

# Type 462

Type 462  
Plain lever H3



## Safety Relief Valves – spring loaded

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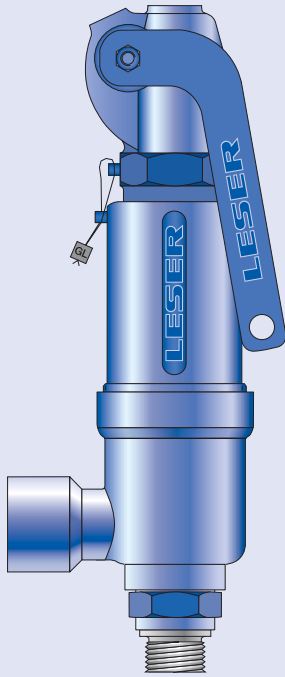
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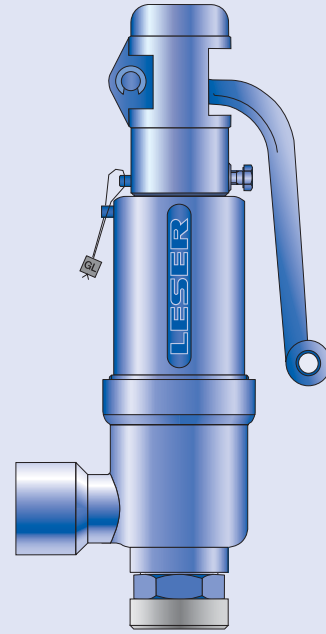
Type 462  
Cap H2



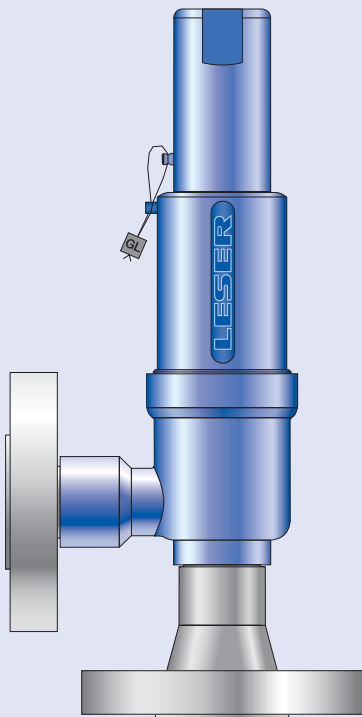
## How to order – Article numbers



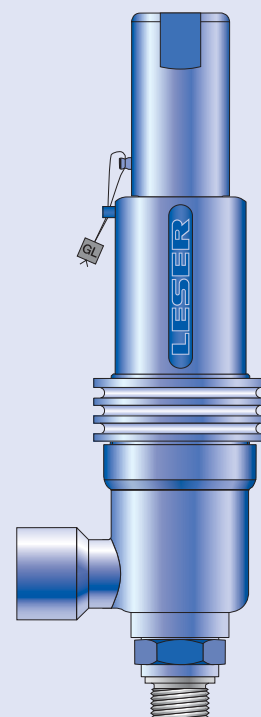
**Type 462 Male**  
Packed lever H4  
Conventional design



**Type 462 Female**  
Cap H2  
Conventional design



**Type 462**  
Cap H2  
Conventional design  
Flanged connection



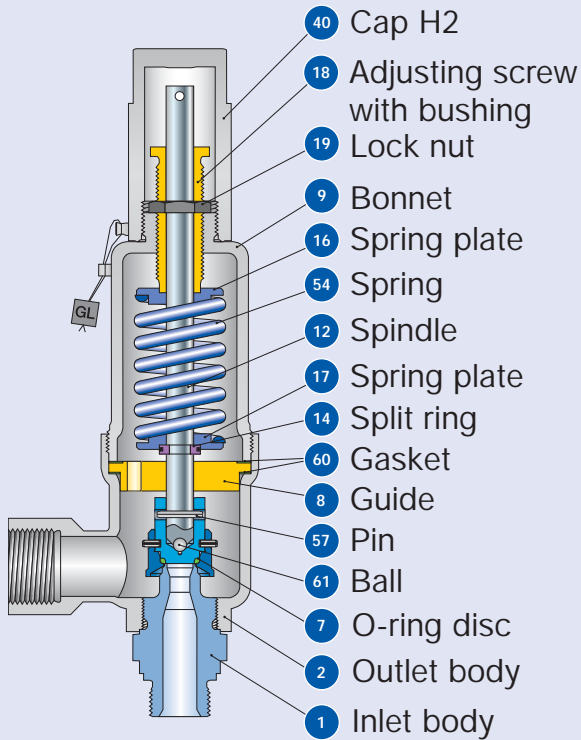
**Type 462**  
Cap H2  
Balanced bellows

## How to order – Article numbers

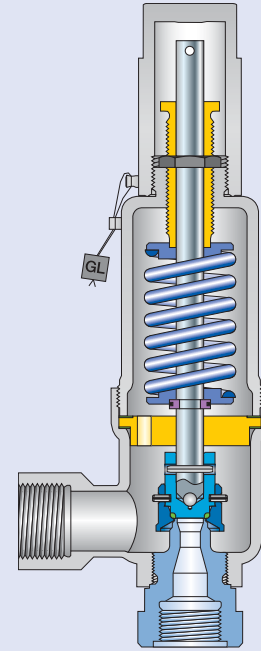
Article numbers				
O-ring material			NBR "N" J30	
			CR "K" J21	
			EPDM "D" J22	
			FKM "L" J23	
			FFKM "C" J20	
Actual Orifice diameter $d_0$ [mm]		9	13	17,5
Actual Orifice area $A_0$ [mm <sup>2</sup> ]		63,9	133	241
Actual Orifice diameter $d_0$ [inch]		0,354	0,512	0,689
Actual Orifice area $A_0$ [inch <sup>2</sup> ]		0,099	0,206	0,374
Outlet chamber casted				
Inlet body	1.4104 H2	Art.-No. 4623.	2902	2912
Outlet body	0.7043 H3	Art.-No. 4623.	2903	2913
Bonnet	0.7043 H4	Art.-No. 4623.	2904	2914
$p$ [bar <sub>g</sub> ]		S/G/L	0,5 – 250	0,5 – 180
$p$ [psig]			7,3 – 3626	7,3 – 2911
				0,5 – 92,5
				7,3 – 1342
Outlet chamber deep-drawn				
Inlet body	1.4404 H2	Art.-No. 4622.	3772	3782
Outlet body	1.4404 H3	Art.-No. 4622.	3773	3783
Bonnet	1.0460 H4	Art.-No. 4622.	3774	3784
$p$ [bar <sub>g</sub> ]		S/G/L	0,5 – 250	0,5 – 180
$p$ [psig]			7,3 – 3626	7,3 – 2611
				0,5 – 92,5
				7,3 – 1342
Outlet chamber deep-drawn				
All body and trim parts	1.4404 H2	Art.-No. 4624.	2952	2962
	H4	Art.-No. 4624.	2954	2964
$p$ [bar <sub>g</sub> ]		S/G/L	0,5 – 250	0,5 – 180
$p$ [psig]			7,3 – 3626	7,3 – 2611
				0,5 – 92,5
				7,3 – 1342

For selection of inlet and outlet connection please refer to page 09/06 – 09/07.

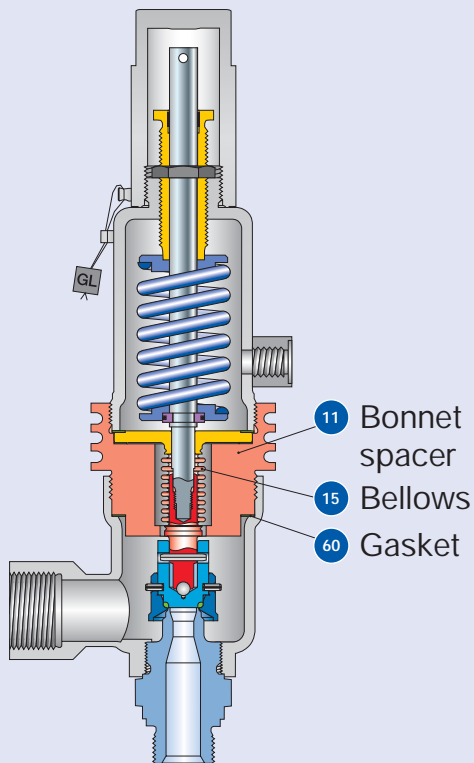
## Available designs



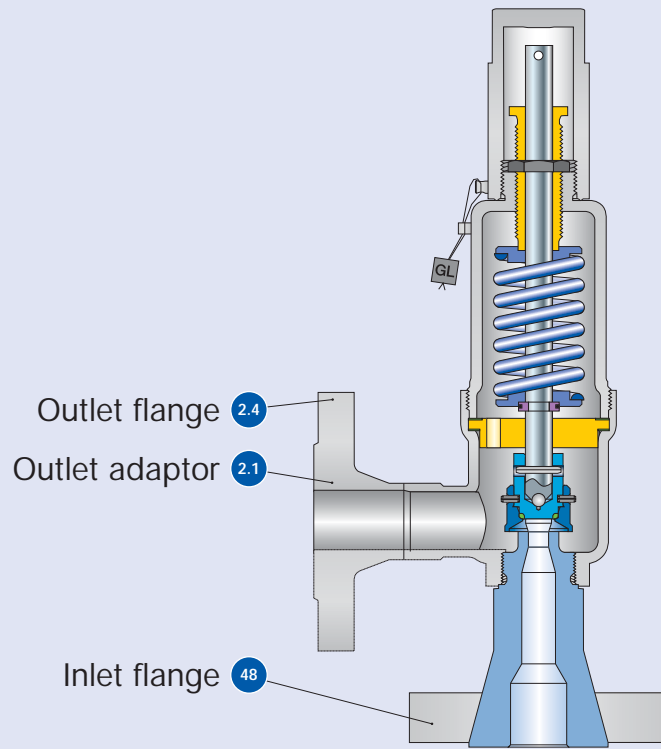
**Conventional design**  
Threaded connection



**Conventional design**  
Threaded connection



**Balanced bellows**  
Threaded connection



**Conventional design**  
Flange connection

## Available designs – materials

Materials					
Item	Component	Remarks	Type 4623	Type 4622	Type 4624
1	Base / Inlet body	Threaded connection	1.4104	1.4404 SA 479 316L	1.4404 SA 479 316L
		Flange connection	1.4404 SA 479 316L	1.4404 SA 479 316L	1.4404 SA 479 316L
2	Outlet body		0.7043 Ductile Gr. 60-40-18	1.4404 SA 479 316L	1.4404 SA 479 316L
2.1	Outlet adaptor	Flange connection	1.4404 316L	1.4404 316L	1.4404 316L
2.4	Outlet flange	Flange connection	1.4404 316L	1.4404 316L	1.4404 316L
7	O-ring disc		1.4404 SA 479 316L	1.4404 SA 479 316L	1.4404 SA 479 316L
		"N"	NBR Nitrile-Butadiene	NBR Nitrile-Butadiene	NBR Nitrile-Butadiene
7.4	Soft seal O-ring	"K"	CR Chloroprene	CR Chloroprene	CR Chloroprene
		"D"	EPDM Ethylen-Propylene-Diene	EPDM Ethylen-Propylene-Diene	EPDM Ethylen-Propylene-Diene
		"L"	FPM Fluorocarbon	FPM Fluorocarbon	FPM Fluorocarbon
		"C"	FFKM Perflouro	FFKM Perflouro	FFKM Perflouro
			1.4104 tenifer Chrome steel tenifer	1.4104 tenifer Chrome steel tenifer	1.4404 316L
8	Guide	Balanced bellows design	1.4404 / SA 316L Upper connection of balanced bellows	1.4404 / SA 316L Upper connection of balanced bellows	1.4404 / SA 316L Upper connection of balanced bellows
			0.7043 Ductile Gr. 60-40-18	1.0460 Carbon steel	1.4404 316L
9	Bonnet	Balanced bellows design	1.4404 316L	1.4404 316L	1.4404 316L
			1.4404 316L	1.4404 316L	1.4404 316L
11	Bonnet spacer	Balanced bellows design	1.4404 316L	1.4404 316L	1.4404 316L
12	Spindle		1.4021 420	1.4404 316L	1.4404 316L
		Balanced bellows design	1.4404 316L	1.4404 316L	1.4404 316L
14	Split ring		1.4104 Chrome steel	1.4104 Chrome steel	1.4404 316L
		Balanced bellows design	1.4571 316Ti	1.4571 316Ti	1.4571 316Ti
16/17	Spring plate		1.0718 Steel	1.0718 Steel	1.4404 316L
			1.4104 / PTFE Chrome steel / PTFE	1.4104 / PTFE Chrome steel / PTFE	1.4104 / PTFE Chrome steel / PTFE
18	Adjusting screw with bushing		1.4104 430	1.4104 430	1.4404 316L
			1.0718 Steel	1.0718 Steel	1.4404 316L
48	Inlet flange	Flange connection	1.4404 316L	1.4404 316L	1.4404 316L
		Standard	1.1200 / 1.8159 / 1.7107 Carbon steel	1.1200 / 1.8159 / 1.7107 Carbon steel	1.4310 Stainless steel
54	Spring	Optional	1.4310 Stainless steel	1.4310 Stainless steel	- -
			1.4310 Stainless steel	1.4310 Stainless steel	1.4310 Stainless steel
57	Pin		1.4310 Stainless steel	1.4310 Stainless steel	1.4310 Stainless steel
			Graphite / 1.4401 Graphite / 316	Graphite / 1.4401 Graphite / 316	Graphite / 1.4401 Graphite / 316
60	Gasket		1.3541 Hardened stainless steel	1.3541 Hardened stainless steel	1.4401 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.

## Dimensions and weights – Metric Units

### Threaded connections

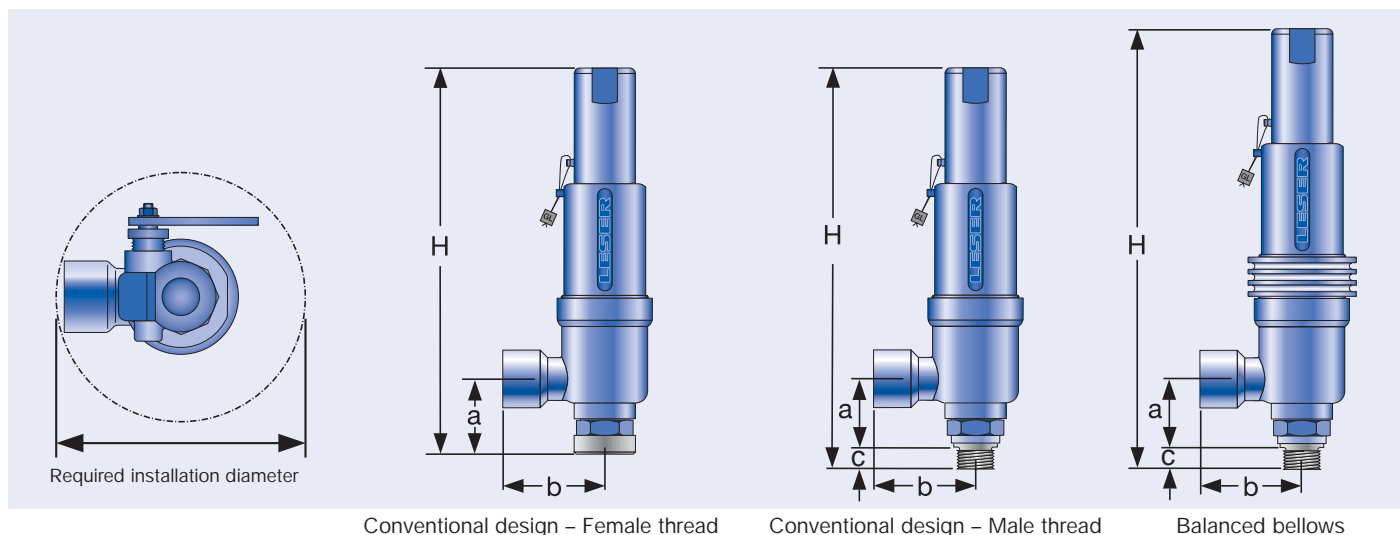
Size Outlet body		1"	1"	1"	1"	1"	1"	1 1/2"	1 1/2"	1 1/2"	1 1/2"	1 1/2"	
Actual Orifice diameter d <sub>0</sub> [mm]		9	9	9	13	13	13	17,5	17,5	17,5	17,5	17,5	
Actual Orifice area A <sub>0</sub> [mm <sup>2</sup> ]		63,6	63,6	63,6	133	133	133	241	241	241	241	241	
<b>Weight</b>	Standard	[kg]	2,6	2,6	2,6	2,6	2,6	2,6	3,0	3,0	3,0	3,0	
	Balanced bellows		3,4	3,4	3,4	3,4	3,4	3,4	3,8	3,8	3,8	3,8	
Required installation diameter		[mm]	165	165	165	165	165	165	165	165	165	165	
<b>Inlet thread "Female"</b>													
<b>DIN ISO 228-1</b>	<b>G</b>	Inlet a	60,5	65,5	70	60,5	65,5	70,5	65,5	70,5	75,5	80,5	-
		Center to face [mm]	Outlet b	75	75	75	75	75	75	75	75	75	75
Height	[mm]	H max.	290,5	295,5	300,5	290,5	295,5	300,5	292,5	297,5	302,5	307,5	-
<b>ISO 7-1/BS 21</b>	<b>Rc</b>	Inlet a	60,5	70,5	70,5	60,5	70,5	70,5	70,5	70,5	-	-	-
		Center to face [mm]	Outlet b	75	75	75	75	75	75	75	75	-	-
Height	[mm]	H max.	290,5	300,5	300,5	290,5	300,5	300,5	297,5	297,5	-	-	-
<b>ANSI/ASME B1.20.1</b>	<b>NPT</b>	Inlet a	60,5	70,5	70,5	60,5	70,5	70,5	70,5	70,5	75,5	80,5	-
		Center to face [mm]	Outlet b	75	75	75	75	75	75	75	75	75	75
Height	[mm]	H max.	290,5	300,5	300,5	290,5	300,5	300,5	297,5	297,5	302,5	307,5	-
<b>Inlet thread "Male"</b>													
<b>DIN ISO 228-1</b>	<b>G</b>	Inlet a	-	55,5	55,5	-	55,5	55,5	55,5	55,5	55,5	55,5	-
		Center to face [mm]	Outlet b	-	75	75	-	75	75	75	75	75	75
<b>ISO 7-1/BS 21</b>	<b>R</b>	Inlet a	-	52,5	52,5	-	52,5	52,5	-	52,5	-	52,5	-
		Center to face [mm]	Outlet b	-	75	75	-	75	75	-	75	-	75
<b>ANSI/ASME B1.20.1</b>	<b>NPT</b>	Inlet a	-	52,5	52,5	-	52,5	52,5	-	52,5	52,5	52,5	53
		Center to face [mm]	Outlet b	-	75	75	-	75	75	-	75	75	75

### Height inlet thread "Male"

Inlet thread		Size		Conventional design					Balanced bellows						
				1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"
DIN ISO 228-1	[mm]	<b>G</b>	H max.	-	301,5	303,5	302,5	304,5	-	-	346,5	348,5	347,5	349,5	-
ISO 7-1/BS 21	[mm]	<b>R</b>	H max.	-	302,5	305,5	-	307,5	-	-	347,5	350,5	-	352,5	-
ASME B1.20.1	[mm]	<b>NPT</b>	H max.	-	304,5	309,5	307,5	307,5	308	-	349,5	354,5	352,5	352,5	353

### Length of screwed end "c" inlet thread "Male"

Inlet thread		Size	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"
DIN ISO 228-1	[mm]	<b>G</b>	14	16	18	20	22	-
ISO 7-1/BS 21	[mm]	<b>R</b>	19	20	23	-	28	-
ASME B1.20.1	[mm]	<b>NPT</b>	22	22	27	28	28	28



## Dimensions and weights – Metric Units

### Flanged connection

	Conventional design			Balanced bellows		
Actual Orifice diameter $d_0$ [mm]	9	13	17,5	9	13	17,5
Actual Orifice area $A_0$ [mm <sup>2</sup> ]	63,6	133	241	63,6	133	241

DIN ISO 1092-1 (Available flange sizes refer to page 09/07)

#### Flange rating PN 40 – 400

Center to face [mm]	Inlet a	100	100	105	100	100	105
	Outlet b	100	100	100	100	100	100
Height [H4] [mm]	H max.	330	330	333	375	375	378

ASME B 16.5 (Available flange sizes refer to page 09/07)

#### Flange rating class 150 – 2500

Center to face [mm]	Inlet a	100	100	105	100	100	105
	Outlet b	100	100	100	100	100	100
Height [H4] [mm]	H max.	330	330	333	375	375	378

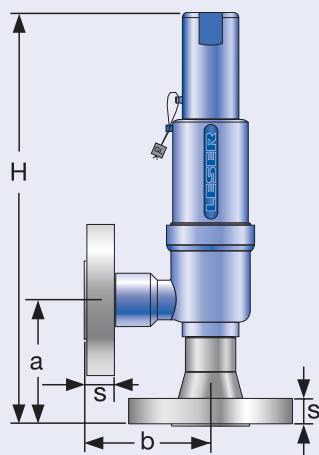
#### Weight

For the calculation of the total weight please use the Formular:  $W_T = W_N + W_F$  (Inlet) +  $W_F$  (Outlet)

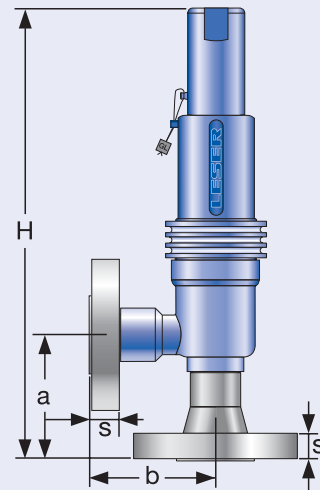
Weight net [kg]	$W_N$	2,6	2,6	3	3,8	3,8	4,2
(without inlet and outlet flange)							

#### Flange dimensions and availability

	Size	DIN ISO 1092-1 / Flange rating PN					ASME B16.5 / Flange rating class					
		40	160	250	320	400	Size	150	300	600	900	1500
<b>DN 15</b>							<b>NPS 1/2"</b>					
Flange thickness [mm]	s	18	22	26	26	30	14	18		26		30,2
Weight slip on flange [kg]	$W_F$	0,8	1,2	2,5	2,5	3,6	0,6	0,9		2,1		3
Available at Inlet		✓	✓	✓	✓	✓	✓	✓		✓		✓
Available at Outlet		✓	✓	✓			✓	✓		✓		
<b>DN 20</b>							<b>NPS 3/4"</b>					
Flange thickness [mm]	s	20	22				15	18		25,4		32
Weight slip on flange [kg]	$W_F$	1,1	1,3				0,8	1,4		2,3		3,5
Available at Inlet		✓	✓				✓	✓		✓		✓
Available at Outlet		✓	✓				✓	✓		✓		
<b>DN 25</b>							<b>NPS 1"</b>					
Flange thickness [mm]	s	22	26	30	36	40	17	21,5		32,5		40
Weight slip on flange [kg]	$W_F$	1,3	2,6	3,5	5	7,5	1	2,1		4,1		5,1
Available at Inlet		✓	✓	✓	✓	✓	✓	✓		✓		✓
Available at Outlet		✓	✓	✓			✓	✓		✓		
<b>DN 40</b>							<b>NPS 1 1/2"</b>					
Flange thickness [mm]	s	23	23	34			22	24		38		
Weight slip on flange [kg]	$W_F$	2,1	2,9	4,3			1,4	2,2		3,9		
Available at Inlet		✓	✓	✓			✓	✓		✓		
Available at Outlet		✓	✓	✓			✓	✓		✓		



Conventional design



Balanced bellows

## Pressure temperature ratings – Metric Units

Metric Units												
Actual Orifice diameter $d_0$ [mm]		9			13			17,5				
Actual Orifice Area $A_0$ [mm <sup>2</sup> ]		63,6			133			241				
Body material: 1.4104 (430F)						Type 4623						
Base / Inlet Body	Connection size	1/2"	3/4"	1"	1/2"	3/4"	1"	3/4"	1"	1 1/4"	1 1/2"	2"
	Pressure rating	PN 400			PN 250			PN 160				
Outlet body	Pressure rating	PN 40			PN 40			PN 40				
Minimum set pressure	p [bar <sub>g</sub> ] S/G/L	0,5			0,5			0,5				
Min. set pressure <sup>1)</sup> standard bellows	p [bar <sub>g</sub> ] S/G/L	40			40			40				
Min. set pressure low press. bellows	p [bar <sub>g</sub> ] S/G/L	3			3			3				
Maximum set pressure	p [bar <sub>g</sub> ] S/G/L	250			180			92,5				
Temperature acc. to DIN EN	min [°C]				-10							
	max [°C]				+350							
Temperature acc. to ASME	min [°C]				-29							
	max [°C]				+150							
Body material: 1.4404 (316L)						Type 4622						
Base / Inlet Body	Connection size	1/2"	3/4"	1"	1/2"	3/4"	1"	3/4"	1"	1 1/4"	1 1/2"	2"
	Pressure rating	PN 250			PN 160			PN 160				
Outlet Body	Pressure rating	PN 40			PN 40			PN 40				
Minimum set pressure	p [bar <sub>g</sub> ] S/G/L	0,5			0,5			0,5				
Min. set pressure <sup>1)</sup> standard bellows	p [bar <sub>g</sub> ] S/G/L	40			40			40				
Min. set pressure low press. bellows	p [bar <sub>g</sub> ] S/G/L	3			3			3				
Maximum set pressure	p [bar <sub>g</sub> ] S/G/L	250			180			92,5				
Temperature acc. to DIN EN	min [°C]				-45							
	max [°C]				+180							
Temperature acc. to ASME	min [°C]				-45							
	max [°C]				+180							
Body material: 1.4404 (316L)						Type 4624						
Base / Inlet Body	Connection size	1/2"	3/4"	1"	1/2"	3/4"	1"	3/4"	1"	1 1/4"	1 1/2"	2"
	Pressure rating	PN 250			PN 160			PN 160				
Outlet Body	Pressure rating	PN 40			PN 40			PN 40				
Minimum set pressure	p [bar <sub>g</sub> ] S/G/L	0,5			0,5			0,5				
Min. set pressure <sup>1)</sup> standard bellows	p [bar <sub>g</sub> ] S/G/L	40			40			40				
Min. set pressure <sup>1)</sup> standard bellows	p [bar <sub>g</sub> ] S/G/L	3			3			3				
Maximum set pressure	p [bar <sub>g</sub> ] S/G/L	250			180			92,5				
Temperature acc. to DIN EN	min [°C]				-45							
	max [°C]				+150							
Temperature acc. to ASME	min [°C]				-268							
	max [°C]				+150							

<sup>1)</sup> Min. set pressure standard bellows = Max. pressure low pressure bellows.  
The temperature is limited by soft seal material. The stated values are valid for EPDM.



## Approvals

Approvals			
Actual Orifice diameter $d_0$ [mm]	9	13	17,5
Actual Orifice area $A_0$ [mm <sup>2</sup> ]	63,6	133	241
Actual Orifice diameter $d_0$ [inch]	0,354	0,512	0,689
Actual Orifice area $A_0$ [inch <sup>2</sup> ]	0,099	0,206	0,374
<b>Europe</b>		<b>Coefficient of discharge <math>K_{dr}</math></b>	
DIN EN ISO 4126-1	Approval No.	072020111Z0008/0/14	
	S/G	0,83	0,81
	L	0,61	0,52
<b>Germany</b>		<b>Coefficient of discharge <math>\alpha_w</math></b>	
AD 2000-Merkblatt A2	Approval No.	TÜV SV 909	
	S/G	0,83	0,81
	L	0,61	0,52
<b>United States</b>		<b>Coefficient of discharge K</b>	
ASME Sec. VIII	Approval No.	M 37112	
	S/G	0,811	
	Approval No.	M 37101	
	L	0,566	
<b>Canada</b>		<b>Coefficient of discharge K</b>	
CRN	Approval No.	OG0730.96	
	S/G	Refer to ASME Sec. VIII	
	L	Refer to ASME Sec. VIII	
<b>China</b>		<b>Coefficient of discharge <math>\alpha_w</math></b>	
CSBQTS	Approval No.		
	S/G	0,83	0,81
	L	0,61	0,52
<b>Russia</b>		<b>Coefficient of discharge <math>\alpha_w</math></b>	
GGTN/	Approval No.	PPC 00-18458	
GOSGOTECHNADZOR	S/G	0,83	0,81
GOST R	L	0,61	0,52
<b>Classification societies</b>		<b>Homepage</b>	
Bureau Veritas	BV	www.bureauveritas.com	The valid certification number is changed with every renewal.  A sample certificate including the valid certification number can be taken from the homepage of the classification societies.
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	

## Capacities – Metric Units

Capacities 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								
Actual Orifice diameter $d_0$ [mm]		9			13			17,5		
Actual Orifice area $A_0$ [mm <sup>2</sup> ]		63,6			133,0			241,0		
LEO <sup>*)</sup> [inch <sup>2</sup> ]		S/G = 0,082 L = 0,086			S/G = 0,171 L = 0,179			S/G = 0,310 L = 0,325		
Set pressure		Capacities			Capacities			Capacities		
		Steam saturated	Air 0°C and 1013 mbar	Water 20°C	Steam saturated	Air 0°C and 1013 mbar	Water 20°C	Steam saturated	Air 0°C and 1013 mbar	Water 20°C
[bar]		[kg/h]	[m <sup>3</sup> /h]	[10 <sup>3</sup> kg/h]	[kg/h]	[m <sup>3</sup> /h]	[10 <sup>3</sup> kg/h]	[kg/h]	[m <sup>3</sup> /h]	[10 <sup>3</sup> kg/h]
0,5	40	47	1,53	87	102	3,19	134	157	4,93	
1	58	69	2,07	125	149	4,32	200	238	6,67	
2	93	113	2,93	195	235	6,11	331	400	9,44	
3	127	155	3,59	258	316	7,48	456	558	11,6	
4	158	195	4,14	322	396	8,64	569	700	13,3	
5	189	234	4,63	386	477	9,66	681	842	14,9	
6	220	274	5,07	449	557	10,6	793	985	16,3	
7	251	313	5,48	511	638	11,4	902	1127	17,7	
8	282	353	5,86	573	718	12,2	1013	1269	18,9	
9	312	392	6,21	636	799	13	1124	1412	20	
10	343	432	6,55	699	879	13,7	1235	1554	21,1	
12	405	511	7,17	824	1040	15	1457	1839	23,1	
14	465	590	7,75	947	1201	16,2	1674	2123	25	
16	527	669	8,28	1072	1363	17,3	1895	2408	26,7	
18	588	748	8,78	1197	1524	18,3	2116	2693	28,3	
20	650	827	9,26	1323	1685	19,3	2338	2977	29,8	
22	709	906	9,71	1444	1846	20,3	2553	3262	31,3	
24	771	986	10,1	1570	2007	21,2	2775	3547	32,7	
26	833	1065	10,6	1696	2168	22	2997	3831	34	
28	895	1144	11	1822	2329	22,9	3221	4116	35,3	
30	957	1223	11,3	1949	2490	23,7	3445	4401	36,5	
32	1020	1302	11,7	2076	2651	24,4	3669	4685	37,7	
34	1079	1381	12,1	2198	2812	25,2	3884	4970	38,9	
36	1142	1460	12,4	2325	2973	25,9	4110	5255	40	
38	1205	1539	12,8	2453	3134	26,6	4336	5539	41,1	
40	1268	1618	13,1	2582	3295	27,3	4564	5824	42,2	
42	1332	1698	13,4	2711	3456	28	4792	6109	43,2	
44	1395	1777	13,7	2841	3617	28,7	5021	6393	44,3	
46	1459	1856	14	2971	3779	29,3	5251	6678	45,3	
48	1524	1935	14,3	3102	3940	29,9	5483	6963	46,2	
50	1588	2014	14,6	3234	4101	30,5	5715	7247	47,2	
60	1910	2409	16	3889	4906	33,5	6874	8671	51,7	
70	2245	2805	17,3	4571	5711	36,1	8079	10094	55,8	
80	2583	3201	18,5	5259	6517	38,6	9294	11518	59,7	
90	2938	3596	19,6	5982	7322	41	10572	12941	63,3	
100	3296	3992	20,7	6711	8127	43,2	11862	14364	66,7	
120	4077	4783	22,7	8302	9738	47,3				
140	4958	5574	24,5	10096	11349	51,1				
160	5977	6365	26,2	12171	12959	54,6				
180	7262	7156	27,8	14786	14570	57,9				
200	8989	7947	29,3							
220	9426	8738	30,7							
240	9843	9529	32,1							
250	10046	9924	32,7							

<sup>\*)</sup> LEO<sub>S/G/L</sub> = LESER Effective Orifice steam / gas / liquids please refer to page 00/11  
 How to use capacity-sheets refer to page 00/09

## Capacities – US Units

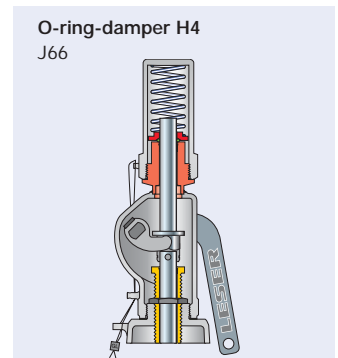
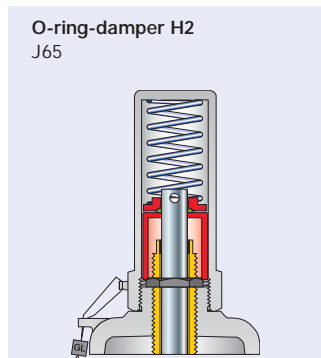
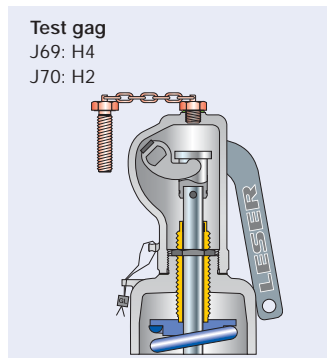
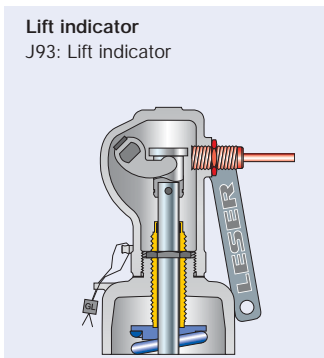
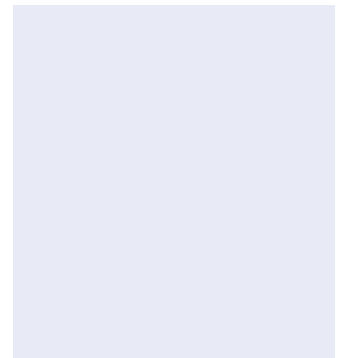
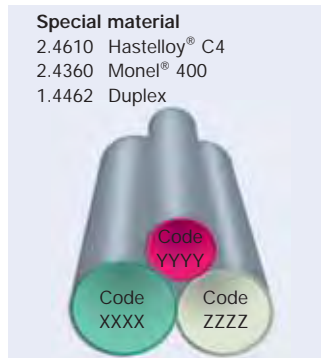
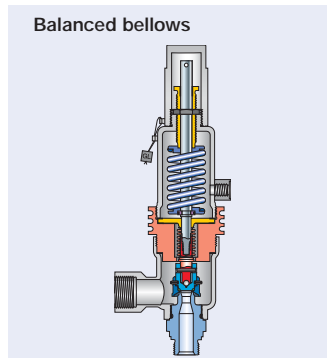
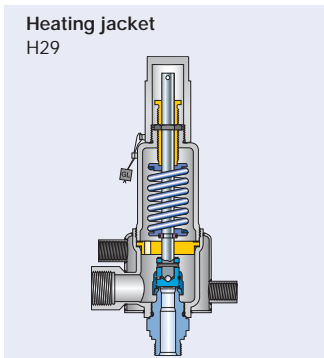
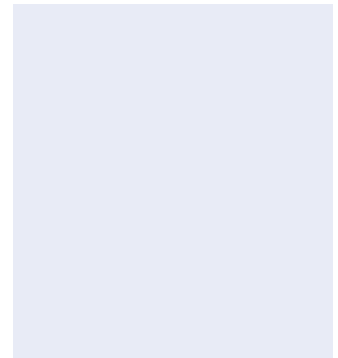
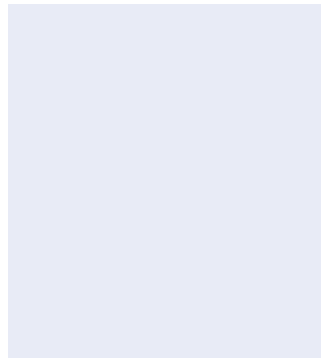
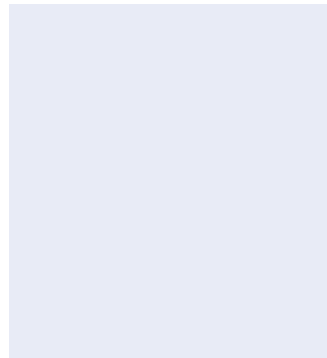
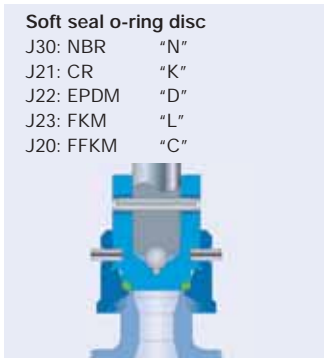
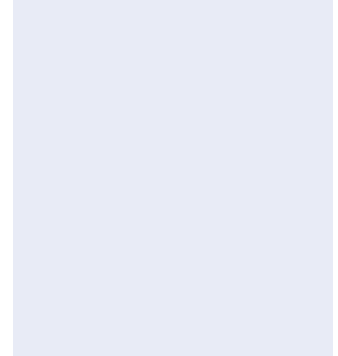
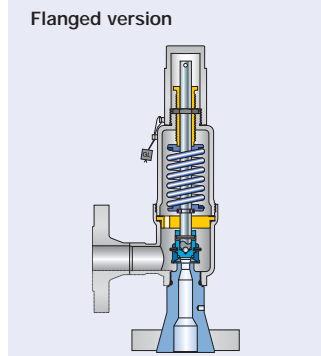
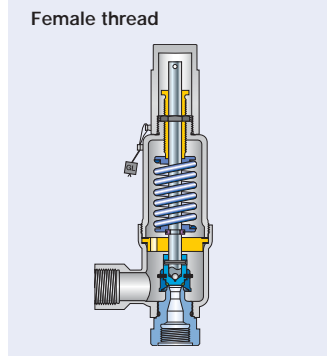
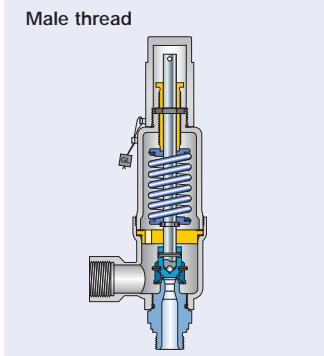
Capacities according to ASME Section VIII (UV), based on set-pressure plus 10% overpressure.  
 Capacities at 30 psig (2,07 bar) and below are based on 3 psig (0,207 bar) overpressure.

US Units		ASME Section VIII								
Actual Orifice diameter $d_0$ [inch]		0,354			0,512			0,689		
Actual Orifice area $A_0$ [inch <sup>2</sup> ]		0,099			0,206			0,374		
LEO <sup>*)</sup> [inch <sup>2</sup> ]		S/G = 0,082 L = 0,086			S/G = 0,171 L = 0,179			S/G = 0,310 L = 0,325		
Set pressure	Capacities			Capacities			Capacities			
	Steam saturated	Air 60° F and 14,5 psig [S.C.F.M.]	Water 70°F [US-G.P.M.]	Steam saturated	Air 60° F and 14,5 psig [S.C.F.M.]	Water 70°F [US-G.P.M.]	Steam saturated	Air 60° F and 14,5 psig [S.C.F.M.]	Water 70°F [US-G.P.M.]	
[psig]	[lb/h]	[S.C.F.M.]	[US-G.P.M.]	[lb/h]	[S.C.F.M.]	[US-G.P.M.]	[lb/h]	[S.C.F.M.]	[US-G.P.M.]	
5	93	33	6,01	195	69	12,5	353	126	22,7	
10	114	41	7,67	238	85	16	431	153	28,9	
20	155	55	10,2	324	115	21,2	586	209	38,4	
30	196	70	12,2	410	146	25,4	742	264	46	
40	242	86	14,1	504	180	29,3	913	326	53,1	
50	287	103	15,8	599	213	32,8	1085	387	59,4	
60	332	119	17,3	693	247	35,9	1256	448	65,1	
70	377	135	18,7	788	281	38,8	1427	509	70,3	
80	423	151	19,9	882	315	41,5	1599	570	75,1	
90	468	167	21,2	977	348	44	1770	631	79,7	
100	513	184	22,3	1071	382	46,4	1941	692	84	
120	604	216	24,4	1260	449	50,8	2284	814	92	
140	695	248	26,4	1449	517	54,9	2626	936	99,4	
160	785	281	28,2	1638	584	58,7	2969	1058	106	
180	876	313	29,9	1827	652	62,3	3311	1180	113	
200	966	346	31,5	2016	719	65,6	3654	1302	119	
220	1057	378	33,1	2205	787	68,8	3996	1424	125	
240	1148	410	34,5	2394	854	71,9	4339	1546	130	
260	1238	443	36	2584	921	74,8	4682	1669	135	
280	1329	475	37,3	2773	989	77,6	5024	1791	141	
300	1419	508	38,6	2962	1056	80,4	5367	1913	146	
320	1510	540	39,9	3151	1124	83	5709	2035	150	
340	1601	572	41,1	3340	1191	85,6	6052	2157	155	
360	1691	605	42,3	3529	1259	88	6394	2279	159	
380	1782	637	43,5	3718	1326	90,5	6737	2401	164	
400	1872	670	44,6	3907	1393	92,8	7080	2523	168	
420	1963	702	45,7	4096	1461	95,1	7422	2645	172	
440	2054	734	46,8	4285	1528	97,3	7765	2767	176	
460	2144	767	47,8	4474	1596	99,5	8107	2889	180	
480	2235	799	48,9	4663	1663	102	8450	3011	184	
500	2326	832	49,9	4852	1731	104	8792	3134	188	
550	2552	913	52,3	5325	1899	109	9649	3439	197	
600	2779	994	54,6	5797	2068	114	10505	3744	206	
650	3005	1075	56,9	6270	2236	118	11362	4049	214	
700	3232	1156	59	6742	2405	123	12218	4354	222	
750	3458	1237	61,1	7215	2573	127	13075	4660	230	
800	3685	1318	63,1	7688	2742	131	13931	4965	238	
850	3911	1399	65	8160	2911	135	14787	5270	245	
900	4138	1480	66,9	8633	3079	139	15644	5575	252	
950	4364	1561	68,7	9105	3248	143	16500	5881	259	
1000	4591	1642	70,5	9578	3416	147	17357	6186	266	
1100	5044	1804	74	10523	3753	154	19070	6796	279	
1200	5497	1966	77,2	11469	4091	161	20782	7407	291	
1300	5950	2128	80,4	12414	4428	167	22495	8017	303	
1400	6394	2290	83,4	13340	4765	174	24174	8628	314	
1500	6889	2452	86,4	14373	5102	180				
1600	7393	2614	89,2	15424	5439	186				
1700	7907	2776	91,9	16497	5776	191				
1800	8433	2938	94,6	17594	6113	197				
1900	8971	3100	97,2	18718	6451	202				
2000	9525	3262	99,7	19872	6788	208				
2200	10684	3586	105	22292	7462	218				
2400	11935	3910	109	24901	8136	227				
2600	13310	4234	114	27770	8811	237				
2800	14864	4558	118	31012	9485	246				
3000	13651	4882	122							
3200	14557	5206	126							
3400	15463	5530	130							
3600	16369	5854	134							
3800	17276	6178	137							

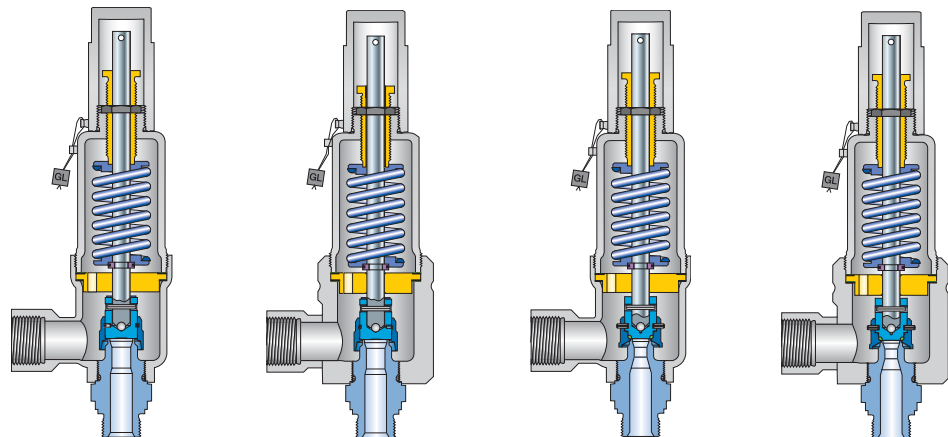
\*) LEO<sub>S/G/L</sub> = LESER Effective Orifice steam / gas / liquids please refer to page 00/11

How to use capacity-sheets refer to page 00/09

## Available Options

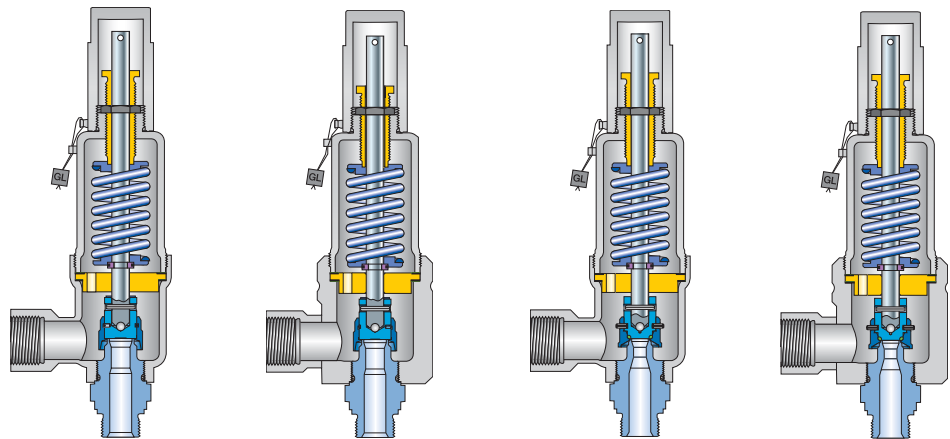


## Overview



Options		459	459 HDD	462	462 HDD
<b>Base / Inlet body</b>					
	Male thread	✓	✓	✓	✓
	Female thread	✓	✓	✓	✓
<b>Flanged version – DIN ISO 1092-1</b>					
Size DN 15		✓	✓	✓	✓
	Inlet		Flange rating PN 40 – 400		
	Outlet		-		
Size DN 20		✓	✓	✓	✓
	Inlet		Flange rating PN 40 + PN 160		
	Outlet		-		
Size DN 25		✓	✓	✓	✓
	Inlet		Flange rating PN 40 – 400		
	Outlet		Flange rating PN 40 – PN 400		
Size DN 40		✓	✓	✓	✓
	Inlet		-		
	Outlet		Flange rating PN 40 – 400		
<b>Flanged version – ASME B16.5</b>					
Size NPS 1/2"		✓	✓	✓	✓
	Inlet		Flange rating class 150 – 2500		
	Outlet		-		
Size NPS 3/4"		✓	✓	✓	✓
	Inlet		Flange rating class 150 – 2500		
	Outlet		-		
Size NPS 1"		✓	✓	✓	✓
	Inlet		Flange rating class 150 – 2500		
	Outlet		Flange rating class 150 – 900		
Size NPS 1 1/2"		✓	✓	✓	✓
	Inlet		Flange rating class 150 – 2500		
	Outlet		Flange rating class 150 – 900		
<b>Disc</b>					
	Disc stellited L25	✓	*	-	-
<b>Type of sealing</b>					
Metal seat	Metal to metal	✓	✓	-	-
	Metal to metal stellited	✓	*	✓	*
Plastic seat	Sealing plate	✓	✓	-	-
Soft seal	O-ring	-	-	✓	✓

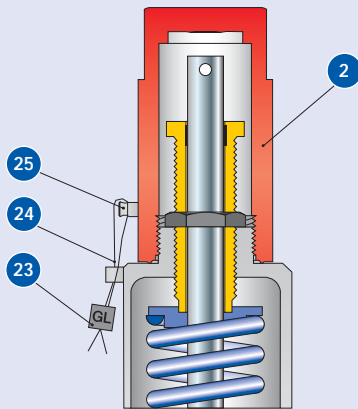
## Overview



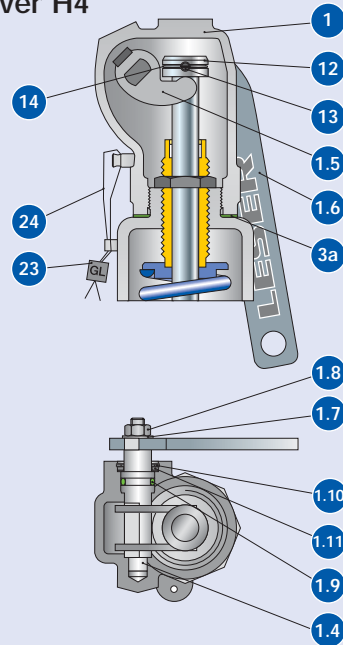
Options		Type	459	459 HDD	462	462 HDD
<b>Caps and levers</b>						
	H2		✓	✓	✓	✓
	H3		✓	-	✓	-
	H4		✓	✓	✓	✓
<b>Heating jacket</b>						
	Outlet body		✓	✓	✓	✓
	Bonnet spacer		✓	✓	✓	✓
<b>Test gag</b>						
	H2		✓	✓	✓	✓
	H4		-	-	-	-
<b>Bellows</b>						
	Stainless steel		✓	✓	✓	✓
	low pressure		✓	✓	✓	✓
	Hasteloy or spec. mat.		✓	✓	✓	✓
	High temp. equipment		-	✓	-	✓
	Elastomer		✓	-	✓	-
<b>Lift indicator</b>						
	Lifting device H4		✓	✓	✓	✓
<b>Lift stopper</b>						
	Bush		✓	✓ except d <sub>0</sub> 6 mm	✓	✓
	Gag		✓	✓	✓	✓
<b>O-ring damper</b>						
	H2		✓	-	✓	-
	H4		✓	-	✓	-

## Caps and levers – Subassembly item 40

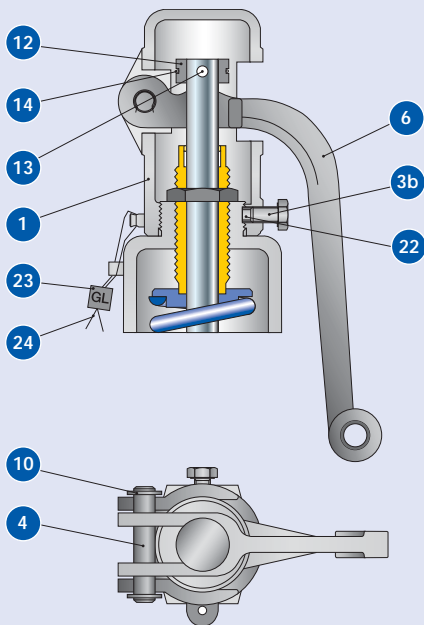
### Cap H2



### Packed lever H4

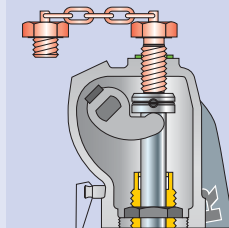
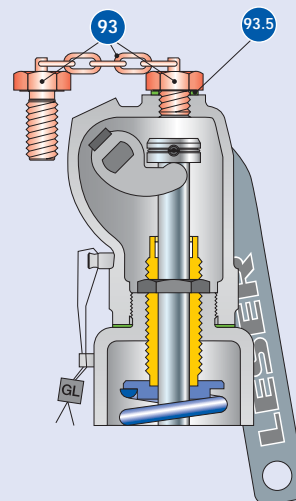


### Plain lever H3



### Test gag

Cap H2: J70  
Packed lever H4: J69



BLOCKED  
Remove  
after testing

## Test gag

The test gag blockades the spindle and keeps the safety valve tight while the system pressure exceeds the set pressure.

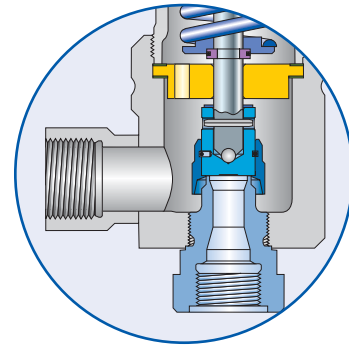
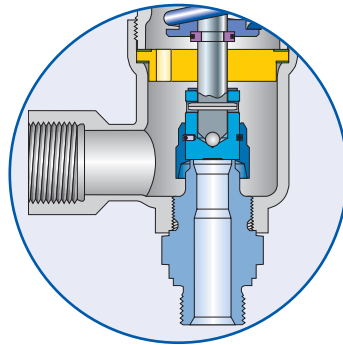
The test gag is used for:

- to perform pressure tests in a system without dismantling of the safety valve
- the individual adjustment of safety valves installed in the same system

After testing the test gag must be removed because otherwise the safety valve cannot protect the system against unallowable overpressure!

## Available connections

For dimensions and weights refer to:  
 Type 459 – page 05/08 + 05/10  
 Type 459 HDD – page 06/08 + 06/10  
 Type 462 – page 07/08 + 07/10  
 Type 462 HDD – page 08/08 + 08/10



Male thread

Female thread

### Threaded connections

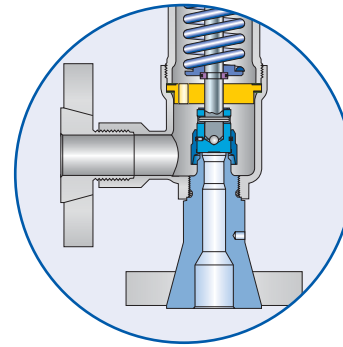
Actual Orifice diameter $d_0$ [mm]	6	9 / 13		17,5		
Actual Orifice area $A_0$ [mm <sup>2</sup> ]	28,3	63,9 / 133		241		
Actual Orifice diameter $d_0$ [inch]	0,236	0,345 / 0,512		0,689		
Actual Orifice area $A_0$ [inch <sup>2</sup> ]	0,044	0,099 / 0,206		0,374		
Valve size	Inlet	Outlet	Inlet	Outlet	Inlet	Outlet
<b>Male thread DIN ISO 228-1</b>						
G	1/2"	V54	-	-	-	-
	3/4"	V55	-	V55	-	-
	1"	V56	V68	V56	V68	V65
	1 1/4"	-	V79	-	V79	V83
	1 1/2"	-	V69	-	V69	V57
<b>Female thread DIN ISO 228-1</b>						
G	1/2"	V50	-	V50	-	-
	3/4"	V51	-	V51	-	V51
	1"	V52	V66	V52	V66	V52
	1 1/4"	-	V81	-	V81	V84
	1 1/2"	-	V67	-	V67	V53
<b>Male thread DIN ISO 7-1/BS 21</b>						
R/BSPT	1/2"	V30	-	-	-	-
	3/4"	V31	-	V31	-	-
	1"	V32	V42	V32	V42	V32
	1 1/2"	-	V43	-	V43	V33
<b>Female thread DIN ISO 7-1/BS 21</b>						
Rc/BSPT	1/2"	V38	-	V38	-	-
	3/4"	V39	-	V39	-	V39
	1"	V40	V36	V40	V36	V40
	1 1/2"	-	V37	-	V37	V41
<b>Male thread ANSI/ASME B1.20.1</b>						
NPT	1/2"	V61	-	-	-	-
	3/4"	V62	-	V62	-	-
	1"	V63	V73	V63	V73	V63
	1 1/4"	-	V82	-	V82	V85
	1 1/2"	-	V74	-	V74	V64
	2"	-	-	-	-	V86
<b>Female thread ANSI/ASME B1.20.1</b>						
NPT	1/2"	V58	-	V58	-	-
	3/4"	V59	-	V59	-	V59
	1"	V60	V71	V60	V71	V60
	1 1/4"	-	V80	-	V80	V87
	1 1/2"	-	V72	-	V72	V75
	2"	-	-	-	-	V88

Flanged and threaded connections can be combined.  
 Threads according to other standards are available.  
 Please specify in writing (diameter, pressure rating, standard).



## Available connections

For dimensions and weights refer to:  
 Type 459 – page 05/09 + 05/11  
 Type 459 HDD – page 06/09 + 06/11  
 Type 462 – page 07/09 + 07/11  
 Type 462 HDD – page 08/09 + 08/11



### Flanged connections

### Flanged version

Actual Orifice diameter $d_0$ [mm]	6	9 / 13	17,5
Actual Orifice area $A_0$ [mm <sup>2</sup> ]	28,3	63,9 / 133	241
Actual Orifice diameter $d_0$ [inch]	0,236	0,345 / 0,512	0,689
Actual Orifice area $A_0$ [inch <sup>2</sup> ]	0,044	0,099 / 0,206	0,374

### DIN ISO 1092-1 (PN > 100: DIN 2501)

	PN	Inlet	Outlet	Inlet	Outlet	Inlet	Outlet
DN 15	40	I21	-	I21	-	-	-
	160	I22	-	I22	-	-	-
	250	I23	-	I23	-	-	-
	320	I24	-	I24	-	-	-
	400	I25	-	I25	-	-	-
DN 20	40	I26	-	I26	-	I26	-
	160	I27	-	I27	-	I27	-
	250	-	-	-	-	-	-
	320	-	-	-	-	-	-
	400	-	-	-	-	-	-
DN 25	40	I31	I46	I31	I46	I31	-
	160	I32	I47	I32	I47	I32	-
	250	I33	I48	I33	I48	I33	-
	320	I34	-	I34	-	I34	-
	400	I35	-	I35	-	I35	-
DN 40	40	-	-	-	I49	-	I49
	320	-	-	-	I50	-	I50
	400	-	-	-	I51	-	I51

### ANSI/ASME B 16.5

	Class	Inlet	Outlet	Inlet	Outlet	Inlet	Outlet
NPS 1/2"	150	V01	-	V01	-	-	-
	300	V02	-	V02	-	-	-
	600	V02	-	V02	-	-	-
	900	V03	-	V03	-	-	-
	1500	V03	-	V03	-	-	-
	2500	V04	-	V04	-	-	-
NPS 3/4"	150	V05	-	V05	-	V05	-
	300	V06	-	V06	-	V06	-
	600	V06	-	V06	-	V06	-
	900	V07	-	V07	-	V07	-
	1500	V07	-	V07	-	V07	-
	2500	V08	-	V08	-	V08	-
NPS 1"	150	V09	V18	V09	V18	V09	-
	300	V10	V19	V10	V19	V09	-
	600	V10	V19	V10	V19	V10	-
	900	V11	V20	V11	V20	V10	-
	1500	V11	-	V11	-	V11	-
	2500	V12	-	V12	-	V12	-
NPS 1 1/2"	150	-	-	-	V21	-	V21
	300	-	-	-	V22	-	V22
	600	-	-	-	V22	-	V22
	900	-	-	-	V23	-	V23

Flanged and threaded connections can be combined. Threads according to other standards are available. Please specify in writing (diameter, pressure rating, standard).

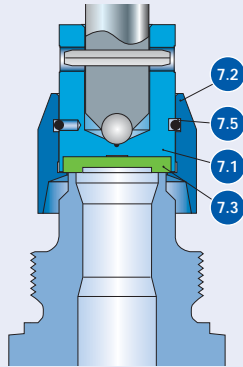
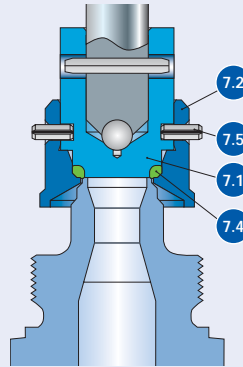
## Sealing surface

### Types 459 and 462 – Soft seal

LESER soft seal solutions allow for superior tightness.

#### Features and benefits

- two different designs for a wide variety application
- large selection of soft seal materials to best adapt to the application
- increased service life of sealing surfaces compared to a metal to metal seat
- simple replacement of the soft seal reduces maintenance costs
- standard ARP O-ring sizes for easy worldwide procurement
- one standard durometer per O-ring material for all set pressures to reduce stocking expenses

Soft seal solutions	Series 459	
	Type 459, 459 HDD	Type 462, 462 HDD
	Disc with inserted sealing plate, optional	O-ring disc
Design		
Requirements	increased tightness at temperatures lower than - 20°C / - 4°F	superior tightness maintained tightness close to the set pressure Pressure range: 5 – 180 bar, 75 – 2600 psig
Example application	Liquefied gases	Gas storage tanks

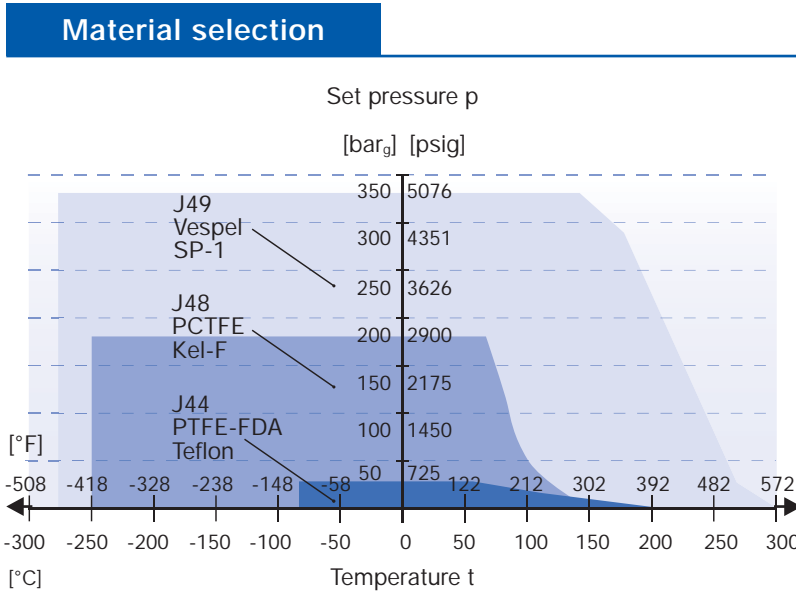
Subassembly of the disc (item 7), bill of materials

Component	Type 459		Type 462	
Disc	Item 7.1	1.4404 SA 479 316L	Item 7.1	1.4404 SA 479 316L
Soft seal Materials refer to next page	Item 7.3	sealing plate	Item 7.4	O-ring
Lifting aid	Item 7.2	1.4404 316L	Item 7.2	1.4404 316L
Retaining clip	Item 7.5	1.4571 316Ti	–	–
Pin	–	–	Item 7.5	1.4310 Stainless steel

For temperature limits and medium resistance please refer to the soft seal material selection, page 09/10.

## Soft seal material selection

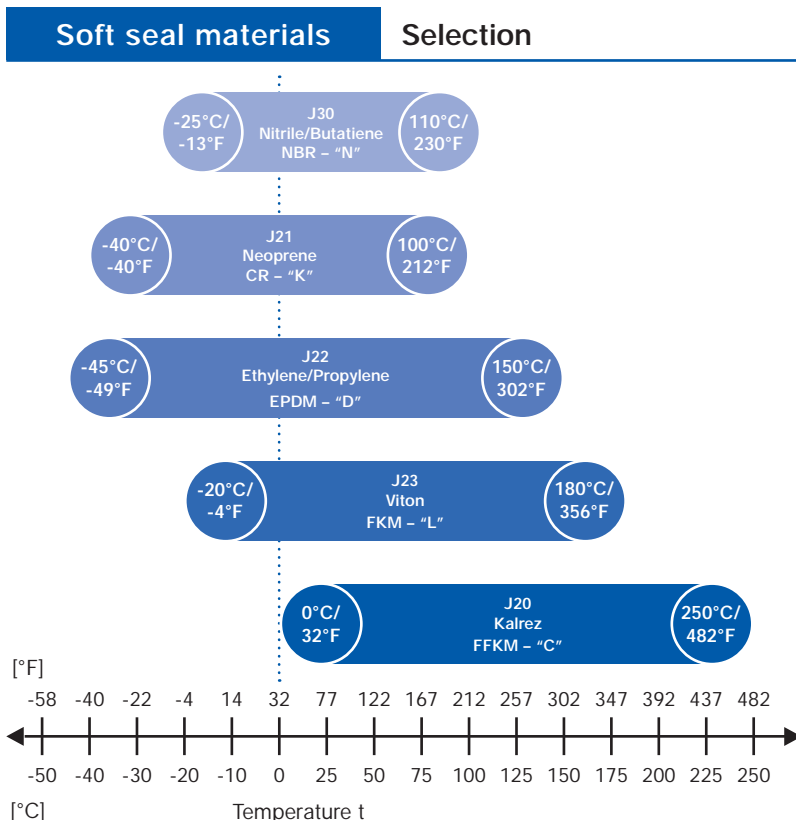
### Type 459/459 HDD – Sealing plate



Option code		
Option code	Code letter <sup>1)</sup>	Application <sup>2)</sup>
J44	PTFE-FDA "A"	Nearly all chemicals
J48	PCTFE "G"	Cryogenic and refrigeration applications, flammable media applications (e.g. gaseous oxygen) up to 50 bar, 725 psig at 60°C, 140°F
J49	VESPEL-SP1 "A"	High temperature and high pressure applications (no steam), for chemical resistance see <a href="http://www.DuPont.com">www.DuPont.com</a>
Other then listed	"X"	For other materials contact: your local representative or <a href="mailto:sales@leser.com">sales@leser.com</a>

Standard material of LESER balanced bellows is stainless steel 1.4571 / 316Ti.

### Type 462/462 HDD – O-ring disc



Option code		
Option code	Code letter <sup>1)</sup>	Application <sup>2)</sup>
J30	NBR "N"	Hydraulic oil, vegetable and animal grease and oil
J21	CR "K"	Parafin oil, silicone oil and grease, water and water based solvents, refrigerants, ozone
J22	EPDM "D"	Hot water and superheated steam up to 150 °C, 302 °F, some organic and inorganic acids, silicone oil and grease, FDA compliant
J23	FKM "L"	High temperature service (no superheated steam), mineral oil and grease, silicone oil and grease, vegetable and animal grease and oil, ozone, FDA compliant compound available on request
J20	FFKM "C"	Nearly all chemicals, standard O-ring compound for Type 438 is Kalrez® 6375 with steam resistance, FDA compliant compound available on request
Other then listed	"X"	For other materials contact: your local representative or <a href="mailto:sales@leser.com">sales@leser.com</a>

<sup>1)</sup> The code letters will be stamped on the disc (Item 7).

<sup>2)</sup> Pressure and temperature service must be considered in any case. Chemical resistance information is supplied by the O-ring manufacturer.