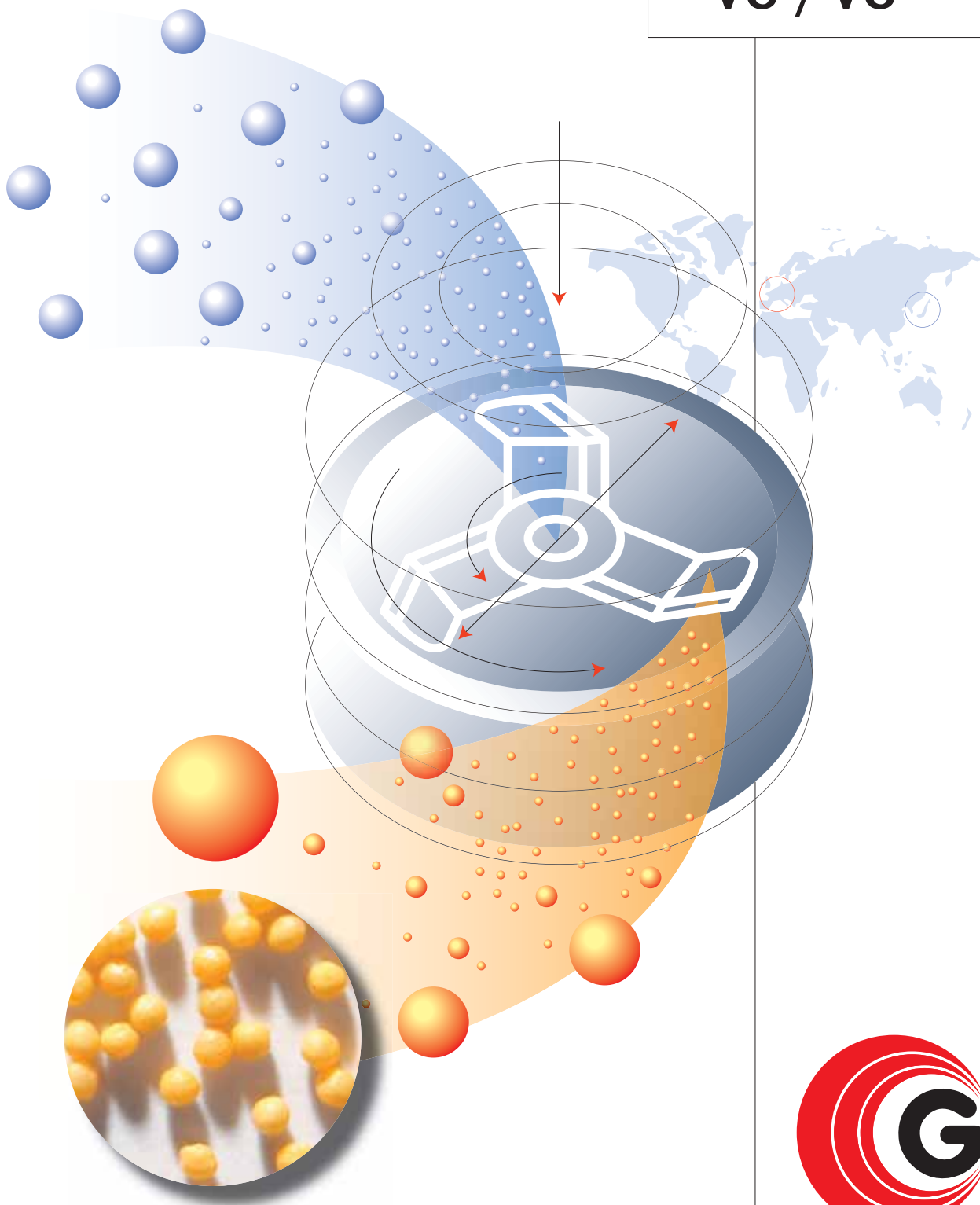


Vertical Granulators

VG / VG^{PRO}



We set the standard

Glatt Vertical Granulators: state-of-the-art technology

Vertical granulators have a long history in the pharmaceutical industry. They are robust, reliable, state-of-the-art technology and, in future, they will continue to play an important part in manufacturing processes in the pharmaceutical industry.

Vertical granulators are always first choice when the process needs high granulate density and rapid granulation. In addition they have low space requirements, are simple to operate and - now more important than ever - they are easy to clean.

Glatt and Powrex. Using synergies together

In recent years Glatt has been actively involved in the further development of vertical granulators in co-operation with the Japanese specialist Powrex. The results of this co-operation are: Powrex's development of the patented "Z" rotor and the use of SC SuperClean® technology, developed and now patented worldwide by Glatt. Further optimisation also was achieved on details such as different working vessel shapes and integrated choppers with a wide range of tools.



Working vessel with patented "Z"-rotor

Rapid granulation and drying

For high flow-rates a combined system with vertical granulator and fluid bed dryer is ideal. This arrangement is very economic, offering rapid granulation in the vertical granulator and efficient drying in the fluid bed dryer. For lower flow-rates or frequent product changes, it is also possible to dry in the vertical granulator. In this case, and depending on the product or process, drying can be supported by suitable measures such as heated wall surfaces, gas-stripping and vacuum.

PRO-Concept

With its PRO concept Glatt is setting a mile stone for complete systems in the wet granulation processing. Through the 12 bar pressure shock resistant design and the resulting minimization of peripheral safety measures against explosion over-pressure - combined with an excellent handling - is the PRO line the new standard of completely contained granulation suites.

Vertical Granulator VG 1200



Whatever quantity you are dealing with - granulating just a few hundred grams in the lab, or producing a few tons each day in a production facility - a Glatt unit provides you with an individual solution, designed and built to suit your requirements. And of course you will be able to call on our extensive service back-up, which enjoys an outstanding reputation worldwide, and one we intend to keep.

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We set the standard

Versatility and flexibility for individual requirements

The main benefit of vertical granulators lies in their rapid granulation and high granulation density. Other factors which can influence the choice of technology are the spatial characteristics of the equipment location and existing pharmaceutical regulations.

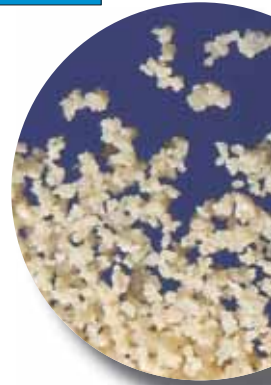
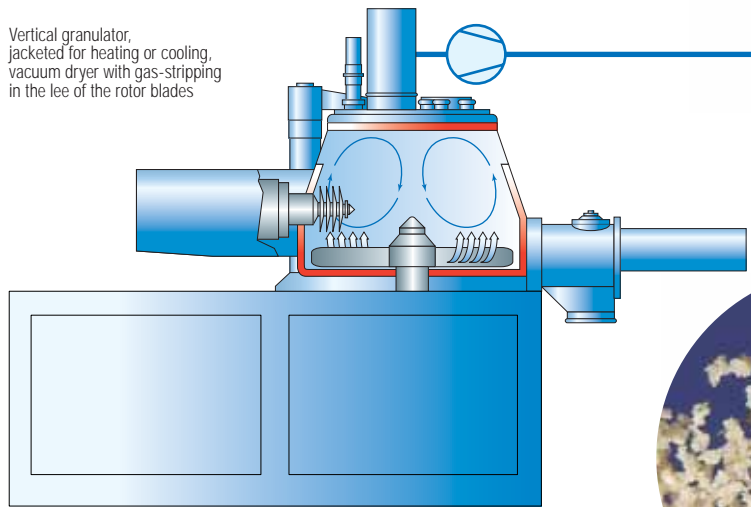
For standard wet granulation, Glatt supplies the VG series. Special configurations can be designed for pellet manufacture. For a combined granulation / drying, other options are also possible: a heated jacketed wall, vacuum and a gas-stripping system, registered for the patent application. If water and organic solvents are used, the vertical granulator can be combined with a specially developed vacuum system with integrated solvent separation.

Glatt can also combine its vertical granulator with a fluid bed dryer or integrate it into other systems. The modular design means units can be configured and adapted easily to the customer's specific premises and requirements.



Granulation suite consisting of a VG 600 and a WSG 120

Vertical granulator, jacketed for heating or cooling, vacuum dryer with gas-stripping in the lee of the rotor blades



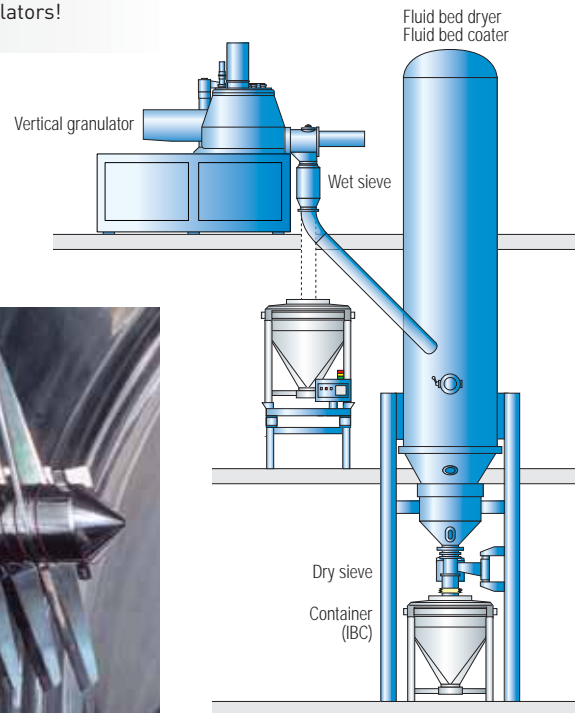
PRO-Concept

Glatt has solved essential problems of conventional 10 bar units through the launch of the **PRO** concept for completely granulation lines (pneumatic conveying systems PCS, vertical granulator VG, sieves GS / GSF and fluid bed units WSG / WST) and is going completely new ways. Innovative high-strength materials and a revolutionary design allow now a total new handling with the 12 bar pressure shock resistant Glatt VG **PRO** unit. A quantum jump in comparison with conventional vertical granulators!

And of course all the product contacting parts and components in Glatt systems in the clean room are made of high grade stainless steel. Of course on site highly qualified and competent employees from our house are available in order to guarantee a smooth installation and start-up.



Chopper



Complete granulation suite for high capacities

Safety and the environment

Consistent reducing of safety risks

Dust and sometimes also organic solvent mixtures are a potential safety risk and therefore a danger to operators, environment and machine. With vertical granulators the hazard of explosion is relatively low due to their design and the nature of the process involved. Product charging and discharging are often more critical with regard to the risk of explosion.

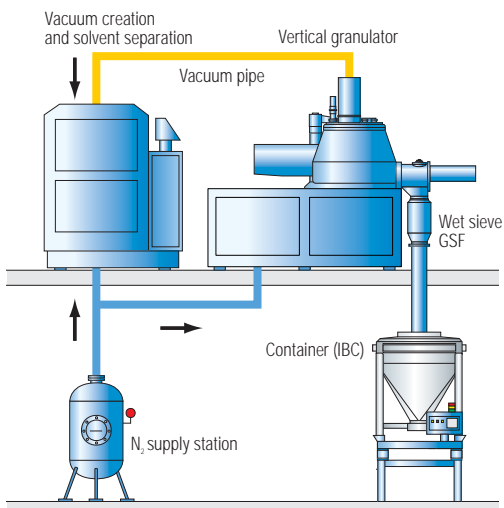
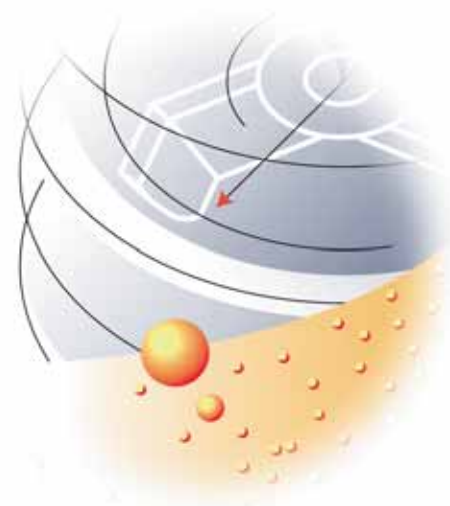
In cases of higher risk, the machine can be fitted with an N_2 inerting system. All vertical granulators correspond in safety and design the demands of the guideline ATEX-100a and have been certified appropriately.



Vertical granulator VG 100 with solvent recovery / solvent separation

PRO-Concept

At the beginning of the new millennium the time was ready for a great step: The VG PRO line sets a new standard with 12 bar pressure shock resistance. Known restrictions of conventional units are eliminated through the launch of the new PRO line. The release of explosion pressure and the discussion around structural demands or factors as well as possible environmental pollution are topics from yesterday. Now even critical products with possible explosion pressures up to 12 bar can be safely processed in a PRO unit. The problem-free production of almost all in the pharmaceutical and food fields processed products are possible by using a contained PRO unit.



Granulating and drying with solvent recovery / solvent separation



Vertical granulator VG PRO 1500 complete with operation platform

Material flow and handling

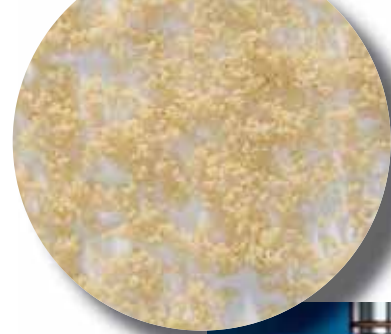
High safety level through total containment

In standard systems charging is fed through charging ports on the working vessel. Depending on the design, the lid can either be flipped up (laboratory units) or swivelled to the side (production units). Discharging is via the discharge port at the side, and usually a wet sieve type GSF is also integrated into the downstream processes in order to homogenize agglomerates. This wet sieve is often integrated in inline design combined with a bypass pipe.

Nowadays open processing is not allowed for a wide range of products. "Total containment" is becoming the standard. Charging is dust-free and achieved via a fixed, pre-installed system, which can also, if needed, be used in combination with a vacuum system. Discharging is carried out mechanically in a closed system, either gravity-charged into containers or through suction into a downstream fluid bed dryer. Depending on the spatial arrangement or material-flow concept the product can then be conveyed pneumatically to the next step in the process.

Granulation liquid

Granulation liquid (binder) is added through nozzle systems and various dosing systems (hose / eccentric / membrane pumps etc.).



Nozzle for 60° full cone jet



Product discharge with docked bypass pipe alternative to the wet sieve



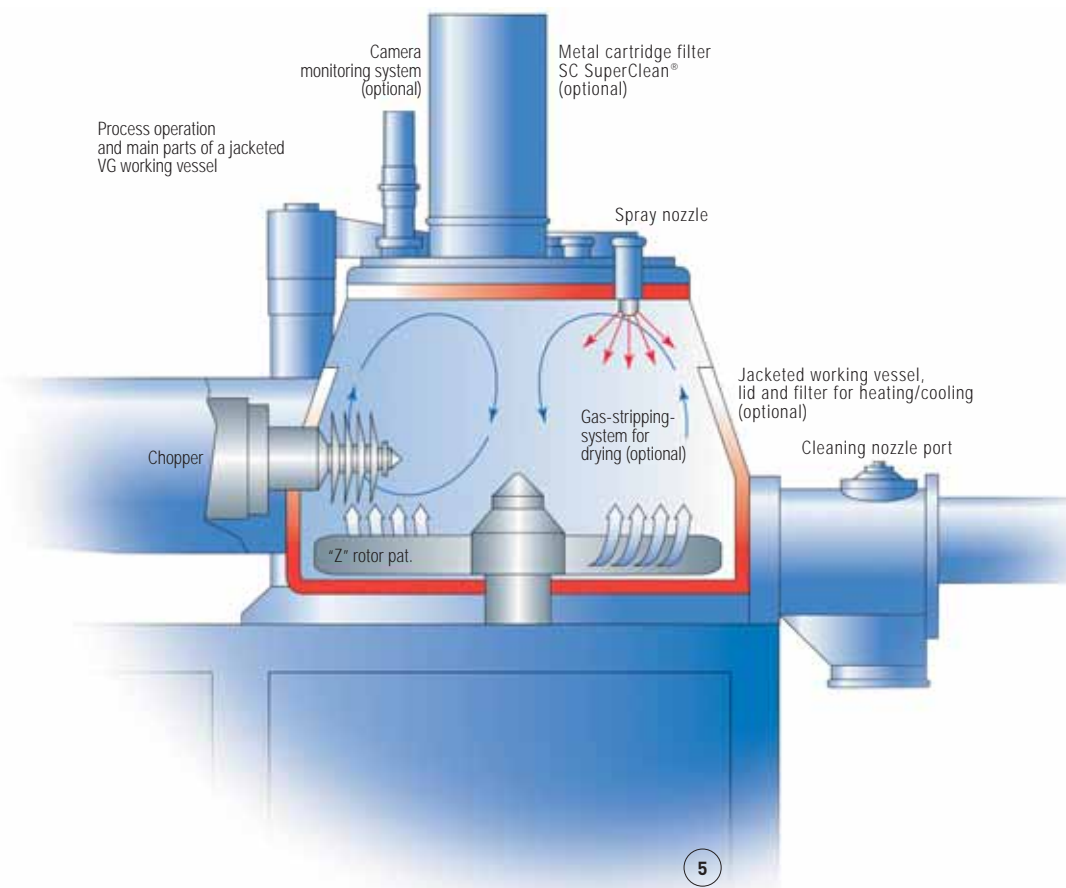
Nozzle for fan-shaped jet



Nozzle for 60° / 45° hollow cone jet



Product discharge with attached Glatt wet sieve GSF 180 with suction shoe for pneumatical product transfer



Neat solutions for automatic cleaning

In the past years CIP (Cleaning In Place) has become a central issue in the pharmaceutical industry. For Glatt, a CIP process is one that is fully automated, reproducible, and produces a defined cleaning result.

We define WIP (Washing in Place) as thorough pre-cleaning which is then finished off by hand. Validation is possible of course on both processes. Glatt vertical granulators can be supplied in both models and of course suitable CIP / WIP supply racks are included in our product programme.

Patented technology for the highest cleaning standards.

The SC Super-Clean® design is Glatt's answer for all fully-automatic cleaning issues in vertical granulators. It cleans problem areas such as sealing gaps or inspection windows, and ensures a defined level of cleaning for filters, as well as giving excellent protection for the health of personnel.

Glatt has developed solutions for all needs and brought them together in the future-oriented SC Super-Clean® series. A lot of these solutions are patented, so for example the protractible washing-nozzle, the SC-SuperClean® metal cartridge filter and the mechanical rotor lifter to be activated by button pressure in order to check the area below the rotor easily.



Hydraulically operated washing nozzle

PRO-Concept

The PRO concept offers these advantages also: While the filter elements are being cleaned by cyclical pressure shock cleaning during the process, the integrated washing-nozzles can be used for the detailed cleaning after long processing or after product changes. Total containment can be also applied of course for the cleaning of PRO units.



WIP station



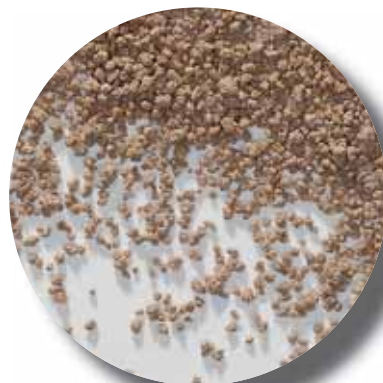
SC SuperClean® metal cartridge filter



CIP sealing system O-Plus



Swivelling lid with inflatable seal



Customised control systems for all production processes

Control systems often have to carry out much more complex tasks than just monitoring a series of machine functions. Individual steps in the process have to be separately configured, critical parameters monitored and the entire process documented. The individual steps in the process can be switched automatically, or manually, as required.

A pre-defined, clearly laid out operating panel allows easy operation. In laboratory equipment all messages are displayed clearly on a TFT display. All production equipment is supplied as standard with a large LCD monitor on which all relevant process parameters are displayed. Optional recipe management is also available upon request.

If you want to display and document all process operations, and integrate this into an existing, higher-ranking system, Glatt's PC-controlled Megaview is the answer. It also enables third-party systems to be integrated into a single, overall control system.

Hardware and software for process controls of all kind

Glatt designs and builds all the software and hardware needed for the control systems. This in-house competence gives a high degree of flexibility to react to customers' individual wishes. We work with Siemens as standard PLC, PC-controlled upwards of a certain performance level. In process visualisation we use well known products such as Intellution, Citect and Wonderware. Explosion-proof control systems are also possible for equipment where there is a potential risk of explosion.

Control systems and validation

After successful start-up our staff carry out the validation of the entire equipment and the associated software package. In detail following qualification levels will be run:

- Design qualification (DQ)
 - Specifications and test plans according to customer requirements
- Installation qualification (IQ)
 - Completeness of the equipment
 - Correct installation
- Operation qualification (OQ)
 - Correct function of the equipment
 - Function of the system in defined fields of action
- Performance qualification (PQ)
 - Reliability of the equipment
 - Reproducible production



Operating panel ET8



Operating panel (EcoView) for stand-alone equipment



Clear installation of the control system for the VG



Operating panel (MegaView) for integrated systems

If requested we can of course also supply extensive documentation for validation, qualification and calibration (DQ, IQ and OQ).



Models

When you're looking for solutions, talk to Glatt

In Glatt's extensive product range you can be sure to find the solution you are looking for. We can also supply individual solutions for special applications, by tailoring our standard components to exactly match your requirements.



Vertical granulator VG 100



Vertical granulator VG 600 with conical working vessel (prepared for through-wall installation)



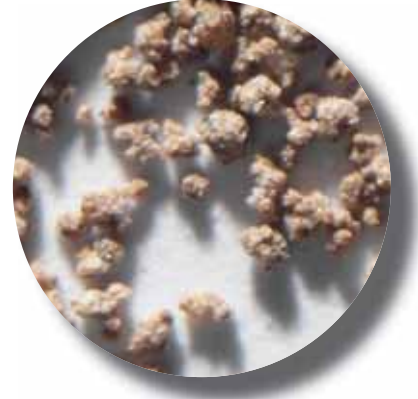
Vertical granulator VG 600 with conical working vessel



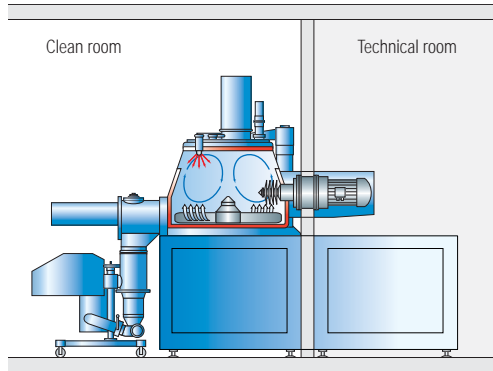
Vertical granulator VG 800 with cylindrical working vessel



Swivelling inline sieve GSF 180 for vertical granulators



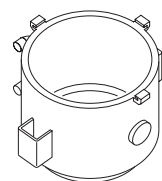
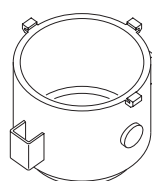
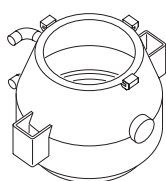
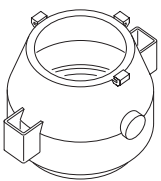
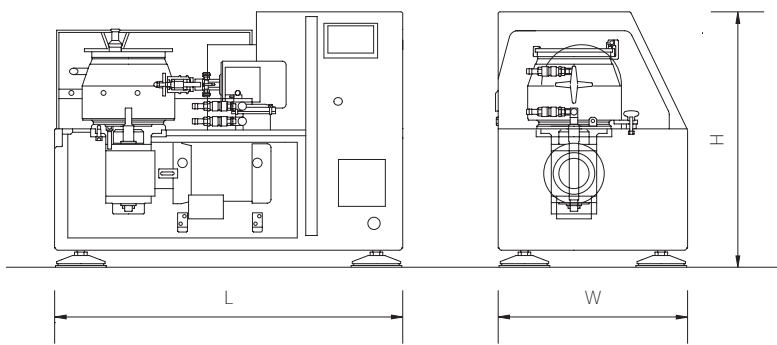
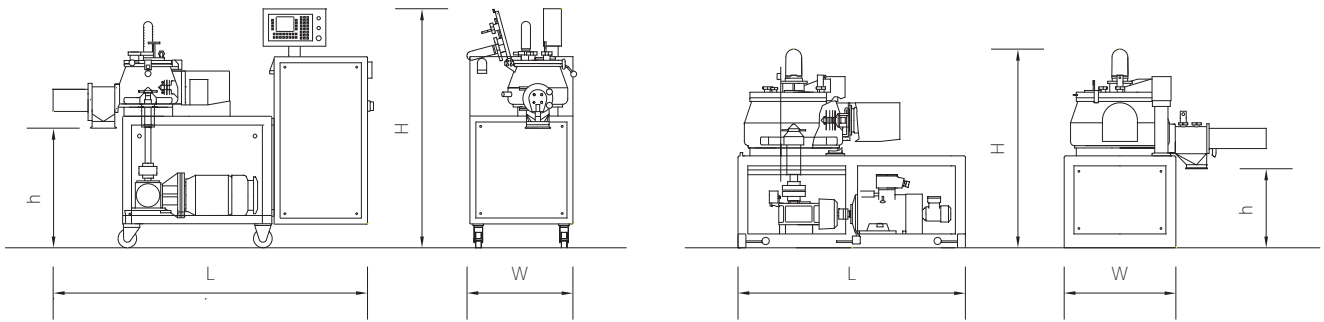
TMG lab scale unit on a mobile table

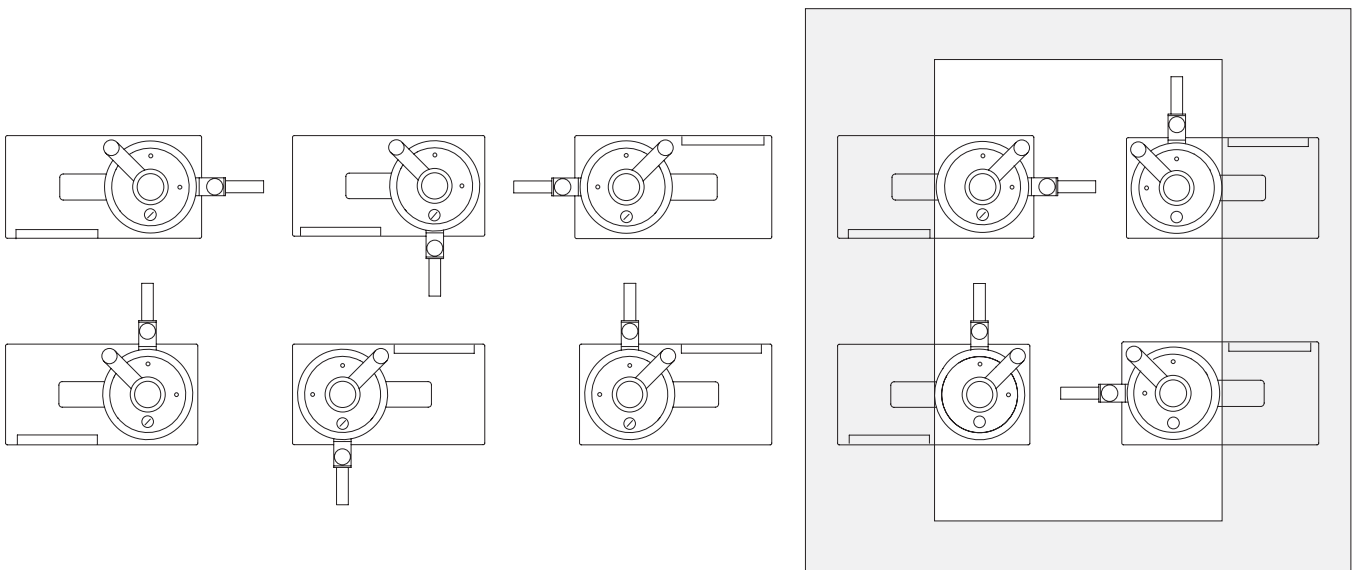
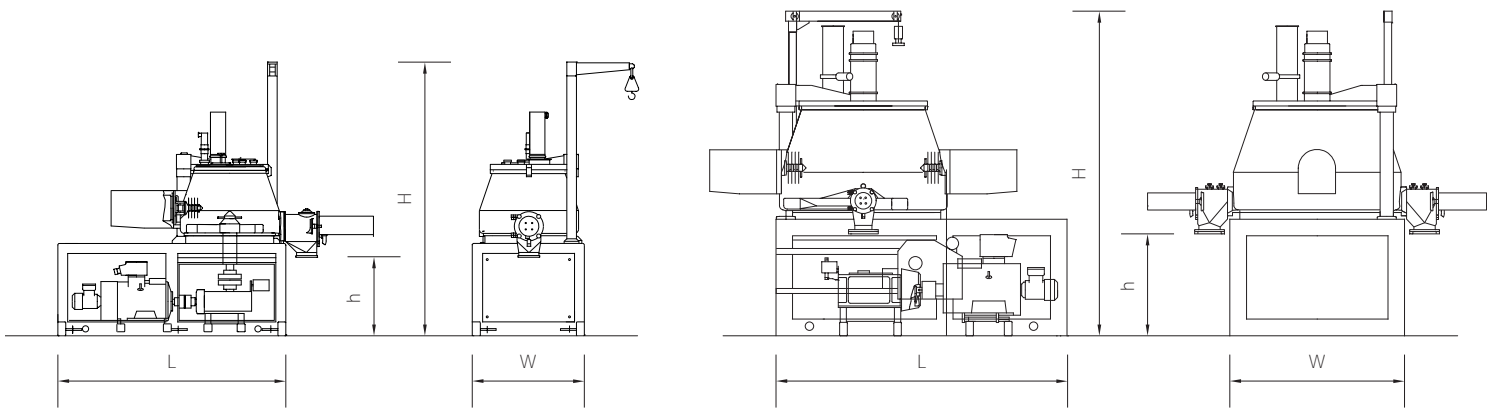


Clean room, through-wall version

Technical data

on demand





Range of Services

The harder the task, the more interesting the challenge

In over 50 years in the business we have learned that every machine is unique. Every customer has his own products, different premises and, not least, different employees, with their own ideas. And so we offer an extensive range of options to optimise our vertical granulators to suit your individual needs. The more difficult the task, the more interesting the challenge for our team. So why not give us a try! Some examples:

Product handling:

We deliver practically everything in and around vertical granulators: sieves, lifting devices, containers (IBCs), container mixers, containment systems, weighing systems, plus a range of other additional equipment.



Process and product development:

Do you want to upgrade or maximise your system? Or find out which system better serves your needs - e.g. a vertical granulator with integrated drying and a fluid bed granulator? We manufacture both systems and so we can provide the kind of objective advice you need.



Engineering:

We plan systems and integrated concepts to fit your premises. We are also your partner for turnkey construction of entire factories.

Contract manufacturing:

Outsourcing is a way of meeting the demands of an increasingly competitive market. Whether you regularly outsource sections of your production or just when you need extra capacity to help launch a new product - we can help you exploit all the options.



Glatt Binzen, Technology Centre

Service:

Our worldwide network of sales and service centres is at your disposal. So contact us if you need a quote, help in trouble-shooting, or information and support. We guarantee short reaction times and first-class service.

On-site validation:

We not only supply all the qualification and validation documentation you need, but will also calibrate, qualify and validate your systems on site.

Training:

Do you need us to provide training for your employees on how to use the control system of your new machinery? Or is it a matter of optimising the processes on your new system? At its Technology Centres, Glatt runs regular training courses on specific themes. We would be happy to organise individual training courses for your company, to programmes worked out and laid down jointly with you. In-house training at your premises is also an option. In Binzen we can also arrange training under production conditions for your production personnel.

Glatt Technology Centre:

Concentrated in the Glatt Technology Centre is more than 50 years' experience in developing and optimising granulation processes. We work under GMP conditions and have at our disposal a top-class range of state-of-the-art machinery and plants. Clinical samples, scale-up under GMP conditions or complete development of a product using the latest technology - everything is possible at Glatt.



We set the standard

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