



Chapter 3.2

Wall diffusers

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Wall diffusers

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Mixing systems technology

Air-movement mixing systems in confined rooms

The selection method used by Solid Air is a simple and quick way to arrive at an accurate and responsible choice of diffuser. However, air distribution as such is a complex matter. The following consideration provides some insight into the influence of ceilings, walls, obstacles and heat sources on the air pattern.

1. Introduction

The purpose of air-distribution systems is to supply the pre-treated air volume required for climate control, without causing nuisance, to a room that is confined by a ceiling, walls and a floor, whilst striving for the most complete possible air refreshment of the room.

On these pages we use a simple calculation model to describe the influence of the ceiling, floor and walls, and we also deal with the impact of heat sources and obstacles.

The most common air distributors for mixing systems work on the principle of: Plane flow, radial flow or a combination of the two, and therefore axial flow is not taken into consideration.

Wall, baffle and louvre ceiling diffusers work on the basis of the plane-flow principle. Perforated, round ceiling diffusers and swirl patterns in a panel work on the basis of the radial-flow principle.

Displacement ventilation works on the basis of a completely different principle. See [chapter 3.3 floor and displacement diffusers](#).

2. Flows limited by a ceiling

a. Plane flow

If air is blown out through an infinitely long baffle, you create a plane flow (fig. 2.1). The air is supplied in the direction of the x-axis.

At a distance x is:

v_x = velocity
 t_x = temperature
 h_x = jet thickness

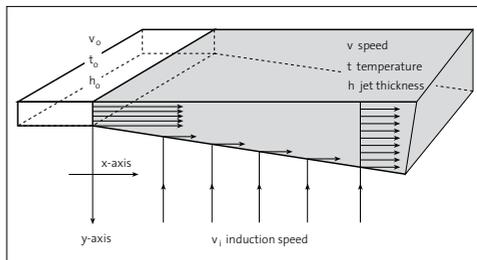


Fig. 2.1 plane flow.

b. Radial flow

If the air is blown through a circular baffle, you create a radial flow (fig. 2.2). The air is supplied in the direction of the r-axis.

At a distance r is:

v_r = velocity
 t_r = temperature
 h_r = jet thickness

The following applies to both flows:

v_0 = air-supply velocity
 t_0 = temperature difference between supply and room air
 h_0 = baffle height
 v_i = induction speed

Observations demonstrate that the air that flows in through the baffle brings the surrounding air into motion and includes it in the jet. This phenomenon is called induction. The velocity of the inflowing air (v_i) is directly proportional to the jet velocity v :

$$v_i = a \cdot v$$

(where a is a constant)

If we assume that the jet velocity in the y-direction does not change, that there is no build-up of static pressure in the room, and that the momentum in the jet is maintained, the following applies:

$$v_0^2 * h_0 = v^2 * h$$

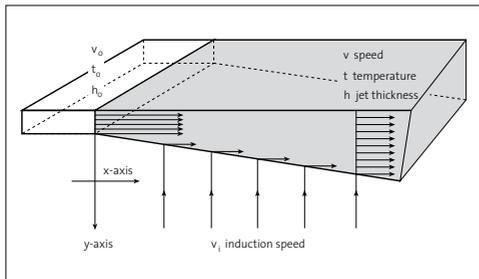


Fig. 2.2 Radial Flow

By using the law of conservation of mass and momentum, it is possible to calculate the jet thickness, velocity and temperature with the applied assumptions (fig. 2.3).

The course of the jet thickness is linear to the distance and increases twice as fast for plane flows as for radial flows.

As the jet induces more, the jet thickness increases faster too. The starting velocity has very little influence on the eventual jet thickness. The calculated course matches observations in practice. The course of the speed for a radial and a plane flow is given in fig. 2.4.

It is clear that the velocity reduces to a lower level with a radial pattern than with a plane pattern. The distance over which the velocity in the jet has a value of 0.25 m/s is called the "throw". At that distance, you can place a wall without producing uncomfortable air movements. If there is no wall, the jet remains intact until the speed becomes 0.10 to 0.15 m/s and it is not longer possible to detect the difference between jet air and room air. The term throw is not an absolute. It is a practical tool to select an air-outflow device. The course of the jet temperature equals the course of the velocity (fig. 2.5).

Takeaways

- Radial flows reduce velocity and speed quicker than plane flows.
- For plane flows, the jet thickness increases twice as quickly as for radial flows.

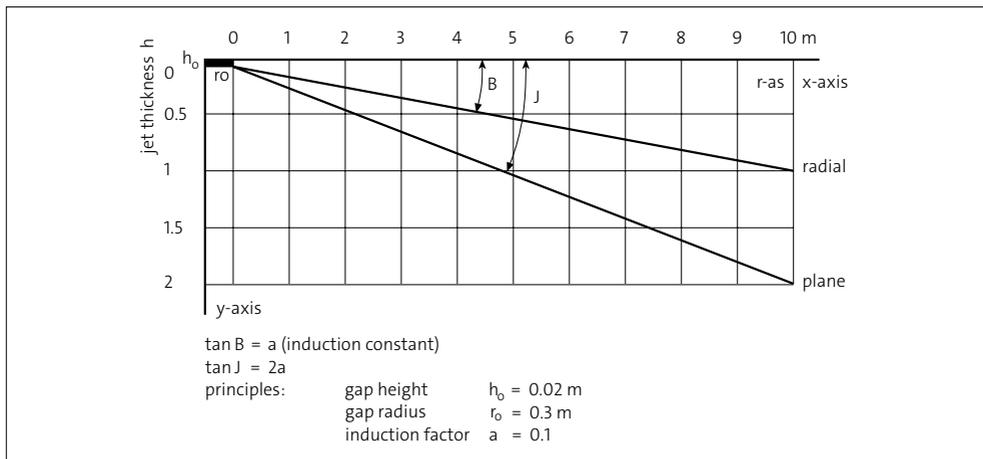


Fig. 2.3 Jet thickness.

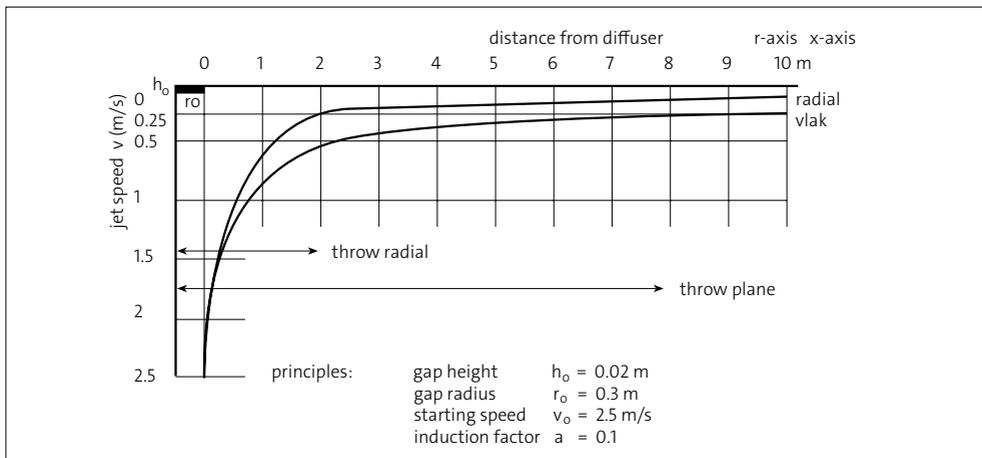


Fig. 2.4 Jet velocity.

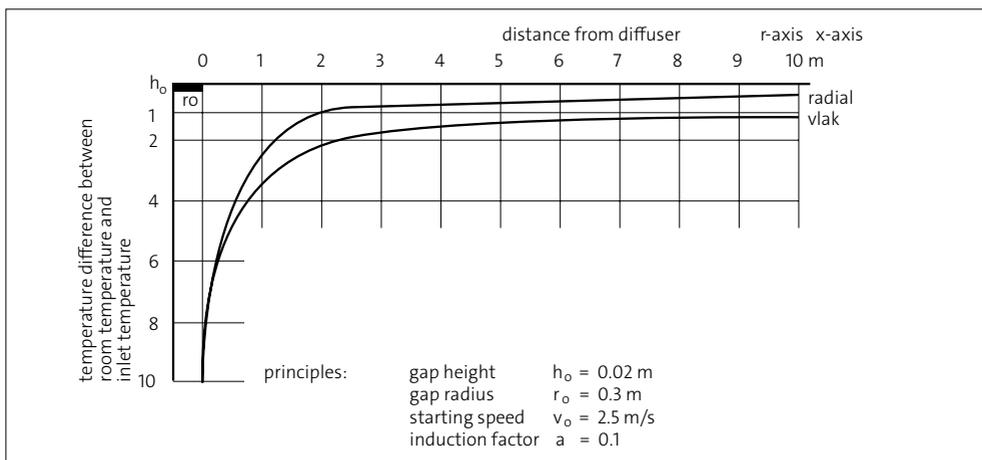


Fig. 2.5 Jet temperature.

3. Influence of the floor

If a floor is built under the existing ceiling, the flow from the infinity of induction air to the jet is impeded. However, according to the assumption, the jet will continue to supply air. At this point, an air movement is produced over the floor that goes against the jet direction, which is known as the return vortex. Assuming that the velocity at the jet edge is nil in the x-direction, the velocity will be highest at floor level.

From this assumption, it is possible to calculate the velocity distribution in the return vortex in the x-direction. The sum of the shaded surfaces in fig. 3.1 and 3.4 should be equal to the blocked surface. This velocity course is theoretical.

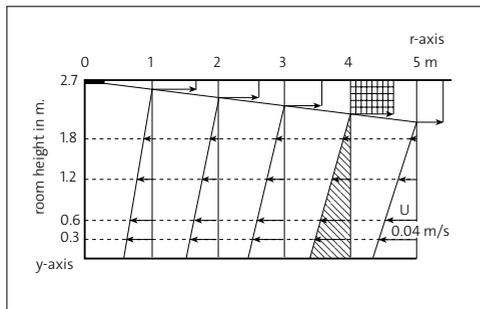


Fig. 3.1 Velocity increase return vortex in the x-direction radial pattern.

To give an impression of the actual course, this has been marked with a thin line at $r = 5$. To describe the complete vortex, the velocity in the y-direction must be calculated too. This is a $x \cdot v$ on the jet edge, and will be nil on the floor. Now, it is possible to calculate the y-component (fig. 3.2 and 3.5). A complete picture of the room flow with a radial pattern is given in fig. 3.3. For the plane flow pattern, see fig. 3.6.

Takeaways

For a plane pattern, the velocities in the return vortex are higher and distributed more unevenly.

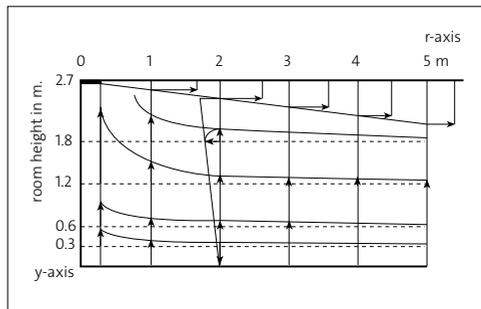


Fig. 3.2 Velocity increase return vortex in the y-direction radial pattern.

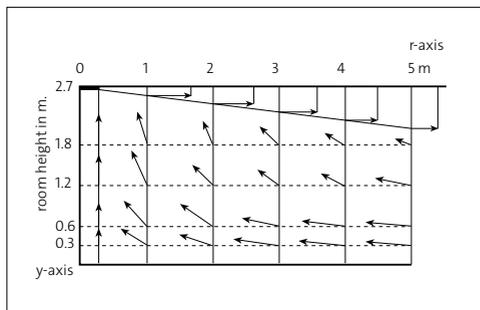


Fig. 3.3 Velocity increase return vortex radial pattern.

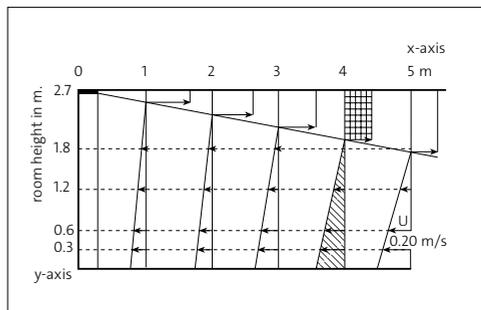


Fig. 3.4 Velocity increase return vortex in the x-direction plane pattern.

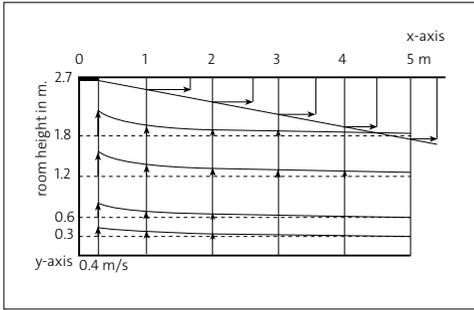


Fig. 3.5 Velocity increase return vortex in the y-direction plane pattern.

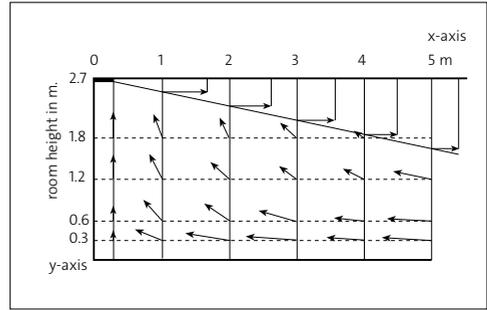


Fig. 3.6 Velocity increase return vortex plane pattern.

4. The influence of walls

The back wall prevents the air jet from going straight on and bends it downwards, whereby the jet expands to the return vortex. This happens with the smallest possible curvature radius, and it creates an eye where the air is motionless. The supply of air from the return vortex is interrupted, and the jet itself becomes a return vortex. In the downward area there is no longer any induction. Therefore, the throw along the back wall may not be

made equal to the throw along the ceiling! It is possible to distinguish two separate areas: induction area, downward and expansion area.

The flow patterns for a plane and radial pattern have been given in fig. 4.1 and 4.2. The radial pattern produces an extremely even vortex with a small downward area.

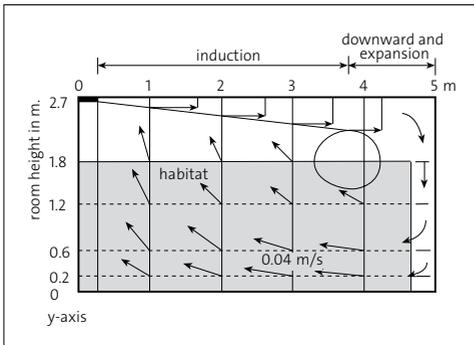


Fig. 4.1 Flow picture radial pattern.

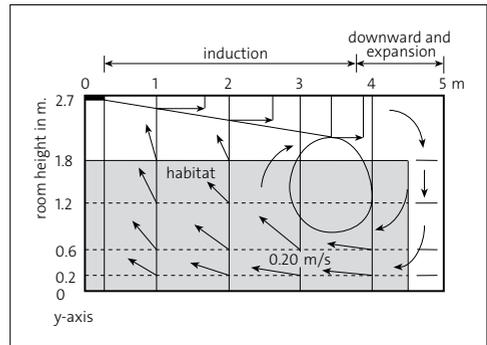


Fig. 4.2 Flow picture plane pattern.

5. The influence of heat sources

With heat development in a room, air with a lower temperature than the room temperature is blown into the room to control the temperature. If the heat load is divided evenly over the floor surface area, this is taken up in the downward and expansion area which means the temperature of the supplied air rises. This heated air rises to the induction area, where the rest of the heat load is taken up by the moving air. The air heated by the heat load is taken up in the cold jet. If the heat production is concentrated in the discharge area (fig. 5.2) the convection flow that is produced will be taken up by the jet without any difficulties, but the temperature gradient of the room will go up.

However, if the heat development is concentrated in the downward area, you have a completely different situation. At that point the convection flow of the heat source is directed against the forced air flow.

With relatively low heat loads, the source is unable to build up its own vortex. In that case, the flow picture does not change (fig. 5.3). If there is a strong source, such as a radiator, there is a problem. The warm convection vortex and the cold return vortex will exist alongside each other. There will be a cold zone, often with high air velocities, alongside a warm area (fig. 5.4).

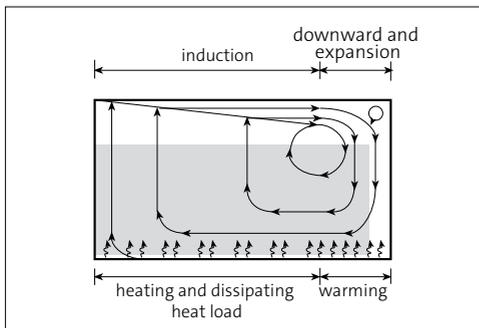


Fig. 5.1 Even heat load.

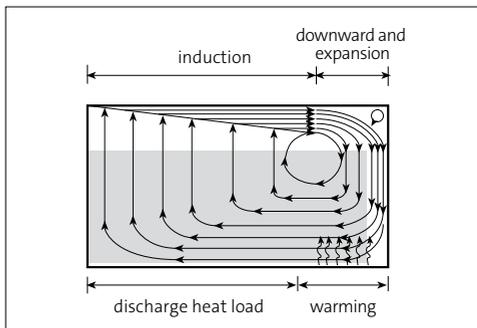


Fig. 5.3 Heat load in the downward area (weak source).

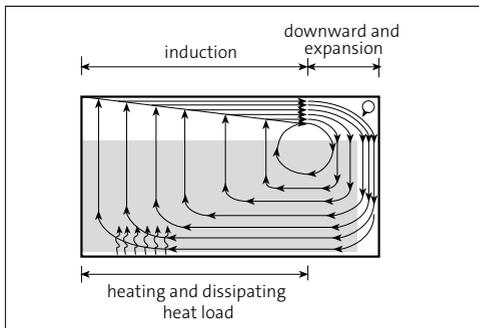


Fig. 5.2 Concentrated heat load.

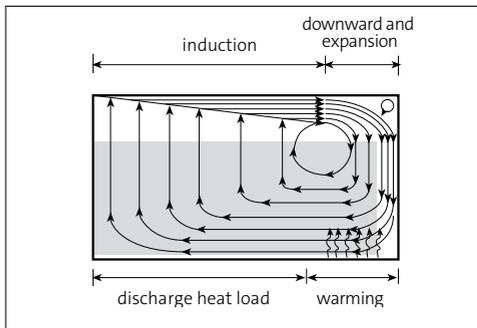


Fig. 5.4 Heat load in the downward area (strong source).

6. Obstacles

The rooms considered up to now were completely empty. In reality used rooms have all types of obstacles that impact the flow pattern. The effect and the level of impact are very difficult to predict. For two situations, data is known from measurements and observations in practice:

- Beam on the ceiling.
- Large closed obstacles on the floor.

Beams bend the air flow. The part of the jet that flows against the beam (or the surface-mounted strip-light fitting) is bent down. Part of the jet will flow under the beam. As the velocity is constant in the entire jet, the resulting momentum direction can be composed from the geometry (fig. 6.1).

Deflection angle: $\tan c = \frac{b}{h - b}$

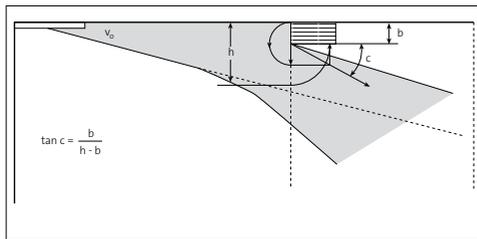


Fig. 6.1 Beam in air flow.

The influence of an obstacle has to be related to the jet thickness at the location of the obstacle. If large solid obstacles are in the room perpendicular to the floor, the creation of the return vortex often becomes completely impossible (fig. 6.2).

The top of the obstacles will operate as a type of “pseudo floor”. Between the obstacles, there is low heat discharge, except when the jet is peeled off as it were and there is too much heat discharge.

These types of problems can occur in bedrooms (closed curtains), laboratories, storage areas, et cetera. By blowing parallel to the obstacles, the flow picture could be better but it is important to be cautious.

As air distributors with a radial outflow are less sensitive to disruption by heat sources or obstacles, they are often preferred over plane patterns for comfort reasons.

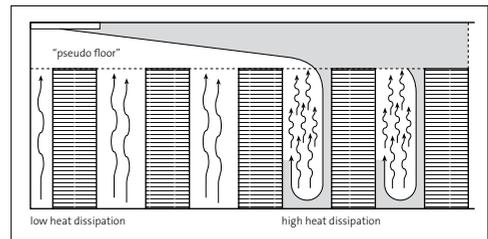


Fig. 6.2 Obstacles perpendicular to the return vortex.

Appendix I

Assumptions:

- 1 The momentum of the jet is retained.
- 2 The jet does not build up static pressure in the room.
- 3 The induction velocity is directly proportionate to the jet velocity.
- 4 The jet velocity is an average constant.
- 5 The velocity in the return vortex is nil on the floor and is linear from the floor to the jet edge.

Appendix II

Overview of formulas:

Plane pattern:

Momentum: $h_o * v_o^2 = h * v^2$

Mass: $d(h * v) = v_i * d_x$

Induction: $v_i = a * v$

Radial pattern:

Momentum: $h_o * r_o * v_o^2 = h * r * v^2$

Mass: $d(h * r * v) = v_i * r * d_x$

Induction: $v_i = a * v$

Appendix III

Definitions:

Symbol	Quantity	Unit
a	Induction constant	-
x, y	Coordinates	m
r	Radius	m
r_o	Baffle radius	m
h_o	Baffle height	m
v_o	Air velocity in the baffle	m/s
v	Air velocity	m/s
v_i	Induction velocity	m/s
t	Air supply temperature	°C (K)
t	Jet temperature	°C (K)

Selection method wall diffusers

1. Select a diffuser type

Selecting a diffuser is not just an aesthetic choice. The properties of the various diffusers determine their suitability for a particular purpose. Base the choice on the number of air changes with a room height of 2.7 m. For transfer or overflow diffusers, the pressure loss and the noise level determine the choice. In connection with noticing the pressure difference over doors, we recommend selecting transfer diffusers on a pressure loss of approximately 10 Pa.

Selection tool

type		number of air changes																			
		2	3	4	5	6	8	10	15	20	25										
Wall	High induction																				
	Smooth vane																				
	Jet effect																				

2. Determine the location of the diffusers on the plan

Ensure a symmetrical distribution where possible. Do not blow towards the external wall, but preferably from the external wall towards the internal area. Do not blow towards strong heat sources, such as radiators, but blow with the natural convection flows.

3. Take account of obstacles

The ceiling is preferably level and closed. Remember that beams, surface-mounted light fittings etc are not in the throw range of the diffusers.

4. Determine the permitted level

The data in the table can be used as guide values.

Usual noise levels:

type of room	db(A)									
	15	20	25	30	35	40	45	50	55	60
bank										
library										
cinema										
lecture theatre										
concert hall										
factory hall										
sports hall										
halls and corridors										
hotel room										
board office										
private										
several persons										
room										
laboratory										
operating theatre										
post office										
radio studio										
restaurant										
class room										
sports centre										
theatre										
hospital room										

5. Determine the air volume per diffuser

Divide the supply-air volume per hour in the room by the number of diffusers.

6. Measure the maximum permissible throw on the drawing

The maximum permissible throw refers to the distance from the centre of the diffuser to a wall or an opposing air flow. Only the horizontally measured distance may be considered permissible throw up to a room height of approximately 3.5 m. The exceptions are noted in the product details.

7. Select the diffuser from the table that complies with all the requirements

- The throw produced by the tables may not exceed the maximum permissible throw; a lower value is permissible.
- The sound pressure L_p is given in dB(A) with an assumed room attenuation of 10. The difference with the actual room attenuation must be corrected.
- Select a diffuser approx. 5 dB below the permissible value.
- When you select the diffuser, take account of the sound addition as a result of there being several diffusers in the room.

8. The tables assume the following details

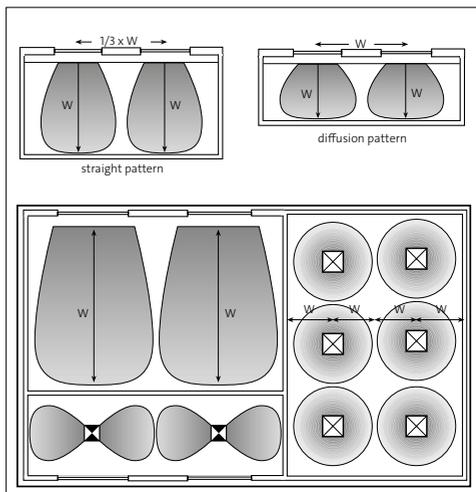
- The tables have an upper limit based on pressure loss and sound values. The lower limit is determined by the minimum required exit speed when discharging cooled air.
- It is permitted to interpolate the interim values.
- The supply-air temperature may be no more than 10 K below or 15 K above the average room temperature.
- However, we do not recommend diffusers in all-air or air-heating systems as such.
- All throw data are given with a ceiling effect.

9. Check the selected throw

The throw may not exceed the maximum permissible W_{max} with the given ceiling height H because of the increasing radius thickness.

10. Important

All Solid Air diffusers are also suitable for supplying heated air with an overtemperature up to approximately 15 K. The use of diffusers in an All-Air or air-heating system is risky in principle and requires more provisions. Please consult our technical experts.



Correction table for several diffusers in 1 room with similar sound level:

number of diffusers in 1 room	1	2	3	4	5	6	7	8
addition in dB	0	+3	+4.8	+6	+7	+7.8	+8.5	+9

Note

The addition applies for a noise observation for all the diffusers at an equal distance. In practice, this is generally not the case and the distance to the observer always varies. That justifies a reasonable maximum addition of 5 dB.

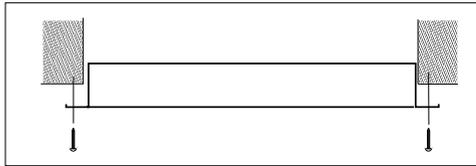
Linear patterns
(high induction and smooth vane wall diffusers) $W_{max} = 7.5 \times (H - 2)$
Axial patterns
(jet diffusers) $W_{max} = 6 \times (H - 2)$

Fitting instructions

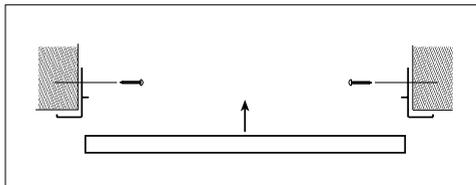
Mounting method

model	A	B	C	D	E
HREC	X	-	-	-	-
JTG	X	-	-	-	-
JTK	-	-	-	-	X
WDL	X	-	-	-	-
WDVC	X	-	X	-	-
WDZD	X	-	-	-	-
WGZC	X	-	-	-	-
WGZD	X	-	-	-	-
WRGC	X	-	-	-	-
WRH	X	X	-	X1	-
WTH	X	X	-	X1	-
WTPD	X	X	-	-	-
WUA	X	-	X	X1	-
WUB	X	-	X	X1	-
WUC	X	-	X	X1	-
WUCK	X	-	-	-	-

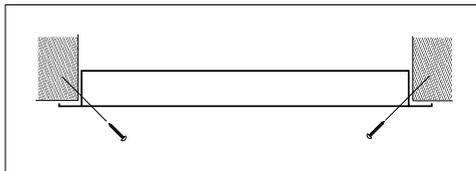
A. Standard fitting, unless stated otherwise



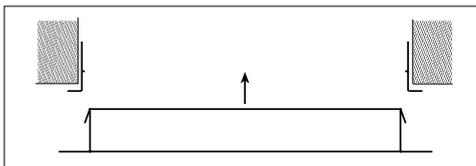
B. Blind fitting from the front



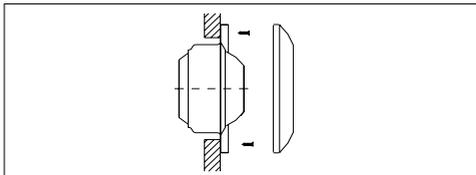
C. Semi-blind fitting



D. Click frame



E. Blind fitting





WTHA/WTHB

Wall diffuser Supply High induction

3

Available types

WTH---

- W** wall diffuser
- T** supply
- H** high induction

- Frame

- A** 26 mm, removable internal unit (standard)
- B** 6.5 mm, removable internal unit

- Accessories

- O** none
- V** volume unit
- B** volume unit and deflector 15°
- S** deflector 15° (supplied separately)

- Discharge direction

- O** right (standard)
- L** left
- R** right
- S** spread (standard 5 degrees upward)

SA-Select

Check SA-Select to create extended order codes and selection details online. **NB!** At this moment, SA-Select is only available in Dutch. But it is possible to create extended order codes and selection details online.

Use

The WTH wall diffuser is suitable for supplying cooled or heated air with a large temperature difference in respect of the room temperature. The diffuser has a high mechanical strength. The high induction internal unit facilitates a large number of air changes and gives the diffuser a short throw. As the horizontal and vertical louvers are in one plane, an optimum spread is guaranteed. The diffuser is factory-set to the required discharge pattern. With a straight, left and right discharge pattern, an upward 5° or 15° inflow is possible for the diffuser, depending on the type of diffuser face. For a spread discharge pattern, this is standard set at 5° up.

Characteristics

Max. number of air changes:	up to 16 x
Undertemperature:	up to 10 K
Overtemperature:	up to 15 K
Free flow:	85 %

Version

Wall diffuser

Frame:	extruded aluminium
Internal unit:	steel
Post-treatment:	epoxy
Colour:	white RAL 9010, optional RAL colour of your choice

Volume unit

Frame and vanes:	extruded aluminium
Post-treatment:	none

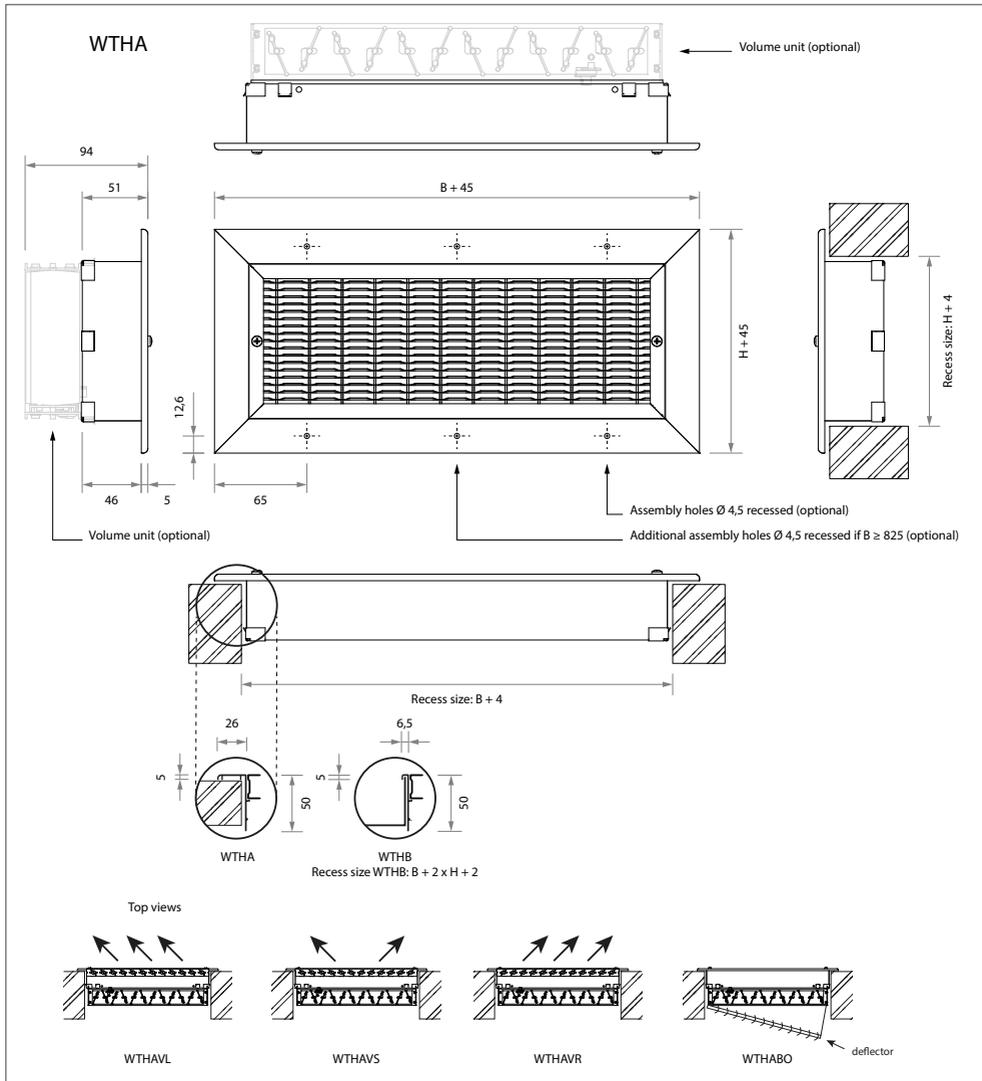
Optional

Click frame: WOOOKO available up to W x H 625 x 325 mm the diffuser has spring clips when used with a click frame.

See documentation.

Plenum boxes: WTO, insulated or uninsulated
Mounting holes: for WTHA only

Dimensions



Standard dimensions

H	B							
	225	325	425	525	625	825	1025	1225
75	■	■	■	■	■	■	■	■
125	■	■	■	■	■	■	■	■
225	■	■	■	■	■	■	■	■
325		■	■	■	■	■	■	■

The available models marked in grey are not preferable from an air-distribution point of view, and therefore they are not included as standard in SA-Select. These selection details are available on request.

Available dimensions

- Interim sizes available in increments of 5 mm.
- Width min. 200, max. 1225.
- Height min. 75, max. 325.

Note

- When fitted < 0.3 m below the ceiling, it is recommended to have an upward inflow at an angle of 5°.
- When fitted 0.3 - 0.6 m below the ceiling, it is recommended to have an upward inflow at an angle of 15°.
- This does not have a measurable impact on the throw length.
- If the distance below the ceiling is greater, there will be a small Coanda effect during cooling and this may create an unstable air pattern.
- Please ask our sales department for more information.
- Only use click frames in solid walls.
- The listed dimensions are in mm.
- Recess size WTHA: $B + 4 \times H + 4$.
- Recess size WTHB: $B + 2 \times H + 2$.

Selection details

WTHA/WTHB

air volume		H	B																											
			225			325			425			525			625			825			1025			1225						
m ³ /s	m ³ /h	W	Δp _s	L _{pa}	W	Δp _s	L _{pa}	W	Δp _s	L _{pa}	W	Δp _s	L _{pa}	W	Δp _s	L _{pa}	W	Δp _s	L _{pa}	W	Δp _s	L _{pa}	W	Δp _s	L _{pa}	W	Δp _s	L _{pa}		
		m	Pa	dB(A)	m	Pa	dB(A)	m	Pa	dB(A)	m	Pa	dB(A)	m	Pa	dB(A)	m	Pa	dB(A)	m	Pa	dB(A)	m	Pa	dB(A)	m	Pa	dB(A)		
0.015	54	75	2.3	2	-																									
0.020	72	75	3.1	4	-																									
0.025	90	75	3.8	6	-	2.6	3	-																						
0.030	108	75	4.6	9	10	3.2	4	-	2.4	2	-																			
		125	3.6	2	-																									
0.040	144	75	6.1	15	18	4.2	7	-	3.2	4	-	2.6	2	-																
		125	4.8	4	-																									
0.050	180	75				5.3	10	15	4.0	6	-	3.2	4	-	2.7	3	-													
		125	6.0	6	-	4.1	2	-																						
0.060	216	75				6.3	15	19	4.8	8	13	3.9	5	-	3.2	4	-													
		125	7.2	8	12	4.9	4	-	3.8	2	-																			
0.070	252	75							5.6	11	17	4.5	7	12	3.8	5	-													
		125	8.4	11	16	5.8	5	-	4.4	3	-																			
0.080	288	75							6.4	15	21	5.1	10	16	4.3	7	12													
		125	9.6	14	20	6.6	6	12	5.0	3	-	4.0	2	-																
0.100	360	75										6.4	15	22	5.3	10	18													
		125				8.2	10	17	6.3	5	11	5.0	3	-	4.2	2	-													
0.125	450	75													6.7	16	23													
		125				10	15	23	7.8	9	17	6.3	5	12	5.3	4	-	3.9	2	-										
		225							5.9	2	-																			
0.150	540	125							9.4	12	21	7.5	8	16	6.3	5	12	4.7	3	-	3.8	2	-							
		225							7.1	3	-	5.7	2	-																
0.200	720	125										10	14	24	8.4	10	19	6.3	5	14	5	3	-							
		225							9.5	5	13	7.6	3	-	6.4	2	-													
0.300	1080	125																9.5	12	24	7.6	8	19							
		225							14	12	24	11	8	19	9.5	5	15	7.1	3	-	5.7	2	-							
		325																8.0	2	-										
0.400	1440	125																			10	14	27							
		225										15	14	26	13	9	23	9.6	5	16	7.6	3	11	6.4	2	-				
0.500	1800	225													11	4	14													
		325													16	15	28	12	8	22	9.5	5	17	7.9	4	13				
0.600	2160	225													13	6	20	10	4	13	8.0	2	-							
		325													16	9	24	12	5	18	9.6	3	13	8.0	2	-				
0.700	2520	225													17	16	31	13	10	26	11	7	22							
		325													19	13	28	14	7	22	11	5	17	9.3	3	13				
0.800	2880	225																		15	13	30	13	9	26					
		325													21	16	32	16	9	25	13	6	21	11	4	17				
1.000	3600	225																												
		325																20	14	31	16	9	26	13	6	22				

General

- The throw is given for a straight inflow pattern, with a maximum spread the given value x 0.65 applies.
- When the inflow pattern is set to the left or the right, the given value x 0.8 applies.
- The pressure loss applies to a fully opened volume unit.
- The assumed room attenuation is 10 dB.
- It is permitted to interpolate the interim values.



WRHA/WRHB/WRHU

Wall diffuser Return

Available types

WRH--O

W wall diffuser

R return

H appearance as high induction wall diffuser

- Frame

A 26 mm, removable internal unit (standard)

B 6.5 mm, removable internal unit

U none, internal unit with U profile

- Accessories

O none

V volume unit

O not applicable

SA-Select

Check SA-Select to create extended order codes and selection details online. **NB!** At this moment, SA-Select is only available in Dutch. But it is possible to create extended order codes and selection details online.

Use

The WRHA wall diffuser is suitable for air extraction and has the same appearance as the supply diffuser WTHA. The diffuser has a high mechanical strength.

Characteristics

The large free flow (85 %) makes the diffuser suitable for a high capacity with a low noise level.

Version

Wall diffuser

Frame: extruded aluminium

Internal unit: steel

Post-treatment: epoxy

Colour: white RAL 9010, optional RAL colour of your choice

Volume unit

Frame and vanes: extruded aluminium

Post-treatment: none

Optional

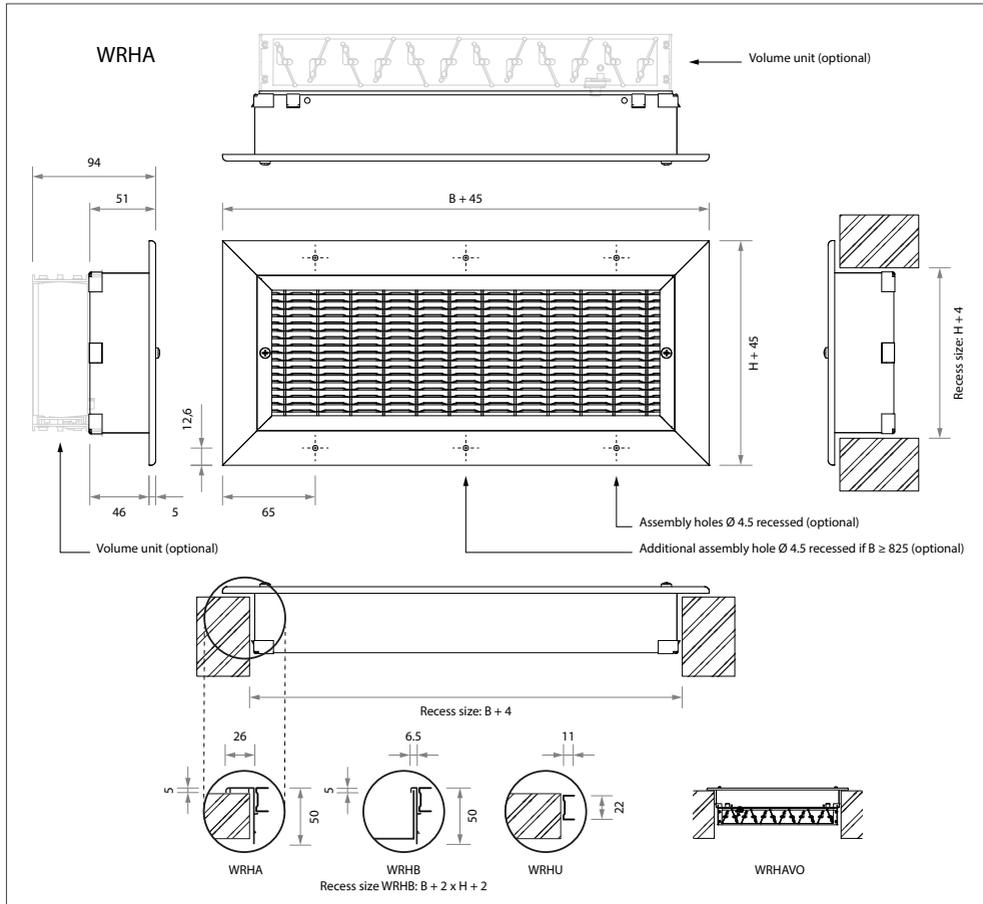
Click frame: WOOOKO available up to W x H: 625 x 325 mm the diffuser has spring clips when used with a click frame. [See documentation.](#)

Plenum boxes: WRO, insulated or uninsulated

Mounting holes: for WRHA only

Filter: on request

Dimensions



Standard dimensions

H	B							
	225	325	425	525	625	825	1025	1225
75	■	■	■	■	■	■	■	■
125	■	■	■	■	■	■	■	■
225	■	■	■	■	■	■	■	■
325	■	■	■	■	■	■	■	■

The available models marked in grey are not preferable from an air-distribution point of view, and therefore they are not included as standard in SA-Select. These selection details are available on request.

Available dimensions

- Interim sizes available in increments of 5 mm.
- Width min. 200, max. 1225.
- Height min. 75, max. 325.

Note

- Only use click frames in solid walls.
- The listed dimensions are in mm.
- Recess size WRHA: $B + 4 \times H + 4$.
- Recess size WRHB: $B + 2 \times H + 2$.

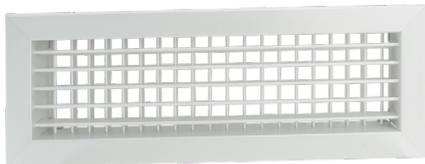
Selection details

WRHA/WRHB/WRHU

air volume		H	B																	
			225		325		425		525		625		825		1025		1225			
m ³ /s	m ³ /h		Δp_s Pa	$L_{T,s}$ dB(A)																
0.015	54	75	2	-																
0.020	72	75	4	-																
0.025	90	75	6	-	3	-														
0.030	108	75	9	13	4	-	2	-												
		125	2	-																
0.040	144	75	15	21	7	12	4	-	2	-										
		125	4	-																
0.050	180	75			10	18	6	11	4	-	3	-								
		125	6	10	2	-														
0.060	216	75			15	22	8	16	5	11	4	-								
		125	8	15	4	-	2	-												
0.070	252	75					11	20	7	15	5	11								
		125	11	19	5	11	3	-												
0.080	288	75					15	24	10	19	7	15								
		125	14	23	6	14	3	-	2	-										
0.100	360	75							15	25	10	21								
		125			10	20	5	14	3	-	2	-								
0.125	450	75										16	26							
		125			15	26	9	20	5	15	4	11	2	-						
		225					2	-												
0.150	540	125					12	24	8	19	5	15	3	-	2	-				
		225					3	-	2	-										
0.200	720	125						14	27	10	22	5	17	3	12					
		225					5	16	3	2	-									
0.300	1080	125											12	27	8	22				
		225					12	27	8	22	5	18	3	12	2	-				
		325										2	-							
0.400	1440	125													14	30				
		225							14	29	9	26	6	19	3	14	2	10		
		325									4	17								
0.500	1800	225									15	31	8	25	5	20	4	16		
		325									6	23	4	16	2	11				
0.600	2160	225										12	30	8	25	5	21			
		325									9	27	5	21	3	16	2	11		
0.700	2520	225										16	34	10	29	7	25			
		325									13	31	7	25	5	20	3	16		
0.800	2880	225											13	33	9	29				
		325									16	35	9	28	6	24	4	20		
1.000	3600	225														15	34			
		325										14	34	9	29	6	25			

General

- The pressure loss applies to a fully opened volume unit.
- The assumed room attenuation is 10 dB.
- It is permitted to interpolate the interim values.



WUCA

Wall/duct diffuser Supply Adjustable vane

Available types

W U - A - O

- W** wall/duct diffuser
- U** universal application

- Vanes

- A** vertical vanes
- B** horizontal vanes
- C** horizontal and vertical vanes

- A** frame 30 mm, fixed internal unit

- Accessories

- O** none
 - V** volume unit
 - B** volume unit and deflector 15°
- O** not applicable

SA-Select

Check SA-Select to create extended order codes and selection details online. **NB!** At this moment, SA-Select is only available in Dutch. But it is possible to create extended order codes and selection details online.

Use

The WUCA (WUAA, WUBA) wall diffuser is suitable for supplying cooled or heated air with a large temperature difference. The diffuser can be fitted in a wall or a duct. The horizontal and/or vertical vanes can be adjusted manually.

Characteristics

Max. number of air changes:	up to 8 x
Undertemperature:	up to 10 K
Overttemperature:	up to 15 K
Free flow:	70 %

Version

Wall diffuser

Frame and vanes:	anodised aluminium
Post-treatment:	none, optional RAL colour of your choice

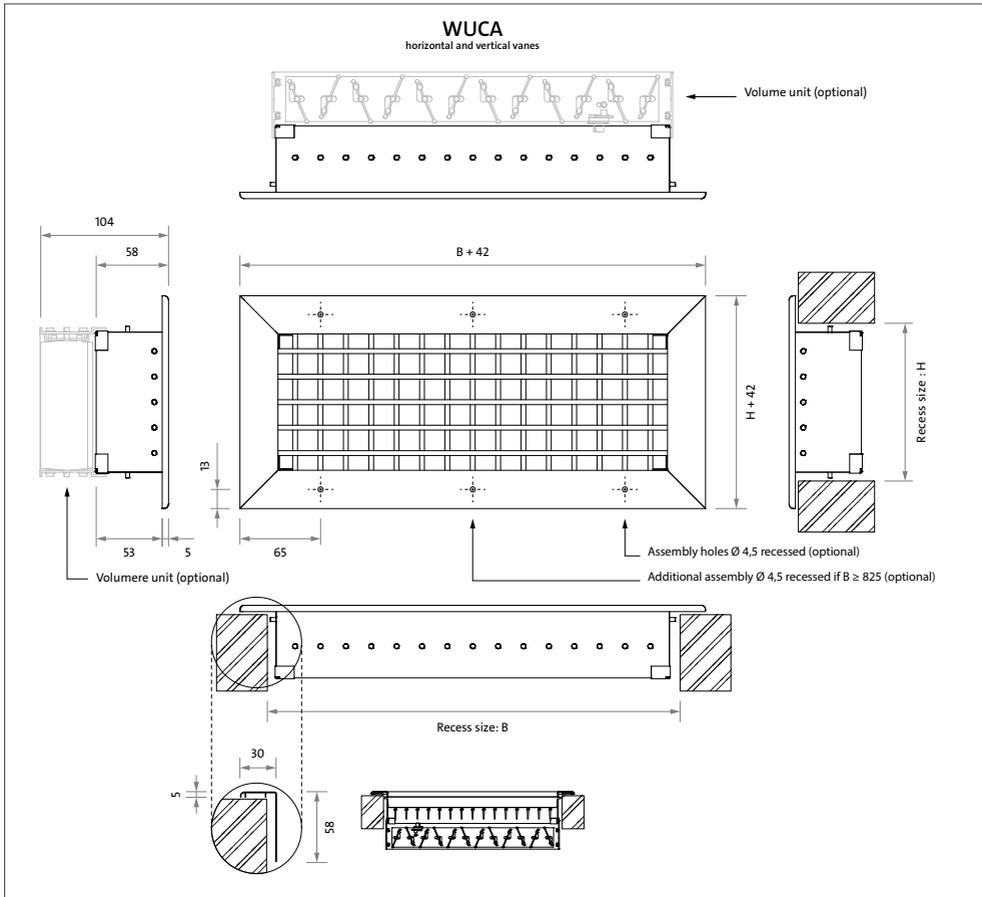
Volume unit

Frame and vanes:	anodised aluminium
Post-treatment:	none

Optional

Click frame:	WOOOKW available up to W x H: 625 x 325 mm the diffuser has spring clips when used with a click frame. See documentation.
Plenum boxes:	WTO/WRO, insulated or uninsulated
Mounting holes:	in frame

Dimensions



Standard dimensions

H	B							
	225	325	425	525	625	825	1025	1225
85	■	■	■	■	■	■	■	■
125	■	■	■	■	■	■	■	■
225	■	■	■	■	■	■	■	■
325	■	■	■	■	■	■	■	■
425	■	■	■	■	■	■	■	■

The available models marked in grey are not preferable from an air-distribution point of view, and therefore they are not included as standard in SA-Select. These selection details are available on request.

Available dimensions

- Width min. 225, max. 1225.
- Height min. 85, max 425.
- Interim widths and heights available in increments of 20 mm.

Note

- The listed dimensions are in mm.
- Recess size: $W \times H$.

Selection details

WUCA

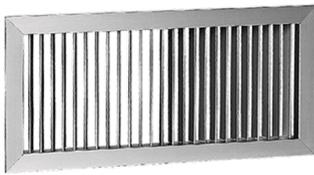
air volume			B																											
			225			325			425			525			625			825			1025			1225						
m ³ /s	m ³ /h	H	W	Δp _i	L _{pa}	W	Δp _i	L _{pa}	W	Δp _i	L _{pa}	W	Δp _i	L _{pa}	W	Δp _i	L _{pa}	W	Δp _i	L _{pa}	W	Δp _i	L _{pa}	W	Δp _i	L _{pa}	W	Δp _i	L _{pa}	
		m	Pa	dB(A)	m	Pa	dB(A)	m	Pa	dB(A)	m	Pa	dB(A)	m	Pa	dB(A)	m	Pa	dB(A)	m	Pa	dB(A)	m	Pa	dB(A)	m	Pa	dB(A)	m	Pa
0.015	54	85																												
0.020	72	85	2.2	2	-																									
0.025	90	85	2.7	2	-	2.2	1	-																						
0.030	108	85	3.3	3	-	2.7	2	-																						
0.040	144	85	4.3	6	12	3.6	3	-	3.1	2	-	2.8	1	-																
		125	3.2	2	-																									
0.050	180	85	5.4	10	18	4.5	4	9	3.8	2	-	3.5	2	-	3.2	1	-													
		125	4.0	3	5	3.3	1	-																						
0.060	216	85				5.4	6	14	4.7	4	8	4.2	2	-	3.8	2	-													
		125	4.8	4	10	4.0	2	-	3.4	1	-																			
0.070	252	85				6.3	9	18	5.4	5	12	4.9	3	7	4.5	2	-													
		125	5.6	6	13	4.6	3	-	4.0	1	-																			
0.080	288	85				7.2	11	21	6.2	6	15	5.6	4	11	5.1	3	7													
		125	6.4	7	17	5.3	3	8	4.6	2	-	4.1	1	-																
0.100	360	85				7.8	10	21	7.0	7	16	6.4	5	13																
		125	8.0	11	23	6.6	5	14	5.7	3	8	5.1	2	-	4.7	1	-													
0.125	450	85										8.7	10	22	8.0	7	18													
		125				8.3	8	20	7.2	5	14	6.4	3	9	5.9	2	5	5.1	1	-										
0.150	540	85										9.6	10	23																
		125				9.9	12	25	8.6	7	19	7.7	4	14	7.1	3	10	6.1	2	-	5.5	1	-							
0.200	720	125							11.5	12	26	10.3	8	21	9.4	5	17	8.2	3	11	7.3	2	7							
		225							8.3	3	12	7.5	2	7	6.8	1	-													
0.300	1080	125													14.1	12	28	12.3	7	22	11.0	4	17							
		225							12.5	7	23	11.2	5	18	10.2	3	14	8.9	2	8	7.9	1	3							
0.400	1440	325													8.4	2	6													
		125																16.3	12	29	14.6	8	25							
0.500	1800	225										14.9	9	25	13.6	6	21	11.8	3	15	10.6	2	11							
		325													11.2	3	13													
0.600	2160	225													17.0	9	27	14.8	5	21	13.2	3	16	12.1	2	12				
		325													14.0	4	19	12.2	2	13	10.9	2	8	10.0	1	-				
0.700	2520	425													12.2	2	13	10.6	1	7										
		225													20.4	13	32	17.7	8	26	15.9	5	21	14.5	3	17				
0.800	2880	325													16.8	6	24	14.6	3	17	13.1	2	13	11.9	2	9				
		425													14.6	4	18	12.7	2	11	11.4	1	7							
0.900	3240	225																20.7	10	30	18.5	7	25	16.9	5	21				
		325													19.6	8	28	17.0	5	21	15.3	3	17	13.9	2	13				
1.000	3600	425													17.1	5	22	14.8	3	15	13.3	2	11	12.1	1	7				
		225																			21.2	9	29	19.3	6	25				
1.000	3600	325													22.4	11	31	19.5	6	25	17.4	4	20	15.9	3	16				
		425													19.5	6	25	16.9	4	19	15.2	2	14	13.8	2	10			24.2	9
1.000	3600	225																												
		425													24.4	10	31	21.2	6	25	18.9	4	20	17.3	2	16				

General

- The throw is given for a straight discharge pattern and fitting up to 0.6 m below a flat, closed ceiling. For a maximum spread, the given throw x 0.65 applies.
- With a setting to the left or the right, the given throw x 0.8 applies.
- The pressure loss applies to a fully opened volume unit and a vane setting for a straight discharge pattern.
- The assumed room attenuation is 10 dB.
- It is permitted to interpolate the interim values.

Note

- When fitted < 0.3 m below the ceiling, it is recommended to have an upward inflow at an angle of approximately 5°.
- When fitted 0.3 - 0.6 m below the ceiling, it is recommended to have an upward inflow at an angle of approximately 15°.
- This does not have a measurable impact on the throw length.
- If the distance below the ceiling is greater, the Coanda effect will be small during cooling and this may create an unstable air pattern.



WUAA/WUBA

Wall/duct diffuser Return Adjustable vane

Available types

W U - A - O

- W** wall/duct diffuser
- U** universal application
- **Vanes**
 - A** vertical vanes
 - B** horizontal vanes
- A** frame 30 mm, fixed internal unit
- **Accessories**
 - O** none
 - V** volume unit
- O** not applicable

SA-Select

Check SA-Select to create extended order codes and selection details online. **NB!** At this moment, SA-Select is only available in Dutch. But it is possible to create extended order codes and selection details online.

Use

De WUAA or WUBA wall diffuser is suitable for discharging air. The diffuser is also suitable as a supply diffuser, see WUCA documentation for the supply selection data. The diffuser can be fitted in a wall or a duct. The horizontal and/or vertical vanes can be adjusted manually. The large vane distance means the diffuser is not prone to becoming dirty.

Characteristics

Free flow: 70 %

Version

Wall diffuser

Frame and vanes: anodised aluminium

Post-treatment: none, optional RAL colour of your choice

Volume unit

Frame and vanes: anodised aluminium

Post-treatment: none

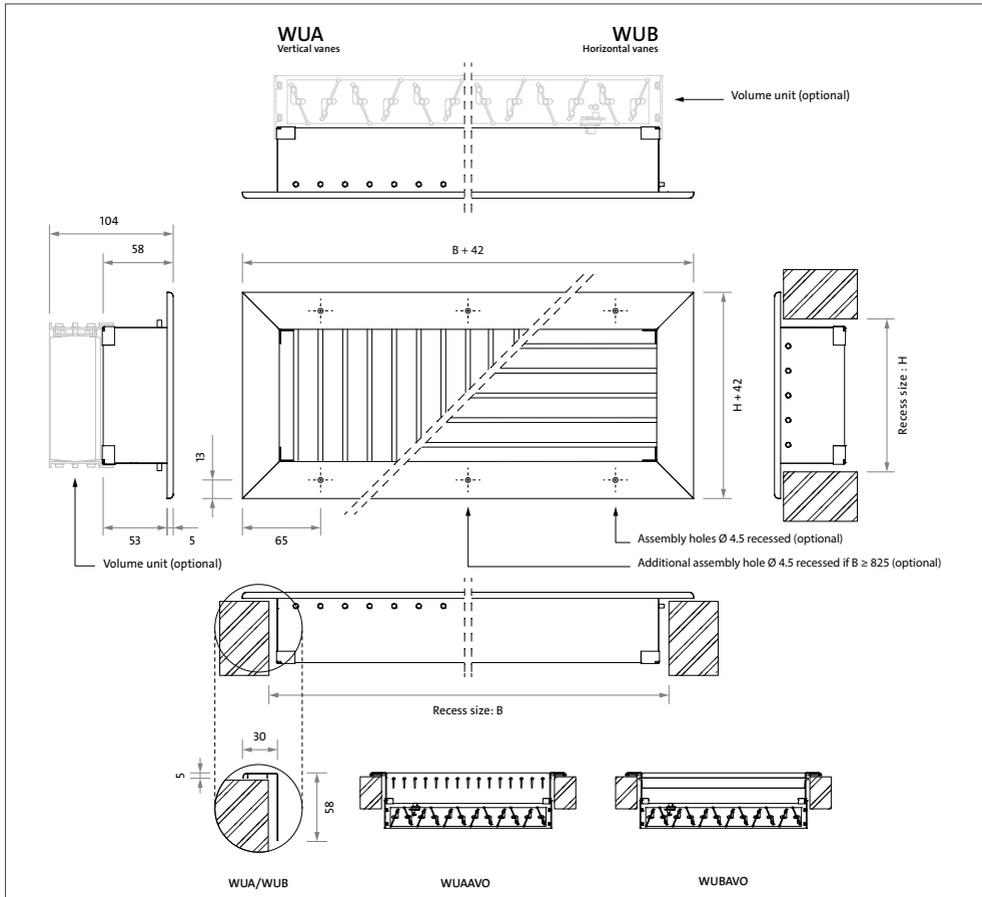
Optional

Click frame: W000KW available up to W x H: 625 x 325 mm the diffuser has spring clips when used with a click frame. See [documentation](#).

Plenum boxes: WRO, insulated or uninsulated

Mounting holes: in frame

Dimensions



Standard dimensions

H	B							
	225	325	425	525	625	825	1025	1225
85	■	■	■	■	■	■	■	■
125	■	■	■	■	■	■	■	■
225	■	■	■	■	■	■	■	■
325	■	■	■	■	■	■	■	■
425	■	■	■	■	■	■	■	■

Note

- The listed dimensions are in mm.
- Recess size: $W \times H$.

Available dimensions

- Width min. 225, max. 1225.
- Height min. 85, max. 425.

WUAA

- Interim widths available in increments of 20 mm.
- Interim heights available in increments of 5 mm.

WUBA

- Interim widths available in increments of 5 mm.
- Interim heights available in increments of 20 mm.

Fitting

- For the matching plenum boxes, please [see our website](#).

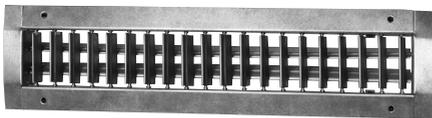
Selection details

WUAA/WUBA

air volume		H	B															
m ³ /s	m ³ /h		225		325		425		525		625		825		1025		1225	
			Δp_s Pa	L_{pA} dB(A)														
0.015	54	85	2	-														
0.020	72	85	3	-														
0.025	90	85	4	-	2	-												
0.030	108	85	6	-	3	-	2	-										
		125	2	-														
0.040	144	85	11	12	5	-	3	-	2	-								
		125	3	-	2	-												
0.050	180	85	17	18	8	9	5	-	3	-	2	-						
		125	5	5	2	-												
0.060	216	85	25	22	11	14	7	8	4	-	3	-						
		125	7	9	3	-	2	-										
0.070	252	85	34	26	16	18	6	7	4	-	4	-						
		125	10	13	5	5	3	-										
0.080	288	85	44	30	20	21	12	15	8	11	5	7						
		125	13	17	6	8	3	-	2	-								
0.100	360	85			32	27	18	21	12	16	8	13						
		125	21	23	9	14	5	8	4	-	2	-						
0.125	450	85					28	27	13	18	9	15						
		125	32	28	15	20	8	14	5	9	4	5	2	-				
0.150	540	225				2	-											
		125			21	25	12	19	8	14	6	10	3	-	2	-		
0.200	720	225				3	5	2	-									
		125			38	32	22	26	14	21	10	17	6	11	4	7		
0.300	1080	225				6	12	4	7	3	-	2	-					
		125							32	32	22	28	12	22	8	17		
0.400	1440	325									3	6	2	-				
		125								56	39	39	36	22	29	14	25	
0.500	1800	225									5	13	3	7	2	-		
		125					37	36	24	31	17	27	10	21	6	16	4	12
0.600	2160	325									8	19	4	13	3	8	2	-
		425									4	13	2	7				
0.700	2520	225							35	36	24	32	14	26	9	21	6	17
		325									11	24	6	17	4	13	3	9
0.800	2880	425									6	18	4	11	2	7		
		225									33	36	19	30	12	25	8	21
1.000	3600	325									15	28	9	21	6	17	4	13
		425									9	22	5	15	3	11	2	7
0.800	2880	225									43	40	24	33	16	29	11	25
		325									20	31	11	25	7	20	5	16
0.800	2880	425									11	25	6	19	4	14	3	10
		225											38	39	24	34	17	30
1.000	3600	325									31	37	17	31	11	26	8	22
		425									18	31	10	25	6	20	4	16

General

- The pressure loss applies to a fully opened volume unit.
- The assumed room attenuation is 10 dB.
- It is permitted to interpolate the interim values.



WUCK

Duct diffuser for round ducts
Supply/Return
Adjustable vane

Available types

W U C K - O

- W** duct diffuser
- U** universal application
- C** horizontal and vertical adjustable vanes
- K** frame with fixed internal unit

- Accessories

- O** none
 - V** volume unit
- O** not applicable

SA-Select

Check [SA-Select](#) to create extended order codes and selection details online. **NB!** At this moment, SA-Select is only available in Dutch. But it is possible to create extended order codes and selection details online.

Use

The WUCK duct diffuser is suitable for supplying cooled or heated air with a large temperature difference. The diffuser can be mounted directly in the round duct. The horizontal and vertical vanes can be adjusted manually. The diffuser can also be used as a return diffuser.

Characteristics

Max. number of air changes:	up to 8 x
Undertemperature:	up to 10 K
Overtemperature:	up to 15 K
Free flow:	70 %

Version

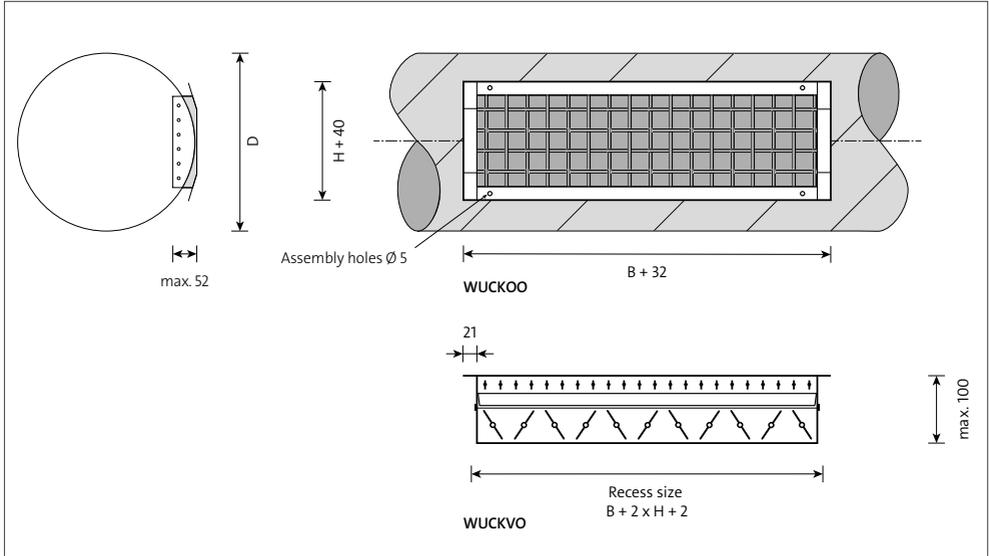
Duct diffuser

Frame and vanes:	sendzimir galvanised steel
Post-treatment:	none, optional RAL colour of your choice

Volume unit

Frame and vanes:	anodised aluminium
Post-treatment:	none

Dimensions



Available dimensions

H	B					
	215	315	415	515	615	815
65	■	■	■	■	■	■
115	■	■	■	■	■	■
215			■	■	■	■

Note

- The listed dimensions are in mm.

Fitting

- Directly on the round duct with self-tapping screws.

Duct diameter

H	D min. - max.
65	150 - 400
115	300 - 900
215	600 - 2400

Selection details

WUCK return

air volume		H	B												
m ³ /s	m ³ /h		215		315		415		515		615		815		
			Δp_s Pa	L_{PA} dB(A)											
0.015	54	65	2	-											
0.020	72	65	3	-											
0.025	90	65	4	-	2	-									
0.030	108	65	6	-	3	-	2	-							
		115	2	-											
0.040	144	65	11	17	5	-	3	-	2	-					
		115	3	-	2	-									
0.050	180	65	17	23	8	14	5	-	3	-	2	-			
		115	5	10	2	-									
0.060	216	65	25	27	11	19	7	13	4	-	3	-			
		115	7	14	3	-	2	-							
0.070	252	65	34	31	16	23	6	12	4	-	4	-			
		115	10	18	5	10	3	-							
0.080	288	65	44	35	20	26	12	20	8	16	5	12	3	6	
		115	13	22	6	13	3	-	2	-					
0.100	360	65			32	32	18	26	12	21	8	18	5	12	
		115	21	28	9	19	5	13	4	-	2	-			
0.125	450	65					28	33	20	28	12	24	7	18	
		115	32	33	15	25	8	19	5	14	4	10	2	-	
		215					2	-							
0.150	540	65											10	23	
		115			21	30	12	24	8	19	6	15	3	-	
		215					3	10	2	-					
0.200	720	65											18	30	
		115			38	37	22	31	14	26	10	22	6	16	
		215					6	17	4	12	3	-	2	-	
0.300	1.080	65											41	41	
		115							32	37	22	33	12	27	
		215					13	28	9	23	6	19	3	13	
0.400	1.440	115							56	44	39	41	22	34	
		215							24	35	15	30	11	26	6
0.500	1.800	215						37	41	24	36	17	32	10	26
0.600	2.160	215								35	41	24	37	14	31
0.700	2.520	215										33	41	19	35
0.800	2.880	215										43	45	24	38
1.000	3.600	215												38	44

General

- The pressure loss applies to a fully opened volume unit and a straight vane setting.
- The assumed room attenuation is 10 dB.
- It is permitted to interpolate the interim values.



WTVM/WRVM

Wall diffuser Supply/Return

Available types

W - V M O -

W wall diffuser

- Supply/Return

T supply

R return

V vertical

M wall mounting

O no accessories

- Version

O no plenum

A plenum with a rear connection

SA-Select

Check SA-Select to create extended order codes and selection details online. **NB!** At this moment, SA-Select is only available in Dutch. But it is possible to create extended order codes and selection details online.

Use

The WTVM wall diffuser is suitable for supplying cooled or heated air. The diffuser is suitable for use in nursing homes, schools, community centres and other buildings where the diffuser is placed directly on the fire-separating wall. It is possible to put a BFDC fire damper in the connecting duct. The diffuser is intended for fitting in a wall at a height of approx. 2.7 m. The diffuser blows towards the wall and downwards. At floor level, the air flow behaves as with a displacement diffuser. When the diffuser is fitted, check there are no obstacles below the diffuser. The WRVM diffuser is suitable for return air.

Characteristics

Displacement or downflow principle

undertemperature:

up to 8 K

overtemperature:

up to 8 K

Version

Wall diffuser

Frame:

anodised aluminium

Internal unit:

steel

Post-treatment:

epoxy

Colour:

white RAL 9010, optional RAL colour of your choice

Plenum box

Material:

sendzimir galvanised steel

Post-treatment:

epoxy

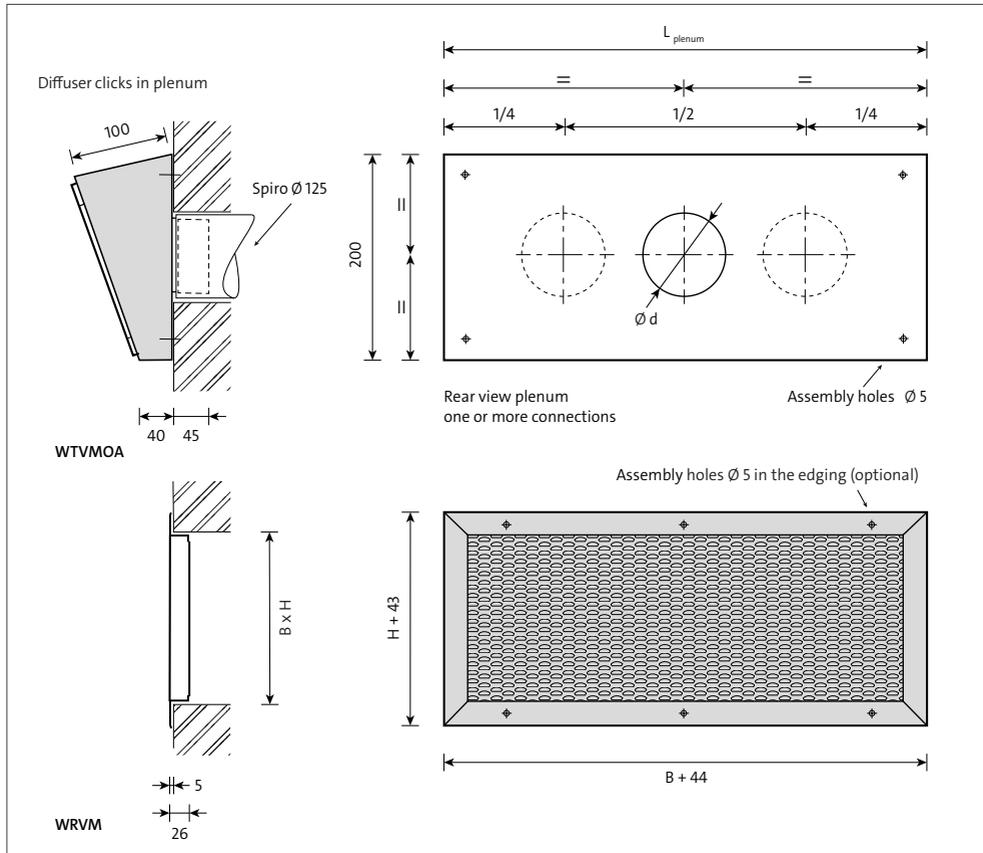
Colour:

white RAL 9010

Optional

mounting holes: in frame

Dimensions



Available dimensions and sizes

B x H	L_{plenum}	D
225 x 125	280	123
325 x 125	380	123
425 x 125	480	123
525 x 125	580	123
625 x 125	680	2 x 123
825 x 125	880	2 x 123
1025 x 125	1080	2 x 123

Note

- The listed dimensions are in mm.
- Recess size: W x H.

Selection details

WTVM

air volume		H	B																						
m ³ /s	m ³ /h		225			325			425			525			625			825			1025				
			Z _{0,2} m	Δp _s Pa	L _{pA} dB(A)	Z _{0,2} m	Δp _s Pa	L _{pA} dB(A)	Z _{0,2} m	Δp _s Pa	L _{pA} dB(A)	Z _{0,2} m	Δp _s Pa	L _{pA} dB(A)	Z _{0,2} m	Δp _s Pa	L _{pA} dB(A)	Z _{0,2} m	Δp _s Pa	L _{pA} dB(A)	Z _{0,2} m	Δp _s Pa	L _{pA} dB(A)		
0.015	54	125	1.2	13	13	0.5	6	-	0.3	3	-	0.2	2	-	-	-	-	-	-	-	-	-	-	-	-
0.020	72	125	2.3	23	22	1.0	10	11	0.5	6	-	0.4	4	-	0.3	3	-	-	-	-	-	-	-	-	-
0.030	108	125				2.3	23	24	1.2	13	16	0.8	8	10	0.5	6	-	0.3	3	-	0.2	2	-	-	-
0.040	144	125				5.1	40	33	2.4	23	25	1.4	15	19	1.0	10	14	0.5	6	-	0.4	4	-	-	-
0.050	180	125							4.2	36	32	2.4	23	26	1.5	16	21	0.8	9	14	0.6	6	-	-	-
0.060	216	125										3.8	33	32	2.4	23	27	1.2	13	19	0.8	8	14	-	-
0.070	252	125													3.5	31	32	1.7	18	24	1.1	11	18	-	-
0.080	288	125													5.1	41	36	2.4	23	28	1.4	15	22	-	-
0.100	360	125																4.2	36	35	2.4	23	29	-	-
0.125	450	125																		4.3	36	36	-	-	-

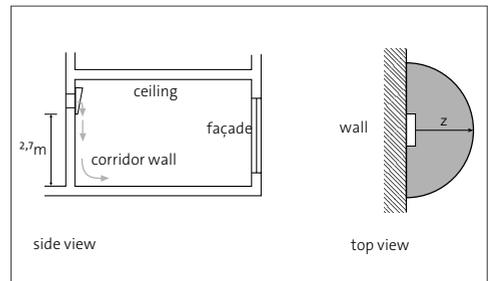
WRVM

air volume		H	B																						
m ³ /s	m ³ /h		225		325		425		525		625		825		1025										
			Δp _s Pa	L _{pA} dB(A)																					
0.015	54	125	12	15	5	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0.020	72	125	21	25	9	14	5	-	3	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-
0.030	108	125			21	26	11	19	7	13	7	12	4	-	-	-	-	-	-	-	-	-	-	-	-
0.040	144	125			38	35	20	28	12	22	9	17	7	11	3	-	-	-	-	-	-	-	-	-	-
0.050	180	125					32	35	19	30	14	24	9	17	5	12	-	-	-	-	-	-	-	-	-
0.060	216	125							28	35	20	30	12	22	7	17	-	-	-	-	-	-	-	-	-
0.070	252	125									28	35	16	26	10	21	-	-	-	-	-	-	-	-	-
0.080	288	125											19	31	13	25	-	-	-	-	-	-	-	-	-
0.100	360	125											30	37	21	31	-	-	-	-	-	-	-	-	-

General

- The operating range Z_{0,2} applies when the diffuser is fitted at a height of 2.7 m above the floor.
- Z_{0,2} is the distance at which the maximum flow speed, measured at 10 cm above the floor, has dropped to 0.2 m/s. The Z_{0,2} values apply with an undertemperature of 8 K between the inflow temperature and the room temperature.
- Operating range Z_{0,2} in metres.
- Minimum centre-to-centre distance of the diffusers in a horizontal direction: Z_{0,2} × 2.
- The assumed room attenuation is 10 dB.
- It is permitted to interpolate the interim values.

Discharge pattern and operating range





WTPD

Wall diffuser Supply Perforated

Available types

W T P D O -

- W** wall diffuser
- T** supply
- P** perforated face plate (removable)
- D** surface-mounted frame, 26 mm
- O** no accessories

- Version

- R** internally insulated plenum box, rear connection
- U** uninsulated plenum box, rear connection
- T** left side connection, internally insulated plenum box
- S** left side connection, uninsulated plenum box
- K** right side connection, internally insulated plenum box
- E** right side connection, uninsulated plenum box

SA-Select

Check SA-Select to create extended order codes and selection details online. **NB!** At this moment, SA-Select is only available in Dutch. But it is possible to create extended order codes and selection details online.

Use

The WTPD wall diffuser is suitable for supplying cooled air with a large temperature difference in respect of the room temperature. The diffuser has an extremely short throw, making it suitable for fitting in an internal wall of a room with an isothermal flow towards radiators or convectors.

Characteristics

Max. number of air changes:	up to 8 x
Undertemperature:	up to 10 K
Overtemperature:	up to 5 K

Version

Perforated diffuser

Frame:	anodised aluminium
Front plate:	steel
Post-treatment:	epoxy
Colour:	white RAL 9010, optional RAL colour of your choice

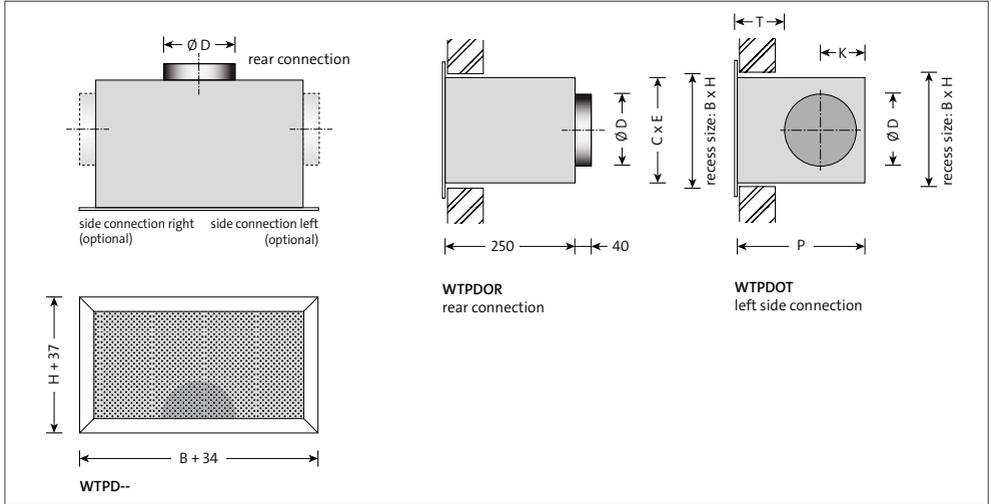
Plenum box

Material:	sendzimir galvanised steel
Internal insulation:	1/2" duct liner
Post-treatment:	none

Optional

Plenums for different wall thicknesses.

Dimensions



Available dimension and sizes

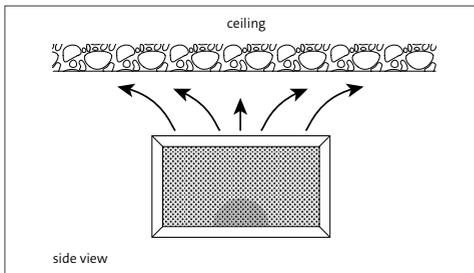
model	B	H	C	E	D	P*	K*	T*
300	313	150	305	145	123	343	107	174
400	388	200	380	195	158	378	124	175
500	483	248	475	240	198	418	144	175
600	578	313	570	305	248	468	169	175

*) with a side connection only

Note

- The listed dimensions are in mm.
- W x H is the recess size.
- Sizes P*, K* en T* are based on a wall thickness of 110 mm.

Discharge pattern



Selection details

WTPD

air volume		model	throw m	Δp_s Pa	L_{pA} dB(A)
m ³ /s	m ³ /h				
0.012	45	300	0.6	1	-
0.015	54	300	0.7	1	-
0.020	72	300	0.9	3	11
		400	0.8	1	3
0.025	90	300	1.2	4	17
		400	1.0	2	9
0.030	108	300	1.5	6	21
		400	1.1	3	14
0.040	144	300	1.8	11	29
		400	1.5	6	21
		500	1.3	4	14
0.050	180	300	2.3	17	35
		400	1.9	9	27
		500	1.6	4	19
		600	1.4	4	16
0.060	216	400	2.4	13	33
		500	2.0	10	25
		600	1.8	6	19
0.080	288	400	2.9	19	37
		500	2.5	15	30
		600	2.2	8	24
0.100	360	500	3.3	25	37
		600	2.9	14	31
0.125	450	600	3.6	22	37
0.150	540	600	4.3	32	42

General

- The assumed room attenuation is 10 dB.
- It is permitted to interpolate the interim values.



WRPD

Wall diffuser Return Perforated

Available types

WRPDO-

- W** wall diffuser
- R** return
- P** perforated face plate (removable)
- D** surface-mounted frame, 26 mm
- O** no accessories

- Version

- R** internally insulated plenum box, rear connection
- U** uninsulated plenum box, rear connection
- T** left side connection, internally insulated plenum box
- S** left side connection, uninsulated plenum box
- K** right side connection, internally insulated plenum box
- E** right side connection, uninsulated plenum box

SA-Select

Check [SA-Select](#) to create extended order codes and selection details online. **NB!** At this moment, SA-Select is only available in Dutch. But it is possible to create extended order codes and selection details online.

Use

The WRPD wall diffuser is suitable for air extraction and has the same appearance as the supply diffuser WTPD.

Characteristics

The large free flow makes the diffuser suitable for a high capacity with a low noise level.

Version

Perforated diffuser

Frame:	anodised aluminium
Front plate:	steel
Post-treatment:	epoxy
Colour:	white RAL 9010, optional RAL colour of your choice

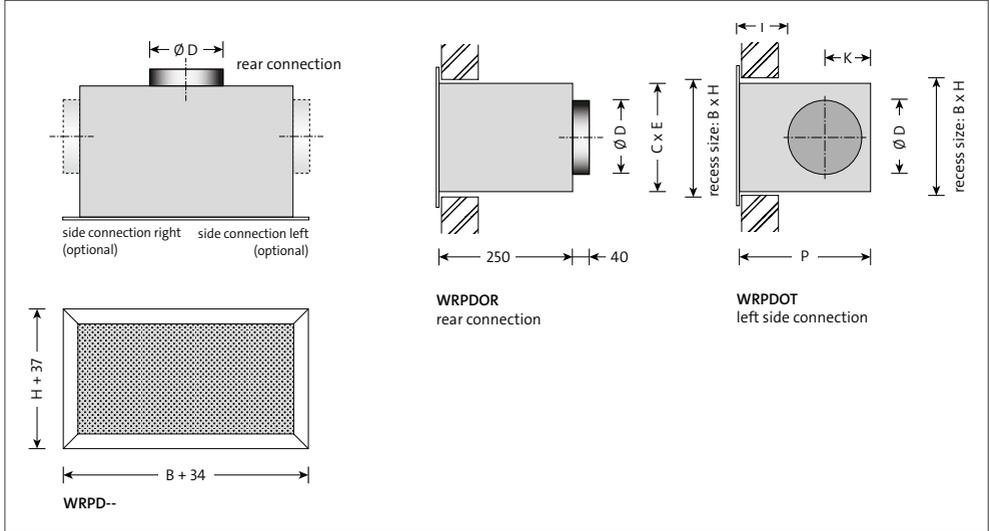
Plenum box

Material:	sendzimir galvanised steel
Internal insulation:	1/2" duct liner
Post-treatment:	none

Optional

Plenums for different wall thicknesses.

Dimensions



Available dimensions and sizes

model	B	H	C	E	D	P*	K*	T*
300	313	150	305	145	123	343	107	110
400	388	200	380	195	158	378	124	110
500	483	248	475	240	198	418	144	110
600	578	313	570	305	248	468	169	110

*) with a side connection only

Note

- The listed dimensions are in mm.
- W x H is the recess size.
- Sizes P*, K* and T* are based on a wall thickness of 110 mm.
- Optional plenums are available for different wall thicknesses.

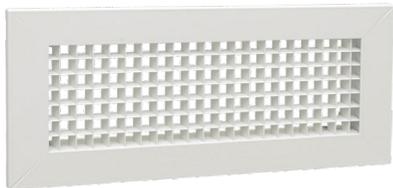
Selection details

WRPD

air volume		model	Δp_s Pa	L_{TA} dB(A)
m ³ /s	m ³ /h			
0.012	45	300	1	-
0.015	54	300	2	-
0.020	72	300	4	-
		400	1	-
0.025	90	300	6	-
		400	2	-
0.030	108	300	9	-
		400	3	-
0.040	144	300	15	13
		400	6	-
		500	5	-
0.050	180	300	24	19
		400	9	-
		500	8	-
		600	4	-
0.060	216	400	14	15
		500	12	15
		600	6	-
0.080	288	400	21	20
		500	18	20
		600	9	10
0.100	360	500	31	27
		600	16	17
0.125	450	600	25	23
0.150	540	600	35	28

General

- The assumed room attenuation is 10 dB.
- It is permitted to interpolate the interim values.



HREC

Wall diffuser Return Lattice

Available types

HREC-Z

- H** high-capacity diffuser
- R** return
- E** lattice (15 x 15 mm)
- C** surface-mounted frame 29 mm, fixed internal unit

- Accessories

- O** none
- V** volume unit

- Z** square connection

SA-Select

Check SA-Select to create extended order codes and selection details online. **NB!** At this moment, SA-Select is only available in Dutch. But it is possible to create extended order codes and selection details online.

Use

De HREC wall diffuser is suitable for air extraction. The diffuser is suitable for high capacity. The aluminium internal unit consists of thin louvres to achieve a good flow. The diffuser is not suitable for mechanical loads and should preferably be mounted out of direct reach.

Characteristics

Free flow: 83 %

Version

Wall diffuser

Frame: anodised aluminium
 Lattice: aluminium
 Post-treatment: epoxy
 Colour: white RAL 9010, optional RAL colour of your choice

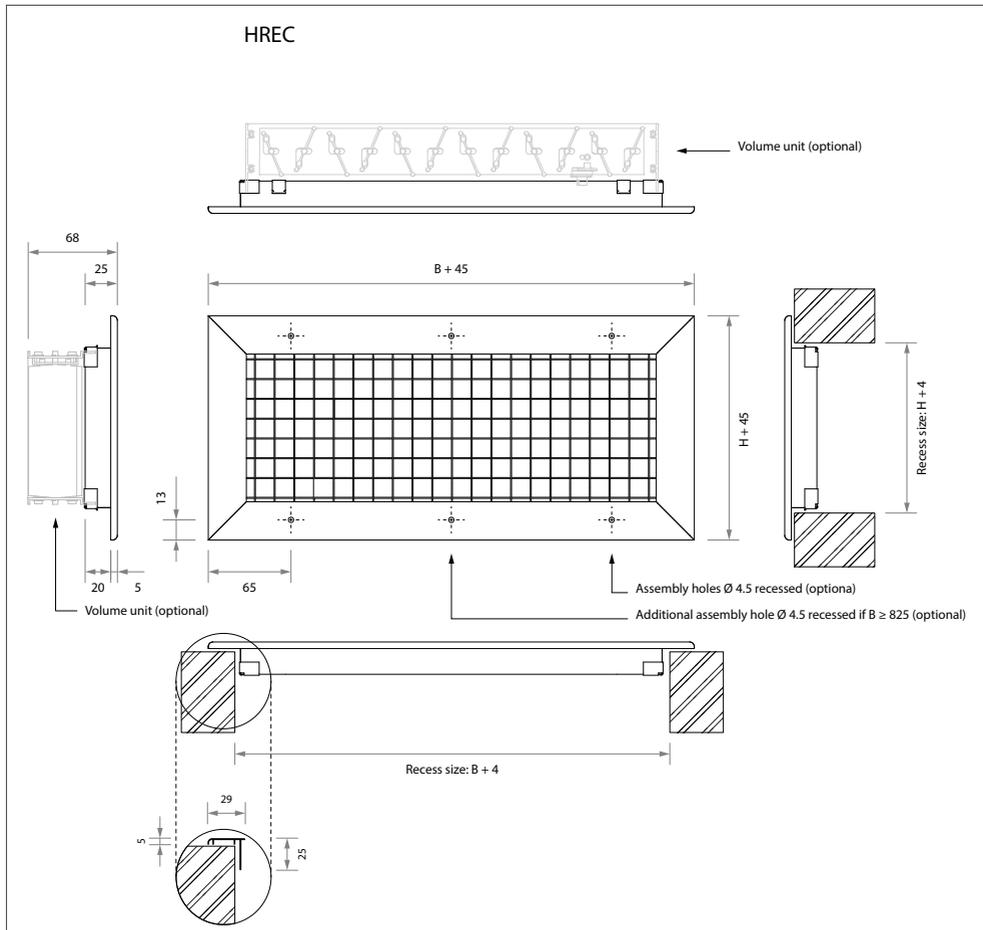
Volume unit

Frame and vanes: anodised aluminium
 Post-treatment: none

Optional

Frame: 25 mm removable internal unit
 U frame: HREU
 Loose lattice: HREO
 Mounting holes: sunk round mounting holes 4.5 mm in frame
 Plenum boxes: WRO to W x H 1025 x 325 mm, insulated or uninsulated

Dimensions



Standard dimensions

H	B							
	225	325	425	525	625	825	1025	1200
75	■	■	■	■	■	■	■	■
125	■	■	■	■	■	■	■	■
225	■	■	■	■	■	■	■	■
325		■	■	■	■	■	■	■
425			■	■	■	■	■	■
525				■	■	■	■	■
600					■	■	■	■

Available dimensions

- Interim widths and heights available in increments of 5 mm.
- Width min. 100, max. 1200.
- Height min. 75, max. 600.

Note

- The listed dimensions are in mm.
- Recess size: $B + 4 \times H + 4$.

Selection details

HREC

air volume		H	B															
m ³ /s	m ³ /h		225		325		425		525		625		825		1025		1200	
			Δp_s Pa	L_{PA} dB(A)														
0.020	72	75	5	-														
0.025	90	75	8	-														
0.030	108	75	12	13	5	-												
		125	3	-														
0.040	144	75	21	22	9	11	5	-										
		125	5	-														
0.050	180	75	34	30	15	18	8	10	5	-								
		125	8	-	3	-												
0.060	216	75	48	36	21	24	12	16	7	-	5	-						
		125	11	14	5	-												
0.080	288	75			37	33	21	25	13	19	9	13	5	-				
		125	19	24	8	12	5	-	3	-								
0.100	360	225	5	-	2	-												
		75					33	32	21	26	14	21	8	13	5	-		
0.125	450	125	30	31	13	19	7	11	5	-	3	-						
		225	7	11	3	-												
0.150	540	75					51	40	33	33	22	28	13	20	8	13	6	-
		125	47	38	21	27	11	18	7	12	5	-						
0.200	720	225	11	18	5	-	3	-										
		75							47	39	32	34	18	26	12	19	8	15
0.300	1080	125			30	33	16	24	11	18	7	13	4	-				
		225	16	24	7	12	4	-	2	-								
0.400	1440	325	7	12	3	-												
		75					29	34	19	27	13	22	7	14	5	-	15	24
0.500	1800	125																
		225	29	33	12	22	7	13	4	-	3	-						
0.600	2160	325	12	22	5	10	3	-										
		125																
0.800	2880	225			28	35	16	27	10	20	7	15	4	-				
		325	28	35	12	23	7	15	4	-								
1.000	3600	425	16	27	7	15	4	-										
		125																
0.400	1440	225			50	44	28	36	18	30	12	24	7	16	4	10	3	-
		325	50	44	22	33	12	24	8	18	5	13	3	-				
0.500	1800	425	28	36	12	24	7	16	4	10	3	-						
		525	18	30	8	18	4	10	3	-								
0.600	2160	125																
		225					43	43	28	37	19	32	11	24	7	17	5	13
0.800	2880	325			34	40	19	32	12	25	8	20	5	12	3	-		
		425	43	43	19	32	11	23	7	17	5	12	3	-				
1.000	3600	525	28	37	12	25	7	17	4	11	3	-						
		125																
0.600	2160	225							40	43	28	38	15	30	10	23	7	19
		325					27	38	17	31	12	26	7	18	4	11	3	-
0.800	2880	425			27	38	15	29	10	23	7	18	4	10	2	-		
		525	40	43	17	31	10	23	6	17	4	11	2	-				
1.000	3600	600	30	39	13	27	7	19	5	13	3	-						
		225																
0.800	2880	325							31	41	21	35	12	27	8	21	6	16
		425					27	39	17	32	12	27	7	19	4	13	3	-
1.000	3600	525			31	41	17	32	11	26	8	21	4	13				
		600			23	37	13	28	8	22	6	17	3	-				
0.800	2880	225																
		325																
1.000	3600	425							27	40	19	34	10	26	7	20	5	15
		525					27	40	17	33	12	28	7	20	4	14	3	-
1.000	3600	600			37	44	20	36	13	29	9	24	5	16	3	-		

General

- The pressure loss applies to a fully opened volume unit.
- The assumed room attenuation is 10 dB.
- It is permitted to interpolate the interim values.



JTGA

Jet diffuser Supply Ring-shaped

Available types

JTG-OO

- J jet diffuser
- T supply
- G smooth vane

- Frame

- A 26 mm
- O none, round version, fits spiro duct

- O no accessories
- O not applicable

SA-Select

Check [SA-Select](#) to create extended order codes and selection details online. **NB!** At this moment, SA-Select is only available in Dutch. But it is possible to create extended order codes and selection details online.

Use

The JTG jet diffuser is suitable for supplying cooled or heated air in large rooms. It has been designed specifically for halls, warehouses, showrooms, sports halls with a height of at least 6 m. The diffuser consists of a number of concentric rings that can be adjusted to all directions with a maximum angle of 30° because of the gimbal suspension. One to four elements are combined on a panel.

Characteristics

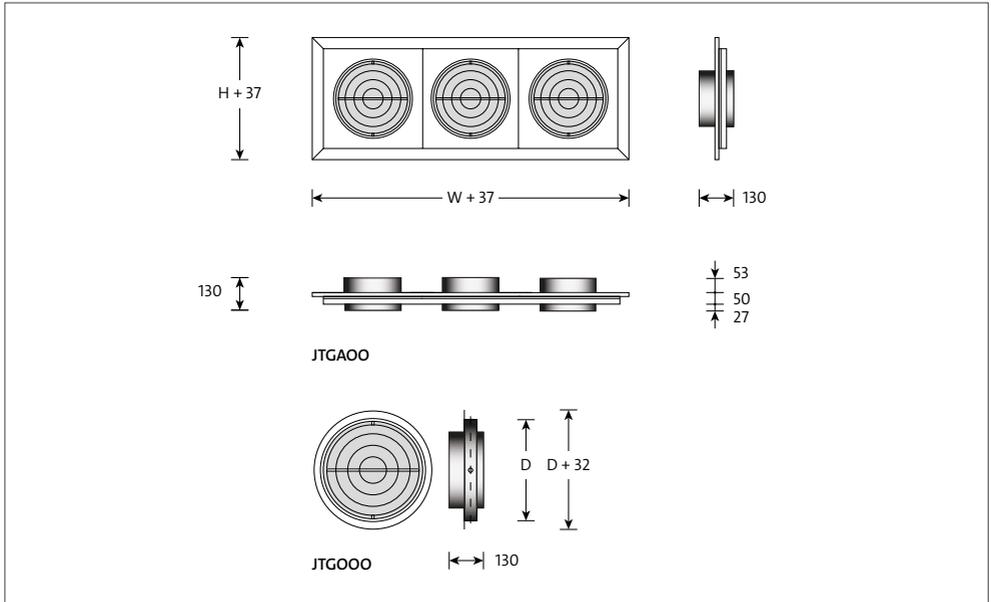
Max. number of air changes:	up to 8 x
Undertemperature:	up to 10 K
Overtemperature:	up to 15 K

Version

Jet diffuser

Frame:	anodised aluminium
Internal unit:	steel
Post-treatment:	epoxy
Colour:	white RAL 9010, optional RAL colour of your choice

Dimensions



Available dimensions and sizes

model	H	D	W			
			elements			
			1	2	3	4
160	260	158	260	505	750	995
200	310	198	310	605	900	1195
250	360	248	360	705	1050	1395
315	410	313	410	805	1200	1595

Note

- The listed dimensions are in mm.
- W x H is the recess size.
- The JTGA jet diffuser is generally mounted on a duct with a velocity of less than 3 m/s.

Selection details

JTGA

air volume		model	elements											
m ³ /s	m ³ /h		1			2			3			4		
		throw m	Δp_s Pa	L_{pA} dB(A)	throw m	Δp_s Pa	L_{pA} dB(A)	throw m	Δp_s Pa	L_{pA} dB(A)	throw m	Δp_s Pa	L_{pA} dB(A)	
0.100	360	160	11	36	27	10	9	12						
		200	11	18	19									
0.125	450	160	12	57	33	11	15	18	10	7	9			
		200	11	28	25	10	7	10						
0.150	540	160	13	82	38	11	21	23	11	9	14	10	5	8
		200	12	40	30	11	10	15						
		250	11	13	18									
0.200	720	160	15	145	45	13	37	30	12	17	22	11	10	15
		200	14	71	37	12	18	22	11	8	14			
		250	12	24	26	11	6	10						
		315	11	9	15									
0.250	900	160	17	226	51	14	59	36	13	26	28	12	15	21
		200	16	111	43	13	28	28	12	13	20	11	7	13
		250	14	37	31	12	9	16						
		315	12	14	21									
0.300	1080	160	20	326	56	16	84	41	14	38	32	13	21	26
		200	18	160	48	14	41	33	13	18	24	12	10	18
		250	15	53	36	13	13	21	11	6	12			
		315	13	20	26									
0.400	1440	160				19	149	48	17	67	40	15	38	34
		200	21	284	55	17	72	41	15	32	31	14	18	25
		250	18	95	44	14	23	29	13	10	20	12	6	13
		315	15	35	33	13	9	18						
0.500	1800	160				22	234	54	19	105	46	17	59	39
		200				19	113	46	17	51	38	16	28	31
		250	20	148	50	16	37	34	15	16	26	13	9	19
		315	17	54	39	14	14	24						
0.600	2160	160							22	151	50	20	85	44
		200				21	163	51	19	73	42	17	41	36
		250	23	213	54	18	53	39	16	24	30	15	13	24
		315	20	78	44	16	19	29	14	9	20			
0.800	2880	160							26	269	58	24	152	52
		200				27	290	58	23	130	50	21	73	44
		250				22	94	47	19	42	37	17	24	32
		315	24	139	51	19	35	36	16	15	27	15	9	21
1.00	3600	160										28	237	57
		200							27	203	56	24	114	49
		250				26	146	52	22	65	44	20	37	38
		315	28	217	57	22	54	42	19	24	33	17	14	27
1.250	4500	200							32	317	62	29	179	55
		250				30	228	58	26	102	49	23	58	43
		315				25	84	48	22	37	39	20	21	33
1.500	5400	200										33	257	60
		250							30	147	54	27	83	48
		315				29	121	53	25	54	44	22	31	38
2.00	7200	250							38	261	61	33	148	56
		315				36	216	60	31	96	51	28	55	45
2.500	9000	250									40	231	61	
		315							37	150	57	33	85	51
3.000	10800	315							43	216	61	38	123	56
4.000	14400	315									49	218	63	

General

- The pressure loss applies to a fully opened volume unit.
- The assumed room attenuation is 10 dB.
- It is permitted to interpolate the interim values.



JTKH

Jet diffuser Supply Manual

Available types

JTKHO--A

- J** jet diffuser
- T** supply
- K** ball-shaped
- H** manual
- O** none

- Accessories

- O** none
- V** volume unit (model 80 to 230)

- Fitting

- O** duct/wall mounting
- F** with connection for flexible duct (model 80 to 230)

A cover ring

SA-Select

Check [SA-Select](#) to create extended order codes and selection details online. **NB!** At this moment, SA-Select is only available in Dutch. But it is possible to create extended order codes and selection details online.

Use

The JTKH jet diffuser is suitable for supplying cooled or heated air in large rooms. The discharge direction can be adjusted manually and is fixed by tightening the screws of the tightening unit. The diffuser has a standard transparent coating so that it can be used in humid areas or swimming pools. The design version means the diffuser can also be used in representative rooms.

Characteristics

Max. number of air changes:	up to 8 x
Undertemperature:	up to 10 K
Overtemperature:	up to 15 K

Version

Jet diffuser

Frame:	anodised aluminium
Post-treatment:	none

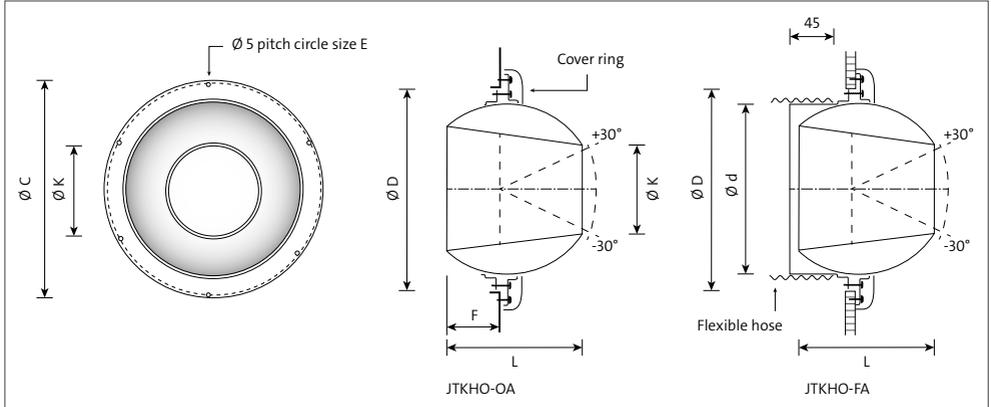
Optional

Post-treatment:	epoxy
Colour:	white RAL 9010, optional RAL colour of your choice

Accessory

Volume unit:	sendzimir galvanised steel
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Dimensions



Available dimensions and sizes

model	d	D	C	K	E	F	L
40	-	111	135	40	119	22	56
50	-	134	166	50	148	30	78
80	160	205	254	80	220	57	131
110	200	248	285	110	266	60	144
150	300	350	387	150	368	103	233
200	400	450	485	200	472	141	308
230	400	450	485	230	472	141	308

Note

- The listed dimensions are in mm.
- D is the recess size.
- Mounting screws are not supplied.
- The cone can be adjusted in all directions.

Selection details

JTKHO--A

air volume		model	throw m	Δp_s Pa	L_{PA} dB(A)
m^3/s	m^3/h				
0.010	36	40	8.1	40	10
		50	7.6	17	-
0.012	44	40	9.3	60	15
		50	8.8	25	-
0.014	52	40	10.3	84	20
		50	9.9	35	-
0.020	72	50	12.0	66	-
		80	9.7	10	-
0.025	90	50	13.4	102	13
		80	11.2	16	-
0.030	108	80	12.5	23	-
0.040	144	80	14.5	40	-
		80	16.0	63	13
0.050	180	110	13.3	18	-
		80	17.3	90	17
0.060	216	110	14.6	25	-
		110	16.4	45	13
0.080	288	150	13.5	13	-
		110	18.0	70	19
0.100	360	150	14.9	21	-
		110	19.4	109	24
0.125	450	150	16.3	32	-
		150	17.4	46	14
0.150	540	200	15.6	15	-
		150	19.3	81	21
0.200	720	200	17.4	26	-
		230	17.7	15	-
		200	20.0	58	16
0.300	1.080	230	20.4	33	10
		200	21.8	102	24
0.400	1.440	230	22.4	59	19

General

- The throw is given without ceiling influence.
- The pressure loss applies without a volume unit.
- The assumed room attenuation is 10 dB.
- It is permitted to interpolate the interim values.



JTKT

Jet diffuser Supply Thermal operation

Available types

JTKTO-OA

- J jet diffuser
- T supply
- K ball-shaped
- T thermal operation
- O none

- Accessories

- O none
- V volume unit
- O mounting in spiro duct
- A cover ring

SA-Select

Check SA-Select to create extended order codes and selection details online. **NB!** At this moment, SA-Select is only available in Dutch. But it is possible to create extended order codes and selection details online.

Use

The JTKT diffuser is suitable for supplying cooled or heated air in large rooms. The diffuser has a thermal spring that adjusts the discharge angle on the basis of the primary air temperature. This ensures that the diffuser blows downwards during heating and upwards during cooling. The maximum turning angle is 60° (+ and - 30°) compared to the horizontal discharge direction. This turning angle can be limited up or down with a mechanism that is built into the mounting ring. The diffuser has a standard transparent coating so that it can be used in humid areas or swimming pools. The design version means the diffuser can also be used in representative rooms.

Characteristics

Max. number of air changes:	up to 8 x
Undertemperature:	up to 10 K
Overtemperature:	up to 15 K

Version

Jet diffuser

Frame:	anodised aluminium
Post-treatment:	none

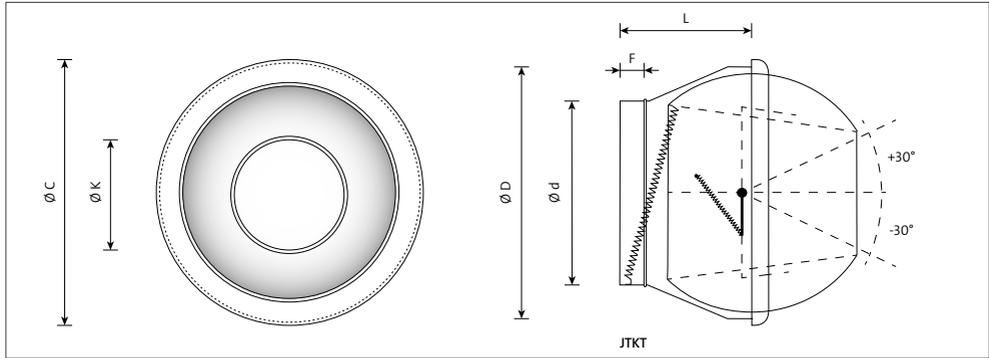
Optional

Post-treatment:	epoxy
Colour:	white RAL 9010, optional RAL colour of your choice

Accessory

Volume unit:	sendzimir galvanised steel
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Dimensions



Available dimensions and sizes

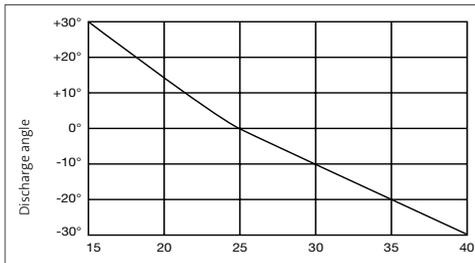
model	d	D	C	K	L	F
80	158	207	258	80	200	50
110	198	255	288	110	215	60
150	313	352	387	150	283	60
200	398	452	485	200	283	60
230	398	452	485	230	283	60

Note

- The listed dimensions are in mm.
- D is the recess size.

Air direction

Discharge angle depends on the primary air temperature.



Fitting instructions

- At the top of the diffuser, there is a sticker with the text 'High'.
- If the diffuser is fitted with the sticker facing up, the air will be directed downwards during heating and upwards during cooling.
- After fitting, the maximum angle must be set for cooling and heating.
- The mechanism can be adjusted with a standard cross-head screwdriver.
- Remove the cover ring from the diffuser and set the required angles.

Selection details

JTKO-OA

air volume		model	throw m	Δp_s Pa	L_{pA} dB(A)
m ³ /s	m ³ /h				
0.020	72	80	9.7	10	-
0.025	90	80	11.2	16	-
0.030	108	80	12.5	23	-
0.040	144	80	14.5	40	-
0.050	180	80	16.0	63	13
		110	13.3	18	-
0.060	216	80	17.3	90	17
		110	14.6	25	-
0.080	288	110	16.4	45	13
		150	13.5	13	-
0.100	360	110	18.0	70	19
		150	14.9	21	-
0.125	450	110	19.4	109	24
		150	16.3	32	-
0.150	540	150	17.4	46	14
		200	15.6	15	-
0.200	720	150	19.3	81	21
		200	17.4	26	-
		230	17.7	15	-
0.300	1080	200	20.0	58	16
		230	20.4	33	10
0.400	1440	200	21.8	102	24
		230	22.4	59	19

General

- The throw is given without ceiling influence.
- The pressure loss applies without a volume unit.
- The assumed room attenuation is 10 dB.
- It is permitted to interpolate the interim values.



UF

Bar diffuser Supply/return With or without frame

Available types

UF----

- U** wall diffuser
- F** bar diffuser

- Vane

- 0** vane 0°
- 1** vane 15°

- Finish

- O** anodised aluminium
- R** RAL 9010

- Frame UF

- O** without frame
- A** standard frame (25 mm)
- B** flat frame (20 mm)
- D** double louvres
 - horizontal: fixed
 - vertical: adjustable

- Accessories

- O** none
- V** volume unit

SA-Select

Check SA-Select to create extended order codes and selection details online. **NB!** At this moment, SA-Select is only available in Dutch. But it is possible to create extended order codes and selection details online

Use

The UF bar diffuser is suitable for supplying cooled or heated air with a limited temperature difference or for return air. The diffuser can be fitted in a wall or a windowsill. A wide range of frames and internal units is available.

Characteristics

Undertemperature, floor/windowsill:	up to 6 K
Undertemperature, wall:	up to 10 K
Overtemperature:	up to 15 K
Free flow:	55 - 75 %

Version

Diffuser

Frame:	anodised aluminium
Vanes:	anodised aluminium
Post-treatment:	none

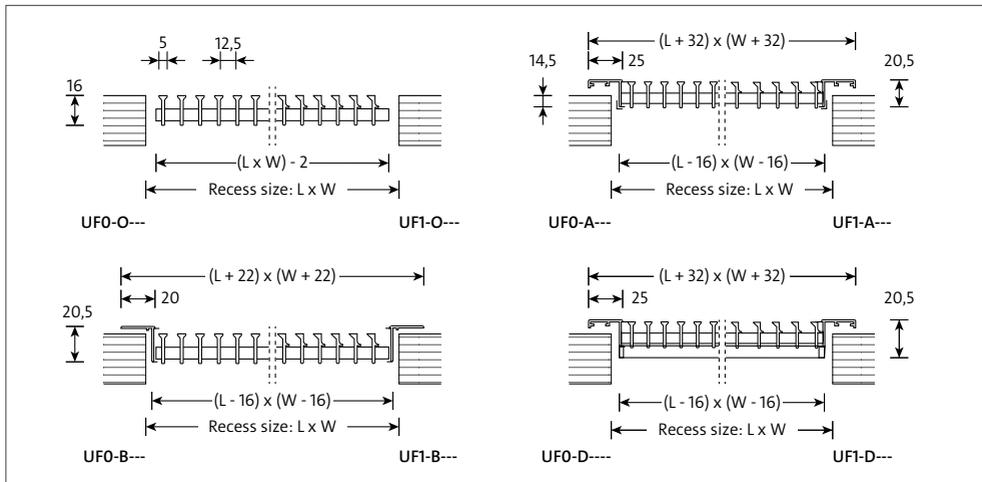
Optional

Post-treatment:	epoxy
Colour:	white RAL 9010

Volume unit

Material:	sendzimir galvanised steel
Post-treatment:	none

Dimensions



Available dimensions

- Length available in one piece up to 2000 mm.
- Width available in one piece up to 600 mm.
- Other lengths and widths available on request.

Selection details

UF0 bar 5 centre-to-centre 12,5 deflection 0°:

B = 75					
m ³ /s/m	m ³ /h/m	throw W _w m	throw W _v m	Δp _s Pa	L _{pA} dB(A)
0.100	360	3.4	2.7	14	21
0.125	450	4.3	3.4	21	26
0.150	540	5.2	4.2	34	32
0.200	720	7.0	5.5	54	38
0.300	1080	8.8	6.9	85	45

B = 100					
m ³ /s/m	m ³ /h/m	throw W _w m	throw W _v m	Δp _s Pa	L _{pA} dB(A)
0.125	450	3.7	2.8	11	20
0.150	540	4.4	3.6	16	25
0.200	720	5.8	4.6	28	32
0.250	900	7.4	5.8	45	38
0.300	1080	9.1	7.3	63	44

B = 150					
m ³ /s/m	m ³ /h/m	throw W _w m	throw W _v m	Δp _s Pa	L _{pA} dB(A)
0.200	720	4.7	3.8	11	24
0.250	900	5.8	4.6	18	29
0.300	1080	7.0	5.6	25	34
0.400	1440	9.0	7.5	45	42
0.500	1800	12.0	9.5	66	49

B = 200					
m ³ /s/m	m ³ /h/m	throw W _w m	throw W _v m	Δp _s Pa	L _{pA} dB(A)
0.250	900	5.0	3.9	9	23
0.300	1080	6.1	4.7	13	28
0.400	1440	8.3	6.3	23	35
0.500	1800	10.2	8	36	42
0.600	2160	12.0	9.5	50	46

B = 300					
m ³ /s/m	m ³ /h/m	throw W _w m	throw W _v m	Δp _s Pa	L _{pA} dB(A)
0.400	1440	6.3	4.8	8	25
0.500	1800	8.2	6.2	14	32
0.600	2160	9.4	7.6	19	36
0.800	2880	12.6	10	29	44
1.000	3600	15.5	12.5	50	51

B = 300					
m ³ /s/m	m ³ /h/m	throw W _w m	throw W _v m	Δp _s Pa	L _{pA} dB(A)
0.400	1440	6.3	4.8	8	25
0.500	1800	8.2	6.2	14	32
0.600	2160	9.4	7.6	19	36
0.800	2880	12.6	10	29	44
1.000	3600	15.5	12.5	50	51

Note

- The listed dimensions are in mm.
- Available with a click frame, information available on request.
- L x W is the recess size.

Selection details

UF1 bar 5 centre-to-centre 12,5 deflection 15 °:

B = 75					
m ³ /s/m	m ³ /h/m	throw Ww m	throw Wv m	Δp _s Pa	L _{pA} dB(A)
0.100	360	3.4	2.7	18	21
0.125	450	4.3	3.4	26	26
0.150	540	5.2	4.2	43	32
0.200	720	7.0	5.5	68	38
0.300	1080	8.8	6.9	106	45

B = 100					
m ³ /s/m	m ³ /h/m	throw Ww m	throw Wv m	Δp _s Pa	L _{pA} dB(A)
0.125	450	3.7	2.8	14	20
0.150	540	4.4	3.6	20	25
0.200	720	5.8	4.6	35	32
0.250	900	7.4	5.8	56	38
0.300	1080	9.1	7.3	79	44

B = 150					
m ³ /s/m	m ³ /h/m	throw Ww m	throw Wv m	Δp _s Pa	L _{pA} dB(A)
0.200	720	4.7	3.8	14	24
0.250	900	5.8	4.6	23	29
0.300	1080	7.0	5.6	31	34
0.400	1440	9.0	7.5	56	42
0.500	1800	12.0	9.5	83	49

B = 200					
m ³ /s/m	m ³ /h/m	throw Ww m	throw Wv m	Δp _s Pa	L _{pA} dB(A)
0.250	900	5.0	3.9	11	23
0.300	1080	6.1	4.7	16	28
0.400	1440	8.3	6.3	29	35
0.500	1800	10.2	8	45	42
0.600	2160	12.0	9.5	63	46

B = 300					
m ³ /s/m	m ³ /h/m	throw Ww m	throw Wv m	Δp _s Pa	L _{pA} dB(A)
0.400	1440	6.3	4.8	10	25
0.500	1800	8.2	6.2	18	32
0.600	2160	9.4	7.6	24	36
0.800	2880	12.6	10	36	44
1.000	3600	15.5	12.5	63	51

General

- Volume per metre diffuser.
- Throw is given with an end velocity of 0.3 m/s.
- Ww: throw for wall mounting with ceiling effect.
- Wv: throw from windowsill/floor and along the ceiling.
- The assumed room attenuation is 10 dB.
- When air is drawn in, the values in the table need to be corrected with the following factors:

Δp_s = table value x 1.8.

L_{pA} = table value + 6 dB.

Correction table length

L m	throw m	dB
0.33	x 0.50	-2
0.66	x 0.85	-1
1.00	x 1.00	0
1.66	x 1.15	+2
2.00	x 1.20	+3



WTRP/WRRP

**Wall diffuser
Supply/Return
Vandal-proof**

Available types

W - R P - S

W wall diffuser

- **Supply/Return**

T supply

R return

R round, perforated

P vandal-proof

- **Accessories**

O none

K clamp ring

S section, 300 mm

SA-Select

Check SA-Select to create extended order codes and selection details online. **NB!** At this moment, SA-Select is only available in Dutch. But it is possible to create extended order codes and selection details online

Use

The WTRP wall diffuser is suitable for supplying cooled air with a large temperature difference in respect of the room temperature. The strong finish makes the diffuser suitable for rooms subject to vandalism, such as police cells. The diffuser cannot be removed from the front, it is fitted from the back. It is possible to put a BFDC fire-resistant butterfly valve in the duct. The WRRP type is suitable for return air and has the same appearance as the supply diffuser WTRP.

Characteristics

Free flow: 45 %

Version

Wall diffuser

Frame: steel 3 mm

Perforated: steel

Internal unit: steel

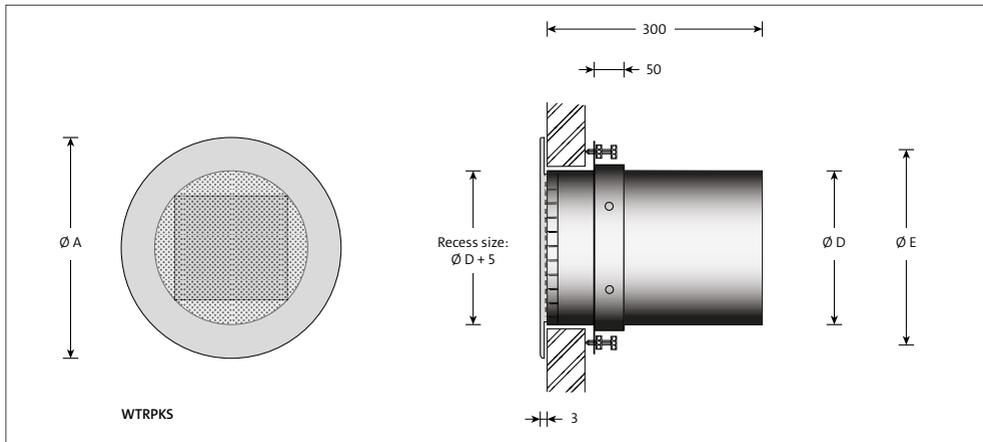
Post-treatment: epoxy

Colour: white RAL 9010, optional RAL colour of your choice

Section

Material: sendzimir galvanised steel

Dimensions



Available dimensions and sizes

model	A	D	E
160	240	159	213
200	280	199	253

Note

- The listed dimensions are in mm.
- Fit the diffuser to maximum 0.2 m below the ceiling.
- If the distance below the ceiling is greater, the Coanda effect will be small during cooling and this may create an unstable air pattern.

Selection details

WTRP

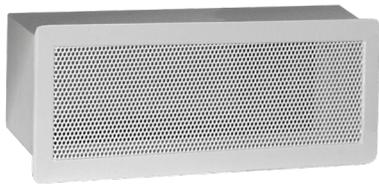
air volume		model 160			model 200		
m ³ /s	m ³ /h	throw m	Δp_s Pa	L_{PA} dB(A)	throw m	Δp_s Pa	L_{PA} dB(A)
0.015	54	3.2	13	-	2.0	5	-
0.020	72	4.3	24	16	2.7	9	-
0.030	108	6.3	53	28	4.0	19	15
0.040	144				5.1	34	24
0.050	180				6.3	53	30
0.060	216				7.5	77	36

WRRP

air volume		model 160		model 200	
m ³ /s	m ³ /h	Δp_s Pa	L_{PA} dB(A)	Δp_s Pa	L_{PA} dB(A)
0.015	54	14	-	6	-
0.020	72	26	21	10	-
0.030	108	58	33	21	20
0.040	144			37	29
0.050	180			58	35
0.060	216			85	41

General

- The pressure loss applies to a fully opened volume unit.
- The assumed room attenuation is 10 dB.
- It is permitted to interpolate the interim values.



WTPP/WRPP

Wall diffuser
Supply/Return
Vandal-proof

Available types

W - P P O -

W wall diffuser

- **Supply/Return**

T supply

R return

P square perforated

P vandal-proof

O no accessories

- **Version**

O none

S section, 300 mm

SA-Select

Check SA-Select to create extended order codes and selection details online. **NB!** At this moment, SA-Select is only available in Dutch. But it is possible to create extended order codes and selection details online

Use

The WTPP wall diffuser is suitable for supplying cooled air with a large temperature difference in respect of the room temperature. The strong finish makes the diffuser suitable for rooms subject to vandalism, such as police cells. The diffuser cannot be removed from the front, it is fitted from the back. A WRPP return version is available.

Characteristics

Free flow: 45 %

Version

Wall diffuser

Frame: steel 3 mm

Perforated: steel, round 4.5 mm pitch 6 mm

Internal unit: steel

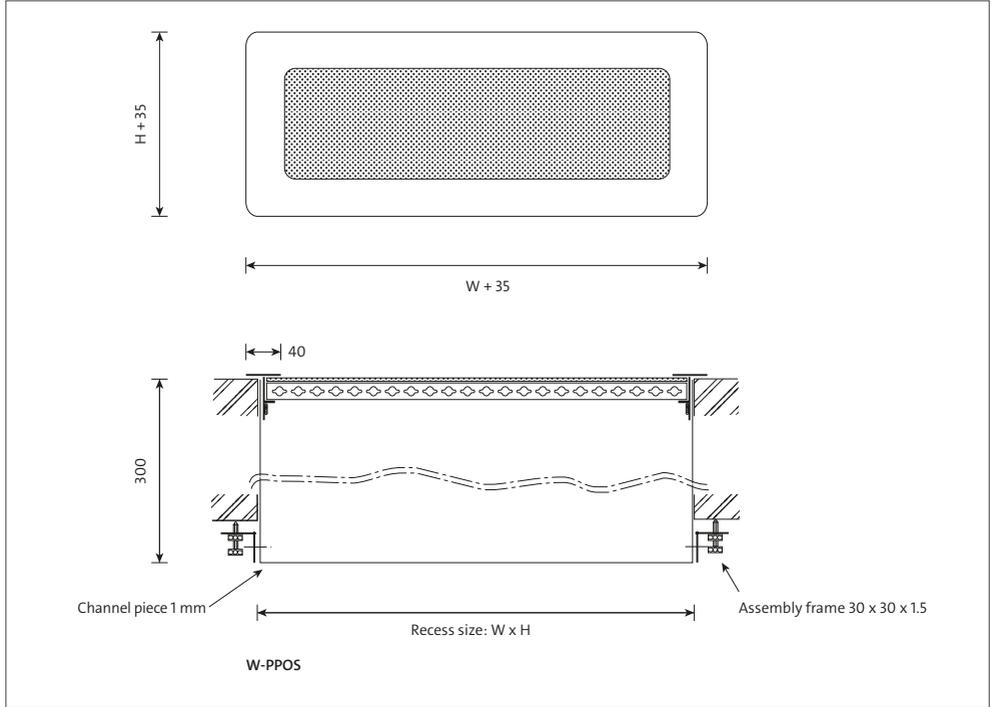
Post-treatment: epoxy

Colour: white RAL 9010

Section

Material: sendzimir galvanised steel,
 1 mm thick

Maatvoering



Available dimensions

H	W			
	225	325	425	525
125	■	■	■	■
225			■	■

Note

- The listed dimensions are in mm.
- $W \times H$ is the recess size.
- Fit the diffuser to maximum 0.2 m below the ceiling.
- If the distance below the ceiling is greater, the Coanda effect will be small during cooling and this may create an unstable air pattern.

Selection details

WTPP Supply

air volume		H	B											
m ³ /s	m ³ /h		225			325			425			525		
			throw m	Δp_s Pa	L_{pA} dB(A)	throw m	Δp_s Pa	L_{pA} dB(A)	throw m	Δp_s Pa	L_{pA} dB(A)	throw m	Δp_s Pa	L_{pA} dB(A)
0.015	54	125	2.0	5	-									
0.020	72	125	2.7	9	-	2.0	4	-						
0.030	108	125	4.0	21	13	2.7	9	-	2.1	5	-			
0.040	144	125	5.3	38	22	3.4	15	-	2.9	8	-	1.9	5	-
0.050	180	125	6.6	59	29	4.5	24	17	3.5	13	-	2.6	8	-
0.060	216	125	7.9	85	34	5.4	34	22	4.2	18	14	3.1	11	-
0.070	252	125				6.4	47	27	4.8	25	19	3.7	16	13
0.080	288	125				7.3	61	31	5.5	33	23	4.4	20	17
0.080	288	225							3.9	6	-			
0.100	360	125							6.9	51	30	5.5	32	24
0.100	360	225							5.2	9	-	4.2	6	-
0.125	450	125										6.9	50	31
0.125	450	225							6.5	15	15	5.2	9	-
0.150	540	225							7.8	21	20	6.3	13	14
0.200	720	225							10.5	38	29	8.4	23	23
0.250	900	225							12.9	59	36	10.2	37	30
0.300	1080	225										12.1	53	35

WRPP Return

air volume		H	B							
m ³ /s	m ³ /h		225		325		425		525	
			Δp_s Pa	L_{pA} dB(A)						
0,015	54	125	6	-						
0,020	72	125	11	-	5	-				
0,030	108	125	25	16	11	-	6	-		
0,040	144	125	46	25	18	-	10	-	6	-
0,050	180	125	71	32	29	20	16	-	10	-
0,060	216	125	102	37	41	25	22	17	13	-
0,070	252	125			56	30	30	22	19	16
0,080	288	125			73	34	40	26	24	20
0,080	288	225					7	-		
0,100	360	125					61	33	38	27
0,100	360	225					11	-	7	-
0,125	450	125							60	34
0,125	450	225					18	18	11	-
0,150	540	225					25	23	16	17
0,200	720	225					46	32	28	26
0,250	900	225					71	39	44	33
0,300	1.080	225							64	38

General

- The assumed room attenuation is 10 dB.
- It is permitted to interpolate the interim values.



WDVC

Wall diffuser Transfer Fixed vane

Available types

WDVC-O

- W** wall diffuser
- D** transfer
- V** fixed vane 45°, centre-to-centre 20 mm
- C** 35 mm aluminium, fixed internal unit

- Accessories

- O** none
- V** volume unit

- O** not applicable

SA-Select

Check SA-Select to create extended order codes and selection details online. **NB!** At this moment, SA-Select is only available in Dutch. But it is possible to create extended order codes and selection details online

Use

De WDVC wall diffuser is suitable for air extraction and as transfer or overflow diffuser. The diffuser can be fitted in a wall. The fixed horizontal vanes prevent being able to look in. Fitting a WDVC on both sides of the wall produces a sightproof finish.

Characteristics

Free flow: 50 %

Version

Wall diffuser

Frame and vanes: anodised aluminium
 Post-treatment: epoxy
 Colour: white RAL 9010, optional RAL colour of your choice

Volume unit

Frame and vanes: extruded aluminium
 Post-treatment: none

Selection details

WDVC

air volume		H	B																	
			225		325		425		525		625		825		1025		1225			
			Δp_s Pa	L_{pA} dB(A)																
m^3/s	m^3/h																			
0.015	54	85	14	23	6	14	4	-												
		85	25	31	11	22	6	16	4	11	3	-								
0.020	72	125	4	10	2	-														
		85	40	37	18	28	10	21	6	17	4	13								
0.025	90	125	6	16	3	7														
		85	57	41	25	32	14	26	9	21	6	17	4	11						
0.030	108	125	9	21	4	12	2	-												
		85			45	40	25	34	16	29	11	25	6	19	4	14	3	10		
0.040	144	125	15	28	7	20	4	13												
		85	24	34	11	25	6	19	4	14	3	10								
0.050	180	225	5	17																
		125	35	39	15	30	9	24	6	19	4	15								
0.060	216	225	7	22	3	13														
		125			28	38	15	31	10	26	7	23	4	16	2	11				
0.080	288	225	13	29	6	20	3	14												
		225	20	35	9	26	5	20	3	15	2	11								
0.100	360	325	8	25	4	17														
		225	31	41	14	32	8	26	5	21	3	17								
0.125	450	325	13	31	6	22	3	16	2	11										
		425	7	25	3	16														
0.150	540	225	44	45	20	37	11	30	7	26	5	22	3	15	2	10				
		325	18	36	8	27	5	21	3	16	2	12								
0.200	720	425	10	29	4	21	3	14												
		525	6	24	3	15														
0.200	720	225			35	44	20	38	13	33	9	29	5	23	3	18	2	14		
		325	33	43	15	35	8	28	5	24	4	20	2	13						
0.300	1080	425	18	37	8	28	4	22	3	17	2	13								
		525	11	32	5	23	3	17	2	12										
0.300	1080	225									20	40	11	33	7	29	5	25		
		325					18	39	12	34	8	30	5	24	3	19	2	15		
0.400	1440	425			18	39	10	32	6	28	4	24	3	17	2	12				
		525	25	42	11	34	6	27	4	22	3	19	2	12						
0.400	1440	325							21	42	15	38	8	31	5	27	4	23		
		425					18	40	11	35	8	31	4	25	3	20	2	16		
0.500	1800	525			20	41	11	35	7	30	5	26	3	20	2	15				
		625	31	46	14	37	8	31	5	26	3	22	2	16						
0.500	1800	425						18	41	12	37	7	31	4	26	3	22			
		525					18	41	11	36	8	32	4	26	3	21	2	17		
0.600	2160	625			21	43	12	37	8	32	5	28	3	21	2	17				
		425								18	42	10	35	6	31	4	27			
0.600	2160	525					25	45	16	41	11	37	6	30	4	25	3	22		
		625			31	48	17	41	11	36	8	32	4	26	3	21	2	17		
0.800	2880	525								20	44	11	38	7	33	5	29			
		625							20	44	14	40	8	34	5	29	3	25		
1.000	3600	525										18	44	11	39	8	35			
		625							31	50	21	46	12	40	8	35	5	31		

General

- The pressure loss applies to a fully opened volume unit.
- The assumed room attenuation is 10 dB.
- It is permitted to interpolate the interim values.



WDZD

Wall/door diffuser
Transfer
Sightproof

Available types

W D Z D O O

- W** wall/door diffuser
- D** transfer
- Z** sightproof
- D** fixed frame, with loose counter frame
- O** not applicable
- O** not applicable

SA-Select

Check SA-Select to create extended order codes and selection details online. **NB!** At this moment, SA-Select is only available in Dutch. But it is possible to create extended order codes and selection details online.

Use

The WDZD wall/door diffuser is suitable for transferring air from one room to another. The diffuser can be fitted in a wall or a door. The horizontal V-shaped vanes are not adjustable.

Characteristics

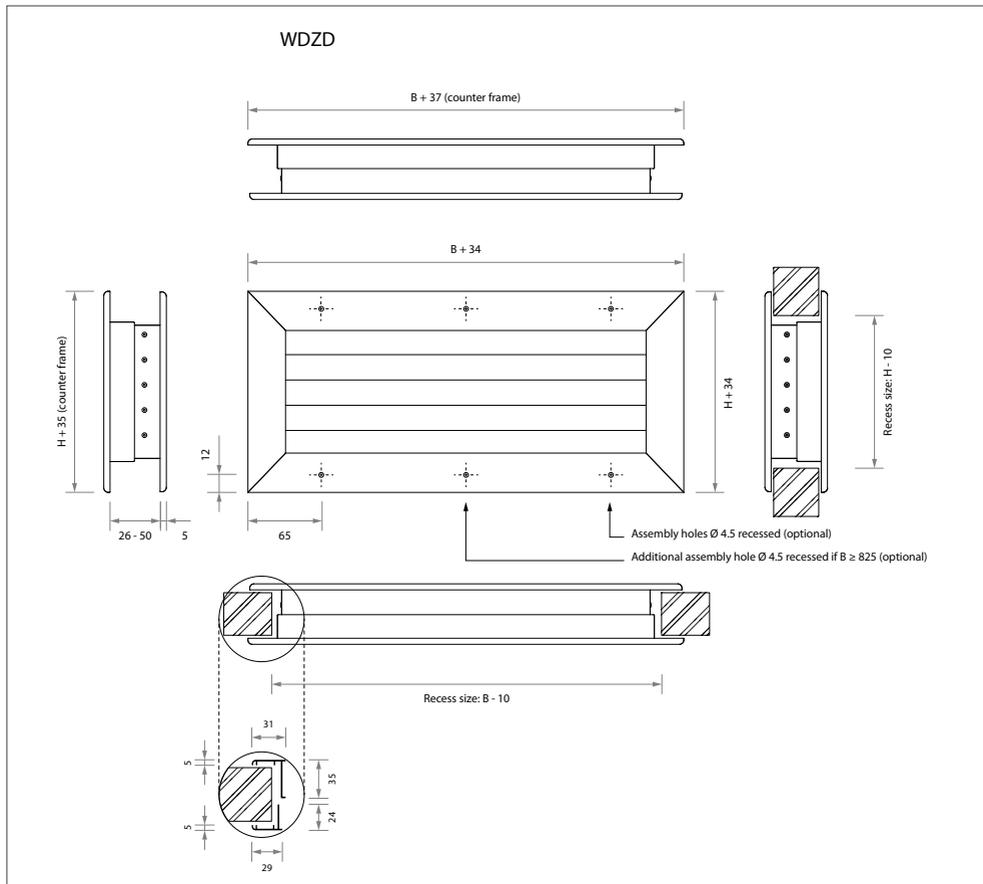
Free flow: 65 %

Version

Wall diffuser

Frame:	anodised aluminium
Counter flange and vanes:	anodised aluminium
Post-treatment:	epoxy
Colour:	white RAL 9010, optional RAL colour of your choice

Dimensions



Standard dimensions

H	B							
	225	325	425	525	625	825	1025	1225
85	■	■	■	■	■	■	■	■
125	■	■	■	■	■	■	■	■
225	■	■	■	■	■	■	■	■
325	■	■	■	■	■	■	■	■
425	■	■	■	■	■	■	■	■
525	■	■	■	■	■	■	■	■
625	■	■	■	■	■	■	■	■

Available dimensions

- Width min. 200, max. 1225.
- Height min. 65, max. 625.
- Interim widths available in increments of 5 mm.
- Interim heights available in increments of 20 mm.

Note

- The listed dimensions are in mm.
- Recess size: B - 10 x H - 10.

Selection details

WDZD

air volume		H	B															
			225		325		425		525		625		825		1025		1225	
			Δp_s Pa	L_{pA} dB(A)														
m ³ /s	m ³ /h																	
0.010	36	85	22	21	10	15	6	11	4	-								
		85	50	29	23	23	13	19	9	15	6	13	3	-				
		125	10	16	5	11	3	-										
0.015	54	85	89	34	41	28	23	24	15	21	11	18	6	14	4	11	3	
		125	18	22	8	16	5	12	3	-								
		85			64	33	37	29	24	25	17	23	9	18	6	15	4	
0.020	72	85						53	32	34	29	24	26	14	22	9	18	
		125	40	30	18	24	10	20	7	17	5	14	3	-				
		85			32	30	19	25	12	22	8	19	5	15	3	12	2	
0.025	90	125	16	24	7	18	4	14	3	11	2	-						
		125			51	34	29	30	19	26	13	24	7	19	5	16	3	
		225	25	29	11	23	7	18	4	15	3	12	2	-				
0.030	108	125						42	33	27	30	19	27	11	23	7	20	
		225	36	32	16	26	9	22	6	19	4	16	2	12	2	-		
		225	49	35	22	29	13	25	8	22	6	19	3	15	2	11		
0.040	144	325	21	29	10	23	5	19	4	15	2	13						
		225	63	38	29	32	17	28	11	24	8	22	4	17	3	14	2	
		325	27	31	12	25	7	21	5	18	3	15	2	11				
0.050	180	425	15	27	7	21	4	17	3	13	2	11						
		225			45	36	26	32	17	29	12	26	7	22	4	18	3	
		325	43	36	20	30	11	26	7	22	5	20	3	15	2	12		
0.060	216	425	24	31	11	25	6	21	4	18	3	15	2	11				
		525	15	28	7	22	4	18	3	14	2	12						
		225						41	36	26	33	18	30	10	26	7	23	
0.070	252	325	66	40	31	34	17	30	11	27	8	24	4	20	3	16	2	
		425	37	36	17	30	10	25	6	22	4	19	2	15	2	12		
		525	23	32	11	26	6	22	4	19	3	16	2	12				
0.080	288	225						59	40	38	37	26	34	15	30	10	26	
		325			44	38	25	33	16	30	11	27	6	23	4	20	3	
		425	53	39	24	33	14	29	9	26	6	23	4	19	2	15	2	
0.100	360	525	34	36	15	30	9	26	6	22	4	19	2	15	1	12		
		225							67	42	47	40	27	35	17	32	12	
		325					45	39	29	36	20	33	11	29	7	25	5	
0.125	450	425			43	39	25	35	16	31	11	29	6	24	4	21	3	
		525	60	41	27	35	16	31	10	28	7	25	4	21	3	17	2	
		625	41	38	19	33	11	28	7	25	5	22	3	18	2	15	1	
0.150	540	325							65	44	45	41	26	37	17	33	12	
		425					56	43	36	39	25	37	14	32	9	29	6	
		525			62	43	35	39	23	36	16	33	9	29	6	25	4	
0.200	720	625			42	40	24	36	16	33	11	30	6	26	4	23	3	
		325											46	42	29	39	21	
		425							64	45	45	42	25	38	16	34	11	
0.300	1080	525																
		625					63	45	40	41	28	39	16	34	10	31	7	
		625					43	42	28	39	19	36	11	32	7	28	5	
0.400	1440	425												40	42	25	39	
		525																
		625																
0.500	1800	425																
		525																
		625																

General

- The assumed room attenuation is 10 dB.
- It is permitted to interpolate the interim values.



WGZD/WGZC

Wand-/deurooster Klankdempend Doorvoer

Available types

WGZ--O

- W** wall diffuser
- G** sound attenuating
- Z** sightproof

- **Frame, fixed 29 mm**

- D** double-sided
- C** single-sided

- **Double-sided thickness: Single-sided thickness:**

- | | |
|----------------------|----------------|
| D = 40 - 69 | D = 45 |
| C = 70 - 89 | C = 75 |
| H = 90 - 99 | H = 95 |
| K = 100 - 109 | K = 105 |
| E = 110 - 150 | E = 115 |

O not applicable

SA-Select

Check SA-Select to create extended order codes and selection details online. **NB!** At this moment, SA-Select is only available in Dutch. But it is possible to create extended order codes and selection details online.

Use

The WGZD (WGZC) sound attenuating wall/door diffuser is suitable for air transfer. The diffuser can be fitted in a door or a wall. The diffusers reduce the noise transfer between connected rooms. The diffusers have standard mounting holes in the frame.

Characteristics

free flow: approx. 10 %
(depending on the height)

Version

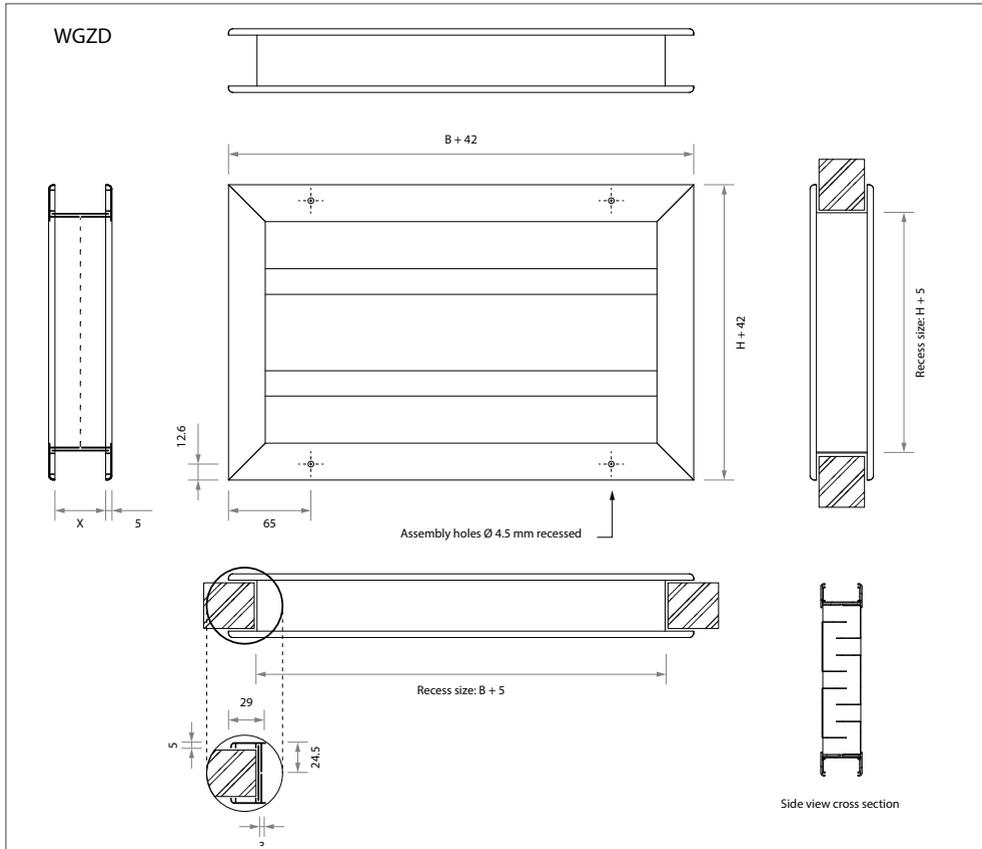
Wall/door diffuser

Frame: anodised aluminium
Vanes: steel
Post-treatment: epoxy
Colour: white RAL 9010, optional RAL colour
of your choice

Optional

Also available without mounting holes (fitted with sealant).

Dimensions



Standard dimensions

H	B							
	225	325	425	525	625	825	1025	1225
110	■	■	■	■	■	■	■	■
190	■	■	■	■	■	■	■	■
270	■	■	■	■	■	■	■	■
350	■	■	■	■	■	■	■	■
430	■	■	■	■	■	■	■	■
510	■	■	■	■	■	■	■	■
590			■	■	■	■	■	■
670			■	■	■	■	■	■
750				■	■	■	■	■
830					■	■	■	■
910						■	■	■
990							■	■

Available dimensions

- Width min. 225, max. 1225.
- Height min. 110, max. 990.
- Interim widths available in increments of 5 mm.

Note

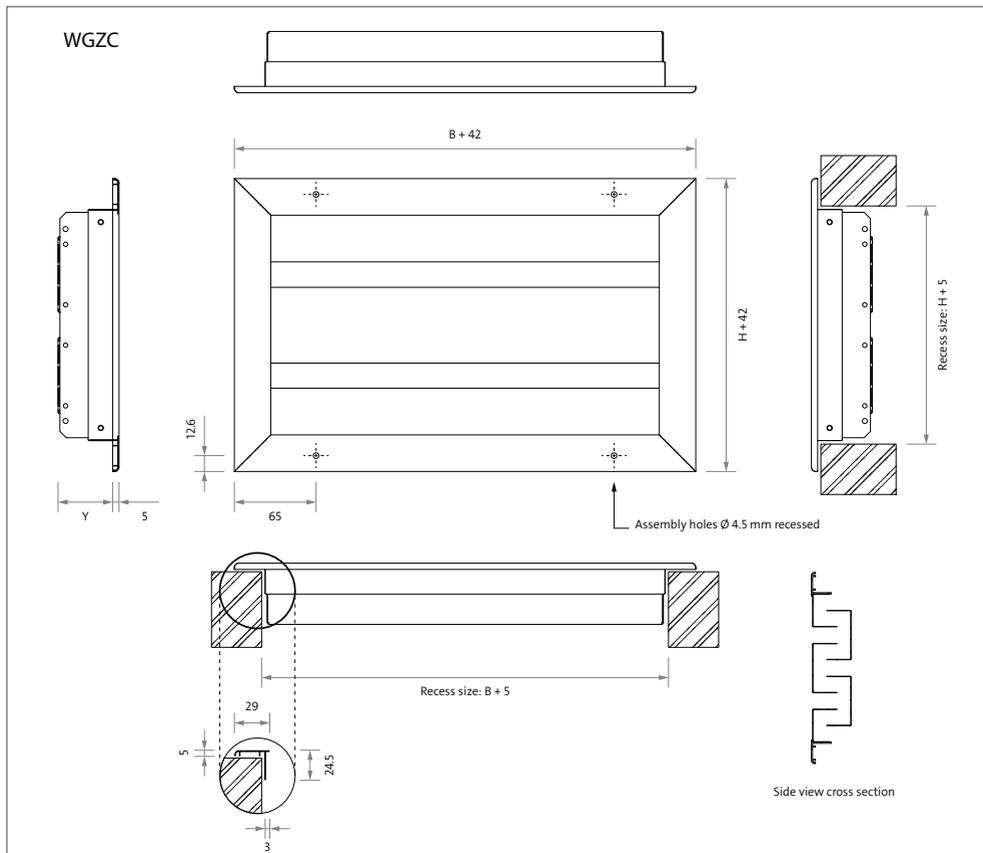
- The listed dimensions are in mm.
- Recess size: $B + 5 \times H + 5$.

Wall/door thickness

- WGZDDO: $x = 40 - 69$
- WGZDCO: $x = 70 - 89$
- WGZDHO: $x = 90 - 99$
- WGZDKO: $x = 100 - 110$
- WGZDEO: $x = 110 - 150$

For a wall thickness greater than 110 mm, we recommend using a WGZC-O diffuser in combination with a 1/2 WGZDDO. Take into account a built-in depth of 30 mm for the 1/2 WGZDDO.

Dimensions



Standard dimensions

H	B							
	225	325	425	525	625	825	1025	1225
110	■	■	■	■	■	■	■	■
190	■	■	■	■	■	■	■	■
270	■	■	■	■	■	■	■	■
350	■	■	■	■	■	■	■	■
430	■	■	■	■	■	■	■	■
510	■	■	■	■	■	■	■	■
590			■	■	■	■	■	■
670			■	■	■	■	■	■
750				■	■	■	■	■
830					■	■	■	■
910						■	■	■
990							■	■

Available dimensions

- Width min. 225, max. 1225.
- Height min. 110, max. 990.
- Interim widths available in increments of 5 mm.

Note

- The listed dimensions are in mm.
- Recess size: $B + 5 \times H + 5$.

Wall/door thickness

- WGZCDO: $y = 45$
- WGZCCO: $y = 75$
- WGZCHO: $y = 95$
- WGZCKO: $y = 105$
- WGZCEO: $y = 115$

For a wall thickness greater than 115 mm, we recommend using a WGZC-O diffuser in combination with a 1/2 WGZDDO. Take into account a built-in depth of 30 mm for the 1/2 WGZDDO.

Selection details

WGZD and WGZC

Pressure loss sound attenuating transfer diffuser

WGZDDO and WGZCDO in Pa.

air volume		required free flow in m ²																		
m ³ /s	m ³ /h	0.002	0.003	0.004	0.005	0.006	0.008	0.01	0.0125	0.015	0.02	0.025	0.03	0.04	0.05	0.06	0.08	0.10	0.125	0.15
0.005	18	6																		
0.006	22	9	4																	
0.008	29	16	7	4																
0.010	36	25	11	6	4	3	2													
0.013	45		17	10	6	4	2	2												
0.015	54		25	14	9	6	4	2												
0.020	72			25	16	11	6	4	3	2										
0.025	90				25	17	10	6	4	3	2									
0.030	108					25	14	9	6	4	2									
0.040	144						25	16	10	7	4	3	2							
0.050	180							25	16	11	6	4	3	2						
0.060	216								23	16	9	6	4	2						
0.080	288									28	16	10	7	4	3	2				
0.100	360										25	16	11	6	4	3	2			
0.125	450											25	17	10	6	4	2			
0.150	540												25	14	9	6	4	2		
0.200	720													25	16	11	6	4	3	2
0.250	900														25	17	10	6	4	3
0.300	1080															25	14	9	6	4
0.400	1440																25	16	10	7
0.500	1800																	25	16	11

preferred range when used in doors: 8 - 10 Pa.

Free flow sound attenuating transfer diffuser

WGZD and WGZC in m²

H	B							
	225	325	425	525	625	825	1025	1225
110	0.0017	0.0025	0.0033	0.0041	0.0049	0.0065	0.0081	0.0097
190	0.0034	0.0050	0.0066	0.0083	0.0099	0.0131	0.0164	0.0188
270	0.0052	0.0076	0.0101	0.0125	0.0150	0.0199	0.0248	0.0298
350	0.0070	0.0103	0.0136	0.0169	0.0203	0.0269	0.0335	0.0402
430	0.0088	0.0130	0.0172	0.0214	0.0256	0.0340	0.0424	0.0508
510	0.0108	0.0160	0.0212	0.0263	0.0315	0.0418	0.0521	0.0624
590			0.0253	0.0314	0.0376	0.0499	0.0622	0.0745
670			0.0295	0.0367	0.0439	0.0583	0.0727	0.0871
750					0.0505	0.0671	0.0836	0.1002
830						0.0761	0.0949	0.1137
910						0.0855	0.1067	0.1278
990							0.1188	0.1423

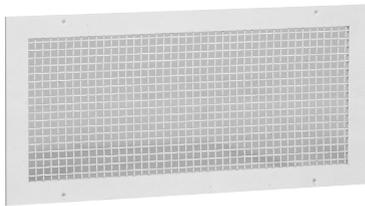
Attenuation values

WGZD and WGZC in dB measured on the diffuser

		attenuation values								
		63	125	250	500	1k	2k	4k	8k	Hz
build-in depth	40 mm	8	9	6	6	12	22	23	21	dB
	110 mm	8	10	7	11	15	26	24	22	dB

General

- The attenuation data is based on a comparable measurement between a recess of 525 x 510 mm and a diffuser of the same size.
- In all critical situations, such as acoustically hard rooms and/or a smaller distance between the source of noise, diffuser and receiver, please consult an acoustic adviser.
- It is permitted to interpolate the interim values.



WRGC

Wall diffuser Return Mesh

Available types

WRGCOO

- W** wall diffuser
- R** return
- G** galvanised mesh
- C** 35 mm aluminium
- O** not applicable
- O** not applicable

SA-Select

Check SA-Select to create extended order codes and selection details online. **NB!** At this moment, SA-Select is only available in Dutch. But it is possible to create extended order codes and selection details online.

Use

The WRGC wall diffuser is suitable for discharging air. The diffuser can be fitted in a wall or a door. The diffusers have standard mounting holes in the frame.

Characteristics

Free flow: 70 %

Version

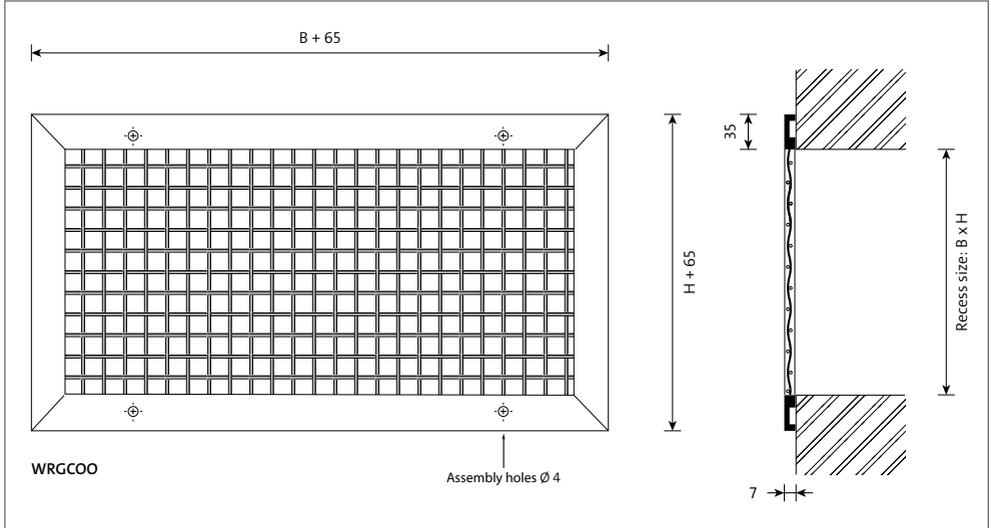
Wall diffuser

Frame: anodised aluminium
 Mesh width: 12 x 12 mm, galvanised
 Post-treatment: epoxy
 Colour: white RAL 9010, optional RAL colour of your choice

Optional

Also available without mounting holes.

Dimensions



Standard dimensions

H	B							
	225	325	425	525	625	825	1025	1225
75	■	■	■	■	■	■	■	■
125	■	■	■	■	■	■	■	■
225	■	■	■	■	■	■	■	■
325	■	■	■	■	■	■	■	■
425	■	■	■	■	■	■	■	■
525	■	■	■	■	■	■	■	■
625	■	■	■	■	■	■	■	■
825	■	■	■	■	■	■	■	■
1025	■	■	■	■	■	■	■	■
1225	■	■	■	■	■	■	■	■

The available models marked in grey are not preferable from an air-distribution point of view, and therefore they are not included as standard in SA-Select. These selection details are available on request.

Available dimensions

- Interim widths and heights available in increments of 5 mm.

Note

- The listed dimensions are in mm.
- Recess size: W x H.

Selection details

WRGC

air volume		H	B																
m ³ /s	m ³ /h		225		325		425		525		625		825		1.025		1.225		
			Δp_s Pa	L_{PA} dB(A)															
0.015	54	75	1	-															
0.020	72	75	2	-															
0.025	90	75	4	6	2	-													
0.030	108	75	5	10	2	-													
0.040	144	75	9	18	4	10	3	-											
		125	3	7	2	-													
0.050	180	75	14	24	7	16	4	10	3	5	2	-							
		125	5	12	2	-													
0.060	216	75	20	28	10	20	6	15	4	10	3	6							
		125	7	17	3	9	2	-											
0.080	288	75	36	36	17	28	10	22	7	17	5	14							
		125	13	25	6	17	4	11	2	6	2	-							
		225	4	12	2	-													
0.100	360	75	56	42	27	34	16	28	10	23	7	19							
		125	20	31	10	23	6	17	4	12	3	8	2	-					
		225	6	18	3	10	2	-											
0.125	450	75			42	39	25	34	16	29	11	25							
		125	32	36	15	28	9	23	6	18	4	14	2	8	2	-			
		225	10	24	5	16	3	10	2	5									
0.150	540	75					35	38	23	34	16	30							
		125	46	41	22	33	13	27	8	23	6	19	3	13	2	8			
		225	14	28	7	20	4	15	3	10	2	6							
		325			3	12	2	7											
0.200	720	75						41	41	29	38								
		125			39	41	23	35	15	30	10	26	6	20	4	16			
		225	25	36	12	28	7	22	5	17	3	14	2	8					
		325			6	20	3	14	2	9	2	6							
0.250	900	75								46	43								
		125					35	41	23	36	16	32	9	26	6	21			
		225	39	42	19	34	11	28	7	23	5	19	3	13	2	9	1	5	
		325			9	26	5	20	3	15	2	11	1	5					
0.300	1080	125					51	45	33	41	24	37	14	31	9	26			
		225	56	46	27	38	16	33	10	28	7	24	4	18	3	13	2	10	
		325			13	30	8	25	5	20	3	16	2	10	1	5			
		425					4	19	3	14	2	10	1	-					
0.400	1440	125							59	48	42	44	24	38	16	34			
		225			48	46	28	40	18	36	13	32	7	26	5	21	3	17	
		325			23	38	13	32	9	28	6	24	4	18	2	13	2	9	
		425					8	26	5	22	4	18	2	12	1	7			
0.500	1800	125										38	44	24	40				
		225					44	46	29	41	20	38	12	32	8	27	5	23	
		325			36	44	21	38	14	33	10	30	6	24	4	19	3	15	
		425					12	32	8	28	6	24	3	18	2	13	1	9	
0.600	2160	125											54	49	35	44			
		225							41	46	36	42	17	36	11	32	8	28	
		325			52	49	30	43	20	38	14	34	8	28	5	24	4	20	
		425					18	37	12	32	8	28	5	22	3	18	2	14	
0.800	2880	225									52	50	30	44	19	39	13	35	
		325					54	50	35	46	25	42	14	36	9	31	6	27	
		425					31	44	29	40	19	36	8	30	5	25	4	21	
1.000	3600	225										46	50	30	45	21	41		
		325							55	51	39	48	22	42	14	37	10	33	
		425							49	50	32	46	13	36	8	31	6	27	

General

- The assumed room attenuation is 10 dB.
- It is permitted to interpolate the interim values.