

Halton Vita VHT HEPA diffuser

Installation, Commissioning and Maintenance guide



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1 Introduction

1.1 About this document

This guide provides guidelines for installing, commissioning and maintenance of the Halton HEPA diffuser.

1.2 Copyright and disclaimers

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1.3 Safety notes

All information in this section is important and relevant for your safety. Please pay special attention to these icons and the accompanying messages when used later in context in this manual.

Warnings

Warning signs indicate a risk of personal injury including death. There is also a potential risk of material damage. Pay attention to the following signs when performing any tasks or moving in the area:



WARNING!

This symbol indicates a potential hazard, obstacle or condition requiring special attention.



DANGER OF ROTATING UNIT PARTS!

This symbol indicates a hazardous location with a risk of personal injury including death and material damage.



DANGER OF OVERHEAD LOADS!

This symbol indicates a hazardous location with a risk of personal injury including death and material damage.



DANGER OF PERSONAL INJURY!

This symbol indicates a hazardous location (excluding the above-mentioned danger areas) with a risk of personal injury including death and material damage.

Cautions

Caution signs indicate a risk of personal injury or material damage. To ensure your own safety, consider the following cautions:



CAUTION!

This symbol indicates a hazardous location with a risk of material damage that can also lead to personal injury.



CAUTION! HEAVY OBJECT

Do not lift objects over 20kg (44lbs) alone. Use a lift or seek assistance.

**CAUTION!**

Risk of personal injury or material damage.

Notes

NOTE: Notes are statements to which you should pay special attention.

1.4 Contact information

You can find the contact details from www.halton.com/contact.

2 Product description

2.1 Overview



Halton Vita VHT is a diffuser that is dedicated for hospitals and cleanrooms. It is suitable to install flush with the ceiling or the wall. Air is supplied through adjustable nozzles.

The diffuser is also available with a fully-perforated front plate for vertical air supply or exhaust. The diffuser is designed to be equipped with HEPA filter with foamed polyurethane (PUR) gasket.

Halton Vita VHT is available in three sizes with two different types of duct connection.

2.2 Operating principle

Halton HEPA diffuser can be used both to supply and exhaust air.

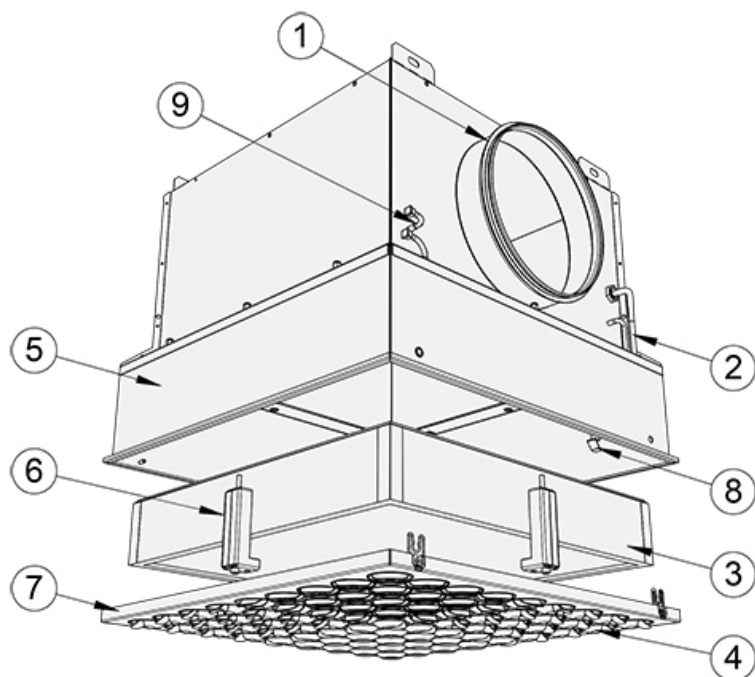
The diffuser supplies the filtered air into the space. Adjustable nozzles allow creating the desired airflow pattern. Nozzles can be adjusted in 15 degrees intervals.



In case of exhaust application, the air is exhausted through the diffusers perforated front panel.



2.3 Main parts and materials



No.	Part	Material	Colour alternatives
1	Duct seal gasket	Rubber	
2	Test probes	PVC hose	
3	Filter	Fibreglass paper, aluminium frame and PUR gasket	
4	Nozzles	Polyacetal (POM)	White, grey, black
5	Casing	Galvannealed steel with antibacterial epoxy polyester powder paint, white (RAL 9010) finishing	Special colours available on request
6	Filter brackets	Acid proof steel	
7	Front panel	Galvannealed steel with antibacterial epoxy polyester powder paint, white (RAL 9010) finishing	Special colours available on request
8	Filter springs	Stainless steel	
9	Pressure measurement ports	Polyurethane	

2.4 Further technical details

For Halton Vita VHT dimensions see the [Dimensions](#) chapter in the technical reference data section.

For filter technical data see the [Filters](#) chapter in the technical reference data section.

3 Installation

3.1 Before you start

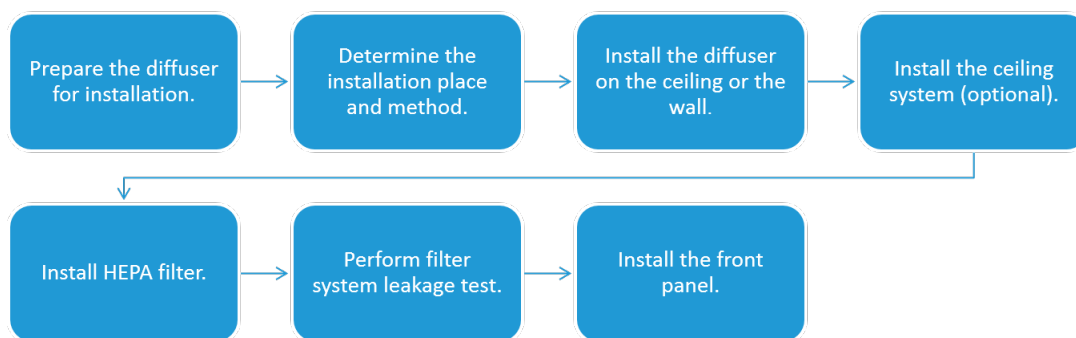
3.1.1 Installation process

The installation is carried out by Halton Field Service or an approved partner.

Follow the installation process chart to install the Halton HEPA diffuser.

Typically there is a several weeks break between diffuser installation and HEPA filter installation due to the construction stages.

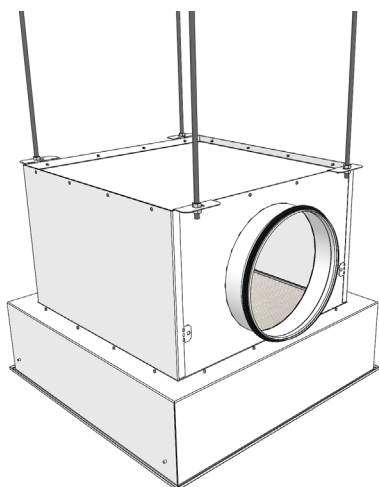
NOTE: The filters and front panels can be delivered on site in a separate shipment to avoid possible damages to the filters during storage.



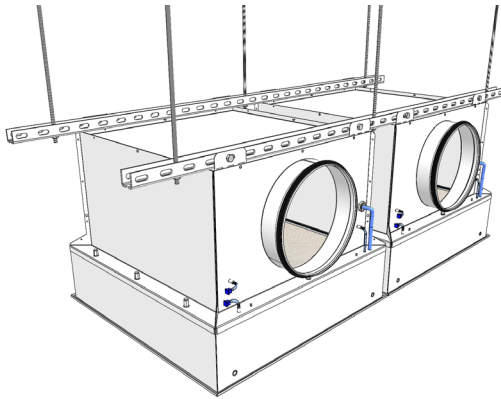
Installation process chart

The possible installation methods are:

- stand-alone



- in-line



3.1.2 Installation requirements

While installing the diffuser, keep the following items in mind:

- Installation should be carried out only by qualified HVAC technicians.
- Fix the unit only to load-bearing ceilings.
- Do not unpack the filter until you are ready to install it.
- It is recommended that you work in pairs and use a lift.



CAUTION!

Do not drill any holes into the casing. If the casing has been damaged, unfiltered air may leak.

3.2 Step by step instructions

3.2.1 Preparing the diffuser for installation

Preparing the diffuser is essential for safe and correct installation.

Procedure

1. Unpack the diffuser and check its condition.
2. Check that all the parts are present;
 - Diffuser casing
 - Front panel

NOTE: The diffuser can be delivered with or without the front panel.

NOTE: The front panel can be attached to the unit. In this case, detach the front panel before installing the filter. It is also recommended to detach the front panel before diffuser installation for easier access to the inside of the unit and nozzles protection.

- Filter brackets
- Filter springs
- HEPA filter

NOTE: See [Main parts and materials](#) for the product structure.

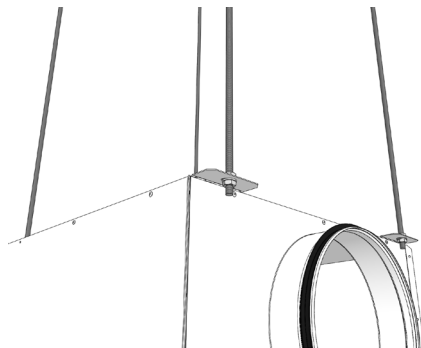
3. Determine the correct location and mark the correct location.
4. Before lifting the units protect the paint by using foam or cardboard.

3.2.2 Mounting the diffuser on the ceiling

The two installation methods are possible: stand-alone and in-line. Different suspension elements are required.

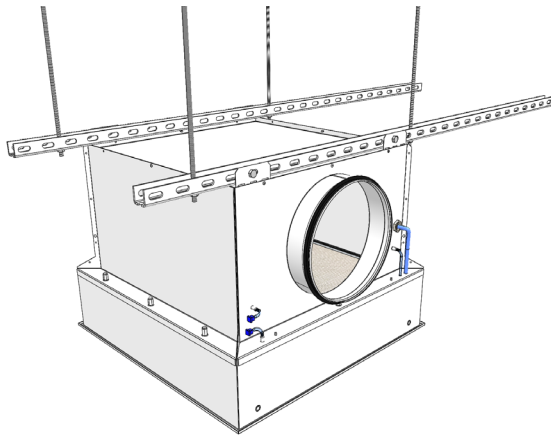
Procedure

1. Fix suspension elements;
 - Rods for stand-alone diffuser installation



NOTE: Brackets can be bent 90° to support this method.

- U-beams for in-line diffuser installation



NOTE: Fixing material is not included in the delivery.



WARNING!

Only use fixing materials designed for the required load.

2. Attach the units to the suspension elements.



WARNING!

Stand clear of suspended loads, unless properly secured.

3. Ensure that the casing is levelled and at required height.
4. Connect the ductwork.
5. Seal the duct connection.

NOTE: If filters are to be installed later, attach front panels (if delivered with the diffuser) and protect the unit from dust by using, for example, a plastic sheet.

3.2.3 Installing the ceiling system

This installation step is optional. The supply and installation of a ceiling system is the responsibility of the customer.

The T-bar runners are installed below the device. The unit is designed to fit in the standard size of the false ceiling grid.

NOTE: For the design of the diffuser compatible with the false ceiling system, contact Halton Sales.

3.2.4 Installing the HEPA filter

Correct HEPA filter installation is essential for contamination control in the room.

Before you start

Make sure that:

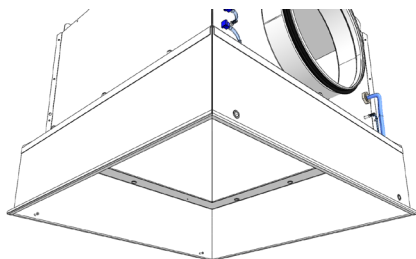
- All the site works that produces dust and dirt are completed.
- All non-essential items are removed from the room.
- The room is clean.
- The ventilation system is tested.
- The air channels are cleaned or properly flushed.
- Check that challenge ports can be located for the filter leakage test.
- The filter is not damaged.
- Clean all the interior surfaces of the casing with a disinfectant.



CAUTION!

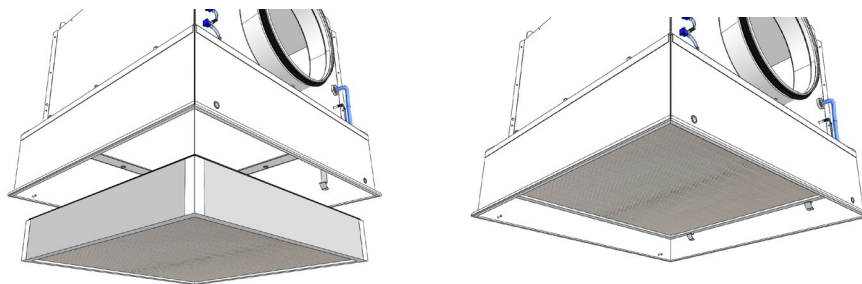
Use extreme caution while fitting the filters. The slightest damage to the filter medium can result in a leaking filter.

1. Remove possible dust protection and front panels, if present (optional).



2. Insert the filter with the gasket upwards into the filter casing until it clicks into place at the springs.

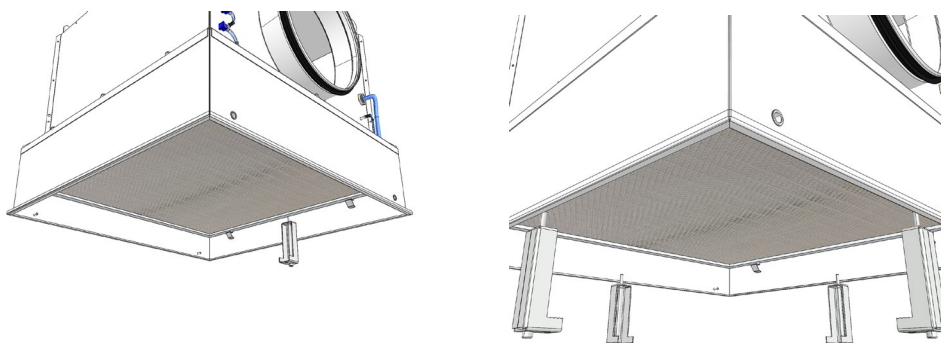
Filter springs will support filter in place.



3. Insert filter brackets.

Filter brackets will centralize the filter.

NOTE: Height of filter brackets depends on the filter depth. Number of filter brackets depends on the diffuser size.

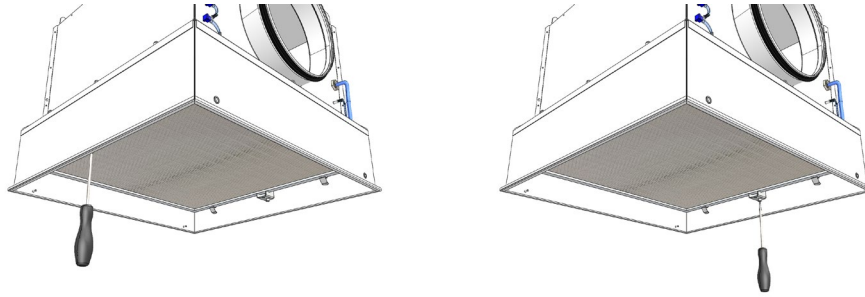


4. Tighten the filter brackets in a crosswise sequence until brackets bottom out on the unit.



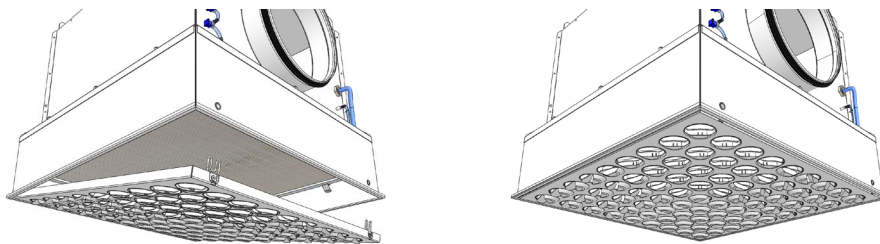
WARNING!

Do not exceed 4 Nm torque.



5. Perform an installed filter system leakage test, for example, according to the *ISO 14644-3 Cleanrooms and associated controlled environments* standard.
6. Mount the diffuser front panel. Push the front panel until the springs will lock.

Inside the casing, there are two pins which align with the holes in the front panel. Insert this side first.



4 Commissioning

4.1 Before you start

4.1.1 Commissioning process

The commissioning is carried out by Halton Field Service or an approved partner.

The main steps in the commissioning process are:

- Verifying that the installation has been performed according to design drawings.
- Adjusting the nozzle settings to create the desired airflow pattern.

4.1.2 Checks before commissioning

Before you start adjusting the nozzle settings:

- Verify that the diffuser installation has been performed according to design drawings.
- Wear sterile clothes (optional).
- Wear protective gloves.
- Check what is the desired airflow pattern. Halton standard nozzle settings are for directing the airflow in up to four directions or as swirl jet.

NOTE: Creating a project-specific airflow pattern is possible. Contact Halton to get the nozzle settings drawings.

- It is recommended to use a tool designed by Halton for turning the nozzles. It can be provided by Halton on request.

4.2 Step by step instructions

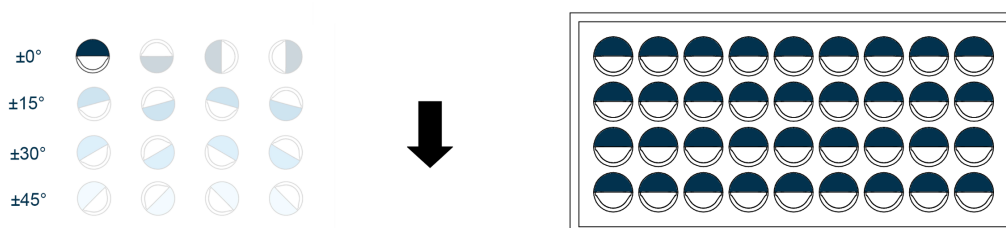
4.2.1 Adjusting the nozzles for 600 x 300 front panel

Procedure

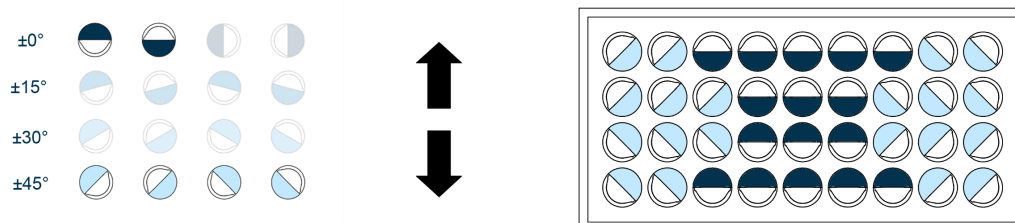
1. Detach the front panel from the diffuser if you're adjusting the nozzles without the Halton tool (optional).

NOTE: See [Removing the diffuser's front panel](#).

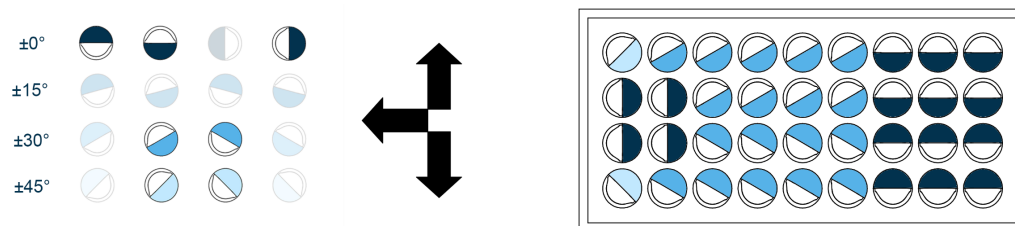
2. Turn the nozzles from the backside of the panel in one of the recommended airflow patterns.



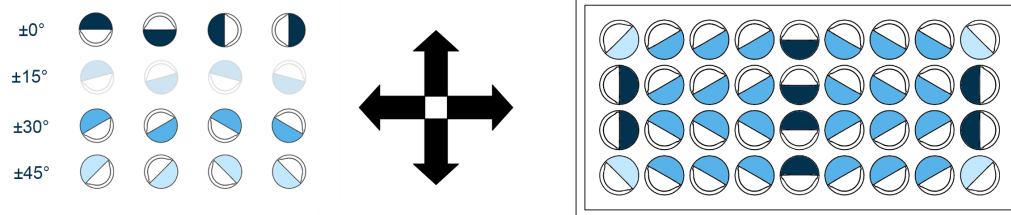
One directional airflow pattern



Two directional airflow pattern



Three directional airflow pattern



Four directional airflow pattern

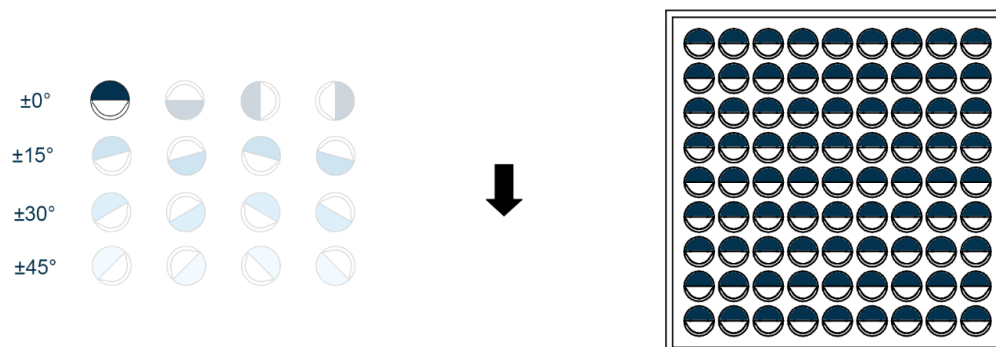
4.2.2 Adjusting the nozzles for 600 x 600 front panel

Procedure

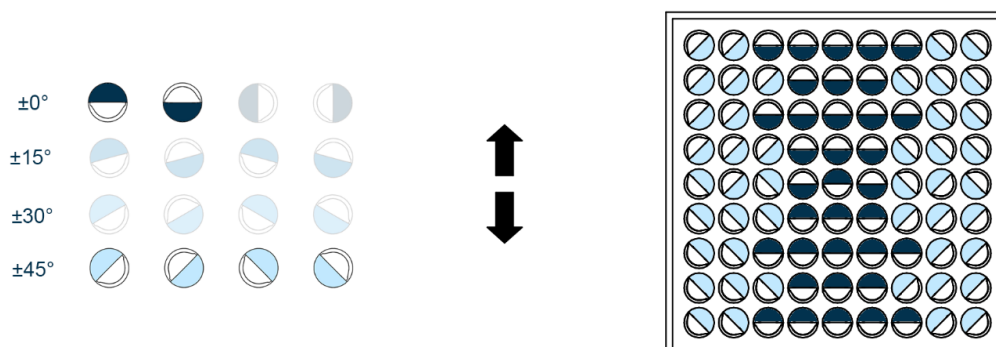
1. Detach the front panel from the diffuser if you're adjusting the nozzles without the Halton tool (optional).

NOTE: See [Removing the diffuser's front panel](#).

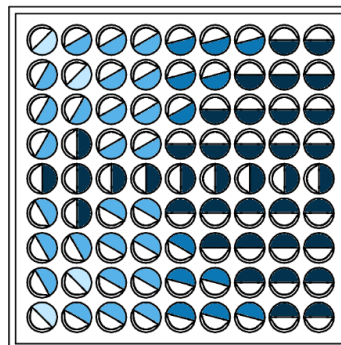
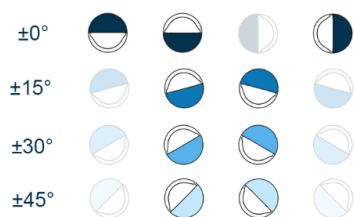
2. Turn the nozzles from the backside of the panel in one of the recommended airflow patterns.



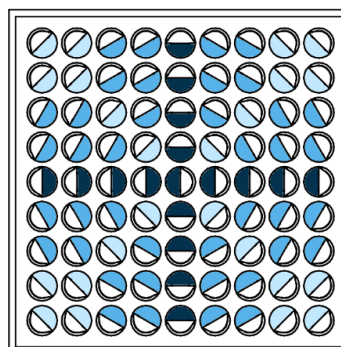
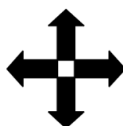
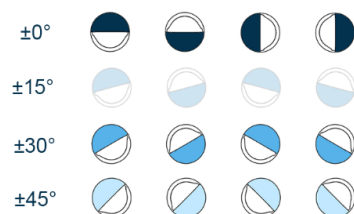
One directional airflow pattern



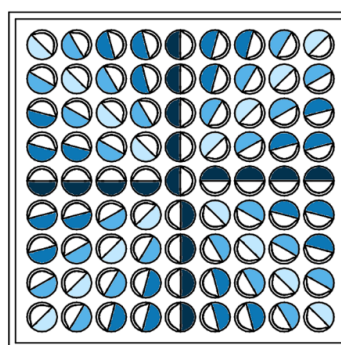
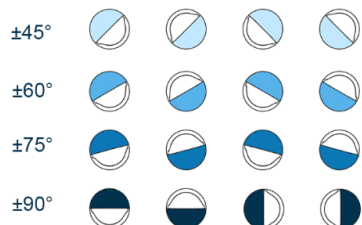
Two directional airflow pattern



Three directional airflow pattern



Four directional airflow pattern



Swirl airflow pattern

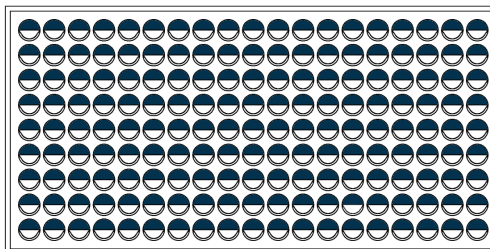
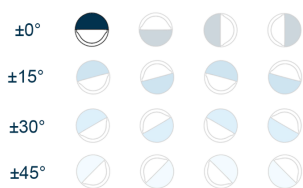
4.2.3 Adjusting the nozzles for 1200 x 600 front panel

Procedure

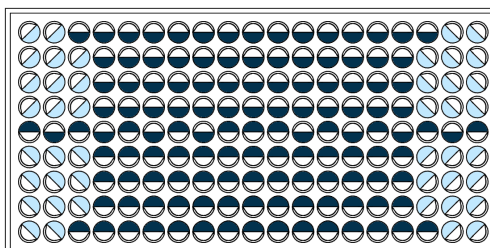
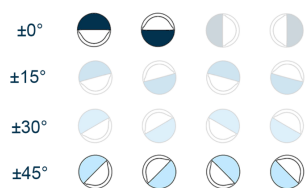
1. Detach the front panel from the diffuser if you're adjusting the nozzles without the Halton tool (optional).

NOTE: See [Removing the diffuser's front panel](#).

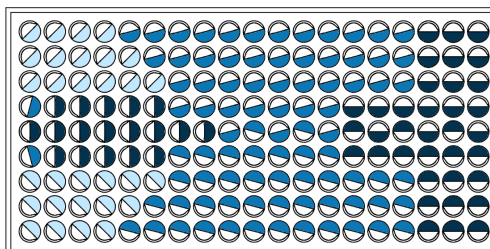
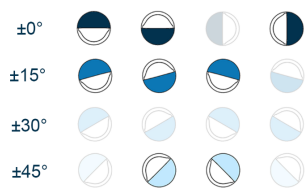
2. Turn the nozzles from the backside of the panel in one of the recommended airflow patterns.



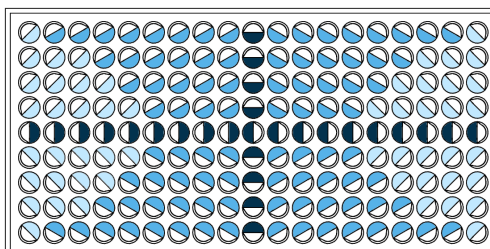
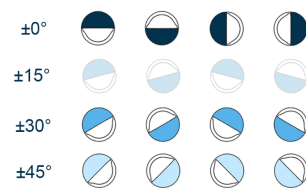
One directional airflow pattern



Two directional airflow pattern



Three directional airflow pattern



Four directional airflow pattern

4.3 Checks after commissioning

It is recommended to verify the airflow pattern with the artificial smoke.

5 Maintenance

5.1 Maintenance schedule

Determining the cleaning frequency is the responsibility of the customer.

Check the HEPA filter periodically and replace the filter when necessary. The servicing frequency of a filter depends on the air cleanliness of the supply air and/or room air. Replace the filter immediately if:

- the final differential pressure has been reached
- the filter is damaged
- micro-organisms, fungal spores, or odours are present in the filter

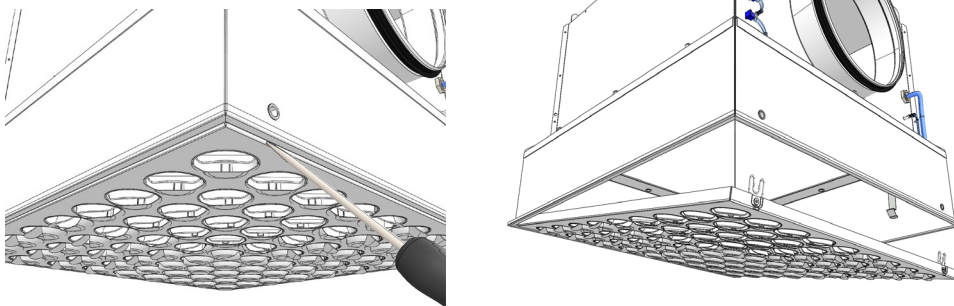
5.2 Removing the diffuser's front panel

Some maintenance tasks, for example, filter changes or cleaning, require removing the diffuser's front panel.

Procedure

1. Detach the front panel.

There are two openings on the side of the front panel.



NOTE: The panel can be removed by one person.



CAUTION!

Risk of material damage. Protect the front panel painting.

2. Place the diffuser face on a protective surface, for example, on the cardboard.

5.3 Changing the HEPA filter

Before you start

- Switch off the air conditioning system, or close the shut-off damper (if any).
- Wear protective equipment.

Procedure

1. Remove the front panel.
NOTE: See [Removing the diffuser's front panel](#).
2. Detach the filter brackets.
3. Support filter and press the filter springs to loosen the filter.



CAUTION!

Risk of injury from a falling filter!

4. Remove the filter from the diffuser casing.
5. Dispose the contaminated filter.

Filters and cleaning materials that have been contaminated with bacterial, toxic or radio active particles are considered hazardous waste and have to be disposed in compliance with local regulations.

6. Wipe the surface of the diffuser with a disinfectant.

NOTE: See [Cleaning the diffuser](#).

7. Install the HEPA filter.

NOTE: See [Installing the HEPA filter](#).

5.4 Cleaning the diffuser

Procedure

1. Remove the front panel.

NOTE: See [Removing the diffuser's front panel](#).

2. Clean the front panel in the pre autoclave washing machine (<95 °C, optional).
3. Wipe the diffuser casing with disinfectants.

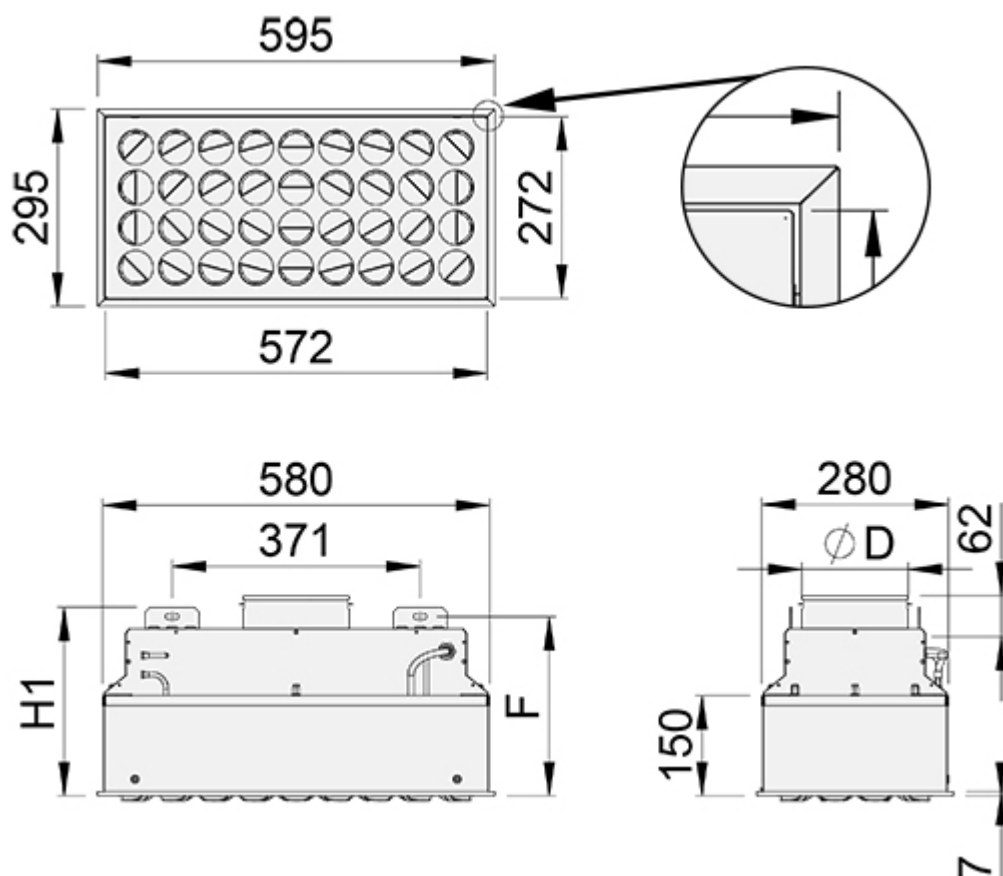
NOTE: Lockable nozzles ensure that nozzle setting is not changed during cleaning.

6 Technical reference data

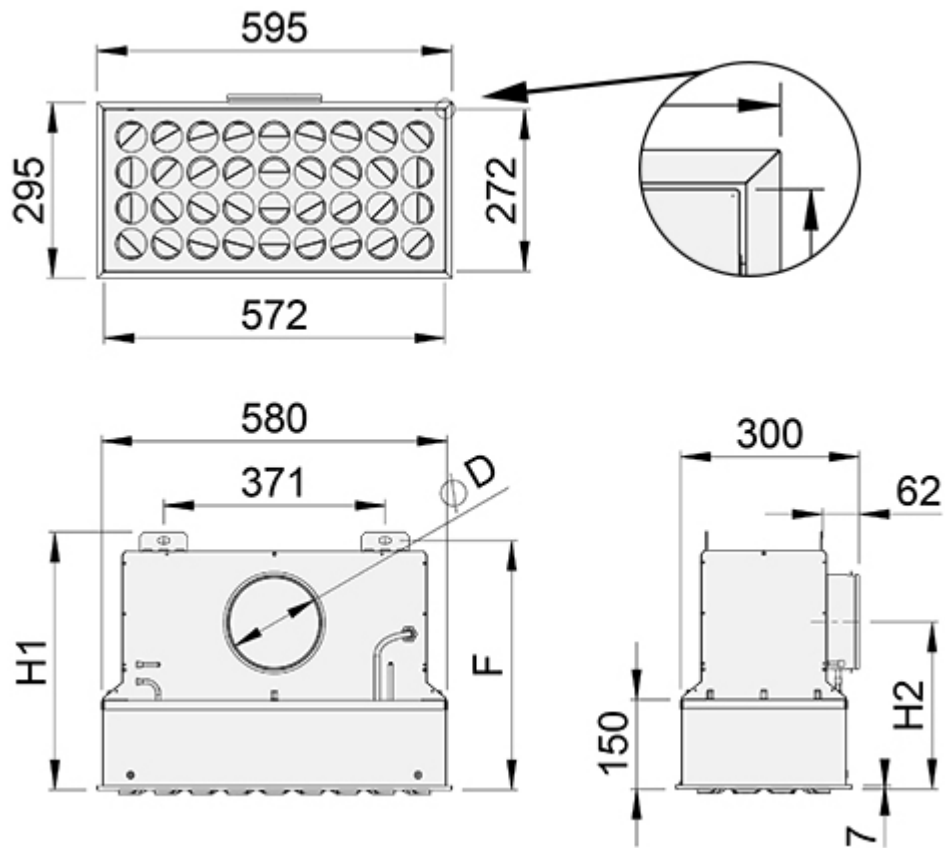
6.1 Dimensions

Halton Vita VHT is available in three sizes (600 x 300, 600 x 600, 1200 x 600). The possibilities of duct connection type and size are listed in the tables.

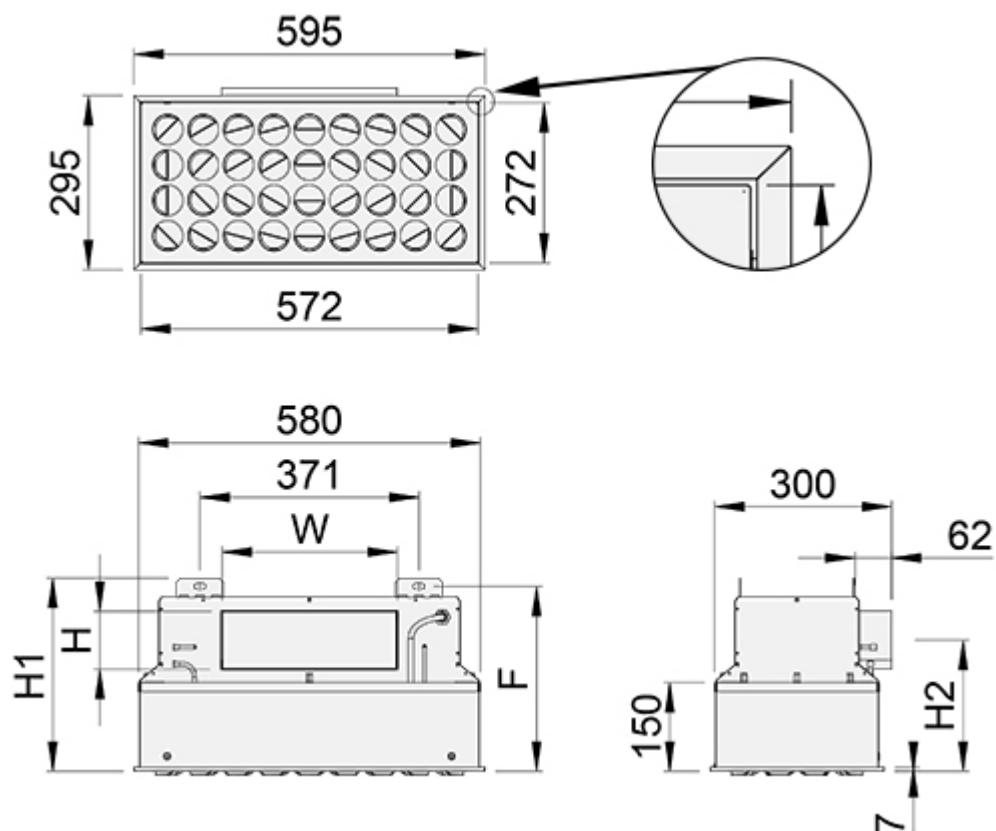
Halton Vita VHT 600 x 300



Halton Vita VHT with top circular duct connection



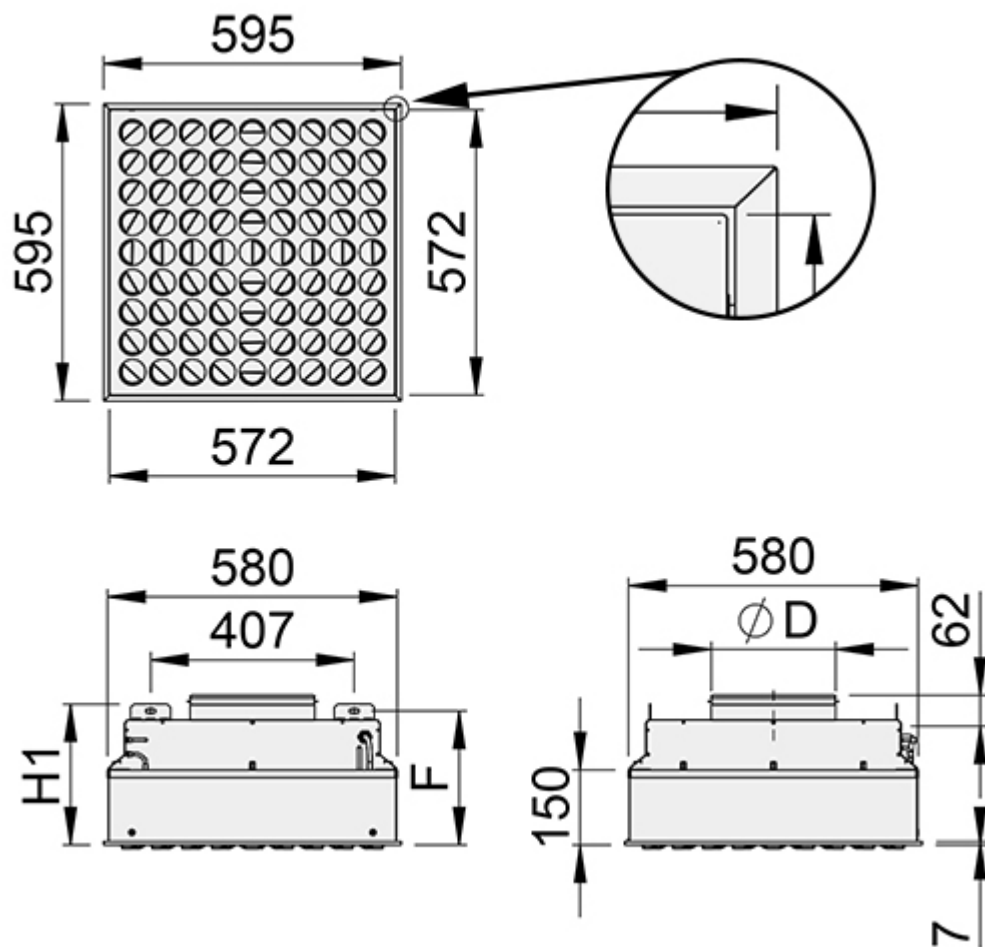
Halton Vita VHT with side circular duct connection



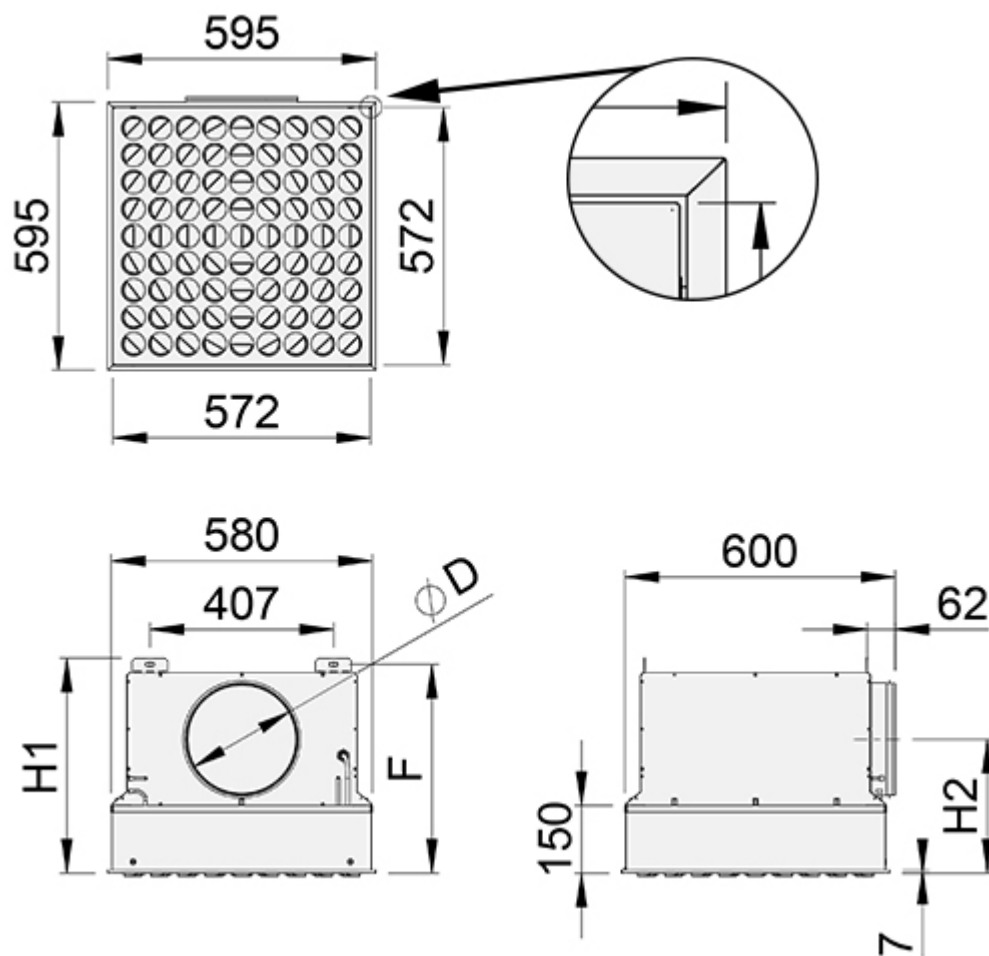
Halton Vita VHT with side rectangular duct connection

Duct connection location	ØD	W	H	H1	H2	F
Top	159	-	-	282	-	268
Side	159	-	-	432	280	418
Side	199	-	-	432	270	418
Side	-	298	98	327	222	313

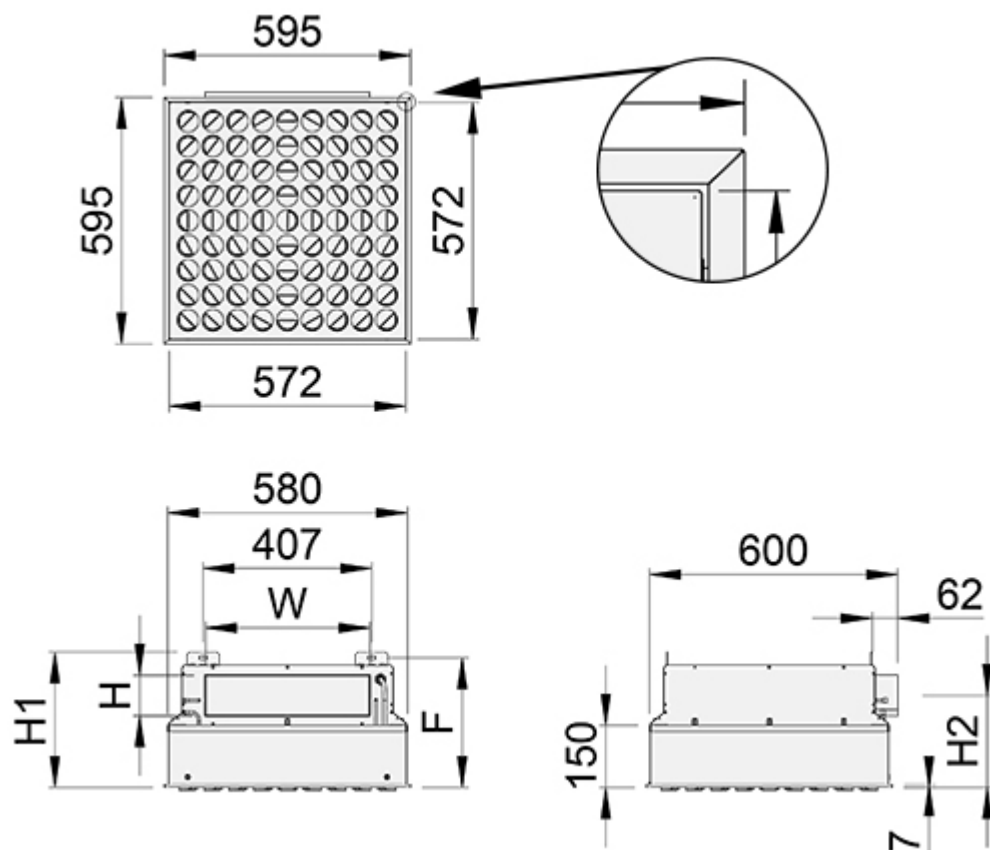
Halton Vita VHT 600 x 600



Halton Vita VHT with top circular duct connection



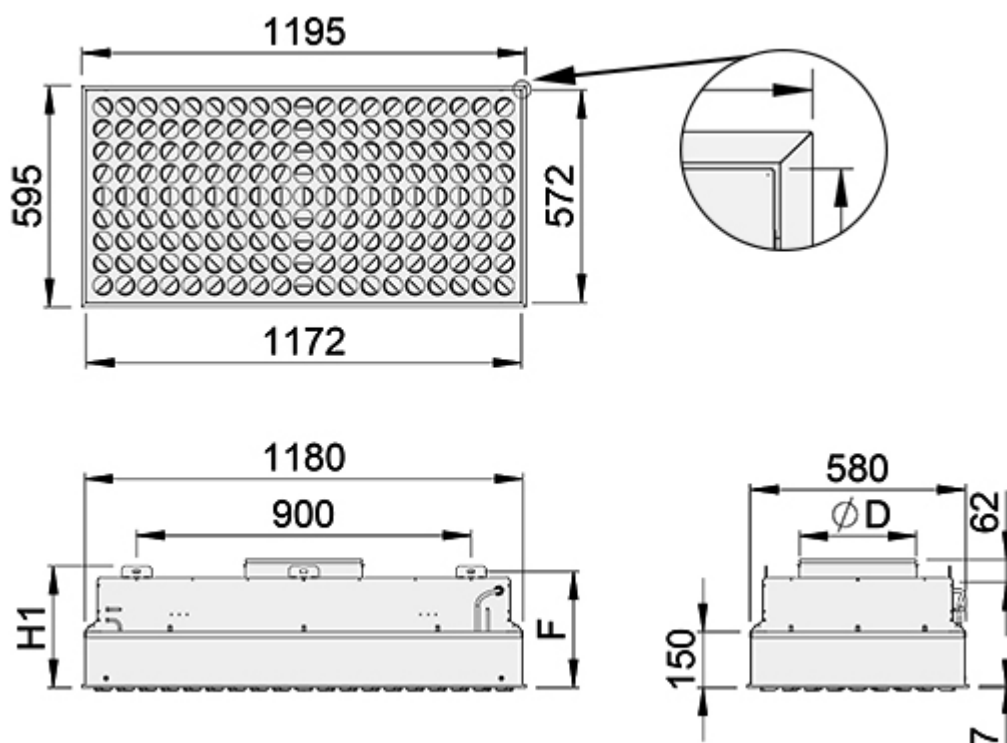
Halton Vita VHT with side circular duct connection



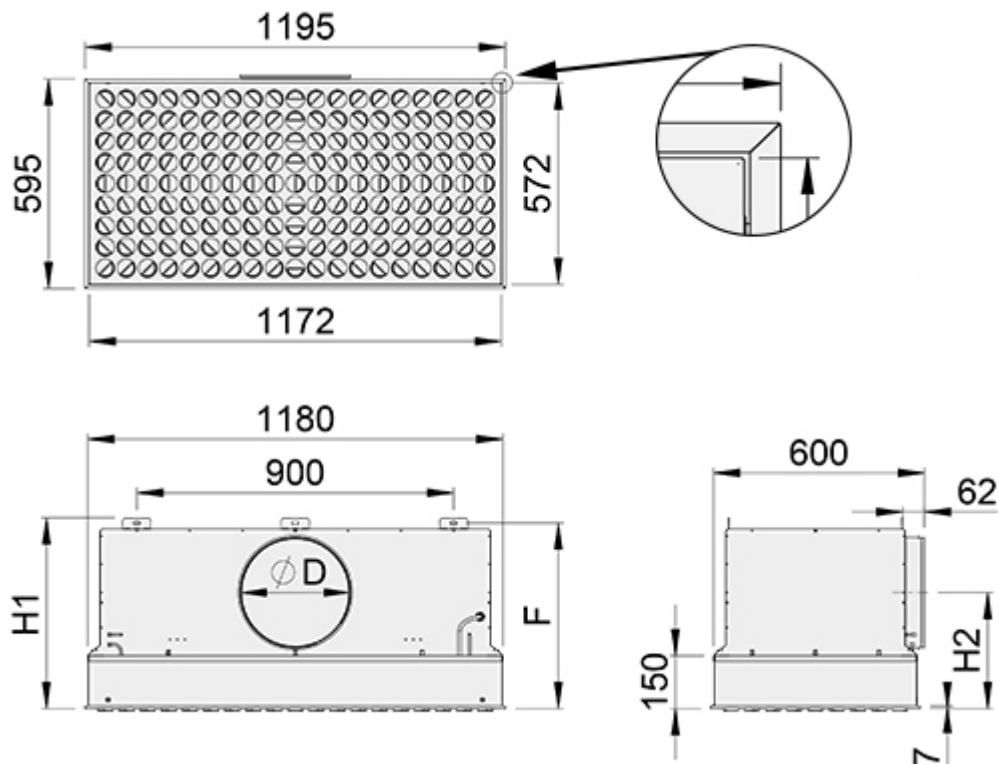
Halton Vita VHT with side rectangular duct connection

Duct connection location	$\varnothing D$	W	H	H1	H2	F
Top	249	-	-	282	-	268
Top	314	-	-	282	-	268
Side	249	-	-	477	297	463
Side	314	-	-	542	330	528
Side	-	398	98	327	222	313
Side	-	398	148	327	247	363

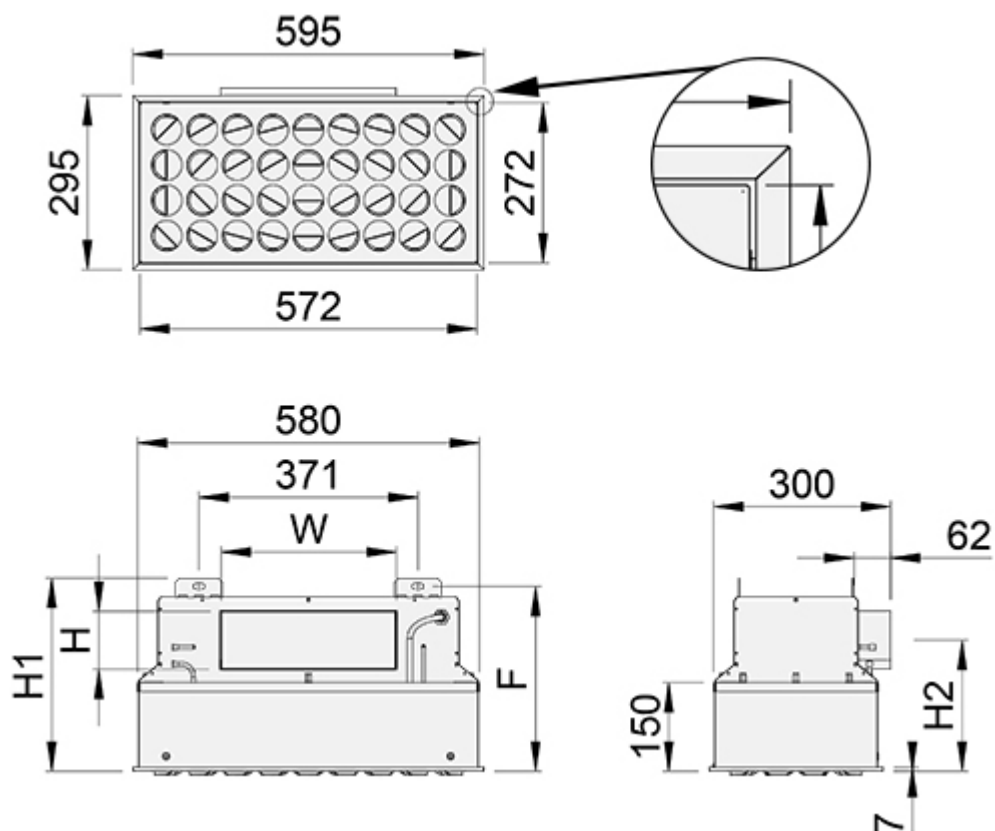
Halton Vita VHT 1200 x 600



Halton Vita VHT with top circular duct connection



Halton Vita VHT with side circular duct connection



Halton Vita VHT with side rectangular duct connection

Duct connection location	ØD	W	H	H1	H2	F
Top	314	-	-	327	-	313
Top	399	-	-	327	-	313
Side	314	-	-	542	330	528
Side	399	-	-	627	372	613
Side	-	398	148	377	247	363
Side	-	598	198	427	272	413

6.2 Filters



Description

High efficiency particulate air (HEPA) filters are widely applied in cleanrooms where high air quality standards are essential.

Performance data of HEPA filters

Filters compatible with Halton Vita VHT diffuser are available in classes E10, H13 and H14 (European Standard EN 1822-1:2009) for standard and high airflow. The available filter depths are: 68, 90, 110 (H14) mm. All filters have a polyurethane (PUR) foam gasket.

Operating range:

- Temperature max. 70 °C
- Humidity max. 90 %
- Final pressure drop max. 500 Pa

Dimensions WxHxD (mm)	Filter class	Order code
225x525x68	H14, H13, E10	AF-H14/H13/E10-AL-225*525*68-PUR
225x525x90	H14, H13, E10	AF-H14/H13/E10-AL-225*525*90-PUR
225x525x110	H14	AF-H14-AL-225*525*110-PUR
525x525x68	H14, H13, E10	AF-H14/H13/E10-AL-525*525*68-PUR
525x525x90	H14, H13, E10	AF-H14/H13/E10-AL-525*525*90-PUR
525x525x110	H14	AF-H14-AL-525*525*110-PUR
1125x525x68	H14, H13, E10	AF-H14/H13/E10-AL-1125*525*68-PUR
1125x525x90	H14, H13, E10	AF-H14/H13/E10-AL-1125*525*90-PUR
1125x525x110	H14	AF-H14-AL-1125*525*110-PUR