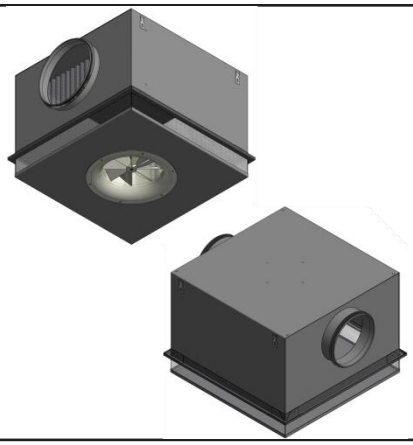


Air Distribution Systems

SD – AKQ
Swirl diffusers

Application

The multi swirl diffuser MSD and MSDC are used in ventilation and air conditioning applications in industrial areas. Each diffuser is capable of introducing high supply air volumes to the space with the additional benefit that they can be used for installation heights as low as 2.5 m. The MSD and MSDC may be installed for the following:

- Laboratories
- Production rooms in the pharmaceutical industry
- Special clean rooms

The MSD and MSDC demonstrate the following characteristics:

- The realisation of high cooling loads due to their high induction capacity
- Draught-free room conditions due to extremely low vertical penetration depth

The requirements of EN 13779 are fulfilled with maximum temperature differences of 10 K in cooling mode and 6 K in heating mode.

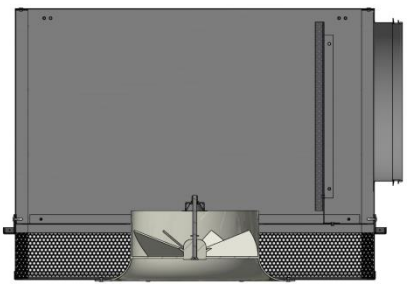
Function

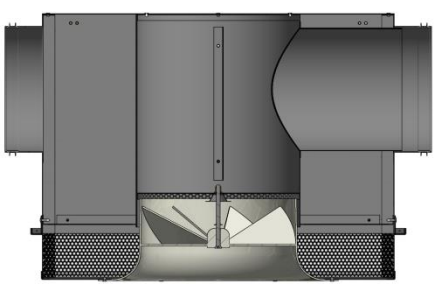
The standard versions of the MSD and MSDC, supply air into the room through 4 types SD or SDC swirl diffusers arranged to form highly inductive individual jets. Selecting the type SDC swirl diffuser with curved swirl blades further reduces both the sound power level and pressure loss of the diffuser. Sections of each swirl diffuser are deactivated to avoid an excessively high vertical penetration depth in the centre of the supply air diffuser assembly.

If a larger supply air volume flow is required, the plenum box may be equipped with an additional displacement section AKQ which allows the diffuser to deliver up to double the supply air volume flow.

Available options and sizes

SD-AKQ/1	SD-AKQ/2
…	…
…	…





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SD – AKQ
Swirl diffusers

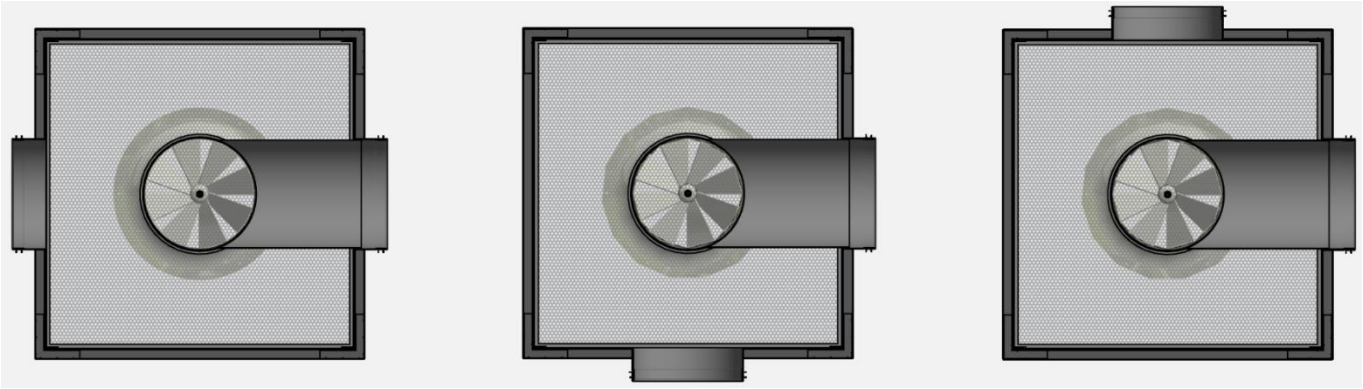
Design/Options

Swirl diffuser options
The faceplate can be fitted with either type SD swirl diffusers flat blades, or type SDC, with curved blades. The type SCD differs offers a lower pressure drop and a lower sound power level for certain sizes. The recommended product options and sizes are shown in the table below.

Design and product options
The MSD is supplied as an assembly with a plenum box and a screw-on faceplate.

The square faceplate contains four swirl diffusers of sizes DN 125, 160 or 180. Two of the swirl diffusers have a clockwise swirl direction clockwise and the other two anticlockwise. Two swirl blades are deactivated on each swirl diffuser to prevent excessive vertical penetration at the centre of the swirl diffuser. This design allows high airflow per diffuser at low ceiling heights

Figure 1: MSD swirl diffuser showing swirl direction and the deactivated sections



Type SD swirl diffuser with flat blades

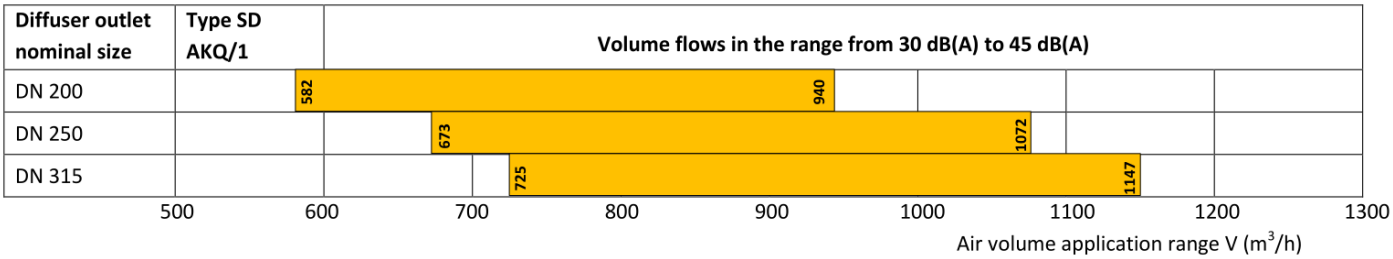
Type SDC swirl diffuser with curved blades

SD AKQ/1 and SD AKQ/2
Swirl diffusers

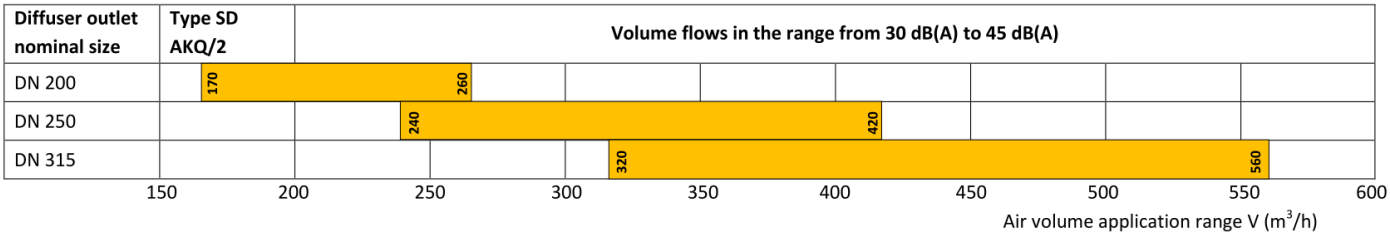
Ranges of application
Sizes and models

Section of different sizes and models by air volume

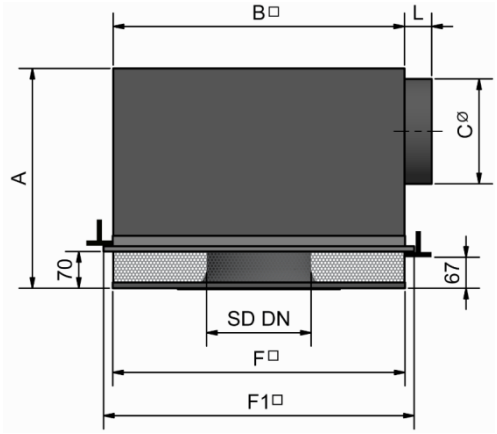
Air flow range of swirl diffuser SD AKQ/1 for size DN 200, 250 and 315



Air flow range of swirl diffuser SD AKQ/2 for size DN 200, 250 and 315



Diffuser dimensions type SD AKQ/1

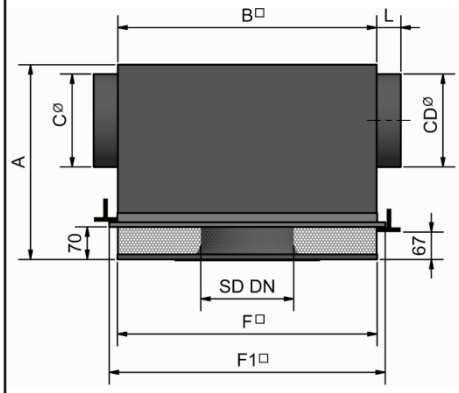


Diffuser outlet nominal size	Dimensions in mm								
	Module 600			Module 625					
	F	F_1	B	F	F_1	B	A	$C^{ø}$	L
200	560	594	557	585	619	582	420	250	60
250	560	594	557	585	619	582	450	315	60
315	560	594	557	585	619	582	450	315	60

SD – AKQ
Swirl diffusers

Design/Options

Diffuser dimensions type SD AKQ/2



Diffuser outlet nominal size	Dimensions in mm										
	Module 600			Module 625			A	Spigot swirl diffuser		Spigot displ. section	
	F	F_1	B	F	F_1	B		size	L	size	L
200	560	594	557	585	619	582	420	200	40	200	40
250	560	594	557	585	619	582	450	200	40	200	40
315	560	594	557	585	619	582	450	250	60	250	60

SD – AKQ
Swirl diffusers

Design information

Centre distances between 2 diffusers and maximum air change rates

Supply air diffuser type MSD-AK
The minimum center distances between two MSD multi swirl supply air diffusers are 40 % (max.) less than between two single SD diffusers. This means, that the maximum air change rate can be increase to 30 ach 1/h using MSD diffusers compared to 12 ach 1/h using SD diffusers, whilst still providing the same air velocity distribution in the occupied zone.

The following formula is used to determine the minimum center distance:

$$t_{min} = \sqrt{\frac{\dot{V}}{n \cdot H}} \text{ x } 0{,}6$$ with:

$\dot{V}$ = Volume flow per diffuser in m³/h
n = Maximum air change rate for standard swirl diffuser type SD in ach 1/h
H = Discharge height of the supply air diffuser in m

Supply air diffuser type MSD-AKQ
The additional displacement area allows the volume flow per diffuser to be increased by a further 80 %. The minimum center distance between two supply air diffusers is reduced 35 % to a single swirl diffuser in the same application. Consequently the maximum air change rate increases to 50 ach 1/h.

The following formula is used to determine the minimum center distance:

$$t_{min} = \sqrt{\frac{\dot{V}}{n \cdot H}} \text{ x } 0{,}5$$ with:

$\dot{V}$ = Volume flow per diffuser in m³/h
n = Maximum air change rate for standard swirl diffuser type SD in ach 1/h
H = Discharge height of the supply air diffuser in m

Comparison of flow patterns when using swirl diffusers of either type SD or SDC
The swirl diffuser type SDC has a lower sound power output and a lower pressure drop then the type SD. However the vertical penetration depth of the SDC is smaller and the horizontal throw slightly greater. This means, that the maximum air volumes are reduced by approx. 8 % when the SDC is used in place of the SD.

SD – AKQ
Swirl diffusers

Sound power level
Pressure loss

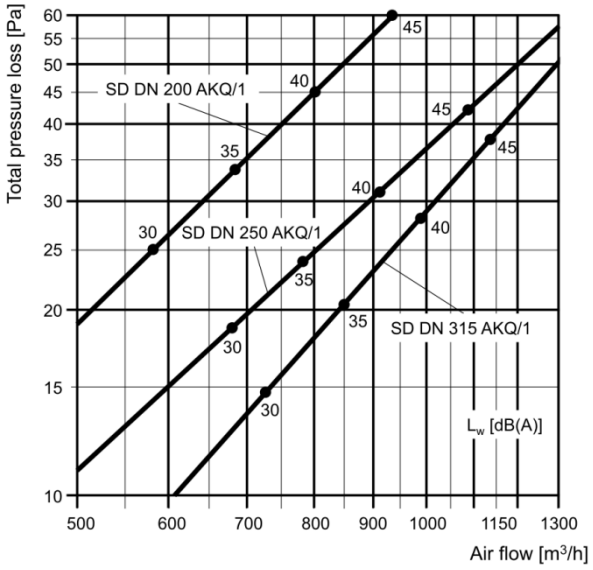


Figure 3: Sound power and pressure loss for **SD AKQ/1** size 200, 250 and 315

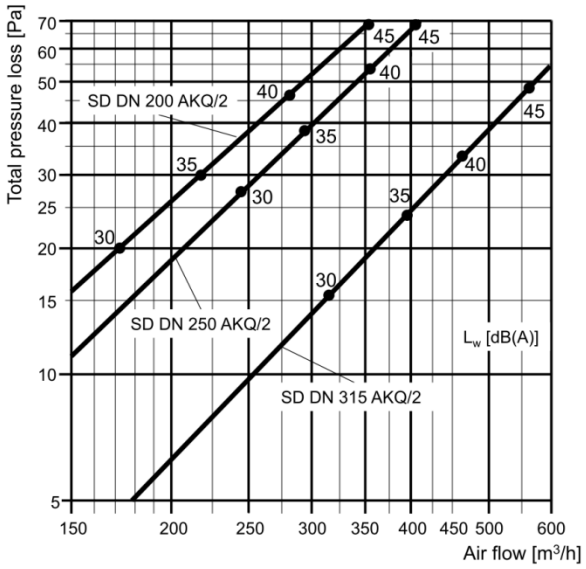


Figure 3: Sound power level and pressure loss for airflow of swirl diffuser for diffuser sizes 200, 250 and 315

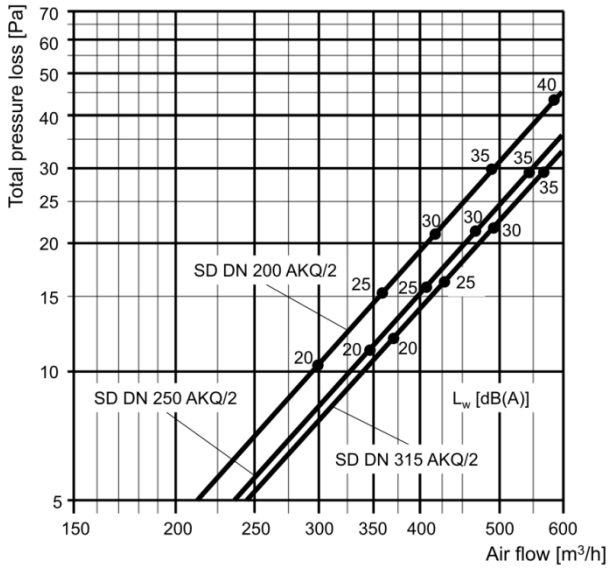


Figure 3: Sound power level and pressure loss for airflow of displacement section for diffuser sizes 200, 250 and 315

Tender text

Position	Description	No. of units	Unit price	Extended price
	MSD Multi-swirl diffuser for use as a supply air diffuser for creating an even air movement in a room using highly inductive individual jets to create the lowest temperature gradient. The swirl diffuser shall consist of a flat square diffuser plate with four integrated swirl diffusers type SD or SDC, of which two have a clockwise swirl direction and 2 have anticlockwise swirl direction. Each swirl diffuser has 2 swirl blades deactivated. The assembly shall have a plenum box made of galvanised sheet steel. The diffuser faceplate shall be attached to the cross member in the plenum box by means of an M6 central screw. Swirl diffuser Nominal size: □ DN 125 □ DN 160 □ DN 180 Swirl diffuser model: □ SD □ SDC Swirl diffuser finish: Powder coated RAL Plenum box construction: □ Without displacement section □ With displacement section MSD Plenum inlet duct connection: □ 1 spigot DN ..... □ 2 spigots DN ..... (90°/ 180° offset) Mounting type: □ Diffuser and plenum to suit modular grid size 600 / 625 mm □ Plenum in grid, swirl diffuser below grid □ Installation in smooth ceiling Surface finish of plenum box: □ Galvanised sheet steel □ Painted according to RAL Volume flow: Max. sound power level:……dB(A) Max. pressure loss Pressure loss:……Pa Manufacturer: **Strulik** Type: **Multi swirl diffuser type MSD/MSDC**			