Clean Service

Safety Relief Valves
Series 48X

CATALOG

LESER

The-Safety-Valve.com

Valve finder

LESER

Product group

High operating to set pressure ratio, high backpressure or low total height?

Yes → **High Efficiency**

No

Clean Service application?

Yes → **Clean Service**

No

Critical Service / highly corrosive application?

Yes → **Critical Service**

No

API specified application?

Yes → **API**

No

Steam, gas and liquid application with low capacity in relation to valve size?

Yes → **Modulate Action**

No

Required Orifice letter?

Orifice ≥ F → **High Performance**

Orifice ≤ F → **Compact Performance**

Products other than safety valve

Yes → **Best Availability**

Medium-controlled

Spring loaded

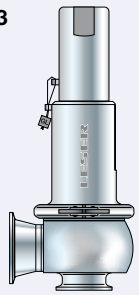
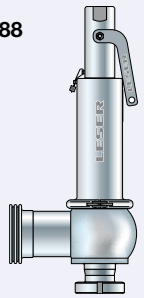
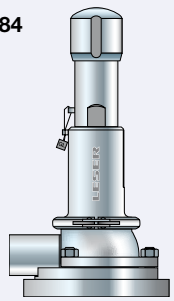
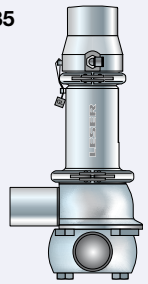
Safety Relief Valves

Change-over valve

Bursting disc

Valve finder

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.
Standard	**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).
Standard	**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.
Superior	**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 18

Contents

LESER

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 < 0,33 (Type 484) up to < 3 (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) 97/23/EC 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 ASMESection 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

LESER´s Clean Service Safety Valves are in use at well-known companies worldwide. Subsequently an extract of our references

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, part SD table SF-5 and SF-6
- 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 FDA and USP VI 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

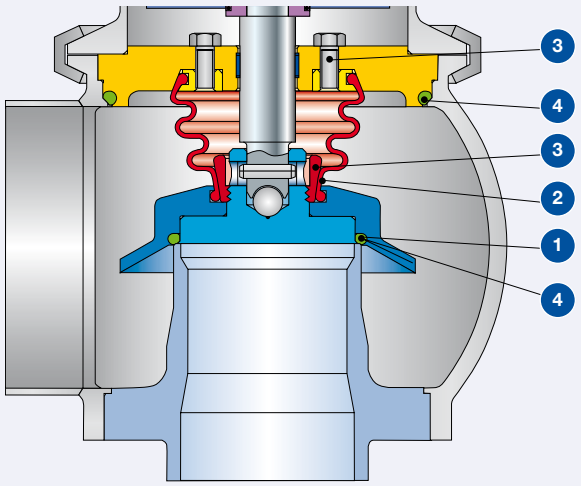
Cleanability first

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.

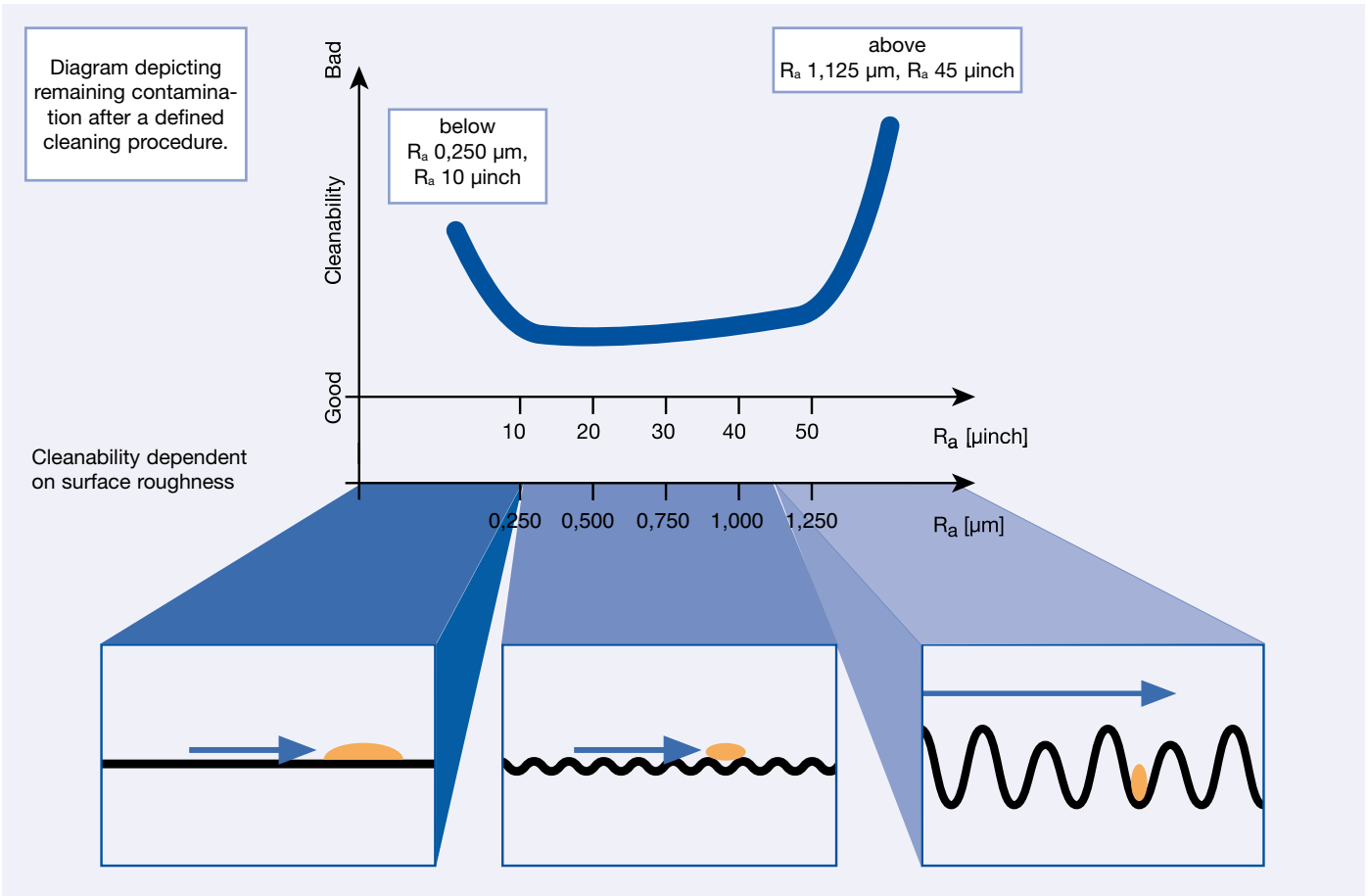
For instance the ASME BPE (Bioprocessing Equipment) states for cleanability:

SD-3.1.1:
– 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.

Surface qualities

Type	Standard surface qualities product contact inlet	Surface qualities of
481, 483, 488	R_a < 0,750 µm R_a < 30 µinch SFV3	R_a < 0,500 µm R_a < 20 µinch for the product contact inlet are available on request, as well as electropolishing of the inside and outside of the valves
484, 485	R_a < 0,750 µm electropolished R_a < 30 µinch electropolished	



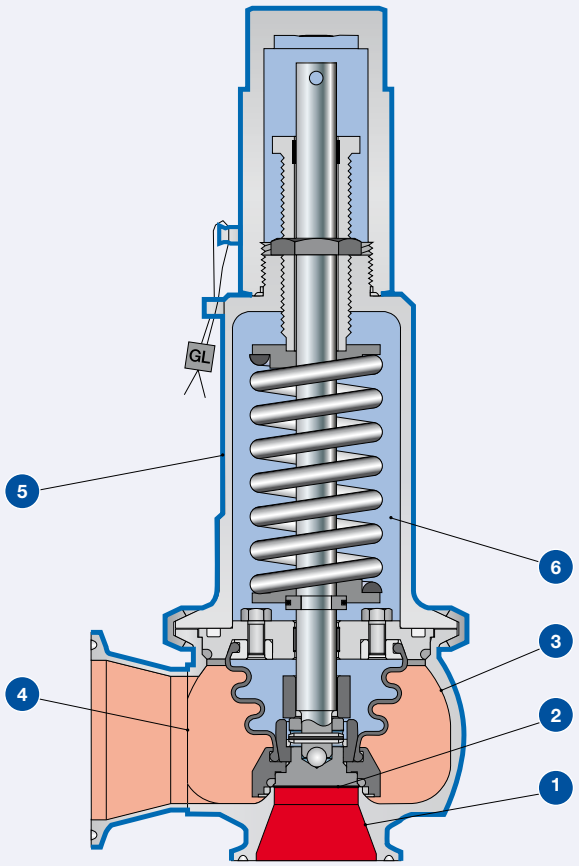
Below R_a 0,250 µm / 10 µinch bacteria or particles “stick” to the surface due to adhesive effects.

An optimized cleanability is reached with a surface roughness between R_a 0,250 µm / 10 µinch and R_a 1,125 µm / 45 µinch.

Above 1,125 µm / 45 µinch the bacteria and particles can “hide” in the corrugations or niches.

LESER Surface Definition

Clean Service Safety Valves



Surface definition

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 table SF-5 · Different surface designation level acc. to table SF-6 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 table SF-5 · 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 table SF-5 · 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 recording 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		Hygiene class	Surface designation
	[µm]	[µinch]	[µm]	[µinch]		
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		Hygiene class	Surface designation
	[µm]	[µinch]	[µm]	[µinch]		
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		–

LESER Surface Packages

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

Clamp and threaded connections

Overview

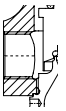
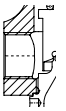
LESER is able to deliver a wide range of connections required for clean service applications. For ordering the right connection please specify inlet and outlet by LESER option code. If the option code is not stated in this table please refer to connection pages of each Type.

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

Overview



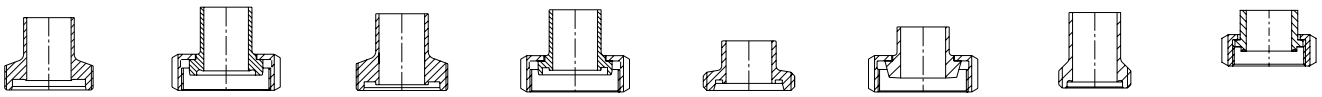


			Clamp connection	Clamp connection	Clamp connection	Clamp connection	Threaded connection	Threaded connection
		Code	BO	SO	CO	DO	XG	XN
		According to	ASME BPE	DIN 32676	ISO 2852	ISO 2852	DIN ISO 228	ASME B 1.20.1
		Pipe standard	BS 4825-1	DIN 11850	ISO 2037	DIN EN ISO 1127	G 1/2 G 3/4 G 1	1/2" NPT 3/4" NPT 1" NPT
			Option code				Option code	
Type 481	d_0 10	Inlet	✓	✓	L96I79	✓	–	–
		Outlet	I76A79	L86A16	L97A79	I74A16	✓	✓
Type 483	d_0 13	Inlet	✓	✓	✓	✓	–	–
		Outlet	✓	✓	✓	✓	–	–
	d_0 25	Inlet	✓	✓	✓	✓	–	–
		Outlet	✓	✓	✓	✓	–	–
Type 488	d_0 23	Inlet	I75	L79	L96	I73	–	–
		Outlet	I76	L86	L97	I74	–	–
	d_0 37	Inlet	I75	L79	L96	I73	–	–
		Outlet	I76	L86	L97	I74	–	–
	d_0 46	Inlet	I75	L79	L96	I73	–	–
		Outlet	I76	L86	L97	I74	–	–
	d_0 60	Inlet	I75	L79	L96	I73	–	–
		Outlet	[1]	L86	L97	I74	–	–
	d_0 74	Inlet	I75	L79	L96	I73	–	–
		Outlet	[1]	L86	L97	I74	–	–
	d_0 92	Inlet	[1]	L79	L96	I73	–	–
		Outlet	[1]	L86	L97	I74	–	–
Type 484	d_0 13	Inlet	For inlet please select vessel connection Type 5034 as shown on page 62.				–	–
		Outlet	I76A80	L86A16	L97A80	I74A16	–	–
	d_0 25	Inlet	For inlet please select vessel connection Type 5034 as shown on page 62.				–	–
		Outlet	I76A81	L86A17	L97A81	I74A17	–	–
Type 485	d_0 13	Inlet	For inlet please select integrated pipework connection Type 5034 as shown on page 74.				–	–
		Outlet	I76A80	L86A16	L97A80	I74A16	–	–
	d_0 25	Inlet	For inlet please select integrated pipework connection Type 5034 as shown on page 74.				–	–
		Outlet	I76A81	L86A17	L97A81	I74A17	–	–

[1] Please select CO-Clamp

For better selection of the different clamp connecting dimensions please refer to page 16 and 17



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

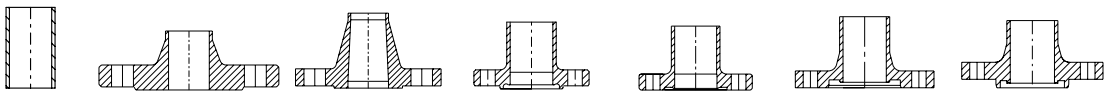
Welded end and flange connections

Overview

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

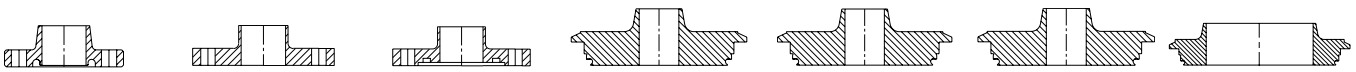
LESER is able to deliver a wide range of connections required for clean service applications. For ordering the right connection please specify inlet and outlet by LESER option code. If the option code is not stated in this table please refer to connection pages of each Type.

Overview



			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]	✓[1]
	d_0 74	Inlet		H85L77	I71	L94	✓	✓	✓	✓
		Outlet		A85L83	I72	L95	✓[2]	✓[2]	✓[2]	✓[2]
	d_0 92	Inlet		H85L77	I71	L94	✓[1]	✓[1]	✓[1]	✓[1]
		Outlet		–	I72	L95	✓[2]	✓[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

LESER

Connecting dimensions

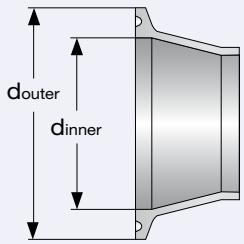
Most clamp connections can be delivered for different pipe standards, such as DIN 11850, ISO 2037, DIN EN ISO 1127 or special customer specifications.

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

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

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

Clamp connections



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.

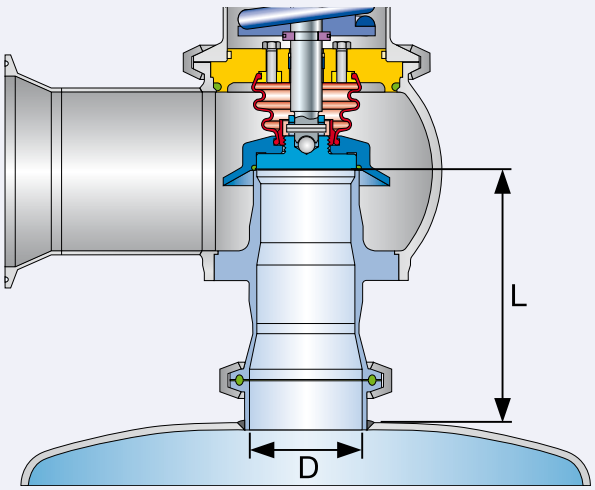
Low dead space

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.

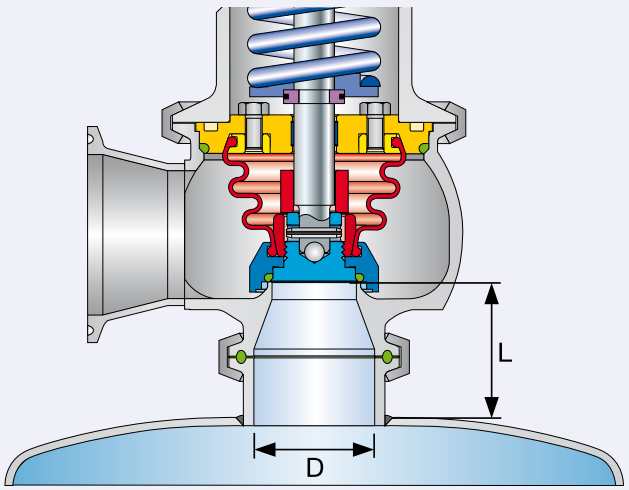
Types 481, 483 and 488 are improved solutions for safety valves with clamp connections, and have L/D ratios less than 1,5 and 2,0 (Type 488). The requirements of ASME BPE Part SD – 3.11.1 (L/D < 2,0) and FDA 21 CFR Part 177.2600 (L/D < 1,5) are fulfilled with these designs.

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.

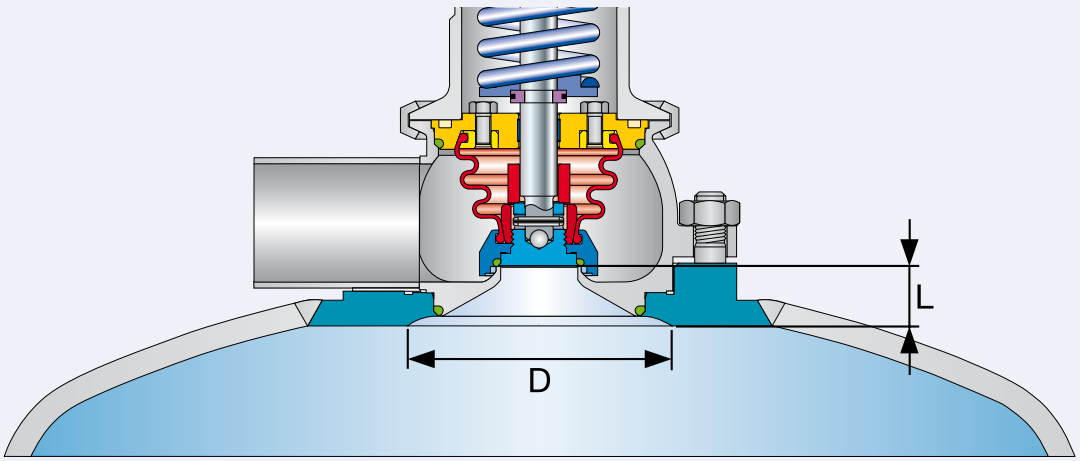
Dead space



Type 488
L/D ~ 2,0



Type 483
L/D ~ 1,5



Type 484
L/D ~ 0,3

Type 481

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

Safety Relief Valves – spring loaded

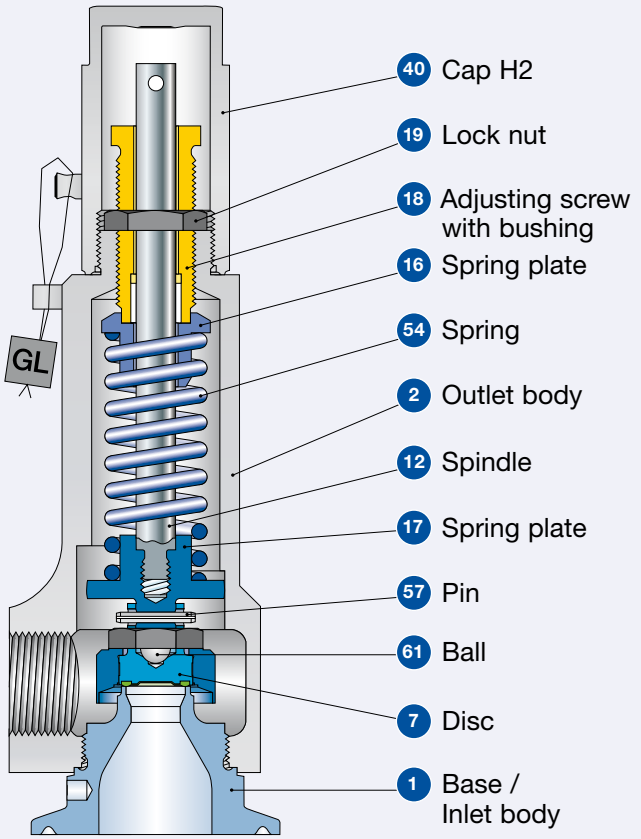
Type 481
Packed knob H4
Inlet: Aseptic clamp and nut
Outlet: Threaded connection

Contents

Type 481

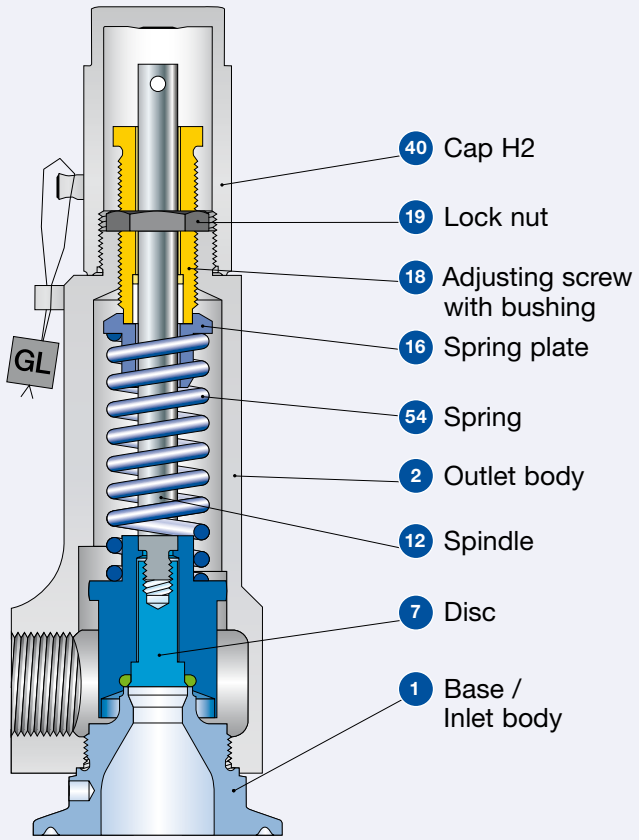
Conventional design

Low set pressure



Type 481
with vulcanized soft seal
Cap H2
Set pressure: 0,1 – 16 bar
1,5 – 232 psig
Inlet: Clamp connection
Outlet: Threaded connection

High set pressure



Type 481 with O-ring

Materials

Conventional design

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

Article numbers

Article numbers

		Vulcanized soft seal	O-ring disc
Actual Orifice diameter d_0 [mm]		10	10
Actual Orifice area A_0 [mm²]		78,5	78,5
Actual Orifice diameter d_0 [inch]		0,394	0,394
Actual Orifice area A_0 [inch²]		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**

Available connections

Available connections

Actual Orifice diameter d_0 [mm]		10		d_0 [mm]		10				
Actual Orifice area A_0 [mm²]		78,5		A_0 [mm²]		78,5				
Clamps		**Option code inlet**		**Clamps**				**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		**Option code inlet**		**Aseptic screwed connection**				**Option code outlet**		
	DN	–		**DN**	G1/2	G3/4	G1	½" NPT	¾" 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.

Dimensions and weights

Metric Units

Inlet clamp connections / Outlet clamp connections

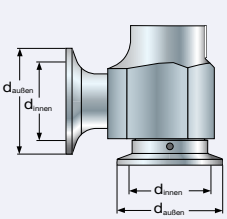
	d_0 [mm]	10				
	A_0 [mm²]	78,5				
Center to face		Inlet a [mm]			Outlet b [mm]	
	DN	15	25		DN	25
	SO	40	30		SO	65
	DO	40	30		DO	65
	NPS	3/4"	1"		NPS	1"
	BO	40	30		BO	65
	CO	–	30		CO	65
Clamp diameter d_{inner} [mm] and d_{outer} [mm]		For varying clamp diameters see page 16 and 17			For varying clamp 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

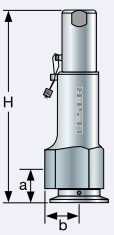
	d_0 [mm]	10				
	A_0 [mm²]	78,5				
Outlet threaded connections			XG	G1/2	G3/4	G1
			XN	NPT1/2"	NPT3/4"	NPT1"
			Center to face b [mm]	30	37	37
Inlet clamp diameters	SO	DN 15	Center to face a [mm]	40	40	43
		DN 25	Center to face a [mm]	30	30	33
	DO	DN 15	Center to face a [mm]	40	40	43
		DN 25	Center 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

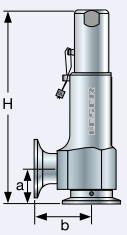
	d_0 [mm]	10				
	A_0 [mm²]	78,5				
Center to face			Inlet a [mm]			Outlet b [mm]
	GS	DN25, NPS 1"	45		GS	DN25, NPS 1"	72
	BS	DN25, NPS 1"	39		BS	DN25, NPS 1"	72
	GT	DN25, NPS 1"	43		GT	DN25, NPS 1"	72
	BT	DN25, NPS 1"	39		BT	DN25, NPS 1"	72
	GO	DN25	46		GO	DN25	72
	KO	DN25	39		KO	DN25	72
	GD	DN25	39		GD	DN25	72
	BD	DN25	42		BD	DN25	72
Height - H4 H max. [mm]			196				
Height - H8 H max. [mm] double piston design			224				
Weight max. [kg]			1,4				



Type 481
Clamp diameters



Type 481
Outlet: Threaded connections



Type 481
Outlet: Clamp connection

Dimensions and weights

US Units

Inlet clamp connections / Outlet clamp connections

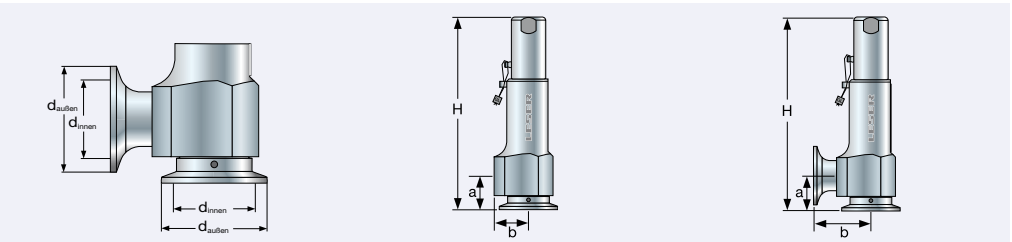
	d_0 [inch]	10				
	A_0 [inch²]	78,5				
Center to face		Inlet a [inch]			Outlet b [inch]	
	DN	15	25		DN	25
	SO	1 9/16	1 3/16		SO	2 9/16
	DO	1 9/16	1 3/16		DO	2 9/16
	NPS	3/4"	1"		NPS	1"
	BO	1 9/16	1 3/16		BO	2 9/16
	CO	–	1 3/16		CO	2 9/16
Clamp diameter d_{inner} [inch] and d_{outer} [inch]		For varying 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 [inch²]	0,122				
Outlet threaded connections			XG	G1/2	G3/4	G1
			XN	NPT1/2"	NPT3/4"	NPT1"
			Center to face b [inch]	1 3/16	1 7/16	1 7/16
Inlet clamp diameters	SO	DN 15	Center to face a [inch]	1 9/16	1 9/16	1 9/16
		DN 25	Center to face a [inch]	1 3/16	1 3/16	1 3/16
	DO	DN 15	Center to face a [inch]	1 9/16	1 9/16	1 9/16
		DN 25	Center to face a [inch]	1 3/16	1 3/16	1 3/16
	BO	NPS 3/4"	Center to face a [inch]	1 9/16	1 9/16	1 9/16
		NPS 1"	Center to face a [inch]	1 3/16	1 3/16	1 3/16
	CO	NPS 1"	Center to face a [inch]	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 [inch²]	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
Clamp diameters

Type 481
Outlet: Threaded connections

Type 481
Outlet: Clamp connection

Pressure temperature ratings

Metric Units

		Vulcanized soft seal		O-ring disc	
Actual Orifice diameter d_0 [mm]		10		10	
Actual Orifice area A_0 [mm²]		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 range[1]		Minimum	Maximum	Minimum	Maximum
EPDM	[°C]	-45	+150	-45	+150
CR	[°C]	-40	+100	-40	+100
FKM	[°C]	-20	+180	-20	+180
NBR	[°C]	-25	+110	-25	+110
FFKM	[°C]	0	+250	0	+250

US Units

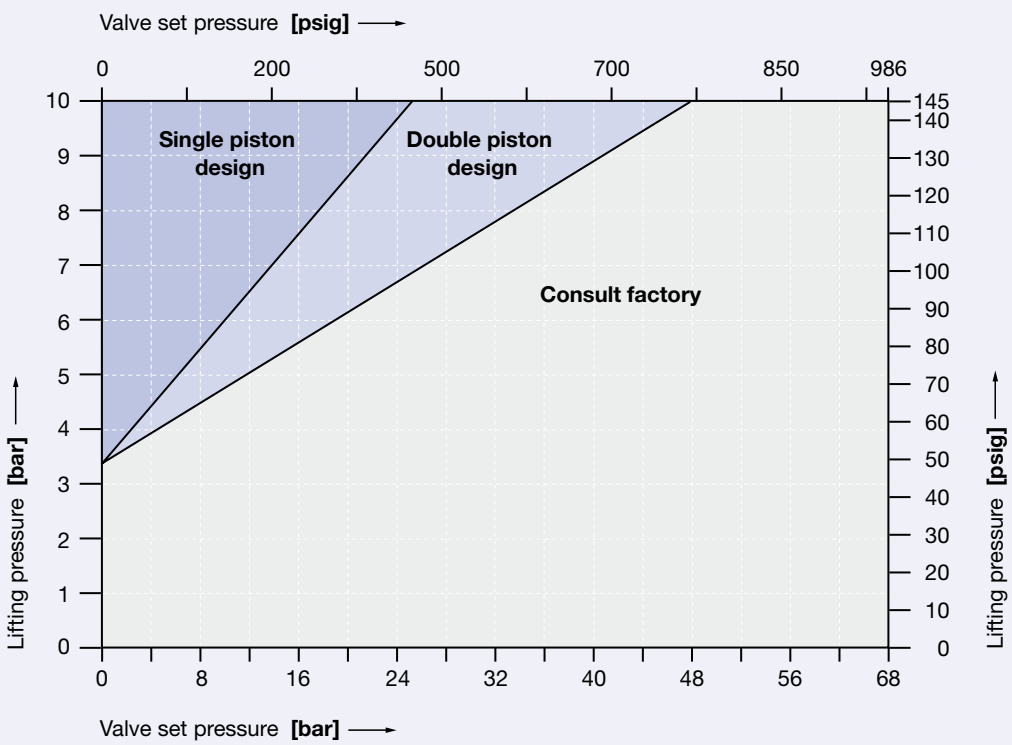
		Vulcanized soft seal		O-ring disc	
Actual Orifice diameter d_0 [inch]		0,394		0,394	
Actual Orifice area A_0 [inch²]		0,122		0,122	
Body material: 1.4404 (316L)					
Inlet / Outlet body	Pressure rating	For pressure ratings please refer to chapter dimensions and weights (page 25)			
Minimum set pressure	p [psig] S/G/L	1,5		233	
Maximum set pressure	p [psig] S/G/L	232		986	
Temperature range[1]		Minimum	Maximum	Minimum	Maximum
EPDM	[°F]	-49	+302	-49	+302
CR	[°F]	-40	+212	-40	+212
FKM	[°F]	-4	+356	-4	+356
NBR	[°F]	-13	+230	-13	+230
FFKM	[°F]	+32	+482	+32	+482

[1] The temperature is limited by the soft seal material

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

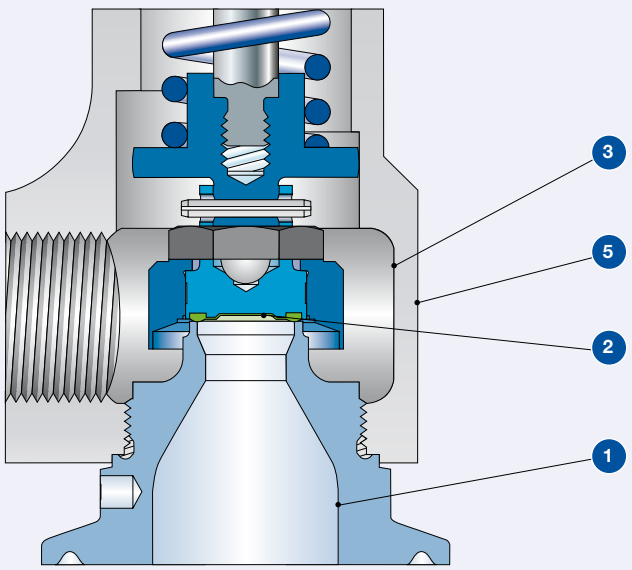
Surface quality

Surface quality

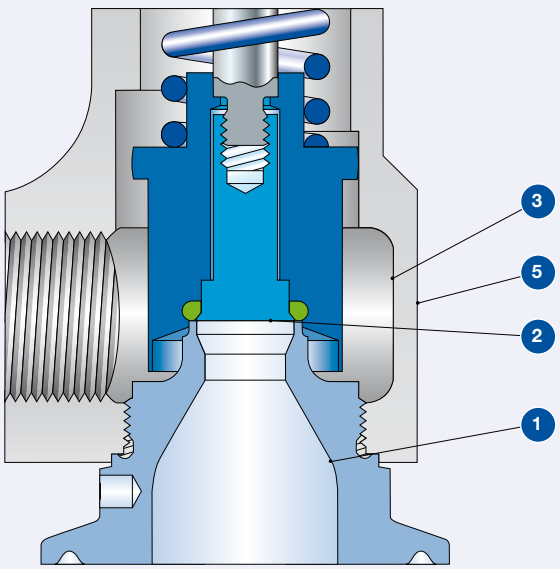
Type of surface	Area			LESER Surface package		
				Clean finish	HyClean finish	Sterile finish
			Option code	B50	B51	B52
	Description	No.		R_a max.	R_a max.	R_a max.
				LESER Surface grade		
Product contact surface	Inlet	1		M4	ME4	ME2
			[µm]	0,750	0,750	0,500
			[µinch]	30	30	20
	Bottom side of disc					
	Soft seal design: Vulcanized	2		Elastomer surface		
	Soft seal design: O-ring	2		M4	ME4	ME2
			[µm]	0,750	0,750	0,500
			[µinch]	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		M6	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



Approvals

Approvals

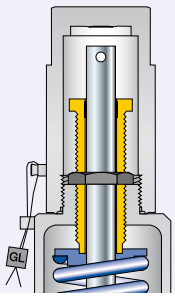
Actual Orifice diameter d_0 [mm]		10	
Actual Orifice area A_0 [mm²]		78,5	
Actual Orifice diameter d_0 [inch]		0,394	
Actual Orifice area A_0 [inch²]		0,122	
Europe		**Coefficient of discharge K_{dr}**	
DIN EN ISO 4126-1	Approval No.	07 202 0111 Z 0008/0/21-2	
	S/G	0,45 (≤ 16 bar)	0,4 (> 16 bar)
	L	0,37 (≤ 16 bar)	0,33 (> 16 bar)
Germany		**Coefficient of discharge α_w**	
AD 2000-Merkblatt A2	Approval No.	TÜV SV 980	
	S/G	0,45 (≤ 16 bar)	0,4 (> 16 bar)
	L	0,37 (≤ 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 ≙ K ≈ 0,406 G: 0,904 SCFM / psia 8 ≙ K ≈ 0,406	
	Approval No.	M 37202	
	L	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) L: 1,49 GPM $\sqrt{psid}$*) ≙ K ≈ 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 ≙ K ≈ 0,406 G: 0,904 SCFM / psia ≙ K ≈ 0,406	
	L	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) L: 1,49 GPM $\sqrt{psid}$* ≙ K ≈ 0,322	
China		**Coefficient of discharge α_w**	
AQSIQ	Approval No.	02301T	
	S/G	0,45 (≤ 16 bar)	0,4 (> 16 bar)
	L	0,37 (≤ 16 bar)	0,33 (> 16 bar)
Eurasian Custom Union		**Coefficient of discharge α_w**	
EAC	Approval No.	For current approval no. see www.leser.com	
	S/G	0,45 (≤ 16 bar)	0,4 (> 16 bar)
	L	0,37 (≤ 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]

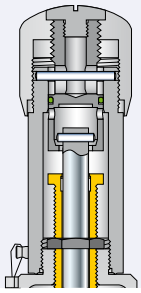
Type 481

Available options

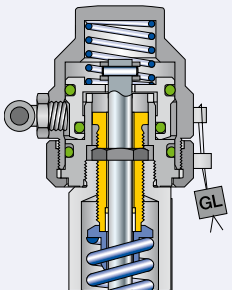
Gastight cap H2
H2



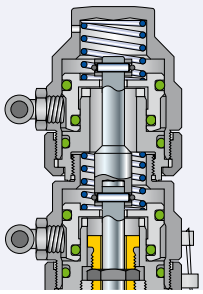
Gastight lifting device H4
Packed knob H4



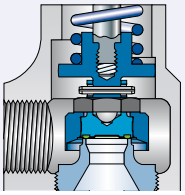
Pneumatic lifting device H8
H8 single piston design



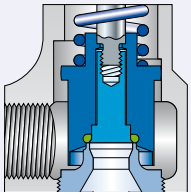
Pneumatic lifting device H8
J41: H8 double piston design



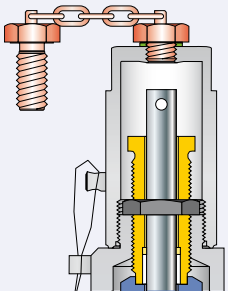
Vulcanized soft seal
J22: EPDM "D"
J21: CR "K"
J23: FKM "L"
J30: NBR "N"
J20: FFKM "C"



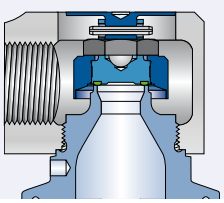
O-ring disc
J22: EPDM "D"
J21: CR "K"
J23: FKM "L"
J30: NBR "N"
J20: FFKM "C"



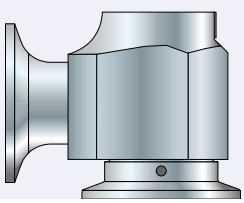
Test gag
J70: H2



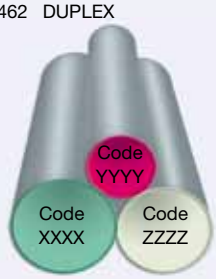
Female NPT outlet
V70: 1/2"
V77: 3/4"
V71: 1"



Clamp connection outlet
I76A79: Clamp BO 1"
L97A79: Clamp CO 1"



Special material
2.4610 HASTELLOY C4
2.4360 MONEL 400
1.4462 DUPLEX



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

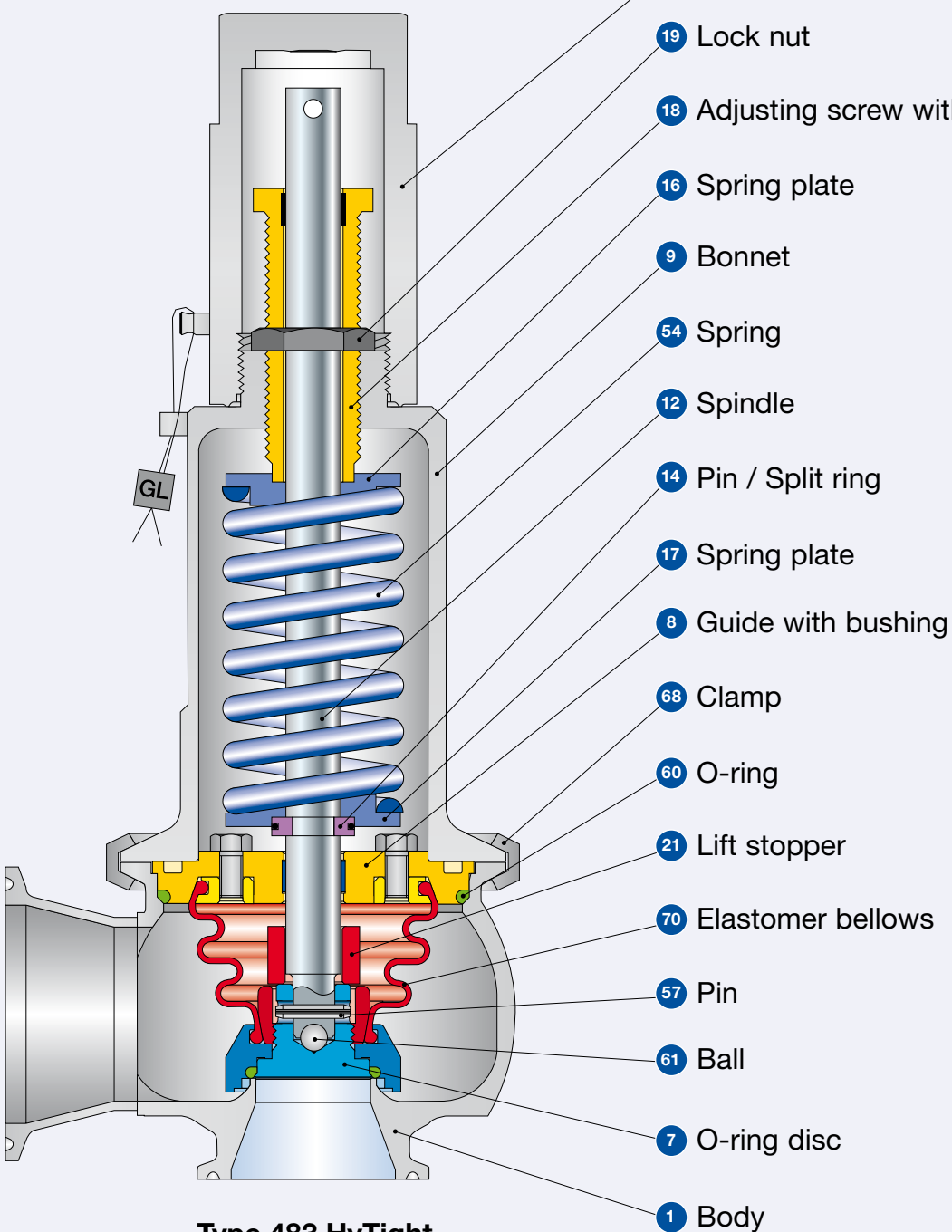
Type 483

Safety Relief Valves – spring loaded

Type 483
Packed knob H4
Inlet and outlet:
Flange connection

Contents

HyTight Assembly



Type 483 HyTight
Cap H2
Inlet and outlet:
Clamp connection

Materials

HyTight Assembly

Item	Component	Remarks	Type 4834 HyTight
1	Body		1.4435 (BN 2)*) SA 479 316L
7	O-ring disc	HyTight Assembly	1.4435 316L
7.4	Soft seal O-ring	"D" FDA USP VI	EPDM
		"C" FDA USP VI	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
21	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	FDA USP VI	EPDM
61	Ball		1.4401 316
68	Clamp		1.4401 316
70	Elastomer bellows	FDA	EPDM

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

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

Article numbers

Article numbers				
Actual Orifice diameter d_0 [mm]			13	25
Actual Orifice area A_0 [mm²]			133	491
Actual Orifice diameter d_0 [inch]			0,512	0,984
Actual Orifice area A_0 [inch²]			0,206	0,761
O-ring material			EPDM "D" J22	EPDM "D" J22
			FFKM "C" J20	FFKM "C" J20
Body material: 1.4435 (316L)				
Bonnet closed	**H2**	Art.-No. **4834.**	**7702**	**7712**
	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**

Available connections

Available connections

Actual Orifice diameter d_0 [mm]		13		25	
Actual Orifice area A_0 [mm²]		133		491	
Clamps		**Option code inlet**			
	DN	**25**		**40**	
	SO	L79I16		L79I17	
	DO	I73I16		I73I17	
	NPS	**1"**	**1 1/2"**	**1 1/2"**	**2"**
	BO	I75I79	I75I80	I75I80	I75I81
	CO	L96I79	L96I80	L96I80	L96I81
Aseptic screwed connection		**Option code inlet**			
Pipe standard	**DN**	**25**		**40**	
DIN 11850 / DIN 11866 Range A	00	–			
	GS	H85H34I16		H85H34I17	
	BS	H85H36I16		H85H36I17	
	GT	H85H54I16		H85H54I17	
	BT	H85H56I16		H85H56I17	
	GO	H85L75I16		H85L75I17	
	KO	H85L76I16		H85L76I17	
	GD	H85H60I16		H85H60I17	
	BD	H85H58I16		H85H58I17	
Pipe standard	**DN**	**25**		**40**	
DIN EN ISO 1127 / DIN 11866 Range B	GS	H86H34I16		H86H34I17	
	BS	H86H36I16		H86H36I17	
	GT	H86H54I16		H86H54I17	
	BT	H86H56I16		H86H56I17	
	GD	H86H60I16		H86H60I17	
	BD	H86H58I16		H86H58I17	
Pipe standard	**NPS**	**1"**	**1 1/2"**	**1 1/2"**	**2"**
BS 4825-1 DIN 11866 Range C	GS	H66H34I79	H66H34I80	H66H34I80	H66H34I81
	BS	H66H36I79	H66H36I80	H66H36I80	H66H36I81
	GT	H66H54I79	H66H54I80	H66H54I80	H66H54I81
	BT	H66H56I79	H66H56I80	H66H56I80	H66H56I81
Aseptic flanged connection		**Option code inlet**			
Pipe standard	**DN**	**25**		**40**	
DIN 11850 / DIN 11866 Range A	NF	H85H71I16		H85H71I17	
	BF	H85H73I16		H85H73I17	
	NG	H85H75I16		H85H75I17	
	BG	H85H77I16		H85H77I17	
	TN	H85L78I16		H85L78I17	
	AF	H85L90I16		H85L90I17	
	AN	H85L92I16		H85L92I17	
	VG	H85I82I16		–	
	VH	H85I83I16		H85I83I17	
Pipe standard	**DN**	**25**		**40**	
DIN EN ISO 1127 / DIN 11866 Range B	NF	H86H71I16			
	BF	H86H73I16			
	NG	H86H75I16			
	BG	H86H77I16			
Pipe standard	**NPS**	**1"**	**1 1/2"**	**1 1/2"**	**2"**
BS 4825-1 DIN 11866 Range C	NF	H66H71I79	H66H71I80	H66H71I80	H66H71I81
	BF	H66H73I79	H66H73I80	H66H73I80	H66H73I81
	NG	H66H75I79	H66H75I80	H66H75I80	H66H75I81
	BG	H66H77I79	H66H77I80	H66H77I80	H66H77I81

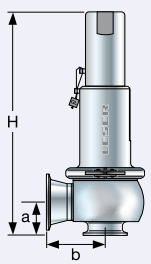
d_0 [mm]	13	25
A_0 [mm²]	133	491
Clamps		**Option code outlet**
DN	**25**	**40**
SO	L86A16	L86A17
DO	I74A16	I74A17
NPS	**1 1/2"**	**2"**
BO	I76A80	I76A81
CO	L97A80	L97A81
Aseptic screwed connection		**Option code outlet**
DN	**25**	**40**
00	A85L83A16	A85L83A17
GS	A85H35A16	A85H35A17
BS	A85H37A16	A85H37A17
GT	A85H55A16	A85H55A17
BT	A85H57A16	A85H57A17
GO	A85L81A16	A85L81A17
KO	A85L82A16	A85L82A17
GD	A85H61A16	A85H61A17
BD	A85H59A16	A85H59A17
DN	**25**	**40**
GS	A86H35A16	A86H35A17
BS	A86H37A16	A86H37A17
GT	A86H55A16	A86H55A17
BT	A86H57A16	A86H57A17
GD	A86H61A16	A86H61A17
BD	A86H59A16	A86H59A17
NPS	**1 1/2"**	**2"**
GS	A84H35A80	A84H35A81
BS	A84H37A80	A84H37A81
GT	A84H55A80	A84H55A81
BT	A84H57A80	A84H57A81
Aseptic flanged connection		**Option code outlet**
DN	**25**	**40**
NF	A85H72A16	A85H72A17
BF	A85H74A16	A85H74A17
NG	A85H76A16	A85H76A17
BG	A85H78A16	A85H78A17
TN	A85L84A16	A85L84A17
AF	A85L91A16	A85L91A17
AN	A85L93A16	A85L93A17
VG	–	–
VH	–	–
DN	**25**	**40**
NF	A86H72A16	A86H72A17
BF	A86H74A16	A86H74A17
NG	A86H76A16	A86H76A17
BG	A86H78A16	A86H78A17
DN	**1 1/2"**	**2"**
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.

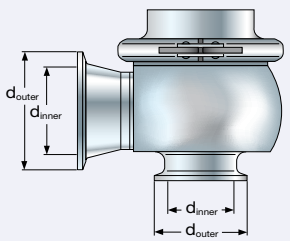
Dimensions and weights

Metric Units

Actual Orifice diameter d_0 [mm]			13	25	13	25
Actual Orifice area A_0 [mm²]			133	491	133	491
Welded connections			**Inlet a**		**Outlet b**	
		PN	**16**	**16**	**16**	**16**
Center to face		[mm]	–	–	81,5	91,5
Height – H4	H max.	[mm]	–	–	–	–
Height – H8 double piston design	H max.	[mm]	–	–	–	–
Clamp connections			**Inlet a**		**Outlet b**	
		PN	**16**	**16**	**16**	**16**
Center to face		[mm]	29	44	52	60
Clamp diameter	d_{inner}	[mm]	For varying clamp diameters please refer to page 16 and 17		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**		**Outlet b**	
		PN	**16**	**16**	**16**	**16**
Center to face		[mm]	40	48	70	78
Height – H4	H max.	[mm]	217	304	–	–
Height – H8 double piston design	H max.	[mm]	245	312	–	–
Aseptic flange connections			**Inlet a**		**Outlet b**	
		PN	**16**	**16**	**16**	**16**
Center to face		[mm]	45 (AN: 40 mm)	51	76 (AN: 60 mm)	82
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		



Type 483 – Cap H2

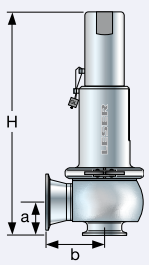


Type 483 – Clamp diameters

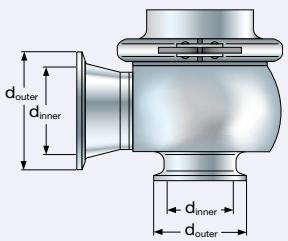
Dimensions and weights

US Units

Actual Orifice diameter d_0 [inch]			0,512	0,984	0,512	0,984
Actual Orifice area A_0 [inch²]			0,206	0,761	0,206	0,761
Welded connections			**Inlet a**		**Outlet b**	
		PN	**16**	**16**	**16**	**16**
Center to face		[inch]	–	–	$3\ ^{7}/_{32}$	$3\ ^{19}/_{32}$
Height – H4	H max.	[inch]	–	–	–	–
Height – H8 double piston design	H max.	[inch]	–	–	–	–
Clamp connections			**Inlet a**		**Outlet b**	
		PN	**16**	**16**	**16**	
Center to face		[inch]	$1\ ^{5}/_{32}$	$1\ ^{23}/_{32}$	$2\ ^{1}/_{16}$	$2\ ^{3}/_{8}$
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]				
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**		**Outlet b**	
		PN	**16**	**16**	**16**	**16**
Center to face		[inch]	$1\ ^{9}/_{16}$	$1\ ^{7}/_{8}$	$2\ ^{3}/_{4}$	$3\ ^{1}/_{16}$
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**		**Outlet b**	
		PN	**16**	**16**	**16**	**16**
Center to face		[inch]	$1\ ^{25}/_{32}$ (AN: $1\ ^{5}/_{8}$)	2	3 (AN: $2\ ^{3}/_{8}$)	$3\ ^{7}/_{32}$
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		



Type 483 – Cap H2



Type 483 – Clamp diameters

Pressure temperature ratings

Metric Units

Actual Orifice diameter d_0 [mm]		13		25	
Actual Orifice area A_0 [mm²]		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 range[1)]		Minimum	Maximum	Minimum	Maximum
EPDM	[°C]	-45	+150	-45	+150
FFKM	[°C]	0	+250	0	+250

US Units

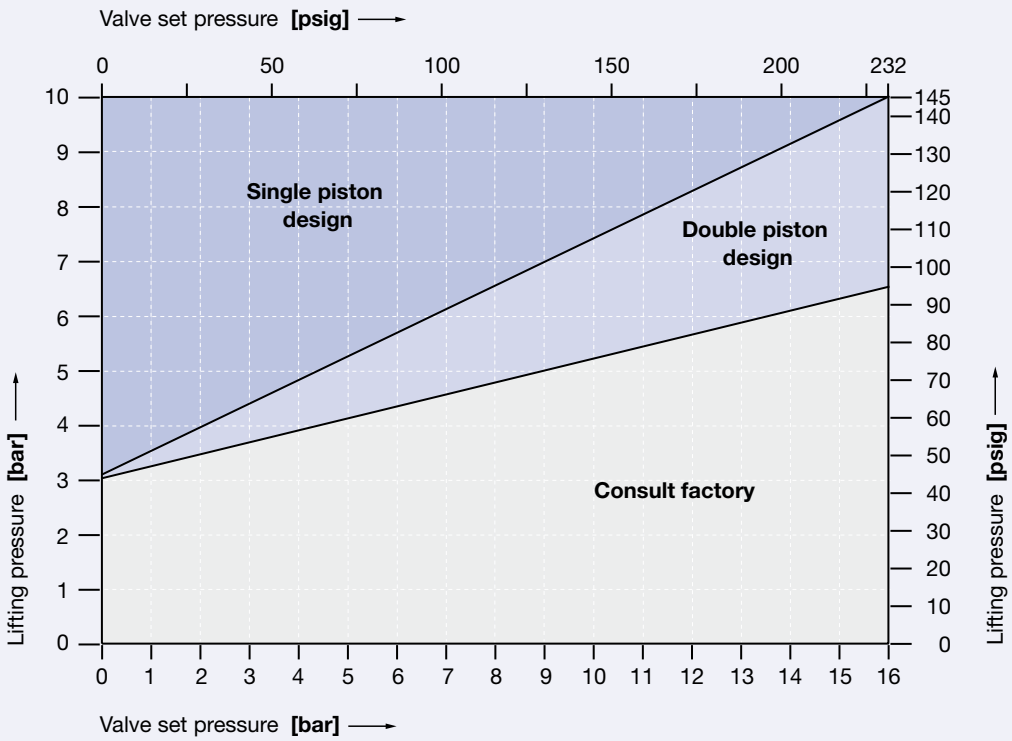
Actual Orifice diameter d_0 [inch]		0,512		0,984	
Actual Orifice area A_0 [inch²]		0,206		0,761	
Body material: 1.4435 (316L)					
Inlet	Pressure rating	For pressure ratings and connection size please refer to chapter dimensions and weights (page 37)			
Outlet	Pressure rating				
Minimum set pressure	p [psig] S/G/L	4,4		1,5	
Maximum set pressure	p [psig] S/G/L	232		232	
Temperature range[1)]		Minimum	Maximum	Minimum	Maximum
EPDM	[°F]	-49	+302	-49	+302
FFKM	[°F]	+32	+482	+32	+482

[1)] The temperature is limited by the soft seal material.

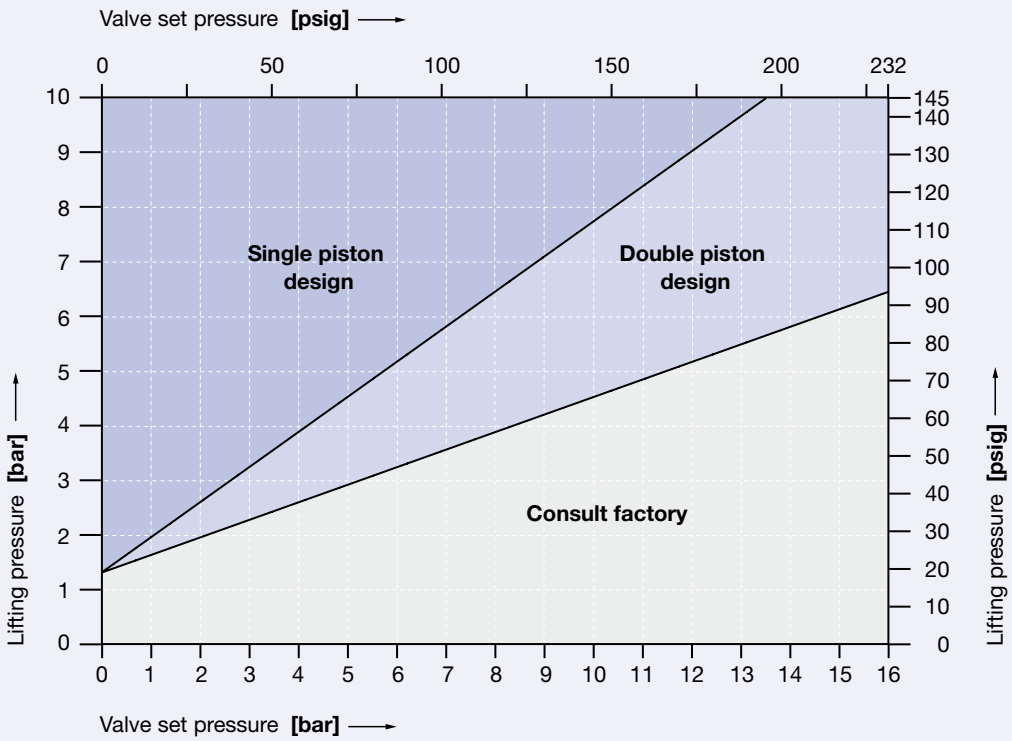
Selection chart H8

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

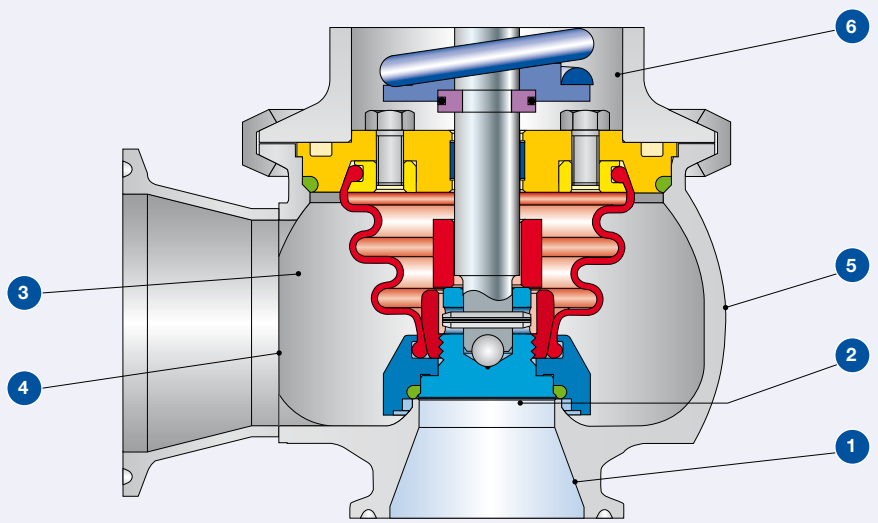


Surface quality

Surface quality

Type of surface	Area			LESER Surface package		
				Clean finish	HyClean finish	Sterile finish
			Option code	B53	B54	B55
	Description	No.		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	ME4
			[µm]	1,500	1,500	0,750
			[µinch]	60	60	30
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.



Approvals

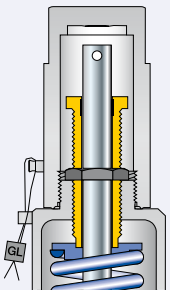
Approvals

Actual Orifice diameter d_0 [mm]		13	25
Actual Orifice area A_0 [mm²]		133	491
Actual Orifice diameter d_0 [inch]		0,512	0,984
Actual Orifice area A_0 [inch²]		0,206	0,761
Europe		**Coefficient of discharge K_{dr}**	
DIN EN ISO 4126-1	Approval No.	07 202 0111 Z 0008/0/20	
	S/G	0,6	0,38
	L	0,4	0,26
Germany		**Coefficient of discharge α_w**	
AD 2000-Merkblatt A2	Approval No.	TÜV SV 1047	
	S/G	0,6	0,38
	L	0,4	0,26
United States		**Coefficient of discharge K**	
ASME Sec. VIII	Approval No.	M37145	M37167
	S/G	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) S: 5,52 lb / hr / psia ≙ K ≈ 0,521 G: 1,96 SCFM / psia ≙ K ≈ 0,521	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) S: 13,97 lb / hr / psia ≙ K ≈ 0,357 G: 4,96 SCFM / psia ≙ K ≈ 0,357
	Approval No.	M37156	M37178
	L	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) L: 2,96 GPM $\sqrt{psid}$*) ≙ K ≈ 0,379	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) L: 7,46 GPM $\sqrt{psid}$*) ≙ K ≈ 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 ≙ K ≈ 0,521 G: 1,96 SCFM / psia ≙ K ≈ 0,521	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) S: 13,97 lb / hr / psia ≙ K ≈ 0,357 G: 4,96 SCFM / psia ≙ K ≈ 0,357
	L	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) L: 2,96 GPM $\sqrt{psid}$*) ≙ K ≈ 0,379	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) L: 7,46 GPM $\sqrt{psid}$*) ≙ K ≈ 0,258
China		**Coefficient of discharge α_w**	
AQSIQ	Approval No.	02301T	
	S/G	0,6	0,38
	L	0,4	0,26
Eurasian Custom Union		**Coefficient of discharge α_w**	
EAC	Approval No.	For current approval no. see www.leser.com	
	S/G	0,6	0,38
	L	0,4	0,26
Classification societies			
		on request	

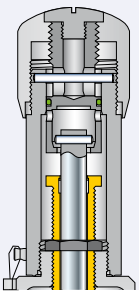
*) psid = Differential pressure P-P_d
P = absolute flow pressure [psia]
P_d = pressure at discharge from valve [psia]

Available options

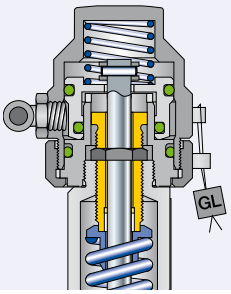
Gastight cap H2
H2



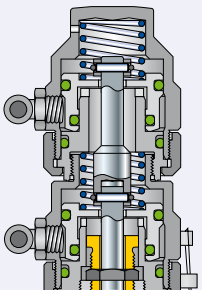
Gastight lifting device H4
Packed knob H4



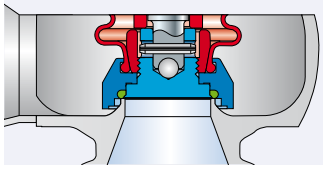
Pneumatic lifting device H8
H8 single piston design



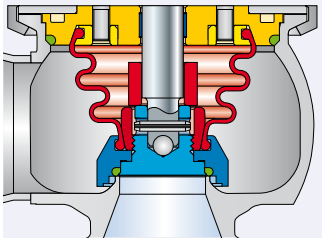
Pneumatic lifting device H8
J41: H8 double piston design



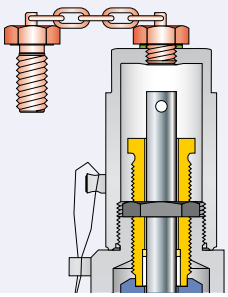
O-ring-disc
J22: EPDM "D"
J20: FFKM "C"



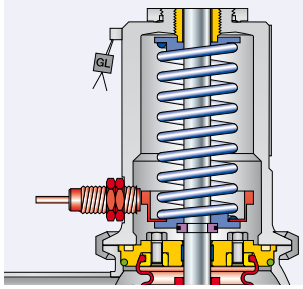
Bellows FFKM "C"
S70 – only for $d_0$13



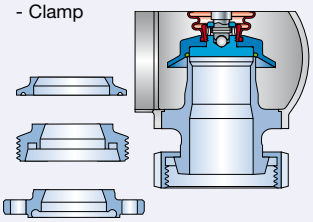
Test gag
J70: H2



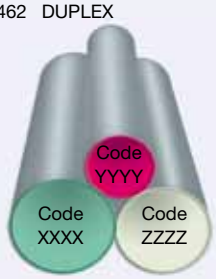
Lift indicator placed in bonnet
J38 + J93



Multiple possibilities of aseptic connections
- Dairy industry coupling
- Sterile screw coupling
- Small flange
- Clamp



Special material
2.4610 HASTELLOY C4
2.4360 MONEL 400
1.4462 DUPLEX



Type 488

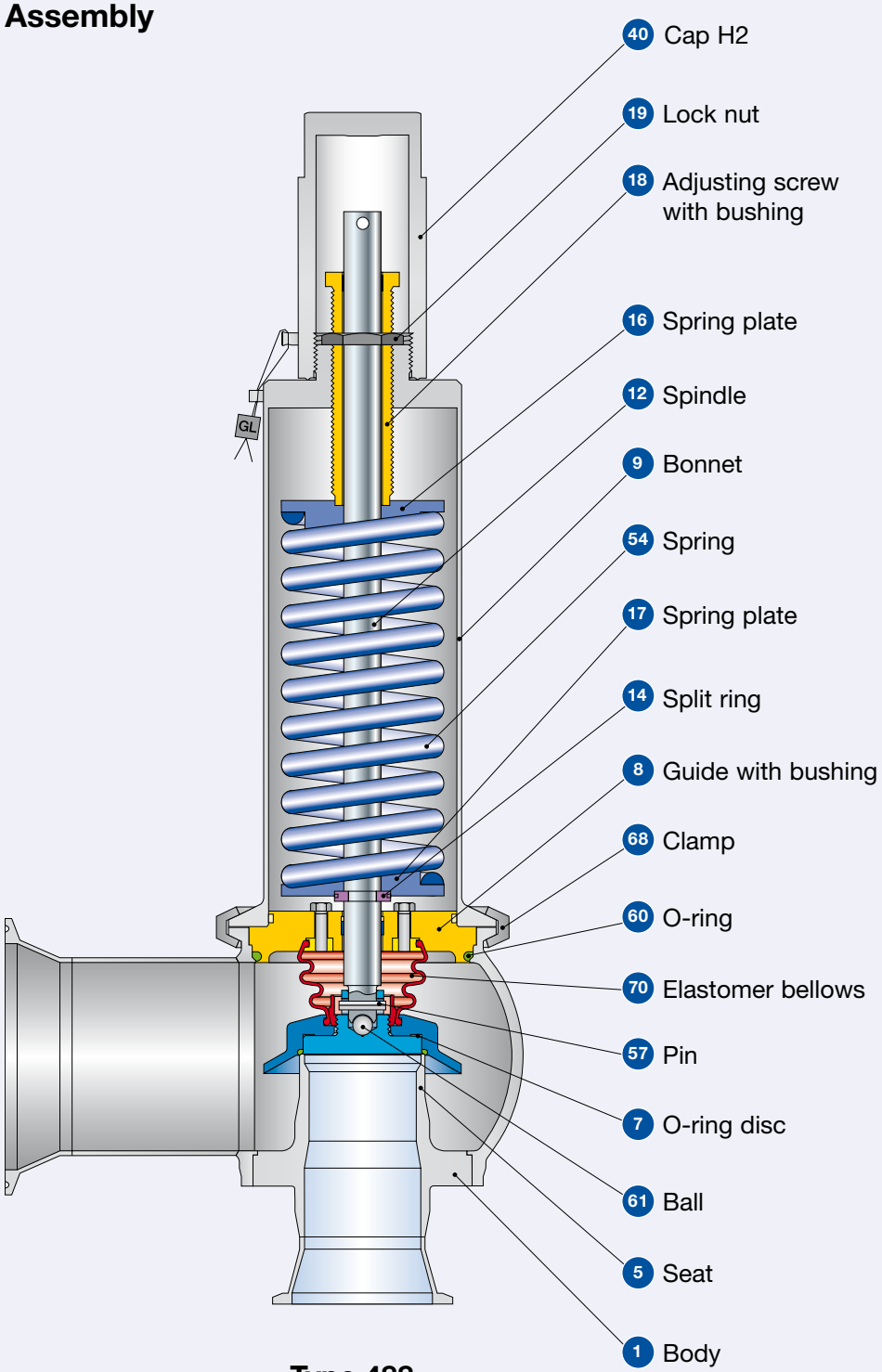
Type 488
Cap H2
Inlet and outlet:
Clamp connection

Safety Relief Valves – spring loaded

Type 488
Packed knob H4
Inlet and outlet:
Flange connection

Contents

HyTight Assembly



Type 488
Cap H2
Inlet and outlet: Clamp connection

Materials — HyTight Assembly

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" FDA USP VI	EPDM
		"K"	CR
		"L" FDA	FKM
		"C" FDA USP VI	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	FDA	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.

Article numbers

Article numbers

Actual Orifice diameter d_0 [mm]			23		37		46		60		74		92	
Actual Orifice area A_0 [mm²]			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 [inch²]			0,644		1,667		2,576		4,383		6,666		10,304	
O-ring material			EPDM	"D" J22	EPDM	"D" J22	EPDM	"D" J22	EPDM	"D" J22	EPDM	"D" J22	EPDM	"D" J22
			CR	"K" J21	CR	"K" J21	CR	"K" J21	CR	"K" J21	CR	"K" J21	CR	"K" J21
			FKM	"L" J23	FKM	"L" J23	FKM	"L" J23	FKM	"L" J23	FKM	"L" J23	FKM	"L" J23
			FFKM	"C" J20	FFKM	"C" J20	FFKM	"C" J20	FFKM	"C" J20	FFKM	"C" J20	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**	

Available connections

	d_0 [mm]	23	37	46	60	74	92
	A_0 [mm²]	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 [mm²]	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			–	–	–

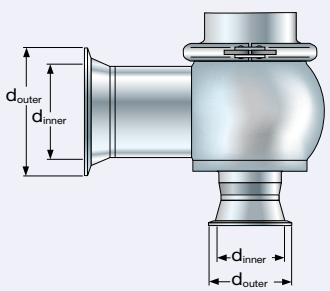
For definitions of connection codes please refer to pages 12 up to 15.

[1] Please select CO-Clamp

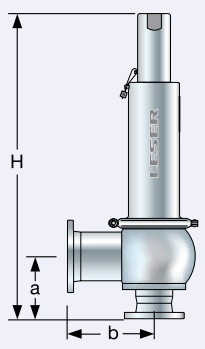
Dimensions and weights

Metric Units

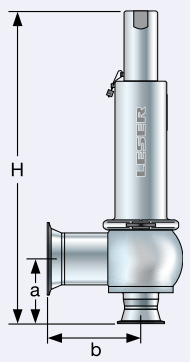
Actual Orifice diameter d_0 [mm]			23	37	46	60	74	92	23	37	46	60	74	92
Actual Orifice area A_0 [mm²]			416	1075	1662	2827	4301	6648	416	1075	1662	2827	4301	6648
Welded connections			**Inlet a**						**Outlet b**					
		PN	**16**	**16**	**16**	**16**	**16**	**16**	**16**	**16**	**16**	**16**	**16**	**16**
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**
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						For varying clamp diameters please refer to page 16 and 17					
	d_{outer}	[mm]												
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**	**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						



Clamp diameters



Flanged connection

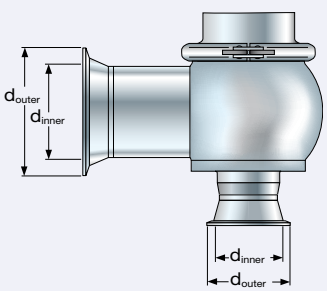


Clamp connection

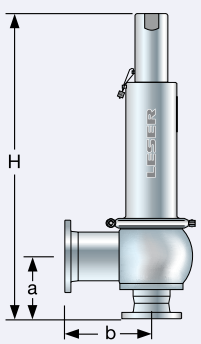
Dimensions and weights

US Units

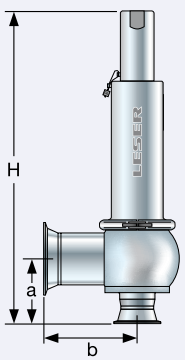
Actual Orifice diameter d_0		[inch]	0,906	1,457	1,811	2,362	2,913	3,622	0,906	1,457	1,811	2,362	2,913	3,622
Actual Orifice area A_0		[inch²]	0,644	1,67	2,576	4,38	6,666	10,30	0,644	1,67	2,576	4,38	6,666	10,30
Welded connections			**Inlet a**						**Outlet b**					
		PN	**16**	**16**	**16**	**16**	**16**	**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]												
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	max.	[lb]	19,8	44,1	47,8	58,4	103,6	123,5						



Clamp diameters



Flanged connection

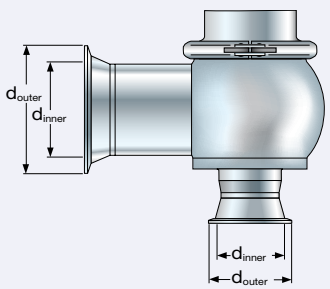


Clamp connection

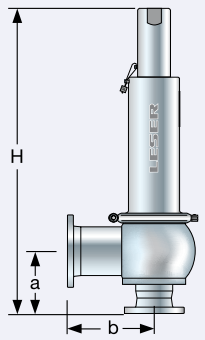
Dimensions and weights

Metric Units

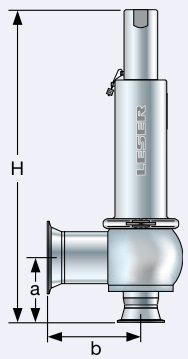
Actual Orifice diameter d_0 [mm]			23	37	46	60	74	92	23	37	46	60	74	92
Actual Orifice area A_0 [mm²]			416	1075	1662	2827	4301	6648	416	1075	1662	2827	4301	6648
DIN / ASME Flange			**Inlet a**						**Outlet b**					
		PN	**16**	**16**	**16**	**16**	**16**	**16**	**16**	**16**	**16**	**16**	**16**	**16**
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						



Clamp diameters



Flanged connection

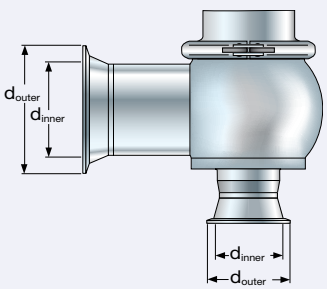


Clamp connection

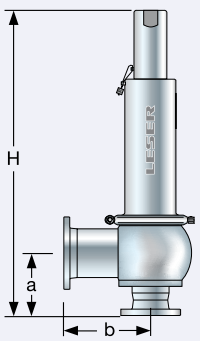
Dimensions and weights

US Units

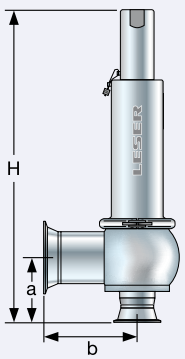
Actual Orifice diameter d_0 [inch]			23	37	46	60	74	92	23	37	46	60	74	92
Actual Orifice area A_0 [inch²]			416	1075	1662	2827	4301	6648	416	1075	1662	2827	4301	6648
DIN / ASME Flange			**Inlet a**						**Outlet b**					
		PN	**16**	**16**	**16**	**16**	**16**	**16**	**16**	**16**	**16**	**16**	**16**	**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						



Clamp diameters



Flanged connection



Clamp connection

Pressure temperature ratings

Metric Units

Actual Orifice diameter d_0 [mm]		23		37		46		60		74		92	
Actual Orifice area A_0 [mm²]		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 pressure[1]	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 range[2]		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
EPDM	[°C]	-45	+150	-45	+150	-45	+150	-45	+150	-45	+150	-45	+150
CR	[°C]	-40	+100	-40	+100	-40	+100	-40	+100	-40	+100	-40	+100
FKM	[°C]	-20	+180	-20	+180	-20	+180	-20	+180	-20	+180	-20	+180
FFKM	[°C]	0	+250	0	+250	0	+250	0	+250	0	+250	0	+250

US Units

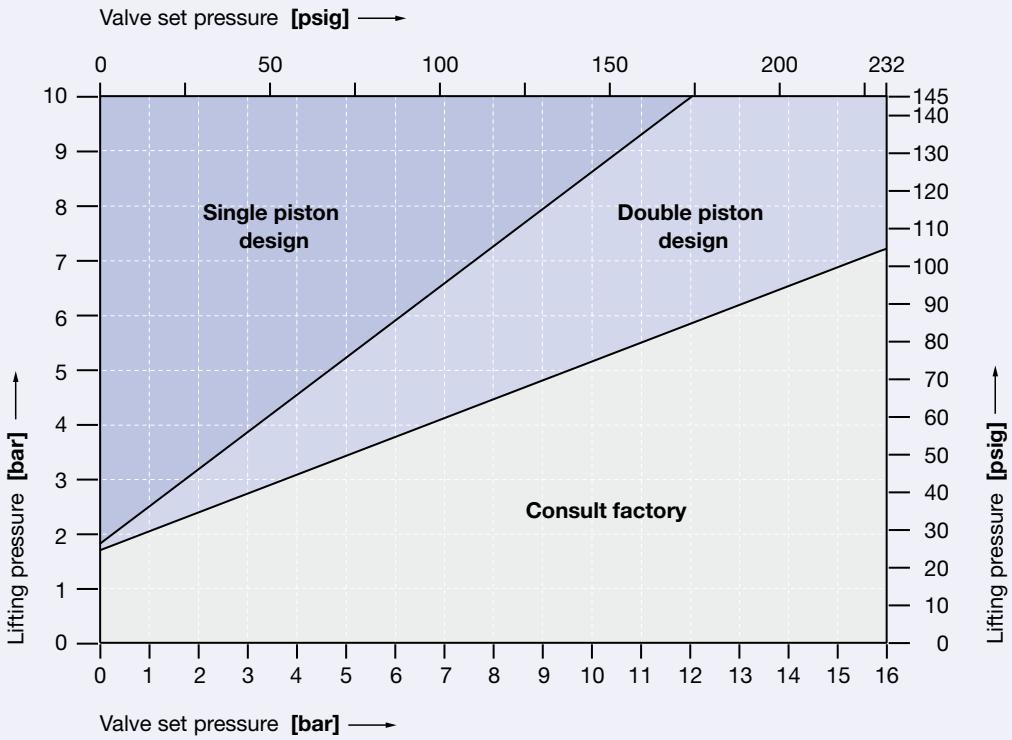
Actual Orifice diameter d_0 [inch]		0,906		1,457		1,811		2,362		2,913		3,622	
Actual Orifice area A_0 [inch ²]		0,644		1,667		2,576		4,383		6,666		10,304	
Body material: 1.4404 (316L)													
Inlet / Outlet	Pressure rating	For pressure ratings and connection size please refer to chapter dimensions and weights (page 49/51)											
Minimum set pressure[1]	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 range[2]		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
EPDM	[°F]	-49	+302	-49	+302	-49	+302	-49	+302	-49	+302	-49	+302
CR	[°F]	-40	+212	-40	+212	-40	+212	-40	+212	-40	+212	-40	+212
FKM	[°F]	-4	+356	-4	+356	-4	+356	-4	+356	-4	+356	-4	+356
FFKM	[°F]	+32	+482	+32	+482	+32	+482	+32	+482	+32	+482	+32	+482

[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 soft seal material.

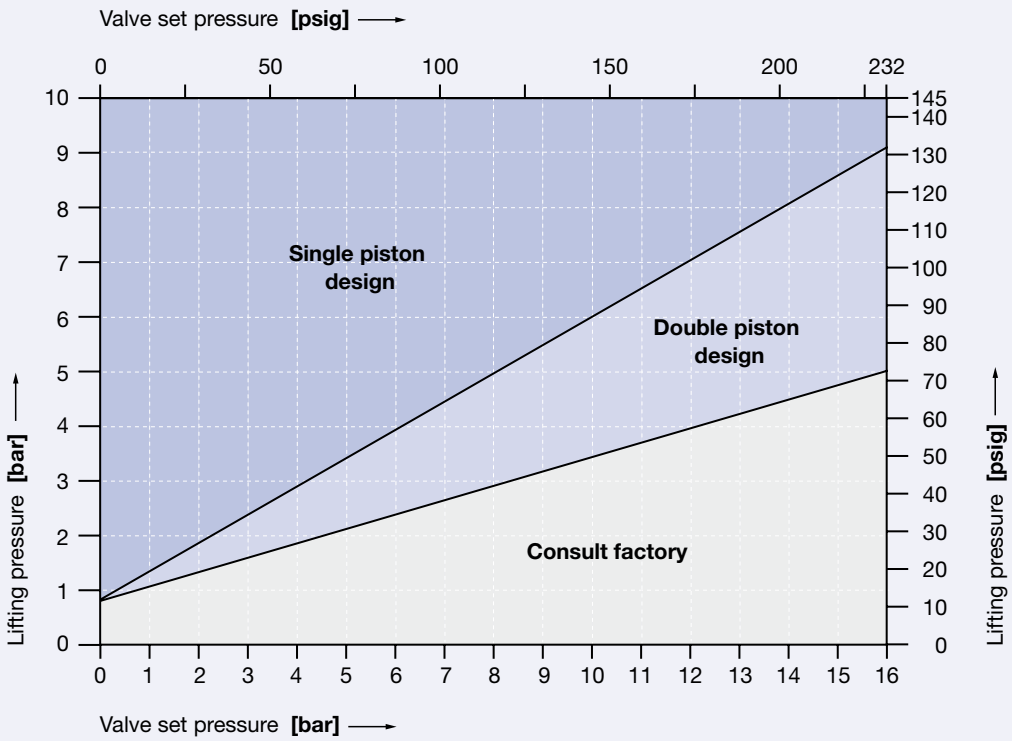
Selection chart H8

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

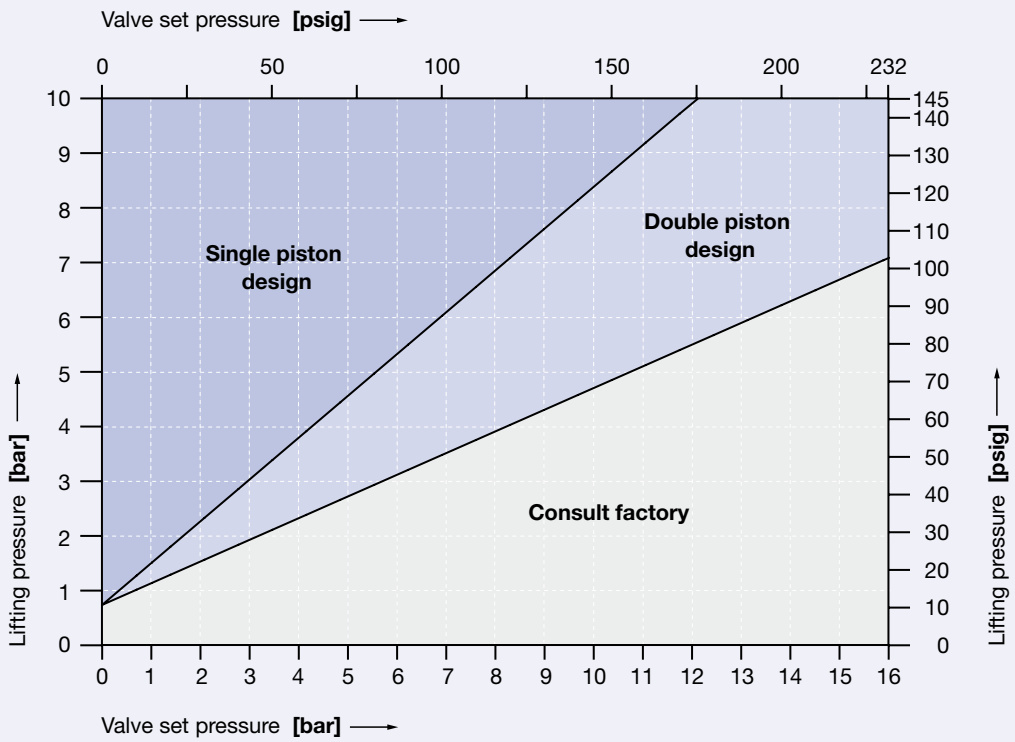


Selection chart lifting device H8, size II. d_0 37 mm / 1,457 inch

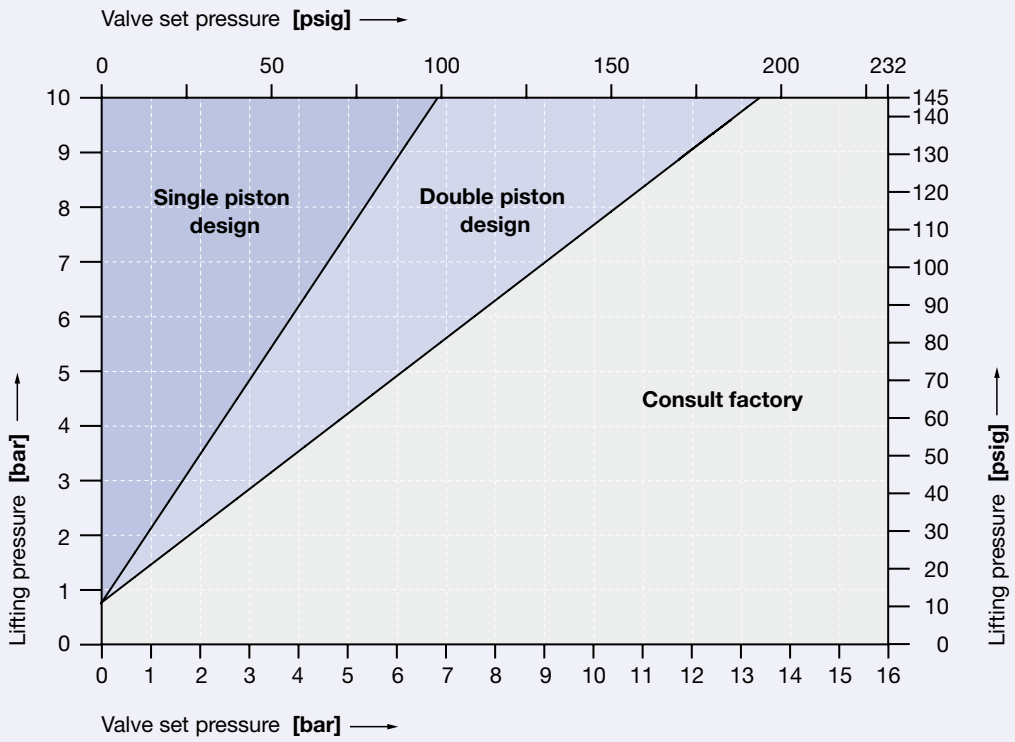


Selection chart H8

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

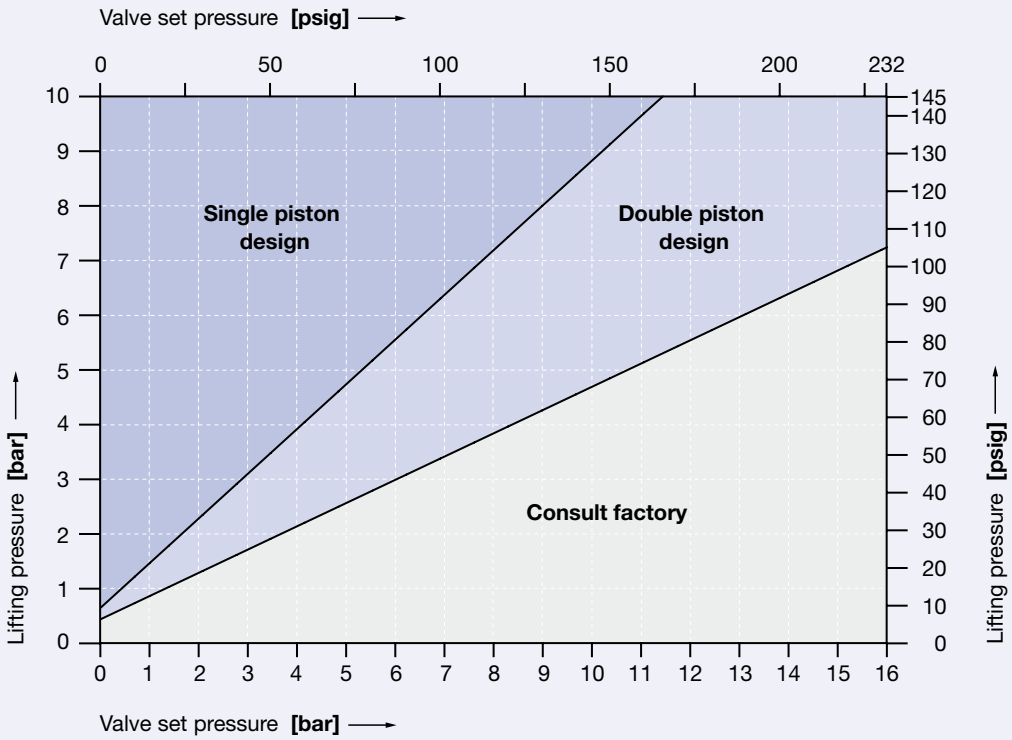


Selection chart lifting device H8, size II. d_0 60 mm / 2,362 inch

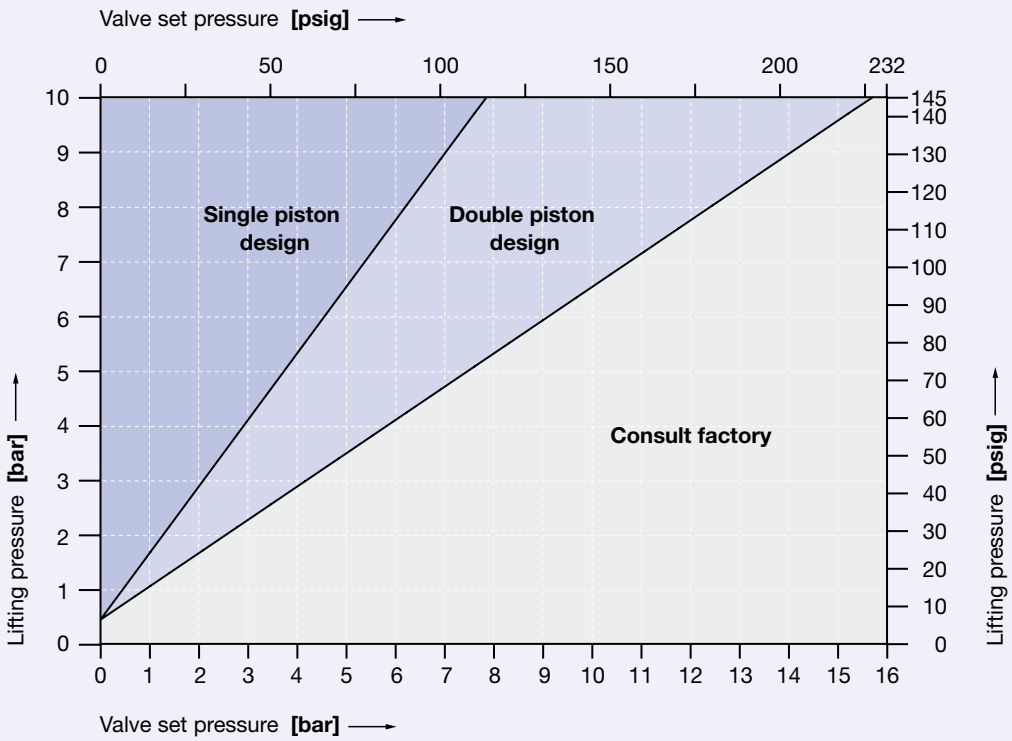


Selection chart H8

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

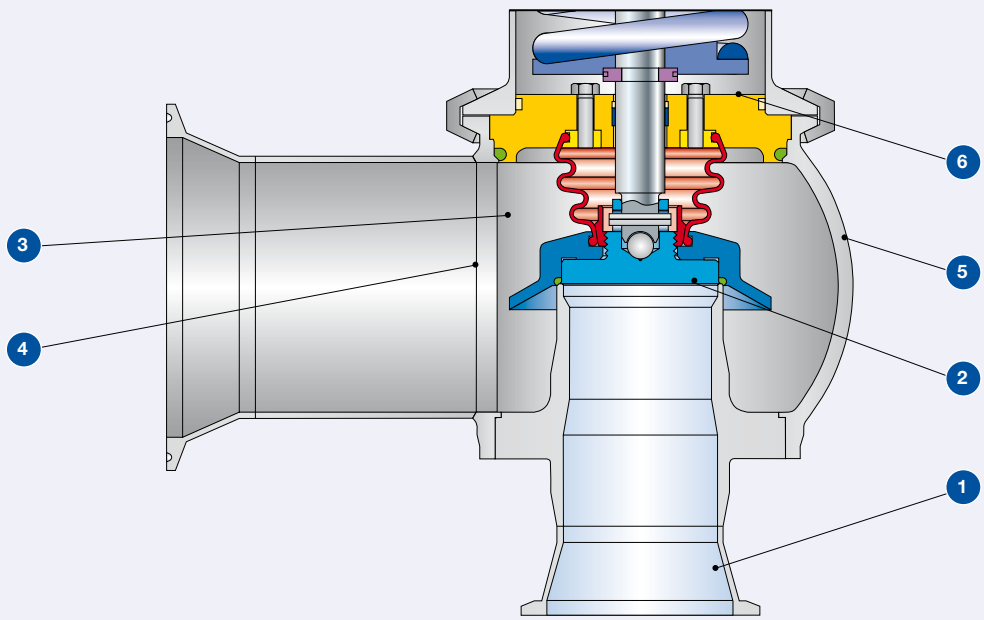


Surface quality

Surface quality

Type of surface	Area			LESER Surface package		
				Clean finish	HyClean finish	Sterile finish
			Option code	B68	B69	B70
	Description	No.		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.

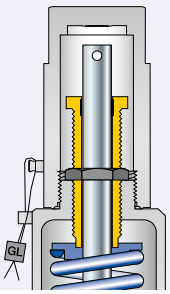


Approvals

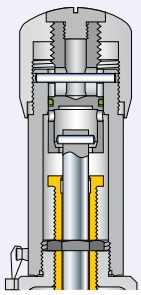
Approvals							
Actual Orifice diameter d_0 [mm]		23	37	46	60	74	92
Actual Orifice area A_0 [mm²]		416	1075	1662	2827	4301	6648
Actual Orifice diameter d_0 [inch]		0,906	1,457	1,811	2,362	2,913	3,622
Actual Orifice area A_0 [inch²]		0,644	1,667	2,576	4,383	6,666	10,304
Europe		**Coefficient of discharge K_{dr}**					
DIN EN ISO 4126-1	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	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.	02301T					
	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					

Available options

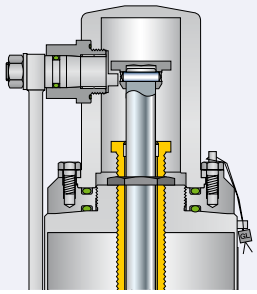
Gastight cap H2
H2



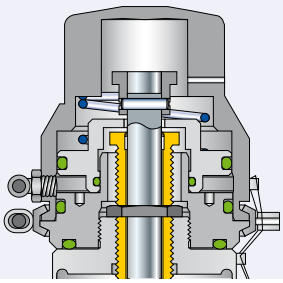
Gastight lifting device H4
Packed knob H4 (d_0 23 only)



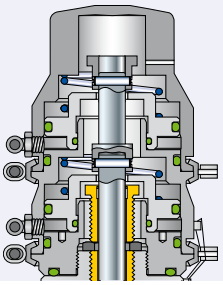
Packed lever H4
(for d_0 > 23)



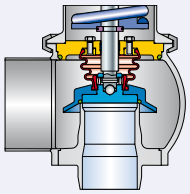
Pneumatic lifting device H8
H8 single piston design



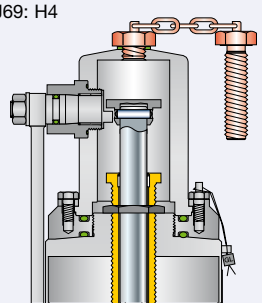
Pneumatic lifting device H8
J41: H8 double piston design



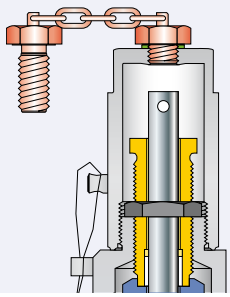
HyTight Assembly
J22: EPDM "D"
J21: CR "K"
J23: FKM "L"
J20: FFKM "C"



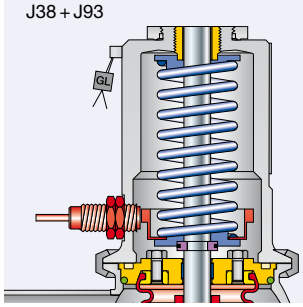
Test gag
(for d_0 > 23)
J69: H4



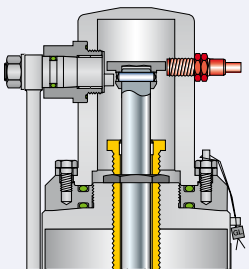
Test gag
J70: H2



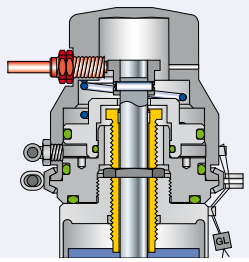
Lift indicator bonnet
(d_0 23 only)
J38 + J93



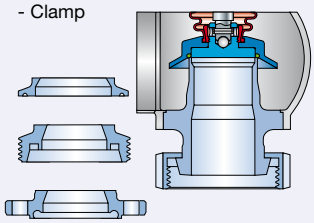
Lift indicator H4
(for d_0 > 23)
J39 + J93



Lift indicator H8
(for d_0 > 23)
J40 + J93



Multiple possibilities of aseptic connections
- Diary industry coupling
- Sterile screw coupling
- Small flange
- Clamp



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

Type 484

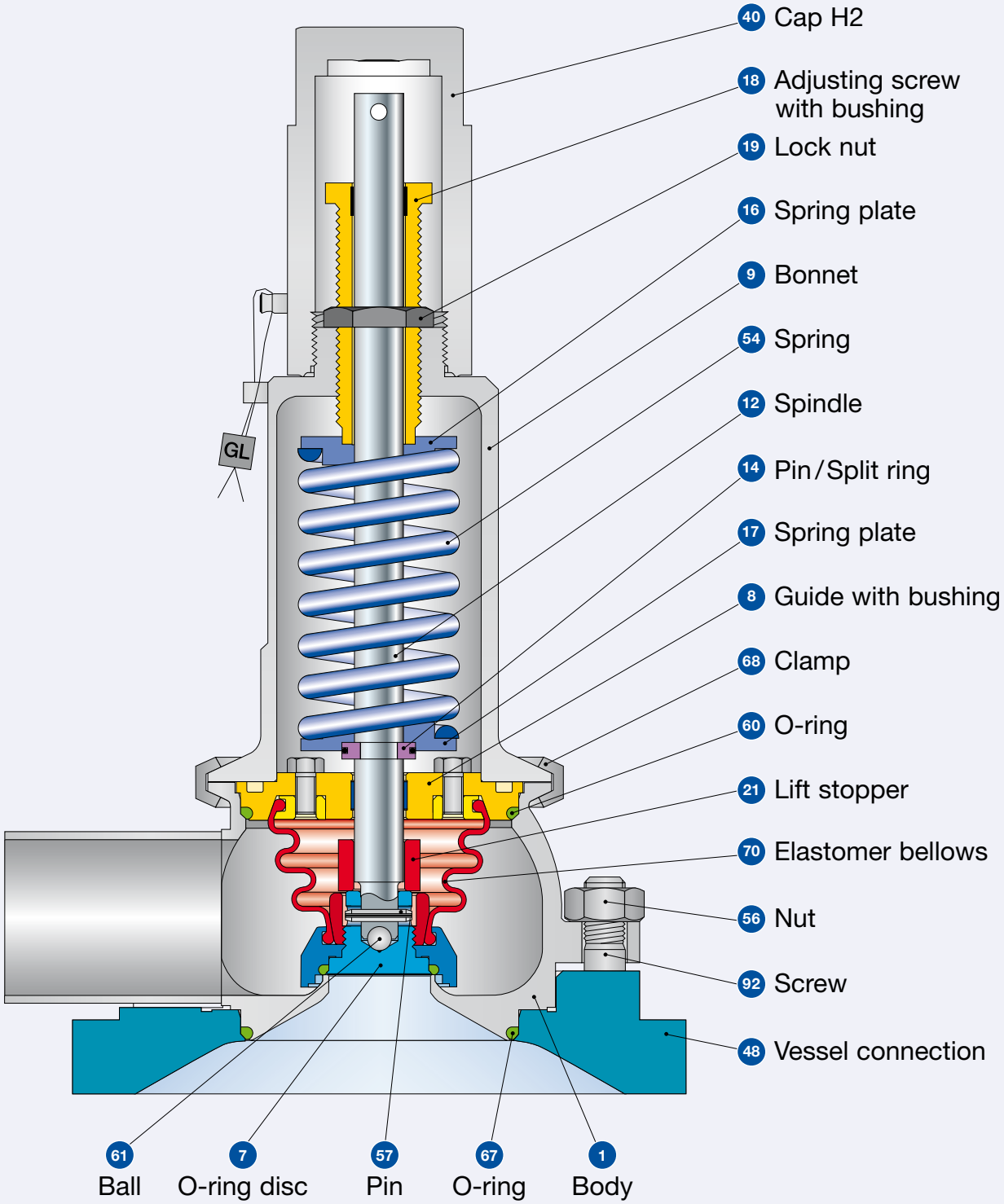
Safety Relief Valves – spring loaded

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

Type 5034
Vessel connection

Contents | Page

HyTight Assembly



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

Materials

HyTight Assembly

Item	Component	Remarks	Type 4844 HyTight
1	Body		1.4435 (BN 2)*) SA 479 316L
7	O-ring disc	HyTight Assembly	1.4435 316L
7.4	Soft seal O-ring	"D" FDA USP VI	EPDM
		"C" FDA USP VI	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
21	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	FDA USP VI	EPDM
61	Ball		1.4401 316
68	Clamp		1.4401 316
70	Elastomer bellows	FDA	EPDM
Vessel connection Type 5034			
48	Vessel connection		1.4435 (BN 2)*) SA 479 316L
56	Nut		1.4401 316
67	O-ring	FDA	EPDM
92	Screw		1.4404 316L
–	Blind flange for pressure test		1.4404 316L

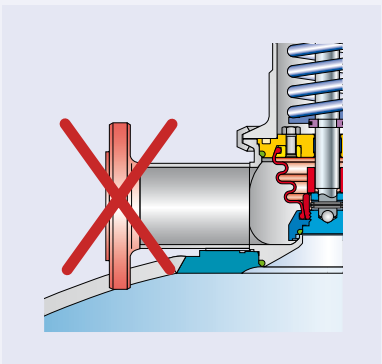
*) The material 1.4435/SA 479 316L fulfils the requirements of the Swiss chemical and pharmaceutical industry Basler Norm (BN 2).

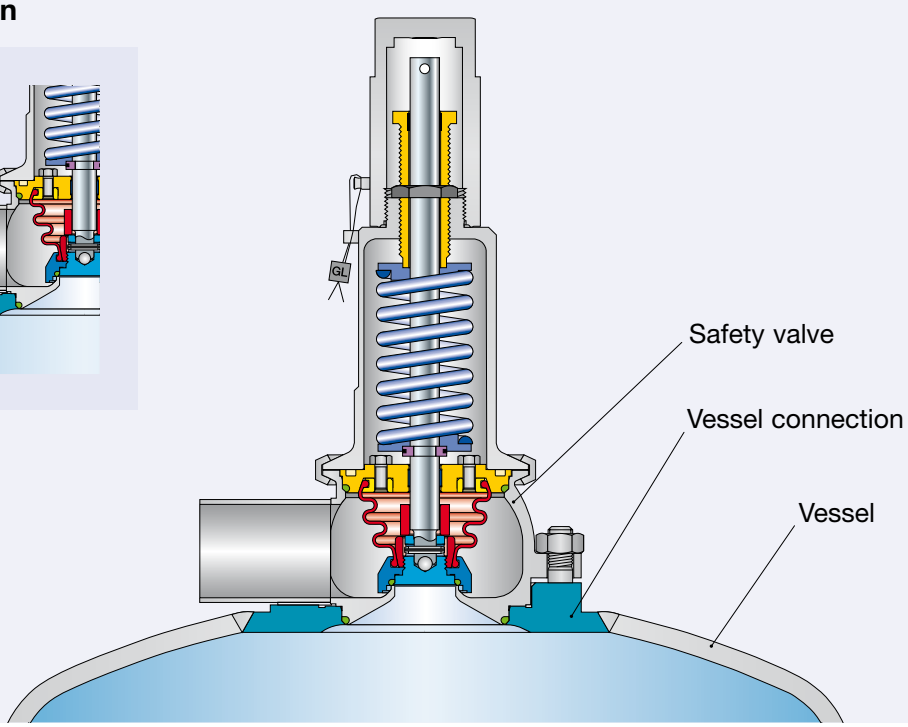
Please notice: – Modifications reserved by LESER.
– LESER can upgrade materials without notice.
– Every part can be replaced by other material acc. to customer specification.

Article numbers

Article numbers					
Actual Orifice diameter d_0 [mm]			13		25
Actual Orifice area A_0 [mm²]			133		491
Actual Orifice diameter d_0 [inch]			0,512		0,984
Actual Orifice area A_0 [inch²]			0,206		0,761
O-ring material			EPDM "D" J22		EPDM "D" J22
			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≤	≤ 5	> 5
Vessel wall thickness [inch]			≤ 13/64	> 13/64	≤ 13/64	> 13/64
		Art.-No. **5034.**	**0980**	**0981**	**0982**	**0983**
Blind flange for pressure test: 1.4404 (316L)			**Please order separately**		
		Art.-No.	**138.8849.9000**		**138.8649.9000**	

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.

Available connections

Available connections

d_0 [mm]		13	25
A_0 [mm²]		133	491
Clamps			**Option code outlet**
	DN	**25**	**40**
	SO	L86A16	L86A17
	DO	I74A16	I71A17
	NPS	**1 1/2"**	**2"**
	BO	I76A80	I76A81
	CO	L97A80	L97A81

Clamps — **Option code inlet**

For inlet please select vessel connection Type 5034 as shown on page 62. For connections directly machined into vessel wall please ask for drawing.

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**	**1 1/2"**	**2"**
BS 4825-1 DIN 11866 Range C	GS	A84H35A80	A84H35A81
	BS	A84H37A80	A84H37A81
	GT	A84H55A80	A84H55A81
	BT	A84H57A80	A84H57A81

Aseptic screwed connection — **Option code inlet**

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.

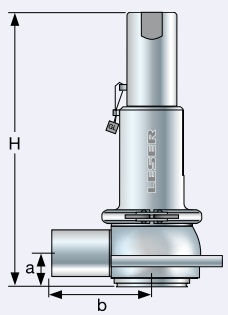
LESER

Dimensions and weights

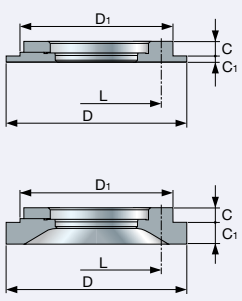
Metric Units

Actual Orifice diameter d_0 [mm]			13		25	
Actual Orifice area A_0 [mm²]			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 a[1)]**	**Outlet b**	**Inlet a[1)]**	**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 a[1)]**	**Outlet b**	**Inlet a[1)]**	**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		For varying clamp diameters please refer to page 16 and 17	
	d_{outer}	[mm]				
Height – H4	H max.	[mm]	201		289	
Height – H8 double piston design	H max.	[mm]	229		296	
Threaded connections			**Inlet a[1)]**	**Outlet b**	**Inlet a[1)]**	**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 a[1)]**	**Outlet b**	**Inlet a[1)]**	**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	

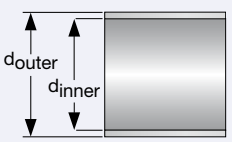
[1)] without vessel connection



Type 484 – Cap H2



Type 5034 – Vessel connection



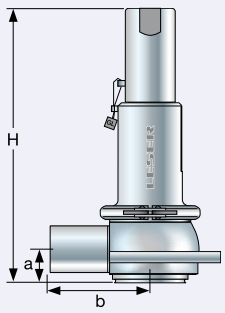
Tube end

Dimensions and weights

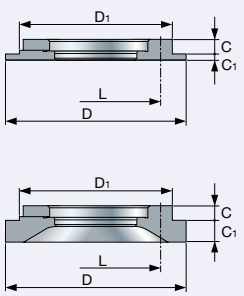
US Units

Actual Orifice diameter d_0		[inch]	0,512		0,984	
Actual Orifice area A_0		[inch²]	0,206		0,761	
Vessel connections						
			Vessel wall thickness		Vessel wall thickness	
			≤ 13/64 inch	> 13/64 inch	≤ 13/64 inch	> 13/64 inch
		PN	**16**	**16**	**16**	**16**
Flange thickness	C	[inch]	15/32	15/32	15/32	15/32
	C_1	[inch]	11/16	23/32	11/16	23/32
Diameter	D	[inch]	5 1/8	5 1/8	5 29/32	5 29/32
	D_1	[inch]	4 11/32	4 11/32	5	5
Bolt circle	L	[inch]	3 17/32	3 17/32	4 11/32	4 11/32
Welded connections			**Inlet a[1)]**	**Outlet b**	**Inlet a[1)]**	**Outlet b**
		PN	**16**	**16**	**16**	**16**
Center to face		[inch]	15/16	3 5/32	1 3/16	3 17/32
Height – H4	H max.	[inch]	7 29/32		11 3/8	
Height – H8 double piston design	H max.	[inch]	9		11 5/32	
Clamp connections			**Inlet a[1)]**	**Outlet b**	**Inlet a[1)]**	**Outlet b**
		PN	**16**	**16**	**16**	**16**
Center to face		[inch]	15/16	4	1 3/16	4 3/8
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]				
Height – H4	H max.	[inch]	7 29/32		11 3/8	
Height – H8 double piston design	H max.	[inch]	9		11 5/32	
Threaded connections			**Inlet a[1)]**	**Outlet b**	**Inlet a[1)]**	**Outlet b**
		PN	**16**	**16**	**16**	**16**
Center to face		[inch]	15/16	4 23/32	1 3/16	5 3/32
Height – H4	H max.	[inch]	7 29/32		11 3/8	
Height – H8 double piston design	H max.	[inch]	9		11 5/32	
Flanged connections			**Inlet a[1)]**	**Outlet b**	**Inlet a[1)]**	**Outlet b**
		PN	**16**	**16**	**16**	**16**
Center to face		[inch]	15/16	4 15/16	1 3/16	5 1/4
Height – H4	H max.	[inch]	7 29/32		11 3/8	
Height – H8 double piston design	H max.	[inch]	9		11 5/32	
Weight						
Weight	max.	[lb]	6,6		8,8	

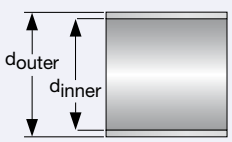
[1)] without vessel connection



Type 484 – Cap H2



Type 5034 – Vessel connection



Tube end

Pressure temperature ratings

Metric Units

Actual Orifice diameter d_0 [mm]		13		25	
Actual Orifice area A_0 [mm²]		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 range[1]		Minimum	Maximum	Minimum	Maximum
EPDM	[°C]	-45	+150	-45	+150
FFKM	[°C]	0	+250	0	+250

US Units

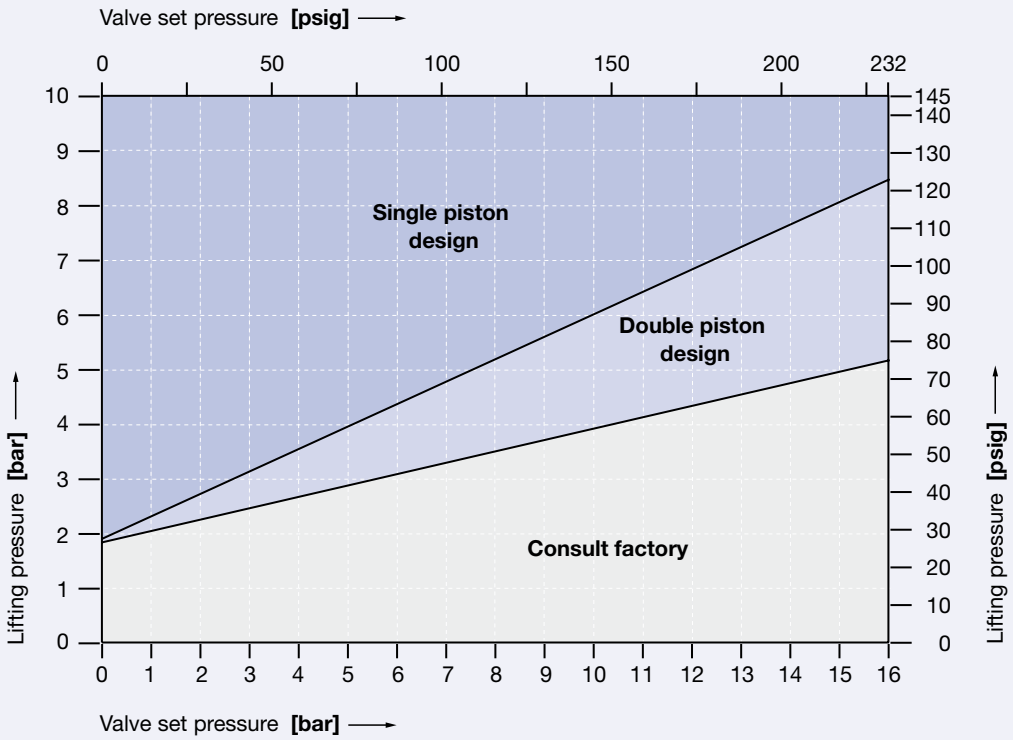
Actual Orifice diameter d_0 [inch]		0,512		0,984	
Actual Orifice area A_0 [inch²]		0,206		0,761	
Body material: 1.4435 (316L)					
Minimum set pressure	p [psig] S/G/L	4,4		1,5	
Maximum set pressure	p [psig] S/G/L	232		232	
Temperature range[1]		Minimum	Maximum	Minimum	Maximum
EPDM	[°F]	-49	+302	-49	+302
FFKM	[°F]	+32	+482	+32	+482

[1] The temperature is limited by the soft seal material.

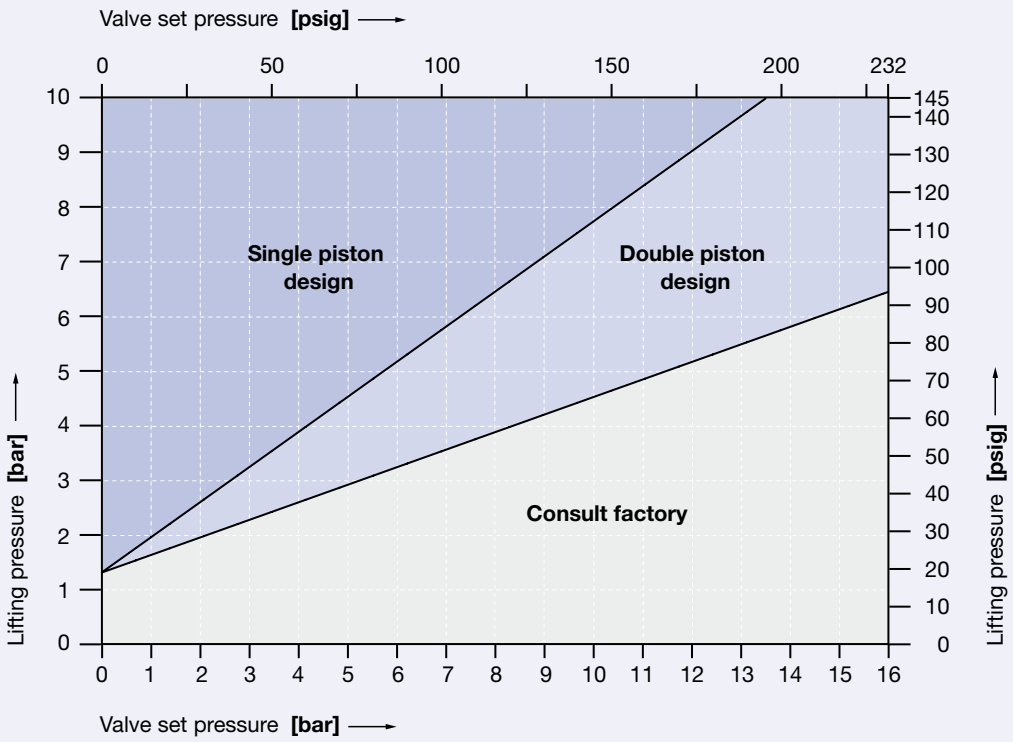
Selection chart H8

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



LESER

Surface quality

Surface quality

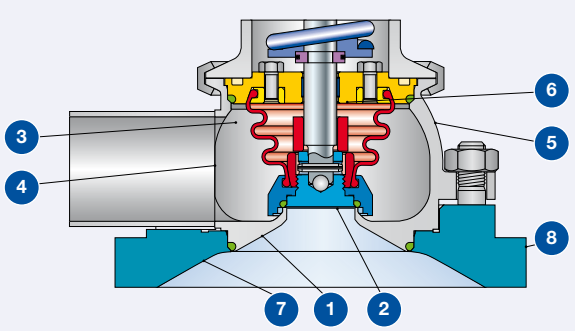
Type of surface	Area			LESER Surface package		
				Clean finish	HyClean finish	Sterile finish
			Option code	B56	B57	B58
	Description	No.		R_a max.	R_a max.	R_a max.
				LESER Surface grade		
Product contact surface	Inlet	1		ME4	ME2	ME1
			[µm]	0,750	0,500	0,375
			[µinch]	30	20	15
	Bottom side of disc	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		
				Clean finish	HyClean finish	Sterile finish
			Option code	B59	B60	B61
	Description	No.		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.



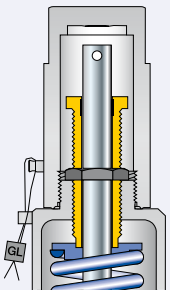
Approvals

Approvals			
Actual Orifice diameter d_0 [mm]		13	25
Actual Orifice area A_0 [mm²]		133	491
Actual Orifice diameter d_0 [inch]		0,512	0,984
Actual Orifice area A_0 [inch²]		0,206	0,761
Europe		**Coefficient of discharge K_{dr}**	
DIN EN ISO 4126-1	Approval No.	07 202 0111 Z 0008/0/20	
	S/G	0,60	0,41
	L	0,40	0,28
Germany		**Coefficient of discharge α_w**	
AD 2000-Merkblatt A2	Approval No.	TÜV SV 1047	
	S/G	0,60	0,41
	L	0,40	0,28
United States		**Coefficient of discharge K**	
ASME Sec. VIII	Approval No.	M37145	M37167
	S/G	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) S: 5,52 lb / hr / psia ≙ K ≈ 0,521 G: 1,96 SCFM / psia ≙ K ≈ 0,521	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) S: 13,97 lb / hr / psia ≙ K ≈ 0,357 G: 4,96 SCFM / psia ≙ K ≈ 0,357
	Approval No.	M37156	M37178
	L	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) L: 2,96 GPM $\sqrt{psid}$*) ≙ K ≈ 0,379	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) L: 7,46 GPM $\sqrt{psid}$*) ≙ K ≈ 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 ≙ K ≈ 0,521 G: 1,96 SCFM / psia ≙ K ≈ 0,521	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) S: 13,97 lb / hr / psia ≙ K ≈ 0,357 G: 4,96 SCFM / psia ≙ K ≈ 0,357
	L	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) L: 2,96 GPM $\sqrt{psid}$*) ≙ K ≈ 0,379	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) L: 7,46 GPM $\sqrt{psid}$*) ≙ K ≈ 0,258
China		**Coefficient of discharge α_w**	
AQSIQ	Approval No.	02301T	
	S/G	0,60	0,41
	L	0,40	0,28
Eurasian Custom Union		**Coefficient of discharge α_w**	
EAC	Approval No.	For current approval no. see www.leser.com	
	S/G	0,60	0,41
	L	0,40	0,28
Classification societies			
		on request	

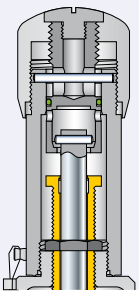
*) psid = Differential pressure P-P_d
P = absolute flow pressure [psia]
P_d = pressure at discharge from valve [psia]

Available options

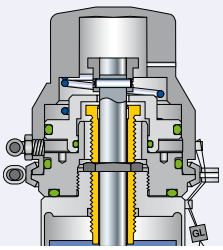
Gastight cap H2
H2



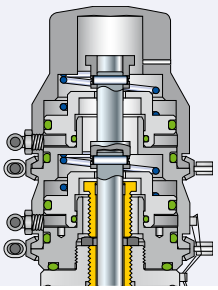
Gastight lifting device H4
Packed knob H4



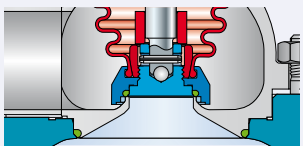
Pneumatic lifting device H8
H8 single piston design



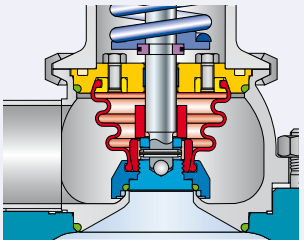
Pneumatic lifting device H8
J41: H8 double piston design



O-ring-disc
J22: EPDM "D"
J20: FFKM "C"

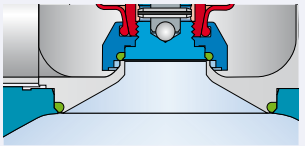


Bellows FFKM "C"
S70 – only for $d_0$13

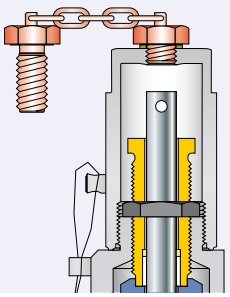


Blind flange for pressure test
Material-No. 138.8849.9000 (d_0 13)
Material-No. 138.8649.9000 (d_0 25)

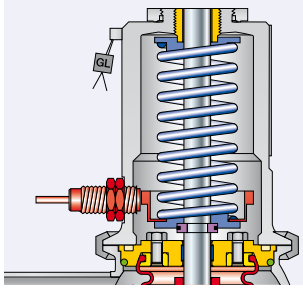
O-ring for vessel connection
EPDM "D"
Material-No. 502.0460.3041 (d_0 13)
Material-No. 502.0600.3041 (d_0 25)



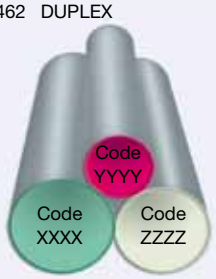
Test gag
J70: H2



Lift indicator placed in bonnet
J38 + J93



Special material
2.4610 HASTELLOY C4
2.4360 MONEL 400
1.4462 DUPLEX



Type 485

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

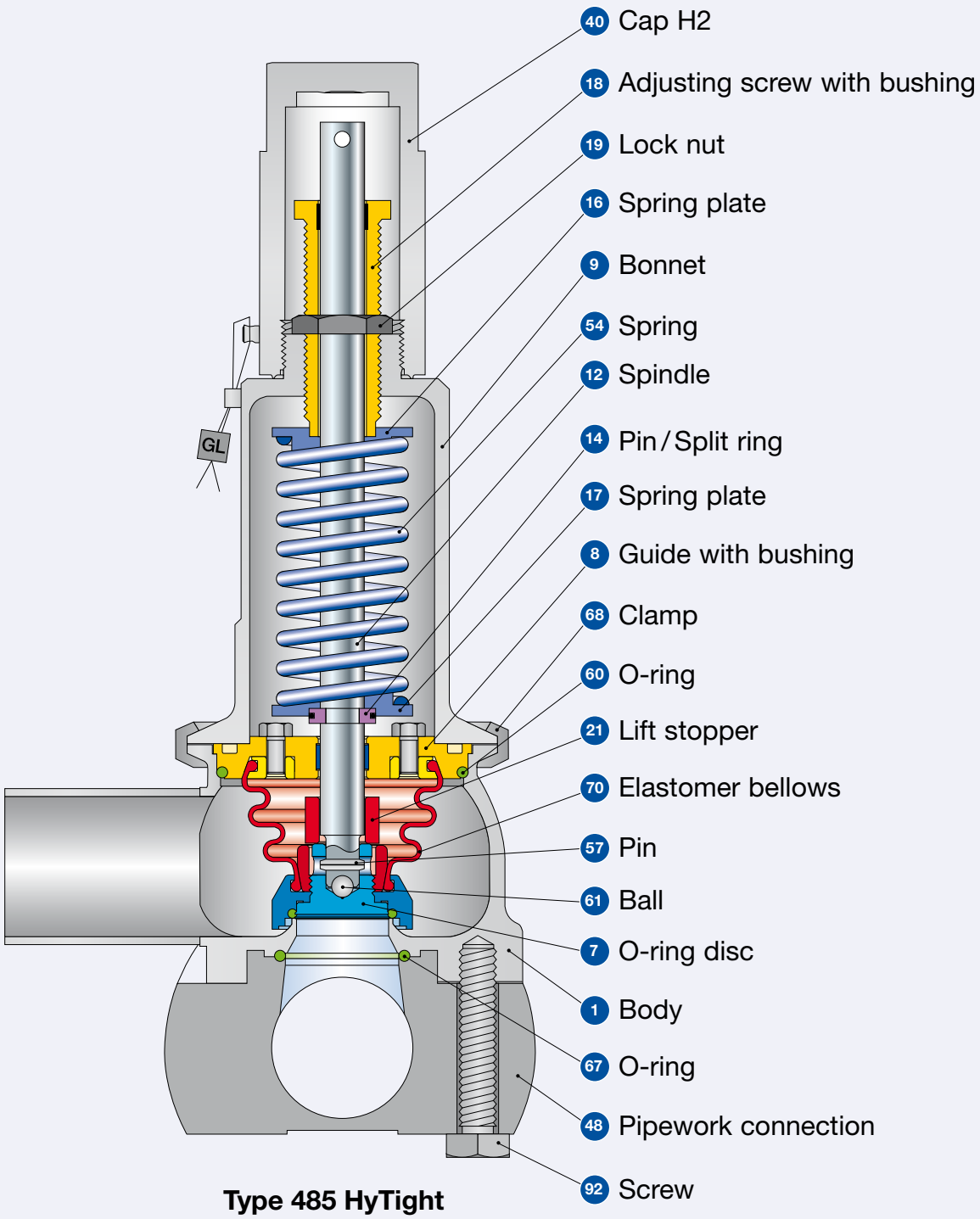
Safety Relief Valves – spring loaded

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

Type 5034
Integrated pipework connection

Contents

HyTight Assembly



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

Materials

HyTight Assembly

Item	Component	Remarks	Type 4854 HyTight
1	Body		1.4435 (BN 2)*) SA 479 316L
7	Disc	HyTight Assembly	1.4435 316L
7.4	Soft seal O-ring	"D" FDA USP VI	EPDM
		"C" FDA USP VI	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
21	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	FDA USP VI	EPDM
61	Ball		1.4401 316
68	Clamp		1.4401 316
70	Elastomer bellows	FDA	EPDM
Integrated pipework connection Type 5034			
48	Pipework connection		1.4435 (BN 2)*) SA 479 316L
67	O-ring	FDA USP VI	EPDM
92	Screw		1.4401 316
–	Blind flange for pressure test		1.4404 316L

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

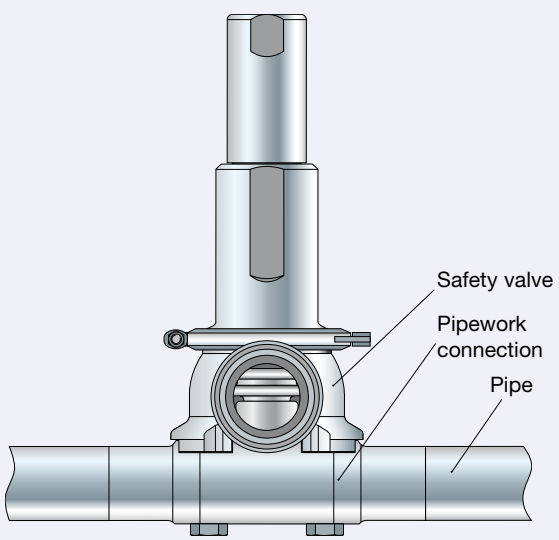
Please notice: – Modifications reserved by LESER.
– LESER can upgrade materials without notice.
– Every part can be replaced by other material acc. to customer specification.

Article numbers

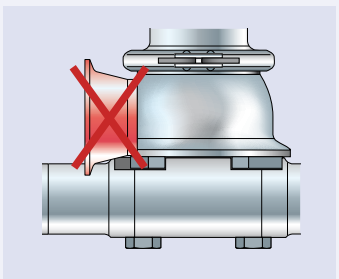
Article numbers

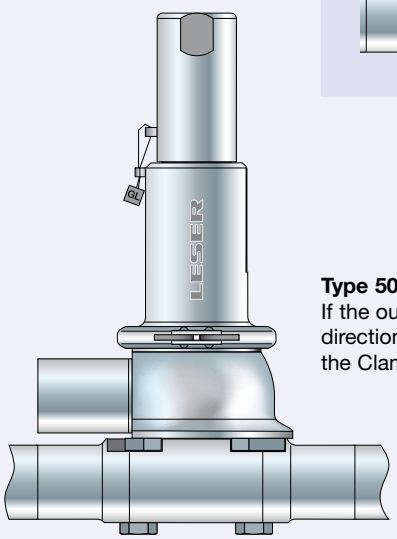
Actual Orifice diameter d_0 [mm]			13	25	
Actual Orifice area A_0 [mm²]			133	491	
Actual Orifice diameter d_0 [inch]			0,512	0,984	
Actual Orifice area A_0 [inch²]			0,206	0,761	
O-ring material			EPDM "D" J22	EPDM "D" J22	
			FFKM "C" J20	FFKM "C" J20	
Body material: 1.4435 (316L)					
Bonnet closed	**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**	**50**
DIN 11850		Art.-No. **5034.**	**0991**	**0992**	**0993**
ISO 2037		Art.-No. **5034.**	**0994**	**0995**	**0996**
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**	

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

Available connections

Available connections

d_0 [mm]		13	25
A_0 [mm²]		133	491
Clamps			**Option code outlet**
	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 outlet**
Pipe standard	**DN**	**25**	**40**
DIN 11850 / DIN 11866 Range A	00	A85L83A16	A85L83A17
	GS	A85H35A16	A85H35A17
	BS	A85H37A16	A85H37A17
	GT	A85H55A16	A85H55A17
	BT	A85H57A16	A85H57A17
	GO	A85L81A16	A85L81A17
	KO	A85L82A16	A85L82A17
	GD	A85H61A16	A85H61A17
	BD	A85H59A16	A85H59A17
Pipe standard	**DN**	**25**	**40**
DIN EN ISO 1127 / DIN 11866 Range B	GS	A86H35A16	A86H35A17
	BS	A86H37A16	A86H37A17
	GT	A86H55A16	A86H55A17
	BT	A86H57A16	A86H57A17
	GD	A86H61A16	A86H61A17
	BD	A86H59A16	A86H59A17
Pipe standard	**NPS**	**1 1/2"**	**2"**
BS 4825-1 DIN 11866 Range C	GS	A84H35A80	A84H35A81
	BS	A84H37A80	A84H37A81
	GT	A84H55A80	A84H55A81
	BT	A84H57A80	A84H57A81
Aseptic flanged connection			**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

Clamps	**Option code inlet**
For inlet please select integrated pipework connection Type 5034 as shown on page 74.	

Aseptic screwed connection	**Option code inlet**

Aseptic flanged connection	**Option code inlet**

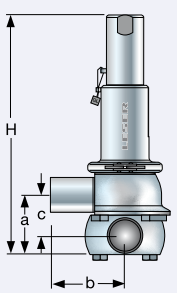
For definitions of connection codes please refer to pages 12 up to 15.

Dimensions and weights

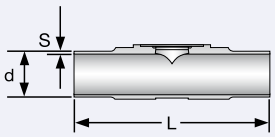
Metric Units

Actual Orifice diameter d_0 [mm]				13				25			
Actual Orifice area A_0 [mm²]				133				491			
Integrated pipework connection				**Inlet**				**Inlet**			
			PN	**16**				**16**			
Nominal pipe size tube			**DN**	**25**				**40**		**50**	
Offset		c	[mm]	38				49		55	
Length		L	[mm]	130				180		180	
DIN 11850	Diameter	d	[mm]	30				42,4		54,5	
	Wall thickness	s	[mm]	2				2		2,25	
ISO 2037	Diameter	d	[mm]	26,5				39		52	
	Wall thickness	s	[mm]	2				2		2	
DIN EN ISO ISO 1127	Diameter	d	[mm]	34				48,3		–	
	Wall thickness	s	[mm]	2,25				2,15		–	
Welded connections				**Inlet a[1)]**	**Outlet b**			**Inlet a[1)]**	**Outlet b**	**Inlet a[1)]**	**Outlet b**
			PN	**16**				**16**		**16**	
Center to face			[mm]	58	80			72	90	84	90
Height – H4		H max.	[mm]	234				331		343	
Height – H8 double piston design		H max.	[mm]	262,2				338,7		350,7	
Clamp connections				**Inlet a[1)]**	**Outlet b**			**Inlet a[1)]**	**Outlet b**	**Inlet a[1)]**	**Outlet b**
			PN	**16**				**16**		**16**	
Center to face			[mm]	58	102			72	112	84	112
Clamp diameter		d_{inner}	[mm]	For varying clamp diameters please refer to page 16 and 17				For varying clamp diameters please refer to page 16 and 17			
		d_{outer}	[mm]								
Height – H4		H max.	[mm]	234				331		343	
Height – H8 double piston design		H max.	[mm]	262,2				338,7		350,7	
Threaded connections				**Inlet a[1)]**	**Outlet b**			**Inlet a**	**Outlet b**	**Inlet a[1)]**	**Outlet b**
			PN	**16**				**16**		**16**	
Center to face			[mm]	58	120			72	130	84	130
Height – H4		H max.	[mm]	234				331		334	
Height – H8 double piston design		H max.	[mm]	262,2				338,7		350,7	
Flanged connections				**Inlet a[1)]**	**Outlet b**			**Inlet a[1)]**	**Outlet b**	**Inlet a[1)]**	**Outlet b**
			PN	**16**				**16**		**16**	
Center to face			[mm]	58	126			72	134	84	134
Height – H4		H max.	[mm]	234				331		343	
Height – H8 double piston design		H max.	[mm]	262,2				338,7		350,7	
Weight											
Weight		max.	[kg]	3,0				5,0			

[1)] without integrated pipework connection



Type 485 – Cap H2



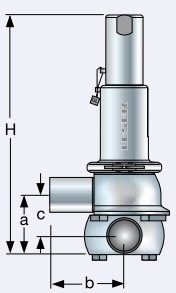
Type 5034 – Integrated pipework connection

Dimensions and weights

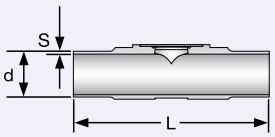
US Units

Actual Orifice diameter d_0 [inch]				0,512		0,984		
Actual Orifice area A_0 [inch²]				0,206		0,761		
Integrated pipework connection				**Inlet**		**Inlet**		
			PN	**16**		**16**		
Nominal pipe size tube			**NPS**	**1"**		**1 1/2"**		**2"**
Offset		c	[inch]	1 1/2		1 15/16		2 5/32
Length		L	[inch]	5 1/8		7 3/32		7 3/32
DIN 11850	Diameter	d	[inch]	1 3/16		1 5/8		2 1/8
	Wall thickness	s	[inch]	3/32		1/8		1/8
ISO 2037	Diameter	d	[inch]	1		1 1/2		2
	Wall thickness	s	[inch]	1/8		1/8		1/8
DIN EN ISO	Diameter	d	[inch]	1 3/8		1 7/8		–
ISO 1127	Wall thickness	s	[inch]	1/8		1/8		–
Welded connections				**Inlet a[1)]**	**Outlet b**	**Inlet a[1)]**	**Outlet b**	**Inlet a[1)]**	**Outlet b**
			PN	**16**		**16**		**16**	
Center to face			[inch]	2 1/4	3 5/32	2 27/32	3 17/32	3 5/16	3 17/32
Height – H4		H max.	[inch]	9 7/32		13 1/32		13 1/2	
Height – H8 double piston design		H max.	[inch]	10 5/16		13 11/32		13 13/16	
Clamp connections				**Inlet a[1)]**	**Outlet b**	**Inlet a[1)]**	**Outlet b**	**Inlet a[1)]**	**Outlet b**
			PN	**16**		**16**		**16**	
Center to face			[inch]	2 1/4	4 1/32	2 27/32	4 13/32	3 5/16	4 13/32
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]	9 7/32		13 1/32		13 1/2	
Height – H8 double piston design		H max.	[inch]	10 5/16		13 11/32		13 13/16	
Threaded connections				**Inlet a[1)]**	**Outlet b**	**Inlet a[1)]**	**Outlet b**	**Inlet a[1)]**	**Outlet b**
			PN	**16**		**16**		**16**	
Center to face			[inch]	2 1/4	4 23/32	2 27/32	5 1/8	3 5/16	5 1/8
Height – H4		H max.	[inch]	9 7/32		13 1/32		13 1/2	
Height – H8 double piston design		H max.	[inch]	10 5/16		13 11/32		13 13/16	
Flanged connections				**Inlet a[1)]**	**Outlet b**	**Inlet a[1)]**	**Outlet b**	**Inlet a[1)]**	**Outlet b**
			PN	**16**		**16**		**16**	
Center to face			[inch]	2 1/4	4 31/32	2 27/32	5 9/32	3 5/16	5 9/32
Height – H4		H max.	[inch]	9 7/32		13 1/32		13 1/2	
Height – H8 double piston design		H max.	[inch]	10 5/16		13 11/32		13 13/16	
Weight									
Weight		max.	[lb]	6,6		11,0			

[1)] without integrated pipework connection



Type 485 – Cap H2



Type 5034 – Integrated pipework connection

Pressure temperature ratings

Metric Units

Actual Orifice diameter d_0 [mm]		13		25	
Actual Orifice area A_0 [mm²]		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 range[1)]		Minimum	Maximum	Minimum	Maximum
EPDM	[°C]	-45	+150	-45	+150
FFKM	[°C]	0	+250	0	+250

US Units

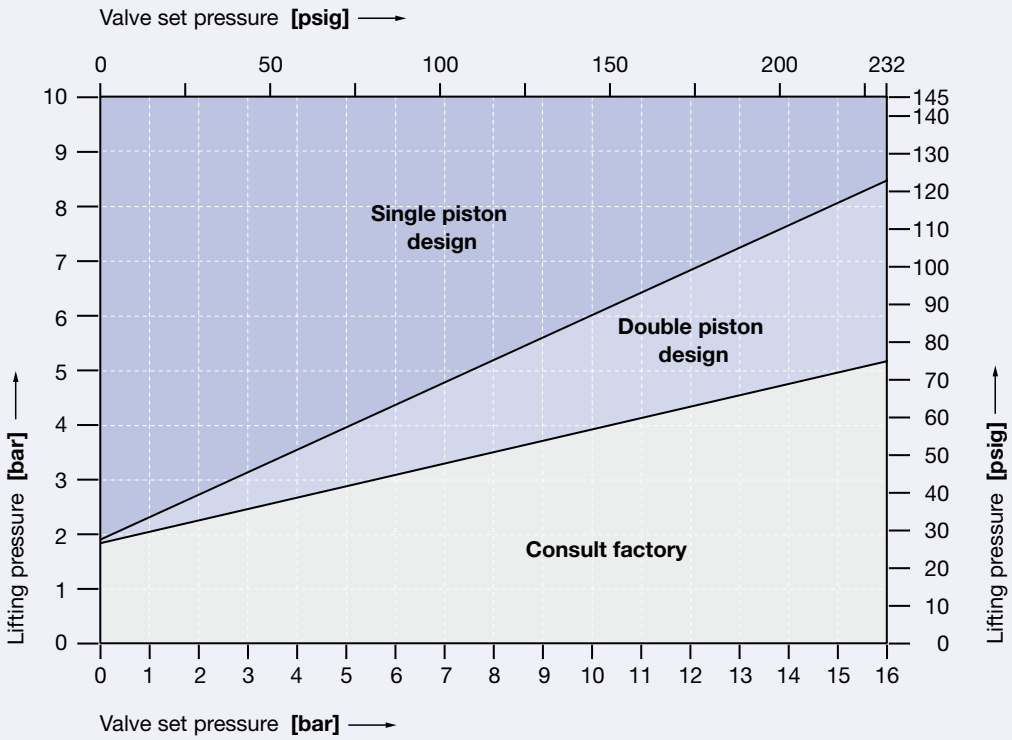
Actual Orifice diameter d_0 [inch]		0,512		0,984	
Actual Orifice area A_0 [inch²]		0,206		0,761	
Body material: 1.4435 (316L)					
Minimum set pressure	p [psig] S/G/L	4,4		1,5	
Maximum set pressure	p [psig] S/G/L	232		232	
Temperature range[1)]		Minimum	Maximum	Minimum	Maximum
EPDM	[°F]	-49	+302	-49	+302
FFKM	[°F]	+32	+482	+32	+482

[1)] The temperature is limited by the soft seal material.

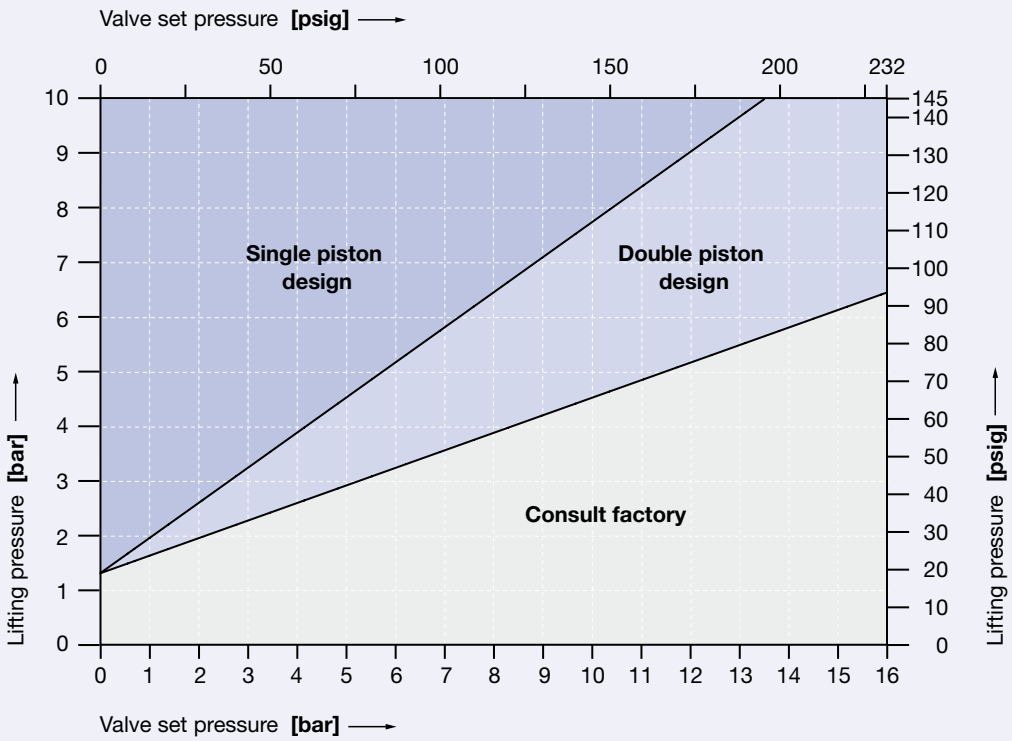
Selection chart H8

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



Surface quality

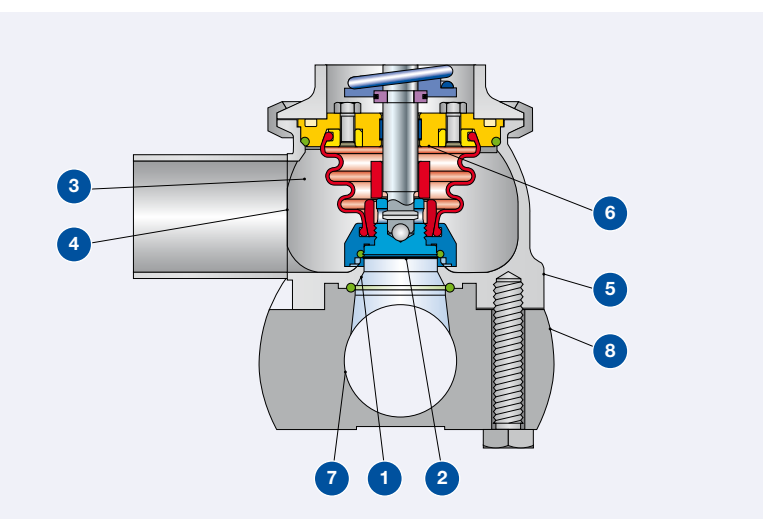
Surface quality

Type of surface	Area			LESER Surface package		
				Clean finish	HyClean finish	Sterile finish
			Option code	B62	B63	B64
	Description	No.		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		
				Clean finish	HyClean finish	Sterile finish
			Option code	B65	B66	B67
	Description	No.		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.



Approvals

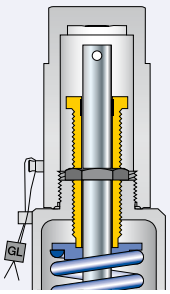
Approvals

Actual Orifice diameter d_0 [mm]		13	25
Actual Orifice area A_0 [mm²]		133	491
Actual Orifice diameter d_0 [inch]		0,512	0,984
Actual Orifice area A_0 [inch²]		0,206	0,761
Europe		**Coefficient of discharge K_{dr}**	
DIN EN ISO 4126-1	Approval No.	07 202 0111 Z 0008/0/20	
	S/G	0,58	0,4
	L	0,39	0,26
Germany		**Coefficient of discharge α_w**	
AD 2000-Merkblatt A2	Approval No.	TÜV SV 1047	
	S/G	0,58	0,4
	L	0,39	0,26
United States		**Coefficient of discharge K**	
ASME Sec. VIII	Approval No.	M37145	M37167
	S/G	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) S: 5,52 lb / hr / psia ≙ K ≈ 0,521 G: 1,96 SCFM / psia ≙ K ≈ 0,521	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) S: 13,97 lb / hr / psia ≙ K ≈ 0,357 G: 4,96 SCFM / psia ≙ K ≈ 0,357
	Approval No.	M37156	M37178
	L	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) L: 2,96 GPM $\sqrt{psid}$*) ≙ K ≈ 0,379	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) L: 7,46 GPM $\sqrt{psid}$*) ≙ K ≈ 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 ≙ K ≈ 0,521 G: 1,96 SCFM / psia ≙ K ≈ 0,521	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) S: 13,97 lb / hr / psia ≙ K ≈ 0,357 G: 4,96 SCFM / psia ≙ K ≈ 0,357
	L	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) L: 2,96 GPM $\sqrt{psid}$*) ≙ K ≈ 0,379	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) L: 7,46 GPM $\sqrt{psid}$*) ≙ K ≈ 0,258
China		**Coefficient of discharge α_w**	
AQSIQ	Approval No.	02301T	
	S/G	0,58	0,4
	L	0,39	0,26
Eurasian Custom Union		**Coefficient of discharge α_w**	
EAC	Approval No.	For current approval no. see www.leser.com	
	S/G	0,58	0,4
	L	0,39	0,26
Classification societies			
		on request	

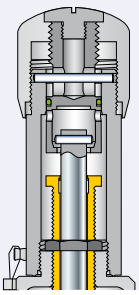
*) psid = Differential pressure P-P_d
P = absolute flow pressure [psia]
P_d = pressure at discharge from valve [psia]

Available options

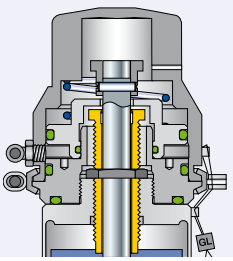
Gastight cap H2
H2



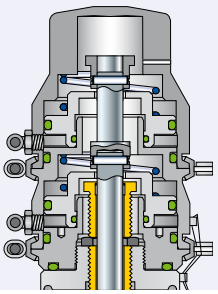
Gastight lifting device H4
Packed knob H4



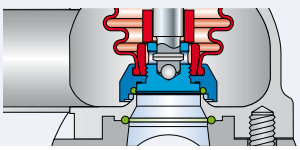
Pneumatic lifting device H8
H8 single piston design



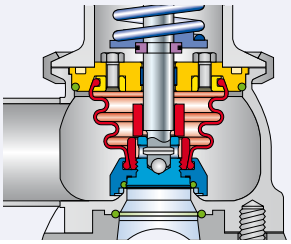
Pneumatic lifting device H8
J41: H8 double piston design



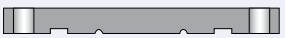
O-ring-disc
J22: EPDM "D"
J20: FFKM "C"



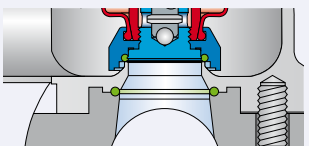
Bellows FFKM "C"
S70 – only for $d_0$13



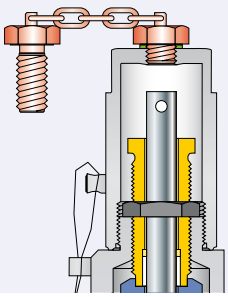
Blind flange for presure test
Material No. 138.8949.9000 (d_0 13)
Material No. 138.8749.9000 (d_0 25)



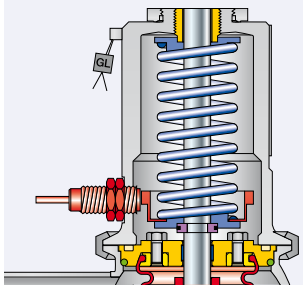
O-ring for integrated pipework connection
EPDM "D"
Material No. 502.0180.3041 (d_0 13)
Material No. 502.0300.3041 (d_0 25)



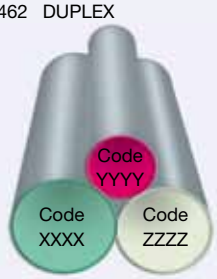
Test gag
J70: H2



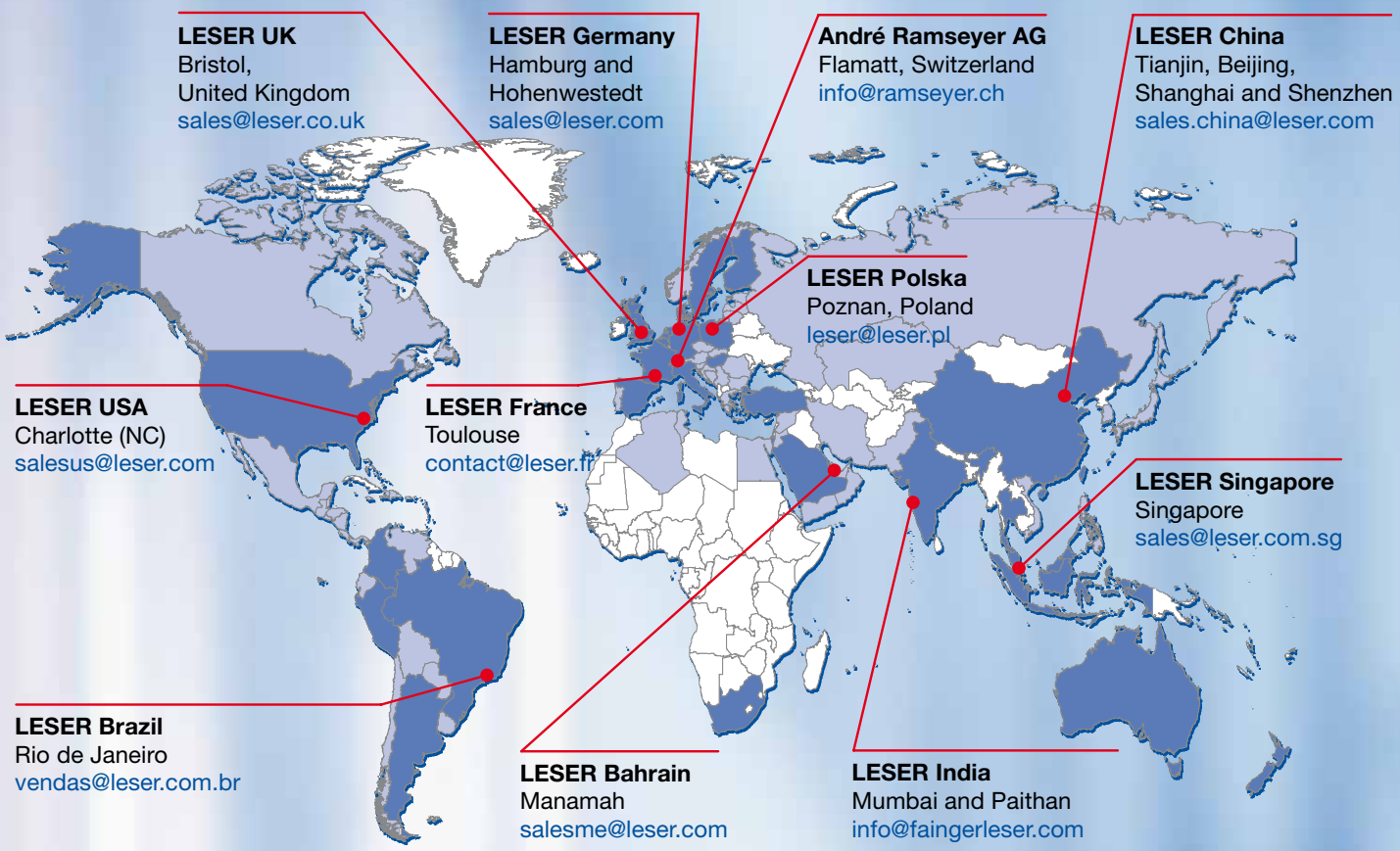
Lift indicator placed in bonnet
J38 + J93



Special material
2.4610 HASTELLOY C4
2.4360 MONEL 400
1.4462 DUPLEX



LESER worldwide



LESER representative

LESER stock and local assembly

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