

# Best Availability

LESER Change-over Valves

Type 330, Type 320

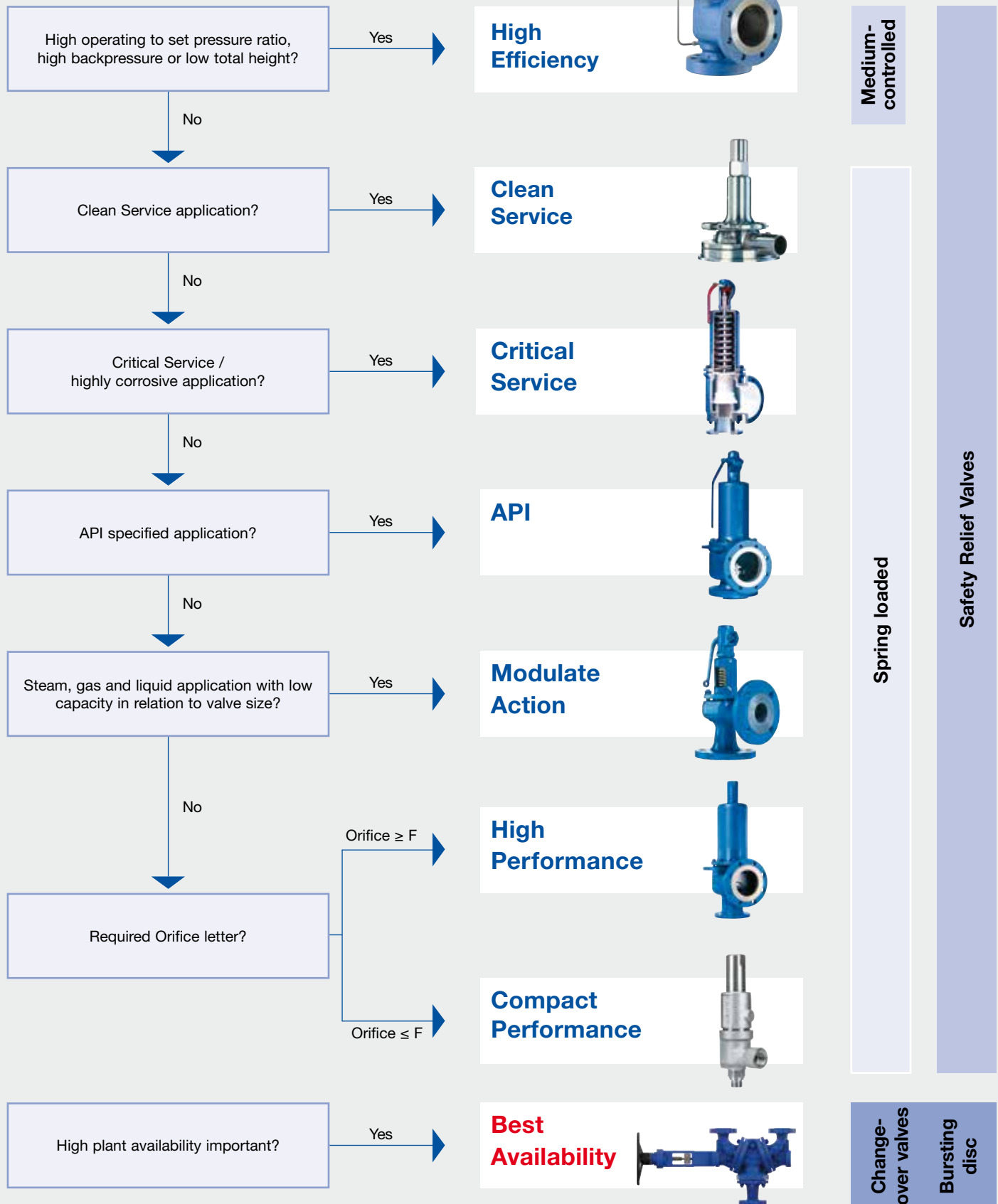


**LESER**

[The-Safety-Valve.com](http://The-Safety-Valve.com)

# Valve finder

## Your path to the right product group



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Type 330 Compact



Type 320 Flow

## LESER Change-over Valves

### Applications

Change-over valves are used in various industries in order to

- ensure uninterrupted operation
- minimise safety risks due to unplanned shutdown periods.

### These industries are

- Petrochemical industry
- Oil and gas industry
- Technical gasses
- Chemicals industry
- Refrigeration



Change-over valves are used to connect two safety valves with a pipe connection to a pressure system, in order to increase operational availability. One safety valve is in operation and one safety valve is on standby.

The standby safety valve can be disassembled and serviced, for example during running operation. The pressure system continues to be protected against impermissible pressure. This way, shutdown periods of the plant can be planned independent of the maintenance cycles of the safety valves.

### LESER Change-over Valves – The advantages

#### Most economic solution

- flow-optimized design for minimal inlet pressure loss
- **Type 330 Compact** for standard requirements, **Type 320 Flow** for high requirements of inlet pressure loss
- variable inlet body on the piping side to adjust to existing piping nominal sizes and to reduce the inlet pressure loss
- smart coupling: standardized solution for lockable combination with change-over valves of different nominal size and pressure ratings with definite dimensions and precise pressure loss coefficients

#### Safe operation 24/7

- precise pressure loss coefficients for any configuration enable a reliable calculation of the inlet pressure loss
- simple and fail-safe switch-over
- robust and maintenance-free design

#### Fast availability

- short delivery times synchronised with the safety valves
- complete optimized combination from one supplier

## General information

### Type 330, Type 320

#### Two change-over valve types

##### Type 330 Compact

offers the solution for low-pressure loss requirements



##### Type 320 Flow

has an optimal flow path for highest pressure loss requirements



Both valve types are available as:

- single change-over valve
- inlet-side combination: A change-over valve is installed at the inlet of two safety valves
- lockable combination: One change-over valve is installed at the inlet and one at the outlet of two safety valves

When providing combinations, the connecting elements of change-over valve and safety valve are not included.

#### Design features

##### Valve sizes

DN 25 – DN 400 / NPS 1" – 16"

##### Pressure ratings

Type 330 Compact: PN 10 – PN 40 / CL150 – CL300  
Type 320 Flow: PN 10 – PN 250 / CL150 – CL1500

##### Flange drillings

in accordance with DIN EN 1092 and ASME B16.5

##### Body materials

Type 330 / 320	Steel	Low-temperature steel	Stainless steel
acc. to DIN EN	1.0619	–	1.4408
acc. to ASME	WCB/WCC	LCB	CF8M

Other materials for special requirements available upon request.

##### Temperature limits for use

Temperature limits correspond to the material limits according to DIN EN and ASME.

Type 330 / 320	[°C]		[°F]	
acc. to DIN EN	- 211	+ 400	- 348	+ 752
acc. to ASME	- 211	+ 400	- 348	+ 752

Higher and lower temperatures on request.

##### Options

Change-over valves can be customised to the plant situation with a variety of options (see Pages 28 – 31), such as:

- Seal: Fulfilment of tightness requirements according to TA Luft ("Technical Instructions on Air Quality Control")
- NACE compliant design

##### Approvals

LESER Change-over Valves can be used worldwide and satisfy the regulatory requirements with the approvals in accordance with:

Technical regulations	Approval / designation
Pressure Equipment Directive PED 2014/68/EU	CE (except for DN 25) <sup>1)</sup>
AD 2000-Merkblatt	
ASME B16.34	no approval required
TR-CU 010, TR-CU 032	EAC

<sup>1)</sup> Change-over valves with a nominal diameter of DN 25 and smaller are designed and manufactured with the sound engineering practices of Germany according to PED 2014/68/EU Article 4 paragraph 3 and may not bear the CE mark.

## Basics

### Design and pressure loss coefficient

#### Basics

Pressure loss in the inlet line is considered to be the pressure difference between the pressure in the system to be safeguarded and the pressure in front of the safety valve during discharge.

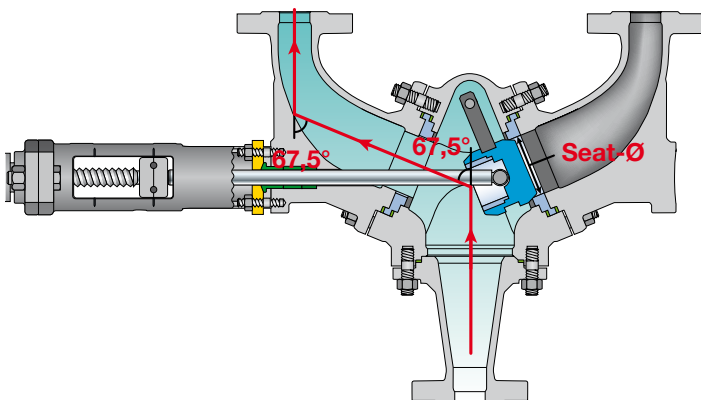
When a safety valve is activated, the flow losses in the inlet line cause a pressure loss. The pressure loss in the inlet line may not exceed 3% of the set pressure in accordance with applying international standards. If the 3% limit is exceeded, the safety valve may not show a stable function any longer (chatter). As a consequence, the full power may not be discharged and there is a danger of excessive pressure within the system.

#### Design

The pressure loss caused by the change-over valve is primarily determined by the design of the flow geometry and the flow area. Due to the nominal size on the safety valve side, the maximum possible expansion across the change-over valve is limited.

In this regard, the LESER Change-over Valve has been optimised with respect to its flow geometry:

Using the incline of the seating surfaces and the motion of the disc on a circular path, a contour favourable for flow was created for the medium. The result is a low deviation of the flow and thus to the lowest possible pressure loss.



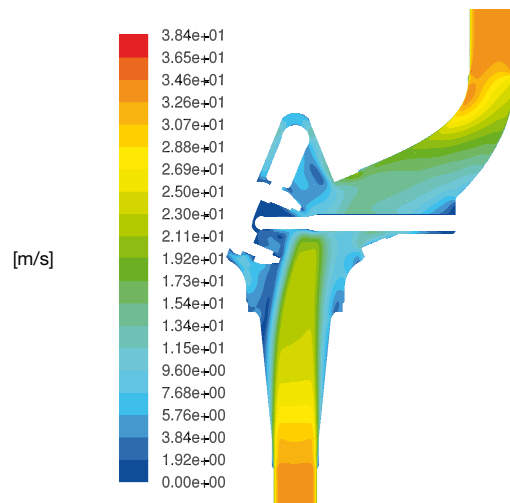
Favourable flow design through incline of seats

#### Pressure loss coefficient

To calculate the inlet pressure loss, the pressure loss coefficient, zeta value ( $\zeta$ ), is required as input size. It is a dimension-less coefficient for the flow resistance. Only in conjunction with a flow diameter is the pressure loss coefficient a useful indication. LESER provides the zeta values in relation to the nominal diameter on the safety valve side, for example the specification for DN 50 is in reference to 50 mm. The lower the zeta value for a change-over valve, the less pressure loss it creates in the inlet line to the safety valve. The following formula for the pressure loss of a change-over valve illustrates how it depends on zeta value the flow area.

$$\Delta p_{wv} = \frac{\rho \cdot \left(\frac{\dot{m}}{\rho \cdot A_{wv}}\right)^2}{2} \cdot \zeta_{wv}$$

There are further coefficients which can be calculated from the zeta value and the flow area, such as the Kv value or the Cv value. Such flow coefficients determine an achievable mass flow of a certain medium in a defined state. The zeta values of the LESER Change-over Valve were calculated and optimised using CFD-simulations and measured and validated by an independent test lab.



Flow simulation: Velocity distribution in a change-over valve

#### Formula symbols

$\Delta p_{wv}$	Pressure loss of a change-over valve
$\Delta p_1$	Pressure loss in piping section
$p_{set}$	Set pressure of the safety valve
$\dot{m}$	Mass flow
$\rho$	Density

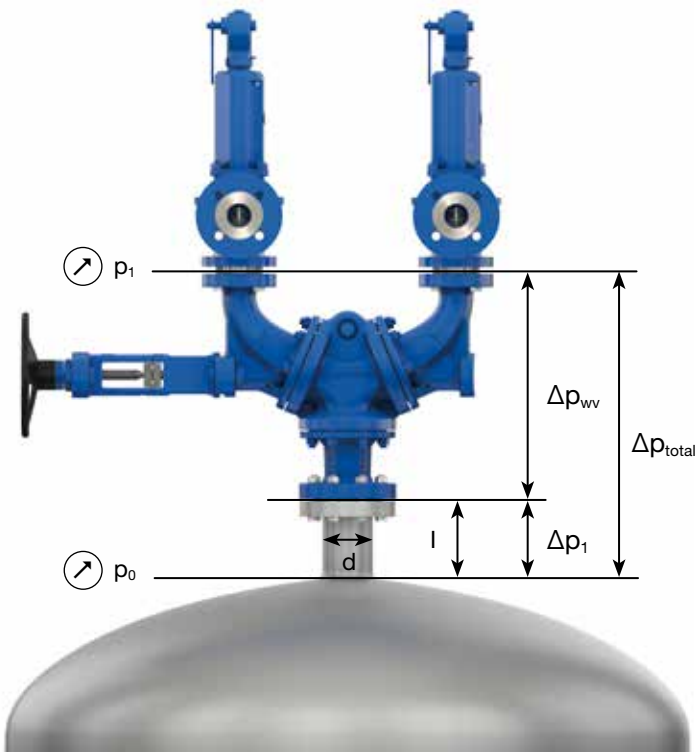
A	Flow area
$\omega$	Flow rate $\omega = \dot{m}/(\rho \cdot A)$
$\zeta$	Pressure loss coefficient
l	Length of piping
d	Flow diameter
$\lambda$	Pipe friction coefficient

## Basics

### Calculation of pressure loss

To calculate the pressure loss in the inlet line to the safety valve entrance, the change-over valve as well as possible addition piping sections and installations must be considered. To do so, the inlet pipe system is divided into sections. A section is formed for each flow or reference diameter.

In the following example, two sections can be formed. One for the change-over valve ( $\Delta p_{wv}$ ) and one for the connected piping ( $\Delta p_1$ ).



The general formula for the calculation of pressure loss in pipes is as follows:

$$\Delta p_{total} = \left( \lambda \cdot \frac{l}{d} + \sum \zeta \right) \cdot \frac{\rho}{2} \cdot \omega^2$$

There is a difference between a part for installations and a part for piping sections

$$\Delta p_{total} = \underbrace{\sum \zeta \cdot \frac{\rho}{2} \cdot \omega^2}_{\text{Installations}} + \underbrace{\lambda \cdot \frac{l}{d} \cdot \frac{\rho}{2} \cdot \omega^2}_{\text{Piping}}$$

#### Installations

- all installations including the change-over valve
- standard values for pressure loss coefficients of installations can be extracted from the applying standards
- zeta values of piping components relating to the same diameter may be added.

#### Piping

- all piping sections
- separate pressure loss calculation for different flow diameters
- reducers for connecting pipes of different sizes, are engaged within the installations part

Applying this to the selected example results in two sections which create a pressure loss in the inlet line. One section for the change-over valve and one section for the piping piece in a certain nominal size.

$$\Delta p_{total} = \Delta p_{wv} + \Delta p_1$$

$$\Delta p_{total} = \frac{\rho}{2} \cdot \omega_{wv}^2 \cdot \zeta_{wv} + \lambda_1 \cdot \frac{l_1}{d_1} \cdot \frac{\rho}{2} \cdot \omega_1^2$$

It is then checked whether the calculated pressure loss falls under the 3%-criterion.

According to applying standards, the 3%-criterion refers to the set pressure. The AD regulations, however, references the 3% to the difference between set pressure and superimposed backpressure.

$$\Delta p_{total} \leq 0,03 \cdot p_{set}$$

Inlet pressure loss exceeding 3% are only permitted in accordance with the standards if the manufacturer is able to confirm the function and performance of the safety valves with higher degrees of pressure loss through trials.

The example selected here represents a normal installation situation. In reality, much more complex installations may occur due to various pipe nominal sizes which make the calculation of pressure loss more difficult.

#### Calculating pressure loss with VALVESTAR®

VALVESTAR® makes it possible to calculate the pressure loss in the inlet line of the safety valve. In the case of different flow areas of the individual sections in the inlet line, the zeta value of the change-over valves must reference a common calculation diameter, which is then used by VALVESTAR® to calculate the pressure loss.

## Designs

### Type 330, Type 320

#### Type 330 Compact

The change-over valve Type 330 Compact is flow-optimized and at the same time compact for installation. It is the best solution if the requirements of the combined safety valves or the additional piping of the pressure loss are not unusually high. Due to its compact design, it is cost-efficient so that it represents the most economical solution for a safety valve/change-over valve combination.

In lockable combinations, it can be selected as standard at the outlet since there are no increased requirements of the pressure loss via the change-over valve (see Page 22).



Type 330

#### Type 320 Flow

The change-over valve Type 320 Flow is flow-optimized to its max. It should always be selected when the requirements of the combined safety valves to the pressure loss are extremely high or if other installations increase the pressure loss in the inlet line so far that the change-over valve used may only create very little pressure loss. The Type 320 Flow is available up to a pressure rating of PN 250 / CL1500.



Type 320

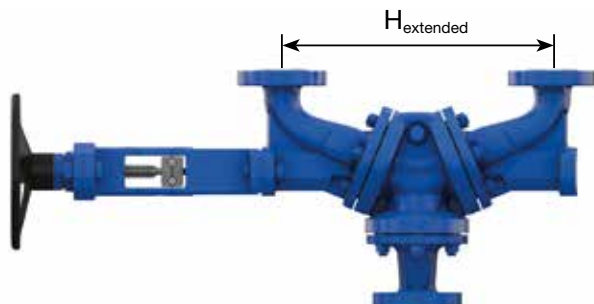
#### Extended flange distance

In order to be able to create standards for lockable combinations with change-over valves in different nominal sizes and pressure ratings, different sets of elbows are available for Type 330. They result in two flange distances of different size (dimension H). The flange distance is determined as follows:

- inlet-side combination with spring-loaded safety valves:  
Standard flange distance (dimension  $H_{\text{standard}}$ )
- inlet-side combination with pilot-operated safety valves:  
Balancing flange distance (dimension  $H_{\text{extended}}$ ) due to the installation parts
- lockable combination: see Page 22

#### Variable inlet body

For Type 320 Flow as well as for Type 330 Compact, there is the option of enlarging the inlet body. This measure significantly optimizes the pressure loss coefficient so that the pressure loss created by the change-over valve is reduced. In addition, the smaller change-over valve (fitting with the safety valve inlet) can be adjusted to larger connection pipes without having to select the change-over valve in a larger nominal size, or welded reducers need to be used.



Type 330 with extended flange distance

Safety valve side DN 40 / 1 1/2"



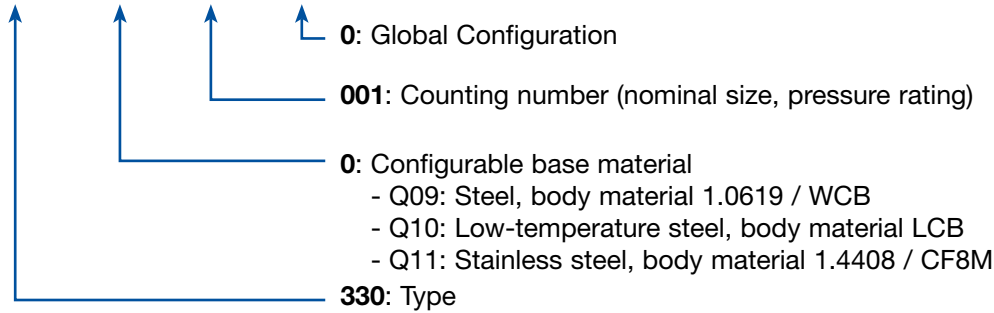
Piping side DN 50 / 2"



## How to Order Type 330, Type 320

### Composition of the article number

# 3300.0010

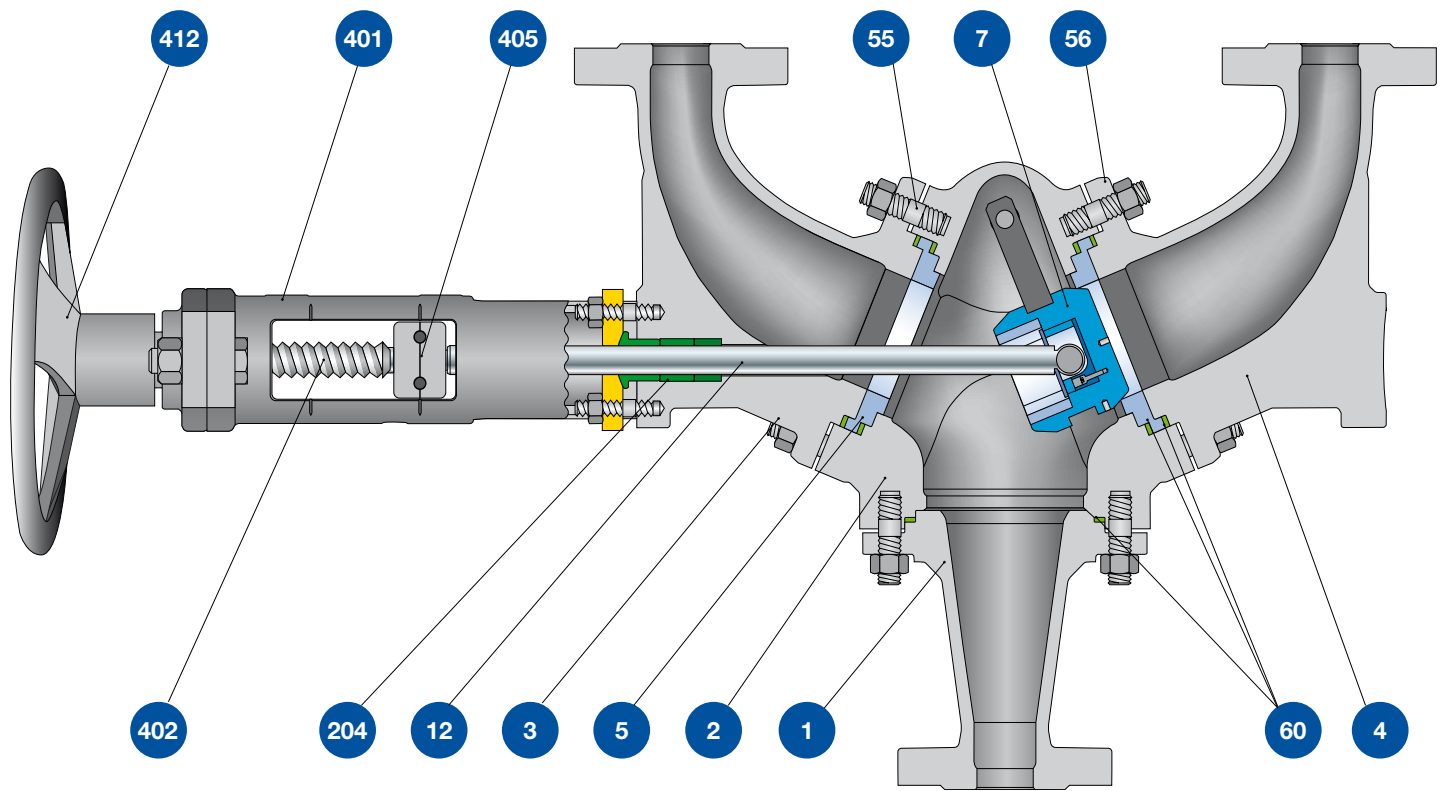


### Order specification

In order to clearly specify a change-over valve, the following information is required:

Base construction				
Article number			-----	
Operating temperature			_____	[°C / °F / K ...]
Operating pressure			_____	[barg / psig ...]
Body materials	Q09	1.0619 / WCB	<input type="checkbox"/>	
	Q10	LCB	<input type="checkbox"/>	
	Q11	1.4408 / CF8M	<input type="checkbox"/>	
	-	Other materials	_____	
Design regulations	ASME B16.34 + PED 2014/68/EU		<input type="checkbox"/>	
	PED 2014/68/EU		<input type="checkbox"/>	
	ASME B16.34		<input type="checkbox"/>	
Connections				
Safety valve side				
Nominal size	DN	_____	NPS	_____
Pressure rating	PN	_____	CL	_____
Flange facing	DIN EN 1092	_____	ASME B16.5	_____
Piping side				
Nominal size	DN	_____	NPS	_____
Pressure rating	PN	_____	CL	_____
Flange facing	DIN EN 1092	_____	ASME B16.5	_____
Combination				
H dimension	standard		<input type="checkbox"/>	
H dimension	extended		<input type="checkbox"/>	
Combined safety valves	LESER Type	-----	others	<input type="checkbox"/>
Lockable combination	no <input type="checkbox"/>	yes →	<input type="checkbox"/>	<input type="checkbox"/>
			Inlet CoV	Outlet CoV
Options				
Documentation				

**Designs**  
**Type 330, Type 320**



## Materials

### Type 330, Type 320

Item	Component	Option Code	Steel	Low-temperature steel	Stainless steel
			Q09	Q10	Q11
1	Inlet body		1.0619	–	1.4408
			SA 216 WCB	SA 352 LCB	SA 351 CF8M
2	Body		1.0619	–	1.4408
			SA 216 WCB	SA 352 LCB	SA 351 CF8M
3	Elbows – Activation side		1.0619	–	1.4408
			SA 216 WCB	SA 352 LCB	SA 351 CF8M
4	Elbows		1.0619	–	1.4408
			SA 216 WCB	SA 352 LCB	SA 351 CF8M
5	Seat	≤ 63 bar	1.4404	1.4404	1.4404
			316 L	316 L	316 L
		> 63 bar	1.4404 stellited	1.4404 stellited	1.4404 stellited
			316 L stellited	316 L stellited	316 L stellited
7	Disc	≤ 63 bar	1.4404	1.4404	1.4404
			SA182 316 L	SA182 316 L	SA182 316 L
		> 63 bar	1.4404 stellited	1.4404 stellited	1.4404 stellited
			SA182 316L stellited	SA182 316L stellited	SA182 316L stellited
12	Spindle	3300.0010 3300.0050 ≤ 150°C 3300.0070	1.4021 Chrome steel	1.4404 316L	1.4404 316L
		3300.0010 3300.0050 > 150°C 3300.0070	1.4021 Chrome steel hardened	1.4980 hardened –	1.4980 hardened –
		others ≤ 50°C	1.4021 Chrome steel	1.4404 316L	1.4404 316L
		others > 50°C	1.4021 hardened Chrome steel gehärtet	1.4980 hardened	1.4980 hardened
204	Packing gland		Graphite	Graphite	Graphite
			Graphite	Graphite	Graphite
401	Yoke		1.0619	1.0619	1.4408
			WCB	WCB	CF8M
402	Threaded spindle		C35	C35	C35
			Steel	Steel	Steel
405	Position indicating device		1.4408	1.4408	1.4408
			CF8M	CF8M	CF8M
412	Hand wheel		1.0335	1.0335	1.0335
			Steel	Steel	Steel
55	Stud	Design regulations:			
		DGRL	1.7225 / SA 193 B7	A4-70 <sup>1)</sup>	A4-70 <sup>1)</sup>
		ASME	1.7225 / SA 193 B7	A4-70 / B8M <sup>1)</sup>	A4-70 / B8M <sup>1)</sup>
		DGRL / ASME	1.7225 / SA 193 B7	A4-70 / B8M <sup>1)</sup>	A4-70 / B8M <sup>1)</sup>
56	Nut	DGRL	1.7225 / SA 194 Gr. 7	A4-70 <sup>1)</sup>	A4-70 <sup>1)</sup>
		ASME	1.7225 / SA 194 Gr. 7	A4-70 / 8M <sup>1)</sup>	A4-70 / 8M <sup>1)</sup>
		DGRL / ASME	1.7225 / SA 194 Gr. 7	A4-70 / 8M <sup>1)</sup>	A4-70 / 8M <sup>1)</sup>
60	Gasket		Graphite	Graphite	Graphite
			Graphite	Graphite	Graphite

<sup>1)</sup> Type 320 DN 80/3" and DN 100 / 4" in PN 250/CL1500:

- PED: 1.4980 / Gr. 660B
- ASME: Gr. 660B
- PED / ASME: 1.4980 / Gr. 660B

**Please note**

- LESER reserves the right to make changes
- LESER may use higher quality materials without giving prior notice
- Every part can be replaced by other material according to customer specification

## Type 330 Compact

### Article numbers and technical data

Metric units

Safety valve side		DN	25	40	50	65	80	100	
Art. No. 3300.			0010	0050	0070	0090	0100	0120	
Pressure rating body basic construction			PN 40						
Standard	Piping side	DN	25	40	50	65	80	100	
	Pressure loss coefficient (zeta)	[-]	0.58	0.7	0.88	0.7	0.89	0.52	
	K <sub>VS</sub> (rt, water)	[m <sup>3</sup> /h]	33	76	107	202	271	555	
	<b>Dimensions and weights</b>								
	E <sub>1</sub>	[mm]	252	242	252	275	275	330	
	E <sub>2</sub>	[mm]	160	160	160	245	245	270	
	C <sub>1</sub>	[mm]	650	650	650	760	760	816	
	C <sub>2</sub>	[mm]	216	244	247	334	344	366	
	s <sup>1) 2)</sup>	[mm]	26	30	33	35	38	42	
	W	[mm]	250	250	250	250	250	400	
	H dimension standard	[mm]	270	330	330	475	475	475	
	Weight H dimension standard	[kg]	73	78	79	117	125	185	
	H dimension extended	[mm]	330	475	475		560	560	
	E <sub>2</sub> H dimension extended	[mm]	180	180	180		265	270	
	C <sub>1</sub> H dimension extended	[mm]	650	714	714		760	815	
	C <sub>2</sub> H dimension extended	[mm]	230	316	320		386	409	
Weight H dimension extended	[kg]	74	85	87		125	190		
Expansion piping side	Safety valve side	DN	25	40		65		100	
	Piping side	DN	40	50		80		125	
	Pressure loss coefficient (zeta)	[-]	0.25	0.51		0.56		0.40	
	K <sub>VS</sub> (rt, water)	[m <sup>3</sup> /h]	56	90		226		632	
	<b>Dimensions and weights</b>								
	E <sub>1</sub>	[mm]	242	252		245		330	
	s piping side <sup>1) 2)</sup>	[mm]	30	33		38		42	
	Weight H dimension standard	[kg]	74	78		121		189	
	Weight H dimension extended	[kg]	75	86		-		194	
	<b>Dimensions and weights</b>								
	Safety valve side	DN	25						
	Piping side	DN	50						
	Pressure loss coefficient (zeta)	[-]	0.21						
	K <sub>VS</sub> (rt, water)	[m <sup>3</sup> /h]	59						
	<b>Dimensions and weights</b>								
	E <sub>1</sub>	[mm]	252						
s piping side <sup>1) 2)</sup>	[mm]	33							
Weight H dimension standard	[kg]	75							
Weight H dimension extended	[kg]	76							

<sup>1)</sup> The flange thickness and the outer diameter of the connection flanges may be larger than specified by the norm.

<sup>2)</sup> The dimensions are subject to a casting tolerance of max. ± 5 mm / <sup>3</sup>/<sub>16</sub> inch.

Safety valve side		DN	125	150	200	250	300	350	400	
<b>Art. No. 3300.</b>			<b>0140</b>	<b>0150</b>	<b>0170</b>	<b>0180</b>	<b>0190</b>	<b>0200</b>	<b>0210</b>	
Pressure rating body basic construction			PN 40				PN 25		PN 16	
<b>Standard</b>	Piping side	DN	125	150	200	250	300	350	400	
	Pressure loss coefficient (zeta)	[-]	0.80	0.91	0.67	0.74	1.07	1.11	0.79	
	$K_{VS}$ (rt, water)	[m <sup>3</sup> /h]	699	943	1954	2905	3479	4649	7198	
	<b>Dimensions and weights</b>									
	$E_1$	[mm]	329	381	499	594	619	652	672	
	$E_2$	[mm]	270	285	394	378	450	450	460	
	$C_1$	[mm]	816	853	1178	1178	1408	1463	1615	
	$C_2$	[mm]	421	442	611	645	664	689	799	
	$s^{1)2)}$	[mm]	42	45	51	57	60	43	46	
	W	[mm]	400	400	850	850	1200	1200	1200	
	H dimension standard	[mm]	560	560	840	840	840 <sup>4)</sup>	840	1000	
	Weight H dimension standard	[kg]	209	270	565	782	1003	1038	1375	
	H dimension extended	[mm]	-	-	560 <sup>3)</sup>	-	-	-	-	
$E_2$ H dimension extended	[mm]	-	-	334	-	-	-	-		
$C_1$ H dimension extended	[mm]			1139						
$C_2$ H dimension extended	[mm]			474						
Weight H dimension extended	[kg]			532						

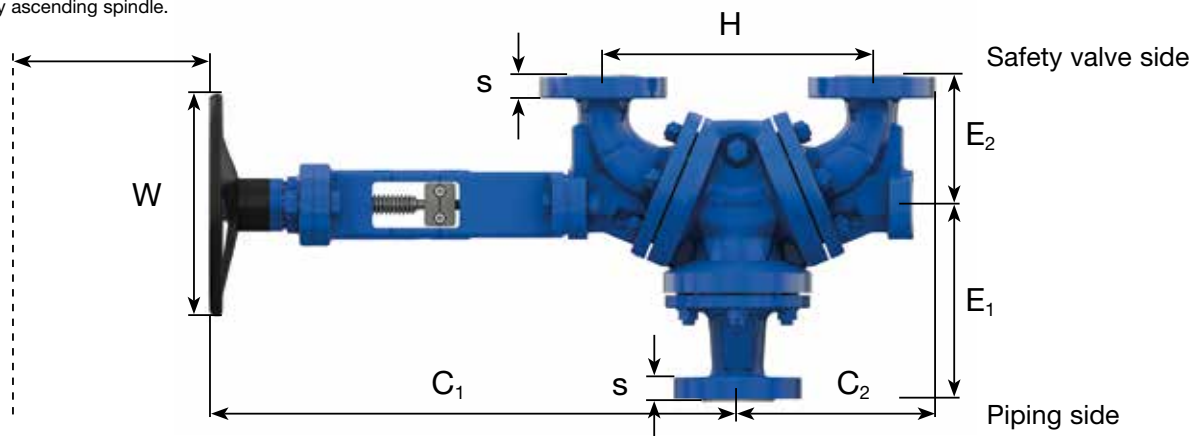
<sup>1)</sup> The flange thickness and the outer diameter of the connection flanges may be larger than specified by the norm.

<sup>2)</sup> The dimensions are subject to a casting tolerance of max.  $\pm 5$  mm /  $3/16$  inch.

<sup>3)</sup> Small flange distance is required only for the combination as an outlet-side change-over valve with 3300.0150.  
Attention: Zeta value then changes to 1.32!

<sup>4)</sup> Only in use as an outlet-side change-over valve in a lockable combination.

The installation space behind the hand wheel must be kept free up to 200 mm due to a partially ascending spindle.



## Type 330 Compact

### Article numbers and technical data

US units

Safety valve side		Valve size	1"	1 1/2"	2"	2 1/2"	3"	4"	
<b>Art. No. 3300.</b>			<b>0010</b>	<b>0050</b>	<b>0070</b>	<b>0090</b>	<b>0100</b>	<b>0120</b>	
Pressure rating body basic construction			CL300						
Standard	Piping side	NPS	1"	1 1/2"	2"	2 1/2"	3"	4"	
	Pressure loss coefficient (zeta)	[-]	0.58	0.7	0.88	0.7	0.89	0.52	
	C <sub>v</sub> (rt, water)	[US-G.PM]	38	88	123	233	314	641	
	<b>Dimensions and weights</b>								
	E <sub>1</sub>	[inch]	9 15/16	9 1/2	9 15/16	10 13/16	10 13/16	13	
	E <sub>2</sub>	[inch]	6 5/16	6 5/16	6 5/16	9 5/8	9 5/8	10 5/8	
	C <sub>1</sub>	[inch]	25 9/16	25 9/16	25 9/16	29 15/16	29 15/16	32 1/8	
	C <sub>2</sub>	[inch]	8 1/2	9 5/8	9 3/4	13 1/8	13 9/16	14 7/16	
	s <sup>1)2)</sup>	[inch]	1	1 3/16	1 5/16	1 3/8	1 1/2	1 5/8	
	W	[inch]	9 13/16	9 13/16	9 13/16	9 13/16	9 13/16	15 3/4	
	H dimension standard	[inch]	10 5/8	13	13	18 11/16	18 11/16	18 11/16	
	Weight H dimension standard	[lb]	161	172	174	258	276	408	
	H dimension extended	[inch]	13	18 11/16	18 11/16		22 1/16	22 1/16	
	E <sub>2</sub> H dimension extended	[inch]	7 1/16	7 1/16	7 1/16		10 7/16	10 5/8	
	C <sub>1</sub> H dimension extended	[inch]	25 9/16	28 1/8	28 1/8		29 7/8	32 1/16	
C <sub>2</sub> H dimension extended	[inch]	9 1/16	12 7/16	12 5/8		15 3/16	16 1/8		
Weight H dimension extended	[lb]	163	187	192		276	419		
Expansion piping side	Safety valve side	Valve size	1"	1 1/2"		2 1/2"		4"	
	Piping side	NPS	1 1/2"	2"		3"		5"	
	Pressure loss coefficient (zeta)	[-]	0.25	0.51		0.56		0.40	
	C <sub>v</sub> (rt, water)	[US-G.PM]	65	104		261		731	
	<b>Dimensions and weights</b>								
	E <sub>1</sub>	[inch]	9 1/2	9 15/16		9 2/3		13	
	s piping side <sup>1)2)</sup>	[inch]	1 3/16	1 5/16		1 1/2		1 5/8	
	Weight H dimension standard	[lb]	163	172		267		417	
	Weight H dimension extended	[lb]	165	190		-		428	
	<b>Dimensions and weights</b>								
	Safety valve side	Valve size	1"						
	Piping side	NPS	2"						
	Pressure loss coefficient (zeta)	[-]	0.21						
	C <sub>v</sub> (rt, water)	[US-G.PM]	68						
	<b>Dimensions and weights</b>								
E <sub>1</sub>	[inch]	9 15/16							
s piping side <sup>1)2)</sup>	[inch]	1 5/16							
Weight H dimension standard	[lb]	165							
Weight H dimension extended	[lb]	168							

<sup>1)</sup> The flange thickness and the outer diameter of the connection flanges may be larger than specified by the norm.

<sup>2)</sup> The dimensions are subject to a casting tolerance of max. ± 5 mm / 3/16 inch.

Safety valve side		Valve size	5"	6"	8"	10"	12"	14"	16"	
<b>Art. No. 3300.</b>			<b>0140</b>	<b>0150</b>	<b>0170</b>	<b>0180</b>	<b>0190</b>	<b>0200</b>	<b>0210</b>	
Pressure rating body basic construction			CL300				CL150		CL150	
Standard	Piping side	NPS	5"	6"	8"	10"	12"	14"	16"	
	Pressure loss coefficient (zeta)	[-]	0.8	0.91	0.67	0.74	1.07	1.11	0.79	
	C <sub>v</sub> (rt, water)	[US-G.PM]	808	1090	2259	3358	4022	5375	8322	
	<b>Dimensions and weights</b>									
	E <sub>1</sub>	[inch]	13	15	19 <sup>5</sup> / <sub>8</sub>	23 <sup>3</sup> / <sub>8</sub>	24 <sup>3</sup> / <sub>8</sub>	25 <sup>2</sup> / <sub>3</sub>	26 <sup>1</sup> / <sub>2</sub>	
	E <sub>2</sub>	[inch]	10 <sup>5</sup> / <sub>8</sub>	11 <sup>1</sup> / <sub>4</sub>	15 <sup>1</sup> / <sub>2</sub>	14 <sup>7</sup> / <sub>8</sub>	17 <sup>3</sup> / <sub>4</sub>	17 <sup>3</sup> / <sub>4</sub>	18 <sup>1</sup> / <sub>8</sub>	
	C <sub>1</sub>	[inch]	32 <sup>1</sup> / <sub>8</sub>	33 <sup>5</sup> / <sub>8</sub>	46 <sup>3</sup> / <sub>8</sub>	46 <sup>3</sup> / <sub>8</sub>	55 <sup>3</sup> / <sub>8</sub>	57 <sup>5</sup> / <sub>8</sub>	63 <sup>5</sup> / <sub>8</sub>	
	C <sub>2</sub>	[inch]	16 <sup>5</sup> / <sub>8</sub>	17 <sup>3</sup> / <sub>8</sub>	24	25 <sup>3</sup> / <sub>8</sub>	26 <sup>1</sup> / <sub>8</sub>	27 <sup>1</sup> / <sub>8</sub>	31 <sup>1</sup> / <sub>2</sub>	
	s <sup>1)2)</sup>	[inch]								
	W	[inch]	15 <sup>3</sup> / <sub>4</sub>	15 <sup>3</sup> / <sub>4</sub>	33 <sup>1</sup> / <sub>2</sub>	33 <sup>1</sup> / <sub>2</sub>	47 <sup>1</sup> / <sub>4</sub>	47 <sup>1</sup> / <sub>4</sub>	47 <sup>1</sup> / <sub>4</sub>	
	H dimension standard	[inch]	22 <sup>1</sup> / <sub>16</sub>	22 <sup>1</sup> / <sub>16</sub>	33 <sup>1</sup> / <sub>8</sub>	33 <sup>1</sup> / <sub>8</sub>	33 <sup>1</sup> / <sub>8</sub> <sup>4)</sup>	33 <sup>1</sup> / <sub>8</sub>	39 <sup>3</sup> / <sub>8</sub>	
	Weight H dimension standard	[lb]	461	595	1246	1724	2211	2288	3031	
	H dimension extended	[inch]	-	-	22 <sup>3)</sup>	-	-	-	-	
	E <sub>2</sub> H dimension extended	[inch]	-	-	13 <sup>1</sup> / <sub>8</sub>	-	-	-	-	
C <sub>1</sub> H dimension extended	[inch]			44 <sup>7</sup> / <sub>8</sub>						
C <sub>2</sub> H dimension extended	[inch]			18 <sup>5</sup> / <sub>8</sub>						
Weight H dimension extended	[lb]			1173						

<sup>1)</sup> The flange thickness and the outer diameter of the connection flanges may be larger than specified by the norm.

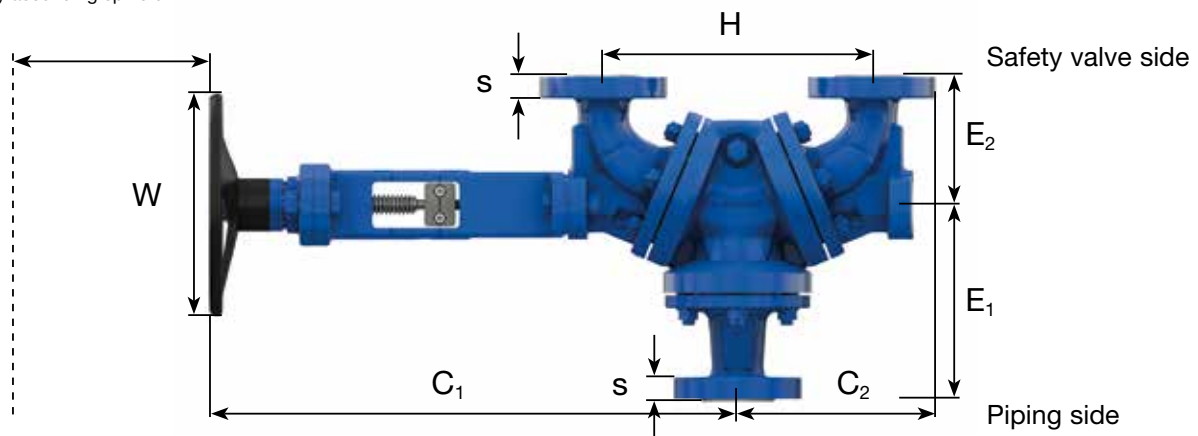
<sup>2)</sup> The dimensions are subject to a casting tolerance of max. ± 5 mm / <sup>3</sup>/<sub>16</sub> inch.

<sup>3)</sup> Small flange distance is required only for the combination as an outlet-side change-over valve with 3300.0150.

Attention: Zeta value then changes to 1.32!

<sup>4)</sup> Only in use as an outlet-side change-over valve in a lockable combination.

The installation space behind the hand wheel must be kept free up to 8 inch due to a partially ascending spindle.



## Type 320 Flow, PN 40 / CL300

### Article numbers and technical data

#### Metric units

Safety valve side		DN	40	50	65	80	100	125	150	200	250	300
Art. No. 3200.			0050	0070	0090	0100	0120	0140	0150	0170	0190	0200
Pressure rating body basic construction			PN 40								PN 25	PN 25
Standard	Piping side	DN	40	50	80	80	100	150	150	200	250	400
	Pressure loss coefficient (zeta)	[-]	0.59	0.53	0.37	0.51	0.49	0.32	0.52	0.5	0.44	0.22
	K <sub>VS</sub> (rt, water)	[m <sup>3</sup> /h]	83	137	278	358	571	1104	1248	2262	3767	7672
	<b>Dimensions and weights</b>											
	E <sub>1</sub>	[mm]	305	305	410	330	432	499	639	669	652	673
	E <sub>2</sub>	[mm]	225	225	260	270	245	334	378	410	410	460
	C <sub>1</sub>	[mm]	714	714	816	816	852	1073	1178	1408	1463	1615
	C <sub>2</sub>	[mm]	316	319	376	386	409	474	581	613	668	782
	s <sup>1) 2)</sup>	[mm]	29	32	38	38	42	45	45	51	39	46
	W	[mm]	250	250	400	400	400	850	850	1200	1200	1200
	H dimension standard	[mm]	475	475	560	560	560	560	840	840	840	1000
Weight	[kg]	103	105	169	174	240	493	690	930	987	1460	
Expansion piping side	Safety valve side	DN	40	50	65	80	-	125	150	200	250	
	Piping side	DN	50	65	100	100	-	200	200	250 <sup>3)</sup>	300 <sup>4)</sup>	
	Pressure loss coefficient (zeta)	[-]	0.32	0.35	0.27	0.35	-	0.16	0.21	0.21	0.25	
	K <sub>VS</sub> (rt, water)	[m <sup>3</sup> /h]	113	169	325	433	-	1562	1963	3490	4998	
	<b>Dimensions and weights</b>											
	E <sub>1</sub>	[mm]	305	275	330	330	-	499	649	619	652	
	s piping side <sup>1) 2)</sup>	[mm]	32	35	42	42	-	50	50	39	40	
	Weight	[kg]	104	107	172	177	-	504	704	921	993	
	Safety valve side	DN	40	50		80	100		150	200	250	
	Piping side	DN	65	80		125	150		250	300	350 <sup>4)</sup>	
	Pressure loss coefficient (zeta)	[-]	0.23	0.28		0.25	0.30		0.15	0.16	0.20	
	K <sub>VS</sub> (rt, water)	[m <sup>3</sup> /h]	133	189		512	730		2323	3999	5588	
	<b>Dimensions and weights</b>											
	E <sub>1</sub>	[mm]	275	275		330	382		594	619	652	
	s piping side <sup>1) 2)</sup>	[mm]	35	38		44	45		57	60	43	
Weight	[kg]	108	109		185	245		714	956	1004		
Safety valve side	DN	40										
Piping side	DN	80										
Pressure loss coefficient (zeta)	[-]	0.22										
K <sub>VS</sub> (rt, water)	[m <sup>3</sup> /h]	136										
<b>Dimensions and weights</b>												
E <sub>1</sub>	[mm]	275										
s piping side <sup>1) 2)</sup>	[mm]	38										
Weight	[kg]	106										

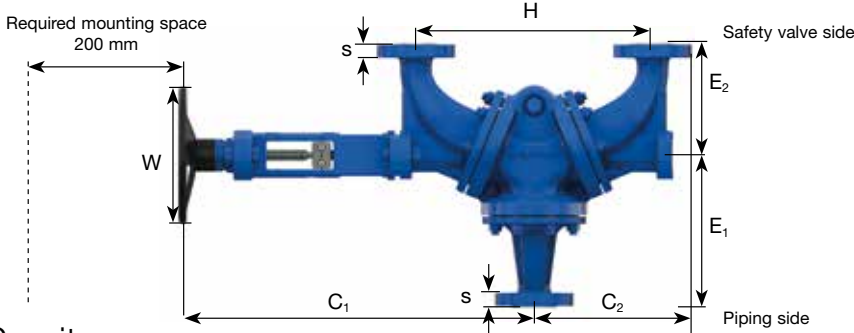
<sup>1)</sup> The flange thickness and the outer diameter of the connection flanges may be larger than specified by the norm.

<sup>2)</sup> The dimensions are subject to a casting tolerance of max. ± 5 mm / <sup>3</sup>/<sub>16</sub> inch.

<sup>3)</sup> PN 25 instead of PN 40

<sup>4)</sup> PN 16 instead of PN 25





US units

Safety valve side	NPS	1 1/2"	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"
<b>Art. No. 3200.</b>		<b>0050</b>	<b>0070</b>	<b>0090</b>	<b>0100</b>	<b>0120</b>	<b>0140</b>	<b>0150</b>	<b>0170</b>	<b>0190</b>	<b>0200</b>
Pressure rating body basic construction		CL300							CL150		

<b>Standard</b>	Piping side	NPS	1 1/2"	2"	3"	3"	4"	6"	6"	8"	10"	16"
	Pressure loss coefficient (zeta)	[-]	0.59	0.53	0.37	0.51	0.49	0.32	0.52	0.5	0.44	0.22
	C <sub>v</sub> (rt, water)	[US-G.PM]	96	158	321	414	660	1276	1443	2615	4355	8870
	<b>Dimensions and weights</b>											
	E <sub>1</sub>	[inch]	12	12	16 1/8	13	17	19 5/8	25 1/8	26 3/8	25 5/8	26 1/2
	E <sub>2</sub>	[inch]	8 7/8	8 7/8	10 1/4	10 5/8	9 5/8	13 1/8	14 7/8	16 1/8	16 1/8	18 1/8
	C <sub>1</sub>	[inch]	28 1/8	28 1/8	32 1/8	32 1/8	33 9/16	42 1/4	46 3/8	55 3/8	57 5/8	63 5/8
	C <sub>2</sub>	[inch]	12 7/16	12 9/16	14 13/16	15 3/16	16 1/8	18 5/8	22 7/8	24 1/8	26 5/16	30 3/4
	s <sup>1)2)</sup>	[inch]	1 1/8	1 1/4	1 1/2	1 1/2	1 5/8	1 3/4	1 3/4	2	1 1/2	1 3/4
	W	[inch]	9 13/16	9 13/16	15 3/4	15 3/4	15 3/4	33 1/2	33 1/2	47 1/4	47 1/4	47 1/4
H dimension standard	[inch]	18 11/16	18 11/16	22 1/16	22 1/16	22 1/16	22 1/16	33 1/16	33 1/16	33 1/16	39 3/8	
Weight	[lb]	227	231	373	384	529	1087	1521	2050	2176	3219	

<b>Expansion piping side</b>	Safety valve side	NPS	1 1/2"	2"	2 1/2"	3"	-	5"	6"	8"	10"	
	Piping side	NPS	2"	2 1/2"	4"	4"	-	8"	8"	10" <sup>3)</sup>	12"	
	Pressure loss coefficient (zeta)	[-]	0.32	0.35	0.27	0.35	-	0.16	0.21	0.21	0.25	
	C <sub>v</sub> (rt, water)	[US-G.PM]	131	195	376	501	-	4035	5778	4035	5778	
	<b>Dimensions and weights</b>											
	E <sub>1</sub>	[inch]	12	10 13/16	13	13	-	19 3/4	25 1/2	24 3/8	25 5/8	
	s piping side <sup>1)2)</sup>	[inch]	1 1/4	1 3/8	1 5/8	1 5/8	-	2	2	1 1/2	1 4/7	
	Weight	[lb]	229	236	379	390	-	1111	1552	2031	2189	

<b>Expansion piping side</b>	Safety valve side	NPS	1 1/2"	2"		3"	4"		6"	8"	10"	
	Piping side	NPS	2 1/2"	3"		5"	6"		10"	12"	14"	
	Pressure loss coefficient (zeta)	[-]	0.23	0.28		0.25	0.3		0.15	0.16	0.2	
	C <sub>v</sub> (rt, water)	[US-G.PM]	154	219		592	844		2686	4623	6460	
	<b>Dimensions and weights</b>											
	E <sub>1</sub>	[inch]	10 13/16	10 13/16		13	15		23 3/8	24 3/8	25 5/8	
	s piping side <sup>1)2)</sup>	[inch]	1 3/8	1 1/2		1 3/4	1 3/4		2 1/4	2 1/4	1 3/4	
	Weight	[lb]	238	240		408	540		1574	2108	2213	

<b>Expansion piping side</b>	Safety valve side	NPS	1 1/2"									
	Piping side	NPS	3"									
	Pressure loss coefficient (zeta)	[-]	0.22									
	C <sub>v</sub> (rt, water)	[US-G.PM]	157									
	<b>Dimensions and weights</b>											
	E <sub>1</sub>	[inch]	10 13/16									
	s piping side <sup>1)2)</sup>	[inch]	1 1/2									
	Weight	[lb]	234									

<sup>1)</sup> The flange thickness and the outer diameter of the connection flanges may be larger than specified by the norm.

<sup>2)</sup> The dimensions are subject to a casting tolerance of max. ± 5 mm / 3/16 inch.

<sup>3)</sup> CL150 instead of CL300

## Type 320 Flow, PN 250 / CL1500

### Article numbers and technical data

#### Metric units

Safety valve side		DN	25	40	50	80	100	150	200	
Art. No. 3200.			0020	0060	0080	0110	0130	0160	0180	
Pressure rating body basic construction			PN 250				PN 100			
Standard	Piping side	DN	25	40	50	80	100	150	200	
	Pressure loss coefficient (zeta)	[-]	0.6	0.6	0.52	0.6	0.53	0.74	0.63	
	K <sub>VS</sub> (rt, water)	[m <sup>3</sup> /h]	32	83	139	330	549	1046	2015	
	<b>Dimensions and weights</b>									
	E <sub>1</sub>	[mm]	380	380	350	536	536	700	699	
	E <sub>2</sub>	[mm]	225	265	265	310	310	379	447	
	C <sub>1</sub>	[mm]	714	760	760	852	852	1178	1178	
	C <sub>2</sub>	[mm]	280	330	346	414	437	597	635	
	s <sup>1) 2)</sup>	[mm]	36	39	46	56	62	59	67	
	W	[mm]	250	250	250	400	400	850	850	
H dimension standard	[mm]	330	475	475	560	560	840	840		
Weight	[kg]	145	164	175	400	435	855	950		

Expansion piping side	Safety valve side	DN	25	40		80	100	150	200	
	Piping side	DN	40	50		100	150 <sup>3)</sup>	200	250	
	Pressure loss coefficient (zeta)	[-]	0.19	0.3		0.39	0.3	0.23	0.29	
	K <sub>VS</sub> (rt, water)	[m <sup>3</sup> /h]	57	117		410	730	1876	2970	
	<b>Dimensions and weights</b>									
	E <sub>1</sub>	[mm]	380	350		536	536	700	699	
	C <sub>2</sub>	[mm]	280	330		414	437	597	635	
	s piping side <sup>1) 2)</sup>	[mm]	39	46		62	64	64	71	
	Weight	[kg]	148	166		410	455	873	980	
	Expansion piping side	Safety valve side	DN	25			80		150	
Piping side		DN	50			150 <sup>3)</sup>		250		
Pressure loss coefficient (zeta)		[-]	0.15			0.24		0.15		
K <sub>VS</sub> (rt, water)		[m <sup>3</sup> /h]	65			522		2323		
<b>Dimensions and weights</b>										
E <sub>1</sub>		[mm]	350			536		700		
s piping side <sup>1) 2)</sup>		[mm]	46			64		71		
Weight	[kg]	151			415		903			

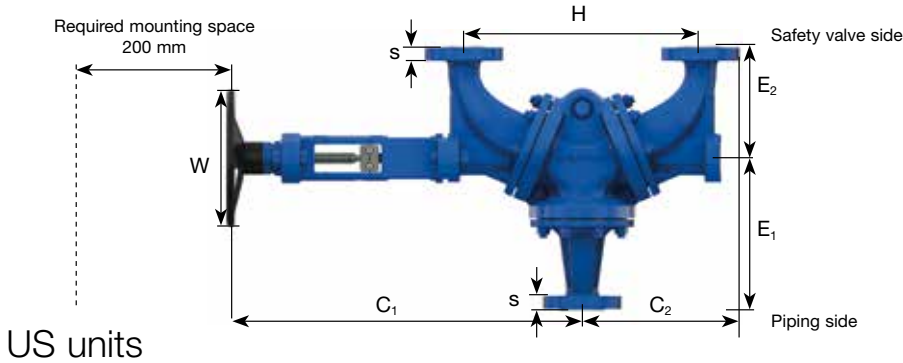
<sup>1)</sup> The flange thickness and the outer diameter of the connection flanges may be larger than specified by the norm.

<sup>2)</sup> The dimensions are subject to a casting tolerance of max. ± 5 mm / <sup>3</sup>/<sub>16</sub> inch.

<sup>3)</sup> PN 100 instead of PN 250

#### Material-conditioned pressure temperature limits of use [°C] in high-pressure ranges

Application limits for 1.0619 DN 25, 40, 50			Application limits for 1.4408 DN 25, 40, 50			Application limits for 1.4408 DN 80, 100			
Pressure rating	1.0619	1.7357	Pressure rating	1.4408	1.4470	Pressure rating	1.4408	1.4581	1.4470
PN 100	400°C	450°C	PN 100	400°C	400°C	PN 100	400°C	400°C	400°C
PN 160	400°C	450°C	PN 160	400°C	400°C	PN 160	<300°C	400°C	400°C
PN 250	<200°C	450°C	PN 250	x	<300°C	PN 250	x	x	<300°C



US units

Safety valve side	NPS	1"	1 1/2"	2"	3"	4"	6"	8"
<b>Art. No. 3200.</b>		<b>0020</b>	<b>0060</b>	<b>0080</b>	<b>0110</b>	<b>0130</b>	<b>0160</b>	<b>0180</b>
Pressure rating body basic construction		CL1500				CL600		

<b>Standard</b>	Piping side	NPS	1"	1 1/2"	2"	3"	4"	6"	8"	
	Pressure loss coefficient (zeta)	[-]	0.6	0.6	0.52	0.6	0.53	0.74	0.63	
	C <sub>v</sub> (rt, water)	[US-G.PM]	37	96	161	382	635	1209	2330	
	<b>Dimensions and weights</b>									
	E <sub>1</sub>	[inch]	14 15/16	14 15/16	13 3/4	21 1/8	21 1/8	27 9/16	27 1/2	
	E <sub>2</sub>	[inch]	8 7/8	10 7/16	10 7/16	12 3/16	12 3/16	14 15/16	17 5/8	
	C <sub>1</sub>	[inch]	28 1/8	29 15/16	29 15/16	33 9/16	33 9/16	46 3/8	46 3/8	
	C <sub>2</sub>	[inch]	11	13	13 5/8	16 5/16	17 3/16	23 1/2	25	
	s <sup>1)2)</sup>	[inch]	1 7/16	1 9/16	1 13/16	2 3/16	2 7/16	2 1/3	2 2/3	
	W	[inch]	9 13/16	9 13/16	9 13/16	15 3/4	15 3/4	33 1/2	33 1/2	
H dimension standard	[inch]	13	18 11/16	18 11/16	22 1/16	22 1/16	33	33		
Weight	[lb]	320	362	386	882	959	1885	2094		

<b>Expansion piping side</b>	Safety valve side	NPS	1"	1 1/2"		3"	4"	6"	8"	
	Piping side	NPS	1 1/2"	2"		4"	6" <sup>3)</sup>	8"	10"	
	Pressure loss coefficient (zeta)	[-]	0.19	0.3		0.39	0.3	0.23	0.29	
	C <sub>v</sub> (rt, water)	[US-G.PM]	66	135		474	844	2169	3434	
	<b>Dimensions and weights</b>									
	E <sub>1</sub>	[inch]	14 15/16	13 3/4		21 1/8	21 1/8	27 9/16	27 1/2	
	C <sub>2</sub>	[inch]	11	13		16 1/4	17 1/4	23 1/2	23 1/2	
	s piping side <sup>1)2)</sup>	[inch]	1 9/16	1 13/16		2 7/16	2 1/2	2 1/2	2 3/4	
	Weight	[lb]	326	366		904	1003	1925	2161	

<b>Expansion piping side</b>	Safety valve side	NPS	1"			3"		6"		
	Piping side	NPS	2"			6" <sup>3)</sup>		10"		
	Pressure loss coefficient (zeta)	[-]	0.15			0.24		0.15		
	C <sub>v</sub> (rt, water)	[US-G.PM]	75			603		2686		
	<b>Dimensions and weights</b>									
	E <sub>1</sub>	[inch]	13 3/4			21 1/8		27 9/16		
	s piping side <sup>1)2)</sup>	[inch]	1 13/16			2 1/2		2 3/4		
Weight	[lb]	333			915		1991			

<sup>1)</sup> The flange thickness and the outer diameter of the connection flanges may be larger than specified by the norm.

<sup>2)</sup> The dimensions are subject to a casting tolerance of max. ± 5 mm / 3/16 inch.

<sup>3)</sup> CL600 instead of CL1500

**Material-conditioned pressure temperature limits of use [°F] in high-pressure ranges**

Application limits for WCB 1", 1 1/2", 2"		
Pressure rating	WCB	WC6
CL600	752 °F	842 °F
CL900	752 °F	842 °F
CL1500	< 392°F	842 °F

Application limits for CF8M 1", 1 1/2", 2"		
Pressure rating	CF8M	CD3MN
CL600	752°F	752°F
CL900	752°F	752°F
CL1500	x	< 572°F

Application limits for CF8M 3", 4"			
Pressure rating	CF8M	CF10M	CD3MN
CL600	752°F	752°F	752°F
CL900	< 572°F	752°F	752°F
CL1500	x	x	< 572°F

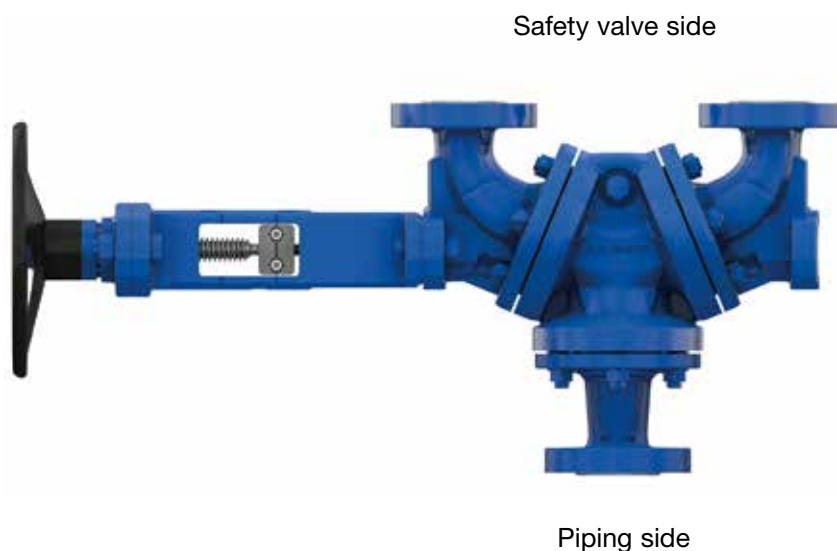
## Flange drillings

### Type 330, Type 320

#### Connection dimensions

The flange drillings and the flange facings meet the requirements of DIN EN 1092 and ASME B16.5/ASME B16.34, so that the change-over valves can be connected with counter flanges without any problems in accordance with these standards. The flange thickness and the outer diameter of the connection flanges may be larger than specified by the norm.

DN	25 – 400	25 – 400
NPS	1" – 16"	1" – 16"
Pressure rating DIN EN 1092	Option code safety valve side	Option code piping side
PN 10	Q2A	Q2L
PN 16	Q2B	Q2M
PN 25	Q2C	Q2N
PN 40	Q2D	Q2O
PN 63	Q2E	Q2P
PN 100	Q2F	Q2Q
PN 160	Q2G	Q2R
PN 250	Q05	Q07
Pressure rating ASME B16.5	Option code safety valve side	Option code piping side
CL150	Q2H	Q2S
CL300	Q2I	Q2T
CL600	Q2J	Q2U
CL900	Q2K	Q2V
CL1500	Q06	Q08



**Flange facings**  
**Type 330, Type 320**

<b>DIN EN 1092</b>		<b>Safety valve side</b>	<b>Piping side</b>
		<b>Option code</b>	<b>Option code</b>
Facing	Raised face, Form B1 (standard ≤ PN 40)	Y64	Y63
	Raised face, Form B2 (standard > PN 40)	Y21	Y09
	Spring, Form C	Y22	Y10
	Groove, Form D	Y25	Y11
	Male face, Form E	Y28	Y12
	Female face, Form F	Y29	Y15
	O-ring male face, Form G	Y30	Y18
	O-ring groove, Form H	Y37	Y19
<b>ASME B16.5</b>		<b>Safety valve side</b>	<b>Piping side</b>
		<b>Option code</b>	<b>Option code</b>
	Flat Face FF	Y82	Y81
	Raised face, RF (standard)	Y84	Y83
	Ring Joint Face, RTJ	Y86	Y85
	Small Tongue Face, STF	Y73	Y65
	Small Groove Face, SGF	Y74	Y66
	Long Tongue Face, LTF	Y75	Y67
	Long Groove Face, LGF	Y76	Y68
	Small Male Face, SMF	Y77	Y69
	Small Female Face, SFF	Y78	Y70
	Long Male Face, LMF	Y79	Y71
	Long Female Face, LFF	Y80	Y72

## Lockable combination

### Type 330, Type 320

#### Lockable combination

A lockable combination is present if a change-over valve has been installed at the inlet as well as at the outlet of the safety valves. The inlet-side combination is expanded by the outlet-side change-over valve and the change-over valves are connected or locked so that improper operation is impossible.



Inlet-side combination



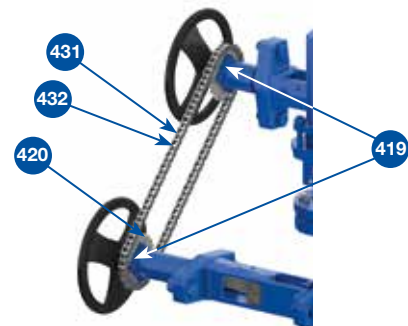
Lockable combination

#### Applications

The lockable combination is used if the combined safety valves are not discharge into the atmosphere. This situation is the case with valuable media or media dangerous to persons and the environment. The safety valves are connected to a joint blow-off line through the lockable combination, while a safety valve is isolated and the other active safety valve secures the system. Due to the combination of two change-over valves with two safety valves, the entire unit only requires one piping at inlet and outlet.

The two change-over valves are supplemented through combination components for the combination and connected via a chain so as to ensure synchronised opening and closing.

Item	Component	Material
419	Tolerance compensation	1.0619
		WCB/WCC
420	Chain wheel	1.0503
		C45
431, 432	Chain with chain lock	Steel
		Steel



#### Combinatorics and variable flange distance

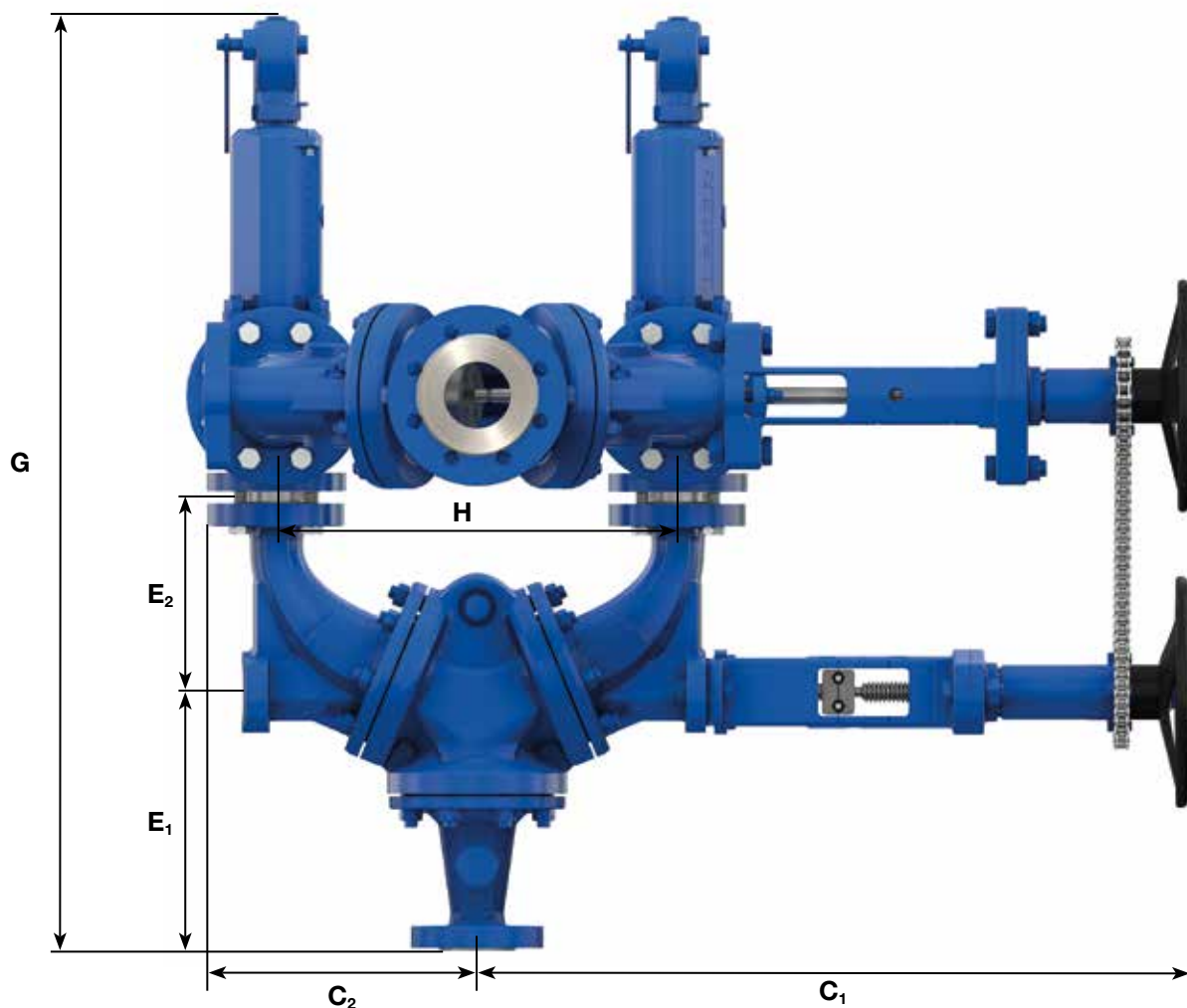
LESER Change-over Valves are available in the same pressure ratings and nominal sizes as safety valve inlet and outlet in lockable combinations. This is made possible by the variable flange distance of the inlet-side change-over valve and a compensation of the adjustment range using different chain wheel transmissions.

## Lockable combination Type 330, Type 320

### Dimensions

The dimensions of the lockable combination result from the selected safety valves and the change-over valves. The total height  $G$  is the sum of dimensions  $E_1 + E_2$  of the change-over valve and the total height of the safety valves  $H_{max}$ . The total width of the lockable combination is larger than the inlet-side combination due to the combination components.

### Deviating C1 dimension in lockable combinations



## Lockable combination

### Dimensions

Metric units

					Outlet-side change-over valve																		
					Lockable combination with spring-loaded safety valves					Lockable combination with pilot-operated safety valves													
					DN	25	40	50	65	80	100	125	150	25	40	50	65	80	100	150			
					Art. No. 3300.	0010	0050	0070	0090	0100	0120	0140	0150	0010	0050	0070	0090	0100	0120	0150			
					Pressure rating <sup>1)</sup>	PN 40							PN 40										
Type	DN	Art. No.	Pressure rating <sup>1)</sup>	Flange distance / width																			
Inlet-side change-over valve	330 Compact	25	3300.0010	PN 40	H dimension [mm]	270	330	330								330							
					max. C <sub>1</sub> [mm]	694	694	694							694								
		40	3300.0050	PN 40	H dimension [mm]		330	330	475	475							475		475				
					max. C <sub>1</sub> [mm]		694	694	804	804							759		804				
		50	3300.0070	PN 40	H dimension [mm]			330		475									475				
					max. C <sub>1</sub> [mm]			694		804										804			
	65	3300.0090	PN 40	H dimension [mm]				475		475													
				max. C <sub>1</sub> [mm]				804		862													
	80	3300.0100	PN 40	H dimension [mm]					475	475											560		
				max. C <sub>1</sub> [mm]					804	862											862		
	100	3300.0120	PN 40	H dimension [mm]						475	560											560	
				max. C <sub>1</sub> [mm]						862	989											989	
	320 Flow	40	3200.0050	PN 40	H dimension [mm]		475	475	475	475						475		475					
					max. C <sub>1</sub> [mm]		759	759	804	804					759		804						
		50	3200.0070	PN 40	H dimension [mm]			475		475								475					
					max. C <sub>1</sub> [mm]			759		804									804				
		65	3200.0090	PN 40	H dimension [mm]						560												
					max. C <sub>1</sub> [mm]						862												
80	3200.0100	PN 40	H dimension [mm]					560	560	560									560				
			max. C <sub>1</sub> [mm]					849	862	862									862				
100	3200.0120	PN 40	H dimension [mm]						560	560											560		
			max. C <sub>1</sub> [mm]						900	900											900		
320 Flow	25	3200.0020	PN 250	H dimension [mm]	330	330	330								330								
				max. C <sub>1</sub> [mm]	759	759	759						759										
	40	3200.0060	PN 250	H dimension [mm]		475	475	475	475						475		475						
				max. C <sub>1</sub> [mm]		804	804	804	804					804		804							
	50	3200.0080	PN 250	H dimension [mm]			475		475									475					
				max. C <sub>1</sub> [mm]			804		804									804					
80	3200.0110	PN 250	H dimension [mm]					560	560	560									560				
			max. C <sub>1</sub> [mm]					869	900	900									907				
100	3200.0130	PN 250	H dimension [mm]						560	560										560			
			max. C <sub>1</sub> [mm]						900	898										900			

<sup>1)</sup> Pressure rating body basic construction



## Lockable combination

### Dimensions

Metric units

					Outlet-side change-over valve											
					Lockable combination with spring-loaded safety valves				Lockable combination with pilot-operated safety valves							
					DN	125	150	200	250	300	350	400	150	200	250	
					Art. No. 3300.	0140	0150	0170	0190	0200	0220	0230	0150	0170	0190	
					Pressure rating <sup>1)</sup>	PN 40			PN 25	PN 16		PN 40				
Type	DN	Art. No.	Pressure rating <sup>1)</sup>	Flange distance / width												
Inlet-side change-over valve	330 Compact	125	3300.0140	PN 40	H dimension [mm]	560										
					max. C <sub>1</sub> [mm]	861										
		150	3300.0150		H dimension [mm]		560	560							560	
					max. C <sub>1</sub> [mm]		943	1139							1139	
		250	3300.0170		H dimension [mm]				840	840						840
					max. C <sub>1</sub> [mm]				1244	1489					1244	
	250	3300.0190	H dimension [mm]						840							
			max. C <sub>1</sub> [mm]						1544							
	320 Flow	80	3200.0100	PN 40	H dimension [mm]	560										
					max. C <sub>1</sub> [mm]	862										
		100	3200.0120		H dimension [mm]		560							560		
					max. C <sub>1</sub> [mm]		900							900		
		125	3200.0140		H dimension [mm]	560										
					max. C <sub>1</sub> [mm]	1139										
		150	3200.0150		H dimension [mm]			840	840						840	
					max. C <sub>1</sub> [mm]			124	1244					1178		
		200	3200.0170		H dimension [mm]				840	840					840	
					max. C <sub>1</sub> [mm]				1489	1489				1489		
		250	3200.0190		PN 25	H dimension [mm]						840				
					max. C <sub>1</sub> [mm]						1544					
	300	3200.0200	PN 16	H dimension [mm]							1000					
max. C <sub>1</sub> [mm]									1696							
320 Flow	80	3200.0110	PN 250	H dimension [mm]		560										
				max. C <sub>1</sub> [mm]		900										
	100	3200.0130		H dimension [mm]		560						560				
				max. C <sub>1</sub> [mm]		898						900				
	150	3200.0160		PN 100	H dimension [mm]			840	840				840			
				max. C <sub>1</sub> [mm]			1244	1244				1244				

<sup>1)</sup> Pressure rating body basic construction

# Lockable combination

## Dimensions

US units

					Outlet-side change-over valve																		
					Lockable combination with spring-loaded safety valves						Lockable combination with pilot-operated safety valves												
					NPS	1"	1 1/2"	2"	2 1/2"	3"	4"	5"	6"	1"	1 1/2"	2"	2 1/2"	3"	4"	6"			
					Art. No. 3300.	0010	0050	0070	0090	0100	0120	0140	0150	0010	0050	0070	0090	0100	0120	0150			
					Pressure rating <sup>1)</sup>	CL300						CL300											
Type	NPS	Art. No.	Pressure rating <sup>1)</sup>	Flange distance / width																			
Inlet-side change-over valve	330 Compact	1"	3300.0010	CL300	H dimension [mm]	10 10/16	13	13									13						
					max. C <sub>1</sub> [mm]	27 5/16	27 5/16	27 5/16												27 5/16			
		1 1/2"	3300.0050	CL300	H dimension [mm]		13	13	18 11/16	18 11/16								18 11/16		18 11/16			
					max. C <sub>1</sub> [mm]		27 5/16	27 5/16	33 10/16	33 10/16										29 7/8		31 5/8	
		2"	3300.0070	CL300	H dimension [mm]			13		18 11/16										18 11/16			
					max. C <sub>1</sub> [mm]			27 5/16		31 5/8												31 5/8	
	2 1/2"	3300.0090	CL300	H dimension [mm]				18 11/16		18 11/16													
				max. C <sub>1</sub> [mm]				31 5/8		33 15/16													
	3"	3300.0100	CL300	H dimension [mm]					18 11/16	18 11/16												22 1/16	
				max. C <sub>1</sub> [mm]					31 5/8	33 15/16													33 15/16
	4"	3300.0120	CL300	H dimension [mm]							18 11/16		22 1/16									22 1/16	
				max. C <sub>1</sub> [mm]								33 15/16		33 7/8									33 7/8
	320 Flow	1 1/2"	3200.0050	CL300	H dimension [mm]		18 11/16	18 11/16	18 11/16	18 11/16							18 11/16		18 11/16				
					max. C <sub>1</sub> [mm]		29 7/8	29 7/8	31 5/8	31 5/8									29 7/8		31 5/8		
		2"	3200.0070	CL300	H dimension [mm]			18 11/16		18 11/16										18 11/16			
					max. C <sub>1</sub> [mm]			29 7/8		31 5/8												31 5/8	
		2 1/2"	3200.0090	CL300	H dimension [mm]							22 1/16											
					max. C <sub>1</sub> [mm]								33 15/16										
3"	3200.0100	CL300	H dimension [mm]						22 1/16	22 1/16	22 1/16										22 1/16		
			max. C <sub>1</sub> [mm]							33 7/16	33 15/16	33 7/8										33 15/16	
4"	3200.0120	CL300	H dimension [mm]							22 1/16		22 1/16									22 1/16		
			max. C <sub>1</sub> [mm]								35 3/8		35 3/8									35 3/8	
320 Flow	1"	3200.0020	CL1500	H dimension [mm]	13	13	13									13							
				max. C <sub>1</sub> [mm]	29 7/8	29 7/8	29 7/8											29 7/8					
	1 1/2"	3200.0060	CL1500	H dimension [mm]		18 11/16	18 11/16	18 11/16	18 11/16								18 11/16		18 11/16				
				max. C <sub>1</sub> [mm]		31 5/8	31 5/8	31 5/8	31 5/8									31 5/8		31 5/8			
	2"	3200.0080	CL1500	H dimension [mm]			18 11/16		18 11/16										18 11/16				
				max. C <sub>1</sub> [mm]			31 5/8		31 5/8												31 5/8		
3"	3200.0110	CL1500	H dimension [mm]					22 1/16	22 1/16		22 1/16										22 1/16		
			max. C <sub>1</sub> [mm]						34 1/4	35 3/8		35 3/8										35 11/16	
4"	3200.0130	CL1500	H dimension [mm]							22 1/16		22 1/16									22 1/16		
			max. C <sub>1</sub> [mm]								35 3/8		35 3/8									35 3/8	

<sup>1)</sup> Pressure rating body basic construction

**Lockable combination**  
**Dimensions**  
US units

					Outlet-side change-over valve											
					Lockable combination with spring-loaded safety valves				Lockable combination with pilot-operated safety valves							
					NPS	5"	6"	8"	10"	12"	14"	16"	6"	8"	10"	
					Art. No. 3300.	0140	0150	0170	0190	0100	0220	0230	0150	0170	0190	
					Pressure rating <sup>1)</sup>	CL300				CL150			CL300		CL150	
Type	NPS	Art. No.	Pressure rating <sup>1)</sup>	Flange distance / width												
Inlet-side change-over valve	330 Compact	5"	3300.0140	CL300	H dimension [mm]	22 1/16										
					max. C <sub>1</sub> [mm]	33 7/8										
		6"	3300.0150	CL300	H dimension [mm]		22 1/16	22 1/16							22 1/16	
					max. C <sub>1</sub> [mm]		37 1/8	44 13/16							44 13/16	
		8"	3300.0170	CL300	H dimension [mm]				33 1/16	33 1/16						33 1/16
					max. C <sub>1</sub> [mm]				49	58 5/8						49
		10"	3300.0190	CL300	H dimension [mm]							33 1/16				
					max. C <sub>1</sub> [mm]							60 13/16				
	320 Flow	3"	3200.0100	CL300	H dimension [mm]	22 1/16										
					max. C <sub>1</sub> [mm]	33 15/16										
		4"	3200.0120	CL300	H dimension [mm]		22 1/16							22 1/16		
					max. C <sub>1</sub> [mm]		35 7/16							35 7/16		
		5"	3200.0140	CL300	H dimension [mm]	22 1/16										
					max. C <sub>1</sub> [mm]	44 13/16										
		6"	3200.0150	CL300	H dimension [mm]			33 1/16	33 1/16						33 1/16	
					max. C <sub>1</sub> [mm]			4 7/8	49					46 3/8		
		8"	3200.0170	CL300	H dimension [mm]				33 1/16	33 1/16						33 1/16
					max. C <sub>1</sub> [mm]				58 5/8	58 5/8					58 5/8	
		10"	3200.0190	CL150	H dimension [mm]							33 1/16				
					max. C <sub>1</sub> [mm]							60 13/16				
		12"	3200.0200	CL150	H dimension [mm]								39 3/8			
max. C <sub>1</sub> [mm]												66 3/4				
320 Flow	3"	3200.0110	CL1500	H dimension [mm]		22 1/16										
				max. C <sub>1</sub> [mm]		35 7/16										
	4"	3200.0130	CL1500	H dimension [mm]		22 1/16						22 1/16				
				max. C <sub>1</sub> [mm]		35 3/8						35 7/16				
	6"	3200.0160	CL600	H dimension [mm]			33 1/16	33 1/16						33 1/16		
				max. C <sub>1</sub> [mm]			49	49					49			

<sup>1)</sup> Pressure rating body basic construction

## Options

Designation / option code	Application	Technical design
<b>Valve design TA-Luft conformity</b> Q69	Reduction of emissions to the outside.	Valve design with TA-Luft conformity sealing systems for body seals (Pos. 60) and compression gland (Pos. 204) to the outside. ≤ 52 bar without lifeloading > 52 bar with lifeloading
<b>Expansion of the piping side</b>  Q5Q (DN 40)      Q5C (NPS 1 1/2") Q5R (DN 50)      Q5D (NPS 2") Q5S (DN 65)      Q5E (NPS 2 1/2") Q5T (DN 80)      Q5F (NPS 3") Q5U (DN 100)     Q5G (NPS 4") Q5V (DN 125)     Q5H (NPS 5") Q5W (DN 150)     Q5I (NPS 6") Q5X (DN 200)     Q5J (NPS 8") Q5Y (DN 250)     Q5K (NPS 10") Q5Z (DN 300)     Q5L (NPS 12") Q6A (DN 350)     Q5M (NPS 14") Q6B (DN 400)     Q5N (NPS 16")	Increase of the nominal size at the piping side to adjust to larger piping nominal sizes or to reduce the pressure loss through the change-over valve.  Available expansions, see Pages 12 and 14 for Type 330 and Pages 16 – 19 for Type 320.	Change-over valve is equipped with inlet bodies with different nominal sizes to the piping.
<b>Stellited sealing surfaces</b> Q67 (Disc) Q68 (Seats)	Increase of wear resistance of seat and disc.	Optional up to 63 bar. From 63 bar the sealing surfaces are stellited by default.
<b>Spindle material</b> Q39 (1.4404/316L)	Higher quality spindle material for the change-over valve optional. Available in steel cast configuration (Q09) upon customer request.	Spindle in 1.4404/316L.
<b>Studs and nuts material</b> Q45 (Studs A4-70) Q4A (Nuts A4-70)	Optional higher quality studs and nuts material for the change-over valve in steel cast configuration (Q09).	Studs and nuts in stainless steel.

## Options

Designation / option code	Application	Technical design
<b>NACE</b> N78 MR0175 N77 MR0103	Use in sour gas applications (upstream). Use in sour gas applications (downstream).	Use of NACE-compliant materials for all pressurised components.
<b>Pickled version</b> Q77	Removal of residues on the casting surface as well as reconstruction of an even passive layer.	Inlet body, body and elbows in stained design. Only available for the stainless-steel configuration (Q11)
<b>Free of oil and grease</b> J85	On request	
<b>Drain hole</b> Q2W (G <sup>1/4</sup> ) Q2Y (G <sup>1/2</sup> ) Q2Z (NPT <sup>1/2</sup> "")	The drain holes enable discharge of the enclosed medium on the locked side of the change-over valve.  Especially for steam protection, the condensate may be discharged through the boreholes.	A borehole each on the bottom side of the elbows (different depending on installation position for inlet-side and outlet-side change-over valves).
<b>Pressure relief with needle valve</b> Q71 – for 10 mm pipe Q75 – Thread NPT 1/2" Q72 – Flange connection DN 15 PN 40 Q7A – Flange connection DN 15 PN 250 Q7B – Flange connection 1/2" CL300/600 Q7C – Conn. for pressure relief v. NPT 1/2"	The drain holes enable discharge of the enclosed medium on the locked side of the change-over valve.  Especially for steam protection, the condensate may be discharged through the boreholes.	A borehole each on the bottom side of the elbows (different depending on installation position for inlet-side and outlet-side change-over valves).

## Options

Designation / option code	Application	Technical design
<b>Remote sensing</b> Q73 (in the inlet body for POSV)	Remote sensing connection for POSV in order to reduce the pressure directly in the inlet of the change-over valve and thereby bridge the pressure loss via the change-over valve.	Connection borehole on the back side of the inlet body inclusiv piping between inlet body and the two elbows.  In addition, a switch valve is supplied for remote sensing line to switch between both sides in order to prevent medium from discharging.
<b>Purge and manometer connection</b> Q3A (NPT 1/2") Q3B (G1/2)	The purge and manometer connection is used for cleaning and/or purging the locked elbow. As an alternative, the connection for pressure monitoring in the locked elbow may be used by connecting a manometer.  It can then display pressure increase due to leaks or the general locked pressure in order to demount the safety valve on the locked side without danger.	One connection each on the front side of the elbows locked with a plastic plug.
<b>Proximity switch</b> Q76 Adaptor M12x1) J93 (N M12x1/M18X1 direct current)	The proximity switches provide an electronic signal indicating on which side (left or right) the disc of the change-over valve is located and therefore which safety valve is active and which one is set to stand-by.	Two proximity switches are screwed into the two end positions in the yoke above the position indicator.
<b>Adjustment guard manual wheel</b> Q3C	Protection against unauthorised switching	Padlock in the boreholes of the yoke.

## Options

Designation / option code	Application	Technical design
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**Pressure balancing unit**

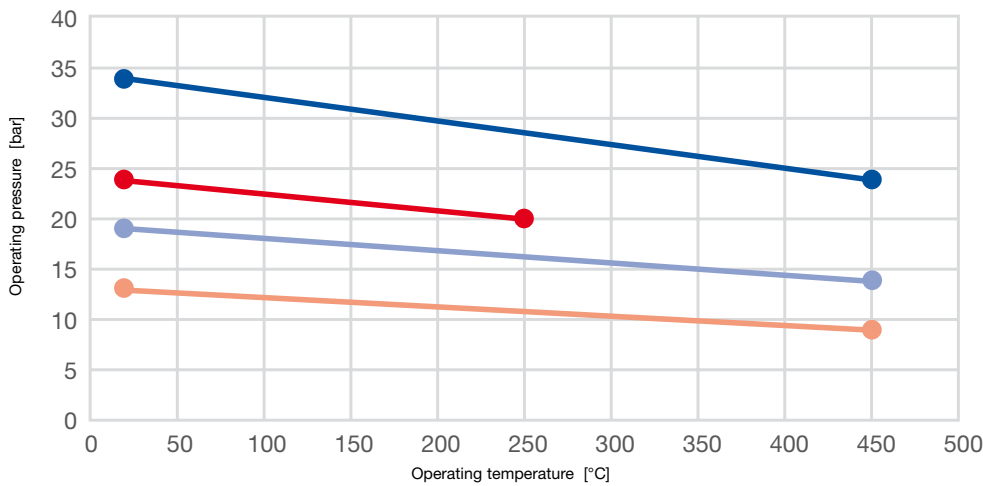
Q70

Simplification of the switch via manual wheel even with high pressures.

As of the following pressure values, LESER recommends the pressure balancing unit in order to prevent damages to the change-over valve:

Connection with a pipe on the back sides of the elbows, including a switch valve.

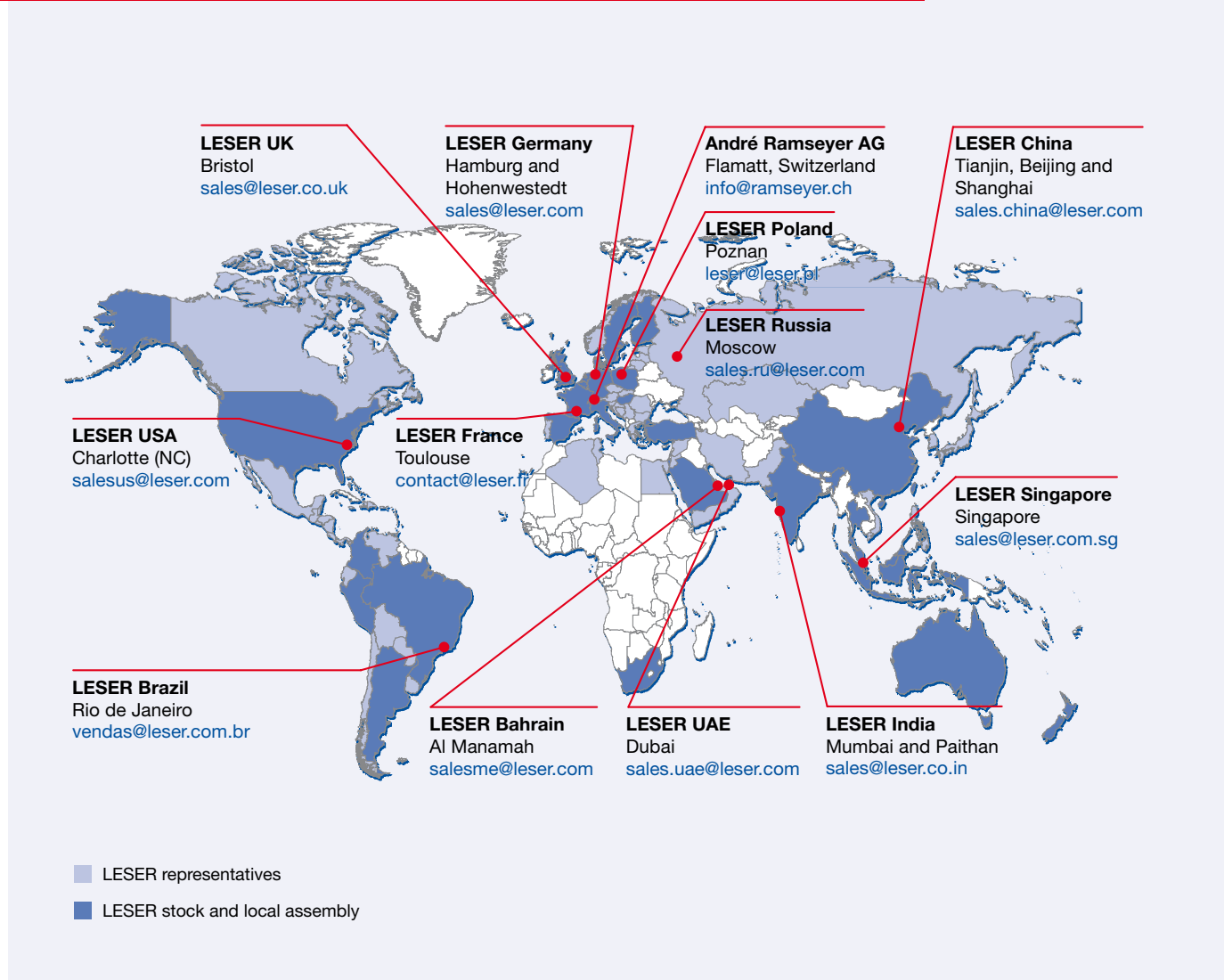
As an alternative, the operating pressure can be reduced below the mentioned limits so as to enable switching without any danger.



Art. No.	Designation
3300.0090	Compact DN 65 / 2 1/2"
3300.0100	Compact DN 80 / 3"
3200.0020	Flow DN 25 / 1" PN 250 / CL1500
3200.0050	Flow DN 40 / 1 1/2" PN 40 / CL300
3200.0060	Flow DN 40 / 1 1/2" PN 250 / CL1500
3200.0070	Flow DN 50 / 2" PN 40 / CL300
3200.0080	Flow DN 50 / 2" PN 250 / CL1500
3300.0010	Compact DN 25 / 1"
3300.0050	Compact DN 40 / 1 1/2"
3300.0070	Compact DN 50 / 2"
3300.0120	Compact DN 100 / 4"
3200.0090	Flow DN 65 / 2 1/2" PN 40 / CL300
3200.0100	Flow DN 80 / 3" PN 40 / CL300
3200.0110	Flow DN 80 / 3" PN 250 / CL1500
3200.0120	Flow DN 100 / 4" PN 40 / CL300
3200.0130	Flow DN 100 / 4" PN 250 / CL1500

# LESER worldwide

LESER has subsidiaries in Europe, America, the Middle East and Asia, and further representatives in more than 80 countries. Thanks to our extensive experience and our 100% focus on safety valves, LESER is one of the top companies in its market – the largest producer in Europe and among the market leaders worldwide. LESER – The Safety Valve Company.



# LESER

The-Safety-Valve.com

## LESER GmbH & Co. KG

20537 Hamburg, Wendenstr. 133-135  
20506 Hamburg, P.O. Box 26 16 51

Fon +49 (40) 251 65-100  
Fax +49 (40) 251 65-500

E-Mail [sales@leser.com](mailto:sales@leser.com)  
Web [www.leser.com](http://www.leser.com)

Change-over valve catalog / Edition May 2018