



Type 438  
Packed knob H4  
Conventional design



Type 438  
Packed knob H4  
Flanged connection



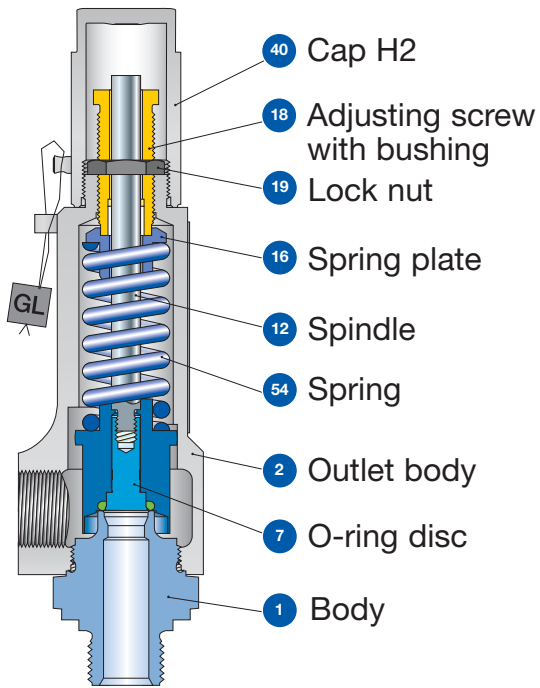
Type 438  
Cap H2  
Long version

## Type 438 Safety Relief Valves

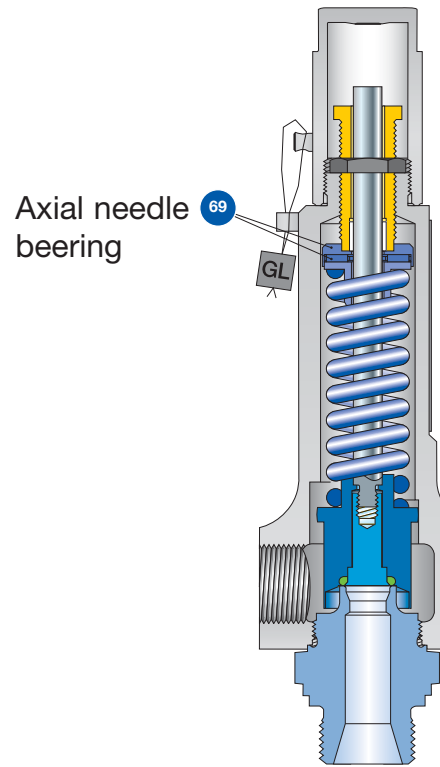
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**Type 438**  
**Designs**

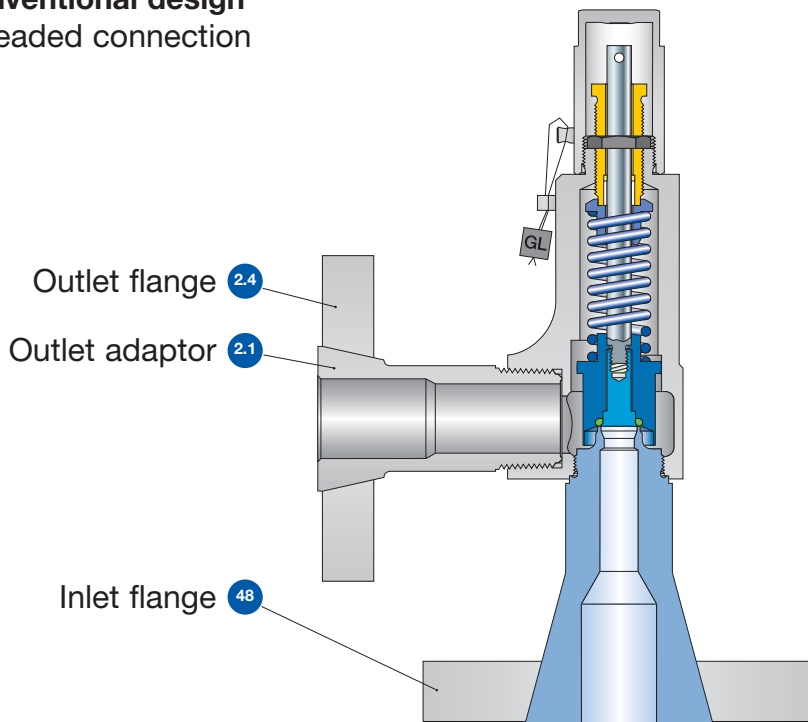
Type 438



**Conventional design**  
 Threaded connection



**Long version**  
 Threaded connection



**Conventional design**  
 Flange connection

## Type 438 Materials

Item	Component	Design	Type 4383	Type 4384
1	Base / Inlet body	Threaded connection	1.4104 <sup>1) 2)</sup> , 1.4404 SA 479 430 <sup>1) 2)</sup> , SA 479 316L	1.4404 SA 479 316L
		Flange connection	1.4404 SA 479 316L	1.4404 SA 479 316L
		Long version	1.4104 <sup>1)</sup> , 1.4404 SA 479 430 <sup>1)</sup> , SA 479 316L	1.4404 SA 479 316L
2	Outlet body		1.4104 <sup>2)</sup> SA 479 430 <sup>2)</sup>	1.4404 SA 479 316L
2.1	Outlet adaptor	Flange connection	1.4404 316L	1.4404 316L
2.4	Outlet flange	Flange connection	1.4404 316L	1.4404 316L
7	O-ring disc		1.4404 SA 479 316L	1.4404 SA 479 316L
7.4	Soft seal O-ring	"N" <sup>3)</sup>	NBR Nitrile-Butadiene	NBR Nitrile-Butadiene
		"K" <sup>3)</sup>	CR Chloroprene	CR Chloroprene
		"D" <sup>3)</sup>	EPDM Ethylen-Propylene-Diene	EPDM Ethylen-Propylene-Diene
		"L" <sup>3)</sup>	FKM Fluorocarbon	FKM Fluorocarbon
		"C" <sup>4)</sup>	FFKM Perfluor	FFKM Perfluor
12	Spindle		1.4021 420	1.4404 316L
		Long version	1.4404 316L	1.4404 316L
16	Spring plate		1.4104 Chrome steel	1.4404 316L
		Long version	1.4404 316L	1.4404 316L
18	Adjusting screw with bushing		1.4104 / PTFE Chrome steel / PTFE	1.4404 / PTFE 316L / PTFE
19	Lock nut		1.0718 Steel	1.4404 316L
40	Cap H2		1.0460 SA 105	1.4404 316L
48	Inlet flange	Flange connection	1.4404 316L	1.4404 316L
54	Spring		1.4310 Stainless steel	1.4310 Stainless steel
69	Axial needle bearing	Long version	1.4404 316L	1.4404 316L

**Please notice:**

- Modifications reserved by LESER.
- LESER can upgrade materials without notice.
- Every part can be replaced by other material acc. to customer specification.
- The materials shall meet the requirements of the relevant regulations (Pressure Equipment Directive (PED), acc. to PED applied harmonized standards, AD 2000-Merkblätter, VdTÜV (Werkstoffblätter) as well as further materials listed in Section 8 of the Type-Examination.

<sup>1)</sup> Only for male thread DIN ISO 228-1 G<sup>3</sup>/<sub>8</sub>, G<sup>1</sup>/<sub>2</sub>, G<sup>3</sup>/<sub>4</sub> (Option codes V49, V54, V55).

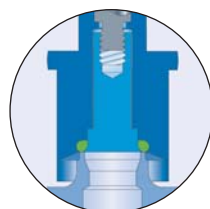
<sup>2)</sup> Material 1.4404/316L for ASME application (Option code N68 or N70)

<sup>3)</sup> Long version: O-ring 90 Shore for set pressures > 120 bar

<sup>4)</sup> O-ring 90 Shore for set pressures > 40 bar

**Type 438**  
**Article numbers**

Type 438



O-ring disc

		Conventional design	Long version
Actual Orifice diameter $d_0$ [mm]		10	10
Actual Orifice area $A_0$ [mm <sup>2</sup> ]		78.5	78.5
Actual Orifice diameter $d_0$ [inch]		0.394	0.394
Actual Orifice area $A_0$ [inch <sup>2</sup> ]		0.122	0.122
<b>O-ring material</b>		NBR "N" J30	NBR "N" J30 <sup>3)</sup>
		CR "K" J21	CR "K" J21 <sup>3)</sup>
		EPDM "D" J22	EPDM "D" J22 <sup>3)</sup>
		FKM "L" J23	FKM "L" J23 <sup>3)</sup>
		FFKM "C" J20 <sup>4)</sup>	FFKM "C" J20 <sup>4)</sup>
<b>Base/Inlet body material: 1.4104 (430)<sup>1)</sup></b>			
<b>H2</b>	Art. No. <b>4383.</b> <sup>2)</sup>	<b>2862</b>	<b>2872</b>
<b>H3</b>	Art. No. <b>4383.</b> <sup>2)</sup> <b>p<sub>max</sub> = 16 bar<sub>g</sub></b>	<b>2863</b>	-
<b>H4</b>	Art. No. <b>4383.</b> <sup>2)</sup>	<b>2864</b>	<b>2874</b>
p [bar <sub>g</sub> ]	S/G/L	<b>5 – 93</b>	<b>93 – 180</b>
p [psig]	S/G/L	<b>72.5 – 1349</b>	<b>1349 – 2611</b>
<b>Base/Inlet body material: 1.4404 (316L)</b>			
<b>H2</b>	Art. No. <b>4384.</b>	<b>2982</b>	<b>2992</b>
<b>H4</b>	Art. No. <b>4384.</b>	<b>2984</b>	<b>2994</b>
p [bar <sub>g</sub> ]	S/G/L	<b>5 – 68</b>	<b>68 – 180</b>
p [psig]	S/G/L	<b>72.5 – 986</b>	<b>986 – 2611</b>

<sup>1)</sup> Material 1.4404/316L for ASME application (Option code N68 or N70)

<sup>2)</sup> Type 4383 should not be selected when a „stainless steel“ valve is required due to corrosive medium.

<sup>3)</sup> O-ring 90 Shore for set pressures > 120 bar

<sup>4)</sup> O-ring 90 Shore for set pressures > 40 bar

## Type 438

### Dimensions and weights

Threaded connections [Metric units]

Size Outlet body	Conventional design			Long version		
	1/2"	3/4"	1"	1/2"	3/4"	1"
Actual Orifice diameter $d_0$ [mm]	10	10	10	10	10	10
Actual Orifice area $A_0$ [mm <sup>2</sup> ]	78.5	78.5	78.5	78.5	78.5	78.5
Weight [kg]	1.2	1.6	1.6	1.4	2.1	2.1
Required installation diameter d [mm]	65	80	80	65	80	80

### Inlet thread female

Size outlet body	Conventional design			Long version			
	1/2"	3/4"	1"	1/2"	3/4"	1"	
<b>Center to face [mm]</b>							
<b>DIN ISO 228-1</b> <b>G</b>	Inlet 1/2" a	46	46	49	46	46	49
		56	56	59	56	56	59
<b>ISO 7-1/BS 21</b> <b>Rc</b>	Inlet 3/4", 1" a	30	37	37	30	37	37
		209	209	212	230	230	233
<b>ASME B1.20.1</b> <b>NPT</b>	Outlet b	219	219	222	240	240	243

### Inlet thread male

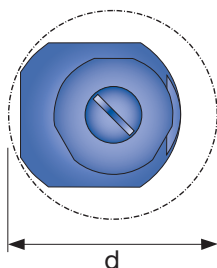
Size outlet body	Conventional design			Long version			
	1/2"	3/4"	1"	1/2"	3/4"	1"	
<b>Center to face [mm]</b>							
<b>DIN ISO 228-1</b> <b>G</b>	Inlet a	33	33	36	33	33	36
		30	37	37	30	37	37
<b>ISO 7-1/BS 21</b> <b>R</b>	Inlet a	31	31	34	31	31	34
		30	37	37	30	37	37
<b>ASME B1.20.1</b> <b>NPT</b>	Outlet b						

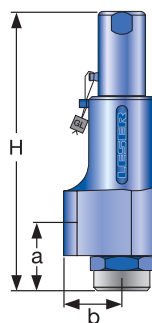
Size inlet thread	Conventional design				Long version				
	3/8"	1/2"	3/4"	1"	3/8"	1/2"	3/4"	1"	
<b>DIN ISO 228-1</b> <b>G</b>	H max.	208	210	212	217	229	231	233	238
<b>ISO 7-1/BS 21</b> <b>R</b>	H max.	-	213	214	220	-	234	235	241
<b>ASME B1.20.1</b> <b>NPT</b>	H max.	-	216	216	224	-	237	237	245

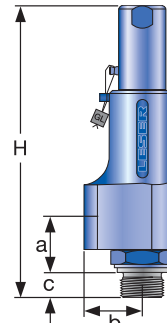
<b>Length of screwed end c [mm]</b>						
Size inlet thread	3/8"		1/2"		1"	
	<b>DIN ISO 228-1</b> <b>G</b>	12	14	16	18	
<b>ISO 7-1/BS 21</b> <b>R</b>	-	19	20	23		
<b>ASME B1.20.1</b> <b>NPT</b>	-	22	22	27		



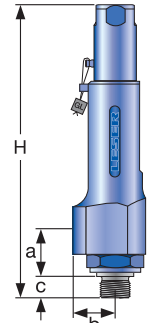
Required installation diameter



Conventional design – female thread



Conventional design – male thread



Long version – male thread

## Type 438

### Dimensions and weights

Threaded connections [US units]

Size Outlet body	Conventional design			Long version		
	1/2" $\frac{1}{2}$ "	3/4" $\frac{3}{4}$ "	1" $1$ "	1/2" $\frac{1}{2}$ "	3/4" $\frac{3}{4}$ "	1" $1$ "
Actual Orifice diameter $d_0$ [inch]	0.394	0.394	0.394	0.394	0.394	0.394
Actual Orifice area $A_0$ [inch <sup>2</sup> ]	0.122	0.122	0.122	0.122	0.122	0.122
Weight [lbs]	2.6	3.5	3.5	3.1	4.6	4.6
Required installation diameter d [inch]	2 <sup>9</sup> / <sub>16</sub>	3 <sup>5</sup> / <sub>32</sub>	3 <sup>5</sup> / <sub>32</sub>	2 <sup>9</sup> / <sub>16</sub>	3 <sup>5</sup> / <sub>32</sub>	3 <sup>5</sup> / <sub>32</sub>

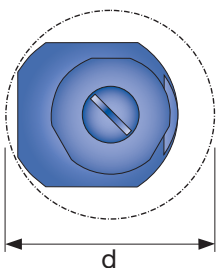
#### Inlet thread female

Size outlet body	Conventional design			Long version				
	1/2" $\frac{1}{2}$ "	3/4" $\frac{3}{4}$ "	1" $1$ "	1/2" $\frac{1}{2}$ "	3/4" $\frac{3}{4}$ "	1" $1$ "		
<b>Center to face [inch]</b>								
<b>DIN ISO 228-1</b>	<b>G</b>	Inlet 1/2" a	1 <sup>13</sup> / <sub>16</sub>	1 <sup>13</sup> / <sub>16</sub>	1 <sup>15</sup> / <sub>16</sub>	1 <sup>13</sup> / <sub>16</sub>	1 <sup>13</sup> / <sub>16</sub>	1 <sup>15</sup> / <sub>16</sub>
<b>ISO 7-1/BS 21</b>	<b>Rc</b>							
<b>ASME B1.20.1</b>	<b>NPT</b>	Inlet 3/4", 1" a	2 <sup>7</sup> / <sub>32</sub>	2 <sup>7</sup> / <sub>32</sub>	2 <sup>5</sup> / <sub>16</sub>	2 <sup>7</sup> / <sub>32</sub>	2 <sup>7</sup> / <sub>32</sub>	2 <sup>5</sup> / <sub>16</sub>
		Outlet b	1 <sup>3</sup> / <sub>16</sub>	1 <sup>15</sup> / <sub>32</sub>	1 <sup>15</sup> / <sub>32</sub>	1 <sup>3</sup> / <sub>16</sub>	1 <sup>15</sup> / <sub>32</sub>	1 <sup>15</sup> / <sub>32</sub>
<b>Height [inch]</b>								
		Inlet 1/2" H max.	8 <sup>7</sup> / <sub>32</sub>	8 <sup>7</sup> / <sub>32</sub>	8 <sup>11</sup> / <sub>32</sub>	9 <sup>1</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>16</sub>	9 <sup>3</sup> / <sub>16</sub>
		Inlet 3/4", 1" H max.	8 <sup>5</sup> / <sub>8</sub>	8 <sup>5</sup> / <sub>8</sub>	8 <sup>3</sup> / <sub>4</sub>	9 <sup>7</sup> / <sub>16</sub>	9 <sup>7</sup> / <sub>16</sub>	9 <sup>9</sup> / <sub>16</sub>

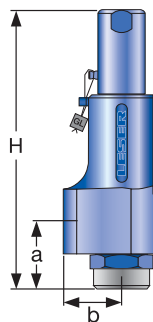
#### Inlet thread male

Size outlet body	Conventional design			Long version						
	1/2" $\frac{1}{2}$ "	3/4" $\frac{3}{4}$ "	1" $1$ "	1/2" $\frac{1}{2}$ "	3/4" $\frac{3}{4}$ "	1" $1$ "				
<b>Center to face [inch]</b>										
<b>DIN ISO 228-1</b>	<b>G</b>	Inlet a	1 <sup>5</sup> / <sub>16</sub>	1 <sup>5</sup> / <sub>16</sub>	1 <sup>13</sup> / <sub>32</sub>	1 <sup>5</sup> / <sub>16</sub>	1 <sup>5</sup> / <sub>16</sub>	1 <sup>13</sup> / <sub>32</sub>		
		Outlet b	1 <sup>3</sup> / <sub>16</sub>	1 <sup>15</sup> / <sub>32</sub>	1 <sup>15</sup> / <sub>32</sub>	1 <sup>3</sup> / <sub>16</sub>	1 <sup>15</sup> / <sub>32</sub>	1 <sup>15</sup> / <sub>32</sub>		
<b>ISO 7-1/BS 21</b>	<b>R</b>									
<b>ASME B1.20.1</b>	<b>NPT</b>	Inlet a	1 <sup>7</sup> / <sub>32</sub>	1 <sup>7</sup> / <sub>32</sub>	1 <sup>11</sup> / <sub>32</sub>	1 <sup>7</sup> / <sub>32</sub>	1 <sup>7</sup> / <sub>32</sub>	1 <sup>11</sup> / <sub>32</sub>		
		Outlet b	1 <sup>3</sup> / <sub>16</sub>	1 <sup>15</sup> / <sub>32</sub>	1 <sup>15</sup> / <sub>32</sub>	1 <sup>3</sup> / <sub>16</sub>	1 <sup>15</sup> / <sub>32</sub>	1 <sup>15</sup> / <sub>32</sub>		
<b>Height [inch]</b>										
Size inlet thread	Conventional design				Long version					
	3/8" $\frac{3}{8}$ "	1/2" $\frac{1}{2}$ "	3/4" $\frac{3}{4}$ "	1" $1$ "	3/8" $\frac{3}{8}$ "	1/2" $\frac{1}{2}$ "	3/4" $\frac{3}{4}$ "	1" $1$ "		
<b>DIN ISO 228-1</b>	<b>G</b>	H max.	8 <sup>3</sup> / <sub>16</sub>	8 <sup>1</sup> / <sub>4</sub>	8 <sup>11</sup> / <sub>32</sub>	8 <sup>17</sup> / <sub>32</sub>	9	9 <sup>3</sup> / <sub>32</sub>	9 <sup>5</sup> / <sub>32</sub>	9 <sup>3</sup> / <sub>8</sub>
<b>ISO 7-1/BS 21</b>	<b>R</b>	H max.	–	8 <sup>3</sup> / <sub>8</sub>	8 <sup>13</sup> / <sub>32</sub>	8 <sup>21</sup> / <sub>32</sub>	–	9 <sup>7</sup> / <sub>32</sub>	9 <sup>1</sup> / <sub>4</sub>	9 <sup>15</sup> / <sub>32</sub>
<b>ASME B1.20.1</b>	<b>NPT</b>	H max.	–	8 <sup>1</sup> / <sub>2</sub>	8 <sup>1</sup> / <sub>2</sub>	8 <sup>13</sup> / <sub>16</sub>	–	9 <sup>5</sup> / <sub>16</sub>	9 <sup>5</sup> / <sub>16</sub>	9 <sup>21</sup> / <sub>32</sub>

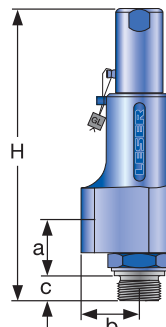
<b>Length of screwed end c [inch]</b>						
Size inlet thread	Conventional design		Long version			
	3/8" $\frac{3}{8}$ "	1/2" $\frac{1}{2}$ "	3/4" $\frac{3}{4}$ "	1" $1$ "		
<b>DIN ISO 228-1</b>	<b>G</b>	1 <sup>5</sup> / <sub>32</sub>	9 <sup>1</sup> / <sub>16</sub>	5 <sup>1</sup> / <sub>8</sub>	2 <sup>3</sup> / <sub>32</sub>	
<b>ISO 7-1/BS 21</b>	<b>R</b>	–	3 <sup>1</sup> / <sub>4</sub>	2 <sup>5</sup> / <sub>32</sub>	2 <sup>9</sup> / <sub>32</sub>	
<b>ASME B1.20.1</b>	<b>NPT</b>	–	7 <sup>1</sup> / <sub>8</sub>	7 <sup>1</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>16</sub>	



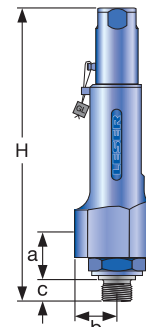
Required installation diameter



Conventional design – female thread



Conventional design – male thread



Long version – male thread

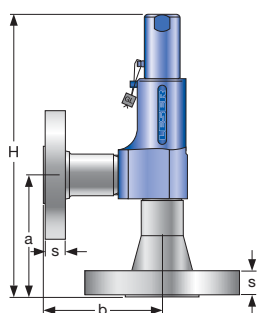
## Type 438

### Dimensions and weights

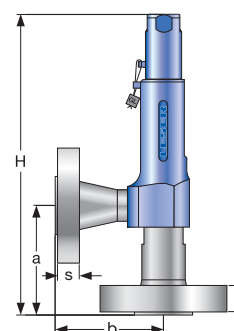
Flanged connections [Metric units]

		Conventional design		Long version	
Actual Orifice diameter $d_0$ [mm]		10		10	
Actual Orifice area $A_0$ [mm <sup>2</sup> ]		78.5		78.5	
<b>DIN EN 1092-1</b>					
<b>Flange rating PN 40</b>					
<b>Center to face</b>	[mm]	Inlet a	103	103	
		Outlet b	100	100	
<b>Height</b>	[mm]	H max.	263	284	
<b>Flange rating <math>\geq</math> PN 160</b>					
<b>Center to face</b>	[mm]	Inlet a	103	103	
		Outlet b	100	100	
<b>Height</b>	[mm]	H max.	266	287	
<b>ASME B 16.5</b>					
<b>Flange rating class 150</b>					
<b>Center to face</b>	[mm]	Inlet a	103	103	
		Outlet b	100	100	
<b>Height</b>	[mm]	H max.	263	284	
<b>Flange rating class <math>\geq</math> 300</b>					
<b>Center to face</b>	[mm]	Inlet a	103	103	
		Outlet b	100	100	
<b>Height</b>	[mm]	H max.	266	287	
<b>Weight</b>					
For the calculation of the total weight please use the Formular: $W_T = W_N + W_F$ (Inlet) + $W_F$ (Outlet)					
<b>Weight net</b>	[kg]	$W_N$	2.4	2.8	
(without inlet and outlet flange)					

		DIN EN 1092-1 / Flange rating PN						ASME B16.5 / Flange rating class						
		Size	40	100	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	28	28	30		14	18	18	26	26	30.2
Weight slip on flange [kg]	$W_F$	0.8	-	1.2	2.5	2.5	3.6		0.6	0.9	2.0	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]	$W_F$	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]	$W_F$	1.3	-	2.6	3.5	5	7.5		1	2.1	2.1	4.1	4.1	5.1



Conventional design



Long version

**Type 438**

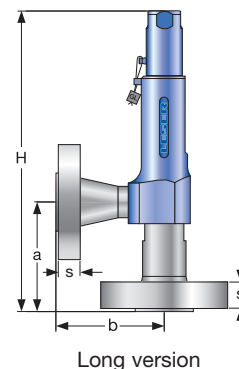
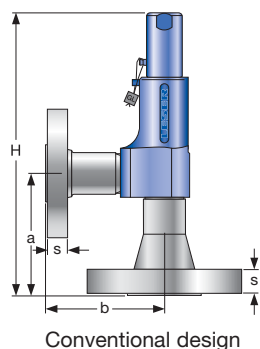
**Dimensions and weights**

Flanged connections [US units]

Type 438

		Conventional design		Long version	
Actual Orifice diameter $d_0$ [inch]		0.394		0.394	
Actual Orifice area $A_0$ [inch <sup>2</sup> ]		0.122		0.122	
<b>DIN EN 1092-1 (Available flange sizes refer to page 04/05)</b>					
<b>Flange rating PN 40</b>					
<b>Center to face</b>	[inch]	Inlet a	$4^{1/16}$		$4^{1/16}$
		Outlet b	$3^{15/16}$		$3^{15/16}$
<b>Height</b>	[inch]	H max.	$10^{11/32}$		$10^{3/16}$
<b>Flange rating <math>\geq</math> PN 160</b>					
<b>Center to face</b>	[inch]	Inlet a	$4^{1/16}$		$4^{1/16}$
		Outlet b	$3^{15/16}$		$3^{15/16}$
<b>Height</b>	[inch]	H max.	$10^{15/32}$		$11^{5/16}$
<b>ASME B 16.5 (Available flange sizes refer to page 04/05)</b>					
<b>Flange rating class 150</b>					
<b>Center to face</b>	[inch]	Inlet a	$4^{1/16}$		$4^{1/16}$
		Outlet b	$3^{15/16}$		$3^{15/16}$
<b>Height</b>	[inch]	H max.	$10^{11/32}$		$11^{3/16}$
<b>Flange rating class <math>\geq</math> 300</b>					
<b>Center to face</b>	[inch]	Inlet a	$4^{1/16}$		$4^{1/16}$
		Outlet b	$3^{15/16}$		$3^{15/16}$
<b>Height</b>	[inch]	H max.	$10^{15/32}$		$11^{5/16}$
<b>Weight</b>					
For the calculation of the total weight please use the Formular: $W_T = W_N + W_F$ (Inlet) + $W_F$ (Outlet)					
<b>Weight net</b>	[lbs]		5.3		6.2
(without inlet and outlet flange) $W_N$					

Flange dimensions and availability															
		DIN EN 1092-1 / Flange rating PN						ASME B16.5 / Flange rating class							
Size		40	100	160	250	320	400	Size	150	300	600	900	1500	2500	
<b>DN 15</b>		<b>NPS 1/2"</b>													
Flange thickness [inch]	s	$23/32$	–	$7/8$	$1^3/32$	$1^3/32$	$1^6/32$		$9/16$	$23/32$	$23/32$	$1^1/32$	$1^1/32$	$1^6/32$	
Weight slip on flange [lbs]	$W_F$	1.8	–	2.6	5.5	5.5	7.9		1.3	2.0	2.0	4.6	4.6	6.6	
<b>DN 20</b>		<b>NPS 3/4"</b>													
Flange thickness [inch]	s	$25/32$	$28/32$	–	–	–	–		$19/32$	$23/32$	$23/32$	1	1	$1^8/32$	
Weight slip on flange [lbs]	$W_F$	2.4	2.9	–	–	–	–		1.8	3.1	3.1	5.0	5.0	7.7	
<b>DN 25</b>		<b>NPS 1"</b>													
Flange thickness [inch]	s	$7/8$	–	$1^1/32$	$1^6/32$	$1^13/32$	$1^18/32$		$21/32$	$27/32$	$27/32$	$1^9/32$	$1^9/32$	$1^18/32$	
Weight slip on flange [lbs]	$W_F$	2.9	–	5.7	7.7	11.0	16.5		2.2	4.6	4.6	9.0	9.0	11.2	





## Type 438

### Pressure/temperature ratings

[Metric units + US units]

#### Metric units

		Conventional design				Long version			
Actual Orifice diameter $d_0$ [mm]		10				10			
Actual Orifice Area $A_0$ [mm <sup>2</sup> ]		78.5				78.5			
<b>Body material: 1.4104 (430)</b>									
<b>Base / Inlet Body</b>	Connection size	3/8"	1/2"	3/4"	1"	3/8"	1/2"	3/4"	1"
	Pressure rating	PN 250				PN 250			
<b>Outlet body</b>	Pressure rating	PN 160				PN 160			
<b>Minimum set pressure</b>	p [bar <sub>g</sub> ]	5				93			
<b>Maximum set pressure</b>	p [bar <sub>g</sub> ]	16 [only H3] 93				180			
<b>Temperature</b> acc. to DIN EN	min [°C]	-10				-10			
	max [°C]	+150				+150			
<b>Temperature</b> acc. to ASME	min [°C]	-29				-29			
	max [°C]	+150				+150			
<b>Body material: 1.4404 (316L)</b>									
<b>Base / Inlet Body</b>	Connection size	3/8"	1/2"	3/4"	1"	3/8"	1/2"	3/4"	1"
	Pressure rating	PN 250				PN 250			
<b>Outlet body</b>	Pressure rating	PN 160				PN 160			
<b>Minimum set pressure</b>	p [bar <sub>g</sub> ]	5				68			
<b>Maximum set pressure</b>	p [bar <sub>g</sub> ]	68				180			
<b>Temperature</b> acc. to DIN EN	min [°C]	-45				-45			
	max [°C]	+150				+150			
<b>Temperature</b> acc. to ASME	min [°C]	-45				-45			
	max [°C]	+150				+150			

#### US units

		Conventional design				Long version			
Actual Orifice diameter $d_0$ [inch]		0.394				0.394			
Actual Orifice area $A_0$ [inch <sup>2</sup> ]		0.122				0.122			
<b>Body material: 1.4104 (430)</b>									
<b>Base / Inlet Body</b>	Connection size	3/8"	1/2"	3/4"	1"	3/8"	1/2"	3/4"	1"
<b>Minimum set pressure</b>	p [psig]	72.5				1349			
<b>Maximum set pressure</b>	p [psig]	232 [only H3] 1349				2611			
<b>Temperature</b> acc. to DIN EN	min [°F]	+14				+14			
	max [°F]	+302				+302			
<b>Temperature</b> acc. to ASME	min [°F]	-20				-20			
	max [°F]	+302				+302			
<b>Body material: 1.4404 (316L)</b>									
<b>Base / Inlet Body</b>	Connection size	3/8"	1/2"	3/4"	1"	3/8"	1/2"	3/4"	1"
<b>Minimum set pressure</b>	p [psig]	72.5				986			
<b>Maximum set pressure</b>	p [psig]	986				2611			
<b>Temperature</b> acc. to DIN EN	min [°F]	-49				-49			
	max [°F]	+302				+302			
<b>Temperature</b> acc. to ASME	min [°F]	-49				-49			
	max [°F]	+302				+302			

<sup>1)</sup> The temperature is limited by soft seal material. The stated values are valid for EPDM.

**Type 438**  
**Approvals**

Type 438

Actual Orifice diameter $d_0$ [mm]		10
Actual Orifice area $A_0$ [mm <sup>2</sup> ]		78.5
Actual Orifice diameter $d_0$ [inch]		0.394
Actual Orifice area $A_0$ [inch <sup>2</sup> ]		0.122
<b>Europe</b> <span style="float: right;"><b>Coefficient of discharge <math>K_{dr}</math></b></span>		
PED / DIN EN ISO 4126-1	Approval No.	072020111Z0008/0/21
	S/G	0.40
	L	0.33
<b>Germany</b> <span style="float: right;"><b>Coefficient of discharge <math>\alpha_w</math></b></span>		
PED / AD 2000-Merkblatt A2	Approval No.	TÜV SV 980
	S/G	0.40
	L	0.33
<b>United States</b> <span style="float: right;"><b>Coefficient of discharge K</b></span>		
ASME Sec. VIII Div. 1	Approval No.	M 37190
	S/G	0.406
	Approval No.	M 371202
	L	0.322
<b>Canada</b> <span style="float: right;"><b>Coefficient of discharge K</b></span>		
CRN	Approval No.	The current approval no. can be found at <a href="http://www.leser.com">www.leser.com</a> .
	S/G	0.406
	L	0.322
<b>China</b> <span style="float: right;"><b>Coefficient of discharge <math>\alpha_w</math></b></span>		
AQSIQ	Approval No.	The current approval no. can be found at <a href="http://www.leser.com">www.leser.com</a> .
	S/G	0.40
	L	0.33
<b>Eurasian Custom Union</b> <span style="float: right;"><b>Coefficient of discharge <math>\alpha_w</math></b></span>		
EAC	Approval No.	The current approval no. can be found at <a href="http://www.leser.com">www.leser.com</a> .
	S/G	0.40
	L	0.33
<b>Classification societies</b>		<b>Homepage</b>
Bureau Veritas	BV	<a href="http://www.bureauveritas.com">www.bureauveritas.com</a>
DNV GL		<a href="http://www.dnvgl.com">www.dnvgl.com</a>
Lloyd's Register EMEA	LREMEA	<a href="http://www.lr.org">www.lr.org</a>
Registro Italiano Navale	RINA	<a href="http://www.rina.org">www.rina.org</a>
U.S. Coast Guard	U.S.C.G	<a href="http://www.uscg.org">www.uscg.org</a>

**Rated slope**

Within the capacity certification according to ASME Sec. VIII Div. 1 the coefficients of discharge for Series 437 are issued as "rated slope values" instead of K values. Rated slope values can be converted into K values. The table above shows the converted K values. The original rated slope values are listed in the table below.

Fluid	Rated slope Type 438
S	2.55 lb / hr / PSIA
G	0.904 SCFM / PSIA
L	1.49 GPM $\sqrt{\text{PSID}}$