

**Industry: Industrial cleaning / high-performance washing machines**  
**Products: FX3U compact controllers,**  
**FR-A540 frequency inverters, control terminals**

# A clean solution: industrial washing machines

In the nearly 80 years of its history, the name Seibt + Kapp has become a synonym for robust and durable products. Quality has top priority for the manufacturer of industrial washing machines, which are used in laundries, hospitals, senior citizens homes and industry. Seibt + Kapp's latest generation of combined washers/extractors are fitted with compact controllers, frequency inverter drives and control terminals from Mitsubishi Electric.



Seibt + Kapp GmbH & Co. KG in Erdmannhausen is one of the most highly regarded manufacturers of high-performance washing machines in Germany. The company's latest development is the Variaflex line, which includes six different models with capacities between 17 and 120kg. The largest machine can wash up to 3,000kg of laundry per day. The versatile machines are fitted with a fully-programmable controller and have very low water and energy consumption.

The intelligent drive and control system concept of the Variaflex line was developed for Seibt + Kapp by researchers at Stuttgart University, who implemented the solution with a carefully-matched combination of MELSEC FX3U compact controllers and FR-A540 frequency inverter drives. The systems were then programmed by Feuer Automation GmbH in Brackenheim, a Mitsubishi Electric partner and automation centre.

Memory capacity and speed were the main factors that led to the choice of Mitsubishi Electric's latest series of compact programmable logic controllers. The PLCs of this series can store up to 64K program steps and they process the program and application instructions at high speed, with a program cycle period of just 0.065µs per logical instruction. This makes the FX3U one of the world's fastest compact controllers.

The large memory makes it possible to store all the washing machine programs in the PLC along with the main software, which speeds up both access to the data and processing. The operator can modify the programs as required, change individual parameters and then add the modified version of the program to the selection list. There is no longer any need for the expensive control unit that had to be included in the previous series – a simple unit with a small memory is sufficient, which reduces the cost.

The controller's high speed makes it possible to calculate the weight of the laundry in the drum faster and with greater precision. Sensors in the machine's suspension system provide around 200 measurement values from which the controller can then calculate the weight of the laundry. This information makes it possible to ensure that the machine always delivers optimum performance and energy efficiency.

A damper system is included in the suspension of the washing drum. Smooth running, speed and the direction of rotation are all controlled by the frequency inverter drive, which communicates with the controller directly via an RS-486 interface. The controller's instruction set includes instructions for Mitsubishi Electric inverters, which significantly facilitates configuration and setup.

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