



Circular diffuser face

Staircase swirl diffusers

SD



For installation into steps and floor areas with no foot traffic

Circular and square staircase swirl diffusers

- Nominal size 180 mm
- Volume flow rate range 10 – 25 l/s or 36 – 90 m³/h
- Diffuser face made of sheet steel, powder-coated
- For constant and variable volume flows
- For false floors and pressurised floors
- Installation into the vertical parts of steps, or into horizontal or sloping floor areas which do not carry foot traffic
- High induction results in a rapid reduction of the temperature difference and airflow velocity
- Low sound power level due to optimised air distribution inside the diffuser

Optional equipment and accessories

- Exposed diffuser face available in RAL CLASSIC colours
- Spigot
- Cross bar

General information	2	Variants	8
Function	3	Attachments	9
Technical data	5	Dimensions	10
Quick sizing	5	Product details	11
Specification text	6	Explanation	14
Order code	7		

General information

Application

- Type SD staircase swirl diffusers are primarily used as supply air diffusers for comfort conditioning applications
- For auditoriums in theatres, cinemas or concert halls
- Supply air discharge directly to the occupied zone
- Swirling air discharge, either parallel to the installation surface or angled, for mixed flow ventilation
- The efficient swirl creates high induction levels, thereby rapidly reducing the temperature difference and airflow velocity (supply air variant)
- For variable and constant volume flows
- For supply air to room air temperature differences from – 6 to +6 K
- For false floors and positive pressure plenums
- Installation into the risers of steps or into horizontal or sloping floor areas which do not carry foot traffic

Special characteristics

- High induction results in a rapid reduction of the temperature difference and airflow velocity
- Air discharge either parallel to the installation surface or angled
- Excellent air quality since the supply air is discharged directly to the occupied zone
- Installation into the risers of steps and into floor areas which do not carry foot traffic

Nominal sizes

- 180

Variants

- SD-Q-LQ: Square diffuser face, square face style
- SD-Q-LR: Square diffuser face, circular face style
- SD-R-LR: Circular diffuser face, circular face style

Parts and characteristics

- Square or circular diffuser face with four sections of blades
- Diffuser face with fixed air control blades
- Angled air discharge from diffuser fixed to cross bar
- Air discharge parallel to the installation surface from diffuser fixed to spigot
- Simple installation of the diffuser face due to central fixing screw with decorative cap

Attachments

- S: Spigot
- T: Cross bar

Construction features

- Spigot suitable for circular air ducts according to DIN EN 1506 or DIN EN 13180

Material and surfaces

- Diffuser face made of sheet steel
- Cross bar and spigot made of galvanised sheet steel
- Spigot dip coated similar to RAL 9005, black
- Exposed diffuser face powder-coated RAL 9010, pure white
- P1: Powder-coated, RAL CLASSIC colour

Standards and guidelines

- Sound power level of the air-regenerated noise measured according to DIN EN ISO 5135

Maintenance

- Low maintenance as construction and materials are not subject to wear and tear
- Inspection and cleaning according to VDI 6022

Function

Staircase swirl diffusers in air conditioning systems create a swirl to supply air to rooms. The resulting airflow induces high levels of room air, thereby rapidly reducing the airflow velocity and the temperature difference between supply air and room air.

Staircase swirl diffusers supply the air directly to the occupied zone and even to individual room occupants. The result is mixed flow ventilation for comfort zones and an excellent air quality in the occupied zone.

Type SD staircase swirl diffusers have fixed blades. Different attachments are available to influence the air pattern and adapt it

to local requirements. A spigot can be used to achieve air discharge parallel to the installation surface, while a cross bar can be used to achieve angled air discharge. The air pattern should be such that the air does not blow onto the feet of people sitting near the diffuser. If staircase swirl diffusers are placed underneath seats or vertically in the steps between seats, angled air discharge is recommended. If diffusers are placed in the steps below the seats, parallel air discharge is recommended. The supply air to room air temperature difference may range from -6 to $+6$ K.

Schematic illustration

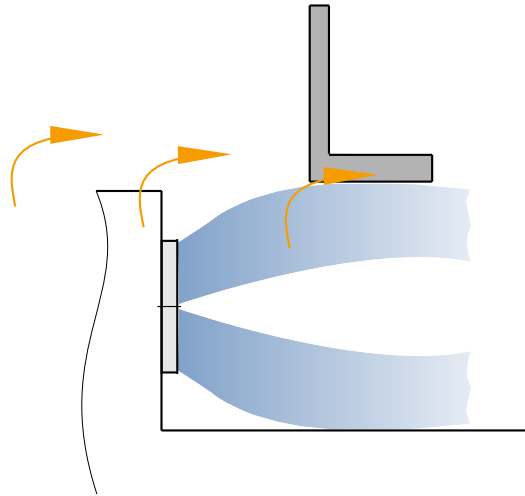


- 1 Diffuser face
- 2 Central fixing screw
- 3 Decorative cap
- 4 Seal

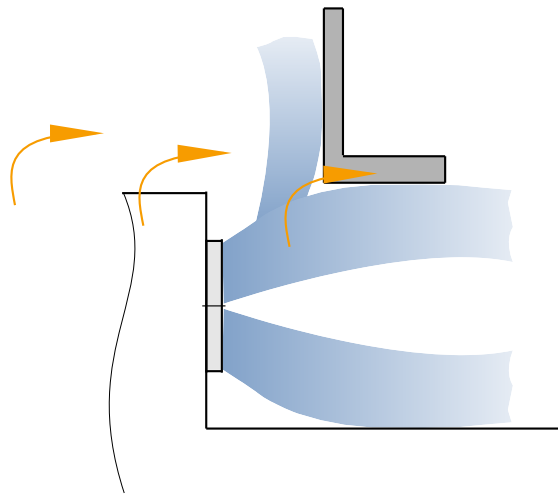
Optional

- 5 Spigot
- 6 Wood screw (three screws supplied with spigot)
- 7 Cross bar

Angled air discharge



Air discharge parallel to the installation surface



Technical data

Nominal sizes	180 mm
Minimum volume flow rate	10 l/s or 36 m ³ /h
Maximum volume flow rate	25 l/s or 90 m ³ /h
Supply air to room air temperature difference	-6 to +6 K

Quick sizing

Quick sizing tables provide a good overview of the volume flow rates and corresponding sound power levels and differential pressures.

SD-Q-LQ-S (supply air), sound power level and total differential pressure

NS	q _v [l/s]	q _v [m ³ /h]	Δp _t [Pa]	L _{WA} [dB(A)]
180	10	36	8	<15
	15	54	18	24
	20	72	33	32
	25	90	51	39

SD-Q-LQ-T (supply air), sound power level and total differential pressure

NS	q _v [l/s]	q _v [m ³ /h]	Δp _t [Pa]	L _{WA} [dB(A)]
180	10	36	3	<15
	15	54	7	21
	20	72	12	32
	25	90	19	40

SD-Q-LR-S, SD-R-LR-S (supply air), sound power level and total differential pressure

NS	q _v [l/s]	q _v [m ³ /h]	Δp _t [Pa]	L _{WA} [dB(A)]
180	10	36	9	<15
	15	54	21	25
	20	72	38	34
	25	90	59	41

SD-Q-LR-T, SD-R-LR-T (supply air), sound power level and total differential pressure

NS	q _v [l/s]	q _v [m ³ /h]	Δp _t [Pa]	L _{WA} [dB(A)]
180	10	36	4	<15
	15	54	10	25
	20	72	18	35
	25	90	27	43

Specification text

This specification text describes the general characteristics of the product. Texts for variants can be generated with our Easy Product Finder design programme.

Staircase swirl diffusers with square or circular diffuser face and fixed air control blades for swirling supply air discharge creating high induction levels. For supply air only, for comfort zones.

Installation into the vertical parts of steps, or into horizontal or sloping floor areas which do not carry foot traffic

Ready-to-install component, consisting of the diffuser face with fixed air control blades, arranged in quadrants.

The diffuser face is fixed to a cross bar or to a spigot with a central screw, concealed by a decorative cap.

Spigot, suitable for air ducts according to DIN EN 1506 or DIN EN 13180.

Sound power level of the air-regenerated noise measured according to DIN EN ISO 5135.

Special characteristics

- High induction results in a rapid reduction of the temperature difference and airflow velocity
- Air discharge either parallel to the installation surface or angled
- Excellent air quality since the supply air is discharged directly to the occupied zone
- Installation into the risers of steps and into floor areas which do not carry foot traffic

Material and surfaces

- Diffuser face made of sheet steel
- Cross bar and spigot made of galvanised sheet steel
- Spigot dip coated similar to RAL 9005, black
- Exposed diffuser face powder-coated RAL 9010, pure white
- P1: Powder-coated, RAL CLASSIC colour

Technical data

- Nominal sizes: 180 mm
- Minimum volume flow rate: 10 l/s or 36 m³ /h
- Maximum volume flow rate: 25 l/s or 90 m³ /h
- Supply air to room air temperature difference: -6 to +6 K

Sizing data

- q_v [m³/h]
- Δp_t [Pa]

Air-regenerated noise

- L_{WA} [dB(A)]



Order code

SD-Q-LQ-S/180/P1-RAL 9006

1	2	3	4	5	6

Type

SD Staircase swirl diffuser

5 Nominal size [mm]

180

2 Construction style

Q Square diffuser face

R Circular diffuser face

6 Exposed surface

No entry: powder-coated, RAL 9010 (pure white)

P1 powder-coated, specify RAL CLASSIC colour

3 Diffuser face style

LQ Square (construction style Q only)

LR circular

Gloss level

RAL 9010 GU 50

RAL 9006 GU 30

All other RAL colours GU 70

4 Fixing

S With spigot

T With cross bar

Order example: SD-Q-LQ-S/180/P1-RAL9006

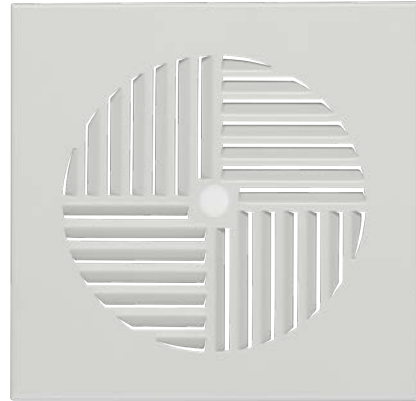
Type	SD
Construction style	Square diffuser face
Perforation pattern	square
Fixing	with spigot
Nominal size [mm]	180
Exposed surface	powder-coated, RAL 9006 (white aluminium)

Variants

SD-Q-LQ



SD-Q-LR



SD-R-LR



Attachments

SD-..._S

Attachment

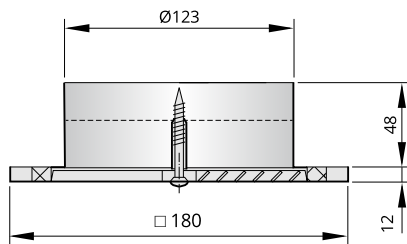
- Spigot

SD-...-T

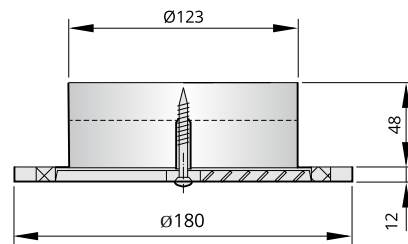
Attachment

- Cross bar

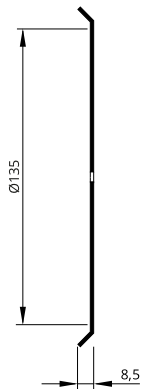
SD-Q-L*-S



SD-R-LR-S

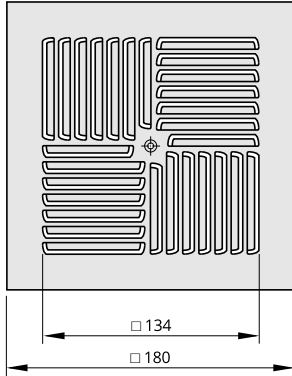


SD-...-T

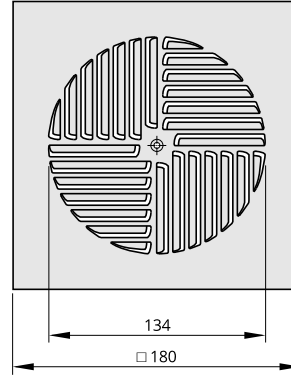


Dimensions

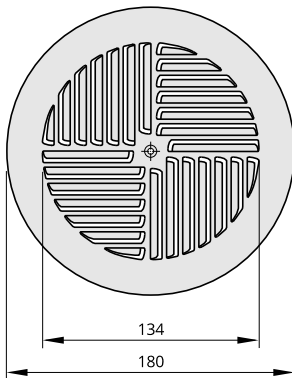
SD-Q-LQ



SD-Q-LR



SD-R-LR



SD

Product variant	m [kg]
SD-Q-LQ	0.3
SD-Q-LR	0.3
SD-R-LR	0.3

Product variant	A _{eff} [m ²]
SD-Q-LQ	0.00445
SD-Q-LR	0.00354
SD-R-LR	0.00354

Product details

SD-Q-LQ, installation into steps



SD-Q-LR, installation into steps



SD-R-LR, installation into steps

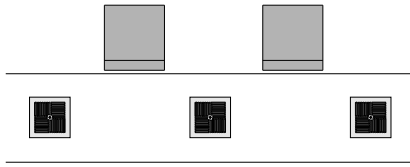


Installation and commissioning

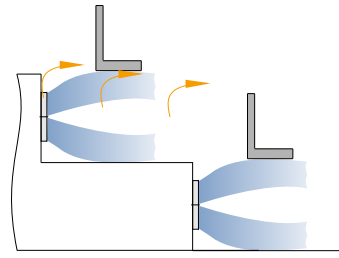
- Flush installation into vertical, horizontal or sloping surfaces which do not carry foot traffic
- Installation with cross bar results in angled air discharge
- Installation with spigot results in parallel air discharge

The schematic diagrams are provided to illustrate installation details.

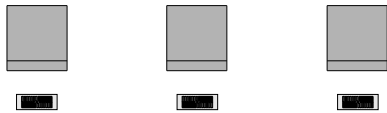
Installation between chairs, angled air discharge



Installation into of steps, angled air discharge

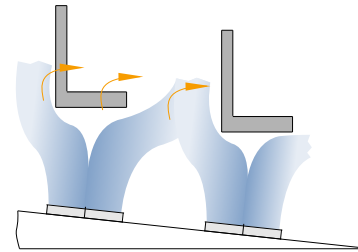


Installation underneath chairs, angled air discharge

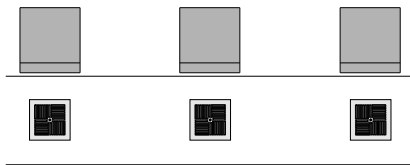


Installation with cross bar

Installation into floor surfaces which do not carry foot traffic, angled air discharge

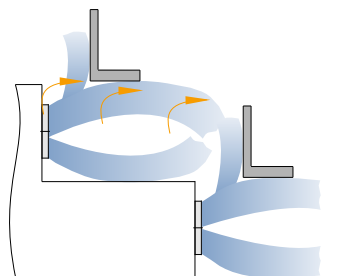


Installation underneath chairs, air discharge parallel to the installation surface



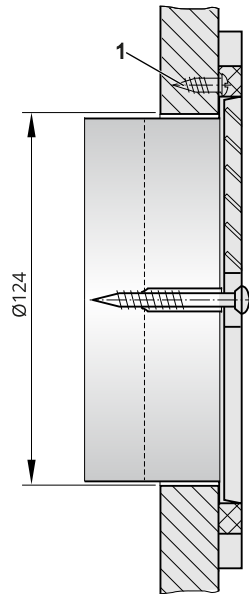
Installation with cross bar

Installation into steps, air discharge parallel to the installation surface



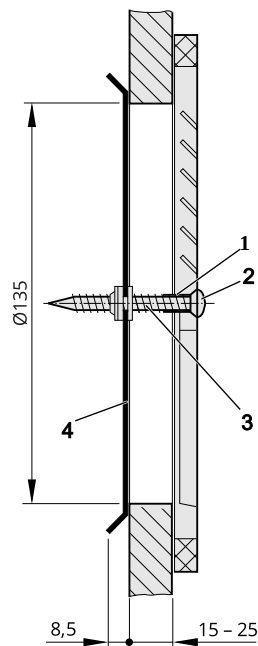
Installation with spigot

Installation opening with spigot



1 Fastening the spigot to the installation surface

Installation opening with cross bar



- 1 Tube
- 2 Decorative cap
- 3 Central fixing screw
- 4 Cross bar



Explanation

L_{WA} [dB(A)]

A-weighted sound power level of air-regenerated noise

q_v [m³/h]; [l/s]

Volume flow rate

Δt_z [K]

Supply air to room air temperature difference, i.e. supply air temperature minus room temperature

Δp_t [Pa]

Total differential pressure

A_{eff} [m²]

Effective air discharge area

All sound power levels are based on 1 pW.

Lengths

All lengths are given in millimetres [mm] unless stated otherwise.