

ORTO

Sound-attenuating transfer unit



QUICK FACTS

- For the transfer of air through a wall
- Fits in a rectangular wall opening
- Simple to install
- Designed for installation above a door
- Accessories:
 - VGR telescopic wall sleeve
- Standard colour White RAL 9003
 - 5 alternative standard colours
 - Other colours upon request

AIR FLOW - PRESSURE DROP - R _w VALUE								
ORTO Size	Hole (mm)	10 Pa		15 Pa		20 Pa		R _w = D _{r,ew} (dB)
		l/s	m ³ /h	l/s	m ³ /h	l/s	m ³ /h	
300	300x50	27	97	32	115	37	133	46
500	500x50	43	155	52	187	61	220	43
700	700x50	62	223	74	266	89	320	40
800	800x50	74	266	88	317	105	378	40

The data applies to installation in a 100 mm thick studded wall with a 10 m² transmission area. One transfer diffuser on each side of the wall.

Technical Description

Design

Sound attenuating transfer unit designed for installation in studded walls, produced as rectangular baffles containing insulating sound-absorbing material covered by a reinforced surface layer, rated to Fire Resistance Class B-s1,d0 conforming to EN ISO 11925-2. Open slot all around. The baffles are to be hung up on mounting frames supplied.

Materials and surface treatment

The baffles are made of sheet steel. The mounting frame is made of galvanised sheet steel. The baffles are painted.

- Standard colour:
 - White semi-gloss, lustre 40, RAL 9003/NCS S 0500-N
- Alternative standard colours:
 - Silver gloss, lustre 80, RAL 9006
 - Grey aluminium gloss, lustre 80, RAL 9007
 - White semi-gloss, lustre 40, RAL 9010
 - Black semi-gloss, lustre 35, RAL 9005
 - Grey semi-gloss, lustre 30, RAL 7037
- Non-painted finish and other colours available on request.

Adaptation

Other colours are available on enquiry. The front of the transfer unit can be provided with text, such as the company name. Please contact your nearest sales office for information.

Accessories

Wall sleeve:

VGR. Rectangular telescopic wall sleeve made of galvanized sheet steel.

Installation

Cut the opening according to table 1. Secure the mounting frame with screws to the wall over the cut opening. Mount the baffles onto the mounting frame as illustrated in figure 1.

If a wall sleeve is used, it can be secured to the mounting frame or the wall structure. Pull the wall sleeve apart or push it together to adjust it to the thickness of the relevant wall.

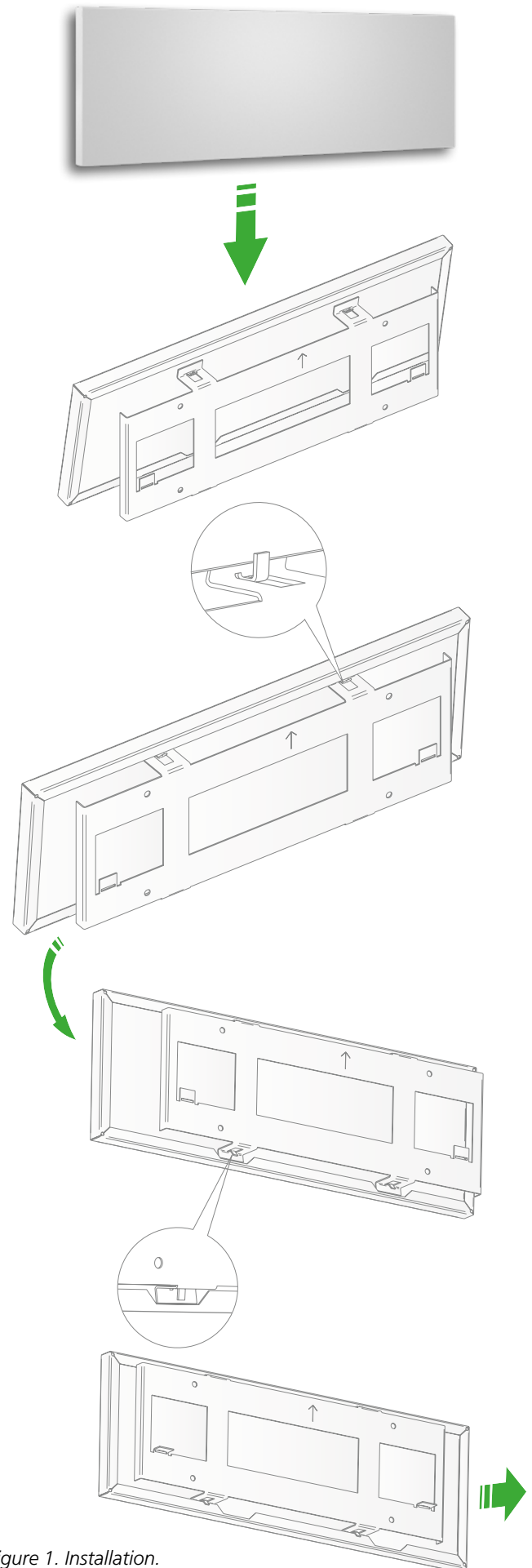


Figure 1. Installation.

Project planning

- The diffuser is designed for installation in a studded walls with plasterboard covering.
- Concrete wall, or wall sleeve decreases the reduction index, see Table 1.
- Rule of thumb: R_w for transfer diffuser= Sound class Door + 5 dB (NOTE! door usually presented for 2 m² transmission area).
- Calculation of the wall structure's resulting R_w value is shown in the example on the next page.
- Table 1 specifies reduction index $D_{n,ew}$ for transfer units, which refer to 10 m² transmission area.
- The measurements have been carried out according to ISO 9614-2 – Technical.
- The $R_w = D_{n,ew}$ value has been evaluated in relation to reference curve i ISO 717-1. The tests have been carried out in a 100 mm thick studded wall with insulation.

Maintenance

Clean the baffle and sound absorbing material, if necessary, using a vacuum cleaner with a brush nozzle or with lukewarm water and dishwashing detergent.

The whole sound absorbing material can be replaced if necessary.

Environment

The Building Materials Declaration is available from www.swegon.com.

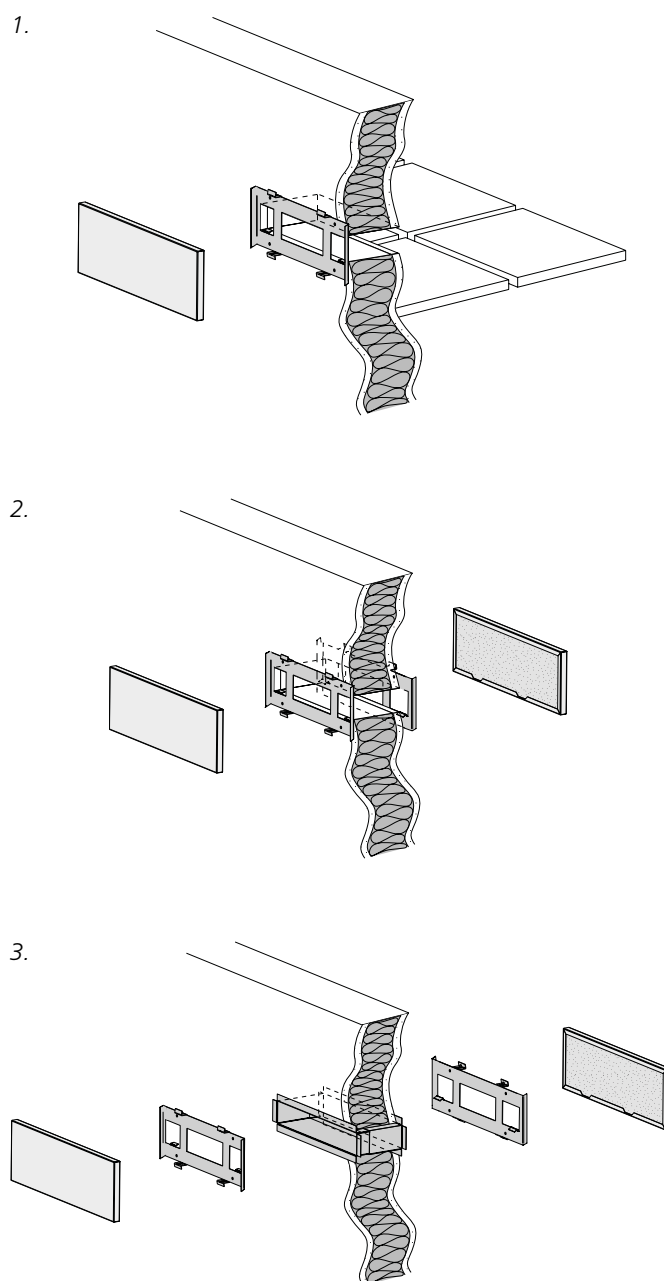


Figure 2. Application options.
 1. Concealed installation towards a corridor.
 2. Visible installation towards a corridor. Double ORTO.
 3. As in (2), but with VGR wall sleeve.

Table 1

ORTO Size	Cut opening in wall (mm)	$R_w = D_{n,ew}$ [dB], 10 m ²			
		One transfer unit	Double transfer units	VGR in hole	Concrete wall
300	300x50	44	46	Decreases -6 dB	Decreases -10 dB
500	500x50	41	43	Decreases -6 dB	Decreases -10 dB
700	700x50	38	40	Decreases -6 dB	Decreases -10 dB
800	800x50	38	40	Decreases -6 dB	Decreases -10 dB

Double transfer units = One unit on each side of the wall. Standard delivery of double transfer units.

Sizing

To calculate the reduction index of the wall

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

$D_{n,ew}$ = The R_w value of the transfer unit referred to 10 m transmission area².

R_{wall} = R_w value of a wall without door and transfer unit, specified most often for 10 m².

Calculate the difference between wall and door as well as transfer unit (10 m transmission area²).

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

NOTE! First recalculate the door to 10 m².

Example: Door + Transfer unit

- Wall, $R_w = 40$ dB, without door and transfer unit.
 - Transfer unit, $R_w = D_{n,ew} = 40$ dB.
 - Door, $R_w = 35$ dB for 2 m² provides from Table 2
- $R_w = D_{n,ew} = 35 + 7 = 42$ dB for the door for 10 m².

Include the door in the calculation:

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

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

$$R_{wall} = 38 \text{ dB with door.}$$

Include the transfer unit in the calculation:

$$R_{wall} = 38 \text{ dB}$$

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

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

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

Change to another transmission area

The specified $D_{n,ew}$ value of the transfer unit provides R_w for a normalised transmission area of 10 m².

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 unit to a door which most often has a 2 m² transmission area.

Door $R_w = 35$ dB for 2 m²

Transfer unit $D_{n,ew}$ for 10 m² = 50 dB

Recalculate to 2 m² transmission area.

The table provides the following: Transfer unit $R_w = D_{n,ew}$ for 2 m² = 50 - 7 = 43 dB

Tip!

Size the transfer unit to be 5 dB better than the door since the R_w value of the door will be the critical figure.

Calculate using the formula:

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

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

S = The wall area.

$D_{n,ew}$ = The $D_{n,ew}$ value of the transfer unit = R_w for 10 m² transmission area.

R_{wall} = The total R value for wall without transfer unit and door.

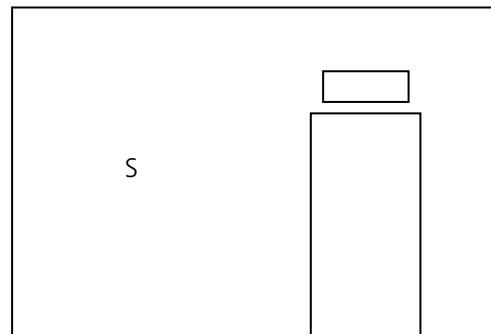


Figure 3. Transfer unit above door, S = wall area.

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

Acoustic data

- The specified sound levels dB(A) are applicable to a normally attenuated room with 10 m² equivalent sound absorption area and 4 dB room attenuation.
- The dB(C) value is normally 6-9 dB higher than the dB(A) value.

ORTO - One transfer unit

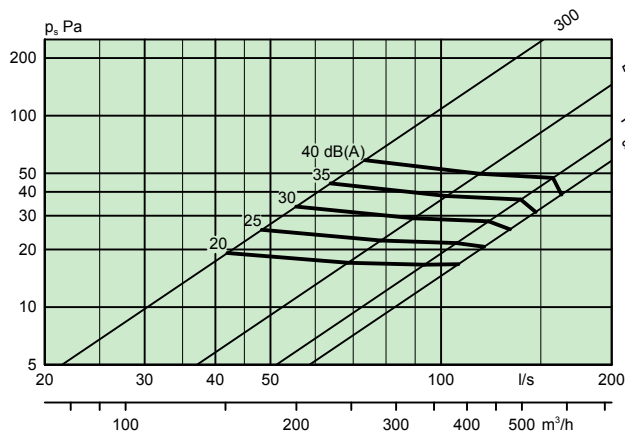
Sound power level L_w (dB)

Table K_{OK}

Size	Mid-frequency (octave band) Hz							
	63	125	250	500	1000	2000	4000	8000
ORTO	63	125	250	500	1000	2000	4000	8000
300	5	5	3	1	1	-6	-21	-27
500	8	7	4	1	0	-4	-19	-26
700	10	8	5	1	-1	-4	-19	-26
800	8	5	2	-1	-1	-2	-25	-27

Sizing diagram

ORTO - One transfer unit



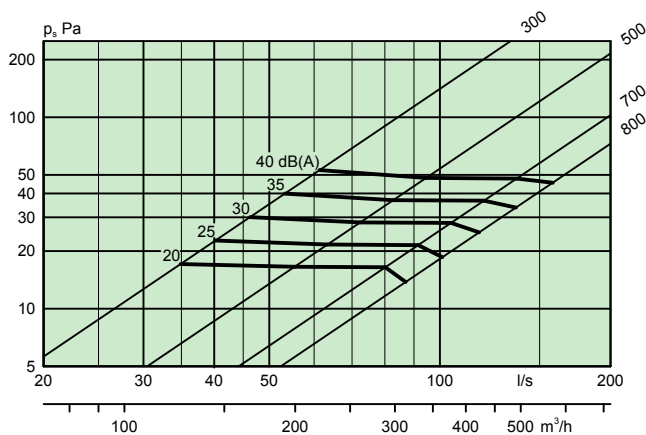
ORTO - Double transfer units

Sound power level L_w (dB)

Table K_{OK}

Size	Mid-frequency (octave band) Hz							
	63	125	250	500	1000	2000	4000	8000
ORTO	63	125	250	500	1000	2000	4000	8000
300	11	9	4	4	-2	-9	-25	-28
500	11	10	5	4	-3	-11	-26	-27
700	11	9	5	3	-2	-9	-26	-26
800	11	12	5	3	-4	-12	-27	-30

ORTO - Double transfer units



Dimensions and weights

ORTO

Size	Dimensions (mm)		Weight (kg)*
	A	I	
300	380	300	1,08
500	580	500	1,62
700	780	700	2,14
800	880	800	2,46

Size of opening, ORTO = I x 50.

*Weight refers to 2 units.

VGR

Size	Dimensions (mm)			Weight (kg)*
	F	G	H	
300	300	50	80-160	0,75
500	500	50	80-160	1,15
700	700	50	80-160	1,60
800	800	50	80-160	1,80

Size of opening, VGR = (F + 5 mm) x (G + 5 mm).

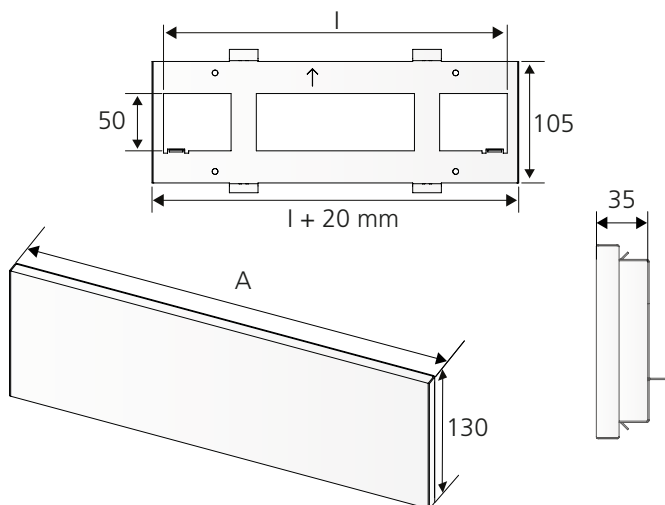


Figure 4. ORTO, dimensions.

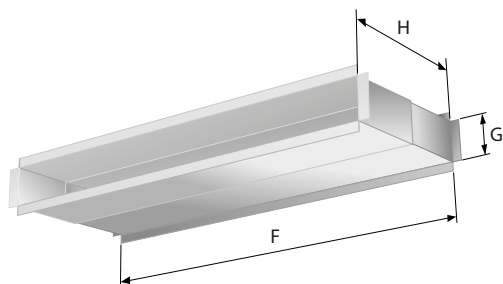


Figure 5. VGR, dimensions.

Ordering key

Product

Rectangular transfer unit	ORTO	a	-bbb
Version:			
Size:	300, 500, 700, 800		

Accessories

Rectangular wall sleeve:	VGR	a	-bbb
Version:			
Double	300:	VGR	300
ORTO	500:		500
	700:		700
	800:		800

Specification text

Swegon's type ORTO rectangular sound attenuating transfer unit, with the following features:

- Acoustic insulation with reinforced surface layer.
- Powder-painted and baked white finish, RAL 9003/NCS S 0500-N.

Size:	ORTOa - bbb	xx items
Accessories:		
Telescopic wall sleeve:	VGRa - bbb	xx items