

process systems

WALDNER
Firmengruppe

drying technology
right from the start



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English

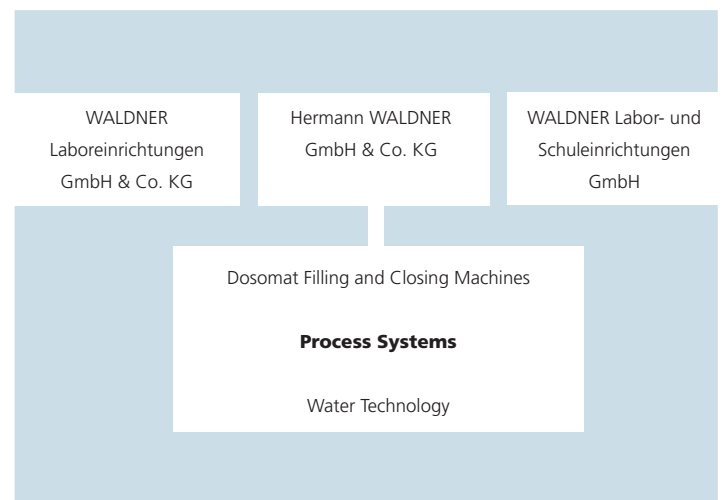


The WALDNER Group - a strong trio

The WALDNER Corporate Group consists of three companies:

- Hermann WALDNER GmbH & Co. KG
- WALDNER Laboreinrichtungen GmbH & Co. KG
- WALDNER Labor- und Schuleinrichtungen GmbH

For nearly one century WALDNER has been setting standards. For the benefit of our customers our business divisions take advantage of our cross-border capabilities. With their size and their involvement in the Corporate Group the three Waldner companies represent stability, expertise and continuity.



Waldner Process Systems

Belonging to Herman Waldner GmbH & Co. KG the business unit Process Systems offers customized procedural solutions for the pharmaceutical, chemical and food industry.

- **Isolators and containments**

Full containment systems for the contamination-free handling of highly active and toxic substances (API) and isolators for sterile applications.

- **Drying technology**

Mobile vacuum contact dryers for dust-free powder handling, vacuum tray dryers conform to GMP standards, intermittent and circulating air tray dryers.

- **Vessels, skids and units**

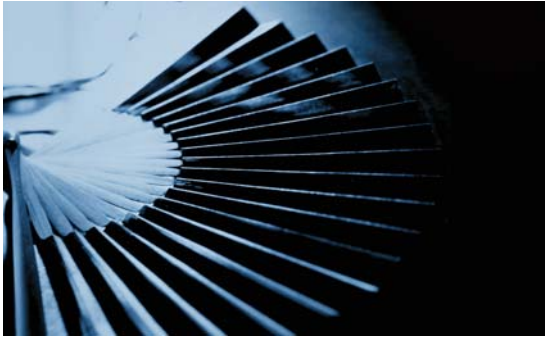
Vessel technology, ranging from single preparation, pressure and reaction vessels to complete units, container systems, single-layer pressure filters.

- **Cooking systems**

Batch cooking lines for the food industry, for the production of aseptic fruit preparations, jam and many more.

Including the process measuring and control equipment, our products can be combined on the basis of the modular design principle. From competent advisory service on the process development and planning to the realisation of turn-key projects, we provide you with an individual service package that is consequently based on your needs. In short - you obtain what we expect from ourselves everyday: First-class solutions.





drying technology **right from the start**

Waldner Process Systems drying technology in the pharmaceutical and chemical industry

In the pharmaceutical industry with rigorous cGMP and FDA criteria, design of drying systems is challenging. Besides the efficient process technology, the contamination-free handling of toxic and highly active substances is more and more in focus when it comes to batch drying of chemical and pharmaceutical products. Waldner Process Systems' innovative drying technology meets these demanding requirements.

In focus: Your product

You define the product that has to be dried and let Waldner Process Systems engineers develop the solution to your **problem**. More than two decades' experience in the manufacturing of drying systems gives evidence of Waldner Process Systems' well-founded know-how. We place this expertise at your disposal for the careful choice and design of a drying unit that is meticulously tailored to your needs. But whatever you are drying, the goal is a process of constant quality that remains transparent and controllable at any time.





Trends of tomorrow

Process optimization, flexible adaptation to the market and cost management are the key factors. Focussing on further developments, Waldner Process Systems developed both a pilot plant scale tray dryer and a mobile vacuum dryer which are located in our test laboratory in Wangen, Germany. Achieved test results can be scaled up and provide a safe and reliable basis for process innovations or the improvement of existing drying technologies.

It is up to you if you either wish to carry out tests together with us in Wangen or on your production site –our “trendsetters” are portable and flexible.



Now and in the future: We are there for you

A Waldner Process Systems drying unit has an average service life of several decades. A successful collaboration with our customers is our principal goal. Only after perfect integration in your production process do we consider a project a success. Experienced engineers and technicians are at your disposal for the qualification of the the drying units (DQ, IQ, OQ) and provide support with validation. The training of your staff, support and advisory service, as well as reliable supply of spare parts is a matter of course to us. Your process optimization takes center stage and our team is at your disposal for all issues concerning your production process.

Smart combinations


For the optimization of process steps the combination of different systems and components provides new perspectives. Contamination-free operation of a vacuum tray dryer? We say yes. Installed in an isolator manufactured by us, the safe and gentle vacuum drying of highly toxic substances can be realized. Based on the modular design principle Waldner Process Systems components can be either combined with each other or can be integrated in existing systems, such as combinations with isolators, laboratory fume hoods or centrifuges. An impressive concept.

The engineering is clever and sometimes surprisingly straightforward – but always made-to-measure.

Comprehensive solutions

Specifically designed to your needs, the Waldner Engineers prepare a detailed construction design for your project. Many years of experience in stainless steel treatment results in our first-class handling of all stainless steel alloys as well as special alloys. Surface roughness and electropolishing are executed according to customer requirements, in case of aggressive products the surface can be furnished with a protective coating. Last but not least: Waldner Process Systems also provides the peripheral equipment including piping, controls, assembly and start up of complex units and lines. This wide scope allows creative project solutions.





With the mobile vacuum contact dryer, system Provat-ech® contamination in drying processes is eliminated. The product remains during the entire drying process in the container, from filling and drying to discharging. Transfer actions are avoided and so both operator and product are protected.

Mobile vacuum contact dryer, system Provatech® – contamination-free drying of toxic and highly active substances

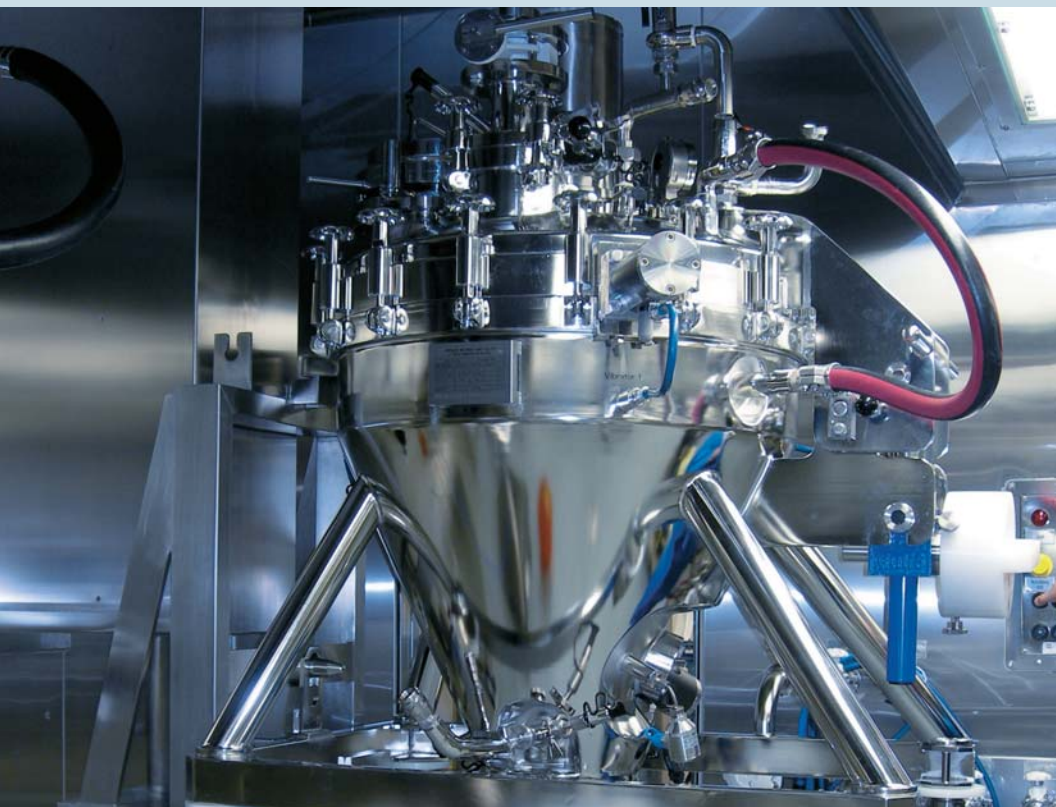
Consisting of a drying station and a product container the mobile vacuum contact dryer - in a word „MVK“ - gives the operator a high degree of safety and flexibility. Its core is the mobile product container which enables the operator to realize the process steps of filling, drying, discharging and cleaning independently at different places.

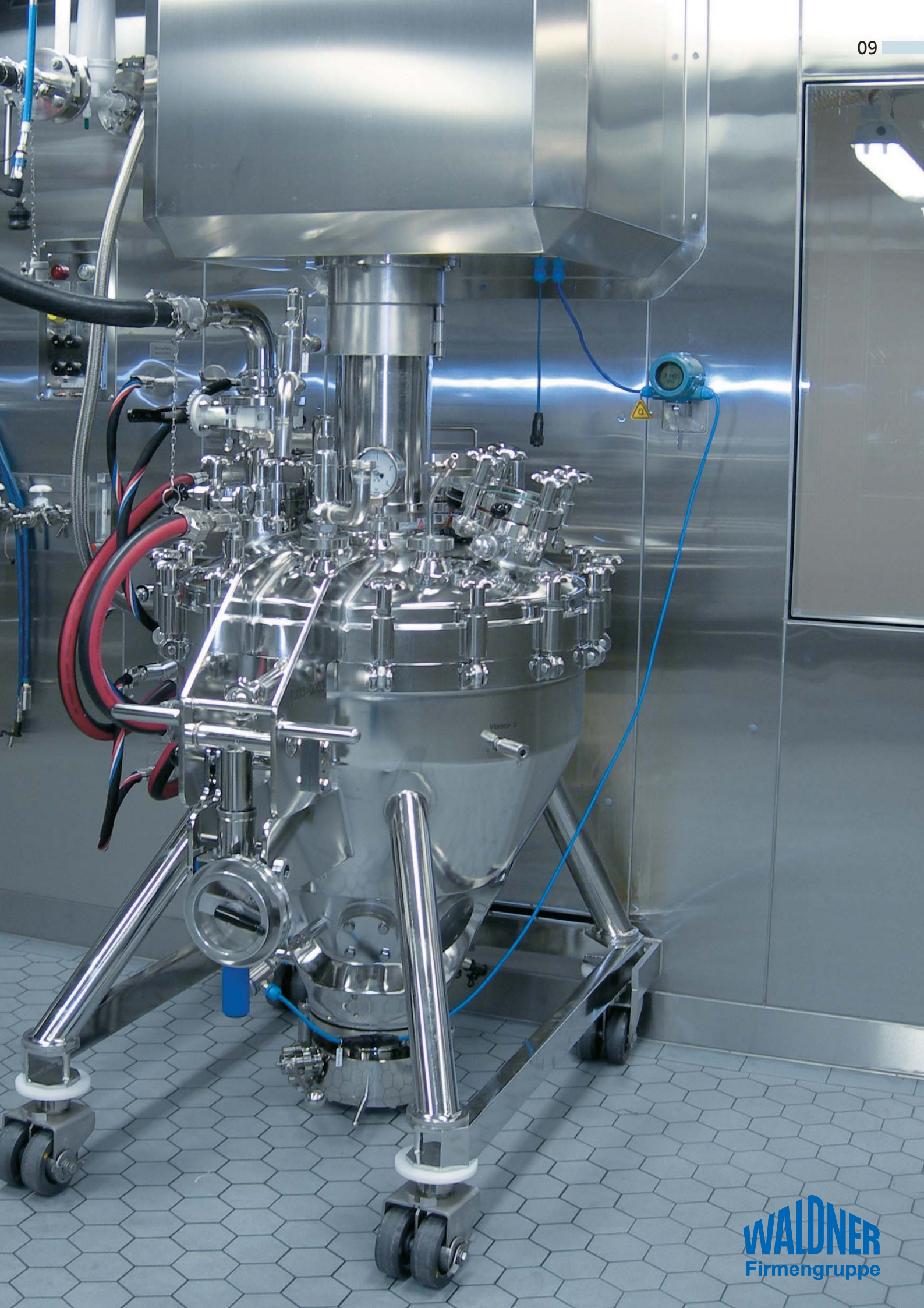
For the drying process the product container is moved to the stationary drying station and is connected to the agitator drive. By means of self-locking quick couplers the machine is connected with the heating & vacuum system and sensors. Product containers ranging in size from 5 to 350 litres can be docked to the drying station, so it is possible to dry different batch sizes that can be scaled up. When utilizing multiple product containers, a quasi-continuous process chain can be realized.

The MVK has important technical advantages. It is a mobile system thanks to its fixed agitator. On the other hand, the agitator drive motor is absent from the mobile product container but integrated

in the drying station. This saves weight and the operator gains a better manoeuvrability. Another benefit is the consistently contamination-free product transfer via split valve docking systems from the centrifuge or filter to the final packaging. The operator avoids extra transfer steps and minimizes contamination. This special dryer forms a self-contained system and remains during the entire process exposure-free – from filling to drying and discharging.

Further advantages of the flexible MVK are its easy handling and the excellent cleanability (CIP/SIP). Of course we also offer a complete system including lifting column and docking systems as well as a completely equipped dryer station with explosion-proof operation terminal, vacuum pump, condenser, collecting tank and heating/cooling system.







Vacuum tray dryers of the series VTP, VTW and VTC

Vacuum tray dryer VTP

With its universal pharma design the VTP is the "star" of our vacuum tray dryers. Designed for smaller and medium shelves (from laboratory size to 17 m²) its principal features are its design according to cGMP standards and its optimum cleanability. The heating plates are integrated into the rear panel and the interior chamber is designed having large corner radii which permit easy visual inspection. Thanks to the welded construction with completely polished interior (electropolished as an option) highest FDA standards are fulfilled. Cleaning can be carried out either manually or by CIP system. For CIP cleaning two cleaning lances are installed on both sides between the side walls and the shelves and are connected at the top by means of quick closures. This way the vacuum chamber and the shelves can be cleaned from all sides. The lances may also be used for the even distribution of carrier gas.

Vacuum tray dryer VTW

The VTW vacuum tray dryer is designed for high standards in the chemical and pharmaceutical industries. In comparison to the VTP this vacuum tray dryer is designed for medium-sized and large shelves with a standard size of 24 m². The heating plates are welded to the side walls, and as an option can be executed in a detachable version. The VTW's energy inlet and outlet are integrated in the insulation jacket and the vacuum chamber can be designed with large radii corners to enhance cleaning and inspection. The carrier gas is led into the clearance zones beneath the heating plates via a carrier gas lance. The flow of the entrainment gas is thus directed over the trays.

Vacuum tray dryer VTC

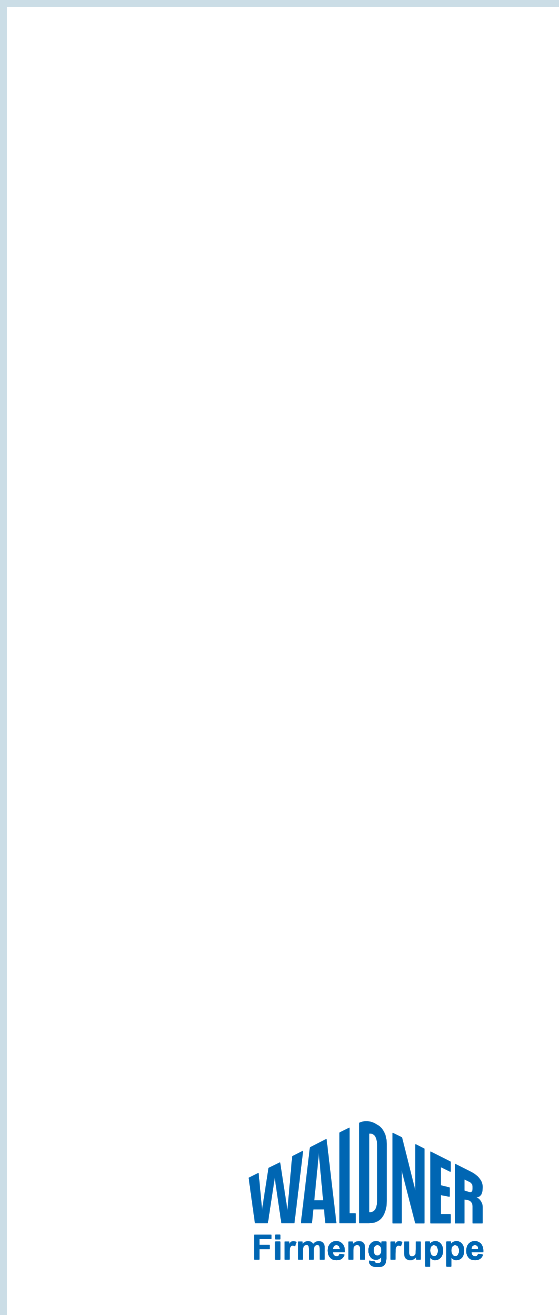
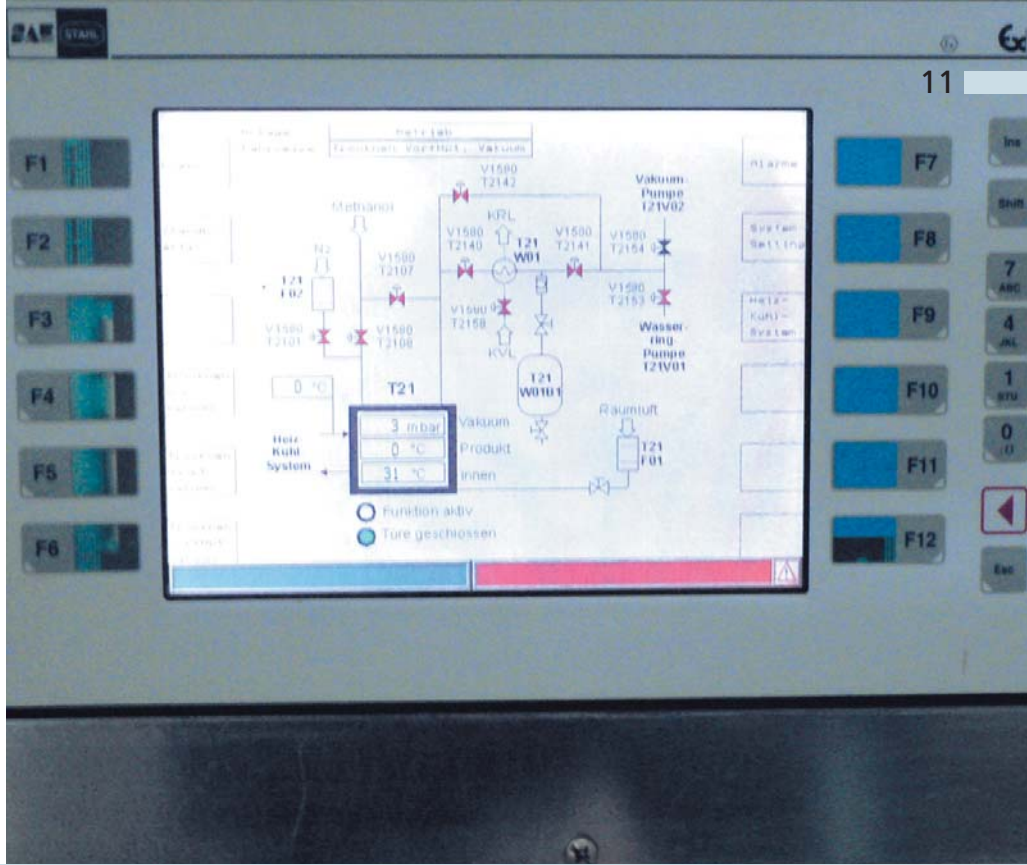
The VTC vacuum tray dryer is a lower-cost alternative to the well proven VTC series, mainly for applications in the chemical industry. The dryer casing corresponds to the VTW, however, the

heating plates are designed as laser welded pillow-plates with smooth and even surfaces. The heating plates are screwed to the rear panel of the casing and are supported at the sides. The benefit this system offers to the operator is the interchangeability of individual heating plates.

Circulating air tray dryer with filter and solvent recovery

This tray dryer version serves the pharmaceutical industry as a universal, convective drying system for products containing solvents or water.

The modularly constructed tray dryer consists of a product chamber and separate energy module. Here the apparatuses for the generation of drying gas are installed (ventilator, filter, heater, & condenser). On the tray carriage the product-loaded trays are placed side by side and on top of each other. By means of a "piggyback trolley", the operator moves the tray carriage into the dryer. Next, the gas-tight door is closed and the drying process can begin via the operation panel.





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