

Washer / Disinfector for Automatic Reprocessing of Instruments Belimed WD 200

Product specifications

Product description

The washer disinfector WD 200 was developed with the objective of ensuring efficient washing of instruments, containers and accessories while minimising consumption of natural resources.

The well-engineered, sophisticated stainless steel chamber and unique high-volume / low-pressure water circulation system allows to reprocess up to 12 DIN trays. Disinfection can be run with $A_0 > 3000$, in accordance with EN ISO 15883-1.

The WD 200 is available with 1 or 2 manual hinged full glass doors allowing visual monitoring during the entire wash cycle.

The system also provides continuous process security, as all relevant performance parameters are monitored by the machine itself via the optional independent process data monitoring system.

The WD 200 washer / disinfector includes following main features:

- Ergonomic product design from Belimed
- Patented process status display
- Large capacity wash chamber up to 12 DIN trays
- Smallest footprint with only 680 mm width
- Resources saving system by dynamic filling up to 20%
- Optional exhaust heat recovery unit
- Visual process inspection at any time by two full glass doors
- Illuminated wash chamber with long-life LED
- Electrical heated wash chamber
- Optional steam heated wash chamber
- Fast filling, draining and heating
- 2 detergent pumps with flow meters and empty level control (maximum: 4)
- Storage space for 2 x 10 L detergent cans
- Disinfection monitoring function, $A_0 = 3000$
- Optional integrated printer on loading or unloading side
- Optional automatic program recognition for up to 12 programs

Field of application

For use in healthcare facilities, e.g. CSSDs, for processing of reusable instruments, containers, OR shoes and other solid objects as well as rigid endoscopes, eye instruments, and neurosurgical instruments. The device is also suitable for reprocessing in the laboratory field.

Dimensions

(□ => standard, o => optional)

Washing chamber: H x W x D: 625 x 575 x 617mm
 Net capacity of washing chamber: 220 L
 Gross capacity of washing chamber: 280 L

External dimension

□ Standard model: H x W x D: 1840 x 680* x 710mm
 o Model with exhaust air condenser: H x W x D: 2210 x 680* x 710mm

*730mm if steam connection from above or/and water connection from below



Technical outfit, standards & options

Door configuration

- Two full glass doors, manual hinged
- One full glass door, manual hinged and rear wall

Supply Voltage

- Electric, 380-415V 3N/AC 50/60Hz
- Electric, 200-220V 3N/AC 50/60Hz
- Electric, 208V 3N/AC 60 Hz
- o steam connection

Languages

The operator panel is able to have max. 3 different languages installed. Whereby German and English are set up in general and the 3rd language is always the local customer language

Capacity / Cycle

- Surgical Instrument (DIN-trays): 12
- MIC Instruments (connections / DIN trays): 48 / 4
- Anaesthesia materials (breathing hoses 1,5 m, bags/masks/catheters/tubes): 10/3/5/5/5
- Sterile goods container incl. lids: 3
- OR shoes: 40
- Baby bottles including caps: 84

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Standard configuration

- WD with drying system as well through the water pipes
- Manual hinged double full glass doors
- Front panel at bottom and top
- Microprocessor-based controller
- 2-line foil keypad LCD-display loading / unloading side
- Patented process status display
- Illuminated wash chamber
- 3 x water supply connections (water supply from top)
- Dynamic filling
- High capacity stainless steel drain valve (DN 40)
- AISI 316L washing chamber
- Disinfection monitoring function, A₀ -value
- Validation connection for external recording of measurements
- RS 232 and RS 485 interfaces
- Storage space for 2 x 10 L dosing cans
- 2 x detergent dosing pumps
- 2 x flow meters for chemicals
- 2 x empty level indicators for 2 x 10 L dosing cans
- Exhaust air damper with condensed water drain
- H13 HEPA filter
- Pressure switch/foam control
- 1 x potential free contact
- Base cover
- Pump pressure sensor
- 12 preset programs

Options (ex-factory installation)

- steam heated wash chamber
- steam heating dryer and wash chamber
- Exhaust vapor air condenser
- DI-water pre-heating (electrical)
- Exhaust heat recovery unit (electrical)
- Independent process documentation IPD
- Conductivity control unit
- Sterile filter monitoring
- 2 x potential free contacts
- Barcode reader for batch record
- Test plug

Options (on-site installation)

- Drain pump set
- Automatic program recognition (magnets)
- Batch documentation with built-in printer (clean or unclean side)
- External printer
- Ethernet Com-Server
- ICS 8535 traceability system
- 2x additional dosing pumps (Pharmed / Viton) incl. flow meters
- 2x additional empty level indicators (10l and 25-30l)
- Cool down set
- Pre-shutoff valve activation function
- Base pan with sensor
- Steam connection set from below / from above

Additional Options (paneling)

- Set side covers, complete for single- and double door
- Set side covers complete with extension (50 mm) incl. base or machines in case of steam supply from top and/or water supply from bottom without vapor air condenser / DI-water pre-heating
- Intermediate and base panel 50 mm without vapor air condenser/DI-water pre-heating
- Intermediate and base panel 50 mm with vapor air condenser/DI-water pre-heating
- Intermediate and base panel 100 mm without vapor air condenser/DI-water pre-heating
- Intermediate and base panel 100 mm with vapor air condenser/DI-water pre-heating
- Paneling vapor air condenser / DI-water pre-heating
- Paneling vapor air condenser / DI-water pre-heating with extension (50 mm)

Further Accessories

- Rack Instruments 1 Level
- Rack Instruments 2 Level
- Rack Instruments 3 Level
- Rack Instruments 4 Level
- Rack Instruments 5 Level
- Rack Instruments 6 Level
- Rack Anesthesia
- Rack MIS
- Rack Containers
- Rack Baby bottle
- Rack 1-level Jet
- Rack LAB
- Transport trolley

Standards*

*only the stated standards in the declaration of conformity are valid

MDD 93/42/EEC (Medical Device Directive)

Safety: IEC/EN 61010-1
IEC/EN 61010-2-040

EMC: IEC/EN 61326-1
EN 61000-4-X

Tap water safety: EN 13076
EN 13077

Type testing: EN ISO 15883-1,-2, confirmed by HygCen

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Model with basic equipment: Design and functions

Washing chamber – The wash chamber is designed of stainless steel 1.4404 (AISI 316L). The wash chamber ceiling and sump are designed with a pitched angle to ensure complete drain of water. This reduces the water evaporation requirement during the drying phase of the cycle and the risk of cross-contamination is eliminated.

Chamber illumination – The washing chamber is illuminated by two integrated long-life LED lamps. This feature supports the operator in visual process inspection.

Outer material – Stainless steel, type 1.4301 (AISI 304) in combination with white foil.

Full-glass hinged doors – The door design provides a full size double wall safety glass. The WD 200 can be equipped with one door for applications in laboratories, or with two doors for a clear separation of dirty and clean zone. The glass allows a visual monitoring of the current running wash cycle.

The hinged doors are manually operated. They are designed to be used as a loading table for washing utensil rack when open. The racks can be loaded up to 80 kg. The transport trolley can be easily docked on the fully opened hinged door.

Electric latch closing system – An electrically-assisted system attaches and seals the door to the chamber, so risk of false closing and leakage are dramatically reduced and ensures an ergonomically handling.

Washing chamber seal – Circumferential silicone seal, which has an extended lifetime because of the intelligent door closing system. A drip tray on the inside prevents water from dripping down when doors are open.

Rotating wash arms – One wash arm is located at the top, the other at the bottom of the washing chamber. Additional wash arms are located on each level of the racks. These are equipped with extra-large spray openings for maximum wetting, resulting in a high flow-rate of water which indicates a high cleaning efficacy with low impingement.

Back flow preventer – To prevent any cross contamination of the hospital sanitary system in case of machine error the unit is equipped with a back flow preventer according tap water protection standards. The water inlet and the wash chamber are physically separated.

Automatic temperature control at water inlet – When precise temperature control of the input water is required the control system will mix the level of hot and cold water to obtain the water temperature required for customer processes.

Gross and fine filter- The water is filtered by a gross filter (mesh size 3 mm). On the suction side of the wash pump, an additional fine filter (mesh size 1,6 mm) is located at the wash chamber exit to prevent any damages of wash pump and blocking of wash arm nozzles. Filters can be manually removed for cleaning from loading side.

Heating system – The Belimed WD 200 is equipped with high power electric heating for wash tank (18 kW for 400V and 14,7 kW for 200-220V/208V) and drying (3,5 kW).

- Electric heated
- Steam heating for wash chamber (drying electric)
- Steam connection from above
- Steam connection from bottom

High performance dryer (electrical / steam) – One high performance dryer (325 m³/h) is included with a heater output of 3.5 KW. The brushless motors are operating without abrasion of coal, so no contamination of air filters and heating elements can occur. The drying temperature is adjustable according to the customer requirements (from room temperature up to 110°C). Fresh air is lead through air filter class H13 (retaining rate 99.95%).

In addition, a fine particulate filter class F5 is connected upstream of the H13 filter. The filtered air goes as well through the water pipes and rack pipes.

Exhaust air flap with condensate separator – The condensate separator prevents a backflow of the condensate into the wash chamber. The condensate flows directly from the exhaust air pipe to the drain. A false air flap reduces the heat loss through the washing/rinsing phases and opens automatically during drying stage.

Microprocessor control – The Renaissance M16C processor with 256 K Byte EE Prom and 10K Byte RAM controls all system functions and monitors system operations. The control system has been specifically developed for washing applications. With the CP-Top keyboard, up to 12 freely definable programs can be selected. A program library with adaptable, ready to use programs assists to define customized wash cycles.

A self-diagnosis system automatically runs test routines periodically for the purpose of early detection of potential errors. Respective input signals are monitored and possible deviations from the target default value range are indicated by visual and acoustic signals.

Operating panel loading side – Membrane keypad with tactile feedback, two-line VFD display monitor (H x W = 20 x 120mm) and integrated process status indicator. The clear display monitor shows the wash program phase and the current value A₀ of the thermal disinfection step.



The following functions are included:

- Programme selection and start
- Online display of the process
- Error messages and instruction texts in plain text with error history
- Maintenance messages

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- Display and configuration of system master data
- Display of measured values
- PLC diagnostics
- User management – logging on and off
- Programme intervention
- Servicing functions

Operating panel unloading side – Membrane keypad, two-line display monitor VFD (H x W: 20 x 120mm) and integrated process status indicator.



The following functions are included by default:

- Display
 - Date/ time
 - Wash programme
 - Current programme step
 - Error messages
 - Acoustic signal switched on
- LED
 - Warning or alarm messages
 - Process in progress
 - Door locked
- Button
 - Key for opening / closing door

Available programs – The WD 200 has 12 validated factory programs installed. Those factory programs are set up to fulfil the common requirements from different standards as EN ISO 15883. Additional programs can be compiled as desired by the customer.

Patented process status display – The process status display, which has a clock-like design with LED technology, can be seen from a large distance. The status display indicates important process data such as remaining run time, readiness for loading or unloading or error messages.

Remaining run time with more than 60 minutes, will be displayed in form of a rapidly moving pointer.

Remaining run time with less than 60 minutes, will be displayed in form of a clock which builds up progressively.

The end of the process is visualized by the display of a complete clock which flashes and then goes out as soon as the door is opened.

A process error is indicated by a complete clock which flashes red.



Dynamic Filling water inlet – Based on the load and rack, the specific needed water amount will be filled in the system. The unique dynamic filling feature ensures the lowest water consumption by accepting no limitation in hygienic and process safety. By minimizing

the amount of used water, the consumption of energy, detergents and water (hot/cold/DI) can be reduced to 20% per batch.

Thermal disinfection with A0 value – A function added to the WD 200 permits abbreviated dwell time in thermal disinfection. The unit monitors and continuously integrates the effective heat volume according to the equation A0-value above 65°C already during the warm-up period. It terminates the process upon attaining the required A0 value of 3000 or 600. It is left to the user to decide if he wishes to terminate the process upon reaching the minimal required A0 value of 3000 or to continue disinfecting to a higher value. In addition, the current A0 value is continuously displayed and recorded.

Wash pump – A wash pump with stainless steel impeller recirculates 625 L per minute of the washing solvent. The wash pump is designed to be fully trained after each cycle step to ensure that no residual water is in the pump housing. This reduces the risk of bacterial residues and prevents cross contamination.

Dosing pumps – Up to 4 dosing pumps can be installed (2 are included in the base model) for dosing the cleaning agents. The flow meters ensure control of flow. The monitoring method is either impulse-controlled or time-controlled and can be selected on-site.

Empty level control for detergents – The WD 200 can be connected to centralized chemical dosing system or connected directly to detergent canister. Up to 2 canister can be placed in the machine, all others needs to be stored next to the machine. Each canister should be equipped with one empty level control which indicates low level alarm at operator panel screen. The empty level detectors are available for 10L or 25 – 30 L canister.

Dosing of detergents – Based on the filled in water amount in the wash chamber, the controller calculates the required amount of detergent following the concentration requirements of the used detergent. The dosing system with the flow meter and the peristaltic pumps ensure a precise dosing.

Foam control – If excessive foam formation is detected via a signal message during pre-rinsing, the pre-rinsing step is automatically repeated without preceding display message.

Validation port for measurement data sampling – One validation port is included on the washer. The port is located on top of the washer for the purpose of inserting thermocouples into the chamber.

Interfaces – Both interfaces - RS232 and RS485 - are available. An external printer or a barcode reader can be connected to the RS232 interface. The RS485 interface is used for example for the BELIMED ICS 8535 batch documentation system.

Servicing access – Service access is on the front side, below the wash chamber. A drawer provides easy access to the controller and electronic components. No service access from the side needed.

Main power switch – the machine provides an easy access for the main power switch for shutdown the complete machine. Access is available from the loading side.

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Batch documentation – The built-in printer documents and records each cycle performance. At the end of a completed cycle, the cycle performance record is printed. The printed cycle information includes transition points, pressure and temperature indication, cycle start time, date, both washer and cycle numbers, and any process faults that occurred during the cycle.

Rack docking system – A cylindrical sleeve on the machine side is pressed against the wash basket by water pressure. This sleeve establishes a form-fitting connection and enables best possible water delivery to the rack.

The water and pressure loss through the process can be reduced to a minimum. The sleeve is returned automatically to the original position when wash pump is deactivated.

Automatic maintenance indication – The control system offers the availability to indicate, when the next scheduled service call should be completed. This allows maximum up-time of the washer and reduces the risk of unexpected down-time.

Options: Design and functions

Exhaust air vapor condenser – The exhaust will be cooled down and dehumidified in the high efficient vapor condenser. By being cooled with tap water or with cooling water from a closed cooling system, the air loses moisture and can thus be fed into the building exhaust air system.

DI-water pre-heating (electrical) – Enables pre-heating of the DI water for thermal disinfection to 93°C parallel to the wash process. This feature allows a cycle reduction up to 14 min compared to standard execution.

Exhaust heat recovery unit (electrical) – During the drying stage, the heat of the exhaust air is used to preheat the DI-water via a heat exchanger. Parallel and in the same time the DI-water is used for cooling/condensate the exhaust. By being cooled, the air loses moisture and can thus be fed into the exhaust air system. The pre heated DI-water (ΔT 27°C) is fed into DI-water preheating tank. This heat recovery saves energy up to 1,4 kWh and up to 14 min cycle time and 35 L of tap water.

Independent process data monitoring (IPD) – All relevant parameters are continuously monitored by independent sensors (optional). Discrepancies between the actual and target values lead to an error message and/or immediate discontinuation of the program.

ICS 8535 – The BELIMED batch documentation system which can be additionally ordered, provides an IT-supported solution to ensure traceability of medical devices circulating between operating theatre and CSSD. All relevant data are stored and available on ICS 8535 of each batch.

2 additional potential-free contacts – One potential-free contact is available as standard. Two more contacts can be optionally installed.

Drain pump set – If a physically drain is not applicable because of limitations in the building drain system, an additional drain pump set can be installed to drain the WD 200 completely.

Floor pan with sensor – To protect the environment for being flooded after a major accident or major break down in the water system, a floor pan with a water level detector sensor can be installed. The level sensor closes automatically all inlet valves as soon as it has been activated.

Sterile filter monitoring – The proper function of the HEPA filter can be monitored by a difference pressure system, which controls the deviation of the pressure drop after the air filter system. If a certain limit will be reached, a warning will be shown on the screen to change the sterile filter. Even a non-proper installed filter will lead to a failure message on the screen.

Bar code reader – By using barcodes for user recognition and documentation, a bar code reader can be ordered optional. All commands can be done with the bar code reader, according the customer needs on both sides of the WD 200.

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Pre-shutoff valve activation function – Belimed recommends to have a shutoff valve for the water piping on building side (for cold water, hot water and DI-water), controlled by the building control system. If such kind of safety installation is not possible, the option pre-shutoff valve activation can be installed. This option does not contain the valve, but gives a signal to activate such kind of a valve.

Ethernet Com-Server – This option allows to connect the controller and the IPD system to any Ethernet.

External printer – The WD 200 is able to send all batch data via ICS 8535 to any external printer, which is connected to the customer network.

Steam connection set from below / from above – To have the full flexibility on the building side, the steam can be connected either from the bottom, or from the top. Both connection sets are available as an option. Belimed recommends to use the panel spacer if multiple WD 200 are lined up.

Additional dosing pumps (Pharmed® / Viton®) – The base model contains 2 dosing systems (incl. dosing pump, flow meter and empty level detergent detector). 2 Additional dosing pump systems can be added. The peristaltic pumps are equipped with silicon tubes. Optionally the tube material can be ordered as Pharmed® or Viton®

Conductivity control unit – some applications require an additional control of the drain after the neutralization step. By using a conductance probe in the drain, the water quality can be measured. If cleaning agent residues are detectable, the neutralization step will be automatically redone.

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Cool down set – If the drain water temperature needs to be lower than the requested 95°C, tap water will be mixed with the drain to lower the drain water temperature beyond 60°C.

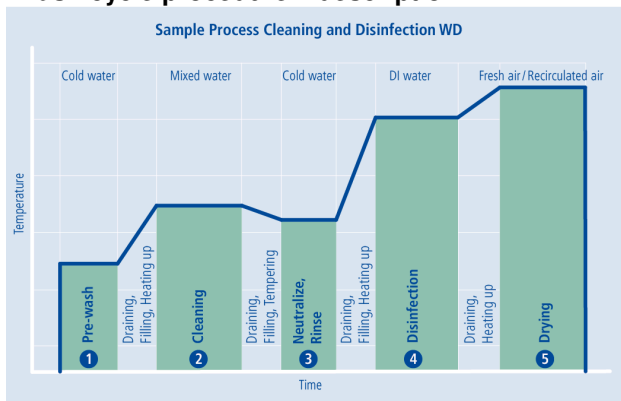
Test plug for sample taking – The washer is equipped with a test plug in the area of the wash chamber sump. With the test plug, water samples can be taken during validation without interrupting the wash process.

Automatic program recognition (magnets) – The Belimed WD 200 can be equipped with a fully automatic basket recognition. By entering the basket the unit select the right program, to avoid any wrong manipulation by the operator.

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Wash cycle procedure – description



Pre-rinse – Cold water is used for the pre-rinsing process. Water is filled in and the pump starts running until a pre-defined minimum level is reached. At the end of the phase, the water is discharged into the drain.

Washing – A mixture of warm and cold water is filled in, depending on the type of process selected. The cleaning agent is dosed precisely according to the manufacturer's specifications. The heating-up process starts in accordance with the programmed temperature profile. At the end of the phase, the water is discarded into the drain.

Neutralizing – After alkaline cleaning, the much-feared caustic carry-over is prevented by neutralizing with a weakly acidic neutralizer.

Rinsing – In the rinsing step, warm water is used to remove cleaning agent residues. Two phases can be run here, depending on the cleaning agent. At the end of the phase, the water is discharged into the drain.

Thermal disinfection – DI water is filled in, circulated and at the same time heated up to 93°C. The disinfection effect is achieved by means of a programmed holding time at 93°C. For disinfection according to A0 > 3000, the energy input is summed up from 65°C upwards. At the end of the phase, the water is emptied completely into the drain.

Chemo-thermal disinfection – Thermal labile washing utensils are disinfected by a chemo-thermal process in which disinfectant is added to the DI water and disinfection is then performed in accordance with the manufacturers' instructions (temperature / contact time). At the end of the phase, the water is emptied completely into the drain.

Drying – Fresh air is fed in via a system equipped with HEPA filters. The air fan is placed before the filter in order to ensure that no particles from the fan or the heating system can enter the chamber.

Self-disinfection of the machine – If the device is out of operation for a defined period of time, a self-disinfection process (according to A0-values) is automatically started or suggested. This is to ensure that the whole system has been disinfected before being taken into operation again, and before instruments are once more reconditioned.

Factory programs

- P1 Mild alkaline washing of Instruments Short
- P2 Mild alkaline washing of Instruments
- P3 Mild alkaline washing of Instruments Intensive
- P4 Mild alkaline washing of Anesthesia
- P5 Mild alkaline washing of Operation Shoes
- P6 Mild Alkaline washing of Baby Bottles / Glass ware
- P7 Self-disinfection
- P8 Drying
- P9 Deliming
- P10 Neutral enzymatic washing of Containers
- P11 Neutral enzymatic washing of Instruments
- P12 Neutral enzymatic washing of Instruments Intensive

Process validation - The aim of process validation is to achieve a high level of safety in the reconditioning of medical devices in order to afford the operators and patients the greatest possible protection. We provided on-site installation qualification and process validation for each of our products

Cleaning agents and disinfectants

The BeliClean range of chemistries have been developed and validated with Belimed Washer/Disinfectors to meet the cleaning efficacy requirements of medical devices and associated accessories according to consistent and repeatable standards outlined in ISO 15883. Belimed offers a fully integrated solution to address your infection prevention requirements, ensure compliance and reduce costs caused by Hospital Acquired Infections.

Contact your local Belimed representative to obtain more information on the full BeliClean range of products and services: enzyme cleaners, alkaline cleaners, neutralizers, instrument lubricants, rinse and dry aids, low and high level disinfecting agents, ongoing maintenance products and more.

Preventive maintenance

Belimed recommends regular preventive maintenance in order to ensure proper function of the device. Belimed has a comprehensive network of trained service technicians who carry out these maintenance tasks on-site.

DISCLAIMER

Do not use this product description for installation of the equipment. Product Description is a subject to change without notice