

# Type 459 HDD



Safety Relief Valves  
Heavy Duty Design  
- spring loaded

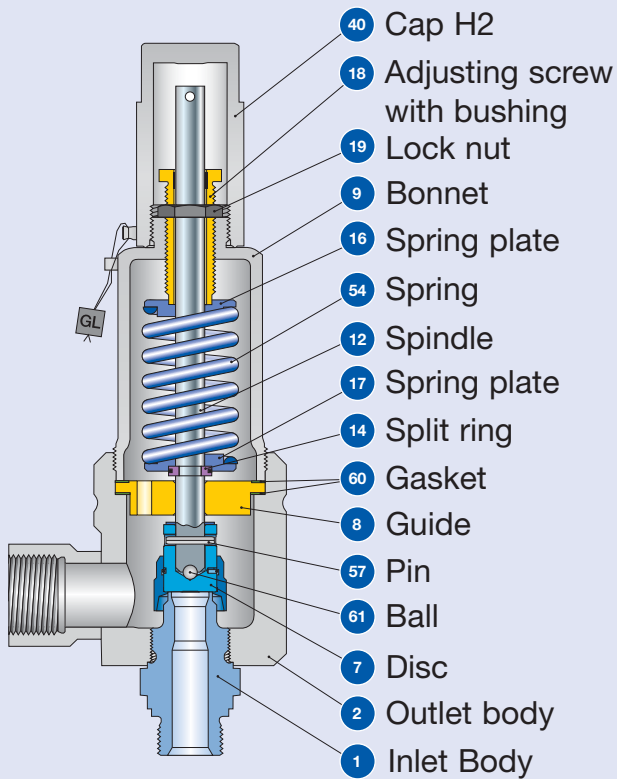
Metric Units

## Facts

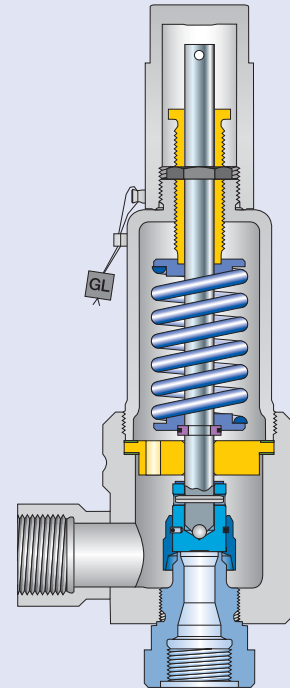
**LESER**

[The-Safety-Valve.com](http://The-Safety-Valve.com)

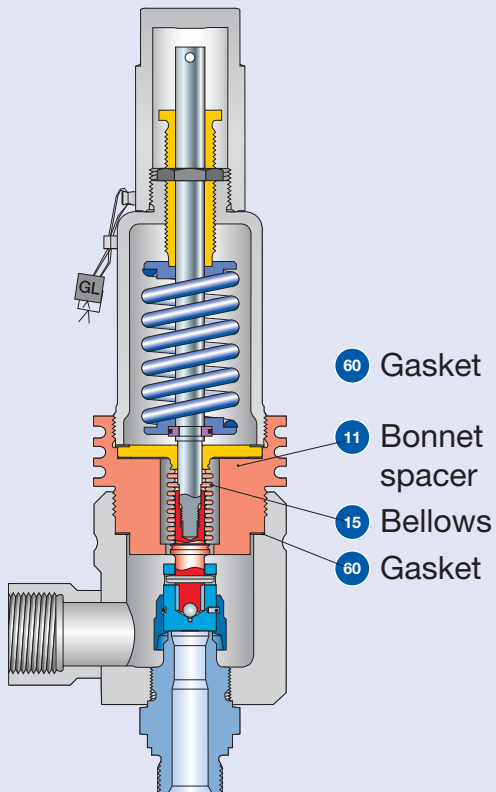
## Available designs



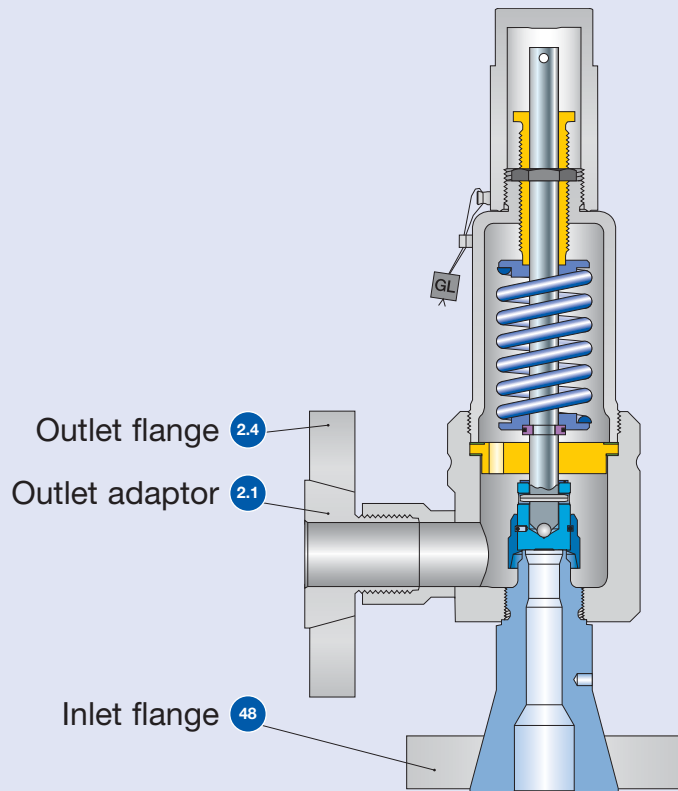
**Conventional design**  
Threaded connection



**Conventional design**  
Threaded connection



**Balanced bellows**  
Threaded connection



**Conventional design**  
Flange connection

## Available designs – materials

Materials			Type 4594 HDD
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 stellited SA 479 316L stellited
			1.4404 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
			1.4404 / PTFE 316L / PTFE
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.

## How to order – Article numbers

Article numbers						
	Actual Orifice diameter $d_0$ [mm]		6 <sup>1)</sup>	9	13	
	Actual Orifice area $A_0$ [mm <sup>2</sup> ]		28.3	63.9	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>Body material: 14404 (316L)</b>						
<b>All body and trim parts</b>	<b>1.4404</b>	<b>H2</b>	<b>Art.-No. 4594.</b>	<b>2532</b>	<b>2582</b>	<b>2592</b>
		<b>H4</b>	<b>Art.-No. 4594.</b>	<b>2534</b>	<b>2584</b>	<b>2594</b>
		p [bar <sub>g</sub> ]	S/G/L	<b>420.01 – 850</b>	<b>1.5 – 420</b>	<b>0.2 – 200</b>
		p [psig]		<b>6091 – 12328</b>	<b>21.7 – 6091</b>	<b>2.9 – 2901</b>

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

<sup>1)</sup> The specification of the medium is necessary at liquid applications (Option Code M09).

## Dimensions and weights – Metric Units

### Threaded connections

	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"	1/2" x 1"	3/4" x 1"	1" x 1"
Actual Orifice diameter d <sub>0</sub> [mm]		6	6	6	9	9	9	13	13	13
Actual Orifice area A <sub>0</sub> [mm <sup>2</sup> ]		28.3	28.3	28.3	63.6	63.6	63.6	133	133	133
Weight [kg]		3.9	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	4.7
Required installation diameter [mm]		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"	1/2" x 1"	3/4" x 1"	1" x 1"
Actual Orifice diameter d <sub>0</sub> [mm]		6	6	6	9	9	9	13	13	13

### Center to face / Height

DIN ISO 228-1	G	Inlet a	53	53	62*)	53	56	62	53	56	62
			ASME B1.20.1	NPT	Outlet b	75	75	75*)	75	75	75
Center to face [mm]		H max.	283	286	292*)	283	286	292	283	286	292
Height [mm]		Balanced bellows H max.	315	318	342*)	315	318	324	315	318	324
ISO 7-1/BS 21	Rc	Inlet a	53	56	64	53	56	64	53	56	64
			Center to face [mm]	Outlet b	75	75	75	75	75	75	75
Height [mm]		H max.	283	286	294	283	286	294	283	286	294
		Balanced bellows H max.	315	318	326	315	318	326	315	318	326

### Inlet thread "Male"

	Size outlet body	1"	1"	1"
Actual Orifice diameter d <sub>0</sub> [mm]		6	9	13

### Center to face [mm]

DIN ISO 228-1	G	Inlet a	52	52	–
		Outlet b	75	75	56
ISO 7-1/BS 21	R	Inlet a	49	49	49
ASME B1.20.1	NPT	Outlet b	75	75	75

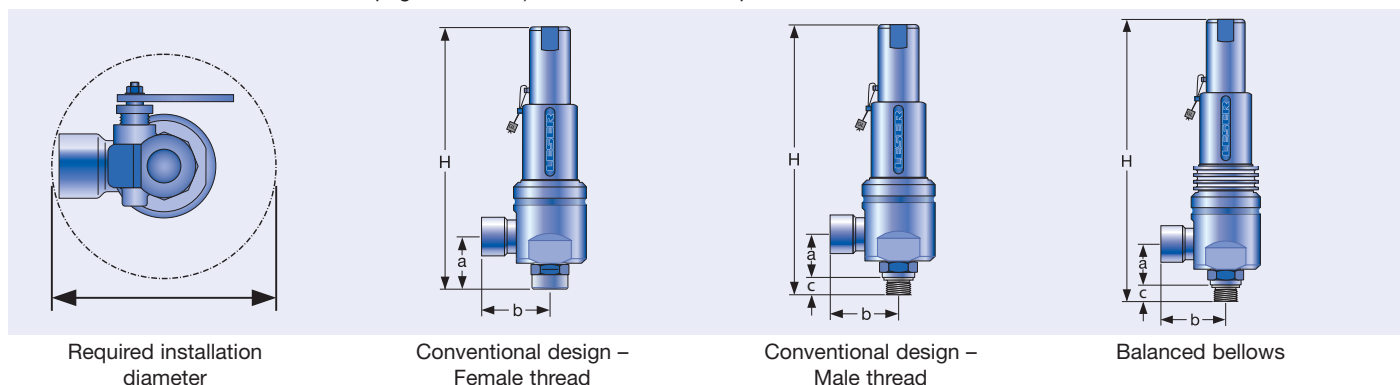
### Height [mm]

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

### Length of screwed end "c" [mm]

Size inlet thread			1/2"	3/4"	1"
DIN ISO 228-1	G		14	16	18
ISO 7-1/BS 21	R		19	20	23
ASME B1.20.1	NPT		22	22	27

Available treaded connections refer to page 09/06. \*) DIN ISO 228-1 G not possible.



Type 459 HDD

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

Flange rating PN 40 – PN 400						
Center to face [mm]	Inleta	100	100	100	100	100
	Outlet b	100	100	100	100	100
Height [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	100	100	100	100	100
	Outlet b	100	100	100	100	100
Height [mm]	H max.	330	330	330	375	375

**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.

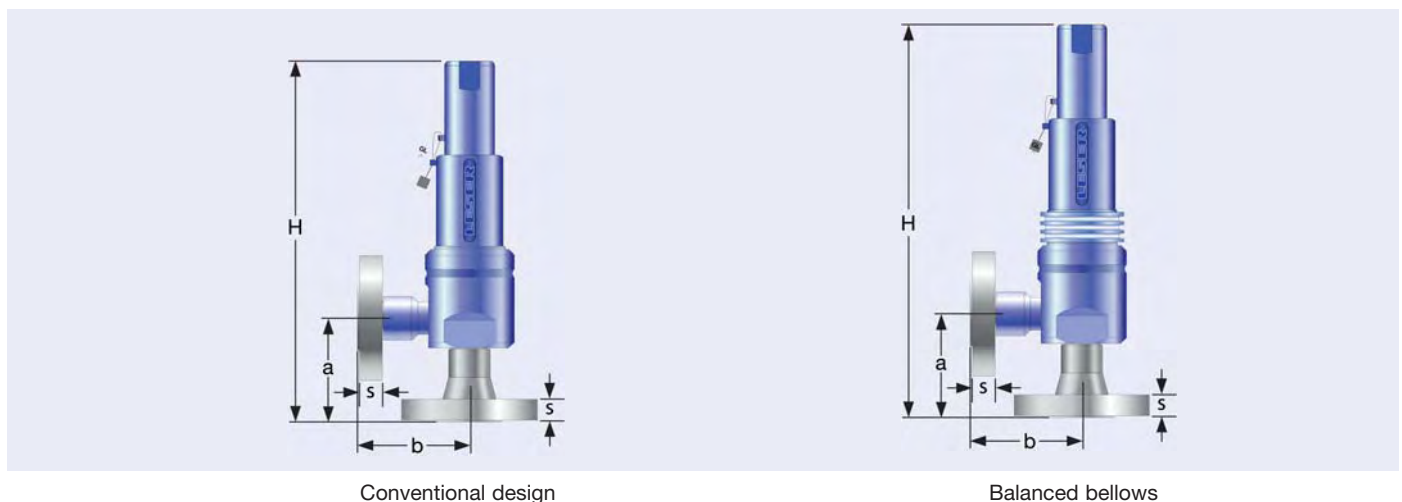
### Weight

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

Weight net (without inlet and outlet flange) [kg]	$m_N$	2.6	2.6	2.6	3.8	3.8	3.8
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### Flange dimensions

Size	DIN EN 1092-1 / Flange rating PN							DIN ISO 1092-1 / Flange rating class						
	40	100	160	250	320	400	Size	150	300	600	900	1500	2500	
<b>DN 15</b>								<b>NPS 1/2"</b>						
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
<b>DN 20</b>								<b>NPS 3/4"</b>						
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
<b>DN 25</b>								<b>NPS 1"</b>						
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
<b>DN 40</b>								<b>NPS 1 1/2"</b>						
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 HDD

## Pressure temperature ratings

Metric Units										
Actual Orifice diameter $d_0$ [mm]		6			9			13		
Actual Orifice Area $A_0$ [mm <sup>2</sup> ]		28.3			63.6			133		
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"
	Pressure rating	PN 700			PN 500			PN 250		
	Pressure rating	PN 160			PN 160			PN 160		
<b>Minimum set pressure</b>	p [bar <sub>g</sub> ] S/G/L	420			1.5			0,2		
<b>Maximum set pressure</b>	p [bar <sub>g</sub> ] S/G	700			420			200		
	p [bar <sub>g</sub> ] L	-								
<b>Temperature acc. to DIN EN</b>	min. [°C]				-270					
	max. [°C]				+550					
<b>Temperature acc. to ASME</b>	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)				Type 4594						
Base / Inlet Body	Connection size	1/2"	3/4"	1"	1/2"	3/4"	1"	3/4"	1"	1 1/4"
<b>Minimum set pressure</b>	p [psig] S/G/L	6091			21.7			2.9		
<b>Maximum set pressure</b>	p [psig] S/G	10150			6091			2901		
	p [psig] L	-								
<b>Temperature acc. to DIN EN</b>	min. [°F]				-454					
	max. [°F]				+1022					
<b>Temperature acc. to ASME</b>	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.

## Available Options

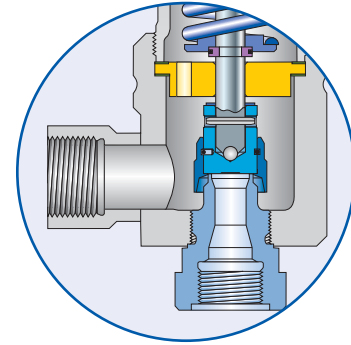
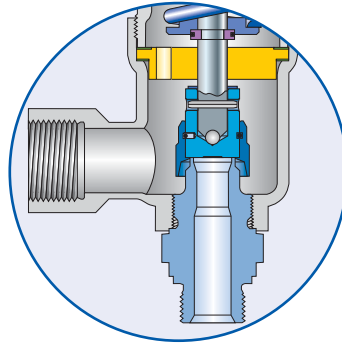
<p><b>Male thread</b></p>	<p><b>Female thread</b></p>	<p><b>Flanged version</b></p>	
<p><b>Stellited sealing surface</b> J25: Disc stellited L20: Base/inlet body</p>	<p><b>Disc with inserted sealing plate</b> J44: PTFE-FDA "N" J48: PCTFE "D" J49: VESPEL-SP "K"</p>		
<p><b>Heating jacket</b> H29</p>	<p><b>Balanced bellows</b></p>	<p><b>INCONEL X-750 spring</b> X08</p>	<p><b>Special material</b> 2.4610 Hastelloy® C4 2.4360 Monel® 400 1.4462 Duplex</p>
<p><b>Lift indicator</b> J93: Lift indicator</p>	<p><b>Test gag</b> J69: H4 J70: H2</p>	<p><b>O-ring-damper H2</b> J65</p>	<p><b>O-ring-damper H4</b> J66</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



### Threaded connections

#### Male thread

#### Female thread

Actual Orifice diameter $d_0$ [mm]	<b>6</b>		<b>9 / 13</b>		<b>17.5</b>	
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	
<b>Valve size</b>	<b>Inlet</b>	<b>Outlet</b>	<b>Inlet</b>	<b>Outlet</b>	<b>Inlet</b>	<b>Outlet</b>
<b>Male thread DIN ISO 228-1</b>						
<b>G</b>	1/2"	V54	–	V54 <sup>1)</sup>	–	–
	3/4"	V55	–	V55	–	–
	1"	V56	V68	V56	V68	V56
	1 1/4"	–	V79	–	V79	V83
	1 1/2"	–	V69	–	V69	V57
<b>Female thread DIN ISO 228-1</b>						
<b>G</b>	1/2"	V50	–	V50	–	–
	3/4"	V51	–	V51	–	V51
	1"	–	V66	V52 <sup>2)</sup>	V66	V52
	1 1/4"	–	V81	–	V81	V84
	1 1/2"	–	V67	–	V67	V53
<b>Male thread DIN ISO 7-1/BS 21</b>						
<b>R/BSPT</b>	1/2"	V30 <sup>3)</sup>	–	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>						
<b>Rc/BSPT</b>	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>						
<b>NPT</b>	1/2"	V61	–	V61 <sup>4)</sup>	–	–
	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>						
<b>NPT</b>	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).

<sup>1)</sup> Only for  $d_0$  9 mm

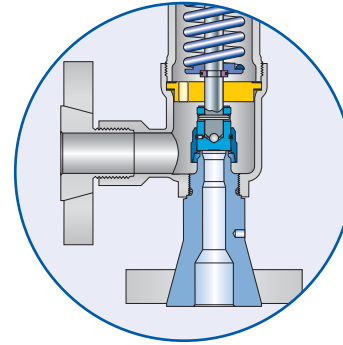
<sup>2)</sup>  $d_0$  9 mm: up to PN 420

<sup>3)</sup> Only as special design

<sup>4)</sup>  $d_0$  13 mm: up to 125 bar and 455 °C

## 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 version

Flanged connections		Pressure rating	d <sub>0</sub> 6 mm		d <sub>0</sub> 9 mm		d <sub>0</sub> 13 mm		d <sub>0</sub> 17.5 mm	
DIN EN 1092-1 (PN > 100: DIN 2501)										
Valve size	Pressure rating	Option code		Option code		Option code		Option code		
DN	PN	Inlet	Outlet	Inlet	Outlet	Inlet	Outlet	Inlet	Outlet	
15	40	I21	-	I21	-	I21	-	-	-	
	160	I22	-	I22	-	I22	-	-	-	
	250	I23	-	I23	-	I23	-	-	-	
	320	I24	-	I24	-	I24	-	-	-	
	400	I25	-	I25	-	I25	-	-	-	
20	40	I26	-	I26	-	I26	-	I26	-	
	100	I27	-	I27	-	I27	-	I27	-	
25	40	I31	I46	I31	I46	I31	I46	I31	-	
	160	I32	I47	I32	I47	I32	I47	I32	-	
	250	I33	I48	I33	I48	I33	I48	I33	-	
	320	I34	-	I34	-	I34	-	I34	-	
	400	I35	-	I35	-	I35	-	I35	-	
40	40	-	-	-	I49	-	I49	-	I49	
	160	-	-	-	I50	-	I50	-	I50	
	250	-	-	-	I51	-	I51	-	I51	
ANSI/ASME B 16.5										
NPS	CL	Option code		Option code		Option code		Option code		
NPS	CL	Inlet	Outlet	Inlet	Outlet	Inlet	Outlet	Inlet	Outlet	
1/2"	150	V01	-	V01	-	V01	-	-	-	
	300	V02	-	V02	-	V02	-	-	-	
	600	V02	-	V02	-	V02	-	-	-	
	900	V03	-	V03	-	V03	-	-	-	
	1500	V03	-	V03	-	V03	-	-	-	
	2500	V04	-	V04	-	V04	-	-	-	
3/4"	150	V05	-	V05	-	V05	-	V05	-	
	300	V06	-	V06	-	V06	-	V06	-	
	600	V06	-	V06	-	V06	-	V06	-	
	900	V07	-	V07	-	V07	-	V07	-	
	1500	V07	-	V07	-	V07	-	V07	-	
	2500	V08	-	V08	-	V08	-	V08	-	
1"	150	V09	V18	V09	V18	V09	V18	V09	-	
	300	V10	V19	V10	V19	V10	V19	V10	-	
	600	V10	V19	V10	V19	V10	V19	V10	-	
	900	V11	V20	V11	V20	V11	V20	V11	-	
	1500	V11	-	V11	-	V11	-	V11	-	
	2500	V12	-	V12	-	V12	-	V12	-	
1 1/2"	150	-	-	-	V21	-	V21	-	V21	
	300	-	-	-	V22	-	V22	-	V22	
	600	-	-	-	V22	-	V22	-	V22	
	900	-	-	-	V23	-	V23	-	V23	

Flanged and threaded connections can be combined.

Threads according to other standards are available. Please specify in writing (diameter, pressure rating, standard).