Best Availability

Change-over valves
Type 310

CATALOG

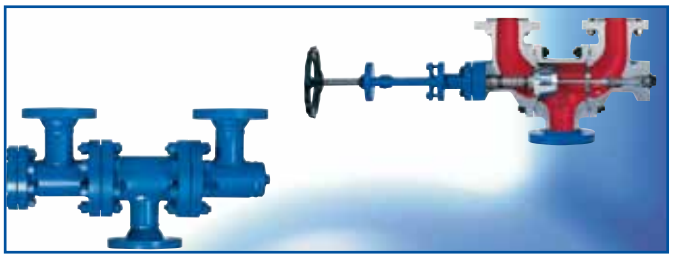
LESER

The-Safety-Valve.com

Product overview

LESER

LESER Change-over and safety valves for any industrial application



Best Availability Change-over valves

High Performance

API

Clean Service

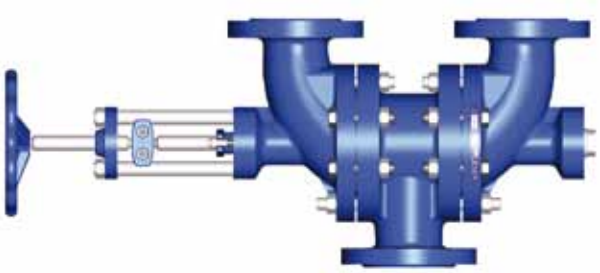
Critical Service

Modulate Action

Compact Performance

Type 310

Contents



Type 310
Gland design

Type 310
Bellows design

General Information

LESER – Change-over valves

The change-over valve product stands for:

- ☑ Uninterrupted operation
- ☑ Easy handling
- ☑ Robust design

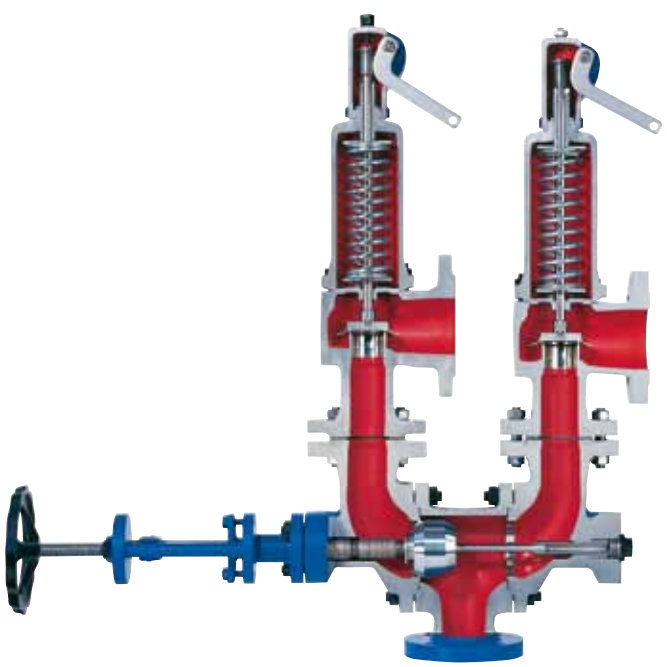
Why change-over valves?

Change-over valves are used to connect two safety valves to a pressure system using one pipe joint. Here, one safety valve is in operation and one safety valve is on stand-by. The stand-by safety valve can be removed during ongoing operation and be serviced, for instance, while protection of the pressure system against inadmissible pressures is maintained.

LESER – Change-over valves

- facilitate a productivity increase of the plant due to the uninterrupted operation, which means
  – reduction of service time and costs
  – reduction of production downtime
- are specifically designed for combination with LESER safety valves.
- are available as
  – individual valve
  – inlet-sided combination with safety valves
  – lockable combination with safety valves
- can be equipped with reducers so that individual adaptations to plant conditions are possible.
- are constantly further developed in close cooperation with plant engineers and service specialists.
- are characterised by longstanding proof in service.
- are equipped with service-free seats which reduces service costs.
- have a compact construction for space-saving installation.
- have a flow-optimised design that leads to low pressure losses in the inlet line. That way, the safety valve works more stable, and also allows to use a change-over valve with the nominal size of the safety valve where applicable.
- have very easy handling and as a result, they are foolproof.
- guarantee the full flow area when changing over and therefore meet all regulatory requirements.

Change-over valves and safety valves from LESER facilitate coordinated planning, delivery and sizing.



Applications

LESER – Change-over valves

LESER change-over valves provide the solution for a continuous operation of plants.

There are deployed in processes

- in which shutting down the plant is not possible.
  Examples are:
  – large natural deposits (e.g. natural gas)
  – storage tanks for technical gasses (e.g. ethylene storage)

- in which shutting down the plant is not desired due to the high technical effort. Shutting down can cause media to harden, stick, or solidify. Examples are:
  – bitumen plants
  – oil fields
  – ethylene plants

- in which shutting down the plant is not wanted in order to guarantee continuous operation, such as
  – refineries

Design features

- 13 valve sizes from DN 25 – DN 500 / NPS 1" – 20" with EN and ASME flanged connections
- Flange classes PN 25 – PN 160 / CL150 – CL900
- Body materials are:

	Steel		Stainless steel	
Type 310	1.0619	WCB	1.4408	CF8M

- Materials that deviate from the standard are possible, e.g. Duplex, LCB, LCC or CF3M
- The temperature range of the change-over valves facilitate use in numerous applications

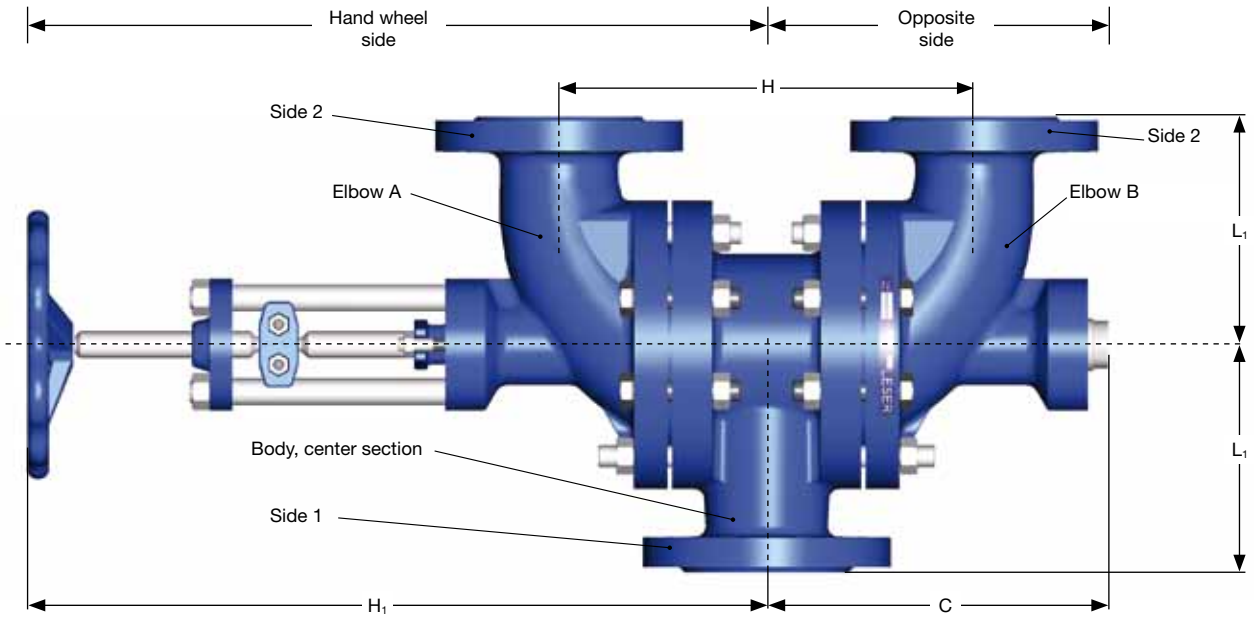
According to DIN EN	Temperature ranges [°C]		Temperature ranges [°F]	
Type 310	-270 °C	+450 °C	-454 °F	+842 °F
As per ASME	Temperature ranges [°C]		Temperature ranges [°F]	
Type 310	-268 °C	+538 °C	-450 °F	+1000 °F

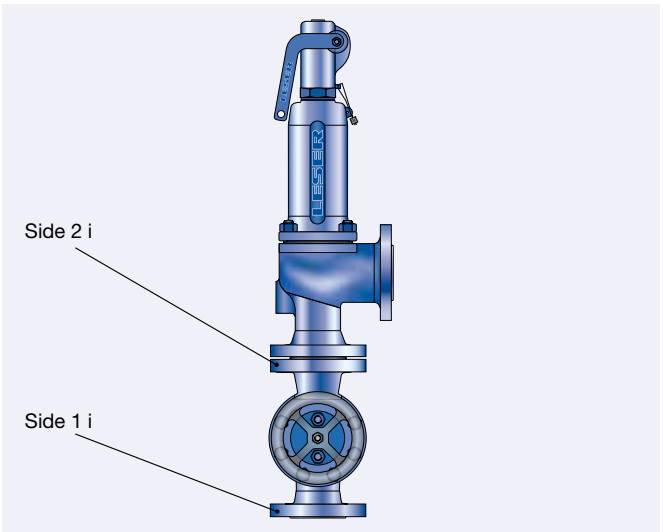
- spindle seal as a gland design and bellows design
  The bellows design meets the requirements of TA Luft
- compact design for low weight and space-saving installation
- conical disc, hence improved seat tightness
- stellited seat surface for low wear
- numerous accessories available for adaptation to the individual plant situation
- sour gas or NACE design possible
- heating jacket available for viscous media

Worldwide Use

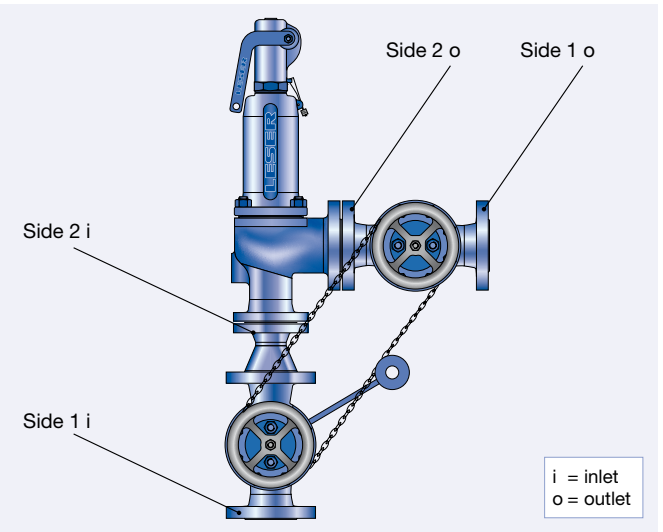
LESER change-over valves can be used worldwide.
They meet national and international regulatory requirements for change-over valves such as the following:
– Pressure equipment directiv PED 97/23/EC
– AD 2000-Merkblatt
– GOST, TR / RTN
– Canadian certification CRN

Terms





Inlet sided combination



Lockable combination

Term	Explanation
Change-over valve sides	
Hand wheel side	Change-over valve side that faces the hand wheel
Opposite side	Change-over valve side that faces away from the hand wheel
Connection name – inlet sided of change-over valve	
Side 1i	Connection of change-over valve to inlet line
Side 2i	Connection of change-over valve to the side on the safety valve inlet
Connection name – outlet sided of change-over valve	
Side 2o	Connection of change-over valve to the side on the safety valve outlet
Side 1o	Connection of change-over valve to blow-down side
Body components	
Elbow A	Elbow on the hand wheel side
Elbow B	Elbow on the opposite side
Body, centre section	Centre piece of the change-over valve
Fitting dimensions of change-over valve	
H	The H dimension describes the distance from the centre of outlet elbow A to the centre of outlet elbow B. This dimension must be the same for the inlet sided and outlet sided change-over valve (only for lockable combination).
H_1 + C	The sum of the dimensions corresponds to the total width.
L_1	The L_1 dimension corresponds to the half-height of the change-over valve.

Type-code and nominal diameters

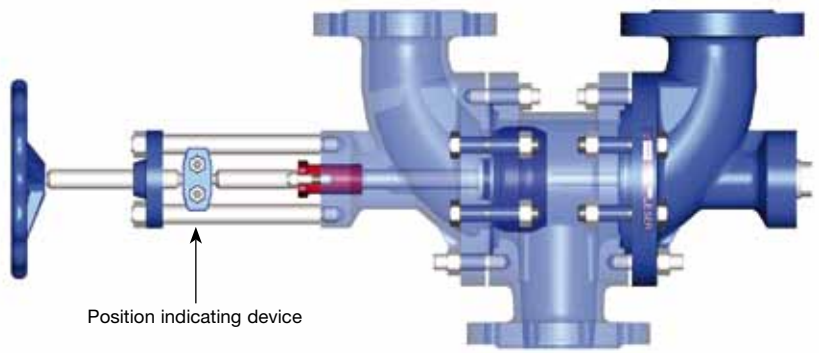
Type 310 is a cast design with nominal diameters of DN 25 to DN 500 / NPS 1" to NPS 20".

Type 310													
DN	25	40	50	65	80	100	125	150	200	250	300	400	500
NPS	1"	1½"	2"	2½"	3"	4"	5"	6"	8"	10"	12"	16"	20"

State of LESER change-over valve on delivery

LESER generally closes the hand wheel side when the valve is delivered. This means that the side with the hand wheel is closed.

From the outside, the disc position can be recognised by the position indicating device. It is located between the column structure – in this position on the hand wheel side.

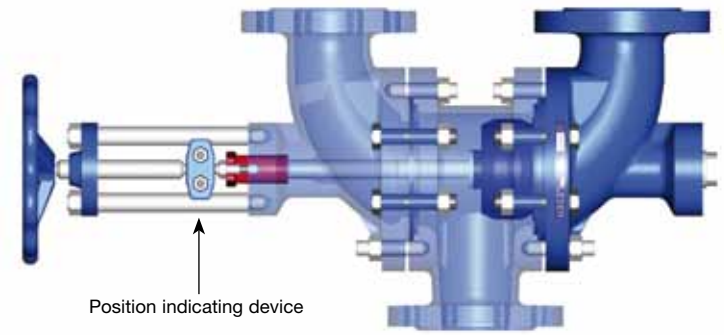


LESER change-over valve Type 310 in delivery condition, hand wheel side closed

Changing over the LESER change-over valve

The change-over is performed by turning the hand wheel. When doing this, make sure that the disc is completely changed over. To guarantee functioning in accordance to the regulatory requirements, it is not permitted to have the disc in the central position permanently!

If the disc is on the opposite side, i.e. the hand wheel side is open, then the position indicating device is on the side of the change-over valve.



LESER change-over valve Type 310 after changing over, opposite side closed

Blowdown cross-section in the change-over phase

Codes and standards like ASME Sec. VIII Div. 1 UG-135 or AD 2000-Merkblatt A2 Par. 6 requires that even when changing-over, the required blow-down cross-section is free. This is ensured through the construction of LESER change-over valves.

Removal of safety valves during operations

Through the use of a change-over valve, the stand-by safety valve can be removed during operations. Here, you must make sure that the safety valve to be removed is shut-off. This means the respective side of the change-over valve must be closed.

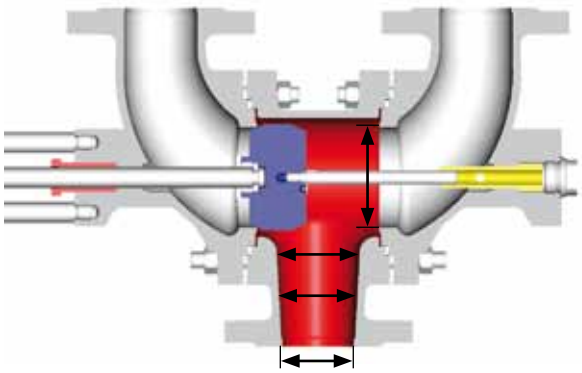
Before the removal of a safety valve, the shut-off side of the change-over valve must be vented in order to relieve the pressure that still remains. Therefore, LESER recommends using an drain hole or a stop valve.

Pressure loss

Basics

According to the international regulatory requirements, the pressure loss in the inlet line to the safety valve must not drop below 3% of the differential pressure between the set pressure and the external back pressure, for large discharged mass flow rates. Pressure loss in the inlet line is understood to be the pressure difference between the pressure in the vessel to be secured and the pressure in front of the safety valve.

This also applies to a combination of change-over and safety valves. The change-over valve is considered to be part of the inlet line.

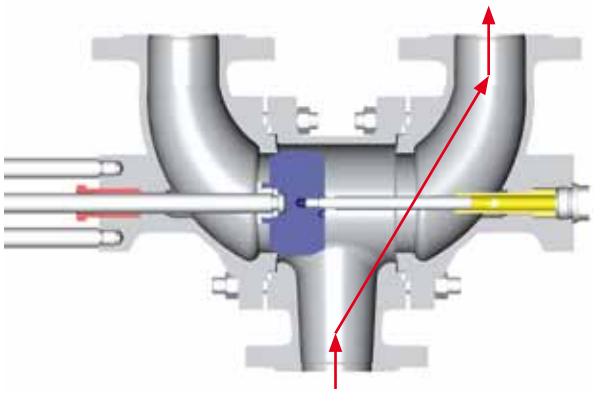


Enlarged orifice area in the seat area

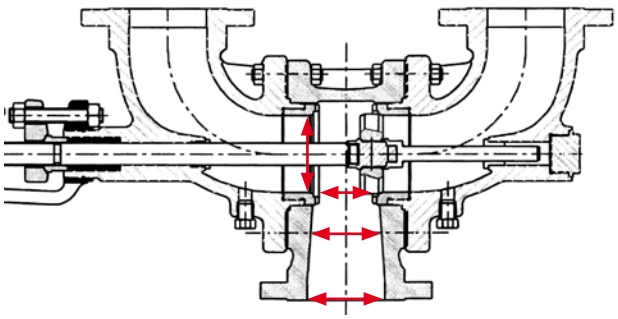
Design of the LESER change-over valve

The outstanding flow behaviour (low pressure loss) of LESER change-over valves is achieved through the following factors:

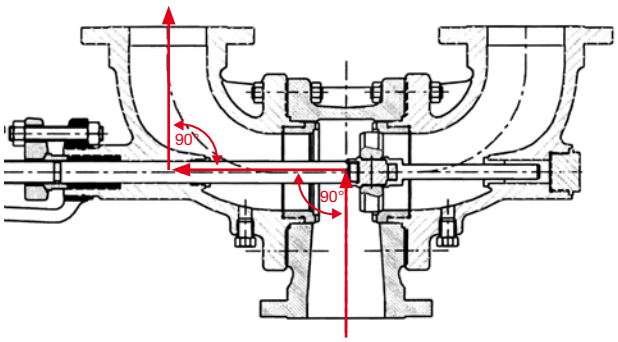
– The orifice area on the inside of the LESER change-over valve is broadened. Through an enlargement of the cross-section, it is possible to reduce the pressure loss.
– Through the low redirection angle of 30°, considerably better flow is achieved than with the customary 90° angles.



30° redirection angle



Orifice area – usual in the market



90° redirection angel – usual in the market

What has to be done if the calculated pressure loss exceeds the 3% criterion?

Various measures are possible in order to keep the pressure loss in the inlet line to the safety valve below the 3% criterion.
– Avoid acute-angled inlet area from the vessel to the pipeline
– ensure the shortest possible inlet line to the safety valve
– increase the inlet line cross-section

If in spite of these measures, the 3% criterion is still exceeded, then the nominal diameter of the change-over valve should be increased and reducers installed. A reduction of up to three nominal diameters is possible.

Resistance Coefficient

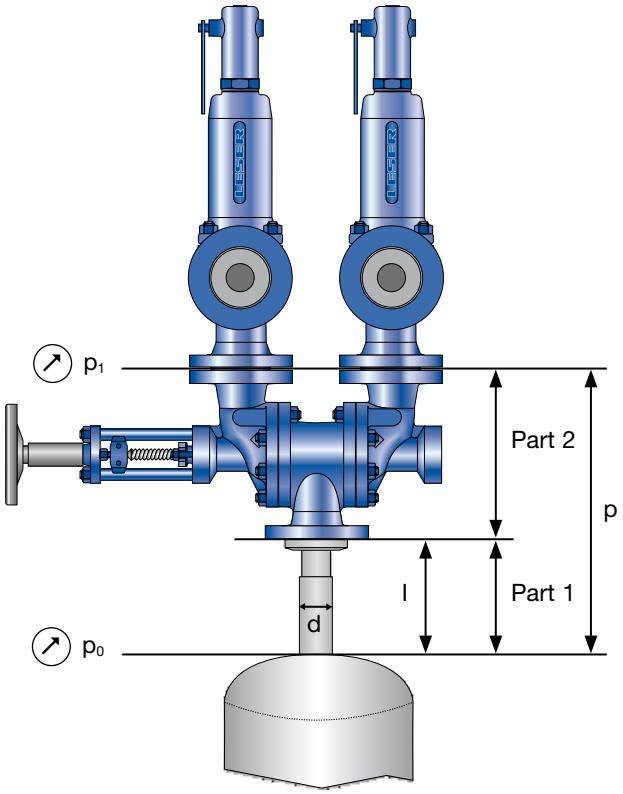
To be able to calculate the pressure loss, you need the pressure loss coefficient ζ (Zeta). The pressure loss coefficient (i.e. the zeta value) is a dimensionless coefficient for the flow resistance of an object in a pipeline through which a medium is flowing. Basically, the pressure loss coefficient should be as low as possible.

The pressure loss coefficients of LESER change-over valves were determined individually on the LESER test bench. The values of the respective change-over valves for calculating the pressure loss can be found on pages 14 and 18. The basis of the calculation can be found on the following page.

Calculation of the pressure loss

Calculation of the pressure loss in the inlet line

LESER change-over valves are constructed such that an equal nominal diameter combination between the change-over valve and safety valve is possible. A calculation is necessary to exactly determine the change-over valve that is to be used.



The pressure loss in the inlet line is calculated with the following formula:

$$\Delta p = \lambda \cdot \left(\frac{l}{d} + \Sigma\,\zeta\right) \frac{\rho}{2} \cdot w^2$$

General formula

this results in

$$\Delta p = \lambda \cdot \frac{l}{d} \cdot \frac{\rho}{2} \cdot w^2 + \Sigma\,\zeta \cdot \frac{\rho}{2} \cdot w^2$$

Part 1

Part 1: Describes the pipe friction in the inlet line to the safety valve.

Part 2: Describes the shape of the inlet line. Contains components such as elbows or change-over valves.

Calculation of the pressure loss in the change-over valve

$$\Delta p_{wv} = \frac{\rho \cdot w^2}{2} \cdot \zeta$$

Examination of part 2
The losses in the change-over valve are expressed by the zeta value.

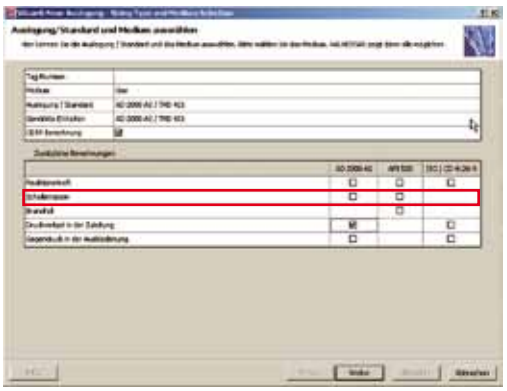
Formula symbols:
Δp Pressure loss in the change-over valve
ρ Density
ζ Pressure loss coefficient (zeta value)
w Flow rate

Calculation of the pressure loss with VALVESTAR®

An easy and user-friendly calculation of the pressure loss in the inlet line to the safety valve can be performed with the LESER design program VALVESTAR®. With the help of the program, it is possible to determine the pressure loss in the LESER change-over valve as well as that of other pipeline components. You can find VALVESTAR® at www.valvestar.com

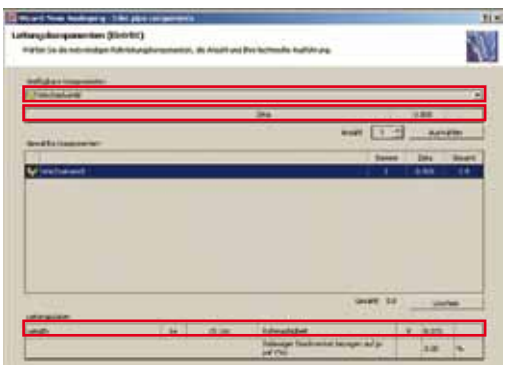
Step 1:
Choose before the configuration of the safety valve

– The calculation of the pressure loss in the inlet line should be calculated as part of the safety valve configuration.
– Possible choices between AD 2000-Merkblatt A2 and ISO 4126-9



Step 2:
Design of the LESER safety valve

Step 3:
Calculation of the pressure loss in the change-over valve after choosing a safety valve
– choice of the line components at the inlet; here it is a change-over valve
– input of the zeta value (pressure loss coefficient)
– specification of the upstream line length



Through the input values, VALVESTAR® automatically calculates the pressure loss in the inlet line to the safety valve. VALVESTAR® also calculates the nominal diameters that are needed to achieve the 3% criterion, if necessary.

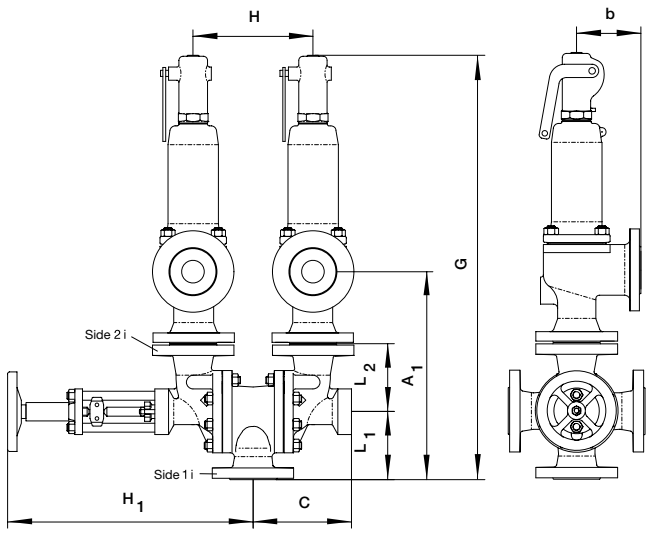
Order form

LESER

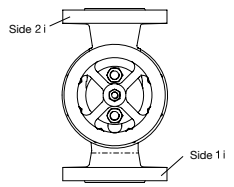
How to order – order form inlet side

Please use the following forms to order change-over valves. This form is used both for the inlet-sided combination as well as for the lockable combination. It only applies to the inlet-sided change-over valve.

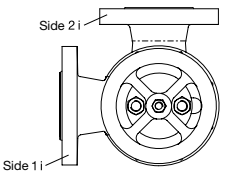
Inlet-sided change-over valve



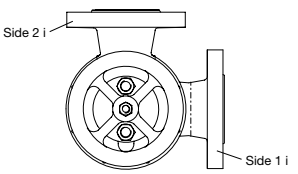
Assembly placement



☐ 1.0 = Standard

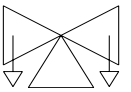


☐ 1.1 = Variant 1

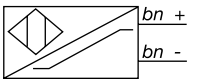


☐ 1.2 = Variant 2

Options

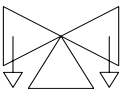


☐ Drain hole G¹/₂

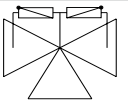


DIN 19234
NAMUR

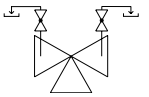
☐ Final position switch



☐ Flushing hole G¹/₂



☐ Bypass with non return valves



☐ Stop valve for pressure relief

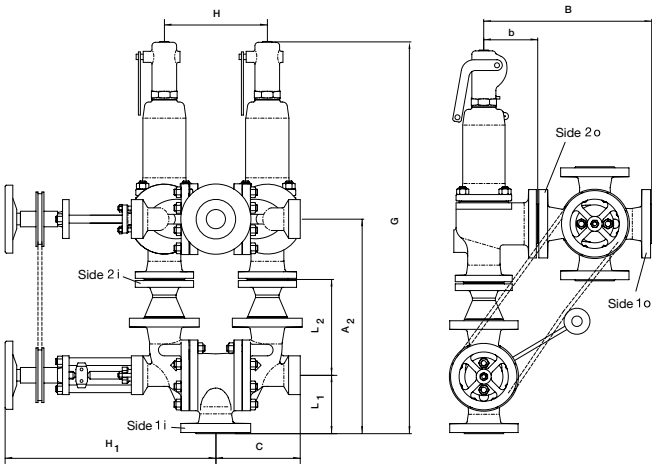
Change-over valve LESER Art. no. 310__._____			**Quantity: _____ Pieces: _____**			**Date: _____**		
☐ DN 25	☐ DN 40	☐ DN 50	☐ DN 65	☐ DN 80	☐ DN 100	☐ DN 125	☐ DN 150	☐ DN 200
☐ NPS 1"	☐ NPS 1½"	☐ NPS 2"	☐ NPS 2½"	☐ NPS 3"	☐ NPS 4"	☐ NPS 5"	☐ NPS 6"	☐ NPS 8"
☐ 1.0619 / WCB		☐ 1.4408 / CF8M	☐ Others as per LDeS 3001.27					
☐ **Gland design**					☐ **Bellows design**			
☐ Hand wheel (standard)		☐ Locking device			☐ Hand wheel (standard)		☐ Locking device	
☐ Chain wheel		☐ Locking device			☐ Chain wheel		☐ Locking device	
☐ Chain of steel		☐ Chain of VA			☐ Chain of steel		☐ Chain of VA	
Side 1, change-over valve body with connection to plant								
☐ PN 40	☐ PN 63	☐ PN 100	☐ PN 160	☐ CL300	☐ CL600	☐ CL900		
☐ Form B1	☐ Form B2	☐ Form RF	☐ Other:					
Side 2, reduction to safety-valve nominal diameter – inlet								
☐ DN 25	☐ DN 40	☐ DN 50	☐ DN 65	☐ DN 80	☐ DN 100	☐ DN 125	☐ DN 150	☐ DN 200
☐ NPS 1"	☐ NPS 1½"	☐ NPS 2"	☐ NPS 2½"	☐ NPS 3"	☐ NPS 4"	☐ NPS 5"	☐ NPS 6"	☐ NPS 8"
☐ Form B1	☐ Form B2	☐ Form RF	☐ Other:					
Side 2, change-over valve elbow A + B to safety valve – inlet								
☐ PN 40	☐ PN 63	☐ PN 100	☐ PN 160	☐ CL300	☐ CL600	☐ CL900		
☐ Form B1	☐ Form B2	☐ Form RF	☐ Other:					
☐ MTR as per DIN EN 10204 3.1 for body components			☐ MTR as per DIN EN 10204 3.1 for internal components disc, spindle, disc guide					
Rating plate data								
☐ K_{VS} value		☐ C_V value	☐ ζ- Value					
Additional change-over valve marking								
☐ No	☐ Yes	☐ Elbow A	☐ Elbow B			☐ Tag No.:		
☐ Text								
☐ Additional information								

Order form

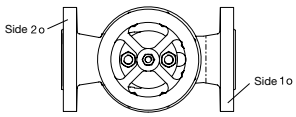
How to order – change-over valve outlet side

This form is used for the lockable combination. It only applies to the outlet-sided change-over valve.

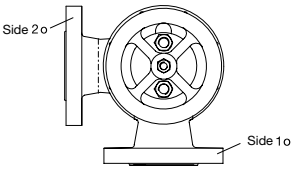
Outlet-sided change-over valve



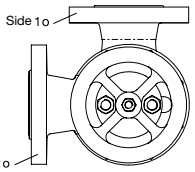
Assembly placement



☐ 2.0 = Standard

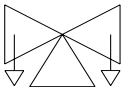


☐ 2.1 = Variant 1

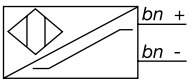


☐ 2.2 = Variant 2

Options

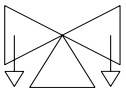


☐ Drain hole G¹/₂

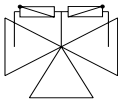


DIN 19234
NAMUR

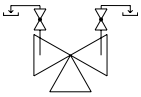
☐ Final position switch



☐ Flushing hole G¹/₂



☐ Bypass with non return valves

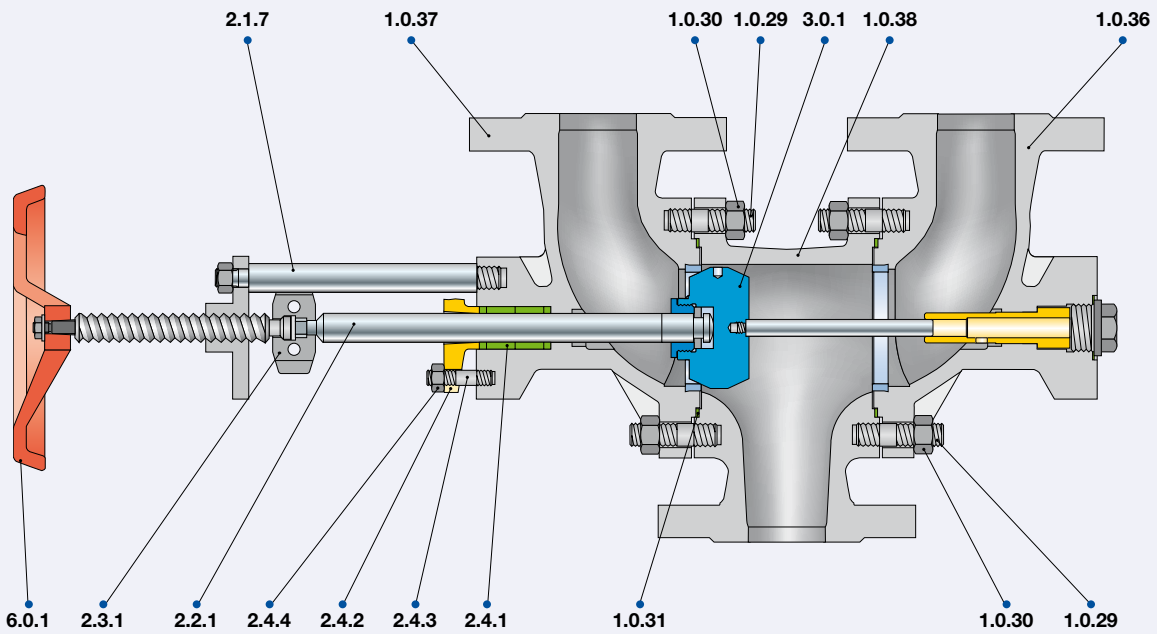


☐ Stop valve for pressure relief

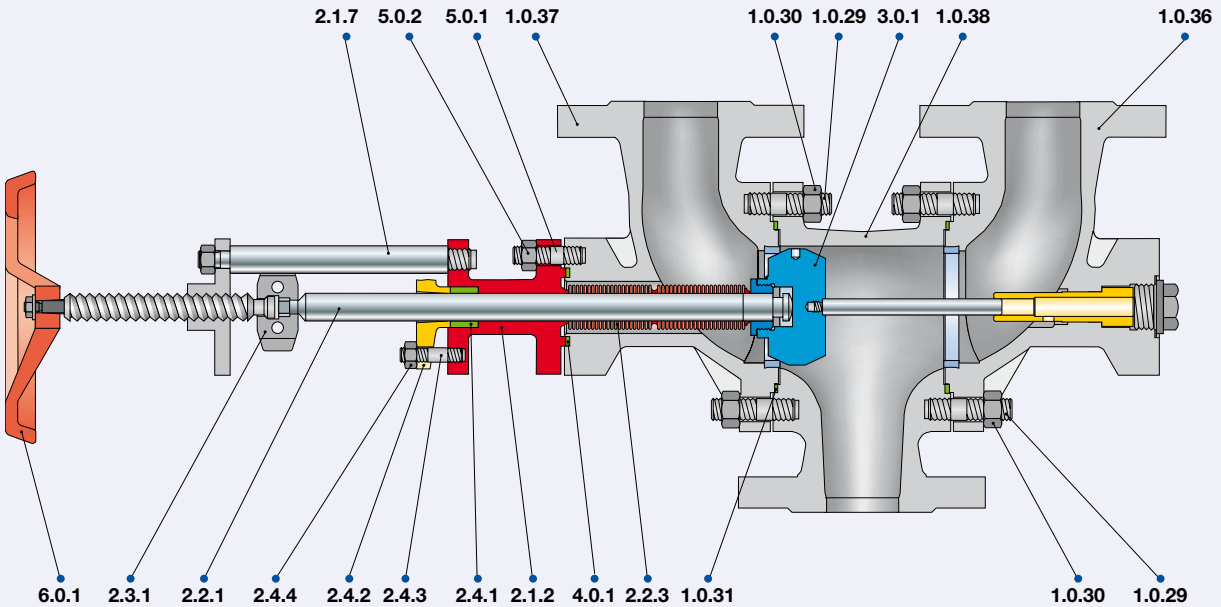
Change-over valve LESER Art. no. 310__._____			**Quantity: _____ Pieces: _____**			**Date: _____**		
☐ DN 25	☐ DN 40	☐ DN 50	☐ DN 65	☐ DN 80	☐ DN 100	☐ DN 125	☐ DN 150	☐ DN 200
☐ NPS 1"	☐ NPS 1¹/₂"	☐ NPS 2"	☐ NPS 2¹/₂"	☐ NPS 3"	☐ NPS 4"	☐ NPS 5"	☐ NPS 6"	☐ NPS 8"
☐ 1.0619 / WCB		☐ 1.4408 / CF8M		☐ Others as per LDeS 3001.27				
☐ **Gland design**				☐ **Bellows design**				
☐ Hand wheel (standard)		☐ Locking device		☐ Hand wheel (standard)		☐ Locking device		
☐ Chain wheel		☐ Locking device		☐ Chain wheel		☐ Locking device		
☐ Chain of steel		☐ Chain of VA		☐ Chain of steel		☐ Chain of VA		
Side 1, change-over valve body with connection to plant								
☐ PN 40	☐ PN 63	☐ PN 100	☐ PN 160	☐ CL300	☐ CL600	☐ CL900		
☐ Form B1	☐ Form B2	☐ Form RF	☐ Other:					
Side 2, reduction to safety-valve nominal diameter – outlet								
☐ DN 25	☐ DN 40	☐ DN 50	☐ DN 65	☐ DN 80	☐ DN 100	☐ DN 125	☐ DN 150	☐ DN 200
☐ NPS 1"	☐ NPS 1¹/₂"	☐ NPS 2"	☐ NPS 2¹/₂"	☐ NPS 3"	☐ NPS 4"	☐ NPS 5"	☐ NPS 6"	☐ NPS 8"
☐ Form B1	☐ Form B2	☐ Form RF	☐ Other:					
Side 2, change-over valve elbow A + B to safety valve – outlet								
☐ PN 40	☐ PN 63	☐ PN 100	☐ PN 160	☐ CL300	☐ CL600	☐ CL900		
☐ Form B1	☐ Form B2	☐ Form RF	☐ Other:					
☐ MTR as per DIN EN 10204 3.1 for body components			☐ MTR as per DIN EN 10204 3.1 for internal components disc, spindle, disc guide					
Rating plate data								
☐ K_{VS} value		☐ C_V value		☐ ζ- Value				
Additional change-over valve marking								
☐ No	☐ Yes	☐ Elbow A		☐ Elbow B		☐ Tag No.:		
☐ Text								
☐ Additional information								

Designs

Gland design



Bellows design



Designs and materials

Materials

Item.	Component	Type 3102		Type 3104	
General components					
1.0.38	Body, centre section	1.0619 SA 216 WCB		1.4408 SA 351 CF8M	
1.0.36	Elbow B	1.0619 Body seat 1.4370 build-up welding SA 216 WCB Body seat SS build-up welding		1.4408 Body seat stellited (Stellite 21) SA 351 CF8M Body seat stellited (Stellite 21)	
1.0.37	Elbow A	1.0619 Body seat 1.4370 build-up welding SA 216 WCB Body seat SS build-up welding		1.4408 Body seat stellited (Stellite 21) SA 351 CF8M Body seat stellited (Stellite 21)	
3.0.1	Disc	DN 25 – DN 50:	1.4021 Vacuum-hardened sealing surface 420 Vacuum-hardened sealing surface	DN 25 – DN 50:	1.4571 316Ti
		DN 65 – DN 125:	1.0460 Hard-faced sealing surface 1.4009 105 Hard-faced sealing surface 1.4009	DN 65 – DN 125:	1.4571 316Ti
		DN 150 – DN 400:	1.0619 Hard-faced sealing surface 1.4009 WCB Hard-faced sealing surface 1.4009	DN 150 – DN 400:	1.4408 stellited (Stellite 6) SA 351 CF8M stellited (Stellite 6)
2.2.1	Spindle Upper spindle part	1.4122 Chrome steel		1.4122 Chrome steel	
	Spindle Lower spindle part	1.4301 304		1.4571 316Ti	
2.1.7	Column design	1.0037 Steel		1.4301 Steel	
2.4.2	Stuffing box	1.0460 Steel		1.4408 CF8M	
2.3.1	Position indicating device / turn lock	1.0420 Steel		1.4408 CF8M	
6.0.1	Hand wheel	0.6020 Cast iron		0.6020 Cast iron	
1.0.29	Hexagon screw / Stud	A2-70 Stainless steel		A2-70 Stainless steel	
1.0.30	Nut	A2-70 Stainless steel		A2-70 Stainless steel	
1.0.31	Body gasket	1.4571 / Graphite 316Ti / Graphite		1.4571 / Graphite 316Ti / Graphite	
2.4.1	Packing gland	Graphite Graphite		Graphite Graphite	
2.4.4	Nut	Steel, galvanized Steel, galvanized		1.4301 Stainless steel	
2.4.3	Stud	Steel, galvanized Steel, galvanized		1.4301 Stainless steel	
Bellows design, specific					
2.2.3	Bellows	1.4571 316Ti		1.4571 316Ti	
2.4.1	Packing gland	Graphite Graphite		Graphite Graphite	
2.1.2	Packing element	1.0460 / 1.0619 SA 105 / WCB		1.4571 /1.4408 316 Ti / CF8M	
4.0.1	Cover gasket	1.4571 / Graphite 316Ti / Graphite		1.4571 / Graphite 316Ti / Graphite	
5.0.2	Nut	Steel, galvanized Steel, galvanized		1.4301 Stainless steel	
5.0.1	Stud	Steel, galvanized Steel, galvanized		1.4301 Stainless steel	

Please note:

- LESER reserves the right to make changes.
- LESER may use higher quality materials without giving prior notice.
- Each component can be replaced by another material according to the customer's specification.

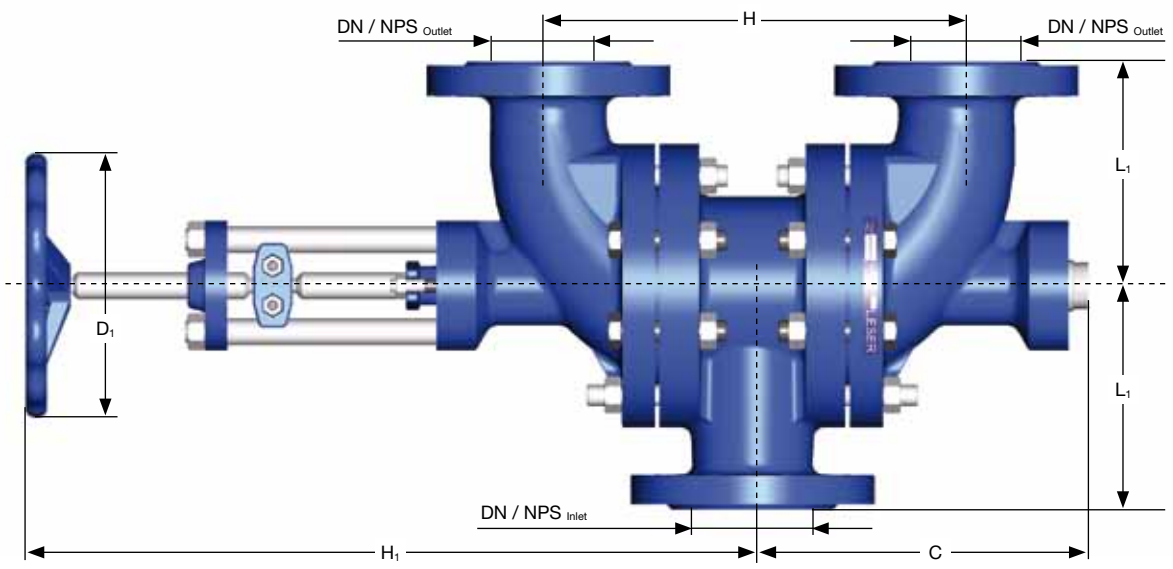
Article numbers and weights, pressure loss coefficients, and flow efficiency coefficient

Article numbers

		DN	25	40	50	65	80	100	125	150	200	250	300
		Valve size	1"	1½"	2"	2½"	3"	4"	5"	6"	8"	10"	12"
Body material: 1.0619 (WCB)													
							PN 40 (CL150 – CL300)						
Gland design	Art. no. **3102.**		**9320**	**9340**	**9350**	**9360**	**9370**	**9380**	**9390**	**9910**	**9920**	**9620**	**9630**
Bellows design	Art. no. **3102.**		**9321**	**9341**	**9351**	**9361**	**9371**	**9381**	**9391**	**9911**	**9921**	**9621**	**9631**
Body material: 1.4408 (CF8M)													
							PN 40 (CL150 – CL300)						
Gland design	Art. no. **3104.**		**9420**	**9440**	**9450**	**9460**	**9470**	**9480**	**9490**	**9950**	**9960**	**9820**	**9830**
Bellows design	Art. no. **3104.**		**9421**	**9441**	**9451**	**9461**	**9471**	**9481**	**9491**	**9951**	**9961**	**9821**	**9831**

Weights												
Gland design	[kg]	25	46	48	96	99	151	156	323	667	830	950
Bellows design	[kg]	28	50	52	106	109	161	166	338	682	850	970
Gland design	[lbs]	56	102	107	220	220	336	347	718	1482	1830	2111
Bellows design	[lbs]	62	111	111	242	242	358	369	751	1516	1889	2156

Pressure loss coefficients ζ												
Gland design	Hand wheel side [–]	0,60	0,60	0,70	0,83	0,83	0,79	0,84	0,81	0,84	0,99	0,84
	Opposite side [–]	0,60	0,70	0,90	0,90	0,90	0,94	0,98	0,89	0,92	0,96	0,91
Bellows design	Hand wheel side [–]	1,00	0,80	0,80	0,93	0,93	0,89	0,94	0,91	0,94	1,05	0,91
	Opposite side [–]	0,60	0,70	0,90	0,90	0,90	0,94	0,98	0,89	0,92	0,96	0,89
Flow efficiency coefficient												
kvs **Gland design**	[m³/h]	32	76	105	178	270	412	631	953	1666	2510	3770
Bellows design	[m³/h]	25	71	105	175	265	412	631	942	1649	2437	3770
Cv **Gland design**	[US-G.P.M]	37	88	122	206	312	476	729	1102	1927	2902	4358
Bellows design	[US-G.P.M]	29	83	122	202	307	476	729	1090	1906	2818	4358



Please take the respective dimensions from the tables on the following page

Dimensions – Metric and US units

Metric units

			DN	25	40	50	65	80	100	125	150	200	250	300
			Valve size	1"	1½"	2"	2½"	3"	4"	5"	6"	8"	10"	12"
≤ PN 40														
	L_1	[mm]		115	150	150	190		230		280	370	430	440
	C	[mm]		145	235	235	300		360		485	635	710	755
	D_1	[mm]		175	200	200	300		300		400	500	600	600
	H	[mm]		190	265	265	360		460		600	800	900	950
Gland design	H_1	[mm]		385	535	535	740		815		1110	1445	1670	1670
Bellows design	H_1	[mm]		470	615	615	910		990		1390	1720	1670	1670
PN 63														
	L_1	[mm]		175	150	210	190		230		330	370	A	A
	C	[mm]		145	235	235	300		360		480	635	A	A
	D_1	[mm]		175	200	200	300		300		500	500	A	A
	H	[mm]		190	265	265	360		460		620	800	A	A
Gland design	H_1	[mm]		385	535	535	740		815		1280	1445	A	A
Bellows design	H_1	[mm]		470	615	615	910		985		1485	1720	A	A
PN 100														
	L_1	[mm]		175	200	200	A		250		330	A	A	A
	C	[mm]		160	275	270	A		360		480	A	A	A
	D_1	[mm]		175	300	300	A		400		500	A	A	A
	H	[mm]		190	320	320	A		460		620	A	A	A
Gland design	H_1	[mm]		385	660	660	A		1020		1280	A	A	A
Bellows design	H_1	[mm]		655	930	930	A		1160		1485	A	A	A
PN 160														
	L_1	[mm]		175	200	200	A		300		A	A	A	A
	C	[mm]		160	275	270	A		420		A	A	A	A
	D_1	[mm]		175	300	300	A		400		A	A	A	A
	H	[mm]		190	320	320	A		540		A	A	A	A
Gland design	H_1	[mm]		385	660	660	A		1075		A	A	A	A
Bellows design	H_1	[mm]		655	930	930	A		1160		A	A	A	A

US units

			DN	25	40	50	65	80	100	125	150	200	250	300
			Valve size	1"	1½"	2"	2½"	3"	4"	5"	6"	8"	10"	12"
CL150 – CL300														
	L_1	[inch]		4 17/32	5 29/32	5 29/32	7 15/32		9 1/16		11 1/32	14 9/16	16 15/16	17 5/16
	C	[inch]		6 5/16	9 1/4	9 1/4	11 13/16		14 3/16		19 3/32	25	27 15/16	29 23/32
	D_1	[inch]		7 7/8	7 7/8	7 7/8	11 13/16		11 13/16		15 3/4	19 11/16	23 5/8	23 5/8
	H	[inch]		7 15/32	10 7/16	10 7/16	14 3/16		18 1/8		23 5/8	31 1/2	35 7/16	37 13/32
Gland design	H_1	[inch]		15 5/32	21 1/16	21 1/16	29 1/8		32 3/32		43 11/16	56 7/8	65 3/4	65 3/4
Bellows design	H_1	[inch]		18 1/2	24 7/32	24 7/32	35 13/16		38 25/32		54 23/32	67 23/32	65 3/4	65 3/4
CL600														
	L_1	[inch]		5 29/32	7 7/8	7 7/8	A		9 27/32		13	A	A	A
	C	[inch]		6 5/16	10 5/8	10 5/8	A		14 3/16		18 29/32	A	A	A
	D_1	[inch]		7 7/8	11 13/16	11 13/16	A		15 3/4		19 11/16	A	A	A
	H	[inch]		7 15/32	12 19/32	12 19/32	A		18 1/8		24 13/32	A	A	A
Gland design	H_1	[inch]		15 5/32	25 31/32	25 31/32	A		40 5/32		50 13/32	A	A	A
Bellows design	H_1	[inch]		25 25/32	36 5/8	36 5/8	A		45 21/32		58 15/32	A	A	A
CL900														
	L_1	[inch]		5 29/32	7 7/8	7 7/8	A		11 13/16		A	A	A	A
	C	[inch]		6 5/16	10 5/8	10 5/8	A		16 17/32		A	A	A	A
	D_1	[inch]		7 7/8	11 13/16	11 13/16	A		15 3/4		A	A	A	A
	H	[inch]		7 15/32	12 19/32	12 19/32	A		21 1/4		A	A	A	A
Gland design	H_1	[inch]		15 5/32	25 31/32	25 31/32	A		42 5/16		A	A	A	A
Bellows design	H_1	[inch]		25 25/32	36 5/8	36 5/8	A		45 21/32		A	A	A	A

A = based on order; the dimensions are conveyed with the order confirmation

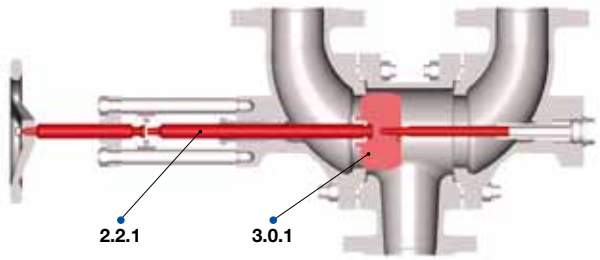
Order information – spare parts

Type 3102 – 1.0619 WCB

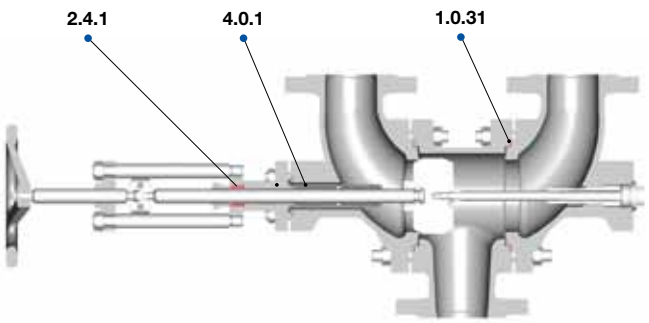
				DN	25	40	50	65	80	100	125	150	200	250	300
				Valve size	1"	1½"	2"	2½"	3"	4"	5"	6"	8"	10"	12"
Spindle seal with gland															
Item No.	**Spare part**	**Quantity**	**Pressure ratings**	**Option Code**	**Article number**										
2.2.1/ 3.0.1	**Spindle-Disc assembly**	1	PN 40 / CL150 – CL300	–	**3102.**	9328	9348	9358	9368	9378	9388	9398	9918	9928	on request
		1	PN 63	Y03											
		1	PN 100 / CL600	Y04 / Y42											
		1	PN 160 / CL900	Y17 / Y43											
Gasket set complete															
Item No.	**Spare part**	**Quantity**			**Article number**										
1.0.31	**Body gasket**	2 pieces			**3102.**	9326	9346	9356	9366	9376	9386	9396	9916	9926	on request
4.0.1	**Cover gasket**	1 piece as of DN 65													
2.4.1	**Packing gland**	1 pieces													

Spindle seal with stainless steel bellows															
Item No.	**Spare part**	**Quantity**	**Pressure ratings**	**Option Code**	**Article number**										
2.2.1/ 3.0.1	**Spindle-Disc assembly**	1	PN 40 / CL150 – CL300	–	**3102.**	9329	9349	9359	9369	9379	9389	9399	9919	9929	on request
		1	PN 63	Y03											
		1	PN 100 / CL600	Y04 / Y42											
		1	PN 160 / CL900	Y17 / Y43											
Gasket set complete															
Item No.	**Spare part**	**Quantity**			**Article number**										
1.0.31	**Body gasket**	2 pieces			**3102.**	9327	9347	9357	9367	9377	9387	9397	9917	9927	on request
4.0.1	**Cover gasket**	≤ DN 50: 1 piece; > DN 50: 2 pieces													
2.4.1	**Packing gland**	1 pieces													

Spare parts



Spare parts, disc assembly



Spare parts, gasket set complete

Order information – spare parts

Type 3104 – 1.4408 (CF8M)

					DN	25	40	50	65	80	100	125	150	200	250	300
					Valve size	1"	1 1/2"	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"
Spindle seal with gland																
Item No.	**Spare part**	**Quantity**	**Pressure ratings**	**Option Code**	**Article number**											
2.2.1/ 3.0.1	**Spindle-Disc assembly**	1	PN 40 / CL150 – CL300	–	**3104.**	9428	9448	9458	9468	9478	9488	9498	9958	9968	on request	
		1	PN 63	Y03												
		1	PN 100 / CL600	Y04 / Y42												
		1	PN 160 / CL900	Y17 / Y43												
Gasket set complete																
Item No.	**Spare part**	**Quantity**			**Article number**											
1.0.31	**Body gasket**	2 pieces			**3104.**	9426	9446	9456	9466	9476	9486	9496	9956	9966	on request	
4.0.1	**Cover gasket**	1 piece as of DN 65														
2.4.1	**Packing gland**	1 pieces														

Spindle seal with stainless steel bellows																
Item No.	**Spare part**	**Quantity**	**Pressure ratings**	**Option Code**	**Article number**											
2.2.1/ 3.0.1	**Spindle-Disc assembly**	1	PN 40 / CL150 – CL300	–	**3104.**	9429	9449	9459	9469	9479	9489	9499	9959	9969	on request	
		1	PN 63	Y03												
		1	PN 100 / CL600	Y04 / Y42												
		1	PN 160 / CL900	Y17 / Y43												
Gasket set complete																
Item No.	**Spare part**	**Quantity**			**Article number**											
1.0.31	**Body gasket**	2 pieces			**3104.**	9427	9447	9457	9467	9477	9487	9497	9957	9967	on request	
4.0.1	**Cover gasket**	≤ DN 50: 1 piece; > DN 50: 2 pieces														
2.4.1	**Packing gland**	1 pieces														

Link chain

				DN	25	40	50	65	80	100	125	150	200	250	300
				NPS	1"	1 1/2"	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"
Item No.	**Spare part**	**Number**	**Material**	**Article number**											
6.0.18	**Link chain**	1 pieces	1.4401 / 316	**3104.**	9425	9445	9455	9465	9475	9485	9495	9955	9965	on request	

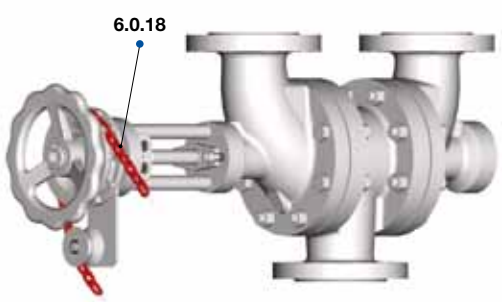
The following spare parts recommendation is to be used as a guideline:

– 1 gasket set complete per change-over valve
– if bellows are used: 1 bellows per change-over valve

The actual need for replacing parts is dependent on several criteria such as:

– Operating temperature
– Environment
– Choice of material
– Medium

These operating conditions have an important effect on the service life of the change-over valve.



Article numbers, pressure loss coefficients, and flow efficiency coefficient

Article numbers

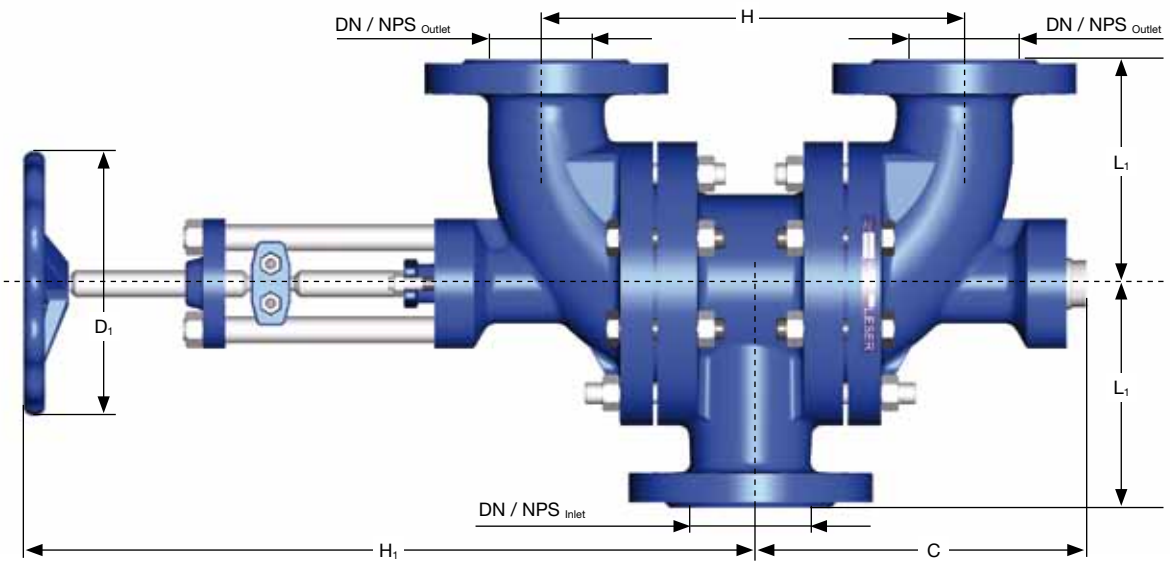
		DN	400	500
		Valve size	16"	20"
Body material: 1.0619 (WCB)				
			PN 25 (CL150)	
Gland design		Art. no. **3102.**	**9640**	**9650**
Bellows design		Art. no. **3102.**	**9641**	**9651**
Body material: 1.4408 (CF8M)				
			PN 25 (CL150)	
Gland design		Art. no. **3104.**	**9840**	**9850**
Bellows design		Art. no. **3104.**	**9841**	**9851**

Pressure loss coefficients ζ				
Gland design		Hand wheel side [–]	0,83	based on order
		Opposite side [–]	0,79	
Bellows design		Hand wheel side [–]	0,91	based on order
		Opposite side [–]	0,79	
Flow efficiency coefficient				
kvs	Gland design	[m³/h]	7017	based on order
	Bellows design	[m³/h]	6702	
Cv	Gland design	[US-G.P.M]	8112	based on order
	Bellows design	[US-G.P.M]	7748	

Dimensions – Metric and US units

Dimensions				
		DN	400	500
		Valve size	16"	20"
Metric units PN 25				
	L_1	[mm]	480	Order-based manufacture
	C	[mm]	895	
	D_1	[mm]	800	
	H	[mm]	1140	
Gland design	**H_1**	[mm]	2170	
Bellows design	**H_1**	[mm]	2465	
US units CL 150				
	L_1	[inch]	18 29/32	Order-based manufacture
	C	[inch]	35 1/4	
	D_1	[inch]	31 1/2	
	H	[inch]	44 7/8	
Gland design	**H_1**	[inch]	85 7/16	
Bellows design	**H_1**	[inch]	97 1/16	

Higher flange pressure ratings will be manufactured based on the order. Please inquire about the respective dimensions at sales@leser.com



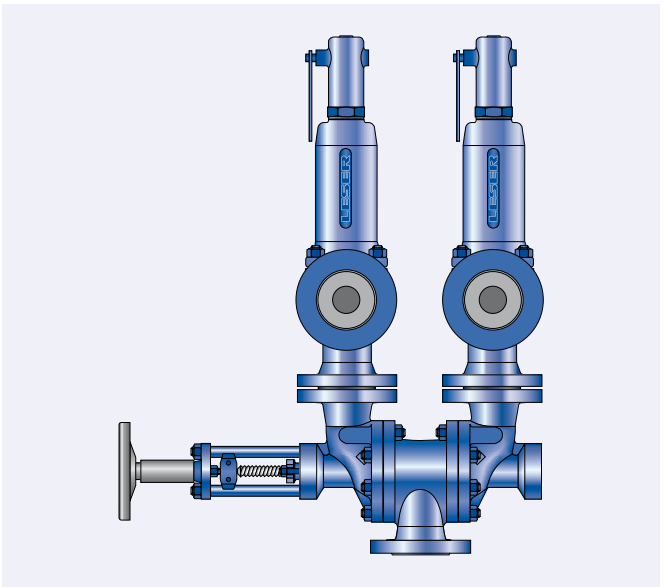
Change-over valve combination

Combination with safety valves

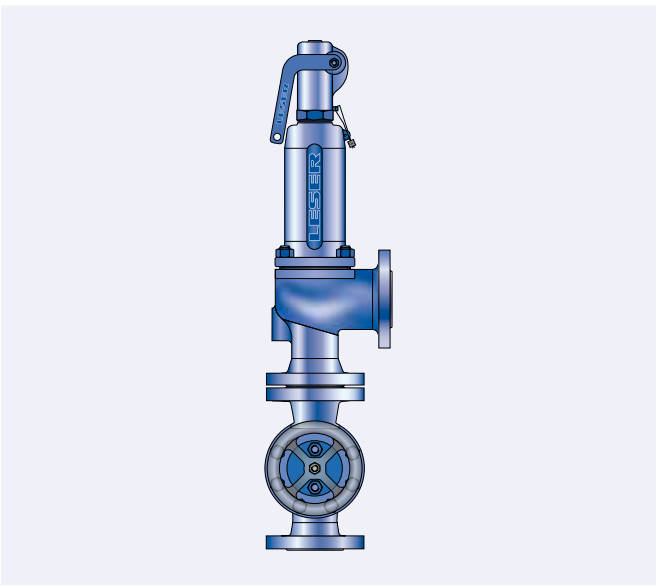
Inlet side combination

There is an inlet sided combination if a change-over valve is installed at the inlet of the safety valve. No change-over valve is installed at that outlet of the safety valve.

This combination is used for applications if
– the safety valves blows into the atmosphere.
– each safety valve is connected to a separate blowdown system.
– each safety valve is connected separately to a common blowdown system. Here, you must make sure that no medium leaks out of the outlet line of the removed safety valve.



Front view: Inlet sided combination



Side view: Inlet sided combination

The fitting dimensions of the inlet-sided combination can be found in the Technical Information category of the download area of the LESER website www.leser.com

Combination with safety valves

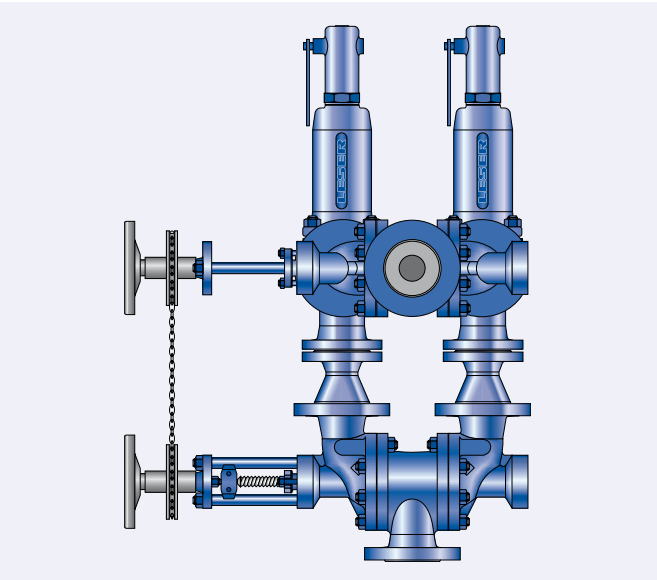
Lockable combination

There is a lockable combination if a change-over valve is installed both at the inlet as well as the outlet of the safety valve. The change-over valves must have the same nominal diameter so that assembly is possible due to the H dimension. The size of the change-over valve is orientated around the change-over valve installed at the outlet.

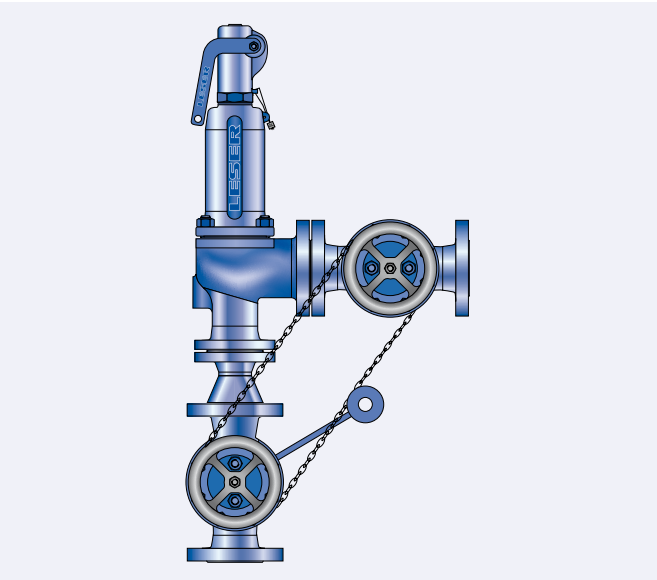
The two change-over valves are setup the same and connected through the chain wheel and chain. That way, it is guaranteed that the stand-by safety valve is closed both at the inlet as well as the outlet.

Please note that each hand wheel must be retightened separately when closing in order to compensate for the play in the chain and hand wheel. Only that way is it guaranteed that the side to be shut-off is tightly closed both at the inlet as well as the outlet of the safety valve.

The combination is used for applications if the safety valves are connected to a common blowdown system.



Front view: Lockable combination



Side view: Lockable combination

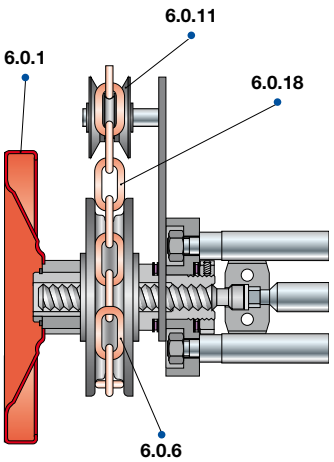
The fitting dimensions of the lockable combination can be found in the Technical Information category of the download area of the LESER website www.leser.com

Change-over valve – chain wheel

Materials

Item.	Component	Type 3102	Type 3104
6.0.1	Hand wheel	0.6020 Cast iron	0.6020 Cast iron
6.0.6	Chain wheel	0.6020 galv. / 0.6025 galv. Cast iron	0.6020 galv. / 0.6025 galv. Cast iron
6.0.11	Small roller	1.4301 Stainless steel	1.4301 Stainless steel
6.0.18	Chain	1.4401 316	1.4401 316

When ordering a lockable combination, a change-over valve with a hand and chain wheel (Option Code Y35) is ordered and a change-over valve with a hand and chain wheel and chain (Option Code Y36).



Application and materials

Application

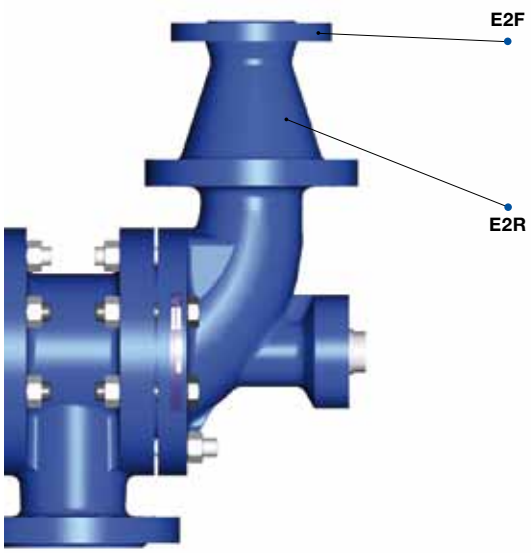
All LESER safety valve product groups have a larger nominal diameter at the outlet than at the inlet (Exception: Modulate Action). The change-over valves of the lockable combination must have the same nominal diameter.

Therefore, if necessary, the outlet nominal diameter of the inlet-side of the change-over valve must be reduced to the inlet nominal diameter of the safety valves, which can be achieved through reducers. Due to the different nominal diameter combinations of the safety valves, a reduction of 1, 2, or 3 nominal diameters may be necessary.

	Inlet-side change-over valve	Outlet-side change-over valve
Safety valve $DN_{Inlet} = DN_{Outlet}$	$DN_{COV} = DN_{Inlet, SV}$	$DN_{COV} = DN_{Outlet, SV}$
Safety valve $DN_{Inlet} < DN_{Outlet}$	$DN_{COV} > DN_{Inlet, SV}$ ➔ Reduction to $DN_{Inlet, SV}$ necessary	$DN_{COV} = DN_{Outlet, SV}$

Installation of reducers

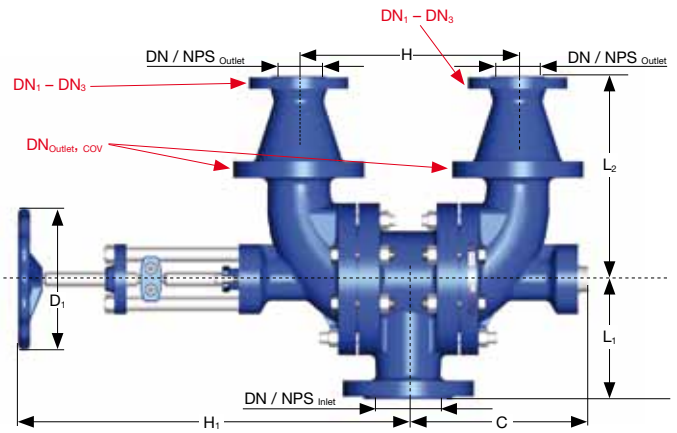
The reducers are pre-welded on side 2 of the inlet side of the change-over valve.



Materials

Item	Component	Type 3102	Type 3104
E2F	Reducer flange	1.0460 SA 105	1.4571 316Ti
E2R	Reducer	1.0305 Steel	1.4571 316Ti

Dimensions and weights



Dimension L_2 represents the half height of the change-over valve plus the height of the reducer (L_2 = L_1 + reducer height).

The other dimensions can be found on pages 15 and 19 for Type 310.

Nominal diameter outlet side change-over valve												
Size	**$DN_{Outlet, COV}$**	DN	40	50	65	80	100	125	150	200	250	300
		NPS	1/2"	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"
Reduction by one nominal diameter												
DN_1	Nominal diameter after reduction	DN	32	40	50	65	80	100	125	150	200	250
		NPS	1 1/4"	1 1/2"	1"	2 1/2"	3"	4"	5"	6"	8"	10"
L_2	PN 40	[mm]	250	265	325	325	380	415	485	580	610	745
	CL300	[inch]	9 3/4	10 1/2	12 6/8	12 3/4	14 15/16	16 3/8	19 1/8	22 3/4	24 1/64	29 1/4
	PN63	[mm]	255	A	340	340	395	430	555	A	A	A
		[inch]	10 1/16	A	13 3/8	13 3/8	15 1/2	16 7/8	21 7/8	A	A	A
	PN 100	[mm]	315	200	A	A	290	A	570	A	A	A
	CL600	[inch]	12 3/8	7 7/8	A	A	11 1/2	A	22 1/2	A	A	A
	PN 160	[mm]	315	200	A	A	380	A	A	A	A	A
	CL900	[inch]	12 2/4	7 7/8	A	A	14 15/16	A	A	A	A	A
Reduction by two nominal diameters												
DN_2	Nominal diameter after reduction	DN	25	32	40	50	65	80	100	125	150	200
		NPS	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	5"	6"	8"
L_2	PN 40	[mm]	250	265	325	325	380	415	485	580	610	730
	CL300	[inch]	9 7/8	10 1/2	12 3/4	12 3/4	14 15/16	16 5/16	19 1/8	22 3/4	24 1/64	28 3/4
	PN63	[mm]	255	330	340	340	395	430	540	A	A	A
		[inch]	10 1/16	13	13 3/8	13 3/8	15 4/8	16 7/8	21 2/8	A	A	A
	PN 100	[mm]	315	330	A	A	380	A	550	A	A	A
	CL600	[inch]	12 3/8	13	A	A	14 15/16	A	21 5/8	A	A	A
	PN 160	[mm]	315	330	A	A	A	A	550	A	A	A
	CL900	[inch]	12 6/16	13	A	A	A	A	21 5/8	A	A	A
Reduction by three nominal diameters												
DN_3	Nominal diameter after reduction	DN	–	25	32	40	50	65	80	100	125	150
		NPS	–	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	5"	6"
L_2	PN 40	[mm]	–	265	A	325	A	A	470	580	A	A
	CL300	[inch]	–	10 1/2	A	12 3/4	A	A	18 1/2	22 3/4	A	A
	PN63	[mm]	–	280	A	340	400	A	540	A	A	A
		[inch]	–	11 1/32	A	13 3/8	15 3/4	A	21 1/4	A	A	A
	PN 100	[mm]	–	A	A	A	A	A	550	A	A	A
	CL600	[inch]	–	A	A	A	A	A	21 1/2	A	A	A
	PN 160	[mm]	–	330	A	A	A	A	A	A	A	A
	CL900	[inch]	–	13	A	A	A	A	A	A	A	A

A = based on order; the dimensions are conveyed with the order confirmation
– = not possible

Weights of change-over valves with reducers

Metric units											
Gland design	[kg]	53	57	96	99	151	156	323	667	830	950
Bellows design	[kg]	57	59	106	109	161	166	338	682	850	970
US units											
Gland design	[lbs]	118	127	213	220	336	347	1510	1874	2138	2138
Bellows design	[lbs]	127	130	236	242	358	369	751	1516	1889	2156

Flange drillings

Flange drillings

DN	25	40	50	65	80	100	125	150	200	250	300	25	40	50	65	80	100	125	150	200	250	300
NPS	1"	1 1/2"	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	1"	1 1/2"	2"	2 ½"	3"	4"	5"	6"	8"	10"	12"
	Option Code – Inlet											Option Code – Outlet										
PN 10	Y96	Y96	Y96	Y96	Y96	Y96	Y96	Y96	Y96	Y96	Y96	Y97	Y97	Y97	Y97	Y97	Y97	Y97	Y97	Y97	Y97	Y97
PN 16	Y13	Y13	Y13	Y13	Y13	Y13	Y13	Y13	Y13	Y13	Y13	Y23	Y23	Y23	Y23	Y23	Y23	Y23	Y23	Y23	Y23	Y23
PN 25	Y01	Y01	Y01	Y01	Y01	Y01	Y01	Y01	*	*	*	Y05	Y05	Y05	Y05	Y05	Y05	Y05	Y05	*	*	*
PN 40	*	*	*	*	*	*	*	*	Y02	Y02	Y02	*	*	*	*	*	*	*	*	Y06	Y06	Y06
PN 63	Y03	Y03	Y03	Y03	Y03	Y03	Y03	Y03	Y03	Y03	Y03	Y07	Y07	Y07	Y07	Y07	Y07	Y07	Y07	Y07	Y07	Y07
PN 100	Y04	Y04	Y04	Y04	Y04	Y04	Y04	Y04	Y04	Y04	Y04	Y08	Y08	Y08	Y08	Y08	Y08	Y08	Y08	Y08	Y08	Y08
PN 160	Y17	Y17	Y17	Y17	Y17	Y17	Y17	Y17	Y17	Y17	Y17	Y27	Y27	Y27	Y27	Y27	Y27	Y27	Y27	Y27	Y27	Y27
CL150	Y14	Y14	Y14	Y14	Y14	Y14	Y14	Y14	Y14	Y14	Y14	Y24	Y24	Y24	Y24	Y24	Y24	Y24	Y24	Y24	Y24	Y24
CL300	Y16	Y16	Y16	Y16	Y16	Y16	Y16	Y16	Y16	Y16	Y16	Y26	Y26	Y26	Y26	Y26	Y26	Y26	Y26	Y26	Y26	Y26
CL600	Y42	Y42	Y42	Y42	Y42	Y42	Y42	Y42	Y42	Y42	Y42	Y44	Y44	Y44	Y44	Y44	Y44	Y44	Y44	Y44	Y44	Y44
CL900	Y43	Y43	Y43	Y43	Y43	Y43	Y43	Y43	Y43	Y43	Y43	Y45	Y45	Y45	Y45	Y45	Y45	Y45	Y45	Y45	Y45	Y45

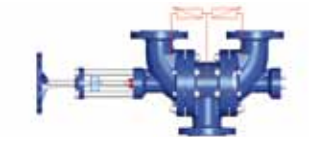
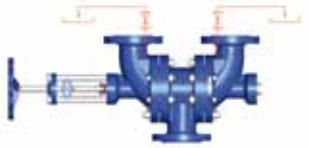
* = Standard

Flange facings

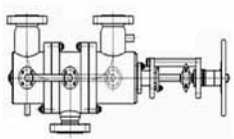
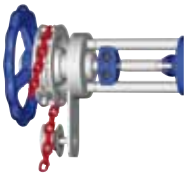
Flange facings

DIN EN 1092 (also see LDeS 3313.40)		Inlet	Outlet
		Option Code	Option Code
Raised face	Form B1	*	*
	Form B2	Y09	Y21
	Tongue, Form C	Y10	Y22
	Groove, Form D	Y11	Y25
	Male, Form E	Y12	Y28
	Female, Form F	Y15	Y29
	O-ring Male, Form G	Y18	Y30
	O-ring Female, Form H	Y19	Y37
ASME B16.5		**Inlet**	**Outlet**
		Option Code	**Option Code**
	Flat Face, FF	Y81	Y82
	Raised Face, RF	Y83	Y84
	Ring Joint Face, RTJ	Y85	Y86
	Small Tongue Face, STF	Y65	Y73
	Small Groove Face, SGF	Y66	Y74
	Long Tongue Face, LTF	Y67	Y75
	Long Groove Face, LGF	Y68	Y76
	Small Male Face, SMF	Y69	Y77
	Small Female Face, SFF	Y70	Y78
	Long Male Face, LMF	Y71	Y79
	Long Female Face, LFF	Y72	Y80

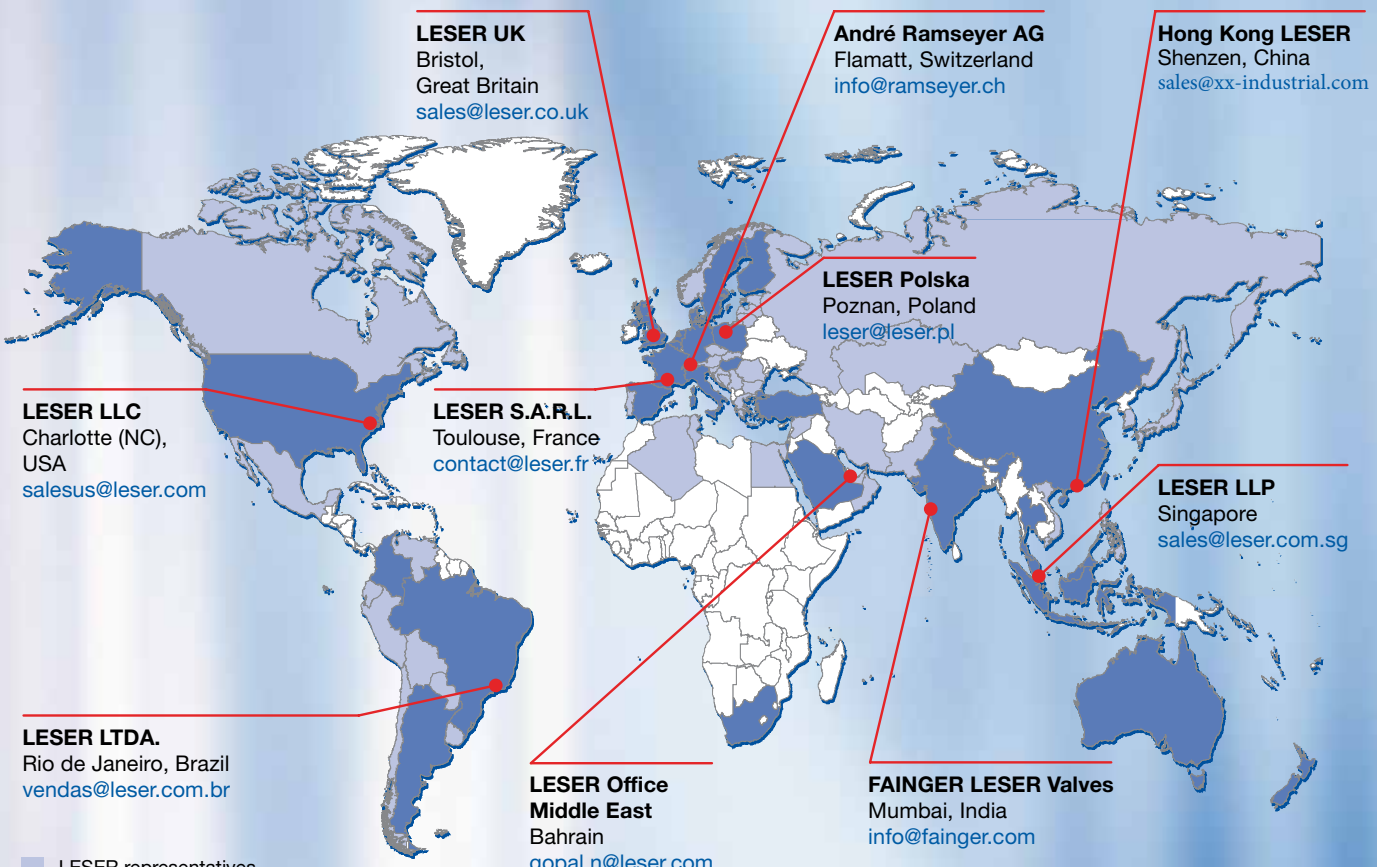
Options

Option	Option Code	Description
Drain hole 	Y99 (≤ DN 200) G $^1/_4$, as per DIN 3852 – Form X Y49 (≥ DN 250) G $^1/_2$, as per DIN 3852 – Form X	**Application** The drain hole is used for draining the change-over valve. Especially for securing steam, the condensate can be removed through the holes. **Technical design** Placement of a drill hole on the bottom of the flanged-end bend. Available for DN 25 to DN 500 / NPS 1" to 20"
Final position switch 	Y98	**Application** The final position switch is a device to show the closed side of the change-over valve. In addition, visual and audible alarms or even process controls can be connected. **Technical design** Installation of induction switches on the column structure. Available for DN 25 to DN 500 / NPS 1" to 20"
Flushing hole 	Y38 G $^1/_2$, as per DIN 3852 – Form X	**Application** Flushing hole is used for automatic cleaning processes like CIP or to avoid build-ups. In addition, the connection can be used to monitor the operating pressure. **Technical design** Placement of the connections in the centre of the elbow. Available for DN 25 to DN 500 / NPS 1" to 20"
Bypass with non return valves 	Y39	**Application** The bypass with non return valves is used for pressure relief when moving the cone to the side to be shut-off. The closed side is relieved after the change-over. **Technical design** Connection of the non return valves in the centre of the elbow. Available for DN 25 to DN 500 / NPS 1" to 20"
Needle valve 	Z51	**Application** The needle valve is used to relieve the gap to the safety valve on the process side. Caution: The pressure in the gap must be relieved before maintenance begins. **Technical design** Installation of a needle valve on the bottom of the flanged-end bend. Available for DN 25 to DN 500 / NPS 1" to 20"
Stop valve for pressure relief 	Y46	**Application** The stop valve is used to relieve the pressure in the gap to the safety valve on the process side. Caution: The pressure in the gap must be relieved before maintenance begins. **Technical design** Installation of a shut-off valve on the bottom of the flanged-end bend. Available for DN 25 to DN 500 / NPS 1" to 20"

Options

Option	Option Code	Description
Locking device for the hand wheel 	Z50	**Application** The locking device is used to secure the hand wheel against unauthorised adjustment. **Technical design** Placement of bolts, link chains and lock on hand wheel and column structure. Available for DN 25 to DN 200 / NPS 1" to 8". As of nominal diameter DN 250 to DN 500, a bevel gear drive is necessary to move the cone. It is available with a locking device.
Heating jacket Inlet Outlet 	H32 Flange connection DN 25 / PN 40 H29 Sleeve G $^{3}/_{4}$, as per DIN 2986	**Application** The application areas for a heating jacket are for securing plants with media that tends to be viscose, crystallise, or clog. **Technical design** The heating jacket is constructed around the change-over valve as a welded structure based on the order. It is available with loose flange or sleeve heating connections. Available for DN 25 to DN 500 / NPS 1" to 20"
Oil and grease free 	J85	**Application** With this option, freedom from oil and grease is guaranteed for the change-over valve. **Technical design** A visual check is performed for freedom from oil and grease, in which a check is made to ensure the change-over valve is free of oil and grease. Available for DN 25 to DN 500 / NPS 1" to 20"
Reducers welded 	Please specify the flange standard, DN and PN	**Application** With the exception of the Modulate Action series, all LESER safety valves have a larger nominal diameter at the outlet than at the inlet. That way, reductions of 1, 2 or 3 nominal diameters can be supported. **Technical design** You can find details on the reducers on pages 22 and 23. Available for DN 25 to DN 300 / NPS 1" to 12"
Lockable combination **Hand and chain wheel** 	Y35	**Application** When using a lockable combination, the change-over valves are equipped with a hand and chain wheel combination. **Technical design** Details on the chain wheel can be found on page 21. Available for DN 25 to DN 500 / NPS 1" to 20"
Lockable combination **Hand and chain wheel and chain** 	Y36	**Application** When using a lockable combination, the change-over valves are equipped with a hand and chain wheel combination and connected with a chain. **Technical design** Details on the chain wheel and chain can be found on page 21. Available for DN 25 to DN 500 / NPS 1" to 20"

LESER worldwide



上海兴祥工业设备有限公司
地址：上海市浦东新区金豫路100号3幢720室
电话：021-51602012 传真：021-51685158
Email:sales@xx-industrial.com