

Best Availability – LESER Change-over Valves. Type 320, 330



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Objectives of this Presentation.

1. [Objectives](#) | 2. [Challenges](#) | 3. [Spare Relief Valve Installations](#) | 4. [LESER COV](#) | 5. [Pressure loss](#) | 6. [Combinations](#) | 7. [Features](#) | 8. [Options & Approvals](#) | 9. [Customer benefits](#)

The aim of this presentation is to provide an overview of the LESER product range **Best Availability – Change-over Valves**.



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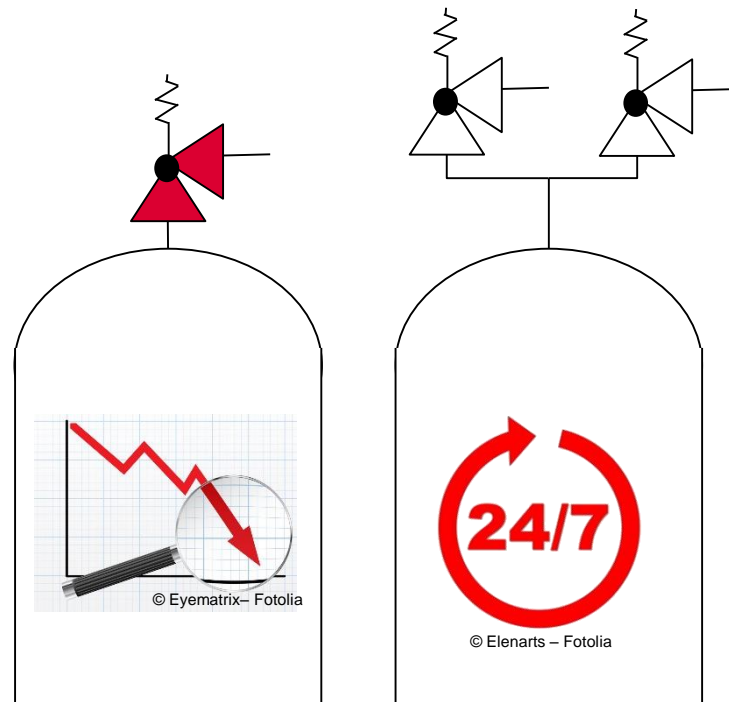
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Challenges. Costly Shutdowns.

1. Objectives | 2. Challenges | 3. Spare Relief Valve Installations | 4. LESER COV | 5. Pressure loss | 6. Combinations | 7. Features | 8. Options & Approvals | 9. Customer benefits

- During planned or unplanned safety valve maintenance, processes protected by a single safety device require a complete shutdown. This is often costly – especially when dealing with critical media or important plant processes that require continuous uptime
- Unplanned shutdowns could lead to losses of millions of euros for plant operators

▶ **A spare relief valve installation is the key**



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Spare Relief Valve Installations. Definition.

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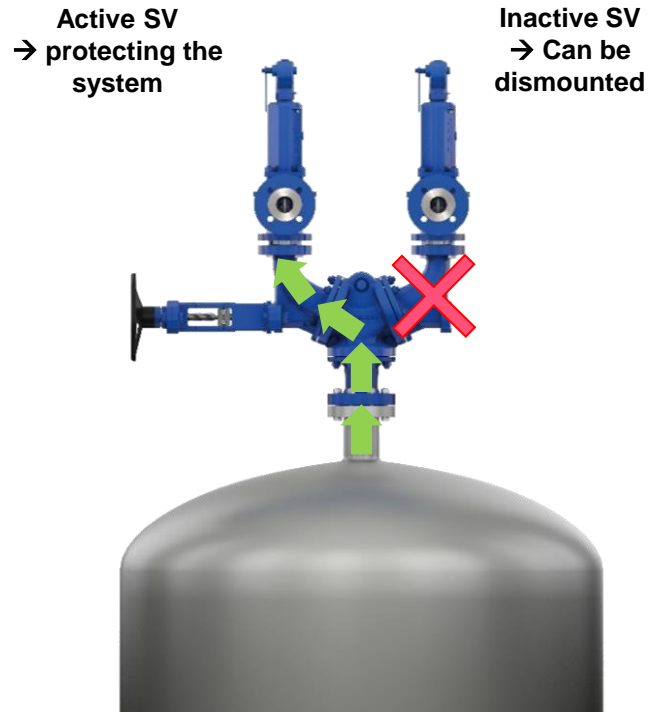
Two safety valves

- of the same type,
- of the same size / rating and
- with the same set pressure

are installed for continuous overpressure protection even if one safety valve needs to be

- repaired
- maintained
- replaced

without unplanned plant shutdown. This increases the plant availability and efficiency.



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Spare Relief Valve Installation. Standards.

1. Objectives | 2. Challenges | 3. Spare Relief Valve Installations | 4. LESER COV | 5. Pressure loss | 6. Combinations | 7. Features | 8. Options & Approvals | 9. Customer benefits

International standards specify how to ensure operation of at least one safety valve if more safety valves are installed:

- Max. 3 % pressure loss* in the inlet pipe of the SV acc. to international standards
- “...remaining safety device(s) [...] shall provide the full relief capacity required at any time” (ISO 4126-9)
- „the cross-section of the supply line shall not be smaller than the cross-section of the inlet to the safety valve.“ (AD 2000-Merkbaltt)



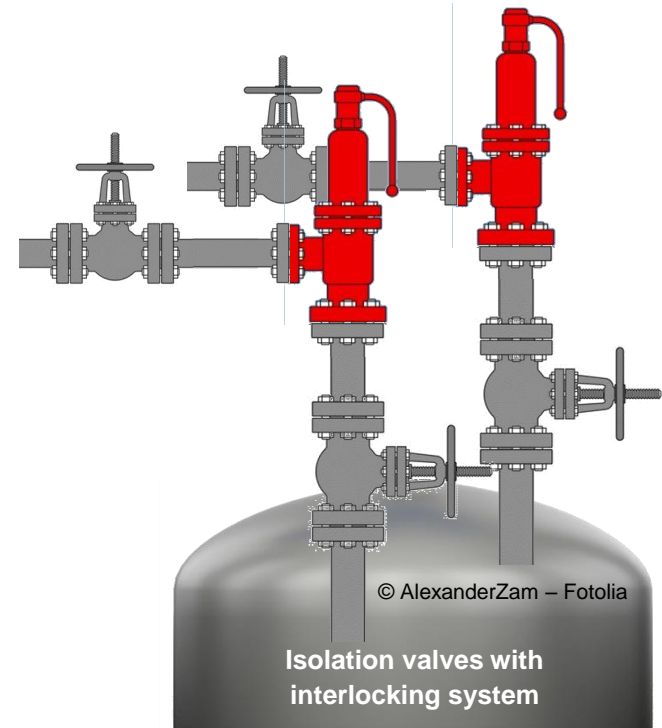
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Spare Relief Valve installation. Alternatives.

1. Objectives | 2. Challenges | 3. Spare Relief Valve Installations | 4. LESER COV | 5. Pressure loss | 6. Combinations | 7. Features | 8. Options & Approvals | 9. Customer benefits

The following solutions are mainly implemented in the market:

- Change-over Valve
- Three-way plug valve
- Isolation valves with or without interlocking system



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Perfect solution. Continuous and safe plant operation.

1. Objectives | 2. Challenges | 3. Spare Relief Valve Installations | 4. LESER COV | 5. Pressure loss | 6. Combinations | 7. Features | 8. Options & Approvals | 9. Customer benefits

- LESER Change-over Valves ensure 24/7 plant availability
- Easy switch-over between two installed safety valves → one operates, while the other is serviced
- Isolation of both safety valves at the same time prevented
- Change-over Valve and safety valves optimized for stable safety valve functioning ensuring safe plant operation



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Change-over Valves are used in.

1. Objectives | 2. Challenges | 3. Spare Relief Valve Installations | 4. **LESER COV** | 5. Pressure loss | 6. Combinations | 7. Features | 8. Options & Approvals | 9. Customer benefits

Industries

- Chemical industry
- Petrochemical industry
- Oil- & Gas industry
- Technical gases

Applications

- Refinery processes
- Refrigeration plant
- CO₂-cooling
- Tank storage

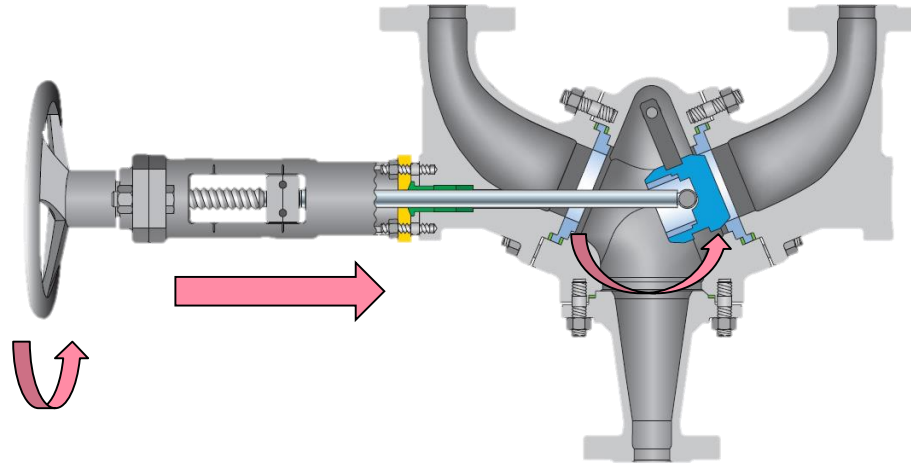


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Functional principle. Easy and quick switch-over by only one step

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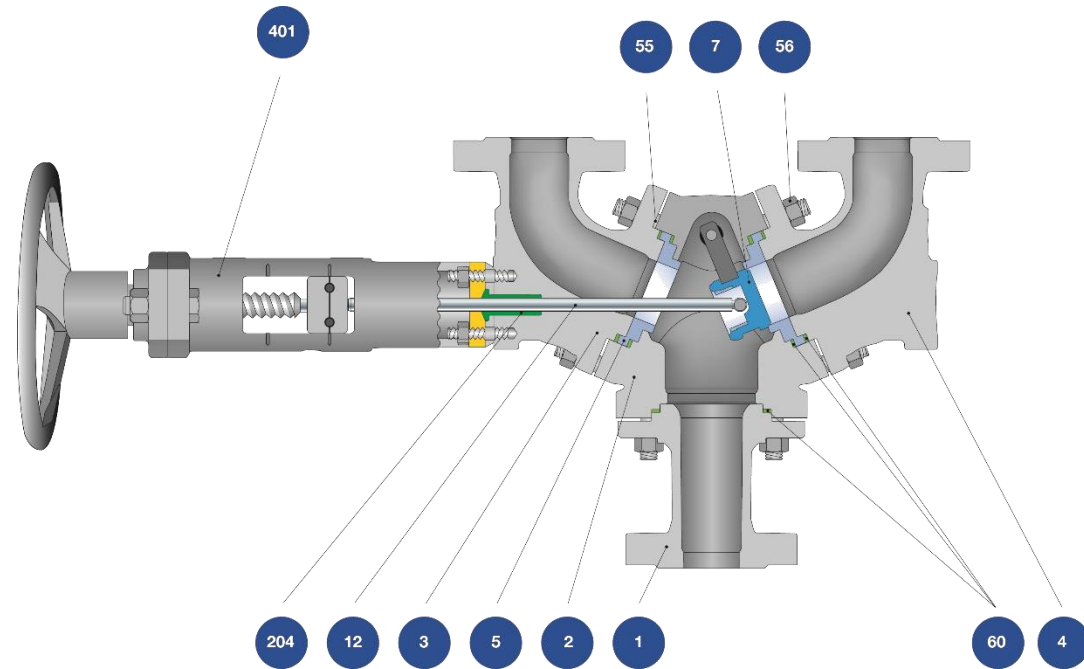
Rotatory movement of the hand wheel

Linear movement of the spindle

Turning of the disc from one side to the other on a circular path

LESER Change-over Valve. Main parts.

1. Objectives | 2. Challenges | 3. Spare Relief Valve Installations | 4. LESER COV | 5. Pressure loss | 6. Combinations | 7. Features | 8. Options & Approvals | 9. Customer benefits



(1) Inlet body

(2) Body

3) Elbow, actuator side

4) Elbow

5) Seats

7) Disc

(12) Spindle

(55) Stud bolts

(56) Nuts

(60) Gaskets

(204) Gland

(401) Yoke

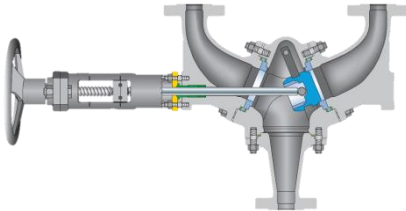
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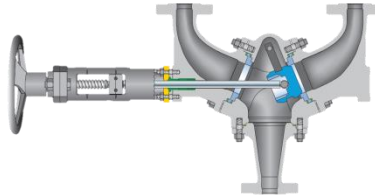
LESER Change-over Valves. General characteristic.

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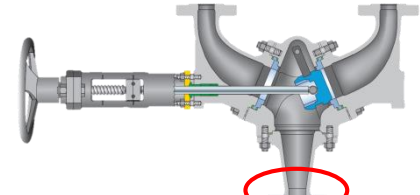
Change-over Valves...



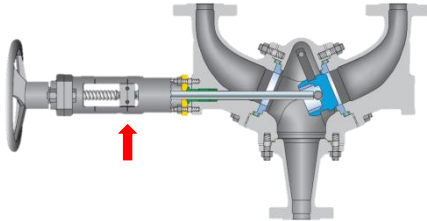
...are a three way + gate valve type



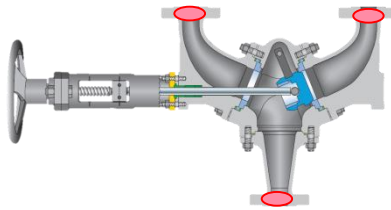
...prevent that both SV are isolated at any time



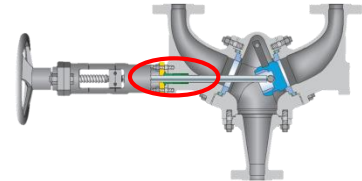
...only need one nozzle at the vessel



...make the active SV side visible from the outside



...provide the min. area of the area of the safety valve at any time



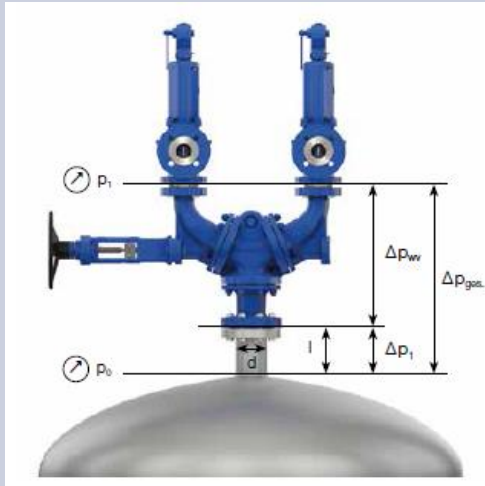
...provide sealing towards the outside for different requirements (e.g. TA-Luft)

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Pressure Loss. Basics – Standard Installations.

1. Objectives | 2. Challenges | 3. Spare Relief Valve Installations | 4. LESER COV | 5. Pressure loss | 6. Combinations | 7. Features | 8. Options & Approvals | 9. Customer benefits



Basics

The pressure loss in the inlet line to the safety valve may not exceed 3% of the pressure difference between set pressure and superimposed back pressure. The Change-over Valve constitutes a component of the inlet line.

Pressure loss coefficient

The pressure loss is calculated with the pressure loss coefficient ζ (Zeta). Basically the pressure loss coefficient should be as low as possible.

Formula symbol for the calculation:

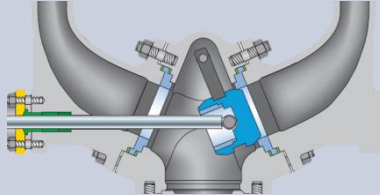
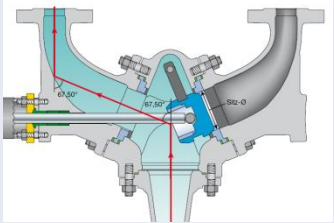
Δp_{wv}	Pressure loss in the change-over valve
ρ	Density
ζ	Pressure loss coefficient (Zeta value)
w	Flow rate

Calculation of the pressure loss in the Change-over Valve

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

Minimal pressure loss. Our measures.

1. Objectives | 2. Challenges | 3. Spare Relief Valve Installations | 4. LESER COV | 5. Pressure loss | 6. Combinations | 7. Features | 8. Options & Approvals | 9. Customer benefits

LESER solution for the Change-over Valve	Result
Increased body size	Widened flow cross-section 
Inclined positioned seats	Optimized flow path 
Decrease inlet pressure loss	Adoptable Inlet nozzle

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Two Types. Pressure loss requirements.

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Type 330 Compact: Design for basic pressure loss requirements



Type 320 Flow: Flow optimized design for highest requirements in regards to inlet pressure loss e.g. additional piping or high capacity SV

- As an experienced safety valve manufacturer we are 100 % committed to safety valves. We have taken this as a reason to develop two types for different pressure loss requirements which are dictated by the safety valves and their installation situations.
- Because of the piping in front of the CoV and its diameter which also influence the pressure loss significantly, our Change-over Valves are adaptable at the inlet nozzle to a larger size. This decreases the pressure loss.

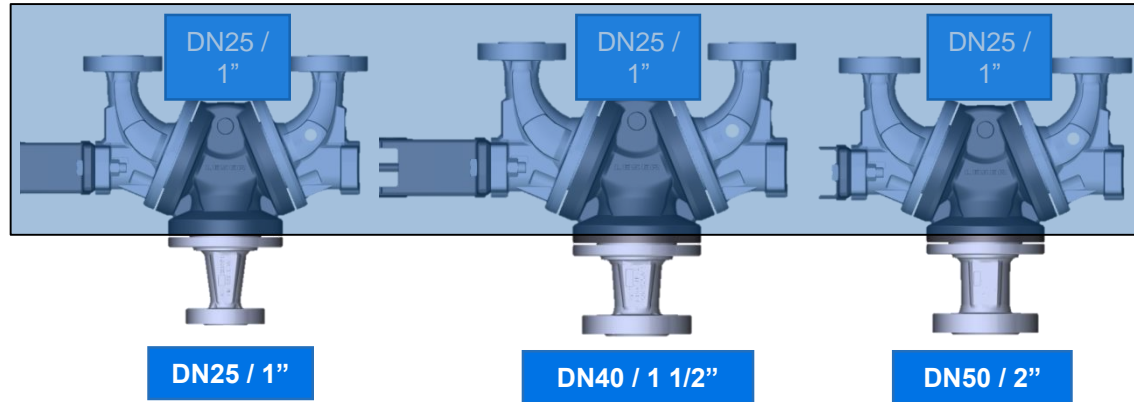
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Easy adaption. Piping side.

1. Objectives | 2. Challenges | 3. Spare Relief Valve Installations | 4. LESER COV | 5. Pressure loss | 6. Combinations | 7. Features | 8. Options & Approvals | 9. Customer benefits

- Different inlet bodies available for adopting the Change-over Valve to a required pipe size or decrease the inlet pressure loss
- Available for Type 330 and Type 320



Inlet expansion instead of reducers at the SV-side
→ Clear dimensions and defined pressure loss coefficients

Inlet sided combination. One Change-over Valve two safety valves.

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Installation

- Change-over Valve at the inlet of the safety valves
- Safety valves will discharge into the atmosphere

Selection

- Change-over Valve selection under consideration of
 - the inlet pressure loss (max. 3%)
 - the required size suitable for the selected safety valve and the piping side



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Smart coupling for lockable combination. The most economical solution.

1. Objectives | 2. Challenges | 3. Spare Relief Valve Installations | 4. LESER COV | 5. Pressure loss | 6. Combinations | 7. Features | 8. Options & Approvals | 9. Customer benefits

Installation

- One Change-over Valve at the inlet of the safety valves
- One Change-over Valve at the outlet of the safety valves
- Safety valves will discharge into one blowdown system

New

- Combination of two Change-over Valves in different sizes and pressure ratings possible (corresponding to the SV inlet and outlet)
- Coupling of the two CoV with a chain to ensure aligned switch-over (avoid blocking of both sides at the same time)
- Compensation of disc travels by chain wheels

Selection

Change-over Valves selection under consideration of

- Inlet pressure loss (max. 3% for inlet CoV)
- Required size on the piping side

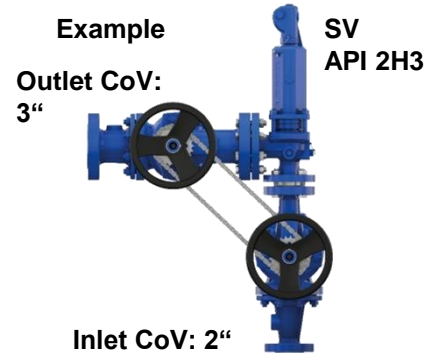


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- Optimized combination of SV and CoV with integral compensation of
 - Standardized flange distances through different sets of elbows
 - Travel distance of the disc
- Smart coupling of CoV with different sizes
- Straight coupling without additional piping or reducers
- Easy and reliable sizing for each version

LESER Change-over Valve. Main features.

1. Objectives | 2. Challenges | 3. Spare Relief Valve Installations | 4. LESER COV | 5. Pressure loss | 6. Combinations | 7. **Features** | 8. Options & Approvals | 9. Customer benefits

	Metric units	US units
Size	DN 25 ... DN 400	NPS 1" ... 16"
Sizes from autumn 2017	DN 125 ... DN 400	NPS 5" ... 16"
Pressure loss coefficient ζ	Min. 0.15	Min. 0.15
Flow coefficient K_v / C_v for DN25/1" – DN100/4"	33 ... 7672 m ³ /h	38 ... 8870 US-G.P.M
Pressure range	PN 10 ... PN 250	Class 150 ... Class 1500
Temperature range	-273 ... +450 °C	-459 ... +842°F
Materials	WCB/WCC/1.0619 LCB/LCC/WCB/WCC/1.0619 CF8M/1.4408 Further on request	WCB/WCC/1.0619 LCB/LCC/WCB/WCC/1.0619 CF8M/1.4408 Further on request



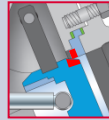
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Options.

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Gasket & gland packing TA-Luft compliant



Stellited seat and disc surfaces



Needle valve / Pressure relief valves



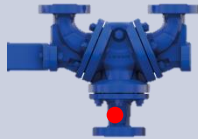
Pressure balance



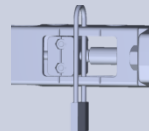
Flushing and manometer connection



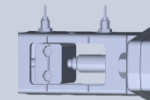
Drain with plug screw



Remote sensing for POSV



Proximity switch as position indicator



Adjustment guard



Corrosion protection systems



Lockable combination
handwheel, chain wheel and chain

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Approvals.

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Worldwide approvals for standardized design (Change-over Valves do not require ASME and TS approval)

Europe	Pressure Equipment Directive PED 2014/68/EU Modul B and D*
Germany	AD 2000-Merkblatt A4
Eurasian Custom Union	EAC TR-CU 010/2011 and 032/2013



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LESER Change-over Valves. Your Benefits.

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EASY AND FAIL-SAFE OPERATION

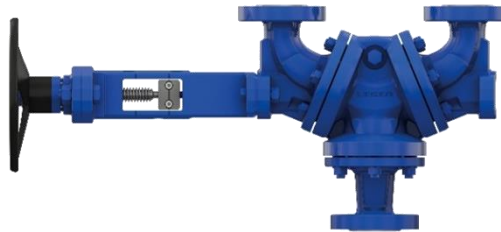
- By turning the hand wheel, the disc moves from one site to another on a circular path
- A complete closure of both sides is impossible, ensuring 100% plant protection by one safety valve

SMART COUPLING

- Standardized solution for lockable combination of Change-over Valves with different sizes and pressure ratings resulting
- Clear dimensions and precise pressure loss coefficients

EASY AND EFFICIENT PLANT PLANNING

- Standardized solution
- → dimension of each individual solution is precisely predictable



PRECISE CALCULATIONS

- LESER's new Change-over Valve has a clearly defined pressure loss coefficient for each configuration
- Reliable and precise calculation of the inlet pressure loss.

PERFECT SOLUTION FOR VARIOUS REQUIREMENTS

- Both Types with improved flow path that minimizes the inlet pressure loss
- Type 330 Compact for pressure loss requirements in basic applications; Type 320 Flow for more demanding requirements
- Inlet nozzle can easily be adapted to our customers' needs.

FAST AVAILABILITY

- Delivery of Change-over Valves at the same time as our safety valves.
- Complete, optimized combination from one supplier

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Best Availability – LESER Change-over Valves
Thank you for your attention.



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