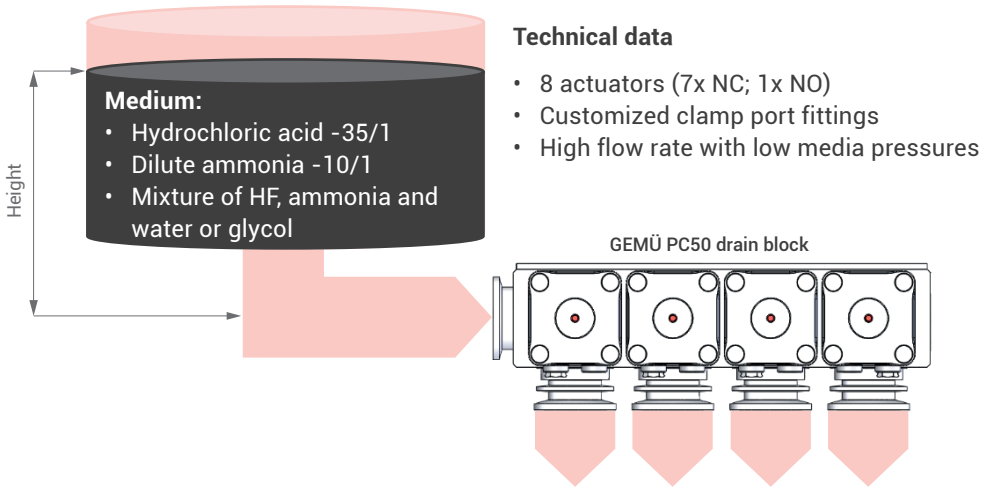
GEMÜ PC50 iComLine variant reduction thanks to the modular design

Modular design for cost-effective and safe configuration of process tools

GEMÜ particularly stands out in the field of process tools in semiconductor production thanks to customized GEMÜ PC50 iComLine valve block solutions. Simple multiple distribution blocks are primarily used in drain applications (applications where the media pressure is solely generated by gravity). They usually have a very similar structure but vary in the number of actuators, connection sizes and outlets. To enable flexible and, in particular, cost-effective work for different requirements, GEMÜ offers various options for configuring GEMÜ PC50 iComLine valve blocks using the modular design.

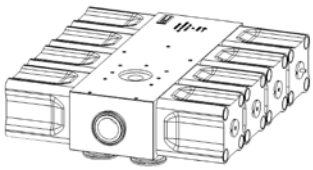
Functional principle and application requirements

GEMÜ PC50 iComLine valve block solutions with the modular design are used in etching processes, among other applications. These involve removing layers of material from a silicon disk in a number of consecutive processes to create the required structure for the wafer. In spray acid (SAT) and spray solvent (SST) tools, the valve blocks are situated underneath the etching chambers and reliably transport the chemicals used to be disposed of after use. In some cases, a different number of chemicals are used depending on the operator. To enable plant manufacturers to respond to different requirements flexibly yet cost-effectively, they use modular valve blocks so that they can define the number of outlets themselves. This process is illustrated below.



Technical data

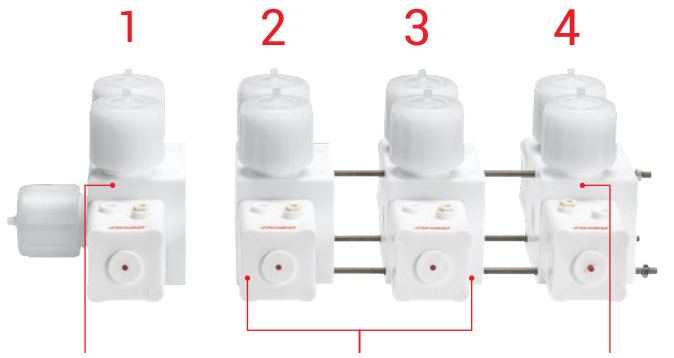
- 8 actuators (7x NC; 1x NO)
- Customized clamp port fittings
- High flow rate with low media pressures

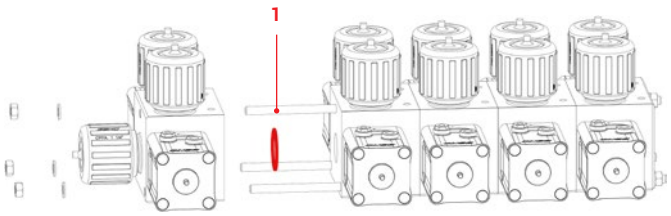


Use of the modular design in drain blocks

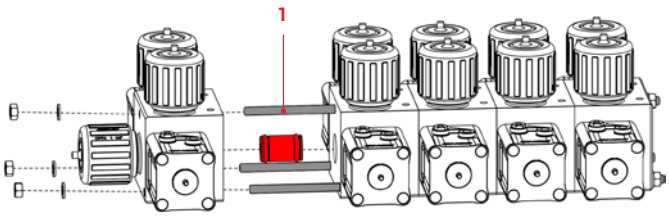
The diagram below illustrates one option for a modular valve block structure. In this example, a flexible number of valve blocks can be chosen between the start and end blocks. The valve blocks are then joined together by threaded rods and sealed using O-rings.
A variable number of valve blocks can be chosen, allowing the number of valves and spigots to be adapted to the plant. When sealing elements are used in conjunction with threaded rods, this means that the modular valve blocks can be joined together. The threaded rods are pushed through the blocks and tightened together by screwing on nuts.

To reliably ensure the seal between the block components, customers can choose from a range of sealing elements depending on pressure, temperature and medium. These seal the connections in the axial direction with almost zero deadleg. GEMÜ offers O-rings made from various different materials, double nipples with two radially sealing O-rings and self-sealing connections without O-rings for this purpose.
To meet the high requirements for purity and process reliability, GEMÜ assembles and tests the set-up valve blocks in a cleanroom.

Feature	Customer benefit	
	Choice of different connection types and sizes	Flexible choice of materials for blocks and sealing elements
	Rod length depends on the number of blocks required	Various actuator sizes available
	Cost saving because intermediate blocks can be reused	Cost saving thanks to reduced development costs



Connecting the modules using an axial O-ring seal (1).



Connecting the modules using a double nipple (1) and two radially sealing O-rings.

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