

## Type 481 Safety Relief Valves – spring loaded

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**Type 481  
Cap H2**  
Inlet: Clamp connection  
Outlet: Threaded connection



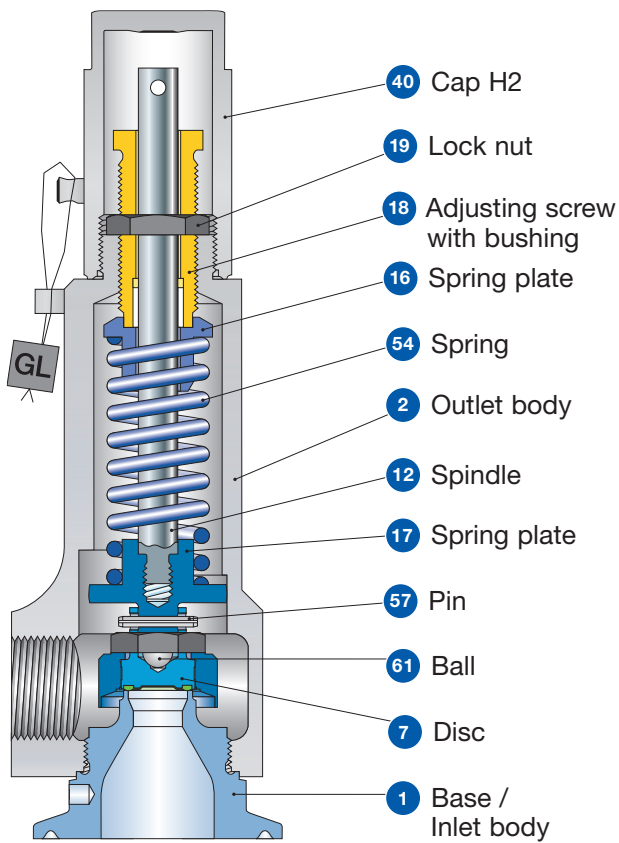
**Type 481  
Packed knob H4**  
Inlet: Aseptic clamp and nut  
Outlet: Threaded connection

# Type 481

## Conventional design

### Low set pressure

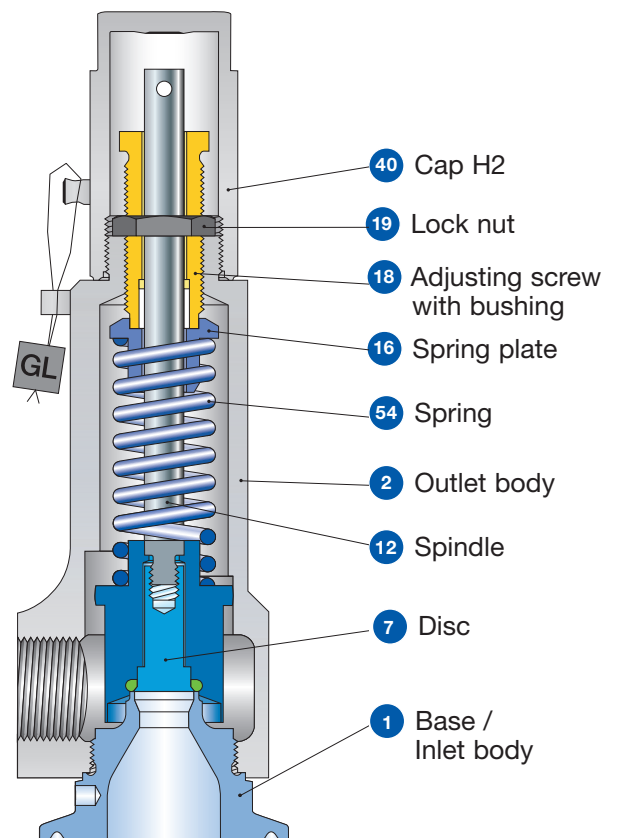
0,1 – 16 bar  
1,5 – 232 psig



**Type 481**  
vulcanized soft seal  
Cap H2  
Inlet: Clamp connection  
Outlet: Threaded connection






### High set pressure

16 – 68 bar  
233 – 986 psig



**Type 481**  
O-ring disc  
Cap H2  
Inlet: Clamp connection  
Outlet: Threaded connection

**Type 481**  
**Conventional design**  
Materials

Item	Component	Remarks	Type 4814	
			Set pressure	
			0,1 – 16 bar 1,5 – 232 psig	16 – 68 bar 233 – 986 psig
			Vulcanized soft seal	O-ring disc
1	Base / Inlet body		1.4404	1.4404
			SA 479 316L	SA 479 316L
2	Outlet body		1.4404	1.4404
			SA 479 316L	SA 479 316L
7	Disc		1.4404	1.4404
			SA 479 316L	SA 479 316L
			Vulcanized soft seal	O-ring soft seal
7.1 or 7.4	Soft seal vulcanized or O-ring	"D"  	EPDM	EPDM
		"K"	CR	CR
		"L" 	FKM	FKM
		"N"	NBR	NBR
		"C"  	FFKM	FFKM
12	Spindle		1.4571	1.4571
			316Ti	316Ti
16	Spring plate		1.4404	1.4404
			316L	316L
17	Spring plate		1.4404	-
			316L	-
18	Adjusting screw with bushing	PTFE + 15 % glass	1.4404 / PTFE	1.4404 / PTFE
			316L / PTFE	316L / PTFE
19	Lock nut		1.4404	1.4404
			316L	316L
40	Cap H2		1.4404	1.4404
			316L	316L
54	Spring		1.4310	1.4310
			Stainless steel	Stainless steel
57	Pin		1.4310	-
			Stainless steel	-
61	Ball		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.

## Type 481

### Article numbers

		Vulcanized soft seal	O-ring disc	
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>Soft seal material</b>		EPDM "D" J22	EPDM "D" J22	
		CR "K" J21	CR "K" J21	
		FKM "L" J23	FKM "L" J23	
		NBR "N" J30	NBR "N" J30	
		FFKM "C" J20	FFKM "C" J20	
<b>Base / Inlet body material: 1.4404 (316L)</b>				
<b>Bonnet closed</b>	<b>H2</b>	Art. No. <b>4814.</b>	<b>7692</b>	<b>7682</b>
	<b>H4</b>	Art. No. <b>4814.</b>	<b>7694</b>	<b>7684</b>
	<b>H8</b>	Art. No. <b>4814.</b>	<b>7698</b>	<b>7688</b>
	p [bar] S/G/L		<b>0,1 – 16</b>	<b>16 – 68</b>
	p [psig] S/G/L		<b>1,5 – 232</b>	<b>233 – 986</b>

## Type 481

### Available connections

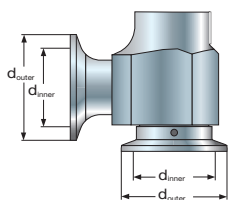
Actual Orifice diameter $d_0$ [mm]		10		$d_0$ [mm]		10	
Actual Orifice area $A_0$ [mm <sup>2</sup> ]		78,5		$A_0$ [mm <sup>2</sup> ]		78,5	
<b>Clamps</b>				<b>Clamps</b>			
		<b>Option code inlet</b>				<b>Option code outlet</b>	
DN	15	25		DN	-	25	
SO	L79I14	L79I16		SO	-	L86A16	
DO	I73I14	I73I16		DO	-	I74A16	
NPS	3/4"	1"		NPS	-	1"	
BO	I75I78	I75I79		BO	-	I76A79	
CO	-	L96I79		CO	-	L97A79	
<b>Aseptic screwed connection</b>				<b>Aseptic screwed connection</b>			
		<b>Option code inlet</b>				<b>Option code outlet</b>	
DN	-			DN	G1/2	G3/4	G1
XG	-			XG	V65	V76	V66
XN	-			XN	-		1/2" NPT
							3/4" NPT
							1" NPT
							-
							V70
							V77
							V71
<b>Pipe standard</b>	<b>DN</b>	<b>25</b>		<b>DN</b>	<b>25</b>		
<b>DIN 11850 / DIN 11866 Range A</b>	GS	H85H34I16		GS	A85H35A16		
	BS	H85H36I16		BS	A85H37A16		
	GT	H85H54I16		GT	A85H55A16		
	BT	H85H56I16		BT	A85H57A16		
	GO	H85L75I16		GO	A85L81A16		
	KO	H85L76I16		KO	A85L82A16		
	GD	H85H60I16		GD	A85H61A16		
	BD	H85H58I16		BD	A85H59A16		
<b>Pipe standard</b>	<b>DN</b>	<b>25</b>		<b>DN</b>	<b>25</b>		
<b>DIN EN ISO 1127 / DIN 11866 Range B</b>	GS	H86H34I16		GS	A86H35A16		
	BS	H86H36I16		BS	A86H37A16		
	GT	H86H54I16		GT	A86H55A16		
	BT	H86H56I16		BT	A86H57A16		
	GD	H86H60I16		GD	A86H61A16		
	BD	H86H58I16		BD	A86H59A16		
<b>Pipe standard</b>	<b>NPS</b>	<b>1"</b>		<b>NPS</b>	<b>1"</b>		
<b>BS 4825-1 DIN 11866 Range C</b>	GS	H66H34I79		GS	A84H35A79		
	BS	H66H36I79		BS	A84H37A79		
	GT	H66H54I79		GT	A84H55A79		
	BT	H66H56I79		BT	A84H57A79		

For definitions of connection codes please refer to pages 12 up to 15.

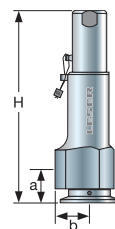
# Type 481

## Dimensions and weights

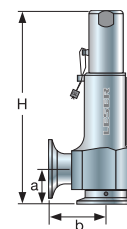
### Metric Units



**Type 481**  
Clamp diameters



**Type 481**  
Outlet: Threaded connections



**Type 481**  
Outlet: Clamp connection

#### Inlet clamp connections / Outlet clamp connections

$d_0$ [mm]	10
$A_0$ [mm <sup>2</sup> ]	78,5

#### Center to face

Inlet a [mm]		Outlet b [mm]	
DN	15	DN	25
SO	40	SO	65
DO	40	DO	65
NPS	3/4"	NPS	1"
BO	40	BO	65
CO	-	CO	65

#### Clamp diameter

$d_{inner}$  [mm] and  $d_{outer}$  [mm]

For varying clamp diameters see page 16 and 17

For varying clamp diameters see page 16 and 17

<b>Height - H4</b> H max. [mm]	203	193
<b>Height - H8</b> H max. [mm] double piston design	231	221
<b>Weight max.</b> [kg]	1,4	1,4

#### Inlet clamp connections / Outlet threaded connections

$d_0$ [mm]	10
$A_0$ [mm <sup>2</sup> ]	78,5

#### Outlet threaded connections

	XG	G <sup>1</sup> / <sub>2</sub>	G <sup>3</sup> / <sub>4</sub>	G1
	XN	NPT <sup>1</sup> / <sub>2</sub> "	NPT <sup>3</sup> / <sub>4</sub> "	NPT1"
Center to face b [mm]		30	37	37

Inlet clamp diameters			Center to face a [mm]			
			SO	DO	BO	CO
DN 15	SO	DN 15	40	40	40	43
		DN 25	30	30	30	33
DN 25	DO	DN 15	40	40	40	43
		DN 25	30	30	30	33
NPS 3/4"	BO	NPS 3/4"	40	40	40	43
		NPS 1"	30	30	30	33
NPS 1"	CO	NPS 1"	30	30	30	33

#### Clamp diameter

$d_{inner}$  [mm] and  $d_{outer}$  [mm]

For varying clamp diameters see page 16 and 17

<b>Height - H4</b> H max. [mm]	203	203	193
<b>Height - H8</b> H max. [mm] double piston design	231	231	221
<b>Weight max.</b> [kg]	1,4	1,4	1,4

#### Inlet Aseptic screwed connections / Outlet Aseptic screwed connections

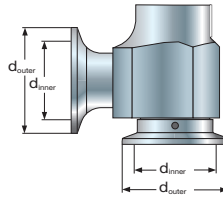
$d_0$ [mm]	10
$A_0$ [mm <sup>2</sup> ]	78,5

#### Center to face

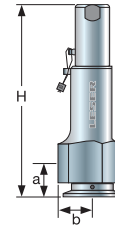
Inlet a [mm]		Outlet b [mm]	
GS	DN25, NPS 1"	GS	DN25, NPS 1"
BS	DN25, NPS 1"	BS	DN25, NPS 1"
GT	DN25, NPS 1"	GT	DN25, NPS 1"
BT	DN25, NPS 1"	BT	DN25, NPS 1"
GO	DN25	GO	DN25
KO	DN25	KO	DN25
GD	DN25	GD	DN25
BD	DN25	BD	DN25

<b>Height - H4</b> H max. [mm]	196
<b>Height - H8</b> H max. [mm] double piston design	224
<b>Weight max.</b> [kg]	1,4

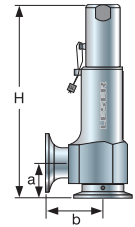
**Type 481**  
**Dimensions and weights**  
US Units



**Type 481**  
Clamp diameters



**Type 481**  
Outlet: Threaded connections



**Type 481**  
Outlet: Clamp connection

**Inlet clamp connections / Outlet clamp connections**

d <sub>0</sub> [inch]	10
A <sub>0</sub> [inch <sup>2</sup> ]	78,5

**Center to face**

Inlet a [inch]			Outlet b [inch]	
DN	15	25	DN	25
SO	1 9/16	1 3/16	SO	2 9/16
DO	1 9/16	1 3/16	DO	2 9/16
NPS	3/4"	1"	NPS	1"
BO	1 9/16	1 3/16	BO	2 9/16
CO	-	1 3/16	CO	2 9/16

**Clamp diameter**

d<sub>inner</sub> [inch] and d<sub>outer</sub> [inch]

For varying clamp diameters  
see page 16 and 17

For varying clamp diameters  
see page 16 and 17

<b>Height - H4</b> H max. [inch]	8	7 19/32
<b>Height - H8</b> H max. [inch] double piston design	9 3/32	8 11/16
<b>Weight max.</b> [lb]	3,086	3,086

**Inlet clamp connections / Outlet threaded connections**

d <sub>0</sub> [inch]	0,394
A <sub>0</sub> [inch <sup>2</sup> ]	0,122

**Outlet threaded connections**

XG	G <sup>1</sup> / <sub>2</sub>	G <sup>3</sup> / <sub>4</sub>	G1
XN	NPT <sup>1</sup> / <sub>2</sub> "	NPT <sup>3</sup> / <sub>4</sub> "	NPT1"

Inlet clamp diameters			Center to face b [inch]	Center to face a [inch]	Center to face a [inch]	Center to face a [inch]	Center to face a [inch]	Center to face a [inch]
SO	DN 15		1 3/16	1 9/16	1 9/16	1 9/16	1 9/16	1 9/16
	DN 25		1 7/16	1 9/16	1 3/16	1 3/16	1 3/16	1 3/16
DO	DN 15		1 9/16	1 9/16	1 9/16	1 9/16	1 9/16	1 9/16
	DN 25		1 3/16	1 9/16	1 3/16	1 3/16	1 3/16	1 3/16
BO	NPS 3/4"		1 9/16	1 9/16	1 9/16	1 9/16	1 9/16	1 9/16
	NPS 1"		1 3/16	1 3/16	1 3/16	1 3/16	1 3/16	1 3/16
CO	NPS 1"		1 3/16	1 3/16	1 3/16	1 3/16	1 3/16	

**Clamp diameter**

d<sub>inner</sub> [inch] and d<sub>outer</sub> [inch]

For varying clamp diameters see page 16 and 17

<b>Height - H4</b> H max. [inch]	8	8	7 5/8
<b>Height - H8</b> H max. [inch] double piston design	9 1/8	9 1/8	8 11/16
<b>Weight max.</b> [lb]	3,086	3,086	3,086

**Inlet Aseptic screwed connections / Outlet Aseptic screwed connections**

d <sub>0</sub> [inch]	10
A <sub>0</sub> [inch <sup>2</sup> ]	78,5

**Center to face**

Inlet a [inch]			Outlet b [inch]		
GS	DN25, NPS 1"	1 3/4	GS	DN25, NPS 1"	2 13/16
BS	DN25, NPS 1"	1 9/16	BS	DN25, NPS 1"	2 13/16
GT	DN25, NPS 1"	1 11/16	GT	DN25, NPS 1"	2 13/16
BT	DN25, NPS 1"	1 9/16	BT	DN25, NPS 1"	2 13/16
GO	DN25	1 13/16	GO	DN25	2 13/16
KO	DN25	1 9/16	KO	DN25	2 13/16
GD	DN25	1 9/16	GD	DN25	2 13/16
BD	DN25	1 5/8	BD	DN25	2 13/16

<b>Height - H4</b> H max. [inch]	7 11/16
<b>Height - H8</b> H max. [inch] double piston design	8 13/16
<b>Weight max.</b> [lb]	3,086

## Type 481

### Pressure temperature ratings

#### Metric Units

		Vulcanized soft seal		O-ring disc	
Actual Orifice diameter $d_0$ [mm]		10		10	
Actual Orifice area $A_0$ [mm <sup>2</sup> ]		78,5		78,5	
<b>Body material: 1.4404 (316L)</b>					
<b>Inlet / Outlet body</b>	Pressure rating	For pressure ratings please refer to chapter dimensions and weights (page 24)			
<b>Minimum set pressure</b>	p [bar] S/G/L	0,1		16	
<b>Maximum set pressure</b>	p [bar] S/G/L	16		68	
<b>Temperature range<sup>1)</sup></b>		Minimum	Maximum	Minimum	Maximum
EPDM	[°C]	-45	+150	-45	+150
CR	[°C]	-40	+100	-40	+100
FKM	[°C]	-18	+180	-18	+180
NBR	[°C]	-25	+110	-25	+110
FFKM	[°C]	0	+250	0	+250

#### US Units

		Vulcanized soft seal		O-ring disc	
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: 1.4404 (316L)</b>					
<b>Inlet / Outlet body</b>	Pressure rating	For pressure ratings please refer to chapter dimensions and weights (page 25)			
<b>Minimum set pressure</b>	p [psig] S/G/L	1,5		233	
<b>Maximum set pressure</b>	p [psig] S/G/L	232		986	
<b>Temperature range<sup>1)</sup></b>		Minimum	Maximum	Minimum	Maximum
EPDM	[°F]	-49	+302	-49	+302
CR	[°F]	-40	+212	-40	+212
FKM	[°F]	-0,4	+356	-0,4	+356
NBR	[°F]	-13	+230	-13	+230
FFKM	[°F]	+32	+482	+32	+482

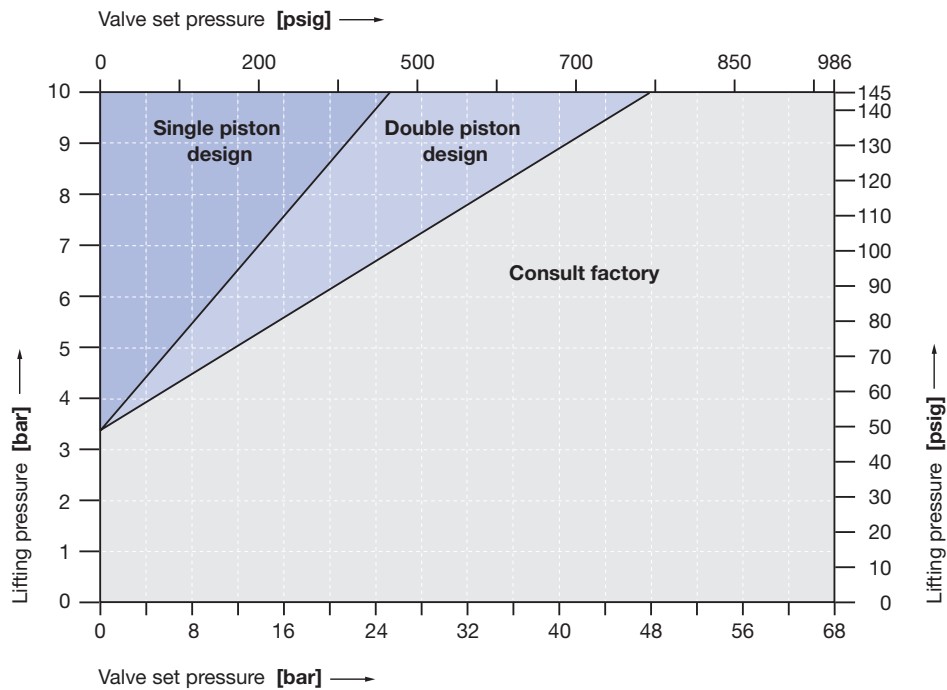
<sup>1)</sup> The temperature is limited by the soft seal material.



## Type 481 Selection chart H8

Depending on the set pressure and lifting pressure (air supply) a double piston lifting device (option code J41) may be required instead of a single piston. The chart below determines the required lifting device.

Selection chart lifting device H8, size 0.  $d_0$  10 mm / 0,394 inch



# Type 481

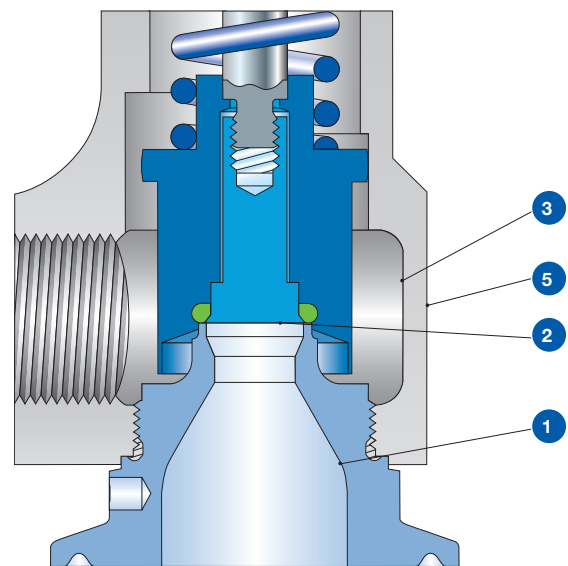
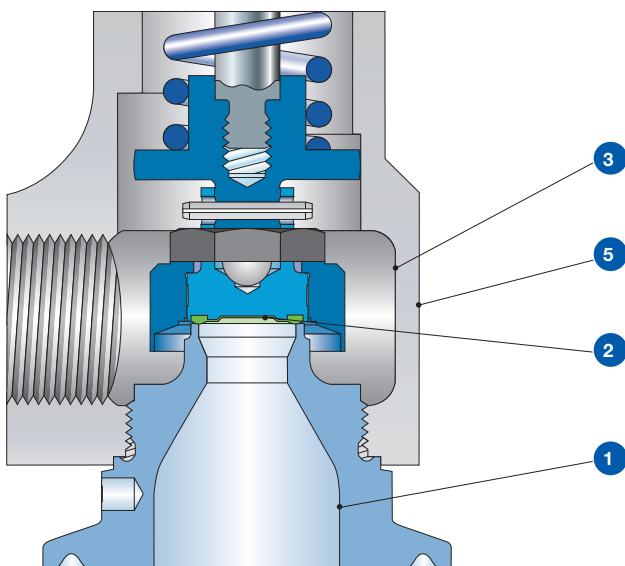
## Surface quality

Type of surface	Area		LESER Surface package				
			Option code	Clean finish	HyClean finish	Sterile finish	
	Description	No.			B50	B51	B52
				R <sub>a</sub> max.	R <sub>a</sub> max.	R <sub>a</sub> max.	
<b>LESER Surface grade</b>							
Product contact surface	Inlet	1		<b>M4</b>	<b>ME4</b>	<b>ME2</b>	
			[μm]	0,750	0,750	0,500	
			[μinch]	30	30	20	
	<b>Bottom side of disc</b>						
	Soft seal design: Vulcanized	2		<b>Elastomer surface</b>			
	Soft seal design: O-ring	2		<b>M4</b>	<b>ME4</b>	<b>ME2</b>	
[μm]			0,750	0,750	0,500		
		[μinch]	30	30	20		
Blow off surface	Inside surface of outlet area	3		<b>M6</b>	<b>ME6</b>	<b>ME6</b>	
			[μm]	3,000	3,000	3,000	
		[μinch]	120	120	120		
Outer surface	Outside surface of inlet and outlet body, cap/lifting device	5		<b>ME6</b>	<b>ME6</b>	<b>ME6</b>	
			[μm]	3,000	3,000	3,000	
		[μinch]	120	120	120		

If required surface deviates from standard specify No. and required LESER Surface Grade.

Type 481 – Vulcanized soft seal

Type 481 – O-ring disc



## Type 481 Approvals

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>		<b>Coefficient of discharge <math>K_{dr}</math></b>	
DIN EN ISO 4126-1, PED	Approval No.	07 202 0111 Z 0008/0/21-2	
	S/G	0,45 ( $\leq$ 16 bar)	0,4 (> 16 bar)
	L	0,37 ( $\leq$ 16 bar)	0,33 (> 16 bar)
<b>Germany</b>		<b>Coefficient of discharge <math>C_{Lw}</math></b>	
AD 2000-Merkblatt A2, PED	Approval No.	TÜV SV 980	
	S/G	0,45 ( $\leq$ 16 bar)	0,4 (> 16 bar)
	L	0,37 ( $\leq$ 16 bar)	0,33 (> 16 bar)
<b>United States</b>		<b>Coefficient of discharge K</b>	
ASME Sec. VIII	Approval No.	M 37190	
	S/G	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) S: 2,55 lb / hr / psia $\triangle$ K $\approx$ 0,406 G: 0,904 SCFM / psia 8 $\triangle$ K $\approx$ 0,406	
	Approval No.	M 37202	
	L	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) L: 1,49 GPM $\sqrt{\text{psid}^*}$ $\triangle$ K $\approx$ 0,322	
<b>Canada</b>		<b>Coefficient of discharge K</b>	
CRN	Approval No.	OG0772.9C	
	S/G	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) S: 2,55 lb / hr / psia $\triangle$ K $\approx$ 0,406 G: 0,904 SCFM / psia $\triangle$ K $\approx$ 0,406	
	L	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) L: 1,49 GPM $\sqrt{\text{psid}^*}$ $\triangle$ K $\approx$ 0,322	
<b>China</b>		<b>Coefficient of discharge <math>C_{Lw}</math></b>	
AQSIQ	Approval No.	For current approval no. see <a href="http://www.leser.com">www.leser.com</a>	
	S/G	0,45 ( $\leq$ 16 bar)	0,4 (> 16 bar)
	L	0,37 ( $\leq$ 16 bar)	0,33 (> 16 bar)
<b>Eurasian Custom Union</b>		<b>Coefficient of discharge <math>C_{Lw}</math></b>	
EAC	Approval No.	For current approval no. see <a href="http://www.leser.com">www.leser.com</a>	
	S/G	0,45 ( $\leq$ 16 bar)	0,4 (> 16 bar)
	L	0,37 ( $\leq$ 16 bar)	0,33 (> 16 bar)
<b>Classification societies</b>		on request	

<sup>\*)</sup> psid = Differential pressure P-P<sub>d</sub>  
P = absolute flow pressure [psia]  
P<sub>d</sub> = pressure at discharge from valve [psia]

# Type 481

## Available options

Type 481

