

# Clean Service

Safety Relief Valves  
Series 48X



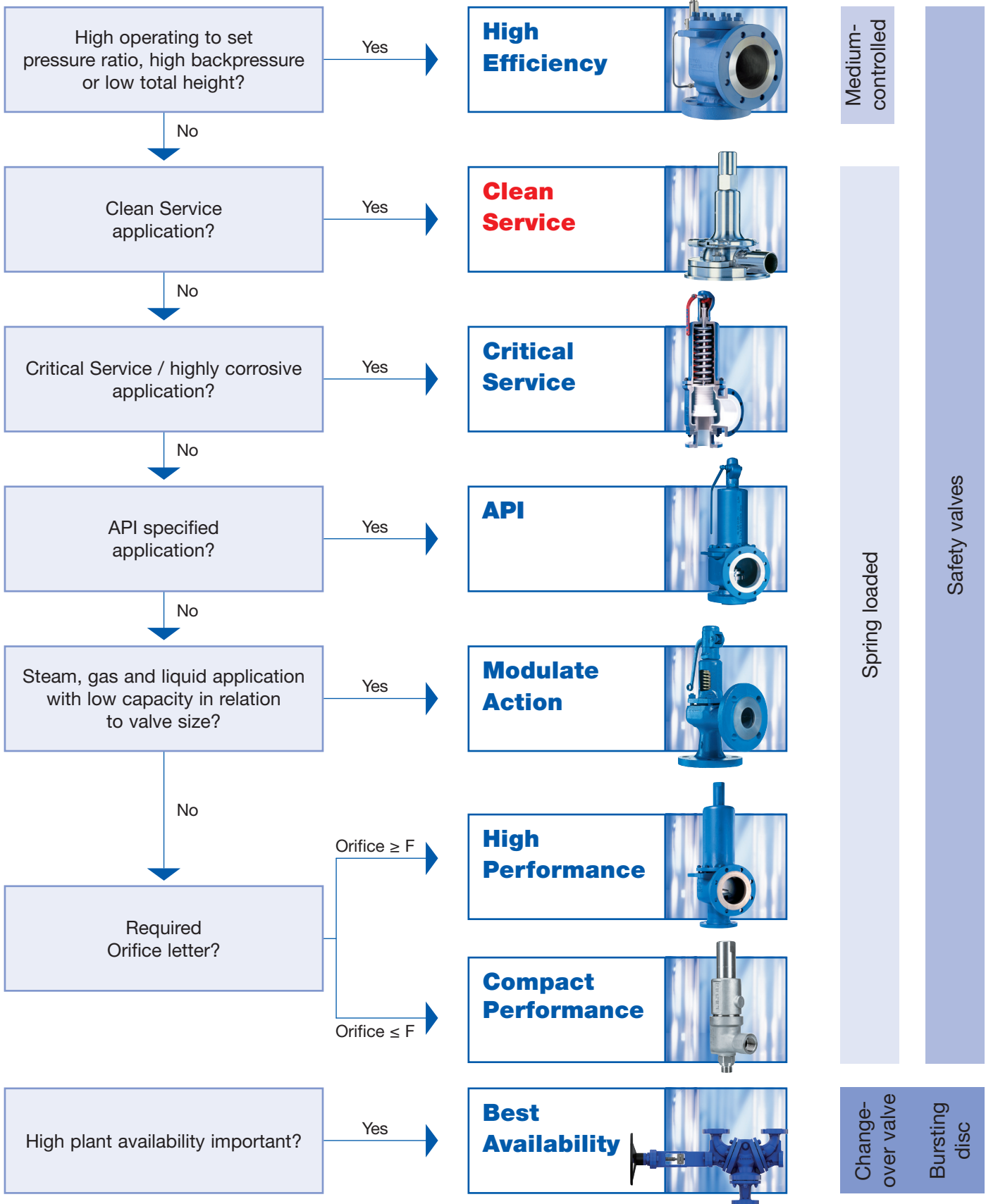
## CATALOG

**LESER**



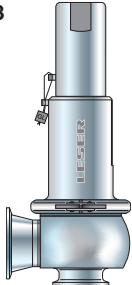

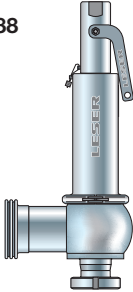

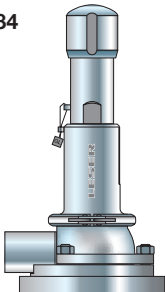

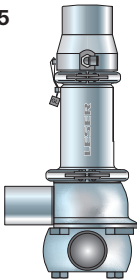

The-Safety-Valve.com

# Valve finder

## How to find the right product group



## How to select the right Clean Service Safety Valve

Type	Orifice	Features	Valve dead space ratio <sup>1)</sup>	Description	
Standard	 481	0,5 x D	Cleanability Inlet Cleanability Outlet Capacity 	L/D < 1,5	Designed for small capacity; Type 481 offers protection for installations in which Clean Service properties are required only at the valve inlet, e. g. protection of gas systems for the bottling of beverages.
	 483	D – F	Cleanability Inlet Cleanability Outlet Capacity 	L/D < 1,5	Designed for small to medium capacity; Type 483 has optimized Clean Service properties for applications requiring clamp connections. Type 483 is applicable in all Clean Service areas (e. g. bottle filling machines, fermenters).
	 488	G – P	Cleanability Inlet Cleanability Outlet Capacity 	L/D < 1,5 – 3,0	Designed for high capacity; Type 488 provides Clean Service properties for applications requiring larger capacities. Type 488 is applicable in large plants, breweries and the beverage industry.
Superior	 484	D – F	Cleanability Inlet Cleanability Outlet Capacity 	L/D < 0,33	Designed for small to medium capacity; Type 484 meets the highest sanitary requirements for high purity applications, e. g. fermentors. The design incorporates a dead space free vessel connection, which is directly welded into the vessel wall and allows maximum cleanability of the valve inlet.
	 485	D – F	Cleanability Inlet Cleanability Outlet Capacity 	L/D < 0,95	Designed for small to medium capacity; Type 485 meets the highest sanitary requirements for high purity applications, e. g. fermentors. The design incorporates a dead space free pipe connection, which is directly welded into the pipework and allows maximum cleanability of the valve inlet. Type 485 can be used in applications where a direct vessel connection used by the Type 484 is not possible, e. g. glass vessels.

<sup>1)</sup> Explanation of dead space ratio see page 11

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## General Information

### LESER – Clean Service Safety Valves

The Clean Service product group represents:

- ✓ High aseptic properties
- ✓ Low dead space
- ✓ Best Cleanability (CIP, SIP or COP)

### LESER's Clean Service Safety Valves

- are designed and manufactured to highest standards and fulfil hygienic and sanitary requirements acc. to
  - DIN 11866 (European Hygienic Pipes Standard)
  - ASME BPE (Bioprocessing Equipment)
  - EN 1672-2
  - DIN ISO 14159
  - USP class VI and FDA 21 CFR
- serve for protection of processes and equipment in the foodstuff and pharmaceutical industry.
- have a dead space ratio  $L/D < 0,3$  (Type 484) up to  $< 2$  (Type 488)
- have a multiple choice of sanitary connections
- are developed in a close cooperation with plant engineers and service specialists.

- are approved by all important approval organisations worldwide which ensures the worldwide applicability e. g.:
  - European Community: CE-marking acc. to Pressure Equipment Directive PED 2014/68/EU and EN ISO 4126-1
  - USA: UV-stamp acc. to ASME Section VIII Division 1, National Board certified capacities
  - Germany: VdTÜV approval acc. to PED, EN ISO 4126-1, TÜV SV 100 and AD 2000-Merkblatt A2
  - Canada: Canadian Registration Number acc. to the requirements of particular provinces
  - China: AQSIQ based on the approval acc. to ASME Section VIII Division 1 and AD 2000-Merkblatt A2
  - Eurasian Custom Union: Approval acc. to Eurasian Custom Union (EAC - Eurasian Conformity)

Furthermore, all LESER Clean Service safety valves are designed, marked, produced and approved acc. to the requirements of the following regulations (directives, codes, rules and standards).

EN ISO 4126-7, EN 12266-1/-2, ASME PTC 25, ASME-Code Sec. II, ASME B 16.34, API Std. 527, API RP 576, AD 2000-Merkblatt A4, AD 2000-Merkblatt HP0



## General Information

### Applications and References

#### LESER's Clean Service Safety Valves

represent the ultimate solution for all critical clean service areas of

- Food industry
- Breweries and beverage
- Pharmaceutical industry
- Cosmetic industry
- Chemical industry
- Special processes

### General Design Features



#### LESER's Clean Service Safety Valves

offer a large variety of types, materials and options to suit any application:

#### Scope of design

- Valve sizes  $d_0$  10 mm / 0,394 inch through  $d_0$  92 mm / 3,622 inch
- Nine orifice sizes from 0,5 x D through P
- Materials: 1.4404 / 316L, 1.4435 / 316L stainless steel as a standard
- Standard soft seat for superior tightness
- Packed knob, packed lifting lever, gastight cap or pneumatic lifting device

#### No bacteria traps or contamination due to

- Minimum dead space design and flushmounting capability
- Wetted-part surfaces in compliance with European Hygienic Pipes Standard DIN 11866 and ASME BPE
- Gap and crevice-free design of internals
- Standard elastomer bellows for protection of the hard to clean parts
- Self-draining body design, avoids residues and reduces corrosion
- Use of  and  compliant elastomer

#### Automatic plant operation during production and cleaning

- Optional pneumatic lifting device for cleaning in place (CIP) or sterilizing in place (SIP)
- Optional proximity switch to indicate the operating condition of the valve
- Self-draining body design and aseptic O-ring disc with bellows (HyTight Assembly) assure a cleanable outlet of the valve

#### Ease of plant design, installation and operation

- Variety of capacities and versions to fit any application
- Multiple choice of sanitary connections
- Single trim for steam, gas and liquid for less spare parts and easier maintenance
- Outlet chamber sealed from bonnet by EPDM bellows
- Crevice-free fastening of all elastomer parts
- Exposed, rinsed O-rings
- No bacteria traps or contamination

#### LESER's Clean Service Safety Valves

can be customized with a great variety of options, e. g.

- Special connections specified by the customer for optimised adaptation to the plant
- HyTight Assembly for superior tightness
- Every part can be replaced by other material acc. customer specification



## HyTight Assembly

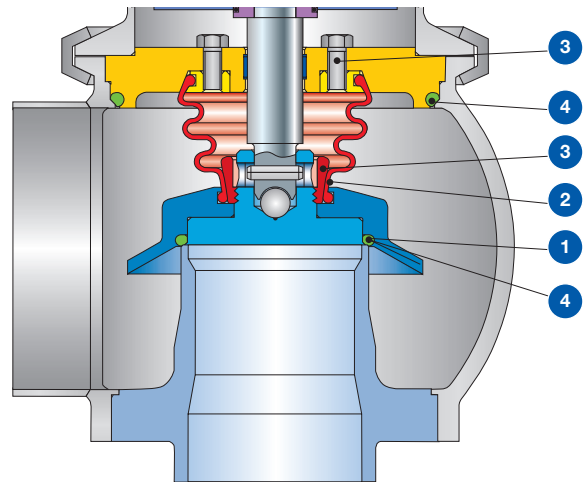
### Cleanability first

Cleanability first – this is the guideline for the design of the LESER Clean Service Safety Valves. Series 48X provides an optimum of cleanability. The following design features represent the ultimate solution for all critical clean service applications. HyTight stands for Hygienic and Tightness.

### HyTight Assembly

The aseptic O-ring disc is the “heart” of the series 48X. This unique design provides for the first time a really cleanable in- and outlet of a safety valve:

- 1 The O-ring sealing provides superior tightness.
- 2 The elastomer bellows protects the hard-to-clean parts in the guiding and bonnet area against contamination. Please note: An elastomer bellows is not back pressure compensating like a stainless steel bellows.
- 3 All fixing elements like screws and nuts are placed inside of the bellows.
- 4 Crevice free internals, rinsed O-rings and FDA compliant elastomers insure there are no bacteria traps.



### Availability

- Standard for Types 483, 484, 485, 488
- not available for Type 481

## Surface Quality

The European Hygienic Pipes Standard DIN 11866 as well as the ASME BPE provide guidances on the hygienic engineering aspects of manufacturing of safe and wholesome food.

The surface quality, especially area in contact with product, greatly influences the cleanability of the safety valve.

For instance the ASME BPE (Bioprocessing Equipment) states for cleanability:

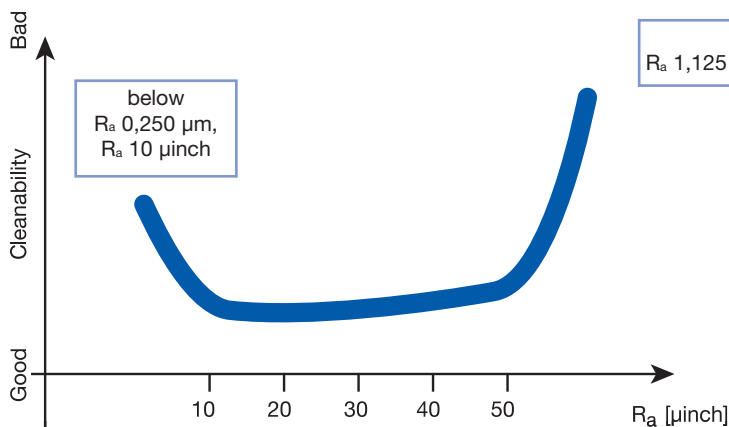
### SD-2.4.2:

- All surfaces shall be cleanable.
- Surface imperfections (e.g., crevices, gouges, obvious pits, etc.) shall be eliminated when ever feasible.

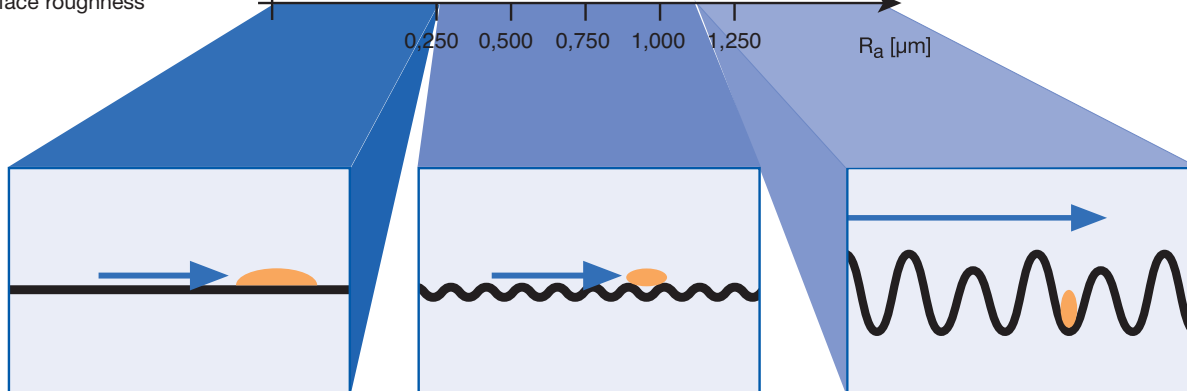
To ensure that the European as well as the ASME BPE requirements are fulfilled, no castings are used in the LESER Clean Service series. High surface quality is achieved by machining most valve bodies and all internal parts from high quality bar material.

Type	Standard surface qualities product contact inlet	Surface qualities of
481, 483, 488	$R_a < 0,750 \mu\text{m}$ $R_a < 30 \mu\text{inch}$ SFV3	$R_a < 0,500 \mu\text{m}$ $R_a < 20 \mu\text{inch}$
484, 485	$R_a < 0,750 \mu\text{m}$ electropolished $R_a < 30 \mu\text{inch}$ electropolished	for the product contact inlet are available on request, as well as electropolishing of the inside and outside of the valves

Diagram depicting remaining contamination after a defined cleaning procedure.



Cleanability dependent on surface roughness



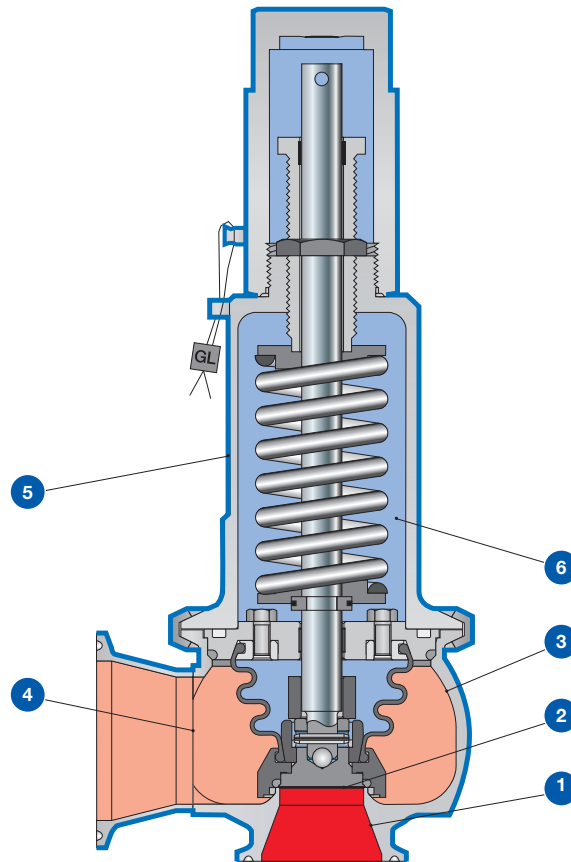
Below  $R_a 0,250 \mu\text{m}$  /  $10 \mu\text{inch}$  bacteria or particles “stick” to the surface due to adhesive effects.

An optimized cleanability is reached with a surface roughness between  $R_a 0,250 \mu\text{m}$  /  $10 \mu\text{inch}$  and  $R_a 1,125 \mu\text{m}$  /  $45 \mu\text{inch}$ .

Above  $1,125 \mu\text{m}$  /  $45 \mu\text{inch}$  the bacteria and particles can “hide” in the corrugations or niches.



## LESER Surface Definition Surface Quality



Area	Description	Surface definition acc. to ASME BPE
Product contact surface · No. 1 Inlet area · No. 2 Bottom side of disc	· Surface permanently in contact with the product	· Design acc. to Part SD · Surface finish in compliance with Part SF · Different surface designation level acc. to table SF-2.4-1 is available
Blow off surface · No. 3 Inside surface of outlet area · No. 4 Welding seam	· Surface not permanently in contact with the product · During blow off surface is wetted with the product · This product cannot flow back to the process, if the outlet is not connected with the production process	· Surface finish preponderant in compliance with Part SF · Weldings are not grinded · Surface designation level acc. to LESER specification
Outer surface · No. 5 Outside surface of body and bonnet	· This surface has no contact to the product, but a shiny surface is expected	· ASME BPE is not applicable · Design acc. to Part SD · Surface finish preponderant in compliance with Part SF · Weldings are not grinded
Shielded surface · No. 6	· Surface never in contact with the product because it is shielded by the bellows	· ASME BPE is not applicable

## LESER Surface Packages

In order to cover international surface requirements like DIN 11866 as well as ASME BPE, LESER defines surface packages (Clean finish, HyClean finish, Sterile finish) and surface grades (M1 – M6 mechanically polished, ME1 – ME6 mechanically polished and electropolished).

### LESER surface grade

Depending on the manufacturing technology the LESER surface grade differentiates between mechanically polished and mechanically polished and electropolished. Following tables show the comparison of LESER surface grade, hygiene class according to DIN 11866 and surface designation according to ASME BPE.

### LESER surface packages are:

- Clean finish      LESER standard package mainly used in breweries
- HyClean finish    Increased surface quality for e. g. dairys, cosmetics applications
- Sterile finish     Increased surface quality for e. g. pharmaceutical applications

### Option codes for available surface packages

#### Mechanically polished

LESER surface grade	Surface condition				DIN 11866	ASME BPE
	R <sub>a</sub> max.		≅ R <sub>z</sub>			
	[μm]	[μinch]	[μm]	[μinch]	Hygiene class	Surface designation
M1	0,375	15	2,5	64	H4	–
M2	0,500	20				SF1
M3	0,625	25				SF2
M4	0,750	30	4	102	H3	SF3
M5	1,500	60	10	254	H1	–
M6	3,000	120	16	406		–

#### Mechanically polished and electropolished

LESER surface grade	Surface condition				DIN 11866	ASME BPE
	R <sub>a</sub> max.		≅ R <sub>z</sub>			
	[μm]	[μinch]	[μm]	[μinch]	Hygiene class	Surface designation
ME1	0,375	15	2,5	64	HE4c	SF4
ME2	0,500	20				SF5
ME3	0,625	25				SF6
ME4	0,750	30	4	102	HE3c	–
ME5	1,500	60	10	254	HE1c	–
ME6	3,000	120	16	406		–

#### Overview option codes

Type	LESER Surface packages		
	Clean finish	HyClean finish	Sterile finish
481	B50	B51	B52
483	B53	B54	B55
488	B68	B69	B70
484	B56	B57	B58
5034 Vessel connection	B59	B60	B61
485	B62	B63	B64
5034 Integrated pipework connection	B65	B66	B67

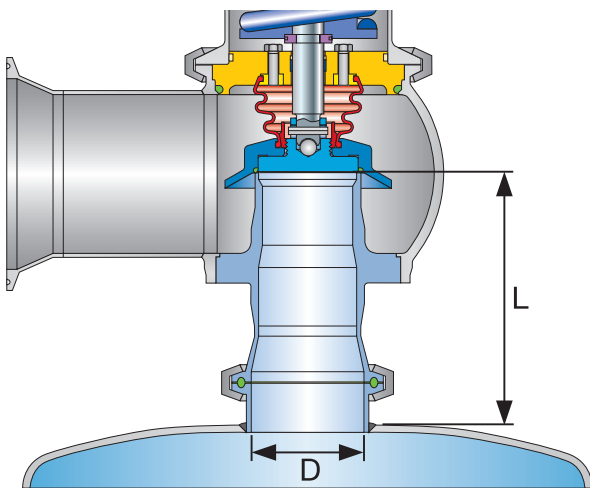
## Low dead space

The dead space ratio is defined by ratio of the length of the inlet (L) to the diameter of the inlet pipe (D). The cleanability is improved as this ratio is reduced.

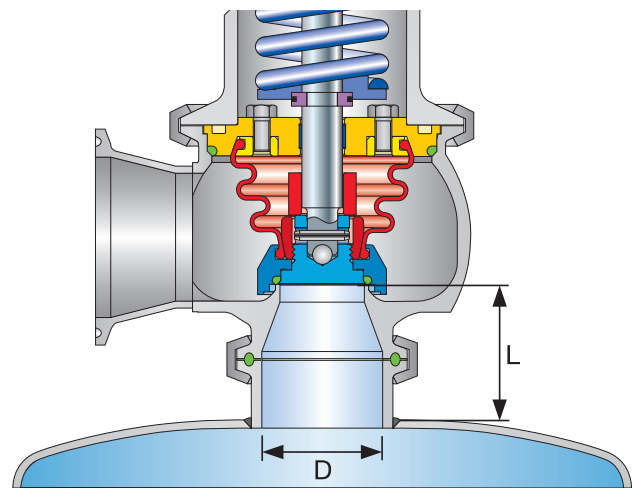
Types 481, 483 and 488 are improved solutions for safety valves with clamp connections, and have L/D ratios less than 1,5 and 2,0 (Type 488). The requirements of ASME BPE Part SD – 3.11.1 ( $L/D < 2,0$ ) and FDA 21 CFR Part 177.2600 ( $L/D < 1,5$ ) are fulfilled with these designs.

For some applications especially in the pharmaceutical industry the requirements are even higher. The solution for these particularly high purity requirements is Type 484 or Type 485 with special connections to the vessel or the piping, providing L/D ratios as low as 0,3 for Type 484 and  $< 0,95$  for Type 485.

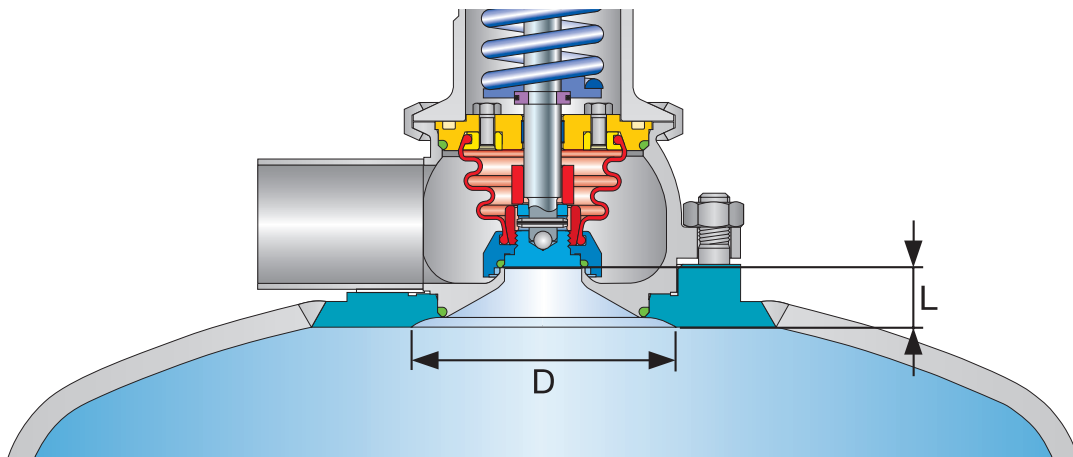
### Dead space



**Type 488**  
L/D ~ 2,0



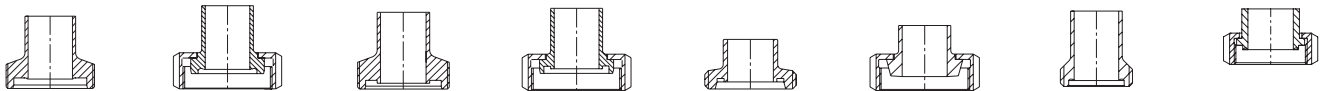
**Type 483**  
L/D ~ 1,5



**Type 484**  
L/D ~ 0,3







Aseptic thread	Aseptic clamp and nut	Aseptic thread	Aseptic clamp and nut	Aseptic thread	Aseptic clamp and nut	Sterile thread	Sterile clamp and nut
GS	BS	GT	BT	GO	KO	GD	BD
DIN 11864 T1 Range A	DIN 11864 T1 Range A	DIN 11864 T1 Range B	DIN 11864 T1 Range B	DIN 11851	DIN 11851	Neumo <sup>2)</sup>	Neumo <sup>2)</sup>
DIN 11850 DIN EN ISO 1127 BS 4825-1	DIN 11850 DIN EN ISO 1127 BS 4825-1	DIN 11850 DIN EN ISO 1127 BS 4825-1	DIN 11850 DIN EN ISO 1127 BS 4825-1	DIN 11850	DIN 11850	DIN 11850 DIN EN ISO 1127	DIN 11850 DIN EN ISO 1127
Option code							
✓	✓	✓	✓	H85L75I16	H85L76I16	✓	✓
✓	✓	✓	✓	A85L81A16	A85L82A16	✓	✓
✓	✓	✓	✓	H85L75I16	H85L76I16	✓	✓
✓	✓	✓	✓	A85L81A16	A85L82A16	✓	✓
✓	✓	✓	✓	H85L75I17	H85L76I17	✓	✓
✓	✓	✓	✓	A85L81A17	A85L82A17	✓	✓
✓	✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓	✓	✓
✓ <sup>1)</sup>	✓ <sup>1)</sup>	✓ <sup>1)</sup>	✓ <sup>1)</sup>	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓	✓	✓
-	-	-	-	✓	✓	-	-
✓ <sup>1)</sup>	✓ <sup>1)</sup>	✓ <sup>1)</sup>	✓ <sup>1)</sup>	✓	✓	✓	✓
-	-	-	-	✓	✓	-	-
-	-	-	-	-	-	-	-
✓	✓	✓	✓	A85L81A16	A85L82A16	✓	✓
-	-	-	-	-	-	-	-
✓	✓	✓	✓	A85L81A17	A85L82A17	✓	✓
-	-	-	-	-	-	-	-
✓	✓	✓	✓	A85L81A16	A85L82A16	✓	✓
-	-	-	-	-	-	-	-
✓	✓	✓	✓	A85L81A17	A85L82A17	✓	✓

<sup>1)</sup> Available for pipe standard DIN 11850 only

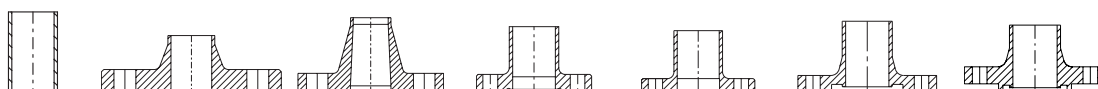
<sup>2)</sup> BioConnect® is registered wordmark of NEUMO GmbH & Co. KG, D – 75438 Knittlingen

## Welded end and flange connections

### Overview

LESER is able to deliver a wide range of connections required for clean service applications. For ordering the right connection please specify inlet and outlet by LESER option code. If the option code is not stated in this table please refer to connection pages of each Type.

Type	Other connections page
481	23
483	35
488	47
484	63
485	75



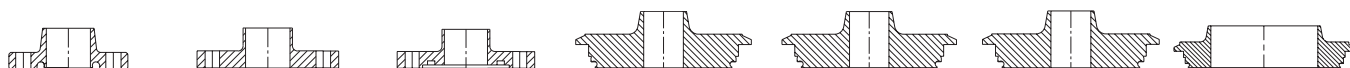
Connection	Welded end	Flange PN 16 Range B1	Flange ASME Class 150RF	Aseptic flange groove	Aseptic flange tongue	Aseptic flange groove	Aseptic flange tongue
Code	00	FD	FA	NF	BF	NG	BG
According to	DIN 11850	DIN EN 1092	ASME B 16.5	DIN 11864 T2 Range A	DIN 11864 T2 Range A	DIN 11864 T2 Range B	DIN 11864 T2 Range B
Pipe standard	DIN 11850	-	-	DIN 11850 DIN EN ISO 1127 BS 4825-1	DIN 11850 DIN EN ISO 1127 BS 4825-1	DIN 11850 DIN EN ISO 1127 BS 4825-1	DIN 11850 DIN EN ISO 1127 BS 4825-1

Option code								
Type 481	d <sub>0</sub> 10	Inlet	-	-	-	-	-	-
		Outlet	-	-	-	-	-	-
Type 483	d <sub>0</sub> 13	Inlet	-	-	-	✓	✓	✓
		Outlet	A85L83A16	-	-	✓	✓	✓
	d <sub>0</sub> 25	Inlet	-	-	-	✓	✓	✓
		Outlet	A85L83A17	-	-	✓	✓	✓
Type 488	d <sub>0</sub> 23	Inlet	H85L77	I71	L94	✓	✓	✓
		Outlet	A85L83	I72	L95	✓	✓	✓
	d <sub>0</sub> 37	Inlet	H85L77	I71	L94	✓	✓	✓
		Outlet	A85L83	I72	L95	✓	✓	✓
	d <sub>0</sub> 46	Inlet	H85L77	I71	L94	✓	✓	✓
		Outlet	A85L83	I72	L95	✓	✓	✓
	d <sub>0</sub> 60	Inlet	H85L77	I71	L94	✓	✓	✓
			A85L83	I72	L95	✓ <sup>1)</sup>	✓ <sup>1)</sup>	✓ <sup>1)</sup>
		Outlet	H85L77	I71	L94	✓	✓	✓
			A85L83	I72	L95	✓ <sup>2)</sup>	✓ <sup>2)</sup>	✓ <sup>2)</sup>
	d <sub>0</sub> 74	Inlet	H85L77	I71	L94	✓	✓	✓
			A85L83	I72	L95	✓ <sup>2)</sup>	✓ <sup>2)</sup>	✓ <sup>2)</sup>
Outlet		H85L77	I71	L94	✓ <sup>1)</sup>	✓ <sup>1)</sup>	✓ <sup>1)</sup>	
		A85L83	I72	L95	✓ <sup>2)</sup>	✓ <sup>2)</sup>	✓ <sup>2)</sup>	
Type 484	d <sub>0</sub> 13	Inlet	-	-	-	-	-	
		Outlet	✓	-	-	✓	✓	
	d <sub>0</sub> 25	Inlet	-	-	-	-	-	
		Outlet	✓	-	-	✓	✓	
Type 485	d <sub>0</sub> 13	Inlet	-	-	-	-	-	
		Outlet	✓	-	-	✓	✓	
	d <sub>0</sub> 25	Inlet	-	-	-	-	-	
		Outlet	✓	-	-	✓	✓	

<sup>1)</sup> Not available for pipe standard BS 4825-1

<sup>2)</sup> Available for pipe standard DIN 11850 only

<sup>3)</sup> XX = nominal pipe size of the safety valve



Varivent flange groove	APV-FG1 Flange flat face PN 10	APV-FG1 Flange groove PN 10	DN 32/XX <sup>3)</sup> Varivent connection	DN 50/XX <sup>3)</sup> Varivent connection	DN 80/XX <sup>3)</sup> Varivent connection	DN 100/XX <sup>3)</sup> Varivent connection
TN	AF	AN	VG	VH	VC	VE
Tuchenhagen	APV	APV	Tuchenhagen	Tuchenhagen	Tuchenhagen	Tuchenhagen
DIN 11850	DIN 11850	DIN 11850	-	-	-	-

**Option code**

-	-	-	-	-	-	-
-	-	-	-	-	-	-
H85H78I16	H85L90I16	H85L92I16	H85I82I16	H85I83I16	-	-
A85L84A16	A85L91A16	A85L93A16	-	-	-	-
H85H78I17	H85L90I17	H85L92I17	-	H85I83I17	-	-
A85L84A17	A85L91A17	A85L93A17	-	-	-	-
H85L78	L90	L92	I82	-	L70	L80
A85L84	L91	L93	-	-	-	-
H85L78	L90	L92	-	I83	L70	L80
A85L84	L91	L93	-	-	-	-
H85L78	L90	L92	-	-	L70	L80
A85L84	L91	L93	-	-	-	-
H85L78	L90	L92	-	-	L70	L80
A85L84	L91	L93	-	-	-	-
H85L78	L90	L92	-	-	L70	L80
A85L84	L91	L93	-	-	-	-
H85L78	L90	L92	-	-	-	L80
A85L84	L91	L93	-	-	-	-
-	-	-	-	-	-	-
A85L84A16	A85L91A16	A85L93A16	-	-	-	-
-	-	-	-	-	-	-
A85L84A17	A85L91A17	A85L93A17	-	-	-	-
-	-	-	-	-	-	-
A85L84A16	A85L91A16	A85L93A16	-	-	-	-
-	-	-	-	-	-	-
A85L84A17	A85L91A17	A85L93A17	-	-	-	-

## Clamp connections

### Connecting dimensions

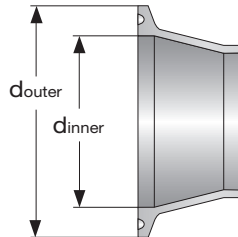
Most clamp connections can be delivered for different pipe standards, such as DIN 11850, ISO 2037, DIN EN ISO 1127 or special customer specifications.

The outer diameters generally the same so that there are no visual determinations between the clamps. Therefore the clamps are defined by inner and outer diameter ( $d_{inner}$  and  $d_{outer}$ ). Additional indication of the pipe standard is not necessary.

For Type 481, 483 and 488 the clamps can be selected in different nominal diameters. Please state option code for clamp and for nominal diameter as shown on the connection pages of each Type.

SO – Clamp: DIN 32676			Pipe: DIN 11850 and DIN 11866 Range A							
Type			Inlet				Outlet			
Art. No.	$d_0$ [mm]	DN	$d_{inner}$ [mm]	$d_{outer}$ [mm]	Option code	DN	$d_{inner}$ [mm]	$d_{outer}$ [mm]	Option code	
4814.	768/769	10	15	16,0	34,0	L79I14	–	–	–	–
			25	26,0	50,5	L79I16	25	26,0	50,5	L86A16
4834.	770	13	25	26,0	50,5	L79I16	25	26,0	50,5	L86A16
	771	25	40	38,0	50,5	L79I17	40	38,0	50,5	L86A17
4884.	884	23	25	26,0	50,5	L79	40	38,0	50,5	L86
	885	37	40	38,0	50,5	L79	65	66,0	91,0	L86
	886	46	50	50,0	64,0	L79	80	81,0	106,0	L86
	887	60	65	66,0	91,0	L79	100	100,0	119,0	L86
	888	74	80	81,0	106,0	L79	125	125,0	155,0	–
	889	92	100	100,0	119,0	L79	150	150,0	183,0	–
DO – Clamp: ISO 2852			Pipe: DIN EN ISO 1127 and DIN 11866 Range B							
Art. No.	$d_0$ [mm]	DN	$d_{inner}$ [mm]	$d_{outer}$ [mm]	Option code	DN	$d_{inner}$ [mm]	$d_{outer}$ [mm]	Option code	
4814.	768/769	10	15	18,1	34,0	I73I14	–	–	–	–
			25	29,7	50,5	I73I16	25	29,7	50,5	I74A16
4834.	770	13	25	29,7	50,5	I73I16	25	29,7	50,5	I74A16
	771	25	40	44,3	64,0	I73I17	40	44,3	64,0	I74A17
4884.	884	23	25	29,7	50,5	I73	40	44,3	64,0	I74
	885	37	40	44,3	64,0	I73	65	72,1	91,0	I74
	886	46	50	56,3	77,5	I73	80	84,9	106,0	I74
	887	60	65	72,1	91,0	I73	100	110,3	130,0	I74
	888	74	80	84,9	106,0	I73	125	135,7	155,0	I74
	889	92	100	110,3	130,0	I73	150	163,1	183,0	I74





BO – Clamp: ASME BPE			Pipe: BS 4825-1 and DIN 11866 Range C							
Type		Inlet					Outlet			
Art. No.	d <sub>0</sub> [mm]	Size	d <sub>inner</sub> [mm]	d <sub>outer</sub> [mm]	Option code	Size	d <sub>inner</sub> [mm]	d <sub>outer</sub> [mm]	Option code	
4814.	768/769	10	3/4"	15,7	25,0	I75I78	–	–	–	–
			1" <sup>1)</sup>	22,1	50,5	I75I79	1" <sup>1)</sup>	22,1	50,5	I76A79
4834.	770	13	1" <sup>1)</sup>	22,1	50,5	I75I79	1 1/2"	34,8	50,5	I76A80
			1 1/2"	34,8	50,5	I75I80	1 1/2"	34,8	50,5	I76A80
	771	25	1 1/2"	34,8	50,5	I75I80	2"	47,5	64,0	I76A81
			2"	47,5	64,0	I75I81	2"	47,5	64,0	I76A81
4884.	884	23	1 1/2"	34,8	50,5	I75	2"	47,5	64,0	I76
	885	37	2"	47,5	64,0	I75	3"	72,9	91,0	I76
	886	46	2 1/2"	60,2	77,5	I75	4"	97,4	119,0	I76
	887	60	3"	72,9	91,0	I75	Please select CO-Clamp			
	888	74	4"	97,4	119,0	I75	Please select CO-Clamp			
	889	92	Please select CO-Clamp				Please select CO-Clamp			
CO – Clamp: ISO 2852			Pipe: ISO 2037							
Art. No.	d <sub>0</sub> [mm]	Size <sup>2)</sup>	d <sub>inner</sub> [mm]	d <sub>outer</sub> [mm]	Option code	Size <sup>2)</sup>	d <sub>inner</sub> [mm]	d <sub>outer</sub> [mm]	Option code	
4814.	768/769	10	1"	22,6	50,5	L96I79	1"	22,6	50,5	L97A79
4834.	770	13	1"	22,6	50,5	L96I79	1 1/2"	35,6	50,5	L97A80
			1 1/2"	35,6	50,5	L96I80	1 1/2"	35,6	50,5	L97A80
	771	25	1 1/2"	35,6	50,5	L96I80	2"	48,6	64,0	L97A81
			2"	48,6	64,0	L96I81	2"	48,6	64,0	L97A81
4884.	884	23	1 1/2"	35,6	50,5	L96	2"	48,6	64,0	L97
	885	37	2"	48,6	64,0	L96	3"	72,9	91,0	L97
	886	46	2 1/2"	60,3	77,5	L96	4"	97,6	119,0	L97
	887	60	3"	72,9	91,0	L96	4 1/2"	110,3	130,0	L97
	888	74	4"	97,6	119,0	L96	5 1/2"	135,7	155,0	L97
	889	92	4 1/2"	110,3	130,0	L96	6,625"	163,1	183,0	L97

<sup>1)</sup> Type B

<sup>2)</sup> No designation in ISO 2852 available. Please check compatibility of dimensions.



## Type 481 Safety Relief Valves – spring loaded

Contents	Page
<b>Materials</b>	
• Conventional design	20
<b>How to order</b>	
• Article numbers	22
• Available connections	23
<b>Dimensions and weights</b>	
• Metric Units	24
• US Units	25
<b>Pressure temperature ratings</b>	
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<b>Selection chart H8</b>	27
<b>Surface quality</b>	28
<b>Approvals</b>	29
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**Type 481  
Cap H2**  
Inlet: Clamp connection  
Outlet: Threaded connection



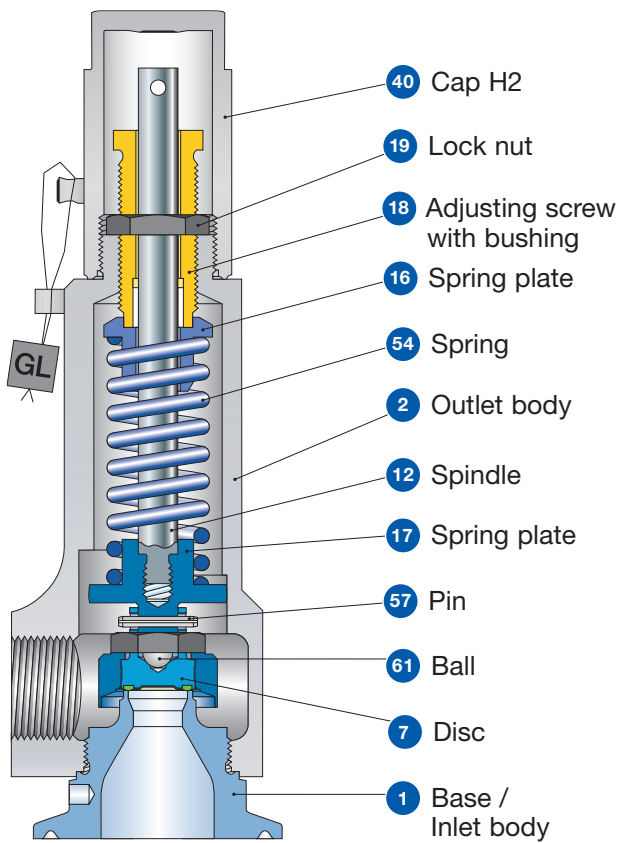
**Type 481  
Packed knob H4**  
Inlet: Aseptic clamp and nut  
Outlet: Threaded connection

# Type 481

## Conventional design

### Low set pressure

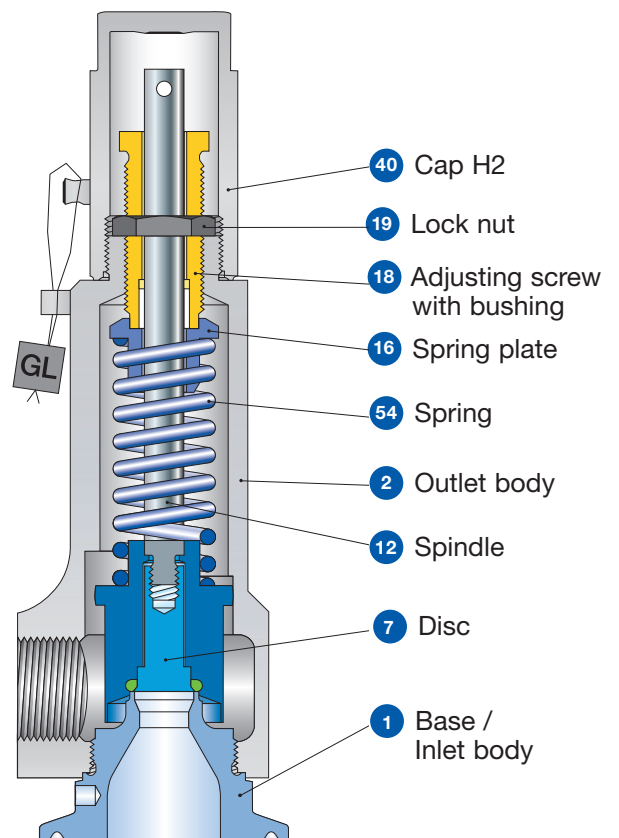
0,1 – 16 bar  
1,5 – 232 psig



**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

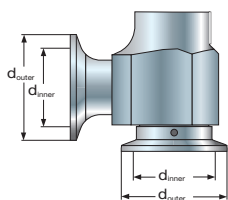
Actual Orifice diameter $d_0$ [mm]		10		$d_0$ [mm]		10	
Actual Orifice area $A_0$ [mm <sup>2</sup> ]		78,5		$A_0$ [mm <sup>2</sup> ]		78,5	
<b>Clamps</b>				<b>Clamps</b>			
		<b>Option code inlet</b>				<b>Option code outlet</b>	
DN	15	25		DN	–	25	
SO	L79I14	L79I16		SO	–	L86A16	
DO	I73I14	I73I16		DO	–	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.

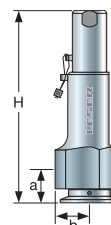
# Type 481

## Dimensions and weights

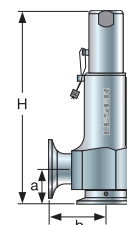
### Metric Units



**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</b> max. [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
<b>Inlet clamp diameters</b>	SO	DN 15	Center to face a [mm]	40	43
		DN 25	Center to face a [mm]	30	33
	DO	DN 15	Center to face a [mm]	40	43
		DN 25	Center to face a [mm]	30	33
	BO	NPS 3/4"	Center to face a [mm]	40	43
		NPS 1"	Center to face a [mm]	30	33
	CO	NPS 1"	Center to face a [mm]	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</b> max. [kg]	1,4	1,4	1,4

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

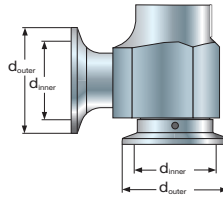
$d_0$ [mm]	10
$A_0$ [mm <sup>2</sup> ]	78,5

#### Center to face

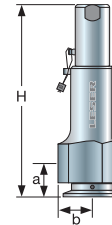
Inlet a [mm]		Outlet b [mm]	
GS	DN25, NPS 1"	GS	DN25, NPS 1"
BS	DN25, NPS 1"	BS	DN25, NPS 1"
GT	DN25, NPS 1"	GT	DN25, NPS 1"
BT	DN25, NPS 1"	BT	DN25, NPS 1"
GO	DN25	GO	DN25
KO	DN25	KO	DN25
GD	DN25	GD	DN25
BD	DN25	BD	DN25

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

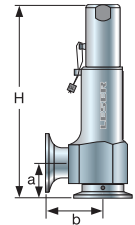
**Type 481**  
**Dimensions and weights**  
US Units



**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

<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

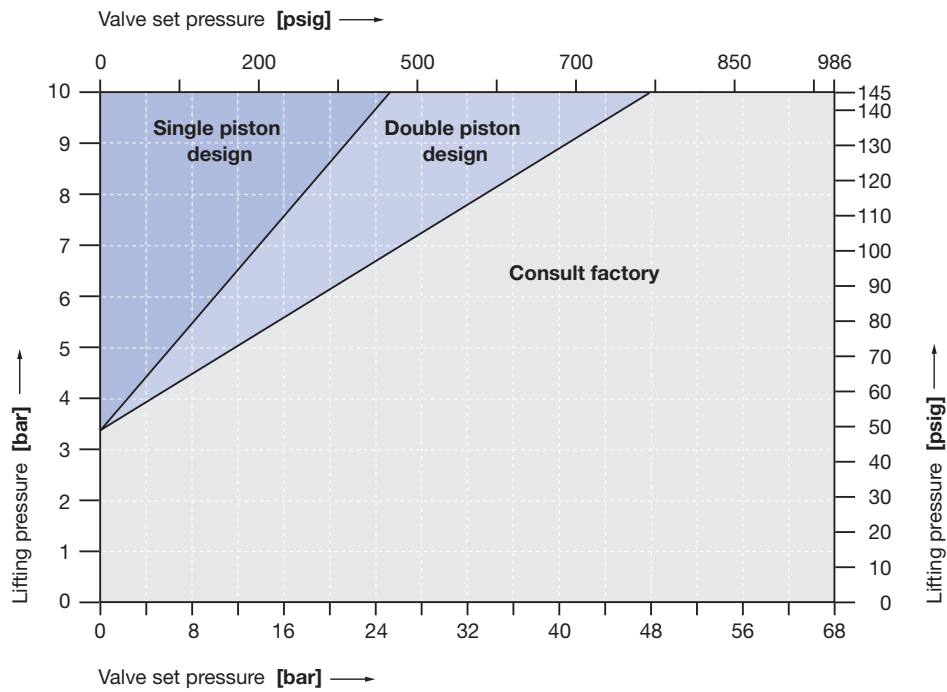
<sup>1)</sup> The temperature is limited by the soft seal material.



## 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



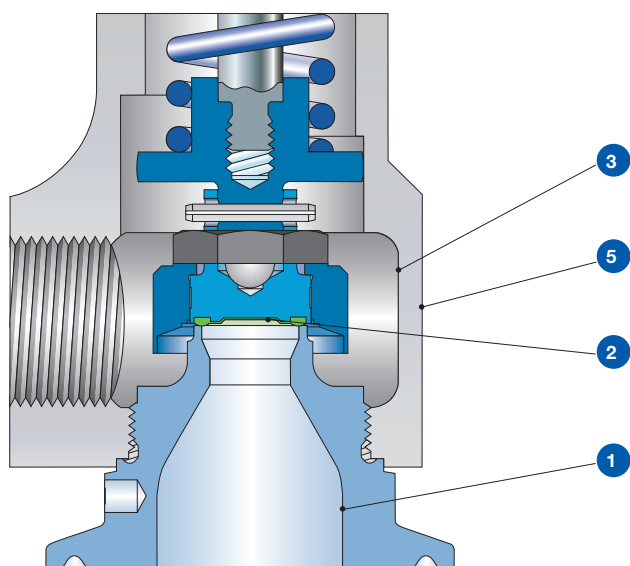
# Type 481

## Surface quality

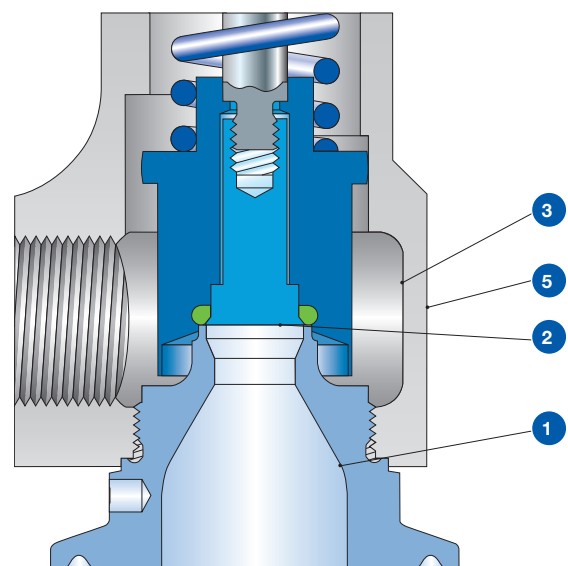
Type of surface	Area		LESER Surface package				
			Option code	Clean finish	HyClean finish	Sterile finish	
	Description	No.		B50	B51	B52	
				R <sub>a</sub> max.	R <sub>a</sub> max.	R <sub>a</sub> max.	
LESER Surface grade							
Product contact surface	Inlet	1		<b>M4</b>	<b>ME4</b>	<b>ME2</b>	
			[μm]	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	[μm]	<b>M4</b>	<b>ME4</b>	<b>ME2</b>	
[μinch]			0,750	0,750	0,500		
			30	30	20		
		[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	
			[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

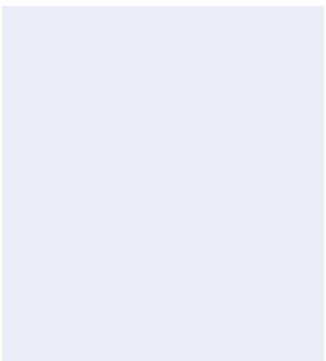
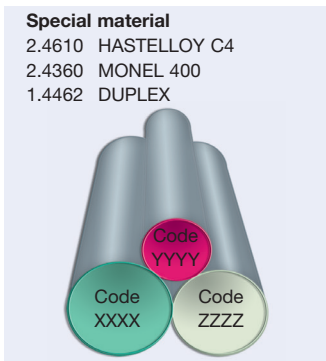
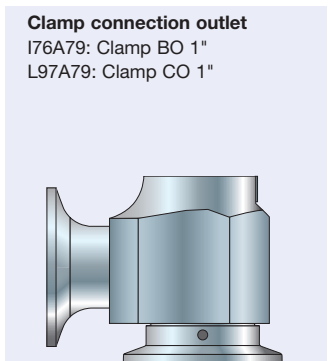
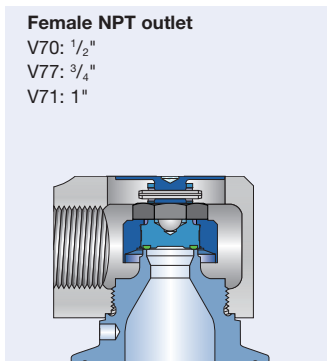
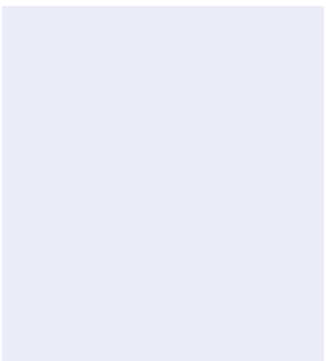
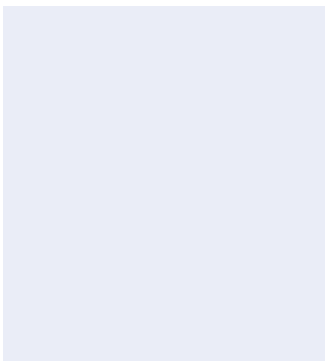
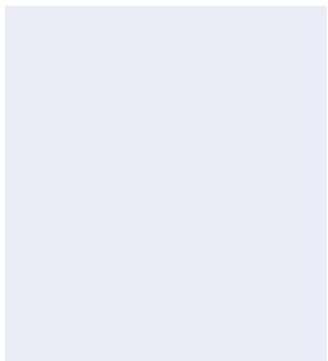
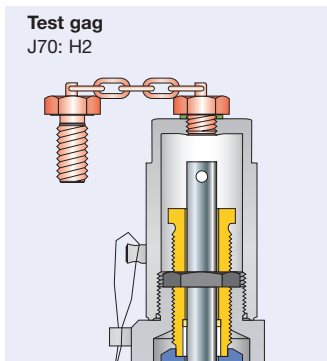
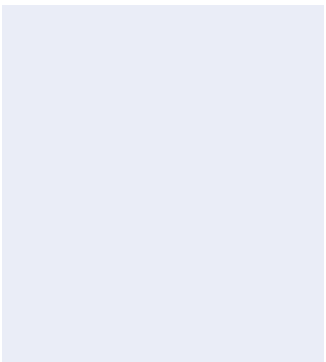
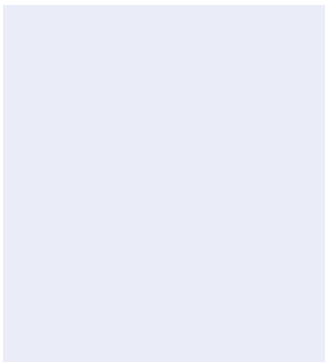
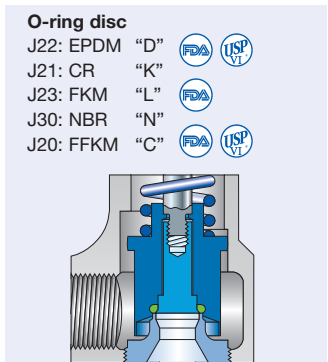
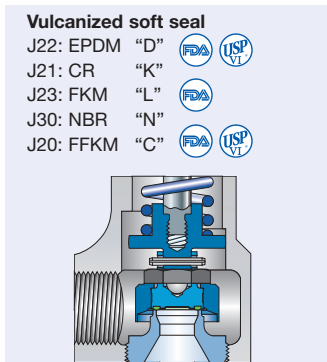
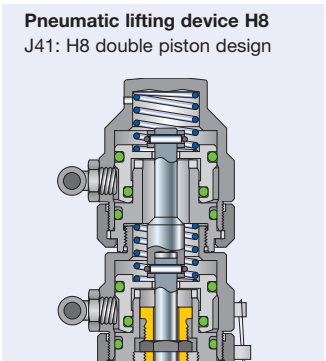
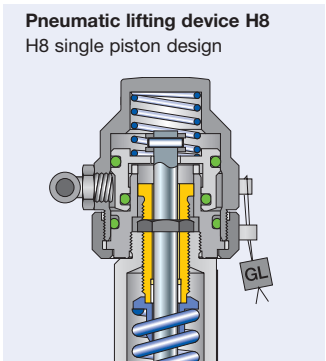
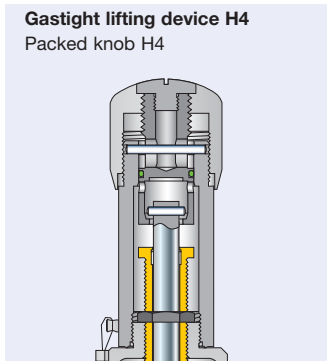
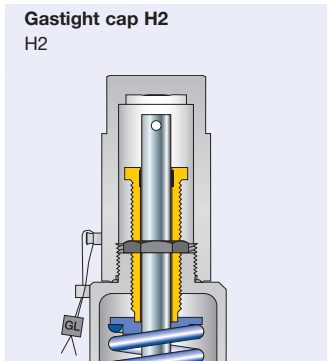
Actual Orifice diameter $d_0$ [mm]	10		
Actual Orifice area $A_0$ [mm <sup>2</sup> ]	78,5		
Actual Orifice diameter $d_0$ [inch]	0,394		
Actual Orifice area $A_0$ [inch <sup>2</sup> ]	0,122		
<b>Europe</b>		<b>Coefficient of discharge <math>K_{dr}</math></b>	
DIN EN ISO 4126-1, PED	Approval No.	07 202 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



**Type 483**  
**Safety Relief Valves – spring loaded**

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<b>Available options</b>	42

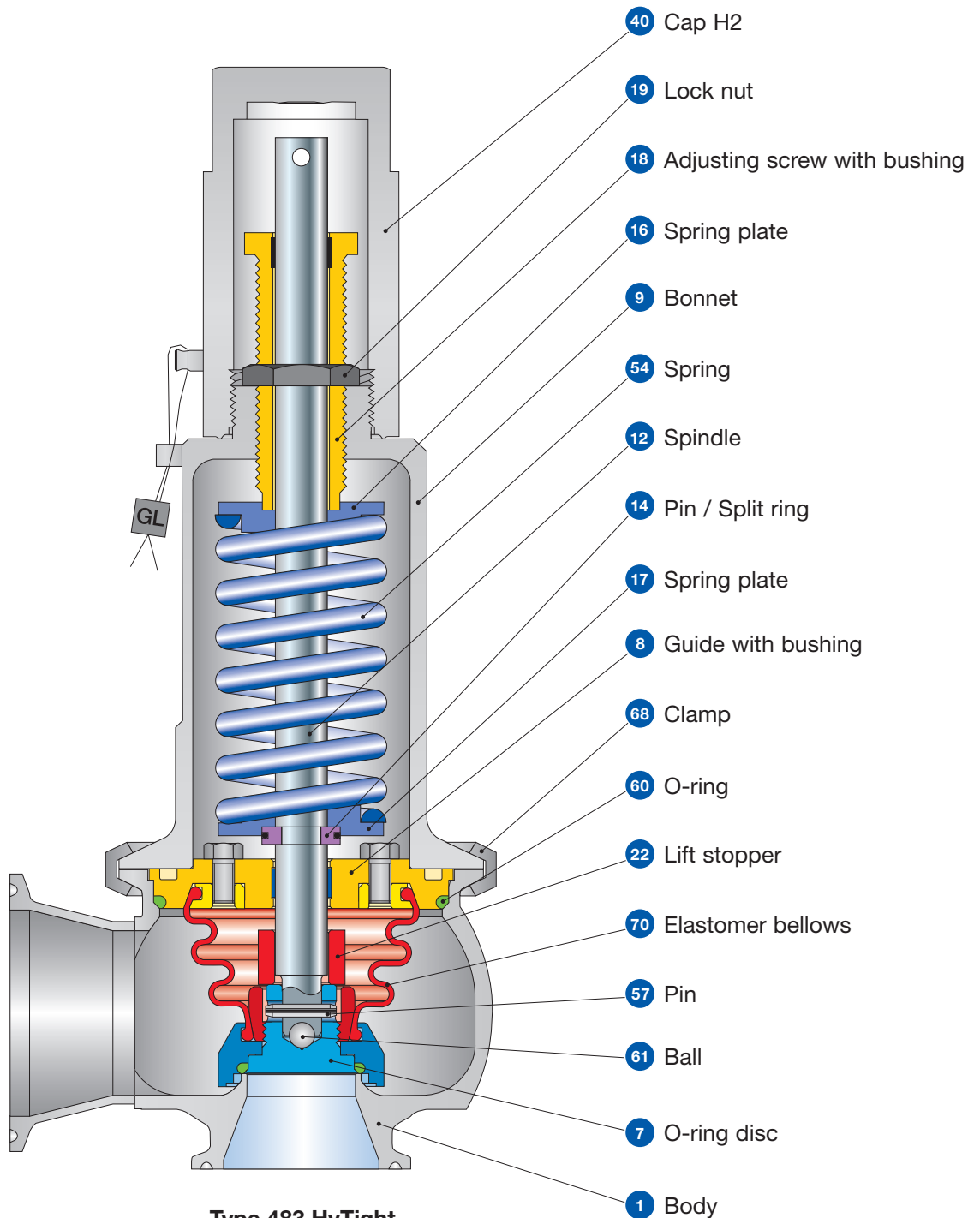


**Type 483**  
**Pneumatic lifting device H8**  
Inlet and outlet: Clamp connection



**Type 483**  
**Packed knob H4**  
Inlet and outlet: Flange connection

# Type 483 HyTight Assembly



**Type 483 HyTight**  
Cap H2  
Inlet and outlet:  
Clamp connection



**Type 483**  
**HyTight Assembly**  
Materials

Item	Component	Remarks	Type 4834 HyTight
1	Body		1.4435 (BN 2) <sup>1)</sup>
			SA 479 316L
7	O-ring disc	HyTight Assembly	1.4435 316L
7.4	Soft seal O-ring	“D”	EPDM
		“L”	FKM <sup>2)</sup>
		“C”	FFKM
8	Guide with bushing	PTFE + 15 % glass	1.4435 316L
9	Bonnet		1.4404 316L
12	Spindle		1.4404 316L
14	Pin / Split ring		1.4310 / 1.4404 Stainless steel / 316L
16 / 17	Spring plate		1.4404
			316L
18	Adjusting screw with bushing	PTFE + 15 % glass	1.4404 / PTFE 316L / PTFE
19	Lock nut		1.4404 316L
22	Lift stopper		1.4404 316L
40	Cap H2		1.4404 316L
54	Spring		1.4310 Stainless steel
57	Pin		1.4310 Stainless steel
60	O-ring		EPDM
61	Ball		1.4401
			316
68	Clamp		1.4401
			316
70	Elastomer bellows		EPDM

<sup>1)</sup> The material 1.4435/SA 479 316L fulfils the requirements of the Swiss chemical and pharmaceutical industry Basler Norm (BN 2).

<sup>2)</sup> For design with lifting device H8 a max. operating temperature of 50°C is allowed.

**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 483

### Article numbers

Actual Orifice diameter $d_0$ [mm]	13	25	
Actual Orifice area $A_0$ [mm <sup>2</sup> ]	133	491	
Actual Orifice diameter $d_0$ [inch]	0,512	0,984	
Actual Orifice area $A_0$ [inch <sup>2</sup> ]	0,206	0,761	
<b>O-ring material</b>	EPDM "D" J22	EPDM "D" J22	
	FKM "L" J23	FKM <sup>1)</sup> "L" J23	
	FFKM "C" J20	FFKM "C" J20	
<b>Body material: 1.4435 (316L)</b>			
<b>Bonnet</b>	<b>H2</b> Art. No. <b>4834.</b>	<b>7702</b>	<b>7712</b>
closed	<b>H4</b> Art. No. <b>4834.</b>	<b>7704</b>	<b>7714</b>
	<b>H8</b> Art. No. <b>4834.</b>	<b>7708</b>	<b>7718</b>
	p [bar] S/G/L	<b>0,3 – 16</b>	<b>0,1 – 16</b>
	p [psig] S/G/L	<b>4,4 – 232</b>	<b>1,5 – 232</b>

<sup>1)</sup> For design with lifting device H8 a max. operating temperature of 50°C is allowed.

## Type 483

### Available connections

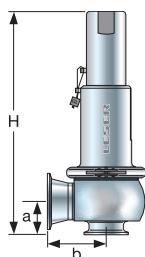
Actual Orifice diameter d <sub>0</sub> [mm]		13		25		d <sub>0</sub> [mm]	13		25				
Actual Orifice area A <sub>0</sub> [mm <sup>2</sup> ]		133		491		A <sub>0</sub> [mm <sup>2</sup> ]	133		491				
<b>Clamps</b>						<b>Clamps</b>							
<b>Option code inlet</b>						<b>Option code outlet</b>							
DN		25		40		DN		25		40			
SO		L79I16		L79I17		SO		L86A16		L86A17			
DO		I73I16		I73I17		DO		I74A16		I74A17			
NPS		1"	1 1/2"	1 1/2"	2"	NPS		1 1/2"		2"			
BO		I75I79	I75I80	I75I80	I75I81	BO		I76A80		I76A81			
CO		L96I79	L96I80	L96I80	L96I81	CO		L97A80		L97A81			
<b>Aseptic screwed connection</b>						<b>Aseptic screwed connection</b>							
<b>Option code inlet</b>						<b>Option code outlet</b>							
Pipe standard		DN		25		DN		25		40			
DIN 11850 / DIN 11866 Range A		00		-		00		A85L83A16		A85L83A17			
		GS		H85H34I16		H85H34I17		GS		A85H35A16		A85H35A17	
		BS		H85H36I16		H85H36I17		BS		A85H37A16		A85H37A17	
		GT		H85H54I16		H85H54I17		GT		A85H55A16		A85H55A17	
		BT		H85H56I16		H85H56I17		BT		A85H57A16		A85H57A17	
		GO		H85L75I16		H85L75I17		GO		A85L81A16		A85L81A17	
		KO		H85L76I16		H85L76I17		KO		A85L82A16		A85L82A17	
		GD		H85H60I16		H85H60I17		GD		A85H61A16		A85H61A17	
		BD		H85H58I16		H85H58I17		BD		A85H59A16		A85H59A17	
Pipe standard		DN		25		DN		25		40			
DIN EN ISO 1127 / DIN 11866 Range B		GS		H86H34I16		H86H34I17		GS		A86H35A16		A86H35A17	
		BS		H86H36I16		H86H36I17		BS		A86H37A16		A86H37A17	
		GT		H86H54I16		H86H54I17		GT		A86H55A16		A86H55A17	
		BT		H86H56I16		H86H56I17		BT		A86H57A16		A86H57A17	
		GD		H86H60I16		H86H60I17		GD		A86H61A16		A86H61A17	
		BD		H86H58I16		H86H58I17		BD		A86H59A16		A86H59A17	
Pipe standard		NPS		1"	1 1/2"	1 1/2"	2"	NPS		1 1/2"	2"		
BS 4825-1 DIN 11866 Range C		GS		H66H34I79	H66H34I80	H66H34I80	H66H34I81	GS		A84H35A80	A84H35A81		
		BS		H66H36I79	H66H36I80	H66H36I80	H66H36I81	BS		A84H37A80	A84H37A81		
		GT		H66H54I79	H66H54I80	H66H54I80	H66H54I81	GT		A84H55A80	A84H55A81		
		BT		H66H56I79	H66H56I80	H66H56I80	H66H56I81	BT		A84H57A80	A84H57A81		
<b>Aseptic flanged connection</b>						<b>Aseptic flanged connection</b>							
<b>Option code inlet</b>						<b>Option code outlet</b>							
Pipe standard		DN		25		DN		25		40			
DIN 11850 / DIN 11866 Range A		NF		H85H71I16		H85H71I17		NF		A85H72A16		A85H72A17	
		BF		H85H73I16		H85H73I17		BF		A85H74A16		A85H74A17	
		NG		H85H75I16		H85H75I17		NG		A85H76A16		A85H76A17	
		BG		H85H77I16		H85H77I17		BG		A85H78A16		A85H78A17	
		TN		H85L78I16		H85L78I17		TN		A85L84A16		A85L84A17	
		AF		H85L90I16		H85L90I17		AF		A85L91A16		A85L91A17	
		AN		H85L92I16		H85L92I17		AN		A85L93A16		A85L93A17	
		VG		H85I82I16		-		VG		-		-	
		VH		H85I83I16		H85I83I17		VH		-		-	
Pipe standard		DN		25		DN		25		40			
DIN EN ISO 1127 / DIN 11866 Range B		NF		H86H71I16				NF		A86H72A16		A86H72A17	
		BF		H86H73I16				BF		A86H74A16		A86H74A17	
		NG		H86H75I16				NG		A86H76A16		A86H76A17	
		BG		H86H77I16				BG		A86H78A16		A86H78A17	
Pipe standard		NPS		1"	1 1/2"	1 1/2"	2"	DN		1 1/2"	2"		
BS 4825-1 DIN 11866 Range C		NF		H66H71I79	H66H71I80	H66H71I80	H66H71I81	NF		A84H72A80	A84H72A81		
		BF		H66H73I79	H66H73I80	H66H73I80	H66H73I81	BF		A84H74A80	A84H74A81		
		NG		H66H75I79	H66H75I80	H66H75I80	H66H75I81	NG		A84H76A80	A84H76A81		
		BG		H66H77I79	H66H77I80	H66H77I80	H66H77I81	BG		A84H78A80	A84H78A81		

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

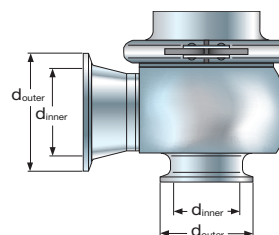
## Type 483

### Dimensions and weights

Metric Units



Type 483 – Cap H2

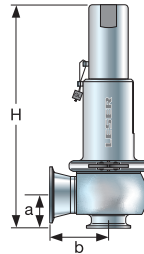


Type 483 – Clamp diameters

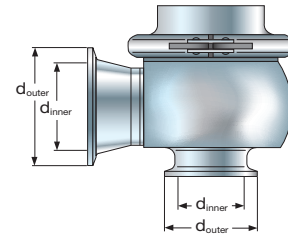
Actual Orifice diameter $d_0$ [inch]		13	25
Actual Orifice area $A_0$ [inch <sup>2</sup> ]		133	491
<b>Welded connections</b>		<b>Inlet a</b>	
	<b>PN</b>	<b>16</b>	<b>16</b>
<b>Center to face</b>	[mm]	–	–
<b>Height – H4</b>	H max. [mm]	–	–
<b>Height – H8</b> double piston design	H max. [mm]	–	–
<b>Clamp connections</b>		<b>Inlet a</b>	
	<b>PN</b>	<b>16</b>	<b>16</b>
<b>Center to face</b>	[mm]	29	44
<b>Clamp diameter</b>	$d_{inner}$ [mm]	For varying clamp diameters please refer to page 16 and 17	
	$d_{outer}$ [mm]		
<b>Height – H4</b>	H max. [mm]	206	303
<b>Height – H8</b> double piston design	H max. [mm]	234	311
<b>Aseptic screwed connections</b>		<b>Inlet a</b>	
	<b>PN</b>	<b>16</b>	<b>16</b>
<b>Center to face</b>	[mm]	40	48
<b>Height – H4</b>	H max. [mm]	217	304
<b>Height – H8</b> double piston design	H max. [mm]	245	312
<b>Aseptic flange connections</b>		<b>Inlet a</b>	
	<b>PN</b>	<b>16</b>	<b>16</b>
<b>Center to face</b>	[mm]	45 (AN: 40 mm)	51
<b>Height – H4</b>	H max. [mm]	222	310
<b>Height – H8</b> double piston design	H max. [mm]	250	318
<b>Weight</b>			
<b>Weight</b>	max. [kg]	1,6	3,7

	13	25
	133	491
<b>Outlet b</b>		
	<b>16</b>	<b>16</b>
	81,5	91,5
	–	–
	–	–
<b>Outlet b</b>		
	<b>16</b>	<b>16</b>
	52	60
	For varying clamp diameters please refer to page 16 and 17	
	–	–
	–	–
<b>Outlet b</b>		
	<b>16</b>	<b>16</b>
	70	78
	–	–
	–	–
<b>Outlet b</b>		
	<b>16</b>	<b>16</b>
	76 (AN: 60 mm)	82
	–	–
	–	–

**Type 483**  
**Dimensions and weights**  
US Units



Type 483 – Cap H2



Type 483 – Clamp diameters

Actual Orifice diameter $d_0$ [inch]		0,512	0,984
Actual Orifice area $A_0$ [inch <sup>2</sup> ]		0,206	0,761
<b>Welded connections</b>		<b>Inlet a</b>	
	<b>PN</b>	<b>16</b>	<b>16</b>
<b>Center to face</b>	[inch]	–	–
<b>Height – H4</b>	H max. [inch]	–	–
<b>Height – H8</b> double piston design	H max. [inch]	–	–
<b>Clamp connections</b>		<b>Inlet a</b>	
	<b>PN</b>	<b>16</b>	<b>16</b>
<b>Center to face</b>	[inch]	1 5/32	1 23/32
<b>Clamp diameter</b>	$d_{inner}$ [inch]	For varying clamp diameters please refer to page 16 and 17	
	$d_{outer}$ [inch]		
<b>Height – H4</b>	H max. [inch]	1 5/32	1 23/32
<b>Height – H8</b> double piston design	H max. [inch]	8 1/8	11 15/16
<b>Aseptic screwed connections</b>		<b>Inlet a</b>	
	<b>PN</b>	<b>16</b>	<b>16</b>
<b>Center to face</b>	[inch]	1 9/16	1 7/8
<b>Height – H4</b>	H max. [inch]	8 17/32	11 31/32
<b>Height – H8</b> double piston design	H max. [inch]	9 27/32	12 17/32
<b>Aseptic flange connections</b>		<b>Inlet a</b>	
	<b>PN</b>	<b>16</b>	<b>16</b>
<b>Center to face</b>	[inch]	1 25/32 (AN: 1 5/8)	2
<b>Height – H4</b>	H max. [inch]	8 3/4	12 7/32
<b>Height – H8</b> double piston design	H max. [inch]	9 27/32	12 17/32
<b>Weight</b>			
<b>Weight</b>	max. [lb]	3,527	8,157

	0,512	0,984
	0,206	0,761
<b>Outlet b</b>		
	<b>16</b>	<b>16</b>
	3 7/32	3 19/32
	–	–
	–	–
<b>Outlet b</b>		
	<b>16</b>	
	2 1/16	2 3/8
	For varying clamp diameters please refer to page 16 and 17	
	–	–
	–	–
<b>Outlet b</b>		
	<b>16</b>	<b>16</b>
	2 3/4	3 1/16
	–	–
	–	–
<b>Outlet b</b>		
	<b>16</b>	<b>16</b>
	3 (AN: 2 3/8)	3 7/32
	–	–
	–	–

## Type 483

### Pressure temperature ratings

#### Metric Units

Actual Orifice diameter $d_0$ [mm]		13		25
Actual Orifice area $A_0$ [mm <sup>2</sup> ]		133		491
<b>Body material: 1.4435 (316L)</b>				
<b>Inlet</b>	Pressure rating	For pressure ratings and connection size please refer to chapter dimensions and weights (page 36)		
<b>Outlet</b>	Pressure rating			
<b>Minimum set pressure</b>	p [bar] S/G/L	0,3		0,1
<b>Maximum set pressure</b>	p [bar] S/G/L	16		16
<b>Temperature range<sup>1)</sup></b>		Minimum	Maximum	Minimum
EPDM	[°C]	-45	+150	-45
FKM	[°C]	-18	+150	-18
FFKM	[°C]	0	+150	0

#### US Units

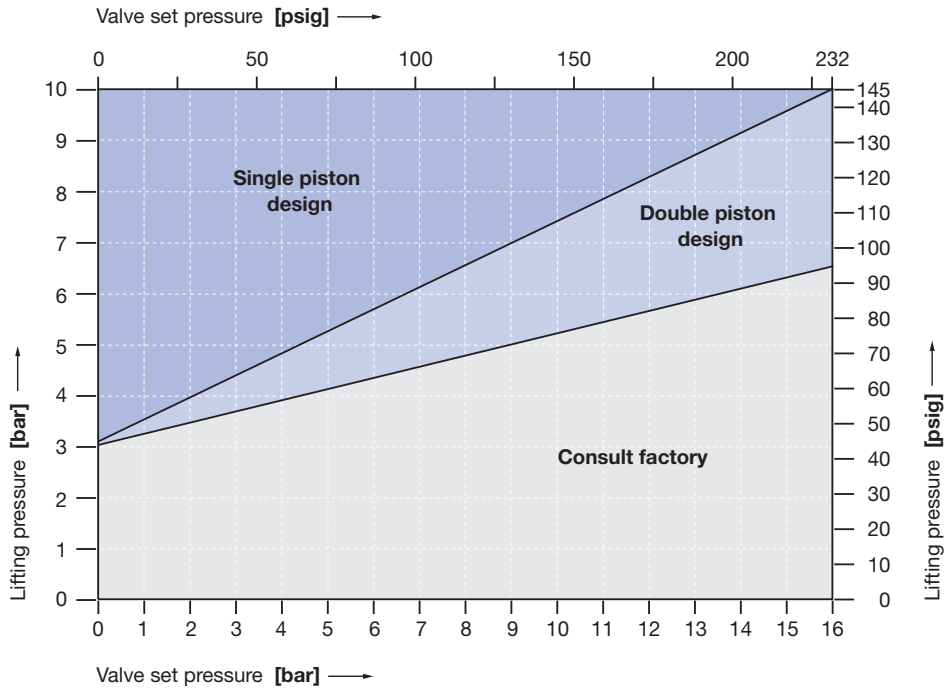
Actual Orifice diameter $d_0$ [inch]		0,512		0,984
Actual Orifice area $A_0$ [inch <sup>2</sup> ]		0,206		0,761
<b>Body material: 1.4435 (316L)</b>				
<b>Inlet</b>	Pressure rating	For pressure ratings and connection size please refer to chapter dimensions and weights (page 37)		
<b>Outlet</b>	Pressure rating			
<b>Minimum set pressure</b>	p [psig] S/G/L	4,4		1,5
<b>Maximum set pressure</b>	p [psig] S/G/L	232		232
<b>Temperature range<sup>1)</sup></b>		Minimum	Maximum	Minimum
EPDM	[°F]	-49	+302	-49
FKM	[°F]	-0,4	+302	-0,4
FFKM	[°F]	+32	+302	+32

<sup>1)</sup> The temperature is limited by the elastomer bellows up to 150 °C / 302 °F.

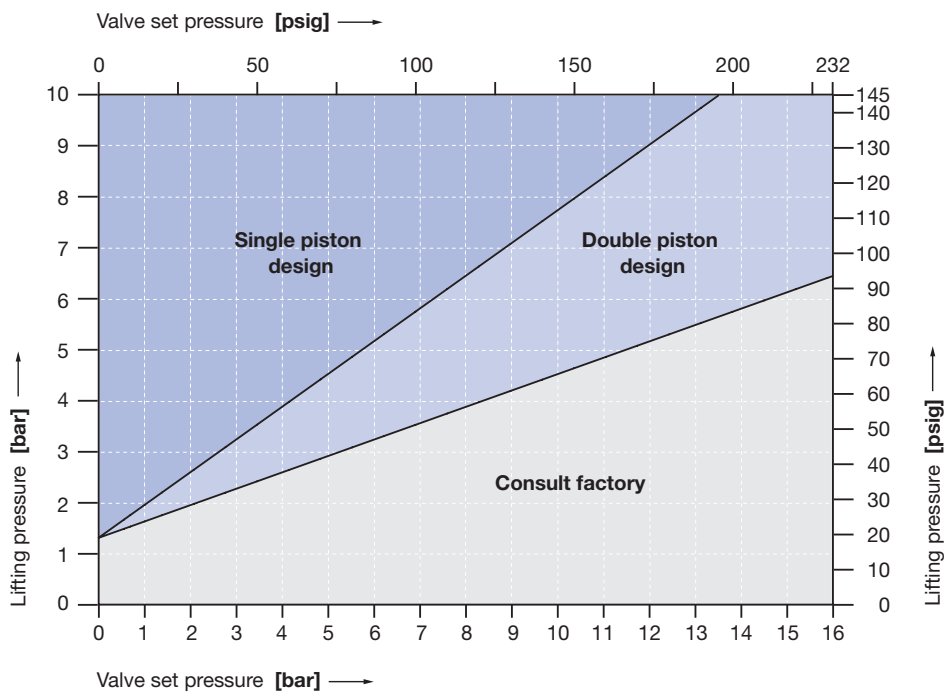
## Type 483 Selection chart H8

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.  $d_0$  13 mm / 0,512 inch



Selection chart lifting device H8, size I.  $d_0$  25 mm / 0,984 inch

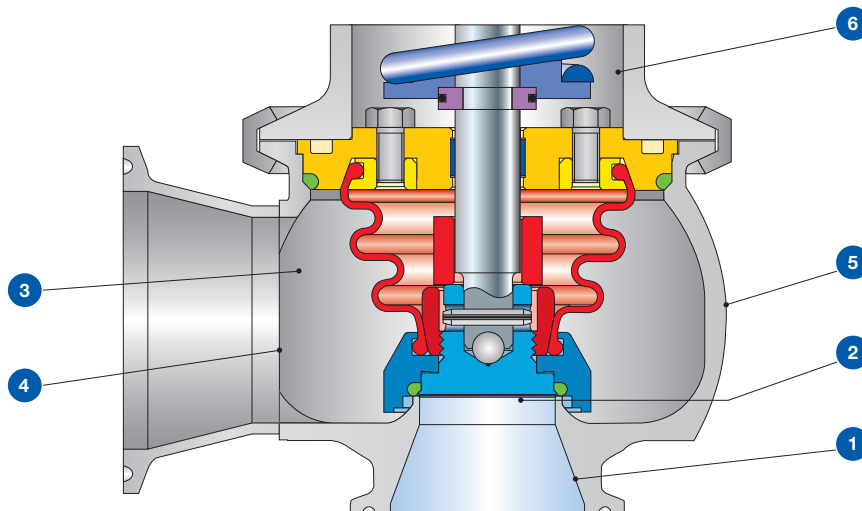


## Type 483

### Surface quality

LESER Surface package						
Type of surface	Area		Option code	Clean finish	HyClean finish	Sterile finish
	Description	No.		B53	B54	B55
				R <sub>a</sub> max.	R <sub>a</sub> max.	R <sub>a</sub> max.
LESER Surface grade						
Product contact surface	Inlet	1	[μm]	M4	ME4	ME1
			[μinch]	0,750	0,750	0,375
	Bottom side of disc	2	[μm]	M4	ME4	ME1
			[μinch]	0,750	0,750	0,375
Blow off surface	Inside surface of outlet area	3	[μm]	M5	ME5	ME4
			[μinch]	1,500	1,500	0,750
	Welding seam	4	[μm]	M6	ME6	ME6
			[μinch]	3,000	3,000	3,000
Outer surface	Outside surface of body, bonnet and cap/lifting device	5	[μm]	M5	ME5	ME4
			[μinch]	1,500	1,500	0,750
Shielded surface	Surface never in contact with the product because it is shielded by the bellows	6		No definition		

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





## Type 483 Approvals

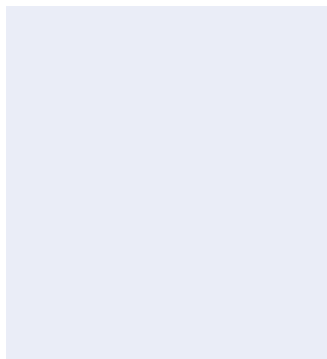
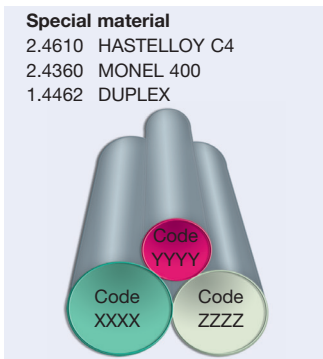
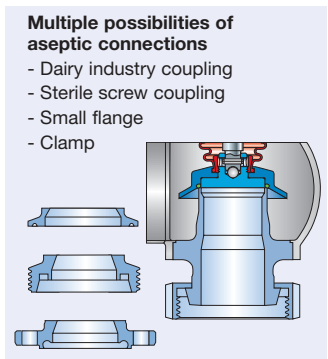
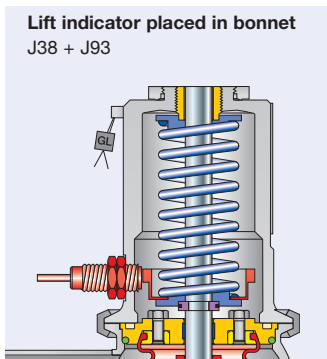
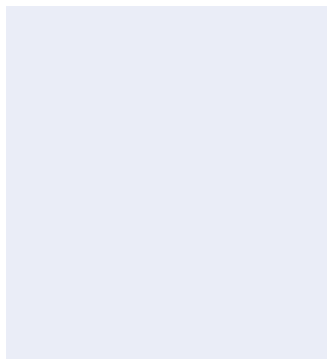
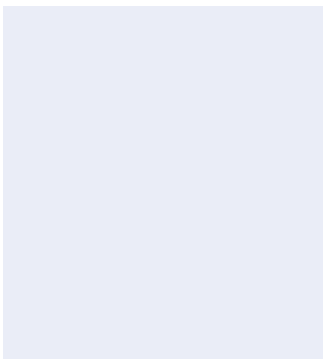
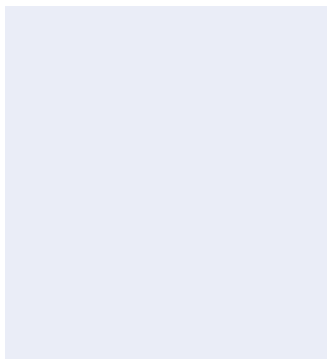
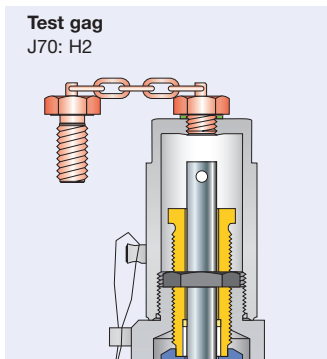
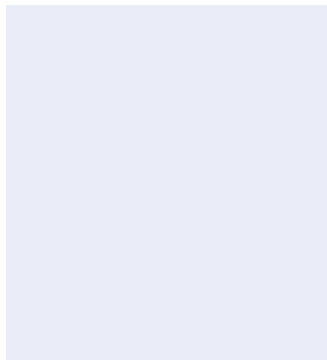
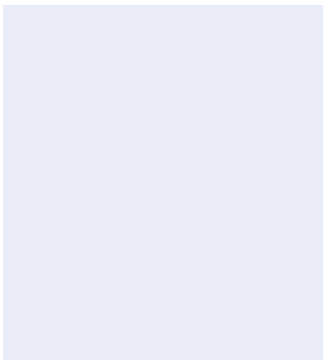
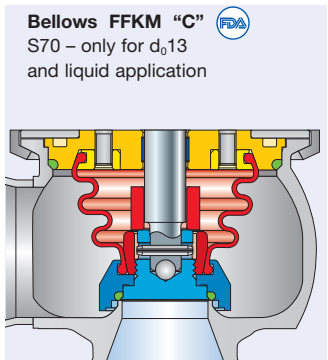
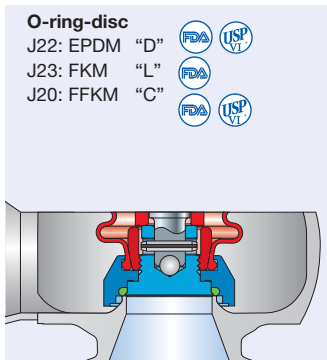
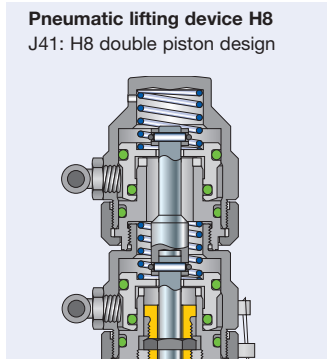
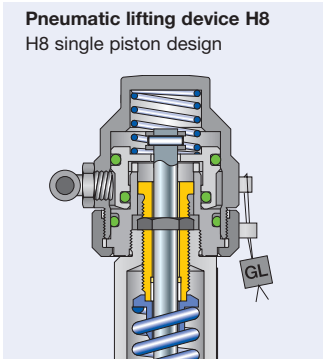
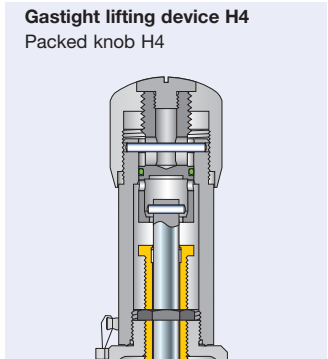
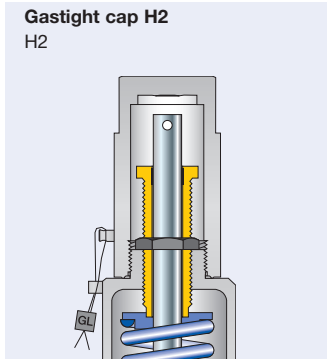
Actual Orifice diameter $d_0$ [mm]	13	25
Actual Orifice area $A_0$ [mm <sup>2</sup> ]	133	491
Actual Orifice diameter $d_0$ [inch]	0,512	0,984
Actual Orifice area $A_0$ [inch <sup>2</sup> ]	0,206	0,761
<b>Europe</b> <span style="float: right;"><b>Coefficient of discharge <math>K_{dr}</math></b></span>		
DIN EN ISO 4126-1, PED	Approval No.	07 202 0111 Z 0008/0/21-2
	S/G	0,6
	L	0,4
<b>Germany</b> <span style="float: right;"><b>Coefficient of discharge <math>C_{Lw}</math></b></span>		
AD 2000-Merkblatt A2, PED	Approval No.	TÜV SV 1047
	S/G	0,6
	L	0,4
<b>United States</b> <span style="float: right;"><b>Coefficient of discharge K</b></span>		
ASME Sec. VIII	Approval No.	M37145
	S/G	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) S: 5,52 lb / hr / psia $\triangle K \approx 0,521$ G: 1,96 SCFM / psia $\triangle K \approx 0,521$
	L	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) L: 2,96 GPM $\sqrt{\text{psid}^*)} \triangle K \approx 0,379$
	Approval No.	M37167
	S/G	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) S: 13,97 lb / hr / psia $\triangle K \approx 0,357$ G: 4,96 SCFM / psia $\triangle K \approx 0,357$
	L	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) L: 7,46 GPM $\sqrt{\text{psid}^*)} \triangle K \approx 0,258$
<b>Canada</b> <span style="float: right;"><b>Coefficient of discharge K</b></span>		
CRN	Approval No.	OG0772.9C
	S/G	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) S: 5,52 lb / hr / psia $\triangle K \approx 0,521$ G: 1,96 SCFM / psia $\triangle K \approx 0,521$
	L	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) L: 2,96 GPM $\sqrt{\text{psid}^*)} \triangle K \approx 0,379$
	Approval No.	M37167
	S/G	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) S: 13,97 lb / hr / psia $\triangle K \approx 0,357$ G: 4,96 SCFM / psia $\triangle K \approx 0,357$
	L	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) L: 7,46 GPM $\sqrt{\text{psid}^*)} \triangle K \approx 0,258$
<b>China</b> <span style="float: right;"><b>Coefficient of discharge <math>C_{Lw}</math></b></span>		
AQSIQ	Approval No.	For current approval no. see <a href="http://www.leser.com">www.leser.com</a>
	S/G	0,6
	L	0,4
<b>Eurasian Custom Union</b> <span style="float: right;"><b>Coefficient of discharge <math>C_{Lw}</math></b></span>		
EAC	Approval No.	For current approval no. see <a href="http://www.leser.com">www.leser.com</a>
	S/G	0,6
	L	0,4
<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 483

## Available options

Type 483



**Type 488**  
**Safety Relief Valves – spring loaded**

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• Metric Units	48, 50
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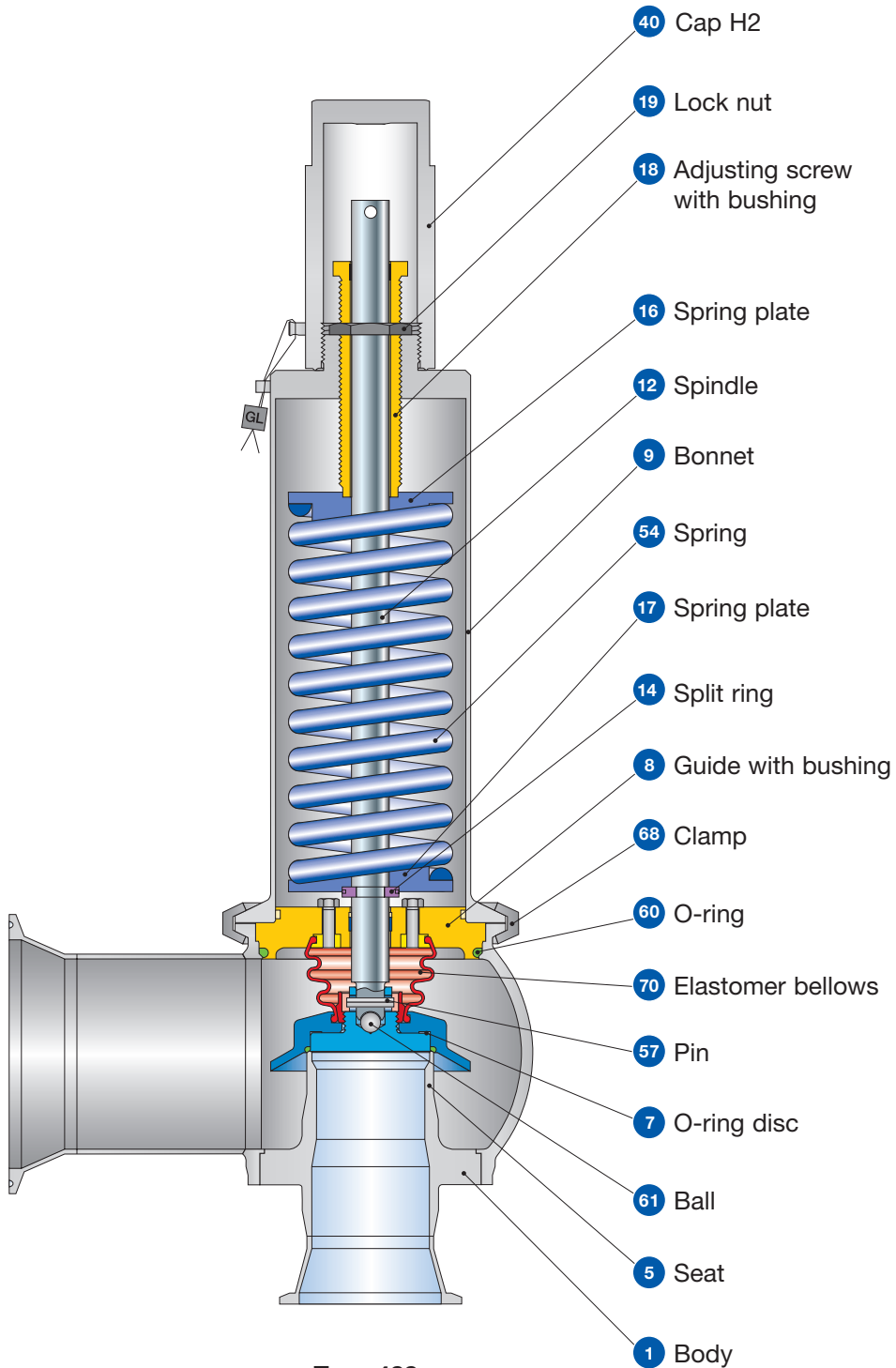


**Type 488**  
**Cap H2**  
Inlet and outlet: Clamp connection







**Type 488**  
**Packed knob H4**  
Inlet and outlet: Flange connection

# Type 488 HyTight Assembly



**Type 488**  
Cap H2  
Inlet and outlet: Clamp connection

**Type 488**  
**HyTight Assembly**  
Materials

Item	Component	Remarks	Type 4884 HyTight
1	Body		1.4404
			SA 479 316L
5	Seat		1.4404
			316L
7	O-ring disc	HyTight Assembly	1.4404
			316L
7.4	Soft seal O-ring	"D" 	EPDM
		"K"	CR
		"L" 	FKM
		"C" 	FFKM
8	Guide with bushing	PTFE + 15 % glass	1.4404
			316L
9	Bonnet		1.4404
			SA 479 316L
12	Spindle		1.4404
			316L
14	Split ring		1.4404
			316L
16 / 17	Spring plate		1.4404
			316L
18	Adjusting screw with bushing	PTFE + 15 % glass	1.4104 / PTFE 430 / PTFE
19	Lock nut		1.4404
			316L
40	Cap H2		1.4404
			316L
54	Spring		1.4310
			Stainless steel
57	Pin		1.4310
			Stainless steel
60	O-ring		EPDM
61	Ball		1.4401
			316
68	Clamp		1.4401
			316
70	Elastomer bellows		EPDM

**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 488

### Article numbers

Actual Orifice diameter $d_0$ [mm]	23	37	46	60	74	92		
Actual Orifice area $A_0$ [mm <sup>2</sup> ]	416	1075	1662	2827	4301	6648		
Actual Orifice diameter $d_0$ [inch]	0,906	1,457	1,811	2,362	2,913	3,622		
Actual Orifice area $A_0$ [inch <sup>2</sup> ]	0,644	1,667	2,576	4,383	6,666	10,304		
<b>O-ring material</b>			EPDM	"D"	J22			
			CR	"K"	J21			
			FKM	"L"	J23			
			FFKM	"C"	J20			
<b>Body material: 1.4404 (316L)</b>				<b>HyTight</b>				
<b>Bonnet closed</b>	<b>H2</b>	Art. No. <b>4884.</b>	<b>8842</b>	<b>8852</b>	<b>8862</b>	<b>8872</b>	<b>8882</b>	<b>8892</b>
	<b>H4</b>	Art. No. <b>4884.</b>	<b>8844</b>	<b>8854</b>	<b>8864</b>	<b>8874</b>	<b>8884</b>	<b>8894</b>
	<b>H8</b>	Art. No. <b>4884.</b>	<b>8848</b>	<b>8858</b>	<b>8868</b>	<b>8878</b>	<b>8888</b>	<b>8898</b>
		p [bar] S/G/L	<b>0,1 – 16</b>	<b>0,1 – 16</b>	<b>0,2 – 15</b>	<b>0,1 – 10,34</b>	<b>0,1 – 10,34</b>	<b>0,1 – 8,2</b>
		p [psig] S/G/L	<b>1,5 – 232</b>	<b>1,5 – 232</b>	<b>3 – 217,56</b>	<b>1,5 – 150</b>	<b>1,5 – 150</b>	<b>1,5 – 118,9</b>

## Type 488

### Available connections

	d <sub>0</sub> [mm]	23	37	46	60	74	92	
	A <sub>0</sub> [mm <sup>2</sup> ]	416	1057	1662	2827	4301	6648	
<b>Clamps</b>								
		<b>Option code inlet</b>						
DN	25	40	50	65	80	100		
SO		L79						
DO		I73						
NPS	1 1/2"	2"	2 1/2"	3"	4"	1)		
BO		I75						
NPS	1 1/2"	2"	2 1/2"	3"	4"	4 1/2"		
CO		L96						
<b>Aseptic screwed connection</b>								
		<b>Option code inlet</b>						
Pipe standard	DN	25	40	50	65	80	100	
DIN 11850 / DIN 11866 Range A	00	H85L77						
	GS	H85H34						
	BS	H85H36						
	GT	H85H54						
	BT	H85H56						
	GO	H85L75						
	KO	H85L76						
	GD	H85H60						
BD	H85H58							
Pipe standard	DN	25	40	50	65	80	100	
DIN EN ISO 1127 / DIN 11866 Range B	GS	H86H34						
	BS	H86H36						
	GT	H86H54						
	BT	H86H56						
	GD	H86H60						
	BD	H86H58						
	Pipe standard	NPS	1 1/2"	2"	2 1/2"	3"	4"	4 1/2"
BS 4825-1 DIN 11866 Range C	GS	H66H34						
	BS	H66H36						
	GT	H66H54						
	BT	H66H56						
<b>Flanged connection</b>								
		<b>Option code inlet</b>						
DN	25	40	50	65	80	100		
FD		I71						
NPS	1"	1 1/2"	2"	2 1/2"	3"	4"		
FA		L94						
<b>Aseptic flanged connection</b>								
		<b>Option code inlet</b>						
Pipe standard	DN	25	40	50	65	80	100	
DIN 11850 / DIN 11866 Range A	NF	H85H71						
	BF	H85H73						
	NG	H85H75						
	BG	H85H77						
	TN	H85L78						
	AF	L90						
	AN	L92						
	VC	L70						
	VG	I82	-					
	VH	I83			-			
	VE	L80						
Pipe standard	DN	25	40	50	65	80	100	
DIN EN ISO 1127 / DIN 11866 Range B	NF	H86H71						
	BF	H86H73						
	NG	H86H75						
	BG	H86H77						
Pipe standard	NPS	1 1/2"	2"	2 1/2"	3"	4"	4 1/2"	
BS 4825-1 DIN 11866 Range C	NF	H66H71						
	BF	H66H73						
	NG	H66H75						
	BG	H66H77						

	d <sub>0</sub> [mm]	23	37	46	60	74	92
	A <sub>0</sub> [mm <sup>2</sup> ]	416	1057	1662	2827	4301	6648
<b>Clamps</b>							
		<b>Option code outlet</b>					
DN	40	65	80	100	125	150	
SO		L86					
DO		I74					
NPS	2"	3"	4"	1)	1)	1)	
BO		I76					
NPS	2"	3"	3 1/2"	4 1/2"	5 1/2"	6,625"	
CO		L97					
<b>Aseptic screwed connection</b>							
		<b>Option code outlet</b>					
DN	40	65	80	100	125	150	
00		A85L83					
GS		A85H35			-		
BS		A85H37			-		
GT		A85H55					
BT		A85H57					
GO		A85L81					
KO		A85L82					
GD		A85H61					
BD		A85H59					
DN	40	65	80	100	125	150	
GS		A86H35					
BS		A86H37					
GT		A86H55					
BT		A86H57					
GD		A86H61					
BD		A86H59					
NPS	2"	3"	4"	4 1/2"	5"	6"	
GS		A84H35					
BS		A84H37					
GT		A84H55					
BT		A84H57					
<b>Flanged connection</b>							
		<b>Option code outlet</b>					
DN	40	65	80	100	125	150	
FD		I72					
NPS	1 1/2"	2 1/2"	3"	4"	5"	6"	
FA		L95					
<b>Aseptic flanged connection</b>							
		<b>Option code outlet</b>					
DN	40	65	80	100	125	150	
NF		A85H72					
BF		A85H74					
NG		A85H76					
BG		A85H78					
TN		A85L84					
AF		L91					
AN		L93					
VC		-					
VG		-					
VH		-					
VE		-					
DN	40	65	80	100	125	150	
NF		A86H72					
BF		A86H74					
NG		A86H76					
BG		A86H78					
NPS	2"	3"	4"	4 1/2"	5"	6"	
NF		A84H72					
BF		A84H74					
NG		A84H76					
BG		A84H78					

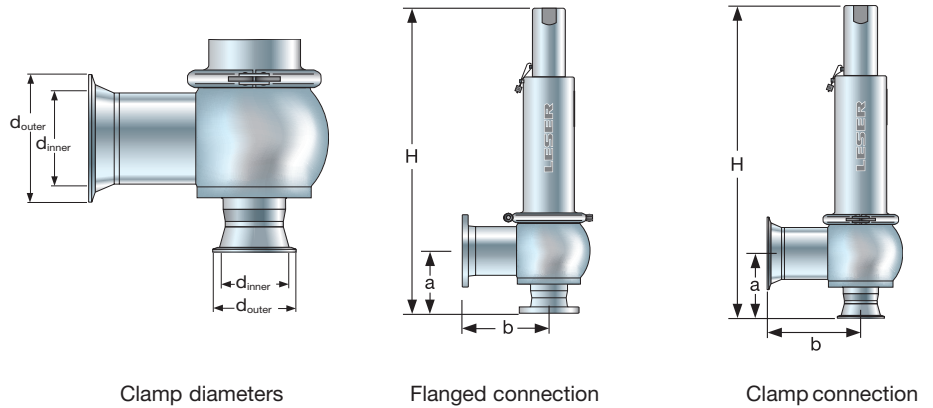
For definitions of connection codes please refer to pages 12 up to 15.

<sup>1)</sup> Please select CO-Clamp

# Type 488

## Dimensions and weights

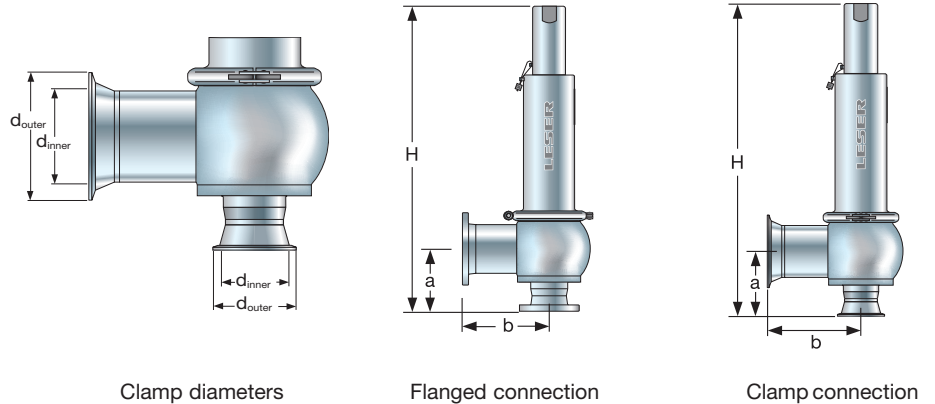
Metric Units



Actual Orifice diameter $d_0$ [mm]		23	37	46	60	74	92								
Actual Orifice area $A_0$ [mm <sup>2</sup> ]		416	1075	1662	2827	4301	6648								
<b>Welded connections</b>		<b>Inlet a</b>						<b>Outlet b</b>							
	<b>PN</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>
<b>Center to face</b>	[mm]	53	70	78	87	103	121	90	125	125	125	150	-		
<b>Height – H4</b>	H max. [mm]	310	487	502	521	625	662	310	487	502	521	625	662		
<b>Height – H8</b> double piston design	H max. [mm]	318	514	529	548	687	724	318	514	529	548	687	724		
<b>Clamp connections</b>		<b>Inlet a</b>						<b>Outlet b</b>							
	<b>PN</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>16</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>
<b>Center to face</b>	[mm]	75	92	99	109	124	149	112	147	147	153	178	181		
<b>Clamp diameter</b>	$d_{inner}$ [mm]	For varying clamp diameters please refer to page 16 and 17													
	$d_{outer}$ [mm]	For varying clamp diameters please refer to page 16 and 17													
<b>Height – H4</b>	H max. [mm]	331	509	524	543	646	690	331	509	524	543	646	690		
<b>Height – H8</b> double piston design	H max. [mm]	339	536	551	570	709	752	339	536	551	570	709	752		
<b>Aseptic screwed connections</b>		<b>Inlet a</b>						<b>Outlet b</b>							
	<b>PN</b>	<b>40</b>	<b>40</b>	<b>25</b>	<b>25</b>	<b>25</b>	<b>25</b>	<b>40</b>	<b>25</b>	<b>25</b>	<b>25</b>	<b>25</b>	<b>16</b>	<b>16</b>	
<b>Center to face</b>	[mm]	93	110	106	117	133	151	130	155	155	155	185	-		
<b>Height – H4</b>	H max. [mm]	349	527	530	551	655	692	349	527	530	551	655	692		
<b>Height – H8</b> double piston design	H max. [mm]	357	554	557	578	717	754	357	554	557	578	717	754		
<b>Aseptic flanged connections acc. to DIN 11684</b>		<b>Inlet a</b>						<b>Outlet b</b>							
	<b>PN</b>	<b>25</b>	<b>25</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>25</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>10</b>	<b>10</b>		
<b>Center to face</b>	[mm]	78	95	103	112	128	146	115	150	150	150	175	183		
<b>Height – H4</b>	H max. [mm]	335	512	527	546	650	687	335	512	527	546	650	687		
<b>Height – H8</b> double piston design	H max. [mm]	343	539	554	573	712	749	343	539	554	573	712	749		
<b>Weight</b>															
<b>Weight</b>	max. [kg]	9	20	21,7	26,5	47	56								



**Type 488**  
**Dimensions and weights**  
US Units

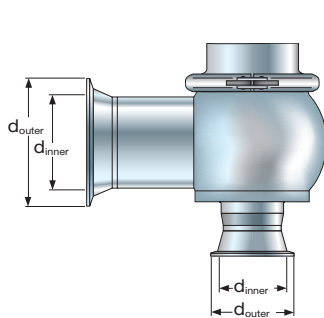


Actual Orifice diameter d <sub>0</sub> [inch]		0,906	1,457	1,811	2,362	2,913	3,622	0,906	1,457	1,811	2,362	2,913	3,622
Actual Orifice area A <sub>0</sub> [inch <sup>2</sup> ]		0,644	1,67	2,576	4,38	6,666	10,30	0,644	1,67	2,576	4,38	6,666	10,30
<b>Welded connections</b>		<b>Inlet a</b>						<b>Outlet b</b>					
	<b>PN</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>
<b>Center to face</b>	[inch]	2 <sup>3</sup> / <sub>32</sub>	2 <sup>3</sup> / <sub>4</sub>	3 <sup>1</sup> / <sub>16</sub>	3 <sup>7</sup> / <sub>16</sub>	4 <sup>1</sup> / <sub>32</sub>	4 <sup>3</sup> / <sub>4</sub>	3 <sup>17</sup> / <sub>32</sub>	4 <sup>15</sup> / <sub>16</sub>	4 <sup>15</sup> / <sub>16</sub>	4 <sup>15</sup> / <sub>16</sub>	5 <sup>14</sup> / <sub>16</sub>	–
<b>Height – H4</b>	H max. [inch]	12 <sup>3</sup> / <sub>16</sub>	19 <sup>3</sup> / <sub>16</sub>	19 <sup>3</sup> / <sub>4</sub>	20 <sup>1</sup> / <sub>2</sub>	24 <sup>5</sup> / <sub>8</sub>	16 <sup>1</sup> / <sub>16</sub>	12 <sup>3</sup> / <sub>16</sub>	19 <sup>3</sup> / <sub>16</sub>	19 <sup>3</sup> / <sub>4</sub>	20 <sup>1</sup> / <sub>2</sub>	24 <sup>5</sup> / <sub>8</sub>	16 <sup>1</sup> / <sub>16</sub>
<b>Height – H8</b> double piston design	H max. [inch]	12 <sup>1</sup> / <sub>2</sub>	20 <sup>1</sup> / <sub>4</sub>	20 <sup>13</sup> / <sub>16</sub>	21 <sup>9</sup> / <sub>16</sub>	27 <sup>1</sup> / <sub>16</sub>	28 <sup>1</sup> / <sub>2</sub>	12 <sup>1</sup> / <sub>2</sub>	20 <sup>1</sup> / <sub>4</sub>	20 <sup>13</sup> / <sub>16</sub>	21 <sup>9</sup> / <sub>16</sub>	27 <sup>1</sup> / <sub>16</sub>	28 <sup>1</sup> / <sub>2</sub>
<b>Clamp connections</b>		<b>Inlet a</b>						<b>Outlet b</b>					
	<b>PN</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>10</b>	<b>10</b>	<b>10</b>
<b>Center to face</b>	[inch]	2 <sup>15</sup> / <sub>16</sub>	3 <sup>19</sup> / <sub>32</sub>	3 <sup>29</sup> / <sub>32</sub>	4 <sup>9</sup> / <sub>32</sub>	4 <sup>7</sup> / <sub>8</sub>	5 <sup>7</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>8</sub>	5 <sup>25</sup> / <sub>32</sub>	5 <sup>25</sup> / <sub>32</sub>	6	7	7 <sup>1</sup> / <sub>8</sub>
<b>Clamp diameter</b>	d <sub>inner</sub> [inch]	For varying clamp diameters please refer to page 16 and 17						For varying clamp diameters please refer to page 16 and 17					
	d <sub>outer</sub> [inch]	For varying clamp diameters please refer to page 16 and 17						For varying clamp diameters please refer to page 16 and 17					
<b>Height – H4</b>	H max. [inch]	13 <sup>1</sup> / <sub>16</sub>	20 <sup>1</sup> / <sub>16</sub>	20 <sup>5</sup> / <sub>8</sub>	21 <sup>3</sup> / <sub>8</sub>	25 <sup>7</sup> / <sub>16</sub>	27 <sup>3</sup> / <sub>16</sub>	13 <sup>1</sup> / <sub>16</sub>	20 <sup>1</sup> / <sub>16</sub>	20 <sup>5</sup> / <sub>8</sub>	21 <sup>3</sup> / <sub>8</sub>	25 <sup>7</sup> / <sub>16</sub>	27 <sup>3</sup> / <sub>16</sub>
<b>Height – H8</b> double piston design	H max. [inch]	13 <sup>3</sup> / <sub>8</sub>	21 <sup>1</sup> / <sub>8</sub>	21 <sup>11</sup> / <sub>16</sub>	22 <sup>7</sup> / <sub>16</sub>	27 <sup>15</sup> / <sub>16</sub>	29 <sup>5</sup> / <sub>8</sub>	13 <sup>3</sup> / <sub>8</sub>	21 <sup>1</sup> / <sub>8</sub>	21 <sup>11</sup> / <sub>16</sub>	22 <sup>7</sup> / <sub>16</sub>	27 <sup>15</sup> / <sub>16</sub>	29 <sup>5</sup> / <sub>8</sub>
<b>Aseptic screwed connections</b>		<b>Inlet a</b>						<b>Outlet b</b>					
	<b>PN</b>	<b>40</b>	<b>40</b>	<b>25</b>	<b>25</b>	<b>25</b>	<b>25</b>	<b>40</b>	<b>25</b>	<b>25</b>	<b>25</b>	<b>16</b>	<b>16</b>
<b>Center to face</b>	[inch]	3 <sup>21</sup> / <sub>32</sub>	4 <sup>5</sup> / <sub>16</sub>	4 <sup>1</sup> / <sub>8</sub>	4 <sup>5</sup> / <sub>8</sub>	5 <sup>3</sup> / <sub>16</sub>	5 <sup>15</sup> / <sub>16</sub>	5 <sup>1</sup> / <sub>8</sub>	6 <sup>1</sup> / <sub>8</sub>	6 <sup>1</sup> / <sub>8</sub>	6 <sup>1</sup> / <sub>8</sub>	7 <sup>9</sup> / <sub>32</sub>	–
<b>Height – H4</b>	H max. [inch]	13 <sup>3</sup> / <sub>4</sub>	20 <sup>3</sup> / <sub>4</sub>	20 <sup>7</sup> / <sub>8</sub>	21 <sup>11</sup> / <sub>16</sub>	25 <sup>13</sup> / <sub>16</sub>	27 <sup>1</sup> / <sub>4</sub>	13 <sup>3</sup> / <sub>4</sub>	20 <sup>3</sup> / <sub>4</sub>	20 <sup>7</sup> / <sub>8</sub>	21 <sup>11</sup> / <sub>16</sub>	25 <sup>13</sup> / <sub>16</sub>	27 <sup>1</sup> / <sub>4</sub>
<b>Height – H8</b> double piston design	H max. [inch]	14 <sup>1</sup> / <sub>16</sub>	21 <sup>13</sup> / <sub>16</sub>	21 <sup>15</sup> / <sub>16</sub>	22 <sup>3</sup> / <sub>4</sub>	28 <sup>1</sup> / <sub>4</sub>	29 <sup>11</sup> / <sub>16</sub>	14 <sup>1</sup> / <sub>16</sub>	21 <sup>13</sup> / <sub>16</sub>	21 <sup>15</sup> / <sub>16</sub>	22 <sup>3</sup> / <sub>4</sub>	28 <sup>1</sup> / <sub>4</sub>	29 <sup>11</sup> / <sub>16</sub>
<b>Aseptic flanged connections</b> acc. to DIN 11684		<b>Inlet a</b>						<b>Outlet b</b>					
	<b>PN</b>	<b>25</b>	<b>25</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>25</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>10</b>	<b>10</b>
<b>Center to face</b>	[inch]	3 <sup>1</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>4</sub>	4 <sup>1</sup> / <sub>16</sub>	4 <sup>7</sup> / <sub>16</sub>	5	5 <sup>3</sup> / <sub>4</sub>	4 <sup>1</sup> / <sub>2</sub>	5 <sup>7</sup> / <sub>8</sub>	5 <sup>7</sup> / <sub>8</sub>	5 <sup>7</sup> / <sub>8</sub>	6 <sup>7</sup> / <sub>8</sub>	7 <sup>3</sup> / <sub>16</sub>
<b>Height – H4</b>	H max. [inch]	13 <sup>3</sup> / <sub>16</sub>	20 <sup>3</sup> / <sub>16</sub>	20 <sup>3</sup> / <sub>4</sub>	21 <sup>1</sup> / <sub>2</sub>	25 <sup>9</sup> / <sub>16</sub>	27 <sup>1</sup> / <sub>16</sub>	13 <sup>3</sup> / <sub>16</sub>	20 <sup>3</sup> / <sub>16</sub>	20 <sup>3</sup> / <sub>4</sub>	21 <sup>1</sup> / <sub>2</sub>	25 <sup>9</sup> / <sub>16</sub>	27 <sup>1</sup> / <sub>16</sub>
<b>Height – H8</b> double piston design	H max. [inch]	13 <sup>1</sup> / <sub>2</sub>	21 <sup>1</sup> / <sub>4</sub>	21 <sup>13</sup> / <sub>16</sub>	22 <sup>9</sup> / <sub>16</sub>	28 <sup>1</sup> / <sub>16</sub>	29 <sup>1</sup> / <sub>2</sub>	13 <sup>1</sup> / <sub>2</sub>	21 <sup>1</sup> / <sub>4</sub>	21 <sup>13</sup> / <sub>16</sub>	22 <sup>9</sup> / <sub>16</sub>	28 <sup>1</sup> / <sub>16</sub>	29 <sup>1</sup> / <sub>2</sub>
<b>Weight</b>		<b>Weight</b>						<b>Weight</b>					
<b>Weight</b>	max. [lb]	19,8	44,1	47,8	58,4	103,6	123,5	19,8	44,1	47,8	58,4	103,6	123,5

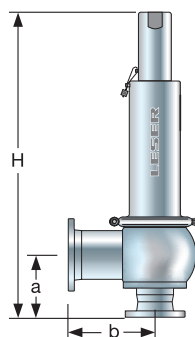
## Type 488

### Dimensions and weights

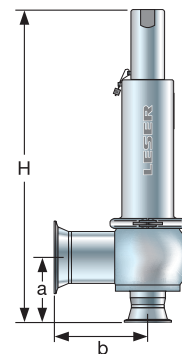
Metric Units



Clamp diameters



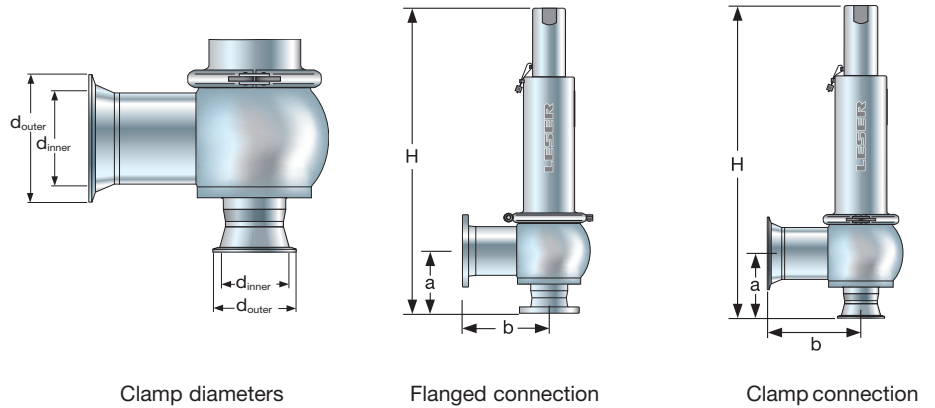
Flanged connection



Clamp connection

Actual Orifice diameter $d_o$ [mm]		23	37	46	60	74	92	23	37	46	60	74	92
Actual Orifice area $A_o$ [mm <sup>2</sup> ]		416	1075	1662	2827	4301	6648	416	1075	1662	2827	4301	6648
<b>DIN / ASME Flange</b>		<b>Inlet a</b>						<b>Outlet b</b>					
	<b>PN</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>
<b>Center to face</b>	[mm]	91	112	123	132	153	173	132	170	175	177	179	184
<b>Height – H4</b>	H max. [mm]	348	529	547	566	675	714	348	529	547	566	675	714
<b>Height – H8</b> double piston design	H max. [mm]	356	556	574	593	737	776	356	556	574	593	737	776
<b>APV Flange</b>		<b>Inlet a</b>						<b>Outlet b</b>					
	<b>PN</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>
<b>Center to face</b>	[mm]	77	94	102	111	127	145	114	149	149	149	177	–
<b>Height – H4</b>	H max. [mm]	334	511	526	545	649	686	334	511	526	545	649	686
<b>Height – H8</b> double piston design	H max. [mm]	342	538	553	572	711	748	342	538	553	572	711	748
<b>Tuchenhagen Varivent Connections</b>		<b>Inlet a</b>						<b>Outlet b</b>					
	<b>PN</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>	–	–	–	–	–	–
<b>Center to face</b>	[mm]	90	107	115	124	140	158	–	–	–	–	–	–
<b>Height – H4</b>	H max. [mm]	347	524	539	558	662	699	347	524	539	558	662	699
<b>Height – H8</b> double piston design	H max. [mm]	355	551	566	585	724	761	355	551	566	585	724	761
<b>Weight</b>													
<b>Weight</b>	max. [kg]	9	20	21,7	26,5	47	56						

**Type 488**  
**Dimensions and weights**  
US Units



Clamp diameters

Flanged connection

Clamp connection

Actual Orifice diameter $d_o$ [inch]		23	37	46	60	74	92	23	37	46	60	74	92
Actual Orifice area $A_o$ [inch <sup>2</sup> ]		416	1075	1662	2827	4301	6648	416	1075	1662	2827	4301	6648
<b>DIN / ASME Flange</b>		<b>Inlet a</b>						<b>Outlet b</b>					
	<b>PN</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>
<b>Center to face</b>	[inch]	3 <sup>9</sup> / <sub>16</sub>	4 <sup>7</sup> / <sub>16</sub>	4 <sup>13</sup> / <sub>16</sub>	5 <sup>3</sup> / <sub>16</sub>	6	6 <sup>13</sup> / <sub>16</sub>	5 <sup>3</sup> / <sub>16</sub>	6 <sup>11</sup> / <sub>16</sub>	6 <sup>7</sup> / <sub>8</sub>	6 <sup>15</sup> / <sub>16</sub>	7 <sup>1</sup> / <sub>16</sub>	7 <sup>1</sup> / <sub>4</sub>
<b>Height – H4</b>	H max. [inch]	13 <sup>11</sup> / <sub>16</sub>	20 <sup>13</sup> / <sub>16</sub>	21 <sup>9</sup> / <sub>16</sub>	22 <sup>5</sup> / <sub>16</sub>	26 <sup>9</sup> / <sub>16</sub>	28 <sup>1</sup> / <sub>8</sub>	13 <sup>11</sup> / <sub>16</sub>	20 <sup>13</sup> / <sub>16</sub>	21 <sup>9</sup> / <sub>16</sub>	22 <sup>5</sup> / <sub>16</sub>	26 <sup>9</sup> / <sub>16</sub>	28 <sup>1</sup> / <sub>8</sub>
<b>Height – H8</b> double piston design	H max. [inch]	14	21 <sup>7</sup> / <sub>8</sub>	22 <sup>5</sup> / <sub>8</sub>	23 <sup>3</sup> / <sub>8</sub>	29	30 <sup>9</sup> / <sub>16</sub>	14	21 <sup>7</sup> / <sub>8</sub>	22 <sup>5</sup> / <sub>8</sub>	23 <sup>3</sup> / <sub>8</sub>	29	30 <sup>9</sup> / <sub>16</sub>
<b>APV Flange</b>		<b>Inlet a</b>						<b>Outlet b</b>					
	<b>PN</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>
<b>Center to face</b>	[inch]	13 <sup>1</sup> / <sub>16</sub>	13 <sup>11</sup> / <sub>16</sub>	4	4 <sup>3</sup> / <sub>8</sub>	5	5 <sup>11</sup> / <sub>16</sub>	4 <sup>1</sup> / <sub>2</sub>	5 <sup>7</sup> / <sub>8</sub>	5 <sup>7</sup> / <sub>8</sub>	5 <sup>7</sup> / <sub>8</sub>	6 <sup>15</sup> / <sub>16</sub>	–
<b>Height – H4</b>	H max. [inch]	13 <sup>1</sup> / <sub>8</sub>	20 <sup>1</sup> / <sub>8</sub>	20 <sup>11</sup> / <sub>16</sub>	21 <sup>7</sup> / <sub>16</sub>	25 <sup>9</sup> / <sub>16</sub>	27	13 <sup>1</sup> / <sub>8</sub>	20 <sup>1</sup> / <sub>8</sub>	20 <sup>11</sup> / <sub>16</sub>	21 <sup>7</sup> / <sub>16</sub>	25 <sup>9</sup> / <sub>16</sub>	27
<b>Height – H8</b> double piston design	H max. [inch]	13 <sup>7</sup> / <sub>8</sub>	21 <sup>3</sup> / <sub>16</sub>	21 <sup>3</sup> / <sub>4</sub>	22 <sup>1</sup> / <sub>2</sub>	28	29 <sup>7</sup> / <sub>16</sub>	13 <sup>7</sup> / <sub>8</sub>	21 <sup>3</sup> / <sub>16</sub>	21 <sup>3</sup> / <sub>4</sub>	22 <sup>1</sup> / <sub>2</sub>	28	29 <sup>7</sup> / <sub>16</sub>
<b>Tuchenhagen Varivent Connections</b>		<b>Inlet a</b>						<b>Outlet b</b>					
	<b>PN</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>	–	–	–	–	–	–
<b>Center to face</b>	[inch]	3 <sup>9</sup> / <sub>16</sub>	4 <sup>3</sup> / <sub>16</sub>	4 <sup>1</sup> / <sub>2</sub>	4 <sup>7</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>2</sub>	6 <sup>1</sup> / <sub>4</sub>	–	–	–	–	–	–
<b>Height – H4</b>	H max. [inch]	13 <sup>11</sup> / <sub>16</sub>	20 <sup>5</sup> / <sub>8</sub>	21 <sup>1</sup> / <sub>4</sub>	21 <sup>15</sup> / <sub>16</sub>	26 <sup>1</sup> / <sub>16</sub>	27 <sup>1</sup> / <sub>2</sub>	13 <sup>11</sup> / <sub>16</sub>	20 <sup>5</sup> / <sub>8</sub>	21 <sup>1</sup> / <sub>4</sub>	21 <sup>15</sup> / <sub>16</sub>	26 <sup>1</sup> / <sub>16</sub>	27 <sup>1</sup> / <sub>2</sub>
<b>Height – H8</b> double piston design	H max. [inch]	14	21 <sup>11</sup> / <sub>16</sub>	22 <sup>5</sup> / <sub>16</sub>	23 <sup>1</sup> / <sub>16</sub>	28 <sup>1</sup> / <sub>2</sub>	29 <sup>15</sup> / <sub>16</sub>	14	21 <sup>11</sup> / <sub>16</sub>	22 <sup>5</sup> / <sub>16</sub>	23 <sup>1</sup> / <sub>16</sub>	28 <sup>1</sup> / <sub>2</sub>	29 <sup>15</sup> / <sub>16</sub>
<b>Weight</b>													
<b>Weight</b>	max. [lb]	19,8	44,1	47,8	58,4	103,6	123,5						

## Type 488

### Pressure temperature ratings

#### Metric Units

Actual Orifice diameter $d_0$ [mm]		23	37	46	60	74	92
Actual Orifice area $A_0$ [mm <sup>2</sup> ]		416	1075	1662	2827	4301	6648
<b>Body material: 1.4404 (316L)</b>							
<b>Inlet / Outlet</b>	<b>Pressure rating</b>	For pressure ratings and connection size please refer to chapter dimensions and weights (page 48/50)					
<b>Minimum set pressure<sup>1)</sup></b>	p [bar] S/G/L	0,1	0,1	0,2	0,1	0,1	0,1
<b>Maximum set pressure</b>	p [bar] S/G/L	16	16	15	10,34	10,34	8,2
<b>Temperature range<sup>2)</sup></b>				Min.	Max.		
EPDM	[°C]			-45	+150		
CR	[°C]			-40	+100		
FKM	[°C]			-18	+150		
FFKM	[°C]			0	+150		

#### US Units

Actual Orifice diameter $d_0$ [inch]		0,906	1,457	1,811	2,362	2,913	3,622
Actual Orifice area $A_0$ [inch <sup>2</sup> ]		0,644	1,667	2,576	4,383	6,666	10,304
<b>Body material: 1.4404 (316L)</b>							
<b>Inlet / Outlet</b>	<b>Pressure rating</b>	For pressure ratings and connection size please refer to chapter dimensions and weights (page 49/51)					
<b>Minimum set pressure<sup>1)</sup></b>	p [psig] S/G/L	1,5	1,5	3	1,5	1,5	1,5
<b>Maximum set pressure</b>	p [psig] S/G/L	232	232	217,56	150	150	118,9
<b>Temperature range<sup>2)</sup></b>				Min.	Max.		
EPDM	[°F]			-49	+302		
CR	[°F]			-40	+212		
FKM	[°F]			-0,4	+302		
FFKM	[°F]			+32	+302		

<sup>1)</sup> For steam, air/gas starting from 1,38 bar (20 psig) the safety valve is certified acc. to ASME Code Sec. VIII, Div. 1.

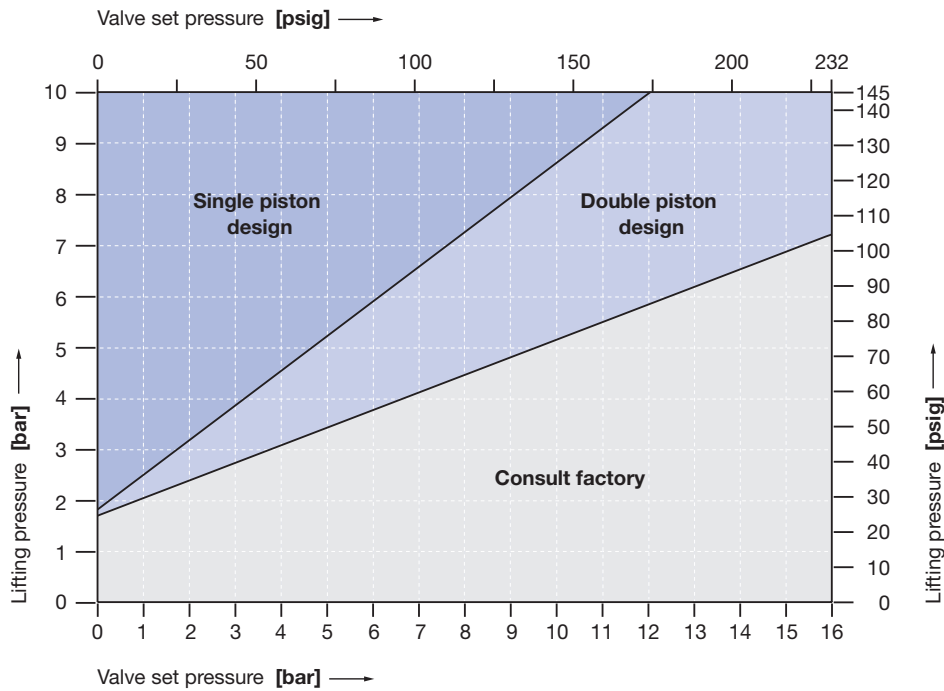
For liquides starting from 1 bar (15 psig) the safety valve is certified acc. to ASME Code Sec. VIII, Div. 1.

<sup>2)</sup> The temperature is limited by the elastomer bellows up to 150 °C / 302 °F.

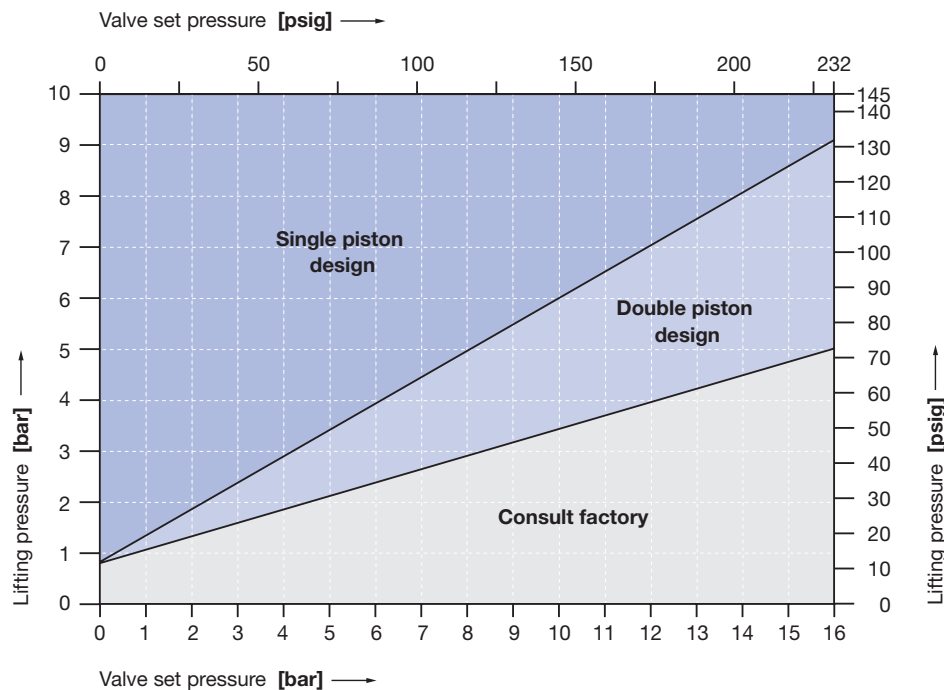
## Type 488 Selection chart H8

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 I.  $d_0$  23 mm / 0,906 inch



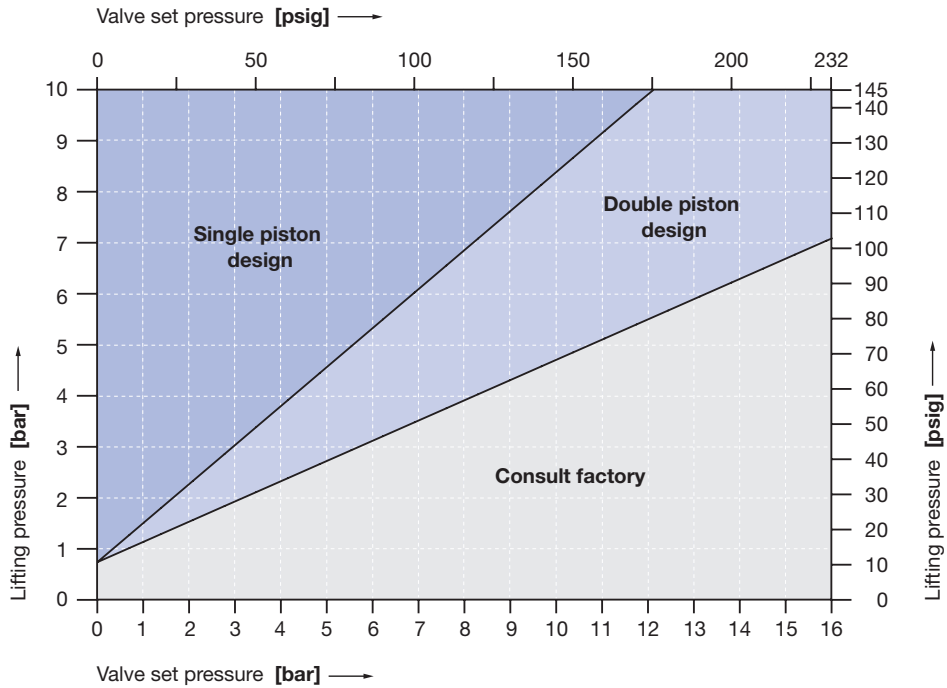
Selection chart lifting device H8, size II.  $d_0$  37 mm / 1,457 inch



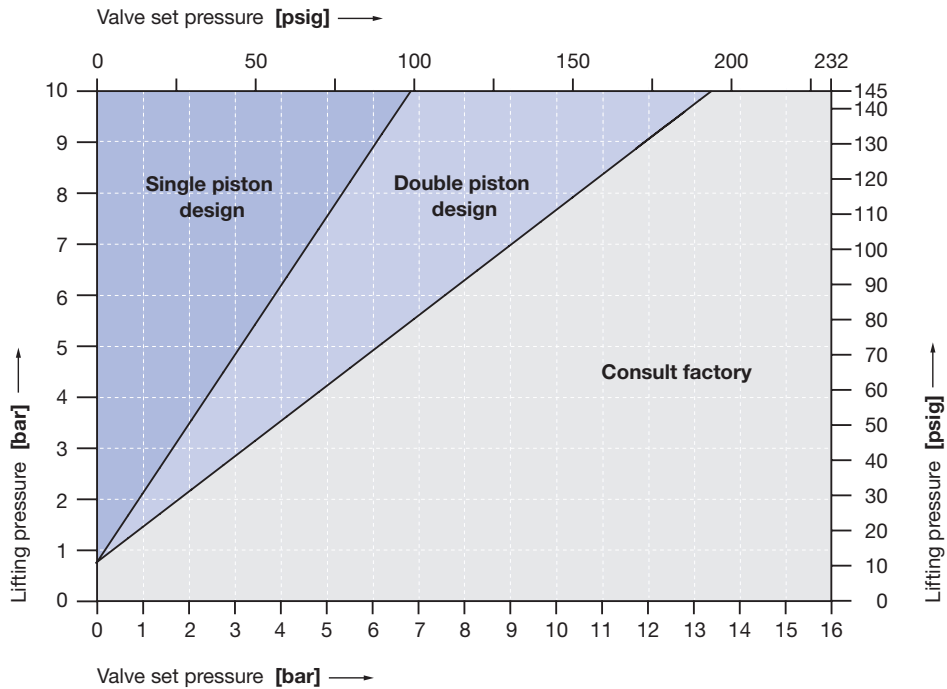
# Type 488

## Selection chart H8

Selection chart lifting device H8, size II.  $d_0$  46 mm / 1,811 inch

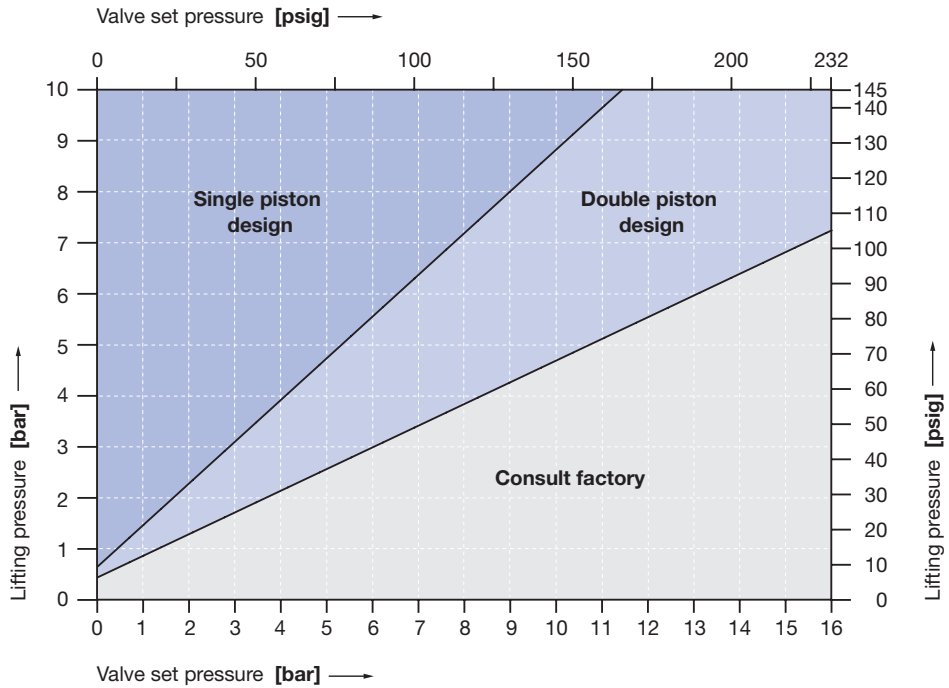


Selection chart lifting device H8, size II.  $d_0$  60 mm / 2,362 inch

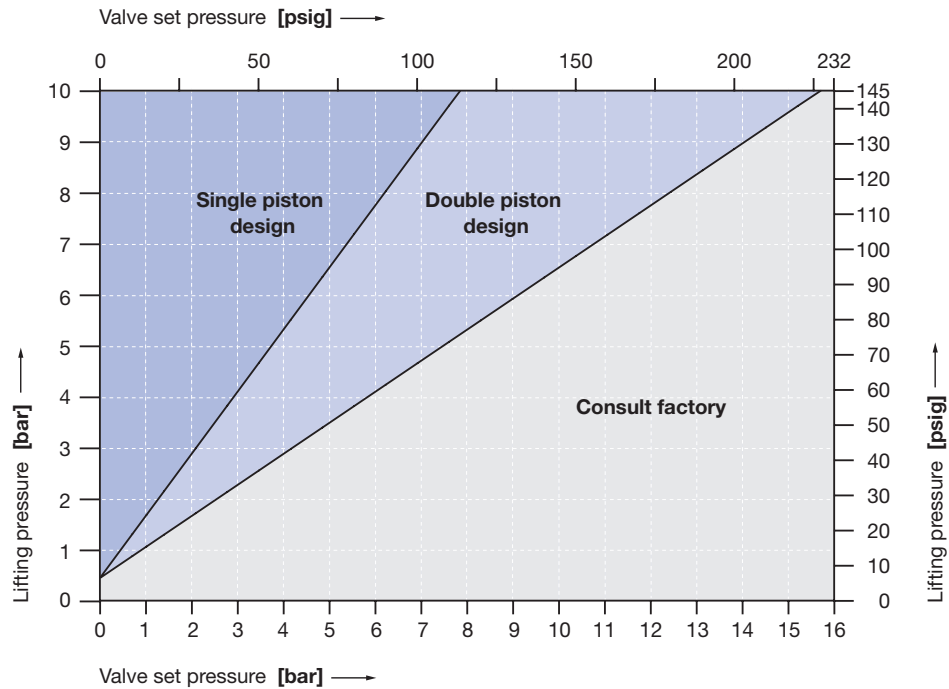


**Type 488**  
**Selection chart H8**

Selection chart lifting device H8, size III.  $d_0$  74 mm / 2,913 inch



Selection chart lifting device H8, size III.  $d_0$  92 mm / 3,622 inch

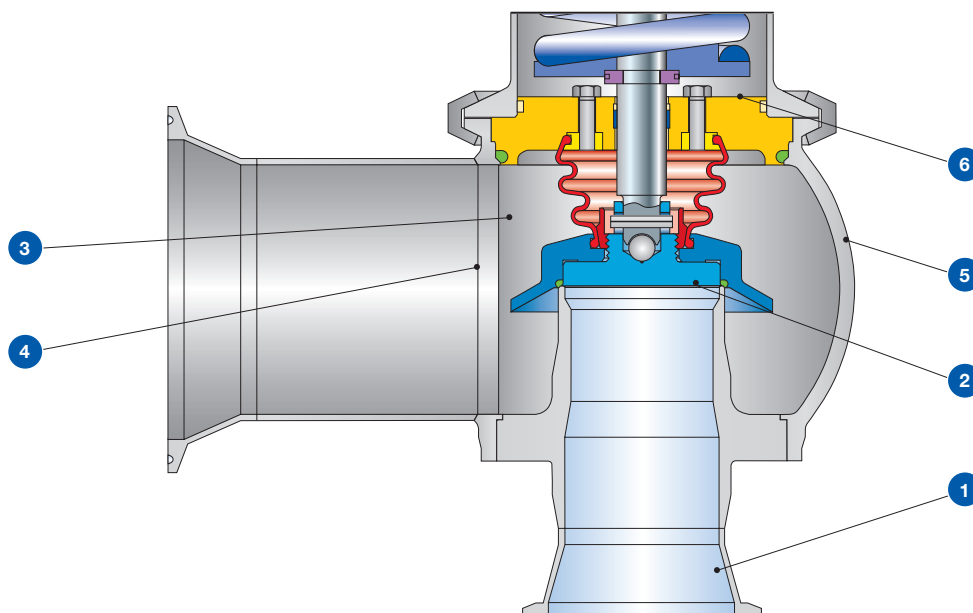


## Type 488

### Surface quality

Type of surface	Area		Option code	LESER Surface package		
				Clean finish	HyClean finish	Sterile finish
	Description	No.		B68	B69	B70
				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>ME1</b>
			[μm]	0,750	0,750	0,375
			[μinch]	30	30	15
	Bottom side of disc	2		<b>M4</b>	<b>ME4</b>	<b>ME1</b>
[μm]			0,750	0,750	0,375	
			[μinch]	30	30	15
Blow off surface	Inside surface of outlet area	3		<b>M5</b>	<b>ME5</b>	<b>ME4</b>
			[μm]	1,500	1,500	0,750
			[μinch]	60	60	30
	Welding seam	4		<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 body, bonnet and cap/lifting device	5		<b>M5</b>	<b>ME5</b>	<b>ME5</b>
			[μm]	1,500	1,500	1,500
			[μinch]	60	60	60
Shielded surface	Surface never in contact with the product because it is shielded by the bellows	6		<b>No definition</b>		

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





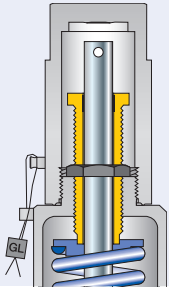
## Type 488 Approvals

Actual Orifice diameter $d_0$ [mm]	23	37	46	60	74	92
Actual Orifice area $A_0$ [mm <sup>2</sup> ]	416	1075	1662	2827	4301	6648
Actual Orifice diameter $d_0$ [inch]	0,906	1,457	1,811	2,362	2,913	3,622
Actual Orifice area $A_0$ [inch <sup>2</sup> ]	0,644	1,667	2,576	4,383	6,666	10,304
<b>Europe</b>		<b>Coefficient of discharge <math>K_{dr}</math></b>				
DIN EN ISO 4126-1, PED	Approval No.	07 202 0111 Z 0008/0/25				
	S/G	0,7				
	L	0,45				
<b>Germany</b>		<b>Coefficient of discharge <math>\alpha_w</math></b>				
AD 2000-Merkblatt A2, PED	Approval No.	TÜV SV 1047				
	S/G	0,7				
	L	0,45				
<b>United States</b>		<b>Coefficient of discharge K</b>				
ASME Sec. VIII	Approval No.	M37022 (1,37 – 16 bar)				
	S/G	0,721				
	Approval No.	M37033 (1 – 16 bar)				
	L	0,472				
<b>Canada</b>		<b>Coefficient of discharge K</b>				
CRN	Approval No.	OG0772.9C				
	S/G	0,721				
	L	0,472				
<b>China</b>		<b>Coefficient of discharge <math>\alpha_w</math></b>				
AQSIQ	Approval No.	For current approval no. see <a href="http://www.leser.com">www.leser.com</a>				
	S/G	0,7				
	L	0,45				
<b>Eurasian Custom Union</b>		<b>Coefficient of discharge <math>\alpha_w</math></b>				
EAC	Approval No.	For current approval no. see <a href="http://www.leser.com">www.leser.com</a>				
	S/G	0,7				
	L	0,45				
<b>Classification societies</b>		on request				

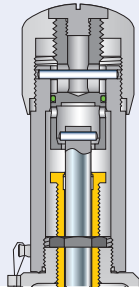
# Type 488

## Available options

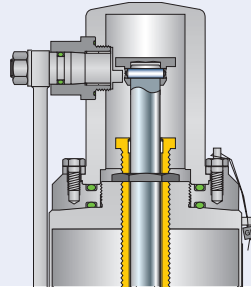
**Gastight cap H2**  
H2



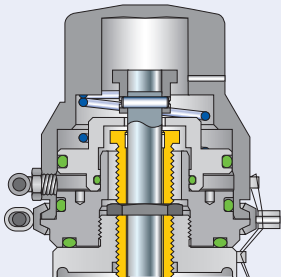
**Gastight lifting device H4**  
Packed knob H4 (d<sub>0</sub> 23 only)



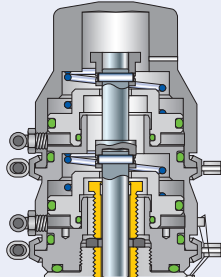
**Packed lever H4**  
(for d<sub>0</sub> > 23)



**Pneumatic lifting device H8**  
H8 single piston design

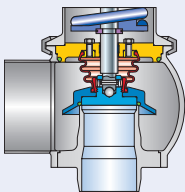


**Pneumatic lifting device H8**  
J41: H8 double piston design

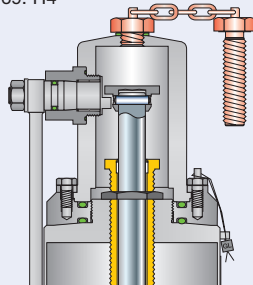


**HyTight Assembly**

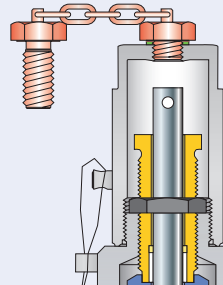
- J22: EPDM "D"
- J21: CR "K"
- J23: FKM "L"
- J20: FFKM "C"



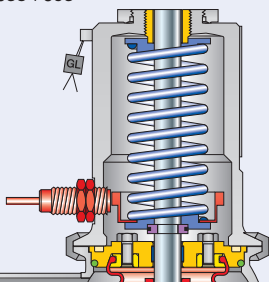
**Test gag**  
(for d<sub>0</sub> > 23)  
J69: H4



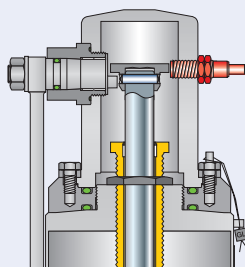
**Test gag**  
J70: H2



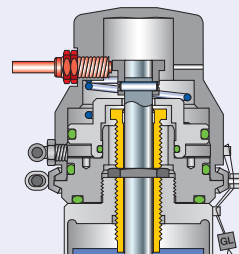
**Lift indicator bonnet**  
(d<sub>0</sub> 23 only)  
J38 + J93



**Lift indicator H4**  
(for d<sub>0</sub> > 23)  
J39 + J93

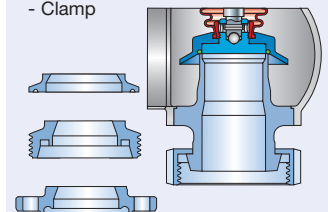


**Lift indicator H8**  
(for d<sub>0</sub> > 23)  
J40 + J93



**Multiple possibilities of aseptic connections**

- Dairy industry coupling
- Sterile screw coupling
- Small flange
- Clamp



## Type 484 Safety Relief Valves – spring loaded

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<b>How to order</b>	
• Article numbers	62
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<b>Dimensions and weights</b>	
• Metric Units	64
• US Units	65
<b>Pressure temperature ratings</b>	
• Metric Units + US Units	66
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**Type 484  
Cap H2**  
Inlet: Vessel connection Type 5034  
Outlet: Welded end connection









**Type 484  
Packed knob H4**  
Inlet: Vessel connection Type 5034  
Outlet: Welded end connection



**Type 5034**  
Vessel connection



**Type 484**  
**HyTight Assembly**  
Materials

Item	Component	Remarks	Type 4844 HyTight
1	Body		1.4435 (BN 2) <sup>1)</sup>
			SA 479 316L
7	O-ring disc	HyTight Assembly	1.4435 316L
7.4	Soft seal O-ring	“D” 	EPDM
		“L” 	FKM <sup>2)</sup>
		“C” 	FFKM
8	Guide with bushing	PTFE + 15 % glass	1.4435 316L
9	Bonnet		1.4404 316L
12	Spindle		1.4404 316L
14	Pin/Split ring		1.4310 / 1.4404 Stainless steel / 316L
16 / 17	Spring plate		1.4404 316L
18	Adjusting screw with bushing	PTFE + 15 % glass	1.4404 / PTFE 316L / PTFE
19	Lock nut		1.4404 316L
22	Lift stopper		1.4310 Stainless steel
40	Cap H2		1.4404 316L
54	Spring		1.4310 Stainless steel
57	Pin		1.4310 Stainless steel
60	O-ring		EPDM
61	Ball		1.4401 316
68	Clamp		1.4401 316
70	Elastomer bellows		EPDM
<b>Vessel connection Type 5034</b>			
48	Vessel connection		1.4435 (BN 2) <sup>1)</sup>
			SA 479 316L
56	Nut		1.4401 316
67	O-ring		EPDM
92	Screw		1.4404
			316L
-	Blind flange for pressure test		1.4404
			316L

<sup>1)</sup> The material 1.4435/SA 479 316L fulfils the requirements of the Swiss chemical and pharmaceutical industry Basler Norm (BN 2).

<sup>2)</sup> For design with lifting device H8 a max. operating temperature of 50°C is allowed.

**Please notice:** – Modifications reserved by LESER.  
– LESER can upgrade materials without notice.  
– Every part can be replaced by other material acc. to customer specification.

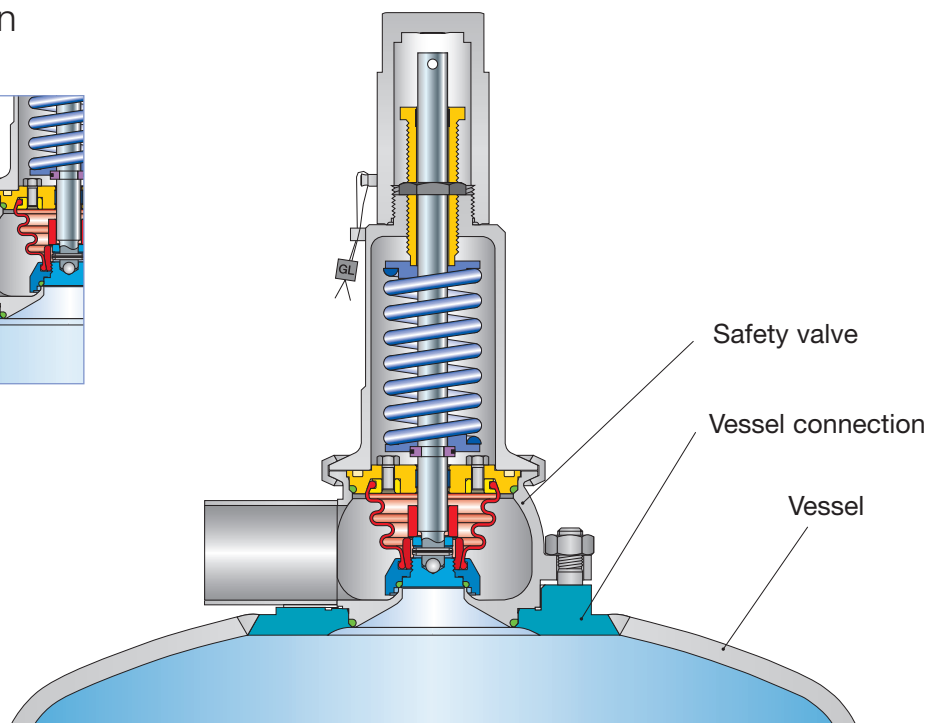
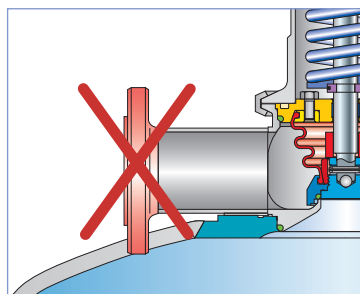
## Type 484

### Article numbers

Actual Orifice diameter $d_0$ [mm]	13	25	
Actual Orifice area $A_0$ [mm <sup>2</sup> ]	133	491	
Actual Orifice diameter $d_0$ [inch]	0,512	0,984	
Actual Orifice area $A_0$ [inch <sup>2</sup> ]	0,206	0,761	
<b>O-ring material</b>	EPDM "D" J22	EPDM "D" J22	
	FKM "L" J23	FKM <sup>1)</sup> "L" J23	
	FFKM "C" J20	FFKM "C" J20	
<b>Body material: 1.4435 (316L)</b>			
<b>Bonnet</b>	<b>H2</b> Art. No. <b>4844.</b>	<b>7722</b>	<b>7732</b>
closed	<b>H4</b> Art. No. <b>4844.</b>	<b>7724</b>	<b>7734</b>
	<b>H8</b> Art. No. <b>4844.</b>	<b>7728</b>	<b>7738</b>
	p [bar] S/G/L	<b>0,3 – 16</b>	<b>0,1 – 16</b>
	p [psig] S/G/L	<b>4,4 – 232</b>	<b>1,5 – 232</b>
<b>Vessel connection material: 1.4435 (316L)</b>		<b>Please order separately</b>	
Vessel wall thickness [mm]	$\leq 5$	$> 5 \leq$	$\leq 5$
Vessel wall thickness [inch]	$\leq \frac{13}{64}$	$> \frac{13}{64}$	$\leq \frac{13}{64}$
Art. No. <b>5034.</b>	<b>0980</b>	<b>0981</b>	<b>0982</b>
<b>Blind flange for pressure test: 1.4404 (316L)</b>		<b>Please order separately</b>	
Art. No.	<b>138.8849.9000</b>	<b>138.8649.9000</b>	

<sup>1)</sup> For design with lifting device H8 a max. operating temperature of 50°C is allowed.

### Fitting information



Due to the dead space free vessel connection, which is directly welded into the vessel wall, please note the required space between outlet connection of the valve (e.g. clamps or flanges) and vessel wall. If required please order a longer outlet connection with your specifications.

## Type 484 Available connections

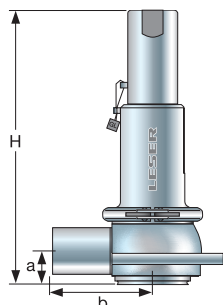
Clamps		Option code inlet		Clamps		Option code outlet	
<p>For inlet please select vessel connection Type 5034 as shown on page 62. For connections directly machined into vessel wall please ask for drawing.</p>				$d_o$ [mm]	13	25	
				$A_o$ [mm <sup>2</sup> ]	133	491	
Aseptic screwed connection		Option code inlet		Aseptic screwed connection		Option code outlet	
				Pipe standard	DN	25	40
				DIN 11850 / DIN 11866 Range A	00	A85L83A16	A85L83A17
					GS	A85H35A16	A85H35A17
					BS	A85H37A16	A85H37A17
					GT	A85H55A16	A85H55A17
					BT	A85H57A16	A85H57A17
					GO	A85L81A16	A85L81A17
					KO	A85L82A16	A85L82A17
					GD	A85H61A16	A85H61A17
					BD	A85H59A16	A85H59A17
				Pipe standard	DN	25	40
				DIN EN ISO 1127 / DIN 11866 Range B	GS	A86H35A16	A86H35A17
					BS	A86H37A16	A86H37A17
					GT	A86H55A16	A86H55A17
					BT	A86H57A16	A86H57A17
					GD	A86H61A16	A86H61A17
					BD	A86H59A16	A86H59A17
				Pipe standard	NPS	1½"	2"
				BS 4825-1 DIN 11866 Range C	GS	A84H35A80	A84H35A81
					BS	A84H37A80	A84H37A81
					GT	A84H55A80	A84H55A81
					BT	A84H57A80	A84H57A81
Aseptic flanged connection		Option code inlet		Aseptic flanged connection		Option code outlet	
				Pipe standard	DN	25	40
				DIN 11850 / DIN 11866 Range A	NF	A85H72A16	A85H72A17
					BF	A85H74A16	A85H74A17
					NG	A85H76A16	A85H76A17
					BG	A85H78A16	A85H78A17
					TN	A85L84A16	A85L84A17
					AF	A85L91A16	A85L91A17
					AN	A85L93A16	A85L93A17
				Pipe standard	DN	25	40
				DIN EN ISO 1127 / DIN 11866 Range B	NF	A86H72A16	A86H72A17
					BF	A86H74A16	A86H74A17
					NG	A86H76A16	A86H76A17
					BG	A86H78A16	A86H78A17
				Pipe standard	DN	1½"	2"
				BS 4825-1 DIN 11866 Range C	NF	A84H72A80	A84H72A81
					BF	A84H74A80	A84H74A81
					NG	A84H76A80	A84H76A81
					BG	A84H78A80	A84H78A81

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

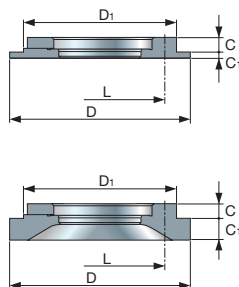
## Type 484

### Dimensions and weights

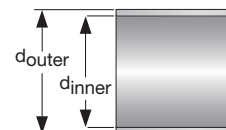
Metric Units



Type 484 – Cap H2



Type 5034 – Vessel connection



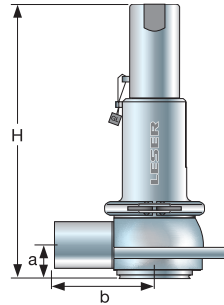
Tube end

Actual Orifice diameter $d_0$ [mm]		13		25	
Actual Orifice area $A_0$ [mm <sup>2</sup> ]		133		491	
<b>Vessel connections</b>					
Vessel wall thickness				Vessel wall thickness	
		$\leq 5$ mm	$> 5$ mm	$\leq 5$ mm	$> 5$ mm
<b>PN</b>		<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>
<b>Flange thickness</b>	C [mm]	12,0	12,0	12,0	12,0
	C <sub>1</sub> [mm]	5,0	18,0	5,0	18,0
<b>Diameter</b>	D [mm]	130,0	130,0	150,0	150,0
	D <sub>1</sub> [mm]	110,0	110,0	127,0	127,0
<b>Bolt circle</b>	L [mm]	90,0	90,0	110,0	110,0
<b>Welded connections</b>		<b>Inlet a<sup>1)</sup></b>	<b>Outlet b</b>	<b>Inlet a<sup>1)</sup></b>	<b>Outlet b</b>
<b>PN</b>		<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>
<b>Center to face</b>	[mm]	24	80	30	90
<b>Height – H4</b>	H max. [mm]	201		289	
<b>Height – H8</b> double piston design	H max. [mm]	229		296	
<b>Clamp connections</b>		<b>Inlet a<sup>1)</sup></b>	<b>Outlet b</b>	<b>Inlet a<sup>1)</sup></b>	<b>Outlet b</b>
<b>PN</b>		<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>
<b>Center to face</b>	[mm]	24	102	30	112
<b>Clamp diameter</b>	$d_{inner}$ [mm]	For varying clamp diameters please refer to page 16 and 17			
	$d_{outer}$ [mm]	For varying clamp diameters please refer to page 16 and 17			
<b>Height – H4</b>	H max. [mm]	201		289	
<b>Height – H8</b> double piston design	H max. [mm]	229		296	
<b>Threaded connections</b>		<b>Inlet a<sup>1)</sup></b>	<b>Outlet b</b>	<b>Inlet a<sup>1)</sup></b>	<b>Outlet b</b>
<b>PN</b>		<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>
<b>Center to face</b>	[mm]	24	120	30	130
<b>Height – H4</b>	H max. [mm]	201		289	
<b>Height – H8</b> double piston design	H max. [mm]	229		296	
<b>Flanged connections</b>		<b>Inlet a<sup>1)</sup></b>	<b>Outlet b</b>	<b>Inlet a<sup>1)</sup></b>	<b>Outlet b</b>
<b>PN</b>		<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>
<b>Center to face</b>	[mm]	24	126	30	134
<b>Height – H4</b>	H max. [mm]	201		289	
<b>Height – H8</b> double piston design	H max. [mm]	229		296	
<b>Weight</b>					
<b>Weight</b>	max. [kg]	3,0		4,0	

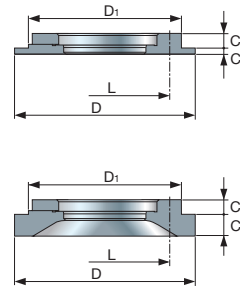
<sup>1)</sup> without vessel connection



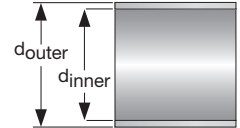
**Type 484**  
**Dimensions and weights**  
US Units



Type 484 – Cap H2



Type 5034 – Vessel connection



Tube end

Actual Orifice diameter $d_0$ [inch]		0,512		0,984	
Actual Orifice area $A_0$ [inch <sup>2</sup> ]		0,206		0,761	
<b>Vessel connections</b>			<b>Vessel wall thickness</b>		
			$\leq 13/64$ inch	$> 13/64$ inch	
<b>PN</b>			<b>16</b>	<b>16</b>	
<b>Flange thickness</b>	C	[inch]	$15/32$	$15/32$	
	C <sub>1</sub>	[inch]	$11/16$	$23/32$	
<b>Diameter</b>	D	[inch]	$5 \frac{1}{8}$	$5 \frac{1}{8}$	
	D <sub>1</sub>	[inch]	$4 \frac{11}{32}$	$4 \frac{11}{32}$	
<b>Bolt circle</b>	L	[inch]	$3 \frac{17}{32}$	$3 \frac{17}{32}$	
<b>Welded connections</b>			<b>Inlet a<sup>1)</sup></b>	<b>Outlet b</b>	
<b>PN</b>			<b>16</b>	<b>16</b>	
<b>Center to face</b>		[inch]	$15/16$	$3 \frac{5}{32}$	
<b>Height – H4</b>	H max.	[inch]	$7 \frac{29}{32}$		$11 \frac{3}{8}$
<b>Height – H8</b> double piston design	H max.	[inch]	9		$11 \frac{5}{32}$
<b>Clamp connections</b>			<b>Inlet a<sup>1)</sup></b>	<b>Outlet b</b>	
<b>PN</b>			<b>16</b>	<b>16</b>	
<b>Center to face</b>		[inch]	$15/16$	4	$1 \frac{3}{16}$
<b>Clamp diameter</b>	d <sub>inner</sub>	[inch]	For varying clamp diameters please refer to page 16 and 17		For varying clamp diameters please refer to page 16 and 17
	d <sub>outer</sub>	[inch]			
<b>Height – H4</b>	H max.	[inch]	$7 \frac{29}{32}$		$11 \frac{3}{8}$
<b>Height – H8</b> double piston design	H max.	[inch]	9		$11 \frac{5}{32}$
<b>Threaded connections</b>			<b>Inlet a<sup>1)</sup></b>	<b>Outlet b</b>	
<b>PN</b>			<b>16</b>	<b>16</b>	
<b>Center to face</b>		[inch]	$15/16$	$4 \frac{23}{32}$	$1 \frac{3}{16}$
<b>Height – H4</b>	H max.	[inch]	$7 \frac{29}{32}$		$11 \frac{3}{8}$
<b>Height – H8</b> double piston design	H max.	[inch]	9		$11 \frac{5}{32}$
<b>Flanged connections</b>			<b>Inlet a<sup>1)</sup></b>	<b>Outlet b</b>	
<b>PN</b>			<b>16</b>	<b>16</b>	
<b>Center to face</b>		[inch]	$15/16$	$4 \frac{15}{16}$	$1 \frac{3}{16}$
<b>Height – H4</b>	H max.	[inch]	$7 \frac{29}{32}$		$11 \frac{3}{8}$
<b>Height – H8</b> double piston design	H max.	[inch]	9		$11 \frac{5}{32}$
<b>Weight</b>					
<b>Weight</b>	max.	[lb]	6,6		8,8

<sup>1)</sup> without vessel connection

## Type 484

### Pressure temperature ratings

#### Metric Units

Actual Orifice diameter $d_0$ [mm]	13	25			
Actual Orifice area $A_0$ [mm <sup>2</sup> ]	133	491			
<b>Body material: 1.4435 (316L)</b>					
<b>Minimum set pressure</b>	p [bar] S/G/L	0,3	0,1		
<b>Maximum set pressure</b>	p [bar] S/G/L	16	16		
<b>Temperature range<sup>1)</sup></b>		Minimum	Maximum	Minimum	Maximum
EPDM	[°C]	-45	+150	-45	+150
FKM	[°C]	-18	+150	-18	+150
FFKM	[°C]	0	+150	0	+150

#### US Units

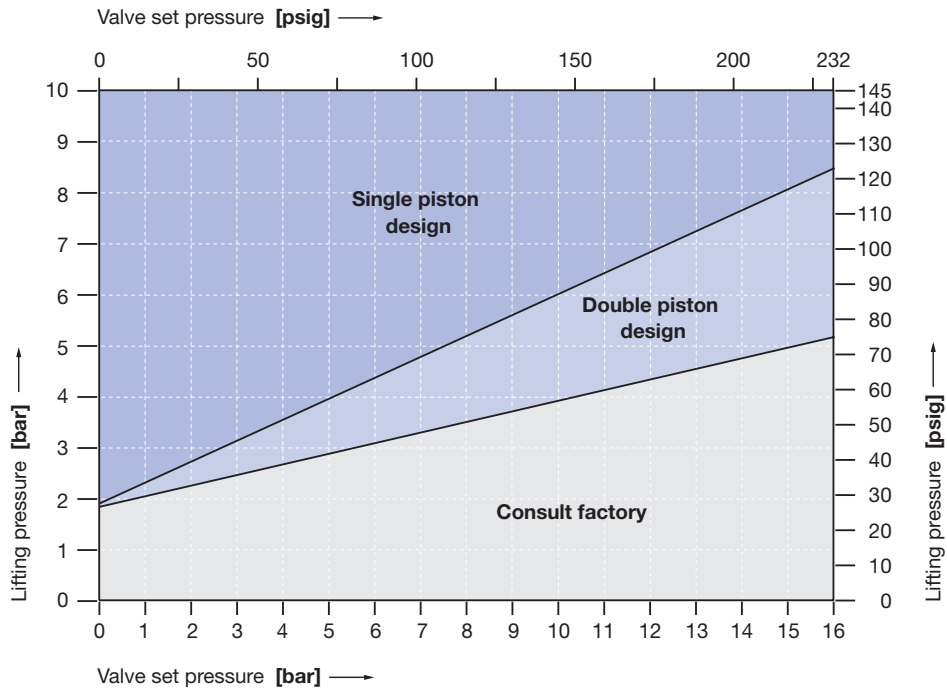
Actual Orifice diameter $d_0$ [inch]	0,512	0,984			
Actual Orifice area $A_0$ [inch <sup>2</sup> ]	0,206	0,761			
<b>Body material: 1.4435 (316L)</b>					
<b>Minimum set pressure</b>	p [psig] S/G/L	4,4	1,5		
<b>Maximum set pressure</b>	p [psig] S/G/L	232	232		
<b>Temperature range<sup>1)</sup></b>		Minimum	Maximum	Minimum	Maximum
EPDM	[°F]	-49	+302	-49	+302
FKM	[°F]	-0,4	+302	-0,4	+302
FFKM	[°F]	+32	+302	+32	+302

<sup>1)</sup> The temperature is limited by the elastomer bellows up to 150 °C / 302 °F.

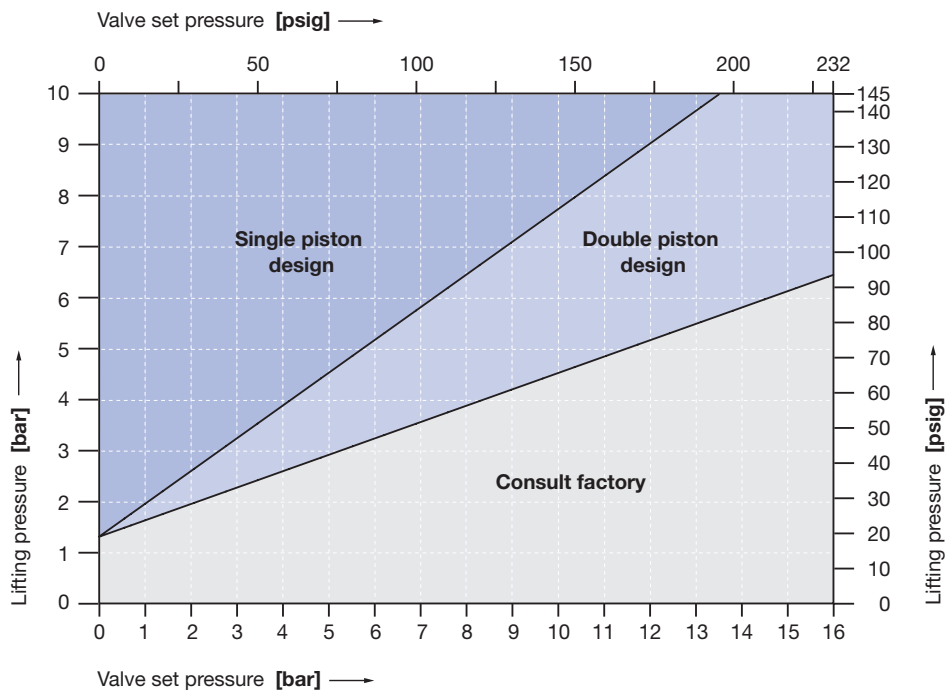
## Type 484 Selection chart H8

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.  $d_0$  13 mm / 0,512 inch



Selection chart lifting device H8, size I.  $d_0$  25 mm / 0,984 inch



## Type 484 Surface quality

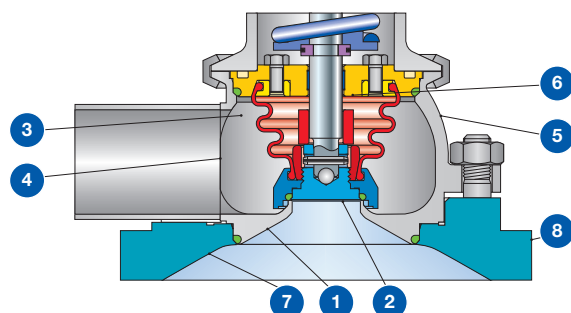
Type of surface	Area		Option code	LESER Surface package			
				Clean finish	HyClean finish	Sterile finish	
	Description	No.		B56	B57	B58	
				R <sub>a</sub> max.	R <sub>a</sub> max.	R <sub>a</sub> max.	
<b>LESER Surface grade</b>							
Product contact surface	Inlet	1		<b>ME4</b>	<b>ME2</b>	<b>ME1</b>	
			[µm]	0,750	0,500	0,375	
				[µinch]	30	20	15
	Bottom side of disc	2		<b>ME4</b>	<b>ME2</b>	<b>ME1</b>	
[µm]			0,750	0,500	0,375		
			[µinch]	30	20	15	
Blow off surface	Inside surface of outlet area	3		<b>ME4</b>	<b>ME3</b>	<b>ME2</b>	
			[µm]	0,750	0,625	0,500	
				[µinch]	30	25	20
	Welding seam	4		<b>ME6</b>	<b>ME5</b>	<b>ME4</b>	
[µm]			3,000	1,500	0,750		
			[µinch]	120	60	30	
Outer surface	Outside surface of body, bonnet and cap/lifting device	5		<b>ME5</b>	<b>ME4</b>	<b>ME4</b>	
			[µm]	1,500	0,750	0,750	
			[µinch]	60	30	30	
Shielded surface	Surface never in contact with the product because it is shielded by the bellows	6		<b>No definition</b>			

## Type 5034 Vessel connection

Type of surface	Area		Option code	LESER Surface package		
				Clean finish	HyClean finish	Sterile finish
	Description	No.		B59	B60	B61
				R <sub>a</sub> max.	R <sub>a</sub> max.	R <sub>a</sub> max.
<b>LESER Surface grade</b>						
Product contact surface	Vessel side	7		<b>M4</b>	<b>M2</b>	<b>M1</b>
			[µm]	0,750	0,500	0,375
			[µinch]	30	20	15
Outer surface	Outside surface	8		<b>M5</b>	<b>M4</b>	<b>M4</b>
			[µm]	1,500	0,750	0,750
			[µinch]	60	30	30

Caution: Electropolishing of the vessel connection is not reasonable before welding.

If required surface deviates from standard clean finish please specify option code and required LESER Surface package.



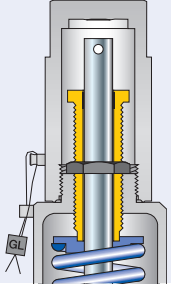
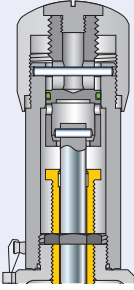
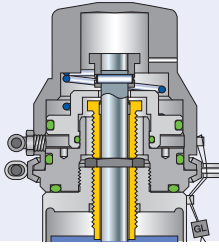
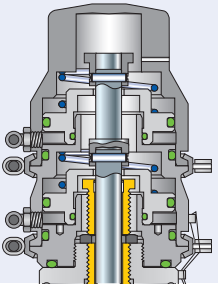






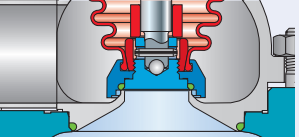

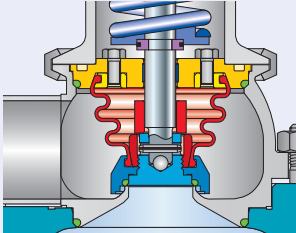


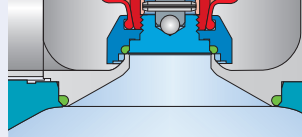
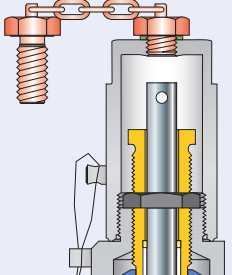
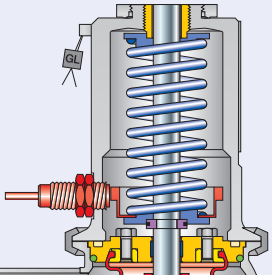
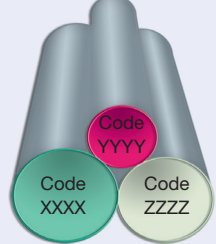
## Type 484 Approvals

Actual Orifice diameter $d_0$ [mm]	13	25
Actual Orifice area $A_0$ [mm <sup>2</sup> ]	133	491
Actual Orifice diameter $d_0$ [inch]	0,512	0,984
Actual Orifice area $A_0$ [inch <sup>2</sup> ]	0,206	0,761
<b>Europe</b> <span style="float: right;"><b>Coefficient of discharge <math>K_{dr}</math></b></span>		
DIN EN ISO 4126-1, PED	Approval No.	07 202 0111 Z 0008/0/20
	S/G	0,60
	L	0,40
<b>Germany</b> <span style="float: right;"><b>Coefficient of discharge <math>C_{Lw}</math></b></span>		
AD 2000-Merkblatt A2, PED	Approval No.	TÜV SV 1047
	S/G	0,60
	L	0,40
<b>United States</b> <span style="float: right;"><b>Coefficient of discharge K</b></span>		
ASME Sec. VIII	Approval No.	M37145
	S/G	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) S: 5,52 lb / hr / psia $\triangle K \approx 0,521$ G: 1,96 SCFM / psia $\triangle K \approx 0,521$
	L	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) L: 2,96 GPM $\sqrt{\text{psid}^*)} \triangle K \approx 0,379$
	Approval No.	M37167
	S/G	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) S: 13,97 lb / hr / psia $\triangle K \approx 0,357$ G: 4,96 SCFM / psia $\triangle K \approx 0,357$
	L	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) L: 7,46 GPM $\sqrt{\text{psid}^*)} \triangle K \approx 0,258$
<b>Canada</b> <span style="float: right;"><b>Coefficient of discharge K</b></span>		
CRN	Approval No.	OG0772.9C
	S/G	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) S: 5,52 lb / hr / psia $\triangle K \approx 0,521$ G: 1,96 SCFM / psia $\triangle K \approx 0,521$
	L	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) L: 2,96 GPM $\sqrt{\text{psid}^*)} \triangle K \approx 0,379$
<b>China</b> <span style="float: right;"><b>Coefficient of discharge <math>C_{Lw}</math></b></span>		
AQSIQ	Approval No.	For current approval no. see <a href="http://www.leser.com">www.leser.com</a>
	S/G	0,60
	L	0,40
<b>Eurasian Custom Union</b> <span style="float: right;"><b>Coefficient of discharge <math>C_{Lw}</math></b></span>		
EAC	Approval No.	For current approval no. see <a href="http://www.leser.com">www.leser.com</a>
	S/G	0,60
	L	0,40
<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 484

## Available options

<p><b>Gastight cap H2</b> H2</p> 	<p><b>Gastight lifting device H4</b> Packed knob H4</p> 	<p><b>Pneumatic lifting device H8</b> H8 single piston design</p> 	<p><b>Pneumatic lifting device H8</b> J41: H8 double piston design</p> 
<p><b>O-ring-disc</b> J22: EPDM "D"   J23: FKM "L"   J20: FFKM "C"  </p> 	<p><b>Bellows FFKM "C"</b>  S70 – only for d<sub>0</sub>13 and liquid application</p> 	<p><b>Blind flange for pressure test</b> Material-No. 138.8849.9000 (d<sub>0</sub> 13) Material-No. 138.8649.9000 (d<sub>0</sub> 25)</p> 	<p><b>O-ring for vessel connection</b> EPDM "D"  Material-No. 502.0460.3041 (d<sub>0</sub> 13) Material-No. 502.0600.3041 (d<sub>0</sub> 25)</p> 
<p><b>Test gag</b> J70: H2</p> 			
<p><b>Lift indicator placed in bonnet</b> J38 + J93</p> 	<p><b>Special material</b> 2.4610 HASTELLOY C4 2.4360 MONEL 400 1.4462 DUPLEX</p> 		

## Type 485 Safety Relief Valves – spring loaded

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**Type 485**  
**Pneumatic lifting device H8**  
Inlet: Integrated pipework connection Type 5034  
Outlet: Flange connection

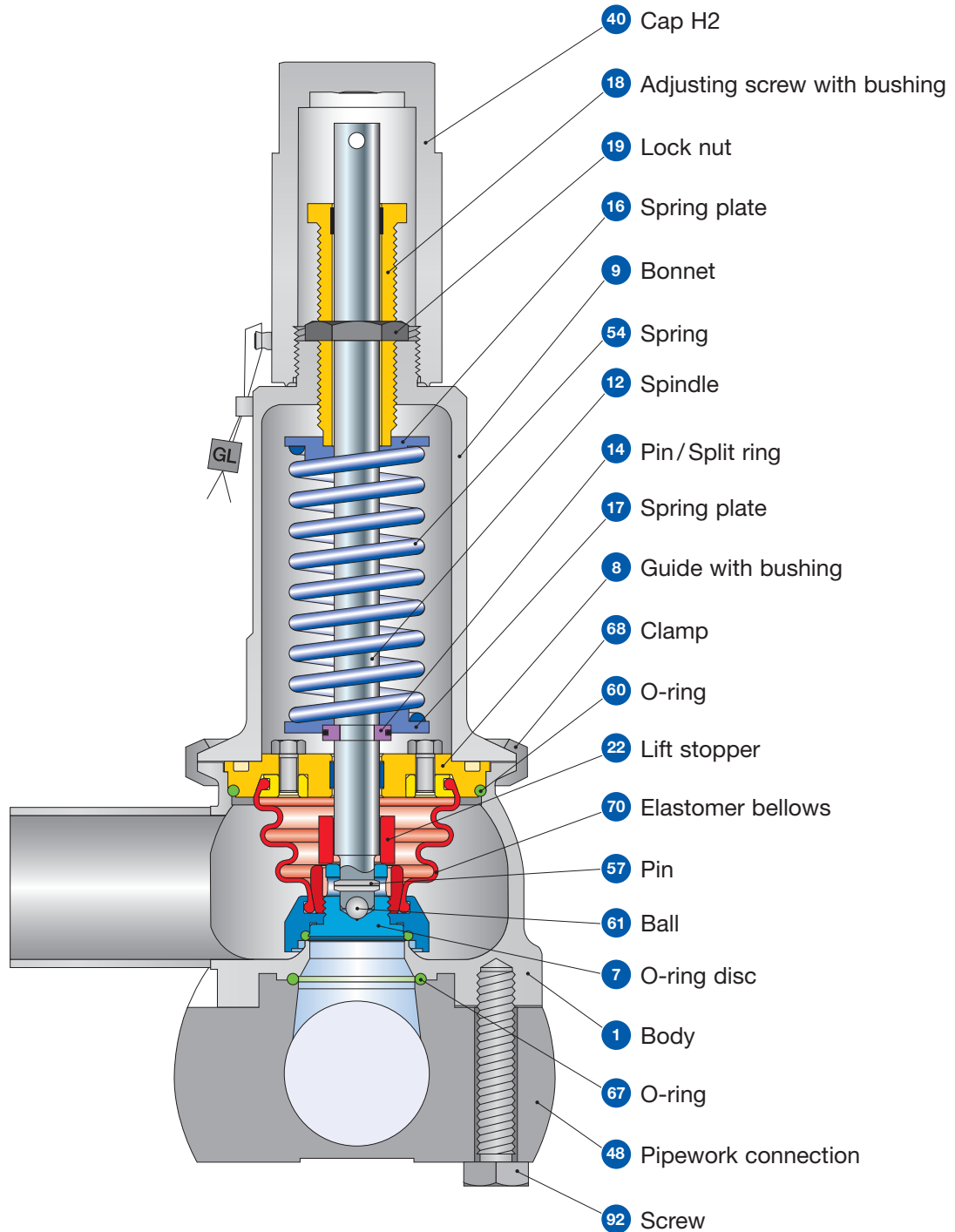


**Type 485**  
**Cap H2**  
Inlet: Integrated pipework connection Type 5034  
Outlet: Welded end connection



**Type 5034**  
Integrated pipework connection










# Type 485 HyTight Assembly



**Type 485 HyTight**  
 Cap H2  
 Inlet: Integrated pipework connection Type 5034  
 Outlet: Welded end connection



**Type 485**  
**HyTight Assembly**  
Materials

Item	Component	Remarks	Type 4854 HyTight
1	Body		1.4435 (BN 2) <sup>1)</sup>
			SA 479 316L
7	Disc	HyTight Assembly	1.4435 316L
7.4	Soft seal O-ring	“D”  	EPDM
		“L” 	FKM <sup>2)</sup>
		“C”  	FFKM
8	Guide with bushing	PTFE + 15 % glass	1.4435 316L
9	Bonnet		1.4404 316L
12	Spindle		1.4404 316L
14	Pin / Split ring		1.4310 / 1.4404 Stainless steel / 316L
16 / 17	Spring plate		1.4404
			316L
18	Adjusting screw with bushing	PTFE + 15 % glass	1.4404 / PTFE 316L / PTFE
19	Lock nut		1.4404 316L
22	Lift stopper		1.4404 316L
40	Cap H2		1.4404 316L
54	Spring		1.4310 Stainless steel
57	Pin	 	1.4310 Stainless steel
60	O-ring		EPDM
61	Ball		1.4401 316
68	Clamp		1.4401 316
70	Elastomer bellows		EPDM
<b>Integrated pipework connection Type 5034</b>			
48	Pipework connection	 	1.4435 (BN 2) <sup>1)</sup>
			SA 479 316L
67	O-ring		EPDM
92	Screw		1.4401
			316
-	Blind flange for pressure test		1.4404
			316L

<sup>1)</sup> The material 1.4435/SA 479 316L fulfils the requirements of the Swiss chemical and pharmaceutical industry Basler Norm (BN 2).

<sup>2)</sup> For design with lifting device H8 a max. operating temperature of 50°C is allowed.

**Please notice:** – Modifications reserved by LESER.  
– LESER can upgrade materials without notice.  
– Every part can be replaced by other material acc. to customer specification.

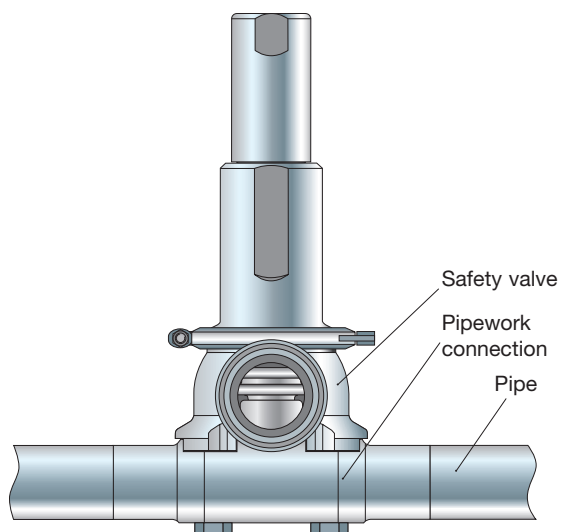
## Type 485

### Article numbers

Actual Orifice diameter $d_0$ [mm]	13	25	
Actual Orifice area $A_0$ [mm <sup>2</sup> ]	133	491	
Actual Orifice diameter $d_0$ [inch]	0,512	0,984	
Actual Orifice area $A_0$ [inch <sup>2</sup> ]	0,206	0,761	
<b>O-ring material</b>	EPDM "D" J22	EPDM "D" J22	
	FKM "L" J23	FKM <sup>1)</sup> "L" J23	
	FFKM "C" J20	FFKM "C" J20	
<b>Body material: 1.4435 (316L)</b>			
<b>Bonnet</b> closed	<b>H2</b> Art. No. <b>4854.</b>	<b>7742</b>	<b>7752</b>
	<b>H4</b> Art. No. <b>4854.</b>	<b>7744</b>	<b>7754</b>
	<b>H8</b> Art. No. <b>4854.</b>	<b>7748</b>	<b>7758</b>
	p [bar] S/G/L	<b>0,3 – 16</b>	<b>0,1 – 16</b>
	p [psig] S/G/L	<b>4,4 – 232</b>	<b>1,5 – 232</b>
<b>Integrated pipework connection material: 1.4435 (316L)</b>		<b>Please order separately</b>	
	<b>DN</b>	<b>25</b>	<b>40</b>
<b>DIN 11850</b>	Art. No. <b>5034.</b>	<b>0991</b>	<b>0992</b>
<b>ISO 2037</b>	Art. No. <b>5034.</b>	<b>0994</b>	<b>0995</b>
<b>DIN EN ISO 1127</b>	Art. No. <b>5034.</b>	<b>0998</b>	<b>0999</b>
			<b>-</b>
<b>Blind flange for pressure test: 1.4404 (316L)</b>		<b>Please order separately</b>	
	Art. No.	<b>138.8949.9000</b>	<b>138.8749.9000</b>

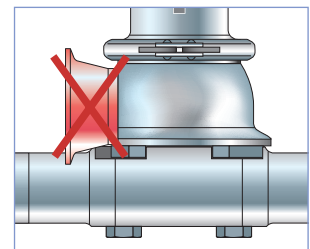
<sup>1)</sup> For design with lifting device H8 a max. operating temperature of 50°C is allowed.

### Fitting information



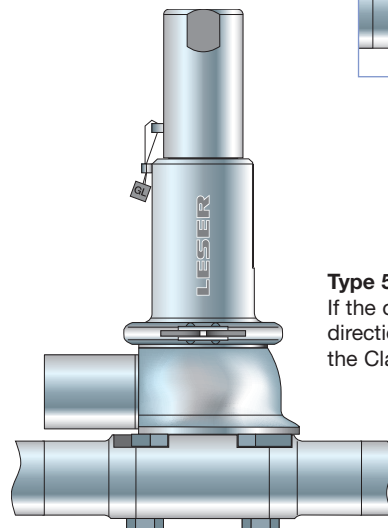
**Type 5034**

Installation: Integrated pipework connection, safety valve



**Type 5034**

If the outlet has the same direction like the pipe, the Clamp is not possible



## Type 485

### Available connections

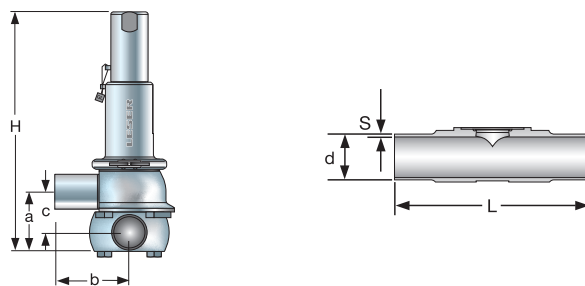
Clamps		Option code inlet	Clamps		Option code outlet	
<p>For inlet please select integrated pipework connection Type 5034 as shown on page 74.</p>			$d_o$ [mm]	13	25	
			$A_o$ [mm <sup>2</sup> ]	133	491	
Aseptic screwed connection			Aseptic screwed connection			
Option code inlet			Option code outlet			
			Pipe standard	DN 25	40	
			DIN 11850 / DIN 11866 Range A	00	A85L83A16	A85L83A17
				GS	A85H35A16	A85H35A17
				BS	A85H37A16	A85H37A17
				GT	A85H55A16	A85H55A17
				BT	A85H57A16	A85H57A17
				GO	A85L81A16	A85L81A17
				KO	A85L82A16	A85L82A17
				GD	A85H61A16	A85H61A17
				BD	A85H59A16	A85H59A17
				Pipe standard	DN 25	40
			DIN EN ISO 1127 / DIN 11866 Range B	GS	A86H35A16	A86H35A17
				BS	A86H37A16	A86H37A17
				GT	A86H55A16	A86H55A17
				BT	A86H57A16	A86H57A17
				GD	A86H61A16	A86H61A17
				BD	A86H59A16	A86H59A17
			Pipe standard	NPS 1 1/2"	2"	
			BS 4825-1 DIN 11866 Range C	GS	A84H35A80	A84H35A81
				BS	A84H37A80	A84H37A81
				GT	A84H55A80	A84H55A81
				BT	A84H57A80	A84H57A81
Aseptic flanged connection			Aseptic flanged connection			
Option code inlet			Option code outlet			
			Pipe standard	DN 25	40	
			DIN 11850 / DIN 11866 Range A	NF	A85H72A16	A85H72A17
				BF	A85H74A16	A85H74A17
				NG	A85H76A16	A85H76A17
				BG	A85H78A16	A85H78A17
				TN	A85L84A16	A85L84A17
				AF	A85L91A16	A85L91A17
				AN	A85L93A16	A85L93A17
				Pipe standard	DN 25	40
			DIN EN ISO 1127 / DIN 11866 Range B	NF	A86H72A16	A86H72A17
				BF	A86H74A16	A86H74A17
				NG	A86H76A16	A86H76A17
				BG	A86H78A16	A86H78A17
			Pipe standard	DN 1 1/2"	2"	
			BS 4825-1 DIN 11866 Range C	NF	A84H72A80	A84H72A81
				BF	A84H74A80	A84H74A81
				NG	A84H76A80	A84H76A81
				BG	A84H78A80	A84H78A81

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

## Type 485

### Dimensions and weights

Metric Units



Type 485 – Cap H2

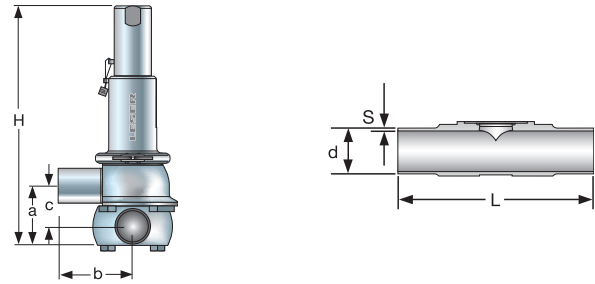
Type 5034 – Integrated pipework connection

Actual Orifice diameter $d_0$ [mm]		13
Actual Orifice area $A_0$ [mm <sup>2</sup> ]		133
<b>Integrated pipework connection</b>		<b>Inlet</b>
PN		16
<b>Nominal pipe size tube</b>		<b>DN</b>
Offset c [mm]		38
Length L [mm]		130
<b>DIN 11850</b>	Diameter d [mm]	30
	Wall thickness s [mm]	2
<b>ISO 2037</b>	Diameter d [mm]	26,5
	Wall thickness s [mm]	2
<b>DIN EN ISO 1127</b>	Diameter d [mm]	34
	Wall thickness s [mm]	2,25
<b>Welded connections</b>		<b>Inlet a<sup>1)</sup></b>
PN		16
<b>Center to face</b>	[mm]	58
<b>Height – H4</b>	H max. [mm]	234
<b>Height – H8</b> double piston design	H max. [mm]	262,2
<b>Clamp connections</b>		<b>Inlet a<sup>1)</sup></b>
PN		16
<b>Center to face</b>	[mm]	58
<b>Clamp diameter</b>	$d_{inner}$ [mm]	For varying clamp diameters please refer to page 16 and 17
	$d_{outer}$ [mm]	
<b>Height – H4</b>	H max. [mm]	234
<b>Height – H8</b> double piston design	H max. [mm]	262,2
<b>Threaded connections</b>		<b>Inlet a<sup>1)</sup></b>
PN		16
<b>Center to face</b>	[mm]	58
<b>Height – H4</b>	H max. [mm]	234
<b>Height – H8</b> double piston design	H max. [mm]	262,2
<b>Flanged connections</b>		<b>Inlet a<sup>1)</sup></b>
PN		16
<b>Center to face</b>	[mm]	58
<b>Height – H4</b>	H max. [mm]	234
<b>Height – H8</b> double piston design	H max. [mm]	262,2
<b>Weight</b>		
<b>Weight</b>	max. [kg]	3,0

		25
		491
<b>Integrated pipework connection</b>		<b>Inlet</b>
PN		16
<b>Nominal pipe size tube</b>		<b>DN</b>
Offset c [mm]		49
Length L [mm]		180
<b>DIN 11850</b>	Diameter d [mm]	42,4
	Wall thickness s [mm]	2
<b>ISO 2037</b>	Diameter d [mm]	39
	Wall thickness s [mm]	2
<b>DIN EN ISO 1127</b>	Diameter d [mm]	48,3
	Wall thickness s [mm]	2,15
<b>Welded connections</b>		<b>Inlet a<sup>1)</sup></b>
PN		16
<b>Center to face</b>	[mm]	72
<b>Height – H4</b>	H max. [mm]	331
<b>Height – H8</b> double piston design	H max. [mm]	338,7
<b>Clamp connections</b>		<b>Inlet a<sup>1)</sup></b>
PN		16
<b>Center to face</b>	[mm]	72
<b>Clamp diameter</b>	$d_{inner}$ [mm]	For varying clamp diameters please refer to page 16 and 17
	$d_{outer}$ [mm]	
<b>Height – H4</b>	H max. [mm]	331
<b>Height – H8</b> double piston design	H max. [mm]	338,7
<b>Threaded connections</b>		<b>Inlet a</b>
PN		16
<b>Center to face</b>	[mm]	72
<b>Height – H4</b>	H max. [mm]	331
<b>Height – H8</b> double piston design	H max. [mm]	338,7
<b>Flanged connections</b>		<b>Inlet a<sup>1)</sup></b>
PN		16
<b>Center to face</b>	[mm]	72
<b>Height – H4</b>	H max. [mm]	331
<b>Height – H8</b> double piston design	H max. [mm]	338,7
<b>Weight</b>		
<b>Weight</b>	max. [kg]	5,0

<sup>1)</sup> without integrated pipework connection

**Type 485**  
**Dimensions and weights**  
US Units



**Type 485 – Cap H2**      **Type 5034 – Integrated pipework connection**

Actual Orifice diameter $d_0$ [inch]		0,512
Actual Orifice area $A_0$ [inch <sup>2</sup> ]		0,206
<b>Integrated pipework connection</b>		
		<b>Inlet</b>
		<b>PN 16</b>
<b>Nominal pipe size tube</b>		<b>NPS 1"</b>
<b>Offset</b>	c [inch]	1 1/2
<b>Length</b>	L [inch]	5 1/8
<b>DIN 11850</b>	Diameter d [inch]	1 3/16
	Wall thickness s [inch]	3/32
<b>ISO 2037</b>	Diameter d [inch]	1
	Wall thickness s [inch]	1/8
<b>DIN EN ISO 1127</b>	Diameter d [inch]	1 3/8
	Wall thickness s [inch]	1/8
<b>Welded connections</b>		
		<b>Inlet a<sup>1)</sup>      Outlet b</b>
		<b>PN 16</b>
<b>Center to face</b>	[inch]	2 1/4      3 5/32
<b>Height – H4</b>	H max. [inch]	9 7/32
<b>Height – H8</b> double piston design	H max. [inch]	10 5/16
<b>Clamp connections</b>		
		<b>Inlet a<sup>1)</sup>      Outlet b</b>
		<b>PN 16</b>
<b>Center to face</b>	[inch]	2 1/4      4 1/32
<b>Clamp diameter</b>	$d_{inner}$ [inch] $d_{outer}$ [inch]	For varying clamp diameters please refer to page 16 and 17
<b>Height – H4</b>	H max. [inch]	9 7/32
<b>Height – H8</b> double piston design	H max. [inch]	10 5/16
<b>Threaded connections</b>		
		<b>Inlet a<sup>1)</sup>      Outlet b</b>
		<b>PN 16</b>
<b>Center to face</b>	[inch]	2 1/4      4 23/32
<b>Height – H4</b>	H max. [inch]	9 7/32
<b>Height – H8</b> double piston design	H max. [inch]	10 5/16
<b>Flanged connections</b>		
		<b>Inlet a<sup>1)</sup>      Outlet b</b>
		<b>PN 16</b>
<b>Center to face</b>	[inch]	2 1/4      4 31/32
<b>Height – H4</b>	H max. [inch]	9 7/32
<b>Height – H8</b> double piston design	H max. [inch]	10 5/16
<b>Weight</b>	max. [lb]	6,6

		0,984	
		0,761	
<b>Inlet</b>			
<b>16</b>			
<b>1 1/2"</b>	<b>2"</b>		
1 15/16	2 5/32		
7 3/32	7 3/32		
1 5/8	2 1/8		
1/8	1/8		
1 1/2	2		
1/8	1/8		
1 7/8	–		
1/8	–		
<b>Inlet a<sup>1)</sup>      Outlet b</b>	<b>Inlet a<sup>1)</sup>      Outlet b</b>	<b>Inlet a<sup>1)</sup>      Outlet b</b>	
<b>16</b>	<b>16</b>	<b>16</b>	
2 27/32	3 17/32	3 5/16      3 17/32	
13 1/32		13 1/2	
13 11/32		13 13/16	
<b>Inlet a<sup>1)</sup>      Outlet b</b>	<b>Inlet a<sup>1)</sup>      Outlet b</b>	<b>Inlet a<sup>1)</sup>      Outlet b</b>	
<b>16</b>	<b>16</b>	<b>16</b>	
2 27/32	4 13/32	3 5/16      4 13/32	
For varying clamp diameters please refer to page 16 and 17			
13 1/32		13 1/2	
13 11/32		13 13/16	
<b>Inlet a<sup>1)</sup>      Outlet b</b>	<b>Inlet a<sup>1)</sup>      Outlet b</b>	<b>Inlet a<sup>1)</sup>      Outlet b</b>	<b>Inlet a<sup>1)</sup>      Outlet b</b>
<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>
2 27/32	5 1/8	3 5/16      5 1/8	
13 1/32		13 1/2	
13 11/32		13 13/16	
<b>Inlet a<sup>1)</sup>      Outlet b</b>	<b>Inlet a<sup>1)</sup>      Outlet b</b>	<b>Inlet a<sup>1)</sup>      Outlet b</b>	<b>Inlet a<sup>1)</sup>      Outlet b</b>
<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>
2 27/32	5 9/32	3 5/16      5 9/32	
13 1/32		13 1/2	
13 11/32		13 13/16	
<b>Weight</b>			
		11,0	

<sup>1)</sup> without integrated pipework connection

## Type 485

### Pressure temperature ratings

#### Metric Units

Actual Orifice diameter $d_0$ [mm]		13		25	
Actual Orifice area $A_0$ [mm <sup>2</sup> ]		133		491	
<b>Body material: 1.4435 (316L)</b>					
<b>Minimum set pressure</b>	p [bar] S/G/L	0,3		0,1	
<b>Maximum set pressure</b>	p [bar] S/G/L	16		16	
<b>Temperature range<sup>1)</sup></b>		Minimum	Maximum	Minimum	Maximum
EPDM	[°C]	-45	+150	-45	+150
FKM	[°C]	-18	+150	-18	+150
FFKM	[°C]	0	+150	0	+150

#### US Units

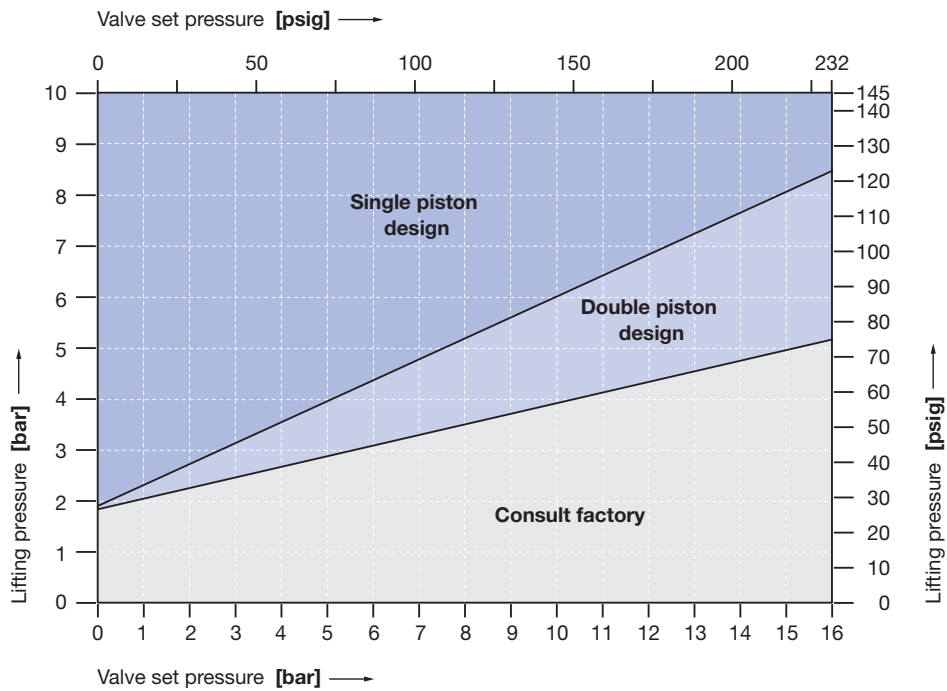
Actual Orifice diameter $d_0$ [inch]		0,512		0,984	
Actual Orifice area $A_0$ [inch <sup>2</sup> ]		0,206		0,761	
<b>Body material: 1.4435 (316L)</b>					
<b>Minimum set pressure</b>	p [psig] S/G/L	4,4		1,5	
<b>Maximum set pressure</b>	p [psig] S/G/L	232		232	
<b>Temperature range<sup>1)</sup></b>		Minimum	Maximum	Minimum	Maximum
EPDM	[°F]	-49	+302	-49	+302
FKM	[°F]	-0,4	+302	-0,4	+302
FFKM	[°F]	+32	+302	+32	+302

<sup>1)</sup> The temperature is limited by the elastomer bellows up to 150 °C / 302 °F.

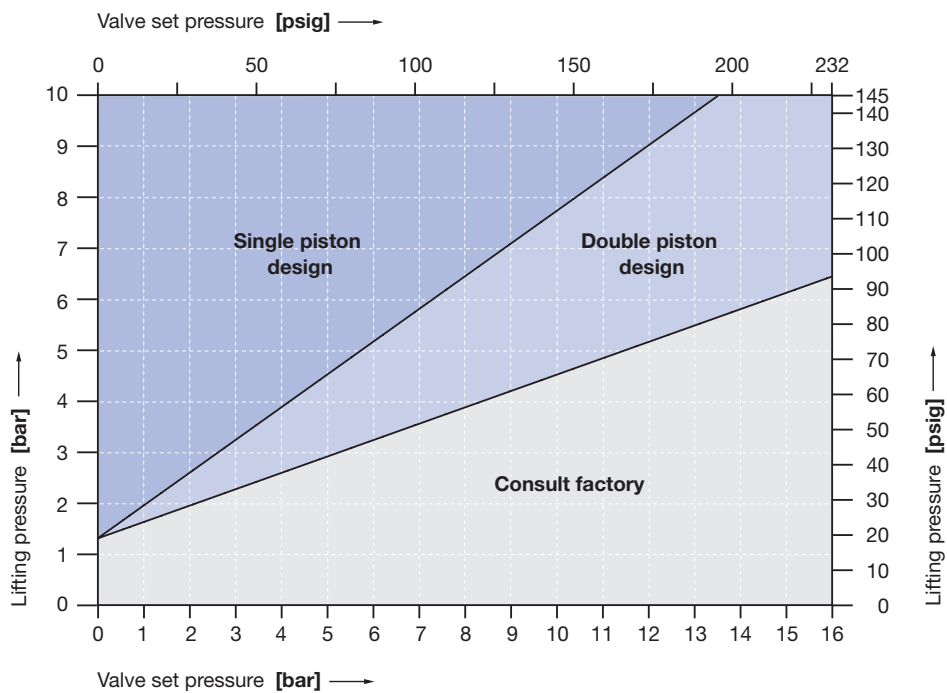
## Type 485 Selection chart H8

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.  $d_0$  13 mm / 0,512 inch



Selection chart lifting device H8, size I.  $d_0$  25 mm / 0,984 inch



## Type 485

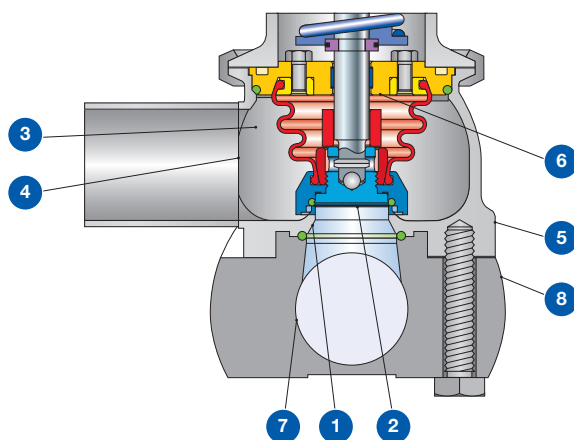
### Surface quality

Type of surface	Area		LESER Surface package			
			Option code	Clean finish	HyClean finish	Sterile finish
	Description	No.		B62	B63	B64
				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>ME4</b>	<b>ME2</b>	<b>ME1</b>
			[µm]	0,750	0,500	0,375
			[µinch]	30	20	15
	Bottom side of disc	2		<b>ME4</b>	<b>ME2</b>	<b>ME1</b>
[µm]			0,750	0,500	0,375	
			[µinch]	30	20	15
Blow off surface	Inside surface of outlet area	3		<b>ME4</b>	<b>ME3</b>	<b>ME2</b>
			[µm]	0,750	0,625	0,500
			[µinch]	30	25	20
	Welding seam	4		<b>ME6</b>	<b>ME5</b>	<b>ME4</b>
[µm]			3,000	1,500	0,750	
			[µinch]	120	60	30
Outer surface	Outside surface of body, bonnet and cap/lifting device	5		<b>ME5</b>	<b>ME4</b>	<b>ME4</b>
			[µm]	1,500	0,750	0,750
			[µinch]	60	30	30
Shielded surface	Surface never in contact with the product because it is shielded by the bellows	6		No definition		

## Type 5034 Integrated pipework connection

Type of surface	Area		LESER Surface package			
			Option code	Clean finish	HyClean finish	Sterile finish
	Description	No.		B65	B66	B67
				R <sub>a</sub> max.	R <sub>a</sub> max.	R <sub>a</sub> max.
<b>LESER Surface grade</b>						
Product contact surface	Pipework side	7		<b>M4</b>	<b>M2</b>	<b>M1</b>
			[µm]	0,750	0,500	0,375
			[µinch]	30	20	15
Outer surface	Outside surface	8		<b>M5</b>	<b>M4</b>	<b>M4</b>
			[µm]	1,500	0,750	0,750
			[µinch]	60	30	30

If required surface deviates from standard clean finish please specify option code and required LESER Surface package.





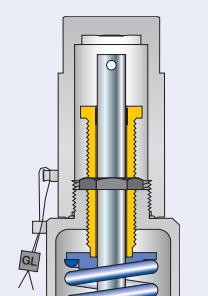
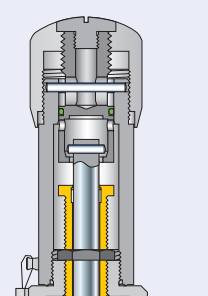
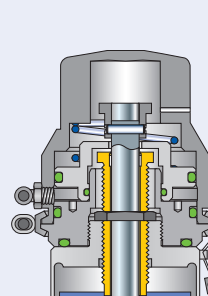
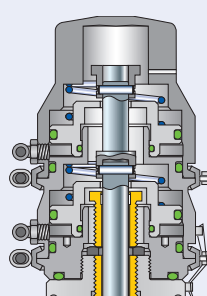






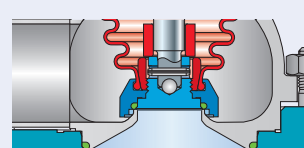

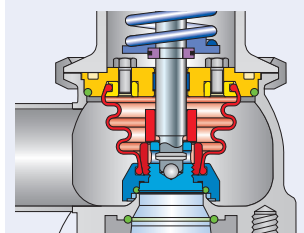
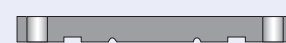

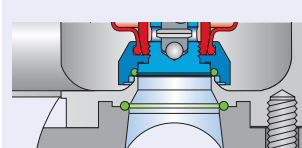
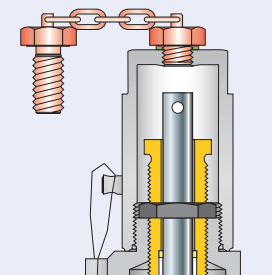
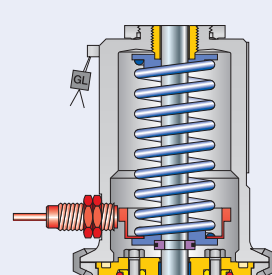
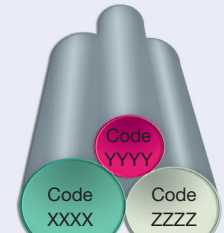
## Type 485 Approvals

Actual Orifice diameter $d_0$ [mm]	13	25
Actual Orifice area $A_0$ [mm <sup>2</sup> ]	133	491
Actual Orifice diameter $d_0$ [inch]	0,512	0,984
Actual Orifice area $A_0$ [inch <sup>2</sup> ]	0,206	0,761
<b>Europe</b> <span style="float: right;"><b>Coefficient of discharge <math>K_{dr}</math></b></span>		
DIN EN ISO 4126-1, PED	Approval No.	07 202 0111 Z 0008/0/20
	S/G	0,58
	L	0,39
<b>Germany</b> <span style="float: right;"><b>Coefficient of discharge <math>C_{Lw}</math></b></span>		
AD 2000-Merkblatt A2, PED	Approval No.	TÜV SV 1047
	S/G	0,58
	L	0,39
<b>United States</b> <span style="float: right;"><b>Coefficient of discharge K</b></span>		
ASME Sec. VIII	Approval No.	M37145
	S/G	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) S: 5,52 lb / hr / psia $\Delta K \approx 0,521$ G: 1,96 SCFM / psia $\Delta K \approx 0,521$
	L	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) L: 2,96 GPM $\sqrt{\text{psid}^*)} \Delta K \approx 0,379$
	Approval No.	M37156
	S/G	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) S: 13,97 lb / hr / psia $\Delta K \approx 0,357$ G: 4,96 SCFM / psia $\Delta K \approx 0,357$
	L	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) L: 7,46 GPM $\sqrt{\text{psid}^*)} \Delta K \approx 0,258$
<b>Canada</b> <span style="float: right;"><b>Coefficient of discharge K</b></span>		
CRN	Approval No.	OG0772.9C
	S/G	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) S: 5,52 lb / hr / psia $\Delta K \approx 0,521$ G: 1,96 SCFM / psia $\Delta K \approx 0,521$
	L	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) L: 2,96 GPM $\sqrt{\text{psid}^*)} \Delta K \approx 0,379$
<b>China</b> <span style="float: right;"><b>Coefficient of discharge <math>C_{Lw}</math></b></span>		
AQSIQ	Approval No.	For current approval no. see <a href="http://www.leser.com">www.leser.com</a>
	S/G	0,58
	L	0,39
<b>Eurasian Custom Union</b> <span style="float: right;"><b>Coefficient of discharge <math>C_{Lw}</math></b></span>		
EAC	Approval No.	For current approval no. see <a href="http://www.leser.com">www.leser.com</a>
	S/G	0,58
	L	0,39
<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]

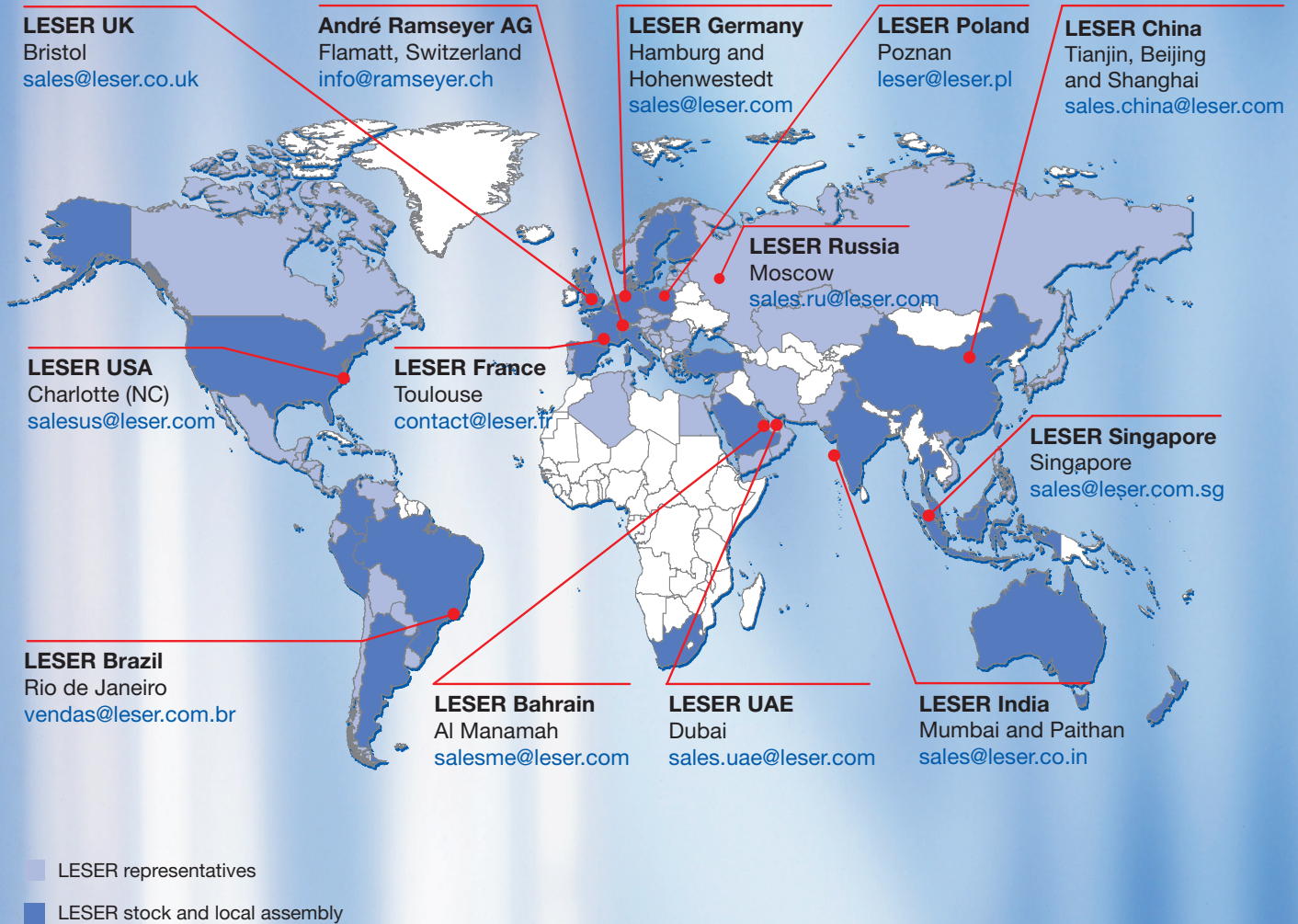
# Type 485

## Available options

<p><b>Gastight cap H2</b> H2</p> 	<p><b>Gastight lifting device H4</b> Packed knob H4</p> 	<p><b>Pneumatic lifting device H8</b> H8 single piston design</p> 	<p><b>Pneumatic lifting device H8</b> J41: H8 double piston design</p> 
<p><b>O-ring-disc</b> J22: EPDM "D"   J23: FKM "L"   J20: FFKM "C"  </p> 	<p><b>Bellows FFKM "C"</b>  S70 – only for d<sub>0</sub>13 and liquid application</p> 	<p><b>Blind flange for pressure test</b> Material No. 138.8949.9000 (d<sub>0</sub> 13) Material No. 138.8749.9000 (d<sub>0</sub> 25)</p> 	<p><b>O-ring for integrated pipework connection</b> EPDM "D"  Material No. 502.0180.3041 (d<sub>0</sub> 13) Material No. 502.0300.3041 (d<sub>0</sub> 25)</p> 
<p><b>Test gag</b> J70: H2</p> 			
<p><b>Lift indicator placed in bonnet</b> J38 + J93</p> 	<p><b>Special material</b> 2.4610 HASTELLOY C4 2.4360 MONEL 400 1.4462 DUPLEX</p> 		



# LESER worldwide



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