

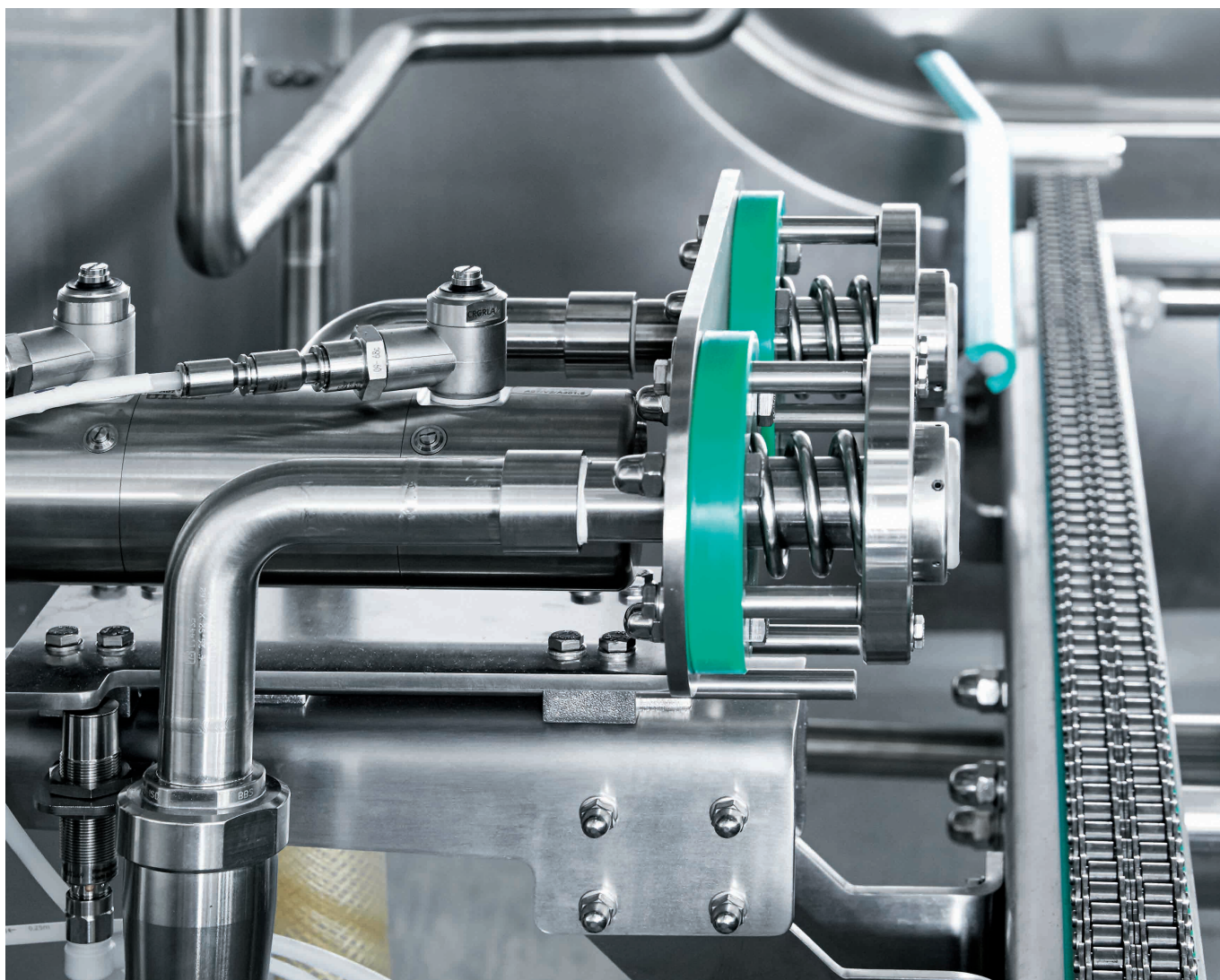
Cleaning mobile production equipment

The cleanroom

In the chemical and pharmaceutical industries, cleanliness is of the utmost importance. Production equipment can only be reused if it is cleaned. A new system from ROTAN GmbH shows how this can be done reliably. The Festo solution comprising valve terminals and stainless steel components ensures operational reliability and a long service life.



Reliable cleaning: safety cabin for opening the vessels using rubber gloves.



The vessels are locked using a special device consisting of a coupling with spring package, stainless steel cylinder CRHD and one-way flow control valve CRGRLA.

ROTAN develops complete solutions for pipeline and plant construction, tank cleaning, instrumentation and control engineering and cleaning technology. The cleaning specialist's systems are used worldwide in a wide range of industry segments, including the chemical and pharmaceutical industries and the paints and coatings industries. The new system from ROTAN cleans mobile production equipment made from stainless steel, such as barrels and containers with capacities ranging from 300 to 1,200 litres. It was designed and constructed in close cooperation with a well-known pharmaceutical company.

Reliable cleaning

The cleaning process comprises four process steps or modules: the inward transfer of the barrels and containers, the safety cabin for opening the vessel lids, the cleaning of the vessels on the inside and outside, and a buffer station for the outward transfer of the vessels.

“Corrosion-resistant components made from high-quality stainless steel increase the operational reliability and availability of our cleaning systems.”

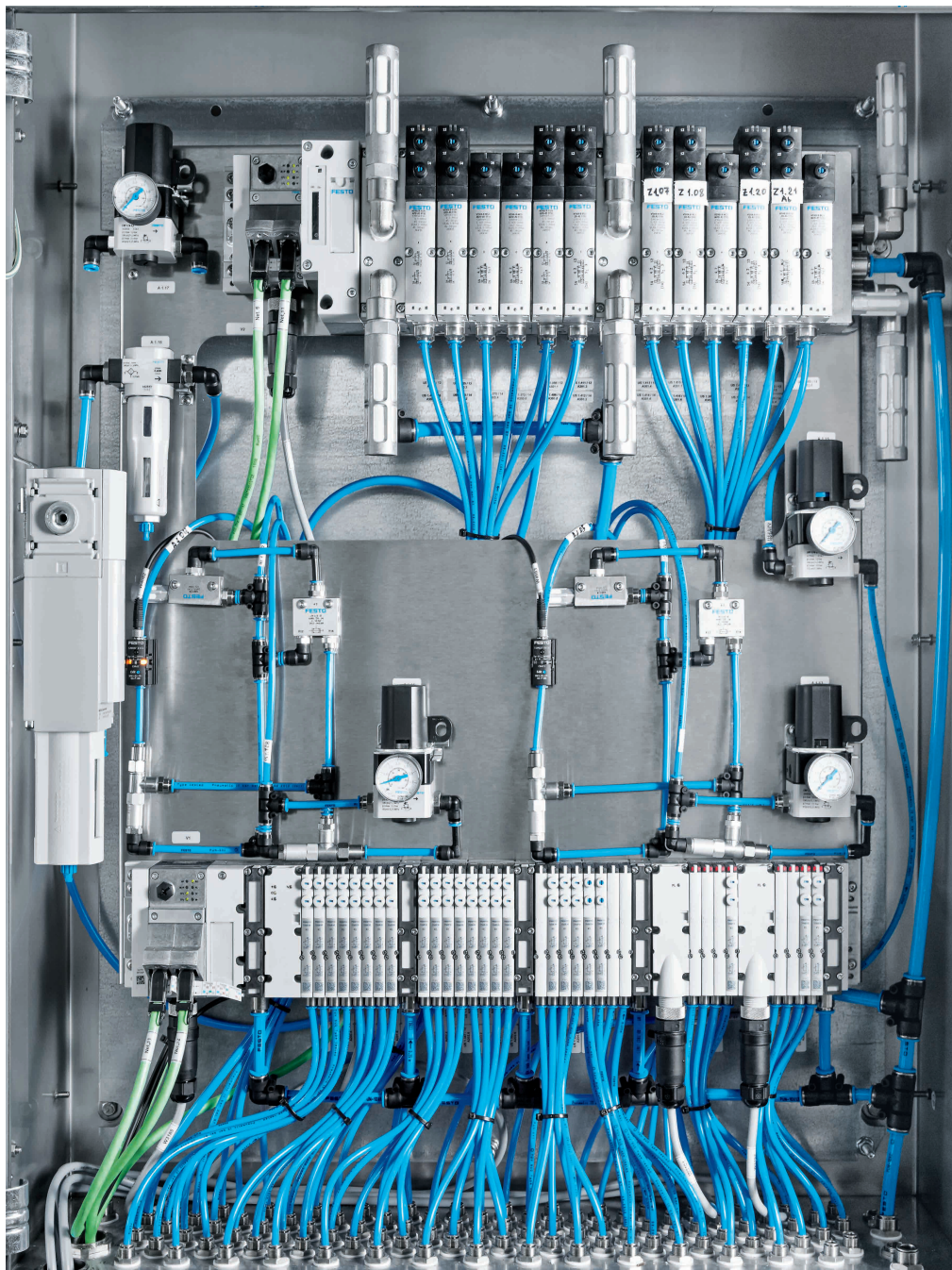


Dr. Ing. Klaus Roos, Head of Cleaning Technology, ROTAN GmbH

The closed contaminated vessels are first transported into the safety cabin via a chain conveyor. Here, the lids of the vessels are opened manually. Because the barrels have openings at the top and bottom, cleaning gloves accessible from the outside are attached in the upper and lower sections of the safety cabin. The vessels can only be opened using the integrated glove when both doors are closed. When the vessels are transported towards the cleaning chamber, the lower gloves are raised slightly by compressed air to ensure that they can fold back. Other small parts that need to be cleaned separately are transferred in special bags. After each cleaning operation, the gloves are tested for leaks with the doors closed and a pressurisation of 0.5 to 0.6 bar. The pressure is controlled by valve terminals MPA, and the pressure sensor is an SDE5 from Festo.

Flexible attachment

The system rinses the chamber after each cleaning operation to remove the contamination from the barrels and containers. Different cleaning agents are used depending on the type of contamination. For water-soluble substances, rinsing with cold water is sufficient. Non-water-soluble substances require cleaning with solutions which meet customers' requirements. The vessels to be cleaned are moved from the safety cabin to the cleaning chamber. Here they are locked using a special device consisting of a coupling with spring package. This enables the system to respond flexibly to possible tolerances of the vessels. The locking process is carried out by the stainless steel cylinder CRHD, while the speed is adjusted via the corrosion-resistant one-way flow control valve CRGRLA. The process ends when the cleaned vessels are transferred to the buffer station.



Reliable control of the pneumatics is provided by VTSA and MPA with fieldbus.

Simultaneous movement

Inflatable seals keep the doors of the inner chamber sealed during cleaning. The doors are opened and closed by two linear pneumatic cylinders. Both cylinders must open and close simultaneously to avoid potential misalignment of the doors. To achieve this, it was essential to ensure that the pneumatic tubing above the valves are exactly the same length. The closing and opening speed of the doors is regulated by one-way flow control valves which are actuated using individual valves.

Long service life

When equipping the ROTAN cleaning system with Festo components, corrosion resistance was of central importance. Among the components used were the stainless steel standard cylinder CRHD, the

stainless steel piston-rod attachment CRSR and the stainless steel Quick Star connector CRQS. The combination of easy-to-clean design and total operational reliability increases system availability and reduces downtimes.

**About Festo:**

Festo SE & Co. KG is a global player and an independent family-owned company with headquarters in Esslingen am Neckar, Germany. The company supplies pneumatic and electrical automation technology to 300,000 customers of factory and process automation in over 35 industries. The products and services are available in 176 countries.

With about 21,200 employees in over 250 branch offices in 61 countries worldwide, Festo achieved a turnover of around €3.2 billion in 2018. Each year around 8 % of this turnover is invested in research and development. In this learning company, 1.5 % of turnover is invested in basic and further training. Yet training services are not only provided for Festo's own staff – Festo Didactic SE also supplies basic and further training programmes in the field of automation technology for customers, students and trainees.