GETINGE

GETINGE 86-SERIES
INSTALLATION MANUAL
502606400

SEV0725001-

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Contents

FOREWORD

This user manual is intended for users of Getinge 86-series washer disinfectors.
The instruction manual describes the design and operation of the machine and the maintenance for which the user is responsible. The purpose of the information in the manual is to ensure safe operation and optimum efficiency.
Before using the machine for the first time, users must have read this instruction manual and familiarized themselves with the operation of the machine and its safety instructions.

To conform to EN ISO 15883, the items must be placed in the proper accessories, recommended by Getinge Disinfection AB.

The customer is responsible for ensuring that an Installation Qualification, an Operating Qualification and a Performance Qualification according to EN ISO 15883 are carried out before the product goes into service.

Read the user manual before using the machine.

The information in this manual describes the machine as dispatched from Getinge. There may be differences due to customization.
The machine is accompanied by the following documentation:

- User manual
- Installation manual (this book)
- Technical manual
- Spare parts list

Getinge reserves the right to change the specification and design without prior notice.
The information in this manual was up to date on the date of issue of the manual.

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SAFETY REGULATIONS

This machine has been designed with a number of built-in safety devices.
To avoid injury, it is highly important not to bypass or disable these safety devices.
If the equipment is used in a manner that was not specified by the manufacturer, the safety equipment on the machine may not be fully effective.
Operators and maintenance personnel must undergo safety training for the machine.

All personnel who handle chemicals for washing and disinfection must understand the washing process, possible health hazards and ways of detecting leaks of toxic chemicals.

Operators and maintenance personnel must undergo regular training in the operation and maintenance of the equipment. There must be a documented list of personnel who have been trained on the machine. Trained personal must be tested to verify the training programme.

The equipment must be used in accordance with the safety instructions below.
If in doubt, contact a representative of the reseller without delay.

Important

- Take care when handling the chemical agents used in the machine.
- Read the instructions on the pack or contact the manufacturer before using the machine for instructions about:
  - what to do if the substance comes into contact with the eyes or skin or if vapors are inhaled.
  - storage of packs and sorting of empty packs for disposal.
- The machine must be connected in accordance with the instructions given in the installation manual.
- The machine may only be used by adults.
- Installation and servicing may only be done by personnel trained for this machine.
- Never bypass door safety switches.
- Leaks in the system caused by worn seals in the door, for example, must be repaired immediately.
- Before doing any repair or servicing work, the personnel concerned must study the relevant handbooks and service manuals.
- Before any welding is done on or close to the machine, all cables connected to the control system via connectors and sockets must be disconnected.
- Before doing any servicing or maintenance work on the machine, isolate it from the electric power supply and drain all tanks.
- Do not wash down or hose down the machine with water.
- Take care when using corrosive substances.
- Observe safety measures for steam and hot water.
- The electrical cabinet may only be opened by authorized and trained personnel.
- Spare parts must be obtained only via Getinge EDC.

The machine must be assembled and installed:

- by qualified personnel.
- in accordance with current local regulations and rules.

Warning:
To avoid the risk of back injury, this equipment should be assembled and installed by two people.

When the work is complete, check that

- all parts have been installed in accordance with the installation instructions
- all screws have been properly tightened
- there are no sharp edges on any parts that may come into contact with people
- all hoses, pipes and connections are intact and free from defects
- all the functions of the machine are working properly. Adjust if necessary.

Carry out an Installation Qualification, an Operating Qualification and a Performance Qualification according to ISO 15883 before putting the machine into service.

Incorrect use may result in damage and injury.

Product liability

Any modification or incorrect use of the equipment without the approval of Getinge Disinfection AB invalidates Getinge Disinfection AB´s product liability.
This product was manufactured by:
GETINGE DISINFECTION AB
Ljungadalsgatan 11
Box 1505
351 15 Växjö
Sweden

CE 0413

Attention symbols

Some of the warnings, instructions and advice in this manual are so important that we use the following special symbols to draw attention to them. The symbols and designs used are:

This symbol indicates a warning in the text of the manual. It warns of a hazard that may lead to more or less severe injury and in certain cases mortal danger. It also highlights warnings to avoid damage to equipment.

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INSTALLATION

- The floor where the machine is to stand must be flat and level within ±5 mm.
- Pull the machine (on a transport pallet) to the location where it will be installed.
- Lift the machine off the pallet.
- Position the machine at the chosen location and adjust the feet so that the machine is stable.

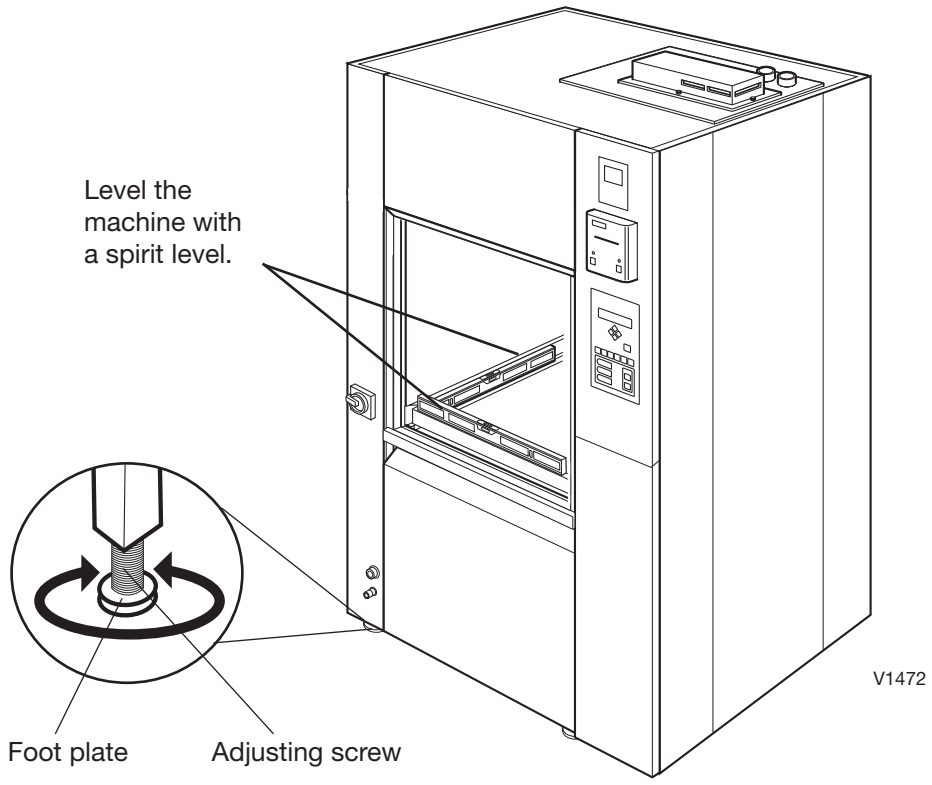

Figure 1. Adjustment

- Using a spirit level, check as shown in Figure 1 that the machine is level within ±2 mm.

If you need to move the machine by using a pallet truck:

- position the pallet truck forks as shown in Figure 2 so as not to damage the machine.

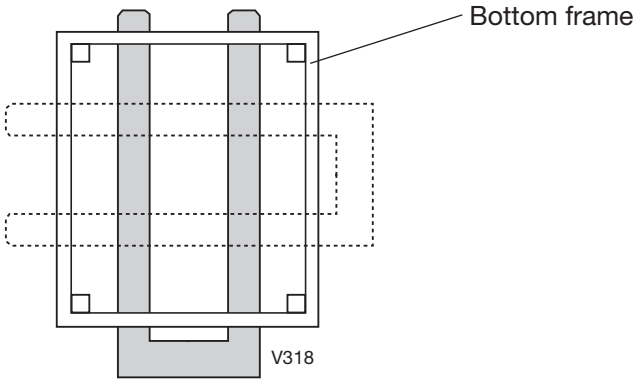

Figure 2. Positioning the pallet truck forks.

Wall-mounted model

- If the machine has double doors and is to be mounted in a wall, the distance between machine and wall must be 15 mm.
- If machines are to be installed next to each other they must be adjusted to the same height on installation.
- Where a plinth plate is used, the height from the floor to the underside of the machine must be at least 100 mm.
- Set the machine horizontal with a spirit level on the side of the machine and adjust with the feet.
- For the loading trolley to work in all the machines, the floor in front of them must be flat and level.

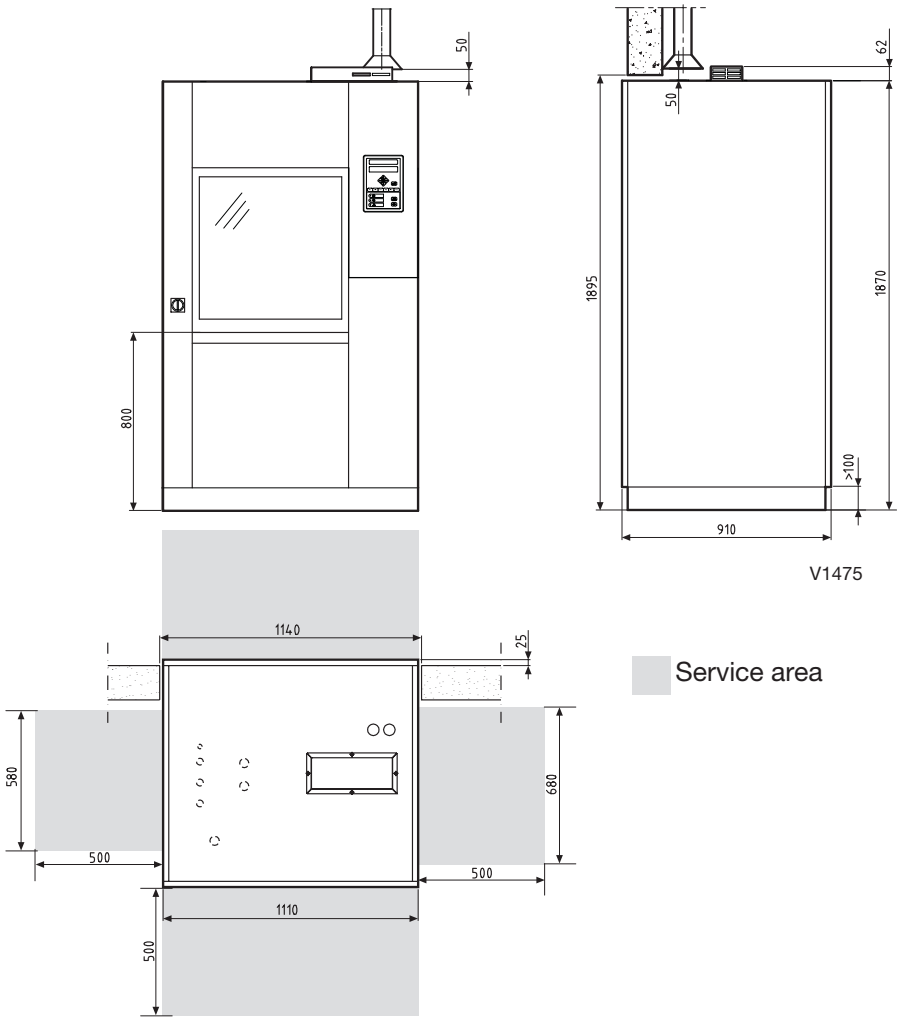

Figure 3. Installation in a wall

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Connecting electric power

Installation may only be done by authorized personnel.

Connect electric power to the machine as follows:

- Connect the power supply to the electrical connections of the machine; see the diagram with alternative connection arrangements.
- For easier servicing and maintenance, the supply to the machine should be fitted with a lockable isolator with a 3 mm break gap. The isolator must be located in an easily accessible position on the wall.

It is important that the connection has the correct overcurrent protection. The correct fuse rating is stated on the type plate.

The main switch on the front of the machine is connected to protective ground (earth) and to the supply voltage stated on the type plate.

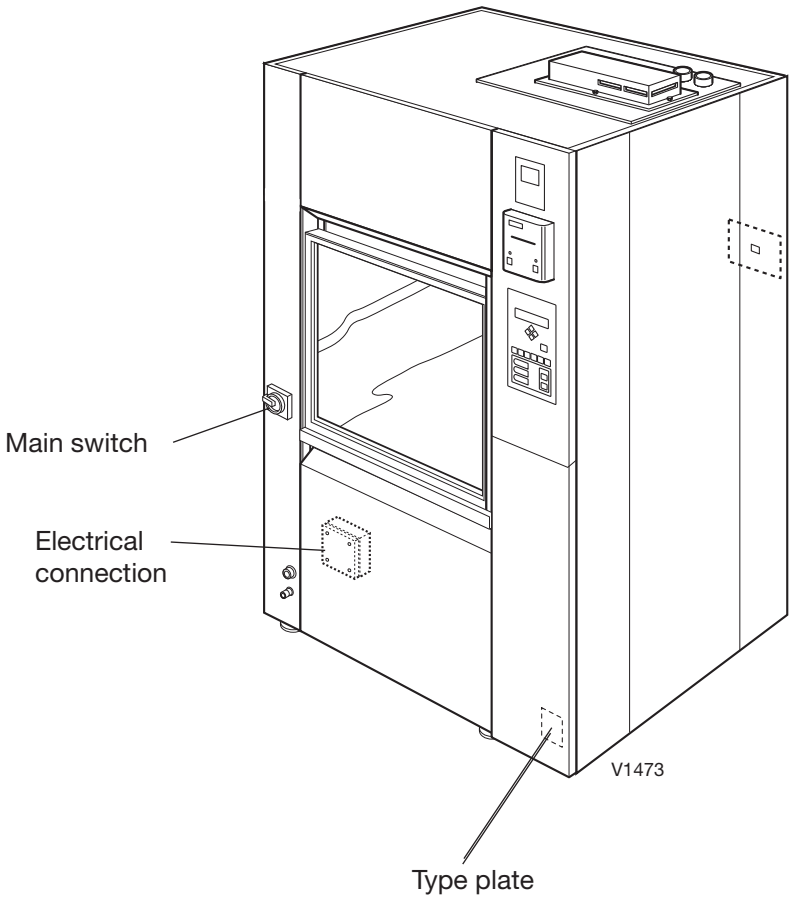
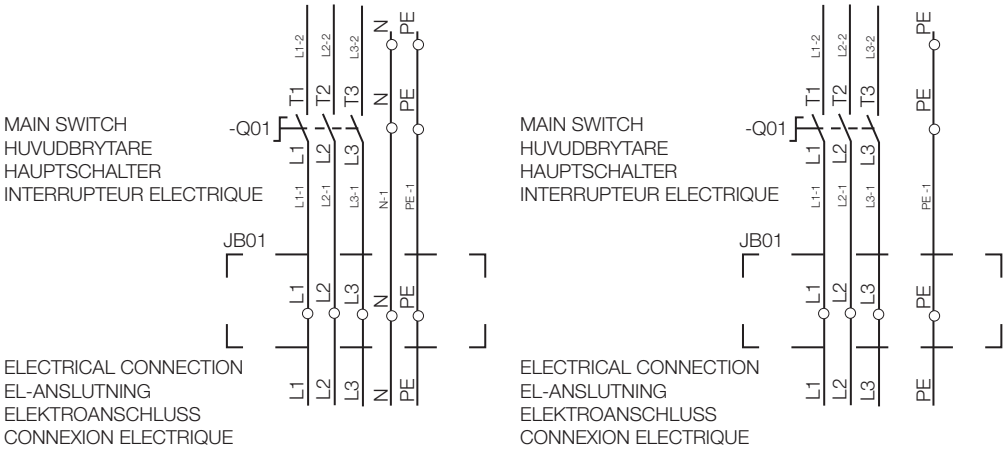


Figure 4 Electrical connection (see alternative connection arrangements)

Alternative connection arrangements



Electrically heated	240/415V 3N+PE, 50Hz 21.1kW 31A FUSE 3x32A	240V 3+PE, 60Hz 21.3kW 54A FUSE 3x60A
	230/400V 3N+PE, 50/60Hz 19.7kW 30A FUSE 3x32A	230V 3+PE, 50Hz 19.7kW 54A FUSE 3x63A
	220/380V 3N+PE, 50/60Hz 17.9kW 29A FUSE 3x32A	208 3+PE, 60Hz 20.5kW 59A FUSE 3x60A
		200V 3+PE, 50/60Hz 19.1kW 58A FUSE 3x63A
Steam-heated	240/415V 3N+PE, 50Hz 6.5kW 14A, FUSE 3x20A	240V 3+PE, 60Hz 6.5kW 23A, FUSE 3x25A
	230/400V 3N+PE, 50/60Hz 6.5kW 14A, FUSE 3x20A	230V 3+PE, 50Hz 6.5kW 24A, FUSE 3x25A
	220/380V 3N+PE, 50/60Hz 6.5kW 14A, FUSE 3x20A	208V 3+PE, 60Hz 6.5kW 26A, FUSE 3x30A
		200V 3+PE, 50/60Hz 6.5kW 27A, FUSE 3x32A
Steam-heated with booster	240/415V 3N+PE, 50Hz 11.4kW 18A, FUSE 3x20A	240V 3+PE, 60Hz 11.5kW 30A, FUSE 3x30A
	230/400V 3N+PE, 50/60Hz 10.7kW 17A, FUSE 3x20A	230V 3+PE, 50Hz 10.7kW 29A, FUSE 3x32A
	220/380V 3N+PE, 50/60Hz 9.8kW 16A, FUSE 3x20A	208V 3+PE, 60Hz 11.1kW 33A, FUSE 3x35A
		200V 3+PE, 50/60Hz 10.4kW 32A, FUSE 3x32A
Steam-heated & electrically heated	240/415V 3N+PE, 50Hz 11.4kW 18A, FUSE 3x20A	240V 3+PE, 60Hz 11.5kW 30A, FUSE 3x30A
	230/400V 3N+PE, 50/60Hz 10.7kW 17A, FUSE 3x20A	230V 3+PE, 50Hz 10.7kW 29A, FUSE 3x32A
	220/380V 3N+PE, 50/60Hz 9.8kW 16A, FUSE 3x20A	208V 3+PE, 60Hz 11.1kW 33A, FUSE 3x35A
		200V 3+PE, 50/60Hz 10.4kW 32A, FUSE 3x32A
Steam-heated & electrically heated with booster	240/415V 3N+PE, 50Hz 21.1kW 31A, FUSE 3x32A	240V 3+PE, 60Hz 21.3kW 54A, FUSE 3x60A
	230/400V 3N+PE, 50/60Hz 19.7kW 30A, FUSE 3x32A	230V 3+PE, 50Hz 19.7kW 52A, FUSE 3x63A
	220/380V 3N+PE, 50/60Hz 17.9kW 29A, FUSE 3x32A	208V 3+PE, 60Hz 20.5kW 59A, FUSE 3x60A
		200V 3+PE, 50/60Hz 19.1kW 58A, FUSE 3x63A

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Connecting water, steam, waste and dryer

Installation may only be done by authorized personnel.

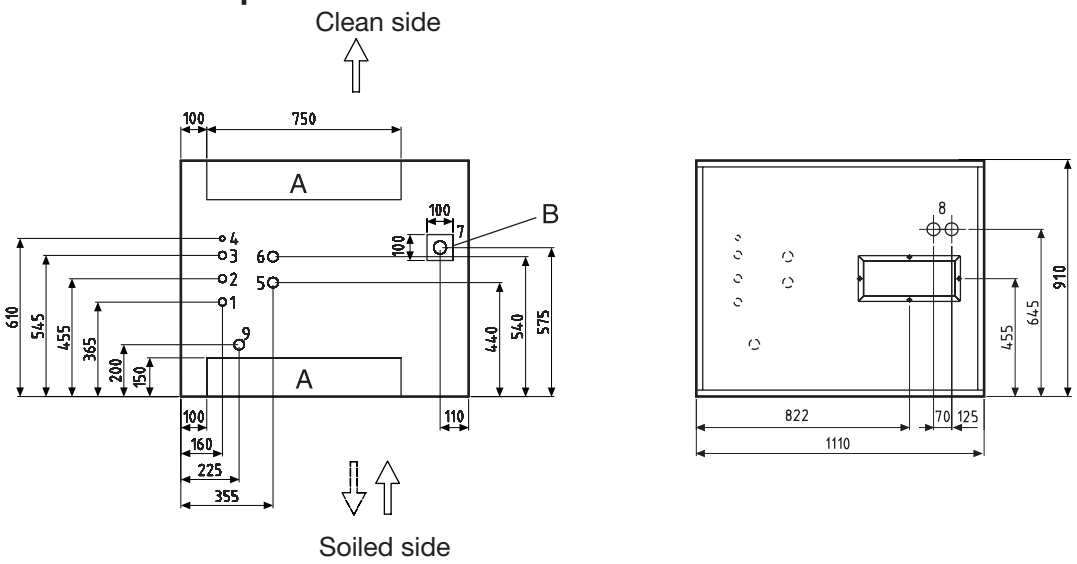
- Provide water and, if required, steam connections with separate stopcocks. Flush out the water and steam pipes that are to be connected to the machine, to prevent clogging of filters and valves.
- Connect the disinfector to cold and hot water and to steam and condensate connections, if used. The connections must meet the following requirements:

	Connection	Pressure	Flow rate
Cold water	3/4” (20 mm) male	100-800 kPa	approx 33 liters/phase** approx 40 liters/phase***
Hot water	3/4” (20 mm) male	100-800 kPa	approx 33 liters/phase** approx 40 liters/phase***
Dist. water/ de-ion. water	3/4” (20 mm) male	100-800 kPa*	approx 33 liters/phase*** approx 40 liters/phase***
Steam	1/2” (15 mm) female	300-500 kPa	0.9 to 1.0 kg/min (300 kPa)
Condensate	1/2” (15 mm) female		
Compressed air	1/2” (15 mm) female	4 to 8 bar	

* Where the pressure is lower than 100 kPa a separate feeder pump must be used.
** At chamber depth = 720 mm
*** At chamber depth = 800 mm

Note:
Distilled or de-ionized water must have a conductivity of less than 40 µS/cm.

Chamber depth 720 mm



Chamber depth 800 mm

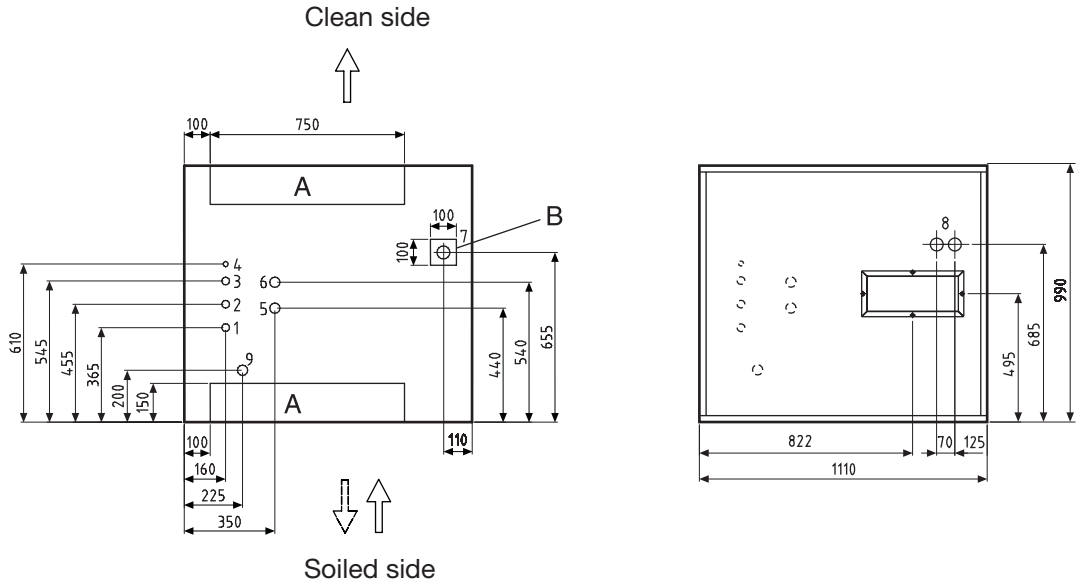


Figure 5. Connecting water, steam, waste and dryer

1. Cold water 350 mm above the floor
2. Hot water 350 mm above the floor
3. Distilled/de-ionized water 350 mm above the floor
4. Compressed air connection (in/out feeder) 400 mm above the floor
5. Steam connection 350 mm above the floor
6. Condensate connection 350 mm above the floor
7. Drain connection at floor
8. Dryer exhaust air at roof
9. Electrical connection 350 mm above the floor

A. No cables or pipes in this area

B. Adjustable within this range

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- PTFE tape is recommended for sealing the connections.
- Connect the disinfector to a waste outlet with a capacity of at least 50 litres/min. Connect the waste as shown in Figure 5. Diameter of waste: 50 mm.

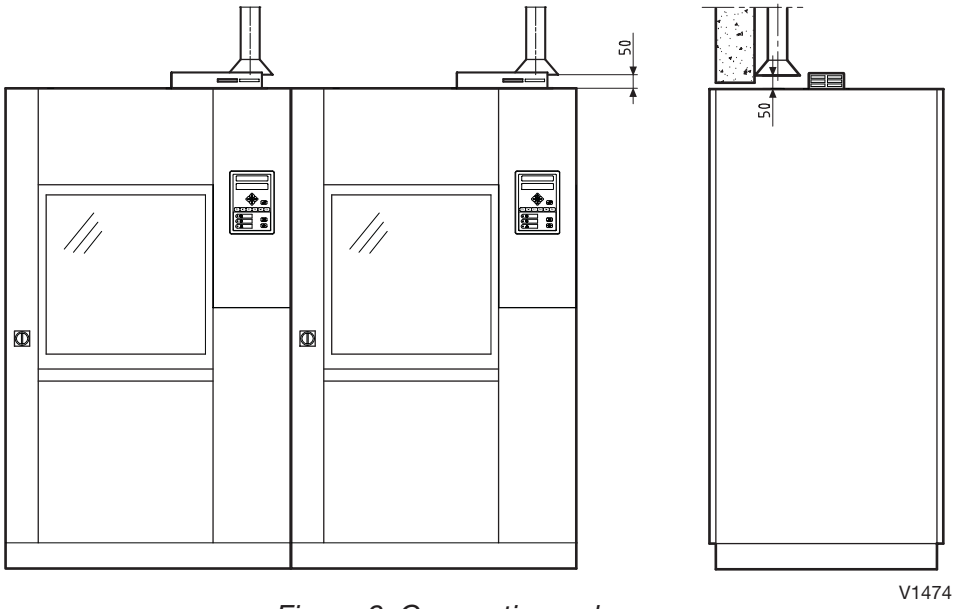

Figure 6. Connecting a dryer

- Connect air exhaust from dryer (if the machine has a dryer). Air quantity approx 350 m^3/h.

Function check

- Check that the machine is connected to the correct voltage and the waste, water, steam and condensate connections are correctly connected. Open the valves for water and steam.
- Fill the detergent containers and place alarm sensors in the containers.
- When starting a new machine, the door can be unlocked and opened with . With a manually-operated door, the door must be pressed down with the handle after it has been unlocked. An automatic door opens automatically.
- Machines with double doors have a system of interlocks to ensure that only one door can be opened at a time.
- The clean-side door can only be opened if the completed process has been approved and the soiled-side door is closed and locked.
- If the soiled-side door cannot be opened, check that the clean-side door is closed and locked. If not, proceed as follows:
  - Manually-operated door - Close the door and press .
  - Automatically-operated door - Press .
- Place a wash rack in the wash chamber and close the door.
- Choose a program where dosing is done from all the detergent and rinse-aid containers and start the machine (see the instruction manual).
- Check that the machine draws water.

Note:
On starting, there must be water in the circulation pump. If there is no water in the pump the shaft seal may be damaged.

- Check that the circulation pump is rotating in the right direction as indicated by the arrow on the pump motor. If not, isolate the power, change the phase sequence at the electrical connections and restart the machine.

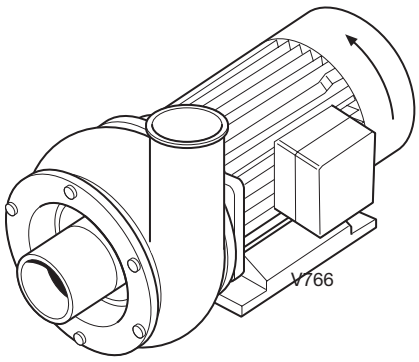

Figure 7. Circulation pump

- Check that the dosing pumps work at the right time in accordance with the program description in the instructions for use and that detergent is drawn off.
- While the program is running, check that the door(s) cannot be opened.

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- On a machine with manual double doors, check the door locking function when the program is complete as follows:
  - If the soiled-side door cannot be opened, check that the clean-side door is closed.
  - Open and close the clean side door.
  - Press ⎍.
  - Open the soiled-side door.
  - Check that the clean side door cannot be opened.
- Check that there are no water or steam leaks. If necessary, retighten water, steam and waste connections.

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TECHNICAL DATA

Dimensions

Outside dimensions

Width 1110 mm

Depth

8666, CM303:	910 mm
8668, CM304:	990 mm

Height 1870 mm

Chamber, effective dimension

Chamber depth

8666, CM303	720 mm
8668, CM304	800 mm

Chamber width	665 mm
Chamber height	667 mm

Chamber volume

8666, CM303	300 litres
8668, CM304	340 litres

Weight including water and load.

Total 350-400Kg

Loading per machine foot	0.85 to 0.98 kN (four feet)
Specific area loading	3.4-3.9 kN/m^2
Floor area loading, machine foot	347 kN/m^2

Connections

Water consumption

8666, CM303	33 liters/phase **Note 1.**
8668, CM304	40 liters/phase **Note 1.**

Cold water

Recommended water quality: Drinking water with max 5°dH

Connection	ISO G-3/4
Pressure	100-800 kPa
Flow rate	30 liters/min

Hot water

Recommended water quality: Preheated drinking water with max 5°dH

Temperature	45-60°C (113-140°F) **Note 2.**
Connection	ISO G-3/4
Pressure	100-800kPa
Flow rate	30 liters/min

Note 1. The water consumption varies depending on the type of wash trolley and the items.

Note 2. The water temperature affects the process time. The lower the water temperature, the longer the process will take.

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Distilled/de-ionized water (option)

Recommended water quality:	The maximum conductivity is determined by the desired washing result.
Max temperature	60°C (140°F) Note 2.
Connection	ISO G-3/4
Pressure	100-800 kPa (where the pressure is lower than 100 kPa, a separate pressure booster pump must be connected. This is available as an option.)
Flow rate	30 liters/min

Compressed air (option with loader/unloader only)

Connection pressure	4.8 bar

Steam (only for a machine with steam-heated chamber)

Connection	ISO G-1/2
Pressure	300-500kPa Notes 3, 4.
Max steam temperature	160 °C (320 °F)
Consumption	about 0.9-1.0 kg/min at 300 kPa

Steam condensate (only for a machine with steam-heated chamber)

Connection	ISO G-1/2 Note 4.

Waste outlet

Dimension, out	ø50 mm (2”)
Minimum capacity of receiving drain	
1. Capacity	40 l/min, max 90 °C (194 °F)
2. Capacity with drain cooling (option)	80 l/min, max 60 °C (140 °F)
Recommended connection dimension	100mm

Evacuation air

Air quantity	350 m3/h approx.
Max temperature:	160 °C (320 °F)
Air humidity	60-100 %

Note 2. The water temperature affects the process time. The lower the water temperature, the longer the process will take.

Note 3. The pressure and temperature of the steam affect the process time. The lower the pressure, the longer the process will take.

Note 4. The pressure differential between the supply and return lines must be greater than 100 kP.

Other points

Circulation system

Design pressure:	200 kPa
Working pressure:	max 130 kPa
Design temperature	160 °C (320 °F)
Working temperature	93°C (199°F)

Electrical connection

See the relevant connection option.

Environmental requirements

Air humidity max	80% at 31 °C (87 °F)
Room temperature	5-40 °C (41-104 °F)

Heat dissipation to the room

Max 4000 W hot air during drying.
Max 1100 W during disinfection at 90 °C (194 °F)
Max external temperature of the machine at 50 °C (123 °F)

Sound level

Table 1 below shows the sound power level as linear octave band values and as co-weighted, A-weighted sound power level, both equivalent L_{wA} and maximum L_{wAFmax}.

Table 1

Calculated sound power level Lw for the test object, db ref 1 pW.

Octave band frequency (Hz)	125	250	500	1000	2000	4000	8000	L_{wA}	L_{wAFmax}
Correction terms (Kok)	67	69	67	67	69	67	70	75	84

The calculated sound power level implies different sound levels LpA in different types of space. With a larger room volume, the sound level decreases slightly and with a smaller room level it increases slightly. Table 2 below shows three example of what to expect in practice.

Table 2

Calculated sound level LpA for the test object in a 70m³ room, db ref 20 µPa.

Type of room	Description	Operator position*	3 meters from the machine
Hard to sound	All surfaces of tile, plaster, concrete or similar, ie no sound absorbing surfaces and no furniture	74	74
Normally-damped	Some sound absorption in the form of furniture and textiles.	70	69
Damped	Full-cover ceiling absorbent and some furnishing with tables, chairs and textiles.	67	65

* The term “operator position” means 1 meter from the machine and 1.5 meters above the floor.

Degree of protection

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Water quality - washer disinfectors

The quality of the water used in all stages of cleaning is important for good results.

The water used in each stage must be compatible with:
* The material of which the washer disinfector is made
* The chemicals used in the process
* Process requirements for the various stages of the process

The main factors for good water quality are:

Hardness	High hardness will cause limescale deposits in the washer disinfector, leading to poor cleaning results.
Ionic contaminants	A high concentration of ionic contaminants may cause corrosion and pitting on stainless steel. Heavy metals such as iron, manganese or copper cause instruments to tarnish.
Microbial contaminants	The water used should not increase the biological load on the equipment that is being treated against micro-organisms and their residual products which may cause fever-like symptoms when they get into the human body.
Sanitary chemicals	High concentrations of and high exposure to sanitary chemicals may cause corrosion and pitting on stainless steel.

Getinge Disinfection AB therefore recommends that water used in the pre-rinsing, washing and final rinsing phases should be of drinkable quality in accordance with the guidelines. Detailed information about acceptable water quality can be found in "Guidelines for Drinking Water Quality 3rd Edition" published by WHO.

Getinge Disinfection AB also recommends following local standards. RO (reverse-osmosis) water (or similarly treated water) is used for the final washing/disinfection phase.
A typical specification for RO water is:

pH	5.5 to 8
Conductivity	<30 $\mu s.cm^{-1}$
TDS	<40 mg/l
Maximum hardness	<50 mg/l
Chlorine	<10 mg/l
Heavy metals	<10 mg/l
Phosphates	<0.2 mg/l som P_2O_5
Silicates	<0.2 mg/l som SiO_2
Endotoxins	<0.25 EU/ml
Total number of micro-organisms	<100 per 100 ml

Further advice should also be obtained from the manufacturers of chemical and medical equipment.

Where local standards are stricter that Getinge Disinfection AB's recommendations, they should be followed. Note that it is the customer's responsibility to supply the washer disinfector with suitable water.

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