

Scalable Automation in Stirrer and Homogenizing Technology

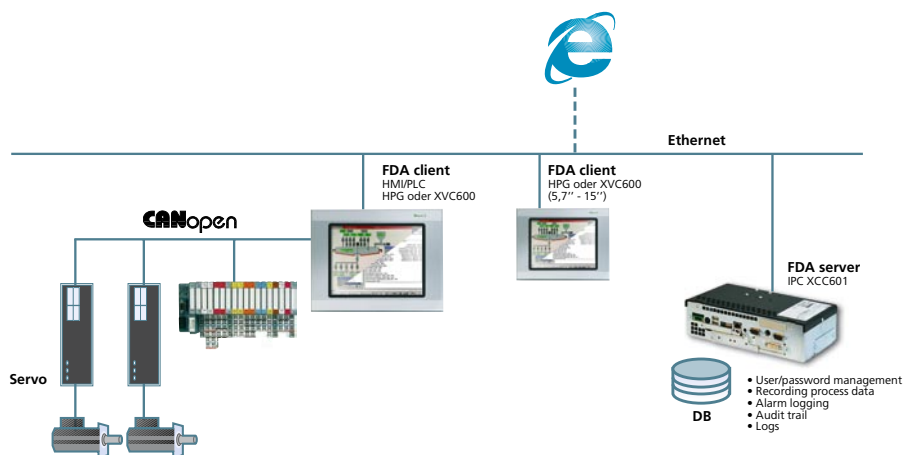


THE COMPANY

VAKUMIX Rühr- und Homogenisieretechnik AG was founded in Weyhe near Bremen in 1995. It designs and manufactures machines and plants for the manufacture of liquid to semi-solid products. Customers include national and international companies in the pharmaceutical, cosmetic, food and chemical industry. VAKUMIX homogenizers and process plants are already used in many countries in Europe, North and South America and Asia.



The level of automation possible in an application largely depends on system size and the volume of materials to be processed. A high level of automation and safety is indispensable when manufacturers have to guarantee high quality products without exception, such as in the pharmaceutical industry. In this sector, automated systems must comply with the international GMT regulations and Good Automated Manufacturing Practice (GAMP). With Moeller's xSystem, machine and system builders are able to achieve full compliance with these stringent regulations.



Ointments and creams primarily consist of greases and water. These ingredients are homogenized together in order to produce a stable combination of these elementary components. The reaction takes place in a mixing container which has a homogenizer and stirrer running inside. The grease phase is initially solid and has to be melted by heating up the container walls. Once the grease has turned to liquid, water that has been heated in the same way is also added. Both phases, grease and water are then sucked in by the homogenizer, and the shearing forces of the homogenizer break up the molecular structures of the individual phases so that the grease and water molecules are then combined to form an emulsion which is then cooled slowly. The viscosity of the product increases at the same time. A number of other substances in liquid or powder form are usually added up to the final end product.

Scaled automation

Vakumix Rühr- und Homogenisierertechnik is a company that uses a scalable automation solution in all its systems from small to large. This ranges from the XVH300 HMI-PLC to the XV400 to the PC based XVC-601 HMI-PLC. The EPAM (Easy PageMachine) Excel-based visualization tool is able to meet all customer requirements in all systems from the compact system to the fully developed large system. This license-free system offers the full range of functions with all automation solutions.

Machine and system builders use the software modules when designing projects for the high-end XVC-601 HMI-PLC as well as for the

smaller and medium sized XC100 and XVH300 devices. The software function blocks are created and tested extensively in compliance with GAMP (Good Automated Manufacturing Practice) so that standard software modules can reduce project design costs. Vakumix now only uses one function block library for all HMI-PLCs. The uniform structure of the user interfaces also reflects the Vakumix philosophy of minimising training requirements and ensuring that global customers can use Vakumix plants reliably.

The touch technology eliminates the need for special keyboards that are difficult to house in humid environments. The flexible language selection options – also for Chinese, Cyrillic, Japanese or Persian – make the Moeller devices ideal for international use. The devices feature a user-friendly alarm handling function: the overall system display provides system supervisors with detailed photos of the flashing error source, the fault location, and the message text window gives precise instructions to rectify the fault. This ensures accurate troubleshooting for the end customer and short downtimes.

A scalable system with one software library for all automation devices saves project design times for all stations of the validation concept (V model). After all, software modifications occurring during programming or during the individual qualification phases always have to be integrated back into the function description and requirements catalog.

Process data acquisition

Batch traceability and the proof of a reproducible and constantly high product quality require extensive data management facilities. For this Moeller offers an FDA server that can run on Windows XP or 2000, and an SQL database for data logging, password management, printing, archiving and an interface to the end customer's IT environment. The data server can be networked via Ethernet straightaway to the HMI-PLCs or at a later time. The server stores logs of every intervention by the system supervisor as well as all process data and error messages. Users can access the database via Ethernet and carry out their own evaluations. Major benefit for complex production systems: several FDA clients can be connected to the FDA server. Data exchange with higher-level SCADA systems is possible as an option for storing or further processing the logged data.

Quicklink ID:

MS1109

CONCLUSION

Stefan Hüfe, electrical engineering manager at Vakumix, had this to say: "The graphical route selection function for filling, circulation and emptying enables us to offer our customers optimum flexibility. We use Moeller's scalable xSystem for both standard and GAMP validated systems. This reduces the time required for project design and commissioning both at Vakumix and at the customer". As his colleague Sven Neumann from the electrical engineering development said: "With the development of standards the use of only one software tool enables us to create a rapidly growing library of function blocks." Robert Müller, sales manager and authorised company representative expressed the view of a Vakumix end customer: "The entire system with FDA server and clients is easy to explain and is cost effective. With the WEB server for all HMI units, our customers can monitor the process, even outside of humid environments – a key benefit."

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