TLV THE STEAM SPECIALIST.

System Solutions

Efficient energy use, effective flash steam utilisation, and tailor-made customer solutions

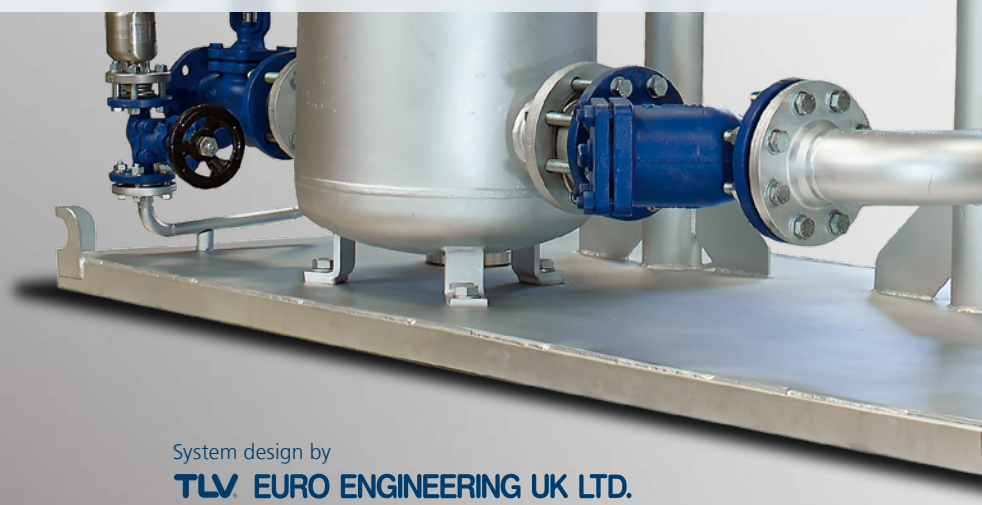
- Condensate drainage
- Flash steam usage
- Heating systems
- Special applications

TLV

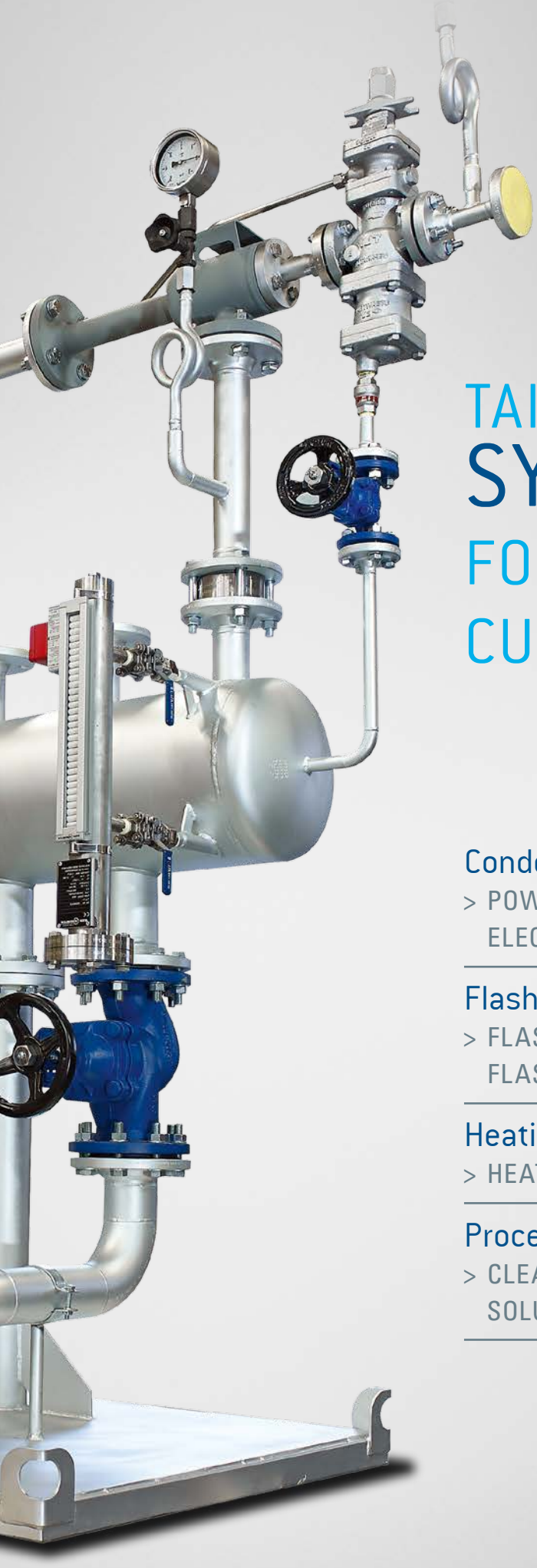
"The pursuit of quality and constant innovation are the basis for long-term success."

The creation of OPTIMISED yet simple SOLUTIONS TO PROBLEMS in the field of PROCESS STEAM CONTROL and CONDENSATE TECHNOLOGY is the primary focus of the company.

- Refineries & Petrochemical industry
- Energy-generation
- Chemical
- Paper & Cardboard
- Laundry
- Beverage
- Plastic
- Rubber
- Pharmaceuticals
- Cosmetics
- Food
- Brewery



System design by
TLV EURO ENGINEERING UK LTD.



TAILOR-MADE SYSTEM SOLUTIONS FOCUSING ON THE CUSTOMER'S NEEDS.

CONDENSATE DRAINAGE

RECOVERY AND DRAINAGE OF CONDENSATE UNDER ALL OPERATIONAL CONDITIONS, INCLUDING STALL. IDEAL CONDENSATE HANDLING.

Complete systems for condensate drainage The reliable delivery of condensate from a plant and production facility back to the boiler house or to a corresponding assembly point is a critical task in the industry. TLV has developed complete range of solutions for the return of condensate for each application. In addition to traditional electric return systems, TLV offers pumping systems using steam, compressed air or inert gas as a motive fluid.

These compact condensate lifting stations deliver the condensate without any need for electricity and are cavitation-free over large distances. This is the optimal solution for space-saving and safe installation in hazardous areas. For the optimal energy efficiency of a steam system, TLV offers closed system applications feeding hot condensate with high energy content directly back into the boiler feed water tank. This solution provides, with minimal size and at the lowest feed height, cavitation-free condensate drainage in high volumes.

PRESSURES
up to 21 bar

TEMPERATURES
up to 220° C

FLOW RATE
up to 9 t/h

APPLICATIONS
Condensate drainage from all kind of reservoirs, receivers, and exchangers

GT- AND GP-SERIES - ENTIRELY STALL-FREE CONDENSATE REMOVAL

Pumping traps will also drain steam applications under changing pressure conditions, even in the case of vacuum formation in the vapour space. The flooding of heat exchangers, water hammer, corrosion problems and temperature fluctuations are thus avoided. Connection-ready skids are manufactured according to customer requirements to remove the condensate in the most effective way. All this combines to increase efficiency and safety in plants.

- Constructed for easy installation
- Ready-to-install skids as comprehensive solution
- Large conveying capacities
- Low feed height
- No cavitation
- No electrics
- Automatic on / off circuits
- Easy maintenance

CONDENSATE PUMP CP-N

This condensate pump is specially designed to pump condensate with a high temperature directly into the boiler. Through this reuse of hot condensate, the fuel consumption to generate steam can be significantly reduced, often by 10–15%.
The system uses a side-channel pump combined with an ejector.
The jet pump ensures that even with minimum filling head (min. 1 m), hot condensate is pumped without causing cavitation.
No high-pressure condensate tank with level control is required in front of the CP-N. Connecting directly to the condensate line is sufficient.

Typical applications

- Closed high-pressure condensate systems
- Direct feeding into boilers without condensate tank

ELECTRICAL CONDENSATE RECOVERY SYSTEM - EPS

Electrical condensate recovery systems by TLV cover a wide range of condensate loads. In addition to standard solutions, bespoke systems are designed to take in to account individual specific requirements with respect to condensate tank size, connections and pump capacities. Dual pumps give a large safety margin, or a duty/standby cabability, and the selection of high quality components guarantees a long service life. Intuitive and versatile control to cover all applications.

Typical applications

- Condensate return in open system
- Return at high back pressures

FLASH STEAM USAGE

OPTIMUM ENERGY UTILISATION IS AN INTEGRAL PART OF ANY PRODUCTION PROCESS. TLV HAS DEVELOPED SYSTEMS FOR THE RECOVERY OF THE ENERGY FROM YOUR FLASH STEAM.

Optimum energy utilisation In the wake of higher energy costs, many plant operators are striving to recover maximum energy from the condensate and its flash steam. Despite a more careful technical design, reusing flash steam becomes more and more important. Eliminating the visible "blowdown vent on the roof" equals the best thermal energy usage by condensate.
Use the high energy content of flash steam, at its formation and optimise your production.
TLV flash vessels, open air heat exchangers and steam compressors offer a variety of solutions for your energy optimisation.

PRESSURES
up to 40 bar

TEMPERATURES
up to 220°C

FLOW RATE
up to 10 t/h

APPLICATIONS
Flash steam from open condensate systems

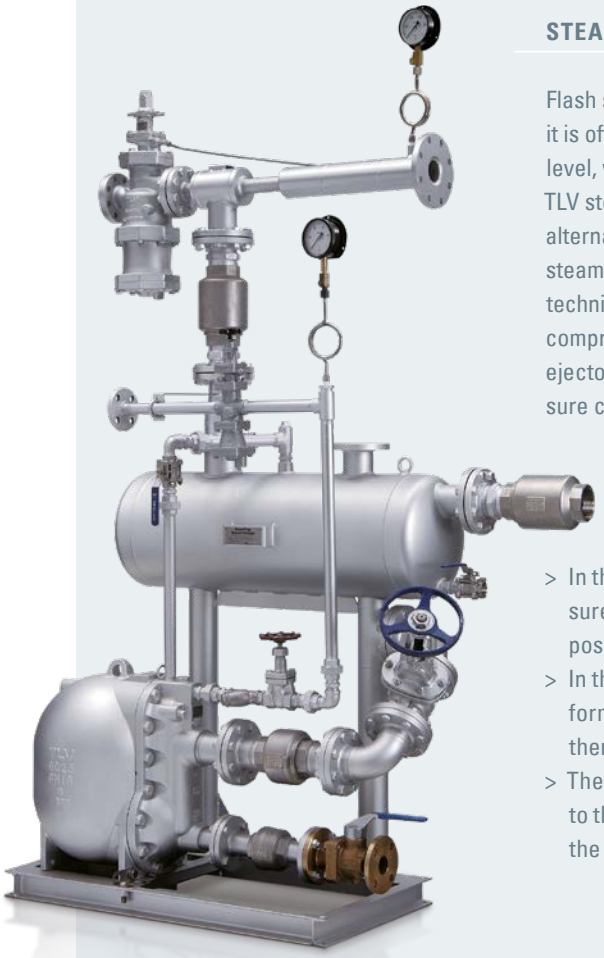
FLASH VESSEL FV

In the condensate system, a simple and efficient method to make use of the resulting flash steam is the use of a flash vessel. Inside the flash vessel, the condensate and the emergent flash steam have enough space to separate from each other. The steam rising to the top can be fed into a steam line for a technical application, therefore reducing the steam generation burden on the boiler. Additional savings are obtained through reduced expenditure on water purification. The successful application of flash vessel systems depends on the size of the flash vessel, the stability of the pressure control, and the effective draining of condensate.

- A good coordination of these elements avoids problems in the system.
- TLV provides complete flash recovery systems, competently designed flash vessel accompanied by the necessary valves to control and safeguard the condensate line and the entire drainage system.

Typical applications

- Systems with several pressure levels
- Further use of flash steam by condensate systems



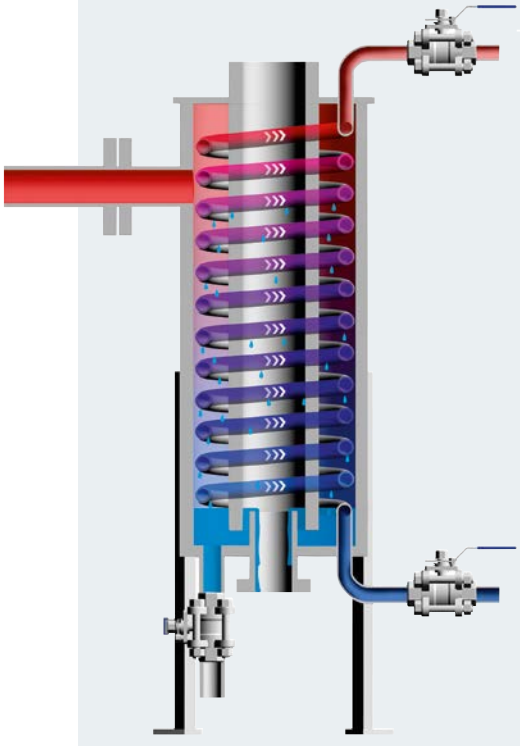
STEAM COMPRESSOR SC

Flash steam occurs in all steam plants, but it is often neglected due to its low pressure level, which is typically too low for reuse. The TLV steam compressor offers an interesting alternative. This non-usable low-pressure steam will be compressed until it reaches a technically usable pressure level. The steam compressor unit consists of a highly efficient ejector and a pressure control valve. Pressure control can be achieved with a high-precision, self-acting pressure reducing valve with a built-in separator and trap without auxiliary power or an electro-pneumatic control valve.

> In the ejector, motive steam at high pressure and aspirated steam at low pressure, possibly flash steam, are mixed.
> In the diffuser, a medium pressure level is formed. The medium pressure steam is then sent forward for reuse.
> The direct reinjection of the flash steam to the steam system significantly reduces the steam production in the boiler.

Typical applications

> Reuse of excess low pressure steam of power generation.
> Reuse of excess process steam with low pressure instead of a blowdown.
> Avoid overheated boiler feed water, energy recovery by flash steam.



FLASH STEAM CONDENSER SR

The TLV flash steam condenser SR allows the energy usage of flash steam at atmospheric conditions. It consists of a specially designed spiral pipe heat exchanger in a compact design.
The SR can also be installed next to the condensate tank.

> The formation of a controlled hydraulic seal ensures that no back pressure can be formed upstream.
> The water seal breaks down at high pressure; excess flash steam is discharged via the vent line.
> Efficient energy recovery in confined space by heat transfer.

Typical applications

> Energy recovery from flash steam
> Avoid back pressure at flash steam systems
> Energy streams of degassers

HEATING SYSTEMS

ROBUST, COMPACT HEAT EXCHANGERS IN STAINLESS STEEL, READY FOR CONNECTION WITH ALL NECESSARY COMPONENTS FOR STEAM SIDE REGULATION AND CONDENSATE RETURN.

Heat exchanger stations by TLV These skids are designed in direct consultation with the planner or operator of steam plants. The aim is to supply the heat exchanger with the highest quality steam for enhanced efficiency and high performance control, as well as to discharge the condensate formed, regardless of pressure fluctuations. This is realized in a compact station ready for connection, which can be integrated into the system quickly and easily.

APPLICATIONS
Hot water
Heaters
Process water
Process media
Temperature control

HEAT PACK AND SteamAqua SQ

Heat exchanger stations are a common requirement in manufacturing and production. The transfer of heat by steam is achieved in a safe environment. This requires optimal balance of temperature control and timely discharge of the condensate. The high heat transfer in a suitably-sized heat exchanger and the ideal selection of a corresponding condensate recovery pump result in a powerful system that efficiently heats up your product.
Water hammer and temperature fluctuations are eliminated with either the space-saving HeatPack heat exchanger or the complete SteamAqua SQ station.

Typical applications
> Heating applications
> Process water

SteamAqua

VACUUM STEAM HEATING: LOW TEMPERATURE HEATING WITH STEAM

Do not miss the benefits of steam heating at temperatures below 100 °C. Heating up temperature sensitive products below 100 °C is often done by a secondary heat transfer water cycle which is heated up by steam in a primary energy transfer.
Due to the slowness of such a hot water system, the temperature control tends to overshoot. The adjustment of temperatures in flow and return pipe lines in such complex systems often sacrifices product quality as a result.
Usage of low pressure or vacuum steam, however, allows steam to become an ideal heat transfer agent below 100 °C. Steam's heat transfer coefficient is three times higher than water. It ensures rapid, optimal heating, and isothermal heating over the entire surface.
The patented TLV Vacuumizer system consists of an ejector which adjusts the vacuum and discharges the condensate. Precise pressure and temperature control and effective steam cooling ensure a stable supply of saturated vacuum steam.
The Vacuumizer system offers optimum product temperature regulation, making it the ideal choice for the safe and rapid heating of temperature-sensitive products.
In addition, this system also allows reaching temperatures above 100 °C and therefore offers the necessary flexibility in production.
The Vacuumizer provides a heating system meeting the highest standards.

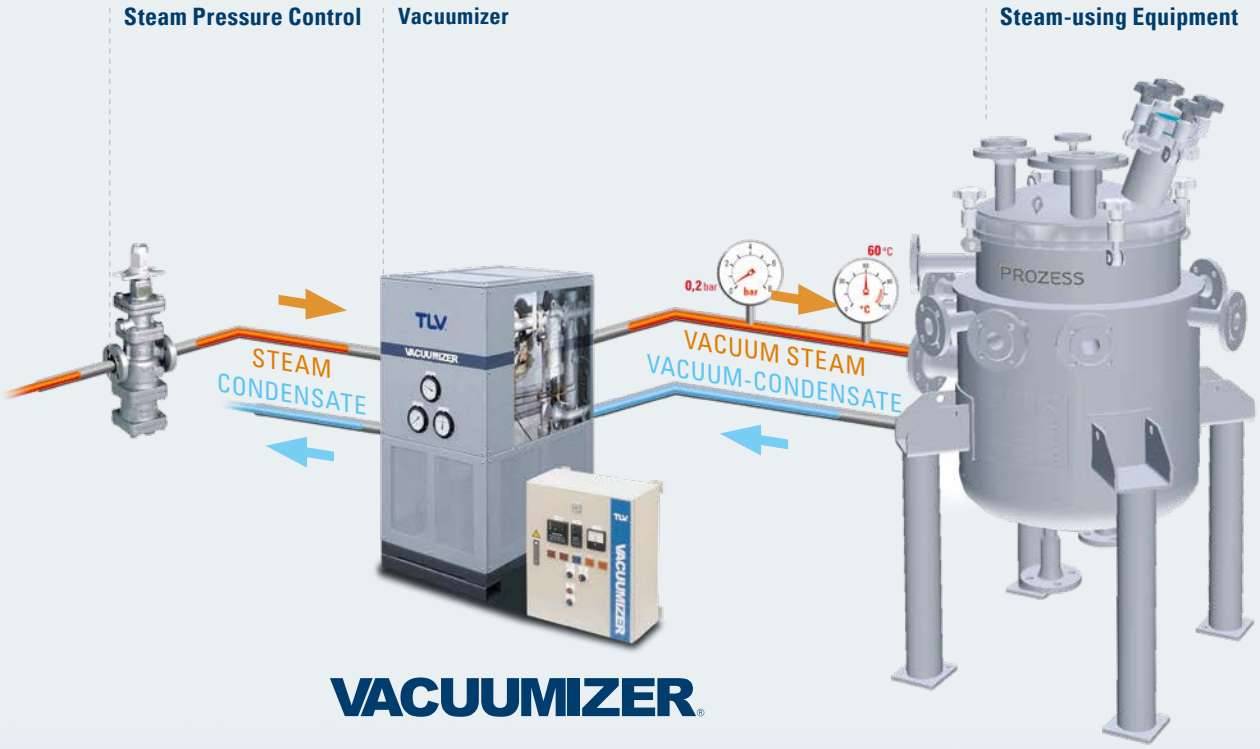
> There will be no temperature gradient on the heating surface. This leads to improved product quality.
> The heating time can be reduced by 25 % or more.
> Precise regulation of the vacuum steam pressure enables a temperature accuracy of ± 1 °C.

Pressure
> 0.05 to 1 bar

Temperatures
> 30 to 100 °C

Steam flow rate
> max. 1000 kg/h

Typical applications
> Heating at 30 – 100 °C
> Control of temperature-sensitive processes with an accuracy of ± 1 °C
> Increase productivity
> Fast heating rates
> Space-saving heating system



VACUUMIZER®

PROCESS SOLUTIONS FOR SPECIAL APPLICATIONS

PROCESSES WITH SPECIAL DEMANDS FOR BOTH STEAM SUPPLY AND CONDENSATE RETURN REQUIRE SPECIAL SOLUTIONS.

TLV offers compelling solutions We develop and implement specific solutions in close cooperation with our customers. Special steam filters and clean steam generators supply your process with the best possible steam quality. Processes with extreme pressure and temperature requirements are planned and implemented, benefiting from a thorough exchange of information. We gladly accept challenges for single steam applications as well as those covering the entire pressure and condensate network.

APPLICATIONS
> Clean steam, pure steam
> Extreme pressures and temperatures
> Special processes

Typical applications
> Pure steam processes in the food or pharmaceutical industries
> Sterilising equipment in hospitals
> Production of high purity products

CLEAN STEAM GENERATOR

Clean steam generators are used to produce pure or clean steam free of any harmful substances.
Usually saturated steam is chosen, but sometimes specially treated hot water is used for heating a steam generator.
Applications of pure or clean steam are found in the food and the cosmetic production industries, for sterilisation or direct steam input, where the demands on steam quality are very high.

> The TLV steam generator features a crevice-free design with reliable production and output of sterile steam.
> Minimum maintenance with maximum availability.
> Pure steam generators are constructed according to the Good Manufacturing Practices (GMP), satisfying the highest quality standards and requirements of your production.

BESPOKE CUSTOMER SOLUTIONS

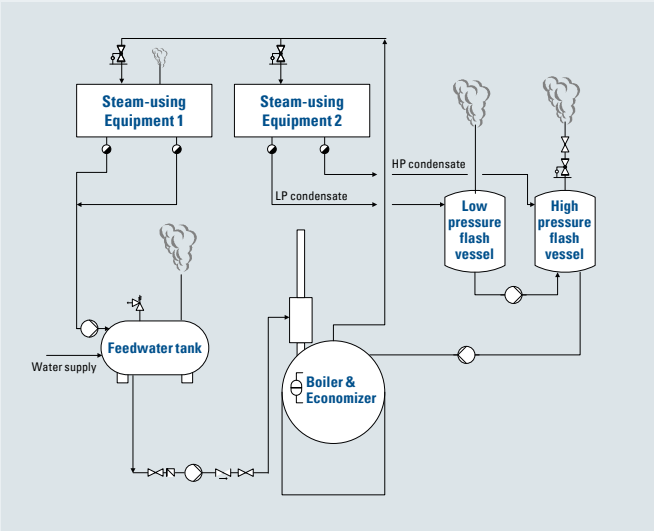
The challenges of steam and condensate systems are vast.
Challenging processes can cause several demands on pressure and temperature control. Designing, planning, construction, and assembly are all conducted by TLV in close consultation with the customer. TLV's system experts are able to develop and implement a suitable solution for every technical challenge.

Typical applications

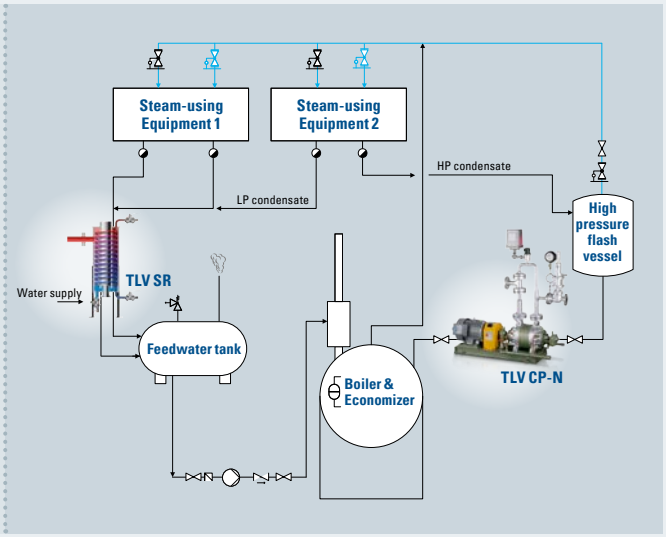
- Skids for special pressure and temperature controls
- Drainage at large condensate amounts
- Drainage at low differential pressures, even under vacuum conditions
- Supply of culinary steam using filters
- Steam drying and steam moisture measurements

PLANT OPTIMISATION

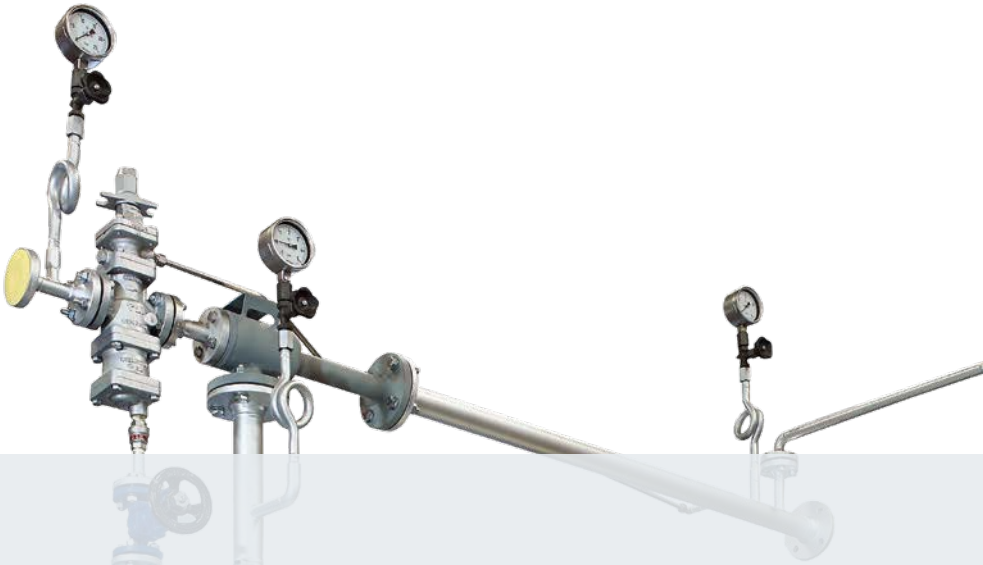
Steam plants which have grown over the years and expanded offer great potential for improvement.
The optimal integration of system solutions and individual components customized to your requirements guarantees maximum reliability while ensuring cost-optimised functionality. Intelligent load management and ease of use are core features.



Existing plant



TLV optimized plant



Learn more about how you can optimise your processes with TLV system solutions.

We consult. Personally, with knowledge.

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