

# Cleaning and Disinfection Systems



Holistic solutions for  
safe cleaning and disinfection  
in central sterilisation facilities

### 1. Return flow from the operating rooms and stations

## 2. Manual cleaning and disinfection

### 3. Automatic cleaning and disinfection

#### 4. Testing and packing



UNCLEAN AREA

## CLEAN

Efficient preparation of medical products is of crucial importance for smooth and cost-effective processes in healthcare facilities. It is necessary to take into account requirements for hygiene as well as efficiency and quality.

Reliable preparation of sterile goods, as a decisive factor for the economic success of operating facilities, is to be understood as a complex overall concept that is more than the sum of its individual processes. MMM has been a successful partner for safe and cost-effective provisioning of sterile medical products for almost 60 years. We are the experts when planning, setup and technical management of all devices, processes and procedures in central sterilisation facilities are involved. We understand this task as calculation of the required device capacities according to needs, provisioning of all required

machines, validation of all processes in the CSSD, a process documentation system coordinated with all machines and comprehensive customer service.

In personal consultations, we develop solutions in which every detail is the perfect response to the particular needs of our customers. We make our contribution to ensuring that the CSSD can meet the high quality standards.

In this way we create value. The consistent MMM concept supports you in maintaining your facility through careful treatment of the valuable instruments and medical products. Ergonomics and protection of personnel and patients are an expression of respectful treatment of the people involved. An optimised workflow and aesthetically appealing machines make work more enjoyable.

## 5. Sterilisation

## 6. Monitoring of the sterilisation process

## 7. Issuance to ORs and stations

## 8. Transport to the ORs and stations




### **Sustainable by design: durable and resource-efficient.**

MMM products are distinguished by their relevance throughout the complete product life cycle. The combination of industrial production and solid workmanship with a high level of production depth "Made in Germany", as well as sophisticated control systems, ensures that the highest requirements are met. Top quality materials are used at MMM on state-of-the-art machinery. Qualified staff and process-oriented quality assurance guarantee consistently high standards. Continuous product development and upgrade packages for older machines ensure that MMM devices always remain up to date. A real investment in the future.

It is a matter of course that all MMM WDs fulfil all quality-relevant requirements and correspond to the newest standards (such as the standards series DIN EN ISO 15883 and guidelines that authorise use of the CE symbol).

The MMM sustainability concept protects the environment even in everyday business operations. To conserve the precious resource of water, MMM devices can be equipped with energy and media recovery systems which reduce the consumption of cold and demineralised water by as much as 20%.



## Wet zone

### Manual cleaning

Successful sterilisation requires correct cleaning and disinfection. In order to fulfil the high quality requirements in the CSSD, the most suitable solution is validated automatic processes. This is the only way that a consistently high level of sterile goods supply can be ensured and verified.

Surgical instruments with complex geometry are increasingly being used in the operating room. Many manufacturers thus stipulate manual pre-cleaning. That's the only way to ensure that contaminated soiling is reliably removed from everywhere on jointed instruments and hollow parts. At the same time, careful manual handling of valuable tools better maintains their value.

MMM's systoCLEAN concept corresponds to the newest guidelines. It offers ergonomic cleaning table counters for a seamless manual pre-cleaning workflow in the unclean area.

In combination with the integrated ultrasonic cleaning sink Ultramatic, even stubborn soiling on surgical and microsurgical instruments can be removed, and hard-to-access locations can be reached.



## Well-designed cleaning table counters

### Hygienic workflow

- Various pre-cleaning sinks, ultrasonic sinks, sinks for final rinsing and corresponding fixtures ensure clean processes during manual pre-cleaning.
- Intelligent concepts protect staff from contamination.
- Ergonomics determines the design and layout.

### Fixtures in accordance with requirements

- Spray pistols with various attachment pieces
- Demineralised water pistol
- Compressed air pistol
- Stop valves

### Thorough ultrasonic cleaning

- Even dried-on substances are gently and reliably removed.
- Suitable as an independent cleaning method or as preparation for automatic cleaning.
- Gentle ultrasonic cleaning shortens exposure times and contributes to value maintenance of sensitive microsurgical instruments.
- Suppressed and FtZ-certified HF generator (made by Bandelin).

### Supplementary components for modularity and individuality

- For flexible and individual design of the wet zone, convenient base cabinets according to the ISO standard are available.
- Extraction via customer-provided exhaust air.
- Spray protection on a hinged wall mount or positionable over all sinks.
- Splash-protected additional lighting.



Ultrasonic sink with hand-operated drain valve and siphon as well as matching sieve trays and spacers.

# Evolution

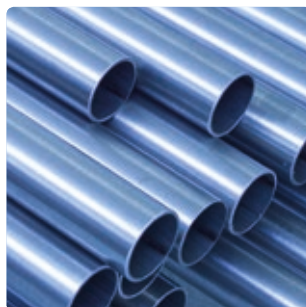
Development on the highest level

## ☐ Automatic cleaning and disinfection

In a well-functioning central sterilisation facility, cleaning and disinfection is the pivotal element for timely provisioning and delivery of a sufficient supply of sterile instruments to the operating rooms. In a very short period of time, large quantities of medical products must be reliably cleaned, disinfected and moved to the clean side of the CSSD in order to then be prepared for sterilisation.

Only a standardised, i.e. automated and validated process, can provide verifiable documentation about these processes.

Successful cleaning and disinfection processes consist of the complex interplay of intelligent process control, cleaning mechanisms in the chamber, coordinated use of the cleaning chemicals and loading in accordance with the specifications.





## Sophisticated design concepts

All components of the MMM cleaning and disinfection devices are manufactured from high-quality materials and with solid workmanship.

### Tailored design

- The compact design fits even into tight spaces.
- Depending on the application, available in a one- or two-door version.
- The highest degree of flexibility for transport into the facility.

### Complete ergonomics

- A loading height convenient for everyone.
- The EasyMove system allows baskets and carts to be moved with little effort.
- CoolTouch silicon grips prevent burns from hot baskets.

### Chamber and piping

- The chamber is manufactured from high-quality, polished stainless steel.
- The SANIcirc piping, which is free of dead space, stands for hygienically flawless and self-draining pipe routing.
- A central water distributor provides for optimal distribution of the volume flow between the machine rotary arms and the charge basket.

**MMM.**  
Protecting  
human  
health.

## The controller

The controller is the intelligent brain of the cleaning and disinfection device. The strings are pulled here; everything comes together in this unit. It controls the actual process sequence.

The sensors continuously provide the controller with information about the actual state of the de-

vice (temperatures, pressures, dosing of the process chemistry, water level, etc.) and control the desired values set during commissioning for the actuators such as valves, pumps and contactors.

All control components are located in one electrical cabinet (protection class IP 54).

### The software – a clever solution

- The MMM Software is validated as per DIN EN 62304 "Medical device software – Software life cycle processes".
- The sophisticated parameter structure enables a high degree of flexibility in the configuration of the machine. Up to 50 programs can be configured at the same time.
- If the unit is not used for a long period of time, an energy-saving idle mode is activated.

### Flexible parametrisation

- The number of process-relevant parameters enables wide-ranging setting options in order to make adjustment of the cleaning and disinfection process to current and future requirements possible. And all of this without changing the software. In this way all adjustment values extensively documented during commissioning remain effective.
- Access to the parameter menu is password-protected.

### Precise process regulation:

- The program sequence is controlled on a fully automatic basis. The actuators are precisely controlled, and all measured values are continuously monitored.
- Redundant sensors ensure the highest process reliability.
- The integrated  $A_0$  value calculator controls the thermal disinfection and documents the disinfection level actually achieved. At the same time, the charge times are shortened and the energy consumption is reduced.
- If required, the process can also be time- and temperature-controlled with additional documentation of the  $A_0$  value.

### Double the safety through process parameter verification (PPV)

- The PPV system verifies and documents the most important process parameters with control-independent sensors. If the limit values are exceeded or undershot, an alarm is triggered and the unit is stopped. It is then impossible to remove items on the clean side.



## □ Making work easier: MMM Smart HMI

The human-machine interface is only one component of the MMM concept for making the work of the operating personnel easier. The MMM visualisation of the navigation using the colour touch display is designed in friendly colours and unambiguous symbols and text. All process-relevant informa-

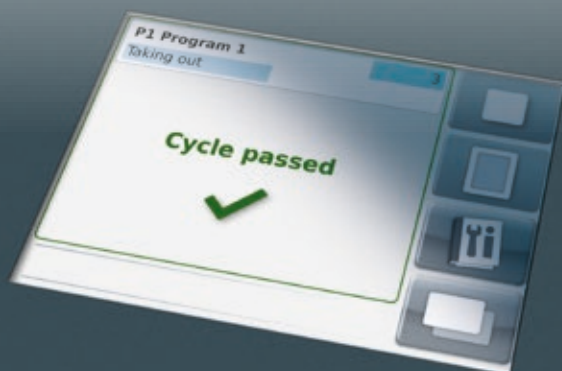
tion, such as device status, process step, values and graphs, is available at a glance on the display. The remaining time of the program is displayed on both sides of the machine in numbers that can be viewed from a distance, allowing the workflow to be optimised without waiting times.

**MMM Smart HMI:**  
Small, finely crafted, ergonomic  
and intuitive to operate

- The clearly structured menu navigation on the colour touch display with unambiguous symbols provides for high operational reliability.
- Impeccably hygienic: The 5.7" display is seamlessly integrated in the glass panel and easy to clean.
- This three-colour chamber lighting indicates the current operational state.
- The large remaining time display enables optimal time management.
- Who did what, and when did they do it? AuditTrail allows all user actions to be documented.

**Barcode scanner:**  
Automatic, reliable, documented

- Barcode reading system with program pre-selection. Automatic barcode detection ensures that the right program corresponding to the items to be cleaned is always selected.
- In conjunction with a documentation system such as EcoSoft, all process steps are automatically documented in accordance with the items to be cleaned.



## □ Clear process documentation

To verify successful cleaning and disinfection, the batch data is initially saved locally in the device. At least 15,000 batches can be saved on the plug-in compact flash memory card. The process documentation contains all the relevant information required for standard-compliant documentation:

For long-term archiving, the batch data can be

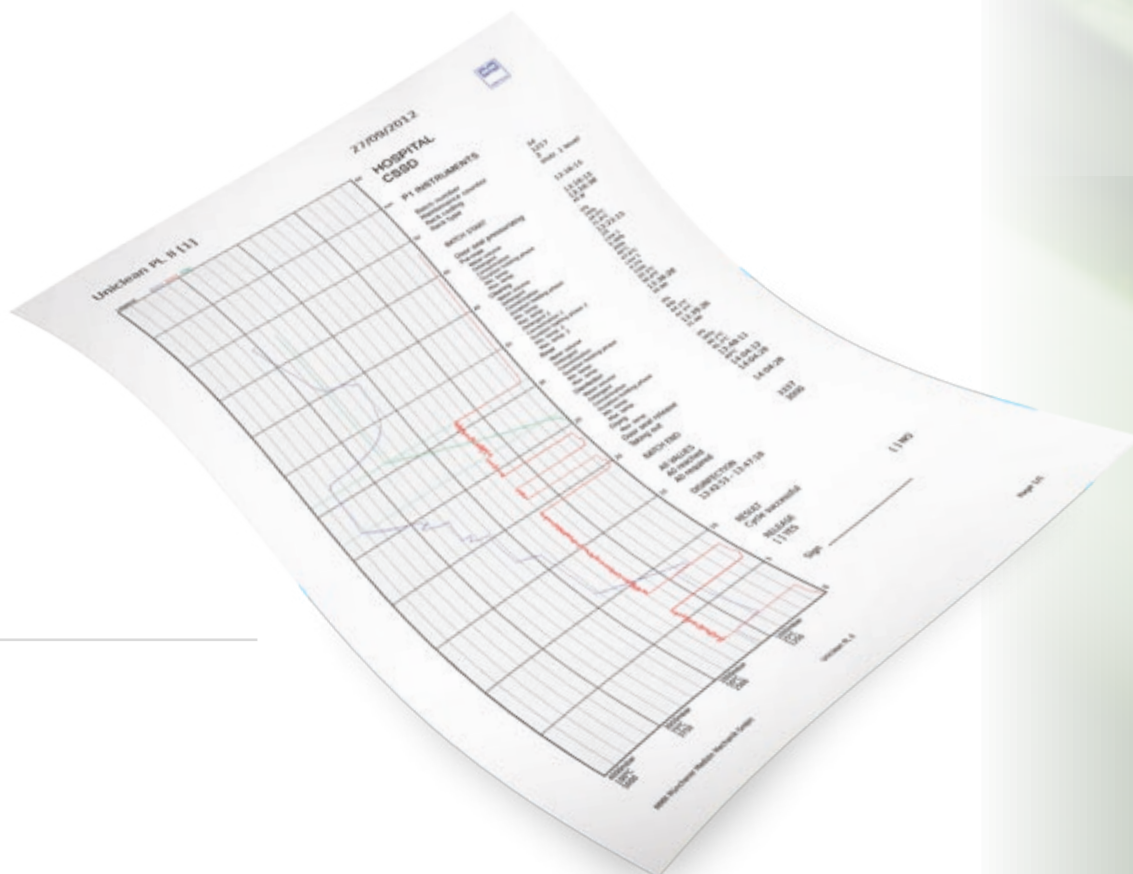
transferred to an external PC using an on-site network. Nothing will be lost in the process. In the event of a power failure, files are automatically transferred as soon as the network is up and running again.

### Everything at a glance:

- Process log with plain text and colour graph display.
- The batch log shows the following information in plain text: Program name, batch number, water and air temperature,  $A_0$  value, concentration of the process chemistry, pump pressure, conductance value, start and end of the process, and the individual process steps.
- The temperature trend of water and air, the  $A_0$  value trend, the pump pressure, and the temperature of the pre-heating tank over time are simultaneously shown as a coloured curve.

### Clearly arranged and including a backup function

- The batch log can be printed out using the integrated printer or an external DIN A4 colour printer.
- Long-term archiving of batch data as files.
- Can be reprinted at any time.
- Interfaces to the MMM EcoSoft documentation system as well as to other commercially available systems.





## Resource management

We protect people – as well as the environment. That's why we designed our cleaning and disinfection

devices to use little energy and water and to reclaim the energy used.

### Low freshwater consumption

- Due to the elaborate interplay of the nozzle system, rotary arm geometry and pump pressure, our cleaning devices consume very little water – without compromising cleaning performance.

### Reduced demineralised water consumption

- With the demineralised recovery tank, the demineralised disinfection water of the last rinse bath is stored and used for intermediate rinsing in the next program sequence. That saves time and energy as well as up to 20% of the demineralised water.


### Heat is energy

- The combination of fresh air and circulating air drying ensures maximum heat usage in the machine and works like an energy store.

### Environment and material

- MMM products are environmentally friendly and recyclable: All components are low in toxic substances and can be returned to the material cycle in recycled form.





## Uniclean PL II

### One-chamber cleaning and disinfection device

The Uniclean PL II is MMM's most powerful cleaning and disinfection system and was developed for thorough preparation of large quantities of medical products such as general surgical and MIC instruments, anaesthesia materials, ophthalmological instruments, instruments for dental surgery, containers, receptacles, bowls, basins, OR footwear and other utensils. The innovative one-chamber machine can accommodate 15 DIN trays.



## Perfect cleaning and disinfection performance

4D cleaning system

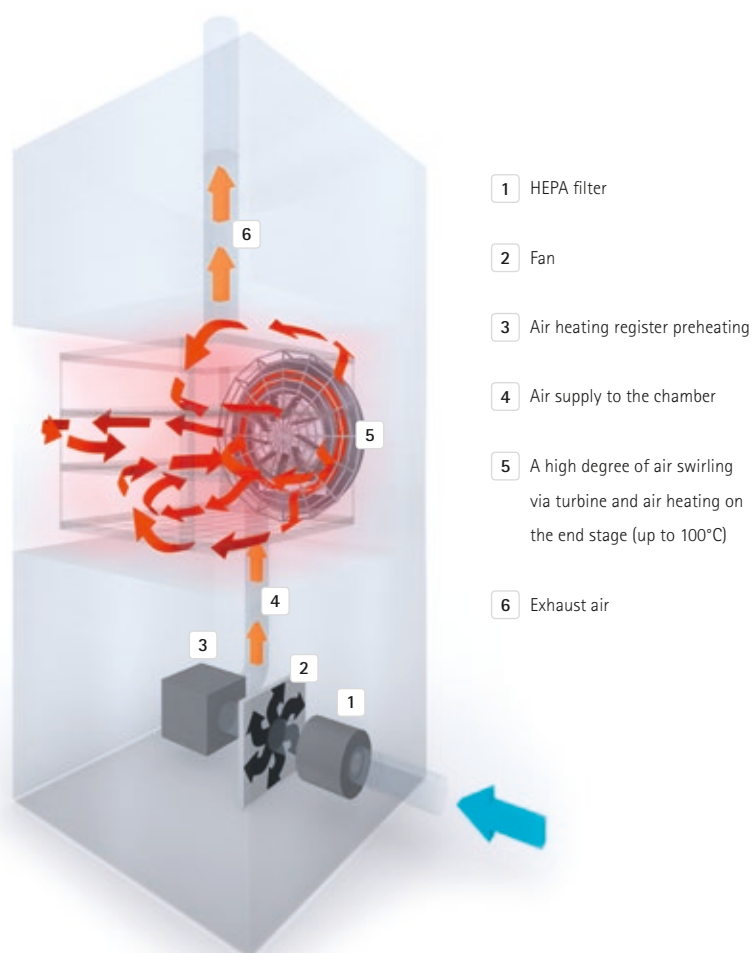


- The 4D cleaning system developed by MMM stands for an all-encompassing spray pattern effective from above and below. The pump pressure, which is optimally matched to the water volumes and process chemistry, distributes the water evenly to all four consumers (two rotary arms in the chamber, two JANUS basket connections).
- The elaborate cleaning geometry and the interplay between the machine and basket allows all external and internal surfaces of the items being treated to be optimally reached and wetted.

H-Flow drying system



- The two-level high-performance drying system consists of two heating elements, a fresh air fan with a HEPA filter and a fan installed in the chamber side. The horizontally swirled airflow allows the hot air to directly reach all levels of the baskets.
- The high degree of hot-air circulation in the chamber allows the existing heat to be stored and greatly accelerates the drying process.
- Impeccably hygienic: The integrated air turbine and the heating elements are cleaned and disinfected in every process.





## Intelligent water management

Water quantity adapted to  
the items to be treated

- The controller optimally adjusts the water fill level to the items to be treated: for example, reduced water requirements for instrument containers with plain surfaces and increased water requirements for anaesthesia sets with many connections for which assurance is needed that they were reliably rinsed out.

Water quantity adapted to  
the process phase

- Not every process phase requires the same amount of water. That's why the fill volume is adjusted to the respective phase.

Short batch times

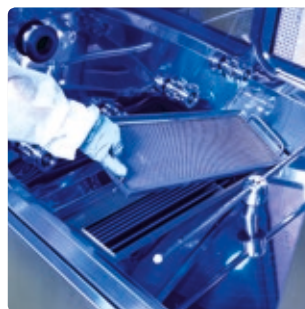
- Thanks to the low water volume, the rinse bath is quickly heated and the chamber can be more quickly filled and drained. At the same time, the consumption of cleaning chemicals is reduced.



## Ergonomics

### Making daily work easier

- The rotary arms must be cleaned on a regular basis. For this reason they are readily accessible and easily removed.
- For daily cleaning, the chamber's fine filter can be removed without tools.



### Dosing of the process chemistry

- The process chemistry can be dosed at several levels depending on the temperature.
- At least two dosing pumps with flowmeters are available for monitoring.
- The dosing system, including the cleaning agent canister, is securely stored in an integrated draw-out drawer.

### Great serviceability

- The service-friendliness of the unit was considered already during the design phase. All important components are clearly arranged and accessible from the front.
- Plug connections make it easier to replace the measuring probes.
- Heavy components such as pumps and fans are mounted on sliding systems for installation and removal that do not cause back strain.







## Modular, versatile and practical: The loading baskets

The cleaning result of a WD largely depends on the design and proper loading of the loading baskets. That's why MMM developed baskets that take into account the special features of the respective items to be treated. The slide-in baskets can be neatly equipped with a variety of module attachments for various utensils. The modular concept does not just reduce procurement costs for as many different baskets and individual situations as possible; it also provides for space and clear arrangement in the prep zone.

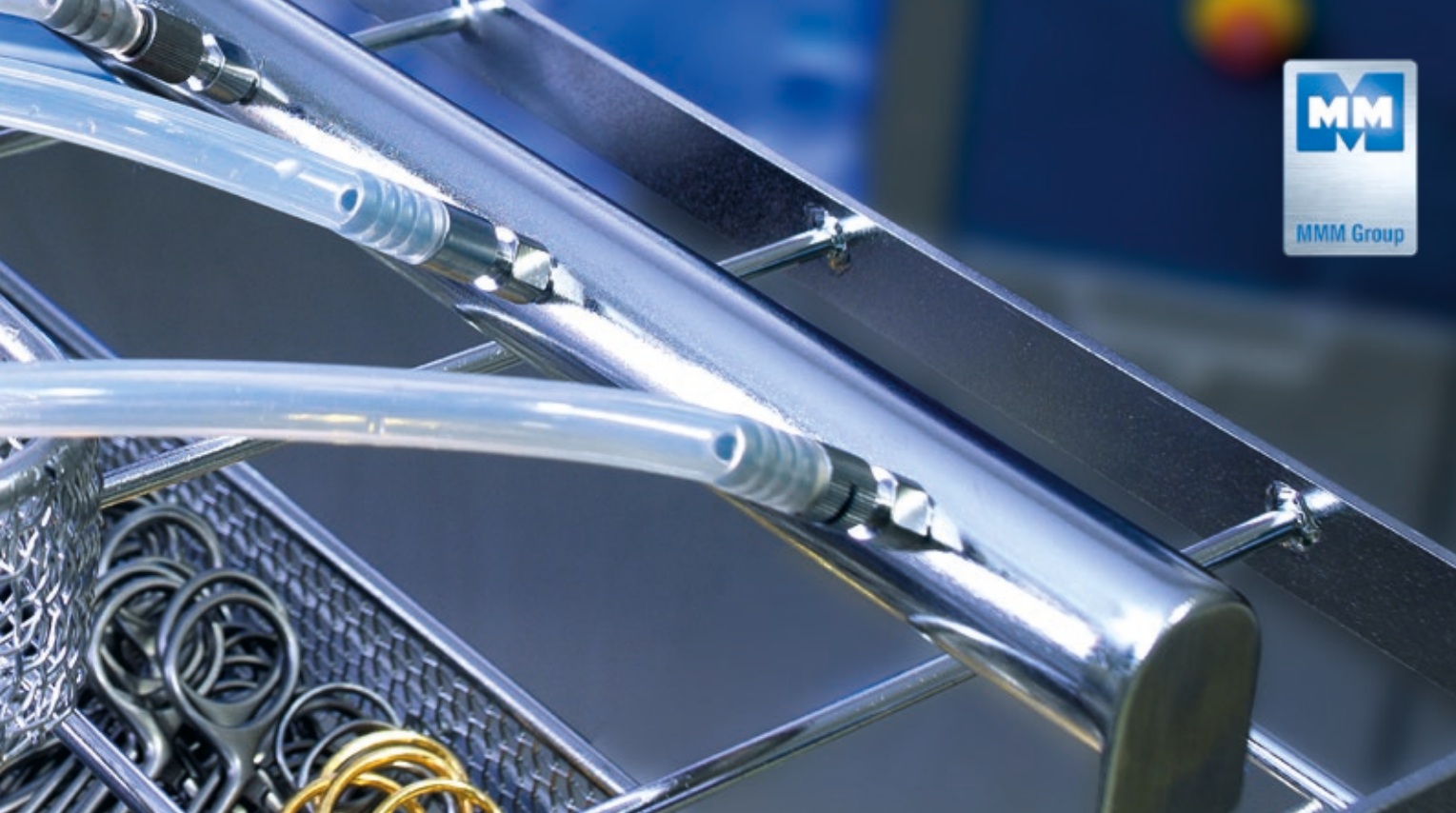
For seamless documentation, each basket can be equipped with its own ID number encrypted as a barcode read by a barcode reader device as the basket enters the chamber and documented in the batch log.

### Perfect handling

#### Ergonomics first.

- To make the handling as pleasant and safe as possible, the loading baskets are open on all four sides and can be conveniently loaded from all sides.
- The practical design of the loading baskets ensures correct and safe loading.
- Fully loaded baskets can quickly reach a weight of up to 150 kg. That's why our baskets are particularly sturdy and torsion-resistant. Thanks to the groove-guided Easy-Move rollers, the baskets can be pushed into the chamber and precisely positioned with little force.
- The rubberised CoolTouch grips can be attached in different ways. They prevent users from burning themselves on the hot baskets during unloading.





#### JANUS system

- The mirror-image arrangement of the basket connections enables uniform pressure and water distribution to all of the basket's consumers.
- The JANUS system also features the highest degree of loading flexibility, because the baskets can also be inserted into the chamber turned by 180°.
- The various attachments and connections ensure perfect spray coverage both inside (hollow parts) and outside.



The image shows a large, industrial-grade cleaning machine with its door open, revealing a blue interior with multiple vertical spray nozzles. To the right of the chamber is a control panel with a digital display showing '3', a red emergency stop button, and various status indicators. The machine is made of stainless steel and is set against a light blue background.

## Uniclean ML

### Large chamber cleaning and disinfecting system

Uniclean ML stands for state-of-the-art technology, the best possible cleaning results and the most convenient operation for cleaning and disinfection of large-volume items in hospitals. The system demonstrates its versatility in its various loading options: transport carts, instrument containers, OR footwear, plastic containers, bowls, emesis basins, OR tables and even instruments.

The machine operates in conformance with DIN EN ISO 15883 and DIN 58955.



## Our motive: Sustainable machine design

### The best cleaning results:

- 176 nozzles pivot and spray in a range of 90° on vertically attached nozzle pipes, thus providing for intensive and comprehensive wetting of the items being washed.
- This allows a high degree of mechanical cleaning effectiveness to be achieved even in hard-to-reach places.
- For mechanical cleaning effectiveness, the Uniclean ML has a generously dimensioned recirculation pump that generates a steady high pressure and constantly high volume flow.

### Hygienically designed:

- **SANlcirc:** the entire piping that touches the product is self-draining due to the slanted pipe routing. This design with very little dead space prevents all formation of residue and microbial contamination from the outset.
- No rubber: Hoses are usually made of a material that is not chemically resistant on a permanent basis, and this can lead to detachments that can cause stubborn soiling of the items being treated. That's why Uniclean ML has no hose connections.
- After every program step, the nozzle system and the chamber are completely drained. This prevents dirty water from being carried over into the next process step.
- In order to make it easier for remaining water to flow off the treated items, the chamber base is tipped at the end of the batch.
- No dirty edges: The control panel is seamlessly integrated in the glass front and easy to clean.

### Fast drying

- The **SECOspeed** drying system consists of a powerful medium-pressure fan for air circulation, a perfectly dimensioned air heating register for fast heating of the air and a HEPA filter for filtering the fresh air.
- The ingenious combination of fresh air and recirculating air results in outstanding drying results in a very brief period of time.
- The recirculation air process also saves energy for heating the drying air.
- If it's clean, it doesn't need to be filtered: The entire drying unit is lined with stainless steel and food-grade materials. That means the recirculating air does not need to be filtered.

### Space- and process-optimised tank system for shorter batch times:

- The tanks fulfil two functions at the same time: First, they pre-heat and pre-dose the process water, and second, they store the returned process water.
- Reuse of the process water means you save three times over: water, energy and process chemicals.
- Every detail of the tank construction fulfils a beneficial purpose: The stainless steel equipment is especially hygienic, the large lines between the tanks and the chamber provide for fast filling of the chamber, and the analogue level control in the tanks enables individual adjustment of the returned water quantity to the customer's specific situation.

## □ Great serviceability

### Service-friendly

- Large filter surface: When treating OR footwear, for example, so much lint accumulates that it can be necessary to clean the fine filter after every batch. That's why the Uniclean ML is equipped with an especially large filter surface, allowing it to go for longer between fine filter cleanings.
- The fine filter must nevertheless be cleaned at least once per day. This is especially simple with the Uniclean ML: It is located in the chamber and easily accessible. It can be removed and cleaned without tools by every trained operator.
- All components are arranged on the side of the chamber and can be easily reached through the collapsible device cover.
- Individual components can be easily replaced, since the machine components are modularly arranged and the measuring probes are provided with plug connections.
- All electrical components are installed in a clearly arranged and tidy manner in just one electrical cabinet of protection class IP 54.





# Customised loading

## The loading carts

The right loading cart for every application: the loading carts of the Uniclean ML are equipped with all equipment that makes it easier to correctly load containers, OR footwear and other utensils. This is important because optimal cleaning results can only be achieved if the items to be cleaned are correctly placed on the cart.

### ☐ Perfect handling

#### Modular loading cart concept

The Uniclean ML is available for individual capacity requirements in different sizes with a length of 1500 mm or 750 mm.

#### Loading combinations

The combination of the different loading carts enables perfect capacity utilisation:

#### Uniclean ML 3120

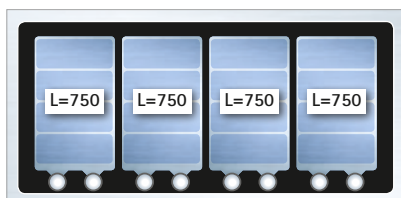
Effective chamber length 3100 mm

Effective dimensions in mm  
900 x 2000 x 3100 (W x H x L)

External device dimensions in mm  
2300 x 2000 x 3500 (W x H x L)



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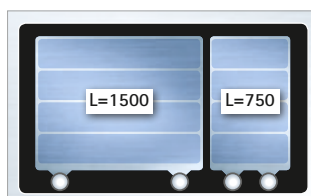


#### Uniclean ML 2220

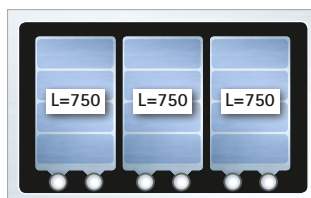
Effective chamber length 2200 mm

Effective dimensions in mm  
900 x 2000 x 2230 (W x H x L)

External device dimensions in mm  
2300 x 2500 x 2630 (W x H x L)

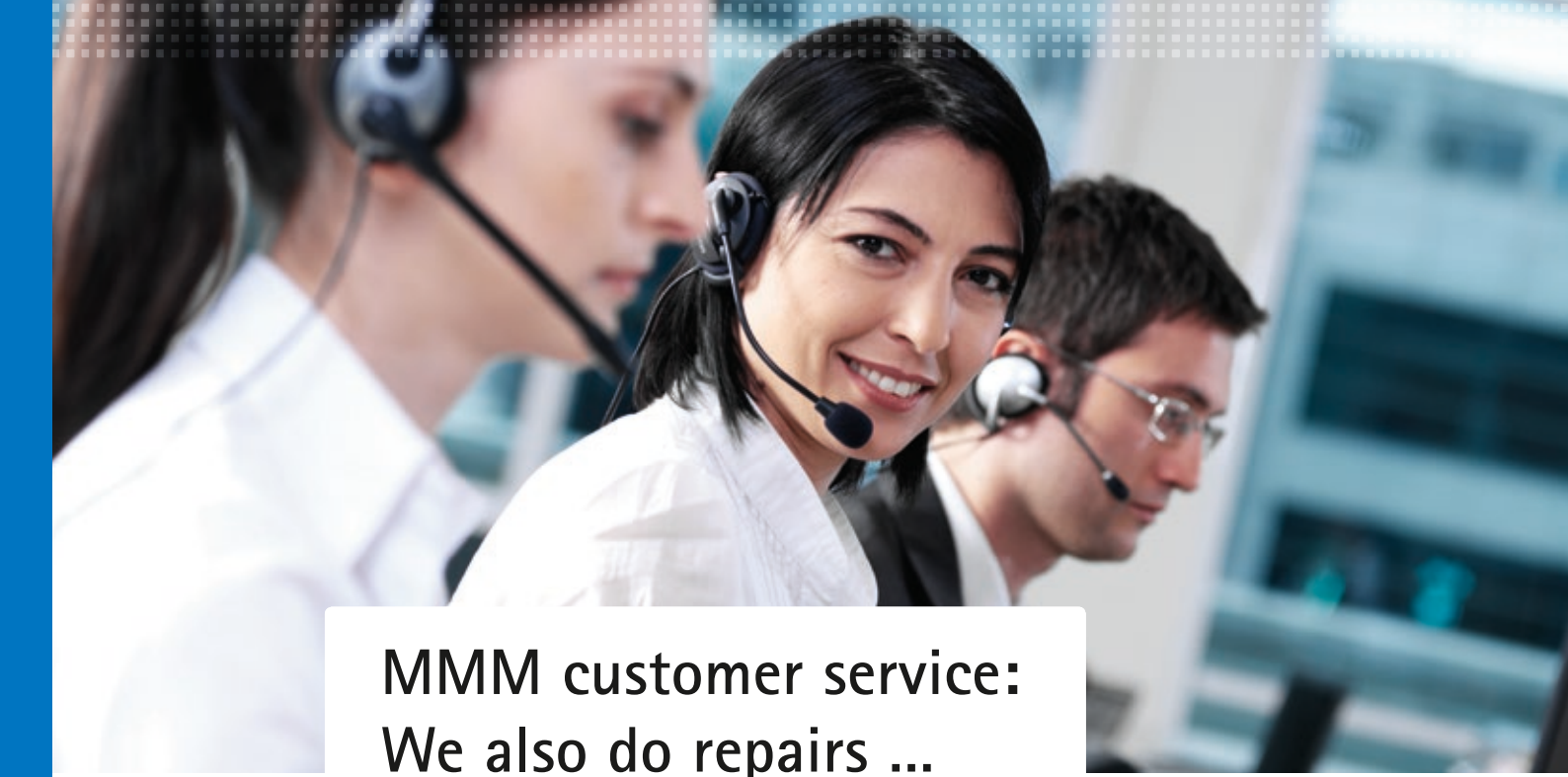


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Technical specifications subject to change without notice.

**MMM.**  
Protecting  
human  
health.

A photograph of three call center agents wearing headsets. A woman in the foreground is smiling at the camera, while two other agents are visible behind her, focused on their work.

## MMM customer service: We also do repairs ... ... but that's not all.

Our knowledgeable service organisation is available to you around the clock, ensuring long-lasting, trouble-free operation of the installed systems. Thanks to our branches and representative offices optimally distributed throughout Europe, we are always nearby and can very quickly be on site in an emergency.

The sophisticated and innovative design of our systems and devices makes it possible in many cases to quickly rectify functional impairments with a remote diagnosis by qualified personnel. On the basis of professional maintenance planning, we guarantee you the highest degree of availability of your systems.

— **Inspection and maintenance**

— **Maintenance planning**

— **Repair**

— **24-hour hotline**

— **Spare parts logistics – 24-hour service**

— **Upgrade service**

— **Process validation**

— **MMM complete service for**

- All in-house products
- WDs of various manufacturers
- Gas plasma sterilisers (service partner of ASP)

It is our goal, however, to ensure that no problems occur. We do not hand over the systems to you until everything is running flawlessly, all programs have been validated and accepted in accordance with your individual items to be cleaned, and the operating personnel have been trained in the use of our systems.

In addition to performing maintenance and repair, we also make sure that the installed systems are up-to-date. With tailored solutions for adaptation to changed situations, for optimisation of consumable materials and for continuous adjustment to individual needs and legal requirements, the service life and cost-effectiveness of the systems are increased and the investment is secured.

**365 / 7 / 24**

We're there for you **365** days a year.

**7** days a week.

**24** hours a day.

**92 / 64 / 3 MMM customer service**

**92** service technicians just in Germany.

An average of **64** km to the customer.

At your side in no more than **3** hours.

## Europe's market leader in process validation.

MMM is your partner when you need to prove that your systems and processes are always consistent with the required specifications.

We offer a variety of packages for validation and preparatory measures such as calibration, adjustment and optimisation of the processes as well as the devices. Process validation by MMM is always according to the current guidelines of DGKH, DGSV

and AKI as well as in accordance with DIN EN ISO 15883 Part 1 and 2 if required. It's not for nothing that we are Europe's market leader, with more than 1000 process validations. More than 38 validation technicians with corresponding premium measurement equipment are available to you daily just in Germany.

### Validation from a single source

- Cleaning and disinfection processes
- Steam sterilisation processes
- Steam-formaldehyde sterilisation processes
- Gas plasma sterilisation processes
- Hot-sealing processes

**38 / 32 / 1000**

More than **38** validation technicians.

**32** premium measuring equipment sets.

More than **1000** process validations.





#### MMM Group

MMM has been operating worldwide as one of the leading system providers in the service of health since 1954. With a complete range of products and services relating to all aspects of cleaning, disinfection and sterilisation systems for hospitals, scientific institutes, laboratories and the pharmaceutical industry, MMM has positioned itself as a crucial quality and innovation driver in the German and international market. In our production plants in

Stadlern, Bavaria, and Brno, Czech Republic, we manufacture products adapted to the requirements of our customers throughout the world. Our two production sites allow us to achieve a high degree of production depth and thus meet the challenging quality requirements of the medical technology sector. A total of 900 employees apply their expertise and dedication to the mission of the MMM Group:

Protecting people.



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