

ServeCool SW | SWP

Operating instructions

ServeCool SW ServeCool SWP

Original operating instructions
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Hoval

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1 Use

1.1 Intended use

The ServeCool unit is an air-conditioning unit for cooling data centres. It cools the IT environment indirectly with high-efficiency plate heat exchangers. This means the air in the server room is completely separated from the fresh air outside, which eliminates the possibility of dust or variations in fresh air humidity affecting highly sensitive IT equipment. The system uses the interaction of different resources for cooling with minimal energy consumption depending on the current environmental conditions:

- Indirect free cooling with fresh air
- Indirect adiabatic cooling
- Mechanical aftercooling via cooling coil (for covering load peaks)

The ServeCool unit is suitable for use in data centres with one hundred to several thousand square metres of air-conditioned IT area. The system's cooling power can be scaled up as required simply by connecting several units in series.

In order to maintain defined air humidity values in the server room, the ServeCool unit can activate an external humidifier (option).

Intended use also includes compliance with the operating instructions. Any usage over and above this use is considered to be not as intended. The manufacturer can accept no liability for damage resulting from improper use.

1.2 User group

The unit may only be installed, operated and serviced by authorised and trained specialist personnel who are familiar with the unit and aware of the risks involved. The operating instructions are for operating engineers and technicians as well as specialists in building, heating and ventilation technology.

2 Safety

2.1 Symbols



Caution

This symbol warns against risk of injury. Please heed all instructions designated by this symbol to prevent injuries and/or death.



Attention

This symbol warns against property damage. Please heed the respective instructions to prevent risk of damage to the unit and its functions.



Notice

This symbol denotes information about the economic use of the equipment or special tips.

2.2 Operational safety

The unit is built to conform to the state-of-the-art and is operationally safe. Despite every precaution being taken, potential and not immediately obvious risks always remain, for example:

- Dangers when working with the electrical system
- Parts (e.g. tools) can fall down below when working on the ventilation unit.
- Malfunctions as a result of defective parts

Therefore:

- Please read the operating instructions before unpacking, installing, commissioning and before maintaining the equipment.
- Store the operating instructions so that they are easily accessible.
- Observe any attached information and warning signs.
- Immediately replace damaged or removed informational and warning signs.
- Follow the local safety and accident prevention regulations at all times.
- Disconnect the power supply before opening the unit.
- When working in the unit, take precautions against unprotected, sharp metal edges.
- The unit may only be installed, operated and serviced by authorised, trained and instructed skilled personnel:
 - Specialists as defined by these operating instructions are those persons who, based on their training, knowledge and experience as well as their knowledge of the relevant regulations and guidelines, can carry out the work assigned to them and recognise potential hazards.
- Unauthorised reconfiguration or modification of the unit is not permitted.

3 Construction and operation

The ServeCool unit has been specially designed for energy-efficient cooling of data centres. It fulfils the following functions:

- Cooling in recirculation operation (with connection to on site water supply and on site chilled water system)
- Filtering of the extract air
- Actuation of a humidifier (optional)

The unit cools in recirculation operation, which means it draws in extract air from the server room, cools it and blows it back into the room as supply air. Depending on the current temperature and humidity conditions, various cooling processes will be taking place simultaneously.

Indirect free cooling with fresh air

The unit draws in cool fresh air. This flows through the two plate heat exchangers, thereby cooling the supply air flow, and is then blown back outside.

Indirect adiabatic cooling

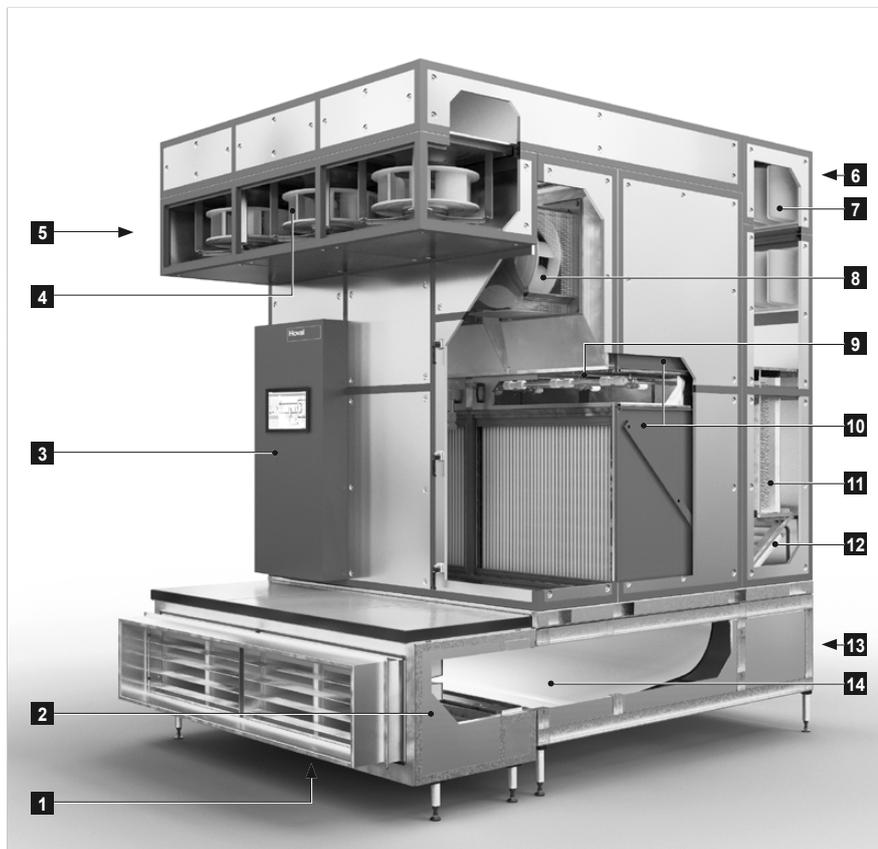
The evaporative cooling (adiabatic system) is operating: water is sprayed into the fresh air flow. Evaporation of the water cools the air; the additional cooling capacity is transferred to the supply air via the plate heat exchanger.

- ServeCool SW: On site central water supply with a redundant pumping station supplies the adiabatic system with water. The pressure of the supply water is used directly at the spray nozzles for spraying the heat exchanger with water.
- ServeCool SWP: A circulating water pump integrated in the unit supplies the adiabatic system with water. This means the spray nozzles are independent from the supply pressure of the water supply in the building. The water supply and discharge pipe on site can be configured with a smaller size than for the ServeCool SW, because the sludge removal of the trough can be enabled by the control for each individual unit.

Mechanical aftercooling

The supply air undergoes mechanical aftercooling via a cooling coil in order to cover load peaks.

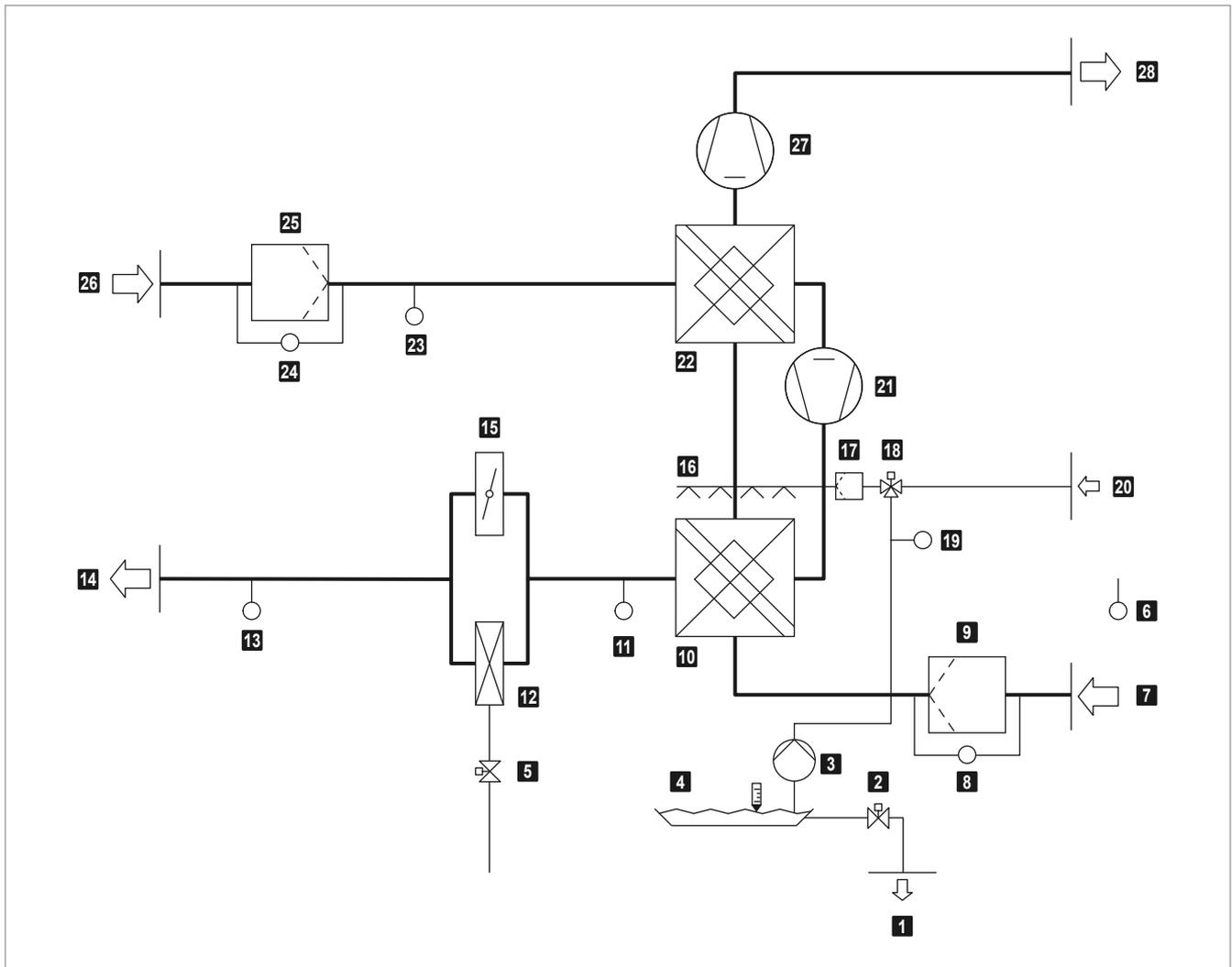
3.1 Construction



- | | |
|-----------|--|
| 1 | Drain valve (only ServeCool SWP) and drain |
| 2 | Fresh air box |
| 3 | Control box |
| 4 | Exhaust air fans |
| 5 | Exhaust air duct connection |
| 6 | Extract air duct connection |
| 7 | Extract air filter |
| 8 | Supply air fans |
| 9 | Spray nozzles |
| 10 | Plate heat exchangers |
| 11 | Cooling coil |
| 12 | Bypass damper |
| 13 | Supply air duct connection |
| 14 | Adiabatic pump and trough (only ServeCool SWP) |

Fig. 1: ServeCool unit construction

3.2 Function diagram



- | | |
|--|--|
| 1 Drain | 15 Bypass damper with actuator |
| 2 Drain valve (only ServeCool SWP) | 16 Spray nozzles |
| 3 Adiabatic pump (only ServeCool SWP) | 17 Water filter (only ServeCool SWP) |
| 4 Trough with liquid level switch | 18 Feed valve |
| 5 Cooling valve (option) | 19 Conductance measurement (only ServeCool SWP) |
| 6 Fresh air combination sensor (temperature, humidity) | 20 Water supply |
| 7 Fresh air | 21 Supply air fan |
| 8 Filter monitoring fresh air (option) | 22 Plate heat exchanger 2 |
| 9 Fresh air filter (option) | 23 Extract air combination sensor (temperature, humidity) |
| 10 Plate heat exchanger 1 | 24 Filter monitoring extract air |
| 11 Energy monitoring combination sensor (temperature, humidity) | 25 Extract air filter |
| 12 Cooling coil | 26 Extract air |
| 13 Supply air combination sensor (temperature, humidity) | 27 Exhaust air fan |
| 14 Supply air | 28 Exhaust air |

Fig. 2: Function diagram

3.3 Operating modes

The ServeCool control system controls the unit according to demand and depending on the operating conditions. The integrated unit controller or higher-level building management system allow the following operating modes to be specified:

Operating mode	Description	Use
Summer operation	<p>The unit uses the following cooling processes depending on the temperature and moisture conditions:</p> <ul style="list-style-type: none"> ■ Indirect free cooling with fresh air ■ Indirect adiabatic cooling ■ Mechanical aftercooling (for covering load peaks) <p>The chiller for supplying the cooling coil and the water supply are in operation.</p>	During the hot season
Winter operation	<p>The unit uses the following cooling processes depending on the temperature and moisture conditions:</p> <ul style="list-style-type: none"> ■ Indirect free cooling with fresh air ■ Mechanical aftercooling (for covering load peaks) <p>The chiller for supplying the cooling coil is in operation. There is no need for a water supply.</p>	During the cold season and in transitional periods

Table 1: Operating modes

4 Type code

SW - 25 / AG . G1 . KV . AK / Q . B1 . SM

Unit type

SW ServeCool SW
SWP ServeCool SWP

Unit size

25

Extract air filter

AG Extract air filter ISO coarse 60 % (standard)
AM Extract air filter ISO ePM10 65 %

Frame height

G1 Frame height 1000 mm (standard)
G2 Frame height 900 mm
G3 Frame height 820 mm

Cooling valve

KV Cooling valve

Fresh air box

-- Without (standard)
AK Fresh air box
AC Fresh air box and condensation prevention system

Source changeover

-- Without (standard)
Q Source changeover

Actuation of humidifier

-- Without (standard)
B1 Actuation of humidifier type 1
B2 Actuation of humidifier type 2

Protection module

-- Without (standard)
SM Protection module

5 Technical data

5.1 Application limits

Fresh air temperature	min.	°C	-30
	max.	°C	45
Extract air temperature	max.	°C	45
Supply air temperature	min.	°C	15

Table 2: Application limits in operation

5.2 Air flow rate, electrical connection

Unit type			SW-25	SWP-25
Nominal air flow rate	Supply air	m ³ /h	25750	25750
	Fresh air	m ³ /h	22000	22000
Electrical connection	Supply voltage	V AC	3 × 400	3 × 400
	Permitted voltage tolerance	%	± 10	± 10
	Frequency	Hz	50	50
	Current consumption (at nominal air flow rate)	A	32.4	34.4
	Power consumption (at nominal air flow rate)	kW	20.4	21.2
Extract air filter	Filter class		ISO coarse 60 %	
	Filter monitoring factory setting	Pa	200	200
Fresh air filter (option)	Filter class		ISO ePM10 65 %	
	Filter monitoring factory setting	Pa	350	350

Table 3: Air flow rate, electrical connection

5.3 Sound level

Sound pressure level (at a distance of 5 m) ¹⁾		dB(A)	60
Total sound power level ²⁾		dB(A)	82
Octave sound power level	63 Hz	dB	52.4
	125 Hz	dB	72.8
	250 Hz	dB	72.5
	500 Hz	dB	70.6
	1000 Hz	dB	70.5
	2000 Hz	dB	66.2
	4000 Hz	dB	58.6
	8000 Hz	dB	48.2

1) with hemispherical radiation in a low-reflection environment (enveloping surface process)

2) determined by intensity process

Table 4: Sound level (fresh air, discharge side)



Notice

To reduce the noise level at night, the speed of the exhaust air fans can be limited to an adjustable set value using the control system.

5.4 Cooling capacity

Cooling capacity	Total	120 kW
	Free and adiabatic cooling	108 kW
	Mechanical	12 kW
Operating point	Extract air conditions	38 °C / 18 %rh
	Supply air conditions	24 °C / 40 %rh
	Fresh air conditions	35 °C / 22 %rh
Cooling coil data	Supply/return temperature	14/20 °C
	Water quantity	1873 l/h
	Water pressure drop	0.44 kPa

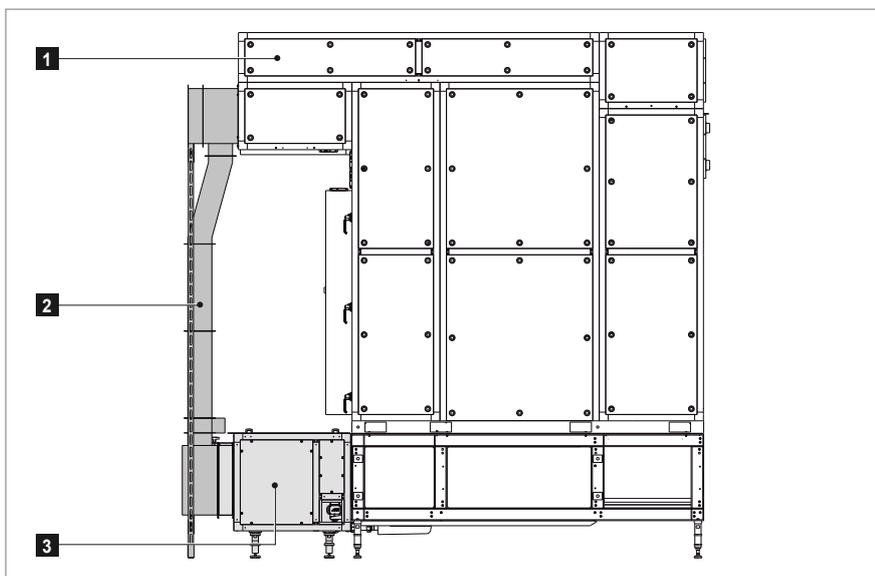
Table 5: Cooling capacity



Notice

The cooling capacity varies depending on the ambient conditions.

5.5 Dimensions and weights



- 1** ServeCool unit
- 2** Condensation Prevention System (option)
- 3** Fresh air box (option)

Fig. 3: Components

Unit type		SW-25	SWP-25	
Components	ServeCool unit	kg	3650	3700
	Condensation Prevention System	kg	230	230
	Fresh air box	kg	265	265
Water capacity	Cooling coil	kg	40	40
	Trough	kg	250	250
Total		kg	4435	4485

Table 6: Weights

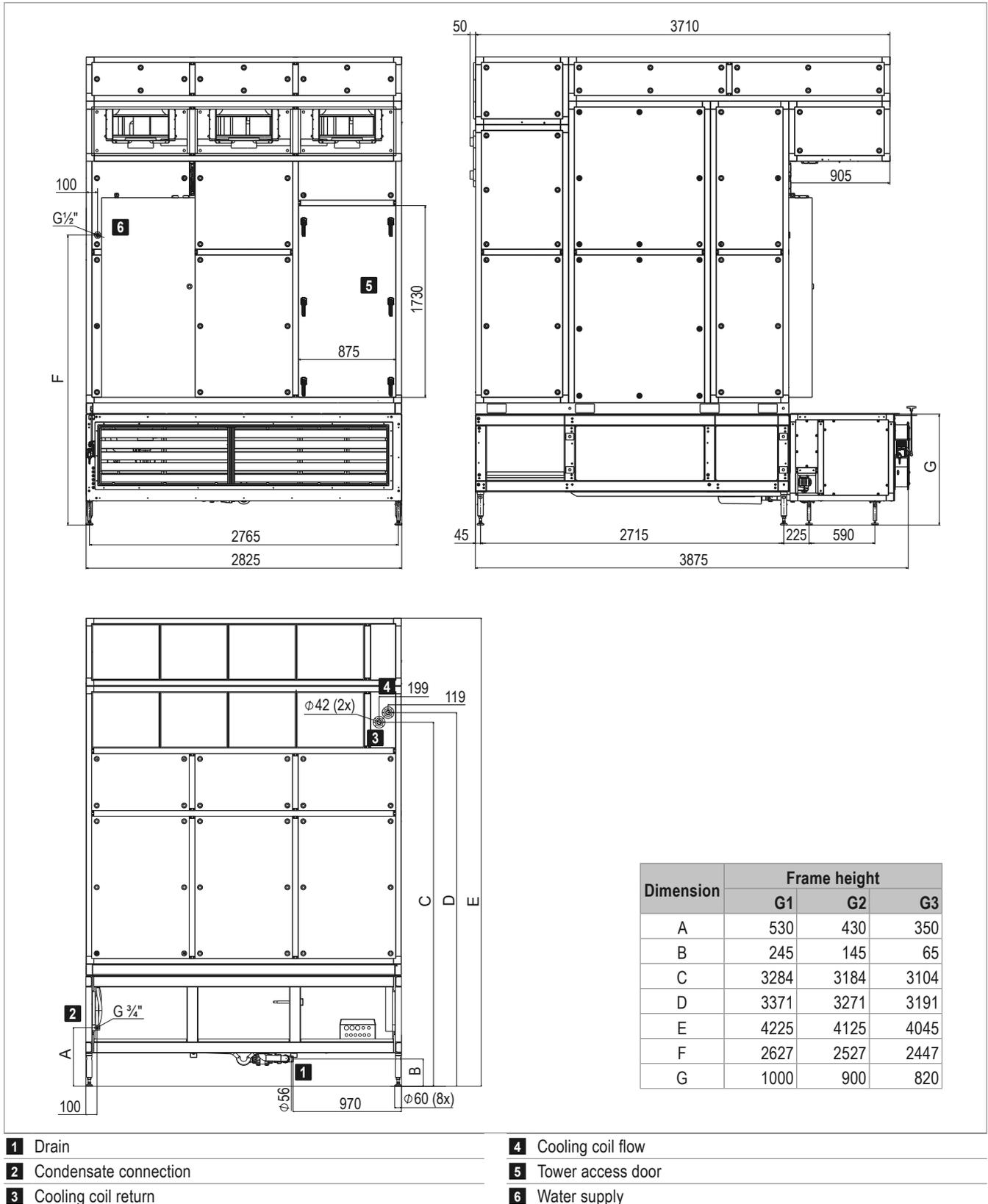


Fig. 4: Dimensional drawing (dimensions in mm)

6 Options

6.1 Extract air filter

An ultrafine dust filter is installed for filtering the extract air (replaces the standard filter).

Filter class	ISO ePM10 65 %
Filter monitoring factory setting	250 Pa

Table 7: Extract air filter technical data

6.2 Frame height

The base frame can be supplied in 3 versions to adapt the ServeCool unit to the structure of the false floor.

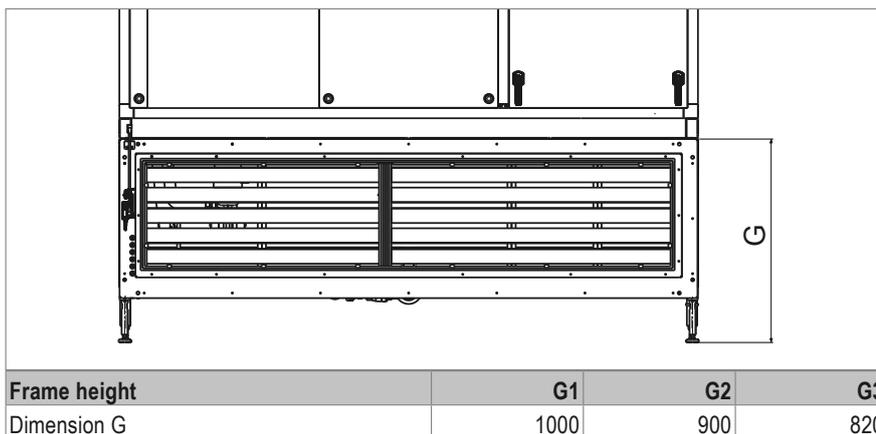


Fig. 5: Dimensional drawing frame height (dimensions in mm)

6.3 Cooling valve

The optionally available cooling valve is a non-pressure-dependent compensating and control valve comprising:

- Linear control valve
- Pressure regulator with integrated diaphragm
- Actuator

The valve is used as an automatic combination valve for control and hydraulic balancing. The valve authority is 100 % ($a = 1$). There is no change in the linear characteristic, irrespective of the settings or the pressure conditions.

Control voltage	0...10 V
Throughflow rate	20000 l/h

Table 8: Cooling valve technical data

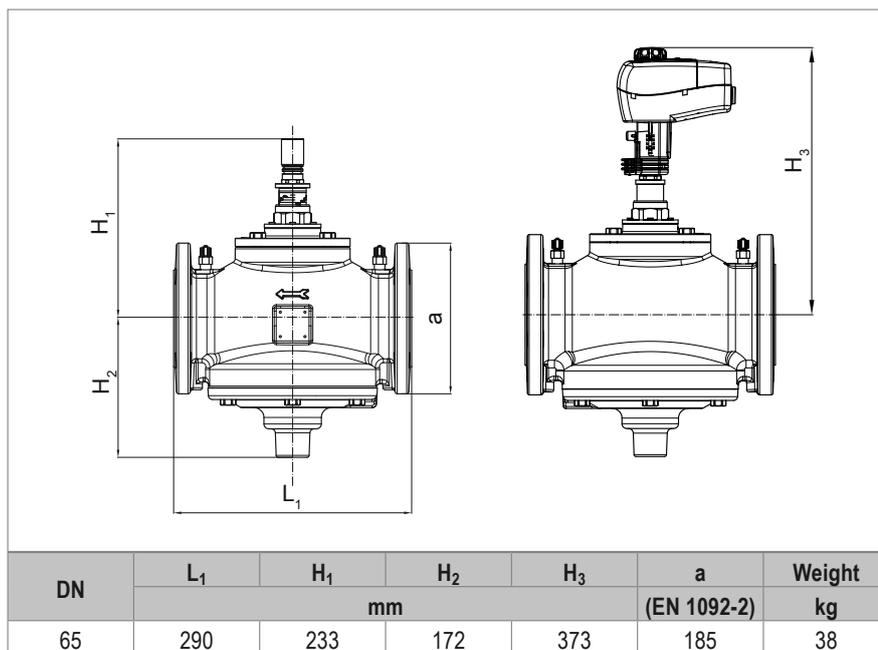


Fig. 6: Cooling valve dimensional drawing

6.4 Fresh air box

The fresh air box is used for directly connecting the fresh air intake to the ServeCool unit by means of an air duct produced in a panel design. The following are installed in the fresh air box:

- Fresh air damper for closing the fresh air opening during maintenance work
- Fresh air filter

Filter class	ISO ePM10 65 %
Filter monitoring factory setting	350 Pa

Table 9: Fresh air filter technical data

6.5 Condensation Prevention System

On request, ServeCool can be fitted with a Condensation Prevention System. This is controlled automatically and prevents humidity in the circulating air from condensing even when fresh air temperatures are very low. Free cooling can therefore be used throughout the year without the costly rehumidification of the supply air.

The following components are installed:

- Mixed air duct with 2 dampers incl. actuator for mixing exhaust air with fresh air
- Combination sensor (temperature and humidity) in the fresh air box for monitoring the intake temperature in the plate heat exchanger

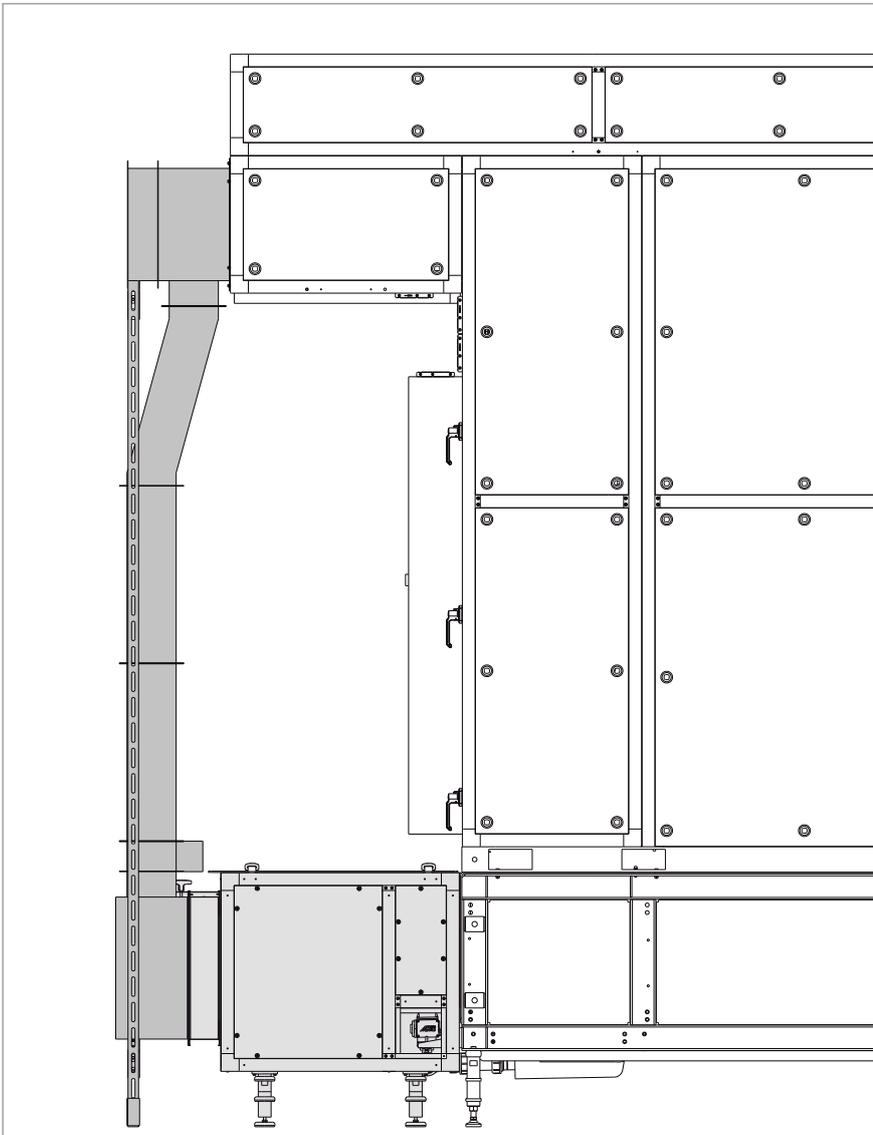


Fig. 7: ServeCool unit with fresh air box and condensation prevention system

6.6 Source changeover

For redundant power supply, it is possible to switch over between two alternative electrical power supply pathways. The switchover time between the two power supplies can be adjusted in seconds. The switchover only takes place if the phase sequence check and phase monitoring enable the switching. The voltage supply for the controller is maintained during the switchover.

6.7 Actuation of humidifier type 1

Electrical components installed in the control box and fully prewired for actuation of an ultrasound humidifier with approx. 5 kg/h humidification performance.

6.8 Actuation of humidifier type 2

Electrical components and software interface for transmission of signals between the Hoval ServeCool and an external humidifier (e.g. 0...10 V or 0...20 mA); electrical components installed in the control box and fully prewired.

6.9 Protection module

Surge voltage protection for protecting the unit against surge voltages from atmospheric discharges and switching operations.

6.10 Control box with BMS interface

The control box with BMS interface enables a simple, secure connection between the ServeCool control system and the building management system. Only 1 subscriber is integrated into the on-site network for the entire system. The BMS interface offers the following functions:

- Provision of system data for the BMS via defined data points (setpoint, alarms, feedback, etc.)
- Plausibility check for BMS input values
- Monitoring of communication and detection of offline units
- Separation of networks (→ reduced network load)

Modbus IP can be used as the communication protocol (others possible on request).

Power is supplied via an on-site UPS network.

7 Transport and installation



Caution

Risk of injury from incorrect handling. Transport, assembly and installation work may only be performed by specialists. Observe safety and accident prevention regulations.

7.1 Scope of delivery

The delivery comprises:

- ServeCool unit (consisting of base frame, tower, exhaust air box and extract air box, fully assembled)
- Fresh air box (option; provided as separate component for installation on site)
- Condensation Prevention System (option; provided as separate component for installation on site)
- Installation accessories (screws, sealant, etc.)
- Auxiliary equipment provided temporarily for installation purposes:
 - Lifting beam for unloading the unit using the crane
 - Heavy-duty rollers for transporting the unit to the installation site

Unit type		SW-25	SWP-25
ServeCool unit	kg	3650	3700
Condensation Prevention System	kg	230	230
Fresh air box	kg	265	265

Table 10: Weights of the components

7.2 Preparation



Notice

When installing at least the first group of units, Hoval recommends having the installation process supervised and monitored by a specialist construction manager from Hoval.

- Make sure that the following items are on hand for the assembly:
 - Installation team (3 people)
 - Crane with a lifting force of 3700 kg
 - Forklift
 - 2 heavy-duty lift trucks with a load-bearing capacity of 2000 kg each
 - Tool (cordless screwdriver, M24 Allen key, etc.)
 - Working platform/ladder (working height of 4 m)
 - Something for disposing of the packaging material (film, wooden pallets)

7.3 Requirements for the installation site

- The unit must be erected at an inside location that is protected against frost.
- Install the unit horizontally.
- Ensure that the installation surface is of sufficient load-bearing capacity. The weight of the unit is distributed over the adjustable feet (see Fig. 8).
- Position the unit in accordance with the airflow direction.
- The unit must be accessible and connecting lines must be able to be dismantled for maintenance and servicing work (for space requirement see Fig. 9).
- A flat surface is required for transporting the unit to the installation site using the heavy-duty rollers.

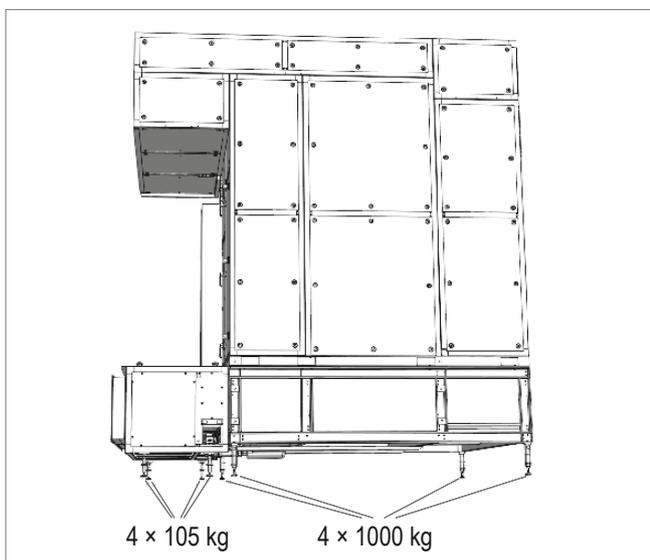


Fig. 8: Load distribution

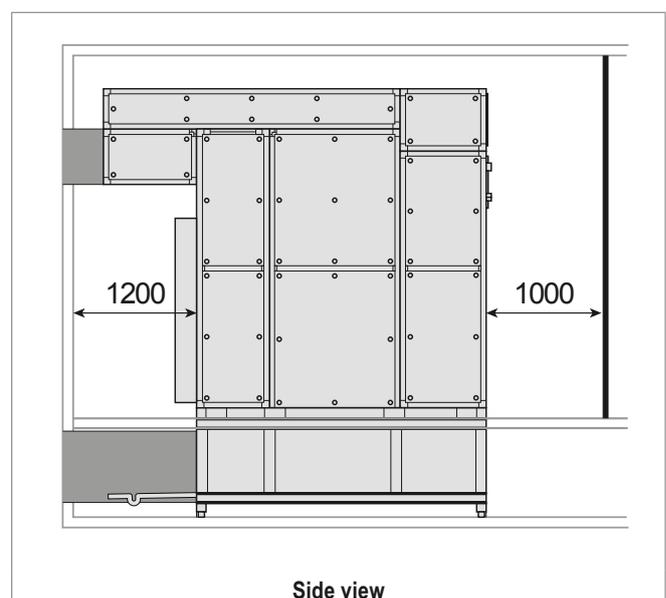
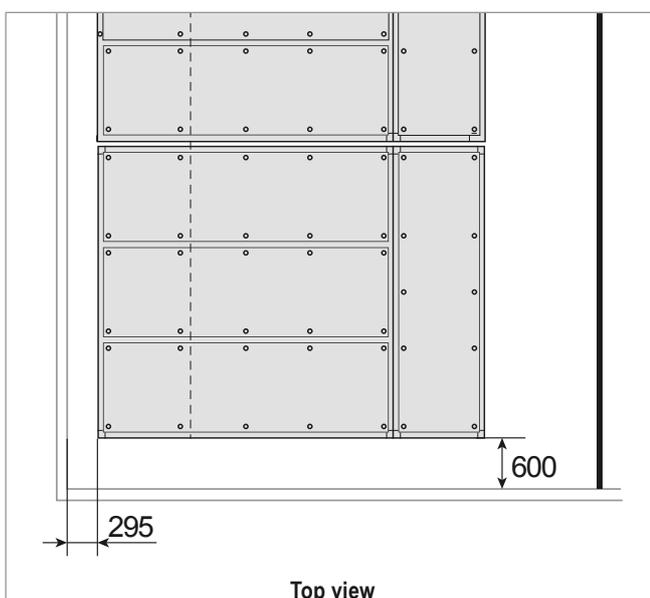


Fig. 9: Space requirements for maintenance and servicing (minimum clearances in mm)

7.4 Installation



Caution

Risk of injury caused by falling load and improper handling. During installation:

- Wear protective equipment (helmet, safety goggles, safety shoes).
- Do not stand under suspended loads.
- Use lifting equipment with sufficient load-bearing capacity.

Unloading and installing the unit

- Use the forklift to unload the pallets and accessories (optional components, auxiliary equipment for installation).
- Remove the packaging film.
- Assemble the lifting beam using the truck-mounted crane, and secure it to the ServeCool unit (see accompanying assembly instructions).



Fig. 10: ServeCool delivery

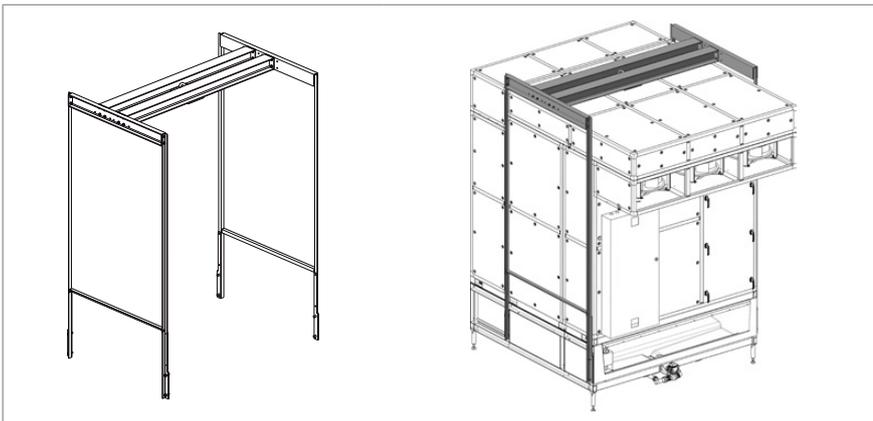


Fig. 11: Lifting beam for unloading the unit

- Lift the unit using the truck-mounted crane and place it on the heavy-duty rollers supplied.
- Remove the lifting beam.
- Push the unit to the installation site.
- Lift the unit using the lifting truck and install it on the adjustable feet.
- Set the unit down and use the adjustable feet to level and align it.

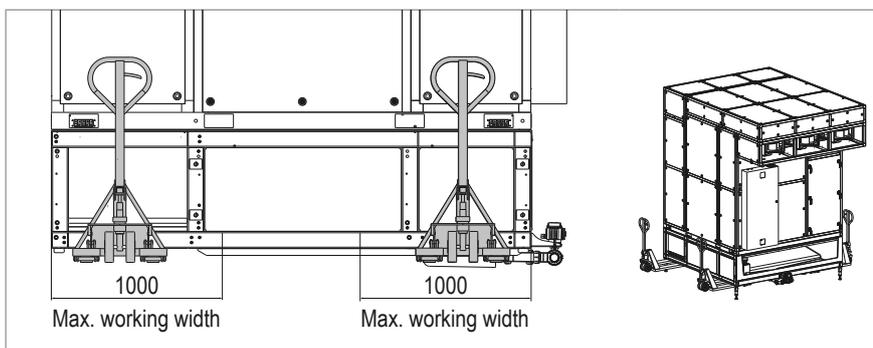
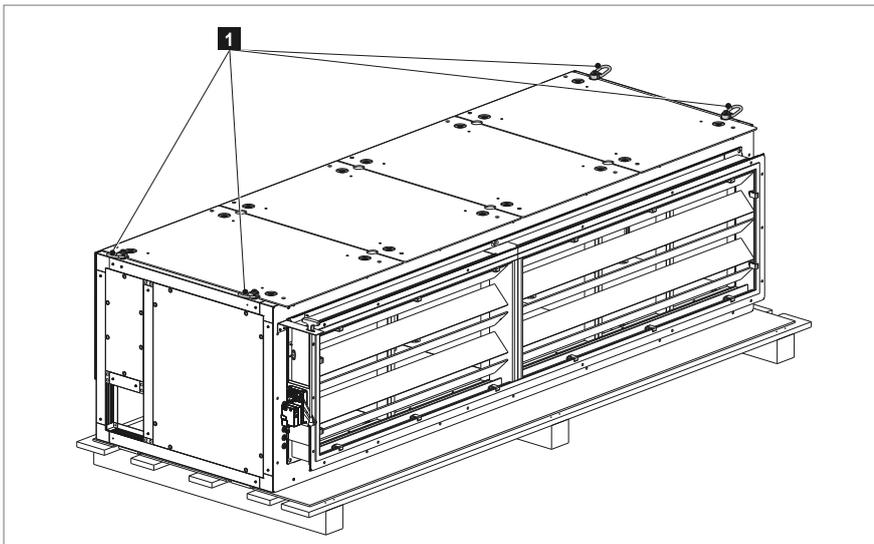


Fig. 12: Positioning the lifting truck

Installing the fresh air box (option)

- Remove the packaging film.
- When lifting with the crane, use the crane lugs supplied.
- Transport the fresh air box to the unit using the lifting truck.
- Clean the sealing surface using a degreasing cleaning agent.
- Stick on the sealing strip supplied.
- Lift off the cover panels on the fresh air box.
- Screw the flange of the fresh air box to the trough edge.



1 Crane lugs

Fig. 13: The crane lugs are mounted on the fresh air box when delivered (4 included with each delivery)

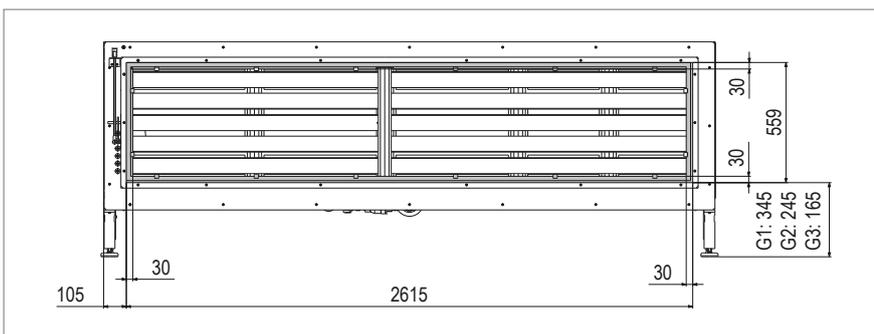


Fig. 14: Dimensions of the fresh air box (in mm)

Installing the Condensation Prevention System (option)

The Condensation Prevention System (CPS) is supplied in individual parts on the pallet and must be installed on the ServeCool unit at the construction site. The installation material is provided. Proceed as follows:

- Remove the packaging film.
- Transport the components to the unit using the lifting truck.
- Clean the flange surfaces of the individual duct pieces using a degreasing cleaning agent.
- Stick on the sealing strip supplied.
- Install the duct component with the mixed air damper **1** on the fresh air duct connection of the ServeCool unit.
- Install the horizontal beam **2** at the bottom of the duct component **1**.
- Secure the vertical beams **3** to the base.
- Screw the horizontal beam **2** and the vertical beams **3** together.
- Put the duct components **4**, **5** and **6** in place one after the other and connect each of them using flange connectors.
- Install the duct component with the exhaust air damper **8** on the exhaust air duct connection of the ServeCool unit.
- Connect the duct components **6** and **8** using flange connectors.
- Install the horizontal beam **7** at the bottom of the duct component **8** flange, and screw it and the vertical beams **3** together.
- Place the actuators on the rod for the dampers and secure them.

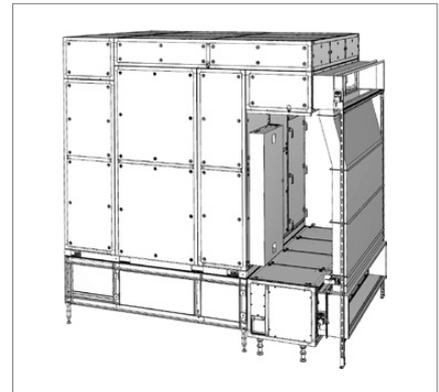


Fig. 15: ServeCool unit with Condensation Prevention System (CPS)

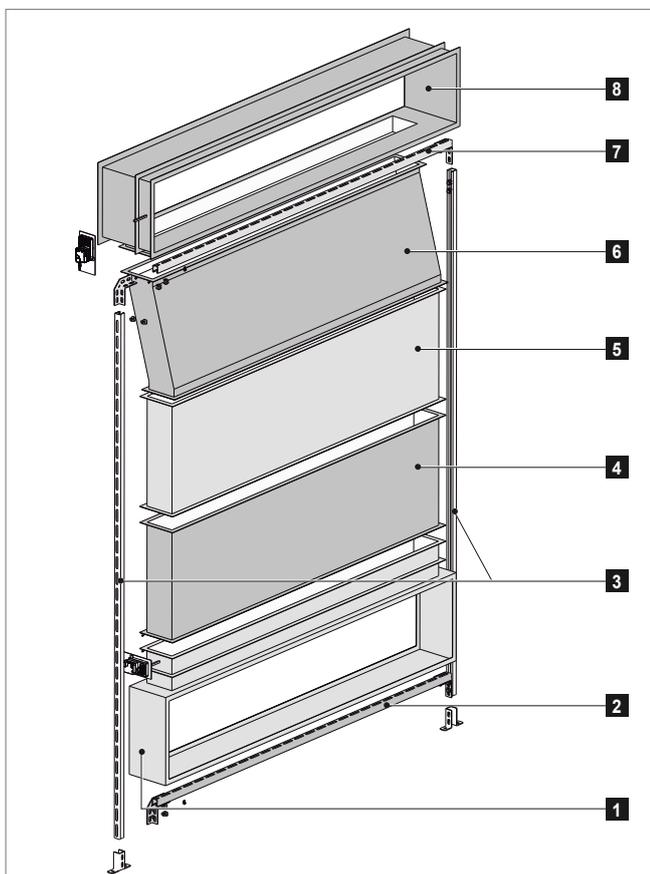


Fig. 16: CPS components

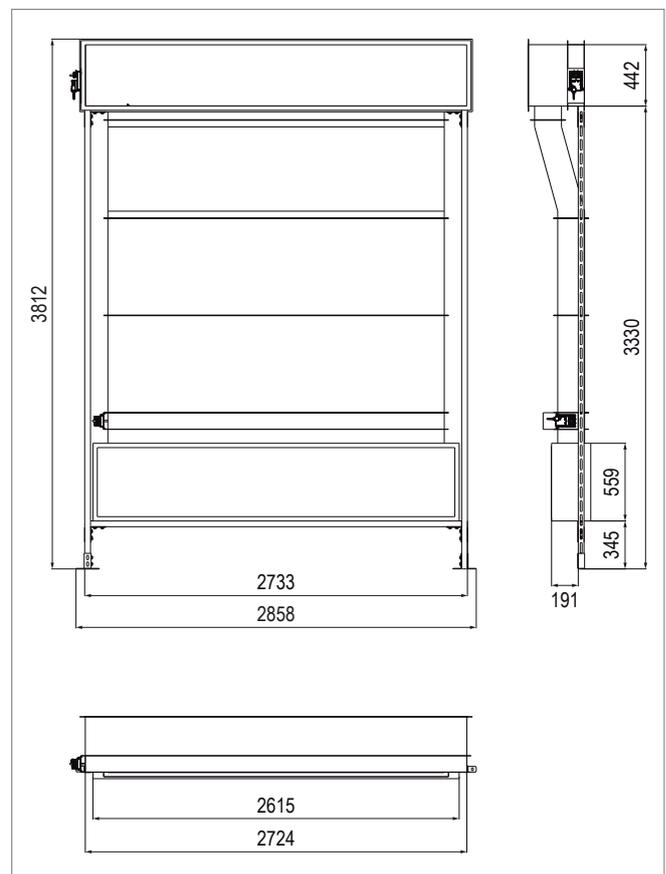


Fig. 17: CPS dimensions (in mm)

Connecting the air ducts

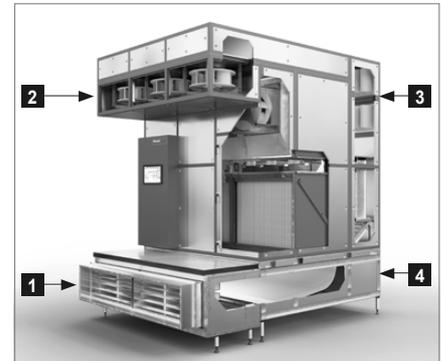
- Connect the ServeCool unit to fresh air and exhaust air ducts installed on site.



Attention

Danger of damaging the units. The unit must not be subjected to the weight of the ducts. Suspend the ducts from the ceiling or support them on the floor.

- The connection to extract air and supply air ducts installed on site depends on the specific conditions of the plant. Ideally, the unit will draw the extract air directly from the server room and blow air back into the false floor directly.
- If you are connecting an extract air duct:
 - Install inspection openings for filter changes (dimensions of the extract air filters: 592 × 490 × 500 mm).
- Connect the air ducts via the compensators so they are free of tension and vibrations.
- Insulate the fresh air duct, including the compensators, up to the building entry point.
- If the ServeCool unit is not equipped with the optional fresh air box:
 - Install a fresh air filter (filter class ISO ePM10 65 %).
 - Install a fresh air damper for closing the fresh air opening during maintenance work.



- 1 Fresh air duct connection
- 2 Exhaust air duct connection
- 3 Extract air duct connection
- 4 Supply air duct connection

Fig. 18: Duct connections

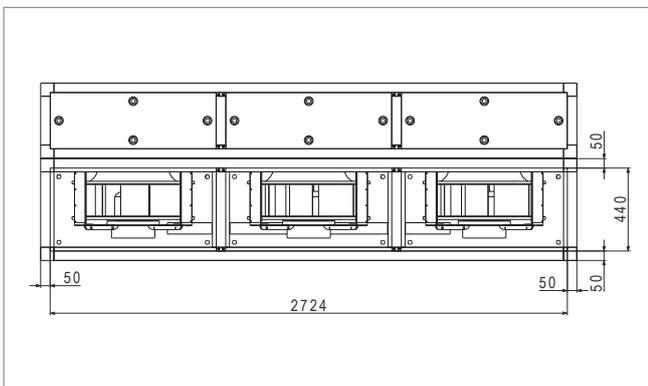
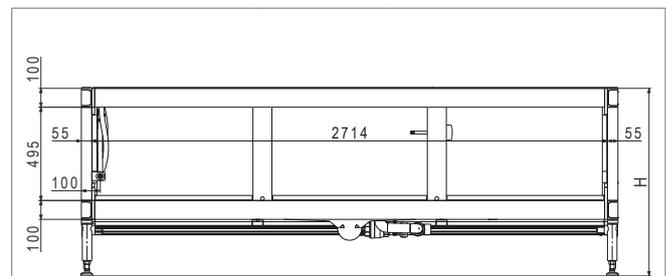


Fig. 19: Dimensional drawing for exhaust air duct (dimensions in mm)



Frame height	G1	G2	G3
Dimension H	995	895	815

Fig. 21: Dimensional drawing for supply air duct (dimensions in mm)

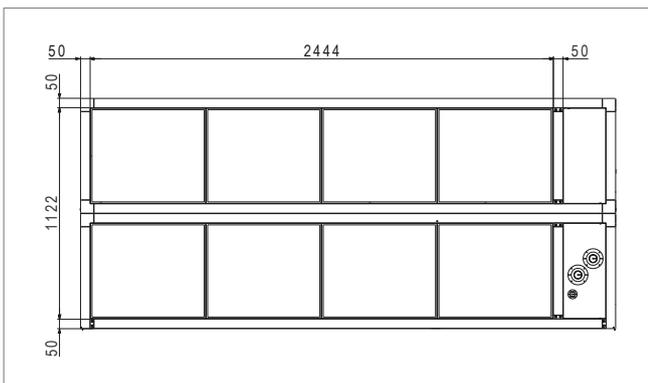
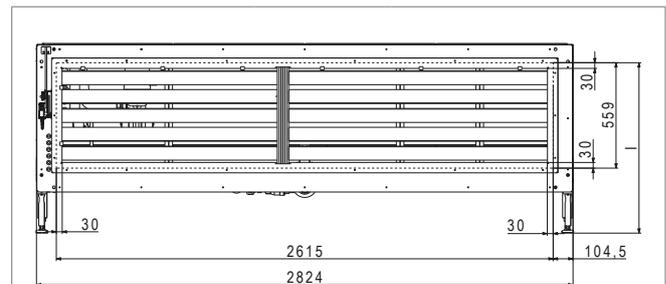


Fig. 20: Dimensional drawing for extract air duct (dimensions in mm) (inspection opening for filter exchange)



Frame height	G1	G2	G3
Dimension I	904	804	724

Fig. 22: Dimensional drawing for fresh air duct (dimensions in mm)

7.5 Hydraulic installation

Cooling coil

- Connect the cooling coil in accordance with the hydraulic diagram.
- Depending on local conditions, check whether compensators for linear expansion are required for the supply and return lines and/or articulated connections are required for the units.
- Insulate the hydraulic lines.

Condensate connection

- Condensate arising in the unit must be removed via a condensate-proof line.
- Dimension the slope and cross-section of the condensate line so that no condensate backflow takes place (max. condensate quantity: 7 kg/h).
- Make sure that the condensate can drain off freely.
- Make sure that the condensate produced is drained in compliance with local regulations.
- The unit already includes a trap function, so there is no need to provide this function externally.
- Fill the traps (plate heat exchanger and cooling coil) with water before commissioning, after each cleaning operation and after an extended downtime.

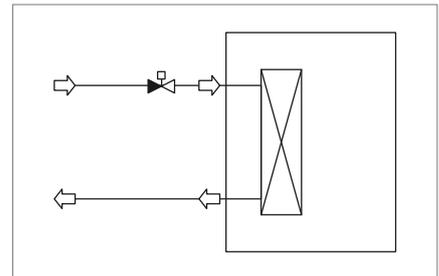
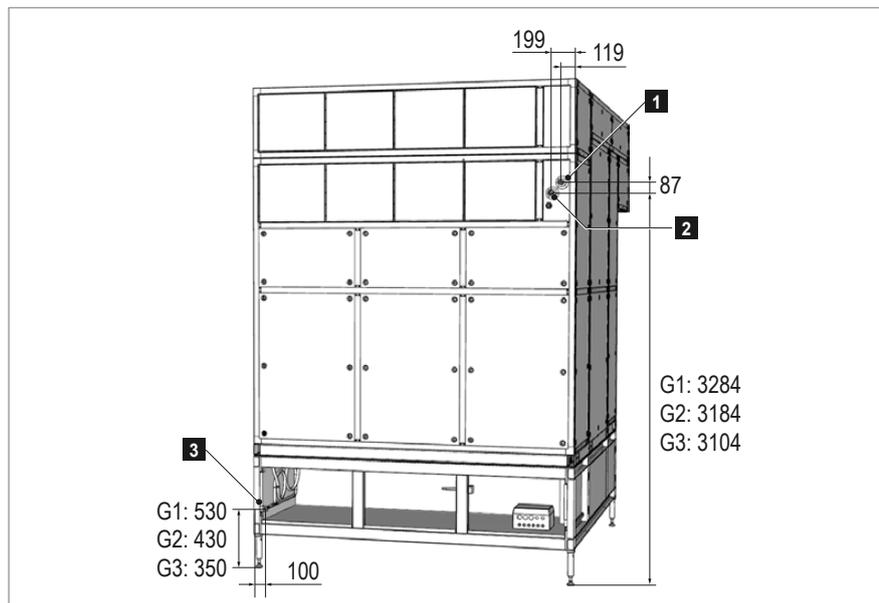


Fig. 23: Connection of the cooling coil



- 1 Cooling coil flow (Ø 42 mm)
- 2 Cooling coil return (Ø 42 mm)
- 3 Condensate connection (G ¾" internal thread)

Fig. 24: Hydraulic connection points (dimensions in mm)

Adiabatic system



Attention

Comply with national regulations on drinking water protection. Decouple the adiabatic system from the drinking water system to prevent backflow, force-back or suck-back of impurities into the drinking water.

Water supply

- Connect the ServeCool unit to the water supply.
- Use suitable materials for the supply line (recommended: stainless steel, PE or PVC).
- Depending on local conditions, check whether a compensator and/or articulated connection for linear expansion is required for the supply line.

Supply pressure recommendation	2 bar
Supply pressure maximum	4 bar

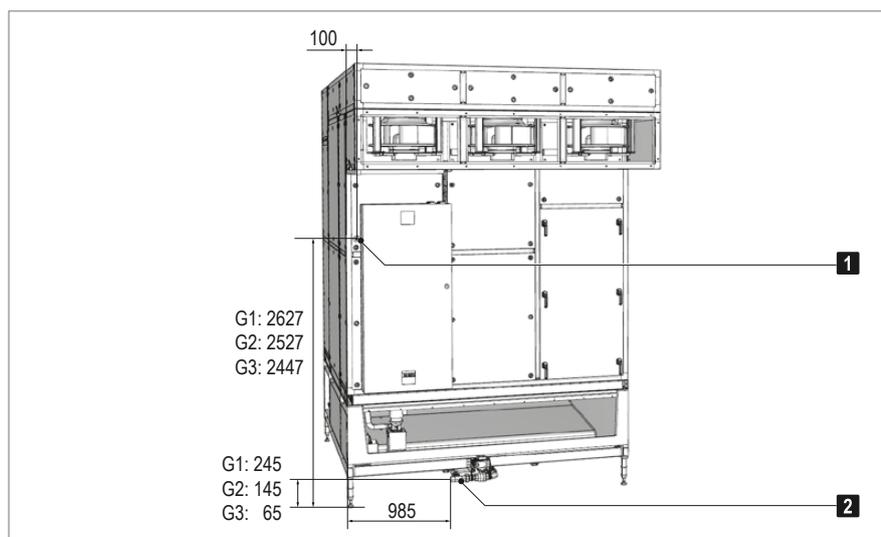
Table 11: Water supply

Supply pressure	0.5	1	2	3	5	bar
Volume flow	360	511	720	878	1138	l/h

Table 12: Water flow through adiabatic system

Drain

- Dimension the slope and cross-section of the discharge pipe so that there is no backing-up of water.
- Connect the discharge pipe via a trap.
- Fill the trap with water before commissioning, after each cleaning operation and after an extended downtime.
- Make sure that the water can drain off freely.



1 Supply (G ½" internal thread)

2 Discharge (Ø 56 mm)

Fig. 25: Adiabatic system connection points

7.6 Water quality

The adiabatic cooling requires a demineralised water supply. Hoval recommends the use of rainwater in a storage system.

Recommended guidance values for the composition of the circulation water:

Appearance	clear, colourless, without sediment		
pH value			7 - 8.5
Electric conductance at 20 °C		µS/cm	< 250
Total hardness	GH	°dH	< 1
Chloride	Cl ⁻	g/m ³	< 20
Sulphate	SO ₄ ²⁻	g/m ³	< 20
Iron	Fe	mg/l	≤ 0.1
Copper	Cu	mg/l	< 1
Colony count		CFU/ml	< 1000
Legionella		CFU/100 ml	< 100
Concentration figure			5 - 10

Table 13: Composition of the circulation water

7.7 Electrical installation



Caution

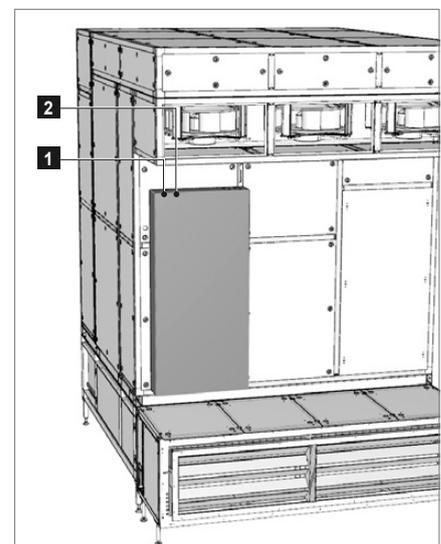
Danger of electric shocks. The electrical installation is to be carried out only by a qualified electrician.

Please note the following:

- Observe all relevant regulations (e.g. EN 60204-1).
- Choose the dimensions of the cable cross sections in line with the applicable regulations.
- Carry out the electrical installation according to the wiring diagram.
- Route signal and bus lines separately from mains cables.
- Secure all connections against working loose.
- The fresh air combination sensor (temperature, humidity) is normally pre-installed in the fresh air box. If there is no fresh air box or if the unit is equipped with a Condensation Prevention System, the sensor will be supplied loose in the control panel:
 - Install the sensor in the fresh air intake duct.

Options:

- Wire the fresh air box to the plug connections in the control box.
- Wire the Condensation Prevention System to the plug connections in the control box.



1 Cable feedthrough for power supply
2 Cable feedthrough for bus cable

Fig. 26: Electrical installation

8 Operation

8.1 Initial commissioning



Attention

Risk of damage to property as a result of performing initial commissioning on your own authority. Initial commissioning must be performed by the manufacturer's customer service technicians.

Preparing for initial commissioning:

Checklist:

- Have all the media connections been made (electric cabling, water piping, condensate drain and air duct connections)?
- Is the cooling medium available?
- Are the hydraulics aligned and balanced?
- Are all the control components installed and wired?
- Are all of the respective trade groups (installer, electrician, etc.) present at the scheduled time?
- Are the system operating personnel present for training at the scheduled time?

8.2 Operation

The system runs fully automatically depending on the BMS specifications, the programmed operating times and the temperature conditions.

- Observe the operating instructions for the control system.
- Check alarm displays regularly.
- Ensure free air outlet and unhindered dispersion of the supply air.
- Observe all relevant local specifications for operating evaporation cooling systems (for example, the 42nd Ordinance for the implementation of the Federal Immission Protection Act, governing evaporation cooling systems, cooling towers and wet separators, and VDI standard 6022 on hygiene requirements for ventilation and air-conditioning systems and units).

8.3 Decommissioning

- Disconnect the power supply.
 - The main switch is on the control panel of the ServeCool unit.
- To prevent frost damage:
 - Have a specialist empty the hydraulic circuit and the adiabatic system or ensure protection against frost using antifreeze.

9 Maintenance and repair



Caution

Risk of injury from incorrect work. Maintenance work must be carried out by trained personnel.

9.1 Safety

Before performing any work on the unit:

- Turn the main switch on the unit to the 'Off' position and secure it against being switched back on.
 - The main switch is on the control panel of the ServeCool unit.
- Wait for the fans to stop.
- Observe the accident prevention regulations.
- Observe the particular dangers involved when working on electrical systems.
- When working in the unit, take precautions against unprotected, sharp metal edges.
- Immediately replace damaged or removed informational and warning signs.
- Following maintenance work, professionally reassemble all dismantled protective devices.
- Secure doors against unauthorised opening (e.g. using cable ties).
- Replacement parts must comply with the technical requirements of the unit manufacturer. The manufacturer recommends the use of original spare parts.

9.2 Maintenance

Maintenance schedule

Activity	Interval
Changing the fresh air and extract air filter	When the filter alarm is displayed, at least annually
Function check, cleaning and, if necessary, repairing the unit	Twice a year (before and after the cooling period) by Hoval customer service
Function check and, if necessary, replacement of the pump and fans	After 40000 operating hours by Hoval customer service

Changing the filter



Caution

Danger of hazardous emissions from damaged filters:

- Only hold the filters on the black filter frame.
- Never touch the white filter medium.
- Replace damaged filter elements immediately.

- Switch the main switch to the 'Off' position and wait until the fans stop running.
- Changing the fresh air filter:
 - Close the fresh air damper manually (pull the handle on the left-hand side upwards).
 - Unlock the cover panels on the fresh air box and lift them off.
 - Release the filter brackets and remove the filter elements.
 - Insert the new filter elements. When doing this, only hold the frame.
 - Fix the filter elements in place with the filter brackets.
 - Replace the cover panels and lock them.
 - Reopen the fresh air damper (push the handle down).
- Changing the extract air filter:
 - Create access to the extract air filters:
 - Use a working platform.
 - If an extract air duct is connected: Open the inspection openings for filter changes.
 - Release the filter brackets and remove the filter elements.
 - Insert the new filter elements. When doing this, only hold the frame.
 - Fix the filter elements in place with the filter brackets.
 - If necessary, close the access doors to the extract air duct.
- Switch the main switch back to the 'On' position.
- Dispose of the filters in accordance with local regulations.
 - The filters are fully incinerable; the disposal of used filters depends on the contents.



1 Fresh air filter

2 Extract air filter

Fig. 27: Electrical installation

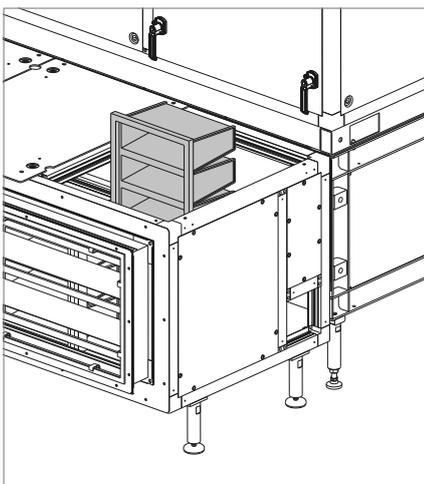


Fig. 28: Fresh air filter

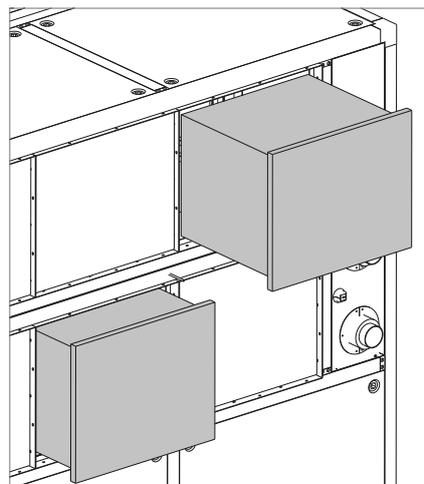


Fig. 29: Extract air filter

Function check, cleaning and commissioning of the adiabatic system for summer operation

- Comprehensive function check, cleaning and, if necessary, repair of the unit (spray nozzles, fans, adiabatic pump, supply and drain valves, liquid level switch, conductance measurement, cooling valve, plate heat exchanger, trough, fresh air and extract air filters)
- Adiabatic system filling and pressure check
- Adiabatic system commissioning

Function check, cleaning and decommissioning of the adiabatic system for winter operation

- Comprehensive function check, cleaning and, if necessary, repair of the unit (spray nozzles, fans, adiabatic pump, supply and drain valves, liquid level switch, conductance measurement, cooling valve, plate heat exchanger, trough, fresh air and extract air filters)
- Checking the air ducts for contamination, corrosion and water condensation
- Adiabatic system emptying
- Adiabatic system decommissioning



Notice

Regular maintenance is essential to ensure that the ServeCool unit is available to the fullest possible extent. Hoval recommends concluding a maintenance contract with the manufacturer's customer service department.

9.3 Repair

If repairs are necessary, contact the manufacturer's customer service department.

10 Dismantling



Caution

Risk of injury caused by falling load and improper handling.

- Wear protective equipment (helmet, safety shoes).
- Do not stand under suspended loads.
- Use cranes or forklifts with sufficient load-bearing capacity.

- Disconnect the power supply to the unit.
- Empty the hydraulic circuit.
- Empty the condensate line.
- Dismantle all media connections.
- Disconnect the unit from fastenings where applicable.
- Dismantle the Condensation Prevention System and remove the individual parts from the site.
- Disconnect the screw connection between the fresh air box and the ServeCool unit.
- Attach the spring hooks for the lifting equipment to the crane lugs and remove the fresh air box from the site.
- Remove the ServeCool unit from the site.

11 Disposal

- Recycle metal components.
- Recycle plastic parts.
- Dispose of electric and electronic parts via hazardous waste.
- Dispose of the filters in accordance with local regulations.
 - The filters are fully incinerable; the disposal of used filters depends on the contents.

12 Spare parts

Mat. no.	Designation	Comments
2062381	Compact filter (592 × 592 × 292)	ISO ePM10 65 % fresh air filter (3x per unit)
2062382	Compact filter (402 × 592 × 292)	ISO ePM10 65 % fresh air filter (2x per unit)
2057915	Bag filter (592 × 490 × 500)	ISO coarse 60 % extract air filter (8x per unit)
2007514	Differential pressure switch	Filter monitoring
2059754	Belimo damper actuator SM24A	Actuator bypass damper
2069529	Belimo damper actuator SM24A-SR	Actuators dampers in CPS
2053925	Auxiliary switch	for Belimo damper actuator
2077219	Sensor KFTF-SD-I	Combinations sensor for temperature/humidity (fresh air, supply air, extract air, energy monitoring)
2069615	Cooling valve + actuator	Balancing and control valve for mechanical cooling
2072934	Radial fan	Supply air and exhaust air fans
2077317	Liquid level switch	Adiabatic system
2077108	Immersible pump	Adiabatic system
2045946	Conductivity meter	Adiabatic system
2057616	Tangential full-cone nozzle	Adiabatic system (spray nozzles)
2075809	Quick-locking bayonet	Adiabatic system (nozzle installation)
2077306	3-way ball valve	Adiabatic system (feed valve)
2077316	Straight-way ball valve	Adiabatic system (drain valve)
2077265	Water filter	Adiabatic system (housing water filter)
2077284	Cartridge	Adiabatic system (water filter cartridge)
2077288	Flow sensor with cable box	Adiabatic system (water filter monitoring)

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