

BROCHURE

Change-over to Availability

LESER's new Change-over Valve – Your economic solution for ensuring safe and efficient 24/7 plant availability.



LESER

The-Safety-Valve.com

A unique solution to ensure process uptime

It's all about availability. LESER's goal has always been safe, continuous plant operation for our customers, especially when it comes to safety valves. They are important safeguards against loss of life, damage to property and harm to the environment - and as such, they are indispensable in today's industry. But to ensure their proper function, they need to be inspected and maintained regularly. During planned or unplanned safety valve maintenance, processes protected by a single safety device require a complete shut-down. This is often costly, especially when dealing with critical media or important plant processes that require continuous uptime. For example, in a refinery with an annual revenue of €2 billion, an unplanned shutdown of five days could lead to an estimated €27 million loss in revenue.

Spare relief valve installations ensure uptime

Spare relief valve installations are designed to ensure process uptime. They enable switching between two installed safety valves, allowing one safety valve to operate while the other is serviced. The result is an uninterrupted process coupled with 24/7 plant safety and availability. However, their design and associated piping must ensure stable function of the safety valve, with a maximum permissible inlet pressure drop of 3% of the safety valve's set pressure.

Plenty of today's spare relief valve installations in the industry are designed with extensive and complex piping and components. This makes the pressure drop calculation difficult, sometimes even impossible, posing a potential threat to efficient and safe plant operation. In addition, some of those installations do not guarantee fail-safe operation at all times, so thorough training of personnel is always required.

A new solution for plant availability

As experts in safety valves, meeting these challenges is our daily business. We rely on keen engineering expertise and continuous feedback from customers all around the world, and we always keep an eye on the market challenges faced by our customers. Therefore, we are able to proactively develop and improve our portfolio of safety valves and Change-over Valves that contribute significantly to safe and efficient plant operation.

Now, there is a single solution to all of these challenges for spare relief valve installations: LESER's new Change-over Valve. It permits fail-safe changeovers with minimum piping via a new, patented design. Its robust, flow-optimised construction facilitates easy operation and process security. It's the result of LESER's latest know-how in design, production and testing.



Years of experience with best-in-class safety valves

This new Change-over Valve is a product of our extensive experience and 100% focus on safety valves, which made LESER one of the industry's top companies today - the biggest producer in Europe and a world market leader. Each of our solutions is characterised by a durable design and a tight finish, both decisive factors in ensuring reliable

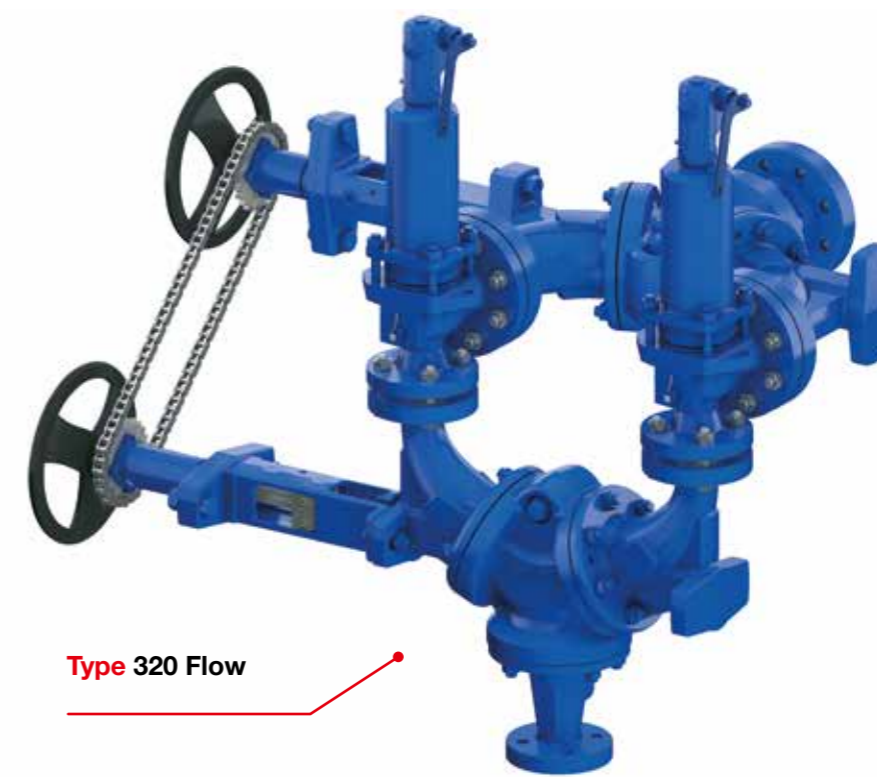
valve function. LESER products regularly undergo inspections in our advanced TÜV- and ASME-certified test lab to fulfill our own high quality demands.

Our portfolio of high-end products is accompanied by a range of services around the safety valve, such as first-hand consultation and comprehensive technical support.

With our high stock availability of raw material and deep vertical integration, we ensure best delivery times available in the market. In addition, with our web services such as order status and certificates, our customers will save time in every aspect.



Inlet sided combination



Type 320 Flow

Type 330 Compact

Lockable combination of a smaller and bigger-sized Change-over Valve

Our contribution to your safe and efficient plant operation

Inspired by extensive experience with our Change-over Valve Type 310, we developed a new Change-over Valve series with a state-of-the-art design. Our aim is to ensure continuous and safe plant operation for our customers by offering a complete, optimised combination of safety valves and Change-over Valves. LESER's expertise in stable safety valve function, combined with our commitment to high quality and reliability led to this new and innovative Change-over Valve.

The best of two worlds: unique product for various applications

One remarkable aspect of our new Change-over Valve is its flexibility. Its adaptable design and availability in a full range of sizes and pressure ratings make it the best solution for a high variety of plant conditions. The range of industries includes chemical and petrochemical as well as oil and gas or technical gas processing.

Within these industries, our Change-over Valve perfectly adapts to processes and applications such as:

- Refinery processes
- Refrigeration plants
- CO2-cooling
- Tank storage
- And many more

In all applications, our customers will benefit from the unique functional principle of LESER's new Change-over Valve. It combines the advantages of the flow-optimised design of the rotor-type Change-over Valve with the easy operation and durable design of the shuttle-type Change-over Valve. With our worldwide unique design, our customers benefit from the best of two worlds: with the disc moving on a circular path, we ensure easy, fail-safe operation with minimal pressure drop. The combinations of LESER Change-over Valves and LESER Safety Valves are optimised and fully tested.

Type 330 Compact and Type 320 Flow: Best fit for your pressure drop requirements

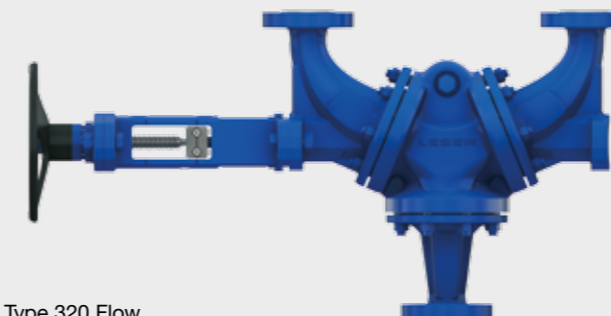
When designing our new Change-over Valve, we considered a wide variety of application requirements. As a result, we developed two different types to ensure an optimal solution for every individual case. Our Type 330 Compact fulfills the pressure drop requirements for basic applications, while Type 320 Flow is specifically designed for more demanding requirements. The latter is the best choice when working with additional piping or in combination with high-capacity safety valves.

Smart coupling for lockable combination: The most economical solution

With our flexible and optimised lockable combination, both Change-over Valve Types 320 and 330 can be combined in order to meet high pressure drop requirements at the inlet and lower pressure drop requirements at the outlet of the safety valve. The unique features of our smart coupling, including standardised flange distances through different sets of elbows, make this combination of smaller and bigger-sized Change-over Valves possible; also with different pressure ratings if required. No additional reducers, weldings or pipings are needed.

Due to this standardised solution, we offer clear dimensions for each combination, making planning processes more comfortable. Our smart coupling compensates the different travel distances of the discs. Thanks to this, the discs of two different-sized Change-over Valves reach their seats in one aligned movement.

We offer our customers the most economical solution having our smart coupling of lockable combinations.



Type 320 Flow

Easy and fail-safe changeover

By turning the hand wheel, the disc moves from one site to another on a circular path. As a result this, a complete closure of both sides at the same time is impossible, ensuring 100% plant protection by one safety valve.

Perfect solution for various requirements

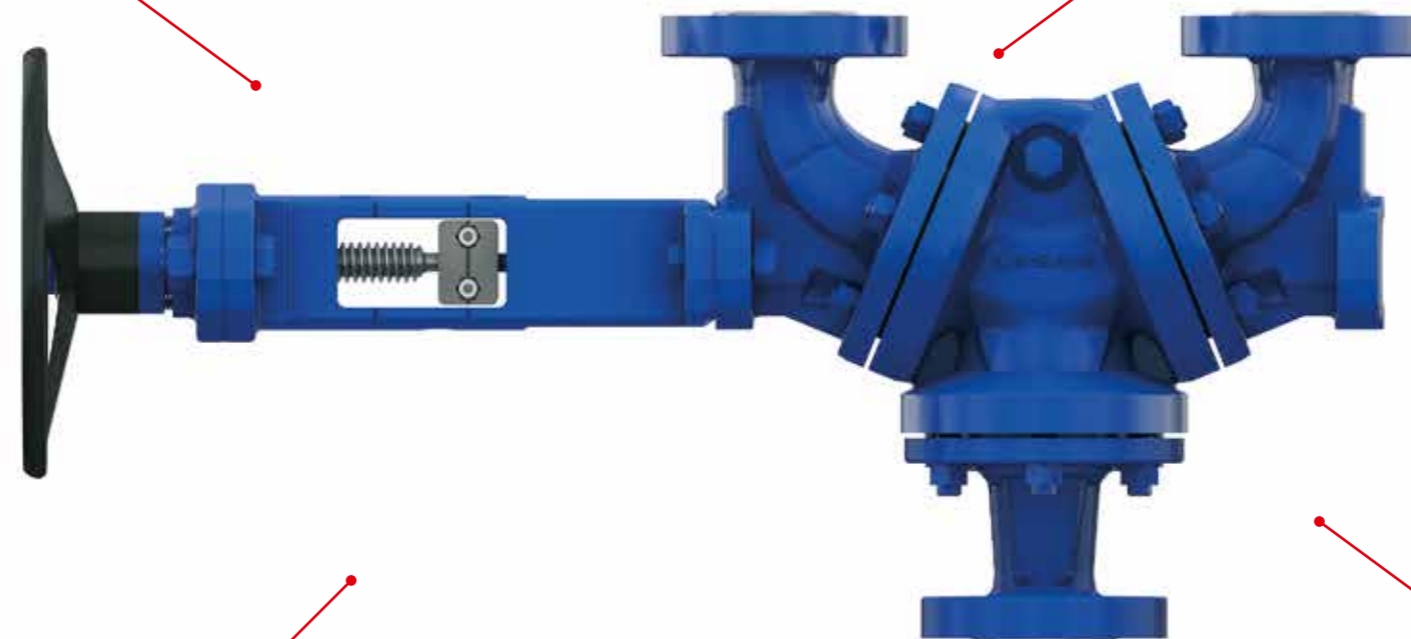
To suit a wide variety of application requirements, our new Change-over Valve is available in two types. Both have an improved flow path that minimises the inlet pressure drop. Type 330 Compact is adapted to pressure drop requirements in basic applications. On the contrary Type 320 Flow fulfills more demanding requirements, for example when additional piping or high capacity safety valves are needed. In addition, the size of the plant piping on the respective system is no challenge for LESER's Change-over Valve: its inlet nozzle can easily be adapted to our customers' needs.

Fast availability

In line with our reputation for fast and convenient deliveries, we were able to reduce our distribution times for Change-over Valves significantly. By working with high stock levels and individual supply chains, we deliver our Change-over Valves at the same time as our safety valves. As such, our customers receive a complete, optimised combination from one supplier. Our expert consulting and web services help to save even more time.

Technical Details: An Overview

	Metric units	US units
Size	DN 25 ... DN 100	NPS 1" ... 4"
Size 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"	32 ... 7018 m ³ /h	37 ... 8113 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



Optimized flow path

A reliable pressure drop calculation is crucial for stable safety valve function, which in turn is necessary for safe plant operation. With their optimised flow path, our Change-over Valves ensure a minimal pressure drop. LESER's new Change-over Valve has a clearly defined resistance coefficient for each configuration, allowing a reliable and precise calculation of the inlet pressure drop. These resistance coefficients were calculated and optimised via computational fluid dynamics (CFD) simulations, and measured and validated in tests by an independent test lab.

Easy and efficient plant planning

Due to the high flexibility of our Change-over Valve, we offer an optimal, scalable solution according to plant needs. Due to the high degree of standardisation, the dimension of each individual solution is precisely predictable. This makes planning of installations and plants easy and efficient.

Reliable operation

Their durable design keeps our Change-over Valves maintenance-free. This durability was proven in lifecycle tests with 1,000 changeovers. In addition, the Change-over Valve has been tested for various application conditions such as cold or hot media, media with particles and under high operating pressure. This tested design ensures reliable operation at all times.

Innovations combined in a revolutionary design

Planned or unplanned safety valve maintenance at crucial processes that are protected by only a single safety device requires a costly complete shutdown. To ensure continuous and safe plant operation, a spare relief valve installation is essential. LESER's answer to this challenge is our new Change-over Valve, ensuring safe 24/7 plant availability. We developed this new solution by conducting both extensive flow testing and CFD simulations. The resulting design is flow-optimised, ensuring minimal pressure drop. Our Type 320 and 330 provide the perfect solution for different pressure drop requirements. Each configuration of our Change-over Valve has a defined resistance coefficient, allowing for a reliable and precise calculation of the inlet pressure drop.

Our new product is easy to operate, permanently securing the safety of the plant in combination with our safety valves. The durable design ensures that the new Change-over Valves are maintenance-free, proven in lifecycle tests with 1,000 changeovers. In addition, LESER's unique ability to combine bigger and smaller-sized Change-over Valves

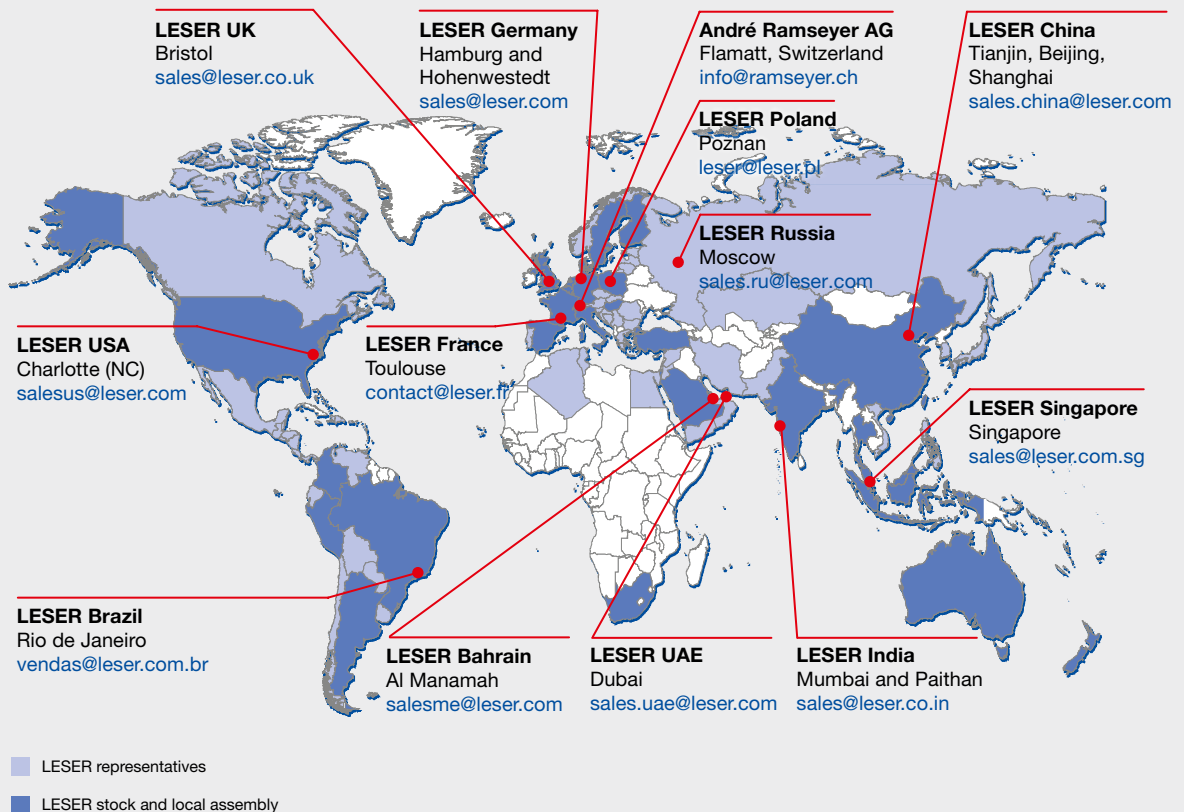
without the need for any reducers, weldings or pipings, offers the most economical solution. We provide our customers with precise dimensions for the whole combination, making planning processes easy and efficient. Our customers benefit from a complete, optimised combination provided by one supplier with fast availability. LESER's Change-over Valves, combined with our safety valves, are the most economical solution for safe and efficient plant availability – 24 hours a day, 7 days a week.

Your benefits at a glance:

- ✓ Fast availability
- ✓ Safe operation 24/7
- ✓ Most economical solution
- ✓ Easy planning and selection
- ✓ Complete, optimised combination from one supplier

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 one of the leading companies worldwide. LESER – The Safety Valve Company.



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Brochure Change-over Valve / Edition March 2017

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