

# Type 459 HDD

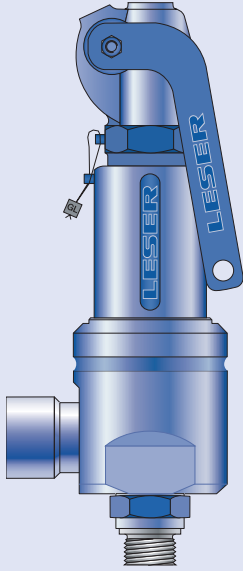


Type 459 HDD  
Cap H2

## Safety Relief Valves Heavy Duty Design – spring loaded

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## How to order – Article numbers



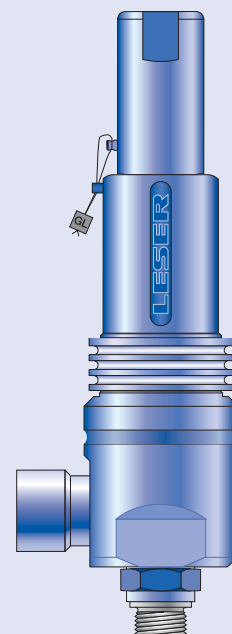
**Type 459 HDD male**  
Packed lever H4  
Conventional design



**Type 459 HDD female**  
Packed lever H4  
Conventional design



**Type 459 HDD**  
Cap H2  
Conventional design  
Flanged connection



**Type 459 HDD**  
Cap H2  
Balanced bellows

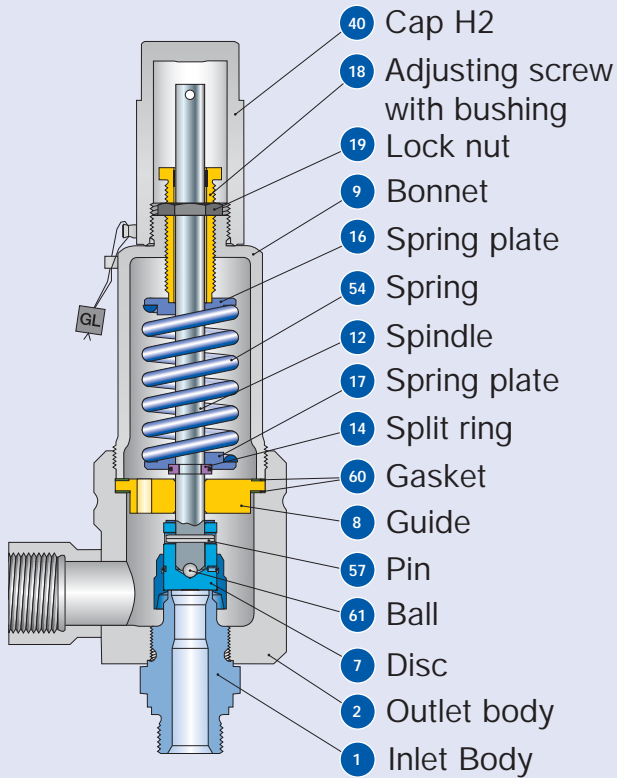
## How to order – Article numbers

Article numbers							
Actual Orifice diameter $d_0$ [mm]			6	6	9	13	
Actual Orifice area $A_0$ [mm <sup>2</sup> ]			28,2	28,2	63,9	133	
Actual Orifice diameter $d_0$ [inch]			0,236	0,236	0,354	0,512	
Actual Orifice area $A_0$ [inch <sup>2</sup> ]			0,044	0,044	0,099	0,206	
Body material: 14404 (316L)							
All body and trim parts	1.4404	H2	Art.-No. 4594.	2532	2542	2582	2592
		H4	Art.-No. 4594.	2534	2544	2584	2594
				420 - 700	700,01 – 850	1,5 – 420	0,2 – 200
			S/G/L	6091 – 10152	10153 – 12325	21,7 – 6091	2,9 – 2901

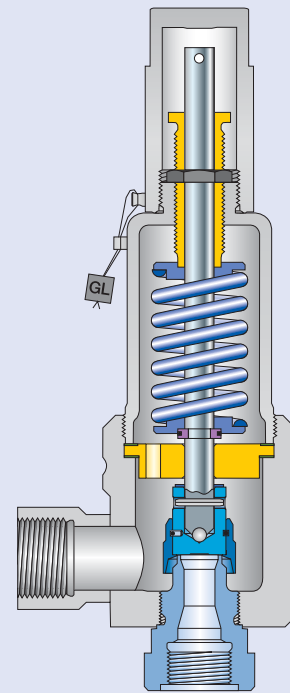
For selection of inlet and outlet connection please refer to page 09/06 – 09/07.

# Type 459 HDD

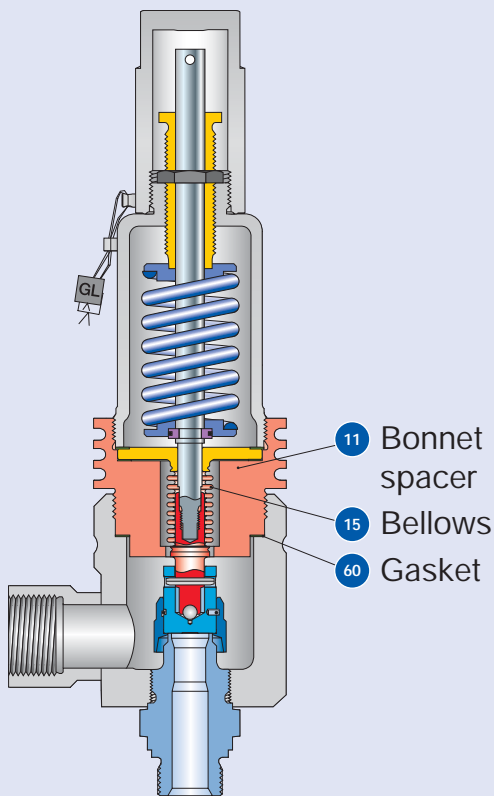
## Available designs



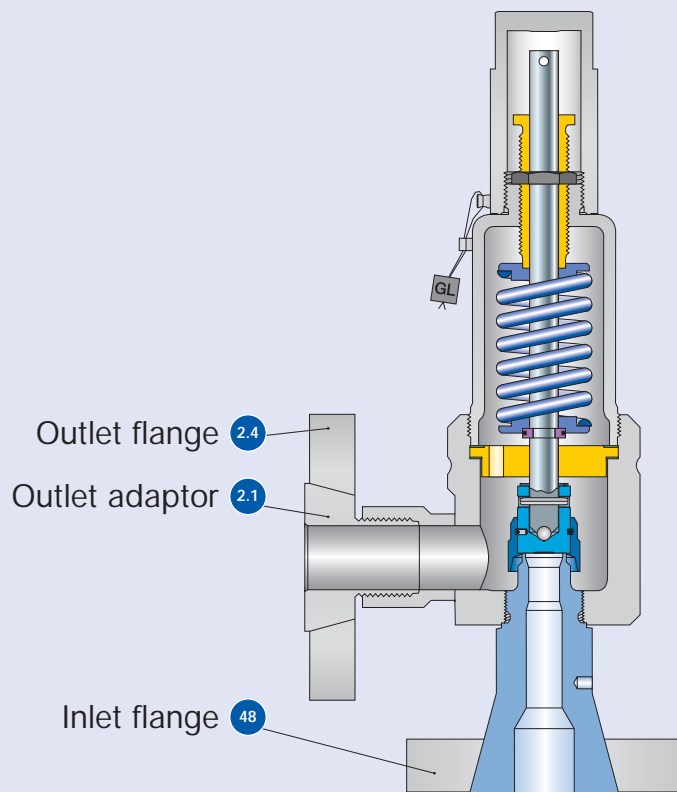
**Conventional design**  
Threaded connection



**Conventional design**  
Threaded connection



**Balanced bellows**  
Threaded connection



**Conventional design**  
Flange connection

Type 459 HDD

## Available designs – materials

Materials			
Item	Component	Remarks	Type 4594 HDD
1	Base / Inlet body	Threaded connection	1.4404 stellited SA 479 316L stellited
		Flange connection	1.4404 stellited SA 479 316L stellited
2	Outlet body		1.4404 SA 479 316L
2.1	Outlet adaptor	Flange connection	1.4404 316L
2.4	Outlet flange	Flange connection	1.4404 316L
7	Disc	Metal seat	1.4404 SA 479 316L
8	Guide		1.4404 316L
		Balanced bellows design	1.4404 / SA 316L Upper connection of balanced bellows
9	Bonnet		1.4404 316L
		Balanced bellows design	1.4404 316L
11	Bonnet spacer	Balanced bellows design	1.4404 316L
12	Spindle		1.4404 316L
		Balanced bellows design	1.4404 316L
14	Split ring		1.4404 316L
15	Bellows	Balanced bellows design	1.4571 316Ti
16/17	Spring plate		1.4404 316L
18	Adjusting screw with bushung		1.4404 / PTFE 316L / PTFE
19	Lock nut		1.4404 316L
40	Cap H2		1.4404 316L
48	Inlet flange	Flange connection	1.4404 316L
54	Spring	Standard	1.4310 Stainless steel
57	Pin		1.4310 Stainless steel
60	Gasket		Graphite / 1.4301 Graphite / 316L
61	Ball		1.4401 316

### Material Options

The Heavy Duty Design of Type 459 HDD offers the possibility to easily obtain special material versions. The fact that all product wetted parts are machined from bar stock materials makes it easier and faster to fulfill almost all material requirements according to the metal availability.

**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

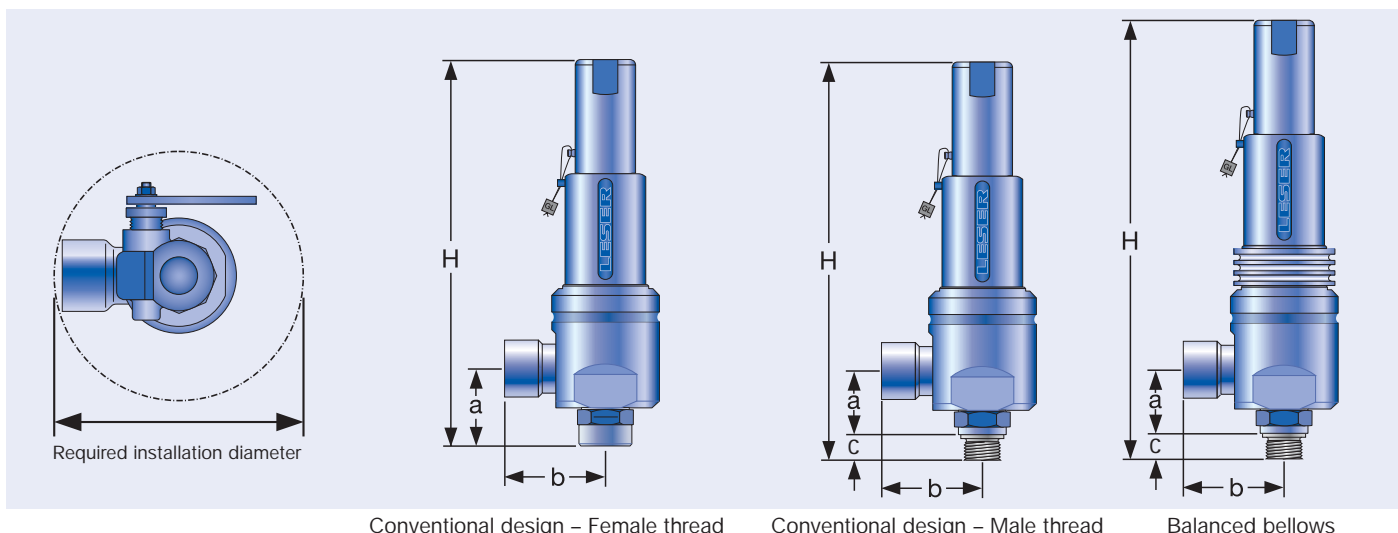
Size Outlet body		1"	1"	1"	1"	1"	1"	1"	1"	
Actual Orifice diameter $d_0$ [mm]		6	6	6	9	9	13	13	13	
Actual Orifice area $A_0$ [mm <sup>2</sup> ]		28,2	28,3	28,3	63,6	63,6	133	133	133	
<b>Weight</b>	Standard [kg]	3,9	3,9	3,9	3,9	3,9	3,9	3,9	3,9	
	Balanced bellows [kg]	4,7	4,7	4,7	4,7	4,7	4,7	4,7	4,7	
Required installation diameter [mm]		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	65,5	70,5	60,5	65,5	70,5
		Center to face [mm]	Outlet b	75	75	75	75	75	75	75
Height [mm]		H max.	290,5	295,5	300,5	295,5	300,5	290,5	295,5	300,5
<b>ISO 7-1/BS 21</b>	<b>Rc</b>	Inlet a	60,5	70,5	70,5	70,5	70,5	60,5	70,5	70,5
		Center to face [mm]	Outlet b	75	75	75	75	75	75	75
Height [mm]		H max.	290,5	300,5	300,5	300,5	300,5	290,5	300,5	300,5
<b>ANSI/ASME B1.20.1</b>	<b>NPT</b>	Inlet a	60,5	70,5	70,5	70,5	70,5	60,5	70,5	75,5
		Center to face [mm]	Outlet b	75	75	75	75	75	75	75
Height [mm]		H max.	290,5	300,5	300,5	300,5	300,5	290,5	300,5	300,5
<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
		Center to face [mm]	Outlet b	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	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
		Center to face [mm]	Outlet b	75	75	75	75	75	–	75

### Height inlet thread "Male"

		Conventional design			Balanced bellows			
Inlet thread		Size	1/2"	3/4"	1"	1/2"	3/4"	1"
DIN ISO 228-1	[mm] <b>G</b>	H max.	300,5	301,5	303,5	345,5	346,5	348,5
ISO 7-1/BS 21	[mm] <b>R</b>	H max.	301,5	302,5	305,5	346,5	347,5	350,5
ASME B1.20.1	[mm] <b>NPT</b>	H max.	304,5	304,5	309,5	349,5	349,5	354,5

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

Inlet thread		Size	1/2"	3/4"	1"
DIN ISO 228-1	[mm] <b>G</b>		15	16	18
ISO 7-1/BS 21	[mm] <b>R</b>		19	20	23
ASME B1.20.1	[mm] <b>NPT</b>		22	22	27



## Dimensions and weights – Metric Units

### Flanged connection

	Conventional design			Balanced bellows		
Actual Orifice diameter $d_0$ [mm]	6	9	13	6	9	13
Actual Orifice area $A_0$ [mm <sup>2</sup> ]	28,3	63,6	133	28,3	63,6	133

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

#### Flange rating PN 40 – 400

Center to face [mm]	Inlet a	Conventional design			Balanced bellows		
		100	100	100	100	100	100
	Outlet b	100	100	100	100	100	
Height [H4] [mm]	H max.	330	330	330	330	330	

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

#### Flange rating class 150 – 2500

Center to face [mm]	Inlet a	Conventional design			Balanced bellows		
		100	100	100	100	100	100
	Outlet b	100	100	100	100	100	
Height [H4] [mm]	H max.	330	330	330	375	375	

#### 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	2,6	3,8	3,8	3,8
(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															
Actual Orifice diameter $d_0$ [mm]		6					9					13			
Actual Orifice Area $A_0$ [mm <sup>2</sup> ]		28,2					63,6					133			
Body material 1.4404 (316L) <span style="float: right;">Type 4594</span>															
Base / Inlet Body	Connection size	1/2"	3/4"	1"	1/2"	3/4"	1"	1/2"	3/4"	1"	3/4"	1"	1 1/4"		
	Pressure rating	PN 700			PN 850			PN 500			PN 250				
Outlet body	Pressure rating	PN 160			PN 160			PN 160			PN 160				
Minimum set pressure	p [bar <sub>g</sub> ] S/G/L	420			420			1,5			0,2				
Maximum set pressure	p [bar <sub>g</sub> ] S/G	700			-			420			200				
	p [bar <sub>g</sub> ] L	-			850										
Temperature acc. to DIN EN	min [°C]								-270						
	max [°C]								+550						
Temperature acc. to ASME	min [°C]								-268						
	max [°C]								+538						

US Units															
Actual Orifice diameter $d_0$ [inch]		0,236					0,354					0,512			
Actual Orifice Area $A_0$ [inch <sup>2</sup> ]		0,044					0,099					0,206			
Body material 1.4404 (316L) <span style="float: right;">Type 4594</span>															
Base / Inlet Body	Connection size	1/2"	3/4"	1"	1/2"	3/4"	1"	1/2"	3/4"	1"	3/4"	1"	1 1/4"		
Minimum set pressure	p [psig] S/G/L	6091			10153			21,7			2,9				
Maximum set pressure	p [psig] S/G	10150			-			6091			2901				
	p [psig] L	-			12325										
Temperature acc. to DIN EN	min [°F]								-454						
	max [°F]								+1022						
Temperature acc. to ASME	min [°F]								-450						
	max [°F]								+1000						

Because there is no open bonnet for this type available, please use at a temperature of 300°C (572°F) a stainless steel bellows or a specific high temperature model without a bellows. For DIN EN applications at temperatures under -10°C please proceed according to AD-2000 Merkblatt W 10.



## Approvals

Approvals				
Actual Orifice diameter $d_0$ [mm]		6	9	13
Actual Orifice area $A_0$ [mm <sup>2</sup> ]		28,2	63,6	133
Actual Orifice diameter $d_0$ [inch]		0,236	0,354	0,512
Actual Orifice area $A_0$ [inch <sup>2</sup> ]		0,044	0,099	0,206
<b>Europe</b>		<b>Coefficient of discharge <math>K_{dr}</math></b>		
DIN EN ISO 4126-1	Approval No.	072020111Z0008/0/13		
	S/G	0,81	0,83	0,81
	L	0,70	0,61	0,53
<b>Germany</b>		<b>Coefficient of discharge <math>\alpha_w</math></b>		
AD 2000-Merkblatt A2	Approval No.	TÜV SV 909		
	S/G	0,81	0,83	0,81
	L	0,70	0,61	0,53
<b>United States</b>		<b>Coefficient of discharge <math>K</math></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 <math>K</math></b>		
CRN	Approval No.	OG0730.95		
	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	0,81	0,83	0,81
	L	0,70	0,61	0,53
<b>Russia</b>		<b>Coefficient of discharge <math>\alpha_w</math></b>		
GGTN/	Approval No.	PPC 00-18458		
GOSGOTECHNADZOR	S/G	0,81	0,83	0,81
GOST R	L	0,7	0,61	0,53
<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		

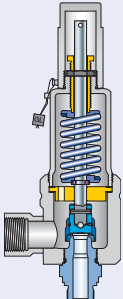
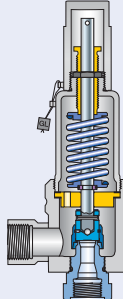
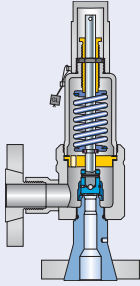
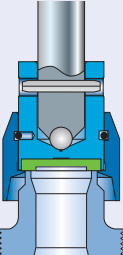
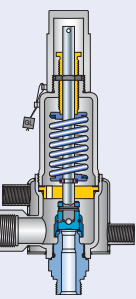
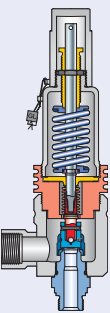
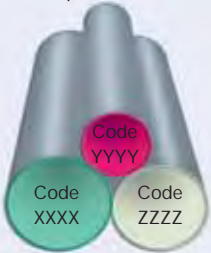
## Capacities – Metric Units

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]		6			9			13				
Actual Orifice area $A_0$ [mm <sup>2</sup> ]		28,2			63,6			133,0				
LEO*) [inch <sup>2</sup> ]		S/G = 0,036 L = 0,038			S/G = 0,082 L = 0,086			S/G = 0,171 L = 0,179				
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]		
0,2								53	61	1,96		
1								120	143	3,75		
1,5					77	92	2,54	156	188	4,6		
2					93	113	2,93	190	229	5,31		
3					127	155	3,59	258	316	6,5		
4					158	195	4,14	322	396	7,51		
5					189	234	4,63	386	477	8,39		
6					220	274	5,07	449	557	9,19		
7					251	313	5,48	511	638	9,93		
8					282	353	5,86	573	718	10,6		
9					312	392	6,21	636	799	11,3		
10					343	432	6,55	699	879	11,9		
12					405	511	7,17	824	1040	13		
14					465	590	7,75	947	1201	14		
16					527	669	8,28	1072	1363	15		
18					588	748	8,78	1197	1524	15,9		
20					650	827	9,26	1323	1685	16,8		
25					802	1025	10,4	1633	2087	18,8		
30					957	1223	11,3	1949	2490	20,6		
35					1111	1421	12,2	2261	2893	22,2		
40					1268	1618	13,1	2582	3295	23,7		
45					1427	1816	13,9	2906	3698	25,2		
50					1588	2014	14,6	3234	4101	26,5		
60					1910	2409	16	3889	4906	29,1		
70					2245	2805	17,3	4571	5711	31,4		
80					2583	3201	18,5	5259	6517	33,6		
90					2938	3596	19,6	5982	7322	35,6		
100					3296	3992	20,7	6711	8127	37,5		
120					4077	4783	22,7	8302	9738	41,1		
140					4958	5574	24,5	10096	11349	44,4		
160					5977	6365	26,2	12171	12959	47,5		
180					7262	7156	27,8	14786	14570	50,3		
200					8989	7947	29,3	18303	16181	53,1		
220						8738	30,7					
240						9529	32,1					
260						10320	33,4					
280						11111	34,6					
300						11902	35,9					
320						12693	37					
340						13484	38,2					
360						14275	39,3					
380						15066	40,4					
400						15857	41,4					
420						16648	42,4					
440					7221	21,6						
460					7564	22,1						
480					7907	22,6						
500					8250	23,1						
520					8593	23,6						
540					8936	24,1						
560					9280	24,5						
580					9623	25						
600					9966	25,4						
650					10309	25,9						
700					11167	26,9						
750					18024	27,9						
800					12882	28,9						
850					13740	29,9						
					14598	30,8						
		No saturated steam application in set pressure range										

\*) 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

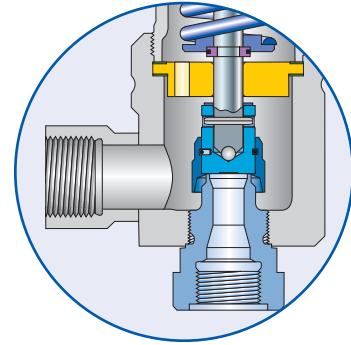
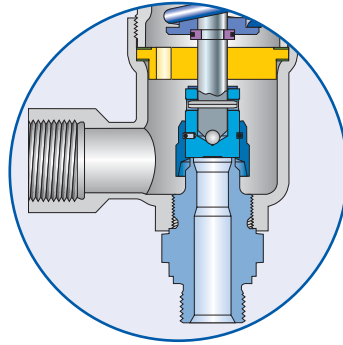
## Available Options

<p><b>Male thread</b></p> 	<p><b>Female thread</b></p> 	<p><b>Flanged version</b></p> 	
<p><b>Disc with inserted sealing plate</b>                  J48: PTFE-FDA "G"                  J49: VESPEL-SP "T"</p> 			
<p><b>Heating jacket</b>                  H29</p> 	<p><b>Balanced bellows</b></p> 		
<p><b>Special material</b>                  2.4610 Hastelloy® C4                  2.4360 Monel® 400                  1.4462 Duplex</p> 			

Type 459 HDD

## 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

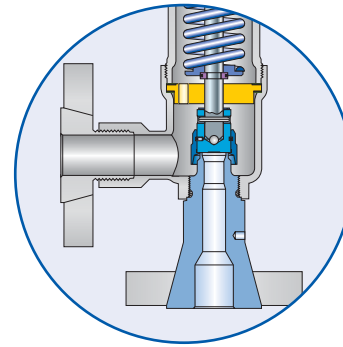
  

Valve size	Inlet	Outlet	Inlet	Outlet	Inlet	Outlet
<b>Male thread DIN ISO 228-1</b>						
G	1/2"	V54	-	-	-	-
	3/4"	V55	-	V55	-	-
	1"	V56	V68	V56	V68	V65
	1 1/4"	-	V79	-	V79	V83
	1 1/2"	-	V69	-	V69	V57
<b>Female thread DIN ISO 228-1</b>						
G	1/2"	V50	-	V50	-	-
	3/4"	V51	-	V51	-	V51
	1"	V52	V66	V52	V66	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"	-	-	-	-	-

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

### Type 459 – Metal seat

LESER metal seats (disc and nozzle) are lapped to optical flatness to ensure a tight seal. LESER safety relief valves are supplied with standard leak tightness according to API 527. Improved tightness is available on request.

### Stellited sealing surface – Option code L20 (base / inlet body) and J25 (disc)

The sealing surfaces of the stainless steel disc and nozzle can be stellited by build-up welding. Stellite is a cobalt-chromium based, non-ferrous alloy with increased hardness, corrosion resistance and wear resistance at high temperatures.

LESER recommends stellited sealing surfaces for type 4374 (seat and disc 1.4404/316L) in the following cases:

- high pressure applications, due to the high stress of the sealing surfaces
- high temperature applications to avoid a permanent deformation of the sealing surfaces, due to the material properties of the seat and disc
- applications with abrasive fluids to increase the wear resistance of the sealing surfaces.

The stellited sealing surfaces of the disc and base / inlet body are standard for type 459 HDD and 462 HDD.

Hardness metal seat								
Item	Component	Type	Option code	Material		Hardness of sealing surface		
				EN	ASME	Values from standards or manufacturers specification	Average value LESER stock	
1	Base / Inlet body	4593	*	EN 10088-3, 1.4104	SA 479 430	≤ 220HBW	EN 10088-3 Table 8	17 – 20 HRC <sup>1)</sup>
		4592 / 4594	*	EN 10272, 1.4404	SA 479 316L	≤ 215HBW	EN 10272 Table 7	16 – 19 HRC <sup>1)</sup>
		4592/4594	L20	EN 10272, 1.4404 stellited	SA 479 316L stellited	≥ 35 HRC	Manufacturers specification	40 HRC
7.1	Disc	4593	*	EN 10088-3, 1.4122 hardened	Hardened stainless steel	≥ 40 HRC	LWN 325.01 Harding procedure	42 – 46 HRC
		4592 / 4594	*	EN 10272, 1.4404	SA 479 316L	≤ 215HBW	EN 10272 Table 7	16 – 19 HRC <sup>1)</sup>
		4592 / 4594	J25	EN 10272, 1.4404 stellited	SA 479 316L stellited	≥ 35 HRC	Manufacturers specification	40 HRC

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

HBW: BRINELL hardness acc. DIN EN ISO 6506-1

HRC: ROCKWELL hardness acc. DIN EN ISO 6508-1

<sup>1)</sup> Rockwell hardness values below 20 HRC are not allowed according to DIN EN ISO 6508-1. Lower, fictitious values were created for better comparison.