

Washing · Disinfection · Drying
A systematic approach to the
reprocessing of laboratory glassware





A systematic approach to the reprocessing of laboratory glassware

Systematic instrument reprocessing solutions

With washer-disinfectors, special reprocessing methods and accessories tailored to the specific needs of applications, Miele offers a comprehensive and systematic approach to the safe and thorough reprocessing of a wide range of laboratory glassware. Only a systematic approach can guarantee reproducible results in both simple and highly sophisticated applications in organic, inorganic and physical chemistry, biology, microbiology, in hospital laboratories, and in the pharmaceutical, food-processing and cosmetics industries. Miele's team of specialists are always at hand to assist laboratory staff in arriving at tailor-made solutions.

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The wide-ranging benefits of the Miele System

Flexible and economical

- Washers-disinfectors with the capacity to meet all requirements
- Modular machine concept with basic features and optional extras
- Efficient single-chamber system for washing, rinsing, disinfecting and drying

Simple and intelligent

- Tried-and-tested standard programmes, innovative special programmes and programme packages
- Electronic controls offering excellent user convenience

Better be on the safe side!

- Serial interface for process documentation and optical interface for servicing
- Machines are built to comply with EN ISO 15883
- Automatic allocation of mobile unit/load to appropriate programme using sensors

Competent and innovative

- Intensive R&D and close cooperation with hygiene experts, scientists and users
- Trend-setting process development and technical features

All from a single source

- Miele offers its own advisory services and after-sales service network
- Qualification (Installation Qualification and Operation Qualification) of laboratory glassware cleaning systems
- Service contracts for peace of mind
- Attractive financing

Technical features vary according to the model

Practical experience combined with expertise Typically Miele



Manual v. machine-based reprocessing

Many laboratories have deliberately chosen to wash their laboratory glassware, e.g. beakers, pipettes, volumetrics and flasks, Erlenmeyer flasks, Petri dishes and test tubes, in a machine-based process. One reason for this is to avoid the risk of exposure to hazardous substances. Broken glass from manual cleaning, for instance, can cause dangerous injuries. Infectious and toxic contaminants pose a health hazard. Cleaning agents used often contain substances that are highly irritant. Automatic, machine-based processes are also more easily standardised, validated and documented. Because washer-disinfectors operate as a closed system with programmes that run fully automatically, the potential danger to laboratory personnel can be kept to a minimum. This, in turn, means that machine preparation provides personnel with maximum protection.

Laboratories use a wide variety of equipment made from glass, ceramic ware and plastic for testing and analysis, creating reactions, for isolating or cleaning substances and for taking samples, etc. Following on from this, cleaning and drying are essential. The cleaning process must ensure that equipment, when re-used, is not affected by its previous use. Requirements vary widely from one laboratory to the next. To establish which machines and accessories, cleaning agents, water quality and cleaning programmes best suit an application, the following aspects need to be considered:

1. Applications

Applications can be subdivided according to the field of science or industry (organic, inorganic or physical chemistry, biology, microbiology, hospitals, pharmaceutical, food or cosmetic industry laboratories, etc.) or according to methods (preparatory work, analyses, sampling). The type of application will also be an important factor in determining the type of machine and accessories as well as the cleaning process and cleaning agents required.

2. Laboratory machines

Laboratory equipment needs to be classified according to its various components (beakers, conical flasks, measuring flasks and cylinders, pipettes, Petri dishes, test tubes, phials, test tubes, etc.), and according to size and volume (1 ml, 500 ml, 1000 ml) and the number of items requiring processing. This information will enable us to provide a detailed quotation based on the right system for your requirements.



3. Contamination

An intimate knowledge of the physical and chemical attributes of the contaminants the machine will need to deal with is of particular importance in choosing the most appropriate cleaning process and detergents.

The physical and chemical properties of a contaminant include, for instance, its solubility in water in acidic, pH-neutral and alkaline conditions, the efficacy of hydrolysis or oxidation, melting and softening points, its ability to emulsify as well as a substance's suspension or dispersing properties.

4. Disinfection

For certain applications laboratory glassware has to be disinfected. On the one hand this protects laboratory personnel who come into contact with bacterial contamination at work. And on the other, disinfection prevents bacterial cross-contamination of test samples and instruments in medical laboratories, hygiene institutes and pharmaceutical laboratories in the food and cosmetic industry.

5. Analytical Methods

The results of analyses can be falsified by contaminants on laboratory glassware. A knowledge of these factors can help in selecting the correct cleaning agent.

6. Analytical purity

Each laboratory has its own definition of "analytical purity", depending on specifications and the nature and reproducibility of test methods. The washer-disinfector including all its accessories and the cleaning programme used must be able to achieve cleaning results that meet the standards required by the application.

Miele's systematic approach covers the following process stages

- Cleaning, disinfection and drying
- Baskets and inserts
- Water treatment
- Detergent recommendations
- Compilation and analysis of cleaning programmes
- Machine commissioning by Miele Service
- Qualification package: Installation Qualification (IQ) and Operation Qualification (OQ)
- Peace-of-mind package including maintenance and service contracts







G 7825 and G 7826 washer-disinfectors

The G 7825/G 7826 series was designed with the requirements of larger laboratories in mind. With a width of only 900 mm, these machines are the ideal proposition in cases where space is at a premium. Depending on the installation site and hygiene requirements, machines are available as single-door front-loading models (G 7825) or as two-door barrier machines (G 7826) for installation in a diaphragm wall.

Flexible solutions for the central and decentral reprocessing of laboratory glassware

Miele's G 7825 and G 7826 washer-disinfectors offer a wide range of installation options, tailored individually to the needs of laboratories. This allows units to be installed both centrally in special departments dedicated to glassware reprocessing or decentrally in smaller laboratories, depending on the volume of glassware.

Wide range of standard functions and optional extras

Miele's modular approach to its G 7825 and G 7826 washer-disinfectors, with a comprehensive set of standard features and the option to customise by adding optional extras, offers a high degree of flexibility to meet specific on-site conditions and hygiene regimes. The sliding plinth/drip tray for the G 7825 has proved to be a huge benefit to service technicians. To simplify handling laboratory glassware, Miele recommends the use of the MF/3 Miele transfer trolley.

Miele quality – “Made in Germany”

All components subscribe to Miele's uncompromising quality standards. The cabinet, hydraulic circuit and the sump are made from high-grade stainless steel. Two stainless-steel spray arms ensure improved water circulation and perfect cleaning results. The heater elements are located outside the cabinet to ensure virtually maintenance-free operation. A double-skin construction reduces heat and sound emissions and guarantees low energy consumption. All machines are available with electric or steam heating and as a convertible steam/electric version. Miele washer-disinfectors feature highly sophisticated solid-state controls to control and monitor process parameters. These are a product of Miele's own in-house development and production expertise and are closely geared to the highly specific requirements of glassware reprocessing.

| Specifications Washer-disinfector | Unit width/depth | Doors | Cabinet Useable dimensions H/W/D Inner cabinet – Useable volume | Capacity per batch |
|--------------------------------------|------------------|-----------------------|---|---|
| G 7825/G 7826 | 900/750 mm | Bottom-hinged door(s) | 683/541/610 mm 225 l | 108 narrow-necked glasses or 104 pipettes |
| PG 8527/PG 8528 | 1150/870 mm | Vertical-rise door(s) | 675/650/800 mm 351 l | 232 narrow-necked glasses or 232 pipettes |

Machine features and specifications



G 7825



G 7825

Versions

- G 7825: Front-loading unit with single bottom-hinged door
- G 7826: Two-door barrier washer-disinfector for installation in a diaphragm wall

Capacity per batch

- 108 narrow-necked glasses or 104 pipettes

Design

- Stand-alone or side-by-side installation
- Width 900 mm
- Modular approach with customised features to meet individual requirements
- Single-chamber system for washing, disinfection and drying
- Service-friendly design
- Heater elements outside inner cabinet
- Low heat and sound energy dissipation thanks to double-skinned design



Miele quality – “Made in Germany”

For many decades now, Miele washer-disinfectors have represented an integral part of quality assurance in laboratories. Miele washer-disinfectors offer uncompromising quality and offer users maximum benefits in terms of hygiene, safety and economy.

Standard machine features



Cleaning technology

- Hygienic freshwater system with fresh water intake for each programme stage
- Cleaning, disinfection and drying in a closed-circuit system
- 2 spray arms in cabinet for thorough cleaning of external glassware surfaces
- Spray arms with high jet impact force
- Full water jet access, ensuring optimum results
- Direct docking of upper baskets to water circuit for maximum utilisation of wash liquor
- Thorough cleaning of lumens with injector system

Standard features

- 2 high-performance circulation pumps
- Triple filtration with large surface filter, coarse filter and micro-fine filter
- Filters in inlet hoses
- Flowmeter to monitor water intake quantities
- 1 drain valve

Dispenser systems

- 2 dispenser pumps for liquid detergent and neutralising agent

Controls

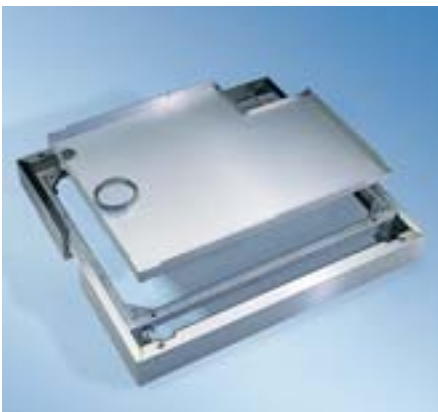
- Freely programmable PROFITRONIC controls
- 64 programme slots with 17 standard washing and disinfection programmes
8 service programmes
39 vacant programme slots
- User navigation with local-language display
- Display of programme selection and programming dialogs, programme sequence, temperature, countdown time, faults, operating hours.
- Compilation of new programmes using machine controls or using PC/laptop via optical interface
- Serial RS 232 interface for process documentation
- Optical interface for service and maintenance

Safety features

- Electric door lock
- Programme safety cut out
- Peak-load negotiation
- Optical and acoustic signal at end of programme
- 2 sensors, 1 each for temperature control and monitoring
- Port for simple positioning of sensors in the wash cabinet for process validation
- Sensors in cabinet and a magnetic strip on mobile units for automatic allocation of loads/inserts to programmes

Modular machine concept

Optional extras



Plinth/drip tray

For installation without on-site plinth

- Frame with built-in drip tray
- Cut-outs for supplies and utilities
- Continuous diaphragm-wall panelling can be provided on site when multiple machines are installed in a run.
- Plinth with castors for easy servicing and maintenance access on G 7825.

Cabinet

- Boiler for demineralised water

Dispensers

- Max. 2 additional integrated dispenser pumps (retrofitable)

Water softener

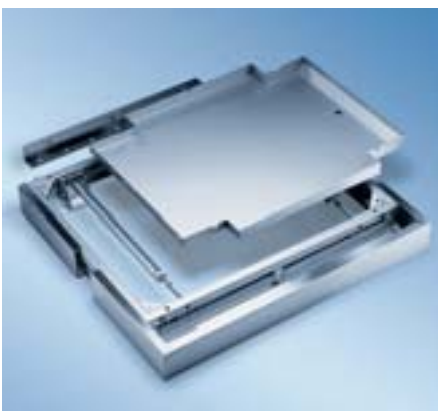
- High-capacity water softener (external)

Drainage

- 2 drain pumps

Steam condenser

- Steam condenser (heat exchanger). No water consumption when connected to on-site cooling water circuit





Drying unit

- 2 hot-air drying units (electrically heated)
- Low-maintenance 3-phase motors with side-channel compressor
- Temperature selectable, 60–115°C
- Time freely adjustable, 1–240 mins.
- 2 pre-filters Class EU 4, filtration rate >95% filter life 200 hours
- 2 x 2 particulate filters H 13, filtration rate >99.992%, filter life 500 h

Printer

- Integrated 6-pin printer to record key process parameters

MAV 25/26 top-box panelling

- Stainless steel cladding with lockable service hatches to conceal steam condenser/drying unit
- Ventilation grille on the unclean side
- Panelling between top box and ceiling must be provided on site.
- H 430, W 900, D 750 mm

Mieltransfer MF/3

- Trolley to simplify the handling of mobile injector units
- Footswitch-operated height-adjustment mechanism
- 4 lockable wheels
- H 1182, W 600, D 807 mm, +/- 100 mm
- Docking height 751 mm, +/- 100 mm

G 7825/7826

E 741/1 mobile unit and modules for laboratory glassware



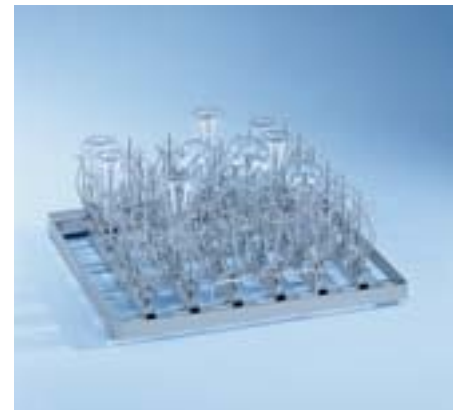
E 741/1 mobile injector unit (empty)

- For modules on 1–4 levels
- Depending on the size of the glassware up to 3 modules can be accommodated
- Water and drying air enters via a direct docking system and adapters
- Loading height:
 - Level 1 to top: 605 mm
 - Level 2 to top: 405 mm
 - Level 3 to top: 267 mm
 - Level 4 to top: 197 mm
- Connection for hot-air drying unit
- Magnetic strip for automatic mobile unit recognition (excl. ML magnets)
- H 680, W 530, D 600 mm



E 742 module

- Module frame with spray arm
- H 112, W 492, D 496 mm



E 743 injector module

- For narrow-necked glassware, 100–500 ml
- 36 nozzles (E 351), 4 x 160 mm with clips (E 353)
- H 190, W 492, D 496 mm



E 744 injector module

- For narrow-necked glassware, 500–1000 ml
- 16 nozzles (E 352), 6 x 220 mm with clips (E 354)
- H 250, W 492, D 496 mm



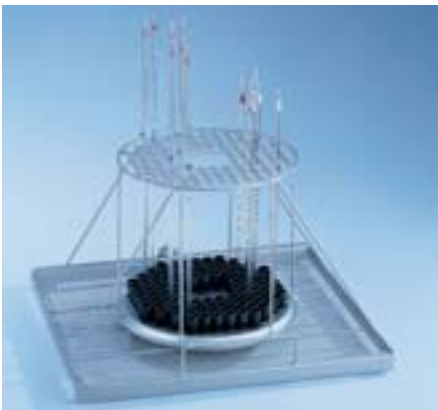
E 752 injector module

- For narrow-necked glassware, 100–1000 ml
- 12 nozzles (E 351) 4 x 160 mm with clips (E 353)
- 13 nozzles (E 352) 6 x 220 mm with clips (E 354)
- H 260, W 492, D 496 mm



E 755 injector module

- For narrow-necked glassware, 25–100 ml
- 36 nozzles (E 470), 2.5 x 90 mm, with holders
- H 130, W 492, D 496 mm



E 745/1 injector module

- For 104 pipettes up to 540 mm
- Holder frame
- Compartment size 16 x 16 mm
- H 288, W 492, D 496 mm



E 746 injector module

- For 23 pipettes held diagonally
- For 10 pipettes up to 560 mm and
- 13 pipettes up to 490 mm
- Holders spaced 20 mm or 26 mm apart
- H 330, W 492, D 496 mm



E 747 injector module

- 104 injector nozzles for centrifugal tubes, phials and test tubes, fraction sampler tubes
- 104 nozzles, 2.5 x 110 mm
- H 168, W 492, D 496 mm

Load samples E 741/1 with modules



Sample load E 741/1 mobile injector unit (with drying unit connection)

- With E 744 injector module for narrow-necked glassware, 500–1000 ml on Levels 1 and 3



Sample load E 741/1 mobile injector unit (with drying unit connection)

- With E 742 module frame and E 106 and E 109 inserts for wide-necked glassware, measuring beakers and glasses on Level 1
- With E 744 injector module for narrow-necked glassware, 500–1000 ml on Level 2



Sample load E 741/1 mobile injector unit (with drying unit connection)

- With E 743 injector module for narrow-necked glassware, 100–500 ml, on Levels 1, 2 and 4



Sample load E 741/1 mobile injector unit (with drying unit connection)

- With E 747 injector module for centrifuge tubes, etc. on Levels 1 and 4
- With E 743 injector module for narrow-necked glassware, 100–500 ml on Level 2

G 7825/G 7826

mobile unit with 2–5 levels



E 757 mobile injector unit
(with drying unit connection)

- For 1–6 large-volume items of laboratory glassware
- 6 nozzles
- Height-adjustable frame with 6 short and 4 long rails. Rails can be adapted to diameter of glassware.
- Connection for hot-air drying
- Magnetic strip for automatic mobile unit recognition (excl. ML magnets)
- H 346, W 530, D 600 mm



E 775 mobile unit
(with drying unit connection) (empty)

- For inserts on 2 levels
- Integrated spray arm Loading dimensions from bottom upwards
Level 1: H 304, W 482, D 590 mm
Level 2: H 290, W 488, D 546 mm
- Connection for hot-air drying
- Magnetic strip for automatic mobile unit recognition (excl. ML magnets)
- H 400, W 530, D 600 mm



E 735/1 mobile unit
(with drying unit connection) (empty)

- For inserts on 3 levels
- 2 built-in spray arms
- Loading dimensions from bottom upwards
Level 1: H 203, W 482, D 590 mm
Level 2: H 203, W 488, D 546 mm
Level 3: H 133, W 488, D 546 mm
- Connection for hot-air drying
- Magnetic strip for automatic mobile unit recognition (excl. ML magnets)
- H 552, W 530, D 600 mm



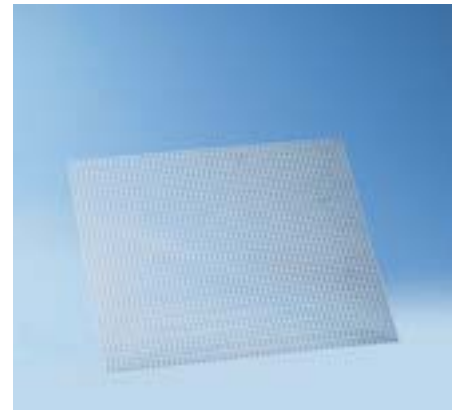
E 701/1 mobile unit
(with drying unit connection) (empty)

- For inserts on 4 levels
- 3 built-in spray arms
- Loading dimensions from bottom upwards
Level 1: H 87, W 482, D 590 mm
Levels 2 and 3: H 87, W 488, D 546 mm
Level 4: H 223, W 488, D 546 mm
- Loading dimensions with E 702:
Level 4: H 87, W 488, D 546 mm
Level 5: H 81, W 488, D 546 mm
- Connection for hot-air drying
- Magnetic strip for automatic mobile unit recognition (excl. ML magnets)
- H 461, W 530, D 600 mm



E 702 top insert for E 701/1

- Level 5 for 2 further inserts
- H 160, W 530, D 560 mm



A 7/1 insert

- Perforated sheet-metal base
- Perforations 7 x 7 mm
- Ridge 3 mm
- For use with E 775, E 735/1 and E 701/1
- H 1, W 543, D 473 mm



PG 8527 and PG 8528 washer-disinfectors

New value-added approach to reprocessing laboratory glassware

For more than four decades, Miele Professional has been at the cutting edge with respect to the efficient and safe machine-based reprocessing of laboratory glassware. The PG 85 generation of lab washers now ushers in a new era in glassware reprocessing. When it comes to de-central and central reprocessing of large quantities of laboratory glassware, the new PG 8527 and PG 8528 washer-disinfectors offer great value-added benefits: Improved cleaning capacity, improved process security and greater economy.

Perfect quality and patented innovations – Typically Miele

PERFECT TOUCH CONTROL: Simple and reliable controls using a flush glass display. Modular controls with a versatile range of extension options to meet future requirements.

PERFECT VISION: All-glass vertical-rise doors and integrated cabinet lighting provide a clear view of cleaning progress inside the cabinet and enable simple process supervision.

PERFECT SPEED SENSOR: A sensor strip outside the cabinet monitors spray arm speeds and compares them with target values to ensure functional safety.

PERFECT PURE SENSOR: Contact-free conductivity measuring and monitoring of wash liquor. Unique process with low tolerance bandwidth to ensure residue-free final rinse.

PERFECT FLOW SENSOR: Standard, integrated metering system to ensure precise dispensing. Dispensed volumes are independent of temperature and viscosity.

PERFECT HEPA DRYING: Optimised air circuit with HEPA filter located directly upstream from the cabinet to ensure perfect hygiene in the drying cycle.

| Specifications Washer-disinfectors | Width/depth | Doors | Inner cabinet Useable dimensions H/W/D Inner cabinet volume | Capacity per batch |
|---------------------------------------|--------------------|------------------------------|--|--|
| G 7825/G 7826 | 900/750 mm | Bottom-hinged door(s) | 683/541/610 mm 225 l | 108 narrow-necked glasses or 104 pipettes |
| PG 8527/PG 8528 | 1150/870 mm | Vertical-rise door(s) | 675/650/800 mm 351 l | 232 narrow-necked glasses or 232 pipettes |

Machine features and specifications



PG 8527



PG 8528

Versions

- PG 8527: Single-door model with vertical sliding door
- PG 8528: Two-door barrier washer-disinfector for installation in a diaphragm wall

Capacity per batch

- 232 narrow-necked glasses or 232 pipettes

Design

- Stand-alone or side-by-side installation
- Width 1150 mm
- Modular approach with customised features to meet individual requirements
- Single-chamber system for washing, disinfection and drying
- Service-friendly design
- Heater elements outside inner cabinet
- Low heat and sound energy dissipation thanks to double-skinned design



Miele quality – “Made in Germany”

For many decades now, Miele washer-disinfectors have represented an integral part of quality assurance in laboratories. Miele washer-disinfectors offer uncompromising quality and offer users maximum benefits in terms of hygiene, safety and economy.

Standard machine features



PG 8527



PG 8528 Clean side

Cleaning technology

- Hygienic freshwater system with fresh intake of water for each programme phase
- Cleaning, disinfection and drying in a closed, single-cabinet system
- Stainless-steel hygiene cabinet with coved corners and pitched ceiling
- 2 spray arms in cabinet for thorough cleaning of external surfaces
- Spray arms with high-impact force
- Full jet access and best possible cleaning results
- Direct docking to water circuit for improved utilisation of wash liquor
- Thorough cleaning of interior surfaces thanks to injector system

Standard features

- 2 powerful circulation pumps
- Triple filtration with large surface filter, coarse filter and micro-fine filter
- Filter in inlet hoses
- Flowmeter to monitor water intake quantities
- 1 drain valve

Dispenser systems

- 2 bellows-type dispenser pumps for liquid detergent and neutralising agent

Controls

- Freely programmable PROFITRONIC+ controls
- 64 programme slots with 16 standard washing and disinfection programmes
17 service programmes
31 vacant programme slots
- User navigation with local-language display
- Display of programme selection and programming dialogs, programme sequence, temperature, countdown time, faults, operating hours
- Compilation of new programmes using machine controls or using PC/laptop via optical interface

Interface

- 4 serial RS 232 interfaces for process documentation
- Optical interface for service and maintenance
- 1 Ethernet interface

Safety features

- Electric door lock
- Programme safety cut out
- Peak-load negotiation
- Optical and acoustic signal at end of programme
- 2 sensors, 1 each for temperature control and monitoring
- Port for simple positioning of sensors in the wash cabinet for process validation
- Sensors in cabinet and a magnetic strip on mobile units for automatic allocation of loads/inserts to programmes
- Dispenser volume control
- Spray arm sensing

Multiport

- For connection of printer and/or scanner

Functional and operational safety

Typically Miele



PROFITRONIC⁺ controls

The new PROFITRONIC⁺ controls have 64 programme slots. 16 slots are taken up by standard cleaning and disinfection programmes, including Miele's innovative OXIVARIO, OXIVARIO PLUS and ORTHOVARIO programmes. 17 further slots are occupied by a wide range of service programmes, leaving 31 programme slots vacant for customised programmes. Programme compilation can be performed at the unit or via PC/laptop/remote service. All process parameters are constantly monitored.

PERFECT TOUCH CONTROL

PERFECT TOUCH display

The display is flush with the machine front and therefore facilitates surface disinfection for better hygiene. Programme selection is simple and requires the use of only three controls. All selection steps appear in local language in the graphic user interface. Users can select their user-interface language from a pool of 15 languages. Display texts, e.g. for actual temperatures, countdown times, detergent concentrations and protocol data, are user-definable.

The controls are modular using CAN-BUS technology, facilitating the connection of further modules. An optical service interface and serial interfaces, e.g. for process documentation, are standard and support a variety of communication processes. The controls also support Miele's remote servicing system.

**Highly flexible and future-proof;
Simple, safe programme selection in a
minimum of steps**

Functional safety and hygiene in full view of user

Typically Miele

PERFECT VISION

Vertical-rise all-glass doors and cabinet lighting

To improve process visibility and supervision, all-glass vertical-rise doors are available as optional extras on the new range of products. The door can be programmed to open automatically at the end of a programme. Door motion is monitored electronically.

Models with all-glass doors also feature cabinet lighting comprising 4 built-in spotlights. Lighting times are programmable.



Hygiene cabinet and filtration system

The inner cabinet is manufactured using high-grade stainless steel (316 L or 1.4404 optional) and features a pitched ceiling and cove cornering to ensure rapid and thorough drain-off, reducing the risk of carry-over.

A triple filter combination, consisting of cabinet filter, coarse filter and micro-fine filter, ensures high process security and simple cleaning. Inlet hoses are also fitted with filters.

The heater elements are outside the cabinet for greater protection. The through-flow heaters are available as electric or steam-heated versions.

Good process visibility and supervision;
High-quality materials, design and features for perfect results;
residue-free drainage in compliance with DVGW and RKI;
Miele innovation: patented overflow system

Everything under control

Typically Miele

PERFECT SPEED SENSOR

Spray arm sensing

Washer-disinfectors from the PG 85 range feature Miele's PERFECT SPEED spray arm monitoring system as a standard feature. The machine display keeps users up to date on whether spray arm rotation in the cabinet and on mobile units is within the specified range. Speeds are monitored by a row of sensors outside the cabinet. In the event that speeds are out of range, e.g. on account of a build-up of foam, an error message is issued or, alternatively, the programme is aborted. Deviations can also be recorded in the automatic process documentation. Consequently, spray arm sensing offers reliable protection against human error and increases process security considerably.



Automatic mobile unit recognition

Miele's high safety standards are achieved in part through the use of an automatic mobile unit recognition system. This system scans a magnetic strip connected to the side of mobile units to identify the type of load and assigns the programme accordingly. This considerably reduces the risk of incorrect programme selection and human error.

Functional check of all spray arms; Fail-safe assignment of mobile units to programmes



Safety, efficiency and hygiene Typically Miele

PERFECT PURE SENSOR

PERFECT PURE SENSOR

Residue from the wash liquor on laboratory equipment can impair the results of analytical experiments. Hence, residue-free final rinse results are extremely important. On the new PG 85 series, conductivity is both measured and monitored using contact-free technology, making the system maintenance-free. The unique system works within extremely narrow tolerance bands in the 0-40 $\mu\text{S}/\text{cm}$ and 0.4-100 mS/cm ranges. If, in the final rinse cycle, the conductivity value defined by the user is not achieved, additional rinse cycles can be added automatically. Monitoring results can be shown in the display and documented accordingly.

Monitoring conductivity throughout an entire process cycle offers an additional method of verifying the reproducibility of validated processes.

Maintenance-free approach to ensuring residue-free rinsing

PERFECT FLOW SENSOR

PERFECT FLOW SENSOR

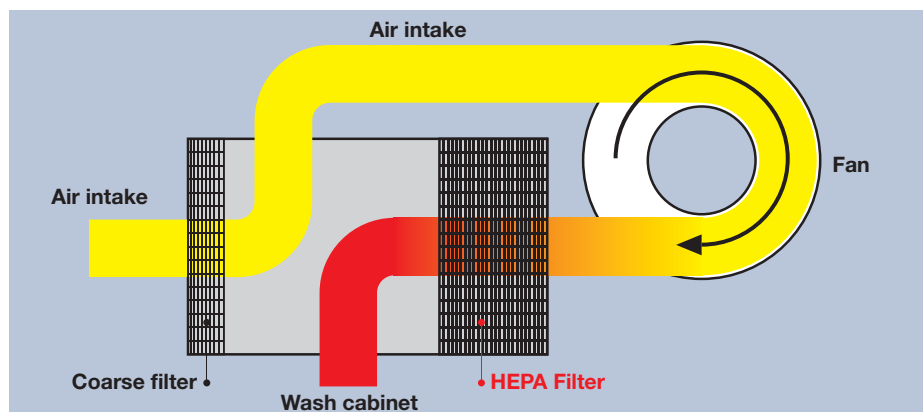
Miele's new PERFECT FLOW SENSOR offers significantly increased dispensing accuracy compared with conventional monitoring systems. This metering system is a standard feature and allows precise volume control in the dispensing system. Dispensing tolerances are user-definable. Compared with conventional flowmeter controls, this method is less susceptible to temperature and viscosity. An error message is issued or the programme aborted if values are outside the tolerance range.

Precise monitoring of concentration levels

PERFECT HEPA DRYING

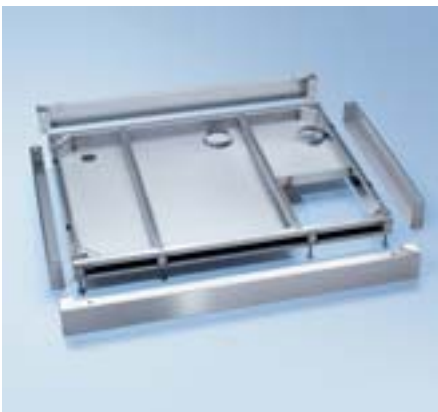
PERFECT HEPA DRYING

In the drying phase, too, Miele innovations set new standards. A Class H 13 temperature-resistant HEPA filter, located directly upstream from the cabinet, prevents the passage of particulate, air-borne contamination from the heaters, the fan and the silencers and ensures high standards of air purity within the cabinet. High-performance HEPA filters also reduce the need for maintenance.



Modular assembly concept

Optional extras



Plinth/drip tray

- For installation without on-site plinth
- Frame with built-in drip tray
- Cut-outs for supplies and utilities
- Continuous diaphragm-wall panelling can be provided on site when multiple machines are installed in a run.
- Plinth/drip tray for PG 8527 on castors for better service access

Cabinet

- Stainless-steel grade 316 L (1.4404)
- Boiler for demineralised water
- Conductivity module
- All-glass door(s) and cabinet lighting

Dispenser systems

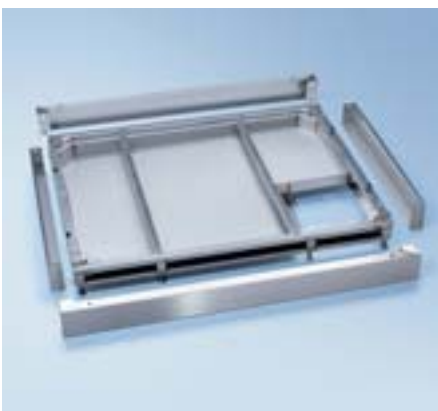
- Max. 3 additional integrated dispenser pumps including volume control

Water softener

- High-capacity water softener (external)

Drainage

- 2 drain pumps



Steam condenser

- Steam condenser (heat exchanger)
- No water consumption when connected to on-site cooling water circuit

Drying unit

- Steam- or electrically heated hot-air drying unit
- Low-maintenance 3-phase motors with side-channel compressor
- Temperature selectable, 40–135°C
- Time freely adjustable, 1–240 mins.
- Class EU 4 pre-filter, filtration rate >95% filter life 200 h
- Class H 13 particulate filter, filtration rate >99.992% filter life 1000 h



PG 8528 unclean side



PG 8528 clean side

Top box cladding

- Lockable stainless-steel service hatches for access to steam condenser and/or drying unit
- Vent grilles on unclean side
- MAV without top cover
- Panelling between top box and ceiling must be provided on site.
- H 760, W 1150, D 765 mm

Printer

- Integrated 8-pin printer to record key process parameters

Scanner connection

- Connection and bracket for scanner

MielTransfer MF-27/28

- Trolley to simplify the handling of mobile injector units
- Both ends can dock onto machine, tables, pass-through hatch or conveyors.
- With removable drip tray
H 70, W 603, D 866 mm
- 4 lockable wheels
- H 1050, W 740, D 980 mm
- Docking height 850 mm, +/-150/-100 mm

A wide range of standard features and optional extras allow machines to be tailored to the needs of individual applications

PG 8527/PG 8528

E 941 mobile unit with sample loads



E 941 mobile unit (with drying unit connection) (empty)

- For modules on 2 levels
- Depending on the size of the glassware up to 2 modules can be accommodated on each level
- Water and drying air enters via a direct docking system and adapters
- Load dimensions from bottom upwards
Level 1 (without top module):
H 609, W 558, D 352 mm
Level 1 (with top module):
H 317, W 558, D 352 mm
Level 2: H 245, W 558, D 352 mm
- Connection for hot-air drying unit
- Magnetic strip for automatic mobile unit recognition
- H 421, W 619, D 790 mm



Sample load E 941 mobile injector unit (with drying unit connection)

- Lower level: 2 x E 944/1 injector modules for narrow-necked glasses, 500–1000 ml
- Upper level: 2 x E 943/1 injector modules for narrow-necked glasses, 100–500 ml



Sample load E 941 mobile injector unit (with drying unit connection)

- Lower level: 2 x E 945/1 top insert frame with E 106 insert for wide-necked glasses or E 109 for beakers
- Upper level: 2 x E 943/1 injector modules for narrow-necked glasses, 100–500 ml



Sample load E 941 mobile injector unit (with drying unit connection)

- Lower level: 1 x E 943/1 injector module for narrow-necked glasses, 100–500 ml and 1 x E 942/2 injector module for pipettes, max. 580 mm
- Upper level: 1 x E 947/1 injector module, e.g. for centrifuge tubes

PG 8527/PG 8525 Modules for E 941 mobile unit



E 942/2 injector module

- For 116 pipettes up to 580 mm
- Holding frame
- Compartment size 16 x 16 mm
- H 279, W 558, D 352 mm



E 943/1 injector module

- For narrow-necked glassware, 100–500 ml
- 32 nozzles (E 351) 4 x 160 mm with clips (E 353)
- H 190, W 558, D 352 mm



E 944/1 injector module

- For narrow-necked glassware, 500–1000 ml
- 15 nozzles (E 352) 6 x 220 mm with clips (E 354)
- H 250, W 558, D 352 mm



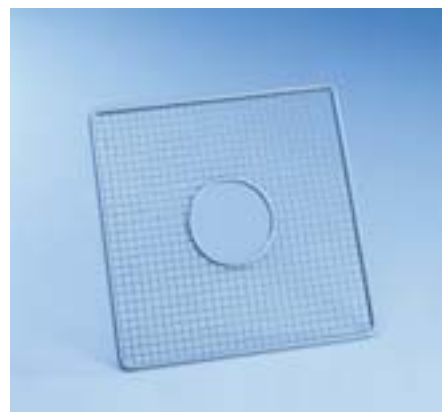
E 945/1 modules

- Base frame for inserts
- H 55, W 558, D 352 mm



E 947/1 injector module

- 88 injector nozzles for centrifugal tubes, phials and fraction sampler tubes
- 88 nozzles, 2.5 x 110 mm
- H 170, W 558, D 352 mm



A 5 cover

- For E 947 insert
- H 8, W 280, D 280 mm

PG 8527/PG 8528 mobile units with 2–5 levels



E 940 mobile unit

(with drying unit connection) (empty)

- For narrow-necked glassware on 2 levels (Mobile injector unit can also be used without top level)
- 115 nozzles with clips
- Lower level: 35 x nozzles (E 352), 6.0 x 220 mm with clips (E 354)
- Upper level: 80 x nozzles (E 351), 4.0 x 160 mm with clips (E 353)
- Connection for hot-air drying unit
- Magnetic strip for automatic mobile unit recognition
- H 565, W 640, D 790 mm



E 950/1 mobile unit

(with drying unit connection)

- For narrow-necked glassware on 3 levels
- 232 nozzles
- Levels 1 + 3: 80 x ID 90 nozzles each (2.5 x 90 mm)
- Level 2: 72 x ID 90 nozzles (2.5 x 90 mm)
- Max. load height on each level 148 mm
- Connection for hot-air drying unit
- Magnetic strip for automatic mobile unit recognition
- H 572, W 640, D 790 mm



E 957 mobile unit

(with drying unit connection)

- For 1–12 large-volume laboratory glassware items
- 12 nozzles
- Height-adjustable frame with 8 short and 6 long supports, screw threads Supports can be adjusted to diameter of glassware.
- Connection for hot-air drying unit
- Magnetic strip for automatic mobile unit recognition
- H 353, W 640, D 790 mm



E 975/1 mobile injector unit (empty)

- For inserts on 2 levels
- Built-in spray arm
- Load dimensions from bottom upwards
- Level 1: H 297, W 592, D 780 mm
- Level 2: H 290, W 592, D 780 mm
- Connection for hot-air drying unit
- Magnetic strip for automatic mobile unit recognition
- H 427, W 640, D 790 mm



E 935/1 mobile injector unit (empty)

- For inserts on 3 levels
- 2 built-in spray arms
- Load dimensions from bottom upwards
- Level 1: H 202, W 590, D 780 mm
- Level 2: H 202, W 590, D 780 mm
- Level 3: H 132, W 590, D 780 mm
- Connection for hot-air drying unit
- Magnetic strip for automatic mobile unit recognition
- H 524, W 640, D 790 mm



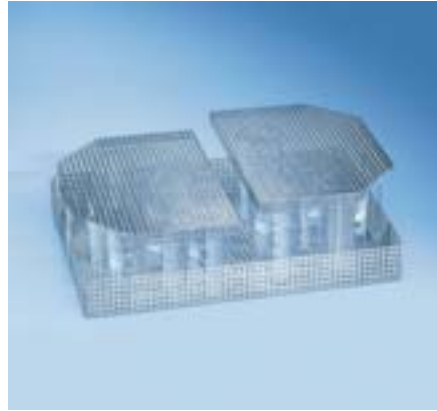
E 900-4/1 mobile injector unit (empty)

- For inserts on 4 levels
- 3 built-in spray arms
- Load dimensions from bottom upwards
- Levels 1–3: H 112.5, W 593, D 780 mm
- Level 4: H 114, W 593, D 780 mm
- Connection for hot-air drying unit
- Magnetic strip for automatic mobile unit recognition
- H 557, W 640, D 790 mm



E 900-5/1 mobile injector unit (empty)

- For inserts on 5 levels
- 4 built-in spray arms
- Load dimensions from bottom upwards
Levels 1–4: H 80, W 593, D 780 mm
Level 5: H 73, W 593, D 780 mm
- Connection for hot-air drying unit
- Magnetic strip for automatic mobile unit recognition
- H 605, W 640, D 790 mm

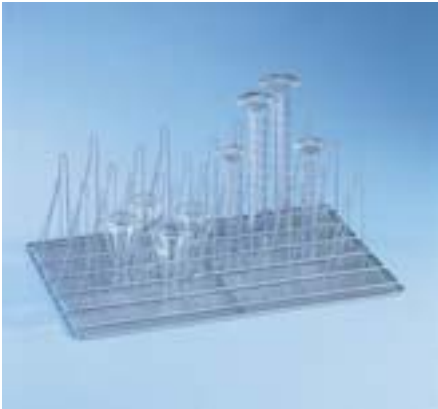


E 969 insert

- For accommodating utensils
- Perforated sheet-metal plate,
7 x 7 x 3 mm
- For E 900-4/1, E 935/1, E 975/1 and
E 941 with E 945/1 module
- H 67/122, W 363, D 533 mm

A 19 lid 1/2

- For E 969 insert
- Perforated sheet-metal plate,
7 x 7 x 3 mm
- H 18, W 351, D 251 mm



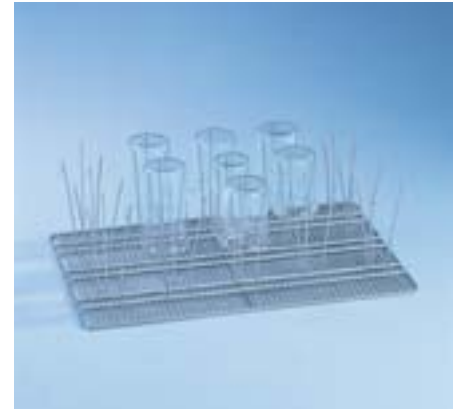
E 960/1 insert 1/2

- With 20 large and 26 small spring hooks
- For wide-necked Erlenmeyer flasks and
measuring cylinders
- H 185, W 357, D 522 mm



E 963 insert 1/2

- With 33 x 3 holders for beakers, 250 ml
- H 155, W 357, D 522 mm



E 965 insert 1/2

- With 15 x 3 holders for beakers,
250–600 ml
- H 173, W 357, D 522 mm

G 7825/G 7826 and PG 8527/PG 8528 Inserts



E 103/1 insert 1/4

- For approx. 200 test tubes, max. **12 x 75 mm**
- Subdivided into 6 areas
- Incl. A 13 cover
- Mesh size 8 x 8 mm
- H 102 (122), W 200, D 320 mm

E 104/1 insert 1/4

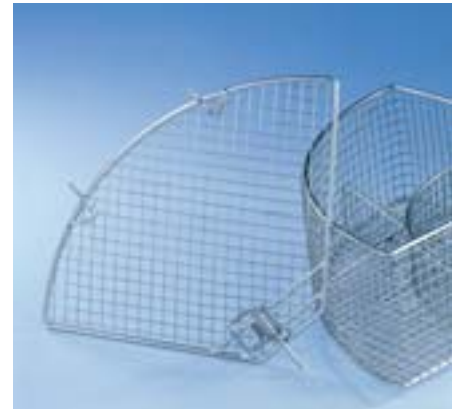
- As E 103, but for test tubes up to **12 x 105 mm**
- Mesh size 8 x 8 mm
- H 132 (152), W 200, D 320 mm

E 105/1 insert 1/4

- As E 103, but for test tubes up to **12 x 165 mm**
- Mesh size 9 x 9 mm
- H 192 (212), W 200, D 320 mm

E 139/1 insert 1/4

- As E 103, but for test tubes up to **12 x 200 mm**
- Mesh size 9 x 9 mm
- H 223 (243), W 200, D 320 mm



A 13 lid

- Replacement for E 103/1, E 104/1, E 105/1 and E 139/1 inserts
- Made from stainless steel
- 1 mm wire mesh
8 mm mesh size
4 mm all-round frame



E 149 insert 1/4

- For 80 test tubes, max. **16 x 105 mm**
- Incl. lid
- 80 compartments 18 x 18 mm
- Base mesh size 8 x 8 mm



AK 12 insert 1/2

- For funnels, beakers, wide-necked glassware, etc.
- H 67/127, W 225, D 442 mm



A 14 lid 1/4

- For AK 12 insert
- Made from stainless steel
- 7 x 7 mm perforations, 3 mm ridge
- H 20, W 210, D 210 mm

Inserts



E 403 insert 1/2

- For 105 Petri dishes, 50–60 mm dia.
- 36 holders, spacing 9 mm
- H 35, W 200, D 445 mm



E 402 insert 1/2

- For 44 Petri dishes, 50–60 mm dia.
- 23 holders, spacing 15 mm
- H 53, W 200, D 445 mm



E 136 insert 1/1

- For 56 Petri dishes, 100 mm dia.
- 56 holders, H 70 mm
- Spacing approx. 26 mm
- H 145, W 485, D 445 mm



E 106 insert 1/2 (illustrated)

- For wide-necked glassware, measuring beakers, etc.
- 10 spring hooks, H 175 mm
- 16 spring clips, H 105 mm, spacing approx. 60 mm
- H 186, W 195, D 430 mm

E 106/1 insert 1/2

- 26 spring hooks, H 105 mm, spacing approx. 60 mm
- H 116, W 195, D 410 mm

E 106/2 insert 1/2

- 13 spring hooks, H 175 mm, spacing approx. 85 mm
- H 186, W 180, D 420 mm



E 109 insert 1/2 (illustrated)

- For 21 beakers up to 250 ml
- 21 x 3 spikes
- H 155, W 230, D 460 mm

E 110 insert 1/2

- For 10 beakers, 250 to 600 ml
- 10 x 3 spikes
- H 175, W 230, D 460 mm

E 111 insert 1/2

- For 8 beakers, 600 to 1000 ml
- 8 x 3 spikes
- H 205, W 230, D 460 mm

E 144 insert 1/2

- For 18 beakers up to 250 ml
- 18 x 3 spikes
- H 131, W 200, D 445 mm

G 7825/G 7826 and PG 8527/PG 8528 Accessories



A2 1/2 cover net (illustration on left)

- 216 x 456 mm
- Plastic-coated metal frame with plastic netting
- For 1/2 inserts

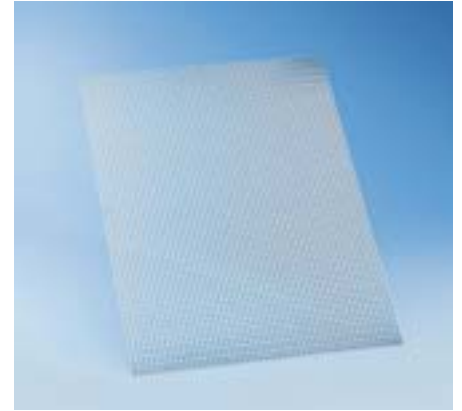
A3 1/4 cover net (illustration on right)

- 206 x 206 mm
- Plastic-coated metal frame with plastic netting
- For 1/4 inserts



A6 cover net 1/2

- 215 x 460 mm
- Stainless-steel frame with polypropylene mesh (particularly stable and durable)



A 9/1 insert

- Perforated metal base
- Perforations 7 x 7 mm
- Ridge 3 mm
- For E 935-3/1, E 975-2/1 and E 901/2
- H 1, W 773, D 573 mm



E 336 injector sleeve MIBO

- For pipettes (max. length 445 mm) in injector mobile units
- Plastic, with screw fitting
- Ø 11 mm
- Length 121 mm



E 352 injector nozzle ①

- For mobile injector unit
- In conjunction with E 354
- 6 x 220 mm, screw thread

E 351 injector nozzle ②

- For mobile injector unit
- In conjunction with E 353
- 4 x 160 mm, screw thread

E 354 clip for nozzle ③

- For E 352 injector nozzle
- Height-adjustable
- 6 x 220 mm

E 353 clip for nozzle ④

- For E 351 injector nozzle
- Height-adjustable
- 4 x 160 mm

E 470 injector nozzle with clip ⑤

- For mobile injector unit
- 2.5 x 90 mm, screw thread



Injector nozzle with plastic support

Front row, from left

ID 160 4 x 160 mm

ID 140 4 x 140 mm

ID 110 2.5 x 110 mm

ID 90 2.5 x 90 mm

Rear row, from left

ID 240 6 x 240 mm

ID 220 6 x 220 mm

ID 200 6 x 200 mm

ID 180 4 x 180 mm



E 362 blind stopper

- M 8 x 1 thread, to close connectors on mobile units

Transport trolleys



MF/3 for G 7823/G 7824/G 7825/G 7826

- Trolley to simplify the handling of mobile injector units
- Footswitch-operated height-adjustment mechanism
- 4 lockable wheels
- H 1182, W 660, D 807 mm, +/- 100 mm
- Docking height 751 mm, +/- 100 mm



MF 27/28 for PG 8527/PG 8528

- 4 lockable wheels, Ø 100 mm,
- Both ends can dock onto machine, tables, pass-through hatch or conveyors.
- Docking height 850, -100, + 150 mm
- H 1050, W 740, D 930 mm
- With removable drip tray
H 70, W 603, D 866 mm

Aqua-Soft-System Test Kit



G 8597 AquaSoft System, Twin-tank water softener

- For continuous supply of softened water for max. supply hardness of approx. 40°d (7.2 mmol/l)
- H 570, W 360, D 360 mm
- Weight (excl. salt) approx. 30 kg
- Freestanding unit on castors. Filled from top.
- Plastic outer panelling
- Throughput: Constant supply 19 l/min, max. flow 30 l/min
- Level controlled twin-tank system
- No electrical connection required
- Equipped with 2 x 4.5 l resin-filled containers and 1 container for 20 kg of salt
- Water connection
 - 2 pressure hoses, approx. 1.5 m, 3/4" threaded union
 - 1 x cold or hot water, max. 70°C
 - Min. 1 bar flow pressure to system, Max. static pressure 8 bar
 - 2.5 bar min. flow pressure on machines without softener
 - 3.5 bar. Min. flow pressure on units with softener
 - 1 x connection from system to machine
 - 2 drain hoses, approx. 1.5 m (DN 8 for reactivation water and overflow. Odour trap and non-return valve to be provided on site.
- Water consumption 19 l/reactivation cycle

Process documentation options in laboratories



Process documentation principles

The documentation of process data represents an integral part of quality assurance. Washing and disinfection is performed using validatable processes, whereby validation includes the need for documentation. Proof that a validated process can be replicated with each batch is best achieved by recording and documenting the most important programme parameters. To facilitate process documentation on a PC, Miele has cooperated with IBH Data Technology GmbH in designing a NetBox documentation system, tailored to the needs of Miele washer-disinfectors. NetBox is a proprietary and comprehensive system consisting of both hard- and software. It allows process protocols from up to 4 washer-disinfectors to be processed and archived.

Effective process documentation system requirements

- Comprehensive system with high level of process security, including pre-installed and configurable software
- Manipulation-proof
- Simple operation without knowledge of PCs
- Simple installation
- Process visualisation
- Batch-related documentation
- Load recognition
- Documented batch approval
- Long-term archiving

The building blocks of the system

- NetBox with keypad and mouse plus cables for connection to washer-disinfectors

Optional:

- Flat screen for process visualisation and load data capture
- Barcode scanner (with connection lead or wireless using Bluetooth technology) to simplify machine operation and load data capture
- RFID transponder as alternative to barcode system
- Network cable if documentation is to be installed in a network

Load assignment, data storage and archiving

NetBox protocols:

Safe and convenient

The NetBox is a complete documentation system including pre-configured software. The system is connected via an interface to the washer-disinfector. The NetBox collects all relevant process data during washing and disinfection programmes. In standard mode, the unit harvests data fully automatically without any involvement on the part of the user. This means maximum operating safety as the NetBox provides considerable protection against operating errors. Once collated, process data remains in memory; the NetBox has the capacity to save up to 1000 batch protocols. Later, data can be saved to a network or a storage device.

In network mode, the unit can be monitored and operated via a PC interface. A flat-screen monitor is also available as an optional extra to plot time/temperature curves. This also helps visualise the data contained in the wash protocol. A further optional extra is a barcode scanner or RFID transponder to facilitate the fast and simple identification of loads. The user can also approve or lock batches, depending on process cycles.

As soon as data is received from a washer-disinfector a batch number is automatically allocated and a report generated.

Depending on the machines, protocols can contain the following parameters:

- Batch no., date and Mach. no.
- Programme name
- Programme starting and ending time and times of individual programme blocks
- Dispenser pump (ID no.), chemical concentration, temperature and times
- Target temperature reached
- Disinfection temperature and holding time
- Faults (e.g. water inlet)
- Manual intervention and outages (e.g. programme aborted, power failure)

On washer-disinfectors with Profitronic controls, the intervals at which the time/temperature profile is plotted (e.g. every 5 secs.) can be defined by the user.

Clip with barcode attached to inserts



Protocol administration

At the end of a programme, a batch protocol is added to the protocol database. All protocols can be called up at any time to check parameters such as Batch no., Mach. no., user, etc. Data records are write-protected and cannot be modified. All persons authorised to access the process documentation programme are recorded in master records as authorised users. Access can also be password-protected. An access code determines the access rights of a user on the system.

Scanning of barcode



Evaluations

NetBox represents an integrated approach to statistical programme evaluations. Saved data can also be made available to other programmes for further processing and evaluation.

A key advantage of the NetBox in comparison to PC-based systems is the operational safety factor. NetBox process documentation also simplifies installation and operation, requires a minimum of space, is ventilator-free and low-cost.

Scanning of staff barcode after batch approval



The process documentation software is optionally available as a software-only solution for installation on a Windows PC.

Remote trouble-shooting with Miele Remote Services



In laboratories, machine park uptime, economy and the reliability and reproducibility of washing and disinfection results is always of prime importance.

Miele Professional offers perfect solutions: Miele Remote Service - an investment in the future. An additional Remote Service Assistant module, developed by Miele, allows service engineers to establish remote contact with Miele washer-disinfectors to diagnose faults and decide on the necessary remedial action. This technology can be used both to update controls and for remote trouble-shooting. Benefits range from analysing technical problems and modifying individual programme parameters through to updating entire programmes.

The option of analysing remote data allows remedial action to be taken faster and in a targeted manner.

The same technology also allows error messages to be automatically relayed by washer-disinfectors in the field to Miele's service centres. As a result, Miele Remote Service ideally complements Miele service contracts: For greater safety and security.

Diagnosis systems designed by Miele for remote use allow access to all relevant control parameters on Miele washer-disinfectors.

RSA

Miele Remote Service Assistant

- Splash-proof wall-mounted housing unit
- Connection of up to 6 Miele machines via RS 232 interface
- Ethernet connection
- Available versions:
 - analog, GSM, (ISDN on request)
- Dimensions:
 - W 217 mm, H 130 mm, D 85 mm
- Weight 650 g

Installation requirements

Appropriate telecommunication connection boxes are required for use in an analog or ISDN network. A sufficiently stable network is required to operate the GSM version. Miele service engineers can provide assistance in selecting the appropriate connection set-up.

**Optimum machine uptime and economic operation**

- More effective communication when servicing is needed
- Call avoidance (reduction in service costs)
- Supports operating and technical staff in resolving problems
- Targeted availability of spare parts through remote trouble-shooting

Additional benefits of regular remote diagnosis:

- Reduced downtimes through early-warning system
- Test protocol offers documented safety
- Reproducible results

Remote Service – Time savings

In the event of unforeseen problems, specially trained Remote Service technicians from Miele can rapidly check the machine status and avoid unwanted machine downtimes. Should a service call-out be needed, the service engineer is already equipped with valuable information on the nature and extent of the fault.

Remote Service – Safety

Combining remote servicing with repair and comprehensive maintenance contracts affords excellent protection and peace of mind, machine uptime and reproducible results combined with good financial forward visibility! Miele Service is more than willing to provide further information.

Remote Service – Investment in the future

Fit for the future with Remote Service. Minor modifications through to complete control updates ensure the latest, state-of-the-art process technology.



Miele Service Pack: Qualification of cleaning systems

In the pharmaceuticals, food-processing and cosmetics industries, all cleaning systems used in production, quality assurance and R&D must be “qualified”.

Qualification involves the following: Design Qualification (DQ), Installation Qualification (IQ), Operation Qualification (OQ), Performance Qualification (PQ) and, in some cases, process validation. In all cases, responsibility for implementing the necessary measures lies with the equipment operator. Miele's in-house after-sales service operation, though, can provide support by assuming some of the duties incumbent on the operator. Miele's tailored service package covers Installation and Operation Qualification (IQ/OQ).

Installation Qualification (IQ)

The objective of Installation Qualification is to verify that the cleaning system and its installation comply with the operator's and manufacturer's requirements. During the IQ inspection, Miele service engineers document, check and assess the following: Compliance of shipment with original order, unit configuration and condition, installation and connection to on-site utilities and the calibration of certain measuring systems.

Implementation

Before IQ/OQ can be performed by Miele's in-house service engineers the necessary documentation must be compiled, checked and approved by the operator for use during the inspection. Miele service technicians will then perform qualification on the basis of this documentation. All the necessary calibrated and certified test apparatus is provided by Miele.

Operation Qualification (OQ)

The objective of Operation Qualification is to furnish proof that the cleaning system meets the requirements of the operator and the equipment manufacturer when installed and connected. Operation Qualification documentation, inspections and evaluation cover functions with a relevance to safety and operation, process-related messages and warnings, and programme sequence.

Training of service engineers

Miele's own service engineers are given training covering all aspects of machine technology (installation, programming, repair and maintenance) in regular refresher courses. This is complemented by specialised training on the qualification of Miele cleaning systems used in industrial and laboratory operations. Theory and practice are not confined to washer-disinfectors either: Miele also covers all peripheral units likely to be encountered in industrial applications (for example Miele's Aqua Purificator to produce demineralised water, dispensing systems and accessories such as mobile injector units and inserts).

Training of operatives and the documentation of such measures is also carried out during Operation Qualification. This constitutes a comprehensive package comprising IQ/OQ paperwork, the services of highly skilled and qualified service engineers and the use of calibrated, certified test apparatus.

Technical data

| Washer-disinfectors | PG 8527 | PG 8528 |
|---|-----------------------|-------------------------------|
| | (1-door model) | (2-door barrier model) |
| Single-door model with vertical-lift door | ● | – |
| Through-feed unit with vertical-lift doors | – | ● |
| All-glass doors/cabinet lighting | ○ | ○ |
| Single/multiple installations | ● | ● |
| Freshwater system, max. temperature 93°C | ● | ● |
| Direct mobile unit docking for cleaning and drying of lumened instruments | ● | ● |
| 2 circulation pumps [Qmax. l/min] | 400/600* | 400/600* |
| Boiler for heating demineralised water | ○ | ○ |
| Controls/programmes | | |
| PROFITRONIC+, user programmable | ● | ● |
| 64 programme slots | ● | ● |
| Electric door lock | ● | ● |
| Peak-load negotiation | ● | ● |
| Process documentation interface | ● | ● |
| Magnetic strip for automatic mobile unit recognition | ● | ● |
| Spray arm sensing | ● | ● |
| Conductivity metering | ○ | ○ |
| Water supply connection | | |
| 1 x cold water, 2–10 bar flow pressure (200–1000 kPa) (max. 4°dH) | ● | ● |
| 1 x hot water, 2–10 bar flow pressure (200–1000 kPa) (max. 4°dH) | ● | ● |
| 1 x demineralised water, 1.5–10 bar flow pressure (200–1000 kPa) | ● | ● |
| 3 inlet hoses 1/2" with 3/4" threaded union | ● | ● |
| Drain valve DN 50, odour trap to be fitted on site | ● | ● |
| 2 drain pumps DN 22, odour trap (optional) to be provided on site | ○ | ○ |
| Electrical connection: Electrically heated | | |
| 3 N AC 400 V 50 Hz | ● | ● |
| Heating Cabinet [kW] | 18 | 18 |
| Heating Boiler [kW] | 15 | 15 |
| Circulation pump [kW] | 0.7/1.2* | 0.7/1.2* |
| Total rated load without drying unit [kW] | 20 | 20 |
| Total rated load with drying unit [kW] | 20 | 20 |
| Fuse rating [A] | 3 x 32 | 3 x 32 |
| Electrical connection: Steam heating | | |
| 3 N AC 400 V 50 Hz | ● | ● |
| Circulation pump [kW] | 0.7/1.2* | 0.7/1.2* |
| Total rated load without drying unit [kW] | 2 | 2 |
| Total rated load with steam-heated drying unit [kW] | 10 | 10 |
| Fuse rating [A] | 3 x 16 | 3 x 16 |
| Steam connection G 1/2" (DN 10) | ● | ● |
| Operating pressure 250–600 kPa (steam-heated drying unit) | ● | ● |
| Compressed air connection 600 kPa | ● | ● |
| Electrical connection: Steam / Electric heating (convertible) | | |
| 3 N AC 400 V 50 Hz | ● | ● |
| Heating Cabinet [kW] | 18 | 18 |
| Heating Boiler [kW] | 15 | 15 |
| Circulation pump [kW] | 0.7/1.2* | 0.7/1.2* |
| Total rated load with drying unit [kW] | 20 | 20 |
| Fuse rating [A] | 3 x 32 | 3 x 32 |
| Steam connection G 1/2" (DN 10) | ● | ● |
| Operating pressure 250–100 kPa (electric drying unit) | ● | ● |
| Compressed air connection 600 kPa | ● | ● |

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