TRANSFER AIR SOLUTIONS

Guide for selecting the
right transfer air solution

Swegon

Quick selection

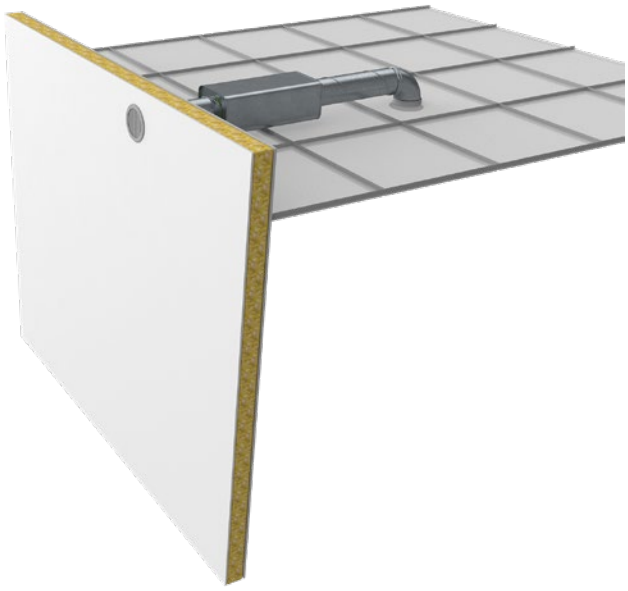
The table shows the R_w value with different combinations of transfer air, where Swegon's sound attenuators, air diffusers and duct components are included.

AIR FLOW - PRESSURE DROP - R_w VALUE							
Duct dimensions	**Transfer diffusers comprising GRC and CLA**	**Total pressure drop pt, l/s**				**$R_w = D_{n,ew}$ 1 m²**	**$D_{n,ew}$ 10 m²**
		5 Pa	**10 Pa**	**15 Pa**	**20 Pa**	**dB**	
100	2x GRC 100+ 1x CLA-A 100-500	12	15	18	20	36	46
100	2x GRC 100+ 1x CLA-A 100-1000	12	15	18	20	47	57
100	2x GRC 100+ 1x CLA-A 100-1000 + 1x CLA-A 100-500	11	14	17	19	65	75
125	2x GRC 125+ 1x CLA-A 125-500	19	24	29	35	32	42
125	2x GRC 125 + 1x CLA-A 125-1000	19	24	29	35	45	55
125	2x GRC 125 + 1x CLA-A 125-1000 + 1x CLA-A 125-500	17	22	27	32	55	65
125	2x GRC 125 + 2x CLA-A 125-1000	17	22	27	32	62	72
160	2x GRC 160 + 1x CLA-A 160-500	31	40	49	58	27	37
160	2x GRC 160 + 1x CLA-A 160-1000	31	40	49	58	39	49
160	2x GRC 160 + 2x CLA-A 160-500	25	35	45	55	41	51
160	2x GRC 160 + 1x CLA-A 160-1000 + 1x CLA-A 160-500	25	35	45	55	50	60
160	2x GRC 160 + 2x CLA-A 160-1000	25	35	45	55	55	65
200	2x GRC 200 + 1x CLA-A 200-1000	54	70	85	100	34	44
200	2x GRC 200 + 1x CLA-A 200-1000 + 1x CLA-A 200-500	48	65	80	95	45	55
200	2x GRC 200 + 2x CLA-A 200-1000	48	65	80	95	52	62
200	2x GRC 200 + 1x CLA-A 200-1000 + 2x CLA-A 200-500	45	60	75	90	55	65
200	2x GRC 200 + 2x CLA-A 200-1000 + 1x CLA-A 200-500	45	60	75	90	61	71
250	2x GRC 250 + 1x CLA-A 250-1000	85	115	140	165	27	37
250	2x GRC 250 + 1st CLA-A 250-1000 + 1x CLA-A 250-500	80	110	133	155	36	46
250	2x GRC 250 + 2x CLA-A 250-1000	80	110	133	155	43	53
250	2x GRC 250 + 2x CLA-A 250-1000 + 1x CLA-A 250-500	75	105	125	145	51	61
250	2x GRC 250 + 3x CLA-A 250-1000	75	105	125	145	57	67
315	2x GRC 315 + 1x CLA-A 315-1000	140	180	220	260	21	31
315	2x GRC 315 + 2x CLA-A 315-1000	125	175	210	245	37	47
	Transfer diffusers comprising GRC, CLA and ALS						
125	2x GRC 160+ALSd 125-160 + 1x CLA-A 125-1000	14	18	22	25	46	56
160	2x GRC 200+ALSd 160-200 + 1x CLA-A 160-1000	23	30	37	45	40	50
	Transfer diffusers comprising GRC, CLA and SOTTO						
125	GRC 125 + 1x CLA-A 125-1000 + SOTTO 125	15	25	31	36	56	66
160	GRC 160 + 1x CLA-A 160-1000 + SOTTO 160	18	30	36	42	51	61

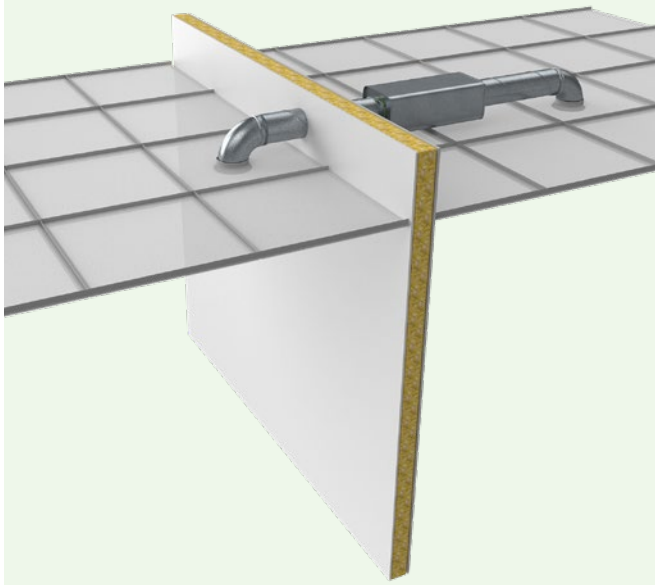
All the values in the table are calculated theoretically based on the relevant measured component.

Installation examples

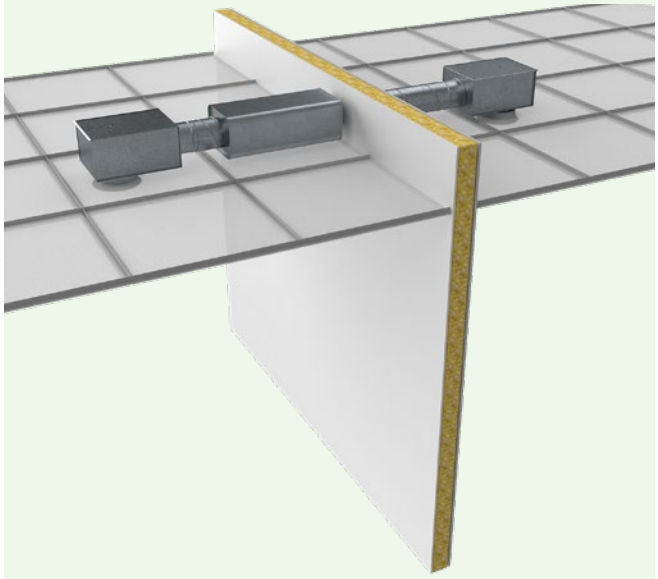
Transfer diffusers comprising GRC + CLA, Ceiling to wall



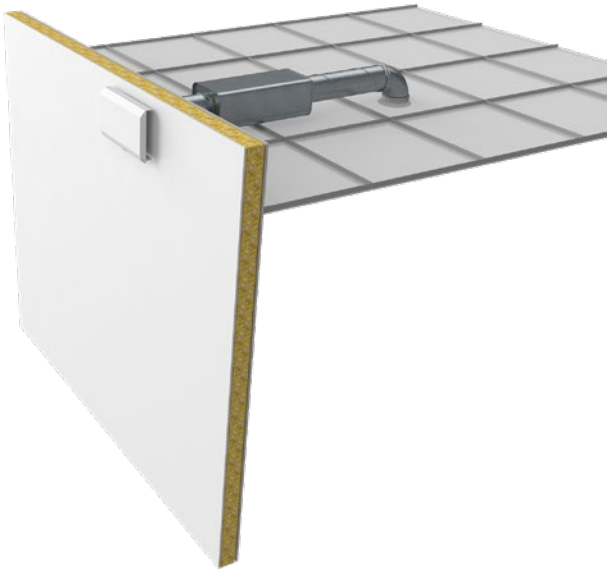
Transfer diffusers comprising GRC + CLA, Ceiling to ceiling



Transfer diffusers comprising GRC + ALS + CLA, Ceiling to ceiling



Transfer diffusers comprising GRC + CLA + SOTTO



Products

Transfer air solutions according to page 2 comprise the following products. Included in the MagiCAD database.

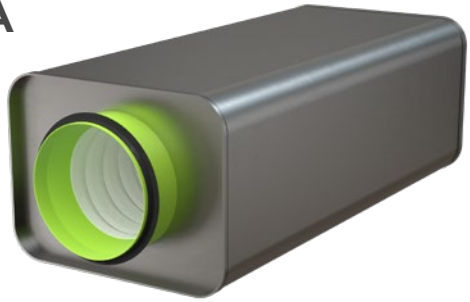
ALS

Commissioning box for air diffusers with removable commissioning damper, fixed measurement tapping and sound absorbing insulation.

- Made of galvanised sheet steel.
- Available with a change in dimension between the standard version inlet and outlet, as well as two changes in dimensions for square ceiling diffusers.
- Available in low version for square ceiling diffusers.
- Sound-absorbing material is fire resistance rated to B-s1,d0 in accordance with EN ISO 11925-2.

Click here to move to the product page at swegon.com with more information about ALS.

CLA



Rectangular sound attenuator with circular connection. Unique properties regarding installation height, fire-resistance class, fibre-migration proof design and sound attenuation. Patent-pending self-supporting fibre-migration proof surface lining and end wall solution.

- Extremely low installation height.
- Very good sound attenuation.
- Fibre-migration proof.
- Air tightness class D.
- Low pressure drop.
- Fire-resistance class EI30 to EI120.

Click here to move to the product page at swegon.com with more information about CLA.

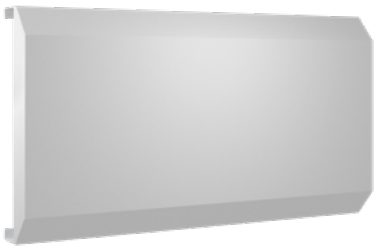
GRC

Circular egg crate grille for extract air and wall/ceiling mounting.

- Extract air.
- 91% free area.
- Manages large air flows.
- Cleanable.
- Can be used together with ALS commissioning box.
- Standard colour White RAL 9003.
  - 5 alternative standard colours.
  - Other colours upon request.

Click here to move to the product page at swegon.com with more information about GRC.

SOTTO



Sound-attenuating transfer diffuser.

- Supplied individually.
- For the transfer of air through a wall.
- Fits in a circular cut opening.
- Simple to install.
- Accessories:
  - TRAC disc valve.
  - VGC telescopic wall sleeve.
- Two physical sizes: 380x170 mm for holes 80-100 mm, 380x220 mm for holes 125-160 mm.
- Standard colour White RAL 9003.
  - 5 alternative standard colours.
  - Other colours upon request.

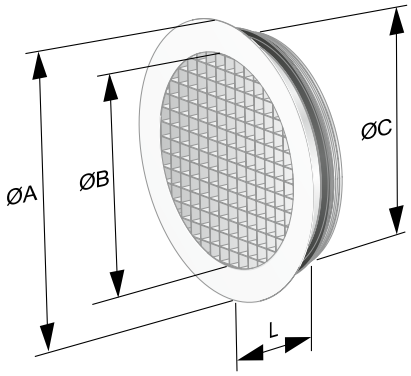
Click here to move to the product page at swegon.com with more information about SOTTO.

Dimension tables

GRC

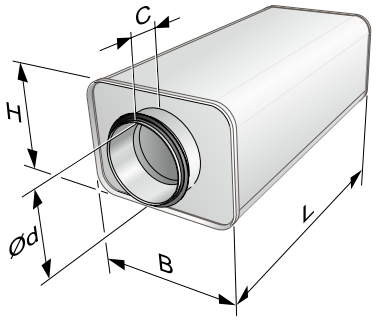
Size	ØA	ØB	ØC	L	Weight, kg
100	138	93	99	36	0.2
125	163	118	124	53	0.2
160	203	148	159	53	0.3
200	243	188	199	53	0.4
250	293	238	249	53	0.5
315	363	303	314	70	0.9
400	448	388	399	75	1.2
500	548	488	499	75	1.6
630	678	618	629	75	2.5

Size of the opening = ØC + 11 mm



CLA

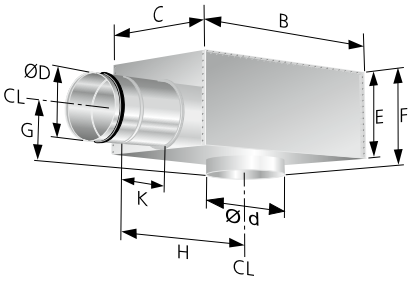
Size	B	C	Ød	H	L	
100	208	45	99	152	500	1000
125	236	45	124	177	500	1000
160	274	45	159	212	500	1000
200	321	45	199	252	500	1000
250	394	45	249	302	500	1000
315	462	45	314	367	500	1000
400	553	70	399	458	500	1000



ALS

Size	B	C	ØD	Ød	E*)	F	G	H	K	Weight, kg
80-100	227	192	79	100	122	162	90	200	50	1.5
100-125	282	217	99	125	140	180	100	275	80	2.1
100-160	342	252	99	160	140	180	100	320	80	2.0
125-160	342	252	124	160	164	204	112	320	80	2.9
125-200	404	288	124	200	164	204	112	360	80	3.5
160-200	404	288	159	200	199	239	130	382	100	4.1
160-250	504	332	159	250	199	239	130	455	100	5.2
200-250	504	332	199	250	239	279	150	477	120	5.7
200-315	622	388	199	315	239	279	150	560	120	7.8
250-315	622	388	249	315	300	340	175	587	145	8.5
315-400	767	488	314	400	-	400	212	722	188	11.8
400-500	887	588	399	500	-	510	280	795	195	18.5

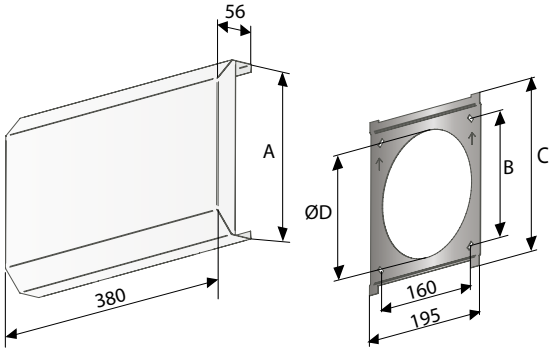
CL = Centre line
*)E also refers to low installation height without sleeve.



SOTTO

Size	Dimensions (mm)					Weight, kg
	A	B	C	ØD	ØI	
80-100	170	110	167	100	80	0.80
80-100	170	110	167	100	100	0.80
125-160	220	160	217	160	125	0,93
125-160	220	160	217	160	160	0,93

Size of the opening, SOTTO = ØI.
NOTE! Two physical sizes.



Planning and design

When the transfer air kit is installed in the wall/ceiling, the wall's noise reduction index may be reduced. The quick selection table on page 2 indicates the possible reduction in the wall's total noise reduction index. Two calculation examples are provided below.

Typical example 1 is transfer air to a corridor, where extract air is drawn above the false ceiling. See Figure 1.

Typical example 2 is two transfer air kits, where extract air is drawn above the false ceiling. See Figure 2.

A transfer air kit must be selected so that it does not impair the sound insulating capacity of the wall structure.

To calculated the wall structure's resulting R_w index, examples 1 and 2 can be followed.

The quick selection table on page 2 presents the R_w value of the transfer diffuser with reference to 1 m^2 and 10 m^2 transmission area. To safeguard the balance and avoid positive/negative pressure in the premises, the transfer air solution should be dimensioned with max 20 Pa.

Example 1:

In a wall with a surface area of 10 m^2 and R_w = 35 dB, a transfer air kit is positioned with 2 x GRC 250 + 1 x CLA-A 250-1000.

R_w transfer air kit = 27 dB. The difference between wall and transfer air kit is 8 dB (35-27). Go into the diagram with surface ratio 10 (S1 = reference area = 1 m^2) and a difference of 8 dB. At the intersection between these, read off how much the wall's reduction index is reduced when a transfer air kit is installed (approx. 2 dB) (see diagram).

I.e. a difference of 8 dB gives a resulting reduction index for the wall in question (incl. transfer air kit) of 33 dB (35 -2).

Example 2:

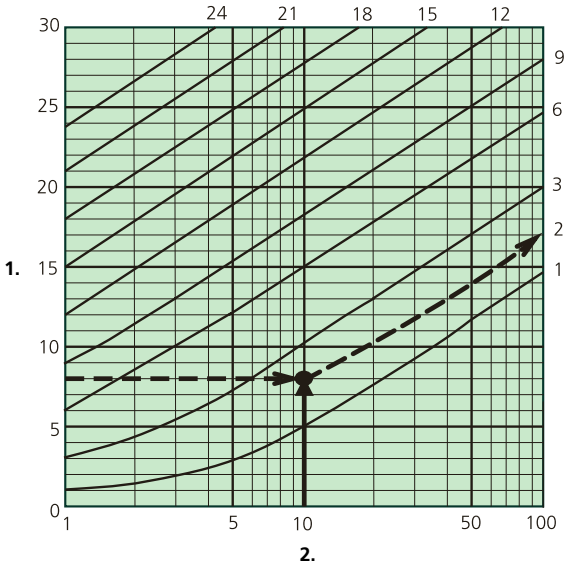
In a wall with a surface area of 10 m^2 and R_w = 44 dB, two transfer air kits are positioned with 2 x GRC 160 + 1 x CLA-A 160-1000 each. R_w transfer air kit = 39 dB.

The difference between wall and transfer air kit is 5 dB (44-39). Go into the diagram with surface ratio 10 (S1 = reference area = 1 m^2) and a difference of 5 dB. At the intersection between these, read off how much the wall's reduction index is reduced when a transfer air kit is installed (1 dB).

I.e. with a transfer air kit in the wall, the wall is impaired by 1 dB. The wall's resulting R_w = 43 dB (44-1).

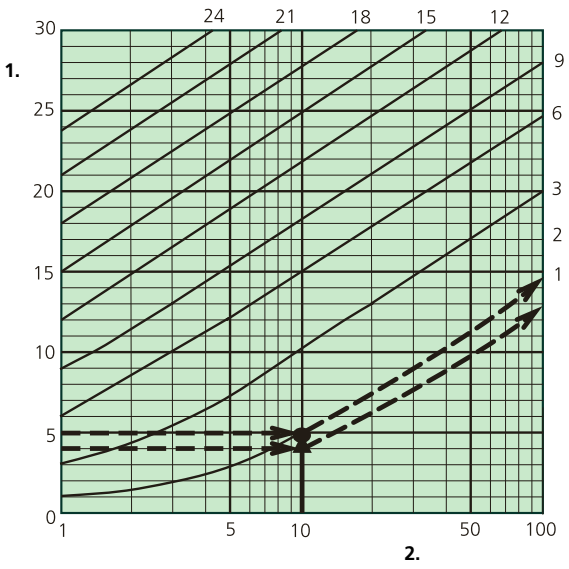
To see how both transfer air kits act together, we will perform the same calculation again. The difference between wall and transfer air kit is now 4 dB (43-39). Read off from the diagram with surface ratio 10 (S1 = reference area = 1 m^2) and a difference of 4 dB. This is approx. 1 dB and the wall's total resulting R_w = 42 dB (43-1).

Decrease in the wall's reduction index when one transfer air kit is installed in it.



1. Difference R_0-R_1 (dB)
2. Surface ratio S_0/S_1

Figure 1.



1. Difference R_0-R_1 (dB)
2. Surface ratio S_0/S_1

Figure 2.

Extended project planning example

To calculate the reduction index of the wall

To calculate the total reduction index of a wall including door and transfer diffuser

$D_{n,ew}$ = The R_w value of the transfer diffuser with reference to 10 m^2 transmission area.

R_{wall}= The R_w value of the wall without door and transfer air diffuser, usually specified for 10 m^2.

Calculate the difference between wall and door as well as transfer diffuser (transmission area 10 m^2).

Difference: R_{wall} - $D_{n,ew}$ is obtained from Table 3.

Note: First recalculate the door to 10 m^2.

Example: Door + Transfer diffuser

- Wall, R_w = 40 dB, without door and transfer diffuser.
- Transfer diffuser, R_w= $D_{n,ew}$= 40 dB.
- Door, R_w = 35 dB for 2 m^2 provided from Table 2.

R_w = $D_{n,ew}$ = 35+7 = 42 dB for the door for 10 m^2.

Include the door in the calculation:

R_{wall}-$D_{n,ew}$= 40-42=-2

Table 3 difference = -2 dB decreases total value of the wall by 2.

R_{wall} = 38 dB with door.

Include the transfer diffuser in the calculation:

R_{wall} = 38 dB

R_{wall}-$D_{n,ew}$= 38-40 = -2

Table 3 difference = -2 dB decreases the new total value of the wall by another 2 dB.

Wall, total value = 36 dB with door + transfer diffuser.

Change to another transmission area

The specified $D_{n,ew}$ value of the transfer diffuser provides R_w for a normalised transmission area of 10 m^2.

Recalculation to other transmission areas:

Table 2

Area (m^2)	10	2	1
Correction (dB)	0	-7	-10

Example: Other transmission area

Compare Swegon ' s transfer diffusers to a door that usually has a 2 m^2 transmission area.

Door R_w = 35 dB for 2 m^2

Transfer diffuser $D_{n,ew}$ for 10 m^2 = 50 dB. Recalculate to 2 m^2 transmission area.

The table provides the following: Transfer diffuser R_w = $D_{n,ew}$ for 2 m^2 = 50-7 = 43 dB

Tip!

Size the transfer diffuser to be 5 dB better than the door, then the R_w value of the door will be the critical figure.

Calculate using the formula:

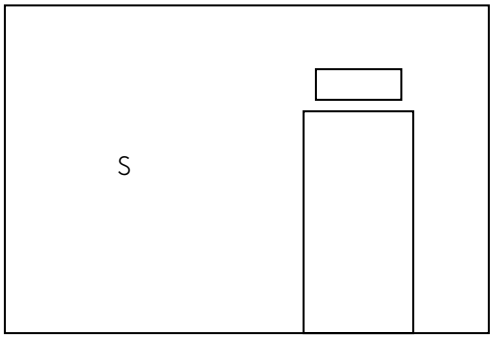
$$R_{tot} = 10 \times \log \left(\frac{S}{(10\ m^2 \times 10^{-0.1 \times D_{n,ew}}) + (S \times 10^{-0.1 \times R_{wall}})} \right)$$

R_{tot} = The total reduction index for wall with transfer diffuser or door.

S = The wall area.

$D_{n,ew}$ = The $D_{n,ew}$ value of the transfer diffuser = R_w for 10 m^2 transmission area.

R_{wall} = The R value for the wall without air diffuser and door.



Transfer diffuser above door, S = wall area.

Table 3

Difference: R_{wall}-$D_{n,ew}$	**Decrease R_{wall} by:**
-5	1
-4	1.5
-3	2
-2	2
-1	2.5
0	3
1	3.5
2	4
3	5
4	5
5	6
6	7
8	9
10	10

03/11/2023

Feel good **inside**

Swegon