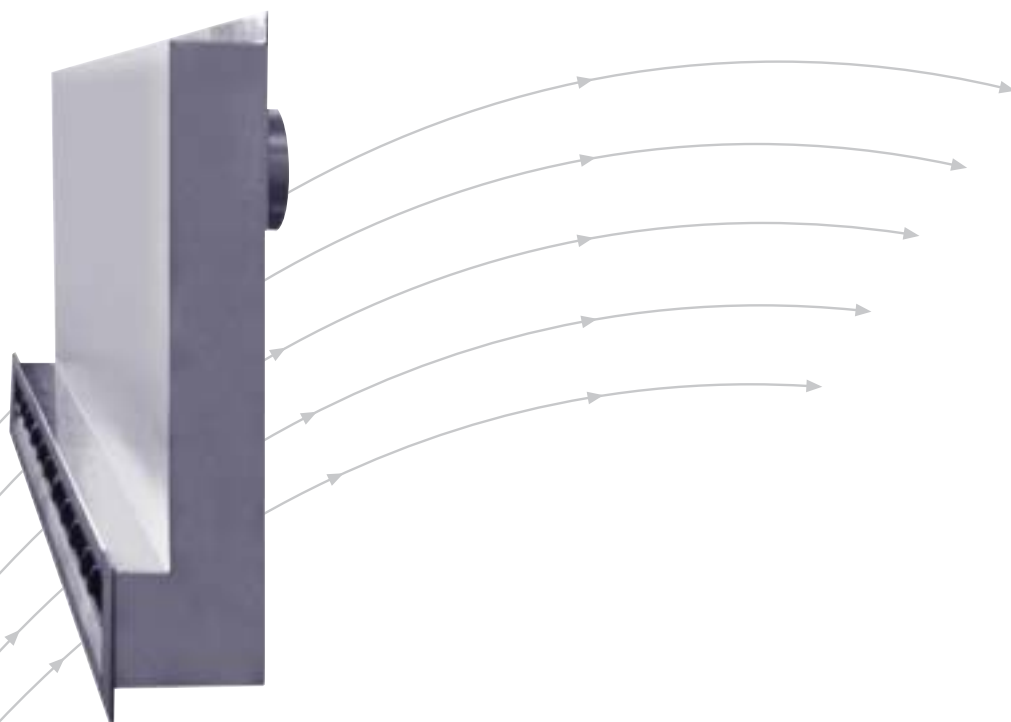


Slot diffusers

- Type VSD50-1-LT
- for lightweight partition walls



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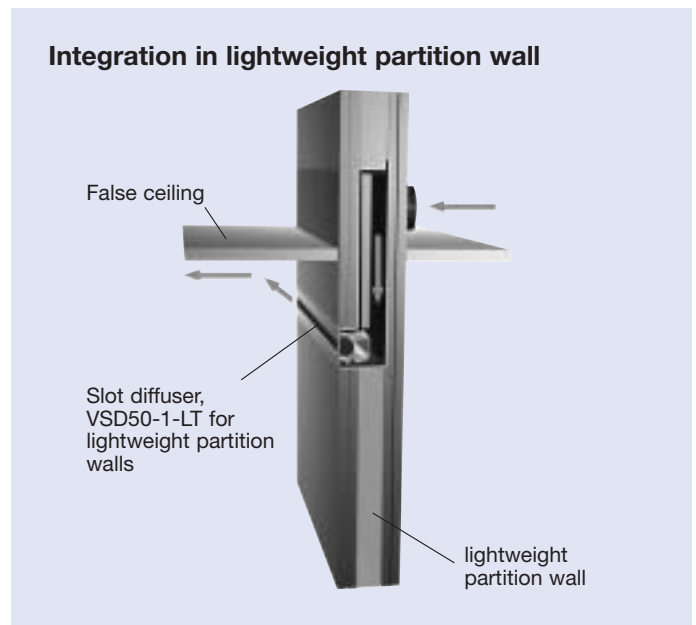
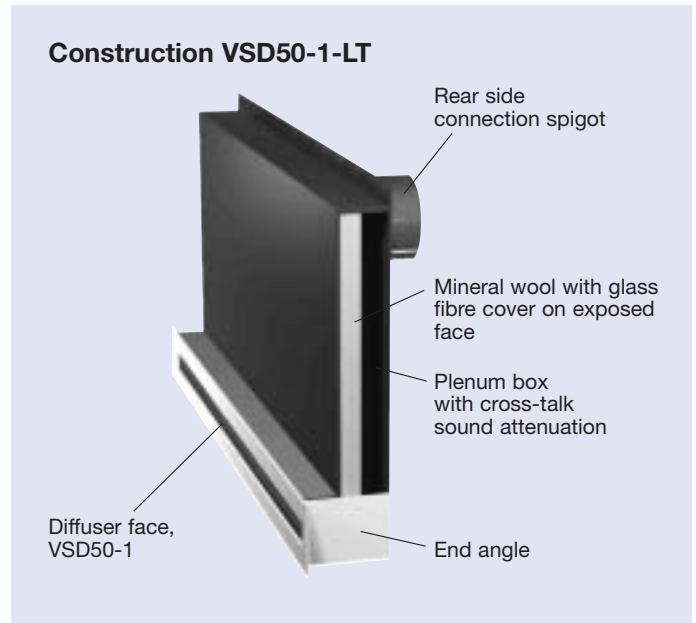
Description

The adjustable slot diffuser type VSD50-1-LT is designed for use in lightweight partition walls (100 mm).

The design and dimensions are suitable for use in a drywall construction and allow complete integration of the slots into a lightweight partition.

The units are available as simple slot diffusers for either supply or extract air and as dual function slot diffusers for both supply and extract air. Each unit consists of a plenum box, which includes integrated cross-talk sound attenuation and a side entry spigot, and a single slot diffuser face configuration. The diffuser face has end angles at both ends and can be a second fix item using clip fixings.

For a detailed description of the type VSD50 slot diffusers, please refer to document 2/2.7/EN/...



Construction · Dimensions · Materials

Construction

The adjustable slot diffusers type VSD50-1-LT consists of a single-slot face and a plenum box, designed as a cross-talk sound attenuator.

Air enters through a rear circular side entry spigot. The diffusers are also available with an optional sealing system and a volume flow control damper. The damper operates as shown below.

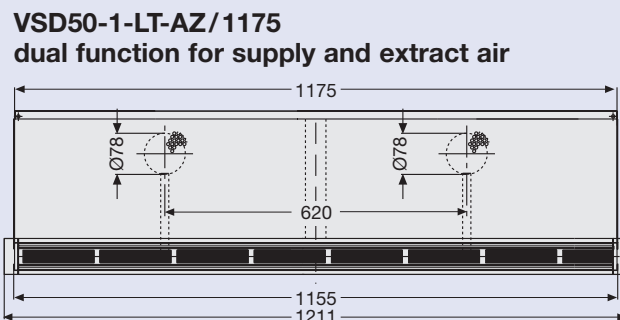
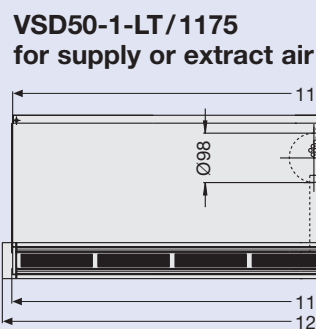
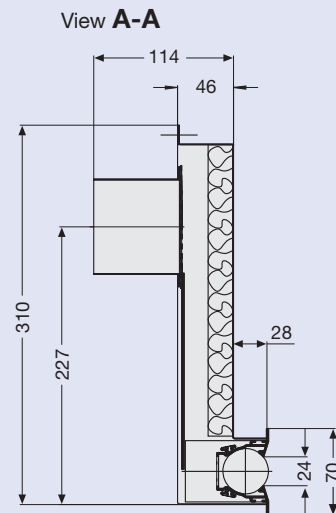
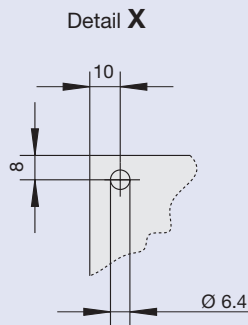
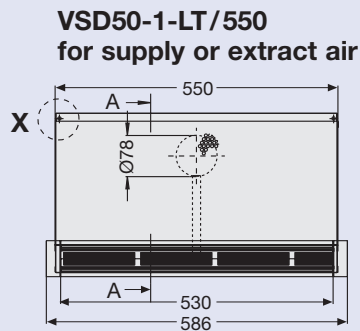
The slot diffusers are suitable for the typical spaces between the vertical framework of lightweight partitions and are available in nominal lengths of 550 mm and 1175 mm for simple diffusers or 1175 mm for supply/extract air dual function diffusers. Refer to the diagrams below for dimensions.

Materials

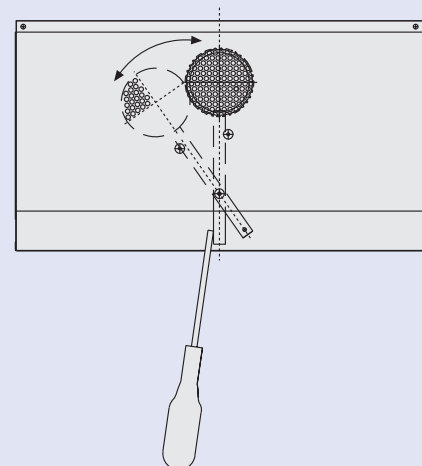
Diffuser face and end angles are of aluminium extrusions, natural anodised E6-C-0, on request powder-coated to RAL 9006 (gloss level 30 %), RAL 9010 (gloss level 50 %) or any other RAL colour (gloss level 70 %).

Air control blades made of black plastic (polystyrene), colour similar to RAL 9005, on request colour white, similar to RAL 9010.

Plenum box and rear spigot made of galvanised steel sheet, interior lining (cross-talk sound attenuation) made of mineral wool with glass fibre cover on exposed face, lip seal made of rubber.



Detail volume flow control damper



Installation · Assembly · Nomenclature

Installation · Assembly

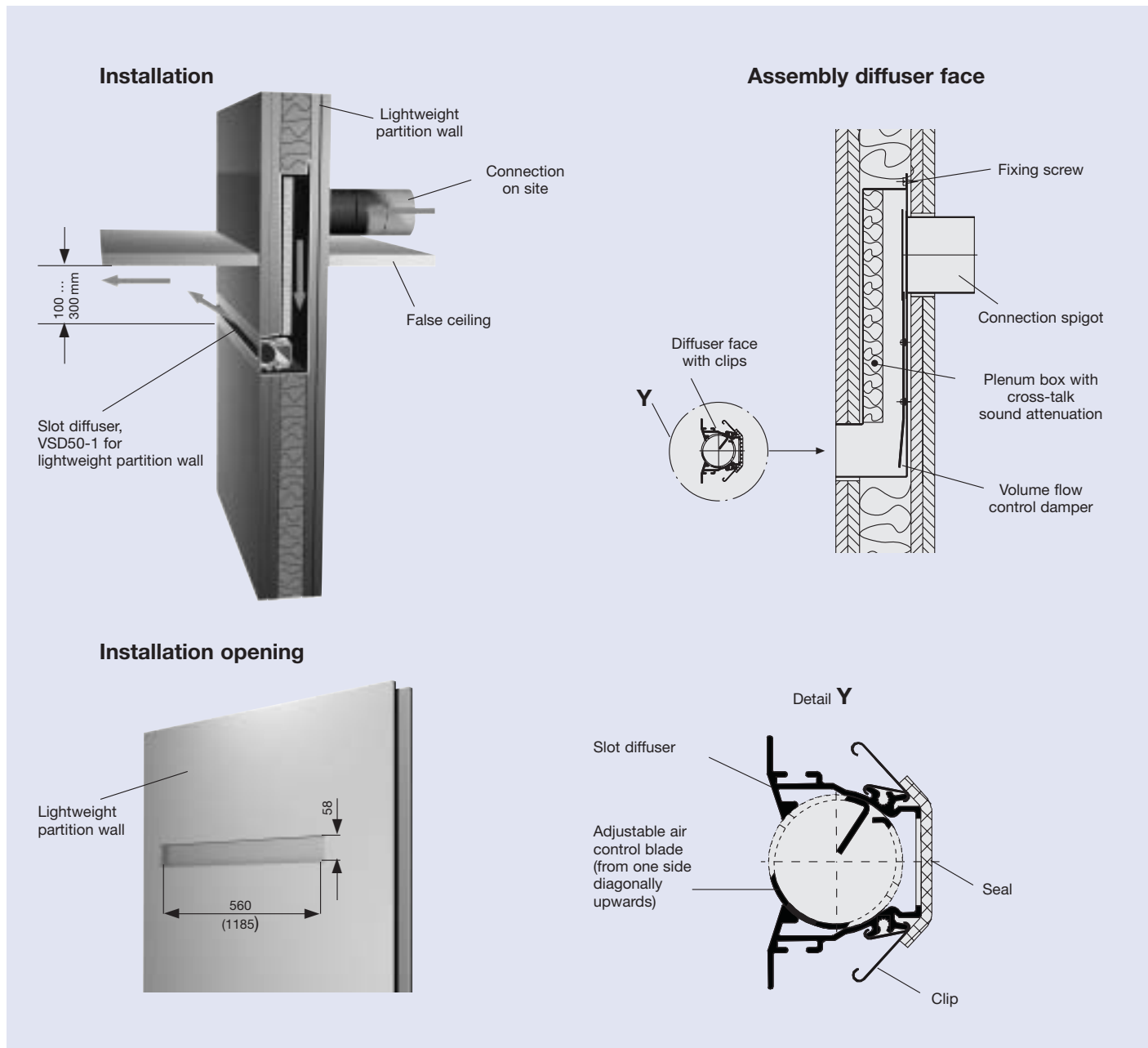
Slot diffuser type VSD50-1-LT is installed as follows:
Once the framework for the lightweight partition wall is in place, install the drywall panels on the spigot side and cut out the hole for the spigot. Next, install the slot diffuser plenum box by sliding the spigot into the cutout and attach the plenum box to the drywall panel using two screws. Refer to Detail X on page 3 for the location of the holes to be drilled for the fixing screws.

Once the opening has been made in the drywall panel on the diffuser side (see below), place the insulation material in the gaps around the diffuser in the lightweight partition wall. The drywall panel with the diffuser face opening can now be installed and the partition is ready for painting or wallpapering. The diffuser face can be installed later using the clip fixing so as to avoid damaging the diffuser face during the construction phase (see below).

Nomenclature

\dot{V}	in l/s or m ³ /h:	Volume flow rate per diffuser
Δp_t	in Pa:	Total pressure drop
L_{WA}	in dB(A):	A-weighted sound power level
L_{WNC}	:	NC rating of sound power level
D_t	in dB:	Insertion loss DIN EN ISO 7235-2004
R'	in dB:	Construction sound reduction index
$R_{W'}$	in dB:	Weighted construction sound reduction index
L_{pA}	in dB(A):	A-weighted sound pressure level in the room
H_1	in m:	Distance between ceiling and occupied zone
X	in m:	Distance between diffuser centre line and wall
L	in m:	Distance from diffuser ($X + H_1$)
\bar{v}_L	in m/s:	Max. time average air velocity at the wall

For aerodynamic data, refer to document 2/2.7/EN/... for slot diffusers. The data for one-way horizontal discharge of VSD50-1 should be used.



Example

Room height = 2.7 m; room depth = 6 m; modular dimension (width) = 1.5 m, room attenuation = 4 dB; cooling load = 55 W/m² (30 W/m² of that is dealt with by other means, leaving 25 W/m² for ventilation) required air change rate: 3 per hour. One VSD50-1-LT-AZ/1175 supply/extract dual function diffuser (assumed damper setting 50 %).

$\dot{V} = 2.7 \text{ m} \cdot 6 \text{ m} \cdot 1.5 \text{ m} \cdot 3/\text{h} = 72.9 \text{ m}^3/\text{h} = 20 \text{ l/s}$. With a supply air differential of -10 K and a volume flow of 20 l/s, the room can be supplied with a cooling capacity of approximately 240 W (~ 27 W/m²).

Diagram 1: $L_{WA(\text{Supply air})} = 27 \text{ dB(A)}$, $\Delta p_{t(\text{Supply air})} = 28 \text{ Pa}$
Correction damper setting 50 % (Table):
 $L_{WA(\text{Supply air})} = 27 + 4 = 31 \text{ dB(A)}$
 $\Delta p_{t(\text{Supply air})} = 28 \times 1.7 = 48 \text{ Pa}$

Diagram 2: $L_{WA(\text{Extract air})} = 24 \text{ dB(A)}$, $\Delta p_{t(\text{Extract air})} = 23 \text{ Pa}$
Correction damper setting 50 % (Table):
 $L_{WA(\text{Extract air})} = 24 + 4 = 28 \text{ dB(A)}$
 $\Delta p_{t(\text{Extract air})} = 23 \times 1.8 = 41 \text{ Pa}$

The difference in the sound power level of the supply and exhaust air is 3 dB. With a difference of 3 dB the larger value should be increased by 2 dB (see diagram 3): $L_{WA(\Sigma)} = 31 + 2 = 33 \text{ dB(A)}$

$$L_{pA} = L_{WA(\Sigma)} - \text{room attenuation} = 33 - 4 = 29 \text{ dB(A)}$$

Aerodynamic data from leaflet 2/2.7/EN/... or selection programme at www.trox.de; one way horizontal air discharge.

$$L = X + H_1 = 6 \text{ m} + 0.9 \text{ m} = 6.9 \text{ m}$$

$$\bar{v}_L = 0.4 \text{ m/s (one way horizontal discharge for linear slot)}$$

Correction for single slot effect of finite length slot:

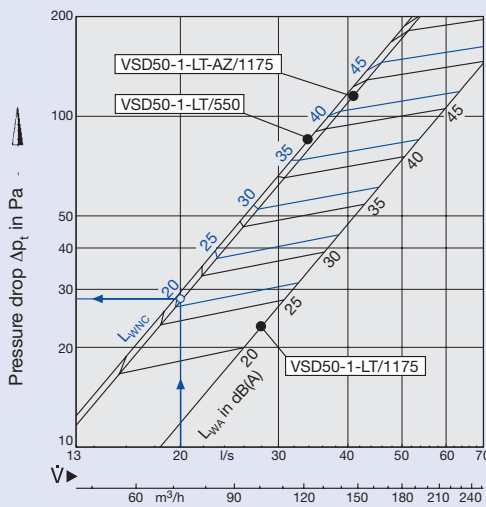
$$\bar{v}_L = 0.71 \times \bar{v}_L(\text{line}) = 0.71 \times 0.4 \text{ m/s} = 0.28 \text{ m/s}$$

⇨ The velocity in the occupied zone at a distance of at least 0.5 m from the face is ≤ 0.14 m/s (0.5 × \bar{v}_L).

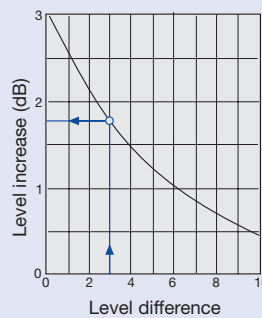
Correction factors damper setting

Type		Δp_t		L_{WA} (dB)	
		50 %	closed	50 %	closed
VSD50-1-LT/550	Supply air	x 1.4	x 3.9	+ 2	+ 6
	Extract air	x 1.4	x 4.7	+ 2	+ 7
VSD50-1-LT/1175	Supply air	x 1.4	x 3.4	+ 3	+ 5
	Extract air	x 1.4	x 3.4	+ 4	+ 8
VSD50-1-LT-AZ/1175	Supply air	x 1.7	x 4.4	+ 4	+ 8
	Extract air	x 1.8	x 5.9	+ 4	+ 12

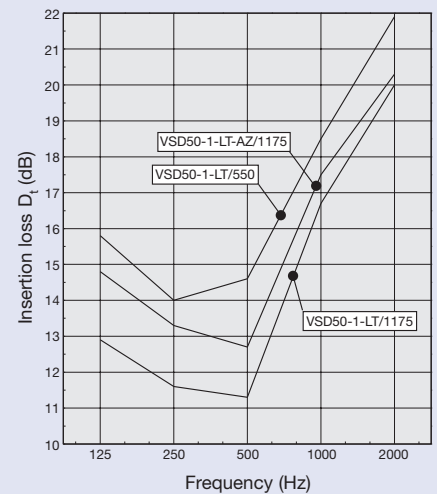
1 Sound power level and pressure drop Supply air



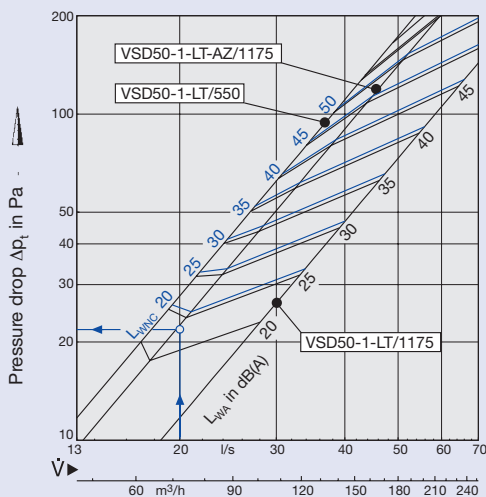
3 Summation of sound levels



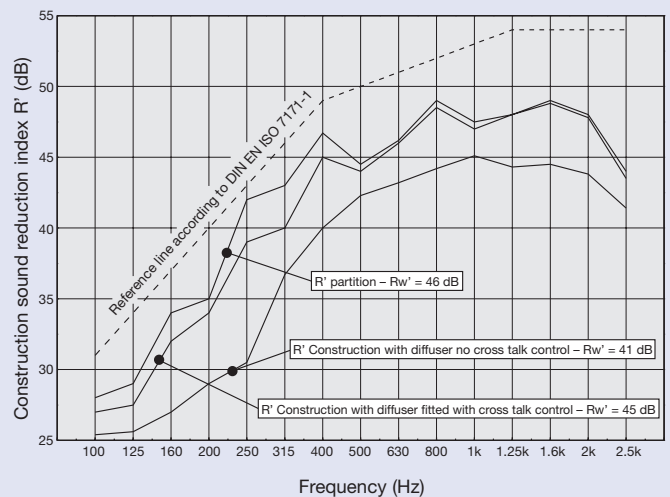
4 Insertion loss



2 Sound power level and pressure drop Extract air



5 Influence of the slot diffuser on the partition sound reduction index



Order Details

Specification Text

Adjustable slot diffusers with aesthetically designed face sections for effective installation into lightweight partition walls, consisting of a single-slot clip fixed front face, end angles, integrated preset air control blades and a plenum box designed as a cross-talk sound attenuator; available as a single diffuser for supply or extract air, or as a dual function diffuser for supply and extract air.

Cross-talk sound attenuator consists of a casing with an inner lining. Air is supplied via circular rear side entry spigot, with optional sealing system and volume flow control damper.

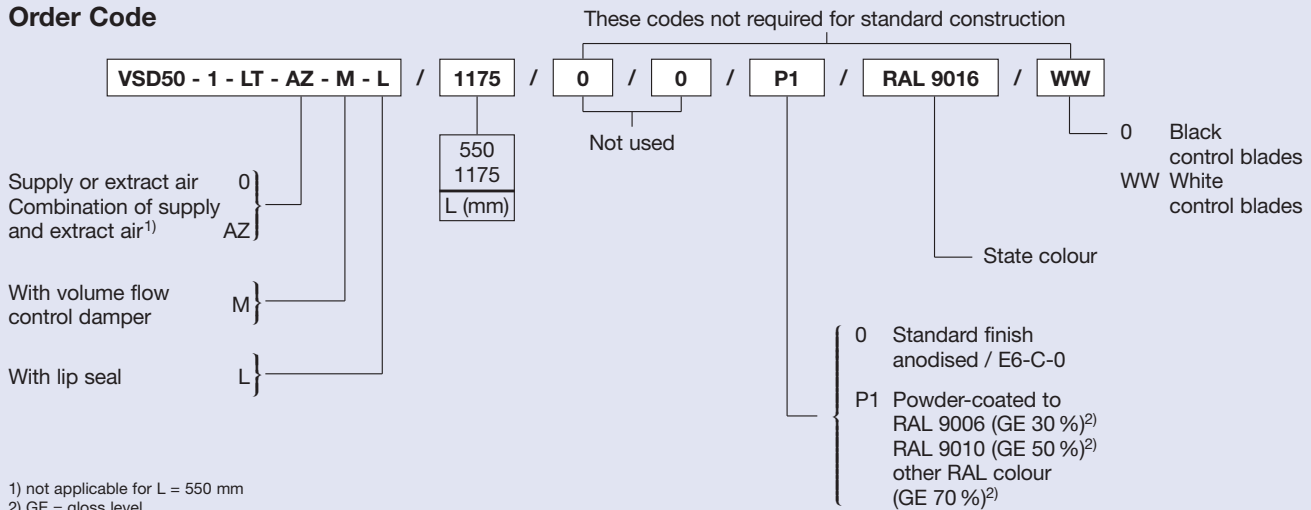
Materials

Diffuser face and end angles are made of aluminium extrusions, natural anodised E6-C-0, on request powder-coated to RAL 9006 (gloss level 30 %), RAL 9010 (gloss level 50 %) or any other RAL colour (gloss level 70 %).

Air control blades made of black plastic (polystyrene), colour similar to RAL 9005, on request colour white, similar to RAL 9010.

Plenum box and connecting spigot made of galvanised steel sheet, interior lining (cross-talk sound attenuation) made of mineral wool with glass fibre cover on exposed face, lip seal made of rubber.

Order Code



Order example

Make: TROX
Type: VSD50 - 1 - LT - AZ - M - L / 1175 / P1 / RAL 9016 / WW