

Type 459
Plain lever H3



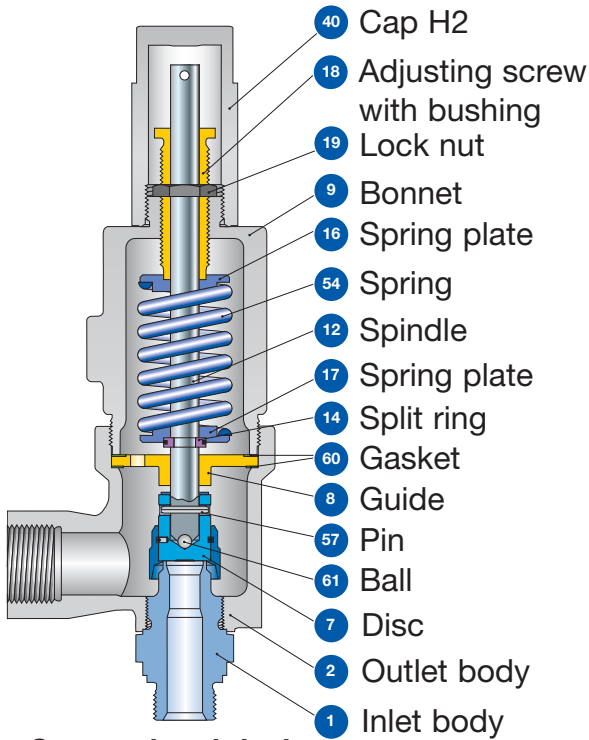
Type 459 Safety Relief Valves

Contents	Page
Designs	42
Materials	43
Article numbers	44
Dimensions and weights	
• Threaded connections	45
• Flanged connections	47
Pressure / temperature ratings	49
Approvals	51

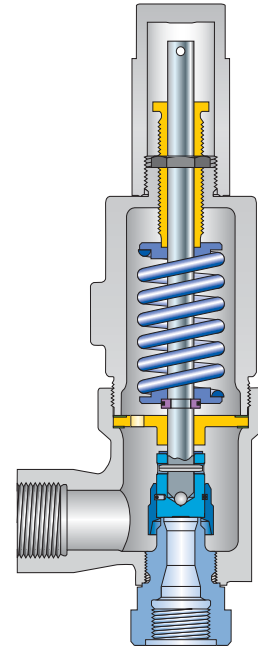
Type 459
Cap H2



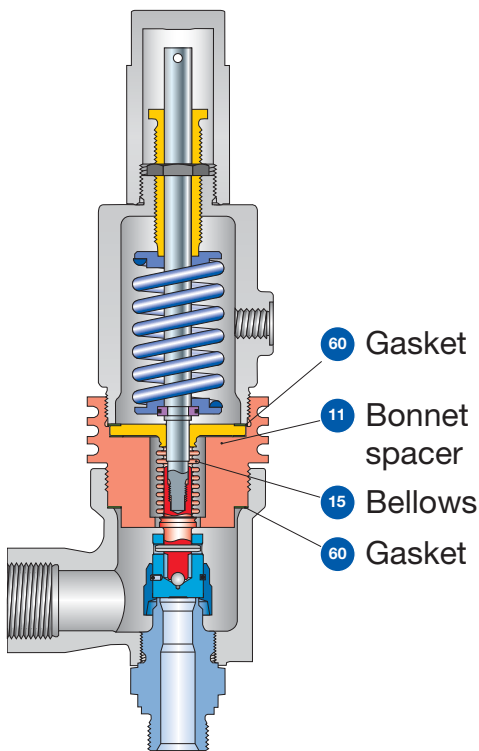
Type 459
Designs



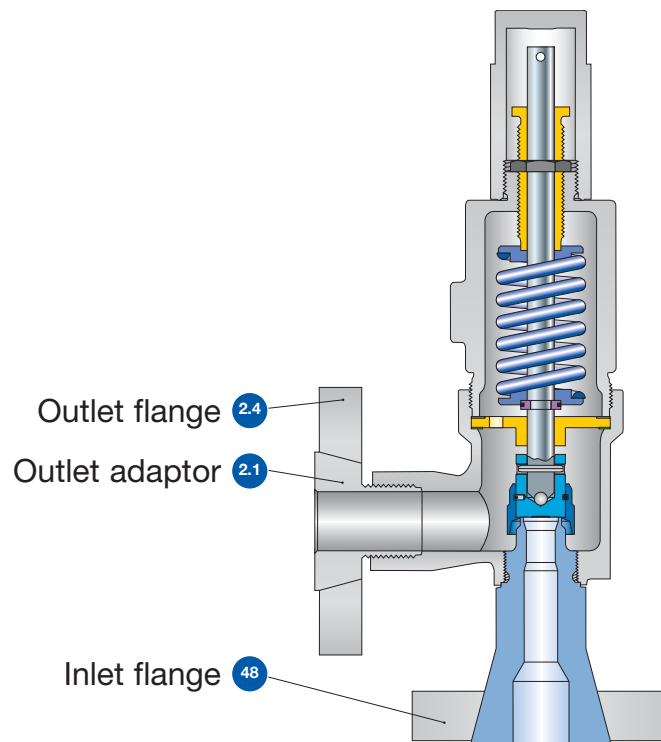
Conventional design
 Threaded connection



Conventional design
 Threaded connection



Balanced bellows
 Threaded connection



Conventional design
 Flange connection

Type 459 Materials

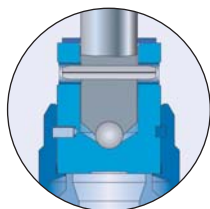
Item	Component	Design	Type 4593	Type 4592	Type 4594
1	Base / Inlet body	Threaded connection	1.4104 ¹⁾ , 1.4404 SA 479 430 ¹⁾ , SA 479 316L	1.4404 SA 479 316L	1.4404 SA 479 316L
		Flange connection	1.4404 SA 479 316L	1.4404 SA 479 316L	1.4404 SA 479 316L
2	Outlet body		1.0619 WCB	1.0619 WCB	1.4408 CF8M
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	Disc	Metal seat	1.4122 Hardened stainless steel	1.4122 Hardened stainless steel	1.4404 316L
8	Guide		1.4104 tenifer Chrome steel tenifer	1.4104 tenifer Chrome steel tenifer	1.4404 316L
		Balanced bellows design	1.4404 / SA 316L Upper conn. part of balanced bellows	1.4404 / SA 316L Upper conn. part of balanced bellows	1.4404 / SA 316L Upper conn. part of balanced bellows
9	Bonnet		0.7043 Ductile Gr. 60-40-18	1.0619 WCB	1.4408 CF8M
		Balanced bellows design	1.0619 WCB	1.0619 WCB	1.4408 CF8M
11	Bonnet spacer	Balanced bellows design	1.0460 Carbon steel	1.0460 Carbon steel	1.4404 316L
12	Spindle		1.4021 420	1.4021 420	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
15	Bellows	Balanced bellows design	1.4571 SA 316Ti	1.4571 316Ti	1.4571 316Ti
16/17	Spring plate		1.0718 Steel	1.0718 Steel	1.4404 316L
18	Adjusting screw with bushung		1.4104 PTFE Chrome steel PTFE	1.4104 PTFE Chrome steel PTFE	1.4404 PTFE 316L PTFE
19	Lock nut		1.4104 Chrome steel	1.4104 Chrome steel	1.4404 316L
40	Cap H2		1.0460 SA 105	1.0460 SA 105	1.4404 316L
48	Inlet flange	Flange connection	1.4404 316L	1.4404 316L	1.4404 316L
54	Spring	Standard	1.1200 / 1.8159 / 1.7107 Carbon steel	1.1200 / 1.8159 / 1.7107 Carbon steel	1.4310 Stainless steel
		Optional	1.4310 Stainless steel	1.4310 Stainless steel	- -
57	Pin		1.4310 Stainless steel	1.4310 Stainless steel	1.4310 Stainless steel
60	Gasket		Graphite / 1.4401 Graphite / 316	Graphite / 1.4401 Graphite / 316	Graphite / 1.4401 Graphite / 316
61	Ball		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.

¹⁾ only valid for male thread DIN ISO 228-1 G $\frac{3}{4}$, G1, G1 $\frac{1}{2}$ (Option codes V55, V56, V57) (please note availability regarding d₀)

Type 459
Article numbers



Metal seat

	Actual Orifice diameter d_0 [mm]		9	13	17.5
	Actual Orifice area A_0 [mm ²]		63.6	133	241
	Actual Orifice diameter d_0 [inch]		0.354	0.512	0.689
	Actual Orifice area A_0 [inch ²]		0.099	0.206	0.374
Outlet body casted					
Inlet body	1.4104	H2	Art. No. 4593.	2502	2512
Outlet body	1.0619	H3	Art. No. 4593.	2503	2513
	WCB				
Bonnet	0.7043	H4	Art. No. 4593.	2504	2514
	p [bar _g]		S/G/L	1.5 – 250¹⁾	0.2 – 200¹⁾
	p [psig]			21.7 – 3625¹⁾	2.9 – 2900¹⁾
Outlet body investment casted					
Inlet body	1.4404	H2	Art. No. 4592.	2472	2482
Outlet body	1.0619	H3	Art. No. 4592.	2473	2483
	WCB				
Bonnet	1.0619	H4	Art. No. 4592.	2474	2484
	p [bar _g]		S/G/L	1.5 – 250	0.2 – 200
	p [psig]			21.7 – 3625	2.9 – 2900
Outlet body investment casted					
Inlet body	1.4404	H2	Art. No. 4594.	2162	2172
Outlet body	1.4408				
	(CF8M)				
Bonnet	1.4408	H4	Art. No. 4594.	2164	2174
	p [bar _g]		S/G/L	1.5 – 250	0.2 – 200
	p [psig]			21.7 – 3625	2.9 – 2900

¹⁾ Max. set pressure 69 bar / 1000 psig for Type 4593 acc. to ASME-Code Sec. VIII, Div. 1 with UV-Stamp.
The design of Type 4593 is permitted with limitations acc. to ASME-Code Sec. VIII, Div. 1, UCD-2, UCD-3.
Type 4593 shall not be used for lethal substances, irrespective of their state of aggregation.

Type 459

Dimensions and weights

Threaded connections [Metric units]

	Size Outlet body	1/2" x 1"	3/4" x 1"	1" x 1"	1/2" x 1"	3/4" x 1"	1" x 1"	3/4" x 1 1/2"	1" x 1 1/2"	1 1/4" x 1 1/2"	1 1/2" x 1 1/2"
Actual Orifice diameter d ₀ [mm]		9	9	9	13	13	13	17.5	17.5	17.5	17.5
Actual Orifice area A ₀ [mm ²]		63.6	63.6	63.6	133	133	133	241	241	241	241
Weight [kg]		3.1	3.1	3.1	3.1	3.1	3.1	3.9	3.9	3.9	3.9
Balanced bellows [kg]		3.9	3.9	3.9	3.9	3.9	4.7	4.7	4.7	4.7	4.7
Required installation diameter d [mm]		165	165	165	165	165	165	165	165	165	165

Inlet thread female

	Size outlet body	1/2" x 1"	3/4" x 1"	1" x 1"	1/2" x 1"	3/4" x 1"	1" x 1"	3/4" x 1 1/2"	1" x 1 1/2"	1 1/4" x 1 1/2"	1 1/2" x 1 1/2"
Actual Orifice diameter d ₀ [mm]		9	9	9	13	13	13	17.5	17.5	17.5	17.5
Center to face / Height											
DIN ISO 228-1 G	Inlet a	53	56	62	53	56	62	60	66	67	73
ASME B1.20.1 NPT	Outlet b	75	75	75	75	75	75	75	75	75	75
Center to face [mm]	H max	283	286	292	283	286	292	287	293	294	300
Height [mm]	Balanced bellows H max	315	318	324	315	318	324	319	325	326	332
ISO 7-1/BS 21 Rc	Inlet a	53	56	64	53	56	64	60	68	-	77
Center to face [mm]	Outlet b	75	75	75	75	75	75	75	75	-	75
Height [mm]	H max	283	286	294	283	286	294	287	295	-	304
	Balanced bellows H max	315	318	326	315	318	326	319	327	-	336

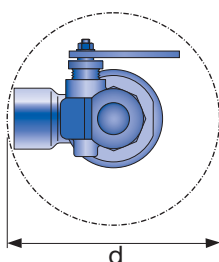
Inlet thread male

	Size outlet body	1" - 1 1/2"	1" - 1 1/2"	1 1/2"	2"
Actual Orifice diameter d ₀ [mm]		9	13	17.5	17.5
Center to face [mm]					
DIN ISO 228-1 G	Inlet 1/2" - 1" a	52	52	-	-
	Inlet 1" - 1 1/2" a	-	-	56	-
	Outlet b	75	75	75	-
ISO 7-1/BS 21 R	Inlet 1/2" - 1" a	49	49	-	-
ASME B1.20.1 NPT	Inlet 1" - 2" a ¹⁾	-	-	53	53
	Outlet b	75	75	75	100

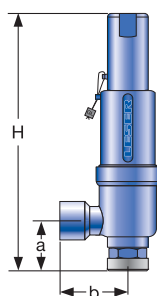
		Conventional design						Balanced bellows					
Size inlet thread		1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"
DIN ISO 228-1 G	H max.	296	298	301	303	305	-	328	330	333	335	337	-
ISO 7-1/BS 21 R	H max.	298	299	303	-	305	-	330	331	335	-	337	-
ASME B1.20.1 NPT	H max.	301	301	307	308	308	309	333	333	339	340	340	341

Length of screwed end c [mm]		1/2"	3/4"	1"	1 1/4"	1 1/2"	2"
DIN ISO 228-1 G		14	16	18	20	22	-
ISO 7-1/BS 21 R		19	20	23	-	25	-
ASME B1.20.1 NPT		22	22	27	28	28	29

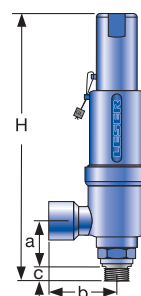
¹⁾ Inlet thread R only up to 1 1/2".



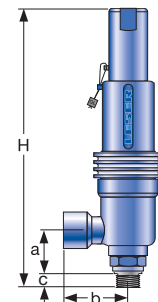
Required installation diameter



Conventional design - female thread



Conventional design - male thread



Balanced bellows

Type 459

Dimensions and weights

Threaded connections [US units]

Size Outlet body		1/2" x 1"	3/4" x 1"	1" x 1"	1/2" x 1"	3/4" x 1"	1" x 1"	3/4" x 1 1/2"	1" x 1 1/2"	1 1/4" x 1 1/2"	1 1/2" x 1 1/2"
Actual Orifice diameter d ₀ [inch]		0.354	0.354	0.354	0.512	0.512	0.512	0.689	0.689	0.689	0.689
Actual Orifice area A ₀ [inch ²]		0.099	0.099	0.099	0.206	0.206	0.206	0.374	0.374	0.374	0.374
Weight	[lbs]	6.8	6.8	6.8	6.8	6.8	6.8	8.6	8.6	8.6	8.6
Balanced bellows	[lbs]	8.6	8.6	8.6	8.6	8.6	8.6	10.4	10.4	10.4	10.4
Required installation diameter d	[inch]	6 1/2	6 1/2	6 1/2	6 1/2	6 1/2	6 1/2	6 1/2	6 1/2	6 1/2	6 1/2

Inlet thread female

Size outlet body		1/2" x 1"	3/4" x 1"	1" x 1"	1/2" x 1"	3/4" x 1"	1" x 1"	3/4" x 1 1/2"	1" x 1 1/2"	1 1/4" x 1 1/2"	1 1/2" x 1 1/2"	
Actual Orifice diameter d ₀ [inch]		0.354	0.354	0.354	0.512	0.512	0.512	0.689	0.689	0.689	0.689	
Center to face / Height												
DIN ISO 228-1	G	Inlet a	2 ³ / ₃₂	2 ⁷ / ₃₂	2 ⁷ / ₁₆	2 ³ / ₃₂	2 ⁷ / ₃₂	2 ⁷ / ₁₆	2 ³ / ₈	2 ¹⁹ / ₃₂	2 ⁵ / ₈	2 ⁷ / ₈
ASME B1.20.1	NPT	Outlet b	2 ¹⁵ / ₁₆	2 ¹⁵ / ₁₆	2 ¹⁵ / ₁₆	2 ¹⁵ / ₁₆	2 ¹⁵ / ₁₆	2 ¹⁵ / ₁₆	2 ¹⁵ / ₁₆	2 ¹⁵ / ₁₆	2 ¹⁵ / ₁₆	2 ¹⁵ / ₁₆
Center to face [inch]		H max.	11 ⁵ / ₃₂	11 ¹ / ₁₄	11 ¹ / ₂	11 ⁵ / ₃₂	11 ¹ / ₁₄	11 ¹ / ₂	11 ⁵ / ₁₆	11 ¹⁷ / ₃₂	11 ⁹ / ₁₆	11 ¹³ / ₁₆
Height [inch]		Balanced bellows H max.	12 ¹³ / ₃₂	12 ¹⁷ / ₃₂	12 ³ / ₄	12 ¹³ / ₃₂	12 ¹⁷ / ₃₂	12 ³ / ₄	12 ⁹ / ₁₆	12 ²⁵ / ₃₂	12 ²⁷ / ₃₂	13 ¹ / ₁₆
ISO 7-1/BS 21	Rc	Inlet a	2 ³ / ₃₂	2 ⁷ / ₃₂	2 ¹⁷ / ₃₂	2 ³ / ₃₂	2 ⁷ / ₃₂	2 ¹⁷ / ₃₂	2 ³ / ₈	2 ¹ / ₁₆	–	3 ¹ / ₃₂
Center to face [inch]		Outlet b	2 ¹⁵ / ₁₆	2 ¹⁵ / ₁₆	2 ¹⁵ / ₁₆	2 ¹⁵ / ₁₆	2 ¹⁵ / ₁₆	2 ¹⁵ / ₁₆	2 ¹⁵ / ₁₆	2 ¹⁵ / ₁₆	–	2 ¹⁵ / ₁₆
Height [inch]		H max.	11 ⁵ / ₃₂	11 ¹ / ₁₄	11 ⁹ / ₁₆	11 ⁵ / ₃₂	11 ¹ / ₁₄	11 ⁹ / ₁₆	11 ⁵ / ₁₆	11 ⁵ / ₈	–	11 ³¹ / ₃₂
		Balanced bellows H max.	12 ¹³ / ₃₂	12 ¹⁷ / ₃₂	12 ²⁷ / ₃₂	12 ¹³ / ₃₂	12 ¹⁷ / ₃₂	12 ²⁷ / ₃₂	12 ⁹ / ₁₆	12 ⁷ / ₈	–	13 ⁷ / ₃₂

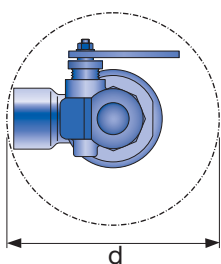
Inlet thread male

Size outlet body		1" – 1 1/2"	1" – 1 1/2"	1 1/2"	2"
Actual Orifice diameter d ₀ [mm]		0.354	0.512	0.689	0.689
Center to face [inch]					
DIN ISO 228-1	G	Inlet 1/2" – 1" a	2 ¹ / ₁₆	2 ¹ / ₁₆	–
		Inlet 1" – 1 1/2" a	–	–	2 ⁷ / ₃₂
		Outlet b	2 ¹⁵ / ₁₆	2 ¹⁵ / ₁₆	2 ¹⁵ / ₁₆
ISO 7-1/BS 21	R	Inlet 1/2" – 1" a	1 ¹⁵ / ₁₆	1 ¹⁵ / ₁₆	–
ASME B1.20.1	NPT	Inlet 1" – 2" a ¹⁾	–	–	2 ³ / ₃₂
		Outlet b	2 ¹⁵ / ₁₆	2 ¹⁵ / ₁₆	2 ¹⁵ / ₁₆

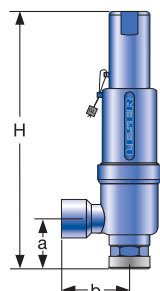
Height [inch]		Conventional design						Balanced bellows						
Size inlet thread		1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	
DIN ISO 228-1	G	H max.	11 ²¹ / ₃₂	11 ²³ / ₃₂	11 ²⁷ / ₃₂	11 ¹⁵ / ₁₆	12	–	12 ²⁹ / ₃₂	13	13 ¹ / ₈	13 ³ / ₁₆	13 ⁹ / ₃₂	–
ISO 7-1/BS 21	R	H max.	11 ²³ / ₃₂	11 ²⁵ / ₃₂	11 ¹⁵ / ₁₆	–	12	–	13	13 ¹ / ₃₂	13 ³ / ₁₆	–	13 ⁹ / ₃₂	–
ASME B1.20.1	NPT	H max.	11 ²⁷ / ₃₂	11 ²⁷ / ₃₂	12 ³ / ₃₂	12 ¹ / ₈	12 ¹ / ₈	12 ⁵ / ₃₂	13 ¹ / ₈	13 ¹ / ₈	13 ¹¹ / ₃₂	13 ³ / ₈	13 ³ / ₈	13 ⁷ / ₁₆

Length of screwed end c [inch]		1/2"	3/4"	1"	1 1/4"	1 1/2"	2"
DIN ISO 228-1	G	9/16	5/8	23/32	25/32	7/8	–
ISO 7-1/BS 21	R	3/4	25/32	29/32	–	31/32	–
ASME B1.20.1	NPT	7/8	7/8	1 1/16	1 3/32	1 3/32	1 5/32

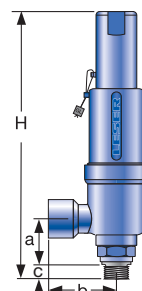
¹⁾ Inlet thread R only to 1 1/2".



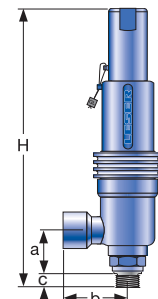
Required installation diameter



Conventional design – female thread



Conventional design – male thread



Balanced bellows

Type 459

Dimensions and weights

Flanged connections [Metric units]

	Conventional design			Balanced bellows		
Actual Orifice diameter d_0 [mm]	9	13	17.5	9	13	17.5
Actual Orifice area A_0 [mm ²]	63.6	133	241	63.6	133	241

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

Flange rating PN 40 – PN 400								
Center to face	[mm]	Inlet a	100	100	105	100	100	105
		Outlet b	100	100	100	100	100	100
Height	[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	[mm]	H max.	330	330	333	375	375	378

Note The outlet dimension b can differ at special combinations of nominal diameter and pressure range if flanged connections are used at the inlet and outlet. Special dimensions are possible. More information at sales@leser.com.

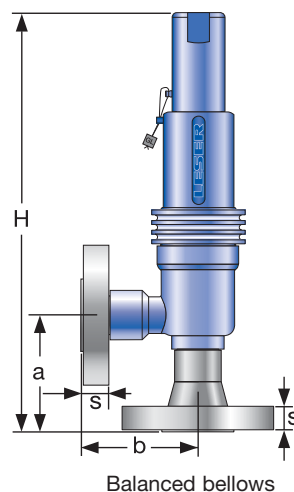
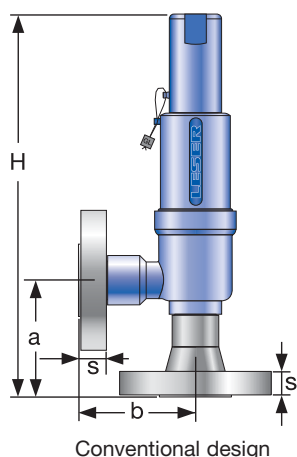
Weight

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

Weight net	[kg]	m_N	3.1	3.1	3.9	4.3	4.3	5.1
(without inlet and outlet flange)								

Flange dimensions

	Size	DIN EN 1092-1 / Flange rating PN						ASME B16.5 / Flange rating					
		40	100	160	250	320	400	150	300	600	900	1500	2500
DN 15		NPS 1/2"											
Flange thickness [mm]	s	18	–	22	28	28	30	14	18	18	26	26	30.2
Weight slip on flange [kg]	m_F	0.8	–	1.2	2.5	2.5	3.6	0.6	0.9	0.9	2.1	2.1	3
DN 20		NPS 3/4"											
Flange thickness [mm]	s	20	22	–	–	–	–	15	18	18	25.4	25.4	32
Weight slip on flange [kg]	m_F	1.1	1.3	–	–	–	–	0.8	1.4	1.4	2.3	2.3	3.5
DN 25		NPS 1"											
Flange thickness [mm]	s	22	–	26	30	36	40	17	21.5	21.5	32.5	32.5	40
Weight slip on flange [kg]	m_F	1.3	–	2.6	3.5	5	7.5	1	2.1	2.1	4.1	4.1	5.1
DN 40		NPS 1 1/2"											
Flange thickness [mm]	s	21	–	23	32	–	–	22	24	24	32	–	–
Weight slip on flange [kg]	m_F	2.1	–	2.9	4.3	–	–	1.4	2.2	2.2	3.9	–	–



Type 459

Dimensions and weights

Flanged connections [US units]

	Conventional design			Balanced bellows		
Actual Orifice diameter d_0 [inch]	0.354	0.512	0.689	0.354	0.512	0.689
Actual Orifice area A_0 [inch ²]	0.099	0.206	0.374	0.099	0.206	0.374

DIN EN 1092-1

Flange rating PN 40 – PN 400								
Center to face	[inch]	Inlet a	$3^{15}/_{16}$	$3^{15}/_{16}$	$4^{1}/_{8}$	$3^{15}/_{16}$	$3^{15}/_{16}$	$4^{1}/_{8}$
		Outlet b	$3^{15}/_{16}$	$3^{15}/_{16}$	$3^{15}/_{16}$	$3^{15}/_{16}$	$3^{15}/_{16}$	$3^{15}/_{16}$
Height [H4]	[inch]	H max.	13	13	$13^{1}/_{8}$	$14^{3}/_{4}$	$14^{3}/_{4}$	$14^{7}/_{8}$

ASME B 16.5

Flange rating class 150 – 2500								
Center to face	[inch]	Inlet a	$3^{15}/_{16}$	$3^{15}/_{16}$	$4^{1}/_{8}$	$3^{15}/_{16}$	$3^{15}/_{16}$	$4^{1}/_{8}$
		Outlet b	$3^{15}/_{16}$	$3^{15}/_{16}$	$3^{15}/_{16}$	$3^{15}/_{16}$	$3^{15}/_{16}$	$3^{15}/_{16}$
Height	[inch]	H max.	13	13	$13^{1}/_{8}$	$14^{3}/_{4}$	$14^{3}/_{4}$	$14^{7}/_{8}$

Note The outlet dimension b can differ at special combinations of nominal diameter and pressure range if flanged connections are used at the inlet and outlet. Special dimensions are possible. More information at sales@leser.com.

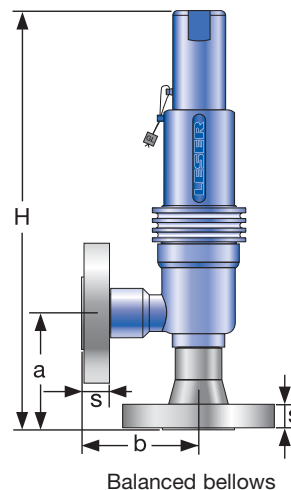
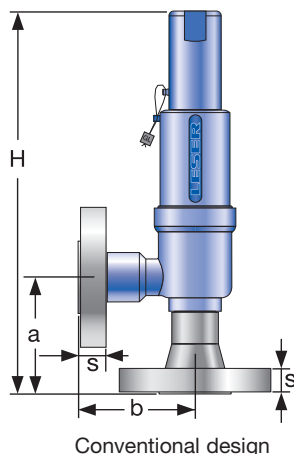
Weight

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

Weight net	[lbs]	m_N	6.8	6.8	8.6	9.5	9.5	11.3
(without inlet and outlet flange)								

Flange dimensions

		DIN EN 1092-1 / Flange rating PN						ASME B16.5 / Flange rating									
		Size		40	100	160	250	320	400	Size		150	300	600	900	1500	2500
DN 15										NPS 1/2"							
Flange thickness	[inch]	s	$2^{3}/_{32}$	–	$7/_{8}$	$1^{3}/_{32}$	$1^{3}/_{32}$	$1^{3}/_{32}$	$1^{3}/_{16}$		$9/_{16}$	$2^{3}/_{32}$	$2^{3}/_{32}$	$1^{1}/_{32}$	$1^{1}/_{32}$	$1^{3}/_{16}$	
Weight slip on flange	[lbs]	m_F	1.8	–	2.6	5.5	5.5	7.9			1.3	2.0	2.0	4.6	4.6	6.6	
DN 20										NPS 3/4"							
Flange thickness	[inch]	s	$2^{5}/_{32}$	$7/_{8}$	–	–	–	–			$1^{9}/_{32}$	$2^{3}/_{32}$	$2^{3}/_{32}$	1	1	$1^{1}/_{4}$	
Weight slip on flange	[lbs]	m_F	2.4	2.9	–	–	–	–			1.8	3.1	3.1	5.1	5.1	7.7	
DN 25										NPS 1"							
Flange thickness	[inch]	s	$7/_{8}$	–	$1^{1}/_{32}$	$1^{3}/_{16}$	$1^{13}/_{32}$	$1^{9}/_{16}$			$2^{1}/_{32}$	$2^{7}/_{32}$	$2^{7}/_{32}$	$1^{9}/_{32}$	$1^{9}/_{32}$	$1^{9}/_{16}$	
Weight slip on flange	[lbs]	m_F	2.9	–	5.7	7.7	11.0	16.5			2.2	4.6	4.6	9.0	9.0	11.2	
DN 40										NPS 1 1/2"							
Flange thickness	[inch]	s	$1^{3}/_{16}$	–	$2^{9}/_{32}$	$1^{1}/_{4}$	–	–			$7/_{8}$	$1^{5}/_{16}$	$1^{5}/_{16}$	$1^{1}/_{4}$	–	–	
Weight slip on flange	[lbs]	m_F	4.5	–	6.3	9.5	–	–			3.2	4.8	4.8	8.6	–	–	



Type 459

Type 459

Pressure/temperature ratings

[Metric units]

Actual Orifice diameter d_0 [mm]		9	13	17.5								
Actual Orifice Area A_0 [mm ²]		63.6	133	241								
Body material: 1.4104 (430)		Type 4593										
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 _g] S/G/L	1.5			0.2			0.2				
Min. set pressure standard bellows	p [bar _g] S/G/L	3			3			3				
Min. set pressure ⁵⁾ high press. bellows	p [bar _g] S/G/L	40			40			40				
Maximum set pressure	p [bar _g] S/G/L	250			200			100				
Temperature acc. to DIN EN	min. [°C]				-10							
	max. [°C]				+300							
Temperature acc. to ASME	min. [°C]				-29							
	max. [°C]				+300							
Body material: 1.4404 (316L)		Type 4592										
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 500 (Option code L20)			PN 160 PN 250 (Option code L20)			PN 160				
Outlet Body	Pressure rating	PN 160			PN 160			PN 160				
Minimum set pressure	p [bar _g] S/G/L	1.5			0.2			0.2				
Min. set pressure standard bellows	p [bar _g] S/G/L	3			3			3				
Min. set pressure ⁵⁾ high press. bellows	p [bar _g] S/G/L	40			40			40				
Maximum set pressure	p [bar _g] S/G/L	250			200			100				
Temperature acc. to DIN EN	min. [°C]				-85 ¹⁾							
	max. [°C]				+450 ²⁾							
Temperature acc. to ASME	min. [°C]				-29							
	max. [°C]				+427							
Body material: 1.4404 (316L)		Type 4594										
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 500 (Option code L20)			PN 160 PN 250 (Option code L20)			PN 160				
Outlet Body	Pressure rating	PN 160			PN 160			PN 160				
Minimum set pressure	p [bar _g] S/G/L	1.5			0.2			0.2				
Min. set pressure standard bellows	p [bar _g] S/G/L	3			3			3				
Min. set pressure ⁵⁾ high press. bellows	p [bar _g] S/G/L	40			40			40				
Maximum set pressure	p [bar _g] S/G/L	250			200			100				
Temperature acc. to DIN EN	min. [°C]				-273 ³⁾							
	max. [°C]				+400 ²⁾							
Temperature acc. to ASME	min. [°C]				-196							
	max. [°C]				+450 ^{2) 4)}							

¹⁾ For DIN EN applications at temperatures under -10°C please proceed in accordance to AD-2000 Merkblatt W10:

- Load case II: under -10°C / 14°F to -60°C / -76°F, $p_{max} = PN \times 0.75$
- Load case III: under -60°C / -76°F to -85°C / -121°F, $p_{max} = PN \times 0.25$

²⁾ Please notice: from 300°C / 572°F a bellows or suitable spring material e.g. Inconel X750 should be selected (refer to LDs 3001.19).

³⁾ For DIN EN applications at temperatures under -200°C please proceed in accordance to AD-2000 Merkblatt W10:

- Load case II: under -200°C / -328°F to -255°C / -427°F, $p_{max} = PN \times 0.75$
- Load case III: under -255°C / -427°F to -273°C / -459°F, $p_{max} = PN \times 0.25$

⁴⁾ The temperature is limited by the standard inlet body. For applications up to 538°C/1000°F (temperature limit of outlet body) a suitable inlet body material and a bellows or Inconel spring is required.

⁵⁾ Min. set pressure high pressure bellows = Max. pressure standard bellows.

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.

Type 459

Pressure/temperature ratings

[US units]

Actual Orifice diameter d_0 [inch]		0.354			0.512			0.689				
Actual Orifice Area A_0 [inch ²]		0.099			0.206			0.347				
Body material: 1.4104 (430)		Type 4593										
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"
Minimum set pressure	p [psig] S/G/L	21.8			2.9			2.9				
Min. set pressure ⁵⁾ standard bellows	p [psig] S/G/L	43.5			43.5			43.5				
Min. set pressure high press. bellows	p [psig] S/G/L	580			580			580				
Maximum set pressure	p [psig] S/G/L	3625			2900			1450				
Temperature acc. to DIN EN	min. [°F]				+14							
	max. [°F]				+572							
Temperature acc. to ASME	min. [°F]				-20							
	max. [°F]				+572							
Body material: 1.4404 (316L)		Type 4592										
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"
Minimum set pressure	p [psig] S/G/L	21.8			2.9			2.9				
Min. set pressure ⁵⁾ standard bellows	p [psig] S/G/L	43.5			43.5			43.5				
Min. set pressure high press. bellows	p [psig] S/G/L	580			580			580				
Maximum set pressure	p [psig] S/G/L	3625			2900			1450				
Temperature acc. to DIN EN	min. [°F]				-121 ¹⁾							
	max. [°F]				+752 ²⁾							
Temperature acc. to ASME	min. [°F]				-20							
	max. [°F]				+800 ²⁾							
Body material: 1.4404 (316L)		Type 4594										
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"
Minimum set pressure	p [psig] S/G/L	21.8			2.9			2.9				
Min. set pressure ⁵⁾ standard bellows	p [psig] S/G/L	43.5			43.5			43.5				
Min. set pressure high press. bellows	p [psig] S/G/L	580			580			580				
Maximum set pressure	p [psig] S/G/L	3625			2900			1450				
Temperature acc. to DIN EN	min. [°F]				-328 ³⁾							
	max. [°F]				+752 ²⁾							
Temperature acc. to ASME	min. [°F]				-321							
	max. [°F]				+842 ^{2) 4)}							

¹⁾ For DIN EN applications at temperatures under -10 °C please proceed in accordance to AD-2000 Merkblatt W10:

- Load case II: under -10 °C / 14 °F to -60 °C / -76 °F, $p_{max} = PN \times 0.75$
- Load case III: under -60 °C / -76 °F to -85 °C / -121 °F, $p_{max} = PN \times 0.25$

²⁾ Please notice: from 300 °C / 572 °F a bellows or suitable spring material e.g. Inconel X750 should be selected (refer to LDsS 3001.19).

³⁾ For DIN EN applications at temperatures under -200 °C please proceed in accordance to AD-2000 Merkblatt W10:

- Load case II: under -200 °C / -328 °F to -255 °C / -427 °F, $p_{max} = PN \times 0.75$
- Load case III: under -255 °C / -427 °F to -273 °C / -459 °F, $p_{max} = PN \times 0.25$

⁴⁾ The temperature is limited by the standard inlet body. For applications up to 538 °C/1000 °F (temperature limit of outlet body) a suitable inlet body material and a bellows or Inconel spring is required.

⁵⁾ Min. set pressure high pressure bellows = Max. pressure standard bellows.

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.

Type 459 Approvals

Actual Orifice diameter d_0 [mm]		9	13	17.5
Actual Orifice area A_0 [mm ²]		63.6	133	241
Actual Orifice diameter d_0 [inch]		0.354	0.512	0.689
Actual Orifice area A_0 [inch ²]		0.099	0.206	0.374
Europe		Coefficient of discharge K_{dr}		
	Approval No.	072021409Z0022/15/D/0135		
PED / DIN EN ISO 4126-1	S/G	0.83	0.81	0.79
	L	0.61	0.53	0.52
Germany		Coefficient of discharge α_w		
	Approval No.	TÜV SV 909		
PED / AD 2000-Merkblatt A2	S/G	0.83	0.81	0.79
	L	0.61	0.53	0.52
United States		Coefficient of discharge K		
	Approval No.	M 37112		
ASME Sec. VIII Div. 1	S/G	0.811		
	Approval No.	M 37101		
	L	0.566		
Canada		Coefficient of discharge K		
	Approval No.	The current approval no. can be found at www.leser.com		
CRN	S/G	0.811		
	L	0.566		
China		Coefficient of discharge α_w		
	Approval No.	The current approval no. can be found at www.leser.com		
AQSIQ	S/G	0.83	0.81	0.79
	L	0.61	0.53	0.52
Eurasian Custom Union		Coefficient of discharge α_w		
	Approval No.	The current approval no. can be found at www.leser.com		
EAC	S/G	0.83	0.81	0.79
	L	0.61	0.53	0.52
Classification societies		Homepage		
Bureau Veritas	BV	www.bureauveritas.com		The valid certification number is changed with every renewal.
DNV GL		www.dnvgl.com		
Lloyd's Register EMEA	LREMEA	www.lr.org		A sample certificate including the valid certification number can be found at www.leser.com
Registro Italiano Navale	RINA	www.rina.org		
U.S. Coast Guard	U.S.C.G	www.uscg.org		