

## Hot water cascade system for sterilization of liquids

The sterilization of liquids plays a large role in pharmaceutical and biotechnological production. The hot water cascade system developed by MMM Münchener Medizin Mechanik GmbH enables liquids in closed receptacles made of glass or other temperature-resistant materials (such as ampoules) to be sterilized quickly, reliably and gently.

### Process description

The advantage of the hot water cascade system lies in its very short cycle times, which are achieved through a high circulation rate and cascade density in combination with short heating up and cooling down times.

First, the chamber containing the item to be sterilized is filled to a pre-defined level (below the item being sterilized) with deionized sterilization water. This water then circulates through a steam-heated heat exchanger and cascades over the item being sterilized at a continuously rising temperature. This efficient method of transferring heat enables the item to be heated up in a quick and gentle way. In the subsequent cooling phase, the sterilization water flows through the now water-cooled heat exchanger and cools the item being sterilized down to a specific temperature. Throughout the process, temperature-controlled supporting pressure generated by sterile-filtered compressed air prevents the tightly sealed receptacle from bursting or becoming deformed.

### Suitable GEMÜ product range

#### Angle seat globe valves

- GEMÜ 554

#### Butterfly valves

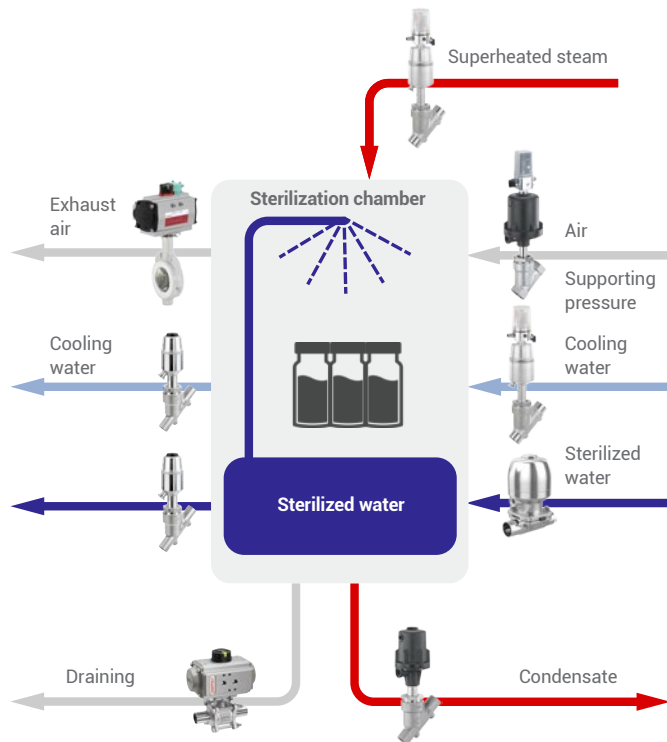
- GEMÜ 491 Edessa

### Key process data

- Working medium: Deionized sterilized water
- Temperatures: 121 °C
- Duration: 20 minutes

## Area of use of GEMÜ products

Pneumatically driven GEMÜ 554 globe valves control the filling of the sterilization chamber with water and the way in which the heat exchanger is heated by steam and cooled using water. By contrast, GEMÜ 490 butterfly valves are used in the circulation line, as these have significantly more compact installation dimensions yet very high flow rates in



comparison with pneumatically operated angle seat globe valves of the same nominal diameter. Furthermore, to meet these stringent requirements, they are fitted with highly resistant TFM™ plastics and FDA-approved silicone as a seal material.



## Why GEMÜ?

GEMÜ offers the appropriate solutions for every process step and every application, especially for supply/auxiliary processes. Offering a wide range of valve types and accessories with various properties, approvals and certificates, GEMÜ is a one-stop shop for complete valves as well as measurement and control systems. If you're searching for a highly skilled provider for your system supplier, we are the partner for you. We can also supply you with the technical expertise relating to the applied procedures.

GEMÜ manufactures and supplies a variety of tried-and-tested valve fittings that meet the highest standards of quality. The wide variety of control valves and quarter turn valves is particularly noteworthy here. As are the space-saving options of block solutions, including for complex applications, and the planning and production of entire subsystems via GEMÜ Systems. We ensure optimal support, including on-site support for end users, through a worldwide sales and service network of subsidiaries and distributors.