



Type 442 DIN
Plain lever H3
Open bonnet
Conventional design



Type 441 DIN
Packed lever H4
Closed bonnet
Conventional design

Type 441 DIN 442 DIN

Type 441, 442 DIN

Flanged Safety Relief Valves – spring loaded

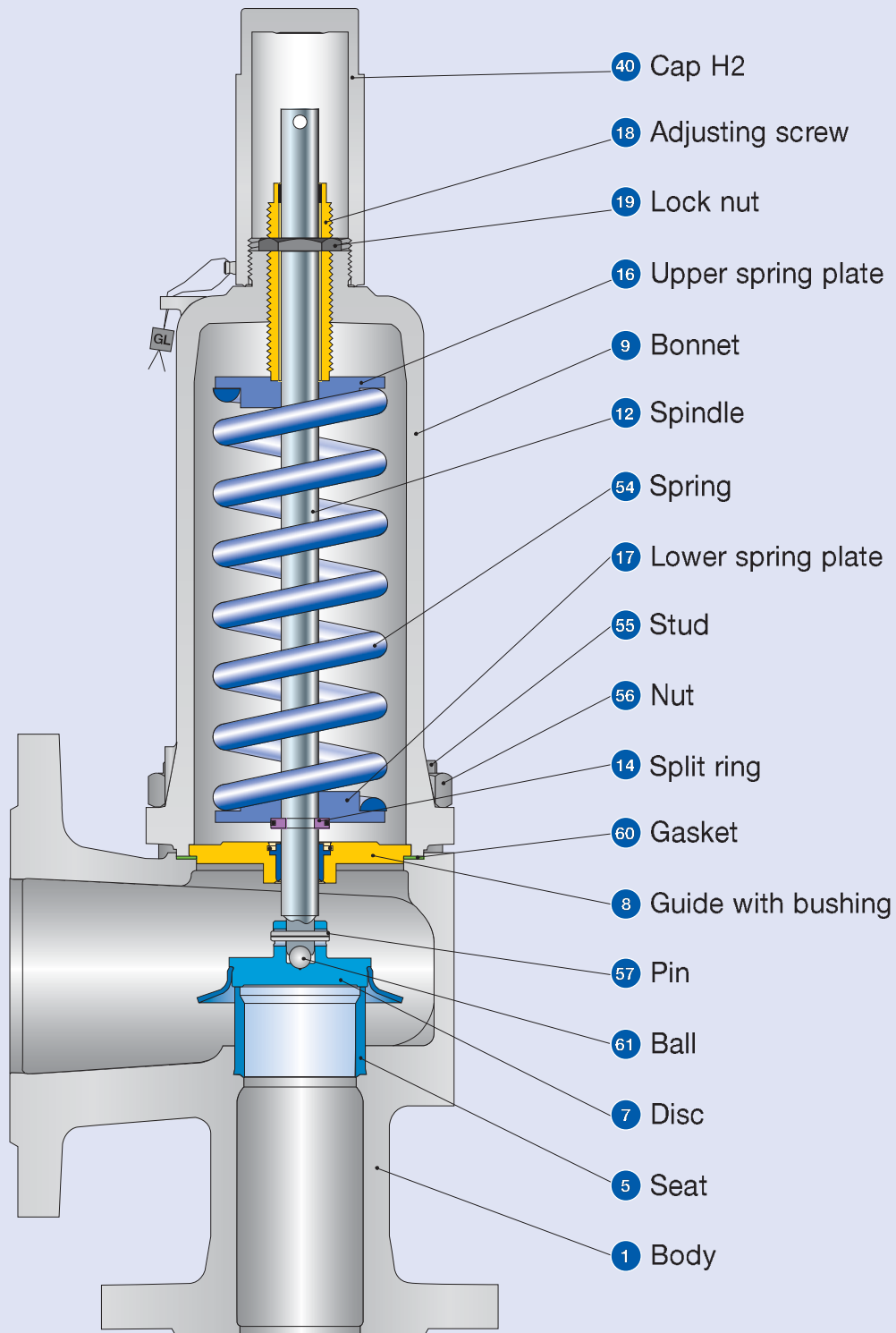
Contents	Chapter/Page
Materials	
• Conventional design	01/02
• Balanced bellows design	01/04
How to order	
• Numbering system	01/06
• Article numbers	01/08
Dimensions and weights	
• Metric Units	01/10
• US Units	01/11
Pressure temperature ratings	
• Metric Units	01/12
• US Units	01/14
Flange drillings and facings	01/16
Order information – Spare parts	01/18
Available options	01/20
Approvals	01/21
Capacities	
• Steam [Metric Units + US Units]	01/22
• Air [Metric Units + US Units]	01/24
• Water [Metric Units + US Units]	01/26
Determination of coefficient of discharge K_{dr}/α_w	01/28

Type 441, 442 DIN

LESER

Conventional design

Type 441, 442 DIN



Conventional design

Materials					
Item	Component	Type 4411 / 4421 DIN	Type 4415 / 4425 DIN	Type 4412 / 4422 DIN	Type 4414 DIN
1	Body	0.6025	0.7043	1.0619	1.4408
		Cast iron	Ductile Gr. 60-40-18	SA 216 WCB	SA 351 CF8M
5	Seat	1.4404	1.4404	1.4404	1.4404
		316L	316L	316L	316L
7	Disc	1.4122	1.4122	1.4122	1.4404
		Hardened stainless steel	Hardened stainless steel	Hardened stainless steel	316L
8	Guide with bushing	1.4104, 1.0501, 0.7040	1.4104, 1.0501, 0.7040	1.4104, 1.0501, 0.7040	1.4404
		Chrome or carbon steel	Chrome or carbon steel	Chrome or carbon steel	316L
		1.4104 tenifer	1.4104 tenifer	1.4104 tenifer	-
		Chrome steel tenifer	Chrome steel tenifer	Chrome steel tenifer	-
9	Bonnet	0.7040, 0.7043, 1.0619	0.7040, 0.7043, 1.0619	0.7040, 0.7043, 1.0619	1.4408, 1.4404, 1.4571
		Ductile Gr. 60-40-18, SA 216 WCB	Ductile Gr. 60-40-18, SA 216 WCB	Ductile Gr. 60-40-18, SA 216 WCB	SA 351 CF8M, SA 479 316L, SA 479 316Ti
12	Spindle	1.4021	1.4021	1.4021	1.4404
		420	420	420	316L
14	Split ring	1.4104	1.4104	1.4104	1.4404
		Chrome steel	Chrome steel	Chrome steel	316L
16/17	Spring plate	1.0718	1.0718	1.0718	1.4404
		Steel	Steel	Steel	316L
18	Adjusting screw with bushing	1.4104 PTFE	1.4104 PTFE	1.4104 PTFE	1.4404 PTFE
		Chrome steel PTFE	Chrome steel PTFE	Chrome steel PTFE	316L PTFE
19	Lock nut	1.0718	1.0718	1.0718	1.4404
		Steel	Steel	Steel	316L
40	Cap H2	1.0718 or 0.7043	1.0718 or 0.7043	1.0718 or 0.7043	1.4404
		12L13 or Gr. 60-40-18	12L13 or Gr. 60-40-18	12L13 or Gr. 60-40-18	316L
54	Spring standard	1.1200, 1.8159, 1.7102	1.1200, 1.8159, 1.7102	1.1200, 1.8159, 1.7102	1.4310
		Carbon steel	Carbon steel	Carbon steel	Stainless steel
		1.4310	1.4310	1.4310	-
		Stainless steel	Stainless steel	Stainless steel	-
55	Stud	1.1181	1.1181	1.1181	1.4401
		Steel	Steel	Steel	B8M
56	Nut	1.0501	1.0501	1.0501	1.4401
		2H	2H	2H	8M
57	Pin	1.4310	1.4310	1.4310	1.4310
		Stainless steel	Stainless steel	Stainless steel	Stainless steel
60	Gasket	Graphite / 1.4401	Graphite / 1.4401	Graphite / 1.4401	Graphite / 1.4401
		Graphite / 316	Graphite / 316	Graphite / 316	Graphite / 316
61	Ball	1.3541	1.3541	1.3541	1.4401
		Hardened stainless steel	Hardened stainless steel	Hardened stainless steel	316

Please notice:

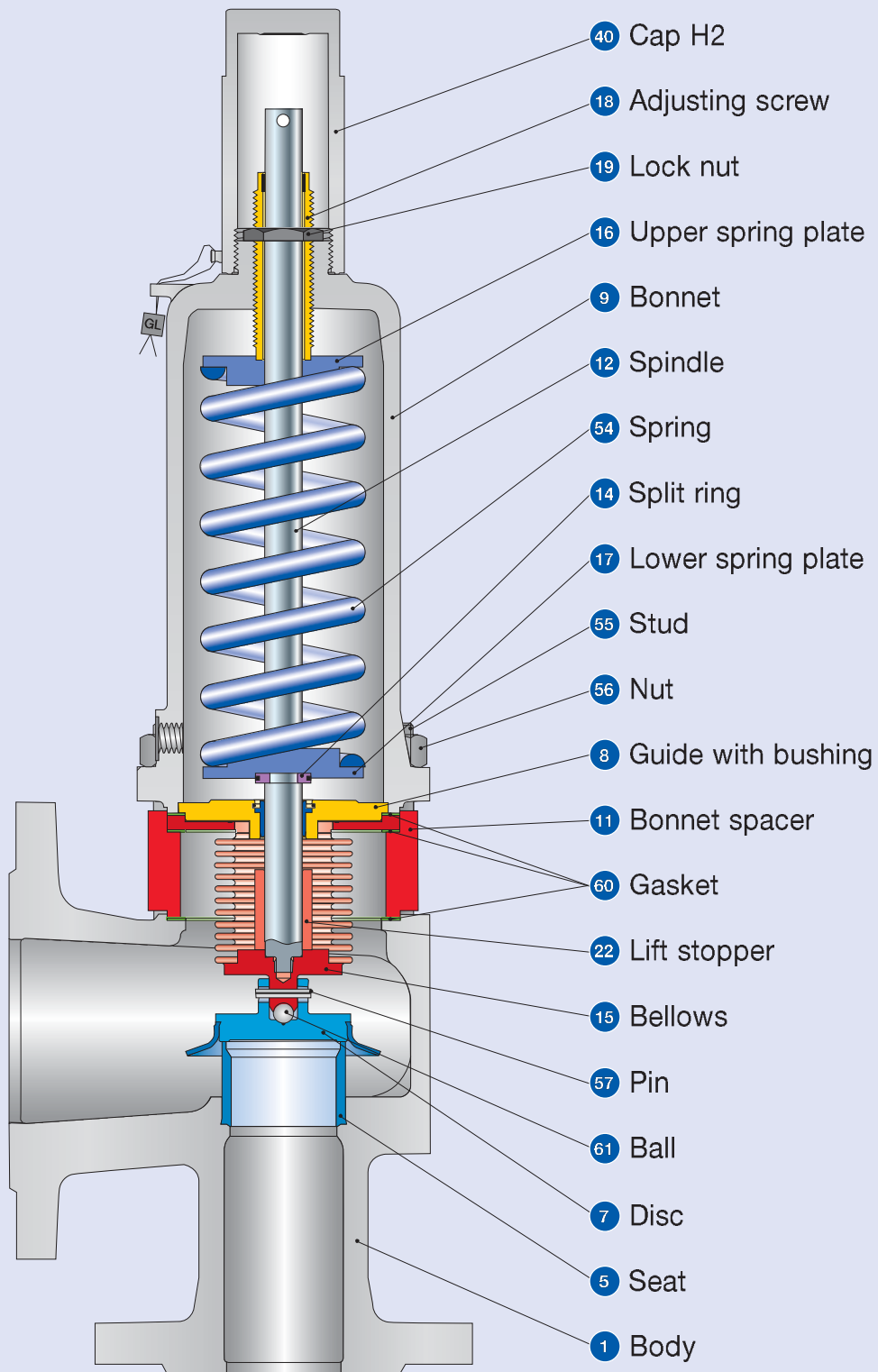
- Modifications reserved by LESER
- If several materials are specified LESER defines the material.
- LESER can upgrade materials without notice.
- Every part can be replaced by other material acc. to customer specification.

Type 441, 442 DIN

LESER

Balanced bellows design

Type 441, 442 DIN



Balanced bellows design

Materials					
Item	Component	Type 4411 / 4421 DIN	Type 4415 / 4425 DIN	Type 4412 / 4422 DIN	Type 4414 DIN
1	Body	0.6025	0.7043	1.0619	1.4408
		Cast iron	Ductile Gr. 60-40-18	SA 216 WCB	SA 351 CF8M
5	Seat	1.4404	1.4404	1.4404	1.4404
		316L	316L	316L	316L
7	Disc	1.4122	1.4122	1.4122	1.4404
		Hardened stainless steel	Hardened stainless steel	Hardened stainless steel	316L
8	Guide with bushing	1.4104, 1.0501, 0.7040	1.4104, 1.0501, 0.7040	1.4104, 1.0501, 0.7040	1.4404
		Chrome or carbon steel	Chrome or carbon steel	Chrome or carbon steel	316L
		1.4104 tenifer	1.4104 tenifer	1.4104 tenifer	-
		Chrome steel tenifer	Chrome steel tenifer	Chrome steel tenifer	-
9	Bonnet	0.7040, 0.7043, 1.0619	0.7040, 0.7043, 1.0619	0.7040, 0.7043, 1.0619	1.4408, 1.4404, 1.4571
		Ductile Gr. 60-40-18, SA 216 WCB	Ductile Gr. 60-40-18, SA 216 WCB	Ductile Gr. 60-40-18, SA 216 WCB	SA 351 CF8M, SA 479 316L, SA 479 316Ti
11	Bonnet spacer	1.0460	1.0460	1.0460	1.4404
		Carbon steel	Carbon steel	Carbon steel	316L
12	Spindle	1.4404	1.4404	1.4404	1.4404
		316L	316L	316L	316L
14	Split ring	1.4104	1.4104	1.4104	1.4404
		Chrome steel	Chrome steel	Chrome steel	316L
15	Bellows	1.4571	1.4571	1.4571	1.4571
		316Ti	316Ti	316Ti	316Ti
16/17	Spring plate	1.0718	1.0718	1.0718	1.4404
		Steel	Steel	Steel	316L
18	Adjusting screw with bushing	1.4104 PTFE	1.4104 PTFE	1.4104 PTFE	1.4404 PTFE
		Chrome steel PTFE	Chrome steel PTFE	Chrome steel PTFE	316L PTFE
19	Lock nut	1.0718	1.0718	1.0718	1.4404
		Steel	Steel	Steel	316L
22	Lift stopper	1.4404	1.4404	1.4104	1.4404
		316L	316L	Chrome steel	316L
40	Cap H2	1.0718 or 0.7043	1.0718 or 0.7043	1.0718 or 0.7043	1.4404
		12L13 or Gr. 60-40-18	12L13 or Gr. 60-40-18	12L13 or Gr. 60-40-18	316L
54	Spring standard	1.1200, 1.8159, 1.7102	1.1200, 1.8159, 1.7102	1.1200, 1.8159, 1.7102	1.4310
		Carbon steel	Carbon steel	Carbon steel	Stainless steel
54	Spring optional	1.4310	1.4310	1.4310	-
		Stainless steel	Stainless steel	Stainless steel	-
55	Stud	1.4401	1.4401	1.4401	1.4401
		B8M	B8M	B8M	B8M
56	Nut	1.4401	1.4401	1.4401	1.4401
		8M	8M	8M	8M
57	Pin	1.4310	1.4310	1.4310	1.4310
		Stainless steel	Stainless steel	Stainless steel	Stainless steel
60	Gasket	Graphite / 1.4401	Graphite / 1.4401	Graphite / 1.4401	Graphite / 1.4401
		Graphite / 316	Graphite / 316	Graphite / 316	Graphite / 316
61	Ball	1.3541	1.3541	1.3541	1.4401
		Hardened stainless steel	Hardened stainless steel	Hardened stainless steel	316

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.

How to order – Example for numbering system

1

Article Number

4412.4512

2

Set Pressure

5 bar_g

3

Connections

H45

1	2	3	4
441	2	.451	2

1 Valve Type 441, 442 DIN
 Type 441 – with closed bonnet
 Type 442 – with open bonnet

2 Material code

Code	Lifting lever
1	0.6025 (cast iron)
2	1.0619 (WCB)
4	1.4408 (CF8M)
5	0.7043 (ductile Gr. 60-40-18)

3 Valve code
 Identifies valve size and body material, refer to page 01/09.

4

Code	Lifting lever	
2	screwed cap	H2
3	plain lever	H3
4	packed lever	H4
5	plain lever with open bonnet	H3

Please state unit (in gauge)!

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

Please refer to page 01/16 and 01/17

4 Options

J22

Type 441, 442 DIN	Option code
• O-ring-disc	
CR	"K" J21
EPDM	"D" J22
FKM	"L" J23
FFKM	"C" J20
• Disc 1.4404 / 316L	L44
• Disc 1.4404 / 316L stellited	J25
• Detachable lifting aid	J26
• Stainless steel bellows	
- open bonnet (Type 442)	J68
- closed bonnet (Type 441)	J78
• Elastomer bellows	J79
• High temperature alloy spring	X01
• Stainless steel spring	X04
• Adaptor for lift indicator H4	J39
• Lift indicator	J93
• Test gag	
- cap H2	J70
- packed lever H4	J69
• Heating jacket	
- Couplings G 3/8	H29
G 3/4	H30
- Flanges DN 15	H31
DN 25	H32
• Drain hole G 1/4	J18
G 1/2	J19
• Free of oil and grease	J85
• Materials	
- NACE	N78

Option code applies only if not standard

5 Documentation

H01 L30

Please select required documentation:

Inspections, tests:	Option code
DIN EN 10204-3.2: TÜV-Nord Certificate for test pressure	M33
LESER CGA (Certificate for Global Application)	H03
- Inspection certificate 3.1 acc. to DIN EN 10204	
- Declaration of conformity acc. to PED 97/23/EC	
Material test certificate:	
DIN EN 10204-3.1	
Part	Option code
Body	H01
Bonnet	L30
Cap / lever cover	L31
Nozzle	L59
Disc	L23
Studs	N07
Nuts	N08

6 Code and Medium

2.0

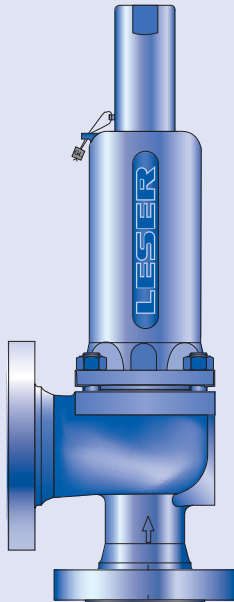
1	2
2	0
1 Code	
1. ASME Section VIII	
2. CE / VdTUEV	
3. ASME Section VIII + CE / VdTUEV	
2 Medium	
.1 Gases	
.2 Liquids	
.3 Steam	
.0 Steam / Gases / Liquids (valid only for CE / VdTUEV)	

Type 441, 442 DIN

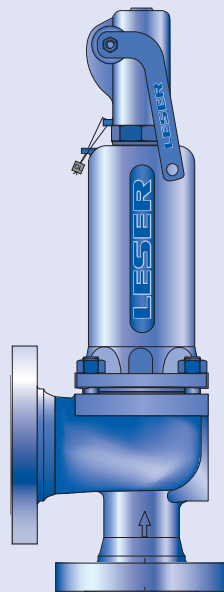
LESER

How to order – Article numbers

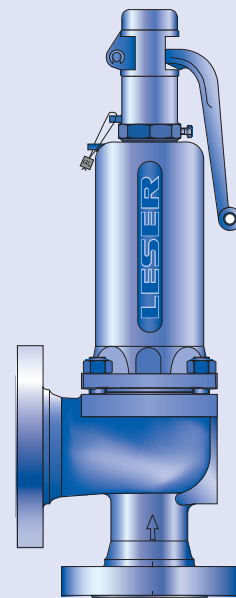
Type 441, 442 DIN



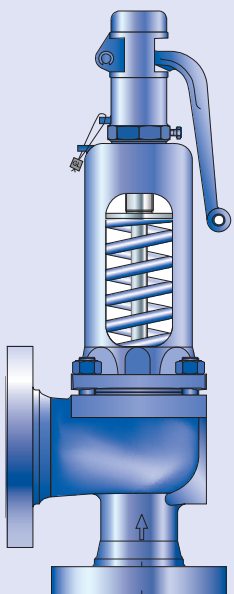
Type 441
Cap H2
Closed bonnet
Conventional design



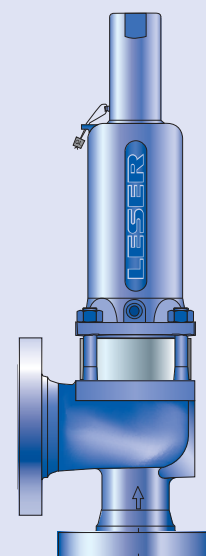
Type 441
Packed lever H4
Closed bonnet
Conventional design



Type 441
Plain lever H3
Closed bonnet
Conventional design



Type 442
Plain lever H3
Open bonnet
Conventional design



Type 441
Cap H2
Closed bonnet
Balanced bellows design

Type 441, 442 DIN

How to order – Article numbers

Article numbers			20	20	25	32	40	50	65	80	100	125	150	200
		DN _I	20	20	25	32	40	50	65	80	100	125	150	200
		DN _O	32	40	40	50	65	80	100	125	150	200	250	300
		Actual Orifice diameter d ₀ [mm]	18	18	23	29	37	46	60	74	92	98	125	165
		Actual Orifice area A ₀ [mm ²]	254	254	416	661	1075	1662	2827	4301	6648	7543	12272	21382
Body material: 0.6025 (cast iron)														
Bonnet closed	H2	Art.-No. 4411.	4372	–	4382	4392	4402	4412	4422	4432	4442	4452	4462	–
	H3	Art.-No. 4411.	4373	–	4383	4393	4403	4413	4423	4433	4443	4453	–	–
	H4	Art.-No. 4411.	4374	–	4384	4394	4404	4414	4424	4434	4444	4454	4464	–
open	H3	Art.-No. 4421.	4375	–	4385	4395	4405	4415	4425	4435	4445	4455	4465	–
Body material: 0.7043 (ductile Gr. 60-40-18)														
Bonnet closed	H2	Art.-No. 4415.	–	–	7382	7392	7402	7412	7422	7432	7442	7452	7462	7472
	H3	Art.-No. 4415.	–	–	7383	7393	7403	7413	7423	7433	7443	7453	–	–
	H4	Art.-No. 4415.	–	–	7384	7394	7404	7414	7424	7434	7444	7454	7464	7474
open	H3	Art.-No. 4425.	–	–	7385	7395	7405	7415	7425	7435	7445	7455	7465	7475
Body material: 1.0619 (WCB)														
Bonnet closed	H2	Art.-No. 4412.	–	4502	4512	4522	4532	4542	4552	4562	4572	4582	4592	4612
	H3	Art.-No. 4412.	–	4503	4513	4523	4533	4543	4553	4563	4573	4583	–	–
	H4	Art.-No. 4412.	–	4504	4514	4524	4534	4544	4554	4564	4574	4584	4594	4614
open	H3	Art.-No. 4422.	–	4505	4515	4525	4535	4545	4555	4565	4575	4585	4595	4615
Body material: 1.4408 (CF8M)														
Bonnet closed	H2	Art.-No. 4414.	–	–	4642	4652	4662	4672	4682	4692	4702	4712	4722	–
	H4	Art.-No. 4414.	–	–	4644	4654	4664	4674	4684	4694	4704	4714	4724	–

Dimensions and weights

Metric Units

	DN _I	20	20	25	32	40	50	65	80	100	125	150	200
	DN _O	32	40	40	50	65	80	100	125	150	200	250	300
	Actual Orifice diameter d ₀ [mm]	18	18	23	29	37	46	60	74	92	98	125	165
	Actual Orifice area A ₀ [mm ²]	254	254	416	661	1075	1662	2827	4301	6648	7543	12272	21382

Weight [kg]		9	9	9	12	16	22	32	56	75	85	131	285
	with bellows	9,4	9,4	10	13	17	24	36	60	83	93	142	289
Center to face [mm]	Inlet a	85	85	105	115	140	150	170	195	220	250	285	290
	Outlet b	95	95	100	110	115	120	140	160	180	200	225	300
Height (H4) [mm]	Standard H max.	304	304	339	446	512	569	699	801	883	913	1083	1380
	Bellows H max.	337	337	378	488	550	615	769	860	939	969	1141	1380
Support brackets [mm] (drilled only on request)	A									277	277	320	490
	B									160	160	185	1)
	C									Ø 18	Ø 18	Ø 18	Ø 18
	D									293	318	392	1)
	E									21	21	28	1)

Body material: 0.6025 (cast iron)

DIN Flange²⁾	Inlet PN 16	-		PN 16
	Outlet PN 16	-		PN 16

Body material: 0.7043 (ductile Gr. 60-40-18)

DIN Flange²⁾	Inlet	-	-	PN 40	PN 16	PN 25
	Outlet	-	-	PN 16		PN 10

Body material: 1.0619 (WCB)

DIN Flange²⁾	Inlet	-	-	PN 40	PN 25
	Outlet	-	-	PN 16	

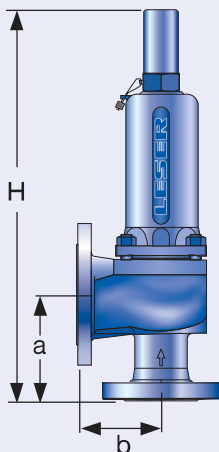
Body material: 1.4408 (CF8M)

DIN Flange²⁾	Inlet	-	-	PN 40
	Outlet	-	-	PN 16

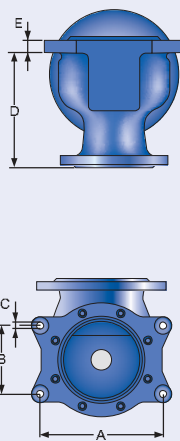
1)

Body material	B	D	E
	[mm]	[mm]	[mm]
0.6025	150	290	16
0.7043	150	489	25
1.0619	160	489	25
1.4408	150	489	25

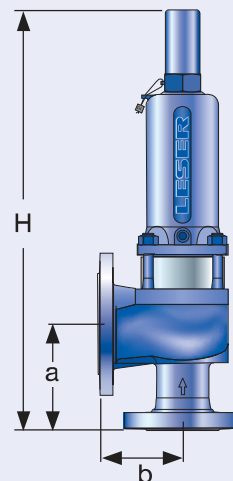
²⁾ Standard flange rating. For other flange drillings and facings please refer to page 01/16 and 01/17.



Conventional design



Support brackets



Balanced bellows design

Type 441, 442 DIN

Dimensions and weights

US Units													
	DN _I	20	20	25	32	40	50	65	80	100	125	150	200
	DN _O	32	40	40	50	65	80	100	125	150	200	250	300
	Actual Orifice diameter d ₀ [inch]	0.71	0.71	0.91	1.14	1.46	1.81	2.36	2.91	3.62	3.86	4.92	6.5
	Actual Orifice area A ₀ [inch ²]	0.394	0.394	0.644	1.024	1.667	2.576	4.383	6.666	10.304	11.691	19.021	33.142
Weight		20	20	20	26	35	49	71	123	165	187	289	628
[lbs]	with bellows	21	21	21	28	38	52	79	132	183	205	313	637
Center to face	Inlet a	3 11/32	3 11/32	4 1/8	4 17/32	5 16/32	5 29/32	6 11/16	7 11/16	8 21/32	9 27/32	11 7/32	11 13/32
[inch]	Outlet b	3 3/4	3 3/4	3 15/16	4 11/32	4 17/32	4 23/32	5 16/32	6 5/16	7 3/32	7 7/8	8 27/32	11 13/16
Height (H4)	Standard H max.	11 13/16	11 13/16	13 11/32	17 9/16	20 5/32	22 13/32	27 17/32	31 17/32	34 3/4	35 15/16	42 5/8	54 11/32
[inch]	Bellows H max.	13 9/32	13 9/32	14 7/8	19 7/32	21 21/32	24 7/32	30 9/32	33 27/32	36 31/32	38 5/32	45	54 11/32
Support brackets	A									10 29/32	10 29/32	12 19/32	19 19/32
[inch]	B									6 1/4	6 1/4	7 9/32	1)
(drilled only on request)	C									Ø 3/4	Ø 3/4	Ø 3/4	Ø 3/4
	D									11 17/32	12 17/32	15 7/16	1)
	E									26/32	26/32	1 3/32	1)

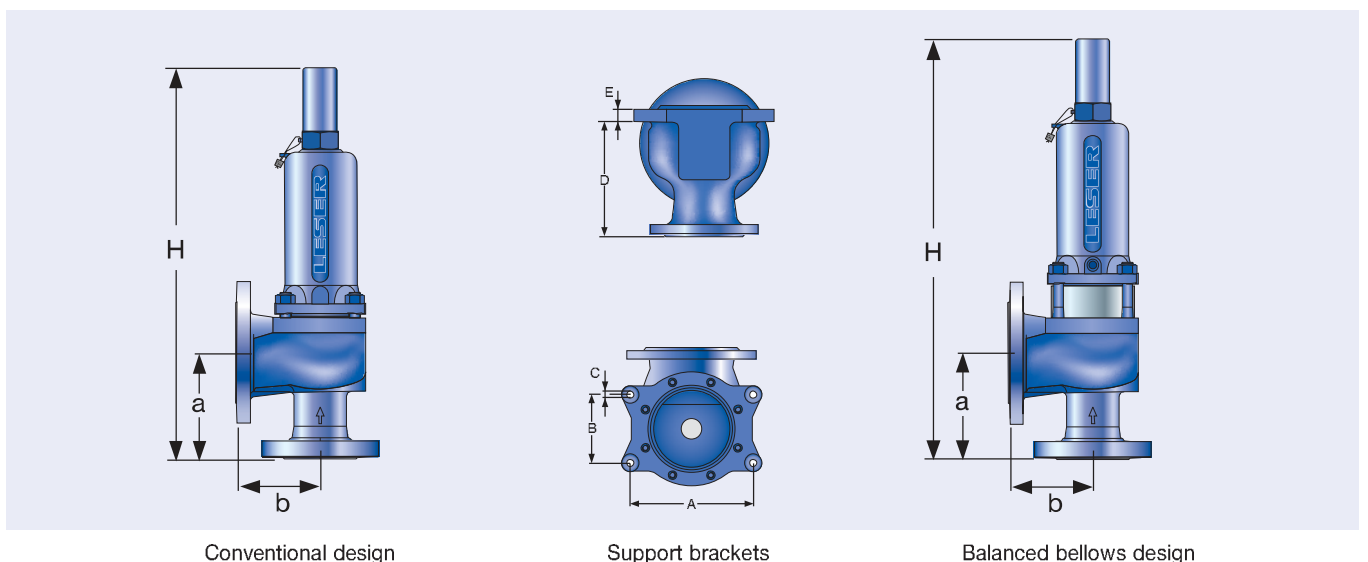
Type 441, 442 DIN

Body material: 0.6025 (cast iron)				
DIN Flange²⁾	Inlet	PN 16	-	PN 16
	Outlet	PN 16	-	PN 16
Body material: 0.7043 (ductile Gr. 60-40-18)				
DIN Flange²⁾	Inlet	-	-	PN 25
	Outlet	-	-	PN 10
Body material: 1.0619 (WCB)				
DIN Flange²⁾	Inlet	-	-	PN 25
	Outlet	-	-	PN 16
Body material: 1.4408 (CF8M)				
DIN Flange²⁾	Inlet	-	-	PN 40
	Outlet	-	-	PN 16

1)

Body material	B	D	E
	[inch]	[inch]	[inch]
0.6025	5 29/32	11 13/32	5/8
0.7043	5 29/32	11 17/32	13/16
1.0619	6 1/4	11 17/32	13/16
1.4408	5 29/32	11 17/32	13/16

2) Standard flange rating. For other flange drillings and facings please refer to page 01/16 and 01/17.



Pressure temperature ratings

Metric Units

DN _i	20	20	25	32	40	50	65	80	100	125	150	200
DN _o	32	40	40	50	65	80	100	125	150	200	250	300
Actual Orifice diameter d ₀ [mm]	18	18	23	29	37	46	60	74	92	98	125	165
Actual Orifice area A ₀ [mm ²]	254	254	416	661	1075	1662	2827	4301	6648	7543	12272	21382

Body material: 0.6025 (cast iron)

DIN Flange	Inlet		PN 16										
	PN 16	-	PN 16										
Outlet		PN 16	-	PN 16									
Minimum set pressure	p [bar _g] S/G/L	0.1	-	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	-
Min. set pressure¹⁾ standard bellows	p [bar _g] S/G/L	3	-	3	3	3	3	3	3	2.74	2.01	0.2	-
Min. set pressure low press. bellows	p [bar _g] S/G/L	2.00	-	0.98	1.41	1.11	1.81	1.50	1.05	1.18	1.41	-	-
Maximum set pressure	p [bar _g] S/G/L	16	-	16	16	16	16	16	16	16	16	16	-
Max. set pressure with special spring	p [bar _g] S/G/L	16	-	16	16	16	16	16	16	16	16	16	-
Temperature acc. to DIN EN	min. [°C]	-10	-	-10									
	max. [°C]	+300	-	+300									
Temperature acc. to ASME	min. [°C]	-	-	-									
	max. [°C]	-	-	-									

Body material: 0.7043 (ductile Gr. 60-40-18)

DIN Flange	Inlet		PN 40							PN 16		PN 25	
	-	-	PN 16							PN 16		PN 10	
Outlet		-	-	PN 16									
Minimum set pressure	p [bar _g] S/G/L	-	-	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Min. set pressure¹⁾ standard bellows	p [bar _g] S/G/L	-	-	3	3	3	3	3	3	2.74	2.01	0.2	0.2
Min. set pressure low press. bellows	p [bar _g] S/G/L	-	-	0.98	1.41	1.11	1.81	1.50	1.05	1.18	1.41	-	-
Maximum set pressure	p [bar _g] S/G/L	-	-	40	40	40	40	40	32	40	16	16	20
Max. set pressure with special spring	p [bar _g] S/G/L	-	-	40	40	40	40	40	40	40	16	16	25
Temperature acc. to DIN EN	min. [°C]	-	-	-60									
	max. [°C]	-	-	+350									
Temperature acc. to ASME	min. [°C]	-	-	-10									
	max. [°C]	-	-	+350									

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

Pressure temperature ratings

Metric Units													
	DN _I	20	20	25	32	40	50	65	80	100	125	150	200
	DN _O	32	40	40	50	65	80	100	125	150	200	250	300
	Actual Orifice diameter d ₀ [mm]	18	18	23	29	37	46	60	74	92	98	125	165
	Actual Orifice area A ₀ [mm ²]	254	254	416	661	1075	1662	2827	4301	6648	7543	12272	21382
Body material: 1.0619 (WCB)													
DIN Flange	Inlet	-	PN 40										PN 25
	Outlet	-	PN 16										
Minimum set pressure	p [bar _g] S/G/L	-	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Min. set pressure ¹⁾ standard bellows	p [bar _g] S/G/L	-	3	3	3	3	3	3	3	2.74	2.01	0.2	0.2
Min. set pressure low press. bellows	p [bar _g] S/G/L	-	2.00	0.98	1.41	1.11	1.81	1.50	1.05	1.18	1.41	-	-
Maximum set pressure	p [bar _g] S/G/L	-	40	40	40	40	40	40	32	40	28	17	20
Max. set pressure with special spring	p [bar _g] S/G/L	-	40	40	40	40	40	40	40	40	28	25	25
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										-
	Outlet	-	-	PN 16										-
Minimum set pressure	p [bar _g] S/G/L	-	-	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	-	
Min. set pressure ¹⁾ standard bellows	p [bar _g] S/G/L	-	-	3	3	3	3	3	3	2.74	2.01	0.2	-	
Min. set pressure low press. bellows	p [bar _g] S/G/L	-	-	0.98	1.41	1.11	1.81	1.50	1.05	1.18	1.41	-	-	
Maximum set pressure	p [bar _g] S/G/L	-	-	40	40	40	33	28	13.6	20	17.7	7	-	
Max. set pressure with special spring	p [bar _g] S/G/L	-	-	40	40	40	37	28	25	26	24	10	-	
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.

Pressure temperature ratings

US Units

		DN _i	20	20	25	32	40	50	65	80	100	125	150	200		
		DN _o	32	40	40	50	65	80	100	125	150	200	250	300		
		Actual Orifice diameter d ₀ [inch]	0.71	0.71	0.91	1.14	1.46	1.81	2.36	2.91	3.62	3.86	4.92	6.5		
		Actual Orifice area A ₀ [inch ²]	0.394	0.394	0.644	1.024	1.667	2.576	4.383	6.666	10.304	11.691	19.021	33.142		
Body material: 0.6025 (cast iron)																
DIN Flange	Inlet	PN 16	-											PN 16	-	
	Outlet	PN 16	-											PN 16	-	
Minimum set pressure	p [psig] S/GL		1.5	-	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	-		
Min. set pressure¹⁾ standard bellows	p [psig] S/GL		43.5	-	43.5	43.5	43.5	43.5	43.5	43.5	39.7	29.1	2.9	-		
Min. set pressure low press. bellows	p [psig] S/GL		29	-	14	20	16	26	22	15	17	20	-	-		
Maximum set pressure	p [psig] S/GL		232	-	232	232	232	232	232	232	232	232	232	-		
Max. set pressure with special spring	p [psig] S/GL		232	-	232	232	232	232	232	232	232	232	232	-		
Temperature acc. to DIN EN	min. [°F]		+14	-											+14	-
	max. [°F]		+572	-											+572	-
Temperature acc. to ASME	min. [°F]		-	-											-	-
	max. [°F]		-	-											-	-

Body material: 0.7043 (ductile Gr. 60-40-18)

DIN Flange			Inlet	-	-	PN 40						PN 16		PN 25		
						Outlet	-	-	PN 16							
Minimum set pressure	p [psig] S/GL		-	-	-	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5		
Min. set pressure¹⁾ standard bellows	p [psig] S/GL		-	-	-	43.5	43.5	43.5	43.5	43.5	43.5	39.7	29.1	2.9		
Min. set pressure low press. bellows	p [psig] S/GL		-	-	-	14	20	16	26	22	15	17	20	-		
Maximum set pressure	p [psig] S/GL		-	-	-	580	580	580	580	580	464	580	232	232		
Max. set pressure with special spring	p [psig] S/GL		-	-	-	580	580	580	580	580	580	580	232	232		
Temperature acc. to DIN EN	min. [°F]		-	-	-											-76
	max. [°F]		-	-	-											+662
Temperature acc. to ASME	min. [°F]		-	-	-											+14
	max. [°F]		-	-	-											+662

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

Pressure temperature ratings

US Units													
	DN _I	20	20	25	32	40	50	65	80	100	125	150	200
	DN _O	32	40	40	50	65	80	100	125	150	200	250	300
	Actual Orifice diameter d ₀ [inch]	0.71	0.71	0.91	1.14	1.46	1.81	2.36	2.91	3.62	3.86	4.92	6.5
	Actual Orifice area A ₀ [inch ²]	0.394	0.394	0.644	1.024	1.667	2.576	4.383	6.666	1.304	11.691	19.021	33.142
Body material: 1.0619 (WCB)													
DIN Flange	Inlet	-	PN 40										PN 25
	Outlet	-	PN 16										
Minimum set pressure	p [psig] S/GL	-	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Min. set pressure ¹⁾ standard bellows	p [psig] S/GL	-	43.5	43.5	43.5	43.5	43.5	43.5	43.5	39.7	29.1	2.9	2.9
Min. set pressure low press. bellows	p [psig] S/GL	-	29	14	20	16	26	22	15	17	20	-	-
Maximum set pressure	p [psig] S/GL	-	580	580	580	580	580	580	464	580	406	247	290
Max. set pressure with special spring	p [psig] S/GL	-	580	580	580	580	580	580	580	580	406	363	363
Temperature acc. to DIN EN	min. [°F]	-	-121										
	max. [°F]	-	+842										
Temperature acc. to ASME	min. [°F]	-	-20										
	max. [°F]	-	+800										

Body material: 1.4408 (CF8M)														
DIN Flange	Inlet	-	-	PN 40										-
	Outlet	-	-	PN 16										-
Minimum set pressure	p [psig] S/GL	-	-	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	-	
Min. set pressure ¹⁾ standard bellows	p [psig] S/GL	-	-	43.5	43.5	43.5	43.5	43.5	43.5	39.7	29.1	2.9	-	
Min. set pressure low press. bellows	p [psig] S/GL	-	-	14	20	16	26	22	15	17	20	-	-	
Maximum set pressure	p [psig] S/GL	-	-	580	580	580	479	406	197	290	257	102	-	
Max. set pressure with special spring	p [psig] S/GL	-	-	580	580	580	537	406	363	377	348	145	-	
Temperature acc. to DIN EN	min. [°F]	-	-	-454										
	max. [°F]	-	-	+752										
Temperature acc. to ASME	min. [°F]	-	-	-450										
	max. [°F]	-	-	+1000										

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

Flange drillings

Flange drillings

		DN _I	20	20	25	32	40	50	65	80	100	125	150	200
		DN _O	32	40	40	50	65	80	100	125	150	200	250	300
		Valve size	–	3/4" x 1 1/2"	1" x 1 1/2"	1 1/4" x 2"	1 1/2" x 2 1/2"	2" x 3"	2 1/2" x 4"	3" x 5"	4" x 6"	5" x 8"	6" x 10"	8" x 12"
		Actual Orifice diameter d ₀ [mm]	18	18	23	29	37	46	60	74	92	98	125	165
		Actual Orifice area A ₀ [mm ²]	254	254	416	661	1075	1662	2827	4301	6648	7543	12272	21382
Body material: 0.6025 (cast iron)														
Inlet	DIN EN 1092	PN 10	Please select body material 1.0619	*	*	*	*	*	*	*	*	*	*	*
		PN 16		*	*	*	*	*	*	*	*	*	*	
		PN 25		–	–	–	–	–	–	–	–	–	–	
		PN 40		–	–	–	–	–	–	–	–	–	–	
Outlet	DIN EN 1092	PN 10	Please select other body material	*	*	*	*	*	*	*	*	H50	H50	
		PN 16		*	*	*	*	*	*	*	*	*	*	
		PN 25		–	–	–	–	–	–	–	–	–	–	
		PN 40		–	–	–	–	–	–	–	–	–	–	
Body material: 0.7043 (ductile Gr. 60-40-18)														
Inlet	DIN EN 1092	PN 10	Please select other body material	*	*	*	*	*	H45	*	H45	*	*	H44
		PN 16		*	*	*	*	*	*	*	*	*	*	H45
		PN 25		*	*	*	*	*	*	*	*	–	–	*
		PN 40		*	*	*	*	*	*	*	*	–	–	–
Outlet	DIN EN 1092	PN 10	Please select other body material	*	*	*	*	*	*	*	*	H50	H50	*
		PN 16		*	*	*	*	*	*	*	*	*	(H51)	
		PN 25		*	(*)	(H15)	(*)	–	–	–	–	–	–	
		PN 40		*	(*)	(H15)	(*)	–	–	–	–	–	–	
Body material: 1.0619 (WCB), 1.4408 (CF8M)														
Inlet	DIN EN 1092	PN 10	Please select other body material	*	*	*	*	*	H45	H45	H45	H45	H45	H44
		PN 16		*	*	*	*	*	H45	H45	H45	H45	H45	H44
		PN 25		*	*	*	*	*	*	*	*	*	*	*
		PN 40		*	*	*	*	*	*	*	*	*	*	*
	ASME B16.5 ¹⁾	CL150		H64	H64	H64	H64	H64	H64	H64	[H64]	H64	H64	H64
		CL300		–	–	H65	–	[H65]	–	–	–	–	–	–
Outlet	DIN EN 1092	PN 10	Please select other body material	*	*	*	*	*	*	*	*	H50	H50	H50
		PN 16		*	*	*	*	*	*	*	*	*	*	*
		PN 25		*	*	*	(H15)	(*)	–	–	–	–	–	H52
		PN 40		*	*	*	(H15)	(*)	–	–	–	–	–	H52
	ASME B16.5 ¹⁾	CL150		H79	H79	H79	H79	H79	[H79]	H79	H79	H79	H79	H79
		CL300		–	–	[H80]	–	–	–	–	–	–	–	–

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.

¹⁾ For drillings according to ASME B16.5 please use preferred Type 441, 442 ANSI.

Flange facings

Flange facings										
Indication		Standard		Inlet		Outlet		Remark		
General										
Flange undrilled		-		H38		H39				
Linde-V-Nut, Form V48		Linde Standard 420-08 LWN 313.36		J07		J08		Groove: Rz 16		
Linde-V-Nut, Form V48A				J05		J06		Groove: Rz 4, e.g. with hydrogen		
Lens seal form L (without sealing lens)		DIN 2696 LWN 313.35		J11		J12				
Acc. to DIN EN 1092										
Flange facing (see also LWN 313.40)				Inlet PN 10 – PN 40		Outlet PN 10 – PN 40		Remark 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.

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.

Order information – Spare parts

Spare parts

	DN _I	20	20	25	32	40	50	65
	DN _O	32	40	40	50	65	80	100
	Actual Orifice diameter d ₀ [mm]	18	18	23	29	37	46	60
	Actual Orifice area A ₀ [mm ²]	254	254	416	661	1075	1662	2827
Disc (Item 7): Metal to metal seat								
Material-No. / Art.-No.								
Disc	1.4122	210.7039.9000	210.9739.9000	210.9839.9000	210.9939.9000	210.8739.9000	220.1639.9000	
detachable lifting aid	1.4404	–	210.9749.9000	210.9849.9000	210.9949.9000	210.8749.9000	220.1649.9000	
Disc (Item 7): Soft seal								
Material-No. / Art.-No.								
Disc	CR	“K”	200.4939.9051	200.5049.9051	200.5149.9051	200.5249.9051	200.5349.9051	200.5449.9051
	EPDM	“D”	200.4939.9041	200.5049.9041	200.5149.9041	200.5249.9041	200.5349.9041	200.5449.9041
	FKM	“L”	200.4939.9071	200.5049.9071	200.5149.9071	200.5249.9071	200.5349.9071	200.5449.9071
	FFKM	“C”	200.4939.9091	200.5049.9091	200.5149.9091	200.5249.9091	200.5349.9091	on request
O-ring (Item 7.4): Soft seal								
Material-No. / Art.-No.								
O-ring	CR	“K”	502.0171.2651	502.0249.3551	502.0313.3551	502.0408.3551	502.0503.3551	502.0660.5351
	EPDM	“D”	502.0171.2641	502.0249.3541	502.0313.3541	502.0408.3541	502.0503.3541	502.0660.5341
	FKM	“L”	502.0171.2671	502.0249.3571	502.0313.3571	502.0408.3571	502.0503.3571	502.0660.5371
	FFKM	“C”	502.0171.2691	502.0249.3591	502.0313.3591	502.0408.3591	502.0503.3591	on request
Bellows (Item 15): 1.4571								
Material-No. / Art.-No.								
Standard bellows			400.0149.0000	400.0949.0000	400.1049.0000	400.1149.0000	400.1249.0000	400.1349.0000
Conversion kit standard¹⁾			5021.1040	5021.1041	5021.1042	5021.1043	5021.1044	5021.1045
Low pressure bellows			400.0149.0021	400.0949.0021	400.1049.0021	400.1149.0021	400.1249.0021	400.1349.0021
Conversion kit low pressure¹⁾	please specify in writing							
Gasket – Body / bonnet (Item 60)								
Material-No. / Art.-No.								
Gasket	Graphite + 1.4401		500.0407.0000	500.0607.0000	500.0807.0000	500.1007.0000	500.1207.0000	500.1607.0000
Option code L68	Gylon (filled PTFE)		500.0405.0000	500.0605.0000	500.0805.0000	500.1005.0000	500.1205.0000	500.1605.0000
Ball (Item 61)								
Material-No. / Art.-No.								
Ball	Ball Ø [mm]	6	6	6	9	9	12	
	1.4404	510.0104.0000	510.0104.0000	510.0104.0000	510.0204.0000	510.0204.0000	510.0304.0000	
Split ring (Item 14)								
Material-No. / Art.-No.								
Split ring	Spindle Ø [mm]	12	12	16	16	16	20	
	1.4404	251.0149.0000	251.0149.0000	251.0249.0000	251.0249.0000	251.0249.0000	251.0349.0000	
Pin (Item 57)								
Material-No. / Art.-No.								
Pin	1.4310	480.0505.0000	480.0505.0000	480.0705.0000	480.0705.0000	480.0705.0000	480.1005.0000	

¹⁾ For pressure range see page 01/12 – 01/15.
A conversion kit contains the following components:

Item	Component	No.
8	Guide	1
11	Bonnet spacer	1
12	Spindle	1
15	Bellows	1
55	Stud	4
60	Gasket	3
	Installation instruction LWN 037.05	1

Refer to page 01/04

Order information – Spare parts

Spare parts						
	DN _I	80	100	125	150	200
	DN _O	125	150	200	250	300
	Actual Orifice diameter d ₀ [mm]	74	92	98	125	165
	Actual Orifice area A ₀ [mm ²]	4301	6648	7543	12272	21382
Disc (Item 7): Metal to metal seat						
Material-No. / Art.-No.						
Disc	1.4122	220.1739.9000	220.1839.9000	220.0439.9000	220.1949.9000	–
detachable lifting aid	1.4404	220.1749.9000	220.1849.9000	220.0449.9000	220.1949.9000	230.1549.9000
Disc (Item 7): Soft seal						
Material-No. / Art.-No.						
Disc	CR	“K”	200.5549.9051	on request	on request	on request
	EPDM	“D”	200.5549.9041	200.5649.9041	200.5749.9041	200.5849.9041
	FKM	“L”	200.5549.9071	200.5649.9071	200.5749.9071	on request
	FFKM	“C”	on request	on request	on request	on request
O-ring (Item 7.4): Soft seal						
Material-No. / Art.-No.						
O-ring	CR	“K”	502.0819.5351	on request	on request	on request
	EPDM	“D”	502.0819.5341	502.1041.5341	502.1041.5341	502.1295.5341
	FKM	“L”	502.0819.5371	502.1041.5371	502.1041.5371	on request
	FFKM	“C”	on request	on request	on request	on request
Bellows (Item 15): 1.4571						
Material-No. / Art.-No.						
Standard bellows			400.1449.0000	400.0849.0000	400.0849.0000	400.3949.0000
Conversion kit standard¹⁾			5021.1046	5021.1047	5021.1047	5021.1048
Low pressure bellows			400.1449.0021	400.0849.0021	400.0849.0021	–
Conversion kit low pressure¹⁾			please specify in writing			–
Gasket – Body / bonnet (Item 60)						
Material-No. / Art.-No.						
Gasket	Graphite + 1.4401		500.1907.0000	500.2107.0000	500.2107.0000	500.2207.0000
Option code L68	Gylon (filled PTFE)		500.1905.0000	500.2105.0000	500.2105.0000	500.2205.0000
Ball (Item 61)						
Material-No. / Art.-No.						
Ball	Ball Ø [mm]	12	15	15	15	18
	1.4404	510.0304.0000	510.0404.0000	510.0404.0000	510.0404.0000	510.0505.0000
Split ring (Item 14)						
Material-No. / Art.-No.						
Split ring	Spindle Ø [mm]	24	24	24	30	35
	1.4404	251.0449.0000	251.0449.0000	251.0449.0000	251.0549.0000	251.1949.0000
Pin (Item 57)						
Material-No. / Art.-No.						
Pin	1.4310	480.1005.0000	480.1105.0000	480.1105.0000	480.1205.0000	480.1405.0000

¹⁾ For pressure range see page 01/12 – 01/15.
A conversion kit contains the following components:

Item	Component	No.
8	Guide	1
11	Bonnet spacer	1
12	Spindle	1
15	Bellows	1
55	Stud	8, 12 depends on valve size
60	Gasket	2, 3 depends on valve size
	Installation instruction LWN 037.05	1

Refer to page 01/04

Type 441, 442 DIN

LESER

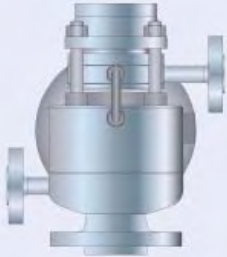
Available Options

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

Type 441, 442 DIN

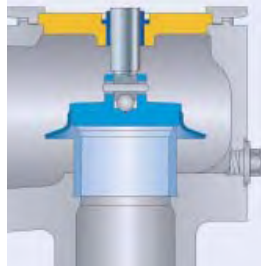
Heating jacket

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 $\frac{1}{2}$



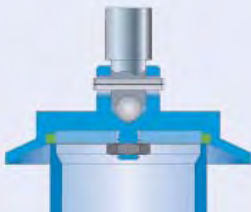
Open bonnet

See Art.-No.



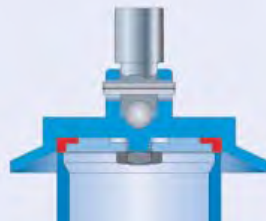
O-ring-disc

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



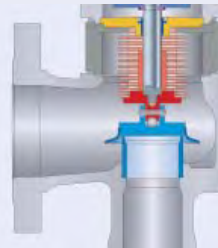
Disc with inserted sealing plate

J44: PTFE-FDA
J48: PCTFE
J49: SP



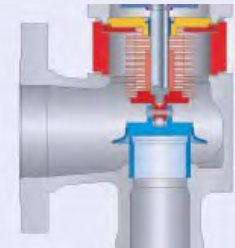
Stainless steel bellows

J68: Open bonnet
J78: Closed bonnet



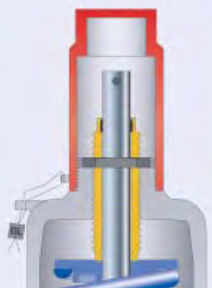
Conversion kit for stainless steel bellows

See Art.-No. page 06/15



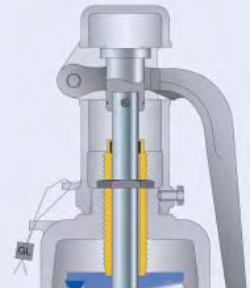
Screwed cap H2

H2



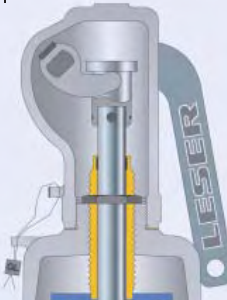
Plain lever H3

H3



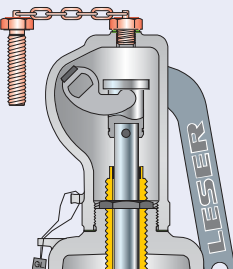
Packed lever H4

H4



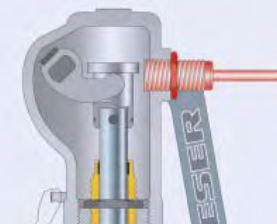
Test gag

J69: H4
J70: H2



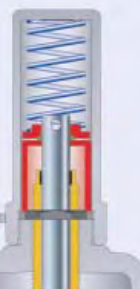
Lift indicator

J39: Adaptor H4
J93: Lift indicator



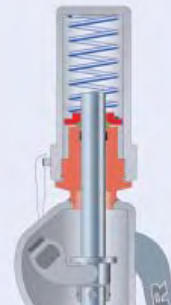
O-ring-damper H2

J65



O-ring-damper H4

J66



Approvals

Approvals		
	DN _I	20 – 200
	DN _O	32 – 300
	Actual Orifice diameter d ₀ [mm]	18 – 165
	Actual Orifice area A ₀ [mm ²]	254 – 21382
Europe		Coefficient of discharge K_{dr}
PED/DIN EN ISO 4126-1	Approval No.	072020111Z0008/0/08 Rev.3
	S/G	0.7
	L	0.45
Germany		Coefficient of discharge U_w
PED/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 Div. 1	Approval No.	M37044
	S/G	0.699
	Approval No.	M37055
	L	0.521
Canada		Coefficient of discharge K
Canada: CRN	Approval No.	For current approval no. see www.leser.com
	S/G	0.699
	L	0.521
China		Coefficient of discharge U_w
AQSIQ	Approval No.	For current approval no. see www.leser.com
	S/G	0.7
	L	0.45
Russia		Coefficient of discharge U_w
GOST R / RTN	Approval No.	For current approval no. see www.leser.com
	S/G	0.7
	L	0.45
Kazakhstan		Coefficient of discharge U_w
GOST-K	Approval No.	For current approval no. see www.leser.com
	S/G	0.7
	L	0.45
Belarus		Coefficient of discharge U_w
GOSPROMNAZADOR	Approval No.	For current approval no. see www.leser.com
	S/G	0.7
	L	0.45
Classification societies		Homepage
Bureau Veritas	BV	www.bureauveritas.com
Det Norske Veritas	DNV	www.dnv.com
Germanischer Lloyd	GL	www.gl-group.com
Lloyd' s Register EMEA	LREMEA	www.lr.org
Registro Italiano Navale	RINA	www.rina.org

The valid certification number is changed with every renewal.

For a sample certificate including the valid certification number see www.leser.com

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	20	20	25	32	40	50	65	80	100	125	150	200	
DN _O	32	40	40	50	65	80	100	125	150	200	250	300	
Actual Orifice diameter d ₀ [mm]	18	18	23	29	37	46	60	74	92	98	125	165	
Actual Orifice area A ₀ [mm ²]	254	254	416	661	1075	1662	2827	4301	6648	7543	12272	21382	
LEO _{S/G} ^{*)} [inch ²]	0.283	0.283	0.462	0.734	1.195	1.847	3.142	4.779	7.387	8.382	13.637	23.761	
Set pressure [bar]	Capacities [kg/h]												
0.1	0	0	0	0	0	0	0	0	0	0	0	0	
0.2	86	86	140	223	363	561	954	1451	2243	2545	4140	7214	
0.5	137	137	224	356	579	895	1523	2316	3580	4062	6609	11516	
1	199	199	326	518	843	1302	2215	3370	5209	5910	9616	16755	
2	318	318	519	825	1343	2075	3531	5371	8302	9420	15326	26704	
3	428	428	699	1111	1808	2794	4754	7232	11178	12683	20635	35954	
4	534	534	871	1385	2254	3485	5928	9018	13938	15816	25731	44834	
5	639	639	1043	1658	2699	4172	7097	10796	16687	18934	30804	53673	
6	744	744	1214	1930	3142	4856	8262	12568	19426	22042	35861	62484	
7	846	846	1381	2196	3574	5525	9399	14297	22098	25074	40794	71080	
8	950	950	1551	2466	4014	6205	10556	16057	24818	28161	45816	79830	
9	1054	1054	1721	2736	4454	6884	11712	17815	27535	31244	50831	88569	
10	1158	1158	1891	3006	4893	7562	12866	19571	30250	34324	55842	97300	
12	1366	1366	2230	3545	5770	8919	15174	23081	35675	40480	65858	114751	
14	1569	1569	2562	4073	6629	10247	17433	26518	40987	46507	75664	131837	
16	1776	1776	2900	4610	7505	11600	19735	30020	46400	52650	85657	149249	
18	1984	1984	3239	5149	8382	12955	22041	33526	51820	58800	95663	166683	
20	2191	2191	3578	5688	9260	14312	24350	37039	57249	64960	105685	184145	
22	2393	2393	3907	6212	10111	15629	26590	40446	62515	70935	115407	201085	
24	2601	2601	4247	6752	10991	16988	28903	43964	67953	77106	125445	218576	
26	2810	2810	4588	7294	11873	18351	31222	47491	73405	83292			
28	3019	3019	4930	7837	12757	19718	33547	51029	78873	89496			
30	3229	3229	5272	8382	13644	21089	35880	54577	84358				
32	3440	3440	5616	8929	14534	22465	38220	58137	89860				
34	3641	3641	5945	9451	15384	23779	40455	61537	95115				
36	3853	3853	6290	10000	16278	25160	42806	65112	100641				
38	4065	4065	6637	10551	17175	26547	45165	68701	106188				
40	4278	4278	6985	11104	18076	27939	47533	72303	111756				

^{*)} 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 DIN



Capacities – Steam

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	20	20	25	32	40	50	65	80	100	125	150	200
DN _O	32	40	40	50	65	80	100	125	150	200	250	300
Actual Orifice diameter d ₀ [inch]	0.71	0.71	0.91	1.14	1.46	1.81	2.36	2.91	3.62	3.86	4.92	6.5
Actual Orifice area A ₀ [inch ²]	0.394	0.394	0.644	1.024	1.667	2.576	4.383	6.666	10.304	11.691	19.021	33.142
LEO _{S/G} ^{*)} [inch ²]	0.283	0.283	0.462	0.734	1.195	1.847	3.142	4.779	7.387	8.382	13.637	23.761
Set pressure [psig]	Capacities [lb/h]											
15			757	1204	1959	3028	5152	7837	12113	13744	22361	38962
20			873	1388	2259	3492	5941	9037	13968	15849	25785	44928
30			1105	1756	2859	4419	7519	11436	17677	20058	32632	56859
40			1360	2162	3519	5439	9254	14076	21757	24687	40165	69983
50			1615	2567	4179	6459	10989	16716	25837	29317	47697	83107
60			1870	2973	4839	7479	12725	19356	29917	33947	55229	96231
70			2125	3378	5499	8499	14460	21995	33997	38576	62761	109355
80			2380	3783	6159	9519	16196	24635	38078	43206	70293	122479
90			2635	4189	6819	10539	17931	27275	42158	47836	77825	135603
100			2890	4594	7479	11559	19666	29915	46238	52466	85357	148727
120			3400	5405	8799	13600	23137	35194	54398	61725	100422	174975
140			3910	6216	10118	15640	26608	40474	62558	70984	115486	201223
160			4420	7027	11438	17680	30079	45753	70719	80244	130550	227471
180			4930	7838	12758	19720	33550	51033	78879	89503	145615	253719
200			5440	8648	14078	21760	37020	56312	87039	98762	160679	279967
220			5950	9459	15398	23800	40491	61592	95200	108022	175743	306215
240			6460	10270	16718	25840	43962	66871	103360	117281	190808	332463
260			6970	11081	18038	27880	47433	72151	111520	126540	205872	358711
280			7480	11892	19358	29920	50904	77430	119680	135800	220936	384960
300			7990	12703	20677	31960	54375	82710	127841	145059	236001	411208
320			8500	13513	21997	34000	57845	87989	136001	154319	251065	437456
340			9010	14324	23317	36040	61316	93269	144161	163578	266129	463704
360			9520	15135	24637	38080	64787	98548	152321	172837	281194	489952
380			10030	15946	25957	40120	68258	103828	160482	182097		
400			10540	16757	27277	42161	71729	109107	168642	191356		
420			11050	17567	28597	44201	75199	114387	176802			
440			11560	18378	29917	46241	78670	119666	184963			
460			12070	19189	31236	48281	82141	124946	193123			
480			12580	20000	32556	50321	85612	130225	201283			
500			13090	20811	33876	52361	89083	135505	209443			
550			14365	22838	37176	57461	97760	148704	229844			
580			15130	24054	39156	60521	102966	156623	242085			

Please select DN_I 25

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

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	20	20	25	32	40	50	65	80	100	125	150	200	
DN _O	32	40	40	50	65	80	100	125	150	200	250	300	
Actual Orifice diameter d ₀ [mm]	18	18	23	29	37	46	60	74	92	98	125	165	
Actual Orifice area A ₀ [mm ²]	254	254	416	661	1075	1662	2827	4301	6648	7543	12272	21382	
LEO _{S/G} ^{*)} [inch ²]	0.283	0.283	0.462	0.734	1.195	1.847	3.142	4.779	7.387	8.382	13.637	23.761	
Set pressure [bar]	Capacities [m _n ³ /h]												
0.1	0	0	0	0	0	0	0	0	0	0	0	0	
0.2	99	99	162	258	420	649	1105	1680	2597	2947	4794	8354	
0.5	161	161	263	418	680	1051	1789	2721	4206	4772	7764	13528	
1	238	238	388	617	1004	1552	2641	4017	6209	7045	11461	19970	
2	384	384	627	996	1622	2507	4265	6487	10026	11377	18509	32251	
3	523	523	854	1357	2209	3414	5809	8836	13657	15497	25212	43930	
4	656	656	1071	1703	2773	4286	7291	11091	17143	19452	31647	55142	
5	790	790	1289	2050	3337	5157	8774	13346	20629	23407	38082	66354	
6	923	923	1507	2396	3900	6029	10257	15601	24114	27362	44516	77565	
7	1057	1057	1725	2742	4464	6900	11739	17857	27600	31317	50951	88777	
8	1190	1190	1943	3089	5028	7771	13222	20112	31086	35273	57386	99989	
9	1323	1323	2161	3435	5592	8643	14704	22367	34571	39228	63821	111201	
10	1457	1457	2379	3781	6155	9514	16187	24622	38057	43183	70255	122413	
12	1724	1724	2814	4474	7283	11257	19152	29132	45028	51093	83125	144836	
14	1991	1991	3250	5167	8411	13000	22117	33642	52000	59003	95994	167260	
16	2257	2257	3686	5859	9538	14743	25082	38153	58971	66914	108863	189684	
18	2524	2524	4121	6552	10666	16486	28047	42663	65942	74824	121733	212107	
20	2791	2791	4557	7245	11793	18228	31012	47173	72913	82734	134602	234531	
22	3058	3058	4993	7938	12921	19971	33977	51683	79885	90644	147472	256954	
24	3325	3325	5429	8630	14048	21714	36943	56194	86856	98555	160341	279378	
26	3592	3592	5864	9323	15176	23457	39908	60704	93827	106465			
28	3859	3859	6300	10016	16304	25200	42873	65214	100799	114375			
30	4125	4125	6736	10708	17431	26942	45838	69725	107770				
32	4392	4392	7171	11401	18559	28685	48803	74235	114741				
34	4659	4659	7607	12094	19686	30428	51768	78745	121713				
36	4926	4926	8043	12786	20814	32171	54733	83255	128684				
38	5193	5193	8478	13479	21941	33914	57698	87766	135655				
40	5460	5460	8914	14172	23069	35657	60663	92276	142626				

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

Capacities – Air

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	20	20	25	32	40	50	65	80	100	125	150	200	
DN _O	32	40	40	50	65	80	100	125	150	200	250	300	
Actual Orifice diameter d ₀ [inch]	0.71	0.71	0.91	1.14	1.46	1.81	2.36	2.91	3.62	3.86	4.92	6.5	
Actual Orifice area A ₀ [inch ²]	0.394	0.394	0.644	1.024	1.667	2.576	4.383	6.666	10.304	11.691	19.021	33.142	
LEO _{S/G} ^{*)} [inch ²]	0.283	0.283	0.462	0.734	1.195	1.847	3.142	4.779	7.387	8.382	13.637	23.761	
Set pressure [psig]	Capacities [S.C.F.M.]												
15			270	429	698	1079	1835	2792	4315	4896	7965	2780	
20			311	494	805	1244	2116	3219	4976	5646	9185	3142	
30			394	626	1019	1574	2679	4074	6297	7145	11624	3764	
40			484	770	1254	1938	3297	5014	7750	8794	14307	4346	
50			575	915	1489	2301	3915	5954	9204	10444	16990	4859	
60			666	1059	1724	2664	4533	6895	10657	12093	19673	5323	
70			757	1204	1959	3028	5152	7835	12111	13742	22356	5749	
80			848	1348	2194	3391	5770	8775	13564	15391	25039	6146	
90			939	1492	2430	3754	6388	9715	15018	17041	27722	6519	
100			1029	1637	2665	4118	7006	10656	16471	18690	30406	6872	
120			1211	1926	3135	4845	8243	12536	19378	21988	35772	7528	
140			1393	2215	3605	5571	9479	14417	22285	25287	41138	8131	
160			1574	2504	4076	6298	10716	16298	25192	28585	46504	8692	
180			1756	2792	4546	7025	11952	18178	28099	31884	51870	9220	
200			1938	3081	5016	7751	13189	20059	31006	35182	57236	9718	
220			2120	3370	5486	8478	14425	21939	33913	38481	62602	10193	
240			2301	3659	5957	9205	15662	23820	36820	41779	67968	10646	
260			2483	3948	6427	9932	16898	25700	39727	45078	73334	11081	
280			2665	4237	6897	10658	18135	27581	42633	48376	78701	11499	
300			2846	4526	7368	11385	19371	29462	45540	51675	84067	11902	
320			3028	4815	7838	12112	20608	31342	48447	54973	89433	12293	
340			3210	5104	8308	12839	21844	33223	51354	58272	94799	12671	
360			3391	5392	8778	13565	23081	35103	54261	61570	100165	13039	
380			3573	5681	9249	14292	24317	36984	57168	64869			
400			3755	5970	9719	15019	25554	38864	60075	68167			
420			3936	6259	10189	15745	26791	40745	62982				
440			4118	6548	110660	16472	28027	42626	65889				
460			4300	6837	11130	17199	29264	44506	68796				
480			4481	7126	11600	17926	30500	46387	71703				
500			4663	7415	12070	18652	31737	48267	74610				
550			5117	8137	13246	20469	34828	52969	81877				
580			5390	8570	13952	21559	36683	55790	86237				

 Please select DN_I 25

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

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.

Metric Units		AD 2000-Merkblatt A2 [10^3kg/h]											
DN _I	20	20	25	32	40	50	65	80	100	125	150	200	
DN _O	32	40	40	50	65	80	100	125	150	200	250	300	
Actual Orifice diameter d ₀ [mm]	18	18	23	29	37	46	60	74	92	98	125	165	
Actual Orifice area A ₀ [mm ²]	254	254	416	661	1075	1662	2827	4301	6648	7543	12272	21382	
LEO _L ^{*)} [inch ²]	0.316	0.316	0.516	0.821	1.336	2.062	3.513	5.343	8.259	9.371	15.246	26.565	
Set pressure [bar]	Capacities [10^3kg/h]												
0.1	2.60	2.60	4.25	6.76	11.0	17.0	28.9	44.0	68.0	77.2	126	219	
0.2	3.19	3.19	5.21	8.28	13.5	20.8	35.5	53.9	83.3	94.6	154	268	
0.5	4.51	4.51	7.37	11.7	19.1	29.5	50.1	76.3	118	134	218	379	
1	6.11	6.11	9.97	15.9	25.8	39.9	67.9	103	160	181	295	513	
2	8.64	8.64	14.1	22.4	36.5	56.4	96.0	146	226	256	417	726	
3	10.6	10.6	17.3	27.5	44.7	69.1	118	179	276	314	510	889	
4	12.2	12.2	19.9	31.7	51.6	79.8	136	206	319	362	589	1027	
5	13.7	13.7	22.3	35.5	57.7	89.2	152	231	357	405	659	1148	
6	15.0	15.0	24.4	38.8	63.2	97.7	166	253	391	444	722	1257	
7	16.2	16.2	26.4	42.0	68.3	106	180	273	422	479	779	1358	
8	17.3	17.3	28.2	44.8	73.0	113	192	292	451	512	833	1452	
9	18.3	18.3	29.9	47.6	77.4	120	204	310	479	543	884	1540	
10	19.3	19.3	31.5	50.1	81.6	126	215	326	505	573	932	1623	
12	21.2	21.2	34.6	54.9	89.4	138	235	358	553	627	1021	1778	
14	22.9	22.9	37.3	59.3	96.6	149	254	386	597	678	1102	1921	
16	24.4	24.4	39.9	63.4	103	160	272	413	638	724	1178	2053	
18	25.9	25.9	42.3	67.3	110	169	288	438	677	768	1250	2178	
20	27.3	27.3	44.6	70.9	115	178	304	462	714	810	1317	2296	
22	28.7	28.7	46.8	74.4	121	187	318	484	748	849	1382	2408	
24	29.9	29.9	48.9	77.7	126	195	333	506	782	887	1443	2515	
26	31.1	31.1	50.9	80.9	132	203	346	526	814	923			
28	32.3	32.3	52.8	83.9	137	211	359	546	844	958			
30	33.5	33.5	54.6	86.8	141	219	372	565	874				
32	34.6	34.6	56.4	89.7	146	226	384	584	903				
34	35.6	35.6	58.2	92.5	151	233	396	602	931				
36	36.7	36.7	59.8	95.1	155	239	407	619	957				
38	37.7	37.7	61.5	97.7	159	246	418	636	984				
40	38.6	38.6	63.1	100	163	252	429	653	1009				

^{*)} 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 DIN



Capacities – Water

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.

US Units		ASME Section VIII [US-G.P.M.]											
	DN _I	20	20	25	32	40	50	65	80	100	125	150	200
	DN _O	32	40	40	50	65	80	100	125	150	200	250	300
	Actual Orifice diameter d ₀ [inch]	0.71	0.71	0.91	1.14	1.46	1.81	2.36	2.91	3.62	3.86	4.92	6.5
	Actual Orifice area A ₀ [inch ²]	0.394	0.394	0.644	1.024	1.667	2.576	4.383	6.666	10.304	11.691	19.021	33.142
	LEO _L ^{*)} [inch ²]	0.316	0.316	0.516	0.821	1.336	2.062	3.513	5.343	8.259	9.371	15.246	26.565
Set pressure [psig]	Capacities [US-G.P.M.]												
15				54.0	85.9	140	216	368	559	864	981	1595	2780
20				61.1	97.1	158	244	416	632	977	1109	1803	3142
30				73.1	116	189	293	498	757	1170	1328	2160	3764
40				84.5	134	219	338	575	874	1351	1533	2494	4346
50				94.4	150	244	378	643	977	1511	1714	2789	4859
60				103	164	268	414	704	1071	1655	1878	3055	5323
70				112	178	289	447	760	1156	1787	2028	3300	5749
80				119	190	309	478	813	1236	1911	2168	3527	6146
90				127	201	328	507	862	1311	2027	2300	3741	6519
100				134	212	346	534	909	1382	2136	2424	3944	6872
120				146	233	379	585	996	1514	2340	2656	4320	7528
140				158	251	409	632	1075	1635	2528	2868	4666	8131
160				169	269	437	676	1150	1748	2702	3066	4989	8692
180				179	285	464	717	1219	1854	2866	3252	5291	9220
200				189	300	489	755	1285	1955	3021	3428	5577	9718
220				198	315	513	792	1348	2050	3169	3596	5850	10193
240				207	329	535	827	1408	2141	3310	3756	6110	10646
260				215	342	557	861	1465	2229	3445	3909	6359	11081
280				223	355	578	894	1521	2313	3575	4057	6599	11499
300				231	368	599	925	1574	2394	3700	4199	6831	11902
320				239	380	618	955	1626	2472	3822	4337	7055	12293
340				246	391	637	985	1676	2549	3939	4470	7272	12671
360				253	403	656	1013	1724	2622	4054	4600	7483	13039
380				260	414	674	1041	1772	2694	4165	4726		
400				267	425	691	1068	1818	2764	4273	4848		
420				274	435	708	1095	1862	2833	4378			
440				280	445	725	1120	1906	2899	4481			
460				286	455	741	1146	1949	2964	4582			
480				293	465	757	1170	1991	3028	4681			
500				299	475	773	1194	2032	3091	4777			
550				313	498	811	1253	2131	3241	5010			
580				322	511	832	1286	2189	3329	5145			

Please select DN_I 25

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

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

- h = Lift [mm]
- d_0 = Flow diameter [mm] of selected safety valve, refer to table article numbers
- h/d_0 = Ratio of lift / flow diameter
- p_{a0} = Back pressure [bar_a]
- p_0 = Set pressure [bar_a]
- p_{a0}/p_0 = Ratio of back pressure / 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 = Back pressure correction factor acc. to API 520 topic 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)

How to use please refer to page 00/08

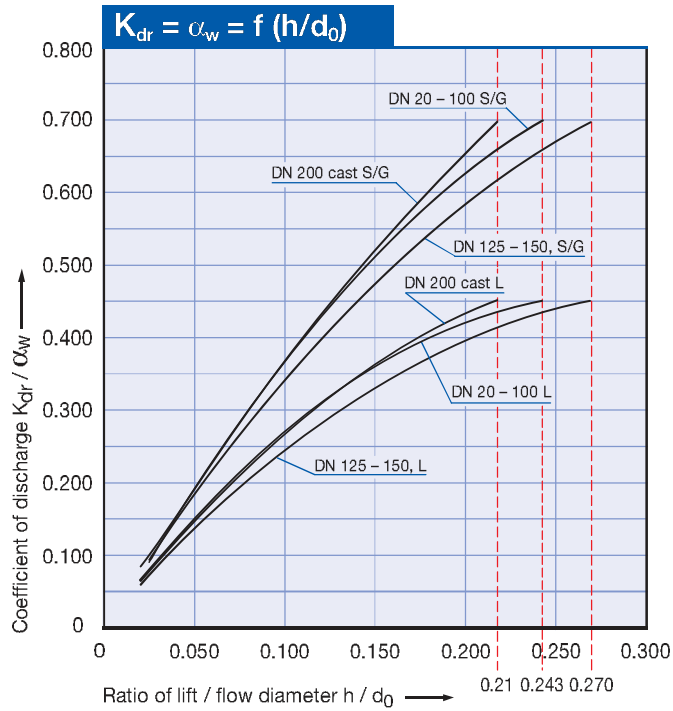


Diagram for evaluation of coefficient of discharge (K_{dr}/α_w) or K_b in reference to the ratio of back pressure / set pressure (p_{a0}/p_0)

