	46
Actual Orifice area A ₀ [mm ²]	416	1075	1662

Body material: 1.0619 (WCB)

DIN Flange	Inlet		PN 40 or 16		
	Outlet		PN 16		
Minimum set pressure	p [bar _g]	S/G/L	0,1	0,1	0,1
Min. set pressure¹⁾ standard bellows	p [bar _g]	S/G/L	3	3	3
Min. set pressure low press. bellows	p [bar _g]	S/G/L	0,98	1,11	1,81
Maximum set pressure	p [bar _g]	S/G/L	40	40	40
Max. set pressure with special spring	p [bar _g]	S/G/L	40	40	40
Temperature acc. to DIN EN	min. [°C]		-85		
	max. [°C]		+450		
Temperature acc. to ASME	min. [°C]		-29		
	max. [°C]		+427		

Body material: 1.4408 (CF8M)

DIN Flange	Inlet		PN 40 or 16		
	Outlet		PN 16		
Minimum set pressure	p [bar _g]	S/G/L	0,1	0,1	0,1
Min. set pressure¹⁾ standard bellows	p [bar _g]	S/G/L	3	3	3
Min. set pressure low press. bellows	p [bar _g]	S/G/L	0,98	1,11	1,81
Maximum set pressure	p [bar _g]	S/G/L	40	40	33
Max. set pressure with special spring	p [bar _g]	S/G/L	40	40	37
Temperature acc. to DIN EN	min. [°C]		-270		
	max. [°C]		+400		
Temperature acc. to ASME	min. [°C]		-268		
	max. [°C]		+538		

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

Type 441, 442 Full nozzle DIN **LESER**

Flange drillings and facings

Flange drillings

	DN _i	25	40	50	
	DN _o	50	65	80	
	Actual Orifice diameter d ₀ [mm]	23	37	46	
	Actual Orifice area A ₀ [mm ²]	416	1075	1662	
Body material: 1.0619 (WCB), 1.4408 (CF8M)					
Inlet	DIN EN 1092	PN 10	*	*	*
		PN 16	*	*	*
		PN 25	*	*	*
		PN 40	*	*	*
	ASME B16.5	CL150	H64	H64	H64
		CL300	–	–	[H65]
Outlet	DIN EN 1092	PN 10	*	*	*
		PN 16	*	*	*
		PN 25	*	(H15)	(*)
		PN 40	*	(H15)	(*)
	ASME B16.5	CL150	H 79	H 79	H 79
		CL300	–	–	–

Flange facings

Indication	Standard	Nozzle	Outlet	Remark						
General										
Flange undrilled	–	H38	H39							
Linde-V-Nut, Form V48	Linde Standard 420-08	–	J08	Groove: Rz 16						
Linde-V-Nut, Form V48A	LWN 313.36	–	J06	Groove: Rz 4, e.g. with hydrogen						
Lens seal form L (without sealing lens)	DIN 2696 LWN 313.35	L57	J12							
Acc. to DIN EN										
Flange facing			Inlet	Outlet	Remark					
DIN EN 1092 (new)		DIN 2526 (old)			Rz-data according to DIN EN 1092 in µm					
(see also LWN 313.40)			PN 10 – PN 40	PN 10 – PN 40						
Raised face	Type B1	Type C	*	*	Facing: Rz = 12,5 – 50					
		Type D								
	Type B2	Type E	–	L38		Facing: Rz = 3,2 – 12,5				
Tongue face C ¹⁾		Tongue face F	L56	H92	Steel flanges only					
Groove face D ¹⁾		Groove face N	L55	H91						
Male face E		Male face V13	I90	H98						
Female face F		Female face R13	I91	H99						
O-ring male face G		Male face V14	I93	J02						
O-ring female face H		Female face R14	I92	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, CL300	L58	CL150	H63

¹⁾ According to DIN EN 1092 groove depths and tongue heights increased compared to the formerly valid DIN (refer to LWN 313.40).

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 2512 and/or DIN EN 1092-1 an additional option code is necessary: "S01: bottom of the groove drilled". Groove and tongue for PN160 flanges refer to DIN 2512/LWN 313.32.

²⁾ Smooth finish is not defined in the effective standards. For LESER's definition for smooth finish see page 00/07.

For signs and symbols refer to page 00/07

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 Full nozzle DIN **LESER**

Approvals

Approvals				
	DN _i	25	40	50
	DN _o	50	65	80
	Actual Orifice diameter d ₀ [mm]	23	37	46
	Actual Orifice area A ₀ [mm ²]	416	1075	1662
Europe		Coefficient of discharge K_{dr}		
DIN EN ISO 4126-1	Approval No.	072020111Z0008/0/08-2		
	S/G	0,7		
	L	0,45		
Germany		Coefficient of discharge α_w		
AD 2000-Merkblatt A2	Approval No.	TÜV SV 576		
	S/G	0,7		
	L	0,45		
United States		Coefficient of discharge K		
ASME Sec. VIII	Approval No.	M37044		
	S/G	0,699		
	Approval No.	M37055		
	L	0,521		
Canada		Coefficient of discharge K		
Canada: CRN	Approval No.	OG1182.9C		
	S/G	0,699		
	L	0,521		
China		Coefficient of discharge α_w		
CSBQTS	Approval No.			
	S/G	0,7		
	L	0,45		
Russia		Coefficient of discharge α_w		
		on request		
Classification societies				
		on request		

Type 441, 442 Full nozzle DIN

Capacities – Steam

Capacities for saturated steam according to AD 2000-Merkblatt A2, based on set pressure plus 10 % overpressure.
Capacities at 1 bar (14,5 psig) and below are based on 0,1 bar (1,45 psig) overpressure.

Metric Units		AD 2000-Merkblatt A2 [kg/h]		
	DN _i	25	40	50
	DN _o	40	65	80
	Actual Orifice diameter d ₀ [mm]	23	37	46
	Actual Orifice area A ₀ [mm ²]	416	1075	1662
	LEO _{S/G} ^{*)} [inch ²]	0,462	1,195	1,847
Set pressure [bar]	Capacities [kg/h]			
0,1	0	0	0	
0,2	140	363	561	
0,5	224	579	895	
1	326	843	1302	
2	519	1343	2075	
3	699	1808	2794	
4	871	2254	3485	
5	1043	2699	4172	
6	1214	3142	4856	
7	1381	3574	5525	
8	1551	4014	6205	
9	1721	4454	6884	
10	1891	4893	7562	
12	2230	5770	8919	
14	2562	6629	10247	
16	2900	7505	11600	
18	3239	8382	12955	
20	3578	9260	14312	
22	3907	10111	15629	
24	4247	10991	16988	
26	4588	11873	18351	
28	4930	12757	19718	
30	5272	13644	21089	
32	5616	14534	22465	
34	5945	15384	23779	
36	6290	16278	25160	
38	6637	17175	26547	
40	6985	18076	27939	

Capacities for saturated steam according to ASME Section VIII (UV), based on set pressure plus 10% overpressure.
Capacities at 2,07 bar (30 psig) and below are based on 0,207 bar (3 psig) overpressure.

US Units		ASME Section VIII [lb/h]		
	DN _i	25	40	50
	DN _o	40	65	80
	Actual Orifice diameter d ₀ [inch]	0,91	1,46	1,81
	Actual Orifice area A ₀ [inch ²]	0,644	1,667	2,576
	LEO _{S/G} ^{*)} [inch ²]	0,462	1,195	1,847
Set pressure [psig]	Capacities [lb/h]			
15	757	1959	3028	
20	873	2259	3492	
30	1105	2859	4419	
40	1360	3519	5439	
50	1615	4179	6459	
60	1870	4839	7479	
70	2125	5499	8499	
80	2380	6159	9519	
90	2635	6819	10539	
100	2890	7479	11559	
120	3400	8799	13600	
140	3910	10118	15640	
160	4420	11438	17680	
180	4930	12758	19720	
200	5440	14078	21760	
220	5950	15398	23800	
240	6460	16718	25840	
260	6970	18038	27880	
280	7480	19358	29920	
300	7990	20677	31960	
320	8500	21997	34000	
340	9010	23317	36040	
360	9520	24637	38080	
380	10030	25957	40120	
400	10540	27277	42161	
420	11050	28597	44201	
440	11560	29917	46241	
460	12070	31236	48281	
480	12580	32556	50321	
500	13090	33876	52361	
550	14365	37176	57461	
580	15130	39156	60521	

*) LEO_{S/G} = LESER Effective Orifice steam/gas please refer to page 00/11
How to use capacity-sheets refer to page 00/09

Type 441, 442 Full nozzle DIN **LESER**

Capacities – Air

Capacities for air according to AD 2000-Merkblatt A2, based on set pressure plus 10 % overpressure at 0 °C and 1013 mbar. Capacities at 1 bar (14,5 psig) and below are based on 0,1 bar (1,45 psig) overpressure.

Metric Units		AD 2000-Merkblatt A2 [m _n ³ /h]		
DN _i		25	40	50
DN _o		40	65	80
Actual Orifice diameter d ₀ [mm]		23	37	46
Actual Orifice area A ₀ [mm ²]		416	1075	1662
LEO _{s/g} ^{*)} [inch ²]		0,462	1,195	1,847
Set pressure [bar]	Capacities [m _n ³ /h]			
0,1	0	0	0	
0,2	162	420	649	
0,5	263	680	1051	
1	388	1004	1552	
2	627	1622	2507	
3	854	2209	3414	
4	1071	2773	4286	
5	1289	3337	5157	
6	1507	3900	6029	
7	1725	4464	6900	
8	1943	5028	7771	
9	2161	5592	8643	
10	2379	6155	9514	
12	2814	7283	11257	
14	3250	8411	13000	
16	3686	9538	14743	
18	4121	10666	16486	
20	4557	11793	18228	
22	4993	12921	19971	
24	5429	14048	21714	
26	5864	15176	23457	
28	6300	16304	25200	
30	6736	17431	26942	
32	7171	18559	28685	
34	7607	19686	30428	
36	8043	20814	32171	
38	8478	21941	33914	
40	8914	23069	35657	

Capacities for air according to ASME Section VIII (UV), based on set pressure plus 10% overpressure at 16 °C (60°F). Capacities at 2,07 bar (30 psig) and below are based on 0,207 bar (3 psig) overpressure.

US Units		ASME Section VIII [S.C.F.M.]		
DN _i		25	40	50
DN _o		40	65	80
Actual Orifice diameter d ₀ [inch]		0,91	1,46	1,81
Actual Orifice area A ₀ [inch ²]		0,644	1,667	2,576
LEO _{s/g} ^{*)} [inch ²]		0,462	1,195	1,847
Set pressure [psig]	Capacities [S.C.F.M.]			
15	270	698	1079	
20	311	805	1244	
30	394	1019	1574	
40	484	1254	1938	
50	575	1489	2301	
60	666	1724	2664	
70	757	1959	3028	
80	848	2194	3391	
90	939	2430	3754	
100	1029	2665	4118	
120	1211	3135	4845	
140	1393	3605	5571	
160	1574	4076	6298	
180	1756	4546	7025	
200	1938	5016	7751	
220	2120	5486	8478	
240	2301	5957	9205	
260	2483	6427	9932	
280	2665	6897	10658	
300	2846	7368	11385	
320	3028	7838	12112	
340	3210	8308	12839	
360	3391	8778	13565	
380	3573	9249	14292	
400	3755	9719	15019	
420	3936	10189	15745	
440	4118	10660	16472	
460	4300	11130	17199	
480	4481	11600	17926	
500	4663	12070	18652	
550	5117	13246	20469	
580	5390	13952	21559	

^{*)} LEO_{s/g} = LESER Effective Orifice steam/gas please refer to page 00/11
How to use capacity-sheets refer to page 00/09

Type 441, 442 Full nozzle DIN **LESER**

Capacities – Water

Capacities for water according to AD 2000-Merkblatt A2, based on set pressure plus 10 % overpressure at 20 °C (68 °F). Capacities at 1 bar (14,5 psig) and below are based on 0,1 bar (1,45 psig) overpressure.

Capacities for water according to ASME Section VIII (UV), based on set pressure plus 10 % overpressure at 21 °C (70 °F). Capacities at 2,07 bar (30 psig) and below are based on 0,207 bar (3 psig) overpressure.

Metric Units		AD 2000-Merkblatt A2 [10 ³ kg/h]		
	DN _i	25	40	50
	DN _o	40	65	80
	Actual Orifice diameter d _o [mm]	23	37	46
	Actual Orifice area A _o [mm ²]	416	1075	1662
	LEO _L ^{*)} [inch ²]	0,516	1,336	2,062
Set pressure [bar]	Capacities [10 ³ kg/h]			
0,1	4,25	11,0	17,0	
0,2	5,21	13,5	20,8	
0,5	7,37	19,1	29,5	
1	9,97	25,8	39,9	
2	14,1	36,5	56,4	
3	17,3	44,7	69,1	
4	19,9	51,6	79,8	
5	22,3	57,7	89,2	
6	24,4	63,2	97,7	
7	26,4	68,3	106	
8	28,2	73,0	113	
9	29,9	77,4	120	
10	31,5	81,6	126	
12	34,6	89,4	138	
14	37,3	96,6	149	
16	39,3	103	160	
18	42,3	110	169	
20	44,6	115	178	
22	46,8	121	187	
24	48,9	126	195	
26	50,9	132	203	
28	52,8	137	211	
30	54,6	141	219	
32	56,4	146	226	
34	58,2	151	233	
36	59,8	155	239	
38	61,5	159	246	
40	63,1	163	252	

US Units		ASME Section VIII [US-G.P.M.]		
	DN _i	25	40	50
	DN _o	40	65	80
	Actual Orifice diameter d _o [inch]	0,91	1,46	1,81
	Actual Orifice area A _o [inch ²]	0,644	1,667	2,576
	LEO _L ^{*)} [inch ²]	0,516	1,336	2,062
Set pressure [psig]	Capacities [US-G.P.M.]			
15	54,0	140	216	
20	61,1	158	244	
30	73,1	189	293	
40	84,5	219	338	
50	94,4	244	378	
60	103	268	414	
70	112	289	447	
80	119	309	478	
90	127	328	507	
100	134	346	534	
120	146	379	585	
140	158	409	632	
160	169	437	676	
180	179	464	717	
200	189	489	755	
220	198	513	792	
240	207	535	827	
260	215	557	861	
280	223	578	894	
300	231	599	925	
320	239	618	955	
340	246	637	985	
360	253	656	1013	
380	260	674	1041	
400	267	691	1068	
420	274	708	1095	
440	280	725	1120	
460	286	741	1146	
480	293	757	1170	
500	299	773	1194	
550	313	811	1253	
580	322	832	1286	

*) LEO_L = LESER Effective Orifice liquids please refer to page 00/12
How to use capacity-sheets refer to page 00/09

Type 441, 442 Full nozzle DIN **LESER**

Available Options

For further information refer to
"Accessories and Options", page 99/01

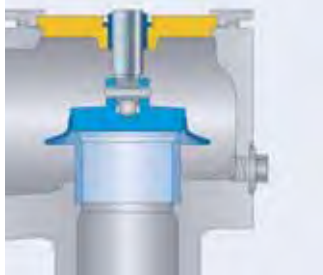
Heating jacket

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 $\frac{1}{2}$



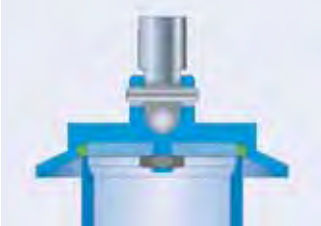
Open bonnet

See Art.-No.



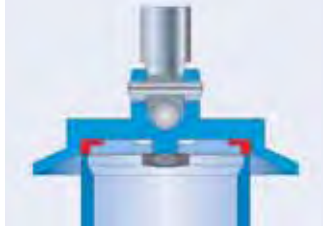
O-ring-disc

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



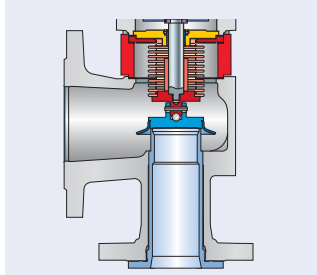
Disc with inserted sealing plate

J44: PTFE-FDA
J48: PCTFE
J49: SP



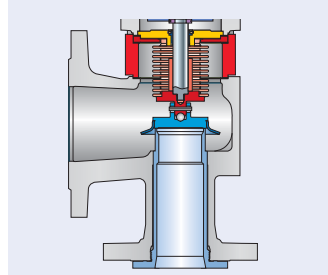
Stainless steel bellows

J68: Open bonnet
J78: Closed bonnet



Conversion kit for stainless steel bellows

See Art.-No. page 06/15



Screwed cap H2



Plain lever H3



Packed lever 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

