

# Clean Service

Safety Relief Valves  
Series 48X



# CATALOG

**LESER**

The-Safety-Valve.com

LESER Safety Valves for every industrial application



Clean Service



High Performance

Series 48X



Compact Performance

Type 481

Type 483



API

Type 488

Type 484

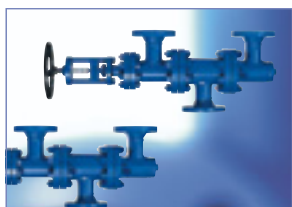


Critical Service

Type 485



Modulate Action



Best Availability

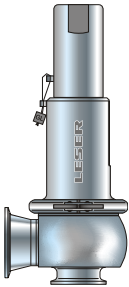


# General



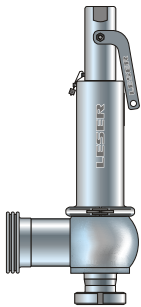
## Type 481

$d_0$  10 mm  
 $d_0$  0,394 inch  
Set pressure 0,1 – 68 bar, 1,5 – 986 psig  
For small capacity, Orifice 0,5 x D



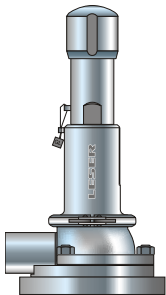
## Type 483

$d_0$  13 mm and  $d_0$  25 mm  
 $d_0$  0,512 inch and  $d_0$  0,984 inch  
Set pressure 0,1 – 16 bar, 1,5 – 232 psig  
For small to medium capacity, Orifice D – F



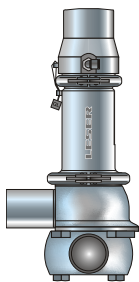
## Type 488

$d_0$  23 mm –  $d_0$  92 mm  
 $d_0$  0,906 inch –  $d_0$  3,622 inch  
Set pressure 0,1 – 16 bar, 1,5 – 232 psig  
For high capacity, Orifice G – P



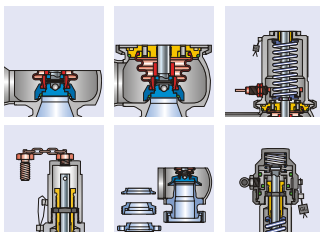
## Type 484

$d_0$  13 mm and  $d_0$  25 mm  
 $d_0$  0,512 inch and  $d_0$  0,984 inch  
Set pressure 0,1 – 16 bar, 1,5 – 232 psig  
For small to medium capacity, Orifice D – F



## Type 485

$d_0$  13 mm and  $d_0$  25 mm  
 $d_0$  0,512 inch and  $d_0$  0,984 inch  
Set pressure 0,1 – 16 bar, 1,5 – 232 psig  
For small to medium capacity, Orifice D – F



# Options

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## LESER Type

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02/01

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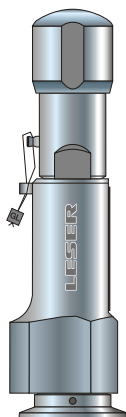
## Type 488

03/01

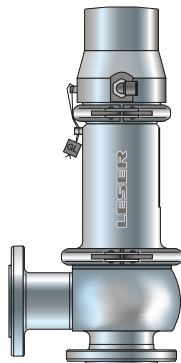
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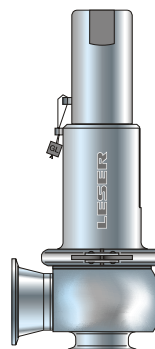
**Type 481**  
Cap H2  
Inlet: Clamp  
Outlet: Threaded connection  
Certified for horizontal fitting



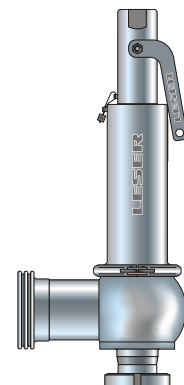
**Type 481**  
Packed knob H4  
Inlet: Clamp,  
Outlet: Threaded connection  
Certified for horizontal fitting



**Type 483**  
Pneumatic lifting device H8  
Inlet: Aseptic flange  
Outlet: Aseptic flange  
Certified for horizontal fitting



**Type 483**  
Cap H2  
Inlet: Clamp  
Outlet: Clamp  
Certified for horizontal fitting

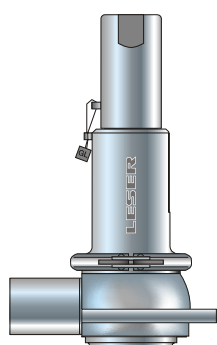


**Type 488**  
Packed lever H4  
Inlet: Aseptic clamp and  
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Outlet: Aseptic thread

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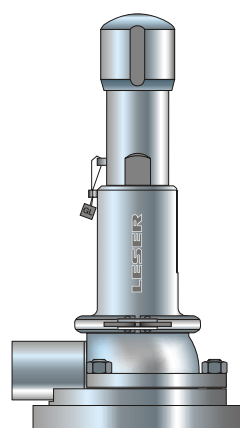
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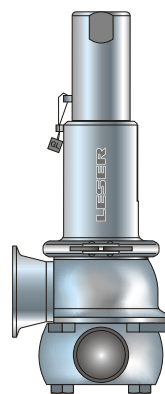
**Type 484**  
Cap H2

Inlet: (for vessel connection)  
Outlet: Welded end connection



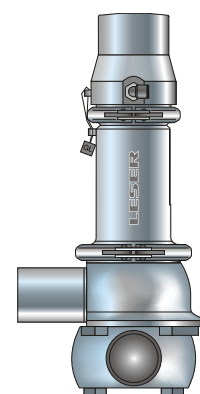
**Type 484**  
Packed knob H4

Inlet: Vessel connection Type 5034  
Outlet: Welded end connection



**Type 485**  
Cap H2

Inlet: Integrated pipework connection Type 5034  
Outlet: Clamp  
Certified for horizontal fitting



**Type 485**  
Pneumatic lifting device H8

Inlet: Integrated pipework connection Type 5034  
Outlet: Welded end connection  
Certified for horizontal fitting

## 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 – 2002, a-2003, a-2004)
  - EN 1672-2
  - DIN ISO 14159
  - EHEDG and 3-A Sanitary standard
  - 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: AQSIO based on the approval acc. to ASME Section VIII Division 1 and AD 2000-Merkblatt A2

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, TRD 110, TRD 421



## 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 2002, 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 and compliant elastomer

#### Automatic plant operation during production and cleaning

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

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

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

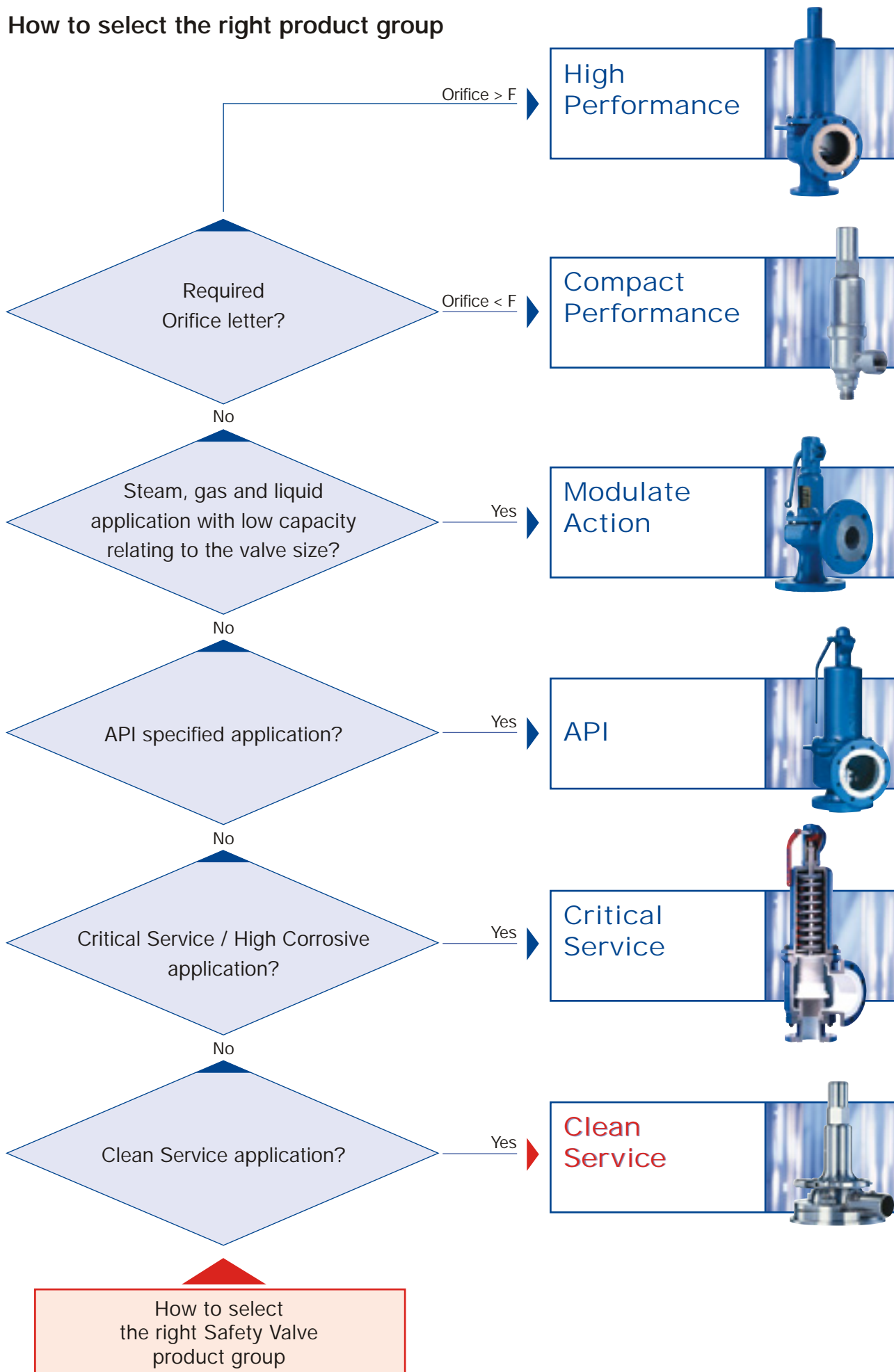
### LESER's Clean Service Safety Valves

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

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

# Valve finder



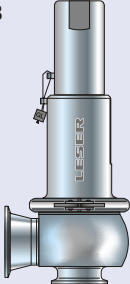

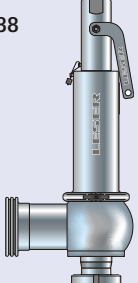

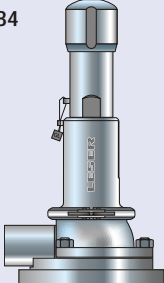

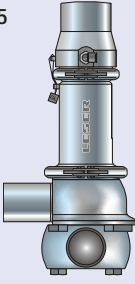

## How to select the right product group



How to select the right Safety Valve product group

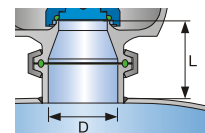


## How to select the right Clean Service Safety Valve

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

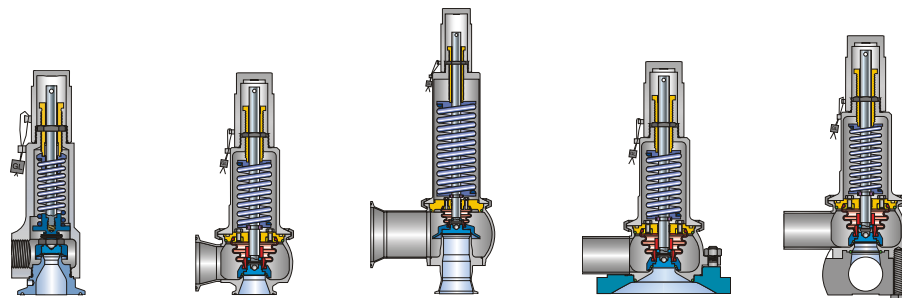


How to select  
the right Clean Service  
Safety Valve



<sup>1)</sup> Explanation of  
dead space ratio  
see page 00/24.

# Valve selection

**LESER**


## Valve size

Type		481	483	488	484	485
d <sub>0</sub> min.	[mm]	10	13	23	13	13
d <sub>0</sub> max.	[mm]	10	25	92	25	25
d <sub>0</sub> min.	[inch]	0,394	0,512	0,906	0,512	0,512
d <sub>0</sub> max.	[inch]	0,394	0,985	3,622	0,985	0,985

## Materials

Type		481	483	488	484	485
1.4404	316L	✓	-	✓	-	-
1.4435 (BN 2)	316L	-	✓	-	✓	✓
2.4610	Hastelloy® C4	✓	✓	-	✓	✓
2.4360	Monel® 400	✓	✓	-	✓	✓
1.4462	Duplex	✓	✓	-	✓	✓

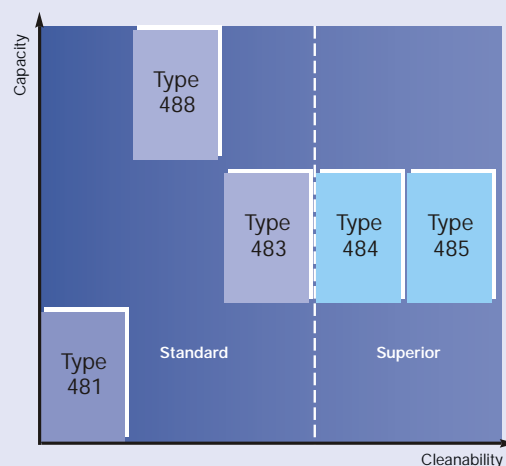
## Set pressure

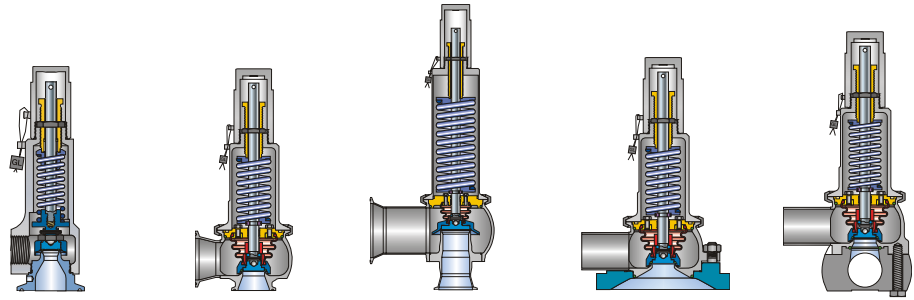
Type		481	483	488	484	485
Metric Units	min. [bar]	0,1	0,1	0,1	0,1	0,1
Metric Units	max. [bar]	68	16	16	16	16
US Units	min. [psig]	1,5	1,5	1,5	1,5	1,5
US Units	max. [psig]	986	232	232	232	232

## Dead space ratio

Type		481	483	488	484	485
L/D		< 1,5	< 1,5	< 1,5 – 3,0	< 0,3	< 0,95

## Capacity / Cleanability





## Temperature range

Type		481	483	488	484	485
EPDM	min. [°C]	-45	-45	-45	-45	-45
EPDM	max. [°C]	+150	+150	+150	+150	+150
EPDM	min. [°F]	-49	-49	-49	-49	-49
EPDM	max. [°F]	+302	+302	+302	+302	+302

For other elastomer temperature limits please refer to soft seal material selection page 99/11

## Capacity

Type		481	483	488	484	485
LEO <sub>S/G</sub>	min.	0,051	0,110	0,476	0,110	0,110
LEO <sub>S/G</sub>	max.	0,051	0,279	7,620	0,279	0,279
Orifice <sub>S/G</sub>	min.	0,46 x D	1,0 x D	1,55 x G	1,0 x D	1,0 x D
Orifice <sub>S/G</sub>	max.	0,46 x D	1,4 x E	1,2 x P	1,4 x E	1,4 x E
LEO <sub>L</sub>	min.	0,060	0,082	0,468	0,082	0,082
LEO <sub>L</sub>	max.	0,060	0,302	7,482	0,302	0,302
Orifice <sub>L</sub>	min.	0,55 x D	0,74 x D	1,52 x G	0,74 x D	0,74 x D
Orifice <sub>L</sub>	max.	0,55 x D	1,54 x F	1,17 x P	1,54 x F	1,54 x F

## Coefficient of discharge

Type		481	483	488	484	485
$K_{d1}/\alpha_w$	S/G	0,40	d <sub>0</sub> 13: 0,60 d <sub>0</sub> 25: 0,38	0,7	d <sub>0</sub> 13: 0,60 d <sub>0</sub> 25: 0,41	d <sub>0</sub> 13: 0,58 d <sub>0</sub> 25: 0,40
$K_{d1}/\alpha_w$	L	0,33	d <sub>0</sub> 13: 0,40 d <sub>0</sub> 25: 0,26	0,45	d <sub>0</sub> 13: 0,40 d <sub>0</sub> 25: 0,28	d <sub>0</sub> 13: 0,39 d <sub>0</sub> 25: 0,26

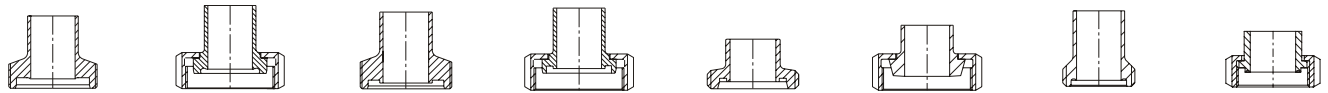
## Approvals

Country	Code	Type	481	483	488	484	485
		Media					
Europe	DIN EN ISO 4126-1 CE-marking	S/G/L	072020111Z0008/0/21-1	072020111Z0008/0/20	072020111Z0008/0/25	072020111Z0008/0/20	072020111Z0008/0/20
Germany	AD 2000-Merkblatt A2	S/G/L	TÜV SV 980	TÜV SV 1047	TÜV SV 1047	TÜV SV 1047	TÜV SV 1047
United States	ASME VIII	S/G	M37190	d <sub>0</sub> 13: M37145 d <sub>0</sub> 25: M37167	M37022 (1,38 to 16 bar) (20 to 232 psig)	d <sub>0</sub> 13: M37145 d <sub>0</sub> 25: M37167	d <sub>0</sub> 13: M37145 d <sub>0</sub> 25: M37167
		L	M37202	d <sub>0</sub> 13: M37156 d <sub>0</sub> 25: M37178	M37033 (≥ 1 bar) (≥ 15 psig)	d <sub>0</sub> 13: M37156 d <sub>0</sub> 25: M37178	d <sub>0</sub> 13: M37156 d <sub>0</sub> 25: M37178
Canada	CRN	S/G/L	OG0772.9C	OG0772.9C	OG0772.9C	OG0772.9C	OG0772.9C
China	AQSIQ	S/G/L	02301T	02301T	02301T	02301T	02301T
Russia	GGTN / GOSGORTECHNADZOR	S/G/L	PPC 00-18458	PPC 00-18458	PPC 00-18458	PPC 00-18458	PPC 00-18458
	GOST R	S/G/L	1989-06	1989-06	1989-06	1989-06	1989-06
Belarus	PROMATOMNADZOR	S/G/L	15-171-2006	15-171-2006	15-171-2006	15-171-2006	15-171-2006

## Classification societies

on request





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	Neumo
DIN 11850 DIN EN ISO 1127 BS 4825-1	DIN 11850 DIN EN ISO 1127 BS 4825-1	DIN 11850 DIN EN ISO 1127 BS 4825-1	DIN 11850 DIN EN ISO 1127 BS 4825-1	DIN 11850	DIN 11850	DIN 11850 DIN EN ISO 1127	DIN 11850 DIN EN ISO 1127
Option code							
✓	✓	✓	✓	H85L75I16	H85L76I16	✓	✓
✓	✓	✓	✓	A85L81A16	A85L82A16	✓	✓
✓	✓	✓	✓	H85L75I16	H85L76I16	✓	✓
✓	✓	✓	✓	A85L81A16	A85L82A16	✓	✓
✓	✓	✓	✓	H85L75I17	H85L76I17	✓	✓
✓	✓	✓	✓	A85L81A17	A85L82A17	✓	✓
✓	✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓	✓	✓
✓ <sup>1)</sup>	✓ <sup>1)</sup>	✓ <sup>1)</sup>	✓ <sup>1)</sup>	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓	✓	✓
-	-	-	-	✓	✓	-	-
✓ <sup>1)</sup>	✓ <sup>1)</sup>	✓ <sup>1)</sup>	✓ <sup>1)</sup>	✓	✓	✓	✓
-	-	-	-	✓	✓	-	-
-	-	-	-	-	-	-	-
✓	✓	✓	✓	A85L81A16	A85L82A16	✓	✓
-	-	-	-	-	-	-	-
✓	✓	✓	✓	A85L81A17	A85L82A17	✓	✓
-	-	-	-	-	-	-	-
✓	✓	✓	✓	A85L81A16	A85L82A16	✓	✓
-	-	-	-	-	-	-	-
✓	✓	✓	✓	A85L81A17	A85L82A17	✓	✓


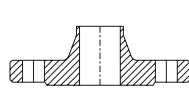
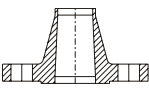
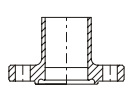
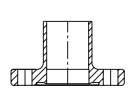
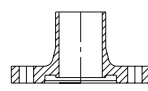
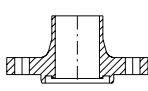
<sup>1)</sup> Available for pipe standard DIN 11850 only

# Welded end and flange connections

## Overview

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.

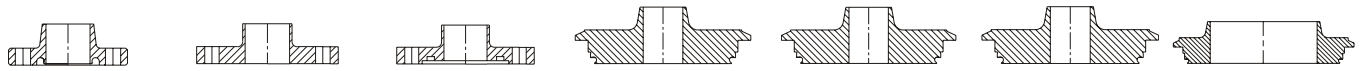
Type	Connection page
481	01/10
483	02/10
488	03/10
484	04/12
485	05/12

Overview									
Connection	Code	Welded end	Flange PN 16 Range B1	Flange ASME Class 150RF	Aseptic flange groove	Aseptic flange tongue	Aseptic flange groove	Aseptic flange tongue	
According to	Pipe standard	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	
Code	Pipe standard	00	FD	FA	NF	BF	NG	BG	
Code	Pipe standard	DIN 11850	-	-	DIN 11850 DIN EN ISO 1127 BS 4825-1	DIN 11850 DIN EN ISO 1127 BS 4825-1	DIN 11850 DIN EN ISO 1127 BS 4825-1	DIN 11850 DIN EN ISO 1127 BS 4825-1	
Option code									
Type 481	d <sub>0</sub> 10	Inlet	-	-	-	-	-	-	
		Outlet	-	-	-	-	-	-	
Type 483	d <sub>0</sub> 13	Inlet	-	-	-	✓	✓	✓	
		Outlet	A85L83A16	-	-	✓	✓	✓	
	d <sub>0</sub> 25	Inlet	-	-	-	✓	✓	✓	
		Outlet	A85L83A17	-	-	✓	✓	✓	
Type 488	d <sub>0</sub> 23	Inlet	H85L77	I71	L94	✓	✓	✓	
		Outlet	A85L83	I72	L95	✓	✓	✓	
	d <sub>0</sub> 37	Inlet	H85L77	I71	L94	✓	✓	✓	
		Outlet	A85L83	I72	L95	✓	✓	✓	
	d <sub>0</sub> 46	Inlet	H85L77	I71	L94	✓	✓	✓	
		Outlet	A85L83	I72	L95	✓	✓	✓	
	d <sub>0</sub> 60	Inlet	H85L77	I71	L94	✓	✓	✓	
		Outlet	A85L83	I72	L95	✓ <sup>1)</sup>	✓ <sup>1)</sup>	✓ <sup>1)</sup>	
	d <sub>0</sub> 74	Inlet	H85L77	I71	L94	✓	✓	✓	
		Outlet	A85L83	I72	L95	✓ <sup>2)</sup>	✓ <sup>2)</sup>	✓ <sup>2)</sup>	
	d <sub>0</sub> 92	Inlet	H85L77	I71	L94	✓ <sup>1)</sup>	✓ <sup>1)</sup>	✓ <sup>1)</sup>	
		Outlet	-	I72	L95	✓ <sup>2)</sup>	✓ <sup>2)</sup>	✓ <sup>2)</sup>	
	Type 484	d <sub>0</sub> 13	Inlet	-	-	-	-	-	-
			Outlet	✓	-	-	✓	✓	✓
d <sub>0</sub> 25		Inlet	-	-	-	-	-	-	
		Outlet	✓	-	-	✓	✓	✓	
Type 485	d <sub>0</sub> 13	Inlet	-	-	-	-	-	-	
		Outlet	✓	-	-	✓	✓	✓	
	d <sub>0</sub> 25	Inlet	-	-	-	-	-	-	
		Outlet	✓	-	-	✓	✓	✓	

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

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

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



Varivent flange groove	APV-FG1 Flange flat face PN 10	APV-FN1 Flange groove PN 10	DN 32/XX <sup>3)</sup> Varivent connection	DN 50/XX <sup>3)</sup> Varivent connection	DN 80/XX <sup>3)</sup> Varivent connection	DN 100/XX <sup>3)</sup> Varivent connection
TN	AF	AN	VG	VH	VC	VE
Tuchenhagen	APV	APV	Tuchenhagen	Tuchenhagen	Tuchenhagen	Tuchenhagen
DIN 11850	DIN 11850	DIN 11850	-	-	-	-
Option code						
-	-	-	-	-	-	-
-	-	-	-	-	-	-
H85H78I16	H85L90I16	H85L92I16	H85I82I16	H85I83I16	-	-
A85L84A16	A85L91A16	A85L93A16	-	-	-	-
H85H78I17	H85L90I17	H85L92I17	-	H85I83I17	-	-
A85L84A17	A85L91A17	A85L93A17	-	-	-	-
H85L78	L90	L92	I82	-	L70	L80
A85L84	L91	L93	-	-	-	-
H85L78	L90	L92	-	I83	L70	L80
A85L84	L91	L93	-	-	-	-
H85L78	L90	L92	-	-	L70	L80
A85L84	L91	L93	-	-	-	-
H85L78	L90	L92	-	-	L70	L80
A85L84	L91	L93	-	-	-	-
H85L78	L90	L92	-	-	L70	L80
A85L84	L91	L93	-	-	-	-
H85L78	L90	L92	-	-	-	L80
A85L84	L91	L93	-	-	-	-
-	-	-	-	-	-	-
A85L84A16	A85L91A16	A85L93A16	-	-	-	-
-	-	-	-	-	-	-
A85L84A17	A85L91A17	A85L93A17	-	-	-	-
-	-	-	-	-	-	-
A85L84A16	A85L91A16	A85L93A16	-	-	-	-
-	-	-	-	-	-	-
A85L84A17	A85L91A17	A85L93A17	-	-	-	-

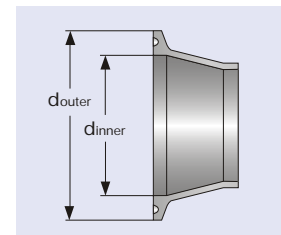
# Clamp connections

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

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



SO – Clamp: DIN 32676			Pipe: DIN 11850 and DIN 11866 Range A							
Type		Inlet					Outlet			
Art.-No.	$d_0$ [mm]	DN	$d_{inner}$ [mm]	$d_{outer}$ [mm]	Option code	DN	$d_{inner}$ [mm]	$d_{outer}$ [mm]	Option code	
4814.	768/769	15	16,0	34,0	L79I14	–	–	–	–	
		25	26,0	50,5	L79I16	25	26,0	50,5	L86A16	
4834.	770	25	26,0	50,5	L79I16	25	26,0	50,5	L86A16	
	771	40	38,0	50,5	L79I17	40	38,0	50,5	L86A17	
4884.	802	25	26,0	50,5	L79	40	38,0	50,5	L86	
	804	40	38,0	50,5	L79	65	66,0	91,0	L86	
	805	50	50,0	64,0	L79	80	81,0	106,0	L86	
	806	65	66,0	91,0	L79	100	100,0	119,0	L86	
	807	80	81,0	106,0	L79	125	125,0	155,0	–	
	808	100	100,0	119,0	L79	150	150,0	183,0	–	
DO – Clamp: ISO 2852			Pipe: DIN EN ISO 1127 and DIN 11866 Range B							
Art.-No.	$d_0$ [mm]	DN	$d_{inner}$ [mm]	$d_{outer}$ [mm]	Option code	DN	$d_{inner}$ [mm]	$d_{outer}$ [mm]	Option code	
4814.	768/769	15	18,1	34,0	I73I14	–	–	–	–	
		25	29,7	50,5	I73I16	25	29,7	50,5	I74A16	
4834.	770	25	29,7	50,5	I73I16	25	29,7	50,5	I74A16	
	771	40	44,3	64,0	I73I17	40	44,3	64,0	I74A17	
4884.	802	25	29,7	50,5	I73	40	44,3	64,0	I74	
	804	40	44,3	64,0	I73	65	72,1	91,0	I74	
	805	50	56,3	77,5	I73	80	84,9	106,0	I74	
	806	65	72,1	91,0	I73	100	110,3	130,0	I74	
	807	80	84,9	106,0	I73	125	135,7	155,0	I74	
	808	100	110,3	130,0	I73	150	163,1	183,0	I74	
BO – Clamp: ASME BPE			Pipe: BS 4825-1 and DIN 11866 Range C							
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	3/4"	15,7	34,0	I75I78	–	–	–	–	
		1"	22,1	50,5	I75I79	–	–	–	–	
4834.	770	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
4884.	802	23	2"	47,5	64,0	I75I81	2"	47,5	64,0	I76A81
			2"	47,5	64,0	I75	2"	47,5	64,0	I76
	804	37	2"	47,5	64,0	I75	3"	72,9	91,0	I76
	805	46	2 1/2"	60,2	77,5	I75	4"	97,4	119,0	I76
	806	60	3"	72,9	91,0	I75	4 1/2"	110,1	130,0	I76
	807	74	3 1/2"	97,4	119,0	I75	5"	135,7	155,0	I76
808	92	4"	110,1	130,0	I75	6"	163,1	183,0	I76	
CO – Clamp: ISO 2852			Pipe: ISO 2037							
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	1"	22,6	50,5	L96I79	1"	22,6	50,5	L97A79	
4834.	770	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
4884.	802	23	2"	48,6	64,0	L96I81	2"	48,6	64,0	L97A81
			2"	48,6	64,0	L96	2"	48,6	64,0	L97
	804	37	2"	48,6	64,0	L96	3"	72,9	91,0	L97
	805	46	2 1/2"	60,3	77,5	L96	3 1/2"	97,6	119,0	L97
	806	60	3"	72,9	91,0	L96	4"	110,3	130,0	L97
	807	74	3 1/2"	97,6	119,0	L96	5"	135,7	155,0	L97
808	92	4"	110,3	130,0	L96	6"	163,1	183,0	L97	



## General signs and symbols

*	This option is covered by standard design
✓	Available
-	Not possible

## Valve size

Due to the different types of connections the "Actual Orifice diameter  $d_0$  [mm]" is the leading dimension for the valve size. All table headers starts with the actual orifice diameter  $d_0$ .

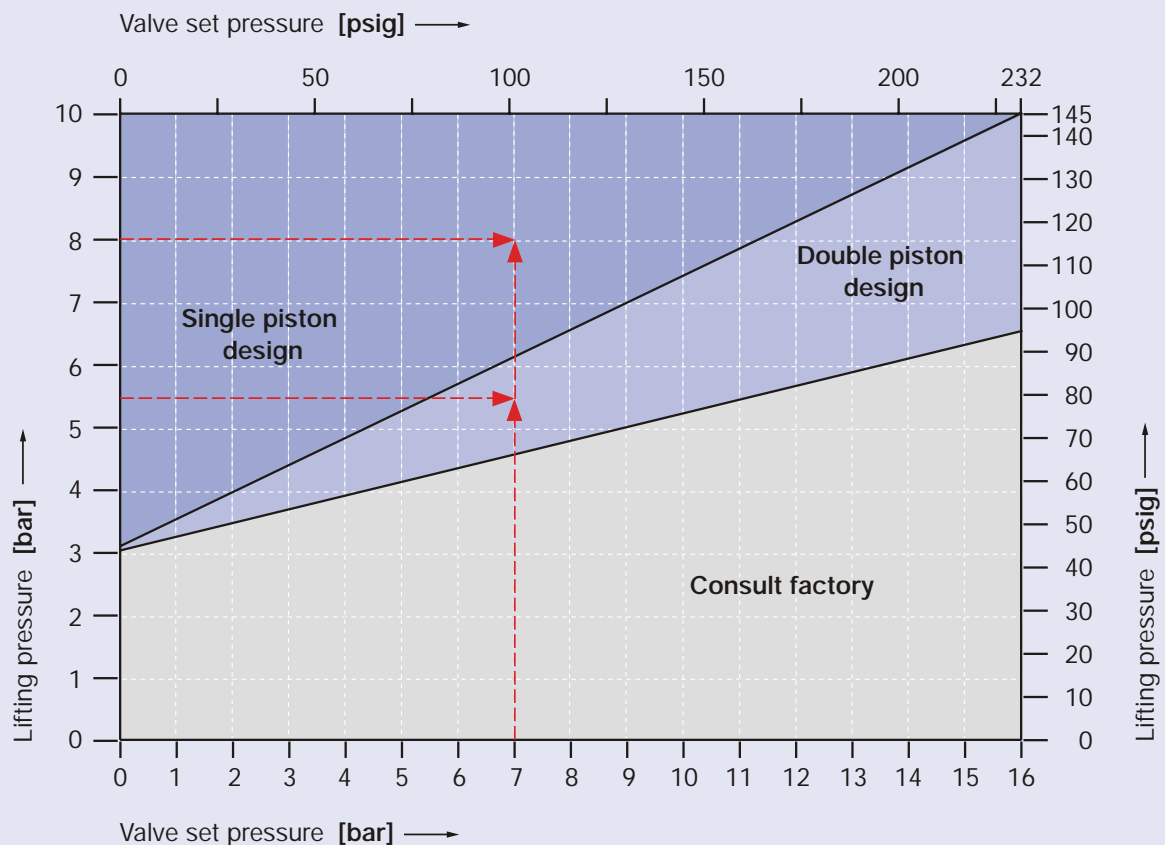
## Pressure Units – Used symbols

Symbols	Designation	Metric Units	US Units
$p$	Set pressure	bar	psig
$p_0$	Absolute pressure in the vessel		
	= $p \times 1,1 + 1,013$	bar <sub>a</sub>	
	= $p \times 1,1 + 14,5$		psia
The overpressure is 10 % of the set pressure, but at least 0,2 bar / 30 psi.			
$p_a$	Back pressure	bar	psig
$p_{a0}$	Absolute back pressure		
	(= $p_a + 1,013$ )	bar <sub>a</sub>	
	(= $p_a + 14.5$ )		psia

## Selection charts 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 determines the required lifting device design.

### Example: Selection chart lifting device H8, size 0. Type 483 $d_0$ 13 mm / 0,512 inch



## Example for "Dimensions – Bestseller"

## Type 483

LESER

## Dimensions – Bestseller

For shortest delivery time please select bestsellers. The specified bestsellers can vary depending on different market requirements.

For further available connections please refer to page 02/10.

## Metric Units

Actual Orifice diameter $d_0$ [mm]	13	
Actual Orifice area $A_0$ [mm <sup>2</sup> ]	133	
<b>Clamp connections</b>		
	<b>Inlet a</b>	<b>Outlet b</b>
<b>COCO</b>	1"	1 1/2"
Option code	L96179L97A80	
Center to face [mm]	29	52
Clamp diameter	$d_{inner}$ [mm]	23
	$d_{outer}$ [mm]	51
Height – H4 H max. [mm]	206	
<b>SOSO</b>	25	25
Option code	L79116L86A16	
Center to face [mm]	29	52
Clamp diameter	$d_{inner}$ [mm]	26
	$d_{outer}$ [mm]	51
Height – H4 H max. [mm]	206	
<b>Threaded connections</b>		
	<b>Inlet a</b>	<b>Outlet b</b>
<b>KOGO</b>	25	25
Option code	H85L76116A85L81A16	
Center to face [mm]	40	70
Height – H4 H max. [mm]	217	
<b>Flanged connections</b>		
	<b>Inlet a</b>	<b>Outlet b</b>
<b>ANAN</b>	25	25
Option code	H85L92116L93A85A16	
Center to face [mm]	45	76
Height – H4 H max. [mm]	222	

	25	
	491	
<b>Inlet a</b>	<b>Outlet b</b>	
1 1/2"	2"	
		L96180L97A81
44	60	
36	49	
51	64	
		303
40	40	
		L79117L86A17
44	60	
38	38	
51	51	
		303
<b>Inlet a</b>	<b>Outlet b</b>	
40	40	
		H85L76117A85L81A17
48	78	
		304
<b>Inlet a</b>	<b>Outlet b</b>	
40	40	
		H85L92117L93A85A17
51	82	
		310
		0,984
		0,761
<b>Inlet a</b>	<b>Outlet b</b>	
1 1/2"	2"	
		L96180L97A81

## US Units

Actual Orifice diameter $d_0$ [inch]	0,512	
Actual Orifice area $A_0$ [inch <sup>2</sup> ]	0,206	
<b>Clamp connections</b>		
	<b>Inlet a</b>	<b>Outlet b</b>
<b>COCO</b>	1"	1 1/2"
Option code	L96179L97A80	

## Explanation

Type 483,  $d_0$  13 mm, Clamp connections

No.	Description		Metric Units	US Units	Example
1	Actual Orifice diameter	$d_0$	[mm]	[inch]	13
2	Actual Orifice area	$A_0$	[mm <sup>2</sup> ]	[inch <sup>2</sup> ]	133
3	Connection code				COCO
4	Nominal pipe size – Inlet connection	NPS			1"
5	Nominal pipe size – Outlet connection	NPS			1 1/2"
6	Option code				L96179L97A80
7	Center to face dimension – Inlet	a	[mm]	[inch]	29
8	Center to face dimension – Outlet	b	[mm]	[inch]	52
9	Inner diameter of inlet clamp	$d_{inner}$	[mm]	[inch]	23
10	Outer diameter of inlet clamp	$d_{outer}$	[mm]	[inch]	51
11	Inner diameter of outlet clamp	$d_{inner}$	[mm]	[inch]	23
12	Outer diameter of outlet clamp	$d_{outer}$	[mm]	[inch]	36
13	Height – H4	H max.	[mm]	[inch]	206

## Example for "Dimensions and weights"

### Type 483



#### Dimensions and weights

Metric Units					
Actual Orifice diameter $d_0$ [mm]		13	25	13	25
Actual Orifice area $A_0$ [mm <sup>2</sup> ]		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 00/11		For varying clamp diameters please refer to page 00/11	
	$d_{outer}$ [mm]				
Height – H4	H max. [mm]	206	303	-	-
Height – H8 double piston design	H max. [mm]	234	311	-	-
Threaded 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	-	-
Weight					
Weight	max. [kg]	1,6	3,7		
US Units					
Actual Orifice diameter $d_0$ [inch]		0,512	0,984	0,512	0,984
Actual Orifice area $A_0$ [inch <sup>2</sup> ]		0,206	0,761	0,206	0,761
Welded connections		Inlet a		Outlet b	
	PN	16	16	16	16
Center to face	[inch]	-	-	3 <sup>7</sup> / <sub>32</sub>	3 <sup>19</sup> / <sub>32</sub>

#### Explanation

#### Type 483, $d_0$ 13 mm, Clamp connections

No.	Description		Metric Units	US Units	Example
1	Actual Orifice diameter	$d_0$	[mm]	[inch]	13
2	Actual Orifice area	$A_0$	[mm <sup>2</sup> ]	[inch <sup>2</sup> ]	133
3	Pressure rating – Inlet clamp	PN			PN 16
4	Pressure rating – Outlet clamp	PN			PN 16
5	Center to face dimension – Inlet	a	[mm]	[inch]	29
6	Center to face dimension – Outlet	b	[mm]	[inch]	52
7	Inner diameter of inlet clamp	$d_{inner}$	[mm]	[inch]	For varying clamp diameters please refer to page 00/11
	Outer diameter of inlet clamp	$d_{outer}$	[mm]	[inch]	
8	Inner diameter of outlet clamp	$d_{inner}$	[mm]	[inch]	For varying clamp diameters please refer to page 00/11
	Outer diameter of outlet clamp	$d_{outer}$	[mm]	[inch]	
9	Height – H4	H max.	[mm]	[inch]	206
10	Height – H8 double piston design	H max.	[mm]	[inch]	234
11	Weight max.		[kg]	[lb]	1,6

## Sample Capacity sheet – How to select capacities for steam: Type 483, d<sub>0</sub> 13 mm

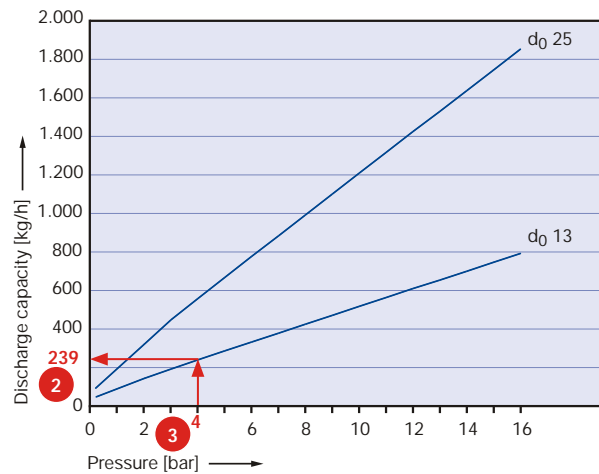
### Type 483



#### Capacities – Metric Units

Capacities for saturated steam, air at 0°C and 1013 mbar, water at 20°C according to AD 2000-Merkblatt A2, based on set pressure plus 10% overpressure. Capacities at 1 bar (14,5 psig) and below are based on 0,1 bar (1,45 psig) overpressure.

Steam		AD 2000-Merkblatt A2 [kg/h]	
Actual Orifice diameter d <sub>0</sub> [mm]	4	13	25
Actual Orifice area A <sub>0</sub> [mm <sup>2</sup> ]	5	133	491
LEO <sub>SG</sub> <sup>*)</sup> [inch <sup>2</sup> ]	6	0,110	0,279
3 Set pressure [bar]	Capacities [kg/h]		
1	88	195	
2	142	320	
3	191	448	
4	239	559	
Maximum temperature for EPDM soft seal			
5	286	669	
6	332	779	
7	378	886	
8	425	995	
9	471	1104	
10	518	1213	
12	611	1430	
14	701	1643	
16	794	1860	



<sup>\*)</sup> LEO<sub>SG</sub> = LESER Effective Orifice steam/gas/liquids please refer to page 00/10.  
How to use capacity-sheets refer to page 00/09

Explanation		Type 483, d <sub>0</sub> 13 mm			
No.	Description		Metric Units	US Units	Example
1	Code				AD 2000-Merkblatt A2
2	Capacity		[kg/h]	[lb/h]	239
3	Set pressure		[bar]	[psig]	4
4	Actual Orifice diameter	d <sub>0</sub>	[mm]	[inch]	13
5	Actual Orifice area	A <sub>0</sub>	[mm <sup>2</sup> ]	[inch <sup>2</sup> ]	133
6	LESER Effective Orifice	LEO <sub>SG</sub>	[inch <sup>2</sup> ]	[inch <sup>2</sup> ]	0,110
7	Base of calculation				see table page 00/16

7

## Base of calculation

	Metric Units	US Units	
<b>Code</b>	Capacity calculation according to AD 2000-Merkblatt A2	Capacity calculation according to ASME Section VIII (UV)	
<b>Media</b>	Standard conditions		
<b>Steam</b> (saturated steam)	Steam table IAPWS-IF97 IAPWS Industrial Formulation for the Thermodynamic Properties of Water and Steam	[kg/h]	Steam table IAPWS-IF97 IAPWS Industrial Formulation for the Thermodynamic Properties of Water and Steam
<b>Air</b>	0° C and 1013 mbar	[m <sub>n</sub> <sup>3</sup> /h]	16° C (60° F)
<b>Water</b>	20° C (68° F)	[10 <sup>3</sup> kg/h]	21° C (70° F)
<b>All media</b>	Calculation pressure		
Calculation pressure	Set pressure plus 10% overpressure	Set pressure plus 10% overpressure	
Calculation pressure for low set pressure	Capacities at 1 bar (14,5 psig) and below are based on 0,1 bar (1,45 psig) overpressure.	Capacities at 2,07 bar (30 psig) and below are based on 0,207 bar (3 psig) overpressure.	

## Example

### Capacity calculation pressure

Metric Units		US Units	
Set pressure	Capacity calculation pressure	Set pressure	Capacity calculation pressure
10 bar	10 bar + 10% overpressure = 11 bar	145 psig	145 psig + 10% overpressure = 159,5 psig
0,5 bar	0,5 bar + 0,1 bar overpressure = 0,6 bar	20 psig	20 psig + 3 psig overpressure = 23 psig

6

## LESER Effective Orifice (= LEO)

Pressure relief devices may be initially sized using the equations shown in API RP 520, sections 3.6 through 3.10 as appropriate for vapors, gases, liquids, or two phase flow. These equations utilize effective coefficient of discharge (S/G 0,975, L 0,650) and effective areas (acc. to API Std. 526, Fifth Edition, June 2002, table 1) which are independent of any specific

valve design. In this way the designer can determine a preliminary pressure relief valve size. By using the LESER Effective Orifice the designer can directly select a LESER safety relief valve after calculating the orifice letter. In this case, a verification of the sizing with the selected actual orifice and the rated coefficient of discharge is not necessary.

LEO <sub>S/G</sub>	LESER Effective Orifice (for steam, gas and vapor)	[inch <sup>2</sup> ]	refer to page 00/17
LEO <sub>L</sub>	LESER Effective Orifice (for liquid)	[inch <sup>2</sup> ]	refer to page 00/17

For further information refer to LESER Engineering Handbook.

This table is based on the rated coefficient of discharge for steams and gases of LESER safety valves certified by ASME. The appropriated K-values are shown in the column "K-value" of the table.

$$LEO_{S/G} [\text{inch}^2] = A_0 [\text{inch}^2] \cdot \left( \frac{K}{0,975} \right)$$

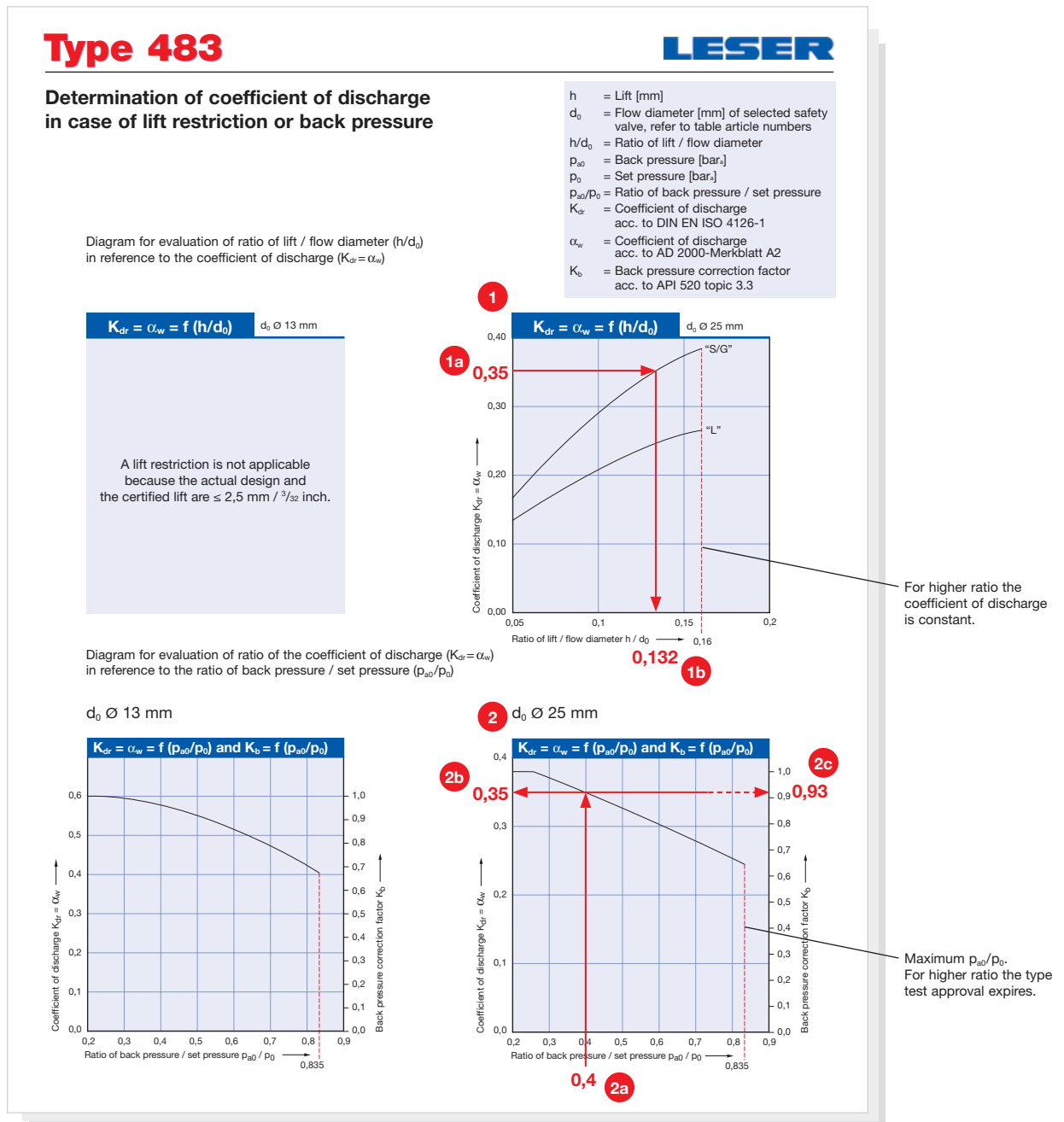
LEO <sub>S/G</sub>		LESER Effective Orifice (for steam, gas and vapor)					
Orifice acc. API 526	Type	d <sub>0</sub> [mm]	d <sub>0</sub> [inch]	K-value	LEO <sub>S/G</sub> [inch <sup>2</sup> ]	% of higher orifice	% of lower orifice
	481	10	0,394	0,406	0,051	46,1%	
D					0,110	100,0%	100,0%
	483, 484, 485	13	0,512	0,521	0,110	56,1%	99,9%
E					0,196	100,0%	100,0%
	483, 484, 485	25	0,984	0,357	0,279	90,7%	142,1%
F					0,307	100,0%	100,0%
	488	23	0,906	0,721	0,476	97,7%	155,1%
G					0,503	100,0%	100,0%
H					0,785	100,0%	100,0%
	488	37	1,457	0,721	1,232	95,8%	157,0%
J					1,287	100,0%	100,0%
K					1,838	100,0%	100,0%
	488	46	1,811	0,721	1,905	66,8%	103,6%
L					2,853	100,0%	100,0%
	488	60	2,362	0,721	3,241	90,0%	113,6%
M					3,600	100,0%	100,0%
N					4,340	100,0%	100,0%
	488	74	2,913	0,721	4,930	77,3%	113,6%
P					6,380	100,0%	100,0%
	488	92	3,622	0,721	7,620	69,0%	119,4%

This table is based on the rated coefficient of discharge for steams and gases of LESER safety valves certified by ASME. The appropriated K-values are shown in the column "K-value" of the table.

$$LEO_L [\text{inch}^2] = A_0 [\text{inch}^2] \cdot \left( \frac{K}{0,650} \right)$$

LEO <sub>L</sub>		LESER Effective Orifice (for liquid)					
Orifice acc. API 526	Type	d <sub>0</sub> [mm]	d <sub>0</sub> [inch]	K-value	LEO <sub>L</sub> [inch <sup>2</sup> ]	% of higher orifice	% of lower orifice
	481	10	0,394	0,322	0,060	74,3%	
	483, 484, 485	13	0,512	0,258	0,082	74,3%	
D					0,110	100,0%	100,0%
E					0,196	100,0%	100,0%
	483, 484, 485	25	0,984	0,258	0,302	98,4%	154,1%
F					0,307	100,0%	100,0%
	488	23	0,906	0,472	0,468	93,0%	152,4%
G					0,503	100,0%	100,0%
H					0,785	100,0%	100,0%
	488	37	1,457	0,472	1,210	94,0%	154,1%
J					1,287	100,0%	100,0%
K					1,838	100,0%	100,0%
	488	46	1,811	0,472	1,871	65,6%	101,8%
L					2,853	100,0%	100,0%
	488	60	2,362	0,472	3,182	88,4%	111,5%
M					3,600	100,0%	100,0%
N					4,340	100,0%	100,0%
	488	74	2,913	0,472	4,841	75,9%	111,5%
P					6,380	100,0%	100,0%
	488	92	3,622	0,472	7,482	67,7%	117,3%

## Sample Determination of $K_{dr} = \alpha_w$ : Type 483, $d_0$ 25 mm



Explanation		Sample – Type 483 flow diameter $d_0 = 25 \text{ mm}$ , rated lift $h = 4,0 \text{ mm}$ , $K_{dr} = \alpha_w \text{ S/G} = 0,38$			
<b>1</b>	<b>Diagram 1</b> Determination of the restricted lift due to reduced $K_{dr} = \alpha_w$	<b>2</b>	<b>Diagram 2</b> Determination of reduced $K_{dr} = \alpha_w$ or $K_b^{(1)}$ due to back pressure		
<b>Step</b>	<b>Description</b>	<b>Sample</b>	<b>Step</b>	<b>Description</b>	<b>Sample</b>
<b>1</b>	Calculate the required coefficient of discharge of the selected safety valve. Applicable formulars are stated in codes and standards.	<b>1a</b> $K_{dr} = \alpha_w = 0,35$	<b>1</b>	Calculate the back pressure ratio $p_{a0}/p_0$ using the actual values for set pressure $p_0$ [bar.] 3 and back pressure $p_{a0}$ [bar.] 1,2	<b>2a</b> $p_{a0}/p_0 = 0,4$
<b>2</b>	Select the starting point (0,35) at the Y-axis of the diagram.		<b>2</b>	Select the starting point (0,4) at the X-axis of the diagram.	
<b>3</b>	Lay a horizontal line onto the ratio graph to identify the intersection point.		<b>3</b>	Lay a vertical line onto the ratio graph to identify the intersection point.	
<b>4</b>	Lay a vertical line to the X-axis to identify the ratio of lift / flow diameter ( $h/d_0$ ).	<b>1b</b> $h/d_0 = 0,132$	<b>4</b>	Lay a horizontal line to the Y-axis to identify the reduced $K_{dr} = \alpha_w$ or $K_b$ .	<b>2b</b> $K_{dr} = \alpha_w = 0,35$ <b>2c</b> $K_b = 0,93$
<b>5</b>	Calculate the restricted lift using the formular $h = d_0 \times h/d_0$ . (For ordering a lift restriction please use option code J51 ref. to page 02/15)	$h = 25 \times 0,132$ $h = 3,3 \text{ mm}$	<b>5</b>	Calculate the sizing with the established $K_{dr} = \alpha_w$ or $K_b$ .	

The European Hygienic Engineering & Design Group (EHEDG) and the European Hygienic Pipes Standard DIN 11866 as well as the of ASME BPE 2002, -a- 2003, -a- 2004 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.

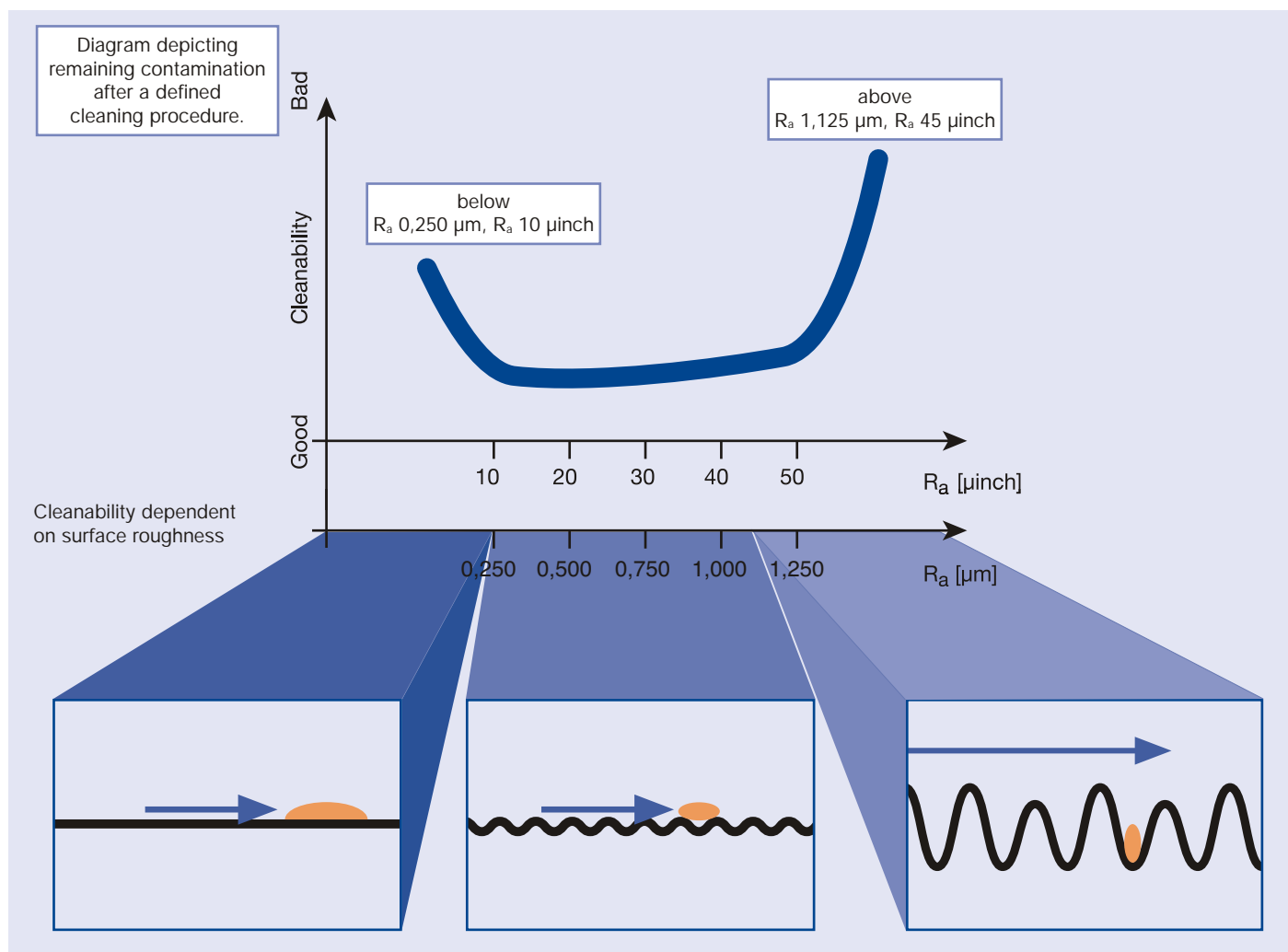
For instance the ASME BPE 2002, -a- 2003, -a- 2004 (Bioprocessing Equipment) states for cleanability:

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



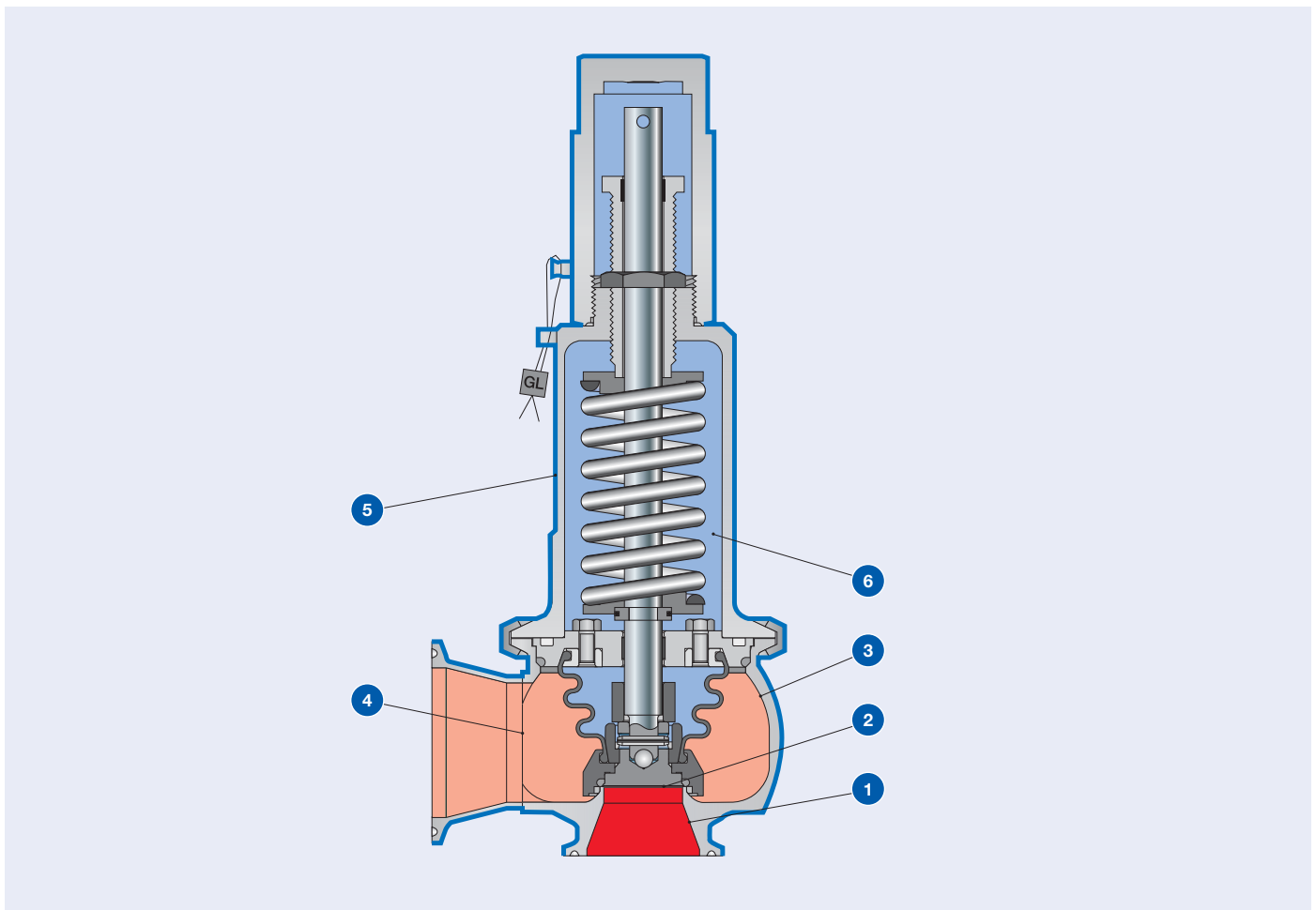
Below  $R_a$  0,250  $\mu\text{m}$  / 10  $\mu\text{inch}$  bacteria or particles "stick" to the surface due to adhesive effects.

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

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



## Clean Service Safety Valves



Surface definition		
Area	Description	Surface definition acc. to ASME BPE 2002
Product contact surface · No. <b>1</b> Inlet area · No. <b>2</b> 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. <b>3</b> Inside surface of outlet area · No. <b>4</b> 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. <b>5</b> 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. <b>6</b>	· Surface never in contact with the product because it is shielded by the bellows	· ASME BPE is not applicable

# International Surface Definition **LESER**

According to DIN 11866 and ASME BPE 2002, -a- 2003, -a- 2004

DIN 11866 Table 4		Acceptance criteria for tubes
Indication		Acceptance criteria (in dependence to ASME-BPE 2002)
Weld failure		Validation acc. to DIN EN 25817 validation group B
Cluster of pits		None accepted
Demarcation		If < 5 % of the total area when visually inspected and R <sub>a</sub> max. is met
Grit lines		If R <sub>a</sub> max. is met
Dents		None accepted
Pits		If diameter < = 0,5µm / 20 µinch and bottom is shiny
Scratches		If length < 6 µm / 236 µinch, depth < 0,1µm / 4 µinch, and R <sub>a</sub> max. is met
Surface cracks		None accepted
Surface inclusions		If R <sub>a</sub> max. is met and there is no liquid penetrant indication
Surface residuals		None accepted

DIN 11866 Table 3		Inner and outer surface condition				
Hygiene class		Surface condition				Outside
Mechanically Polished	Mechanically Polished and Electropolished	Inside surface		Welding seam inside		
		R <sub>a</sub>	R <sub>a</sub>	R <sub>a</sub>	R <sub>a</sub>	
		[µm]	[µinch]	[µm]	[µinch]	
H1	HE1c	< 1,6	< 63	< 3,2	< 125	Pickled or shiny annealed without roughness guidelines or grinded R <sub>a</sub> < 1,0 µm / 40 µinch
H2	HE2c	< 0,8	< 32	< 0,8	< 32	
H3	HE3c	< 0,8	< 32	< 0,8	< 32	
H4	HE4c	< 0,4	< 16	< 0,4	< 16	
H5	HE5c	< 0,25	< 10	< 0,25	< 10	

ASME BPE Table SF-5		Acceptance criteria for interior surface finishes of valve bodies
Anomaly or Indication		Acceptance criteria
Cluster of pits		No more than 4 pits per each 12,7 mm x 12,7 mm / 1/2 µinch x 1/2 µinch inspection window. The cumulative total of all relevant pits shall not exceed 1 µm / 40 µinch
Demarcation		If < 5 % of the total area when visually inspected and R <sub>a</sub> max. is met
Dents		None accepted
Grit lines		If R <sub>a</sub> max. is met
Nicks		If depth < 0,25 µm / 10 µinch
Pits		If diameter < 0,5 µm / 20 µinch and bottom is shiny. Pits < 0,075 µm / 3 µinch diameter are irrelevant and acceptable.
Porosity		If diameter < 0,25 µm / 10 µinch and bottom is shiny
Scratches		If length < 6,25 µm / 250 µinch, depth < 0,075 µm / 3 µinch, and R <sub>a</sub> max. is met
Surface cracks		None accepted
Surface inclusions		If R <sub>a</sub> max. is met and there is no liquid penetrant indication
Surface residuals		None accepted, visual inspection
Surface roughness (R <sub>a</sub> )		See table SF-6
Weld slag		None accepted

ASME BPE Table SF-6					
Surface designation	Mechanically polished <sup>1)</sup>		Surface designation	Mechanically polished and electropolished	
	R <sub>a</sub> max.			R <sub>a</sub> max.	
	[µm]	[µinch]		[µm]	[µinch]
SFV1	0,500	20	SFV4	0,375	15
SFV2	0,625	25	SFV5	0,500	20
SFV3	0,750	30	SFV6	0,625	25

General note: All R<sub>a</sub> readings are taken across the lay, wherever possible.

<sup>1)</sup> Or any other finishing method that meets the R<sub>a</sub> max.

In order to cover international surface requirements like DIN 11866 as well as ASME BPE, which are displayed on page 00/21, 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 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

## 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.

Mechanically polished						
LESER surface grade	Surface condition				DIN 11866	ASME BPE
	R <sub>a</sub> max.		≅ R <sub>z</sub>		Hygiene class	Surface designation
	[µm]	[µinch]	[µm]	[µinch]		
M1	0,375	15	2,5	64	H4	–
M2	0,500	20				SFV1
M3	0,625	25				SFV2
M4	0,750	30	4	102	H3	SFV3
M5	1,500	60	10	254	H1	–
M6	3,000	120	16	406		–

Mechanically polished and electropolished						
LESER surface grade	Surface condition				DIN 11866	ASME BPE
	R <sub>a</sub> max.		≅ R <sub>z</sub>		Hygiene class	Surface designation
	[µm]	[µinch]	[µm]	[µinch]		
ME1	0,375	15	2,5	64	HE4c	SFV4
ME2	0,500	20				SFV5
ME3	0,625	25				SFV6
ME4	0,750	30	4	102	HE3c	–
ME5	1,500	60	10	254	HE1c	–
ME6	3,000	120	16	406		–

For available surface packages and surface grades of each type please refer to catalog sections "Surface quality".

## Option codes for available surface packages

Overview option codes				
Type	Details see page	LESER Surface packages		
		Clean finish	HyClean finish	Sterile finish
481	01/13	B50	B51	B52
483	02/13	B53	B54	B55
488	03/15	B68	B69	B70
484	04/15	B56	B57	B58
5034 Vessel connection	04/15	B59	B60	B61
485	05/15	B62	B63	B64
5034 Integrated pipework connection	05/15	B65	B66	B67

## 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

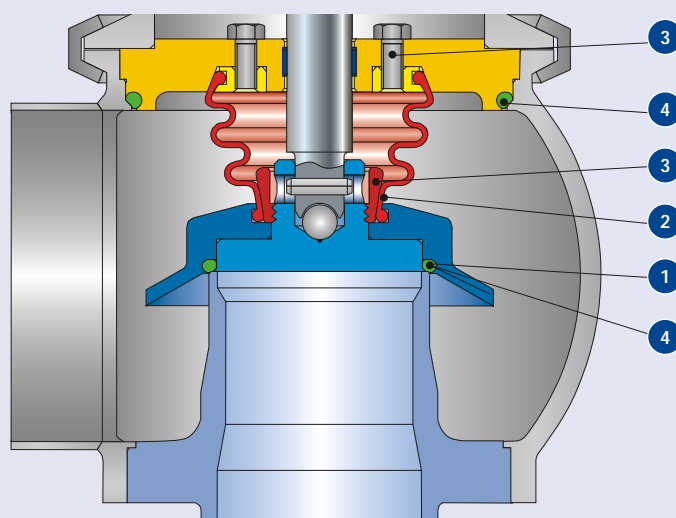
The aseptic O-ring disc is the “heart” of the series 48X. This unique design provides for the first time a really cleanable in- and outlet of a safety valve:

- 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

## HyTight Assembly

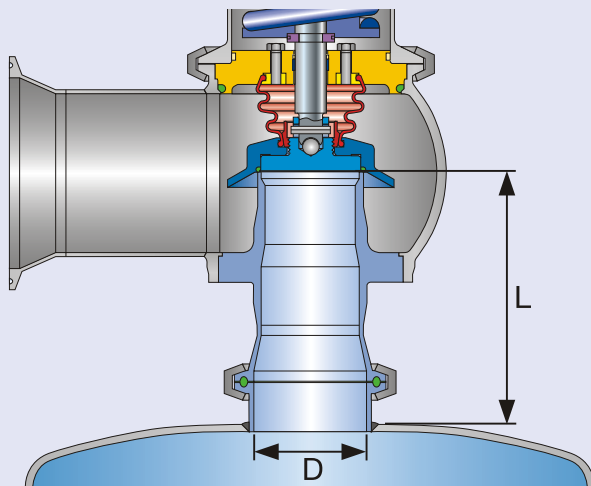


The dead space ratio is defined by ratio of the length of the inlet (L) to the diameter of the inlet pipe (D). The cleanability is improved as this ratio is reduced.

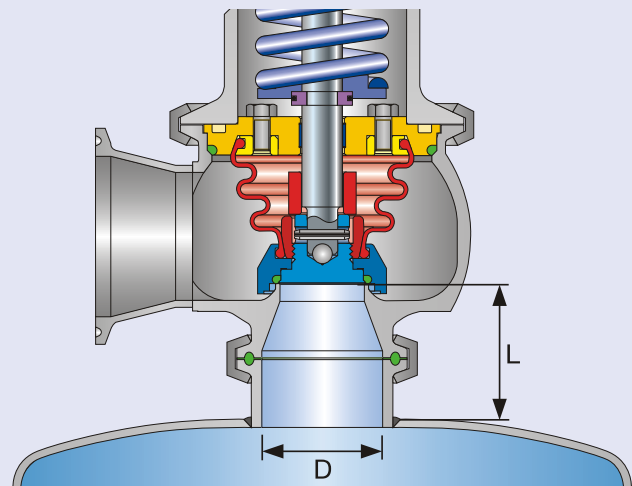
Types 481, 483 and 488 are improved solutions for safety valves with clamp connections, and have L/D ratios less than 1,5 and 2,0 (Type 488). The requirements of ASME BPE 2002 Part SD – 3.11.1 ( $L/D < 2,0$ ) and FDA 21 CFR Part 177.2600 ( $L/D < 1,5$ ) are fulfilled with these designs.

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.

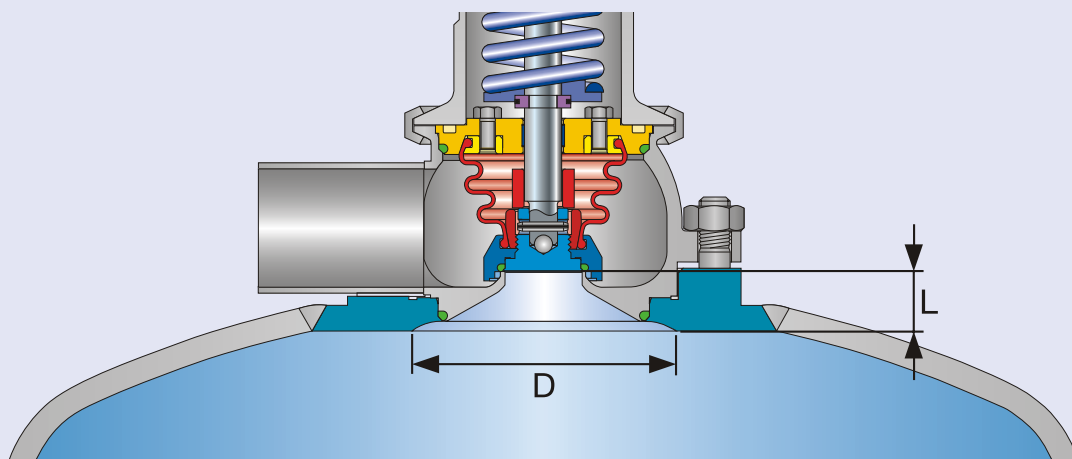
## Dead space



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



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



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

### What is the standard surface quality for all LESER clean service safety valves?

The surface quality for LESER clean service safety valves depends on the valve type. Nevertheless, each Clean Service safety valve LESER offers complies with DIN 11866 and ASME BPE 2002, -a- 2003, -a- 2004.

### Does LESER fulfil ASME BPE 2002, -a- 2003, -a- 2004 requirements?

ASME BPE 2002 is a general guideline for design and construction of Clean Service Equipment. LESER follows this guideline as well as DIN EN 1672-2 and fulfils the requirements of both.

### What is FDA?

FDA (Food and Drug Administration) is a federal science-based law enforcement agency in the USA mandated to protect public health and safety.

### What does 21 CFR Part 177.2600 mean?

This is a title of the Federal Food, Drug and Cosmetic Act (1938)

21: title 21, Food and Drugs  
CFR: Code of Federal Regulations  
177.: Part "polymers"  
2600: section "elastomers"

### Are the elastomer materials in a compliance with FDA?

LESER certifies that the standard EPDM fitted directly into product contact parts of the Clean Service safety valves are in accordance with the rules of the "Food and Drug Administration" (FDA) 21 CFR Part 177.2600: "Rubber articles intended for repeated use". LESER is also able to supply FFKM (Kalrez®) and FKM (Viton®) in FDA compliant grades.

### What does USP mean?

United States Pharmacopeia. Their vision is: "USP's vision is to be a leader in promoting the public health by creating a unique knowledge base – consisting of quality standards and information on proper use – for medicines and related products and practices. USP will ensure that people throughout the world have access to this knowledge base."

### What is the USP-NF?

The United States Pharmacopeia – National Formulary (USP – NF) is a book of public pharmacopeial standards. It contains standards for medicines, dosage forms, drug substances, excipients, medical devices, and dietary supplements. The current edition is USP30 – NF25.

### What is USP Class VI?

In the USP "Chapter <88> Biological reactivity tests, in vivo" you can find a definition of test procedures for elastomers, which come in contact with humans and animals. There are 6 grades of test; the highest one is Class VI. Furthermore the "Chapter <87> Biological reactivity tests, in vitro" is relevant, which describe tests about the cytotoxicity.

### Which elastomer materials acc. to USP Class VI are available at LESER?

LESER supplies as standard elastomers EPDM and FFKM (e.g. ISOLAST® or Kalrez®) with manufacturer's certificate acc. to USP <87> cytotoxicity test and USP <88> Class VI.

### What is 3A?

3-A Sanitary Standards, Inc. (3-A SSI) is a non-profit association representing equipment manufacturers, processors, regulatory sanitarians and other public health professionals.

Through many decades of cooperation, these groups have established a comprehensive inventory of 3-A Sanitary Standards and 3-A Accepted Practices now known around the world for dairy and food processing equipment and systems.

### What does EHEDG mean?

EHEDG is the shortform for "European Hygienic Engineering & Design Group". The EHEDG provides guidance on the hygienic engineering aspects of manufacturing of safe and wholesome food.

### What is EHEDG test?

The EHEDG defines test methods for definition and examination of cleanability. The test methods are described in the following "Docs": "Doc 2, A method for assessing the in-place cleanability of food processing equipment" or "Doc 15, A method for the assessment of in-place cleanability of moderately-sized food processing equipment".

The test can be performed at certified laboratories and is documented in an EHEDG Test certificate. Up to now there is only a low request for EHEDG tested safety valves. Nevertheless, LESER is able to perform these tests at any time.



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

# Type 481

Type 481

## Safety Relief Valves - spring loaded



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

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#### Capacities

- Steam, Air, Water [Metric Units] 01/16

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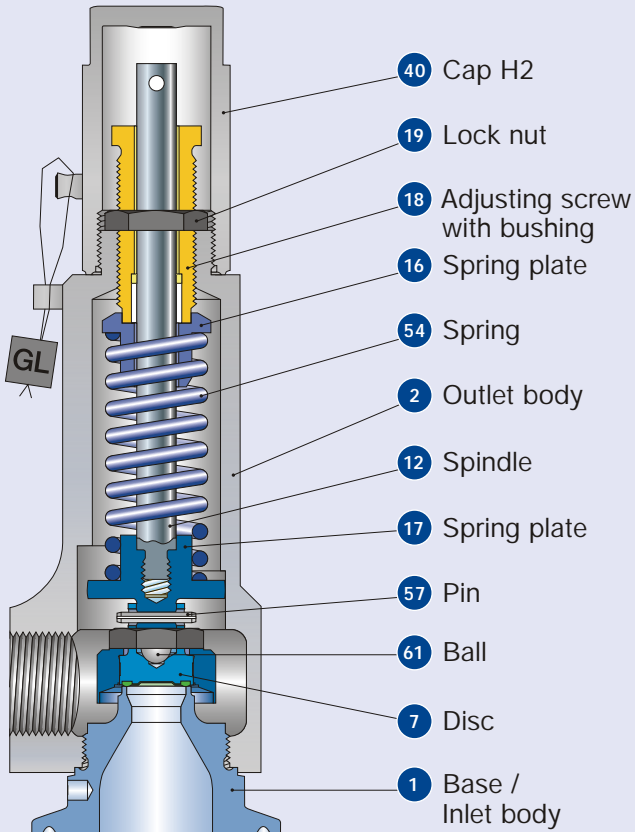
Determination of coefficient 01/18

of discharge  $K_{dr}/\alpha_w$

## Conventional design

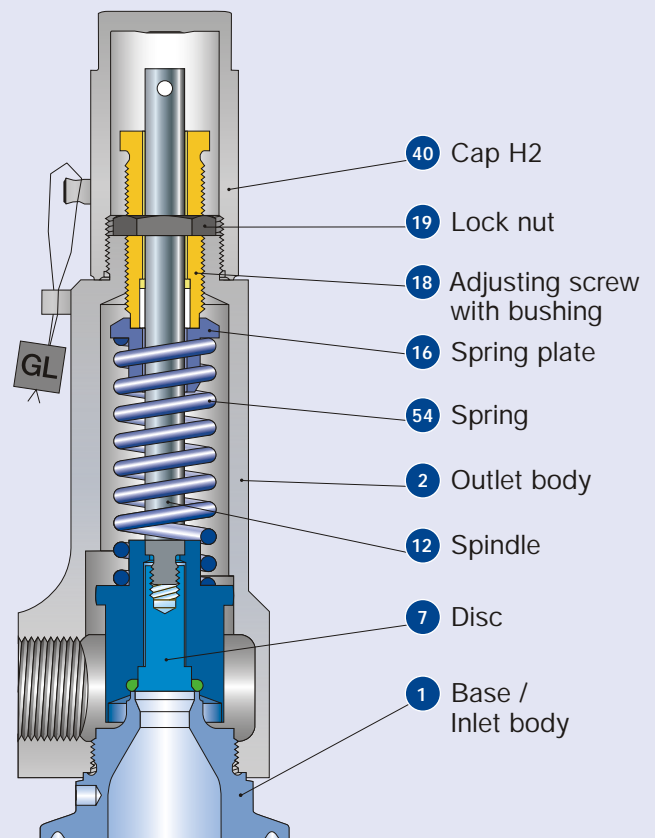
Type 481

### 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**  
 Set pressure: 16 – 68 bar  
 233 – 986 psig  
 Inlet: Clamp connection  
 Outlet: Threaded connection



## Conventional design

Materials			Type 4814	
Item	Component	Remarks	Set pressure	
			0,1 – 16 bar 1,5 – 232 psig	16 – 68 bar 233 – 986 psig
1	Base / Inlet body		1.4404	1.4404
			SA 479 316L	SA 479 316L
2	Outlet body		1.4404	1.4404
			SA 479 316L	SA 479 316L
7	Disc		1.4404	1.4404
			SA 479 316L	SA 479 316L
			Vulcanized soft seal	O-ring soft seal
7.1	Soft seal vucanized or O-ring	“D”  	EPDM	EPDM
		“K”	CR	CR
		“L” 	FKM	FKM
		“N”	NBR	NBR
		“C”  	FFKM	FFKM
12	Spindle		1.4404	1.4404
			316L	316L
16	Spring plate		1.4404	1.4404
			316L	316L
17	Spring plate		1.4404	–
			316L	–
18	Adjusting screw with bushing	PTFE + 15 % glass	1.4404 / PTFE	1.4404 / PTFE
			316L / PTFE	316L / PTFE
19	Lock nut		1.4404	1.4404
			316L	316L
40	Cap H2		1.4404	1.4404
			316L	316L
54	Spring		1.4310	1.4310
			Stainless steel	Stainless steel
57	Pin		1.4310	–
			Stainless steel	–
61	Ball		1.4401	–
			316	–

**Please notice:**

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

## How to order – Numbering system

Type 481

# 1

## Article Number

1	2	3	4
481	4	769	2

**1** Type 481  
Types of sealing

Soft seal	Soft seal material
EPDM	Buna-EP®
CR	Neoprene®
FKM	Viton®
NBR	Buna-N®
FFKM	Kalrez®, ISOLAST®

**2** Material code

Code	Body material
4	1.4404 (316L)

**3** Valve code  
Identifies pressure range,  
orifice and design of soft seal

Code	Soft seal / pressure range
769	Vulcanized soft seal $p_{set} = 0,1 - 16 \text{ bar}$ $p_{set} = 1,5 - 232 \text{ psig}$
768	O-ring disc $p_{set} = 16 - 68 \text{ bar}$ $p_{set} = 233 - 986 \text{ psig}$

Refer to page 01/07

**4** Code for lifting device

Code	Lifting device	
2	Screwed cap	H2
4	Packed knob	H4
8	Pneumatic lifting device	H8

4814.7692

Article Number

# 2

## Set Pressure

Please state unit (in gauge)!

Please do not exceed the pressure range defined in the spring charts.

For pressure range, refer to page 01/07

12 bar

Set Pressure

# 3

## Connections

Please refer to table "Available connections" on pages 00/07 and 01/10.

Please state one option code for each inlet **and** outlet.

I75I78

V70






Connections

## 4

### Options

#### Type 481

#### Option code

- O-ring disc or vulcanized soft seal disc  
Standard: EPDM "D"   **J22**
- Option: CR "K" **J21**
- FKM "L"  **J23**
- NBR "N" **J30**
- FFKM "C"   **J20**
- Test gag H2 **J70**  
(Available for cap H2 only)
- Pneumatic lifting device H8 **J41**  
Double piston design
- LESER Surface package  
HyClean finish **B51**  
Sterile finish **B52**

For detailed information refer to page 01/13

Option code applies only if not standard

J41

J70

Options

## 5

### Documentation

Please select requested documentation:

#### Inspections, tests: Option code

DIN EN 10204-3.2: TÜV-Nord  
Certificate for test pressure **M33**

#### LESER CGA (Certificate for Global Application) H03

- Inspection certificate 3.1 acc. to DIN EN 10204
- Declaration of conformity acc. to PED 97/23/EC

#### Material test certificate:

DIN EN 10204-3.1

#### Part Option code

Base / Inlet body **H01**  
Outlet body **L34**  
Cap / lever cover **L31**  
Disc **L23**  
Certificate of surface quality **N04**

H01

L23

Documentation

## 6

### Code and Medium

#### 1 Code

1. ASME Section VIII
2. CE / VdTUEV
3. ASME Section VIII + CE / VdTUEV

#### 2 Medium

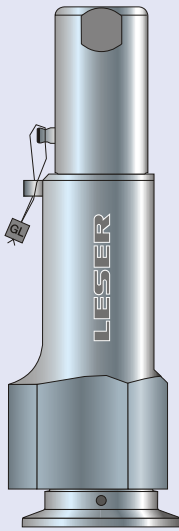
- .1 Gases
- .2 Liquids
- .3 Steam
- .0 Steam / Gases / Liquids (valid only for CE / VdTUEV)

2.0

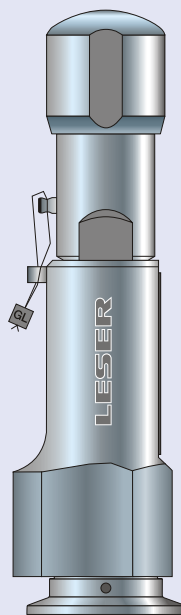
Code and Medium

## How to order – Article numbers

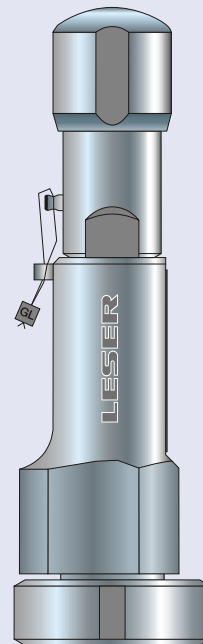
Type 481



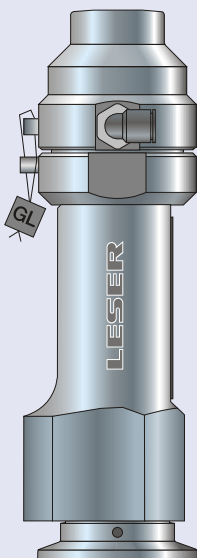
**Type 481**  
Cap H2  
Inlet: Clamp connection  
Outlet: Threaded connection



**Type 481**  
Packed knob H4  
Inlet: Clamp connection  
Outlet: Threaded connection

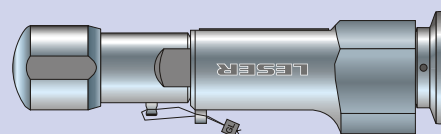


**Type 481**  
Packed knob H4  
Inlet: Aseptic clamp and nut  
Outlet: Threaded connection



**Type 481**  
Pneumatic lifting device H8  
Inlet: Clamp connection  
Outlet: Threaded connection

Certified for horizontal fitting.



**Attention!** Only with outlet  
in downward direction.

## How to order – Article numbers

### Article numbers

			Vulcanized soft seal	O-ring disc
Actual Orifice diameter $d_0$ [mm]			10	10
Actual Orifice area $A_0$ [mm <sup>2</sup> ]			78,5	78,5
Actual Orifice diameter $d_0$ [inch]			0,394	0,394
Actual Orifice area $A_0$ [inch <sup>2</sup> ]			0,122	0,122
<b>Soft seal material</b>			EPDM "D" J22	EPDM "D" J22
			CR "K" J21	CR "K" J21
			FKM "L" J23	FKM "L" J23
			NBR "N" J30	NBR "N" J30
			FFKM "C" J20	FFKM "C" J20
<b>Base / Inlet body material: 1.4404 (316L)</b>				
<b>Bonnet</b>	<b>H2</b>	Art.-No. <b>4814.</b>	<b>7692</b>	<b>7682</b>
closed	<b>H4</b>	Art.-No. <b>4814.</b>	<b>7694</b>	<b>7684</b>
	<b>H8</b>	Art.-No. <b>4814.</b>	<b>7698</b>	<b>7688</b>
		p [bar] S/G/L	<b>0,1 – 16</b>	<b>16 – 68</b>
		p [psig] S/G/L	<b>1,5 – 232</b>	<b>233 – 986</b>

## Pressure temperature ratings

### Metric Units

			Vulcanized soft seal	O-ring disc
Actual Orifice diameter $d_0$ [mm]			10	10
Actual Orifice area $A_0$ [mm <sup>2</sup> ]			78,5	78,5
<b>Body material: 1.4404 (316L)</b>				
<b>Inlet / Outlet body</b>	Pressure rating	For pressure ratings please refer to chapter dimensions and weights (page 01/09)		
<b>Minimum set pressure</b>	p [bar] S/G/L	0,1		16
<b>Maximum set pressure</b>	p [bar] S/G/L	16		68
<b>Temperature range<sup>1)</sup></b>		Minimum	Maximum	Minimum
EPDM	[°C]	-45	+150	-45
CR	[°C]	-40	+100	-40
FKM	[°C]	-20	+180	-20
NBR	[°C]	-25	+110	-25
FFKM	[°C]	0	+250	0

### US Units

			Vulcanized soft seal	O-ring disc
Actual Orifice diameter $d_0$ [inch]			0,394	0,394
Actual Orifice area $A_0$ [inch <sup>2</sup> ]			0,122	0,122
<b>Body material: 1.4404 (316L)</b>				
<b>Inlet / Outlet body</b>	Pressure rating	For pressure ratings please refer to chapter dimensions and weights (page 01/09)		
<b>Minimum set pressure</b>	p [psig] S/G/L	1,5		233
<b>Maximum set pressure</b>	p [psig] S/G/L	232		986
<b>Temperature range<sup>1)</sup></b>		Minimum	Maximum	Minimum
EPDM	[°F]	-49	+302	-49
CR	[°F]	-40	+212	-40
FKM	[°F]	-4	+356	-4
NBR	[°F]	-13	+230	-13
FFKM	[°F]	+32	+482	+32

<sup>1)</sup> The temperature is limited by the soft seal material. Refer to table "Soft seal selection" on page 99/11.

## Dimensions – Bestseller

For shortest delivery time please select bestsellers. The specified bestsellers can vary depending on different market requirements

For further available connections please refer to page 01/10.

### Metric Units

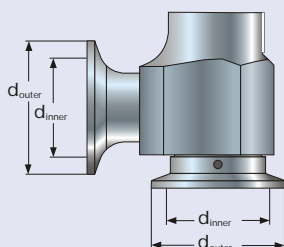
Actual Orifice diameter $d_0$ [mm]		10	
Actual Orifice area $A_0$ [mm <sup>2</sup> ]		78,5	
Clamp connections		Inlet a	Outlet b
COCO		1"	1"
Option code L96I79L97A79			
Center to face	[mm]	30	65
Clamp diameter	$d_{inner}$ [mm]	23	23
	$d_{outer}$ [mm]	51	51
Height – H4	H max. [mm]	193	
Clamp / Threaded connections		Inlet a	Outlet b
SOXG		15	G 1/2"
Option code L79I14V65			
Center to face	[mm]	30	30
Clamp diameter	$d_{inner}$ [mm]	16	–
	$d_{outer}$ [mm]	34	–
Height – H4	H max. [mm]	193	
COXG		1"	G 1/2"
Option code L96I79V65			
Center to face	[mm]	33	37
Clamp diameter	$d_{inner}$ [mm]	23	–
	$d_{outer}$ [mm]	51	–
Height – H4	H max. [mm]	193	

Actual Orifice diameter $d_0$ [mm]		10	
Actual Orifice area $A_0$ [mm <sup>2</sup> ]		78,5	
Clamp connections		Inlet a	Outlet b
COCO		1"	1"
Option code L96I79L97A79			
Center to face	[mm]	30	65
Clamp diameter	$d_{inner}$ [mm]	23	23
	$d_{outer}$ [mm]	51	51
Height – H4	H max. [mm]	193	
Clamp / Threaded connections		Inlet a	Outlet b
SOXG		15	G 1/2"
Option code L79I14V65			
Center to face	[mm]	30	30
Clamp diameter	$d_{inner}$ [mm]	16	–
	$d_{outer}$ [mm]	34	–
Height – H4	H max. [mm]	193	
COXG		1"	G 1/2"
Option code L96I79V65			
Center to face	[mm]	33	37
Clamp diameter	$d_{inner}$ [mm]	23	–
	$d_{outer}$ [mm]	51	–
Height – H4	H max. [mm]	193	

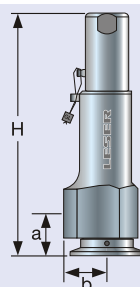
### US Units

Actual Orifice diameter $d_0$ [inch]		0,394	
Actual Orifice area $A_0$ [inch <sup>2</sup> ]		0,122	
Clamp connections		Inlet a	Outlet b
COCO		1"	1"
Option code L96I79L97A79			
Center to face	[inch]	1 3/16	2 9/16
Clamp diameter	$d_{inner}$ [inch]	7/8	7/8
	$d_{outer}$ [inch]	2	2
Height – H4	H max. [inch]	7 19/32	
Clamp / Threaded connections		Inlet a	Outlet b
SOXG		15	G 1/2"
Option code L79I14V65			
Center to face	[inch]	1 3/16	1 3/16
Clamp diameter	$d_{inner}$ [inch]	5/8	–
	$d_{outer}$ [inch]	1 11/32	–
Height – H4	H max. [inch]	7 19/32	
COXG		1"	G 1/2"
Option code L96I79V65			
Center to face	[inch]	1 5/16	1 15/32
Clamp diameter	$d_{inner}$ [inch]	29/32	–
	$d_{outer}$ [inch]	2	–
Height – H4	H max. [inch]	7 19/32	

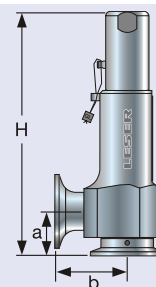
Actual Orifice diameter $d_0$ [inch]		0,394	
Actual Orifice area $A_0$ [inch <sup>2</sup> ]		0,122	
Clamp connections		Inlet a	Outlet b
COCO		1"	1"
Option code L96I79L97A79			
Center to face	[inch]	30	65
Clamp diameter	$d_{inner}$ [inch]	23	23
	$d_{outer}$ [inch]	51	51
Height – H4	H max. [inch]	193	
Clamp / Threaded connections		Inlet a	Outlet b
SOXG		15	G 1/2"
Option code L79I14V65			
Center to face	[inch]	30	30
Clamp diameter	$d_{inner}$ [inch]	16	–
	$d_{outer}$ [inch]	34	–
Height – H4	H max. [inch]	193	
COXG		1"	G 1/2"
Option code L96I79V65			
Center to face	[inch]	33	37
Clamp diameter	$d_{inner}$ [inch]	23	–
	$d_{outer}$ [inch]	51	–
Height – H4	H max. [inch]	193	



Type 481 – Clamp diameters



Type 481 – Outlet: Threaded connection



Type 481 – Outlet: Clamp connection

## Dimensions and weights

Metric Units			
Actual Orifice diameter $d_0$ [mm]		10	10
Actual Orifice area $A_0$ [mm <sup>2</sup> ]		78,5	78,5
DN		15	25
Clamp connections		Inlet a	
PN		16	16
Center to face	Outlet G 1/2 [mm]	40	30
	Outlet G 3/4 [mm]	40	30
	Outlet G 1 [mm]	43	33
Clamp diameter	$d_{inner}$ [mm]	For varying clamp diameters please refer to page 00/11	
	$d_{outer}$ [mm]		
Height – H4	H max. [mm]	203	193
Height – H8 double piston design	H max. [mm]	231	221
Threaded connections		Inlet a	
PN		16	16
Center to face (female thread)	Outlet G 1/2 [mm]	–	39
	Outlet G 3/4 [mm]	–	39
	Outlet G 1 [mm]	–	42
Center to face	Outlet G 1/2 [mm]	–	39
	Outlet G 3/4 [mm]	–	39
	Outlet G 1 [mm]	–	42
Height – H4	H max. [mm]	–	202
Height – H8 double piston design	H max. [mm]	–	230
Weight			
Weight	max. [kg]	1,4	1,4

US Units			
Actual Orifice diameter $d_0$ [inch]		0,394	0,394
Actual Orifice area $A_0$ [inch <sup>2</sup> ]		0,122	0,122
DN		15	25
Clamp connections		Inlet a	
PN		16	16
Center to face	Outlet G 1/2 [inch]	1 9/16	1 3/16
	Outlet G 3/4 [inch]	1 9/16	1 3/16
	Outlet G 1 [inch]	1 11/16	1 5/16
Clamp diameter	$d_{inner}$ [inch]	For varying clamp diameters please refer to page 00/11	
	$d_{outer}$ [inch]		
Height – H4	H max. [inch]	8	7 19/32
Height – H8 double piston design	H max. [inch]	9 3/32	8 11/16
Threaded connections		Inlet a	
PN		16	16
Center to face (female thread)	Outlet G 1/2 [inch]	–	1 17/32
	Outlet G 3/4 [inch]	–	1 9/16
	Outlet G 1 [inch]	–	1 21/32
Center to face	Outlet G 1/2 [inch]	–	1 17/32
	Outlet G 3/4 [inch]	–	1 9/16
	Outlet G 1 [inch]	–	1 21/32
Height – H4	H max. [inch]	–	7 15/16
Height – H8 double piston design	H max. [inch]	–	9 1/16
Weight			
Weight	max. [lb]	3,086	3,086

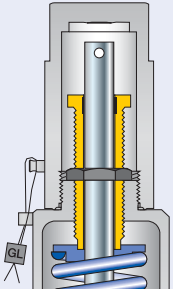
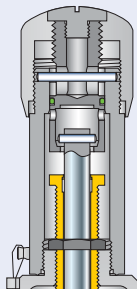
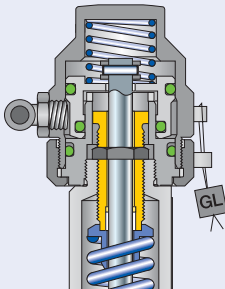
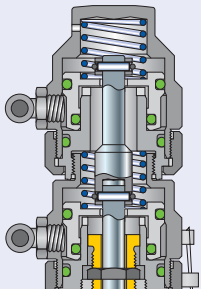







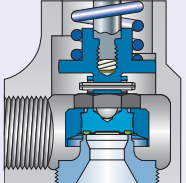







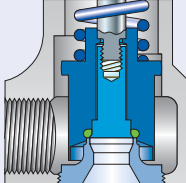
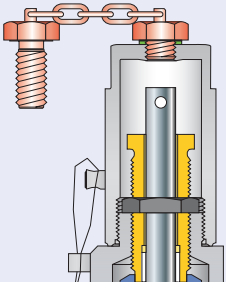
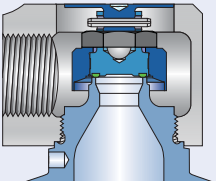
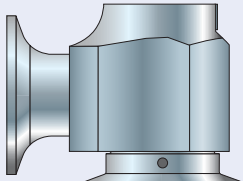
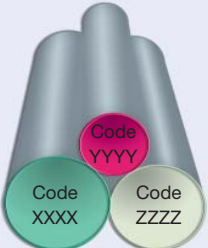
## Option codes for available connections

For detailed information about the available connections please refer to "How to use" on page 00/07.

Connections							
	d <sub>0</sub> [mm]	10					
	d <sub>0</sub> [inch]	0,394					
Clamps		Option code inlet					
	DN	15	25				
For dimensions refer to page 00/07	SO	L79I14	L79I16				
	DO	I73I14	I73I16				
	NPS	¾"	1"				
	BO	I75I78	I75I79				
	CO	-	L96I79				
Clamp connections suitable for NA-Connect available							
Threaded connections		Option code inlet					
	DN	-					
	XG	-					
	XN	-					
Pipe standard		Option code inlet					
	DN	25					
DIN 11850 / DIN 11866 Range A	GS	H85H34I16					
	BS	H85H36I16					
	GT	H85H54I16					
	BT	H85H56I16					
	GO	H85L75I16					
	KO	H85L76I16					
	GD	H85H60I16					
	BD	H85H58I16					
Pipe standard		Option code inlet					
	DN	25					
DIN EN ISO 1127 / DIN 11866 Range B	GS	H86H34I16					
	BS	H86H36I16					
	GT	H86H54I16					
	BT	H86H56I16					
	GD	H86H60I16					
	BD	H86H58I16					
Pipe standard		Option code inlet					
	NPS	1"					
BS 4825-1 DIN 11866 Range C	GS	H87H34I79					
	BS	H87H36I79					
	GT	H87H54I79					
	BT	H87H56I79					
	d <sub>0</sub> [mm]	10					
	d <sub>0</sub> [inch]	0,394					
		Option code outlet					
	DN	-	25				
	SO	-	L86A16				
	DO	-	I74A16				
	NPS	-	1"				
	BO	-	-				
	CO	-	L97A79				
		Option code outlet					
	DN	G ½"	G ¾"	G 1"	½" NPT	¾" NPT	1" NPT
	XG	V65	V76	V66	-		
	XN	-		V70	V77	V71	
Pipe standard		Option code outlet		Option code outlet			
	DN	25		25			
	GS	A85H35A16		A85H35A16			
	BS	A85H37A16		A85H37A16			
	GT	A85H55A16		A85H55A16			
	BT	A85H57A16		A85H57A16			
	GO	A85L81A16		A85L81A16			
	KO	A85L82A16		A85L82A16			
	GD	A85H61A16		A85H61A16			
	BD	A85H59A16		A85H59A16			
Pipe standard		Option code outlet		Option code outlet			
	DN	25		25			
	GS	A86H35A16		A86H35A16			
	BS	A86H37A16		A86H37A16			
	GT	A86H55A16		A86H55A16			
	BT	A86H57A16		A86H57A16			
	GD	A86H61A16		A86H61A16			
	BD	A86H59A16		A86H59A16			
Pipe standard		Option code outlet		Option code outlet			
	NPS	1"		1"			
	GS	A87H35A79		A87H35A79			
	BS	A87H37A79		A87H37A79			
	GT	A87H55A79		A87H55A79			
	BT	A87H57A79		A87H57A79			



## Available options

<p><b>Gastight cap H2</b> H2</p> 	<p><b>Gastight lifting device H4</b> Packed knob H4</p> 	<p><b>Pneumatic lifting device H8</b> H8 single piston design</p> 	<p><b>Pneumatic lifting device H8</b> J41: H8 double piston design</p> 
<p><b>Vulcanized soft seal</b>            J22: EPDM "D"              J21: CR "K"             J23: FKM "L"             J30: NBR "N"             J20: FFKM "C"  </p> 	<p><b>O-ring disc</b>            J22: EPDM "D"              J21: CR "K"             J23: FKM "L"             J30: NBR "N"             J20: FFKM "C"  </p> 		
<p><b>Test gag</b> J70: H2</p> 			
<p><b>Female NPT outlet</b>            V70: 1/2"            V77: 3/4"            V71: 1"</p> 	<p><b>Clamp connection outlet</b> Clamp: 1"</p> 	<p><b>Special material</b>            2.4610 HASTELLOY C4            2.4360 MONEL 400            1.4462 DUPLEX</p> 	

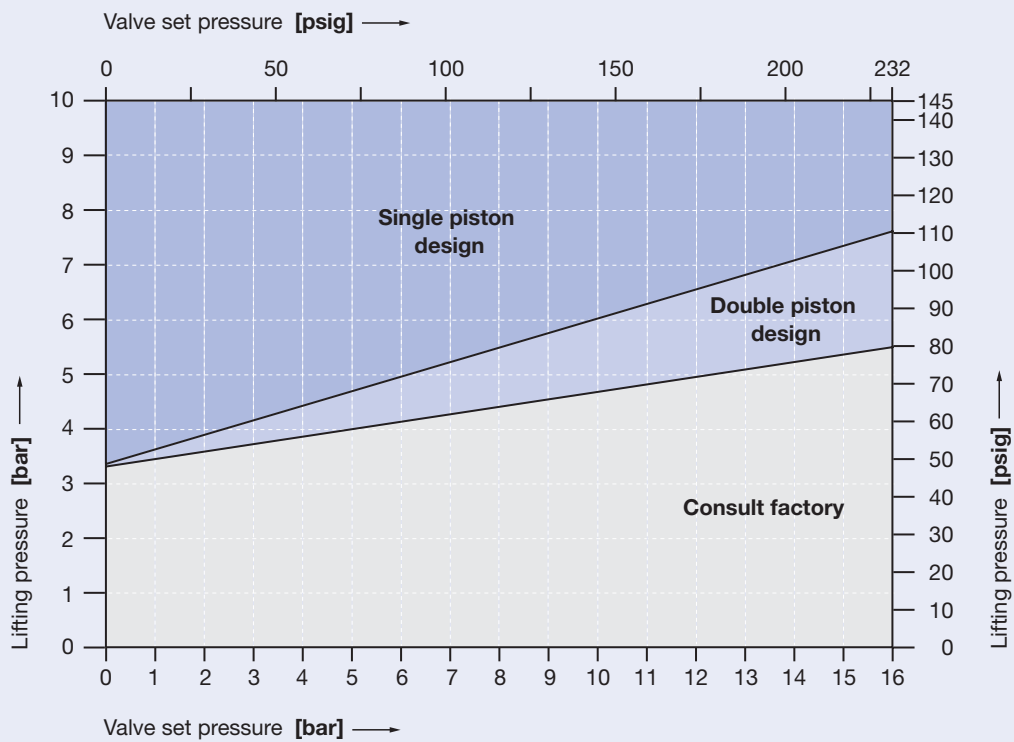
## Selection chart H8

Type 481

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.

For information about this chart please refer to "How to use" on page 00/12.

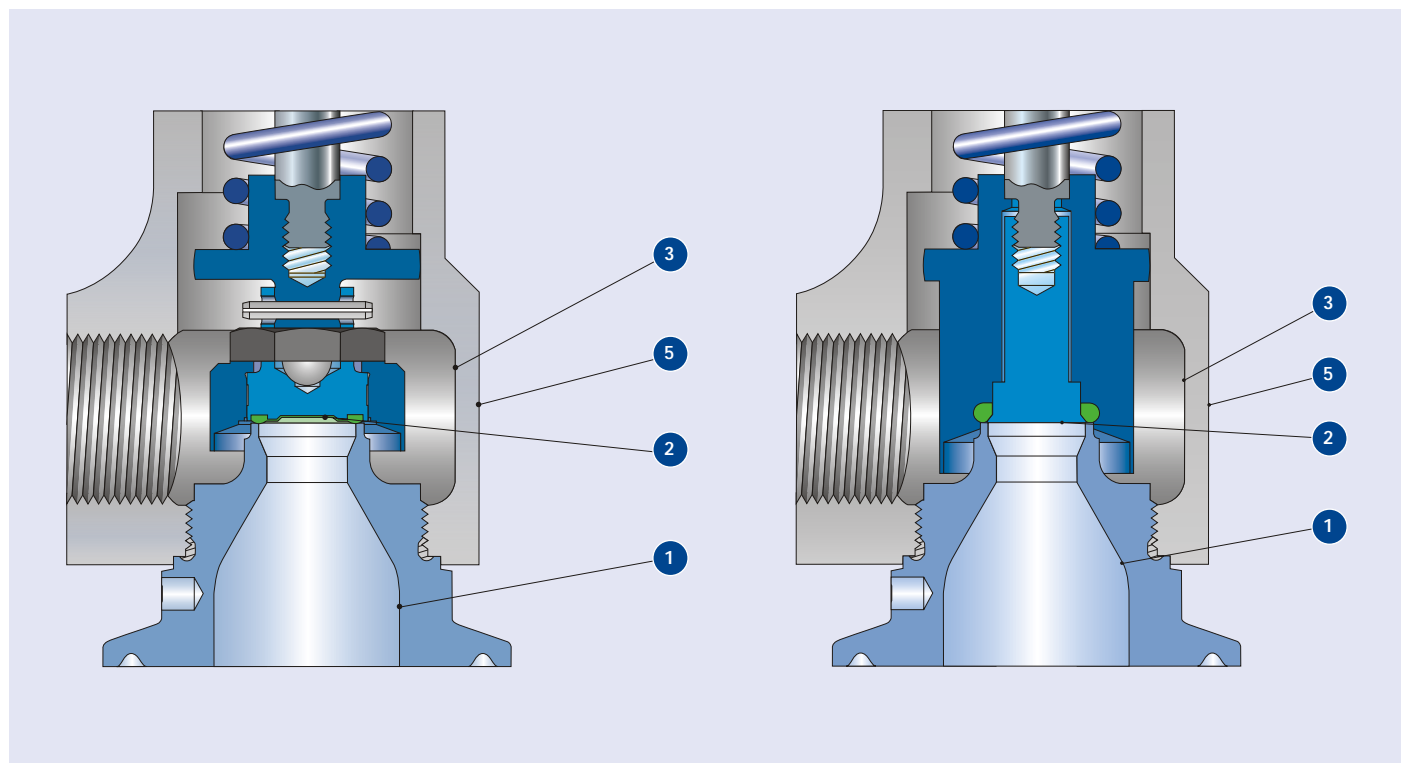
**Selection chart lifting device H8, size 0. d<sub>0</sub> 10 mm / 0,394 inch**



## Surface quality

Surface quality			LESER Surface package			
Type of surface	Area		Option code	Clean finish	HyClean finish	Sterile finish
	Description	No.		B50	B51	B52
				R <sub>a</sub> max.	R <sub>a</sub> max.	R <sub>a</sub> max.
			LESER Surface grade			
Product contact surface	Inlet	1		M4	ME4	ME2
			[µm]	0,750	0,750	0,500
			[µinch]	30	30	20
	Bottom side of disc			Elastomer surface		
	Soft seal design: Vulcanized	2		M4	ME4	ME2
Soft seal design: O-ring	3	[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
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

## Order information – Spare parts

### Spare parts

		Actual Orifice diameter $d_0$ [mm]	10
		Actual Orifice area $A_0$ [mm <sup>2</sup> ]	78,5
		Actual Orifice diameter $d_0$ [inch]	0,394
		Actual Orifice area $A_0$ [inch <sup>2</sup> ]	0,122
<b>Inlet body (Item 1)</b>			<b>Material-No. / Art.-No.</b>
<b>Inlet body</b>	CO	Connection size	$\frac{3}{4}$ "
		1.4404	–
	SO	Connection size	DN 15
		1.4404	136.4649.9271
			1" / 136.4649.9265 / DN 25 / 136.4649.9263
<b>Disc with vulcanized soft seal (Item 7)</b>			<b>Material-No. / Art.-No.</b>
<b>Disc</b>	1.4404	EPDM "D"  	200.9049.9041
		CR "K"	200.9049.9051
		FKM "L" 	200.9049.9071
		NBR "N"	200.9049.9081
		FFKM "C"  	200.9049.9091
<b>Disc – soft seal with O-ring (Item 7)</b>			<b>Material-No. / Art.-No.</b>
<b>Disc</b>	1.4404	EPDM "D"  	200.8349.9741
		CR "K"	200.8349.9751
		FKM "L" 	200.8349.9771
		NBR "N"	200.8349.9781
		FFKM "C"  	200.8349.9721
<b>O-ring – soft seal (Item 7.4)</b>			<b>Material-No. / Art.-No.</b>
<b>O-ring</b>		EPDM "D"  	502.0107.2641
		CR "K"	502.0107.2651
		FKM "L" 	502.0107.2671
		NBR "N"	502.0107.2681
		FFKM "C"  	502.0107.2621

## Approvals

Approvals			
Actual Orifice diameter $d_0$ [mm]		10	
Actual Orifice area $A_0$ [mm <sup>2</sup> ]		78,5	
Actual Orifice diameter $d_0$ [inch]		0,394	
Actual Orifice area $A_0$ [inch <sup>2</sup> ]		0,122	
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 ( $\leq$ 16 bar)	0,4 (> 16 bar)
	L	0,37 ( $\leq$ 16 bar)	0,33 (> 16 bar)
Germany		Coefficient of discharge $\alpha_w$	
AD 2000-Merkblatt A2	Approval No.	TÜV SV 980	
	S/G	0,45 ( $\leq$ 16 bar)	0,4 (> 16 bar)
	L	0,37 ( $\leq$ 16 bar)	0,33 (> 16 bar)
United States		Coefficient of discharge K	
ASME Sec. VIII	Approval No.	M 37190	
	S/G	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) S: 2,55 lb / hr / psia $\Delta$ K $\approx$ 0,406 G: 0,904 SCFM / psia 8 $\Delta$ K $\approx$ 0,406	
	Approval No.	M 37202	
	L	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) L: 1,49 GPM $\sqrt{\text{psid}^*}$ $\Delta$ K $\approx$ 0,322	
Canada		Coefficient of discharge K	
CRN	Approval No.	OG0772.9C	
	S/G	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) S: 2,55 lb / hr / psia $\Delta$ K $\approx$ 0,406 G: 0,904 SCFM / psia $\Delta$ K $\approx$ 0,406	
	L	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) L: 1,49 GPM $\sqrt{\text{psid}^*}$ $\Delta$ K $\approx$ 0,322	
China		Coefficient of discharge $\alpha_w$	
AQSIQ	Approval No.	02301T	
	S/G	0,45 ( $\leq$ 16 bar)	0,4 (> 16 bar)
	L	0,37 ( $\leq$ 16 bar)	0,33 (> 16 bar)
Russia		Coefficient of discharge $\alpha_w$	
GGTN/ GOSGORTECHNADZOR	Approval No.	PPC 00-18458	
GOST R	Approval No.	1989-06	
	S/G	0,45 ( $\leq$ 16 bar)	0,4 (> 16 bar)
	L	0,37 ( $\leq$ 16 bar)	0,33 (> 16 bar)
Belarus		Coefficient of discharge $\alpha_w$	
PROMATOMNADZOR	Approval No.	15-171-2006	
	S/G	0,45 ( $\leq$ 16 bar)	0,4 (> 16 bar)
	L	0,37 ( $\leq$ 16 bar)	0,33 (> 16 bar)
Classification societies			
on request			

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

## Capacities – Metric Units

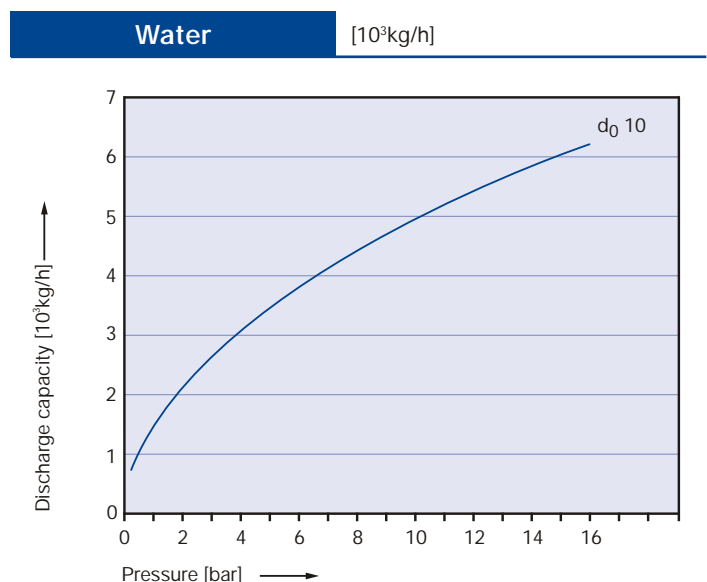
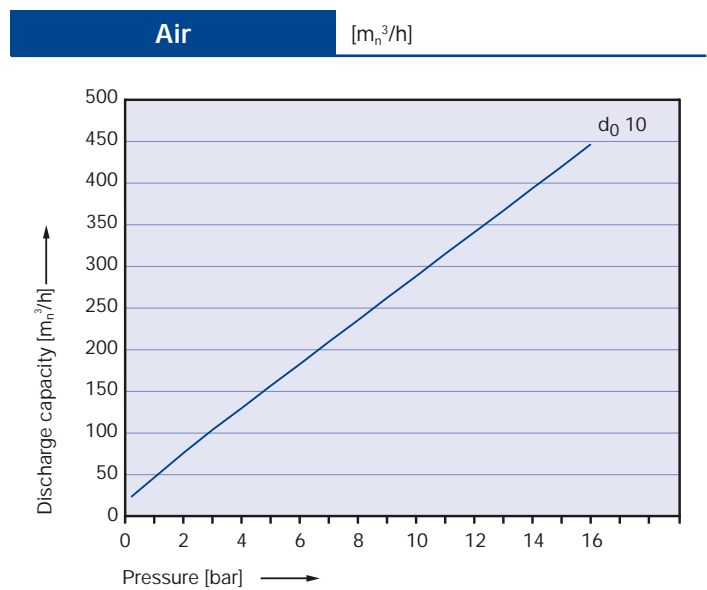
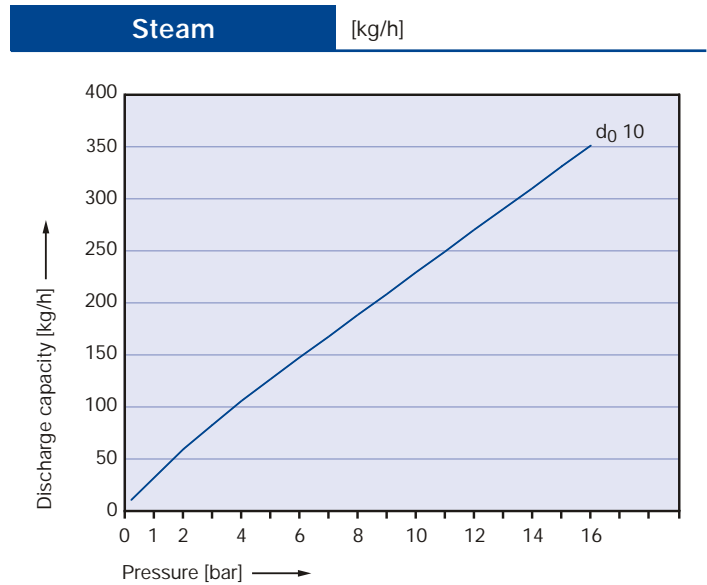
Capacities according to AD 2000-Merkblatt A2, based on set pressure plus 10% overpressure.

Capacities at 1 bar (14,5 psig) and below are based on 0,1 bar (1,45 psig) overpressure. For pressure range refer to "Pressure temperature ratings" on page 01/07.

Type 481

Metric Units		AD 2000-Merkblatt A2	
Actual Orifice diameter $d_0$ [mm]		10	
Actual Orifice area $A_0$ [mm <sup>2</sup> ]		78,5	
LEO <sup>*)</sup> [inch <sup>2</sup> ]		S/G = 0,051 L = 0,06	
Set pressure		Capacities	
	Steam saturated	Air 0° C and 1013 mbar	Water 20° C
[bar]	[kg/h]	[m <sub>n</sub> <sup>3</sup> /h]	[10 <sup>3</sup> kg/h]
Vulcanized soft seal			
1	41	49	1,55
2	63	76	2,19
3	85	104	2,69
4	106 <small>max. temp. for EPDM soft seal</small>	130	3,1
5	127	157	3,47
6	148	183	3,8
7	168	210	4,1
8	189	236	4,38
9	209	263	4,65
10	230	289	4,9
12	271	342	5,37
14	311	395	5,8
16	352	448	6,2
O-ring soft seal			
18		445	5,87
20		492	6,18
22		539	6,49
24		586	6,77
26		633	7,05
28		681	7,32
30		728	7,75
32		775	7,82
34		822	8,06
36		869	8,3
38		916	8,52
40		963	8,74
50		1198	9,78
60		1434	10,7

<sup>\*)</sup> LEO<sub>S/G/L</sub> = LESER Effective Orifice steam/gas/liquids please refer to page 00/17.  
How to use capacity-sheets refer to page 00/15.



## Capacities – US Units

Capacities according to ASME Section VII, based on set pressure plus 10% overpressure.

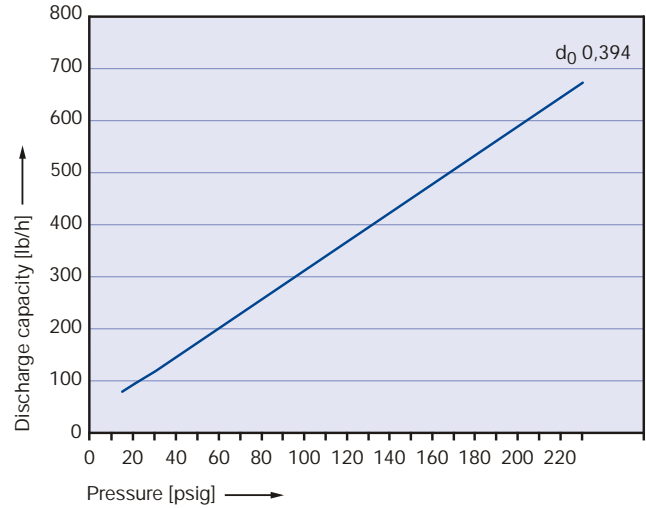
Capacities at 30 psig (2,07 bar) and below are based on 3 psig (0,207 bar) overpressure. For pressure range refer to "Pressure temperature ratings" on page 01/07.

US Units		ASME Section VIII	
Actual Orifice diameter $d_0$ [inch]		0,394	
Actual Orifice area $A_0$ [inch <sup>2</sup> ]		0,122	
LEO <sup>1)</sup> [inch <sup>2</sup> ]		S/G = 0,051 L = 0,06	
Set pressure		Capacities	
	Steam saturated	Air 60° F and 14,5 psig	Water 70° F
[psig]	[lb/h]	[SCFM]	[GPM]
Vulcanized soft seal			
15 <sup>2)</sup>	83	30	6,32
20	96	34	7,15
30	121	43	8,56
40	149	53	9,89
50	177	63	11,1
60	205	73	12,1
70	233	83	13,1
80	261	93	14
90	289	103	14,8
100	317	113	15,6
120	373	133	17,1
140	429	153	18,5
160	485	173	19,8
180	541	193	21
200	597	213	22,1
220	653	233	23,2
O-ring soft seal			
240		253	24,2
260		273	25,2
280		293	26,2
300		313	27,1
320		333	28
340		353	28,8
360		373	29,7
380		393	30,5
400		413	31,3
500		513	35
600		613	38,3
700		713	41,4
800		813	44,2
900		913	46,9

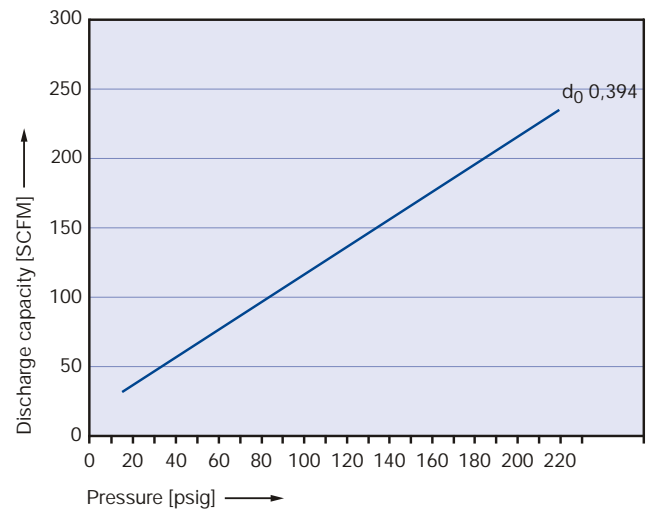
<sup>1)</sup> LEO<sub>S/G/L</sub> = LESER Effective Orifice steam/gas/liquids please refer to page 00/17. How to use capacity-sheets refer to page 00/15.

<sup>2)</sup> For steam and air/gas startin g from 20 psig the safety valve is certified acc. to ASME Code Sec. VIII, Div. 1.

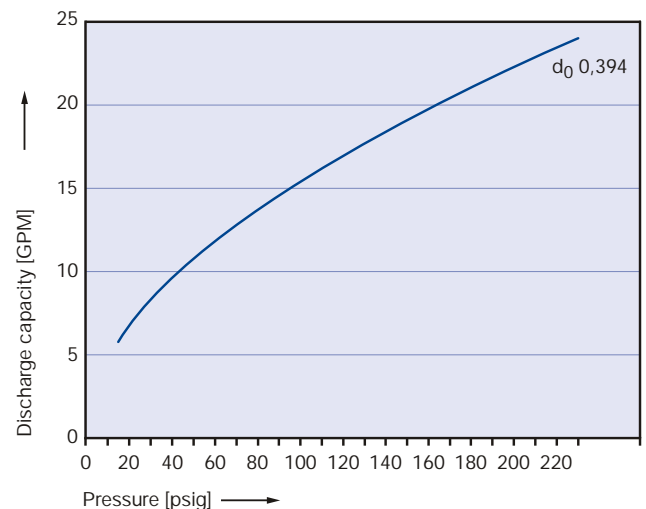
### Steam [lb/h]



### Air [SCFM]



### Water [GPM]



## Determination of coefficient of discharge in case of lift restriction or back pressure

- h = Lift [mm]
- d<sub>0</sub> = Flow diameter [mm] of selected safety valve, refer to table article numbers
- h/d<sub>0</sub> = Ratio of lift / flow diameter
- p<sub>a0</sub> = Back pressure [bar<sub>a</sub>]
- p<sub>0</sub> = Set pressure [bar<sub>a</sub>]
- p<sub>a0</sub>/p<sub>0</sub> = Ratio of back pressure / set pressure
- K<sub>dr</sub> = Coefficient of discharge acc. to DIN EN ISO 4126-1
- α<sub>w</sub> = Coefficient of discharge acc. to AD 2000-Merkblatt A2
- K<sub>b</sub> = Back pressure correction factor acc. to API 520 topic 3.3

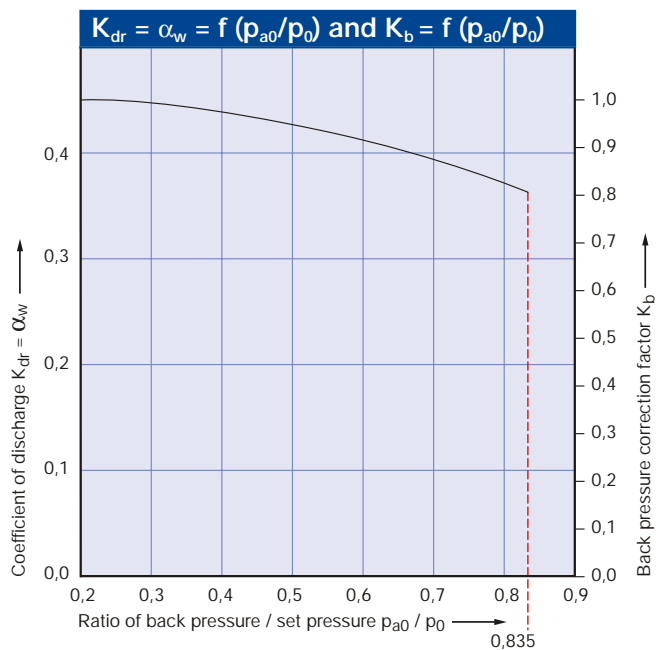
Diagram for evaluation of ratio of lift / flow diameter (h/d<sub>0</sub>) in reference to the coefficient of discharge (K<sub>dr</sub> = α<sub>w</sub>)

$$K_{dr} = \alpha_w = f(h/d_0)$$

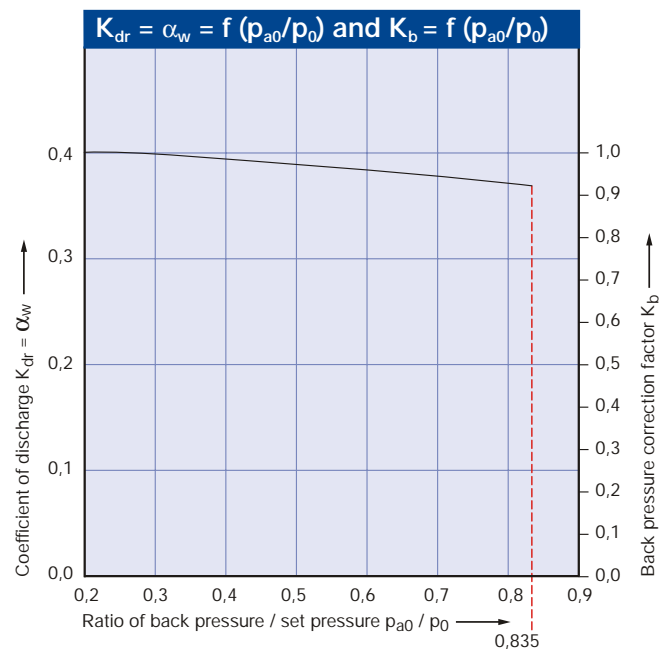
A lift restriction is not applicable because the actual design and the certified lift are ≤ 1,5 mm / 1/16 inch.

Diagram for evaluation of ratio of the coefficient of discharge (K<sub>dr</sub> = α<sub>w</sub>) in reference to the ratio of back pressure / set pressure (p<sub>a0</sub>/p<sub>0</sub>)

0,1 bar – 16 bar



16 bar – 68 bar



How to use please refer to page 00/18





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

# Type 483

## Safety Relief Valves - spring loaded

Type 483

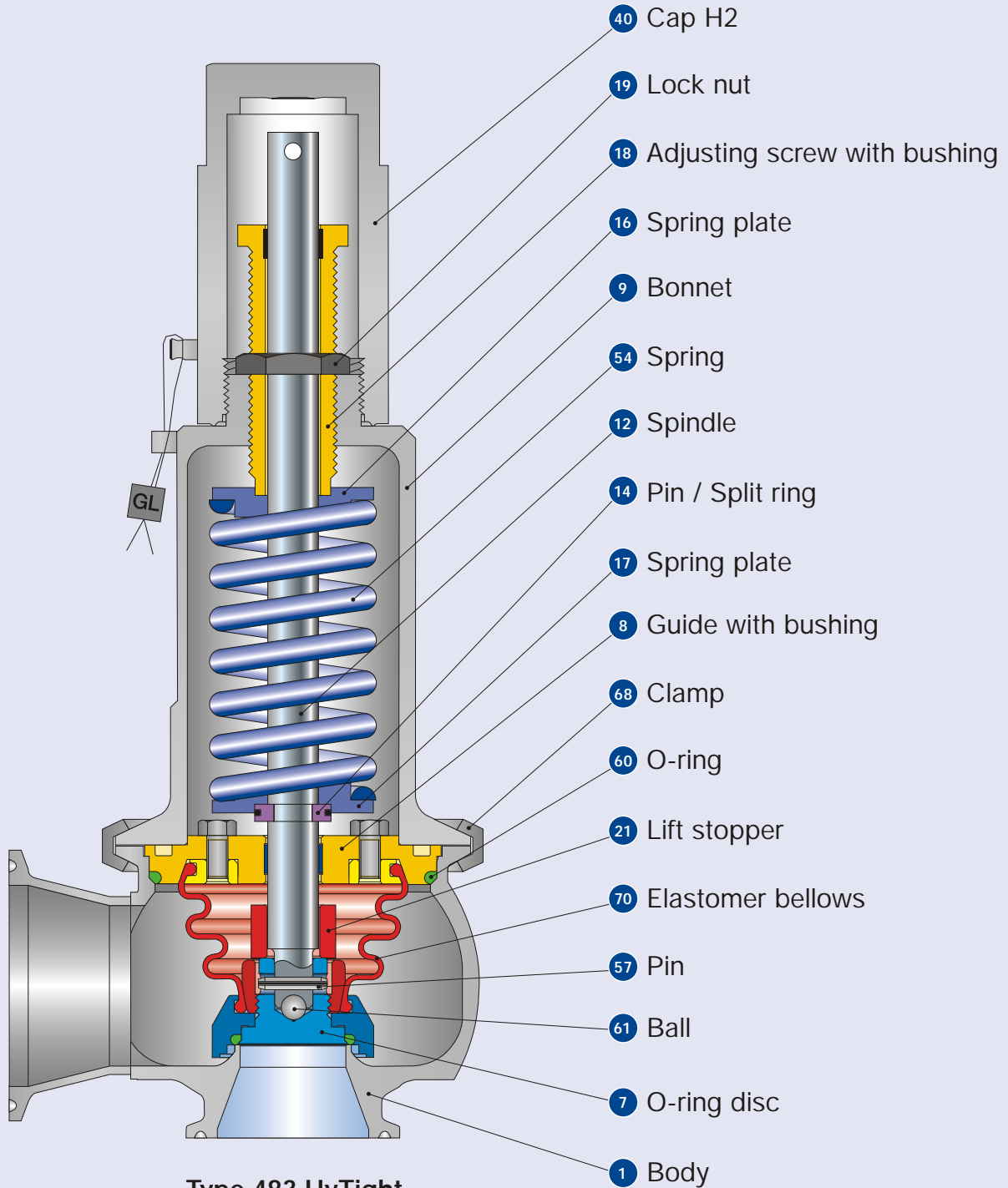


Type 483  
Packed knob H4  
Inlet and outlet:  
Flange connection

Contents	Chapter/Page
<b>Materials</b>	
• HyTight Assembly	02/02
<b>How to order</b>	
• Numbering system	02/04
• Article numbers	02/06
<b>Pressure temperature ratings</b>	
• Metric Units + US Units	02/07
<b>Dimensions – Bestseller</b>	
• Metric Units + US Units	02/08
<b>Dimensions and weights</b>	
• Metric Units + US Units	02/09
Option codes for available connections	02/10
Available options	02/11
Selection chart H8	02/12
Surface quality	02/13
Order information – Spare parts	02/14
Approvals	02/15
<b>Capacities</b>	
• Steam, Air, Water [Metric Units]	02/16
• Steam, Air, Water [US Units]	02/17
Determination of coefficient of discharge $K_{dr}/\alpha_w$	02/18









## HyTight Assembly

Type 483



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

## HyTight Assembly

Materials			
Item	Component	Remarks	Type 4834 HyTight
1	Body		1.4435 (BN 2) <sup>*)</sup>
			SA 479 316L
7	O-ring disc	HyTight Assembly	1.4435 316L
7.1	Soft seal O-ring	"D"  	EPDM
		"K"	CR
		"L" 	FKM
		"N"	NBR
		"C"  	FFKM
8	Guide with bushing	PTFE + 15 % glass	1.4435
			316L
9	Bonnet		1.4404
			316L
12	Spindle		1.4404
			316L
14	Pin / Split ring		1.4310 / 1.4404
			Stainless steel / 316L
16 / 17	Spring plate		1.4404
			316L
18	Adjusting screw with bushing	PTFE + 15 % glass	1.4404 / PTFE
			316L / PTFE
19	Lock nut		1.4404
			316L
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	 	EPDM
61	Ball		1.4401
			316
68	Clamp		1.4401
			316
70	Elastomer bellows		EPDM

<sup>\*)</sup> The material 1.4435/SA 479 316L fulfils the requirements of the Swiss chemical and pharmaceutical industry Basler Norm (BN 2). For details please refer to LWN 290.90.

**Please notice:**

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

## How to order – Numbering system

Type 483

# 1

### Article Number

1	2	3	4
483	4	771	8

- 1** Type 483
- Small to medium capacity
  - High aseptic requirements

**2** Material code

Code	Body material
4	1.4435 (316L)

- 3** Valve code
- Identifies valve size and body material, refer to page 02/07.

Code	d <sub>0</sub>
770	13
771	25

**4** Code for lifting device

Code	Lifting device	
2	Screwed cap	H2
4	Packed knob	H4
8	Pneumatic lifting device	H8

4834.7718

Article Number

# 2

### Set Pressure

Please state unit (in gauge)!

Please do not exceed the pressure range defined in the spring charts.

For pressure range, refer to page 02/07

4 bar

Set Pressure

# 3

### Connections

Please refer to table "Available connections" on page 00/07 and 02/10.

Please state one option code for each inlet and outlet.

L96I79

L97A80

Connections

## 4

### Options

#### Type 483 Option code

- O-ring-disc
 

Standard: EPDM "D"	<b>J22</b>
Option: CR "K"	<b>J21</b>
FKM "L"	<b>J23</b>
NBR "N"	<b>J30</b>
FFKM "C"	<b>J20</b>
- Adaptor for lift indicator  
Bonnet **J38**
- Lift indicator **J93**
- Pneumatic lifting device H8  
Double piston design **J41**
- Bellows FFKM "C" **S70**
- LESER Surface package
 

HyClean finish	<b>B54</b>
Sterile finish	<b>B55</b>

For detailed information refer to page 02/13

Option code applies only if not standard

**J38**
**J93**
**Options**

## 5

### Documentation

Please select requested documentation:

#### Inspections, tests: Option code

DIN EN 10204-3.2: TÜV-Nord  
Certificate for test pressure **M33**

#### LESER CGA (Certificate for Global Application) H03

- Inspection certificate 3.1 acc. to DIN EN 10204
- Declaration of conformity acc. to PED 97/23/EC

#### Material test certificate:

DIN EN 10204-3.1

#### Part Option code

Body	<b>H01</b>
Bonnet	<b>L30</b>
Cap / lever cover	<b>L31</b>
Disc	<b>L23</b>
Certificate of surface quality	<b>N04</b>

**H01**
**L30**
**Documentation**

## 6

### Code and Medium

1	2
2	0

#### 1 Code

1. ASME Section VIII
2. CE / VdTUEV
3. ASME Section VIII + CE / VdTUEV

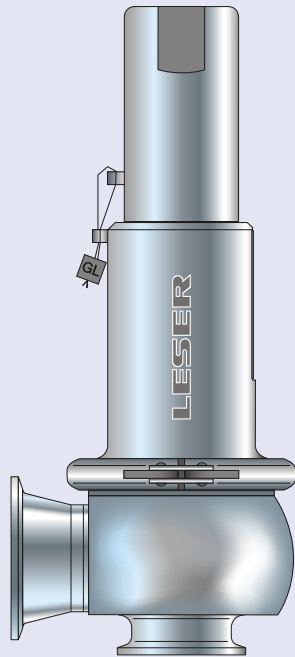
#### 2 Medium

- .1 Gases
- .2 Liquids
- .3 Steam
- .0 Steam / Gases / Liquids (valid only for CE / VdTUEV)

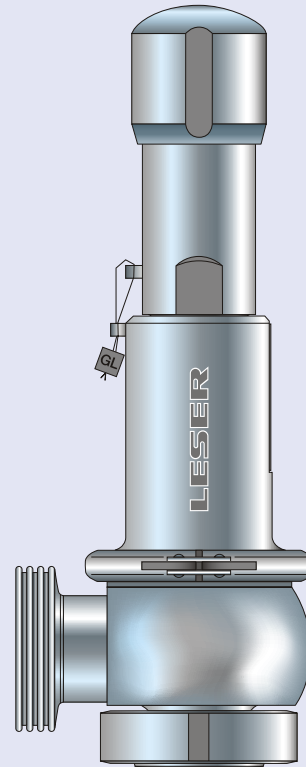
**2.0**
**Code and Medium**

## How to order – Article numbers

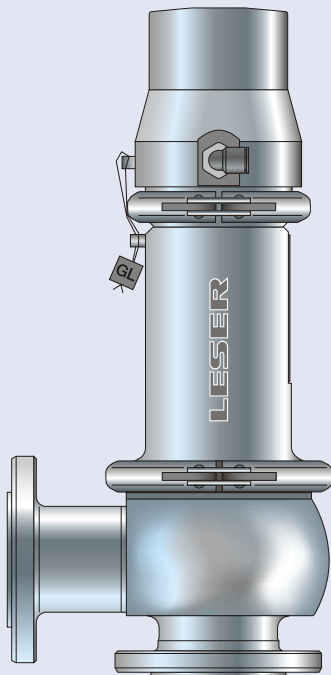
Type 483



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

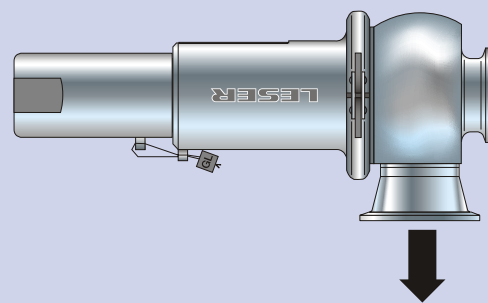


**Type 483**  
Packed knob H4  
Inlet: Aseptic clamp and nut  
Outlet: Aseptic thread



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

Certified for horizontal fitting.



**Attention!** Only with outlet  
in downward direction.

## How to order – Article numbers

Article numbers				
Actual Orifice diameter $d_0$ [mm]			13	25
Actual Orifice area $A_0$ [mm <sup>2</sup> ]			133	491
Actual Orifice diameter $d_0$ [inch]			0,512	0,984
Actual Orifice area $A_0$ [inch <sup>2</sup> ]			0,206	0,761
O-ring 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
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

## Pressure temperature ratings

Metric Units					
Actual Orifice diameter $d_0$ [mm]			13	25	
Actual Orifice area $A_0$ [mm <sup>2</sup> ]			133	491	
Body material: 1.4435 (316L)					
Inlet body	Pressure rating	For pressure ratings and connection size please refer to chapter dimensions and weights (page 02/09)			
Outlet body	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 <sup>1)</sup>		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					
Actual Orifice diameter $d_0$ [inch]			0,512	0,984	
Actual Orifice area $A_0$ [inch <sup>2</sup> ]			0,206	0,761	
Body material: 1.4435 (316L)					
Inlet body	Pressure rating	For pressure ratings and connection size please refer to chapter dimensions and weights (page 02/09)			
Outlet body	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 <sup>1)</sup>		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

<sup>1)</sup> The temperature is limited by the soft seal material. Refer to table "Soft seal selection" on page 99/11.

## Dimensions – Bestseller

For shortest delivery time please select bestsellers. The specified bestsellers can vary depending on different market requirements.

For further available connections please refer to page 02/10.

### Metric Units

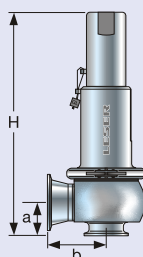
Actual Orifice diameter $d_0$ [mm]		13	
Actual Orifice area $A_0$ [mm <sup>2</sup> ]		133	
<b>Clamp connections</b>		<b>Inlet a</b>	<b>Outlet b</b>
<b>COCO</b>		1"	1 1/2"
Option code		L96I79L97A80	
<b>Center to face</b>	[mm]	29	52
<b>Clamp diameter</b>	$d_{inner}$ [mm]	23	36
	$d_{outer}$ [mm]	51	51
<b>Height – H4</b>	H max. [mm]	206	
<b>SOSO</b>		25	25
Option code		L79I16L86A16	
<b>Center to face</b>	[mm]	29	52
<b>Clamp diameter</b>	$d_{inner}$ [mm]	26	26
	$d_{outer}$ [mm]	51	51
<b>Height – H4</b>	H max. [mm]	206	
<b>Threaded connections</b>		<b>Inlet a</b>	<b>Outlet b</b>
<b>KOGO</b>		25	25
Option code		H85L76I16A85L81A16	
<b>Center to face</b>	[mm]	40	70
<b>Height – H4</b>	H max. [mm]	217	
<b>Flanged connections</b>		<b>Inlet a</b>	<b>Outlet b</b>
<b>ANAN</b>		25	25
Option code		H85L92I16L93A85A16	
<b>Center to face</b>	[mm]	45	76
<b>Height – H4</b>	H max. [mm]	222	

### US Units

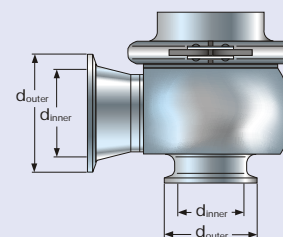
Actual Orifice diameter $d_0$ [inch]		0,512	
Actual Orifice area $A_0$ [inch <sup>2</sup> ]		0,206	
<b>Clamp connections</b>		<b>Inlet a</b>	<b>Outlet b</b>
<b>COCO</b>		1"	1 1/2"
Option code		L96I79L97A80	
<b>Center to face</b>	[inch]	1 5/32	2 1/16
<b>Clamp diameter</b>	$d_{inner}$ [inch]	29/32	1 13/32
	$d_{outer}$ [inch]	2	2
<b>Height – H4</b>	H max. [inch]	8 3/32	
<b>SOSO</b>		1"	1"
Option code		L79I16L86A16	
<b>Center to face</b>	[inch]	1 1/8	2 1/16
<b>Clamp diameter</b>	$d_{inner}$ [inch]	1 1/32	1 1/32
	$d_{outer}$ [inch]	2	2
<b>Height – H4</b>	H max. [inch]	8 1/8	
<b>Threaded connections</b>		<b>Inlet a</b>	<b>Outlet b</b>
<b>KOGO</b>		25	25
Option code		H85L76I16A85L81A16	
<b>Center to face</b>	[inch]	1 9/16	2 3/4
<b>Height – H4</b>	H max. [inch]	8 17/32	
<b>Flanged connections</b>		<b>Inlet a</b>	<b>Outlet b</b>
<b>ANAN</b>		25	25
Option code		H85L92I16L93A85A16	
<b>Center to face</b>	[inch]	1 3/4	3
<b>Height – H4</b>	H max. [inch]	8 3/4	

25	
491	
<b>Inlet a</b>	<b>Outlet b</b>
1 1/2"	2"
L96I80L97A81	
44	60
36	49
51	64
303	
40	40
L79I17L86A17	
44	60
38	38
51	51
303	
<b>Inlet a</b>	<b>Outlet b</b>
40	40
H85L76I17A85L81A17	
48	78
304	
<b>Inlet a</b>	<b>Outlet b</b>
40	40
H85L92I17L93A85A17	
51	82
310	

0,984	
0,761	
<b>Inlet a</b>	<b>Outlet b</b>
1 1/2"	2"
L96I80L97A81	
1 23/32	2 3/8
1 13/32	1 15/16
2	2 17/16
11 15/16	
1 1/2"	1 1/2"
L79I17L86A17	
1 23/32	2 3/8
1 1/2	1 1/2
2	2
11 5/16	
<b>Inlet a</b>	<b>Outlet b</b>
40	40
H85L76I17A85L81A17	
1 7/8	3 1/16
11 31/32	
<b>Inlet a</b>	<b>Outlet b</b>
40	40
H85L92I17L93A85A17	
2	3 1/4
12 3/16	



Type 483 – Cap H2



Type 483 – Clamp diameters



## Dimensions and weights

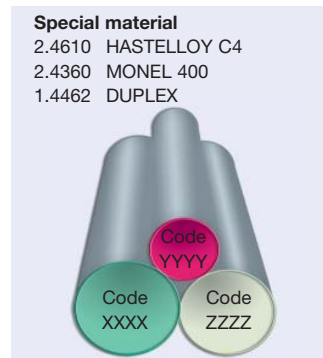
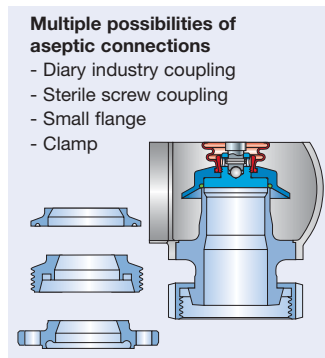
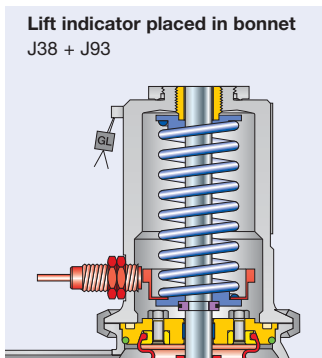
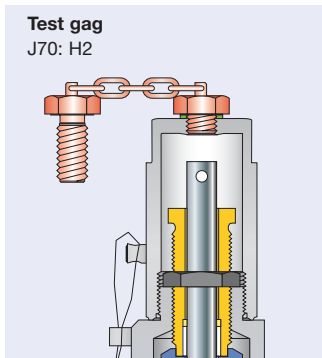
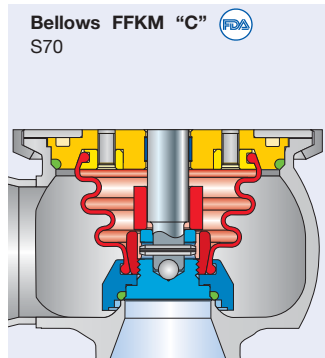
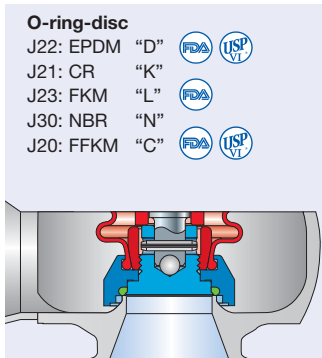
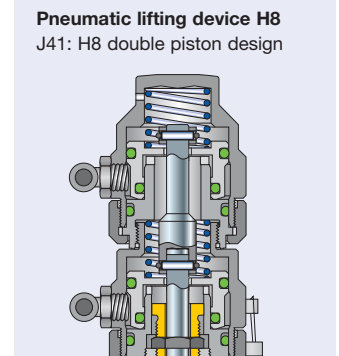
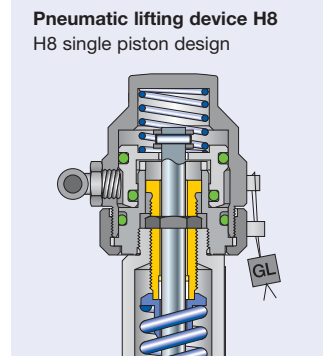
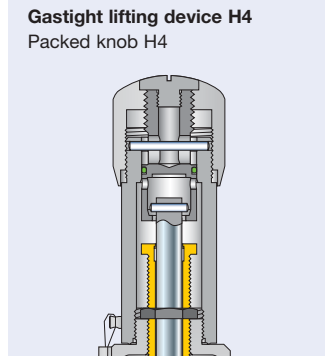
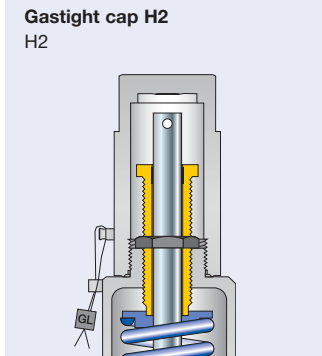
Metric Units			
Actual Orifice diameter $d_0$ [mm]		13	25
Actual Orifice area $A_0$ [mm <sup>2</sup> ]		133	491
Welded connections		Inlet a	
	PN	16	16
Center to face	[mm]	-	-
Height – H4	H max. [mm]	-	-
Height – H8	H max. [mm]	-	-
double piston design			
Clamp connections		Inlet a	
	PN	16	16
Center to face	[mm]	29	44
Clamp diameter	$d_{inner}$ [mm]	For varying clamp diameters please refer to page 00/11	
	$d_{outer}$ [mm]		
Height – H4	H max. [mm]	206	303
Height – H8	H max. [mm]	234	311
double piston design			
Threaded connections		Inlet a	
	PN	16	16
Center to face	[mm]	40	48
Height – H4	H max. [mm]	217	304
Height – H8	H max. [mm]	245	312
double piston design			
Flanged connections		Inlet a	
	PN	16	16
Center to face	[mm]	45	51
Height – H4	H max. [mm]	222	310
Height – H8	H max. [mm]	250	318
double piston design			
Weight			
Weight	max. [kg]	1,6	3,7
US Units			
Actual Orifice diameter $d_0$ [inch]		0,512	0,984
Actual Orifice area $A_0$ [inch <sup>2</sup> ]		0,206	0,761
Welded connections		Inlet a	
	PN	16	16
Center to face	[inch]	-	-
Height – H4	H max. [inch]	-	-
Height – H8	H max. [inch]	-	-
double piston design			
Clamp connections		Inlet a	
	PN	16	16
Center to face	[inch]	1 <sup>5</sup> / <sub>32</sub>	1 <sup>23</sup> / <sub>32</sub>
Clamp diameter	$d_{inner}$ [inch]	For varying clamp diameters please refer to page 00/11	
	$d_{outer}$ [inch]		
Height – H4	H max. [inch]	1 <sup>5</sup> / <sub>32</sub>	1 <sup>23</sup> / <sub>32</sub>
Height – H8	H max. [inch]	8 <sup>1</sup> / <sub>8</sub>	11 <sup>15</sup> / <sub>16</sub>
double piston design			
Threaded connections		Inlet a	
	PN	16	16
Center to face	[inch]	1 <sup>9</sup> / <sub>16</sub>	1 <sup>7</sup> / <sub>8</sub>
Height – H4	H max. [inch]	8 <sup>17</sup> / <sub>32</sub>	11 <sup>31</sup> / <sub>32</sub>
Height – H8	H max. [inch]	9 <sup>27</sup> / <sub>32</sub>	12 <sup>17</sup> / <sub>32</sub>
double piston design			
Flanged connections		Inlet a	
	PN	16	16
Center to face	[inch]	1 <sup>25</sup> / <sub>32</sub>	2
Height – H4	H max. [inch]	8 <sup>3</sup> / <sub>4</sub>	12 <sup>7</sup> / <sub>32</sub>
Height – H8	H max. [inch]	9 <sup>27</sup> / <sub>32</sub>	12 <sup>17</sup> / <sub>32</sub>
double piston design			
Weight			
Weight	max. [lb]	3,527	8,157
		13	25
		133	491
		Outlet b	
		16	16
		81,5	91,5
		-	-
		-	-
		Outlet b	
		16	16
		52	60
		For varying clamp diameters please refer to page 00/11	
		-	-
		-	-
		Outlet b	
		16	16
		70	78
		-	-
		-	-
		Outlet b	
		16	16
		76	82
		-	-
		-	-
		0,512	0,984
		0,206	0,761
		Outlet b	
		16	16
		3 <sup>7</sup> / <sub>32</sub>	3 <sup>19</sup> / <sub>32</sub>
		-	-
		-	-
		Outlet b	
		16	16
		2 <sup>1</sup> / <sub>16</sub>	2 <sup>3</sup> / <sub>8</sub>
		For varying clamp diameters please refer to page 00/11	
		-	-
		-	-
		Outlet b	
		16	16
		2 <sup>3</sup> / <sub>4</sub>	3 <sup>1</sup> / <sub>16</sub>
		-	-
		-	-
		Outlet b	
		16	16
		3	3 <sup>7</sup> / <sub>32</sub>
		-	-
		-	-

## Option codes for available connections

For detailed information about the available connections please refer to "How to use" on page 00/07

Connections					
		d <sub>0</sub> [mm]		13	25
		d <sub>0</sub> [inch]		0,512	0,984
Clamps		Option code inlet			
		DN	25	40	
For dimensions refer to page 00/07	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
Clamp connections suitable for NA-Connect available					
Threaded connections		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
Flange connections		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	H85H78I16		H85H78I17	
	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
		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
Pipe standard		DN	25	40	
		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"	
		GS	A84H35A80		A84H35A81
		BS	A84H37A80		A84H37A81
		GT	A84H55A80		A84H55A81
		BT	A84H57A80		A84H57A81
		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
		VC	-		
		VE	-		
Pipe standard		DN	25	40	
		NF	A86H72A16		A86H72A17
		BF	A86H74A16		A86H74A17
		NG	A86H76A16		A86H76A17
		BG	A86H78A16		A86H78A17
Pipe standard		NPS	1 1/2"	2"	
		NF	A84H72A80		A84H72A81
		BF	A84H74A80		A84H74A81
		NG	A84H76A80		A84H76A81
		BG	A84H78A80		A84H78A81

## Available options



Type 483

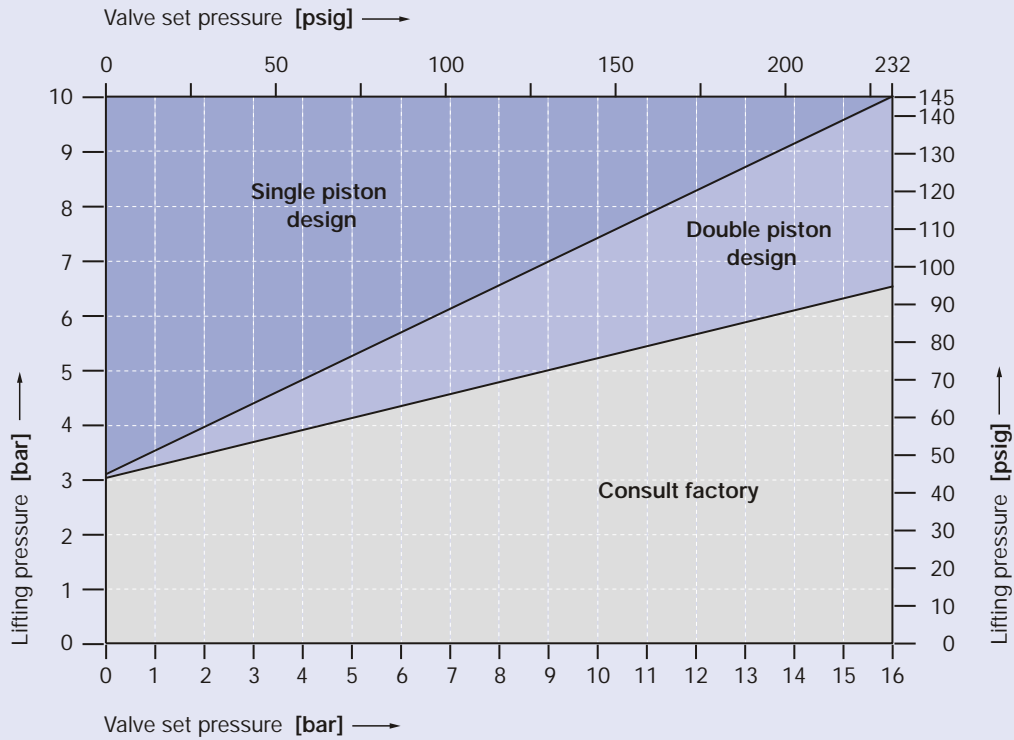
## Selection chart H8

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

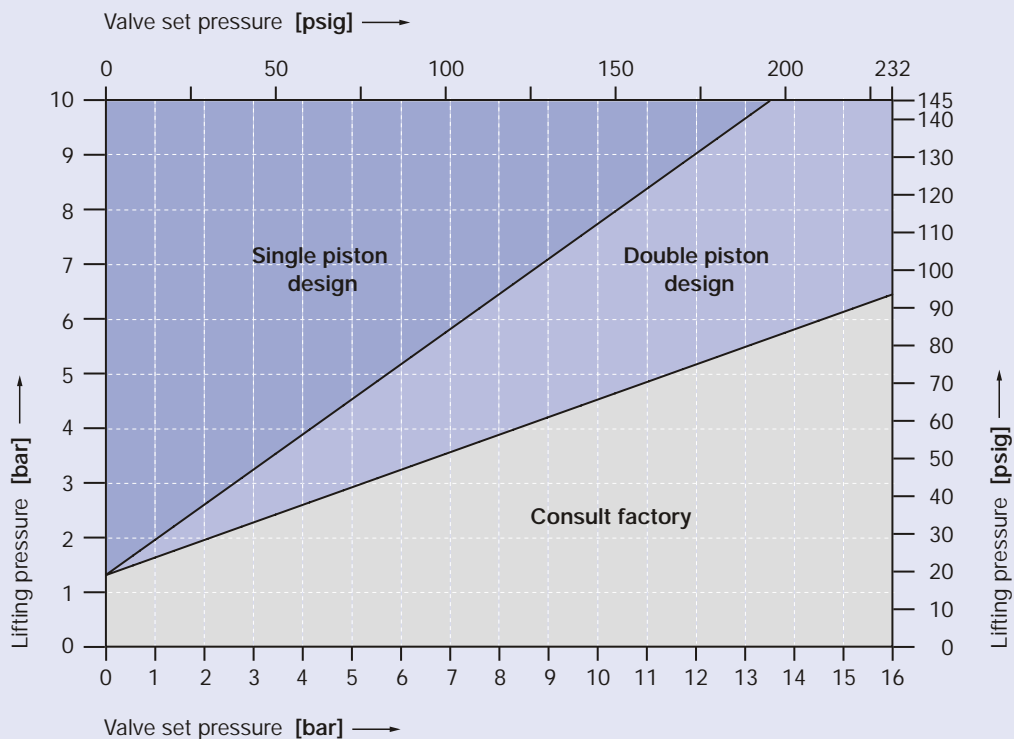
For information about this chart please refer to "How to use" on page 00/12.

Type 483

**Selection chart lifting device H8, size 0.  $d_0$  13 mm / 0,512 inch**



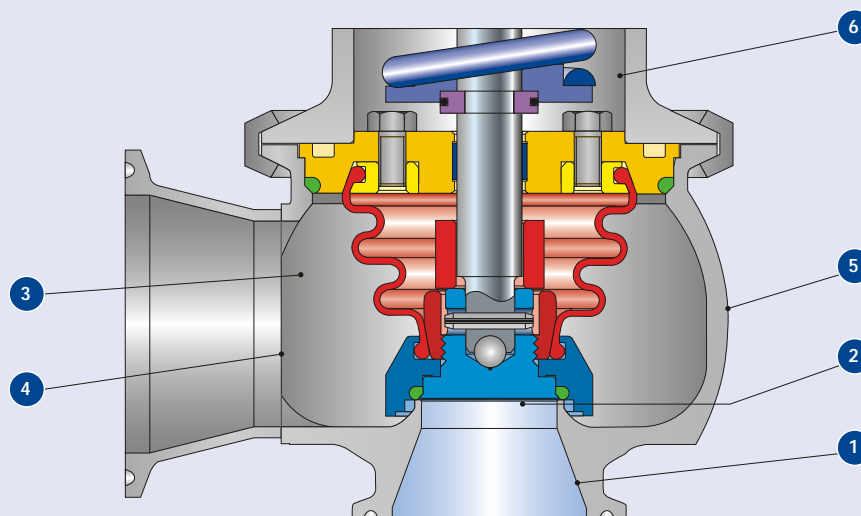
**Selection chart lifting device H8, size I.  $d_0$  25 mm / 0,984 inch**



## Surface quality



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

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



## Order information – Spare parts

### Spare parts

Actual Orifice diameter $d_0$ [mm]	13	25
Actual Orifice area $A_0$ [mm <sup>2</sup> ]	133	491
Actual Orifice diameter $d_0$ [inch]	0,512	0,984
Actual Orifice area $A_0$ [inch <sup>2</sup> ]	0,206	0,761
<b>Disc (Item 7): Soft seal</b>		
		<b>Material-No. / Art.-No.</b>
<b>Disc 1.4435</b>	EPDM "D" 	200.8169.9741
	CR "K"	200.8169.9751
	FKM "L" 	200.8169.9771
	NBR "N"	200.8169.9781
	FFKM "C" 	200.8169.9791
Assembly tool for Aseptic O-ring disc	tool not required for this valve size	445.0139.0000
<b>O-ring (Item 7.4): Soft seal</b>		
		<b>Material-No. / Art.-No.</b>
<b>O-ring</b>	EPDM "D" 	502.0123.2641
	CR "K"	502.0123.2651
	FKM "L" 	502.0123.2671
	NBR "N"	502.0123.2681
	FFKM "C" 	502.0123.2691
<b>Pin / Split ring (Item 14)</b>		
		<b>Material-No. / Art.-No.</b>
<b>Pin / Split ring</b>	Spindle $\varnothing$ [mm]	8
	1.4310 / 1.4404	480.0405.0000
<b>Pin (Item 57)</b>		
		<b>Material-No. / Art.-No.</b>
<b>Pin</b>	$\varnothing$ [mm]	3
	1.4310	480.0405.0000
<b>O-ring body / guide (Item 60)</b>		
		<b>Material-No. / Art.-No.</b>
<b>O-ring</b>	EPDM "D" 	502.0460.3041
<b>Ball (Item 61)</b>		
		<b>Material-No. / Art.-No.</b>
<b>Ball</b>	$\varnothing$ [mm]	6
	1.4401	510.0104.0000
<b>Bellows (Item 70)</b>		
		<b>Material-No. / Art.-No.</b>
<b>Bellows</b>	EPDM "D" 	224.2349.9000
	FFKM "C" 	on request

## Approvals

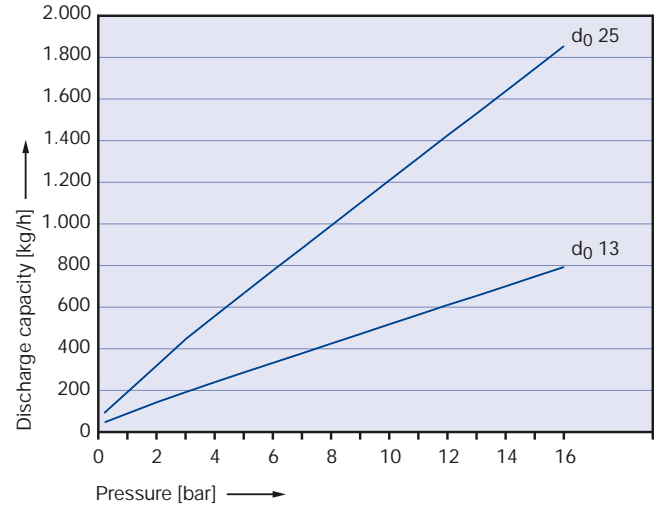
Approvals			
	Actual Orifice diameter $d_0$ [mm]	13	25
	Actual Orifice area $A_0$ [mm <sup>2</sup> ]	133	491
	Actual Orifice diameter $d_0$ [inch]	0,512	0,984
	Actual Orifice area $A_0$ [inch <sup>2</sup> ]	0,206	0,761
<b>Europe</b>		<b>Coefficient of discharge <math>K_{dr}</math></b>	
DIN EN ISO 4126-1	Approval No.	07 202 0111 Z 0008/0/20	
	S/G	0,6	0,38
	L	0,4	0,26
<b>Germany</b>		<b>Coefficient of discharge <math>\alpha_w</math></b>	
AD 2000-Merkblatt A2	Approval No.	TÜV SV 1047	
	S/G	0,6	0,38
	L	0,4	0,26
<b>United States</b>		<b>Coefficient of discharge K</b>	
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 $\Delta K \approx 0,521$ G: 1,96 SCFM / psia $\Delta K \approx 0,521$	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) S: 13,97 lb / hr / psia $\Delta K \approx 0,357$ G: 4,96 SCFM / psia $\Delta K \approx 0,357$
	Approval No.	M37156	M37178
	L	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) L: 2,96 GPM $\sqrt{\text{psid}^*)} \Delta K \approx 0,379$	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) L: 7,46 GPM $\sqrt{\text{psid}^*)} \Delta K \approx 0,258$
<b>Canada</b>		<b>Coefficient of discharge K</b>	
CRN	Approval No.	OG0772.9C	
	S/G	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) S: 5,52 lb / hr / psia $\Delta K \approx 0,521$ G: 1,96 SCFM / psia $\Delta K \approx 0,521$	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) S: 13,97 lb / hr / psia $\Delta K \approx 0,357$ G: 4,96 SCFM / psia $\Delta K \approx 0,357$
	L	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) L: 2,96 GPM $\sqrt{\text{psid}^*)} \Delta K \approx 0,379$	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) L: 7,46 GPM $\sqrt{\text{psid}^*)} \Delta K \approx 0,258$
<b>China</b>		<b>Coefficient of discharge <math>\alpha_w</math></b>	
AQSIQ	Approval No.	02301T	
	S/G	0,6	0,38
	L	0,4	0,26
<b>Russia</b>		<b>Coefficient of discharge <math>\alpha_w</math></b>	
GGTN/ GOSGORTECHNADZOR	Approval No.	PPC00-18458	
GOST R	Approval No.	1989-06	
	S/G	0,6	0,38
	L	0,4	0,26
<b>Belarus</b>		<b>Coefficient of discharge <math>\alpha_w</math></b>	
PROMATOMNADZOR	Approval No.	15-171-2006	
	S/G	0,6	0,38
	L	0,4	0,26
<b>Classification societies</b>			
on request			

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

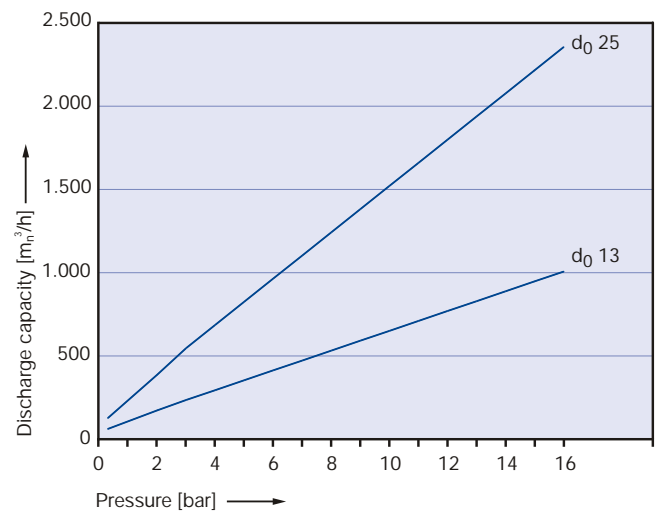
## Capacities – Metric Units

Capacities for saturated steam, air at 0° C and 1013 mbar, water at 20° C according to AD 2000-Merkblatt A2, based on set pressure plus 10% overpressure. Capacities at 1 bar (14,5 psig) and below are based on 0,1 bar (1,45 psig) overpressure. For pressure range refer to "Pressure temperature ratings" on page 02/07.

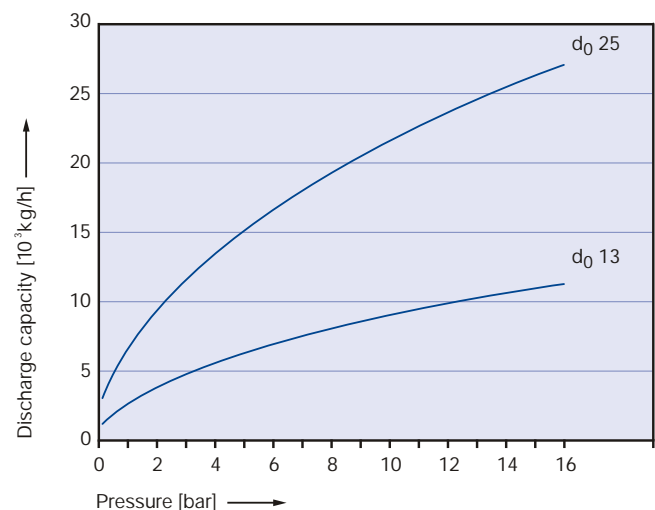
Steam		AD 2000-Merkblatt A2 [kg/h]	
Actual Orifice diameter $d_0$ [mm]		13	25
Actual Orifice area $A_0$ [mm <sup>2</sup> ]		133	491
LEO <sub>S/G</sub> <sup>*)</sup> [inch <sup>2</sup> ]		0,110	0,279
Set pressure [bar]	Capacities [kg/h]		
1	88	195	
2	142	320	
3	191	448	
4	239	559	
Maximum temperature for EPDM soft seal			
5	286	669	
6	332	779	
7	378	886	
8	425	995	
9	471	1104	
10	518	1213	
12	611	1430	
14	701	1643	
16	794	1860	



Air		AD 2000-Merkblatt A2 [m <sup>3</sup> /h]	
Actual Orifice diameter $d_0$ [mm]		13	25
Actual Orifice area $A_0$ [mm <sup>2</sup> ]		133	491
LEO <sub>S/G</sub> <sup>*)</sup> [inch <sup>2</sup> ]		0,110	0,279
Set pressure [bar]	Capacities [m <sup>3</sup> /h]		
1	105	233	
2	171	386	
3	234	547	
4	293	687	
5	353	827	
6	413	967	
7	472	1106	
8	532	1246	
9	592	1386	
10	651	1526	
12	771	1805	
14	890	2084	
16	1009	2364	



Water		AD 2000-Merkblatt A2 [10 <sup>3</sup> kg/h]	
Actual Orifice diameter $d_0$ [mm]		13	25
Actual Orifice area $A_0$ [mm <sup>2</sup> ]		133	491
LEO <sub>L</sub> <sup>*)</sup> [inch <sup>2</sup> ]		0,082	0,302
Set pressure [bar]	Capacities [10 <sup>3</sup> kg/h]		
1	2,83	6,81	
2	4,01	9,63	
3	4,91	11,8	
4	5,66	13,6	
5	6,33	15,2	
6	6,94	16,7	
7	7,49	18	
8	8,01	19,3	
9	8,5	20,4	
10	8,96	21,5	
12	9,81	23,6	
14	10,6	25,5	
16	11,3	27,2	



\*) LEO<sub>S/G/L</sub> = LESER Effective Orifice steam/gas/liquids please refer to page 00/17.  
How to use capacity-sheets refer to page 00/15.

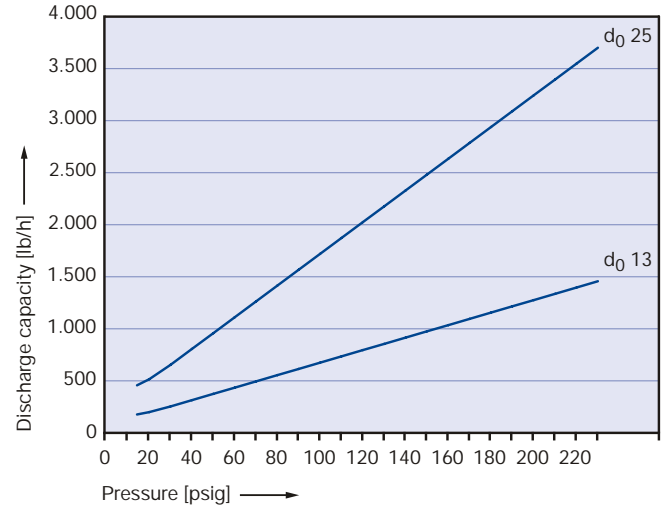
Type 483



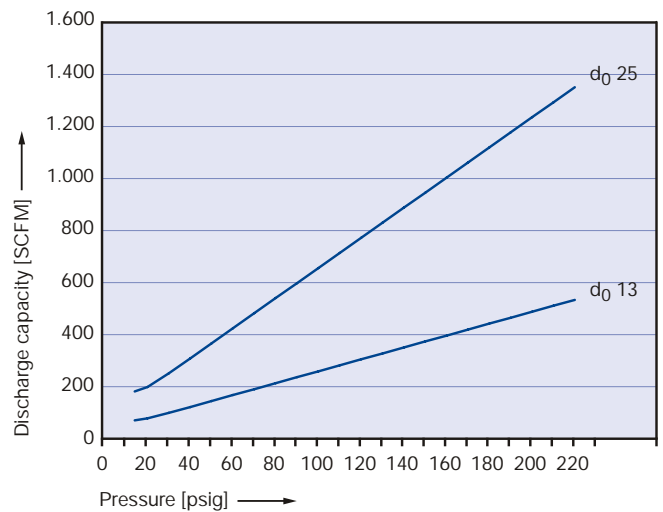
## Capacities – US Units

Capacities for saturated steam, air at 60°F and 14,5 psig, water at 70°F according to ASME VIII (UV), based on set pressure plus 10% overpressure. Capacities at 30 psig (2,07 bar) and bellow are based on 3 psig (0,207 bar) overpressure. For pressure range refer to "Pressure temperature ratings" on page 02/07.

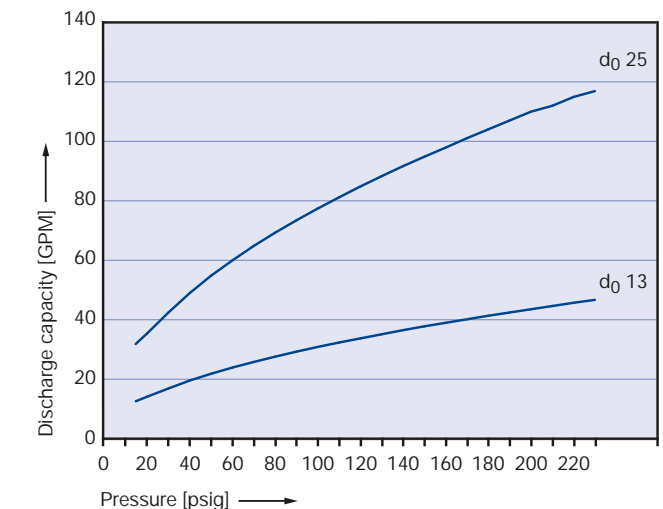
Steam		ASME Section VIII [lb/h]	
Actual Orifice diameter $d_0$ [inch]	0,512	0,984	
Actual Orifice area $A_0$ [inch <sup>2</sup> ]	0,206	0,761	
LEO <sub>SiG</sub> <sup>1)</sup> [inch <sup>2</sup> ]	0,110	0,279	
Set pressure [psig]	Capacities [lb/h]		
15	180	457	
20	208	527	
30	263	667	
40	324	821	
50	385	974	
60	445	1128	
Maximum temperature for EPDM soft seal			
70	506	1282	
80	567	1436	
90	627	1590	
100	688	1744	
120	810	2052	
140	931	2359	
160	1052	2667	
180	1174	2975	
200	1295	3283	
220	1417	3590	
230	1478	3744	



Air		ASME Section VIII [SCFM]	
Actual Orifice diameter $d_0$ [inch]	0,512	0,984	
Actual Orifice area $A_0$ [inch <sup>2</sup> ]	0,206	0,761	
LEO <sub>SiG</sub> <sup>1)</sup> [inch <sup>2</sup> ]	0,110	0,279	
Set pressure [psig]	Capacities [SCFM]		
15	64	163	
20	74	188	
30	94	238	
40	115	292	
50	137	347	
60	159	402	
70	180	457	
80	202	512	
90	224	566	
100	245	621	
120	289	731	
140	332	841	
160	375	950	
180	419	1060	
200	462	1170	
220	505	1279	
230	527	1334	



Water		ASME Section VIII [GPM]	
Actual Orifice diameter $d_0$ [inch]	0,512	0,984	
Actual Orifice area $A_0$ [inch <sup>2</sup> ]	0,206	0,761	
LEO <sub>SiG</sub> <sup>1)</sup> [inch <sup>2</sup> ]	0,082	0,302	
Set pressure [psig]	Capacities [GPM]		
15	12,6	31,6	
20	14,2	35,7	
30	17	42,8	
40	19,7	49,4	
50	22	55,3	
60	24,1	60,5	
70	26	65,4	
80	27,8	69,9	
90	29,5	74,1	
100	31,1	78,1	
120	34	85,6	
140	36,8	92,5	
160	39,3	98,8	
180	41,7	105	
200	43,9	111	
220	46,1	116	
230	47,1	118	



<sup>1)</sup> LEO<sub>SiG/L</sub> = LESER Effective Orifice steam/gas/liquids please refer to page 00/17. How to use capacity-sheets refer to page 00/15.

## Determination of coefficient of discharge in case of lift restriction or back pressure

- h = Lift [mm]
- d<sub>0</sub> = Flow diameter [mm] of selected safety valve, refer to table article numbers
- h/d<sub>0</sub> = Ratio of lift / flow diameter
- p<sub>a0</sub> = Back pressure [bar.]
- p<sub>0</sub> = Set pressure [bar.]
- p<sub>a0</sub>/p<sub>0</sub> = Ratio of back pressure / set pressure
- K<sub>dr</sub> = Coefficient of discharge acc. to DIN EN ISO 4126-1
- α<sub>w</sub> = Coefficient of discharge acc. to AD 2000-Merkblatt A2
- K<sub>b</sub> = Back pressure correction factor acc. to API 520 topic 3.3

Diagram for evaluation of ratio of lift / flow diameter (h/d<sub>0</sub>) in reference to the coefficient of discharge (K<sub>dr</sub> = α<sub>w</sub>)

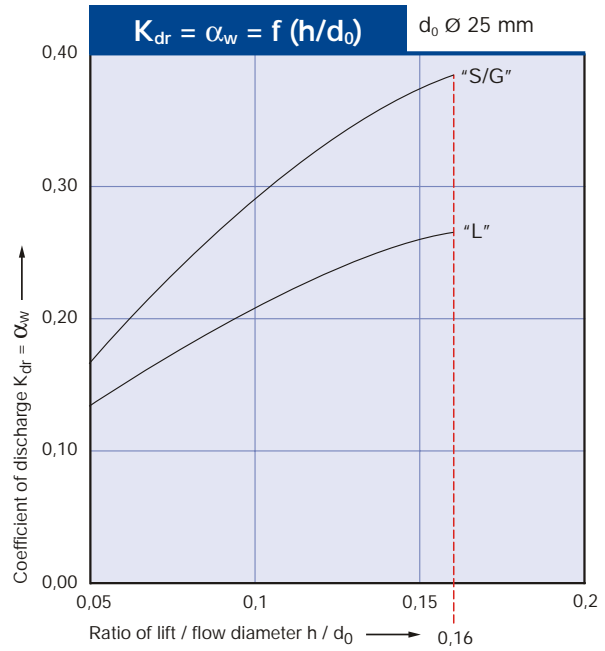
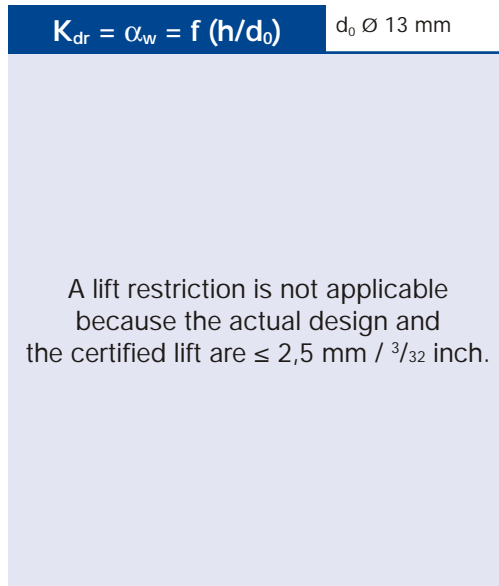
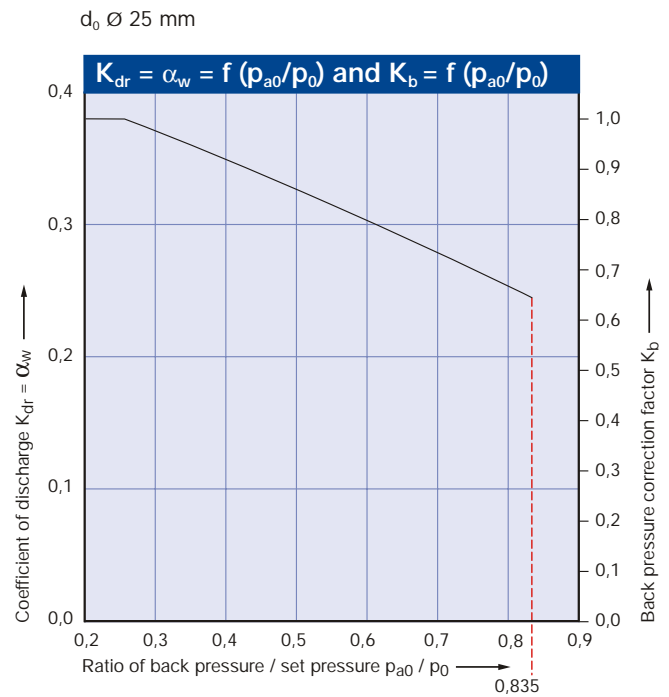
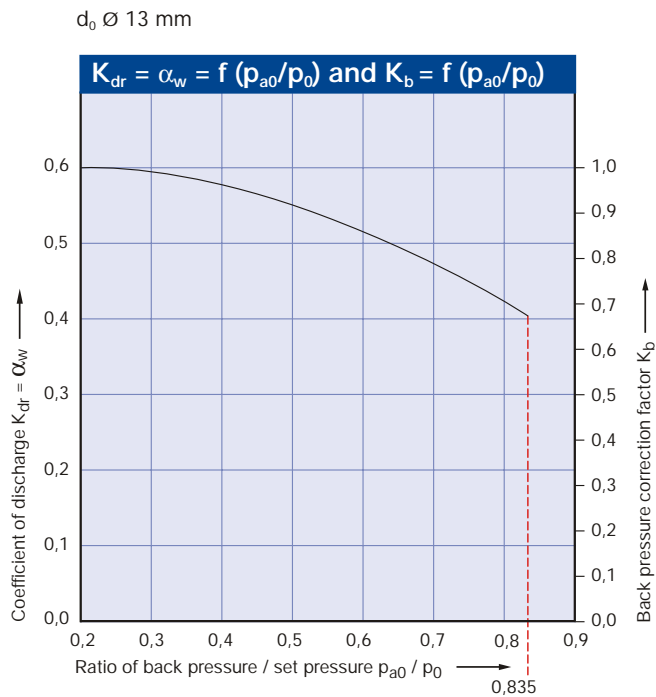


Diagram for evaluation of ratio of the coefficient of discharge (K<sub>dr</sub> = α<sub>w</sub>) in reference to the ratio of back pressure / set pressure (p<sub>a0</sub>/p<sub>0</sub>)



How to use please refer to page 00/18

Type 483

# 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

### Chapter/Page

#### Materials

• HyTight Assembly 03/02

#### How to order

• Numbering system 03/04  
• Article numbers 03/06

#### Pressure temperature ratings

• Metric Units + US Units 03/07

#### Dimensions – Bestseller

• Metric Units + US Units 03/08

#### Dimensions and weights

• Metric Units + US Units 03/09

Option codes for available connections 03/10

Available options 03/11

Selection chart H8 03/12

Surface quality 03/15

Order information – Spare parts 03/16

Approvals 03/17

#### Capacities

• Steam [Metric Units + US Units] 03/18

• Air [Metric Units + US Units] 03/20

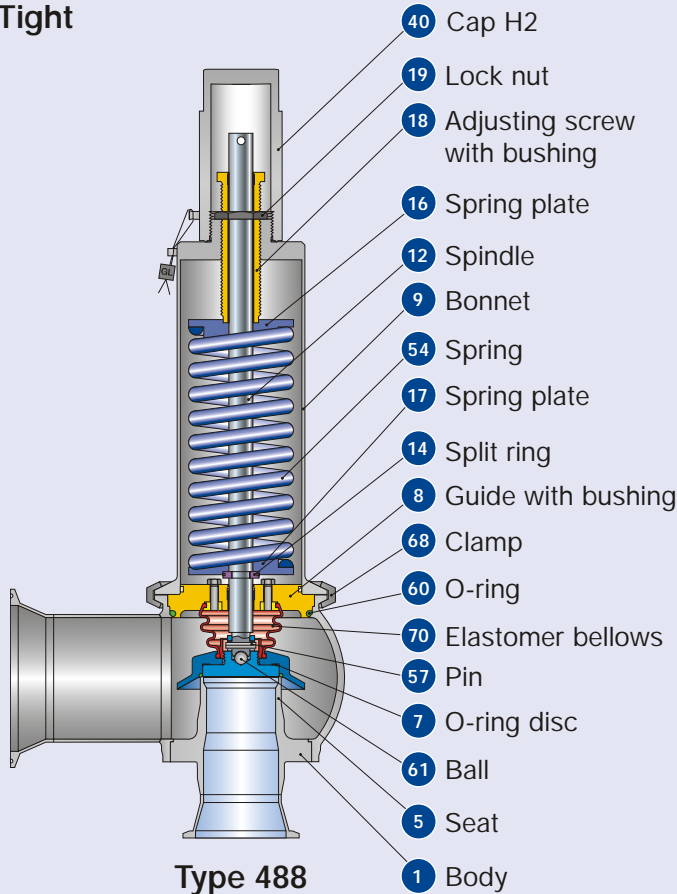
• Water [Metric Units + US Units] 03/22

Determination of coefficient  
of discharge  $K_{dr}/\alpha_w$  03/24

## HyTight Assembly

Type 488

### HyTight



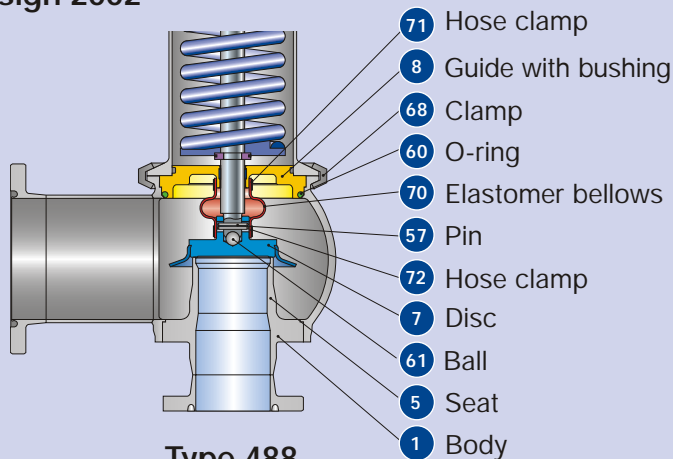
- 40 Cap H2
- 19 Lock nut
- 18 Adjusting screw with bushing
- 16 Spring plate
- 12 Spindle
- 9 Bonnet
- 54 Spring
- 17 Spring plate
- 14 Split ring
- 8 Guide with bushing
- 68 Clamp
- 60 O-ring
- 70 Elastomer bellows
- 57 Pin
- 7 O-ring disc
- 61 Ball
- 5 Seat
- 1 Body

**Type 488**  
Cap H2

Inlet and outlet: Clamp connection

For features and benefits of HyTight Assembly please refer to page 00/23.

### Design 2002



- 71 Hose clamp
- 8 Guide with bushing
- 68 Clamp
- 60 O-ring
- 70 Elastomer bellows
- 57 Pin
- 72 Hose clamp
- 7 Disc
- 61 Ball
- 5 Seat
- 1 Body

**Type 488**  
Cap H2

Inlet and outlet: Flange connection

## HyTight Assembly

The new standard design of the Type 488 is equipped with HyTight Assembly.

The Design 2002 is just available on customer requirement, e. g. for applications with old customer specification which can not be changed into HyTight.  
(For Article number see "Prices 2007").

Materials			
Item	Component	Remarks	Type 4884 HyTight
1	Body		1.4404
			SA 479 316L
5	Seat		1.4404
			316L
7	Disc	Metal seat Design 2002	-
			-
7	O-ring disc	HyTight Assembly	1.4404
			316L
7.1	Soft seal O-ring	"D"  	EPDM
		"K"	CR
		"L" 	FKM
		"C"  	FFKM
8	Guide with bushing	PTFE + 15 % glass	1.4404
			316L
9	Bonnet		1.4404
			SA 479 316L
12	Spindle		1.4404
			316L
14	Split ring		1.4404
			316L
16/17	Spring plate		1.4404
			316L
18	Adjusting screw with bushing	PTFE + 15 % glass	1.4104 / PTFE
			430 / PTFE
19	Lock nut		1.4404
			316L
40	Cap H2		1.4404
			316L
54	Spring		1.4310
			Stainless steel
57	Pin		1.4310
			Stainless steel
60	O-ring		EPDM
61	Ball		1.4401
			316
68	Clamp		1.4401
			316
70	Elastomer bellows		EPDM
71	Hose clamp	Design 2002	-
			-
72	Hose clamp	Design 2002	-
			-

**Please notice:**

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

## How to order – Numbering system

# 1

### Article Number

1	2	3	4
488	4	805	8

**1** Type 488  
– High capacity  
Types of sealing

HyTight	
EPDM	Buna-EP®
CR	Neoprene®
FKM	Viton®
FFKM	Kalrez®, ISOLAST®

**2** Material code

Code	Body material
4	1.4404 (316L)

**3** Valve code  
Identifies valve size and body material refer to page 03/07.

**4** Code for lifting device

Code	Lifting device	
2	Screwed cap	H2
4	Packed knob (only d <sub>0</sub> 23)	H4
4	Packed lever (for d <sub>0</sub> > 23)	H4
8	Pneumatic lifting device	H8

4884.8058

Article No.

# 2

### Set Pressure

Please state unit (in gauge)!

Please do not exceed the pressure range defined in the spring charts.

For pressure range, refer to page 03/07

4 bar

Set Pressure

# 3

### Connections

Please refer to table "Available connections" on pages 00/07 and 03/10.

Please state one option code for each inlet **and** outlet.

L96

L97

Connections

## 4

### Options

#### Type 488 Option code

- O-ring-disc
 

Standard: EPDM "D"		<b>J22</b>
Option: CR "K"		<b>J21</b>
FKM "L"		<b>J23</b>
FFKM "C"		<b>J20</b>
- Adaptor for lift indicator
 

Bonnet (d <sub>0</sub> 23 only)	<b>J38</b>
H4	<b>J39</b>
H8	<b>J40</b>
- Lift indicator **J93**
- Pneumatic lifting device H8 **J41**
  - Double piston design
- LESER Surface package
 

HyClean finish	<b>B69</b>
Sterile finish	<b>B70</b>

For detailed information refer to page 03/15

Option code applies only if not standard

J40

J93

Options

## 5

### Documentation

Please select requested documentation:

#### Inspections, tests: Option code

DIN EN 10204-3.2: TÜV-Nord  
Certificate for test pressure **M33**

#### LESER CGA (Certificate for Global Application) H03

- Inspection certificate 3.1 acc. to DIN EN 10204
- Declaration of conformity acc. to PED 97/23/EC

#### Material test certificate:

DIN EN 10204-3.1

#### Part Option code

Body	<b>H01</b>
Bonnet	<b>L30</b>
Cap / lever cover	<b>L31</b>
Disc	<b>L23</b>
Certificate of surface quality	<b>N04</b>

H01

L23

Documentation

## 6

### Code and Medium

1	2
2	0

#### 1 Code

1. ASME Section VIII
2. CE / VdTUEV
3. ASME Section VIII + CE / VdTUEV

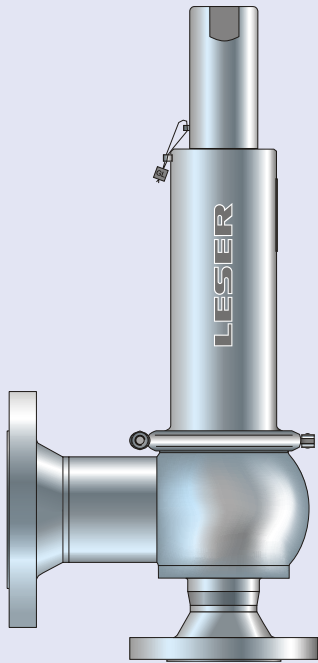
#### 2 Medium

- .1 Gases
- .2 Liquids
- .3 Steam
- .0 Steam / Gases / Liquids (valid only for CE / VdTUEV)

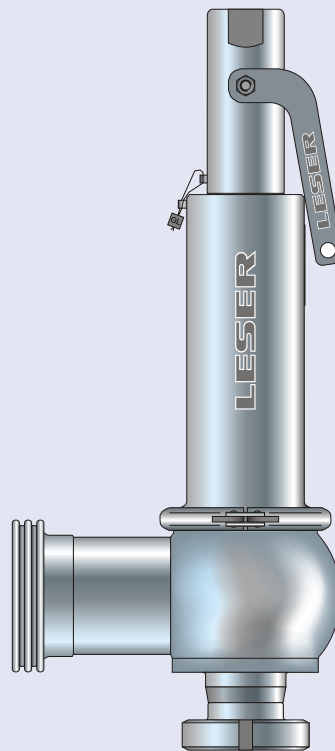
2.0

Code and Medium

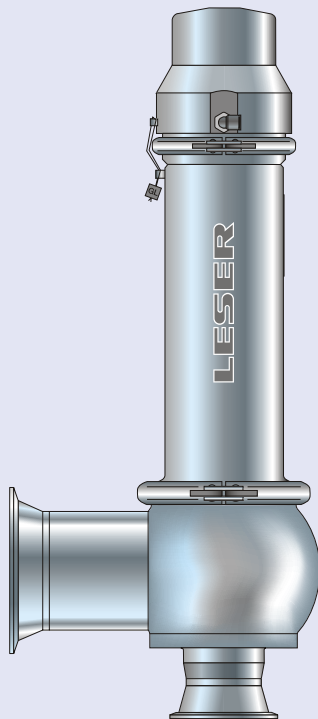
## How to order – Article numbers



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



**Type 488**  
Packed lever H4  
Inlet: Aseptic clamp and nut connection  
Outlet: Aseptic thread



**Type 488**  
Pneumatic lifting device H8  
Inlet and outlet: Clamp connection



## How to order – Article numbers

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

## Pressure temperature ratings

Metric Units													
Actual Orifice diameter $d_0$ [mm]			23	37	46	60	74	92					
Actual Orifice area $A_0$ [mm <sup>2</sup> ]			416	1075	1662	2827	4301	6648					
Body material: 1.4404 (316L)													
<b>Inlet / Outlet</b>	<b>Pressure rating</b>	For pressure ratings and connection size please refer to chapter dimensions and weights (page 03/09)											
<b>Minimum set pressure<sup>1)</sup></b>	p [bar] S/G/L	0,1	0,1	0,2	0,1	0,1	0,1						
<b>Maximum set pressure</b>	p [bar] S/G/L	16	16	15	10,34	10,34	8,2						
<b>Temperature range<sup>2)</sup></b>		Min.	Max.	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 <sup>2</sup> ]			0,644	1,667	2,576	4,383	6,666	10,304					
Body material: 1.4404 (316L)													
<b>Inlet / Outlet</b>	<b>Pressure rating</b>	For pressure ratings and connection size please refer to chapter dimensions and weights (page 03/09)											
<b>Minimum set pressure<sup>1)</sup></b>	p [psig] S/G/L	1,5	1,5	3	1,5	1,5	1,5						
<b>Maximum set pressure</b>	p [psig] S/G/L	232	232	217,56	150	150	118,9						
<b>Temperature range<sup>2)</sup></b>		Min.	Max.	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

<sup>1)</sup> For steam, air/gas starting from 1,38 bar (20 psig) the safety valve is certified acc. to ASME Code Sec. VIII, Div. 1.  
For liquides starting from 1 bar (15 psig) the safety valve is certified acc. to ASME Code Sec. VIII, Div. 1.

<sup>2)</sup> The temperature is limited by the soft seal material. Refer to table "Soft seal selection" on page 99/11.

## Dimensions – Bestseller

For shortest delivery time please select bestsellers. The specified bestsellers can vary depending on different market requirements.

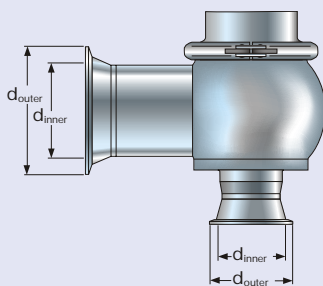
For further available connections please refer to page 03/10.

### Metric Units

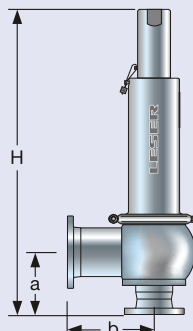
Actual Orifice diameter $d_0$ [mm]		23	37	46	60	74	92							
Actual Orifice area $A_0$ [mm <sup>2</sup> ]		416	1075	1662	2827	4301	6648							
<b>Clamp connections</b>	<b>Inlet a</b>	<b>Outlet b</b>	<b>Inlet a</b>	<b>Outlet b</b>	<b>Inlet a</b>	<b>Outlet b</b>	<b>Inlet a</b>	<b>Outlet b</b>	<b>Inlet a</b>	<b>Outlet b</b>	<b>Inlet a</b>	<b>Outlet b</b>		
<b>COCO</b>	1 1/2"	2"	2"	3"	2 1/2"	4"	3"	4 1/2"	4"	5"	4 1/2"	6"		
Option code	L96L97													
<b>Center to face</b>	[mm]	75	112	92	147	99	147	109	153	124	178	149	181	
<b>Clamp diameter</b>	$d_{inner}$	[mm]	36	49	49	73	60	98	73	110	98	136	110	163
	$d_{outer}$	[mm]	51	64	64	91	78	119	91	130	119	155	130	183
<b>Height – H4</b>	H max.	[mm]	332	518	534	552	640	684						
<b>Threaded connections</b>	<b>Inlet a</b>	<b>Outlet b</b>	<b>Inlet a</b>	<b>Outlet b</b>	<b>Inlet a</b>	<b>Outlet b</b>	<b>Inlet a</b>	<b>Outlet b</b>	<b>Inlet a</b>	<b>Outlet b</b>	<b>Inlet a</b>	<b>Outlet b</b>		
<b>KOGO</b>	25	40	40	65	50	80	65	100	80	125	100	150		
Option code	H85L76A85L81													
<b>Center to face</b>	[mm]	93	130	110	160	113	160	122	160	138	185	156	188	
<b>Height – H4</b>	H max.	[mm]	350	536	547	566	654	691						
<b>Flanged connections</b>	<b>Inlet a</b>	<b>Outlet b</b>	<b>Inlet a</b>	<b>Outlet b</b>	<b>Inlet a</b>	<b>Outlet b</b>	<b>Inlet a</b>	<b>Outlet b</b>	<b>Inlet a</b>	<b>Outlet b</b>	<b>Inlet a</b>	<b>Outlet b</b>		
<b>TNTN</b>	25	40	40	65	50	80	65	100	80	125	100	150		
Option code	H85L78A85L84													
<b>Center to face</b>	[mm]	99	134	114	170	123	170	132	170	148	195	166	198	
<b>Height – H4</b>	H max.	[mm]	356	540	557	576	664	701						

### US Units

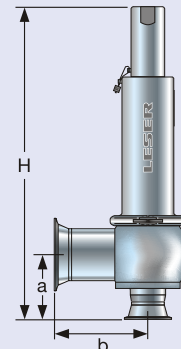
Actual Orifice diameter $d_0$ [inch]		0,906	1,457	1,811	2,362	2,913	3,622							
Actual Orifice area $A_0$ [inch <sup>2</sup> ]		0,644	1,67	2,576	4,38	6,666	10,30							
<b>Clamp connections</b>	<b>Inlet a</b>	<b>Outlet b</b>	<b>Inlet a</b>	<b>Outlet b</b>	<b>Inlet a</b>	<b>Outlet b</b>	<b>Inlet a</b>	<b>Outlet b</b>	<b>Inlet a</b>	<b>Outlet b</b>	<b>Inlet a</b>	<b>Outlet b</b>		
<b>COCO</b>	1 1/2"	2"	2"	3"	2 1/2"	4"	3"	4 1/2"	4"	5"	4 1/2"	6"		
Option code	L96L97													
<b>Center to face</b>	[inch]	2 15/16	4 13/32	3 5/8	5 25/32	3 29/32	5 25/32	4 9/32	6 1/32	4 7/8	7	5 7/8	7 1/8	
<b>Clamp diameter</b>	$d_{inner}$	[inch]	1 13/32	1 15/16	1 15/16	2 7/8	2 3/8	3 27/32	2 7/8	4 11/32	3 27/32	5 11/32	4 11/32	6 7/16
	$d_{outer}$	[inch]	2	2 17/32	2 17/32	3 19/32	3 1/16	4 11/16	3 19/32	5 1/8	4 11/16	6 3/32	5 1/8	7 7/32
<b>Height – H4</b>	H max.	[inch]	13 1/16	20 13/32	21 13/32	21 3/4	25 3/16	26 29/32						
<b>Threaded connections</b>	<b>Inlet a</b>	<b>Outlet b</b>	<b>Inlet a</b>	<b>Outlet b</b>	<b>Inlet a</b>	<b>Outlet b</b>	<b>Inlet a</b>	<b>Outlet b</b>	<b>Inlet a</b>	<b>Outlet b</b>	<b>Inlet a</b>	<b>Outlet b</b>		
<b>KOGO</b>	25	40	40	65	50	80	65	100	80	125	100	150		
Option code	H85L76A85L81													
<b>Center to face</b>	[inch]	3 21/32	5 5/32	4 5/16	6 5/16	4 14/32	6 5/16	4 13/16	6 5/16	5 13/32	7 9/32	6 5/32	7 13/32	
<b>Height – H4</b>	H max.	[inch]	13 15/32	21 1/8	21 9/16	22 9/32	25 23/32	27 3/16						
<b>Flanged connections</b>	<b>Inlet a</b>	<b>Outlet b</b>	<b>Inlet a</b>	<b>Outlet b</b>	<b>Inlet a</b>	<b>Outlet b</b>	<b>Inlet a</b>	<b>Outlet b</b>	<b>Inlet a</b>	<b>Outlet b</b>	<b>Inlet a</b>	<b>Outlet b</b>		
<b>TNTN</b>	25	40	40	65	50	80	65	100	80	125	100	150		
Option code	H85L78A85L84													
<b>Center to face</b>	[inch]	3 7/8	5 1/4	4 15/32	6 11/16	4 13/16	6 11/16	5 3/16	6 11/16	5 13/16	7 11/16	6 17/32	7 25/32	
<b>Height – H4</b>	H max.	[inch]	14	21 4/16	21 15/16	22 11/16	26 2/16	27 9/16						



Clamp diameters



Flanged connection



Clamp connection

## Dimensions and weights

### Metric Units

Actual Orifice diameter d <sub>0</sub> [mm]		23	37	46	60	74	92
Actual Orifice area A <sub>0</sub> [mm <sup>2</sup> ]		416	1075	1662	2827	4301	6648
<b>Welded connections</b>		<b>Inlet a</b>					
	<b>PN</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>
Center to face	[mm]	53	70	78	87	103	121
Height – H4	H max. [mm]	332	518	534	552	640	684
Height – H8 double piston design	H max. [mm]	338	535	550	569	707	750
<b>Clamp connections</b>		<b>Inlet a</b>					
	<b>PN</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>10</b>	<b>10</b>	<b>10</b>
Center to face	[mm]	75	92	99	109	124	149
Clamp diameter	d <sub>inner</sub> [mm]	For varying clamp diameters please refer to page 00/11					
	d <sub>outer</sub> [mm]						
Height – H4	H max. [mm]	332	518	534	552	640	684
Height – H8 double piston design	H max. [mm]	338	535	550	569	707	750
<b>Threaded connections</b>		<b>Inlet a</b>					
	<b>PN</b>	<b>40</b>	<b>40</b>	<b>25</b>	<b>25</b>	<b>25</b>	<b>25</b>
Center to face	[mm]	93	110	113	122	138	156
Height – H4	H max. [mm]	350	536	547	566	654	691
Height – H8 double piston design	H max. [mm]	356	553	564	582	721	757
<b>Flanged connections</b>		<b>Inlet a</b>					
	<b>PN</b>	<b>25</b>	<b>25</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>
Center to face	[mm]	99	114	123	132	148	166
Height – H4	H max. [mm]	356	540	557	576	664	701
Height – H8 double piston design	H max. [mm]	362	557	574	592	731	767
<b>Weight</b>		<b>Weight</b>					
	max. [kg]	9	20	21,7	26,5	47	56

### US Units

Actual Orifice diameter d <sub>0</sub> [inch]		0,906	1,457	1,811	2,362	2,913	3,622
Actual Orifice area A <sub>0</sub> [inch <sup>2</sup> ]		0,644	1,67	2,576	4,38	6,666	10,30
<b>Welded connections</b>		<b>Inlet a</b>					
	<b>PN</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>
Center to face	[inch]	2 <sup>3</sup> / <sub>32</sub>	2 <sup>3</sup> / <sub>4</sub>	3 <sup>1</sup> / <sub>16</sub>	3 <sup>7</sup> / <sub>16</sub>	4 <sup>1</sup> / <sub>32</sub>	4 <sup>3</sup> / <sub>4</sub>
Height – H4	H max. [inch]	13 <sup>1</sup> / <sub>16</sub>	20 <sup>13</sup> / <sub>32</sub>	21 <sup>1</sup> / <sub>32</sub>	21 <sup>3</sup> / <sub>4</sub>	25 <sup>3</sup> / <sub>16</sub>	26 <sup>15</sup> / <sub>16</sub>
Height – H8 double piston design	H max. [inch]	13 <sup>5</sup> / <sub>16</sub>	21 <sup>1</sup> / <sub>16</sub>	21 <sup>21</sup> / <sub>32</sub>	22 <sup>13</sup> / <sub>32</sub>	27 <sup>27</sup> / <sub>32</sub>	29 <sup>17</sup> / <sub>32</sub>
<b>Clamp connections</b>		<b>Inlet a</b>					
	<b>PN</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>10</b>	<b>10</b>	<b>10</b>
Center to face	[inch]	2 <sup>15</sup> / <sub>16</sub>	3 <sup>19</sup> / <sub>32</sub>	3 <sup>29</sup> / <sub>32</sub>	4 <sup>9</sup> / <sub>32</sub>	4 <sup>7</sup> / <sub>8</sub>	5 <sup>7</sup> / <sub>8</sub>
Clamp diameter	d <sub>inner</sub> [inch]	For varying clamp diameters please refer to page 00/11					
	d <sub>outer</sub> [inch]						
Height – H4	H max. [inch]	13 <sup>1</sup> / <sub>16</sub>	20 <sup>13</sup> / <sub>32</sub>	21 <sup>1</sup> / <sub>32</sub>	21 <sup>3</sup> / <sub>4</sub>	25 <sup>3</sup> / <sub>16</sub>	26 <sup>15</sup> / <sub>16</sub>
Height – H8 double piston design	H max. [inch]	13 <sup>5</sup> / <sub>16</sub>	21 <sup>1</sup> / <sub>16</sub>	21 <sup>21</sup> / <sub>32</sub>	22 <sup>13</sup> / <sub>32</sub>	27 <sup>27</sup> / <sub>32</sub>	29 <sup>17</sup> / <sub>32</sub>
<b>Threaded connections</b>		<b>Inlet a</b>					
	<b>PN</b>	<b>40</b>	<b>40</b>	<b>25</b>	<b>25</b>	<b>25</b>	<b>25</b>
Center to face	[inch]	3 <sup>21</sup> / <sub>32</sub>	4 <sup>5</sup> / <sub>16</sub>	4 <sup>7</sup> / <sub>16</sub>	4 <sup>13</sup> / <sub>16</sub>	5 <sup>7</sup> / <sub>16</sub>	6 <sup>5</sup> / <sub>32</sub>
Height – H4	H max. [inch]	13 <sup>25</sup> / <sub>32</sub>	21 <sup>1</sup> / <sub>8</sub>	21 <sup>9</sup> / <sub>16</sub>	22 <sup>9</sup> / <sub>32</sub>	25 <sup>23</sup> / <sub>32</sub>	27 <sup>3</sup> / <sub>16</sub>
Height – H8 double piston design	H max. [inch]	14 <sup>1</sup> / <sub>32</sub>	21 <sup>25</sup> / <sub>32</sub>	22 <sup>3</sup> / <sub>16</sub>	22 <sup>15</sup> / <sub>16</sub>	28 <sup>3</sup> / <sub>8</sub>	29 <sup>13</sup> / <sub>16</sub>
<b>Flanged connections</b>		<b>Inlet a</b>					
	<b>PN</b>	<b>25</b>	<b>25</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>
Center to face	[inch]	3 <sup>7</sup> / <sub>8</sub>	4 <sup>13</sup> / <sub>32</sub>	4 <sup>13</sup> / <sub>16</sub>	5 <sup>3</sup> / <sub>16</sub>	5 <sup>13</sup> / <sub>16</sub>	6 <sup>17</sup> / <sub>32</sub>
Height – H4	H max. [inch]	14 <sup>1</sup> / <sub>32</sub>	21 <sup>9</sup> / <sub>32</sub>	21 <sup>15</sup> / <sub>16</sub>	22 <sup>21</sup> / <sub>32</sub>	26 <sup>1</sup> / <sub>8</sub>	27 <sup>19</sup> / <sub>32</sub>
Height – H8 double piston design	H max. [inch]	14 <sup>9</sup> / <sub>32</sub>	21 <sup>15</sup> / <sub>16</sub>	22 <sup>19</sup> / <sub>32</sub>	23 <sup>5</sup> / <sub>16</sub>	28 <sup>25</sup> / <sub>32</sub>	30 <sup>7</sup> / <sub>32</sub>
<b>Weight</b>		<b>Weight</b>					
	max. [lb]	19,8	44,1	47,8	58,4	103,6	123,5

		13	37	46	60	74	92
		416	1075	1662	2827	4301	6648
<b>Outlet b</b>							
	<b>PN</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>
Center to face	[mm]	90	125	125	125	150	153
Height – H4	H max. [mm]	332	518	534	552	640	684
Height – H8 double piston design	H max. [mm]	338	535	550	569	707	750
<b>Outlet b</b>							
	<b>PN</b>	<b>16</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>
Center to face	[mm]	112	147	147	153	178	181
<b>Outlet b</b>							
		For varying clamp diameters please refer to page 00/11					
Height – H4	H max. [mm]	332	518	534	552	640	684
Height – H8 double piston design	H max. [mm]	338	535	550	569	707	750
<b>Outlet b</b>							
	<b>PN</b>	<b>40</b>	<b>25</b>	<b>25</b>	<b>25</b>	<b>16</b>	<b>16</b>
Center to face	[mm]	130	160	160	160	185	188
Height – H4	H max. [mm]	350	536	547	566	654	691
Height – H8 double piston design	H max. [mm]	356	553	564	582	721	757
<b>Outlet b</b>							
	<b>PN</b>	<b>25</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>10</b>	<b>10</b>
Center to face	[mm]	134	170	170	170	195	198
Height – H4	H max. [mm]	356	540	557	576	664	701
Height – H8 double piston design	H max. [mm]	362	557	574	592	731	767

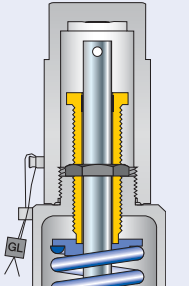
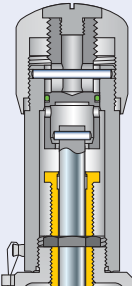
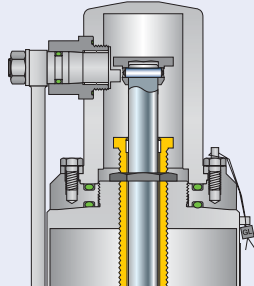
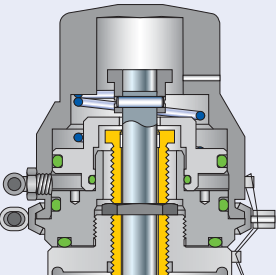
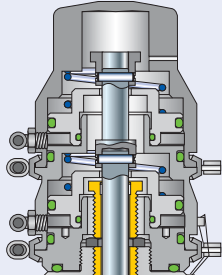







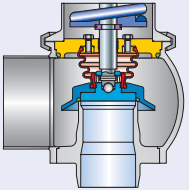
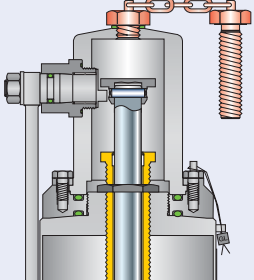
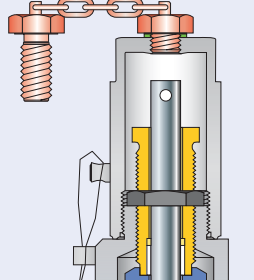
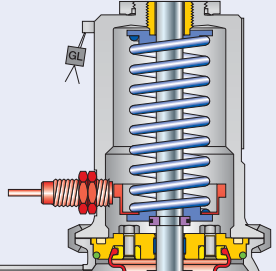
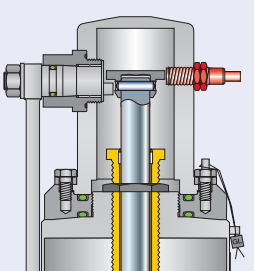
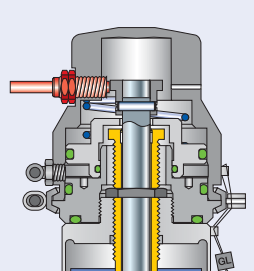
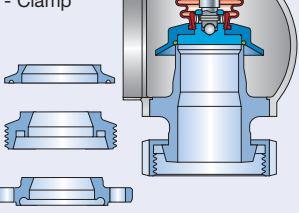
		0,906	1,457	1,811	2,362	2,913	3,622
		0,644	1,67	2,576	4,38	6,666	10,30
<b>Outlet b</b>							
	<b>PN</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>
Center to face	[inch]	3 <sup>17</sup> / <sub>32</sub>	4 <sup>15</sup> / <sub>16</sub>	4 <sup>15</sup> / <sub>16</sub>	4 <sup>15</sup> / <sub>16</sub>	5 <sup>9</sup> / <sub>32</sub>	6
Height – H4	H max. [inch]	13 <sup>1</sup> / <sub>16</sub>	20 <sup>13</sup> / <sub>32</sub>	21 <sup>1</sup> / <sub>32</sub>	21 <sup>3</sup> / <sub>4</sub>	25 <sup>3</sup> / <sub>16</sub>	26 <sup>15</sup> / <sub>16</sub>
Height – H8 double piston design	H max. [inch]	13 <sup>5</sup> / <sub>16</sub>	21 <sup>1</sup> / <sub>16</sub>	21 <sup>21</sup> / <sub>32</sub>	22 <sup>13</sup> / <sub>32</sub>	27 <sup>27</sup> / <sub>32</sub>	29 <sup>17</sup> / <sub>32</sub>
<b>Outlet b</b>							
	<b>PN</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>10</b>	<b>10</b>	<b>10</b>
Center to face	[inch]	4 <sup>3</sup> / <sub>8</sub>	5 <sup>25</sup> / <sub>32</sub>	5 <sup>25</sup> / <sub>32</sub>	6	7	7 <sup>1</sup> / <sub>8</sub>
<b>Outlet b</b>							
		For varying clamp diameters please refer to page 00/11					
Height – H4	H max. [inch]	13 <sup>1</sup> / <sub>16</sub>	20 <sup>13</sup> / <sub>32</sub>	21 <sup>1</sup> / <sub>32</sub>	21 <sup>3</sup> / <sub>4</sub>	25 <sup>3</sup> / <sub>16</sub>	26 <sup>15</sup> / <sub>16</sub>
Height – H8 double piston design	H max. [inch]	13 <sup>5</sup> / <sub>16</sub>	21 <sup>1</sup> / <sub>16</sub>	21 <sup>21</sup> / <sub>32</sub>	22 <sup>13</sup> / <sub>32</sub>	27 <sup>27</sup> / <sub>32</sub>	29 <sup>17</sup> / <sub>32</sub>
<b>Outlet b</b>							
	<b>PN</b>	<b>40</b>	<b>25</b>	<b>25</b>	<b>25</b>	<b>16</b>	<b>16</b>
Center to face	[inch]	5 <sup>3</sup> / <sub>32</sub>	6 <sup>5</sup> / <sub>16</sub>	6 <sup>5</sup> / <sub>16</sub>	6 <sup>5</sup> / <sub>16</sub>	7 <sup>9</sup> / <sub>32</sub>	7 <sup>3</sup> / <sub>8</sub>
Height – H4	H max. [inch]	13 <sup>25</sup> / <sub>32</sub>	21 <sup>1</sup> / <sub>8</sub>	21 <sup>9</sup> / <sub>16</sub>	22 <sup>9</sup> / <sub>32</sub>	25 <sup>23</sup> / <sub>32</sub>	27 <sup>3</sup> / <sub>16</sub>
Height – H8 double piston design	H max. [inch]	14 <sup>1</sup> / <sub>32</sub>	21 <sup>25</sup> / <sub>32</sub>	22 <sup>3</sup> / <sub>16</sub>	22 <sup>15</sup> / <sub>16</sub>	28 <sup>3</sup> / <sub>8</sub>	29 <sup>13</sup> / <sub>16</sub>
<b>Outlet b</b>							
	<b>PN</b>	<b>25</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>10</b>	<b>10</b>
Center to face	[inch]	5 <sup>1</sup> / <sub>4</sub>	6 <sup>11</sup> / <sub>16</sub>	6 <sup>11</sup> / <sub>16</sub>	6 <sup>11</sup> / <sub>16</sub>	7 <sup>11</sup> / <sub>16</sub>	7 <sup>25</sup> / <sub>32</sub>
Height – H4	H max. [inch]	14 <sup>1</sup> / <sub>32</sub>	21 <sup>9</sup> / <sub>32</sub>	21 <sup>15</sup> / <sub>16</sub>	22 <sup>21</sup> / <sub>32</sub>	26 <sup>1</sup> / <sub>8</sub>	27 <sup>19</sup> / <sub>32</sub>
Height – H8 double piston design	H max. [inch]	14 <sup>9</sup> / <sub>32</sub>	21 <sup>15</sup> / <sub>16</sub>	22 <sup>19</sup> / <sub>32</sub>	23 <sup>5</sup> / <sub>16</sub>	28 <sup>25</sup> / <sub>32</sub>	30 <sup>7</sup> / <sub>32</sub>

## Option codes for available connections

For detailed information about the available connections please refer to "How to use" on page 00/07

Connections																
	d <sub>0</sub> [mm]	23	37	46	60	74	92									
	d <sub>0</sub> [inch]	0,906	1,457	1,811	2,362	2,913	3,622									
<b>Clamps</b>				<b>Option code inlet</b>				<b>Option code outlet</b>								
	DN	25	40	50	65	80	100	DN	40	65	80	100	125	150		
For dimensions refer to page 00/07	SO	L79						SO	L86							
	DO	I73						DO	I74							
	NPS	1 1/2"	2"	2 1/2"	3"	3 1/2"	4"	NPS	2"	3"	3 1/2"	4"	5"	6"		
	BO	I75						BO	I76							
	CO	L96						CO	L97							
Clamp connections suitable for NA-connect available																
<b>Threaded connections</b>				<b>Option code inlet</b>				<b>Option code outlet</b>								
Pipe standard	DN	25	40	50	65	80	100	DN	40	65	80	100	125	150		
DIN 11850/ DIN 11866 Range A	00	H85L77						00	A85L83							
	GS	H85H34						GS	A85H35							
	BS	H85H36						BS	A85H37							
	GT	H85H54						GT	A85H55							
	BT	H85H56						BT	A85H57							
	GO	H85L75						GO	A85L81							
	KO	H85L76						KO	A85L82							
	GD	H85H60						GD	A85H61							
	BD	H85H58						BD	A85H59							
Pipe standard	DN	25	40	50	65	80	100	DN	40	65	80	100	125	150		
DIN EN ISO 1127/ DIN 11866 Range B	GS	H86H34						GS	A86H35							
	BS	H86H36						BS	A86H37							
	GT	H86H54						GT	A86H55							
	BT	H86H56						BT	A86H57							
	GD	H86H60						GD	A86H61							
	BD	H86H58						BD	A86H59							
Pipe standard	NPS	1 1/2"	2"	2 1/2"	3"	4"	4 1/2"	NPS	2"	3"	4"	4 1/2"	5"	6"		
BS 4825-1 DIN 11866 Range C	GS	H66H34						GS	A84H35							
	BS	H66H36						BS	A84H37							
	GT	H66H54						GT	A84H55							
	BT	H66H56						BT	A84H57							
<b>Flanged connections</b>				<b>Option code inlet</b>				<b>Option code outlet</b>								
	DN	25	40	50	65	80	100	DN	40	65	80	100	125	150		
	FD	I71						FD	I72							
	NPS	1"	1 1/2"	2"	2 1/2"	3"	4"	NPS	1 1/2"	2 1/2"	3"	4"	5"	6"		
	FA	L94						FA	L95							
Pipe standard	DN	25	40	50	65	80	100	DN	40	65	80	100	125	150		
DIN 11850/ DIN 11866 Range A	NF	H85H71						NF	A85H72							
	BF	H85H73						BF	A85H74							
	NG	H85H75						NG	A85H76							
	BG	H85H77						BG	A85H78							
	TN	H85L78						TN	A85L84							
	AF	L90						AF	L91							
	AN	L92						AN	L93							
	VC	L70						VC	-							
	VG	I82	-						VG	-						
	VH	-	I83	-						VH	-					
	VE	L80						VE	-							
Pipe standard	DN	25	40	50	65	80	100	DN	40	65	80	100	125	150		
DIN EN ISO 1127/ DIN 11866 Range B	NF	H86H71						NF	A86H72							
	BF	H86H73						BF	A86H74							
	NG	H86H75						NG	A86H76							
	BG	H86H77						BG	A86H78							
Pipe standard	NPS	1 1/2"	2"	2 1/2"	3"	4"	4 1/2"	NPS	2"	3"	4"	4 1/2"	5"	6"		
BS 4825-1 DIN 11866 Range C	NF	H66H71						NF	A84H72							
	BF	H66H73						BF	A84H74							
	NG	H66H75						NG	A84H76							
	BG	H66H77						BG	A84H78							

## Available options

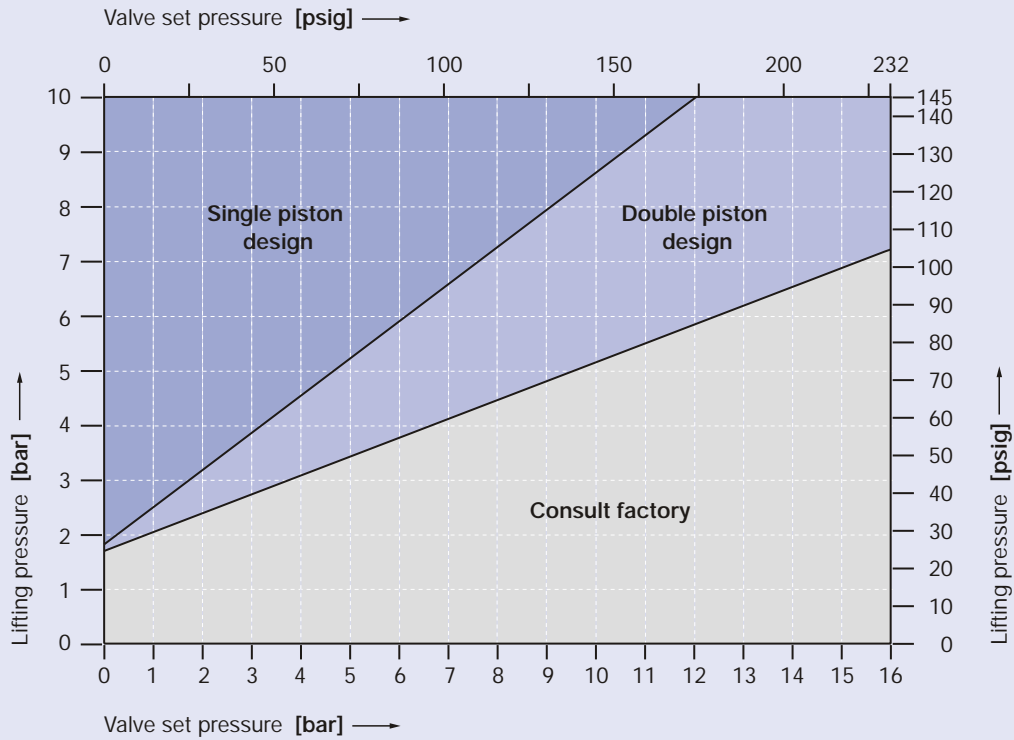
<p><b>Gastight cap H2</b> H2</p> 	<p><b>Gastight lifting device H4</b> Packed knob H4 (<math>d_0</math> 23 only)</p> 	<p><b>Packed lever H4</b> (for <math>d_0 &gt; 23</math>)</p> 	
<p><b>Pneumatic lifting device H8</b> H8 single piston design</p> 	<p><b>Pneumatic lifting device H8</b> J41: H8 double piston design</p> 		
<p><b>HyTight Assembly</b> J22: EPDM "D"   J21: CR "K"  J23: FKM "L"  J30: NBR "N"  J20: FFKM "C"  </p> 	<p><b>Test gag</b> (for <math>d_0 &gt; 23</math>) J69: H4</p> 	<p><b>Test gag</b> J70: H2</p> 	
<p><b>Lift indicator bonnet</b> (<math>d_0</math> 23 only) J38 + J93</p> 	<p><b>Lift indicator H4</b> (for <math>d_0 &gt; 23</math>) J39 + J93</p> 	<p><b>Lift indicator H8</b> (for <math>d_0 &gt; 23</math>) J40 + J93</p> 	<p><b>Multiple possibilities of aseptic connections</b></p> <ul style="list-style-type: none"> <li>- Dairy industry coupling</li> <li>- Sterile screw coupling</li> <li>- Small flange</li> <li>- Clamp</li> </ul> 

## Selection chart H8

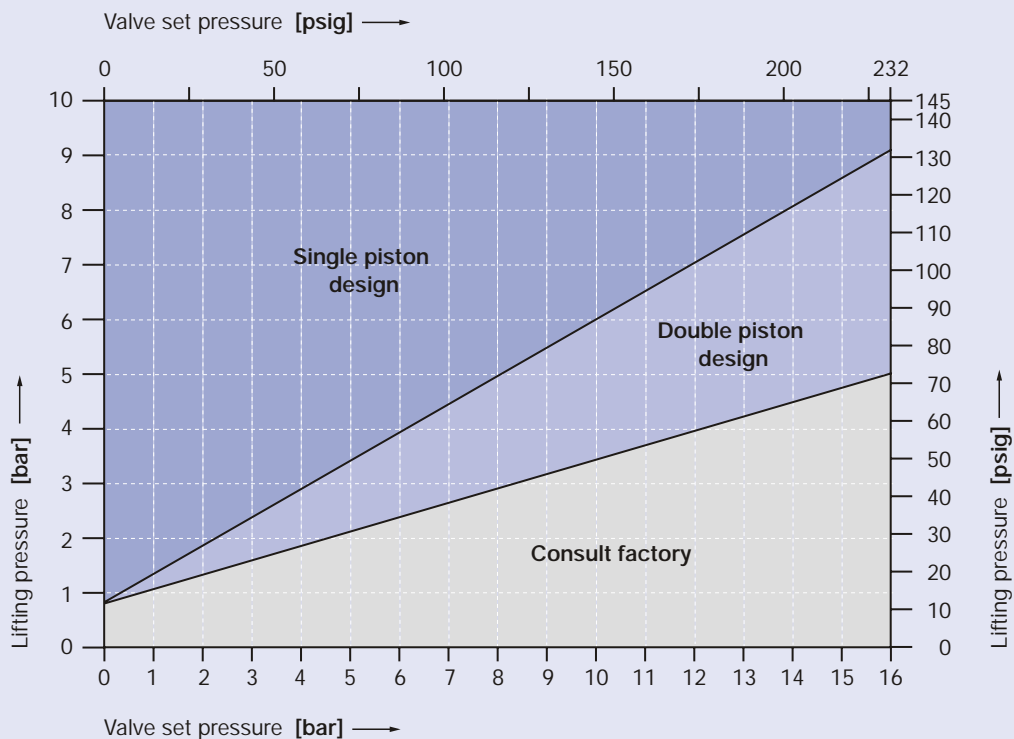
Depending on the set pressure and lifting pressure (air supply) a double piston lifting device (option code J41) may be required instead of a single piston. The chart below determines the required lifting device.

For information about this chart please refer to "How to use" on page 00/12.

Selection chart lifting device H8, size I.  $d_0$  23 mm / 0,906 inch

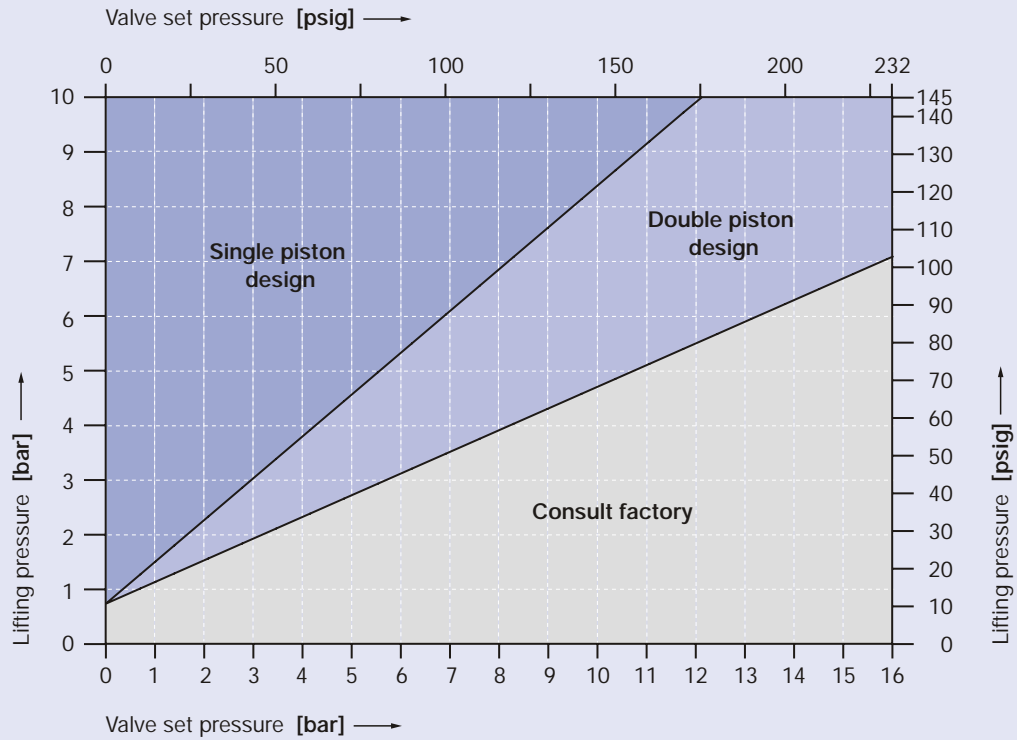


Selection chart lifting device H8, size II.  $d_0$  37 mm / 1,457 inch

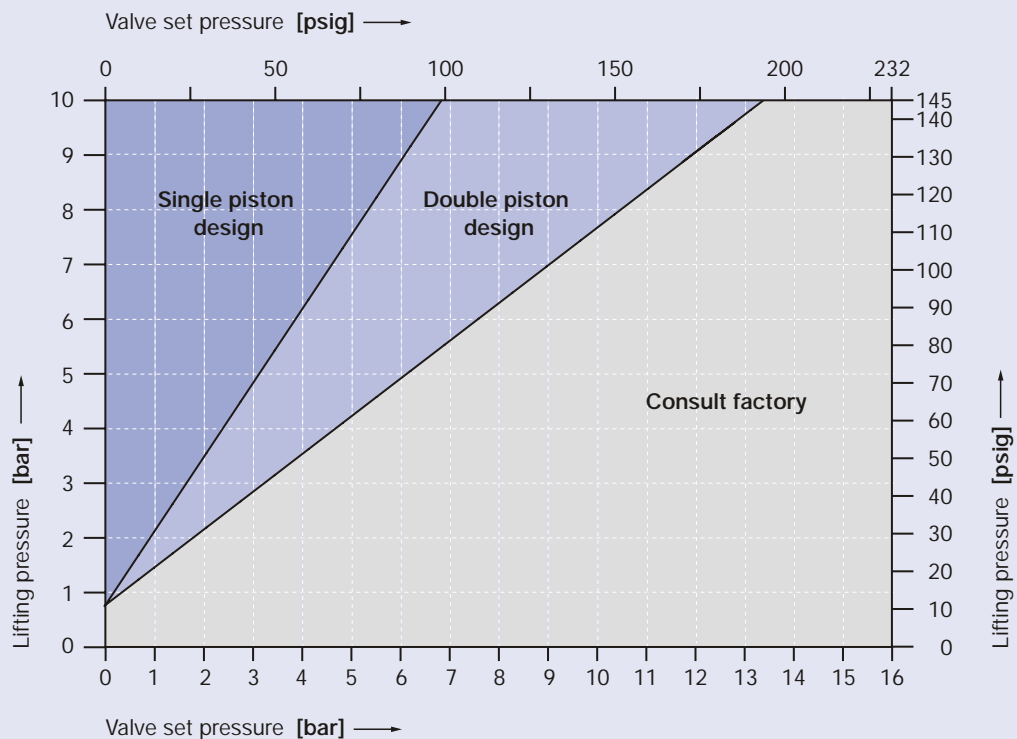


## Selection chart H8

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



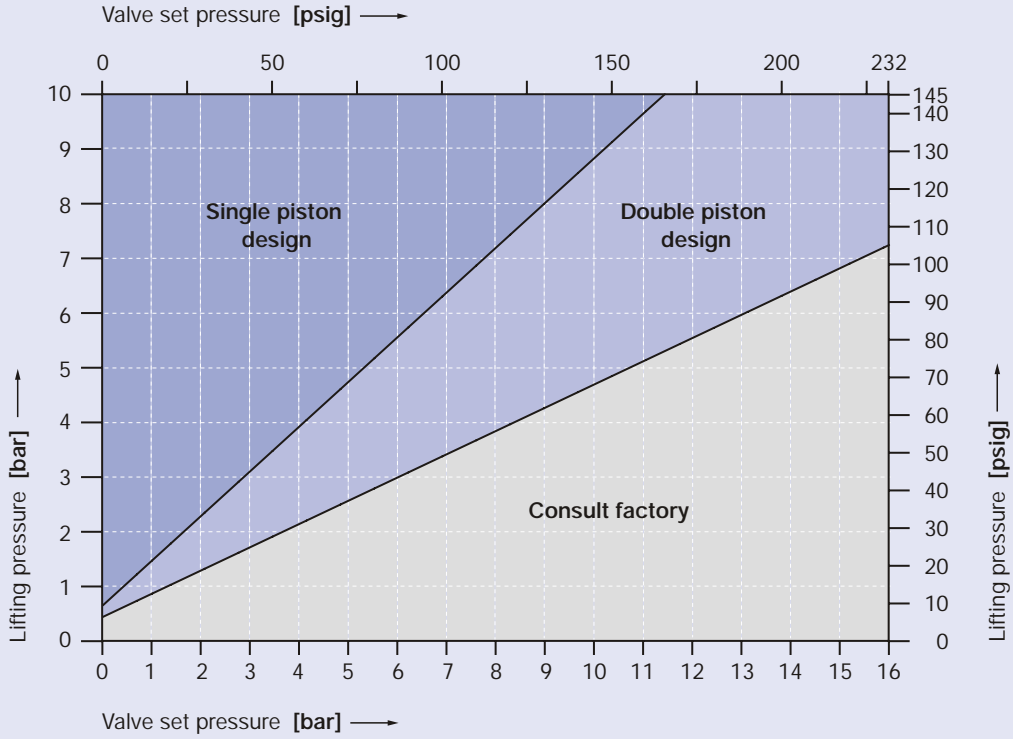
Selection chart lifting device H8, size II.  $d_0$  60 mm / 2,362 inch



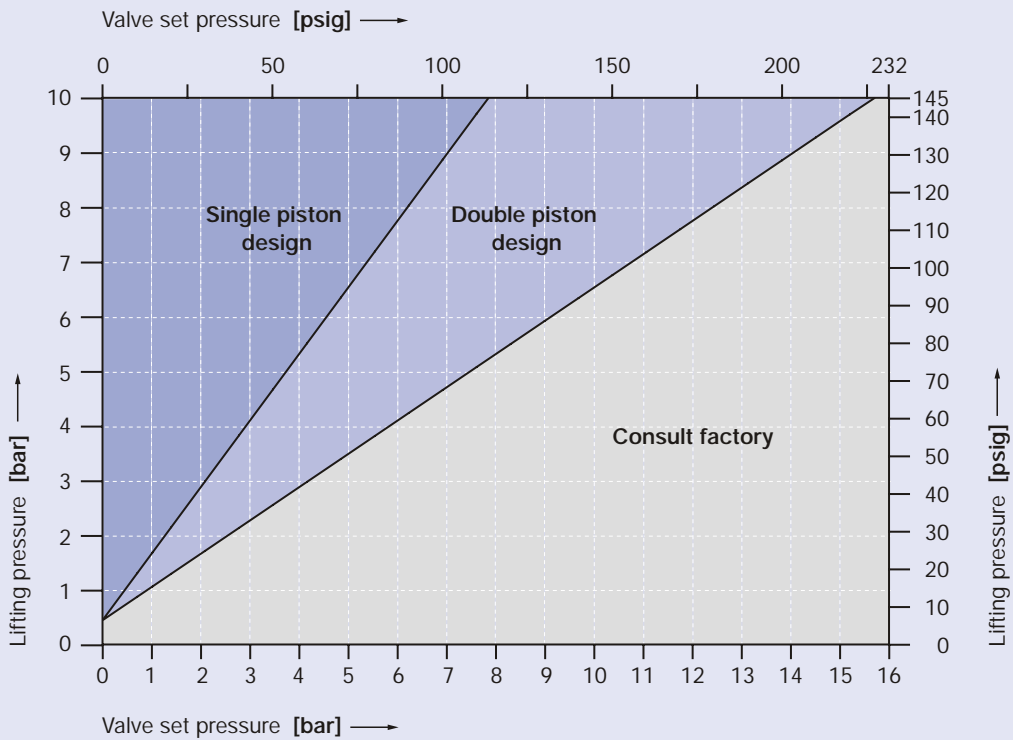
## Selection chart H8

Type 488

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

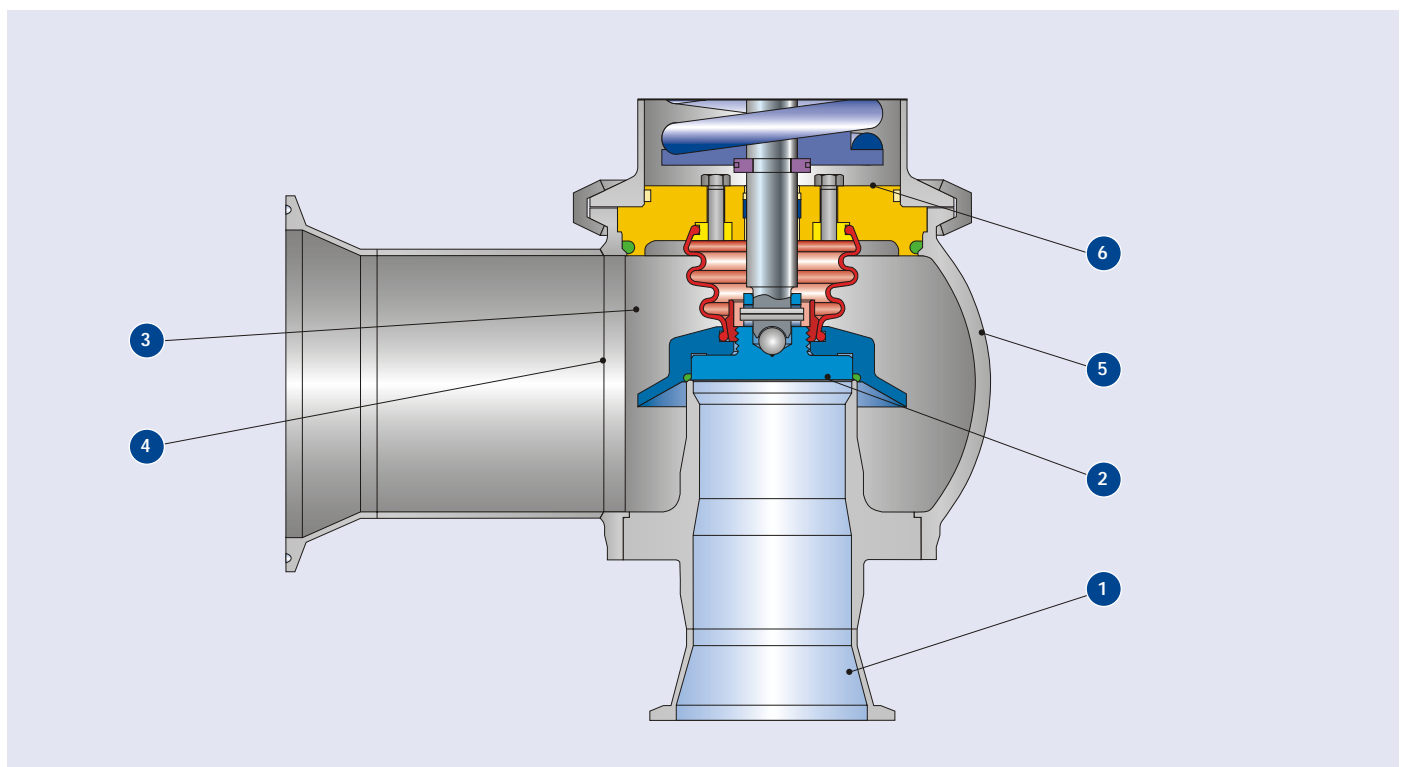




## Surface quality














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
















## Order information – Spare parts

### Type 488 – HyTight

Actual Orifice diameter $d_0$ [mm]	23	37	46	60	74	92	
Actual Orifice area $A_0$ [mm <sup>2</sup> ]	416	1075	1662	2827	4301	6648	
Actual Orifice diameter $d_0$ [inch]	0,906	1,457	1,811	2,362	2,913	3,622	
Actual Orifice area $A_0$ [inch <sup>2</sup> ]	0,644	1,667	2,576	4,383	6,666	10,304	
<b>Disc – soft seal (Item 7)</b>		<b>Material-No. / Art.-No.</b>					
<b>Disc</b> 1.4404	EPDM “D”  	205.3549.9741	205.3649.9741	205.3749.9741	205.3849.9741	205.3949.9741	205.4049.9741
	CR “K”	205.3549.9751	205.3649.9751	205.3749.9751	205.3849.9751	205.3949.9751	205.4049.9751
	FKM “L” 	205.3549.9771	205.3649.9771	205.3749.9771	205.3849.9771	205.3949.9771	205.4049.9771
	FFKM “C”  	205.3549.9791	205.3649.9791	205.3749.9791	205.3849.9791	205.3949.9791	205.4049.9791
<b>Disc – soft seal (Item 7.4)</b>		<b>Material-No. / Art.-No.</b>					
<b>O-ring</b>	EPDM “D”  	502.0249.3541	502.0408.3541	502.0503.3541	502.0660.5341	502.0819.5341	502.1041.5341
	CR “K”	502.0249.3551	502.0408.3551	502.0503.3551	502.0660.5351	502.0819.5351	502.1041.5351
	FKM “L” 	502.0249.3571	502.0408.3571	502.0503.3571	502.0660.5371	502.0819.5371	502.1041.5371
	FFKM “C”  	502.0249.3591	502.0408.3591	502.0503.3591	502.0660.5391	502.0819.5391	502.1041.5391
<b>Split ring (Item 14)</b>		<b>Material-No. / Art.-No.</b>					
<b>Split ring</b>	Spindle Ø [mm]	12	16	16	16	20	20
	1.4404	251.0149.0000	251.0249.0000	251.0249.0000	251.0249.0000	251.0349.0000	251.0349.0000
<b>Pin (Item 57)</b>		<b>Material-No. / Art.-No.</b>					
<b>Pin</b>	Ø [mm]	3	4	4	5	5	5
	1.4310	480.3205.0000	480.1605.0000	480.1605.0000	480.3005.0000	480.3105.0000	480.3105.0000
<b>O-ring body / guide (Item 60)</b>		<b>Material-No. / Art.-No.</b>					
<b>O-ring</b>	EPDM “D”  	502.0600.3041	502.0850.4041	502.0850.4041	502.1130.4041	502.1380.4041	502.1580.5041
<b>Ball (Item 61)</b>		<b>Material-No. / Art.-No.</b>					
<b>Ball</b>	Ø [mm]	6	9	9	12	12	15
	1.4401	510.0104.0000	510.0204.0000	510.0204.0000	510.0304.0000	510.0304.0000	510.0404.0000
<b>Bellows (Item 70)</b>		<b>Material-No. / Art.-No.</b>					
<b>Bellows</b>	EPDM “D” 	224.2849.9000	224.2949.9000	224.2949.9000	224.2649.9000	224.2649.9000	224.2649.9000

### Type 488 – Design 2002

<b>Disc – Metal to metal seat (Item 7)</b>		<b>Material-No. / Art.-No.</b>					
<b>Disc</b>	1.4404	225.4049.9000	210.0949.9000	210.1049.9000	210.1949.9000	210.2049.9000	210.2349.9000
	1.4404 electropolished	225.4049.9700	210.0949.9700	210.1049.9700	210.1949.9700	210.2049.9700	210.2349.9700
<b>O-ring disc (Item 7)</b>		<b>Material-No. / Art.-No.</b>					
<b>O-ring disc</b>	EPDM “D”  	200.5049.9041	200.5249.9041	200.5349.9041	200.5449.9041	200.5549.9041	200.5649.9041
	CR “K”	200.5049.9051	200.5249.9051	200.5349.9051	200.5449.9051	200.5549.9051	200.5649.9051
	FKM “L” 	200.5049.9071	200.5249.9071	200.5349.9071	200.5449.9071	200.5549.9071	200.5649.9071
	FFKM “C”  	200.5049.9091	200.5249.9091	200.5349.9091	200.5449.9091	200.5549.9091	200.5649.9091
<b>O-ring for design 2002 version (Item 7.4)</b>		<b>Material-No. / Art.-No.</b>					
<b>O-ring</b>	EPDM “D”  	502.0249.3541	502.0408.3541	502.0503.3541	502.0660.5341	502.0819.5341	502.1041.5341
	CR “K”	502.0249.3551	502.0408.3551	502.0503.3551	502.0660.5351	502.0819.5351	502.1041.5351
	FKM “L” 	502.0249.3571	502.0408.3571	502.0503.3571	502.0660.5371	502.0819.5371	502.1041.5371
	FFKM “C”  	502.0249.3591	502.0408.3591	502.0503.3591	502.0660.5391	502.0819.5391	502.1041.5391
<b>Split ring (Item 14)</b>		<b>Material-No. / Art.-No.</b>					
<b>Split ring</b>	Spindle Ø [mm]	12	16	16	16	20	20
	1.4404	251.0149.0000	251.0249.0000	251.0249.0000	251.0249.0000	251.0349.0000	251.0349.0000
<b>Pin (Item 57)</b>		<b>Material-No. / Art.-No.</b>					
<b>Pin</b>	Ø [mm]	3	4	4	5	5	5
	1.4310	480.0205.0000	480.0605.0000	480.0605.0000	480.0905.0000	480.1005.0000	480.1005.0000
<b>O-ring (Item 60)</b>		<b>Material-No. / Art.-No.</b>					
<b>O-ring</b>	EPDM “D”  	502.0600.3041	502.0850.4041	502.0850.4041	502.1130.4041	502.1380.4041	502.1580.5041
<b>Ball (Item 61)</b>		<b>Material-No. / Art.-No.</b>					
<b>Ball</b>	Ball Ø [mm]	6	9	9	12	12	15
	1.4401	510.0104.0000	510.0204.0000	510.0204.0000	510.0304.0000	510.0304.0000	510.0404.0000
<b>Bellows (Item 70)</b>		<b>Material-No. / Art.-No.</b>					
<b>Bellows</b>	EPDM “D” 	224.0479.0000	521.0307.0000	521.0307.0000	521.0107.0000	521.0408.0000	521.0408.0000
<b>Hose clamp (Item 71)</b>		<b>Material-No. / Art.-No.</b>					
<b>Hose clamp</b>	1.4301	524.0606.0000	524.0706.0000	524.0706.0000	524.0806.0000	–	–
	1.4401	–	–	–	–	524.0505.0000	524.0505.0000
<b>Hose clamp (Item 72)</b>		<b>Material-No. / Art.-No.</b>					
<b>Hose clamp</b>	1.4301	524.0606.0000	524.0706.0000	524.0706.0000	524.0806.0000	524.0906.0000	524.0906.0000

## Approvals

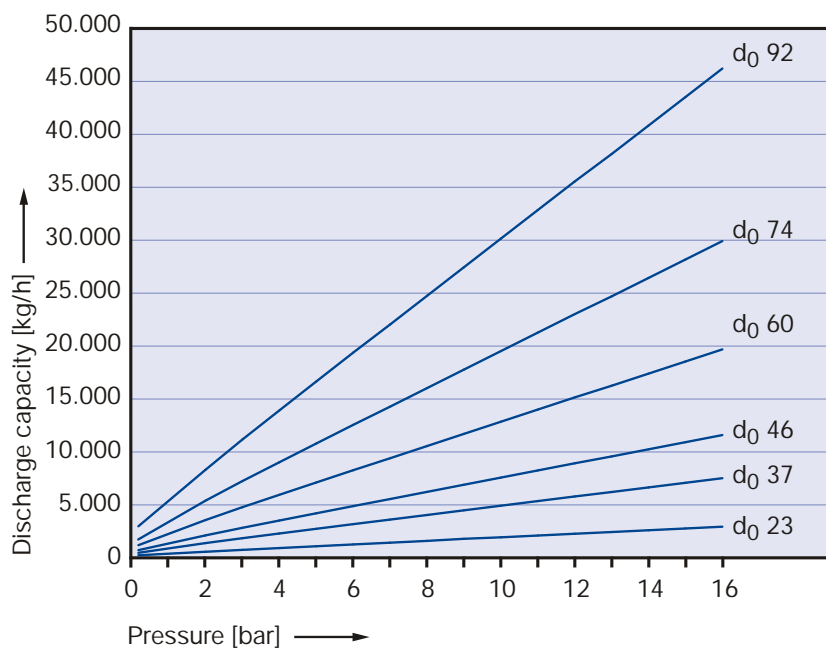
Approvals						
Actual Orifice diameter $d_0$ [mm]	23	37	46	60	74	92
Actual Orifice area $A_0$ [mm <sup>2</sup> ]	416	1075	1662	2827	4301	6648
Actual Orifice diameter $d_0$ [inch]	0,906	1,457	1,811	2,362	2,913	3,622
Actual Orifice area $A_0$ [inch <sup>2</sup> ]	0,644	1,667	2,576	4,383	6,666	10,304
<b>Europe</b>			<b>Coefficient of discharge <math>K_{dr}</math></b>			
DIN EN ISO 4126-1	Approval No.	07 202 0111 Z 0008/0/25				
	S/G	0,7				
	L	0,45				
<b>Germany</b>			<b>Coefficient of discharge <math>\alpha_w</math></b>			
AD 2000-Merkblatt A2	Approval No.	TÜV SV 1047				
	S/G	0,7				
	L	0,45				
<b>United States</b>			<b>Coefficient of discharge K</b>			
ASME Sec. VIII	Approval No.	M37022 (1,37 – 16 bar)				
	S/G	0,721				
	Approval No.	M37033 (1 – 16 bar)				
	L	0,472				
<b>Canada</b>			<b>Coefficient of discharge K</b>			
CRN	Approval No.	OG0772.9C				
	S/G	0,721				
	L	0,472				
<b>China</b>			<b>Coefficient of discharge <math>\alpha_w</math></b>			
AQSIQ	Approval No.	02301T				
	S/G	0,7				
	L	0,45				
<b>Russia</b>			<b>Coefficient of discharge <math>\alpha_w</math></b>			
GGTN/ GOSGORTECHNADZOR	Approval No.	PPL 00-18458				
GOST R	Approval No.	1989-06				
	S/G	0,7				
	L	0,45				
<b>Belarus</b>			<b>Coefficient of discharge <math>\alpha_w</math></b>			
PROMATOMNADZOR	Approval No.	15-171-2006				
	S/G	0,7				
	L	0,45				
<b>Classification societies</b>			on request			

## Capacities – Steam

Capacities for saturated steam according to AD 2000-Merkblatt A2, based on set pressure plus 10 % overpressure.  
 Capacities at 1 bar (14,5 psig) and below are based on 0,1 bar (1,45 psig) overpressure.  
 For pressure range refer to "Pressure temperature ratings" on page 03/07.

Metric Units		AD 2000-Merkblatt A2 [kg/h]					
Actual Orifice diameter $d_0$ [mm]		23	37	46	60	74	92
Actual Orifice area $A_0$ [mm <sup>2</sup> ]		416	1075	1662	2827	4301	6648
$LEO_{S/G}^{*)}$ [inch <sup>2</sup> ]		0,476	1,232	1,905	3,241	4,93	7,62
Set pressure [bar]	Capacities [kg/h]						
1	326	843	1302	2215	3370	5209	
2	519	1343	2075	3531	5371	8302	
3	699	1808	2794	4754	7232	11178	
4	871	2254	3485	5928	9018	13938	
Maximum temperature for EPDM soft seat							
5	1043	2699	4172	7097	10796	16687	
6	1214	3142	4856	8262	12568	19426	
7	1381	3574	5525	9399	14297	22098	
8	1551	4014	6205	10556	16057	24818	
9	1721	4454	6884	11712	17815	27535	
10	1891	4893	7562	12866	19571	30250	
12	2230	5770	8919	15174	23081	35675	
14	2562	6629	10247	17433	26518	40987	
16	2900	7505	11600	19735	30020	46400	

\*)  $LEO_{S/G}$  = LESER Effective Orifice steam/gas please refer to page 00/17.  
 How to use capacity-sheets refer to page 00/15.



## Capacities – Steam

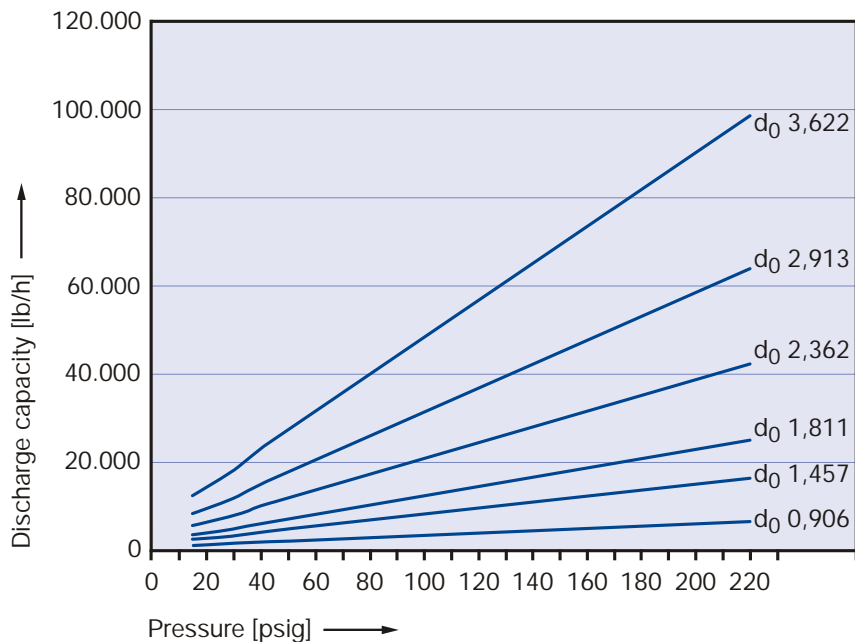
Capacities for saturated steam according to ASME VIII (UV), based on set pressure plus 10 % overpressure.  
 Capacities at 30 psig (2,07 bar) and below are based on 3 psig (0,207 bar) overpressure.  
 For pressure range refer to "Pressure temperature ratings" on page 03/07.

US Units		ASME Section VIII [lb/h]					
Actual Orifice diameter $d_0$ [inch]		0,906	1,457	1,811	2,362	2,913	3,622
Actual Orifice area $A_0$ [inch <sup>2</sup> ]		0,644	1,667	2,576	4,383	6,666	10,304
$LEO_{S/G}^{1)}$ [inch <sup>2</sup> ]		0,476	1,232	1,905	3,241	4,93	7,62
Set pressure [psig]	Capacities [lb/h]						
15 <sup>2)</sup>	748	1937	2994	5093	7747	11974	
20	863	2233	3452	5873	8933	13808	
30	1092	2826	4369	7432	11306	17475	
40	1403	3630	5610	9545	14519	22442	
50	1666	4311	6663	11335	17242	26650	
60	1929	4991	7715	13125	19965	30859	
Maximum temperature for EPDM soft seat							
70	2192	5672	8767	14915	22688	35067	
80	2455	6353	9819	16705	25411	39276	
90	2718	7033	10871	18495	28133	43485	
100	2981	7714	11923	20285	30856	47693	
120	3507	9075	14028	23865	36302	56110	
140	4033	10437	16132	27445	41748	64527	
160	4559	11798	18236	31026	47193	72944	
180	5085	13160	20340	34606	52639	81362	
200	5611	14521	22445	38186	58085	89779	
220	6137	15883	24549	41766	63530	98196	
230	6400	16563	25601	43556	66253	102404	

<sup>1)</sup>  $LEO_{S/G}$  = LESER Effective Orifice steam/gas please refer to page 00/17.

How to use capacity-sheets refer to page 00/15.

<sup>2)</sup> For steam starting from 20 psig the safety valve is certified acc. to ASME Code Sec. VIII, Div. 1.

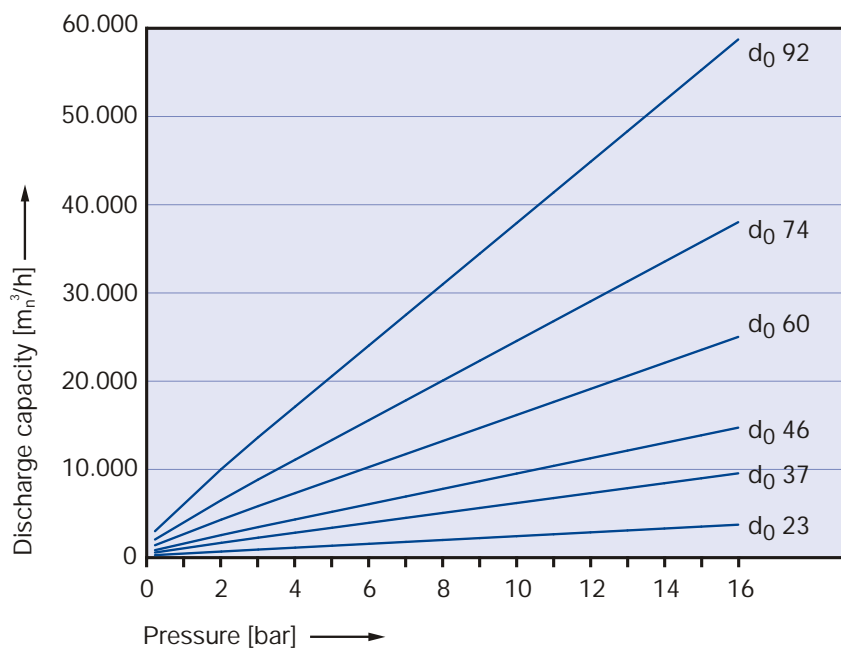


## Capacities – Air

Capacities for air according to AD 2000-Merkblatt A2, based on set pressure plus 10% overpressure at 0° C and 1013 mbar.  
 Capacities at 1 bar (14,5 psig) and below are based on 0,1 bar (1,45 psig) overpressure.  
 For pressure range refer to “Pressure temperature ratings” on page 03/07.

Metric Units	AD 2000-Merkblatt A2 [m <sub>n</sub> <sup>3</sup> /h]					
Actual Orifice diameter d <sub>0</sub> [mm]	23	37	46	60	74	92
Actual Orifice area A <sub>0</sub> [mm <sup>2</sup> ]	416	1075	1662	2827	4301	6648
LEO <sub>S/G</sub> <sup>*)</sup> [inch <sup>2</sup> ]	0,476	1,232	1,905	3,241	4,93	7,62
Set pressure [bar]	Capacities [m <sub>n</sub> <sup>3</sup> /h]					
1	388	1004	1552	2641	4017	6209
2	627	1622	2507	4265	6487	10026
3	854	2209	3414	5809	8836	13657
4	1071	2773	4286	7291	11091	17143
5	1289	3337	5157	8774	13346	20629
6	1507	3900	6029	10257	15601	24114
7	1725	4464	6900	11739	17857	27600
8	1943	5028	7771	13222	20112	31086
9	2161	5592	8643	14704	22367	34571
10	2379	6155	9514	16187	24622	38057
12	2814	7283	11257	19152	29132	45028
14	3250	8411	13000	22117	33642	52000
16	3686	9538	14743	25082	38153	58971

\*) LEO<sub>S/G</sub> = LESER Effective Orifice steam/gas please refer to page 00/17.  
 How to use capacity-sheets refer to page 00/15.

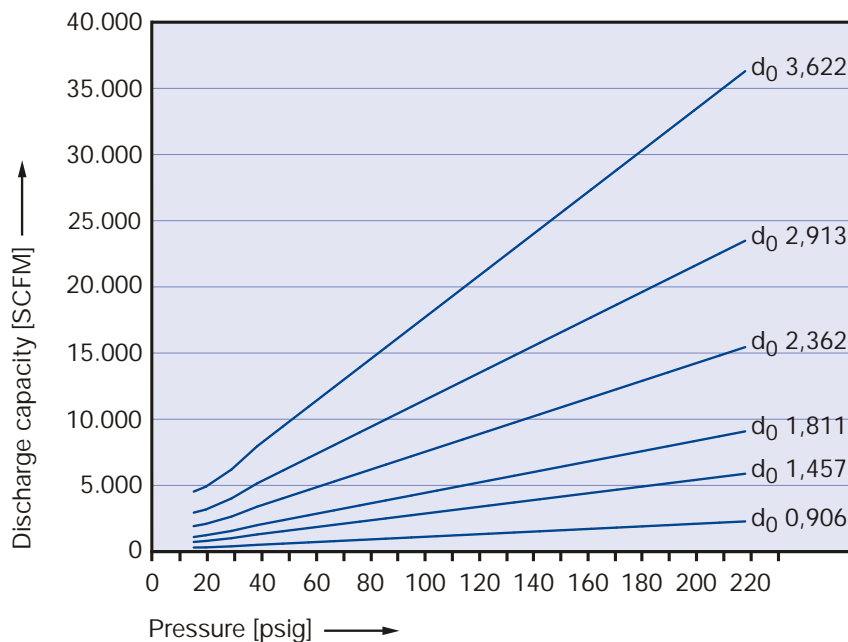


## Capacities – Air

Capacities for air according to ASME VIII (UV), based on set pressure plus 10% overpressure at 60° F and 14,5 psig.  
 Capacities at 30 psig (2,07 bar) and bellow are based on 3 psig (0,207 bar) overpressure.  
 For pressure range refer to "Pressure temperature ratings" on page 03/07.

US Units	ASME Section VIII [SCFM]					
Actual Orifice diameter $d_0$ [inch]	0,906	1,457	1,811	2,362	2,913	3,622
Actual Orifice area $A_0$ [inch <sup>2</sup> ]	0,644	1,667	2,576	4,383	6,666	10,304
$LEO_{S/G}^{1)}$ [inch <sup>2</sup> ]	0,476	1,232	1,905	3,241	4,93	7,62
Set pressure [psig]	Capacities [SCFM]					
15 <sup>2)</sup>	267	690	1066	1814	2760	4266
20	307	796	1230	2092	3182	4919
30	389	1007	1556	2648	4027	6225
40	500	1293	1999	3401	5172	7994
50	593	1536	2373	4038	6142	9494
60	687	1778	2748	4676	7112	10993
70	781	2021	3123	5314	8081	12492
80	874	2264	3498	5951	9051	13991
90	968	2506	3873	6589	10021	15490
100	1062	2749	4247	7227	10991	16990
120	1249	3234	4997	8502	12931	19988
140	1437	3719	5747	9778	14871	22986
160	1624	4204	6496	11053	16810	25985
180	1811	4689	7246	12329	18750	28983
200	1999	5174	7995	13604	20690	31982
220	2186	5659	8745	14879	22630	34980
230	2280	5902	9120	15517	23600	36479

<sup>1)</sup>  $LEO_{S/G}$  = LESER Effective Orifice steam/gas please refer to page 00/17.  
 How to use capacity-sheets refer to page 00/15.  
<sup>2)</sup> For air/gas starting from 20 psig the safety valve is certified acc. to ASME Code Sec. VIII, Div. 1.

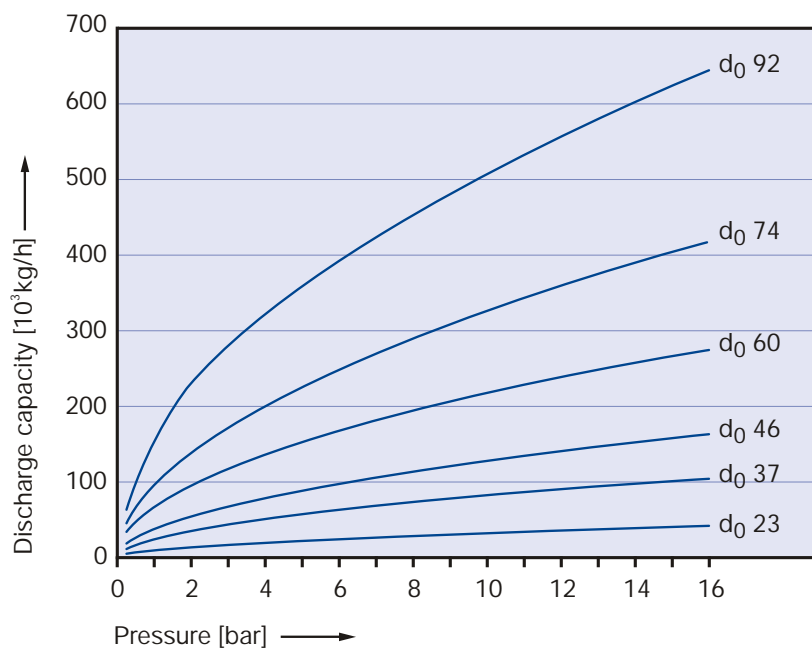


## Capacities – Water

Capacities for water according to AD 2000-Merkblatt A2, based on set pressure plus 10% overpressure at 20° C.  
 Capacities at 1 bar (14,5 psig) and below are based on 0,1 bar (1,45 psig) overpressure.  
 For pressure range refer to “Pressure temperature ratings” on page 03/07.

Metric Units	AD 2000-Merkblatt A2 [10 <sup>3</sup> kg/h]					
Actual Orifice diameter d <sub>0</sub> [mm]	23	37	46	60	74	92
Actual Orifice area A <sub>0</sub> [mm <sup>2</sup> ]	416	1075	1662	2827	4301	6648
LEO <sub>L</sub> <sup>*)</sup> [inch <sup>2</sup> ]	0,468	1,21	1,871	3,182	4,841	7,482
Set pressure [bar]	Capacities [10 <sup>3</sup> kg/h]					
1	9,97	25,8	39,9	67,9	103	160
2	14,1	36,5	56,4	96	146	226
3	17,3	44,7	69,1	118	179	276
4	19,9	51,6	79,8	136	206	319
5	22,3	57,7	89,2	152	231	357
6	24,4	63,2	97,7	166	253	391
7	26,4	68,3	106	180	273	422
8	28,2	73	113	192	292	451
9	29,9	77,4	120	204	310	479
10	31,5	81,6	126	215	326	505
12	34,6	89,4	138	235	358	553
14	37,3	96,6	149	254	386	597
16	39,9	103	160	271	413	638

\*) LEO<sub>L</sub> = LESER Effective Orifice liquids please refer to page 00/17.  
 How to use capacity-sheets refer to page 00/15.



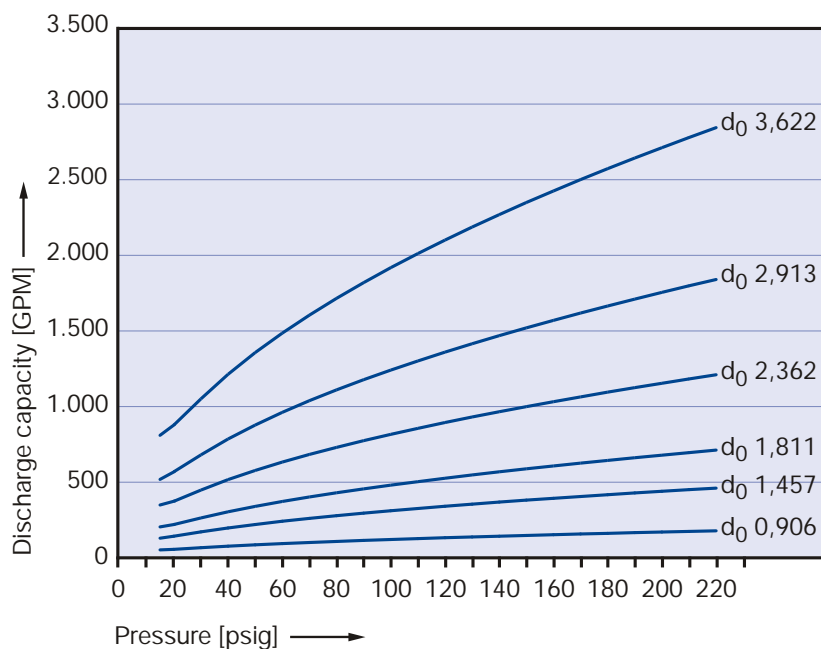


## Capacities – Water

Capacities for water according to ASME VIII (UV), based on set pressure plus 10% overpressure at 70° F.  
 Capacities at 30 psig (2,07 bar) and bellow are based on 3 psig (0,207 bar) overpressure.  
 For pressure range refer to "Pressure temperature ratings" on page 03/07.

US units	ASME Section VIII [GPM]					
Actual Orifice diameter $d_0$ [inch]	0,906	1,457	1,811	2,362	2,913	3,622
Actual Orifice area $A_0$ [inch <sup>2</sup> ]	0,644	1,667	2,576	4,383	6,666	10,304
$LEO_L^1$ [inch <sup>2</sup> ]	0,468	1,21	1,871	3,182	4,841	7,482
Set pressure [psig]	Capacities [GPM]					
15	48,9	127	196	333	507	783
20	55,3	143	221	376	573	885
30	66,3	172	265	451	686	1060
40	76,5	198	306	521	792	1224
50	85,5	221	342	582	885	1369
60	93,7	243	375	638	970	1499
70	101	262	405	689	1048	1619
80	108	280	433	736	1120	1731
90	115	297	459	781	1188	1836
100	121	313	484	823	1252	1936
120	133	343	530	902	1372	2120
140	143	371	573	974	1482	2290
160	153	396	612	1041	1584	2448
180	162	420	649	1105	1680	2597
200	171	443	684	1164	1771	2737
220	179	464	718	1221	1857	2871
230	183	475	734	1249	1899	2935

<sup>1</sup>  $LEO_L$  = LESER Effective Orifice liquids please refer to page 00/17.  
 How to use capacity-sheets refer to page 00/15.



## Determination of coefficient of discharge in case of lift restriction or back pressure

- $h$  = Lift [mm]
- $d_0$  = Flow diameter [mm] of selected safety valve, refer to table article numbers
- $h/d_0$  = Ratio of lift / flow diameter
- $p_{a0}$  = Back pressure [bar<sub>a</sub>]
- $p_0$  = Set pressure [bar<sub>a</sub>]
- $p_{a0}/p_0$  = Ratio of back pressure / set pressure
- $K_{dr}$  = Coefficient of discharge acc. to DIN EN ISO 4126-1
- $\alpha_w$  = Coefficient of discharge acc. to AD 2000-Merkblatt A2
- $K_b$  = Back pressure correction factor acc. to API 520 topic 3.3

Diagram for evaluation of ratio of lift / flow diameter ( $h/d_0$ ) in reference to the coefficient of discharge ( $K_{dr} = \alpha_w$ )

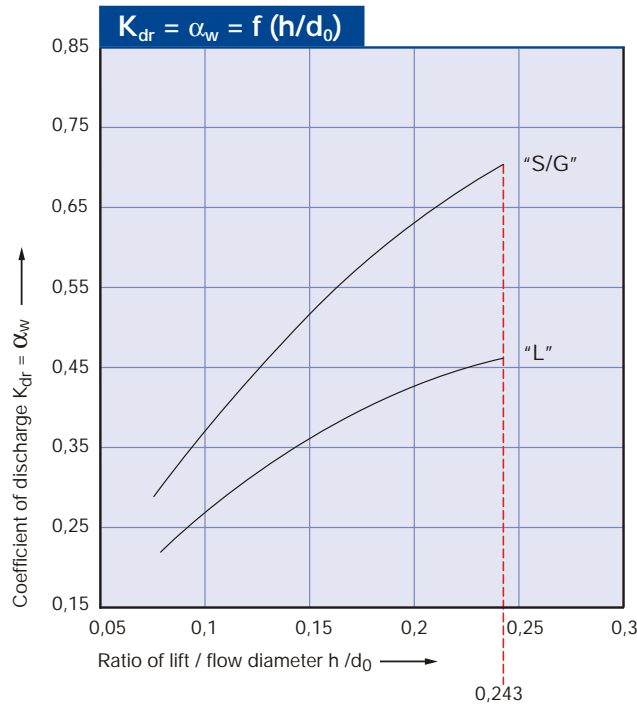
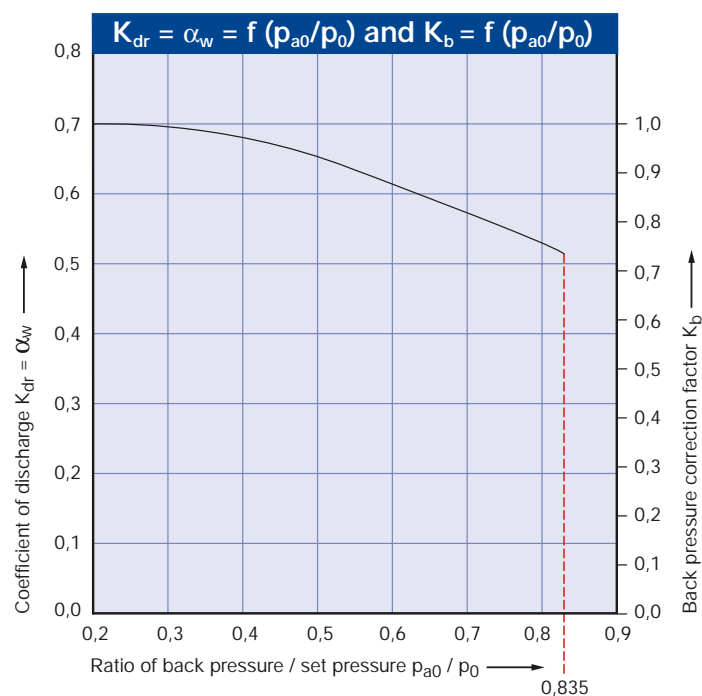


Diagram for evaluation of ratio of the coefficient of discharge ( $K_{dr} = \alpha_w$ ) in reference to the ratio of back pressure / set pressure ( $p_{a0}/p_0$ )



How to use please refer to page 00/18.



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

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• Article numbers 04/06

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• Metric Units + US Units 04/09

#### Dimensions and weights

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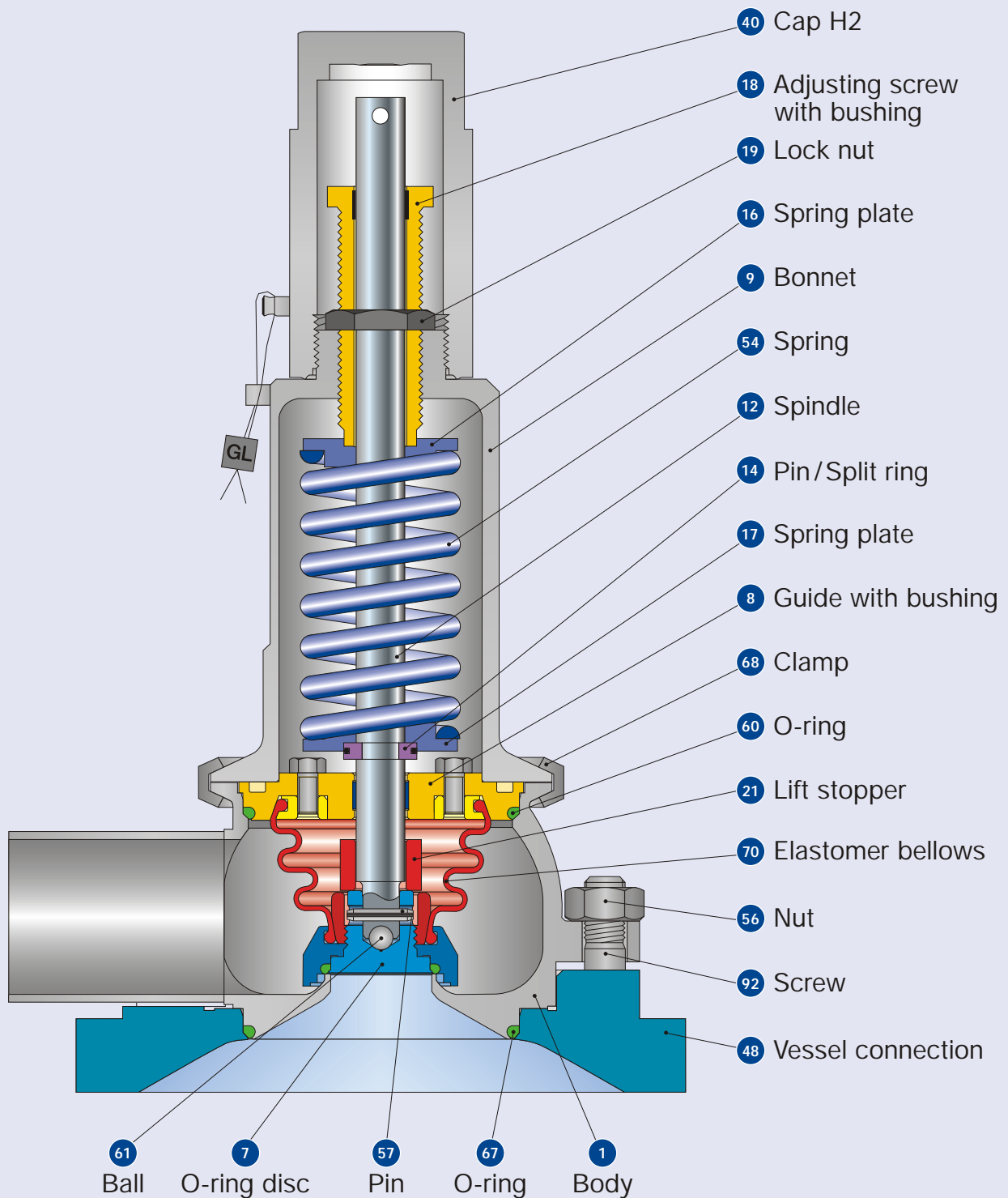
#### Capacities

• Steam, Air, Water [Metric Units] 04/18

• Steam, Air, Water [US Units] 04/19

Determination of coefficient  
of discharge  $K_{dr}/\alpha_w$  04/20

## HyTight Assembly









### Type 484 HyTight

Cap H2

Inlet: Vessel connection Type 5034

Outlet: Welded end connection

## HyTight Assembly

Materials			
Item	Component	Remarks	Type 4844 HyTight
1	Body		1.4435 (BN 2) <sup>*)</sup> SA 479 316L
7	O-ring disc	HyTight Assembly	1.4435 316L
7.4	Soft seal O-ring	"D" 	EPDM
		"K"	CR
		"L" 	FKM
		"N"	NBR
		"C" 	FFKM
8	Guide with bushing	PTFE + 15 % glass	1.4435 316L
9	Bonnet		1.4404 316L
12	Spindle		1.4404 316L
14	Pin/Split ring		1.4310 / 1.4404 Stainless steel / 316L
16 / 17	Spring plate		1.4404 316L
			1.4404 / PTFE 316L / PTFE
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		EPDM
61	Ball		1.4401 316
68	Clamp		1.4401 316
70	Elastomer bellows		EPDM
<b>Vessel connection Type 5034</b>			
48	Vessel connection		1.4435 (BN 2) <sup>*)</sup> SA 479 316L
56	Nut		1.4401 316
67	O-ring		EPDM
92	Screw		1.4404 316L
-	Blind flange for pressure test		1.4404 316L

<sup>\*)</sup> The material 1.4435/SA 479 316L fulfils the requirements of the Swiss chemical and pharmaceutical industry Basler Norm (BN 2). For details please refer to LWN 290.90.

**Please notice:**

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

## How to order – Numbering system

# 1

### Article Number

1	2	3	4
484	4	772	8

- 1** Type 484
- Small to medium capacity
  - High aseptic requirements

**2** Material code

Code	Body material
4	1.4435 (316L)

- 3** Valve code
- Identifies valve size and body material, refer to page 02/07.

Code	d <sub>0</sub>
772	13
773	25

**4** Code for lifting device

Code	Lifting device	
2	Screwed cap	H2
4	Packed knob	H4
8	Pneumatic lifting device	H8

4844.7728

Article Number

# 2

### Set Pressure

Please state unit (in gauge)!

Please do not exceed the pressure range defined in the spring charts.

For pressure range, refer to page 04/07

4 bar

Set Pressure

# 3

### Connections

Inlet:

Type 4844.772x

Vessel connection	
Article No.	Vessel wall thickness
5034.0980	≤ 5 mm
5034.0981	> 5 mm

Type 4844.773x

Vessel connection	
Article No.	Vessel wall thickness
5034.0982	≤ 5 mm
5034.0983	> 5 mm

Outlet:

Standard outlet is butt-welded end. If another connection is required, state in writing, please.

A85L83A16

Connections

## 4

### Options

**Type 484**                      **Option code**

- O-ring-disc
 

Standard: EPDM	"D"				<b>J22</b>
Option: CR	"K"				<b>J21</b>
	FKM				<b>J23</b>
	NBR	"N"			<b>J30</b>
	FFKM	"C"			<b>J20</b>
- Adaptor for lift indicator  
Bonnet **J38**
- Lift indicator **J93**
- Pneumatic lifting device H8  
Double piston design **J41**
- Bellows FFKM "C" **S70**
- LESER Surface package
 

HyClean finish		<b>B57</b>
Sterile finish		<b>B58</b>

For detailed information refer to page 04/15

Option code applies only if not standard

**J38**

**J93**

**Options**

## 5

### Documentation

Please select requested documentation:

**Inspections, tests:**                      **Option code**

DIN EN 10204-3.2: TÜV-Nord  
Certificate for test pressure                      **M33**

**LESER CGA (Certificate for Global Application)**                      **H03**

- Inspection certificate 3.1 acc. to DIN EN 10204
- Declaration of conformity acc. to PED 97/23/EC

**Material test certificate:**

DIN EN 10204-3.1

**Part**    **Option code**

- |                                |  |            |
|--------------------------------|--|------------|
| Body                           |  | <b>H01</b> |
| Bonnet                         |  | <b>L30</b> |
| Cap / lever cover              |  | <b>L31</b> |
| Disc                           |  | <b>L23</b> |
| Certificate of surface quality |  | <b>N04</b> |

**H01**

**L30**

**Documentation**

## 6

### Code and Medium

1	2
2	0

**1 Code**

1. ASME Section VIII
2. CE / VdTUEV
3. ASME Section VIII + CE / VdTUEV

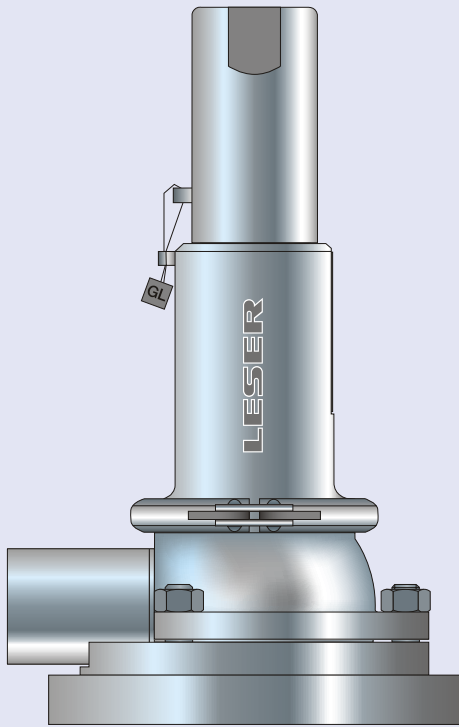
**2 Medium**

- .1 Gases
- .2 Liquids
- .3 Steam
- .0 Steam / Gases / Liquids (valid only for CE / VdTUEV)

**2.0**

**Code and Medium**

## How to order – Article numbers

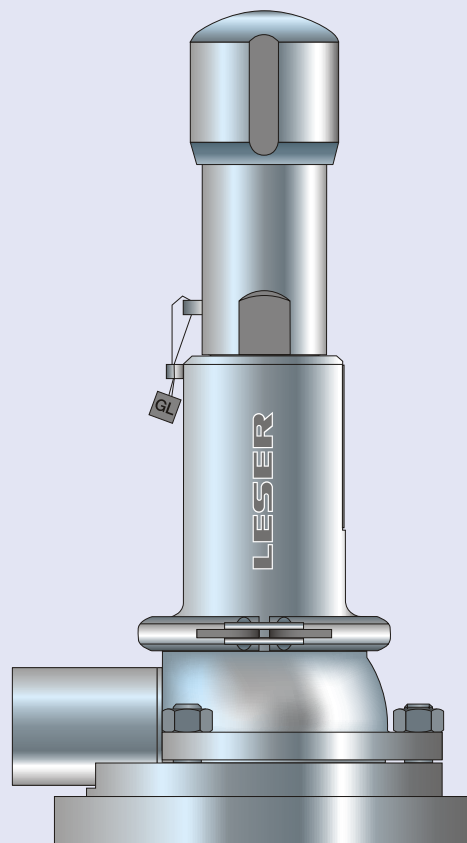


**Type 484**

Cap H2

Inlet: Vessel connection Type 5034

Outlet: Welded end connection



**Type 484**

Packed knob H4

Inlet: Vessel connection Type 5034

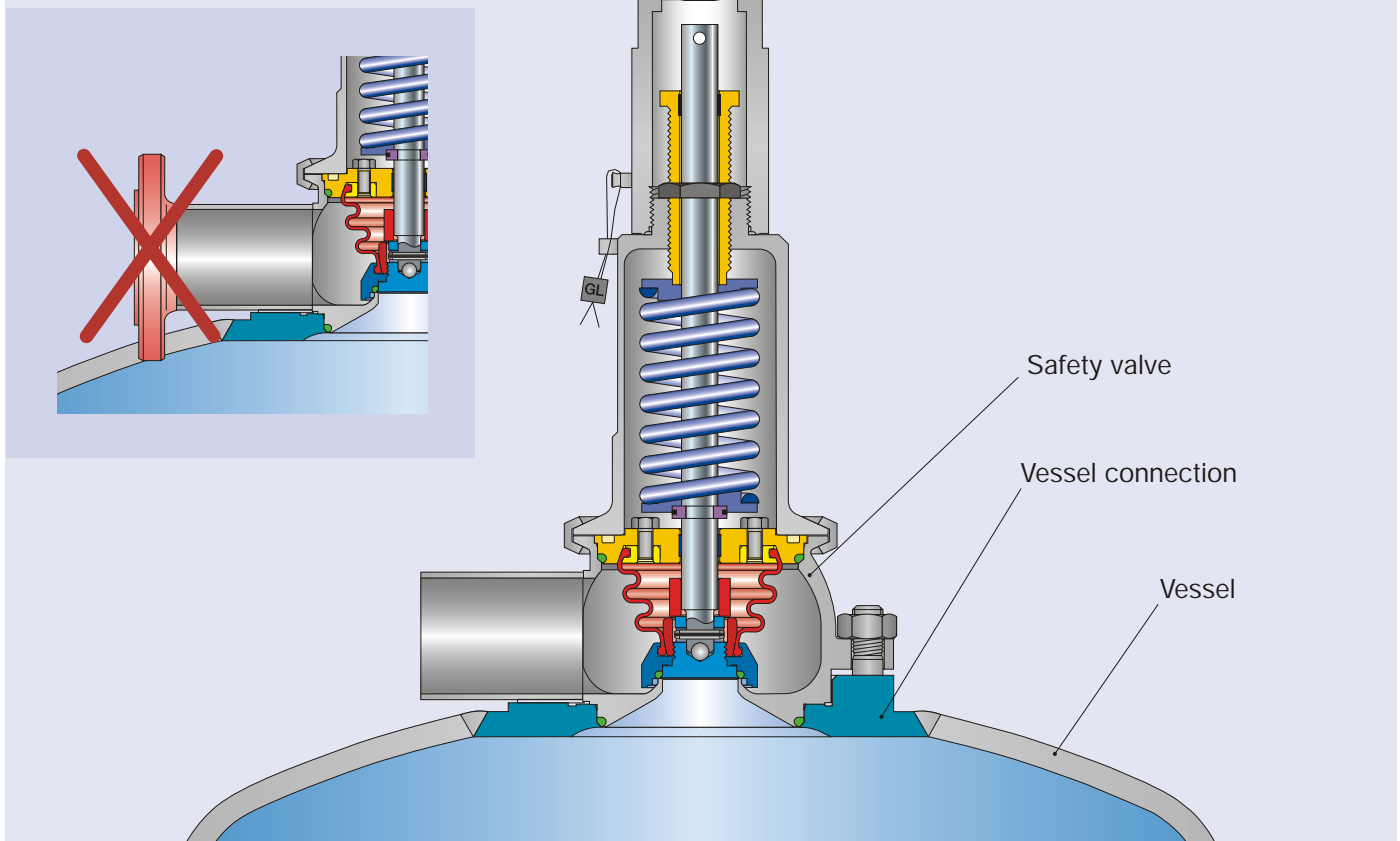
Outlet: Welded end connection



## How to order – Article numbers

Article numbers				
Actual Orifice diameter $d_0$ [mm]		13		25
Actual Orifice area $A_0$ [mm <sup>2</sup> ]		133		491
Actual Orifice diameter $d_0$ [inch]		0,512		0,984
Actual Orifice area $A_0$ [inch <sup>2</sup> ]		0,206		0,761
O-ring 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
Body material: 1.4435 (316L)				
Bonnet	H2	Art.-No. 4844.	7722	7732
	closed	H4	Art.-No. 4844.	7724
		H8	Art.-No. 4844.	7728
		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]	≤ <sup>13</sup> / <sub>64</sub>	> <sup>13</sup> / <sub>64</sub>	≤ <sup>13</sup> / <sub>64</sub>	> <sup>13</sup> / <sub>64</sub>
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.

## Pressure temperature ratings

Metric Units					
Actual Orifice diameter $d_0$ [mm]		13	25		
Actual Orifice area $A_0$ [mm <sup>2</sup> ]		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 <sup>1)</sup>		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					
Actual Orifice diameter $d_0$ [inch]		0,512	0,984		
Actual Orifice area $A_0$ [inch <sup>2</sup> ]		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 <sup>1)</sup>		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

<sup>1)</sup>The temperature is limited by the soft seal material. Refer to table "Soft seal selection" on page 99/11.

## Dimensions – Bestseller

For shortest delivery time please select bestsellers. The specified bestsellers can vary depending on different market requirements.

For further available connections please refer to page 04/12.

### Metric Units

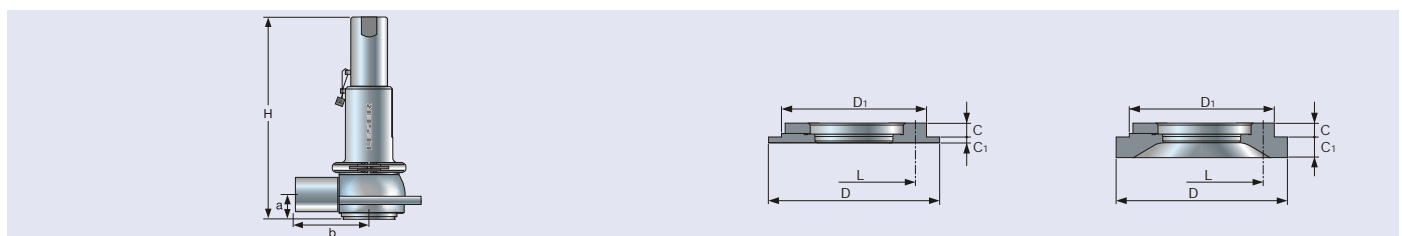
Actual Orifice diameter $d_0$ [mm]		13	
Actual Orifice area $A_0$ [mm <sup>2</sup> ]		133	
<b>Vessel connections</b>			
Vessel wall thickness			
		≤ 5 mm	> 5 mm
<b>Flange thickness</b>	C	[mm]	12,0
	C <sub>1</sub>	[mm]	5,0
<b>Diameter</b>	D	[mm]	130,0
	D <sub>1</sub>	[mm]	110,0
<b>Bolt circle</b>	L	[mm]	90,0
<b>Welded connections</b>		<b>Inlet a</b> (without vessel connection)	<b>Outlet b</b>
<b>00: Butt-welded end</b>		25	
Option code		A85L83A16	
<b>Center to face</b>	[mm]	24	80,0
<b>Height – H4</b>	H max. [mm]	201	
<b>Threaded connections</b>		<b>Inlet a</b> (without vessel connection)	<b>Outlet b</b>
<b>GD</b>		25	
Option code (DIN 11850 / DIN 11866 Range A)		A85H61A16	
Option code (DIN EN ISO 1127 / DIN 11866 Range B)		A86H61A16	
<b>Center to face</b>	[mm]	24	120
<b>Height – H4</b>	H max. [mm]	201	

		25	
		491	
<b>Vessel wall thickness</b>			
		≤ 5 mm	> 5 mm
<b>Flange thickness</b>	C	[mm]	12,0
	C <sub>1</sub>	[mm]	5,0
<b>Diameter</b>	D	[mm]	150,0
	D <sub>1</sub>	[mm]	127,0
<b>Bolt circle</b>	L	[mm]	110,0
<b>Welded connections</b>		<b>Inlet a</b> (without vessel connection)	<b>Outlet b</b>
<b>00: Butt-welded end</b>		40	
Option code		A85L83A17	
<b>Center to face</b>	[mm]	30,0	90,0
<b>Height – H4</b>	H max. [mm]	298	
<b>Threaded connections</b>		<b>Inlet a</b> (without vessel connection)	<b>Outlet b</b>
<b>GD</b>		40	
Option code (DIN 11850 / DIN 11866 Range A)		A85H61A17	
Option code (DIN EN ISO 1127 / DIN 11866 Range B)		A86H61A17	
<b>Center to face</b>	[mm]	30,0	130
<b>Height – H4</b>	H max. [mm]	298	

### US Units

Actual Orifice diameter $d_0$ [inch]		0,512	
Actual Orifice area $A_0$ [inch <sup>2</sup> ]		0,206	
<b>Vessel connections</b>			
Vessel wall thickness			
		≤ <sup>13</sup> / <sub>64</sub> inch	> <sup>13</sup> / <sub>64</sub> inch
<b>Flange thickness</b>	C	[inch]	<sup>15</sup> / <sub>32</sub>
	C <sub>1</sub>	[inch]	<sup>3</sup> / <sub>16</sub>
<b>Diameter</b>	D	[inch]	5 <sup>1</sup> / <sub>8</sub>
	D <sub>1</sub>	[inch]	4 <sup>11</sup> / <sub>32</sub>
<b>Bolt circle</b>	L	[inch]	3 <sup>17</sup> / <sub>32</sub>
<b>Welded connections</b>		<b>Inlet a</b> (without vessel connection)	<b>Outlet b</b>
<b>00: Butt-welded end</b>		25	
Option code		A85L83A16	
<b>Center to face</b>	[inch]	<sup>15</sup> / <sub>16</sub>	3 <sup>5</sup> / <sub>32</sub>
<b>Height – H4</b>	H max. [inch]	7 <sup>29</sup> / <sub>32</sub>	
<b>Threaded connections</b>		<b>Inlet a</b> (without vessel connection)	<b>Outlet b</b>
<b>GD</b>		25	
Option code (DIN 11850 / DIN 11866 Range A)		A85H61A16	
Option code (DIN EN ISO 1127 / DIN 11866 Range B)		A86H61A16	
<b>Center to face</b>	[inch]	<sup>15</sup> / <sub>16</sub>	4 <sup>23</sup> / <sub>32</sub>
<b>Height – H4</b>	H max. [inch]	7 <sup>29</sup> / <sub>32</sub>	

		0,984	
		0,761	
<b>Vessel wall thickness</b>			
		≤ <sup>13</sup> / <sub>64</sub> inch	> <sup>13</sup> / <sub>64</sub> inch
<b>Flange thickness</b>	C	[inch]	<sup>15</sup> / <sub>32</sub>
	C <sub>1</sub>	[inch]	<sup>3</sup> / <sub>16</sub>
<b>Diameter</b>	D	[inch]	5 <sup>29</sup> / <sub>32</sub>
	D <sub>1</sub>	[inch]	4 <sup>11</sup> / <sub>32</sub>
<b>Bolt circle</b>	L	[inch]	4 <sup>11</sup> / <sub>32</sub>
<b>Welded connections</b>		<b>Inlet a</b> (without vessel connection)	<b>Outlet b</b>
<b>00: Butt-welded end</b>		40	
Option code		A85L83A17	
<b>Center to face</b>	[inch]	1 <sup>3</sup> / <sub>16</sub>	3 <sup>17</sup> / <sub>32</sub>
<b>Height – H4</b>	H max. [inch]	11 <sup>3</sup> / <sub>8</sub>	
<b>Threaded connections</b>		<b>Inlet a</b> (without vessel connection)	<b>Outlet b</b>
<b>GD</b>		40	
Option code (DIN 11850 / DIN 11866 Range A)		A85H61A17	
Option code (DIN EN ISO 1127 / DIN 11866 Range B)		A86H61A17	
<b>Center to face</b>	[inch]	1 <sup>3</sup> / <sub>16</sub>	5 <sup>3</sup> / <sub>32</sub>
<b>Height – H4</b>	H max. [inch]	11 <sup>3</sup> / <sub>8</sub>	

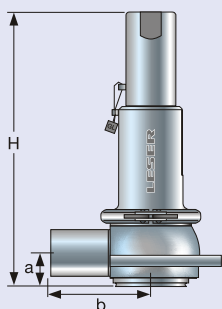


Type 484 – Gastight cap H2

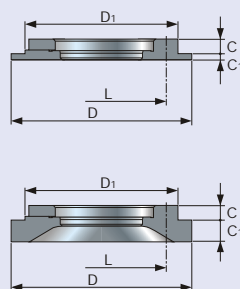
Type 5034 – Vessel connection

## Dimensions and weights

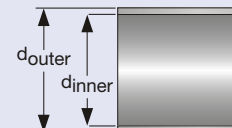
Metric Units					
Actual Orifice diameter $d_0$ [mm]			13	25	
Actual Orifice area $A_0$ [mm <sup>2</sup> ]			133	491	
Vessel connections				Vessel wall thickness	
				$\leq 5$ mm	$> 5$ mm
				<b>16</b>	<b>16</b>
Flange thickness	C	[mm]	12,0	12,0	
	$C_1$	[mm]	5,0	18,0	
Diameter	D	[mm]	130,0	130,0	
	$D_1$	[mm]	110,0	110,0	
Bolt circle	L	[mm]	90,0	90,0	
Welded connections				Inlet a	Outlet b
				(without vessel connection)	(without vessel connection)
				<b>16</b>	<b>16</b>
Center to face		[mm]	24	80	
Height – H4	H max.	[mm]	201		
Height – H8	H max.	[mm]	229		
double piston design				289	
Clamp connections				Inlet a	Outlet b
				(without vessel connection)	(without vessel connection)
				<b>16</b>	<b>16</b>
Center to face		[mm]	24	102	
Clamp diameter	$d_{inner}$	[mm]	For varying clamp diameters please refer to page 00/11		
	$d_{outer}$	[mm]	For varying clamp diameters please refer to page 00/11		
Height – H4	H max.	[mm]	201		
Height – H8	H max.	[mm]	229		
double piston design				289	
Threaded connections				Inlet a	Outlet b
				(without vessel connection)	(without vessel connection)
				<b>16</b>	<b>16</b>
Center to face		[mm]	24	120	
Height – H4	H max.	[mm]	201		
Height – H8	H max.	[mm]	229		
double piston design				289	
Flanged connections				Inlet a	Outlet b
				(without vessel connection)	(without vessel connection)
				<b>16</b>	<b>16</b>
Center to face		[mm]	24	126	
Height – H4	H max.	[mm]	201		
Height – H8	H max.	[mm]	229		
double piston design				289	
Weight					
Weight	max.	[kg]	3,0	4,0	



Type 484 – Cap H2



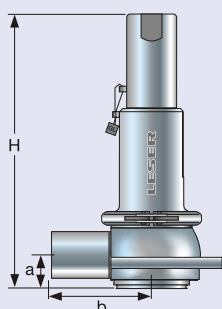
Type 5034 – Vessel connection



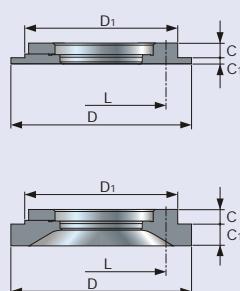
Tube end

## Dimensions and weights

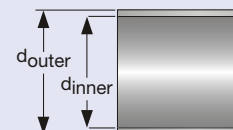
US Units						
Actual Orifice diameter $d_0$ [inch]			0,512		0,984	
Actual Orifice area $A_0$ [inch <sup>2</sup> ]			0,206		0,761	
Vessel connections			Vessel wall thickness		Vessel wall thickness	
			$\leq 13/64$ inch	$> 13/64$ inch	$\leq 13/64$ inch	$> 13/64$ inch
PN			16	16	16	16
Flange thickness	C	[inch]	$15/32$	$15/32$	$15/32$	$15/32$
	C <sub>1</sub>	[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 <sub>1</sub>	[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 (without vessel connection)		Outlet b (without vessel connection)	
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 (without vessel connection)		Outlet b (without vessel connection)	
PN			16	16	16	16
Center to face		[inch]	$15/16$	4	$1 3/16$	$4 3/8$
Clamp diameter	d <sub>inner</sub>	[inch]	For varying clamp diameters please refer to page 00/11		For varying clamp diameters please refer to page 00/11	
	d <sub>outer</sub>	[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 (without vessel connection)		Outlet b (without vessel connection)	
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 (without vessel connection)		Outlet b (without vessel connection)	
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	



Type 484 – Cap H2



Type 5034 – Vessel connection



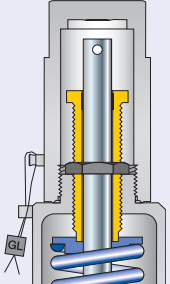
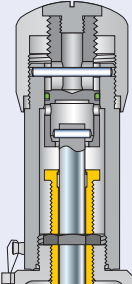
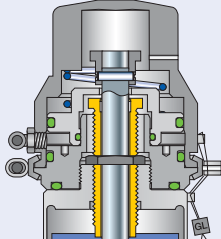
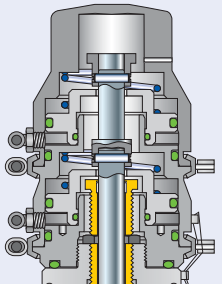





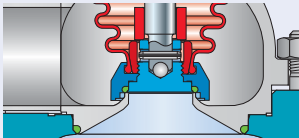

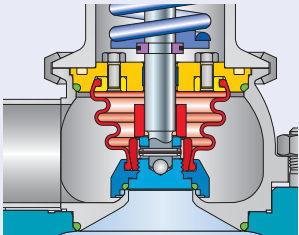


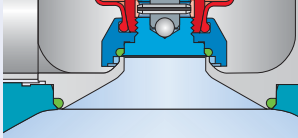
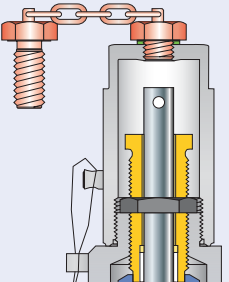
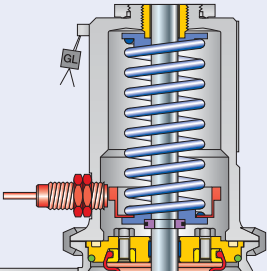
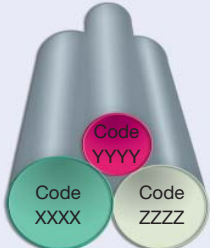
Tube end

## Option codes for available connections

For detailed information about the available connections please refer to "How to use" on page 00/07

Connections			
Clamps		Option code inlet	
For dimensions refer to page 00/07	For inlet please select vessel connection Type 5034 as shown on page 04/07. For connections directly machined into vessel wall please ask for drawing.		
Threaded connections		Option code inlet	
Pipe standard			
DIN 11850 / DIN 11866 Range A			
Pipe standard			
DIN EN ISO 1127 / DIN 11866 Range B			
Pipe standard			
BS 4825-1 DIN 11866 Range C			
Flange connections		Option code inlet	
Pipe standard			
DIN 11850 / DIN 11866 Range A			
Pipe standard			
DIN EN ISO 1127 / DIN 11866 Range B			
Pipe standard			
BS 4825-1 DIN 11866 Range C			
		$d_0$ [mm]	13                      25
		$d_0$ [inch]	0,512                      0,984
		Option code outlet	
		DN	25                      40
		SO	L86A16                      L86A17
		DO	I74A16                      I74A17
		NPS	1 1/2"                      2"
		BO	I76A80                      I76A81
		CO	L97A80                      L97A81
		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
		DN	25                      40
		NF	A85H72A16                      A85H72A17
		BF	A85H74A16                      A85H74A17
		NG	A85H76A16                      A85H76A17
		BG	A85H78A16                      A85H78A17
		TN	A85L84A16                      A85L84A17
		AF	A85L91A16                      A85L91A17
		AN	A85L93A16                      A85L93A17
		DN	25                      40
		NF	A86H72A16                      A86H72A17
		BF	A86H74A16                      A86H74A17
		NG	A86H76A16                      A86H76A17
		BG	A86H78A16                      A86H78A17
		NPS	1 1/2"                      2"
		NF	A84H72A80                      A84H72A81
		BF	A84H74A80                      A84H74A81
		NG	A84H76A80                      A84H76A81
		BG	A84H78A80                      A84H78A81

## Available options

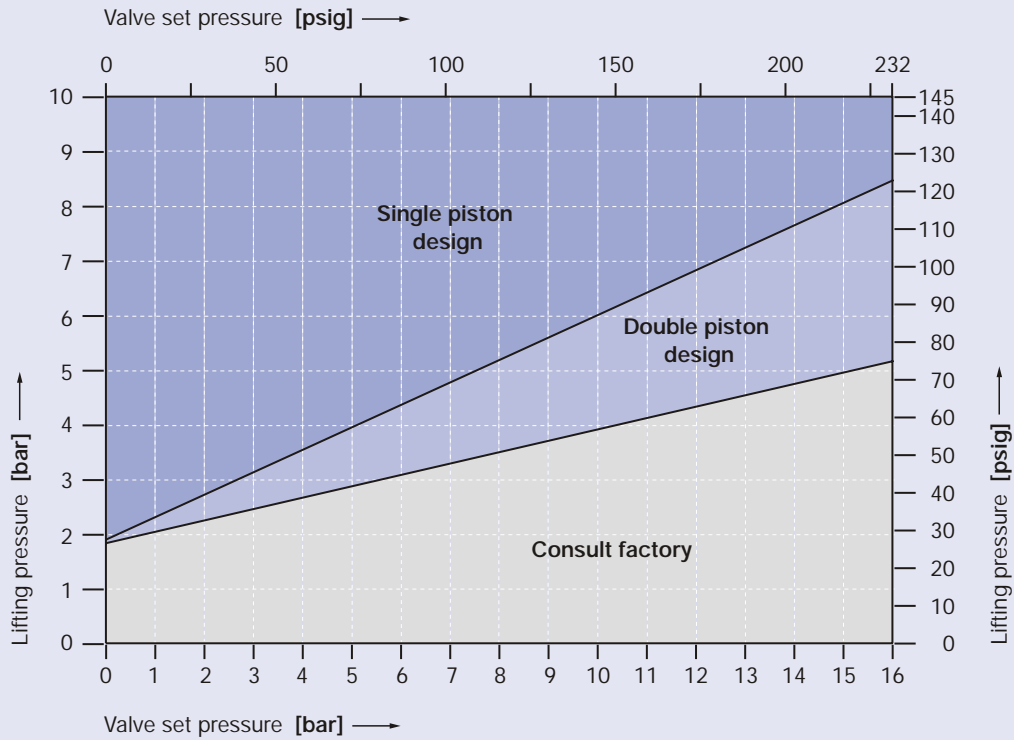
<p><b>Gastight cap H2</b> H2</p> 	<p><b>Gastight lifting device H4</b> Packed knob H4</p> 	<p><b>Pneumatic lifting device H8</b> H8 single piston design</p> 	<p><b>Pneumatic lifting device H8</b> J41: H8 double piston design</p> 
<p><b>O-ring-disc</b> J22: EPDM "D"   J21: CR "K" J23: FKM "L"  J30: NBR "N" J20: FFKM "C"  </p> 	<p><b>Bellows FFKM "C"</b>  S70</p> 	<p><b>Blind flange for pressure test</b> Material-No. 138.8849.9000 (d<sub>0</sub> 13) Material-No. 138.8649.9000 (d<sub>0</sub> 25)</p> 	<p><b>O-ring for vessel connection</b> EPDM "D"  Material-No. 502.0460.3041 (d<sub>0</sub> 13) Material-No. 502.0600.3041 (d<sub>0</sub> 25)</p> 
<p><b>Test gag</b> J70: H2</p> 			
<p><b>Lift indicator placed in bonnet</b> J38 + J93</p> 	<p><b>Special material</b> 2.4610 HASTELLOY C4 2.4360 MONEL 400 1.4462 DUPLEX</p> 		

## Selection chart H8

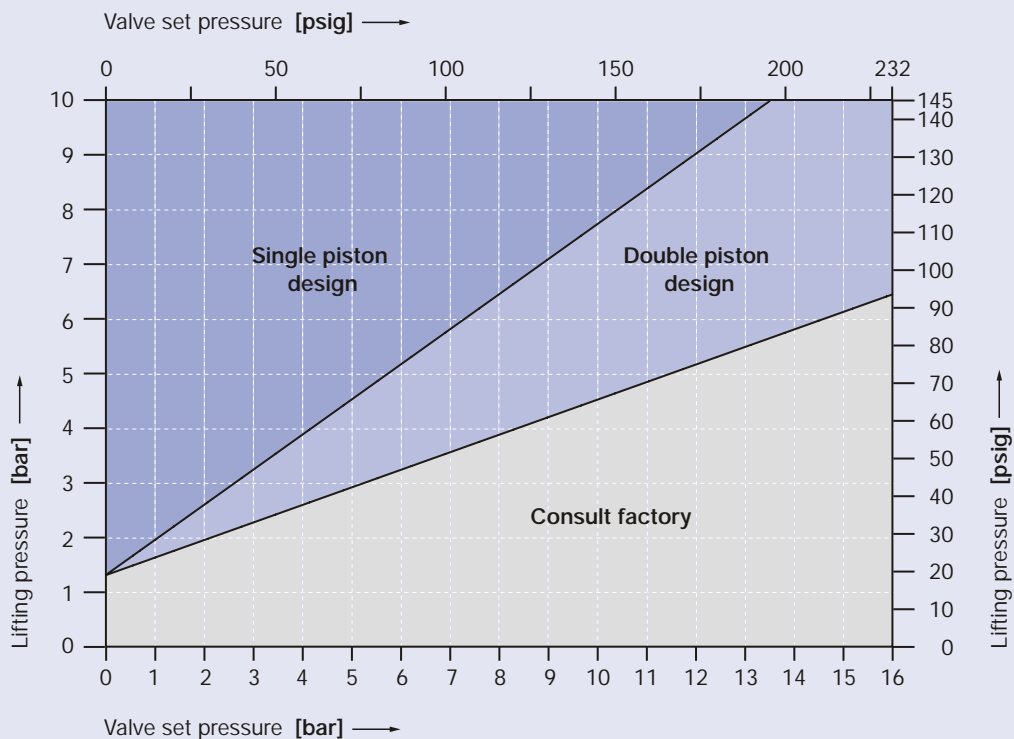
Depending on the set pressure and lifting pressure (air supply) a double piston lifting device (option code J41) may be required instead of a single piston. The chart below determines the required lifting device.

For information about this chart please refer to "How to use" on page 00/12.

**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**



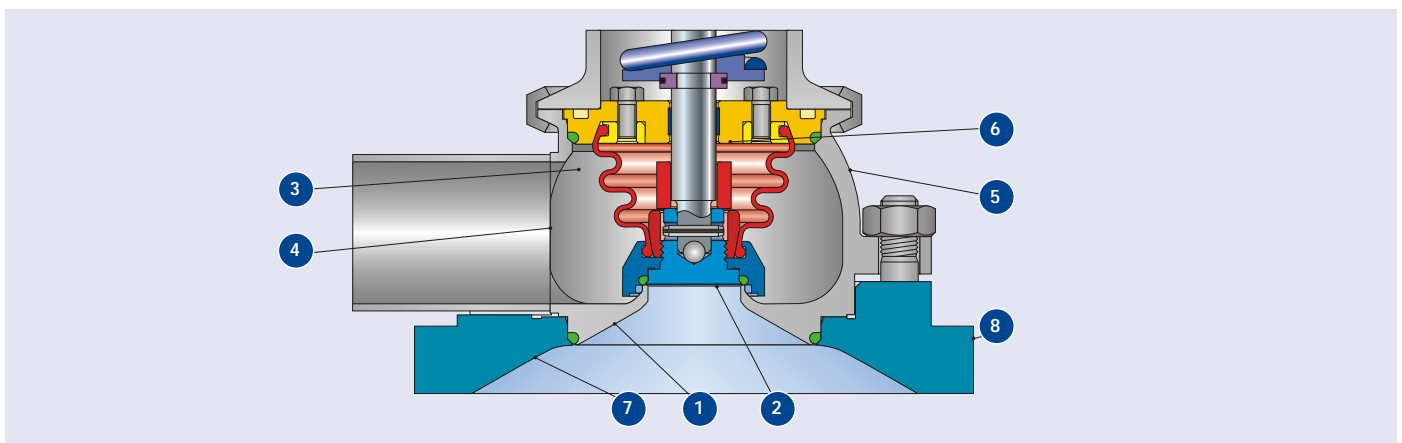


## Surface quality












Surface quality			LESER Surface package				
Type of surface	Area		Option code	Clean finish	HyClean finish	Sterile finish	
	Description	No.		B56	B57	B58	
				R <sub>a</sub> max.	R <sub>a</sub> max.	R <sub>a</sub> max.	
<b>LESER Surface grade</b>							
Product contact surface	Inlet	1		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		Option code	LESER Surface package		
	Description	No.		Clean finish	HyClean finish	Sterile finish
				B59	B60	B61
				R <sub>a</sub> max.	R <sub>a</sub> max.	R <sub>a</sub> max.
<b>LESER Surface grade</b>						
Product contact surface	Vessel side	7		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.



## Order information – Spare parts

Spare parts			
Actual Orifice diameter $d_0$ [mm]		13	25
Actual Orifice area $A_0$ [mm <sup>2</sup> ]		133	491
Actual Orifice diameter $d_0$ [inch]		0,512	0,984
Actual Orifice area $A_0$ [inch <sup>2</sup> ]		0,206	0,761
Disc (Item 7): Soft seal		Material-No. / Art.-No.	
<b>Disc</b> 1.4435	EPDM "D" 	200.8169.9741	200.2569.9741
	CR "K"	200.8169.9751	200.2569.9751
	FKM "L" 	200.8169.9771	200.2569.9771
	NBR "N"	200.8169.9781	200.2569.9781
	FFKM "C" 	200.8169.9791	200.2569.9791
Assembly tool for Aseptic O-ring disc		tool not required for this valve size	445.0139.0000
O-ring (Item 7.4)		Material-No. / Art.-No.	
<b>O-ring</b>	EPDM "D" 	502.0123.2641	502.0250.2641
	CR "K"	502.0123.2651	502.0250.2651
	FKM "L" 	502.0123.2671	502.0250.2671
	NBR "N"	502.0123.2681	502.0250.2681
	FFKM "C" 	502.0123.2691	502.0250.2691
Pin / Split ring (Item 14)		Material-No. / Art.-No.	
<b>Pin / Split ring</b>	Spindle $\varnothing$ [mm]	8	12
	1.4310 / 1.4404	480.0405.0000	251.0149.0000
Pin (Item 57)		Material-No. / Art.-No.	
<b>Pin</b>	$\varnothing$ [mm]	3	3
	1.4310	480.0405.0000	480.0405.0000
O-ring body / guide (Item 60)		Material-No. / Art.-No.	
<b>O-ring</b>	EPDM "D" 	502.0460.3041	502.0600.3041
	FFKM "C" 	502.0123.3021	502.0600.3021
Ball (Item 61)		Material-No. / Art.-No.	
<b>Ball</b>	$\varnothing$ [mm]	6	6
	1.4401	510.0104.0000	510.0104.0000
O-ring vessel connection (Item 67)		Material-No. / Art.-No.	
<b>O-ring</b>	EPDM "D" 	502.0460.3041	502.0600.3041
Bellows (Item 70)		Material-No. / Art.-No.	
<b>Bellows</b>	EPDM "D" 	224.2329.9000	224.2429.9000
	FFKM "C" 	on request	on request

## Approvals

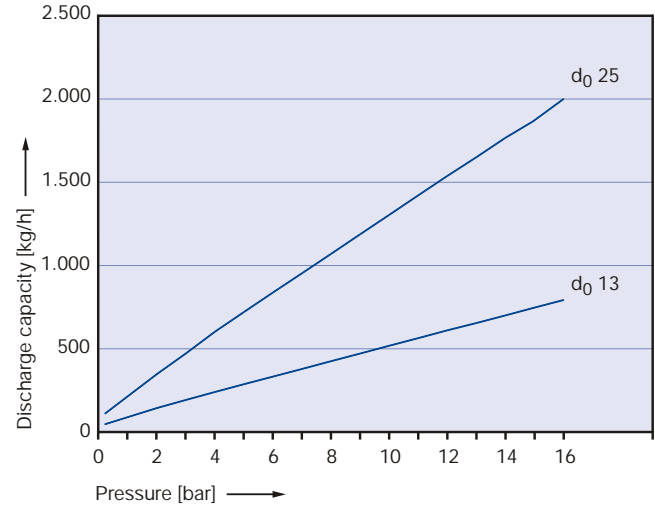
Approvals		
Actual Orifice diameter $d_0$ [mm]	13	25
Actual Orifice area $A_0$ [mm <sup>2</sup> ]	133	491
Actual Orifice diameter $d_0$ [inch]	0,512	0,984
Actual Orifice area $A_0$ [inch <sup>2</sup> ]	0,206	0,761
<b>Europe</b> <span style="float: right;">Coefficient of discharge <math>K_{dr}</math></span>		
DIN EN ISO 4126-1	Approval No.	07 202 0111 Z 0008/0/20
	S/G	0,60
	L	0,40
<b>Germany</b> <span style="float: right;">Coefficient of discharge <math>\alpha_w</math></span>		
AD 2000-Merkblatt A2	Approval No.	TÜV SV 1047
	S/G	0,60
	L	0,40
<b>United States</b> <span style="float: right;">Coefficient of discharge K</span>		
ASME Sec. VIII	Approval No.	M37145
	S/G	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) S: 5,52 lb / hr / psia $\Delta K \approx 0,521$ G: 1,96 SCFM / psia $\Delta K \approx 0,521$
	L	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) L: 2,96 GPM $\sqrt{\text{psid}^*)} \Delta K \approx 0,379$
	Approval No.	M37156
	S/G	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) S: 13,97 lb / hr / psia $\Delta K \approx 0,357$ G: 4,96 SCFM / psia $\Delta K \approx 0,357$
	L	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) L: 7,46 GPM $\sqrt{\text{psid}^*)} \Delta K \approx 0,258$
	Approval No.	M37167
	S/G	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) S: 13,97 lb / hr / psia $\Delta K \approx 0,357$ G: 4,96 SCFM / psia $\Delta K \approx 0,357$
	L	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) L: 7,46 GPM $\sqrt{\text{psid}^*)} \Delta K \approx 0,258$
<b>Canada</b> <span style="float: right;">Coefficient of discharge K</span>		
CRN	Approval No.	OG0772.9C
	S/G	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) S: 5,52 lb / hr / psia $\Delta K \approx 0,521$ G: 1,96 SCFM / psia $\Delta K \approx 0,521$
	L	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) L: 2,96 GPM $\sqrt{\text{psid}^*)} \Delta K \approx 0,379$
	S/G	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) S: 13,97 lb / hr / psia $\Delta K \approx 0,357$ G: 4,96 SCFM / psia $\Delta K \approx 0,357$
	L	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) L: 7,46 GPM $\sqrt{\text{psid}^*)} \Delta K \approx 0,258$
<b>China</b> <span style="float: right;">Coefficient of discharge <math>\alpha_w</math></span>		
AQSIQ	Approval No.	02301T
	S/G	0,60
	L	0,40
<b>Russia</b> <span style="float: right;">Coefficient of discharge <math>\alpha_w</math></span>		
GGTN/ GOSGORTECHNADZOR	Approval No.	PPC00-18458
GOST R	Approval No.	1989-06
	S/G	0,60
	L	0,40
<b>Belarus</b> <span style="float: right;">Coefficient of discharge <math>\alpha_w</math></span>		
PROMATOMNADZOR	Approval No.	15-171-2006
	S/G	0,60
	L	0,40
<b>Classification societies</b>		
on request		

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

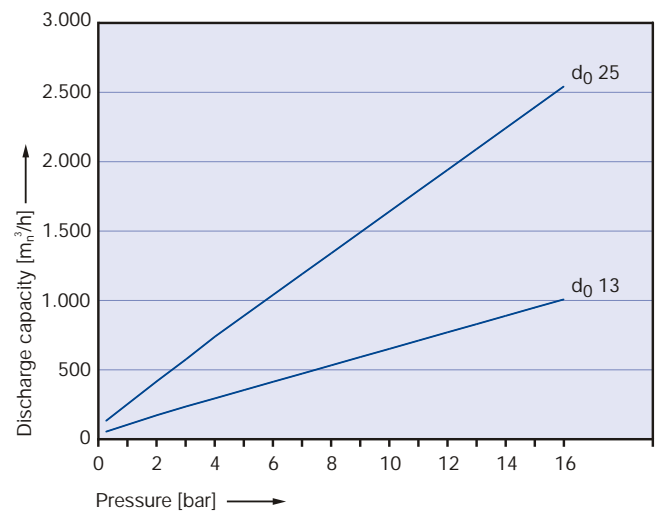
## Capacities – Metric Units

Capacities for saturated steam, air at 0° C and 1013 mbar, water at 20° C according to AD 2000-Merkblatt A2, based on set pressure plus 10% overpressure. Capacities at 1 bar (14,5 psig) and below are based on 0,1 bar (1,45 psig) overpressure. For pressure range refer to "Pressure temperature ratings" on page 04/08.

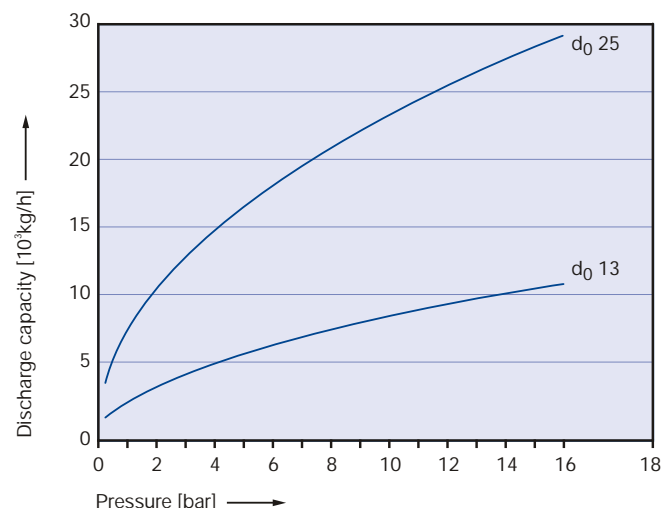
Steam		AD 2000-Merkblatt A2 [kg/h]	
Actual Orifice diameter $d_0$ [mm]	13	25	
Actual Orifice area $A_0$ [mm <sup>2</sup> ]	133	491	
LEO <sub>S/G</sub> <sup>*)</sup> [inch <sup>2</sup> ]	0,110	0,279	
Set pressure [bar]	Capacities [kg/h]		
1	88	213	
2	142	347	
3	191	472	
4	239	603	
Maximum temperature for EPDM soft seal			
5	286	722	
6	332	840	
7	378	956	
8	425	1073	
9	471	1191	
10	518	1308	
12	611	1543	
14	701	1773	
16	794	2007	



Air		AD 2000-Merkblatt A2 [m <sup>3</sup> /h]	
Actual Orifice diameter $d_0$ [mm]	13	25	
Actual Orifice area $A_0$ [mm <sup>2</sup> ]	133	491	
LEO <sub>S/G</sub> <sup>*)</sup> [inch <sup>2</sup> ]	0,110	0,279	
Set pressure [bar]	Capacities [m <sup>3</sup> /h]		
1	105	254	
2	171	418	
3	234	576	
4	293	741	
5	353	892	
6	413	1043	
7	472	1194	
8	532	1344	
9	592	1495	
10	651	1646	
12	771	1947	
14	890	2249	
16	1009	2551	



Water		AD 2000-Merkblatt A2 [10 <sup>3</sup> kg/h]	
Actual Orifice diameter $d_0$ [mm]	13	25	
Actual Orifice area $A_0$ [mm <sup>2</sup> ]	133	491	
LEO <sub>L</sub> <sup>*)</sup> [inch <sup>2</sup> ]	0,082	0,302	
Set pressure [bar]	Capacities [10 <sup>3</sup> kg/h]		
1	2,83	7,33	
2	4,01	10,4	
3	4,91	12,7	
4	5,66	14,7	
5	6,33	16,4	
6	6,94	18	
7	7,49	19,4	
8	8,01	20,7	
9	8,5	22	
10	8,96	23,2	
12	9,81	25,4	
14	10,6	27,4	
16	11,3	29,3	

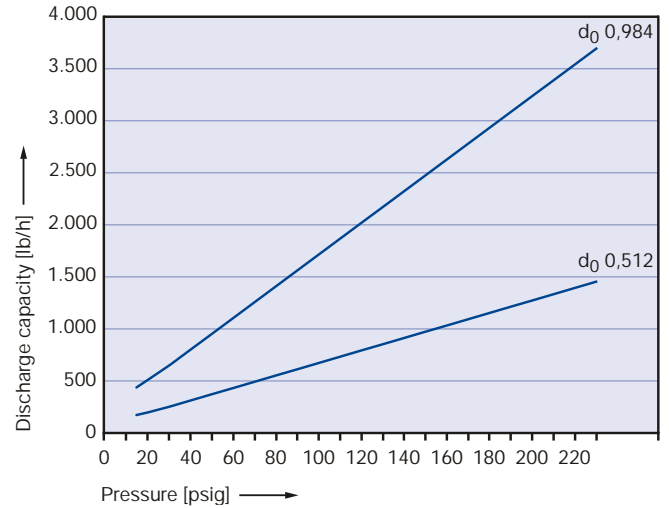


\*) LEO<sub>S/G/L</sub> = LESER Effective Orifice steam/gas/liquids please refer to page 00/17.  
How to use capacity-sheets refer to page 00/15.

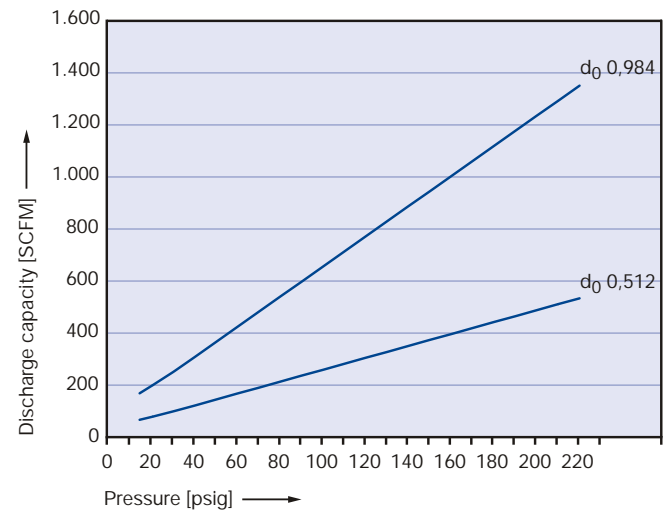
## Capacities – US Units

Capacities for saturated steam, air at 60°F and 14,5 psig, water at 70°F according to ASME VIII (UV), based on set pressure plus 10% overpressure. Capacities at 30 psig (2,07 bar) and below are based on 3 psig (0,207 bar) overpressure. For pressure range refer to "Pressure temperature ratings" on page 04/08.

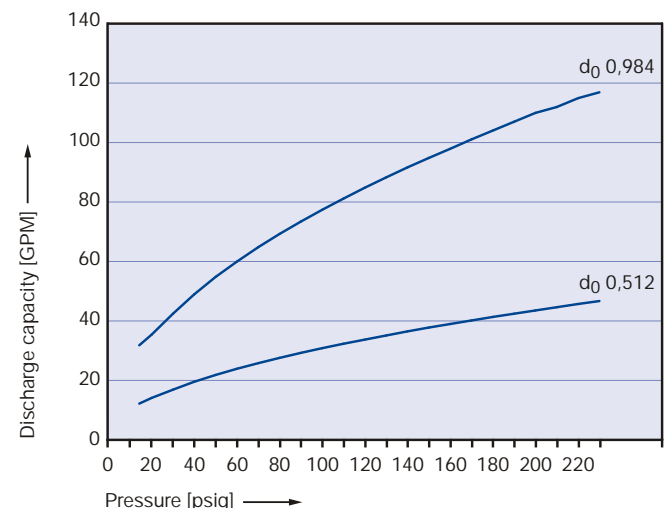
Steam		ASME Section VIII [lb/h]	
Actual Orifice diameter $d_0$ [inch]	0,512	0,984	
Actual Orifice area $A_0$ [inch <sup>2</sup> ]	0,206	0,761	
LEO <sub>SL</sub> <sup>1)</sup> [inch <sup>2</sup> ]	0,110	0,279	
Set pressure [psig]	Capacities [lb/h]		
15	180	457	
20	208	527	
30	263	667	
40	324	821	
50	385	974	
60	445	1128	
Maximum temperature for EPDM soft seal			
70	506	1282	
80	567	1436	
90	627	1590	
100	688	1744	
120	810	2052	
140	931	2359	
160	1052	2667	
180	1174	2975	
200	1295	3283	
220	1417	3590	
230	1478	3744	



Air		ASME Section VIII [SCFM]	
Actual Orifice diameter $d_0$ [inch]	0,512	0,984	
Actual Orifice area $A_0$ [inch <sup>2</sup> ]	0,206	0,761	
LEO <sub>SL</sub> <sup>1)</sup> [inch <sup>2</sup> ]	0,110	0,279	
Set pressure [psig]	Capacities [SCFM]		
15	64	163	
20	74	188	
30	94	238	
40	115	292	
50	137	347	
60	159	402	
70	180	457	
80	202	512	
90	224	566	
100	245	621	
120	289	731	
140	332	841	
160	375	950	
180	419	1060	
200	462	1170	
220	505	1279	
230	527	1334	



Water		ASME Section VIII [GPM]	
Actual Orifice diameter $d_0$ [inch]	0,512	0,984	
Actual Orifice area $A_0$ [inch <sup>2</sup> ]	0,206	0,761	
LEO <sub>SL</sub> <sup>1)</sup> [inch <sup>2</sup> ]	0,082	0,302	
Set pressure [psig]	Capacities [GPM]		
15	12,6	31,6	
20	14,2	35,7	
30	17	42,8	
40	19,7	49,4	
50	22	55,3	
60	24,1	60,5	
70	26	65,4	
80	27,8	69,9	
90	29,5	74,1	
100	31,1	78,1	
120	34	85,6	
140	36,8	92,5	
160	39,3	98,8	
180	41,7	105	
200	43,9	111	
220	46,1	116	
230	47,1	118	



<sup>1)</sup> LEO<sub>SL</sub> = LESER Effective Orifice steam/gas/liquids please refer to page 00/17. How to use capacity-sheets refer to page 00/15.

## Determination of coefficient of discharge in case of lift restriction or back pressure

- h = Lift [mm]
- d<sub>0</sub> = Flow diameter [mm] of selected safety valve, refer to table article numbers
- h/d<sub>0</sub> = Ratio of lift / flow diameter
- p<sub>a0</sub> = Back pressure [bar<sub>a</sub>]
- p<sub>0</sub> = Set pressure [bar<sub>a</sub>]
- p<sub>a0</sub>/p<sub>0</sub> = Ratio of back pressure / set pressure
- K<sub>dr</sub> = Coefficient of discharge acc. to DIN EN ISO 4126-1
- α<sub>w</sub> = Coefficient of discharge acc. to AD 2000-Merkblatt A2
- K<sub>b</sub> = Back pressure correction factor acc. to API 520 topic 3.3

Diagram for evaluation of ratio of lift / flow diameter (h/d<sub>0</sub>) in reference to the coefficient of discharge (K<sub>dr</sub>=α<sub>w</sub>)

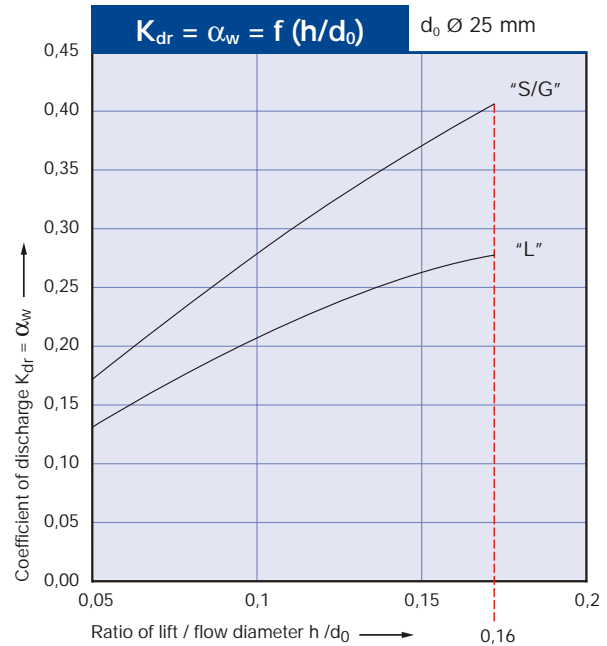
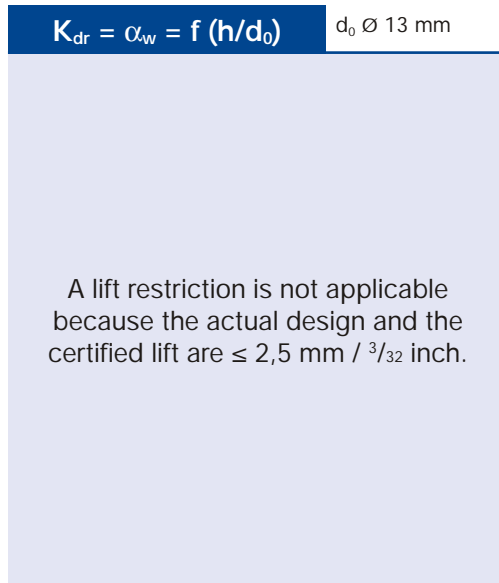
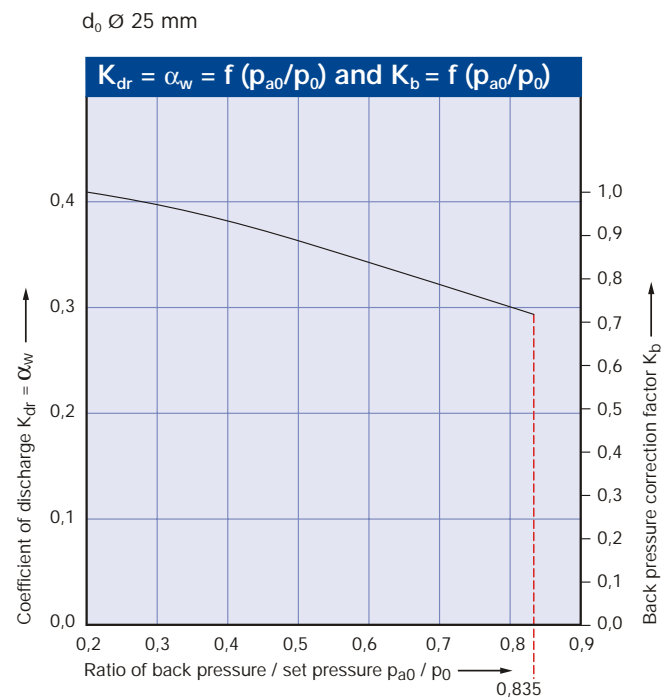
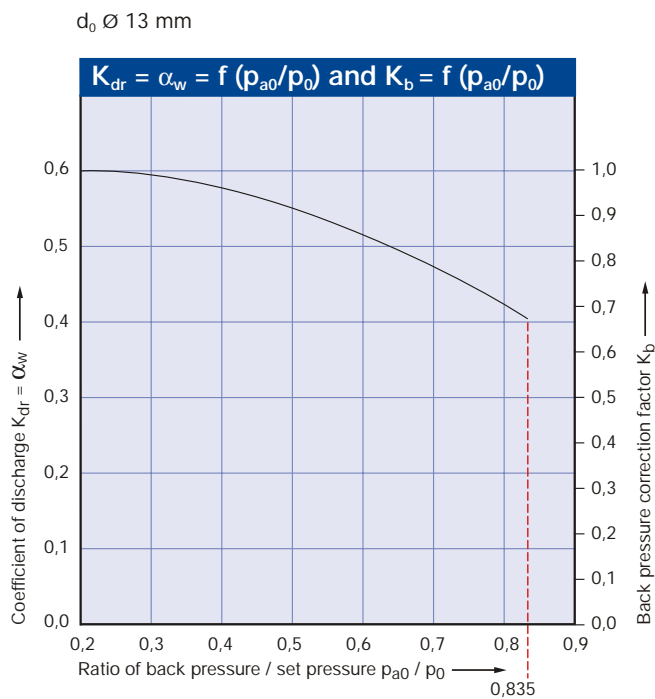


Diagram for evaluation of ratio of the coefficient of discharge (K<sub>dr</sub>=α<sub>w</sub>) in reference to the ratio of back pressure / set pressure (p<sub>a0</sub>/p<sub>0</sub>)





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



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



**Type 5034**  
 Integrated pipework connection

# Type 485

## Safety Relief Valves - spring loaded

### Contents

### Chapter/Page

#### Materials

• HyTight Assembly 05/02

#### How to order

• Numbering system 05/04  
 • Article numbers 05/06

#### Pressure temperature ratings

• Metric Units + US Units 05/08

#### Dimensions - Bestseller

• Metric Units + US Units 05/09

#### Dimensions and weights

• Metric Units 05/10  
 • US Units 05/11

Option codes for available connections 05/12

Available options 05/13

Selection chart H8 05/14

Surface quality 05/15

Order information - Spare parts 05/16

Approvals 05/17

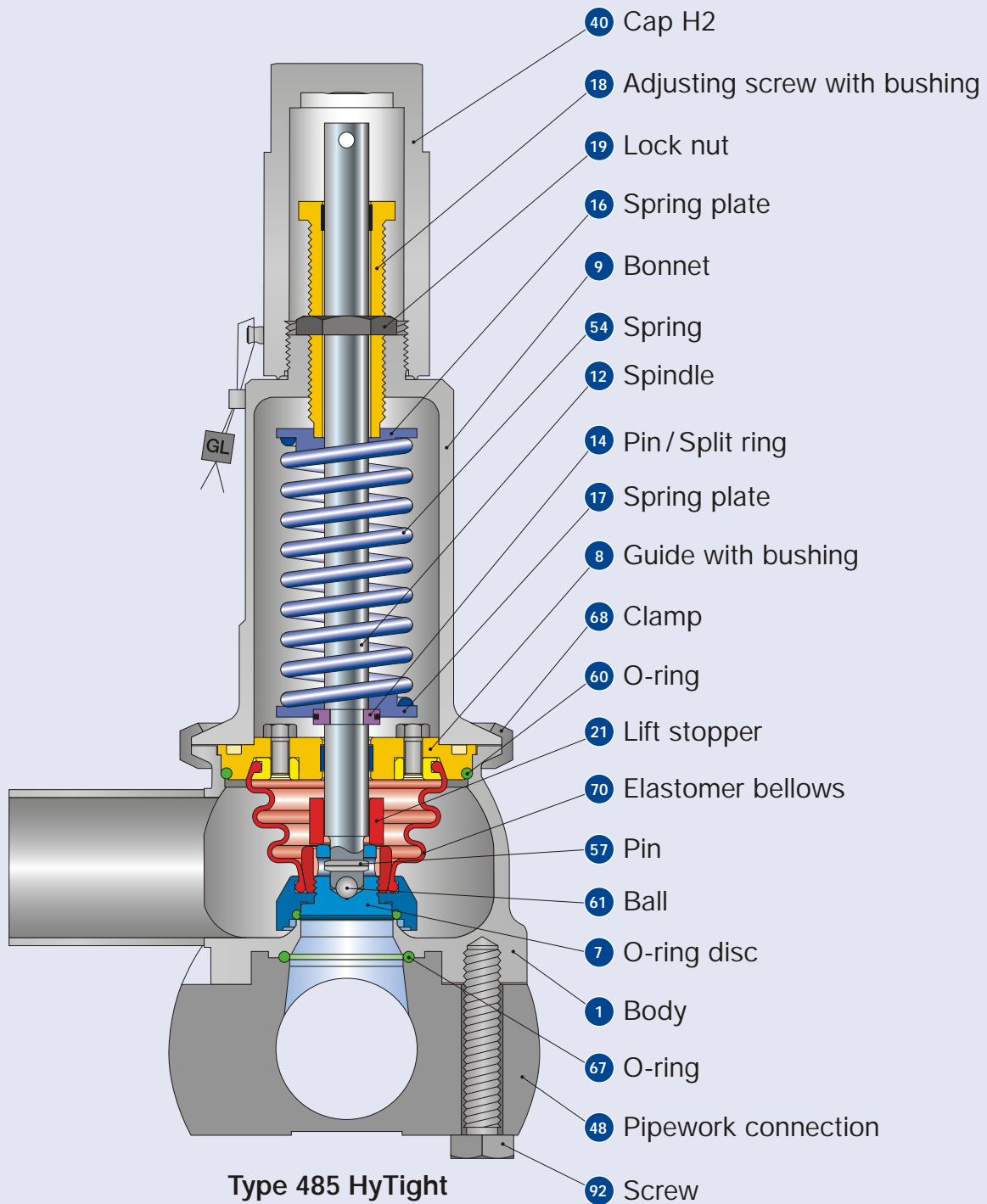
#### Capacities

• Steam, Air, Water [Metric Units] 05/18

• Steam, Air, Water [US Units] 05/19

Determination of coefficient of discharge  $K_{dr}/\alpha_w$  05/20

## HyTight Assembly













**Type 485 HyTight**  
Cap H2

Inlet: Integrated pipework connection Type 5034  
Outlet: Welded end connection



## HyTight Assembly

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

<sup>\*)</sup> The material 1.4435/SA 479 316L fulfils the requirements of the Swiss chemical and pharmaceutical industry Basler Norm (BN 2). For details please refer to LWN 290.90.

**Please notice:**

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

## How to order – Numbering system

# 1

### Article Number

1	2	3	4
485	4	774	8

- 1 Type 485**  
 – Small to medium capacity  
 – High aseptic requirements

**2 Material code**

Code	Body material
4	1.4435 (316L)

- 3 Valve code**  
 Identifies valve size and body material, refer to page 02/07.

Code	d <sub>0</sub>
774	13
775	25

**4 Code for lifting device**

Code	Lifting device	
2	Screwed cap	H2
4	Packed knob	H4
8	Pneumatic lifting device	H8

4854.7748

Article Number

# 2

### Set Pressure

Please state unit (in gauge)!

Please do not exceed pressure range mentioned in the spring charts.

For pressure range, refer to page 05/07

4 bar

Set Pressure

# 3

### Connections

Inlet:

**Type 4854.774x**

Integrated pipework connection		
Article No.	Pipe standard	Size
5034.0991	DIN 11850	DN 25
5034.0994	ISO 2037	DN 25
5034.0998	DIN EN ISO 1127	DN 25

**Type 4854.775x**

Integrated pipework connection		
Article No.	Pipe standard	Size
5034.0992	DIN 11850	DN 40
5034.0993		DN 50
5034.0995	ISO 2037	DN 40
5034.0996		DN 50
5034.0999	DIN EN ISO 1127	DN 40
-		DN 50

Outlet:

Standard outlet is butt-welded end.  
 If another connection is required, state in writing, please.

A85L83A16

Connections







## 4

### Options

#### Type 485

#### Option code

- O-ring-disc
 

Standard: EPDM "D"	 	<b>J22</b>
Option: CR "K"		<b>J21</b>
FKM "L"		<b>J23</b>
NBR "N"		<b>J30</b>
FFKM "C"	 	<b>J20</b>
- Adaptor for lift indicator  
Bonnet **J38**
- Lift indicator **J93**
- Pneumatic lifting device H8  
Double piston design **J41**
- Bellows FFKM "C"  **S70**
- LESER Surface package  
HyClean finish **B69**  
Sterile finish **B70**

For detailed information refer to page 05/15

Option code applies only if not standard

J41

J93

Options

## 5

### Documentation

Please select requested documentation:

**Inspections, tests:** **Option code**  
DIN EN 10204-3.2: TÜV-Nord  
Certificate for test pressure **M33**

**LESER CGA (Certificate for Global Application)** **H03**  
- Inspection certificate 3.1 acc. to DIN EN 10204  
- Declaration of conformity acc. to PED 97/23/EC

**Material test certificate:**  
DIN EN 10204-3.1

Part	Option code
Body	<b>H01</b>
Bonnet	<b>L30</b>
Cap / lever cover	<b>L31</b>
Disc	<b>L23</b>
Certificate of surface quality	<b>N04</b>

H01

L30

Documentation

## 6

### Code and Medium

1	2
2	0

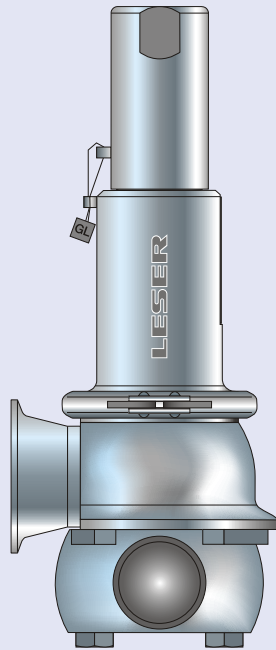
- 1 Code**
1. ASME Section VIII
  2. CE / VdTUEV
  3. ASME Section VIII + CE / VdTUEV

- 2 Medium**
- .1 Gases
  - .2 Liquids
  - .3 Steam
  - .0 Steam / Gases / Liquids (valid only for CE / VdTUEV)

2.0

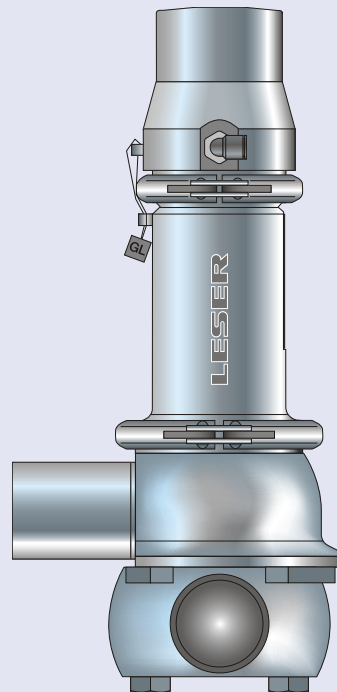
Code and Medium

## How to order – Article numbers



**Type 485**  
Cap H2

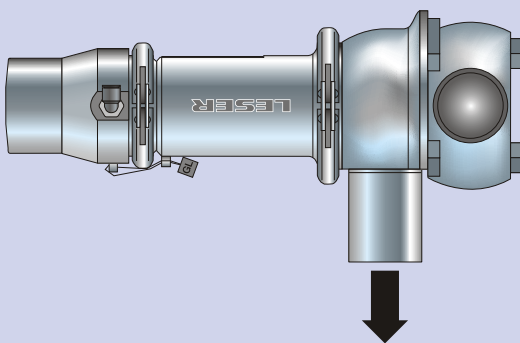
Inlet: Integrated pipework connection Type 5034  
Outlet: Clamp connection



**Type 485**

Pneumatic lifting device H8  
Inlet: Integrated pipework connection Type 5034  
Outlet: Welded end connection

**Certified for horizontal fitting.**

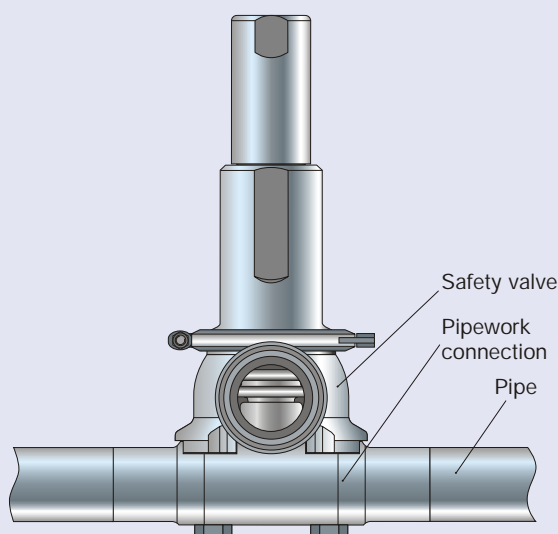
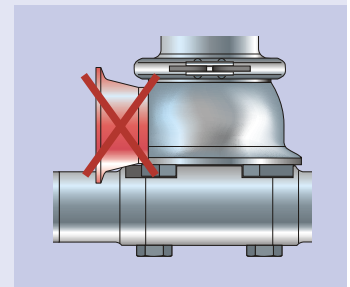


**Attention!** Only with outlet  
in downward direction.

## How to order – Article numbers

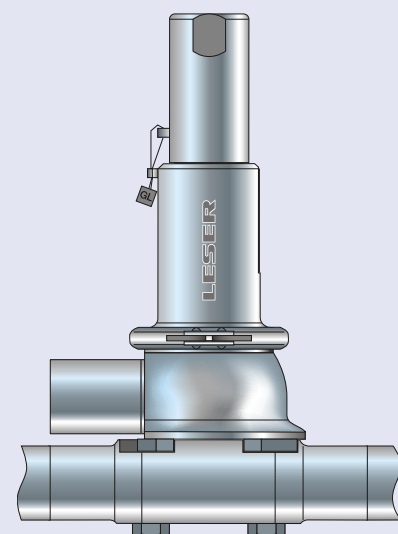
Article numbers				
Actual Orifice diameter $d_0$ [mm]		13	25	
Actual Orifice area $A_0$ [mm <sup>2</sup> ]		133	491	
Actual Orifice diameter $d_0$ [inch]		0,512	0,984	
Actual Orifice area $A_0$ [inch <sup>2</sup> ]		0,206	0,761	
O-ring material		EPDM "D" J22	EPDM "D" J22	
		CR "K" J21	CR "K" J21	
		FKM "L" J23	FKM "L" J23	
		NBR "N" J30	NBR "N" J30	
		FFKM "C" J20	FFKM "C" J20	
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

## Pressure temperature ratings

Metric Units					
Actual Orifice diameter $d_0$ [mm]		13	25		
Actual Orifice area $A_0$ [mm <sup>2</sup> ]		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 <sup>1)</sup>		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					
Actual Orifice diameter $d_0$ [inch]		0,512	0,984		
Actual Orifice area $A_0$ [inch <sup>2</sup> ]		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 <sup>1)</sup>		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

<sup>1)</sup>The temperature is limited by the soft seal material. Refer to table "Soft seal selection" on page 99/11.

## Dimensions – Bestseller

For shortest delivery time please select bestsellers. The specified bestsellers can vary depending on different market requirements.

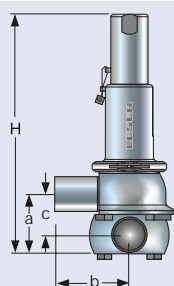
For further available connections please refer to page 05/12.

Metric Units			
Actual Orifice diameter $d_0$ [mm]		13	
Actual Orifice area $A_0$ [mm <sup>2</sup> ]		133	
Integrated pipework connection ISO 2037		Inlet	
Nominal pipe size tube		25	
		1"	
Wall thickness	s [mm]	1,6	
Diameter	d [mm]	25,4	
Length	L [mm]	130	
Welded connections		Inlet a (with integrated pipework connection)	Outlet b
<b>00: Butt-welded end</b>		<b>25</b>	
Option code		A85L83A16	
Center to face	[mm]	58	80
Offset	c [mm]	38	
Height – H4	H max. [mm]	234	
Threaded connections		Inlet a (with integrated pipework connection)	Outlet b
<b>GD</b>		<b>25</b>	
Option code (DIN 11850 / DIN 11866 Range A)		A85H61A16	
Option code (DIN EN ISO 1127 / DIN 11866 Range B)		A86H61A16	
Center to face	[mm]	58	120
Offset	c [mm]	38	
Height – H4	H max. [mm]	234	

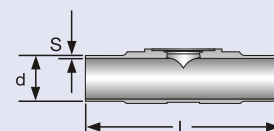
		25	
		491	
Inlet			
<b>40</b>		<b>50</b>	
<b>1 1/2"</b>		<b>2"</b>	
1,6		1,6	
38		51	
180		180	
Inlet a (with integrated pipework connection)	Outlet b	Inlet a (with integrated pipework connection)	Outlet b
	<b>40</b>		<b>40</b>
	A85L83A17		A85L83A17
72	90	84	90
49		55	
331		343	
Inlet a (with integrated pipework connection)	Outlet b	Inlet a (with integrated pipework connection)	Outlet b
	<b>40</b>		<b>40</b>
	A85H61A17		A85H61A17
	A86H61A17		A86H61A17
72	130	84	130
49		55	
331		343	

US Units			
Actual Orifice diameter $d_0$ [inch]		0,512	
Actual Orifice area $A_0$ [inch <sup>2</sup> ]		0,206	
Integrated pipework connection ISO 2037		Inlet	
Nominal pipe size tube		25	
		1"	
Wall thickness	s [inch]	1/16	
Diameter	d [inch]	1	
Height – H4	L [inch]	5 1/8	
Welded connections		Inlet a (with integrated pipework connection)	Outlet b
<b>00: Butt-welded end</b>		<b>25</b>	
Option code		A85L83A16	
Center to face	[inch]	2 1/4	3 5/32
Offset	c [inch]	1 1/2	
Height – H4	H max. [inch]	9 7/32	
Threaded connections		Inlet a (with integrated pipework connection)	Outlet b
<b>GD</b>		<b>25</b>	
Option code (DIN 11850 / DIN 11866 Range A)		A85H61A16	
Option code (DIN EN ISO 1127 / DIN 11866 Range B)		A86H61A16	
Center to face	[inch]	2 1/4	4 23/32
Offset	c [inch]	1 1/2	
Height – H4	H max. [inch]	9 7/32	

		0,984	
		0,761	
Inlet			
<b>40</b>		<b>50</b>	
<b>1 1/2"</b>		<b>2"</b>	
1/16		1/16	
1 1/2		1 1/2	
7 3/32		7 3/32	
Inlet a (with integrated pipework connection)	Outlet b	Inlet a (with integrated pipework connection)	Outlet b
	<b>40</b>		<b>40</b>
	A85L83A17		A85L83A17
2 27/32	3 17/32	3 5/16	3 17/32
1 15/16		2 5/32	
13 1/32		13 1/2	
Inlet a (with integrated pipework connection)	Outlet b	Inlet a (with integrated pipework connection)	Outlet b
	<b>40</b>		<b>40</b>
	A85H61A17		A85H61A17
	A86H61A17		A86H61A17
2 27/32	5 1/8	3 5/16	5 1/8
1 15/16		2 5/32	
13 1/32		13 1/2	



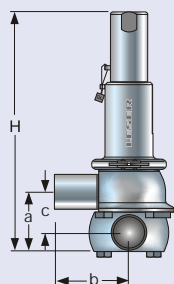
Type 485 – Cap H2



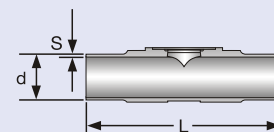
Type 5034 – Integrated pipework connection

## Dimensions and weights

Metric Units				Imperial Units				
Actual Orifice diameter $d_0$ [mm]		13		0.512		20		
Actual Orifice area $A_0$ [mm <sup>2</sup> ]		133		206		491		
Integrated pipework connection				Inlet				
Nominal pipe size tube		PN		16		16		
Offset		c	[mm]	38		1.5		
Length		L	[mm]	130		5.1		
DIN 11850	Diameter	d	[mm]	30		1.181		
	Wall thickness	s	[mm]	2		0.079		
ISO 2037	Diameter	d	[mm]	25,4		1.0		
	Wall thickness	s	[mm]	1,6		0.063		
DIN EN ISO	Diameter	d	[mm]	33,7		1.327		
ISO 1127	Wall thickness	s	[mm]	2		0.079		
Welded connections				Inlet a (with integrated pipework connection)		Outlet b		
Nominal pipe size tube		PN		16		16		
Center to face		[mm]	58	2.283		2.362		
Height - H4		H max. [mm]	234	9.213		9.252		
Height - H8 double piston design		H max. [mm]	262,2	10.323		10.362		
Clamp connections				Inlet a (with integrated pipework connection)		Outlet b		
Nominal pipe size tube		PN		16		16		
Center to face		[mm]	58	2.283		2.362		
Clamp diameter		$d_{inner}$ [mm]	For varying clamp diameters please refer to page 00/11				0.906	
		$d_{outer}$ [mm]					0.945	
Height - H4		H max. [mm]	234	9.213		9.252		
Height - H8 double piston design		H max. [mm]	262,2	10.323		10.362		
Threaded connections				Inlet a (with integrated pipework connection)		Outlet b		
Nominal pipe size tube		PN		16		16		
Center to face		[mm]	58	2.283		2.362		
Height - H4		H max. [mm]	234	9.213		9.252		
Height - H8 double piston design		H max. [mm]	262,2	10.323		10.362		
Flanged connections				Inlet a (with integrated pipework connection)		Outlet b		
Nominal pipe size tube		PN		16		16		
Center to face		[mm]	58	2.283		2.362		
Height - H4		H max. [mm]	234	9.213		9.252		
Height - H8 double piston design		H max. [mm]	262,2	10.323		10.362		
Weight				Inlet a (with integrated pipework connection)		Outlet b		
Weight		max. [kg]	3,0	1.323		1.362		



Type 485 - Cap H2



Type 5034 - Integrated pipework connection

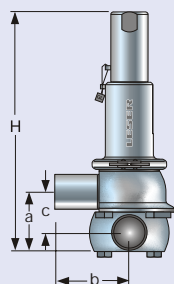


## Dimensions and weights

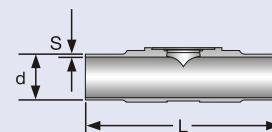
### US Units

Actual Orifice diameter $d_0$ [inch]		0,512
Actual Orifice area $A_0$ [inch <sup>2</sup> ]		0,206
Integrated pipework connection		Inlet
PN		16
Nominal pipe size tube		NPS 1"
Offset	c [inch]	1 1/2
Length	L [inch]	5 1/8
DIN 11850	Diameter d [inch]	1 3/16
	Wall thickness s [inch]	3/32
ISO 2037	Diameter d [inch]	1
	Wall thickness s [inch]	1/16
DIN EN ISO	Diameter d [inch]	1 5/16
	Wall thickness s [inch]	3/32
Welded connections		Inlet a (with integrated pipework connection)      Outlet b
PN		16
Center to face	[inch]	2 1/4      3 5/32
Height – H4	H max. [inch]	9 7/32
Height – H8 double piston design	H max. [inch]	10 5/16
Clamp connections		Inlet a (with integrated pipework connection)      Outlet b
PN		16
Center to face	[inch]	2 1/4      4 1/32
Clamp diameter	$d_{inner}$ [inch] $d_{outer}$ [inch]	For varying clamp diameters please refer to page 00/11
Height – H4	H max. [inch]	9 7/32
Height – H8 double piston design	H max. [inch]	10 5/16
Threaded connections		Inlet a (with integrated pipework connection)      Outlet b
PN		16
Center to face	[inch]	2 1/4      4 23/32
Height – H4	H max. [inch]	9 7/32
Height – H8 double piston design	H max. [inch]	10 5/16
Flanged connections		Inlet a (with integrated pipework connection)      Outlet b
PN		16
Center to face	[inch]	2 1/4      4 31/32
Height – H4	H max. [inch]	9 7/32
Height – H8 double piston design	H max. [inch]	10 5/16
Weight		
Weight	max. [lb]	6,6

		0,984
		0,761
Integrated pipework connection		Inlet
PN		16
Nominal pipe size tube		1 1/2"      2"
Offset	c [inch]	1 15/16      2 5/32
Length	L [inch]	7 3/32      7 3/32
DIN 11850	Diameter d [inch]	1 21/32      2 1/8
	Wall thickness s [inch]	3/32      3/32
ISO 2037	Diameter d [inch]	1 1/2      2
	Wall thickness s [inch]	1/16      1/16
DIN EN ISO	Diameter d [inch]	1 29/32      –
	Wall thickness s [inch]	3/32      –
Welded connections		Inlet a (with integrated pipework connection)      Outlet b      Inlet a (with integrated pipework connection)      Outlet b
PN		16      16      16      16
Center to face	[inch]	2 27/32      3 17/32      3 5/16      3 17/32
Height – H4	H max. [inch]	13 1/32      13 1/2
Height – H8 double piston design	H max. [inch]	13 11/32      13 13/16
Clamp connections		Inlet a (with integrated pipework connection)      Outlet b      Inlet a (with integrated pipework connection)      Outlet b
PN		16      16      16      16
Center to face	[inch]	2 27/32      4 13/32      3 5/16      4 13/32
Clamp diameter	$d_{inner}$ [inch] $d_{outer}$ [inch]	For varying clamp diameters please refer to page 00/11
Height – H4	H max. [inch]	13 1/32      13 1/2
Height – H8 double piston design	H max. [inch]	13 11/32      13 13/16
Threaded connections		Inlet a (with integrated pipework connection)      Outlet b      Inlet a (with integrated pipework connection)      Outlet b
PN		16      16      16      16
Center to face	[inch]	2 27/32      5 1/8      3 5/16      5 1/8
Height – H4	H max. [inch]	13 1/32      13 1/2
Height – H8 double piston design	H max. [inch]	13 11/32      13 13/16
Flanged connections		Inlet a (with integrated pipework connection)      Outlet b      Inlet a (with integrated pipework connection)      Outlet b
PN		16      16      16      16
Center to face	[inch]	2 27/32      5 9/32      3 5/16      5 9/32
Height – H4	H max. [inch]	13 1/32      13 1/2
Height – H8 double piston design	H max. [inch]	13 11/32      13 13/16
Weight		
Weight	max. [lb]	11,0



Type 485 – Cap H2



Type 5034 – Integrated pipework connection



## 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

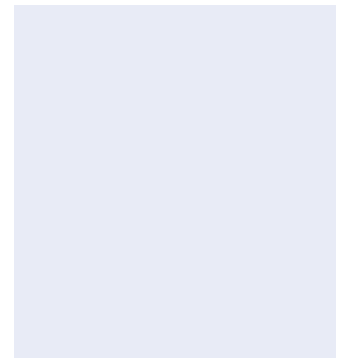
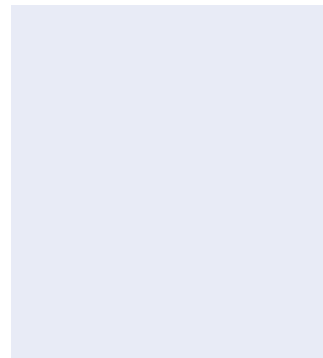
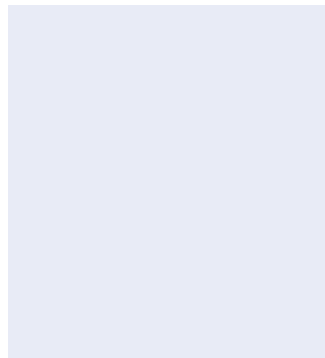
**O-ring-disc**  
J22: EPDM "D"   
J21: CR "K"  
J23: FKM "L"   
J30: NBR "N"  
J20: FFKM "C"

**Bellows FFKM "C"**   
S70

**Blind flange for pressure test**  
Material No. 138.8949.9000 (d<sub>0</sub> 13)  
Material No. 138.8749.9000 (d<sub>0</sub> 25)

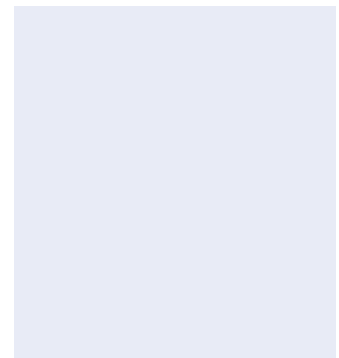
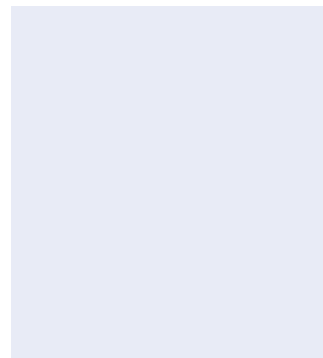
**O-ring for integrated pipework connection**  
EPDM "D"   
Material No. 502.0180.3041 (d<sub>0</sub> 13)  
Material No. 502.0300.3041 (d<sub>0</sub> 25)

**Test gag**  
J70: H2



**Lift indicator placed in bonnet**  
J38 + J93

**Special material**  
2.4610 HASTELLOY C4  
2.4360 MONEL 400  
1.4462 DUPLEX

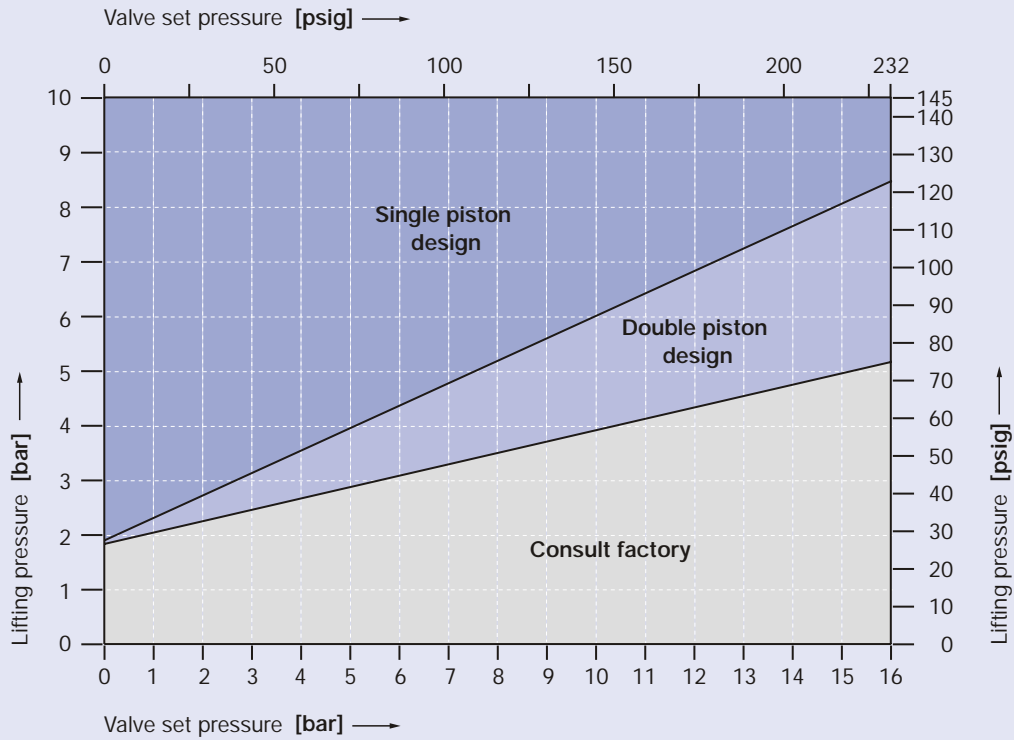


## Selection chart H8

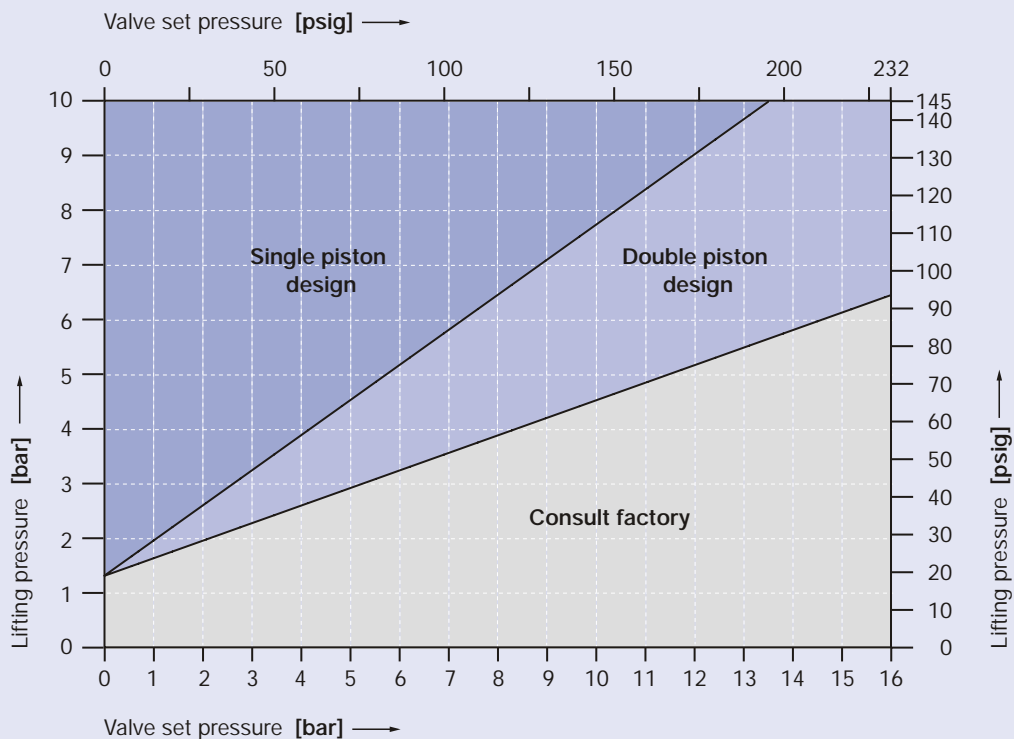
Depending on the set pressure and lifting pressure (air supply) a double piston lifting device (option code J41) may be required instead of a single piston. The chart below determines the required lifting device.

For information about this chart please refer to "How to use" on page 00/12.

Selection chart lifting device H8, size 0.  $d_0$  13 mm / 0,512 inch



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



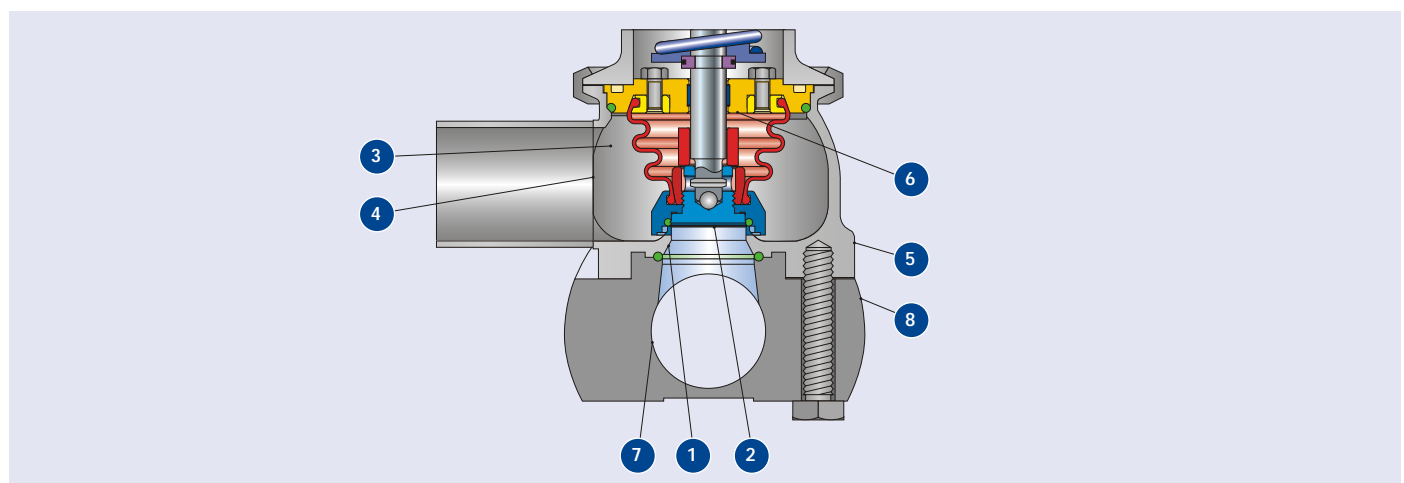
Type 485

## Surface quality


















Surface quality			LESER Surface package				
Type of surface	Area		Option code	Clean finish	HyClean finish	Sterile finish	
	Description	No.		B62	B63	B64	
				R <sub>a</sub> max.	R <sub>a</sub> max.	R <sub>a</sub> max.	
<b>LESER Surface grade</b>							
Product contact surface	Inlet	1		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		Option code	Clean finish	HyClean finish	Sterile finish
	Description	No.		B65	B66	B67
				R <sub>a</sub> max.	R <sub>a</sub> max.	R <sub>a</sub> max.
<b>LESER Surface grade</b>						
Product contact surface	Pipework side	7		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 please specify No. and required LESER Surface Grade.



## Order information – Spare parts

Spare Parts			
Actual Orifice diameter $d_0$ [mm]		13	25
Actual Orifice area $A_0$ [mm <sup>2</sup> ]		133	491
Actual Orifice diameter $d_0$ [inch]		0,512	0,984
Actual Orifice area $A_0$ [inch <sup>2</sup> ]		0,206	0,761
Disc – (Item 7): Soft seal		Material-No. / Art.-No.	
<b>Disc</b> 1.4435	EPDM “D”  	200.8169.9741	200.2569.9741
	CR “K”	200.8169.9751	200.2569.9751
	FKM “L” 	200.8169.9771	200.2569.9771
	NBR “N”	200.8169.9781	200.2569.9781
	FFKM “C”  	200.8169.9791	200.2569.9791
Assembly tool for Aseptic O-ring disc		tool not required for this valve size	445.0139.0000
O-ring (Item 7.4): Soft seal		Material-No. / Art.-No.	
<b>O-ring</b>	EPDM “D”  	502.0123.2641	502.0250.2641
	CR “K”	502.0123.2651	502.0250.2651
	FKM “L” 	502.0123.2671	502.0250.2671
	NBR “N”	502.0123.2681	502.0250.2681
	FFKM “C”  	502.0123.2691	502.0250.2691
Pin / Split ring (Item 14)		Material-No. / Art.-No.	
<b>Pin / Split ring</b>	Spindle Ø [mm]	8	12
	1.4310 / 1.4404	480.0405.0000	251.0149.0000
Pin (Item 57)		Material-No. / Art.-No.	
<b>Pin</b>	Ø [mm]	3	3
	1.4310	480.0405.0000	480.0405.0000
O-ring body / guide (Item 60)		Material-No. / Art.-No.	
<b>O-ring</b>	EPDM “D”  	502.0460.3041	502.0600.3041
	FFKM “C”  	502.0460.3021	502.0600.3021
Ball (Item 61)		Material-No. / Art.-No.	
<b>Ball</b>	Ø [mm]	6	6
	1.4401	510.0104.0000	510.0104.0000
O-ring pipework connection (Item 67)		Material-No. / Art.-No.	
<b>O-ring</b>	EPDM “D” 	502.0180.3041	502.0300.3041
Bellows (Item 70)		Material-No. / Art.-No.	
<b>Bellows</b>	EPDM “D” 	224.2349.9000	224.2449.9000
	FFKM “C” 	on request	on request

## Approvals

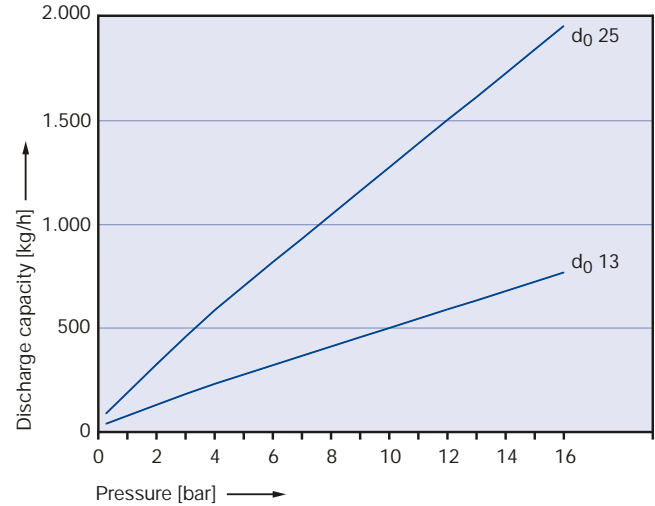
Approvals		
Actual Orifice diameter $d_0$ [mm]	13	25
Actual Orifice area $A_0$ [mm <sup>2</sup> ]	133	491
Actual Orifice diameter $d_0$ [inch]	0,512	0,984
Actual Orifice area $A_0$ [inch <sup>2</sup> ]	0,206	0,761
<b>Europe</b> <span style="float: right;">Coefficient of discharge <math>K_{dr}</math></span>		
DIN EN ISO 4126-1	Approval No.	07 202 0111 Z 0008/0/20
	S/G	0,58
	L	0,39
<b>Germany</b> <span style="float: right;">Coefficient of discharge <math>\alpha_w</math></span>		
AD 2000-Merkblatt A2	Approval No.	TÜV SV 1047
	S/G	0,58
	L	0,39
<b>United States</b> <span style="float: right;">Coefficient of discharge K</span>		
ASME Sec. VIII	Approval No.	M37145
	S/G	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) S: 5,52 lb / hr / psia $\Delta K \approx 0,521$ G: 1,96 SCFM / psia $\Delta K \approx 0,521$
	L	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) L: 2,96 GPM $\sqrt{\text{psid}^*)} \Delta K \approx 0,379$
	Approval No.	M37156
	S/G	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) S: 13,97 lb / hr / psia $\Delta K \approx 0,357$ G: 4,96 SCFM / psia $\Delta K \approx 0,357$
	L	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) L: 7,46 GPM $\sqrt{\text{psid}^*)} \Delta K \approx 0,258$
	Approval No.	M37167
	S/G	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) S: 13,97 lb / hr / psia $\Delta K \approx 0,357$ G: 4,96 SCFM / psia $\Delta K \approx 0,357$
	L	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) L: 7,46 GPM $\sqrt{\text{psid}^*)} \Delta K \approx 0,258$
<b>Canada</b> <span style="float: right;">Coefficient of discharge K</span>		
CRN	Approval No.	OG0772.9C
	S/G	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) S: 5,52 lb / hr / psia $\Delta K \approx 0,521$ G: 1,96 SCFM / psia $\Delta K \approx 0,521$
	L	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) L: 2,96 GPM $\sqrt{\text{psid}^*)} \Delta K \approx 0,379$
	S/G	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) S: 13,97 lb / hr / psia $\Delta K \approx 0,357$ G: 4,96 SCFM / psia $\Delta K \approx 0,357$
	L	Rated slope acc. to ASME VIII, Div. 1 UG-131 (d) (2) L: 7,46 GPM $\sqrt{\text{psid}^*)} \Delta K \approx 0,258$
<b>China</b> <span style="float: right;">Coefficient of discharge <math>\alpha_w</math></span>		
AQSIQ	Approval No.	02301T
	S/G	0,58
	L	0,39
<b>Russia</b> <span style="float: right;">Coefficient of discharge <math>\alpha_w</math></span>		
GGTN/ GOSGORTECHNADZOR	Approval No.	PPC00-18458
GOST R	Approval No.	1989-06
	S/G	0,58
	L	0,39
<b>Belarus</b> <span style="float: right;">Coefficient of discharge <math>\alpha_w</math></span>		
PROMATOMNADZOR	Approval No.	15-171-2006
	S/G	0,58
	L	0,39
<b>Classification societies</b>		
on request		

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

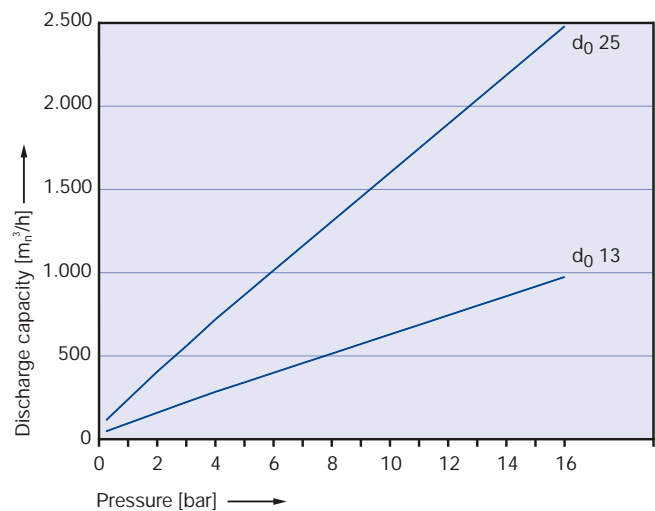
## Capacities – Metric Units

Capacities for saturated steam, air at 0° C and 1013 mbar, water at 20° C according to AD 2000-Merkblatt A2, based on set pressure plus 10% overpressure. Capacities at 1 bar (14,5 psig) and below are based on 0,1 bar (1,45 psig) overpressure. For pressure range refer to "Pressure temperature ratings" on page 05/08.

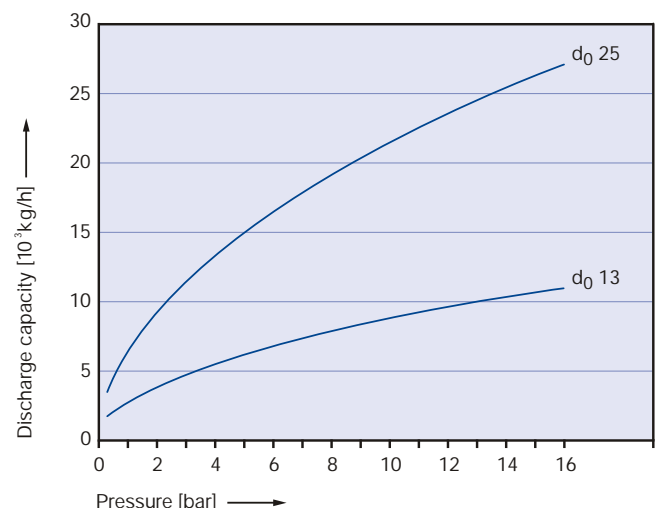
Steam		AD 2000-Merkblatt A2 [kg/h]	
Actual Orifice diameter $d_0$ [mm]		13	25
Actual Orifice area $A_0$ [mm <sup>2</sup> ]		133	491
LEO <sub>SiG</sub> <sup>*)</sup> [inch <sup>2</sup> ]		0,110	0,279
Set pressure [bar]	Capacities [kg/h]		
1	78	201	
2	130	338	
3	182	460	
4	231	588	
Maximum temperature for EPDM soft seal			
5	276	704	
6	321	820	
7	336	932	
8	411	1047	
9	456	1162	
10	500	1276	
12	590	1505	
14	678	1729	
16	768	1958	



Air		AD 2000-Merkblatt A2 [m <sup>3</sup> /h]	
Actual Orifice diameter $d_0$ [mm]		13	25
Actual Orifice area $A_0$ [mm <sup>2</sup> ]		133	491
LEO <sub>SiG</sub> <sup>*)</sup> [inch <sup>2</sup> ]		0,110	0,279
Set pressure [bar]	Capacities [m <sup>3</sup> /h]		
1	93	240	
2	157	408	
3	222	562	
4	284	723	
5	341	870	
6	399	1018	
7	457	1165	
8	514	1312	
9	572	1459	
10	630	1606	
12	745	1900	
14	860	2194	
16	976	2488	



Water		AD 2000-Merkblatt A2 [10 <sup>3</sup> kg/h]	
Actual Orifice diameter $d_0$ [mm]		13	25
Actual Orifice area $A_0$ [mm <sup>2</sup> ]		133	491
LEO <sub>L</sub> <sup>*)</sup> [inch <sup>2</sup> ]		0,082	0,302
Set pressure [bar]	Capacities [10 <sup>3</sup> kg/h]		
1	2,76	6,81	
2	3,91	9,63	
3	4,78	11,8	
4	5,52	13,6	
5	6,71	15,2	
6	6,76	16,7	
7	7,31	18	
8	7,81	19,3	
9	8,28	20,4	
10	8,73	21,5	
12	9,57	23,6	
14	10,3	25,5	
16	11	27,2	



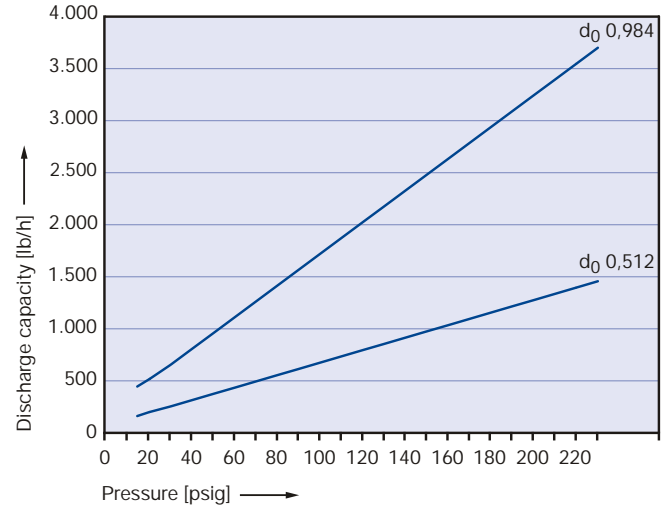
\*) LEO<sub>SiG/L</sub> = LESER Effective Orifice steam/gas/liquids please refer to page 00/17.  
How to use capacity-sheets refer to page 00/15.



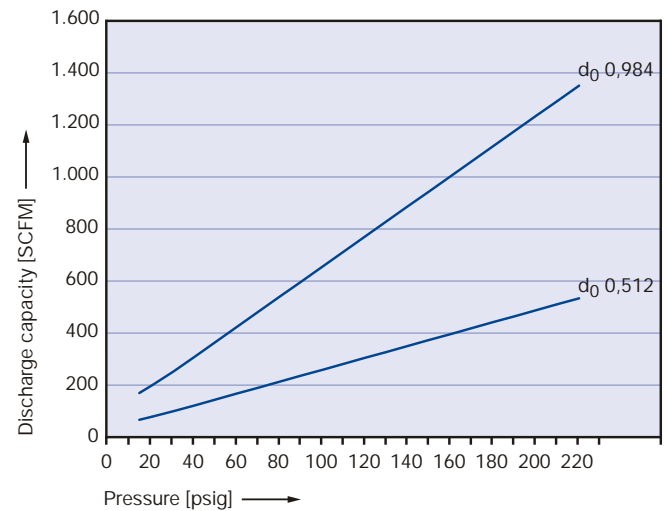
## Capacities – US Units

Capacities for saturated steam, air at 60°F and 14,5 psig, water at 70°F according to ASME VIII (UV), based on set pressure plus 10% overpressure. Capacities at 30 psig (2,07 bar) and below are based on 3 psig (0,207 bar) overpressure. For pressure range refer to "Pressure temperature ratings" on page 05/08.

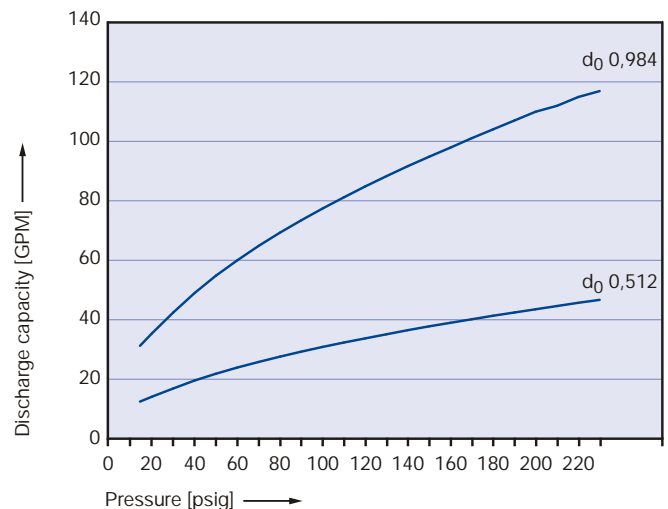
Steam		ASME Section VIII [lb/h]	
Actual Orifice diameter $d_0$ [inch]	0,512	0,984	
Actual Orifice area $A_0$ [inch <sup>2</sup> ]	0,206	0,761	
LEO <sub>S/G</sub> <sup>1)</sup> [inch <sup>2</sup> ]	0,110	0,279	
Set pressure [psig]	Capacities [lb/h]		
15	180	457	
20	208	527	
30	263	667	
40	324	821	
50	385	974	
60	445	1128	
Maximum temperature for EPDM soft seal			
70	506	1282	
80	567	1436	
90	627	1590	
100	688	1744	
120	810	2052	
140	931	2359	
160	1052	2667	
180	1174	2975	
200	1295	3283	
220	1417	3590	
230	1478	3744	



Air		ASME Section VIII [SCFM]	
Actual Orifice diameter $d_0$ [inch]	0,512	0,984	
Actual Orifice area $A_0$ [inch <sup>2</sup> ]	0,206	0,761	
LEO <sub>S/G</sub> <sup>1)</sup> [inch <sup>2</sup> ]	0,110	0,279	
Set pressure [psig]	Capacities [SCFM]		
15	64	163	
20	74	188	
30	94	238	
40	115	292	
50	137	347	
60	159	402	
70	180	457	
80	202	512	
90	224	566	
100	245	621	
120	289	731	
140	332	841	
160	375	950	
180	419	1060	
200	462	1170	
220	505	1279	
230	527	1334	



Water		ASME Section VIII [GPM]	
Actual Orifice diameter $d_0$ [inch]	0,512	0,984	
Actual Orifice area $A_0$ [inch <sup>2</sup> ]	0,206	0,761	
LEO <sub>S/G</sub> <sup>1)</sup> [inch <sup>2</sup> ]	0,082	0,302	
Set pressure [psig]	Capacities [GPM]		
15	12,6	31,6	
20	14,2	35,7	
30	17	42,8	
40	19,7	49,4	
50	22	55,3	
60	24,1	60,5	
70	26	65,4	
80	27,8	69,9	
90	29,5	74,1	
100	31,1	78,1	
120	34	85,6	
140	36,8	92,5	
160	39,3	98,8	
180	41,7	105	
200	43,9	111	
220	46,1	116	
230	47,1	118	



<sup>1)</sup> LEO<sub>S/G/L</sub> = LESER Effective Orifice steam/gas/liquids please refer to page 00/17. How to use capacity-sheets refer to page 00/15.

## Determination of coefficient of discharge in case of lift restriction or back pressure

- h = Lift [mm]
- d<sub>0</sub> = Flow diameter [mm] of selected safety valve, refer to table article numbers
- h/d<sub>0</sub> = Ratio of lift / flow diameter
- p<sub>a0</sub> = Back pressure [bar<sub>a</sub>]
- p<sub>0</sub> = Set pressure [bar<sub>a</sub>]
- p<sub>a0</sub>/p<sub>0</sub> = Ratio of back pressure / set pressure
- K<sub>dr</sub> = Coefficient of discharge acc. to DIN EN ISO 4126-1
- α<sub>w</sub> = Coefficient of discharge acc. to AD 2000-Merkblatt A2
- K<sub>b</sub> = Back pressure correction factor acc. to API 520 topic 3.3

Diagram for evaluation of ratio of lift / flow diameter (h/d<sub>0</sub>) in reference to the coefficient of discharge (K<sub>dr</sub> = α<sub>w</sub>)

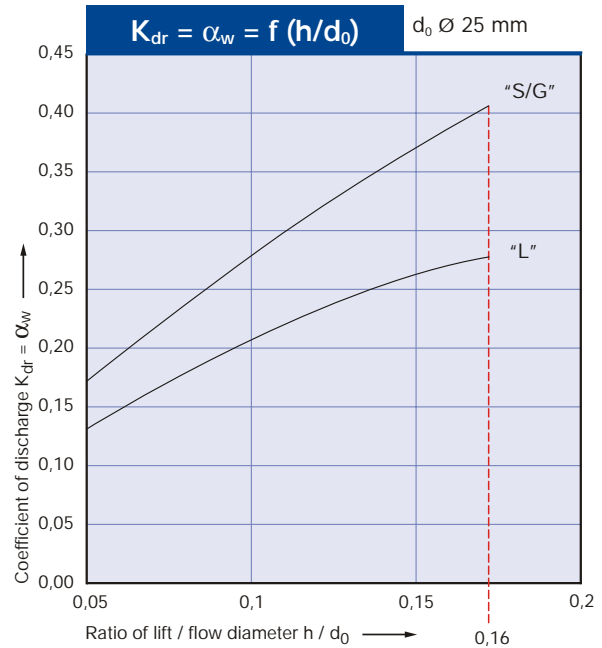
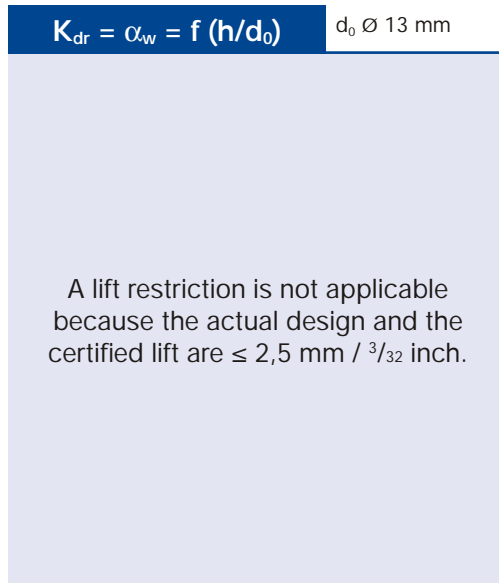
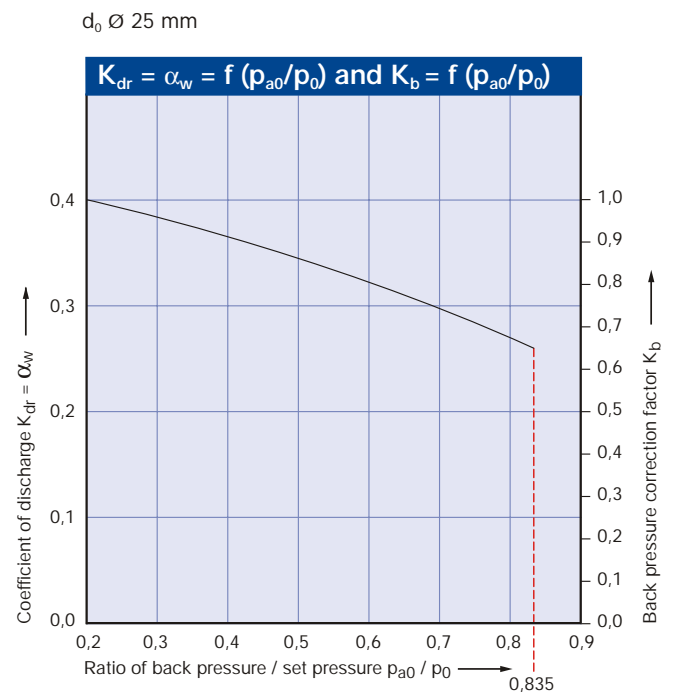
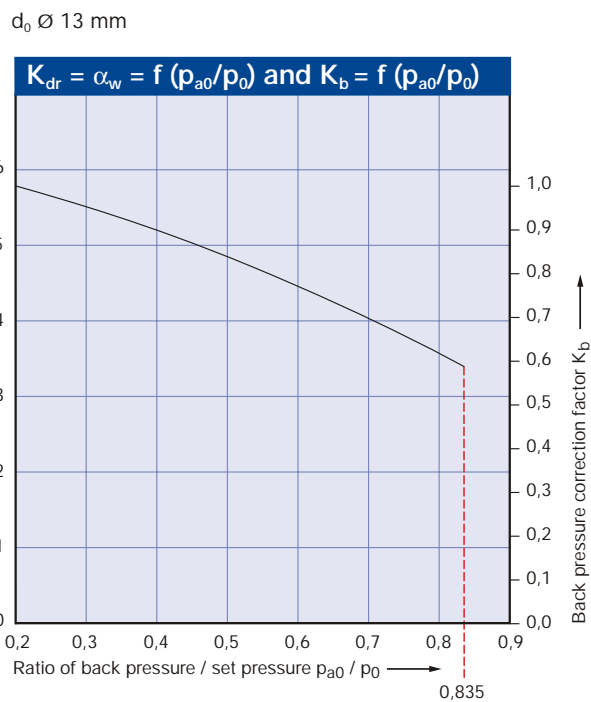
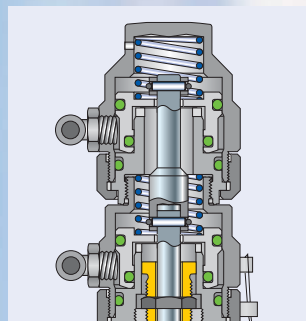
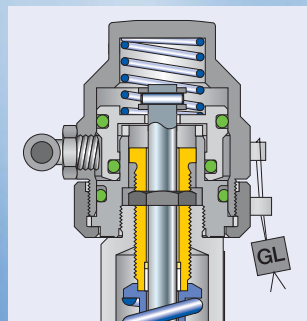
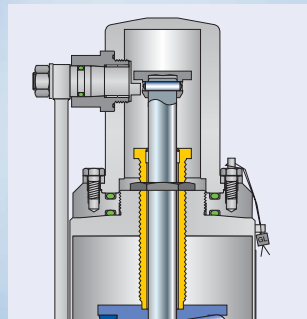
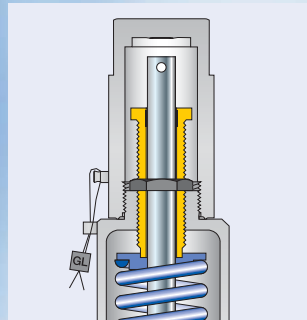
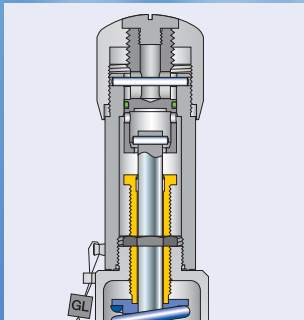
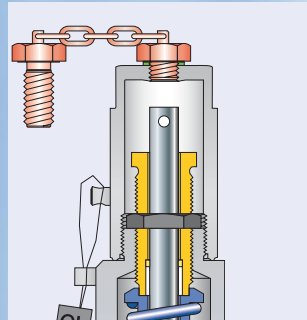
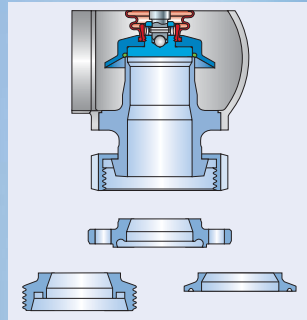
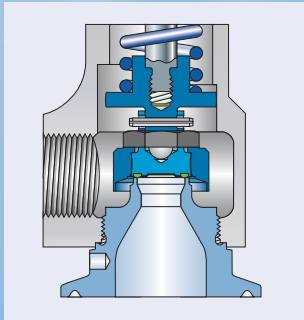
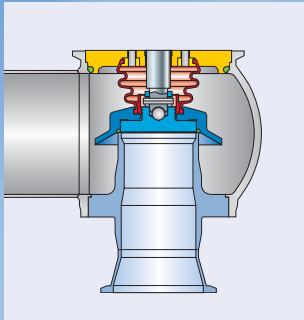


Diagram for evaluation of ratio of the coefficient of discharge (K<sub>dr</sub> = α<sub>w</sub>) in reference to the ratio of back pressure / set pressure (p<sub>a0</sub>/p<sub>0</sub>)



How to use please refer to page 00/18

# Accessories and Options



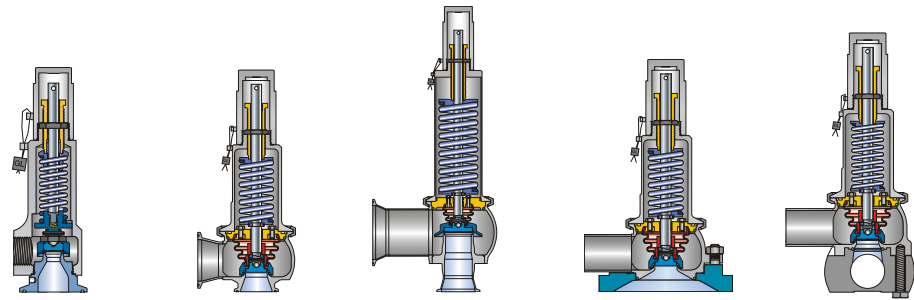
## Contents

## Chapter/Page

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Packed lever H4	99/06
Pneumatic lifting device H8	
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- double piston	99/08
Soft seal disc	99/10
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Assembling tools and blind flanges	99/13

First in safety  
Information tools

## Overview

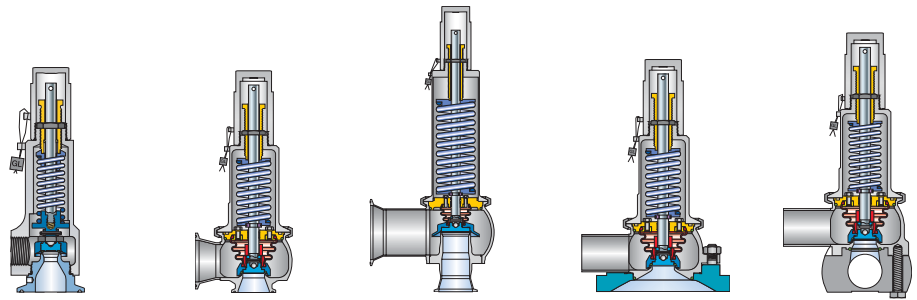


Connections		481	483	488	484	485
Type						
Butt-welded end		-	✓	✓	✓	✓
Clamp		✓	✓	✓	✓	✓
Threaded		✓	✓	✓	-	-
Flanged		-	✓	✓	-	-
Vessel connection		-	-	-	✓	-
Integrated pipework connection		-	-	-	-	✓

Type of sealing		481	483	488	484	485
Type						
Soft seal	O-ring	✓	✓ HyTight	✓ HyTight	✓ HyTight	✓ HyTight
	Vulcanized soft seal	✓	-	-	-	-

Caps and levers		481	483	488	484	485
Type						
H2		✓	✓	✓	✓	✓
H4	Packed knob	✓	✓	✓ d <sub>0</sub> 23 only	✓	✓
	Packed lever	-	-	✓ > d <sub>0</sub> 23	-	-
H8	Single piston	✓	✓	✓	✓	✓
	Double piston J41	✓	✓	✓	✓	✓

## Overview



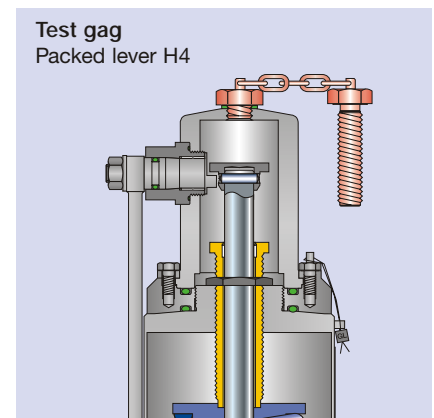
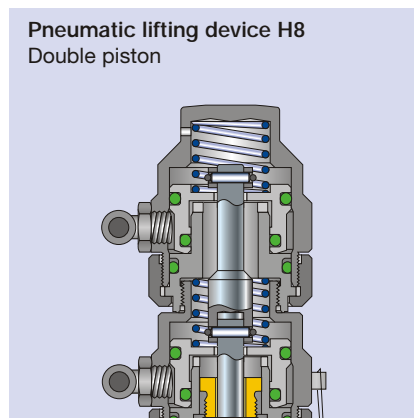
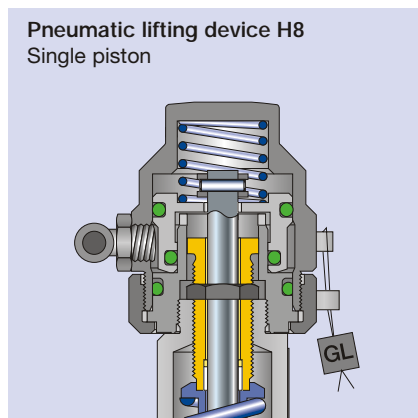
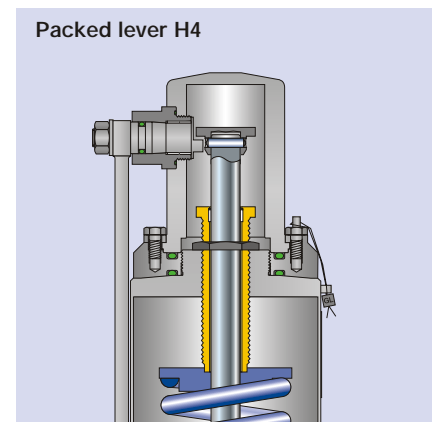
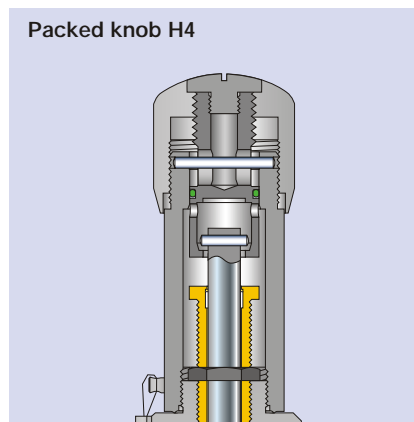
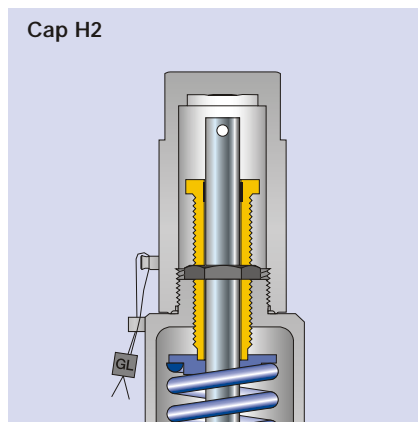
Test gag		481	483	488	484	485
Type						
H2	J70	✓	✓	✓	✓	-
H4	J69	-	-	✓	-	-

Lift indicator		481	483	488	484	485
Type						
Bonnet	J38J93	-	✓	✓ d <sub>0</sub> 23 only	✓	✓
Lifting device H4	J39J93	-	-	✓	-	-
Lifting device H8	J40J93	-	✓	✓	✓	✓

Elastomer bellows		481	483	488	484	485
Type						
EPDM "D"	S70	-	✓	✓	✓	✓
FFKM "C"	S70	-	✓	-	✓	✓

## Caps and levers – Overview

Overview								
Type	d <sub>0</sub>		Cap	Packed knob	Packed lever	Pneumatic lifting device	Test gag	
	[mm]	[inch]	H2	H4	H4	H8	H2	H4 packed lever
481	10	0,394	size 0	size 0	–	size 0	size 0	–
483	13	0,512	size 0	size 0	–	size 0	size 0	–
	25	0,984	size 1	size 1	–	size 0	size 1	–
488	23	0,906	size 1	size 1	–	size 1	size 1	–
	37	1,457	size 2	–	size 2	size 2	size 2	size 2
	46	1,811	size 2	–	size 2	size 2	size 2	size 2
	60	2,362	size 2	–	size 2	size 2	size 2	size 2
	74	2,913	size 3	–	size 3, bolted	size 3	size 3	size 3, bolted
	92	3,622	size 3	–	size 3, bolted	size 3	size 3	size 3, bolted
484	13	0,512	size 0	size 0	–	size 0	size 0	–
	25	0,984	size 1	size 1	–	size 1	size 1	–
485	13	0,512	size 0	size 0	–	size 0	size 0	–
	25	0,984	size 1	size 1	–	size 1	size 1	–



## Caps and levers – Subassembly item 40

Designs	Cap H2	Packed knob H4
		<p>The packed lifting knob has a unique design setting it apart from conventional lifting levers. The packed lifting knob is twisted to open the safety valve, and remains in the open position until it is twisted closed. This feature allows steam or cleaning solution to flush through the valve during a cleaning cycle.</p>
<b>Test gag</b>	Description of the test gag see page 99/06	Not available for packed knob H4

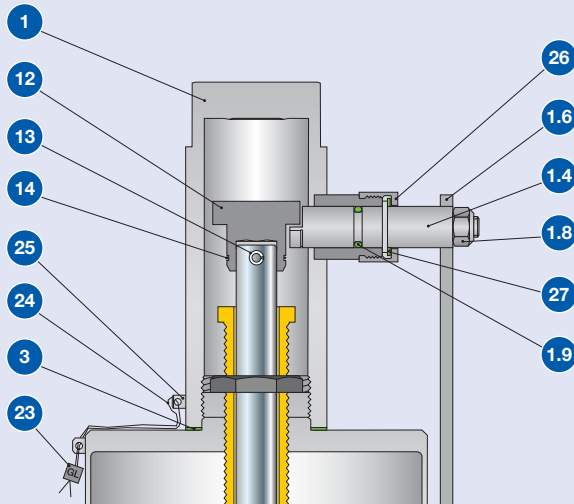
Materials		Cap H2	Packed knob H4
Item	Component		
1	Lever cover	–	1.4404 316L
2	Cap	1.4404 316L	1.4404 316L
12	Spindle cap	–	1.4404 316L
13	Pin	–	1.4401 8M
14	Retaining clip	–	1.4571 316Ti
16	Pin	–	1.4310 Stainless steel
19	O-ring	–	FKM --
22	Stop unit	–	1.4404 316L
23	Seal	Plastic --	Plastic --
24	Seal wire	1.4541 321	1.4541 321
25	Sealing nose	1.4435 316L	1.4435 316L

**Please notice:**

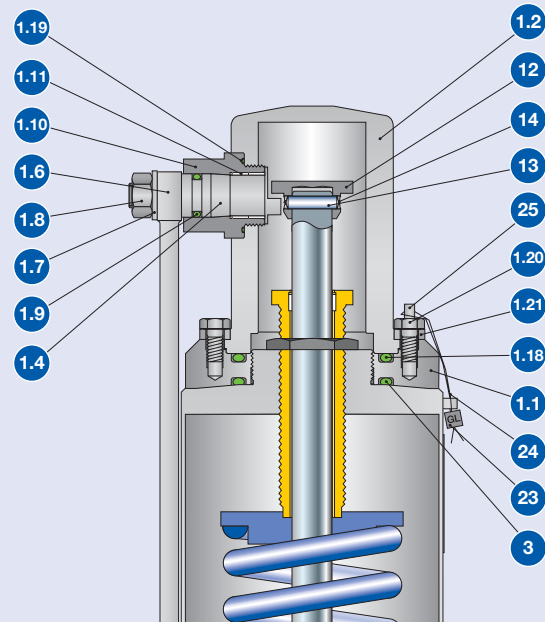
- Modifications reserved by LESER.
- LESER can upgrade materials without notice.
- Every part can be replaced by other material acc. to customer specification.

## Caps and levers – Subassembly item 40

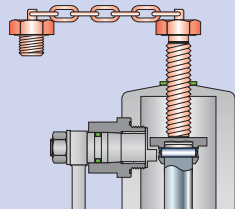
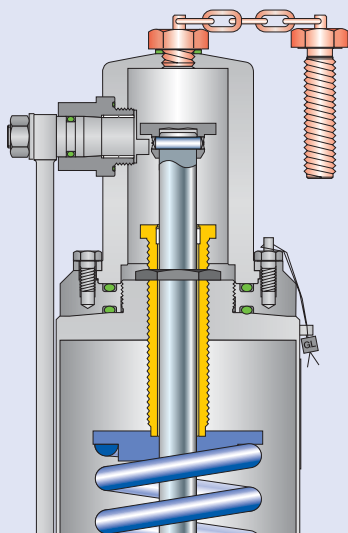
**Packed lever H4**  
Size II



**Packed lever H4**  
Size III



**Test gag**  
Cap H2: J70  
Packed lever H4: J69  
(Type 488,  $d_0$  37 – 92)



### Test gag

The test gag blockades the spindle and keeps the safety valve closed while the system pressure exceeds the set pressure.

The test gag is used for:

- to perform pressure tests in a system without dismantling of the safety valve
- the individual adjustment of safety valves installed in the same system

After testing the screws must be replaced because otherwise the safety valve cannot protect the system against unallowable overpressure!



## Caps and levers bolted – Subassembly item 40

Materials			Packed lever
Item	Component		Packed lever H4
	Size II	Size III	
1	Lever cover	-	1.4404 316L
1.1	-	Lever cover-base	1.4404 316L
1.2	-	Lever cover-top	1.4404 316L
1.4	Shaft/bolt		1.4404 316L
1.6	Lever		1.4301 304
1.7	Washer		1.4401 316
1.8	Hex. nut		1.4401 8M
1.9	O-ring		FKM --
1.10	Shaft/bearing		1.4404 316L
1.11	Bushing		PTFE + 15 % glass --
1.18	O-ring		FKM --
1.19	O-ring		FKM --
1.20	Hex. screw		1.4401 B8M
1.21	Retaining ring		1.4404 316L
3	-	O-ring	FKM --
3	Spacer	-	1.4571 316Ti
12	Spindle cap		1.4404 316L
13	Pin		1.4401 8M
14	Retaining clip		1.4571 316Ti
23	Seal		Plastic --
24	Seal wire		1.4541 321
25	Sealing nose		1.4435 316L
26	Union nut	-	1.4404 316L
27	Washer	-	PTFE --
93	Test gag		1.4401 B8M
93.5	Washer		Fiber --

**Please notice:**

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

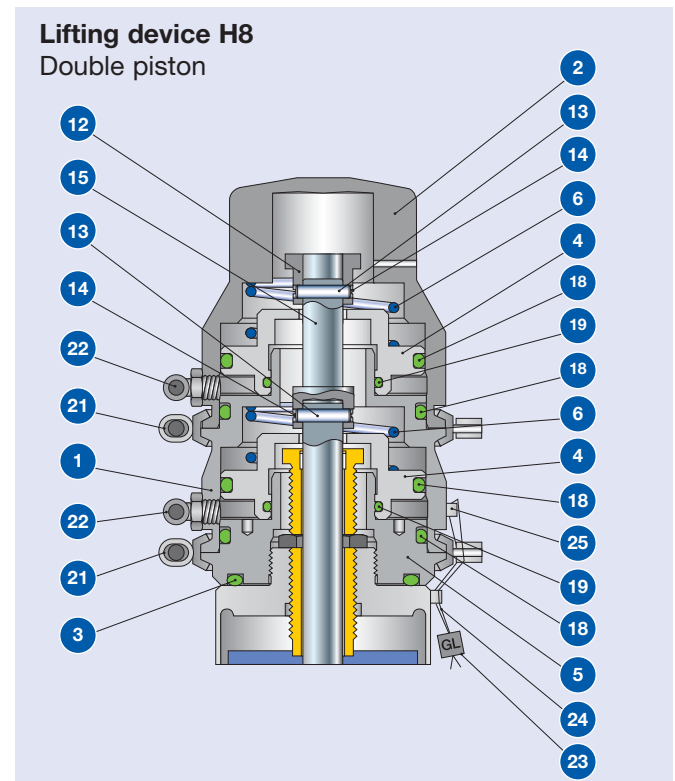
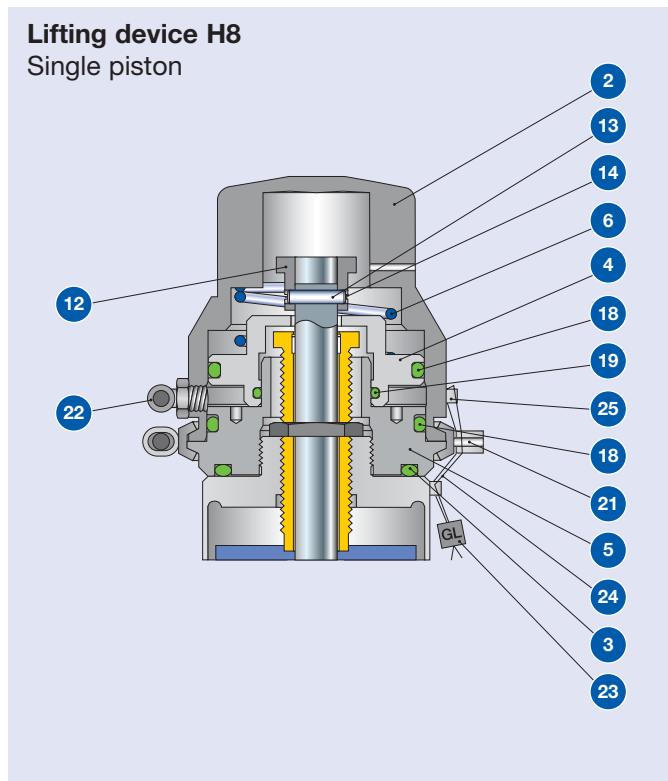
## Caps and lever – Subassembly item 40

### Pneumatic lifting device H8

The pneumatic lifting device H8 allows Cleaning In Place (CIP) or Sterilizing In Place (SIP). Applying air pressure to the lifting device will lift the spindle, which will open the valve and allow steam or cleaning solution to flush through the valve.

Depending on the set pressure and lifting pressure (air supply) a double piston lifting device may be required instead of a single piston. For the choice of the lifting device design please refer to the “H8 selection charts” for applicable valve types.

How to use the “H8 selection charts” please see page 00/12.



## Caps and lever – Subassembly item 40

Materials		Pneumatic lifting device H8	
Item	Component	Single piston	Double piston
1	Cylinder	–	1.4404
		–	316L
2	Cap	1.4404	1.4404
		316L	316L
3	O-ring	FKM	FKM
		–	–
4	Piston	1.4404	1.4404
		316L	316L
5	Piston guide	1.4404	1.4404
		316L	316L
6	Spring	1.4310	1.4310
		Stainless steel	Stainless steel
12	Spindle cap	1.4404	1.4404
		316L	316L
13	Pin	1.4401	1.4401
		8M	8M
14	Retaining clip	1.4571	1.4571
		316Ti	316Ti
18	O-ring	FKM	FKM
		–	–
19	O-ring	FKM	FKM
		–	–
21	Clamp	1.4401	1.4401
		316	316
22	Female elbow fitting	Plastic	Plastic
		–	–
23	Seal	Plastic	Plastic
		–	–
24	Seal wire	1.4541	1.4541
		321	321
25	Sealing nose	1.4435	1.4435
		316L	316L

**Please notice:**

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

## Soft seal disc – Subassembly item 7

LESER soft seal solutions allow for superior tightness.

### Features and Benefits

- different designs for a wide variety application
- large selection of soft seal materials to best adapt to the application
- increased service life of sealing surfaces compared to a metal to metal seat
- simple replacement of the soft seal reduces maintenance costs
- standard ARP O-ring sizes for easy worldwide procurement
- one standard durometer per O-ring material for all set pressures to reduce stocking expenses

Design of soft seal		Type 481		Type 483, 484, 485, 488
Design		Vulcanized soft seal disc	O-ring disc	HyTight Assembly
Set pressure		0,1 – 16 bar	16 – 68 bar	
		1,5 – 232 psig	233 – 986 psig	
Tightness acc. to LWN 220.01		9 x 10 <sup>-5</sup> mbarl/s	9 x 10 <sup>-5</sup> mbarl/s	9 x 10 <sup>-5</sup> mbarl/s

Materials	Subassembly item 7						
	Type 481				Type 483, 484, 485		Type 488
Disc	Item 7.1	1.4404	Item 7.1	1.4404	Item 7.1	1.4435	1.4404
		316L		316L		316L	316L
Soft seal Materials refer to next page		Vulcanized disc	Item 7.4	O-ring	Item 7.4	O-ring	
Lifting aid	Item 7.2	1.4404	Item 7.2	1.4404	Item 7.2	1.4435	1.4404
		316L		316L		316L	316L
Nut	Item 7.5	1.4404		–	Item 7.5	1.4404	
		316L		–		316L	

For temperature limits, medium resistance and option codes please refer to the soft seal selection table, page 99/11.

## Soft seal selection

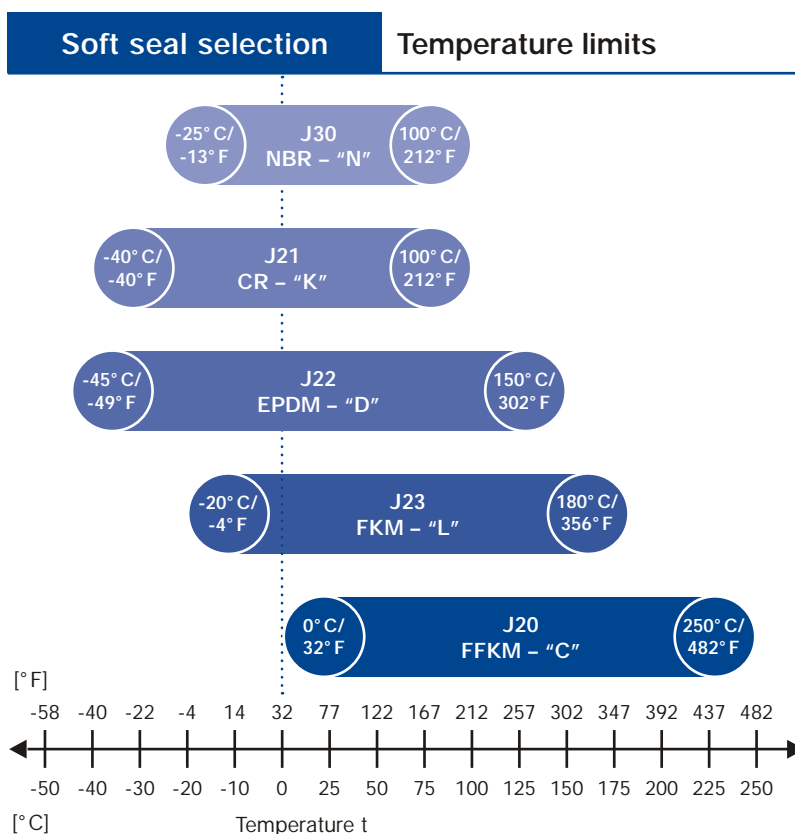
### Type 481 – O-ring disc and Type 483, 484, 485, 488 – HyTight Assembly Type 481 – Vulcanized soft seal disc

Soft seal selection								
Abbreviation ASTM 1418	Trade name (Designation)	Code- letter <sup>1)</sup>	Option Code	T <sub>min</sub>		T <sub>max</sub>		Application <sup>2)</sup>
				[°C]	[°F]	[°C]	[°F]	
<b>O-ring</b>								
CR	Neoprene®	K	J21	-40	-40	100	212	Parafin oil, silicone oil and grease, water and waterbased solvents, refrigerants, ozone
NBR	Buna-N® (Nitrile-Butadiene)	N	J30	-25	-13	100	212	Hydraulic oil, vegetable and animal grease and oil
EPDM	Buna-EP® (Ethylene-Propylene-Diene)	D	J22	-45	-49	150	302	Hot water and superheated steam up to 150° C, 302° F, several organic and inorganic acids, silicone oil and grease, FDA compliant and USP VI compliant compound
FKM	Viton® (Fluorocarbon)	L	J23	20	-4	180	356	High temperature service (no superheated steam), mineral oil and grease, silicone oil and grease, vegetable and animal grease and oil, ozone, FDA compliant compound
FFKM	Kalrez® (Perfluoro)	C	J20	0	32	250	482	Nearly all chemicals, standard compound is Kalrez® 6230 or ISOLAST® J9515, FDA and USP VI compliant compound
Other than listed		X	For other materials please contact your local representative or sales@leser.com					

<sup>1)</sup> The code letters will be stamped on the disc.

<sup>2)</sup> Pressure and temperature service must be considered in any case.

Chemical resistance and the temperature limits depend on O-ring manufacturer information. LESER can not take any warranty.



Trademarks		Soft seal
Registered trademarks	Company	
Buna-N®, Viton®, Neoprene®, Kalrez®	DuPont	
Buna EP®	Bayer	
ISOPLAST®	Busak + Shamban	

## Lift indicator

The lift indicator is a useful device that can be used in process control to monitor the operating status of a safety valve.

To detect lifting, LESER provides a special lifting device H4 incorporating a proximity switch. The lift indicator will detect a safety valve lift equal to or more than 1 mm / 0.04 inch, which may be the result of overpressure or of operation of the lifting device.

LESER provides inductive DC proximity switches, type DIN EN 60947-5-6 (NAMUR) using two-wire technology.

These intrinsically safe proximity switches can be used in explosion hazard area zone 0 (II 1 D Ex iaD 20 T6).

Other types of proximity switch may be used.

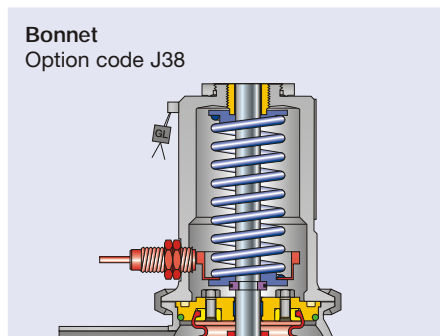
If a technical specification is supplied along with the type of connection thread LESER can verify compatibility.

For technical details of proximity switch refer to

manufacturers homepage: [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com)

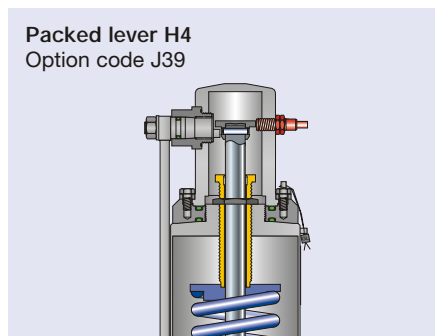
For assembly and adjustment refer to LESER works standard LWN 323.03-E.

## Adaptor for lift indicator placed in:



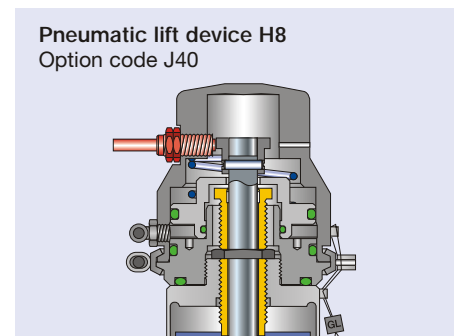
**Bonnet**  
Option code J38

Type 483, 484, 485 d<sub>0</sub>: all  
Type 488 d<sub>0</sub>: 23 mm



**Packed lever H4**  
Option code J39

Type 488 d<sub>0</sub>: 37 – 92 mm



**Pneumatic lift device H8**  
Option code J40

Type 488 d<sub>0</sub>: 37 – 92 mm

### Availability

Item	Component	Option code
9	Bonnet with adaptor for lift indicator	J38
40	Lifting device H4 with adaptor for proximity switch M18 x 1 [mm]	J39
40	Pneumatic lifting device H8 with adaptor for proximity switch M18 x 1 [mm]	J40
94	Lift indicator M18 x 1, used type = PEPPERL+FUCHS NJ5-18GK-N	J93

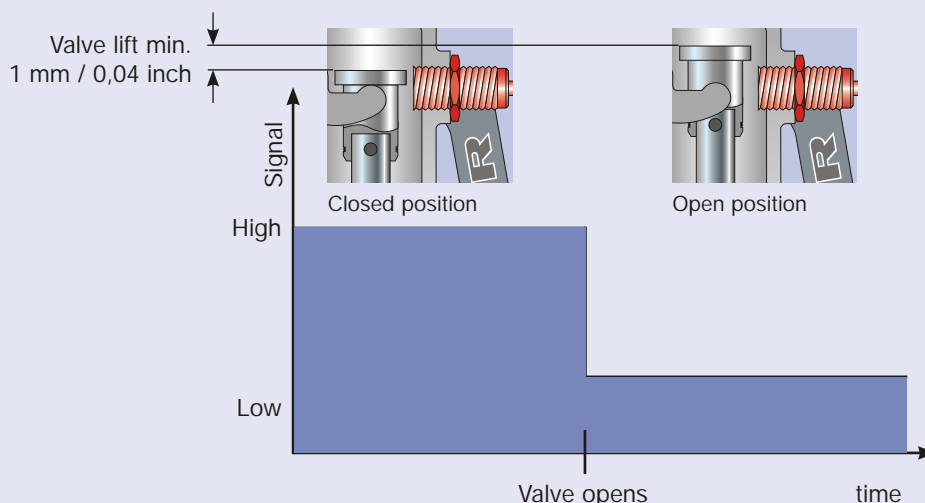
### Operating chart

#### A, closed position

The lift indicator is positioned in front of the coupling or control sleeve when the safety valve is closed.

#### B, open position



When the safety valve opens or is lifted (in both cases at least 1 mm / 0,04 inch), the lift indicator changes its signal. The signal also changes if the lift indicator accidentally becomes loosened or unscrewed (fail safe).



## Blind flanges and assembling tools

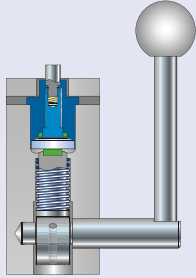
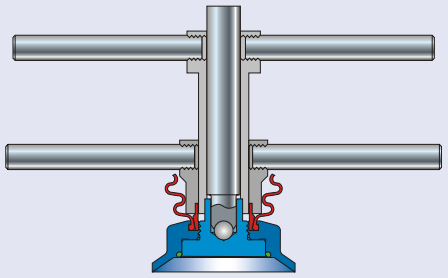
### Blind flange for pressure test

For the pressure test of a vessel with welded in vessel connection or a pipe with integrated pipework connection a special blind flange is required. The blinde flange will be manufactured to customer's order only and has to be ordered separately.

Blind flange		Type 484	Type 485
Design			
		Material-No.	Material-No.
<b>Blind flange</b>			
d <sub>0</sub> [mm]	13	138.8849.9000	138.8949.9000
	25	138.8649.9000	138.8749.9000
<b>O-ring (Item 67)</b>			
d <sub>0</sub> [mm]	13	502.0460.3041	502.0180.3041
	25	502.0600.3041	502.0300.3041

### Assembling tools

LESER offers for the assembly and disassembly of clean service safety valves special assembling tools. The assembling tools make the handling easier and avoid damages of the components.

Assembling tools		Type 481	Type 483, 484, 485, 488
		O-ring disc	HyTight Assembly
Design			
Assembling instructions		LWN 324.10	LWN 324.06
	d <sub>0</sub> [mm]	Material-No.	Material-No.
Type 481	10	445.0439.0000	-
Type 483, 484, 485	13	-	No special tools necessary
	25	-	
	23	-	
Type 488	37 - 46	-	445.0239.0000
	60 - 92	-	445.0339.0000

## ... a not so brief history of LESER

Headquartered in Germany, with a state of the art factory and more than 300 employees LESER are supplying high quality safety valves all over the world.



The company started in Germany in 1818, more than 185 years ago, as a brass foundry and developed a product portfolio of components of mechanical equipment and machines during the "industrial revolution".

In 1885 the company delivered its first safety valve and since the 1970's LESER has specialized only in safety valves.

Since the 1980's LESER has been the leading supplier for safety valves in Europe and strengthens this position each year. Currently LESER are expanding its activities worldwide.



## Safe solutions from the specialist

Today, LESER's product range comprises a total of 7 product groups with 38 safety valve types. A variety of materials and sizes from DN 10 to DN 400 – 1/2" to 16", provide safe solutions for almost every industrial application.

### High Performance:

Safety valves of this design are generally installed for protection of pressure vessels and industrial systems (gas, steam and liquid applications) by providing rapid discharge of the maximum possible mass flow.

### API:

Safety valves according to the API Standard 526; predominantly applicable for the petrochemical and chemical industries.

### Compact Performance:

Safety valves for protection of small and medium mass flows for traditional applications like pumps and compressor, but also adapted for cryo applications.

### Clean Service:

Safety valves for protection of systems with sanitary and hygienic requirements in the food, beverage and pharmaceutical industries.

### Critical Service:

Safety valves partially or fully lined typically with PTFE, suitable for aggressive and corrosive media.

### Modulate Action:

Safety valves which are installed for protection of small mass flow predominantly for liquids to assure a minimization of the media losses. Suitable for thermal relief applications.

**Best Availability:** Other complimentary product series such as supplementary loading systems, change-over valves and bursting discs which complete the LESER product offering.



## Why LESER?

**Short delivery:** Extensive stocks of LESER products are maintained in more than 20 countries to guarantee short delivery lead times worldwide. Most spares can be shipped overnight.

**German manufacturing and assembly worldwide:** LESER safety valves are manufactured exclusively in Germany by LESER! A certified and well-trained network close to LESER's customers provides assembly and setting services with a short response time. This guarantees a superior quality level worldwide.

**New safety valve development:** LESER continually improve existing valve lines and develop new valve models to fulfill customers' demands. The LESER R&D Team consists of over 30 people.

**Proven technology:** LESER operates three flow testing laboratories with ASME and TÜV certification, which are among the biggest facilities in the world. The simulation of customer plant configuration for safe solutions in special cases is daily business at LESER.

**Special Solutions:** LESER's extensive engineering capabilities combined with most modern in-house manufacturing equipment provide quick delivery of special solutions. We design, build and test according to your specification.

**Installed base:** By number LESER have the largest installed base of safety valves throughout the world. Currently LESER produce 75.000 safety valves per year. This installed base guarantees reliability for customers.

**Focus on Safety Valves:** LESER is a privately owned company that is totally focussed on design and manufacturing of one product: safety valves. This ensures LESER's commitment to your safety valve requirements.

All LESER Safety Valves carry CE and ASME



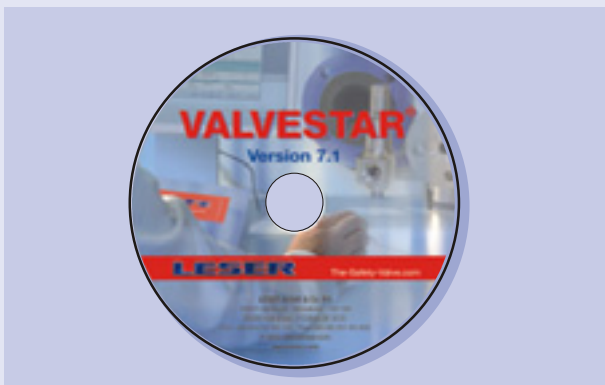
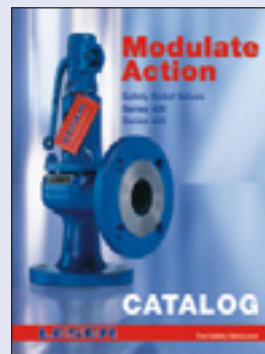
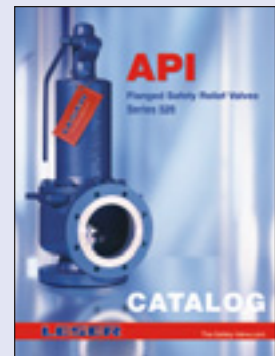
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- Applications
- Features and benefits
- How to orders
- Codes and standards
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- Pressure ranges
- Temperature ranges
- Options
- Spare parts
- Approvals
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(Please use our Fax Order document)

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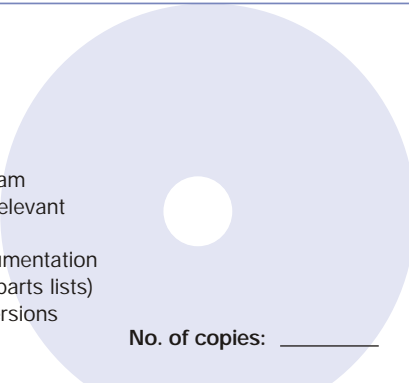
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