# Cleaning without residues for greater efficiency

bürkert

/ Efficient cleaning with high flow rate / In the laboratory, you analyse samples that human lives often depend on. Accurate test results are crucial in this context. After each test, your analysis device must clean the dosing needles and cuvettes without leaving any residues. The faster you clean, the more analyses can be done in an hour. The precious cleaning solution needs to be used as much as necessary but as sparingly as possible. A system solution meets your needs efficiently – cleaning sparingly, quickly and safely.

In In-Vitro Diagnostics, the cleaning of dosing needles and cuvettes constitutes a key requirement. Be it in the field of haematology, clinical chemistry or immunology: Safety and accuracy are the top priorities. At the same time, laboratories must be able to handle high sample throughputs in a short period of time in order to work economically.

Blood   Reagents   Cleaning agent

Data
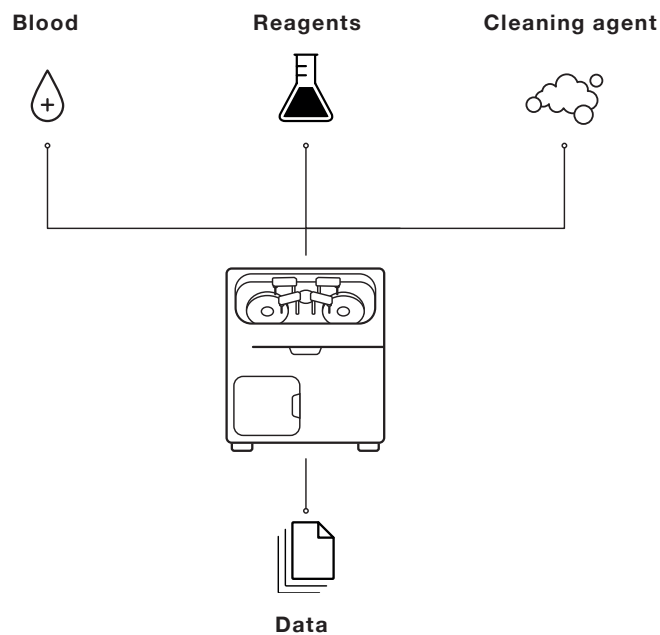
Are you looking to clean dosing needles and cuvettes without any residues left behind? Discover how you can handle this task more quickly and efficiently on the following pages.

/ Spick & span / Accurate analysis results are essential – which is why <u>cleaning without residues</u> is mandatory. Do you want to prevent impurities and cross-contamination of samples at any cost? How can you clean dosing needles and cuvettes more quickly while conserving cleaning solution?

2/2-way valve Type 0127

Pump
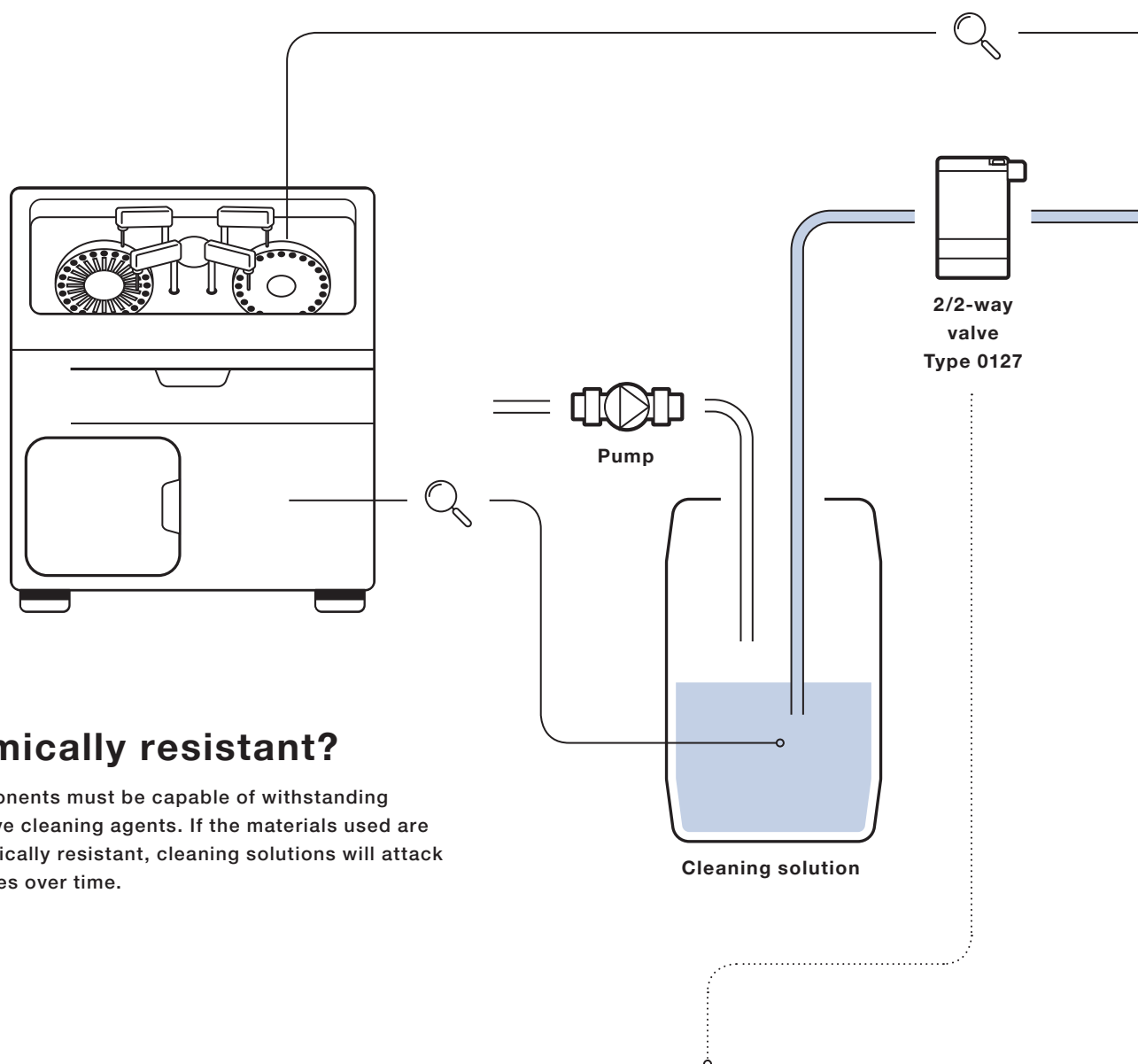
Cleaning solution

Chemically resistant?

All components must be capable of withstanding aggressive cleaning agents. If the materials used are not chemically resistant, cleaning solutions will attack your valves over time.

Fast and reliable.

Valves also need to be able to switch reliably in cycles of just milliseconds: The time window for cleaning is incredibly small and requires a minimum quantity of cleaning solution. If the specified switching time is not correct, too much or too little cleaning solution maybe dosed. This means contamination and unnecessarily high consumption of cleaning solutions.

Cleaning dosing needles inside and out

If you need to dose different reagents, the dosing needle must be cleaned after each dosing process to avoid leaving any residues. An air cushion prevents both cleaning agent and medium from entering the syringe pump, preventing its contamination. How to clean the needle inside and out.

The needle is dipped in a cleaning solution, which cleans it on the outside.

The inside of the needle is cleaned by pumping cleaning agent through the needle.

Air cushion

Needle

Syringe pump

Cleaning solution

Cleaning solution

2/2-way valve Type 0127

Waste products
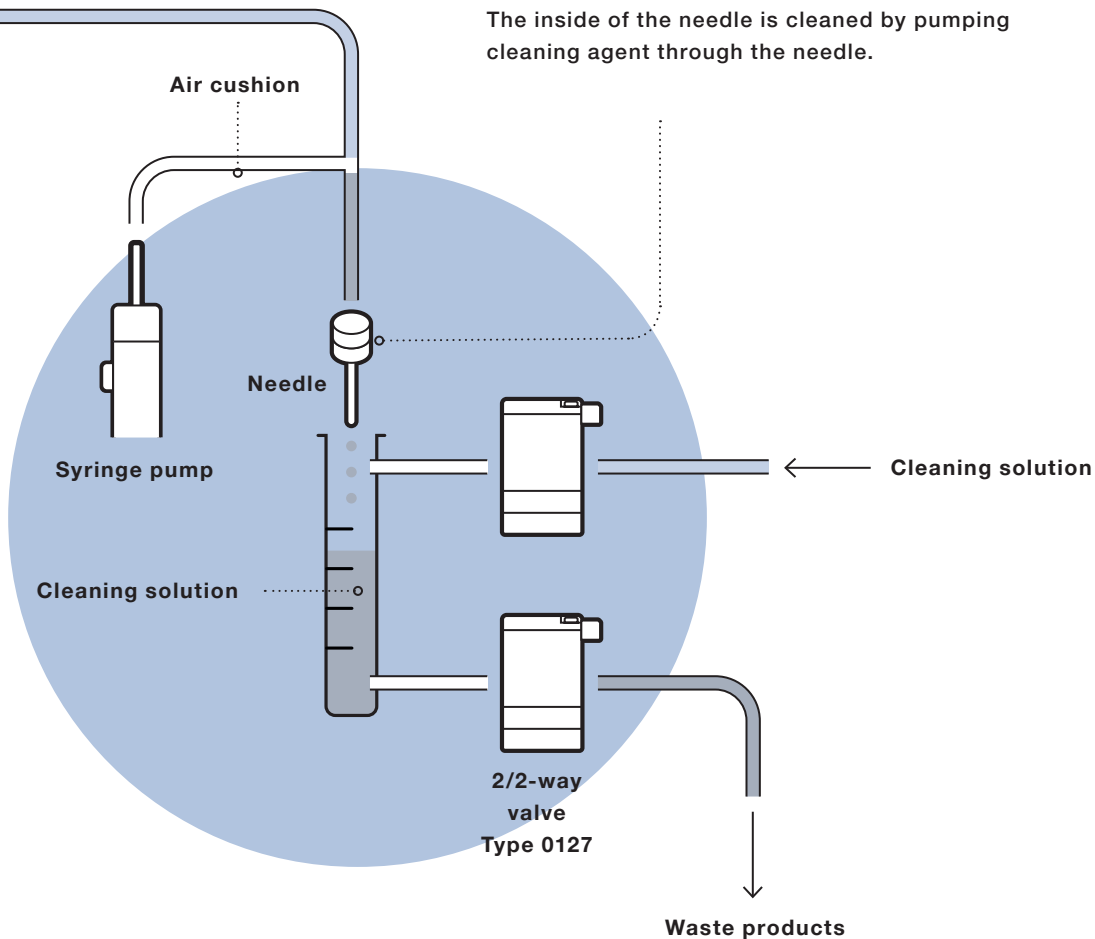
Contamination avoidance

The valve seat must withstand continuous exposure to the cleaning solution. If the valve leaks even just a little, the dosing needle will drip and potentially contaminate the entire analyser.

/ **Clean cuvette at washing station** / **Once an analysis is complete, the cuvettes must be cleaned. Attention is paid to the sparing use of media and chemicals, as these are expensive to buy and dispose of. Valves need to switch with high precision in order to precisely control fluid consumption. Tolerances are not only a safety hazard but also consume more cleaning agents if processes are imprecise.**

2/2-way dosing valve Type 6724

Waste products

Caustic soda

Cleaning agent

Deionised water
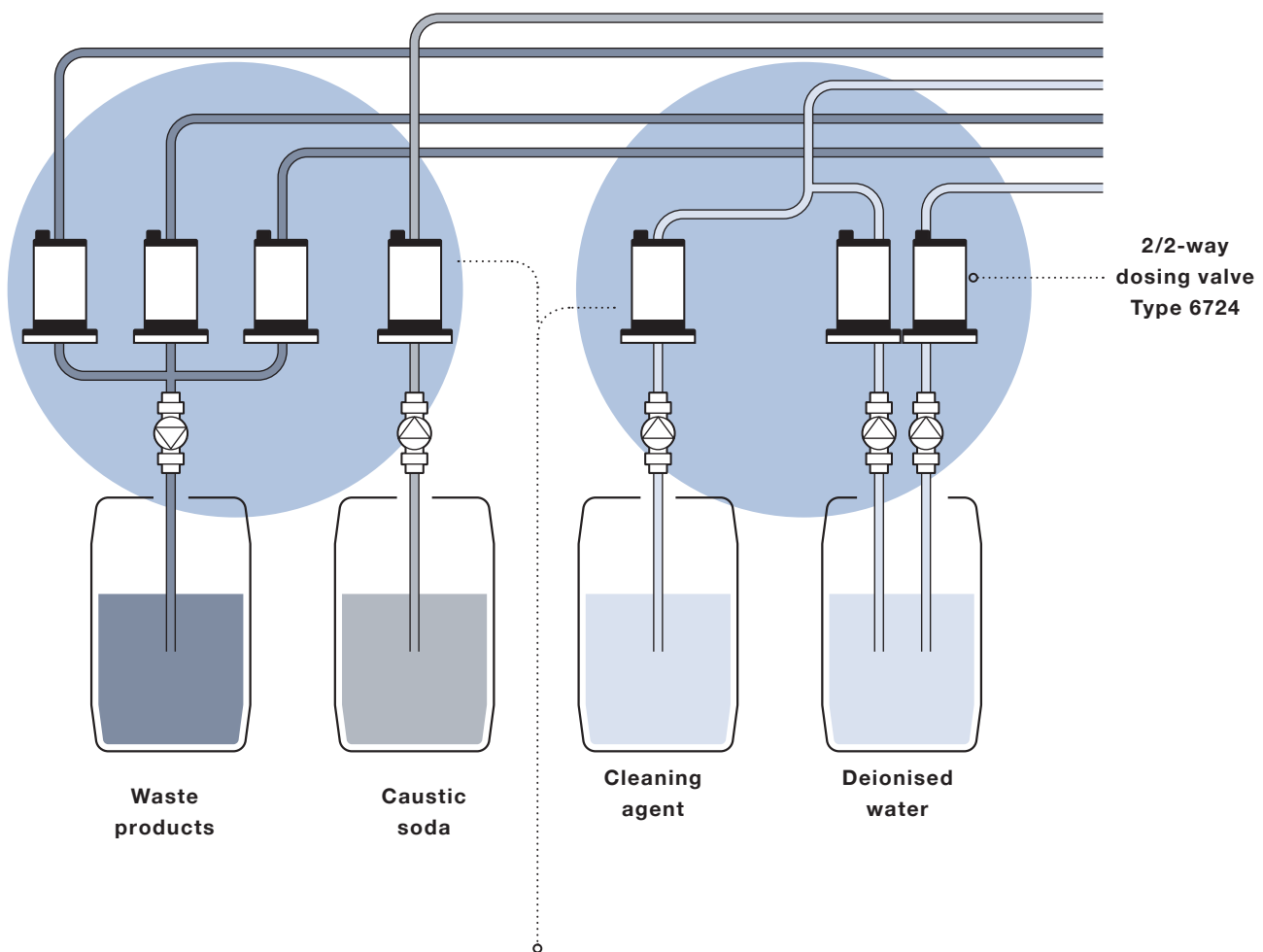
Fast cleaning

The speed of the cleaning cycle also determines how efficient your analysis device is working overall. The faster the up to 15 rinsing processes are completed, the faster you can analyse the next sample. The analysed solution is drawn by vacuum from the cuvette and disposed of.

Safe cleaning

Our valves are characterised by exceptional tightness and guarantee high flow rates for most products. We only use high-grade, chemically resistant materials such as FFKM and EPDM for seals as well as PEEK and PPS for bodies.

Economical use of reagents and cleaning fluids

Cleaning fluids and reagents are a cost factor both in terms of acquisition and disposal. Bürkert components therefore use these sparingly: The dead space in the valves is minimised on the one hand while the flow rate is high on the other. All this is achieved with very small unit sizes that require minimal space in the device.

Intelligent solutions by design

Customised solutions on a block offer the ability to shorten hoses to reduce the volume that needs to be cleaned using cleaning agents. This has an impact on the consumption of the necessary cleaning agent and the speed of cleaning.

Fast cleaning

The Bürkert solution accelerates your entire cleaning process: Thanks to their high flow coefficient, our valves dose fluids faster than conventional valves. With a higher sample throughput, you can automatically increase the efficiency of your device.

Compact design

Our compact system solutions allow you to save space in your analysis device. Despite their small design, they still impress with very high flow volumes thanks to optimised flow paths in the valves.

Long service life

We use high-grade materials and designs that are built for a long service life. This means that our components only rarely need maintenance. For you, this means that Bürkert valves contribute to the efficient use of the analysis device.

/ Fast and safe cleaning / Bürkert components always clean your analysis device without leaving any residues, faster than conventional solutions. Our valves are designed to enable high flow rates and switch with exceptional precision. This allows you to speed up your cleaning process – while maintaining the same quality of cleaning. The result: Bürkert's solution contributes to error-free test results while making your laboratory device more efficient thanks to reduced consumption of cleaning agents.

2/2-way dosing valve Type 6628
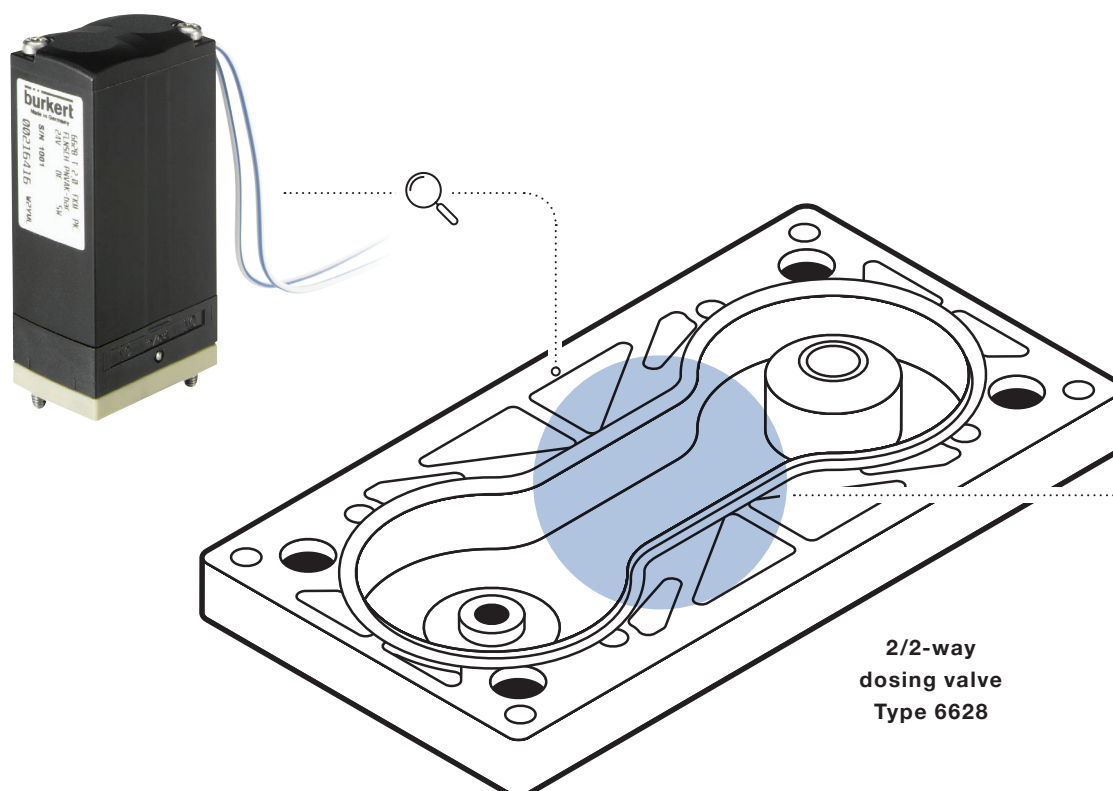
Flow coefficient (Kv value)

The Kv value is also referred to as the flow coefficient. It indicates the calculated quantity of liquid or gas that can flow through an open valve in a given period of time. The higher the flow coefficient, the more medium can be conveyed through an open valve in the same period of time. To transport gases or liquids through a valve, a certain pressure difference is required. The higher the flow coefficient, the less pressure drop is required to achieve the desired flow rate volume.

Less pressure drop means potential cost savings, as pumps and compressors can be reduced or minimised accordingly.
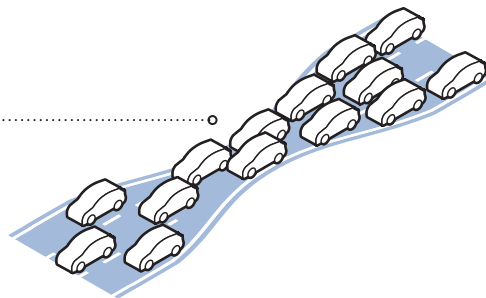
High Kv values can have a positive effect on the cost-benefit ratio by allowing the process to run quicker.
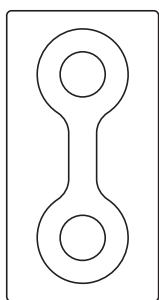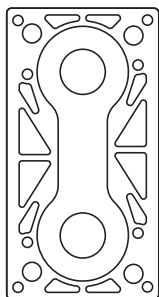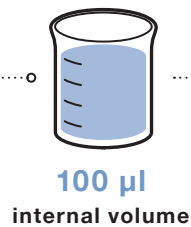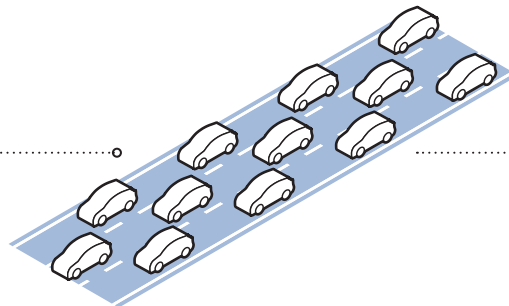
**Conventional
dosing valve**
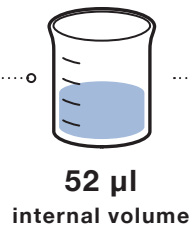
52 μl
internal volume

Poorly optimised fluid channel design can create bottlenecks, flow
turbulence and poor rinsability.

**2/2-way
dosing valve
Type 6628**

100 μl
internal volume

**Full flow ahead**
for your media

Having channels with **optimised fluidic design** eliminates dead space.
The entire fluid chamber can be rinsed out quickly without leaving any
residues.

/ Individually developed system solutions / At our Systemhaus facilities, we can put together the perfect cleaning solution for your needs. Our focus is always on your success. We optimise our components to enable you to clean faster and use less cleaning agent.
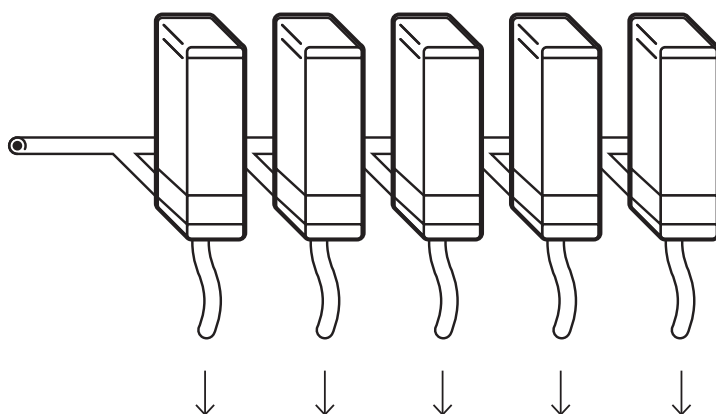
Conventional solution

In conventional solutions, you need to clean not only every needle and every valve, but also the associated hoses. Let us assume that you use 3-mm hoses with a length of 50 cm per valve. In the example shown, you need to clean an internal volume of 17.6 millilitres.
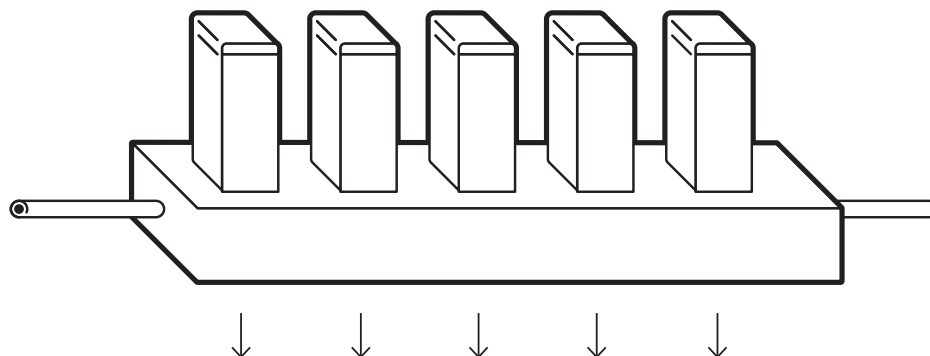
Bürkert system solution

The 5-fold standard block solution for Type 0127 from Bürkert has an internal volume of 5.2 millilitres. The substantially smaller internal volume allows cleaning agents to be used more sparingly. Fewer hoses and threaded fittings also reduce the risk of leaks.

Sample calculation

Let us assume that your analysis device manages 2,400 tests in an hour. This means that an individual cycle, including cleaning, takes 1.5 seconds. Because Bürkert valves have a higher flow coefficient, they rinse up to 20 per cent faster – managing a cycle in just 1.2 seconds instead of 1.5, for example. Calculated over the space of an hour, you can perform an additional 600 tests and cleaning cycles with Bürkert valves. **The result:** higher sample throughput and more efficiency for you.

Conventional solution

52 μl
internal volume

1.5 sec.
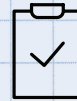per cleaning cycle

40 tests
per min.

2400 tests
per hour

Bürkert system solution

100 μl
internal volume

1.2 sec.
per cleaning cycle

50 tests
per min.

3000 tests
per hour.

600 cleaning cycles/test
more per hour

Cleaning