

Clean Service

Safety Relief Valves
Series 48X



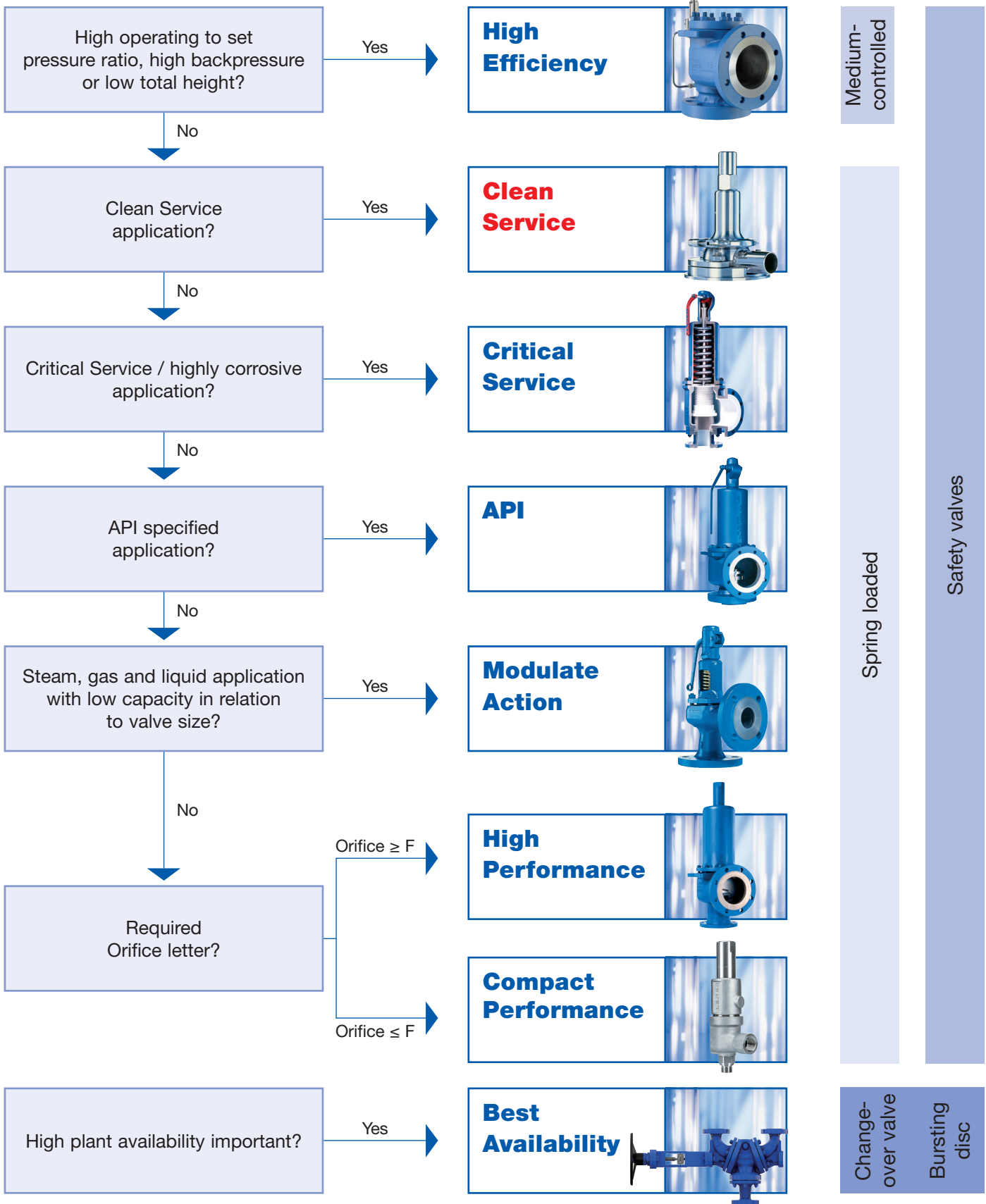
CATALOG

LESER



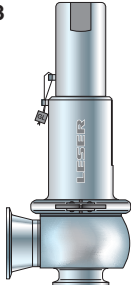

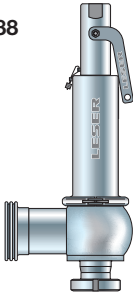

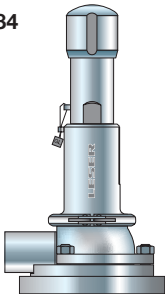

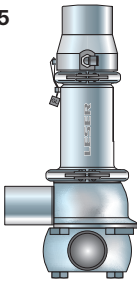

The-Safety-Valve.com

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 ¹⁾	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.

¹⁾ 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

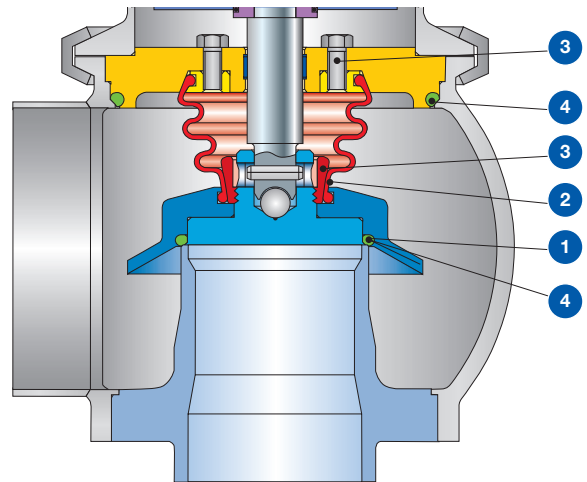
Cleanability first

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:

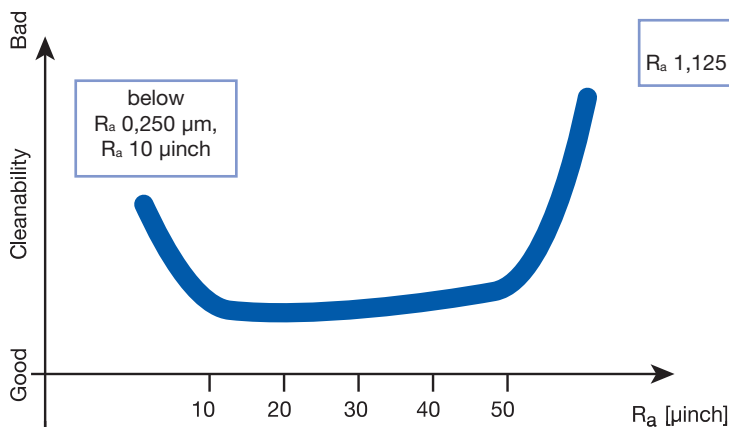
SD-2.4.2:

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

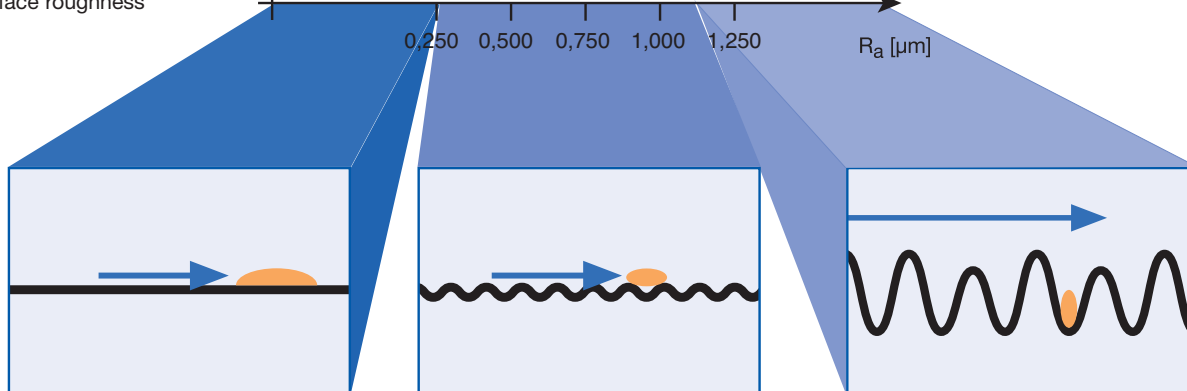
To ensure that the European as well as the ASME BPE requirements are fulfilled, no castings are used in the LESER Clean Service series. High surface quality is achieved by machining most valve bodies and all internal parts from high quality bar material.

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

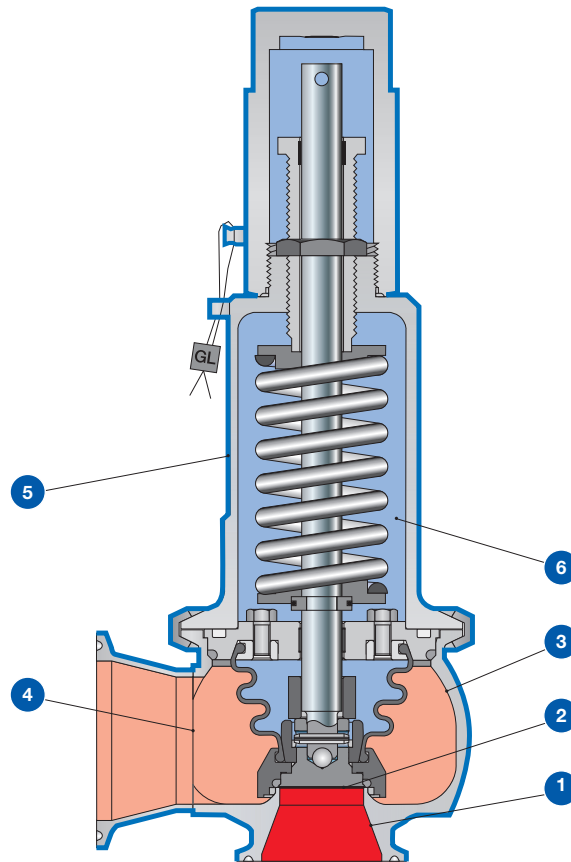


Below $R_a 0,250 \mu\text{m}$ / $10 \mu\text{inch}$ bacteria or particles “stick” to the surface due to adhesive effects.

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 _a max.		≅ R _z			
	[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 _a max.		≅ R _z			
	[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

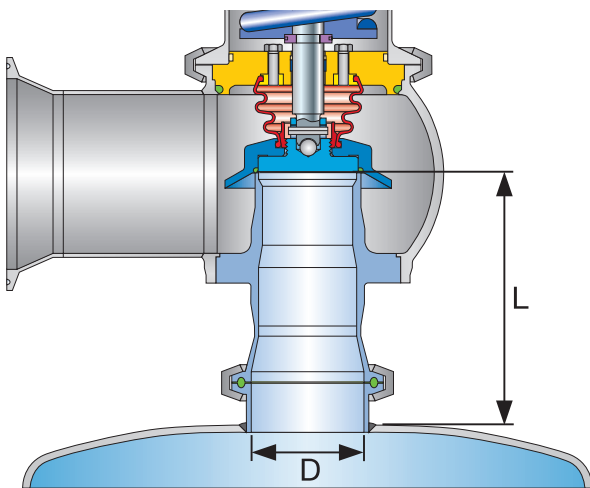
Low dead space

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.

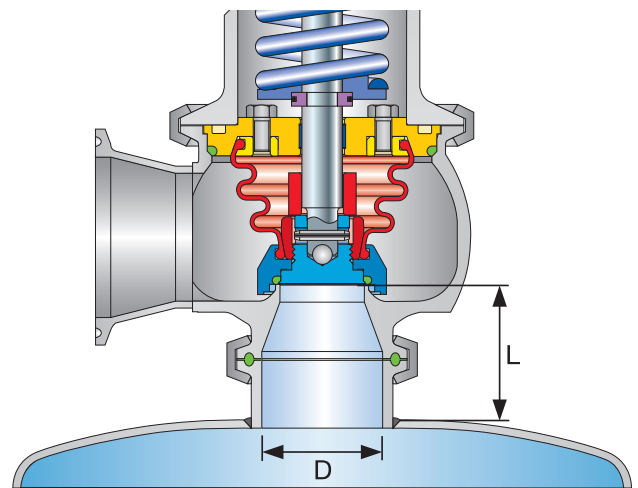
Types 481, 483 and 488 are improved solutions for safety valves with clamp connections, and have L/D ratios less than 1,5 and 2,0 (Type 488). The requirements of ASME BPE Part SD – 3.11.1 ($L/D < 2,0$) and FDA 21 CFR Part 177.2600 ($L/D < 1,5$) are fulfilled with these designs.

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.

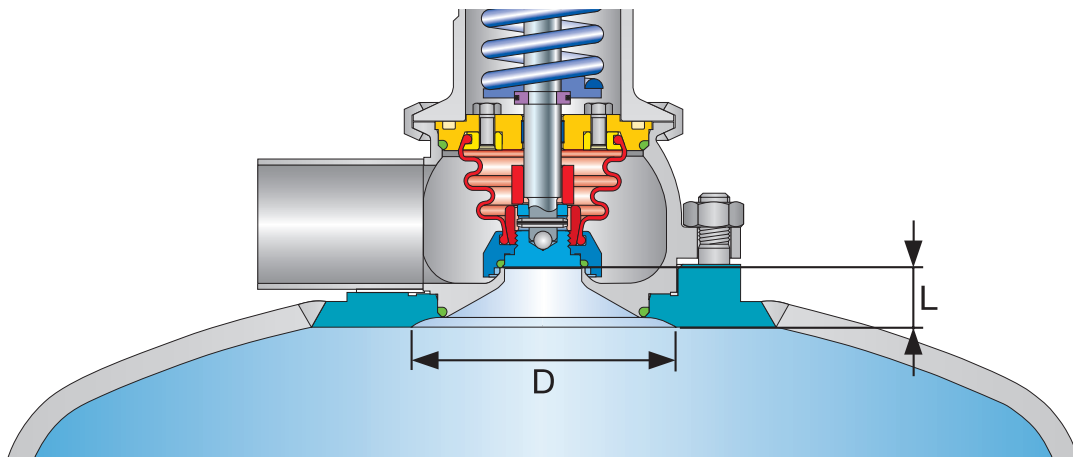
Dead space



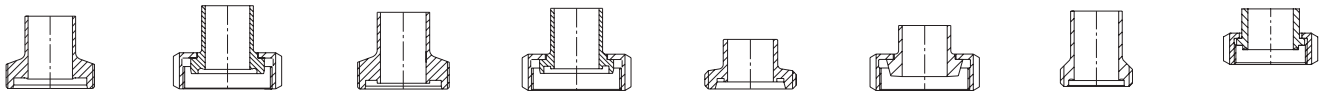
Type 488
L/D ~ 2,0



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 ²⁾	Neumo ²⁾
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	✓	✓
✓	✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓	✓	✓
✓ ¹⁾	✓ ¹⁾	✓ ¹⁾	✓ ¹⁾	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓	✓	✓
-	-	-	-	✓	✓	-	-
✓ ¹⁾	✓ ¹⁾	✓ ¹⁾	✓ ¹⁾	✓	✓	✓	✓
-	-	-	-	✓	✓	-	-
-	-	-	-	-	-	-	-
✓	✓	✓	✓	A85L81A16	A85L82A16	✓	✓
-	-	-	-	-	-	-	-
✓	✓	✓	✓	A85L81A17	A85L82A17	✓	✓
-	-	-	-	-	-	-	-
✓	✓	✓	✓	A85L81A16	A85L82A16	✓	✓
-	-	-	-	-	-	-	-
✓	✓	✓	✓	A85L81A17	A85L82A17	✓	✓

¹⁾ Available for pipe standard DIN 11850 only

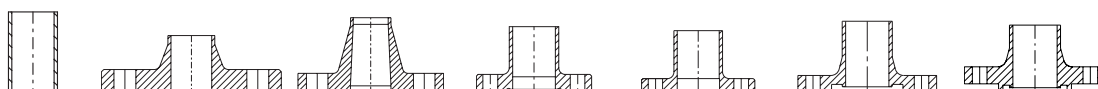
²⁾ BioConnect® is registered wordmark of NEUMO GmbH & Co. KG, D – 75438 Knittlingen

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



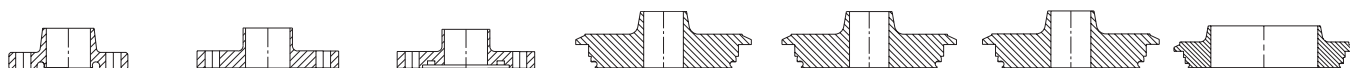
Connection	Welded end	Flange PN 16 Range B1	Flange ASME Class 150RF	Aseptic flange groove	Aseptic flange tongue	Aseptic flange groove	Aseptic flange tongue
Code	00	FD	FA	NF	BF	NG	BG
According to	DIN 11850	DIN EN 1092	ASME B 16.5	DIN 11864 T2 Range A	DIN 11864 T2 Range A	DIN 11864 T2 Range B	DIN 11864 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 ₀ 10	Inlet	-	-	-	-	-	-
		Outlet	-	-	-	-	-	-
Type 483	d ₀ 13	Inlet	-	-	-	✓	✓	✓
		Outlet	A85L83A16	-	-	✓	✓	✓
	d ₀ 25	Inlet	-	-	-	✓	✓	✓
		Outlet	A85L83A17	-	-	✓	✓	✓
Type 488	d ₀ 23	Inlet	H85L77	I71	L94	✓	✓	✓
		Outlet	A85L83	I72	L95	✓	✓	✓
	d ₀ 37	Inlet	H85L77	I71	L94	✓	✓	✓
		Outlet	A85L83	I72	L95	✓	✓	✓
	d ₀ 46	Inlet	H85L77	I71	L94	✓	✓	✓
		Outlet	A85L83	I72	L95	✓	✓	✓
	d ₀ 60	Inlet	H85L77	I71	L94	✓	✓	✓
		Outlet	A85L83	I72	L95	✓ ¹⁾	✓ ¹⁾	✓ ¹⁾
	d ₀ 74	Inlet	H85L77	I71	L94	✓	✓	✓
		Outlet	A85L83	I72	L95	✓ ²⁾	✓ ²⁾	✓ ²⁾
	d ₀ 92	Inlet	H85L77	I71	L94	✓ ¹⁾	✓ ¹⁾	✓ ¹⁾
		Outlet	-	I72	L95	✓ ²⁾	✓ ²⁾	✓ ²⁾
Type 484	d ₀ 13	Inlet	-	-	-	-	-	-
		Outlet	✓	-	-	✓	✓	✓
	d ₀ 25	Inlet	-	-	-	-	-	-
		Outlet	✓	-	-	✓	✓	✓
Type 485	d ₀ 13	Inlet	-	-	-	-	-	-
		Outlet	✓	-	-	✓	✓	✓
	d ₀ 25	Inlet	-	-	-	-	-	-
		Outlet	✓	-	-	✓	✓	✓

¹⁾ Not available for pipe standard BS 4825-1

²⁾ Available for pipe standard DIN 11850 only

³⁾ 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 ³⁾ Varivent connection	DN 50/XX ³⁾ Varivent connection	DN 80/XX ³⁾ Varivent connection	DN 100/XX ³⁾ 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

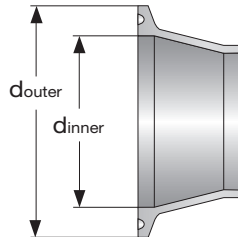
Connecting dimensions

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	15	16,0	34,0	L79I14	–	–	–	–	
		25	26,0	50,5	L79I16	25	26,0	50,5	L86A16	
4834.	770	25	26,0	50,5	L79I16	25	26,0	50,5	L86A16	
	771	40	38,0	50,5	L79I17	40	38,0	50,5	L86A17	
4884.	884	25	26,0	50,5	L79	40	38,0	50,5	L86	
	885	40	38,0	50,5	L79	65	66,0	91,0	L86	
	886	50	50,0	64,0	L79	80	81,0	106,0	L86	
	887	65	66,0	91,0	L79	100	100,0	119,0	L86	
	888	80	81,0	106,0	L79	125	125,0	155,0	–	
	889	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	15	18,1	34,0	I73I14	–	–	–	–	
		25	29,7	50,5	I73I16	25	29,7	50,5	I74A16	
4834.	770	25	29,7	50,5	I73I16	25	29,7	50,5	I74A16	
	771	40	44,3	64,0	I73I17	40	44,3	64,0	I74A17	
4884.	884	25	29,7	50,5	I73	40	44,3	64,0	I74	
	885	40	44,3	64,0	I73	65	72,1	91,0	I74	
	886	50	56,3	77,5	I73	80	84,9	106,0	I74	
	887	65	72,1	91,0	I73	100	110,3	130,0	I74	
	888	80	84,9	106,0	I73	125	135,7	155,0	I74	
	889	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 ₀ [mm]	Size	d _{inner} [mm]	d _{outer} [mm]	Option code	Size	d _{inner} [mm]	d _{outer} [mm]	Option code	
4814.	768/769	10	3/4"	15,7	25,0	I75I78	–	–	–	–
			1" ¹⁾	22,1	50,5	I75I79	1" ¹⁾	22,1	50,5	I76A79
4834.	770	13	1" ¹⁾	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 ₀ [mm]	Size ²⁾	d _{inner} [mm]	d _{outer} [mm]	Option code	Size ²⁾	d _{inner} [mm]	d _{outer} [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

¹⁾ Type B

²⁾ No designation in ISO 2852 available. Please check compatibility of dimensions.

Type 481 Safety Relief Valves – spring loaded

Contents	Page
Materials	
• Conventional design	20
How to order	
• Article numbers	22
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• Metric Units	24
• US Units	25
Pressure temperature ratings	
• Metric Units + US Units	26
Selection chart H8	27
Surface quality	28
Approvals	29
Available options	30



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



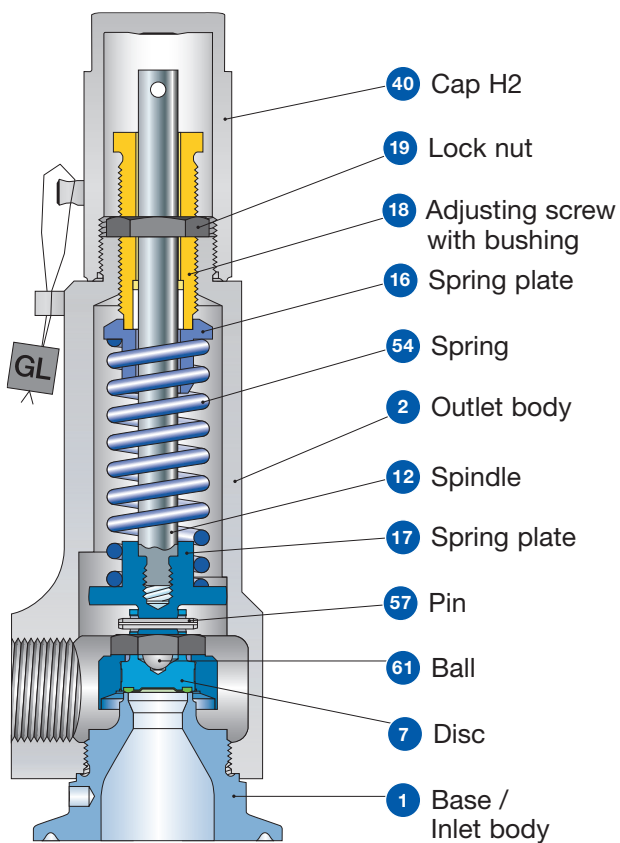
**Type 481
Packed knob H4**
Inlet: Aseptic clamp and nut
Outlet: Threaded connection

Type 481

Conventional design

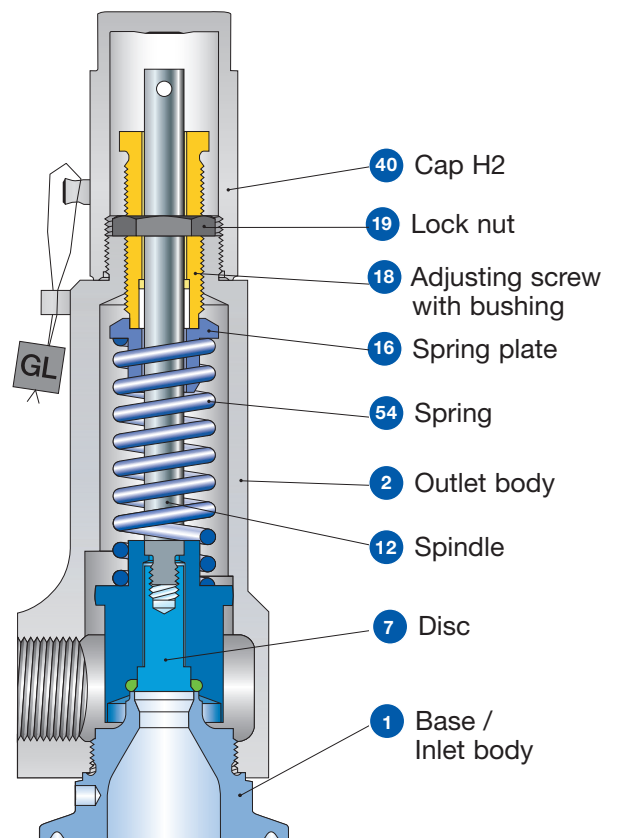
Low set pressure

0,1 – 16 bar
1,5 – 232 psig



High set pressure




16 – 68 bar
233 – 986 psig



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

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

Type 481
Conventional design
Materials

Item	Component	Remarks	Type 4814	
			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 ²]		78,5	78,5	
Actual Orifice diameter d_0 [inch]		0,394	0,394	
Actual Orifice area A_0 [inch ²]		0,122	0,122	
Soft seal material		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	
Base / Inlet body material: 1.4404 (316L)				
Bonnet closed	H2	Art. No. 4814.	7692	7682
	H4	Art. No. 4814.	7694	7684
	H8	Art. No. 4814.	7698	7688
	p [bar] S/G/L		0,1 – 16	16 – 68
	p [psig] S/G/L		1,5 – 232	233 – 986

Type 481

Available connections

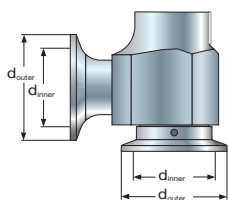
Actual Orifice diameter d_0 [mm]	10		d_0 [mm]	10					
Actual Orifice area A_0 [mm ²]	78,5		A_0 [mm ²]	78,5					
Clamps			Clamps						
	Option code inlet			Option code outlet					
DN	15	25	DN	25					
SO	L79I14	L79I16	SO	L86A16					
DO	I73I14	I73I16	DO	I74A16					
NPS	3/4"	1"	NPS	1"					
BO	I75I78	I75I79	BO	I76A79					
CO	-	L96I79	CO	L97A79					
Aseptic screwed connection			Aseptic screwed connection						
	Option code inlet			Option code outlet					
DN	-		DN	G1/2	G3/4	G1	1/2" NPT	3/4" NPT	1" NPT
XG	-		XG	V65	V76	V66	-		
XN	-		XN	-			V70	V77	V71
Pipe standard	DN	25	DN	25					
DIN 11850 / DIN 11866 Range A	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						
Pipe standard	DN	25	DN	25					
DIN EN ISO 1127 / DIN 11866 Range 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					
Pipe standard	NPS	1"	NPS	1"					
BS 4825-1 DIN 11866 Range C	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.

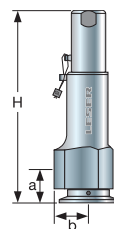
Type 481

Dimensions and weights

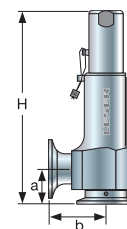
Metric Units



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 ²]	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

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

Inlet clamp connections / Outlet threaded connections

d_0 [mm]	10
A_0 [mm ²]	78,5

Outlet threaded connections

XG	G ¹ / ₂	G ³ / ₄	G1
XN	NPT ¹ / ₂ "	NPT ³ / ₄ "	NPT1"

Center to face b [mm]	30	37	37
-----------------------	----	----	----

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

Clamp diameter

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

For varying clamp diameters see page 16 and 17

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

Inlet Aseptic screwed connections / Outlet Aseptic screwed connections

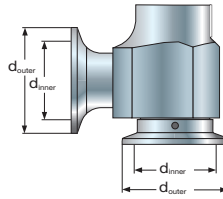
d_0 [mm]	10
A_0 [mm ²]	78,5

Center to face

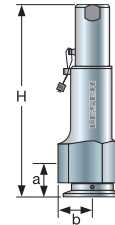
Inlet a [mm]		Outlet b [mm]	
GS	DN25, NPS 1"	GS	DN25, NPS 1"
BS	DN25, NPS 1"	BS	DN25, NPS 1"
GT	DN25, NPS 1"	GT	DN25, NPS 1"
BT	DN25, NPS 1"	BT	DN25, NPS 1"
GO	DN25	GO	DN25
KO	DN25	KO	DN25
GD	DN25	GD	DN25
BD	DN25	BD	DN25

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

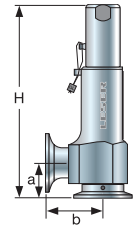
Type 481
Dimensions and weights
US Units



Type 481
Clamp diameters



Type 481
Outlet: Threaded connections



Type 481
Outlet: Clamp connection

Inlet clamp connections / Outlet clamp connections

d ₀ [inch]	10
A ₀ [inch ²]	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_{inner} [inch] and d_{outer} [inch]

For varying clamp diameters
see page 16 and 17

For varying clamp diameters
see page 16 and 17

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

Inlet clamp connections / Outlet threaded connections

d ₀ [inch]	0,394
A ₀ [inch ²]	0,122

Outlet threaded connections

XG	G ¹ / ₂	G ³ / ₄	G1
XN	NPT ¹ / ₂ "	NPT ³ / ₄ "	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_{inner} [inch] and d_{outer} [inch]

For varying clamp diameters see page 16 and 17

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

Inlet Aseptic screwed connections / Outlet Aseptic screwed connections

d ₀ [inch]	10
A ₀ [inch ²]	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

Height - H4 H max. [inch]	7 11/16
Height - H8 H max. [inch] double piston design	8 13/16
Weight max. [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 ²]		78,5		78,5	
Body material: 1.4404 (316L)					
Inlet / Outlet body	Pressure rating	For pressure ratings please refer to chapter dimensions and weights (page 24)			
Minimum set pressure	p [bar] S/G/L	0,1		16	
Maximum set pressure	p [bar] S/G/L	16		68	
Temperature range¹⁾		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

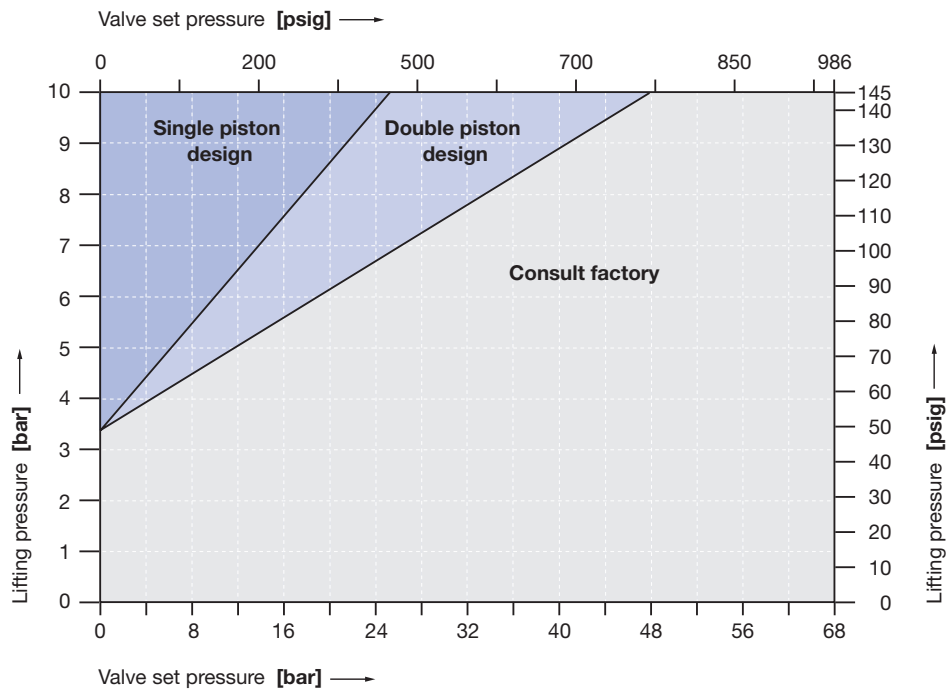
		Vulcanized soft seal		O-ring disc	
Actual Orifice diameter d_0 [inch]		0,394		0,394	
Actual Orifice area A_0 [inch ²]		0,122		0,122	
Body material: 1.4404 (316L)					
Inlet / Outlet body	Pressure rating	For pressure ratings please refer to chapter dimensions and weights (page 25)			
Minimum set pressure	p [psig] S/G/L	1,5		233	
Maximum set pressure	p [psig] S/G/L	232		986	
Temperature range¹⁾		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

¹⁾ 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



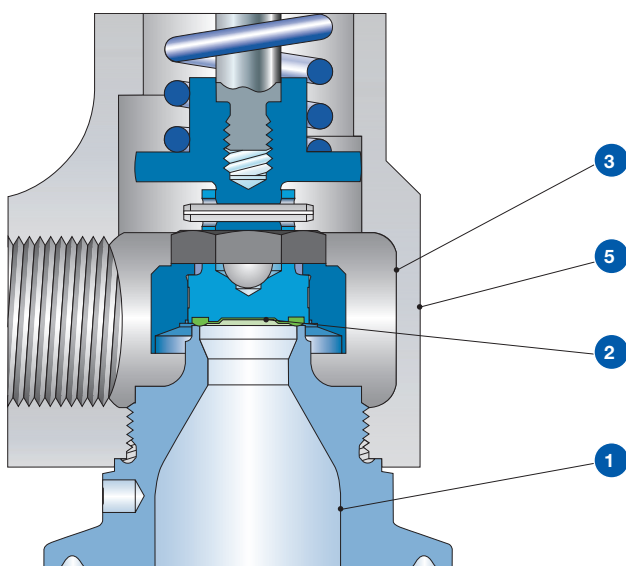
Type 481

Surface quality

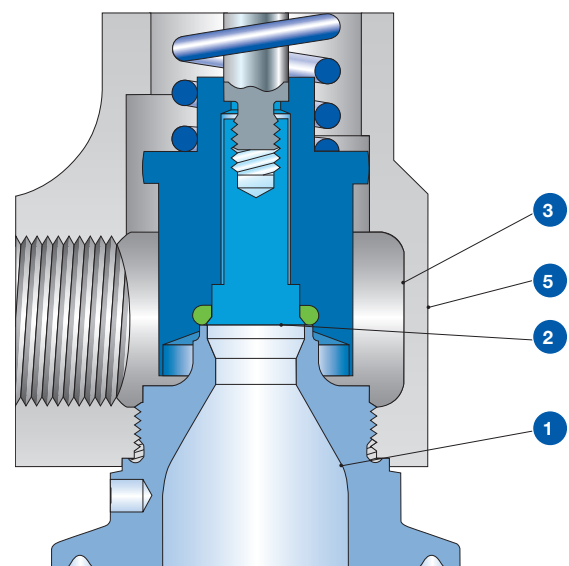
Type of surface	Area		LESER Surface package				
			Option code	Clean finish	HyClean finish	Sterile finish	
	Description	No.		B50	B51	B52	
				R _a max.	R _a max.	R _a max.	
LESER Surface grade							
Product contact surface	Inlet	1		M4	ME4	ME2	
			[μm]	0,750	0,750	0,500	
			[μinch]	30	30	20	
	Bottom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

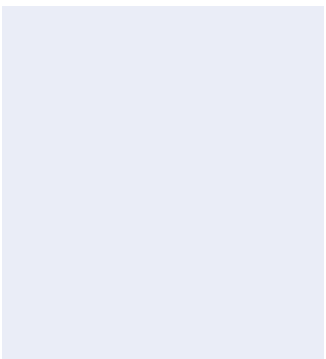
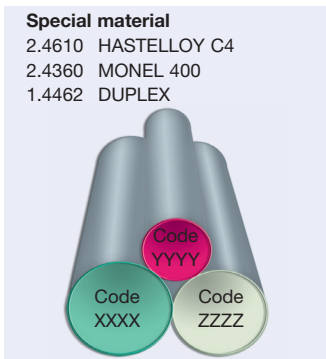
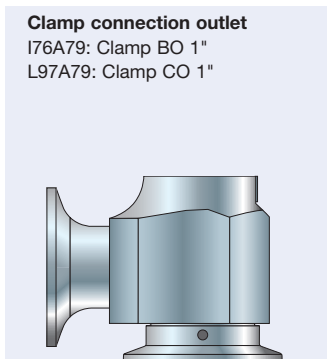
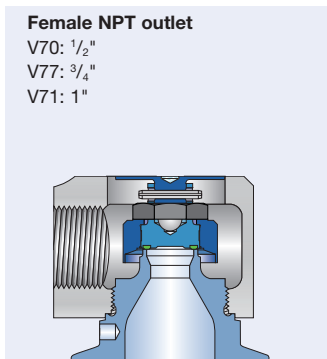
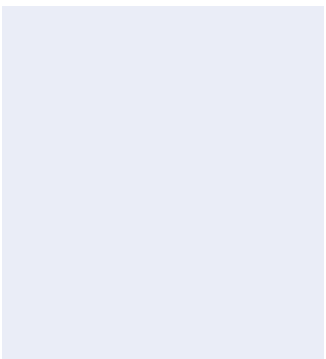
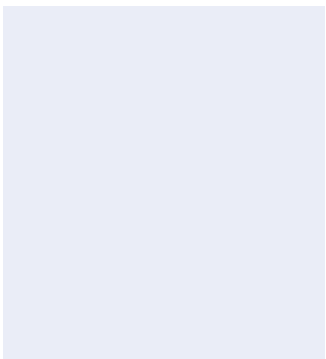
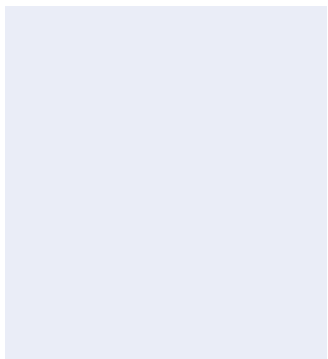
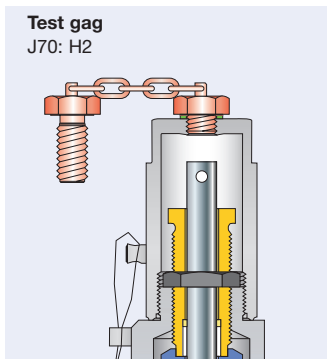
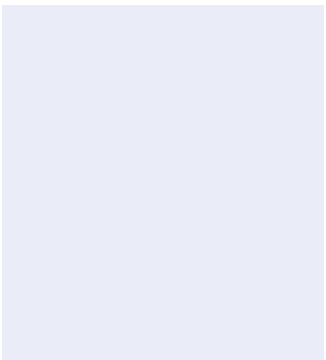
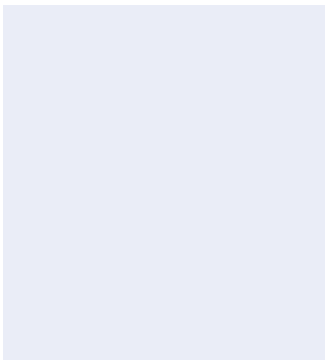
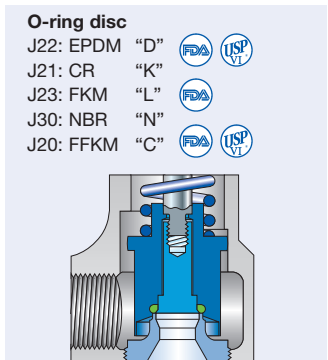
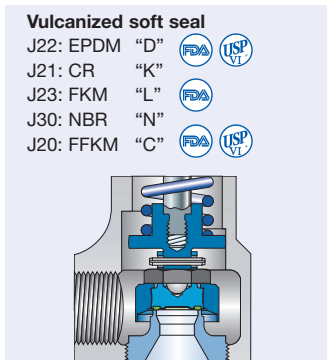
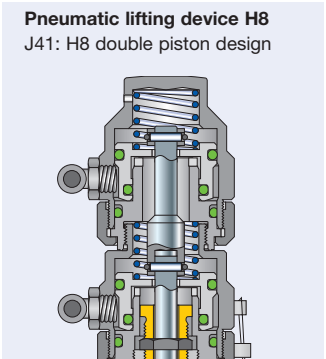
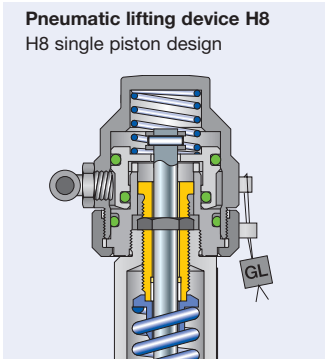
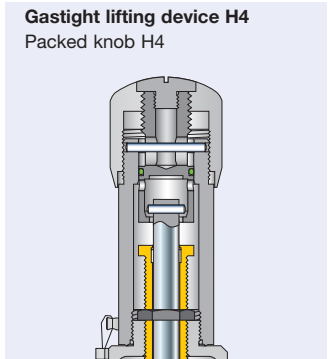
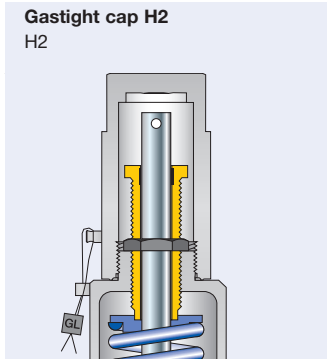
Actual Orifice diameter d_0 [mm]	10		
Actual Orifice area A_0 [mm ²]	78,5		
Actual Orifice diameter d_0 [inch]	0,394		
Actual Orifice area A_0 [inch ²]	0,122		
Europe		Coefficient of discharge K_{dr}	
DIN EN ISO 4126-1, PED	Approval No.	07 202 0111 Z 0008/0/21-2	
	S/G	0,45 (\leq 16 bar)	0,4 ($>$ 16 bar)
	L	0,37 (\leq 16 bar)	0,33 ($>$ 16 bar)
Germany		Coefficient of discharge C_{Lw}	
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)
United States		Coefficient of discharge K	
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	
Canada		Coefficient of discharge K	
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	
China		Coefficient of discharge C_{Lw}	
AQSIQ	Approval No.	For current approval no. see www.leser.com	
	S/G	0,45 (\leq 16 bar)	0,4 ($>$ 16 bar)
	L	0,37 (\leq 16 bar)	0,33 ($>$ 16 bar)
Eurasian Custom Union		Coefficient of discharge C_{Lw}	
EAC	Approval No.	For current approval no. see www.leser.com	
	S/G	0,45 (\leq 16 bar)	0,4 ($>$ 16 bar)
	L	0,37 (\leq 16 bar)	0,33 ($>$ 16 bar)
Classification societies		on request	

^{*)} psid = Differential pressure P-P_d
P = absolute flow pressure [psia]
P_d = pressure at discharge from valve [psia]

Type 481

Available options

Type 481



Type 483 Safety Relief Valves – spring loaded

Contents	Page
Materials	
• HyTight Assembly	32
How to order	
• Article numbers	34
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Dimensions and weights	
• Metric Units	36
• US Units	37
Pressure temperature ratings	
• Metric Units + US Units	38
Selection chart H8	39
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Approvals	41
Available options	42

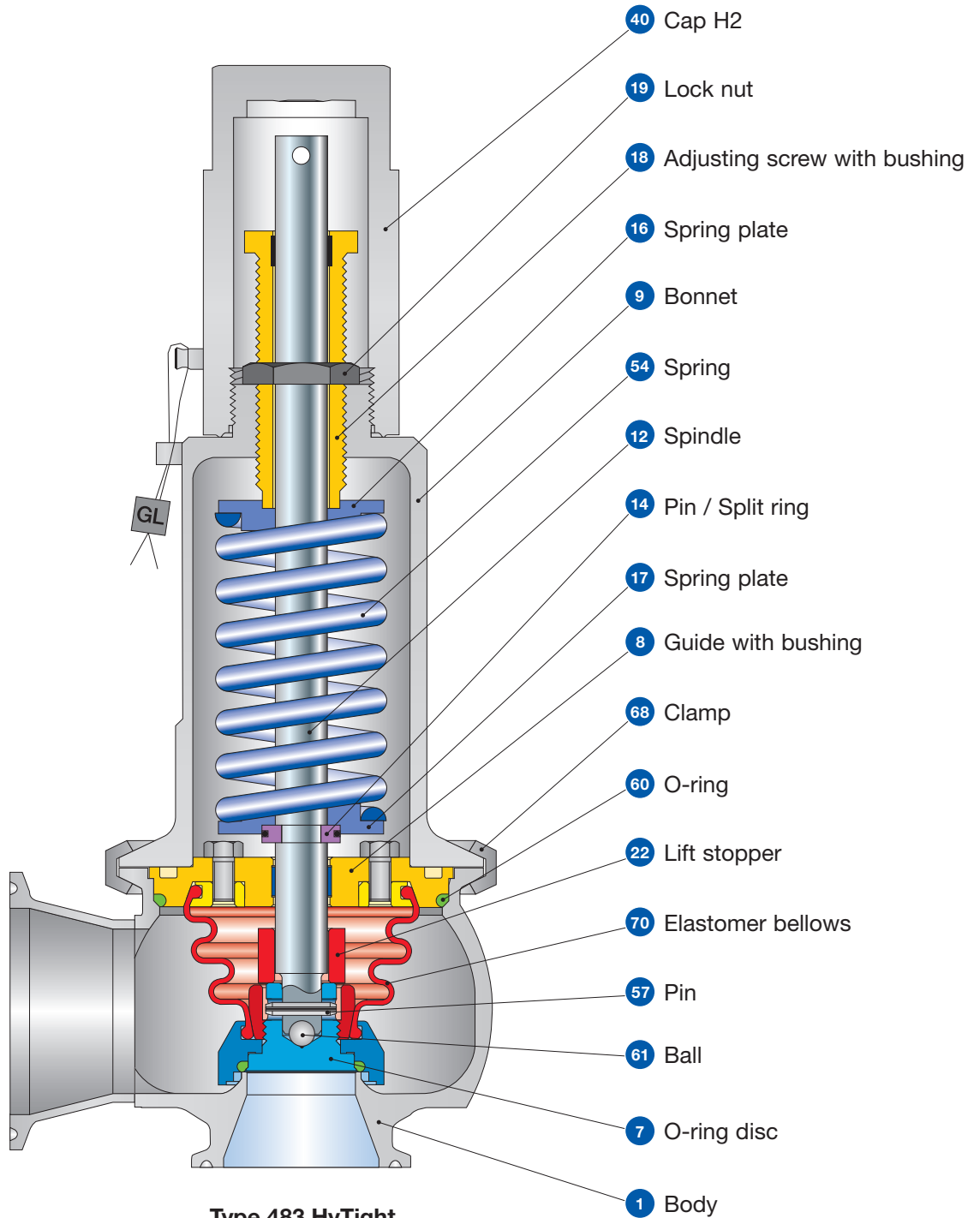


Type 483
Pneumatic lifting device H8
Inlet and outlet: Clamp connection



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) ¹⁾
			SA 479 316L
7	O-ring disc	HyTight Assembly	1.4435 316L
7.4	Soft seal O-ring	"D"	EPDM
		"L"	FKM ²⁾
		"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

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

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

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

Type 483

Available connections

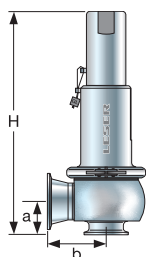
Actual Orifice diameter d ₀ [mm]		13		25		d ₀ [mm]	13		25				
Actual Orifice area A ₀ [mm ²]		133		491		A ₀ [mm ²]	133		491				
Clamps						Clamps							
Option code inlet						Option code outlet							
DN		25		40		DN		25		40			
SO		L79I16		L79I17		SO		L86A16		L86A17			
DO		I73I16		I73I17		DO		I74A16		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			
Aseptic screwed connection						Aseptic screwed connection							
Option code inlet						Option code outlet							
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		
Aseptic flanged connection						Aseptic flanged connection							
Option code inlet						Option code outlet							
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.

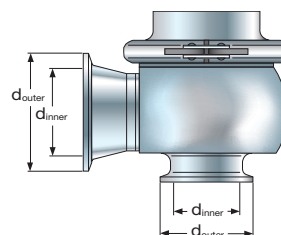
Type 483

Dimensions and weights

Metric Units



Type 483 – Cap H2

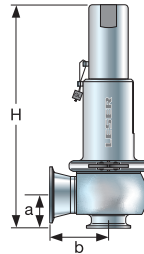


Type 483 – Clamp diameters

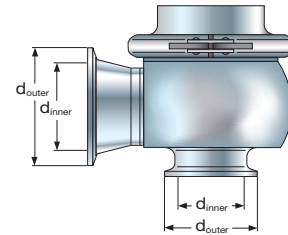
Actual Orifice diameter d_o [inch]		13	25
Actual Orifice area A_o [inch ²]		133	491
Welded connections		Inlet a	
	PN	16	16
Center to face	[mm]	–	–
Height – H4	H max. [mm]	–	–
Height – H8 double piston design	H max. [mm]	–	–
Clamp connections		Inlet a	
	PN	16	16
Center to face	[mm]	29	44
Clamp diameter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

	13	25
	133	491
Outlet b		
	16	16
	81,5	91,5
	–	–
	–	–
Outlet b		
	16	16
	52	60
	For varying clamp diameters please refer to page 16 and 17	
	–	–
	–	–
Outlet b		
	16	16
	70	78
	–	–
	–	–
Outlet b		
	16	16
	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 ²]		0,206	0,761
Welded connections		Inlet a	
	PN	16	16
Center to face	[inch]	–	–
Height – H4	H max. [inch]	–	–
Height – H8 double piston design	H max. [inch]	–	–
Clamp connections		Inlet a	
	PN	16	16
Center to face	[inch]	1 ⁵ / ₃₂	1 ²³ / ₃₂
Clamp diameter	d_{inner} [inch]	For varying clamp diameters please refer to page 16 and 17	
	d_{outer} [inch]		
Height – H4	H max. [inch]	1 ⁵ / ₃₂	1 ²³ / ₃₂
Height – H8 double piston design	H max. [inch]	8 ¹ / ₈	11 ¹⁵ / ₁₆
Aseptic screwed connections		Inlet a	
	PN	16	16
Center to face	[inch]	1 ⁹ / ₁₆	1 ⁷ / ₈
Height – H4	H max. [inch]	8 ¹⁷ / ₃₂	11 ³¹ / ₃₂
Height – H8 double piston design	H max. [inch]	9 ²⁷ / ₃₂	12 ¹⁷ / ₃₂
Aseptic flange connections		Inlet a	
	PN	16	16
Center to face	[inch]	1 ²⁵ / ₃₂ (AN: 1 ⁵ / ₈)	2
Height – H4	H max. [inch]	8 ³ / ₄	12 ⁷ / ₃₂
Height – H8 double piston design	H max. [inch]	9 ²⁷ / ₃₂	12 ¹⁷ / ₃₂
Weight			
Weight	max. [lb]	3,527	8,157

	0,512	0,984
	0,206	0,761
Outlet b		
	16	16
	3 ⁷ / ₃₂	3 ¹⁹ / ₃₂
	–	–
	–	–
Outlet b		
	16	
	2 ¹ / ₁₆	2 ³ / ₈
	For varying clamp diameters please refer to page 16 and 17	
	–	–
	–	–
Outlet b		
	16	16
	2 ³ / ₄	3 ¹ / ₁₆
	–	–
	–	–
Outlet b		
	16	16
	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 ²]		133		491
Body material: 1.4435 (316L)				
Inlet	Pressure rating	For pressure ratings and connection size please refer to chapter dimensions and weights (page 36)		
Outlet	Pressure rating			
Minimum set pressure	p [bar] S/G/L	0,3		0,1
Maximum set pressure	p [bar] S/G/L	16		16
Temperature range¹⁾		Minimum	Maximum	Minimum
EPDM	[°C]	-45	+150	-45
FKM	[°C]	-18	+150	-18
FFKM	[°C]	0	+150	0

US Units

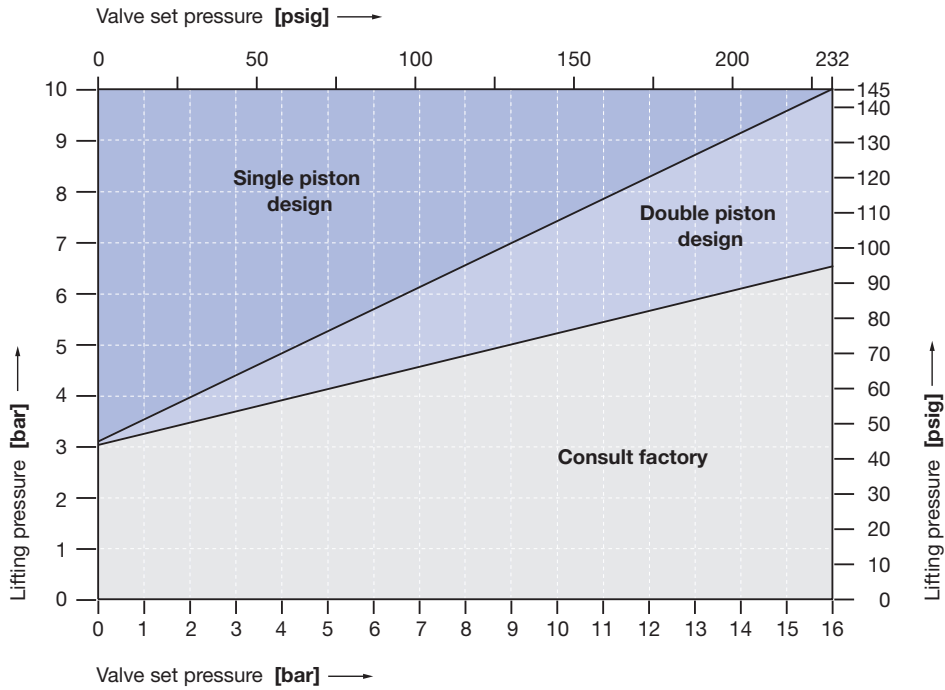
Actual Orifice diameter d_0 [inch]		0,512		0,984
Actual Orifice area A_0 [inch ²]		0,206		0,761
Body material: 1.4435 (316L)				
Inlet	Pressure rating	For pressure ratings and connection size please refer to chapter dimensions and weights (page 37)		
Outlet	Pressure rating			
Minimum set pressure	p [psig] S/G/L	4,4		1,5
Maximum set pressure	p [psig] S/G/L	232		232
Temperature range¹⁾		Minimum	Maximum	Minimum
EPDM	[°F]	-49	+302	-49
FKM	[°F]	-0,4	+302	-0,4
FFKM	[°F]	+32	+302	+32

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

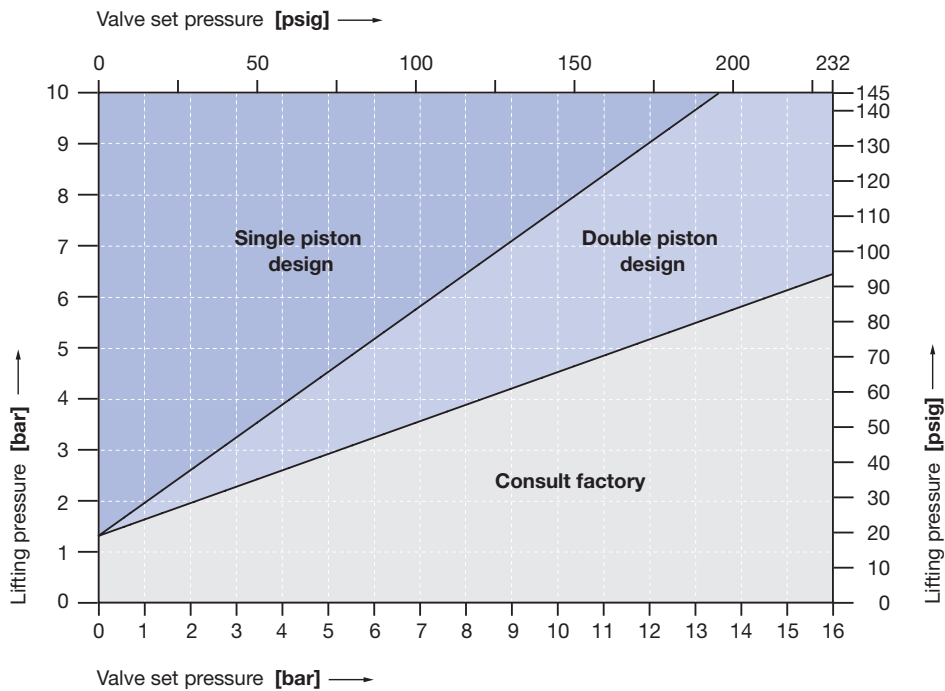
Type 483 Selection chart H8

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

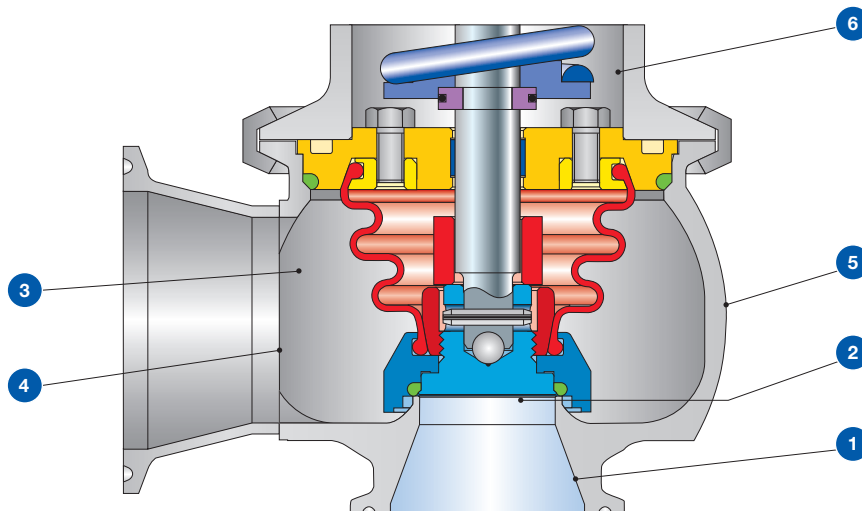


Type 483

Surface quality

LESER Surface package						
Type of surface	Area		Option code	Clean finish	HyClean finish	Sterile finish
	Description	No.		B53	B54	B55
				R _a max.	R _a max.	R _a 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

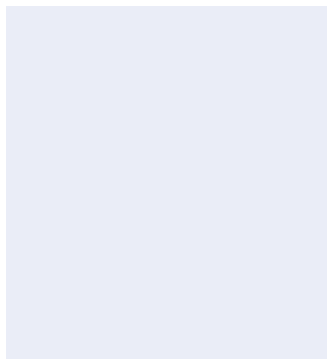
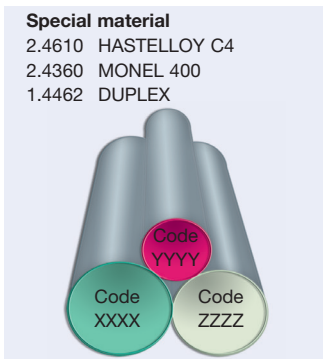
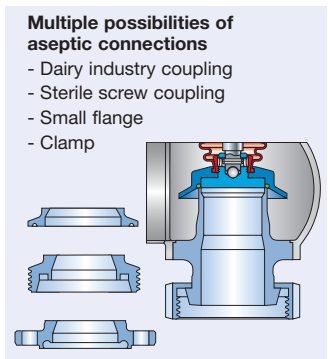
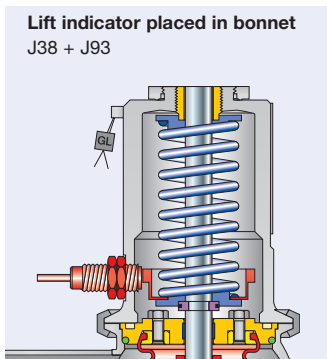
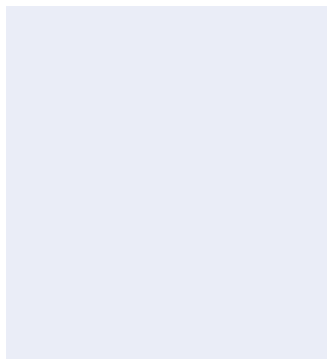
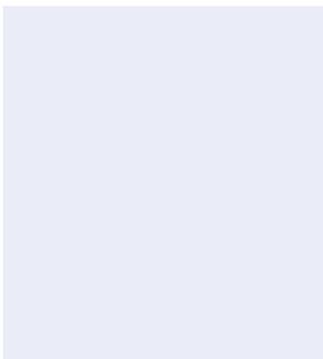
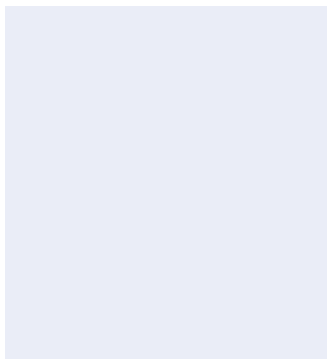
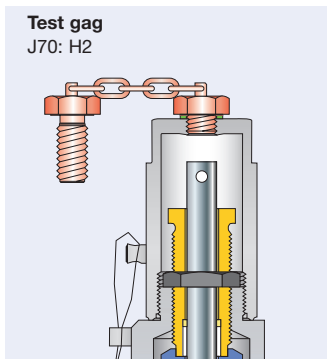
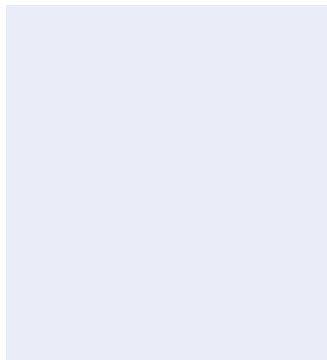
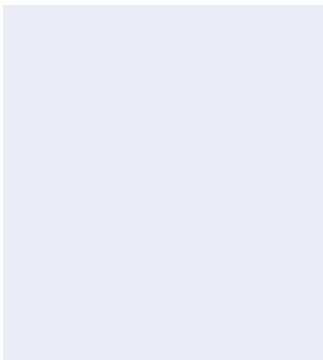
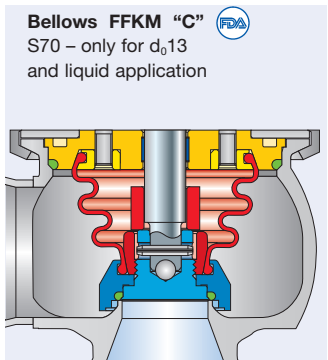
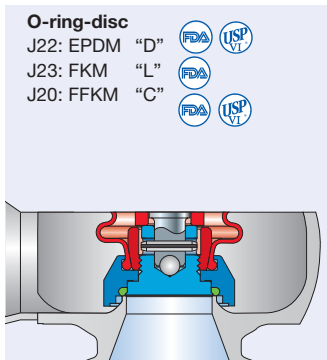
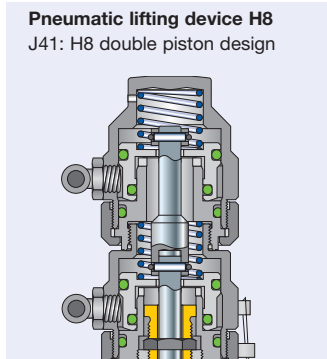
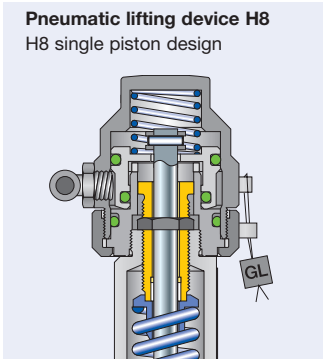
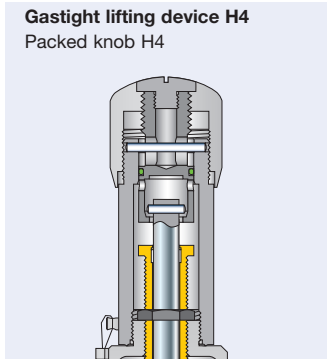
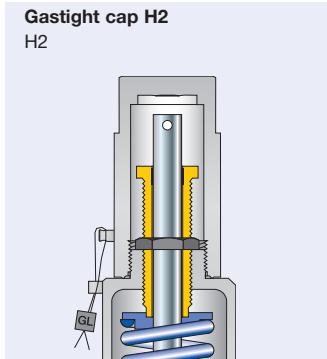
Actual Orifice diameter d_0 [mm]	13	25
Actual Orifice area A_0 [mm ²]	133	491
Actual Orifice diameter d_0 [inch]	0,512	0,984
Actual Orifice area A_0 [inch ²]	0,206	0,761
Europe Coefficient of discharge K_{dr}		
DIN EN ISO 4126-1, PED	Approval No.	07 202 0111 Z 0008/0/21-2
	S/G	0,6
	L	0,4
Germany Coefficient of discharge C_{Lw}		
AD 2000-Merkblatt A2, PED	Approval No.	TÜV SV 1047
	S/G	0,6
	L	0,4
United States Coefficient of discharge K		
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 $\sqrt{\text{psid}^*)} \triangle K \approx 0,258$
Canada Coefficient of discharge K		
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 $\sqrt{\text{psid}^*)} \triangle K \approx 0,258$
China Coefficient of discharge C_{Lw}		
AQSIQ	Approval No.	For current approval no. see www.leser.com
	S/G	0,6
	L	0,4
Eurasian Custom Union Coefficient of discharge C_{Lw}		
EAC	Approval No.	For current approval no. see www.leser.com
	S/G	0,6
	L	0,4
Classification societies		
		on request

^{*)} psid = Differential pressure P-P_d
P = absolute flow pressure [psia]
P_d = pressure at discharge from valve [psia]

Type 483

Available options

Type 483



Type 488 Safety Relief Valves – spring loaded

Contents	Page
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• Article numbers	46
• Available connections	47
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• Metric Units	48, 50
• US Units	49, 51
Pressure temperature ratings	
• Metric Units + US Units	52
Selection chart H8	53
Surface quality	56
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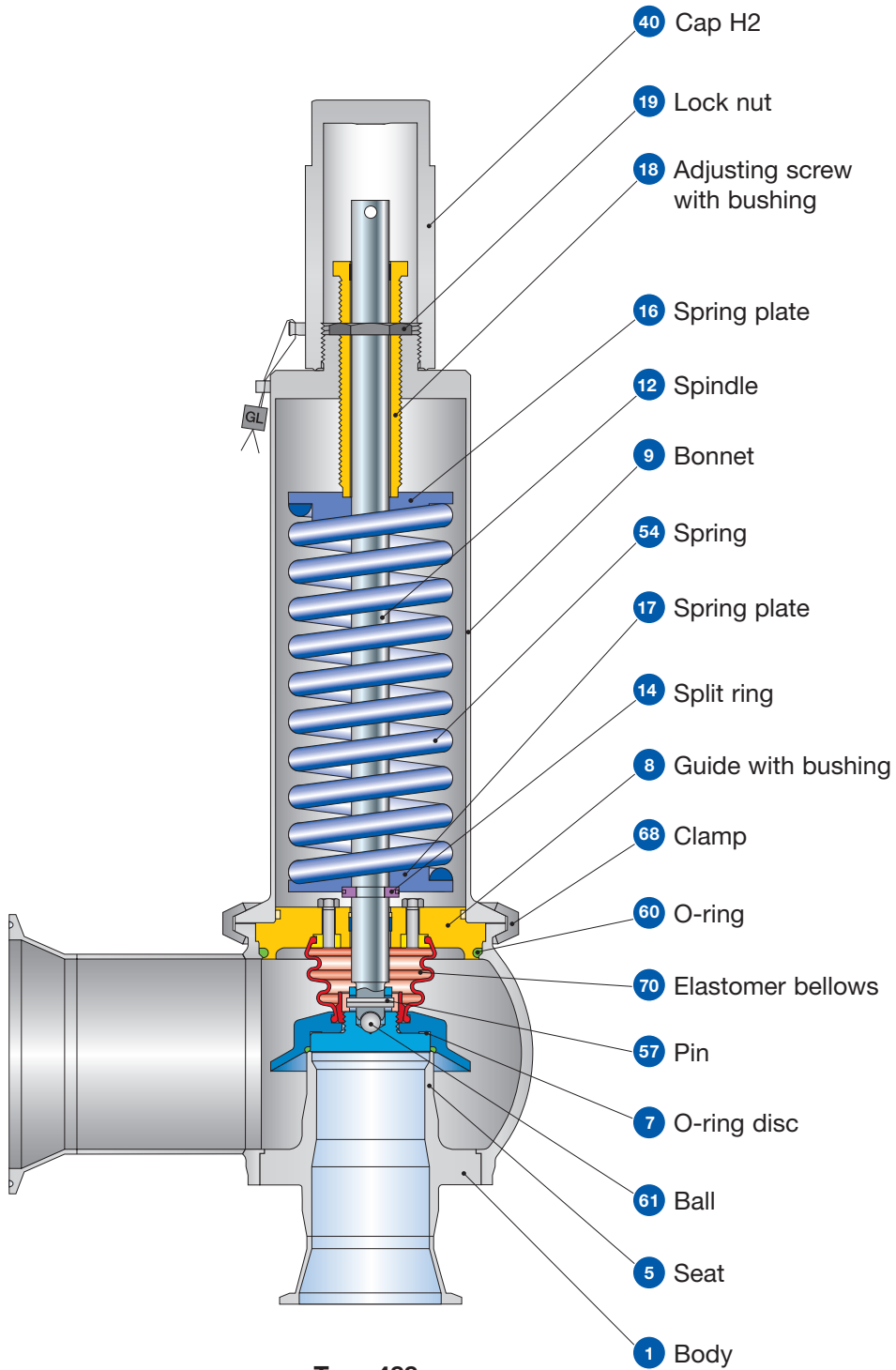


**Type 488
Cap H2**
Inlet and outlet: Clamp connection







**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 ²]	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 ²]	0,644	1,667	2,576	4,383	6,666	10,304		
O-ring material			EPDM	"D"	J22			
			CR	"K"	J21			
			FKM	"L"	J23			
			FFKM	"C"	J20			
Body material: 1.4404 (316L)				HyTight				
Bonnet closed	H2	Art. No. 4884.	8842	8852	8862	8872	8882	8892
	H4	Art. No. 4884.	8844	8854	8864	8874	8884	8894
	H8	Art. No. 4884.	8848	8858	8868	8878	8888	8898
		p [bar] S/G/L	0,1 – 16	0,1 – 16	0,2 – 15	0,1 – 10,34	0,1 – 10,34	0,1 – 8,2
		p [psig] S/G/L	1,5 – 232	1,5 – 232	3 – 217,56	1,5 – 150	1,5 – 150	1,5 – 118,9

Type 488

Available connections

	d ₀ [mm]	23	37	46	60	74	92	
	A ₀ [mm ²]	416	1057	1662	2827	4301	6648	
Clamps								
		Option code inlet						
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							
Aseptic screwed connection								
		Option code inlet						
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						
Flanged connection								
		Option code inlet						
DN	25	40	50	65	80	100		
FD	I71							
NPS	1"	1 1/2"	2"	2 1/2"	3"	4"		
FA	L94							
Aseptic flanged connection								
		Option code inlet						
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 ₀ [mm]	23	37	46	60	74	92
	A ₀ [mm ²]	416	1057	1662	2827	4301	6648
Clamps							
		Option code outlet					
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						
Aseptic screwed connection							
		Option code outlet					
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						-
Flanged connection							
		Option code outlet					
DN	40	65	80	100	125	150	
FD	I72						
NPS	1 1/2"	2 1/2"	3"	4"	5"	6"	
FA	L95						
Aseptic flanged connection							
		Option code outlet					
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						-

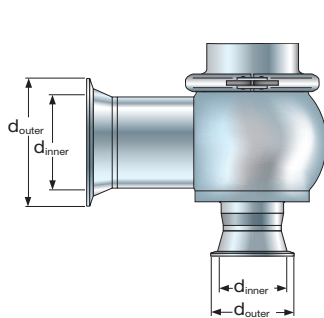
For definitions of connection codes please refer to pages 12 up to 15.

¹⁾ Please select CO-Clamp

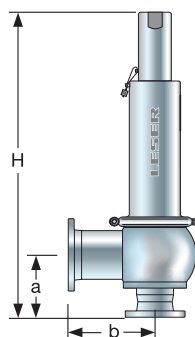
Type 488

Dimensions and weights

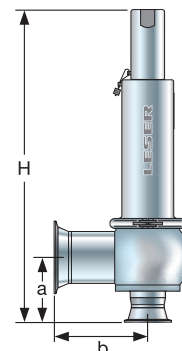
Metric Units



Clamp diameters



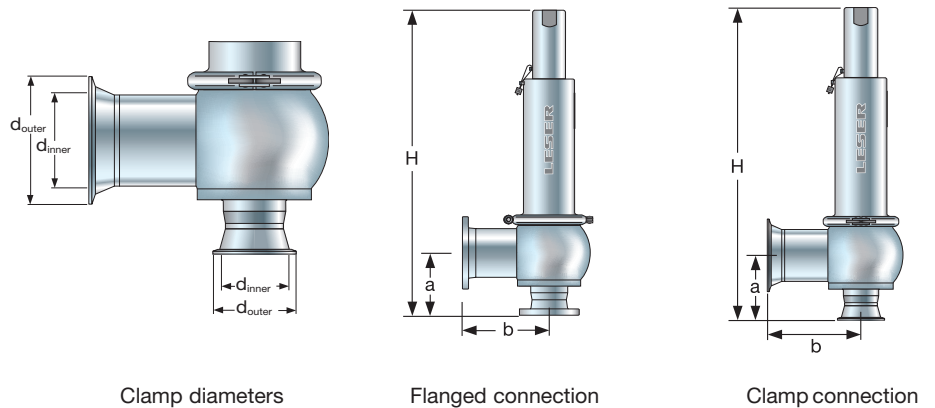
Flanged connection



Clamp connection

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

Type 488
Dimensions and weights
US Units

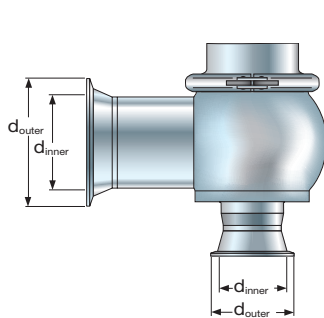


Actual Orifice diameter d ₀ [inch]		0,906	1,457	1,811	2,362	2,913	3,622	0,906	1,457	1,811	2,362	2,913	3,622
Actual Orifice area A ₀ [inch ²]		0,644	1,67	2,576	4,38	6,666	10,30	0,644	1,67	2,576	4,38	6,666	10,30
Welded connections		Inlet a						Outlet b					
	PN	16	16	16	16	16	16	16	16	16	16	16	16
Center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

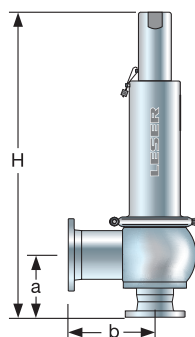
Type 488

Dimensions and weights

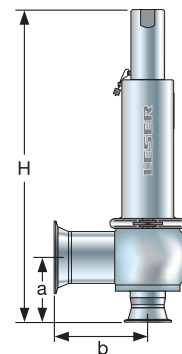
Metric Units



Clamp diameters



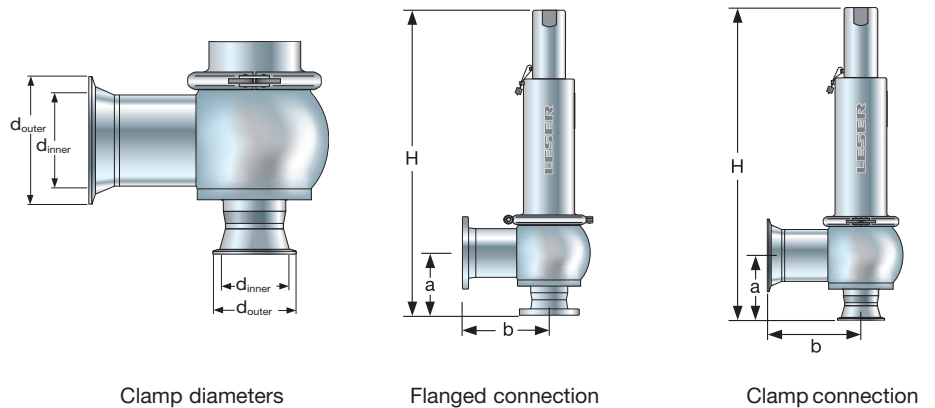
Flanged connection



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 ²]		416	1075	1662	2827	4301	6648	416	1075	1662	2827	4301	6648
DIN / ASME Flange		Inlet a						Outlet b					
	PN	16	16	16	16	16	16	16	16	16	16	16	16
Center to face	[mm]	91	112	123	132	153	173	132	170	175	177	179	184
Height – H4	H max. [mm]	348	529	547	566	675	714	348	529	547	566	675	714
Height – H8 double piston design	H max. [mm]	356	556	574	593	737	776	356	556	574	593	737	776
APV Flange		Inlet a						Outlet b					
	PN	10	10	10	10	10	10	10	10	10	10	10	10
Center to face	[mm]	77	94	102	111	127	145	114	149	149	149	177	–
Height – H4	H max. [mm]	334	511	526	545	649	686	334	511	526	545	649	686
Height – H8 double piston design	H max. [mm]	342	538	553	572	711	748	342	538	553	572	711	748
Tuchenhagen Varivent Connections		Inlet a						Outlet b					
	PN	10	10	10	10	10	10	–	–	–	–	–	–
Center to face	[mm]	90	107	115	124	140	158	–	–	–	–	–	–
Height – H4	H max. [mm]	347	524	539	558	662	699	347	524	539	558	662	699
Height – H8 double piston design	H max. [mm]	355	551	566	585	724	761	355	551	566	585	724	761
Weight													
Weight	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 ²]		416	1075	1662	2827	4301	6648	416	1075	1662	2827	4301	6648
DIN / ASME Flange		Inlet a						Outlet b					
	PN	16	16	16	16	16	16	16	16	16	16	16	16
Center to face	[inch]	3 ⁹ / ₁₆	4 ⁷ / ₁₆	4 ¹³ / ₁₆	5 ³ / ₁₆	6	6 ¹³ / ₁₆	5 ³ / ₁₆	6 ¹¹ / ₁₆	6 ⁷ / ₈	6 ¹⁵ / ₁₆	7 ¹ / ₁₆	7 ¹ / ₄
Height – H4	H max. [inch]	13 ¹¹ / ₁₆	20 ¹³ / ₁₆	21 ⁹ / ₁₆	22 ⁵ / ₁₆	26 ⁹ / ₁₆	28 ¹ / ₈	13 ¹¹ / ₁₆	20 ¹³ / ₁₆	21 ⁹ / ₁₆	22 ⁵ / ₁₆	26 ⁹ / ₁₆	28 ¹ / ₈
Height – H8 double piston design	H max. [inch]	14	21 ⁷ / ₈	22 ⁵ / ₈	23 ³ / ₈	29	30 ⁹ / ₁₆	14	21 ⁷ / ₈	22 ⁵ / ₈	23 ³ / ₈	29	30 ⁹ / ₁₆
APV Flange		Inlet a						Outlet b					
	PN	10	10	10	10	10	10	10	10	10	10	10	10
Center to face	[inch]	13 ¹ / ₁₆	13 ¹¹ / ₁₆	4	4 ³ / ₈	5	5 ¹¹ / ₁₆	4 ¹ / ₂	5 ⁷ / ₈	5 ⁷ / ₈	5 ⁷ / ₈	6 ¹⁵ / ₁₆	–
Height – H4	H max. [inch]	13 ¹ / ₈	20 ¹ / ₈	20 ¹¹ / ₁₆	21 ⁷ / ₁₆	25 ⁹ / ₁₆	27	13 ¹ / ₈	20 ¹ / ₈	20 ¹¹ / ₁₆	21 ⁷ / ₁₆	25 ⁹ / ₁₆	27
Height – H8 double piston design	H max. [inch]	13 ⁷ / ₈	21 ³ / ₁₆	21 ³ / ₄	22 ¹ / ₂	28	29 ⁷ / ₁₆	13 ⁷ / ₈	21 ³ / ₁₆	21 ³ / ₄	22 ¹ / ₂	28	29 ⁷ / ₁₆
Tuchenhagen Varivent Connections		Inlet a						Outlet b					
	PN	10	10	10	10	10	10	–	–	–	–	–	–
Center to face	[inch]	3 ⁹ / ₁₆	4 ³ / ₁₆	4 ¹ / ₂	4 ⁷ / ₈	5 ¹ / ₂	6 ¹ / ₄	–	–	–	–	–	–
Height – H4	H max. [inch]	13 ¹¹ / ₁₆	20 ⁵ / ₈	21 ¹ / ₄	21 ¹⁵ / ₁₆	26 ¹ / ₁₆	27 ¹ / ₂	13 ¹¹ / ₁₆	20 ⁵ / ₈	21 ¹ / ₄	21 ¹⁵ / ₁₆	26 ¹ / ₁₆	27 ¹ / ₂
Height – H8 double piston design	H max. [inch]	14	21 ¹¹ / ₁₆	22 ⁵ / ₁₆	23 ¹ / ₁₆	28 ¹ / ₂	29 ¹⁵ / ₁₆	14	21 ¹¹ / ₁₆	22 ⁵ / ₁₆	23 ¹ / ₁₆	28 ¹ / ₂	29 ¹⁵ / ₁₆
Weight													
Weight	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 ²]		416	1075	1662	2827	4301	6648
Body material: 1.4404 (316L)							
Inlet / Outlet	Pressure rating	For pressure ratings and connection size please refer to chapter dimensions and weights (page 48/50)					
Minimum set pressure¹⁾	p [bar] S/G/L	0,1	0,1	0,2	0,1	0,1	0,1
Maximum set pressure	p [bar] S/G/L	16	16	15	10,34	10,34	8,2
Temperature range²⁾				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 ²]		0,644	1,667	2,576	4,383	6,666	10,304
Body material: 1.4404 (316L)							
Inlet / Outlet	Pressure rating	For pressure ratings and connection size please refer to chapter dimensions and weights (page 49/51)					
Minimum set pressure¹⁾	p [psig] S/G/L	1,5	1,5	3	1,5	1,5	1,5
Maximum set pressure	p [psig] S/G/L	232	232	217,56	150	150	118,9
Temperature range²⁾				Min.	Max.		
EPDM	[°F]			-49	+302		
CR	[°F]			-40	+212		
FKM	[°F]			-0,4	+302		
FFKM	[°F]			+32	+302		

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

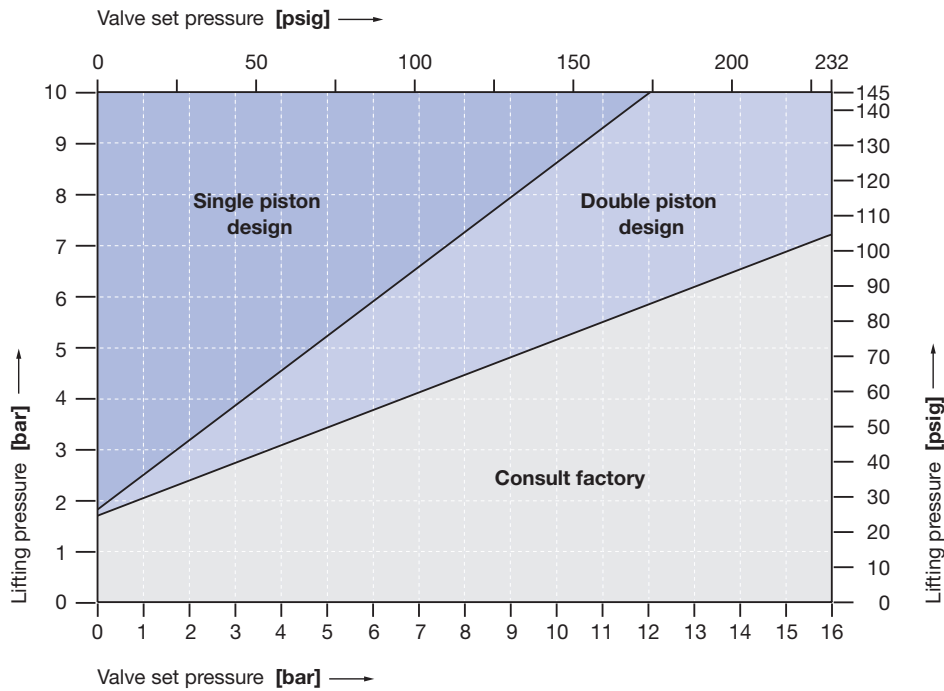
For liquides starting from 1 bar (15 psig) the safety valve is certified acc. to ASME Code Sec. VIII, Div. 1.

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

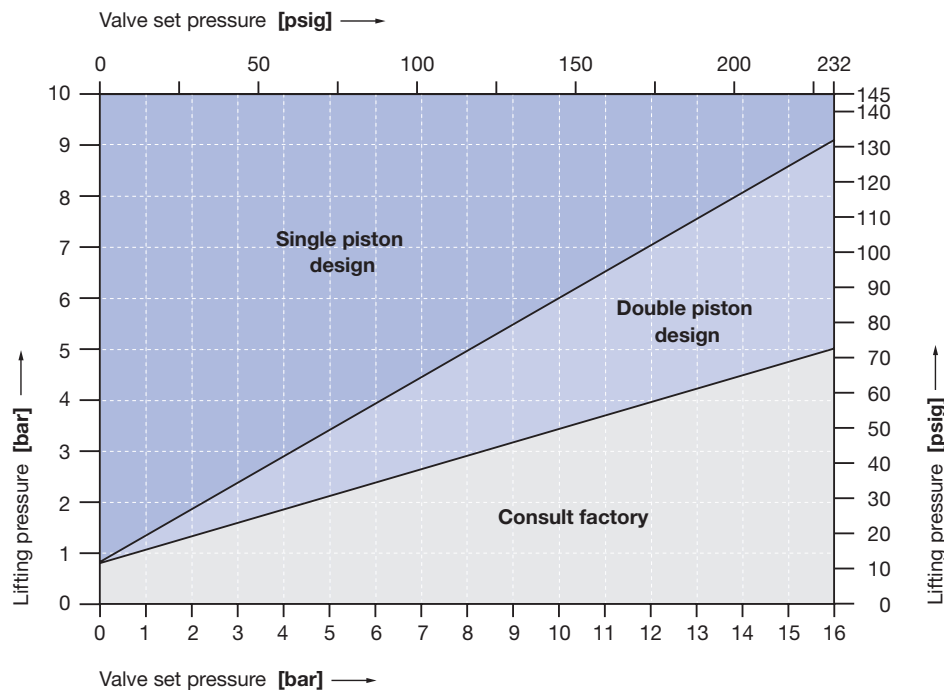
Type 488 Selection chart H8

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



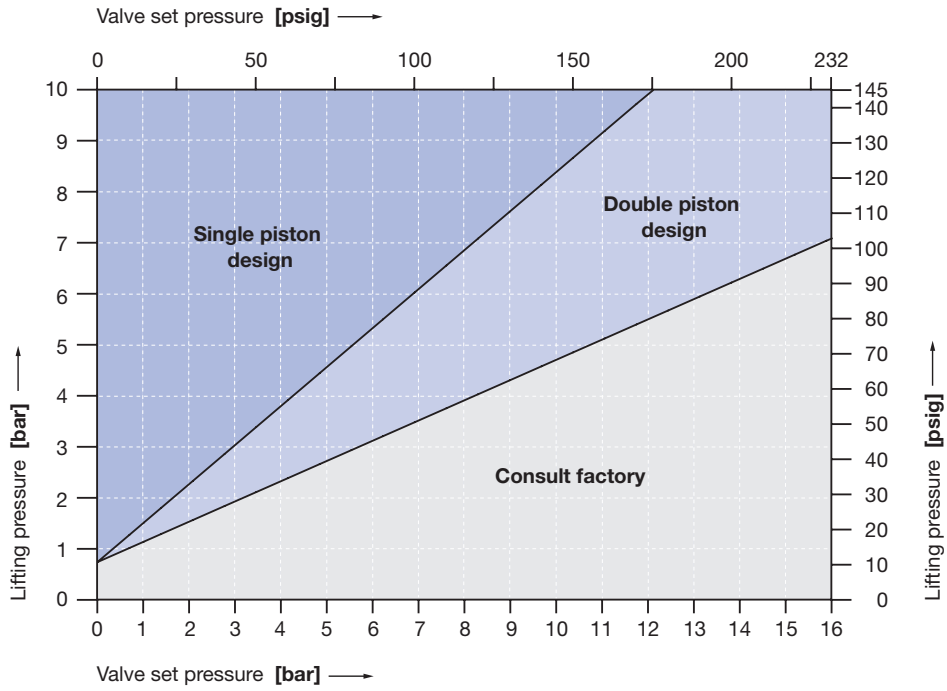
Selection chart lifting device H8, size II. d_0 37 mm / 1,457 inch



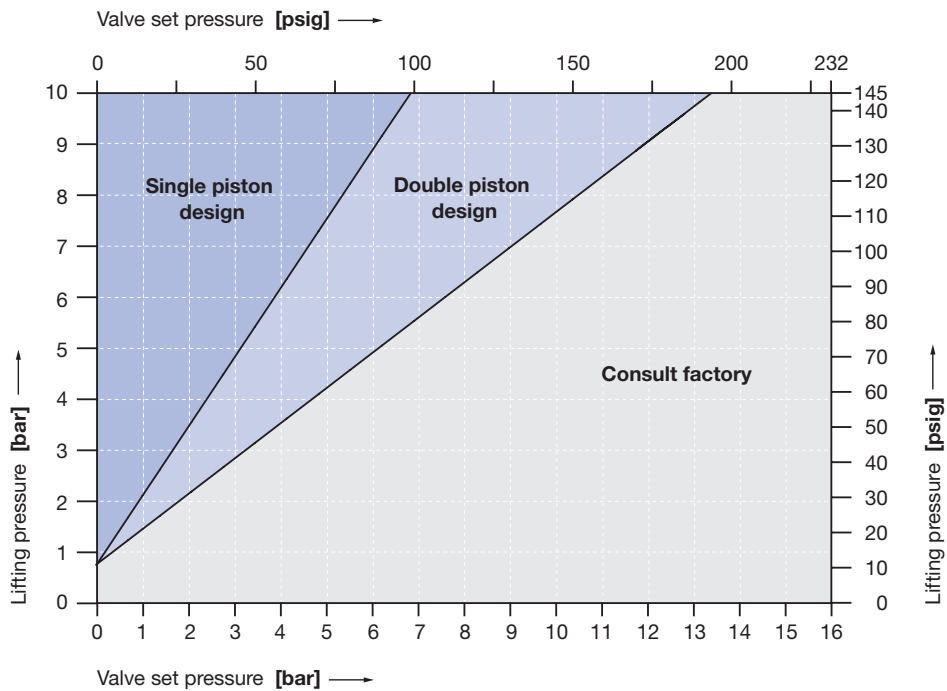
Type 488

Selection chart H8

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

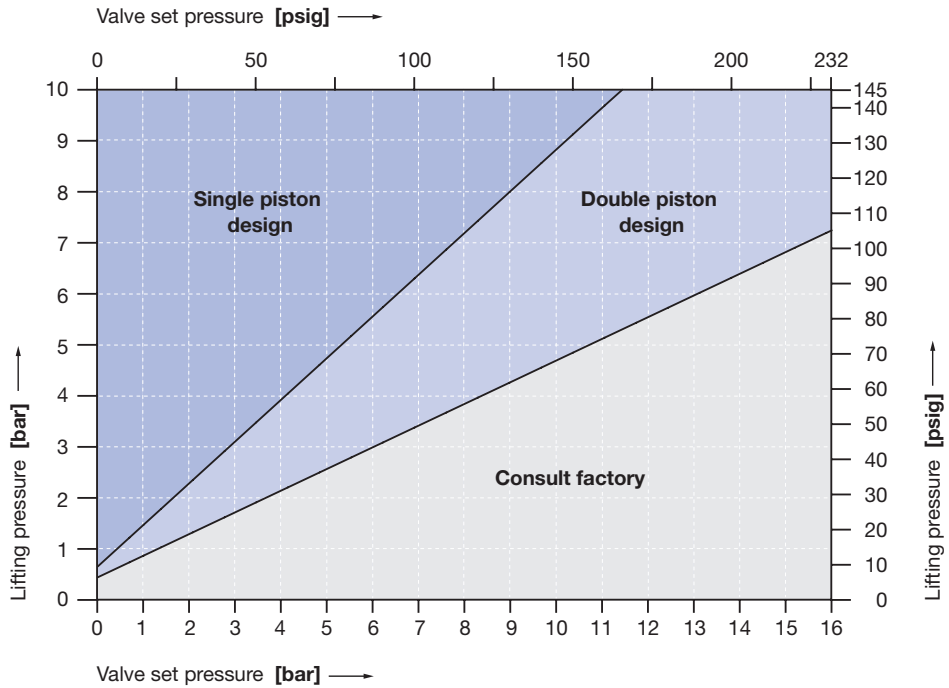


Selection chart lifting device H8, size II. d_0 60 mm / 2,362 inch

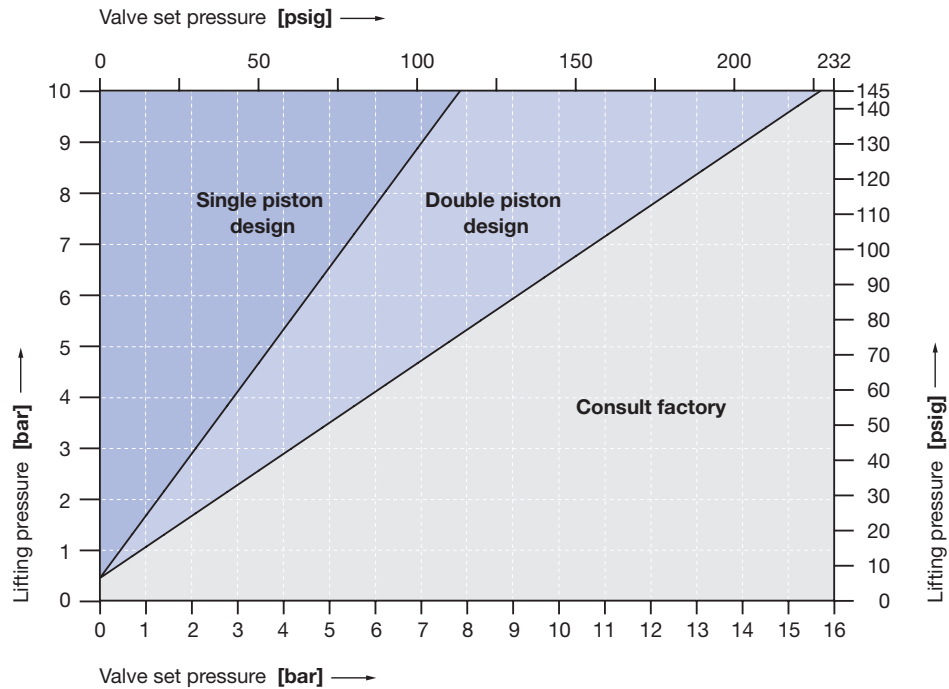


Type 488
Selection chart H8

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

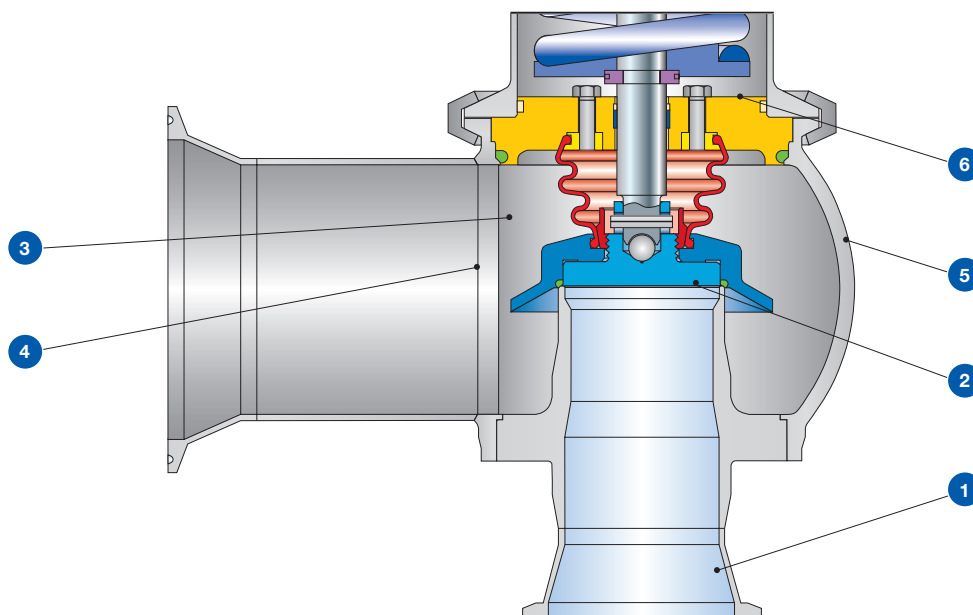


Type 488

Surface quality

Type of surface	Area		Option code	LESER Surface package		
				Clean finish	HyClean finish	Sterile finish
	Description	No.		B68	B69	B70
				R _a max.	R _a max.	R _a max.
LESER Surface grade						
Product contact surface	Inlet	1		M4	ME4	ME1
			[μm]	0,750	0,750	0,375
			[μinch]	30	30	15
	Bottom side of disc	2		M4	ME4	ME1
[μm]			0,750	0,750	0,375	
			[μinch]	30	30	15
Blow off surface	Inside surface of outlet area	3		M5	ME5	ME4
			[μm]	1,500	1,500	0,750
			[μinch]	60	60	30
	Welding seam	4		M6	ME6	ME6
[μm]			3,000	3,000	3,000	
			[μinch]	120	120	120
Outer surface	Outside surface of body, bonnet and cap/lifting device	5		M5	ME5	ME5
			[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		No definition		

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



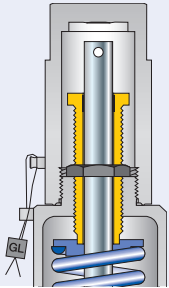
Type 488 Approvals

Actual Orifice diameter d_0 [mm]	23	37	46	60	74	92
Actual Orifice area A_0 [mm ²]	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 ²]	0,644	1,667	2,576	4,383	6,666	10,304
Europe		Coefficient of discharge K_{dr}				
DIN EN ISO 4126-1, PED	Approval No.	07 202 0111 Z 0008/0/25				
	S/G	0,7				
	L	0,45				
Germany		Coefficient of discharge α_w				
AD 2000-Merkblatt A2, PED	Approval No.	TÜV SV 1047				
	S/G	0,7				
	L	0,45				
United States		Coefficient of discharge K				
ASME Sec. VIII	Approval No.	M37022 (1,37 – 16 bar)				
	S/G	0,721				
	Approval No.	M37033 (1 – 16 bar)				
	L	0,472				
Canada		Coefficient of discharge K				
CRN	Approval No.	OG0772.9C				
	S/G	0,721				
	L	0,472				
China		Coefficient of discharge α_w				
AQSIQ	Approval No.	For current approval no. see www.leser.com				
	S/G	0,7				
	L	0,45				
Eurasian Custom Union		Coefficient of discharge α_w				
EAC	Approval No.	For current approval no. see www.leser.com				
	S/G	0,7				
	L	0,45				
Classification societies		on request				

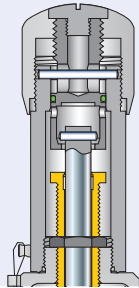
Type 488

Available options

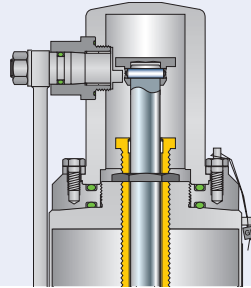
Gastight cap H2
H2



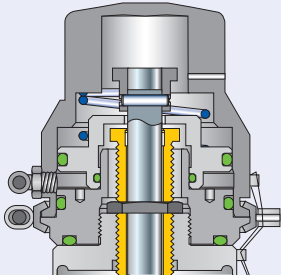
Gastight lifting device H4
Packed knob H4 (d₀ 23 only)



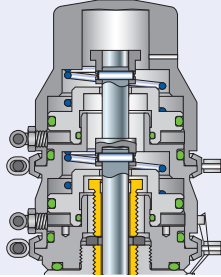
Packed lever H4
(for d₀ > 23)








Pneumatic lifting device H8
H8 single piston design

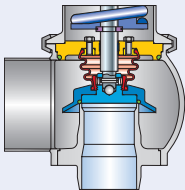


Pneumatic lifting device H8
J41: H8 double piston design

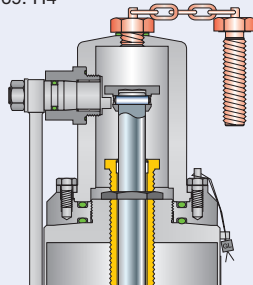


HyTight Assembly

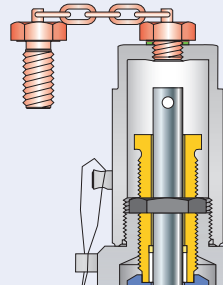
- J22: EPDM "D"  
- J21: CR "K" 
- J23: FKM "L" 
- J20: FFKM "C" 



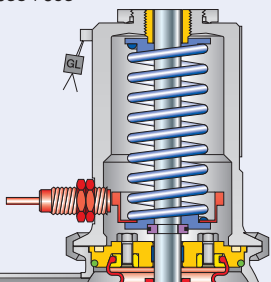
Test gag
(for d₀ > 23)
J69: H4



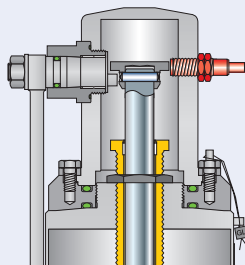
Test gag
(for d₀ > 23)
J70: H2



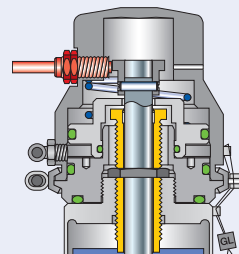
Lift indicator bonnet
(d₀ 23 only)
J38 + J93



Lift indicator H4
(for d₀ > 23)
J39 + J93

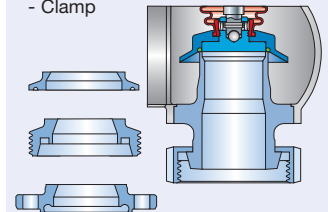


Lift indicator H8
(for d₀ > 23)
J40 + J93



Multiple possibilities of aseptic connections

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



Type 484 Safety Relief Valves – spring loaded

Contents	Page
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• Metric Units	64
• US Units	65
Pressure temperature ratings	
• Metric Units + US Units	66
Selection chart H8	67
Surface quality	68
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**Type 484
Cap H2**
Inlet: Vessel connection Type 5034
Outlet: Welded end connection

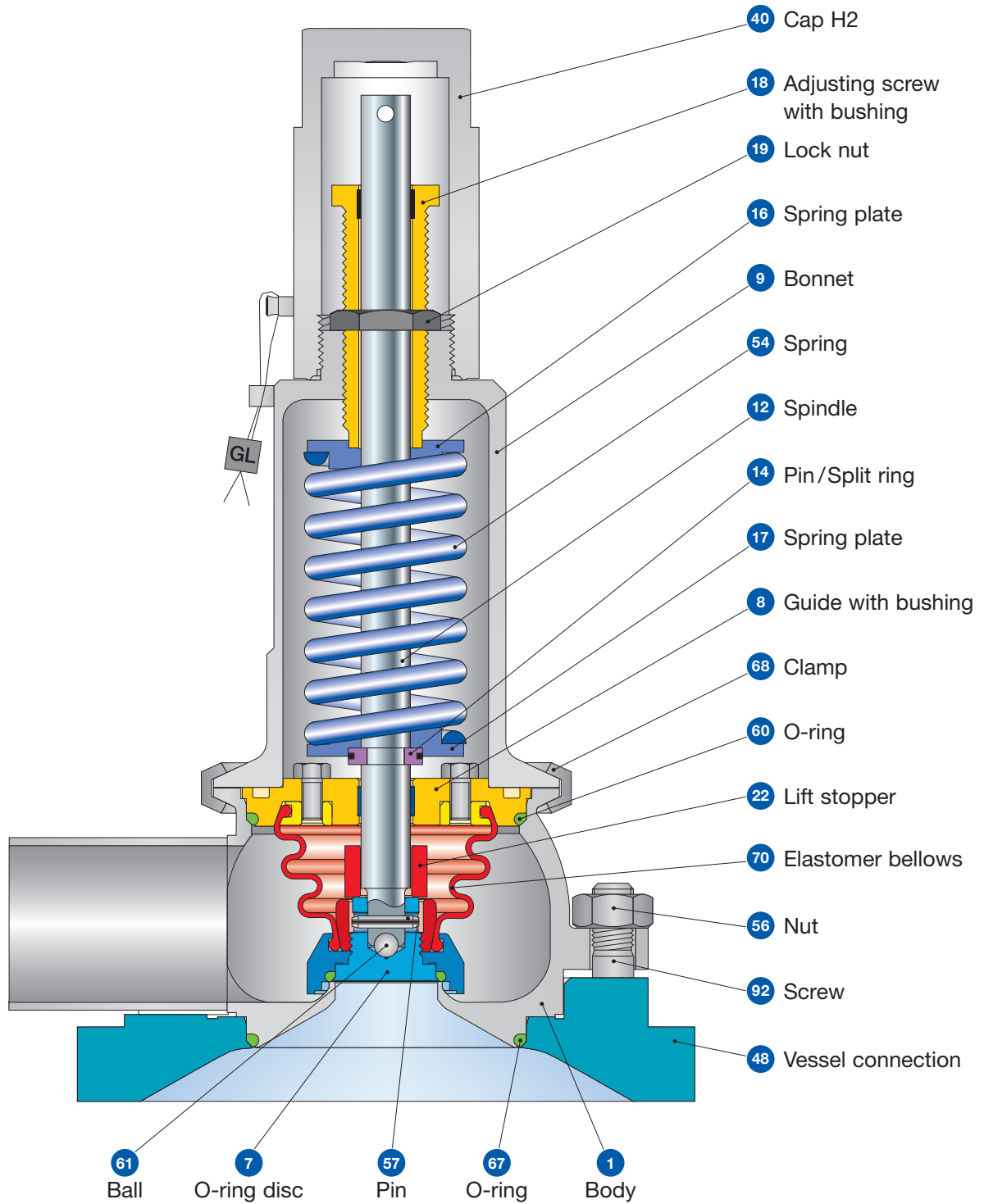


**Type 484
Packed knob H4**
Inlet: Vessel connection Type 5034
Outlet: Welded end connection









Type 5034
Vessel connection

Type 484
HyTight Assembly



Type 484 HyTight
 Cap H2
 Inlet: Vessel connection Type 5034
 Outlet: Welded end connection

Type 484
HyTight Assembly
Materials

Item	Component	Remarks	Type 4844 HyTight
1	Body		1.4435 (BN 2) ¹⁾
			SA 479 316L
7	O-ring disc	HyTight Assembly	1.4435 316L
7.4	Soft seal O-ring	“D” 	EPDM
		“L” 	FKM ²⁾
		“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
Vessel connection Type 5034			
48	Vessel connection		1.4435 (BN 2) ¹⁾
			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

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

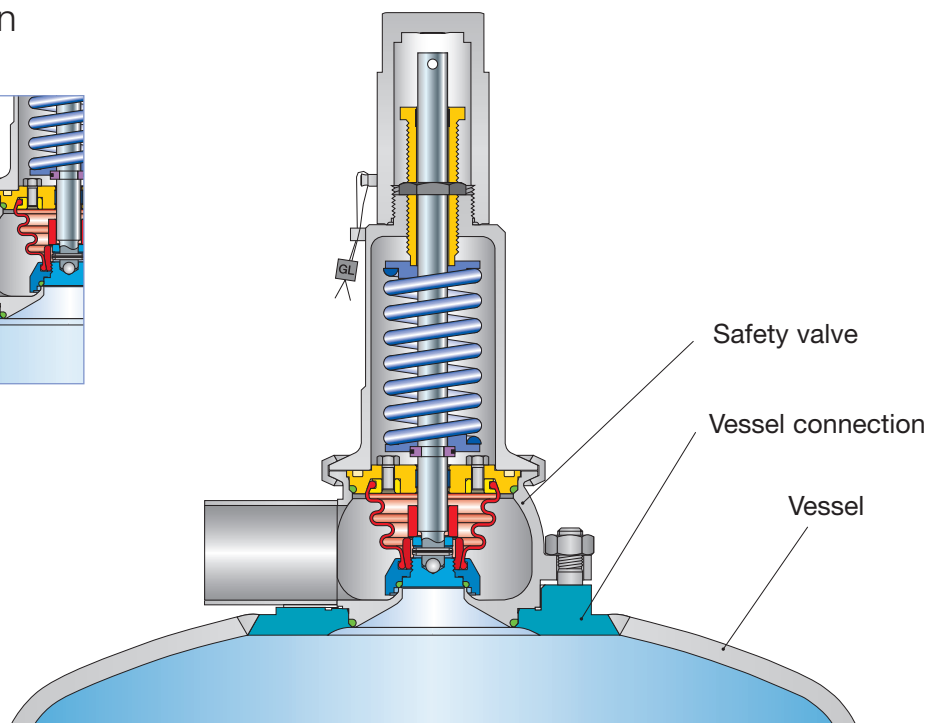
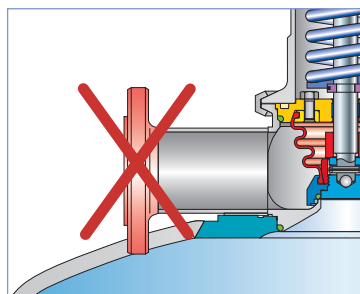
Type 484

Article numbers

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

¹⁾ 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

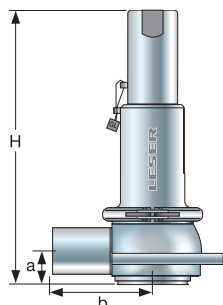
Clamps		Option code inlet		Clamps		Option code outlet	
<p>For inlet please select vessel connection Type 5034 as shown on page 62. For connections directly machined into vessel wall please ask for drawing.</p>				d_o [mm]	13	25	
				A_o [mm ²]	133	491	
Aseptic screwed connection		Option code inlet		Aseptic 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.

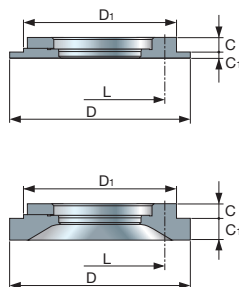
Type 484

Dimensions and weights

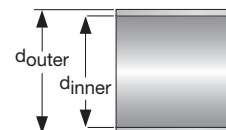
Metric Units



Type 484 – Cap H2



Type 5034 – Vessel connection

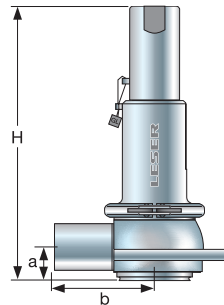


Tube end

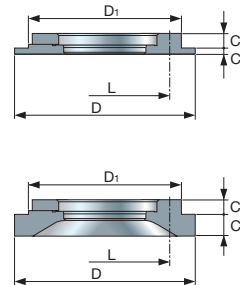
Actual Orifice diameter d_0 [mm]		13		25	
Actual Orifice area A_0 [mm ²]		133		491	
Vessel connections					
Vessel wall thickness				Vessel wall thickness	
		≤ 5 mm	> 5 mm	≤ 5 mm	> 5 mm
PN		16	16	16	16
Flange thickness	C [mm]	12,0	12,0	12,0	12,0
	C_1 [mm]	5,0	18,0	5,0	18,0
Diameter	D [mm]	130,0	130,0	150,0	150,0
	D_1 [mm]	110,0	110,0	127,0	127,0
Bolt circle	L [mm]	90,0	90,0	110,0	110,0
Welded connections		Inlet a¹⁾	Outlet b	Inlet a¹⁾	Outlet b
PN		16	16	16	16
Center to face	[mm]	24	80	30	90
Height – H4	H max. [mm]	201		289	
Height – H8 double piston design	H max. [mm]	229		296	
Clamp connections		Inlet a¹⁾	Outlet b	Inlet a¹⁾	Outlet b
PN		16	16	16	16
Center to face	[mm]	24	102	30	112
Clamp diameter	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			
Height – H4	H max. [mm]	201		289	
Height – H8 double piston design	H max. [mm]	229		296	
Threaded connections		Inlet a¹⁾	Outlet b	Inlet a¹⁾	Outlet b
PN		16	16	16	16
Center to face	[mm]	24	120	30	130
Height – H4	H max. [mm]	201		289	
Height – H8 double piston design	H max. [mm]	229		296	
Flanged connections		Inlet a¹⁾	Outlet b	Inlet a¹⁾	Outlet b
PN		16	16	16	16
Center to face	[mm]	24	126	30	134
Height – H4	H max. [mm]	201		289	
Height – H8 double piston design	H max. [mm]	229		296	
Weight					
Weight	max. [kg]	3,0		4,0	

¹⁾ without vessel connection

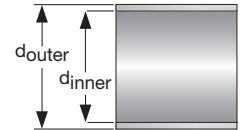
Type 484
Dimensions and weights
US Units



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 ²]		0,206		0,761	
Vessel connections			Vessel wall thickness		
			$\leq 13/64$ inch	$> 13/64$ inch	
PN			16	16	
Flange thickness	C	[inch]	$15/32$	$15/32$	
	C ₁	[inch]	$11/16$	$23/32$	
Diameter	D	[inch]	$5 \frac{1}{8}$	$5 \frac{1}{8}$	
	D ₁	[inch]	$4 \frac{11}{32}$	$4 \frac{11}{32}$	
Bolt circle	L	[inch]	$3 \frac{17}{32}$	$3 \frac{17}{32}$	
Welded connections			Inlet a¹⁾	Outlet b	
PN			16	16	
Center to face		[inch]	$15/16$	$3 \frac{5}{32}$	
Height – H4	H max.	[inch]	$7 \frac{29}{32}$		$11 \frac{3}{8}$
Height – H8 double piston design	H max.	[inch]	9		$11 \frac{5}{32}$
Clamp connections			Inlet a¹⁾	Outlet b	
PN			16	16	
Center to face		[inch]	$15/16$	4	$1 \frac{3}{16}$
Clamp diameter	d _{inner}	[inch]	For varying clamp diameters please refer to page 16 and 17		For varying clamp diameters please refer to page 16 and 17
	d _{outer}	[inch]			
Height – H4	H max.	[inch]	$7 \frac{29}{32}$		$11 \frac{3}{8}$
Height – H8 double piston design	H max.	[inch]	9		$11 \frac{5}{32}$
Threaded connections			Inlet a¹⁾	Outlet b	
PN			16	16	
Center to face		[inch]	$15/16$	$4 \frac{23}{32}$	$1 \frac{3}{16}$
Height – H4	H max.	[inch]	$7 \frac{29}{32}$		$11 \frac{3}{8}$
Height – H8 double piston design	H max.	[inch]	9		$11 \frac{5}{32}$
Flanged connections			Inlet a¹⁾	Outlet b	
PN			16	16	
Center to face		[inch]	$15/16$	$4 \frac{15}{16}$	$1 \frac{3}{16}$
Height – H4	H max.	[inch]	$7 \frac{29}{32}$		$11 \frac{3}{8}$
Height – H8 double piston design	H max.	[inch]	9		$11 \frac{5}{32}$
Weight					
Weight	max.	[lb]	6,6		8,8

¹⁾ without vessel connection

Type 484

Pressure temperature ratings

Metric Units

Actual Orifice diameter d_0 [mm]	13		25		
Actual Orifice area A_0 [mm ²]	133		491		
Body material: 1.4435 (316L)					
Minimum set pressure	p [bar] S/G/L	0,3		0,1	
Maximum set pressure	p [bar] S/G/L	16		16	
Temperature range¹⁾		Minimum	Maximum	Minimum	Maximum
EPDM	[°C]	-45	+150	-45	+150
FKM	[°C]	-18	+150	-18	+150
FFKM	[°C]	0	+150	0	+150

US Units

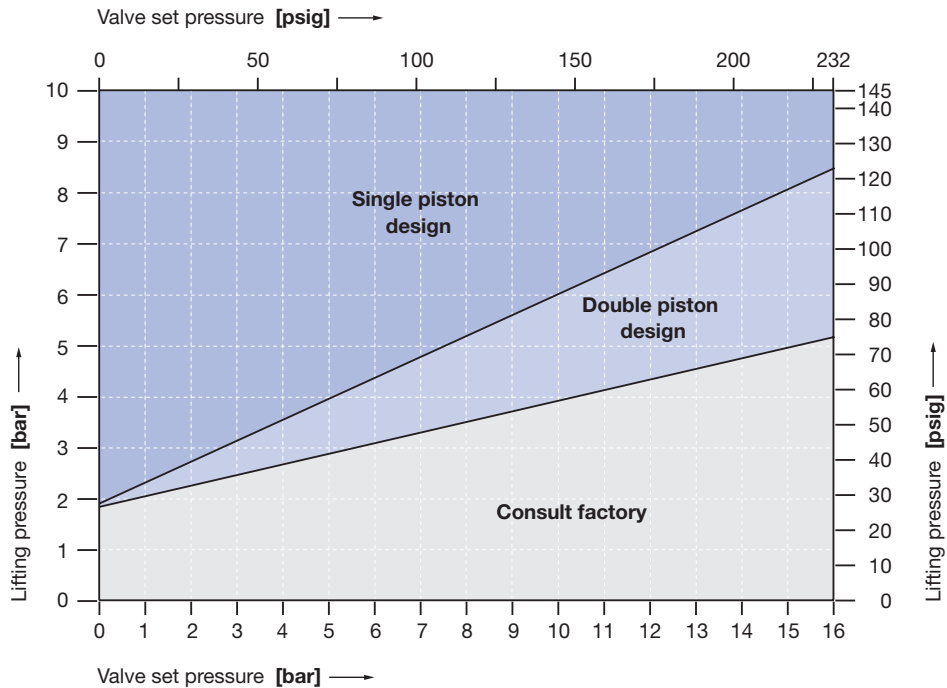
Actual Orifice diameter d_0 [inch]	0,512		0,984		
Actual Orifice area A_0 [inch ²]	0,206		0,761		
Body material: 1.4435 (316L)					
Minimum set pressure	p [psig] S/G/L	4,4		1,5	
Maximum set pressure	p [psig] S/G/L	232		232	
Temperature range¹⁾		Minimum	Maximum	Minimum	Maximum
EPDM	[°F]	-49	+302	-49	+302
FKM	[°F]	-0,4	+302	-0,4	+302
FFKM	[°F]	+32	+302	+32	+302

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

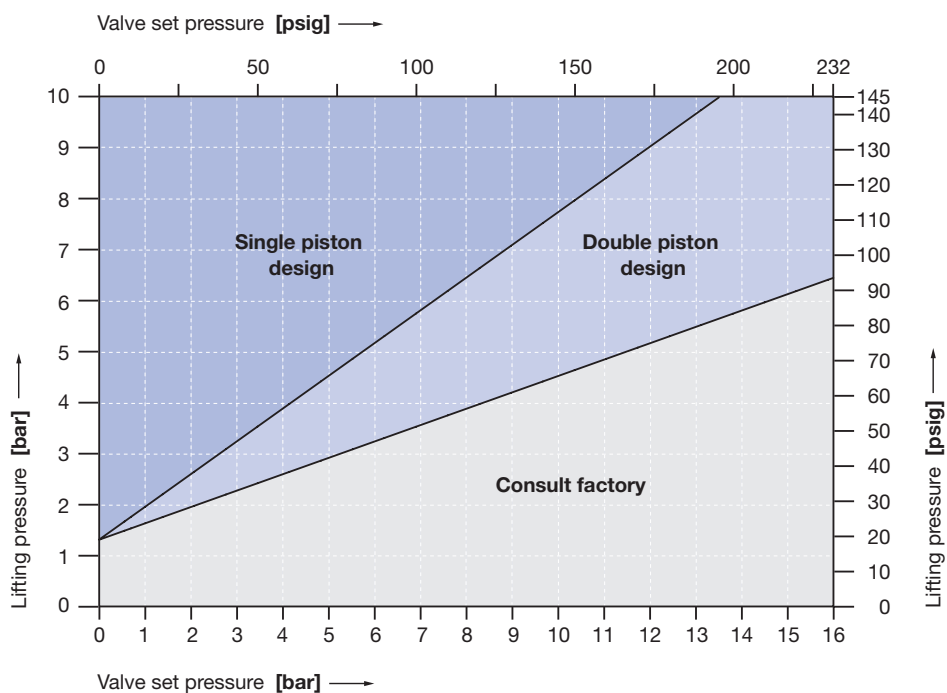
Type 484 Selection chart H8

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

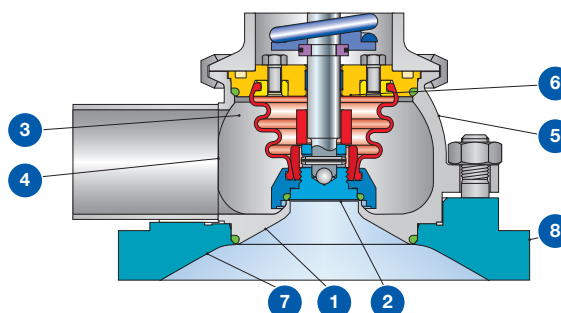
Type of surface	Area		LESER Surface package				
			Option code	Clean finish	HyClean finish	Sterile finish	
	Description	No.		B56	B57	B58	
				R _a max.	R _a max.	R _a max.	
LESER Surface grade							
Product contact surface	Inlet	1		ME4	ME2	ME1	
			[µm]	0,750	0,500	0,375	
				[µinch]	30	20	15
	Bottom side of disc	2		ME4	ME2	ME1	
[µm]			0,750	0,500	0,375		
			[µinch]	30	20	15	
Blow off surface	Inside surface of outlet area	3		ME4	ME3	ME2	
			[µm]	0,750	0,625	0,500	
				[µinch]	30	25	20
	Welding seam	4		ME6	ME5	ME4	
[µm]			3,000	1,500	0,750		
			[µinch]	120	60	30	
Outer surface	Outside surface of body, bonnet and cap/lifting device	5		ME5	ME4	ME4	
			[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 Vessel connection

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



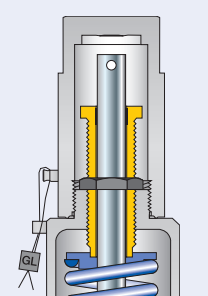
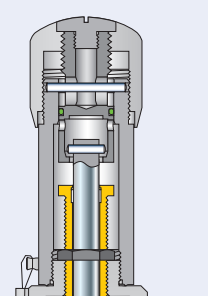
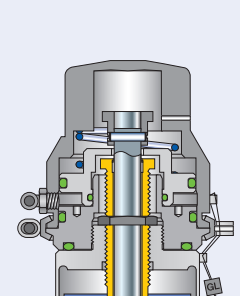
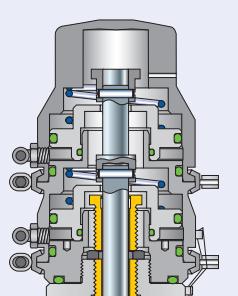






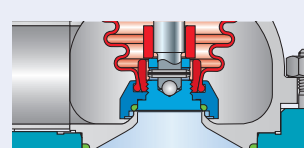

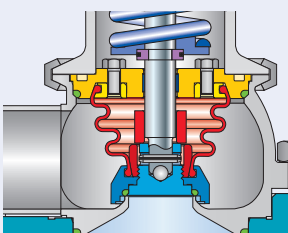
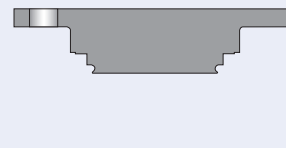

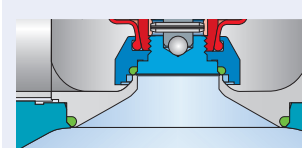
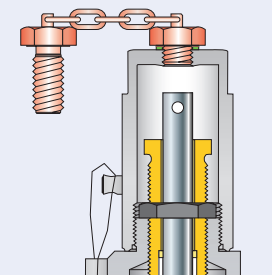
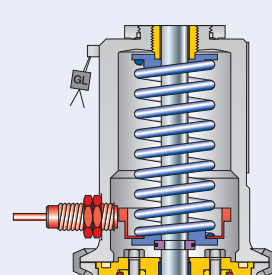
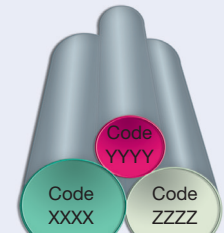
Type 484 Approvals

Actual Orifice diameter d_0 [mm]	13	25
Actual Orifice area A_0 [mm ²]	133	491
Actual Orifice diameter d_0 [inch]	0,512	0,984
Actual Orifice area A_0 [inch ²]	0,206	0,761
Europe Coefficient of discharge K_{dr}		
DIN EN ISO 4126-1, PED	Approval No.	07 202 0111 Z 0008/0/20
	S/G	0,60
	L	0,40
Germany Coefficient of discharge C_{Lw}		
AD 2000-Merkblatt A2, PED	Approval No.	TÜV SV 1047
	S/G	0,60
	L	0,40
United States Coefficient of discharge K		
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.	M37156
	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 $\sqrt{\text{psid}^*)} \triangle K \approx 0,258$
Canada Coefficient of discharge K		
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 $\sqrt{\text{psid}^*)} \triangle K \approx 0,379$
China Coefficient of discharge C_{Lw}		
AQSIQ	Approval No.	For current approval no. see www.leser.com
	S/G	0,60
	L	0,40
Eurasian Custom Union Coefficient of discharge C_{Lw}		
EAC	Approval No.	For current approval no. see www.leser.com
	S/G	0,60
	L	0,40
Classification societies		
		on request

^{*)} psid = Differential pressure P-P_d
P = absolute flow pressure [psia]
P_d = pressure at discharge from valve [psia]

Type 484

Available options

<p>Gastight cap H2 H2</p> 	<p>Gastight lifting device H4 Packed knob H4</p> 	<p>Pneumatic lifting device H8 H8 single piston design</p> 	<p>Pneumatic lifting device H8 J41: H8 double piston design</p> 
<p>O-ring-disc J22: EPDM "D"   J23: FKM "L"   J20: FFKM "C"  </p> 	<p>Bellows FFKM "C"  S70 – only for d₀13 and liquid application</p> 	<p>Blind flange for pressure test Material-No. 138.8849.9000 (d₀ 13) Material-No. 138.8649.9000 (d₀ 25)</p> 	<p>O-ring for vessel connection EPDM "D"  Material-No. 502.0460.3041 (d₀ 13) Material-No. 502.0600.3041 (d₀ 25)</p> 
<p>Test gag J70: H2</p> 			
<p>Lift indicator placed in bonnet J38 + J93</p> 	<p>Special material 2.4610 HASTELLOY C4 2.4360 MONEL 400 1.4462 DUPLEX</p> 		

Type 484

Type 485
Safety Relief Valves – spring loaded

Contents	Page
Materials	
• HyTight Assembly	72
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• Article numbers	74
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• Metric Units	76
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Pressure temperature ratings	
• Metric Units + US Units	78
Selection chart H8	79
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Type 485
Pneumatic lifting device H8
Inlet: Integrated pipework connection Type 5034
Outlet: Flange connection

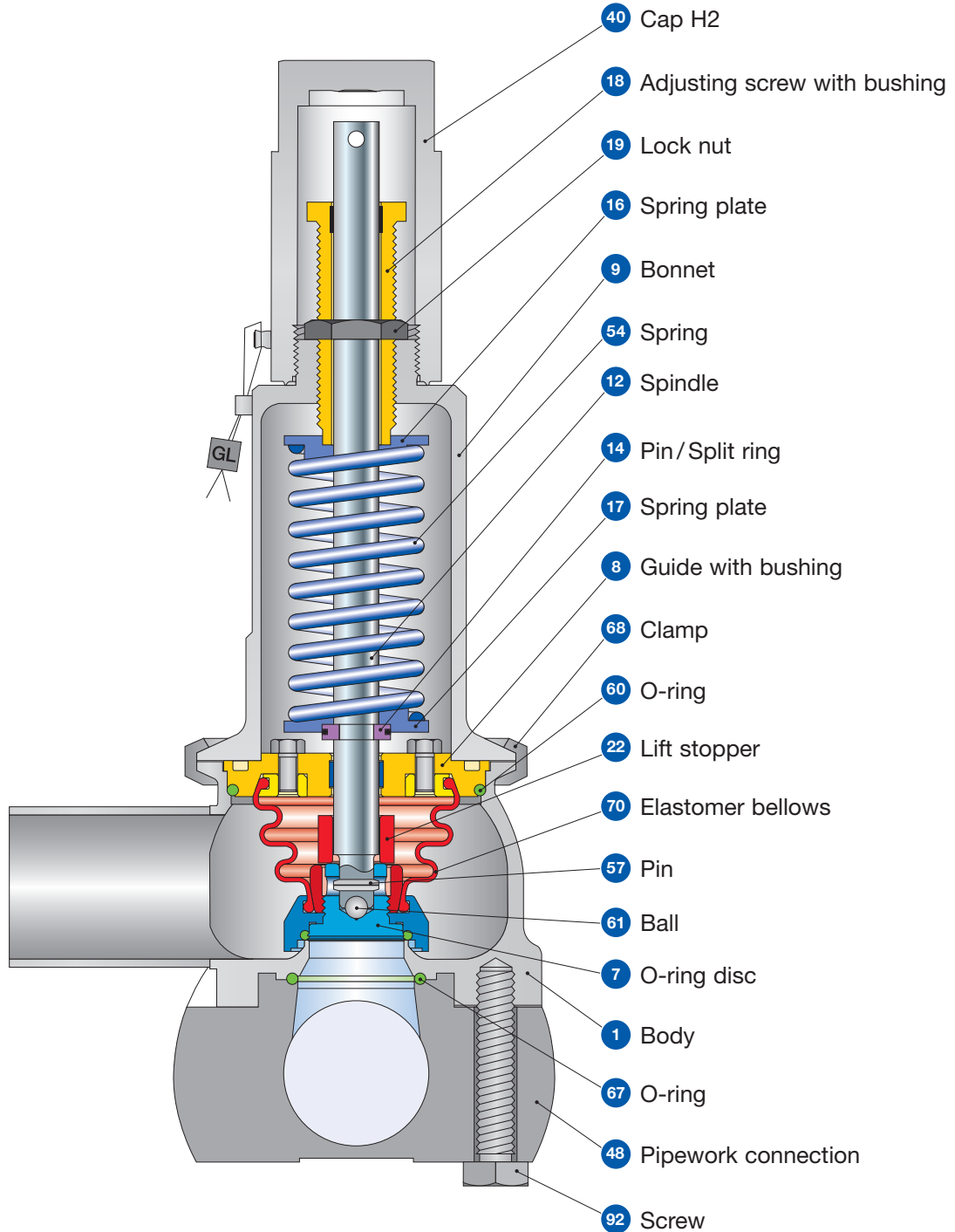


Type 485
Cap H2
Inlet: Integrated pipework connection Type 5034
Outlet: Welded end connection



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) ¹⁾
			SA 479 316L
7	Disc	HyTight Assembly	1.4435 316L
7.4	Soft seal O-ring	“D”  	EPDM
		“L” 	FKM ²⁾
		“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
Integrated pipework connection Type 5034			
48	Pipework connection	 	1.4435 (BN 2) ¹⁾
			SA 479 316L
67	O-ring		EPDM
92	Screw		1.4401
			316
-	Blind flange for pressure test		1.4404
			316L

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

²⁾ 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.

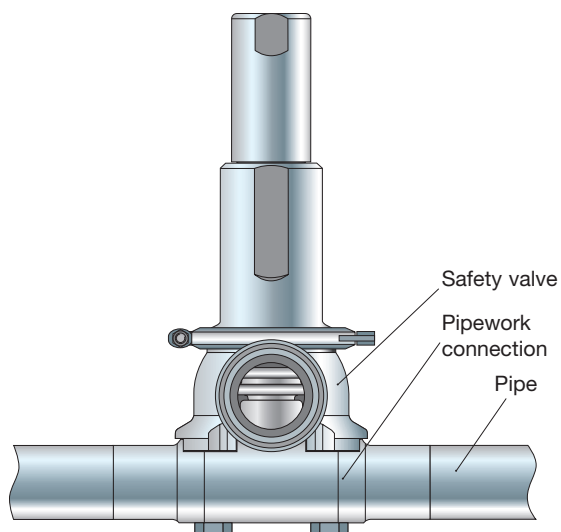
Type 485

Article numbers

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

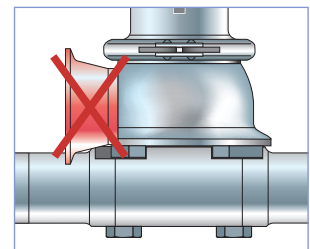
¹⁾ For design with lifting device H8 a max. operating temperature of 50°C is allowed.

Fitting information



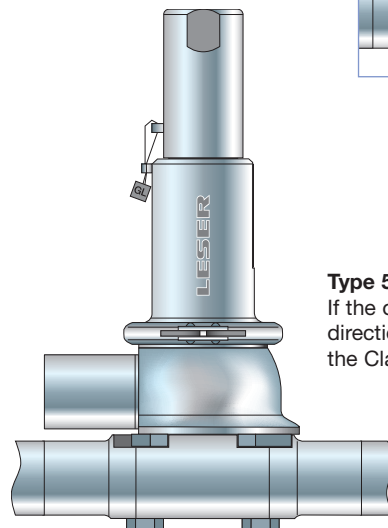
Type 5034

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

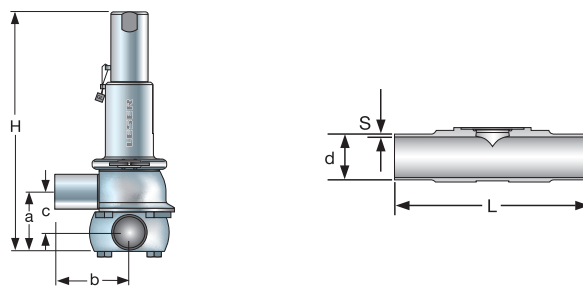
Clamps		Option code inlet	Clamps		Option code outlet	
<p>For inlet please select integrated pipework connection Type 5034 as shown on page 74.</p>			d ₀ [mm]	13	25	
			A ₀ [mm ²]	133	491	
			DN	25	40	
			SO	L86A16	L86A17	
			DO	I74A16	I71A17	
			NPS	1 1/2"	2"	
			BO	I76A80	I76A81	
			CO	L97A80	L97A81	
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
			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		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	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

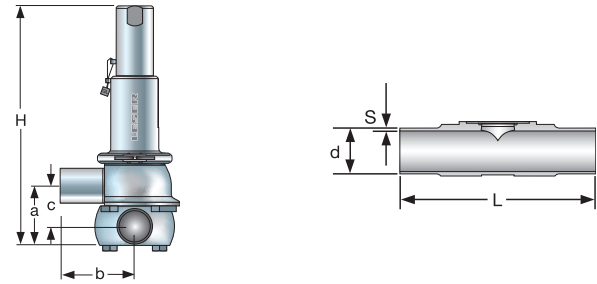
Type 5034 – Integrated pipework connection

Actual Orifice diameter d_0 [mm]		13
Actual Orifice area A_0 [mm ²]		133
Integrated pipework connection		Inlet
PN		16
Nominal pipe size tube		DN
DN		25
Offset	c [mm]	38
Length	L [mm]	130
DIN 11850	Diameter d [mm]	30
	Wall thickness s [mm]	2
ISO 2037	Diameter d [mm]	26,5
	Wall thickness s [mm]	2
DIN EN ISO 1127	Diameter d [mm]	34
	Wall thickness s [mm]	2,25
Welded connections		Inlet a¹⁾
PN		16
Center to face	[mm]	58
Height – H4	H max. [mm]	234
Height – H8 double piston design	H max. [mm]	262,2
Clamp connections		Inlet a¹⁾
PN		16
Center to face	[mm]	58
Clamp diameter	d_{inner} [mm]	For varying clamp diameters please refer to page 16 and 17
	d_{outer} [mm]	
Height – H4	H max. [mm]	234
Height – H8 double piston design	H max. [mm]	262,2
Threaded connections		Inlet a¹⁾
PN		16
Center to face	[mm]	58
Height – H4	H max. [mm]	234
Height – H8 double piston design	H max. [mm]	262,2
Flanged connections		Inlet a¹⁾
PN		16
Center to face	[mm]	58
Height – H4	H max. [mm]	234
Height – H8 double piston design	H max. [mm]	262,2
Weight		
Weight	max. [kg]	3,0

		25
		491
Integrated pipework connection		Inlet
PN		16
Nominal pipe size tube		DN
DN		40
Offset	c [mm]	49
Length	L [mm]	180
DIN 11850	Diameter d [mm]	42,4
	Wall thickness s [mm]	2
ISO 2037	Diameter d [mm]	39
	Wall thickness s [mm]	2
DIN EN ISO 1127	Diameter d [mm]	48,3
	Wall thickness s [mm]	2,15
Welded connections		Inlet a¹⁾
PN		16
Center to face	[mm]	72
Height – H4	H max. [mm]	331
Height – H8 double piston design	H max. [mm]	338,7
Clamp connections		Inlet a¹⁾
PN		16
Center to face	[mm]	72
Clamp diameter	d_{inner} [mm]	For varying clamp diameters please refer to page 16 and 17
	d_{outer} [mm]	
Height – H4	H max. [mm]	331
Height – H8 double piston design	H max. [mm]	338,7
Threaded connections		Inlet a
PN		16
Center to face	[mm]	72
Height – H4	H max. [mm]	331
Height – H8 double piston design	H max. [mm]	338,7
Flanged connections		Inlet a¹⁾
PN		16
Center to face	[mm]	72
Height – H4	H max. [mm]	331
Height – H8 double piston design	H max. [mm]	338,7
Weight		
Weight	max. [kg]	5,0

¹⁾ 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 ²]		0,206
Integrated pipework connection		
		Inlet
		PN 16
Nominal pipe size tube		NPS 1"
Offset	c [inch]	1 1/2
Length	L [inch]	5 1/8
DIN 11850	Diameter d [inch]	1 3/16
	Wall thickness s [inch]	3/32
ISO 2037	Diameter d [inch]	1
	Wall thickness s [inch]	1/8
DIN EN ISO 1127	Diameter d [inch]	1 3/8
	Wall thickness s [inch]	1/8
Welded connections		
		Inlet a¹⁾ Outlet b
		PN 16
Center to face	[inch]	2 1/4 3 5/32
Height – H4	H max. [inch]	9 7/32
Height – H8 double piston design	H max. [inch]	10 5/16
Clamp connections		
		Inlet a¹⁾ Outlet b
		PN 16
Center to face	[inch]	2 1/4 4 1/32
Clamp diameter	d_{inner} [inch] d_{outer} [inch]	For varying clamp diameters please refer to page 16 and 17
Height – H4	H max. [inch]	9 7/32
Height – H8 double piston design	H max. [inch]	10 5/16
Threaded connections		
		Inlet a¹⁾ Outlet b
		PN 16
Center to face	[inch]	2 1/4 4 23/32
Height – H4	H max. [inch]	9 7/32
Height – H8 double piston design	H max. [inch]	10 5/16
Flanged connections		
		Inlet a¹⁾ Outlet b
		PN 16
Center to face	[inch]	2 1/4 4 31/32
Height – H4	H max. [inch]	9 7/32
Height – H8 double piston design	H max. [inch]	10 5/16
Weight	max. [lb]	6,6

		0,984
		0,761
Inlet		
16		
1 1/2"	2"	
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	–	
Inlet a¹⁾ Outlet b	Inlet a¹⁾ Outlet b	Inlet a¹⁾ Outlet b
16	16	16
2 27/32	3 17/32	3 5/16 3 17/32
13 1/32		13 1/2
13 11/32		13 13/16
Inlet a¹⁾ Outlet b	Inlet a¹⁾ Outlet b	Inlet a¹⁾ Outlet b
16	16	16
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
Inlet a¹⁾ Outlet b	Inlet a¹⁾ Outlet b	Inlet a¹⁾ Outlet b
16	16	16
2 27/32	5 1/8	3 5/16 5 1/8
13 1/32		13 1/2
13 11/32		13 13/16
Inlet a¹⁾ Outlet b	Inlet a¹⁾ Outlet b	Inlet a¹⁾ Outlet b
16	16	16
2 27/32	5 9/32	3 5/16 5 9/32
13 1/32		13 1/2
13 11/32		13 13/16
Weight		
		11,0

¹⁾ 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 ²]		133		491
Body material: 1.4435 (316L)				
Minimum set pressure	p [bar] S/G/L	0,3		0,1
Maximum set pressure	p [bar] S/G/L	16		16
Temperature range¹⁾		Minimum	Maximum	Minimum
EPDM	[°C]	-45	+150	-45
FKM	[°C]	-18	+150	-18
FFKM	[°C]	0	+150	0

US Units

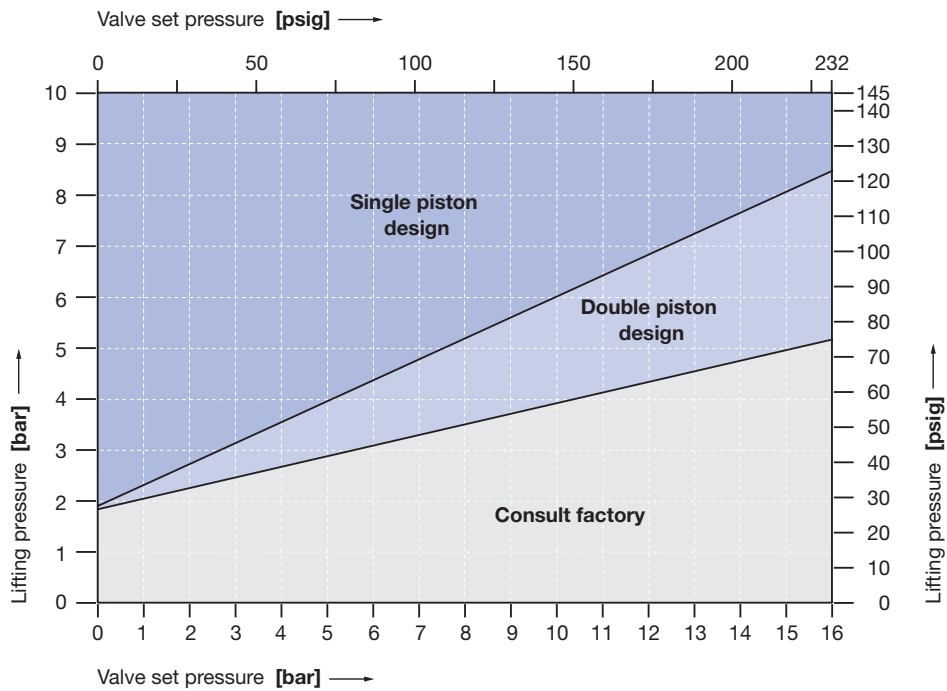
Actual Orifice diameter d_0 [inch]		0,512		0,984
Actual Orifice area A_0 [inch ²]		0,206		0,761
Body material: 1.4435 (316L)				
Minimum set pressure	p [psig] S/G/L	4,4		1,5
Maximum set pressure	p [psig] S/G/L	232		232
Temperature range¹⁾		Minimum	Maximum	Minimum
EPDM	[°F]	-49	+302	-49
FKM	[°F]	-0,4	+302	-0,4
FFKM	[°F]	+32	+302	+32

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

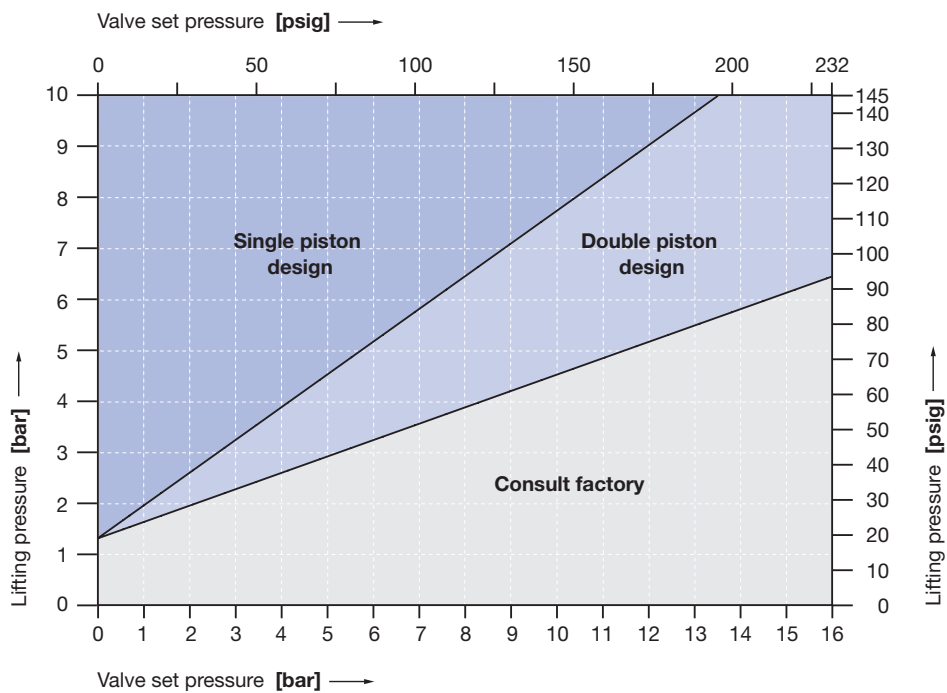
Type 485 Selection chart H8

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

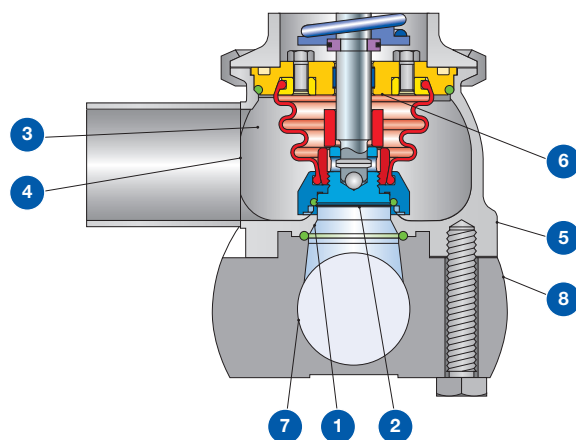
Surface quality

Type of surface	Area		LESER Surface package			
			Option code	Clean finish	HyClean finish	Sterile finish
	Description	No.		B62	B63	B64
				R _a max.	R _a max.	R _a max.
LESER Surface grade						
Product contact surface	Inlet	1		ME4	ME2	ME1
			[µm]	0,750	0,500	0,375
			[µinch]	30	20	15
	Bottom side of disc	2		ME4	ME2	ME1
[µm]			0,750	0,500	0,375	
			[µinch]	30	20	15
Blow off surface	Inside surface of outlet area	3		ME4	ME3	ME2
			[µm]	0,750	0,625	0,500
			[µinch]	30	25	20
	Welding seam	4		ME6	ME5	ME4
[µm]			3,000	1,500	0,750	
			[µinch]	120	60	30
Outer surface	Outside surface of body, bonnet and cap/lifting device	5		ME5	ME4	ME4
			[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 _a max.	R _a max.	R _a max.
LESER Surface grade						
Product contact surface	Pipework side	7		M4	M2	M1
			[µm]	0,750	0,500	0,375
			[µinch]	30	20	15
Outer surface	Outside surface	8		M5	M4	M4
			[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.



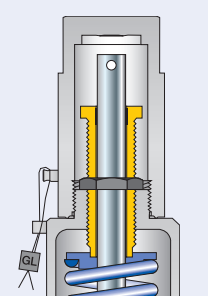
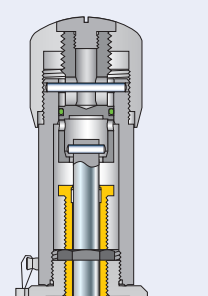
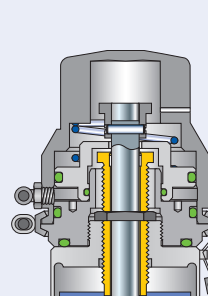
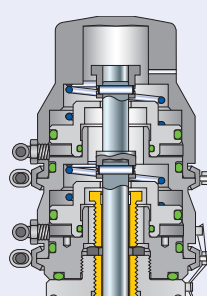






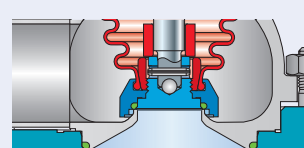

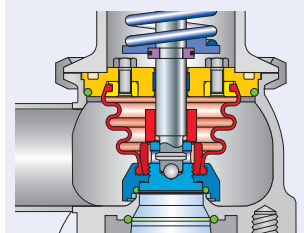
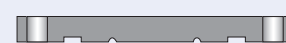

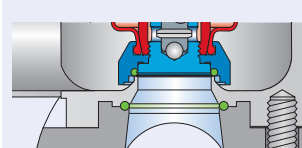
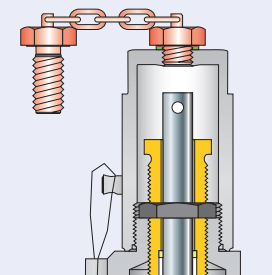
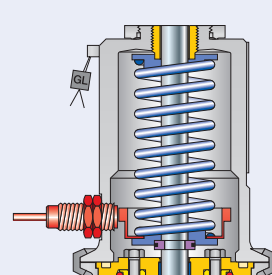
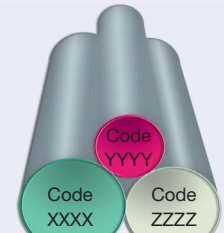
Type 485 Approvals

Actual Orifice diameter d_0 [mm]	13	25
Actual Orifice area A_0 [mm ²]	133	491
Actual Orifice diameter d_0 [inch]	0,512	0,984
Actual Orifice area A_0 [inch ²]	0,206	0,761
Europe Coefficient of discharge K_{dr}		
DIN EN ISO 4126-1, PED	Approval No.	07 202 0111 Z 0008/0/20
	S/G	0,58
	L	0,39
Germany Coefficient of discharge C_{Lw}		
AD 2000-Merkblatt A2, PED	Approval No.	TÜV SV 1047
	S/G	0,58
	L	0,39
United States Coefficient of discharge K		
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 $\sqrt{\text{psid}^*)} \Delta K \approx 0,258$
Canada Coefficient of discharge K		
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 $\sqrt{\text{psid}^*)} \Delta K \approx 0,379$
China Coefficient of discharge C_{Lw}		
AQSIQ	Approval No.	For current approval no. see www.leser.com
	S/G	0,58
	L	0,39
Eurasian Custom Union Coefficient of discharge C_{Lw}		
EAC	Approval No.	For current approval no. see www.leser.com
	S/G	0,58
	L	0,39
Classification societies		
		on request

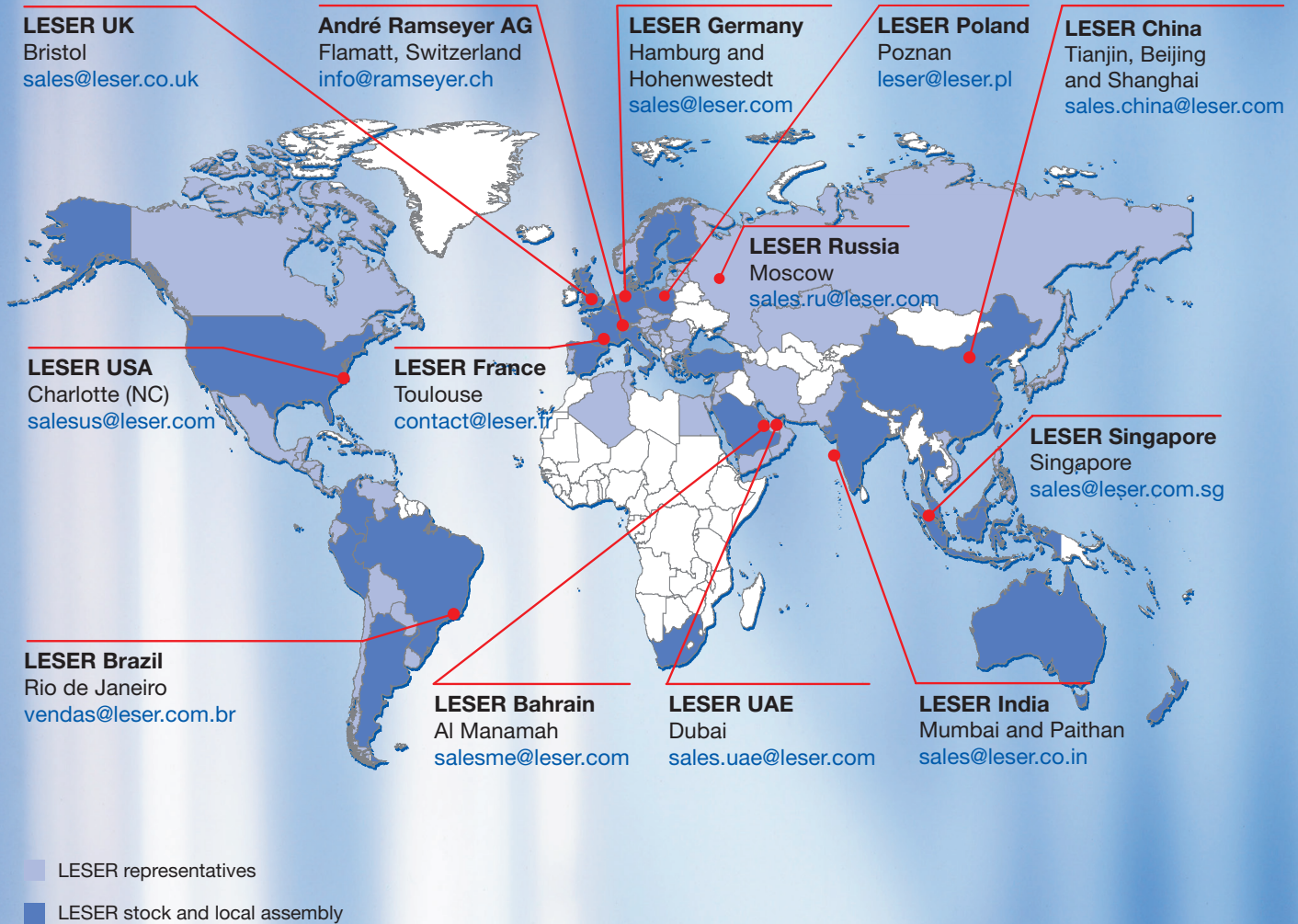
^{*)} psid = Differential pressure P-P_d
P = absolute flow pressure [psia]
P_d = pressure at discharge from valve [psia]

Type 485

Available options

<p>Gastight cap H2 H2</p> 	<p>Gastight lifting device H4 Packed knob H4</p> 	<p>Pneumatic lifting device H8 H8 single piston design</p> 	<p>Pneumatic lifting device H8 J41: H8 double piston design</p> 
<p>O-ring-disc J22: EPDM "D"   J23: FKM "L"   J20: FFKM "C"  </p> 	<p>Bellows FFKM "C"  S70 – only for d₀13 and liquid application</p> 	<p>Blind flange for pressure test Material No. 138.8949.9000 (d₀ 13) Material No. 138.8749.9000 (d₀ 25)</p> 	<p>O-ring for integrated pipework connection EPDM "D"  Material No. 502.0180.3041 (d₀ 13) Material No. 502.0300.3041 (d₀ 25)</p> 
<p>Test gag J70: H2</p> 			
<p>Lift indicator placed in bonnet J38 + J93</p> 	<p>Special material 2.4610 HASTELLOY C4 2.4360 MONEL 400 1.4462 DUPLEX</p> 		

LESER worldwide



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