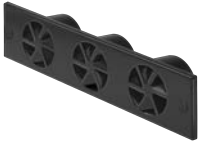
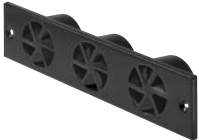


# Staircase swirl diffusers

## SDRF



Fixing screws concealed with decorative caps



Screw fixing



Spring clip fixing

### Compact height, ideal for steps

Circular and rectangular staircase swirl diffusers

- Nominal sizes with 1 to 6 outlets
- Volume flow rate range 2 – 25 l/s or 7 – 90 m<sup>3</sup>/h
- Diffuser face made of sheet steel, powder-coated
- For constant and variable volume flows
- For false floors as pressurised floors
- Installation into the risers of steps
- Visible screw fixing
- 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
- Spring clip fixing (concealed)

General information	2	Order code	9
Function	3	Variants	10
Technical data	7	Dimensions	11
Quick sizing	7	Product details	13
Specification text	8	Explanation	16

## General information

### Application

- Type SDRF 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 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 designed as positive pressure plenums
- Installation into the risers of steps

### Special characteristics

- High induction results in a rapid reduction of the temperature difference and airflow velocity
- Air discharge parallel to the installation surface
- Excellent air quality since the supply air is discharged directly to the occupied zone
- Vertical installation into steps

### Nominal sizes

- No. of outlets: 1, 2, 3, 4, 5, 6

### Variants

- SDRF-K: Spring clip fixing
- SDRF-S: Screw fixing

### Parts and characteristics

- Circular diffuser face with one outlet
- Rectangular diffuser face with two to six outlets
- Outlets with fixed blades and with flow-optimising cup; cup with perforated rear plate used as a damper element to improve air distribution if there are several outlets
- Fixing screws (with decorative caps) facilitate installing the diffuser face
- Optional spring clip fixing

### Material and surfaces

- Diffuser face made of sheet steel
- Flow cup made of ABS plastic, UL 94, V-0, flame retardant
- Flow cup similar to RAL 9005, black
- Exposed diffuser face powder-coated, RAL 9005, jet black
- 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

### Functional description

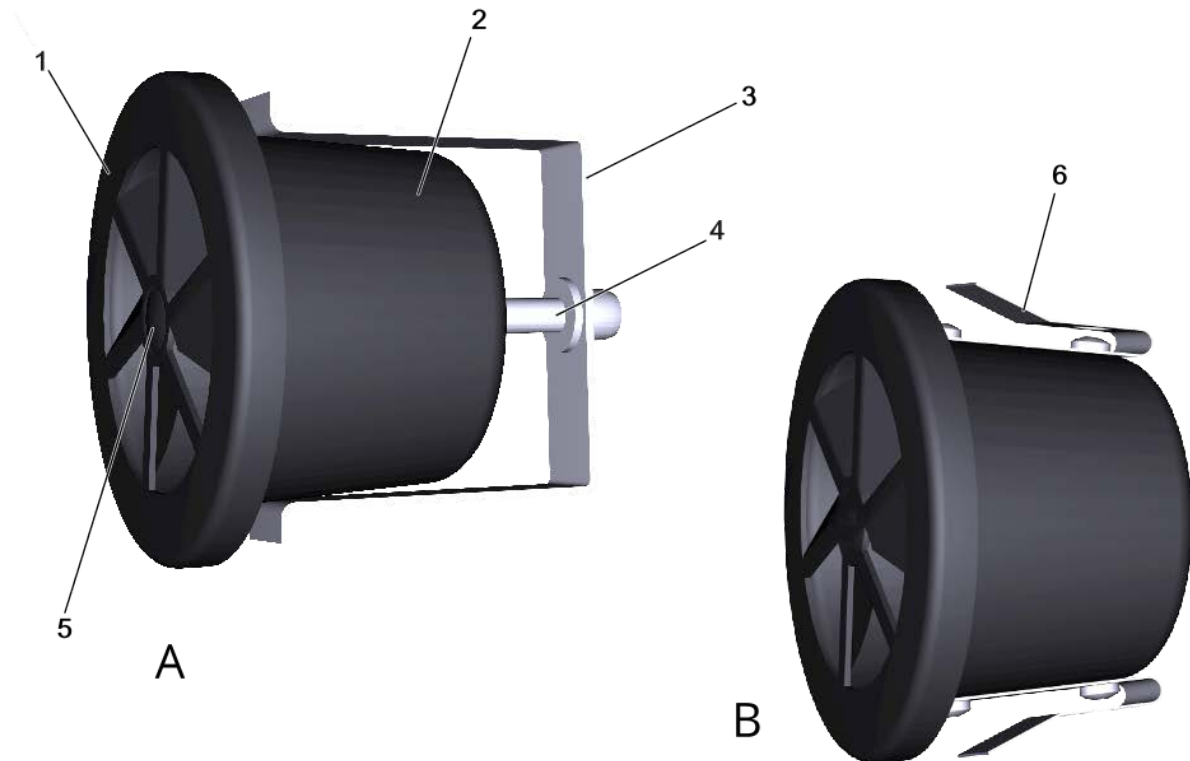
Staircase swirl diffusers in air conditioning systems create a swirl to supply air to rooms. The resulting airflow induces high levels of room air, thereby rapidly reducing the airflow velocity and the temperature difference between supply air and room air.

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 SDRF staircase swirl diffusers have fixed blades. Air discharge parallel to the installation surface. The supply air to room air temperature difference may range from  $-6$  to  $+6$  K.

### Schematic illustration, SDRF/1



A SDRF-S

B SDRF-K

1 Diffuser face

2 Flow cup

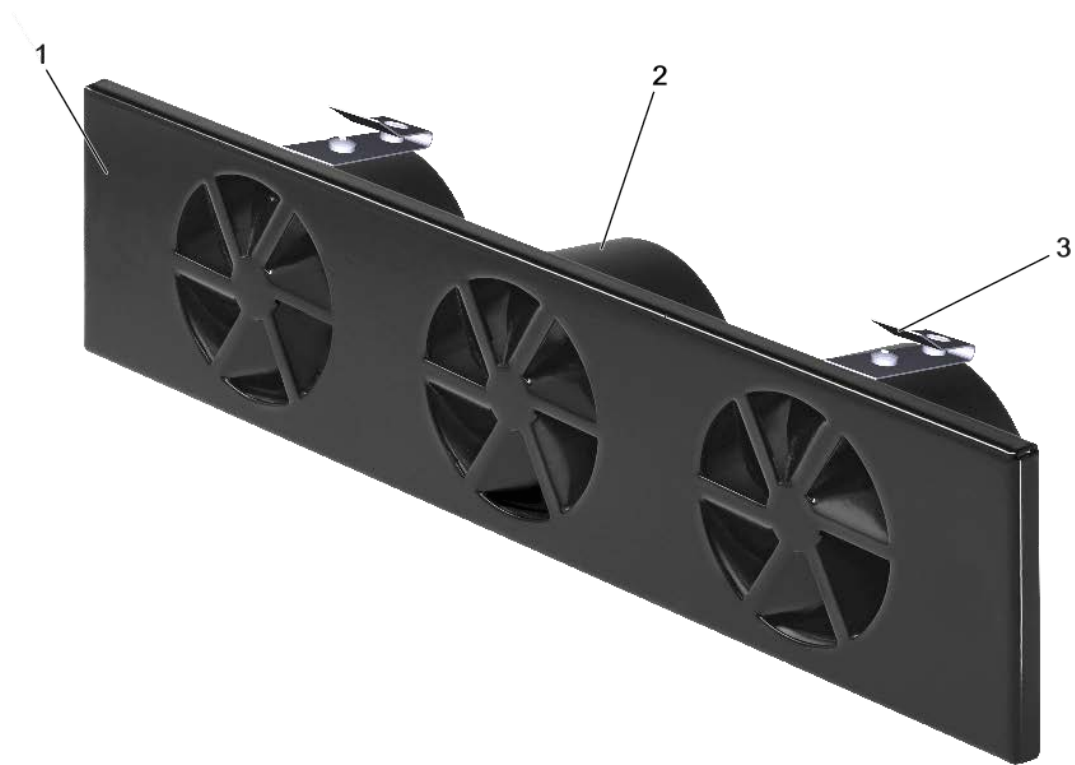
3 Cross bar

4 Central fixing screw

5 Decorative cap

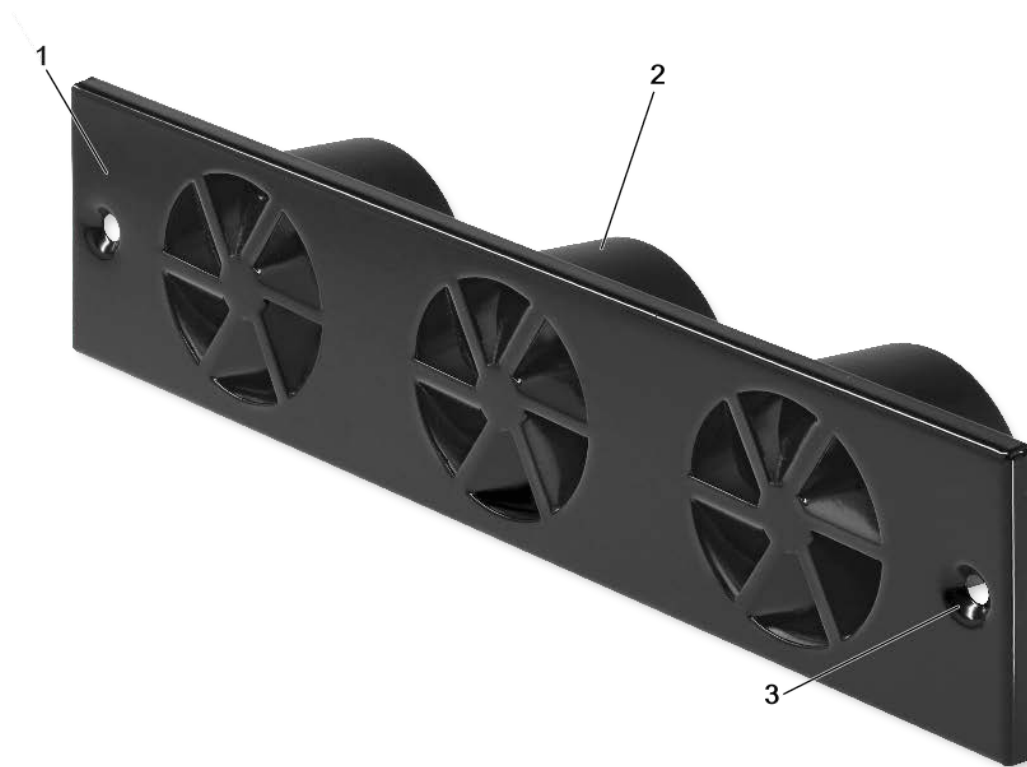
6 Spring clip

## Schematic illustration, SDRF-K



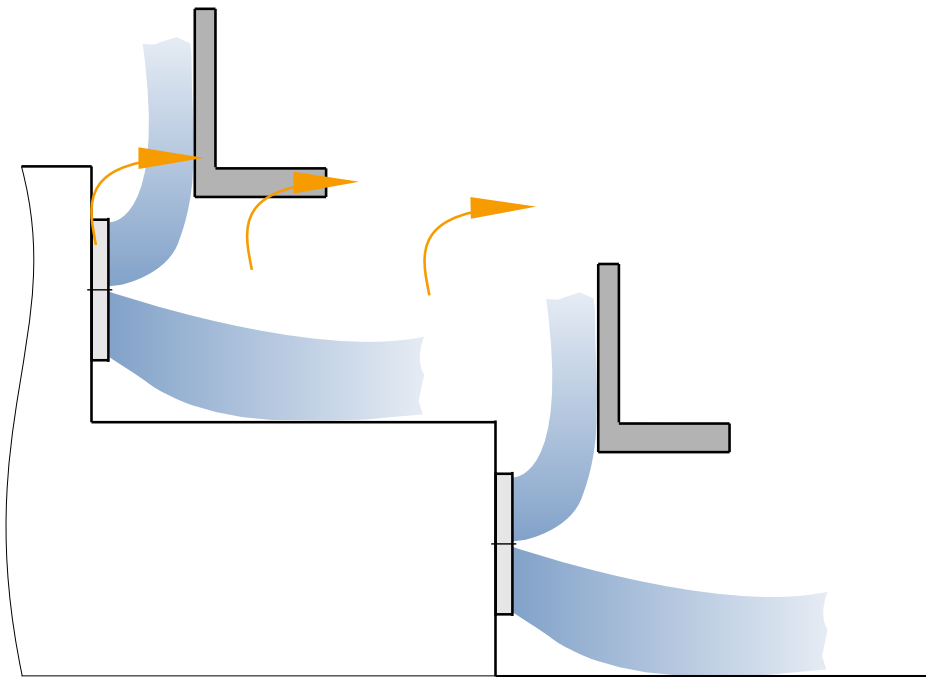
- 1 Diffuser face
- 2 Flow cup
- 3 Spring clip

## Schematic illustration, SDRF-S



- 1 Diffuser face
- 2 Flow cup
- 3 Fixing hole

Air discharge parallel to the installation surface



## Technical data

Nominal sizes	1, 2, 3, 4, 5, 6 outlets
Minimum volume flow rate	2 – 12 l/s or 7 – 43 m <sup>3</sup> /h
Maximum volume flow rate	5 – 25 l/s or 18 – 90 m <sup>3</sup> /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.

### SDRF, sound power level and total differential pressure

NS	q <sub>v</sub> [l/s]	q <sub>v</sub> [m <sup>3</sup> /h]	Δp <sub>t</sub> [Pa]	L <sub>WA</sub> [dB(A)]
1	2	7	6	<15
	3	11	14	24
	4	14	25	33
	5	18	39	39
2	7	25	9	22
	9	32	18	31
	10	36	30	38
	14	50	37	41
3	6	22	7	19
	8	29	12	26
	12	43	27	37
	14	50	37	41
4	8	29	7	<15
	12	43	15	29
	14	50	20	33
	18	65	33	41
5	10	36	6	17
	12	43	9	22
	16	58	16	31
	20	72	25	38
6	12	43	6	<15
	16	58	10	23
	20	72	16	31
	25	90	25	38

### Sizing example

#### Given data

q<sub>v</sub> = 15 l/s (54 m<sup>3</sup>/h)

Staircase swirl diffuser

Maximum sound power level 35 dB(A)

#### Quick sizing

Type SD

Possible variants: SD-Q-LQ, SD-Q-LR

Type SDRF

Possible nominal sizes: SDRF/4, SDRF/5

Selected: SDRF/4

## 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.

### Specification text

Staircase swirl diffusers with rectangular or circular diffuser face and fixed air control blades for swirling supply air discharge creating high induction levels. For supply air diffuser in comfort zones. For installation into the risers of steps.

Ready-to-install component which consists of a diffuser face with one to six outlets. Each outlet with radially arranged fixed blades and a flow cup with fixed damper element.

Screw fixing of the diffuser face, concealed by a decorative cap or spring clip fixing.

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 parallel to the installation surface
- Excellent air quality since the supply air is discharged directly to the occupied zone
- Vertical installation into steps

### Material and surfaces

- Diffuser face made of sheet steel
- Flow cup made of ABS plastic, UL 94, V-0, flame retardant
- Flow cup similar to RAL 9005, black
- Exposed diffuser face powder-coated, RAL 9005, jet black
- P1: Powder-coated, RAL CLASSIC colour

### Technical data

- Nominal sizes: 1, 2, 3, 4, 5 or 6 outlets
- Minimum volume flow rate: 2 – 12 l/s or 7 – 43 m<sup>3</sup> /h
- Maximum volume flow rate: 5 to 25 l/s or 18 to 90 m<sup>3</sup> /h
- Supply air to room air temperature difference: –6 to +6 K

### Sizing data

- $q_v$  [m<sup>3</sup>/h]
- $\Delta p_t$  [Pa]

Air-regenerated noise

- $L_{WA}$  [dB(A)]





Order code

SDRF – K / 3 / P1 - RAL 9010

| | | |  
1 2 3 4

**1 Type**

**SDRF** Staircase swirl diffuser

**2 Fixing**

**K** with spring clips

**S** with screws

**3 Number of outlets**

**1 – 6**

**4 Exposed surface**

No entry: powder-coated, RAL 9005 (jet black)

**P1** powder-coated, specify RAL CLASSIC colour

Gloss level

RAL 9010 GU 50

RAL 9006 GU 30

All other RAL colours GU 70

**Order example: SDRF-K/3/P1-RAL9010**

Type

SDRF – Staircase swirl diffuser

Fixing

with spring clips

Number of outlets

3

Exposed surface

powder-coated, RAL 9010 (pure white)

## Variants

SDRF-K/1



SDRF-K/2



SDRF-K/3



SDRF-K/4



SDRF-K/5

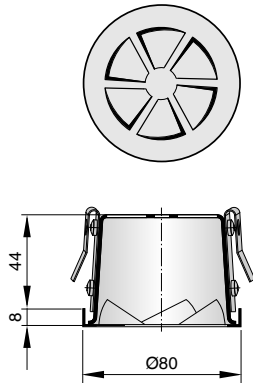


SDRF-K/6

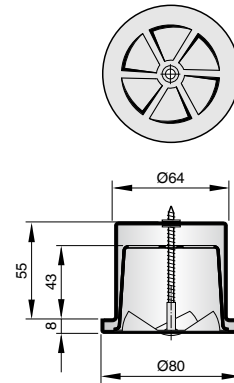


## Dimensions

**SDRF-K/1**



**SDRF-S/1**



**SDRF-\*/1**

	m [kg]
NS	
1	0.1

**SDRF-K (nominal size 2 – 6)**

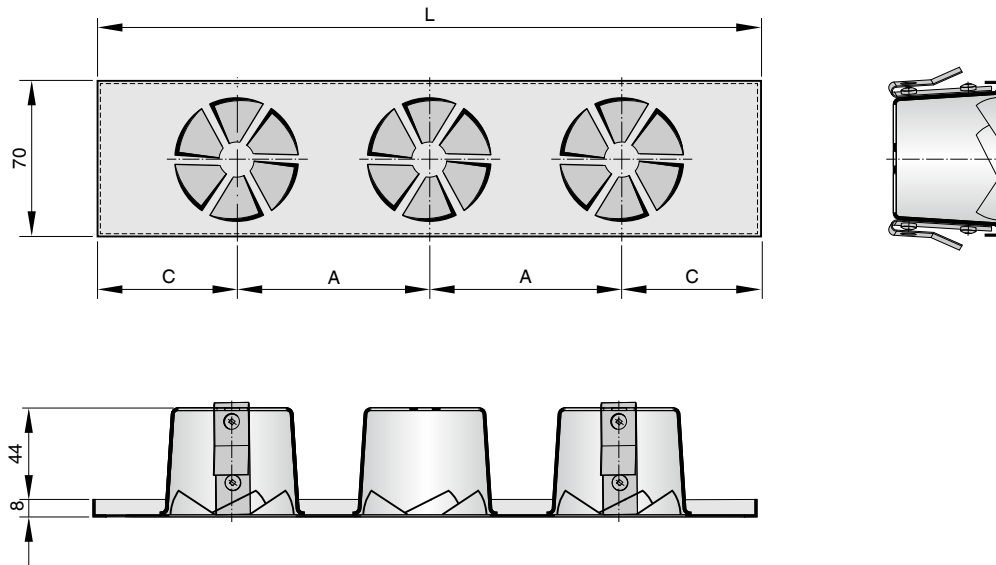


Illustration shows SDRF-K/3

**SDRF-S (nominal size 2 to 6)**

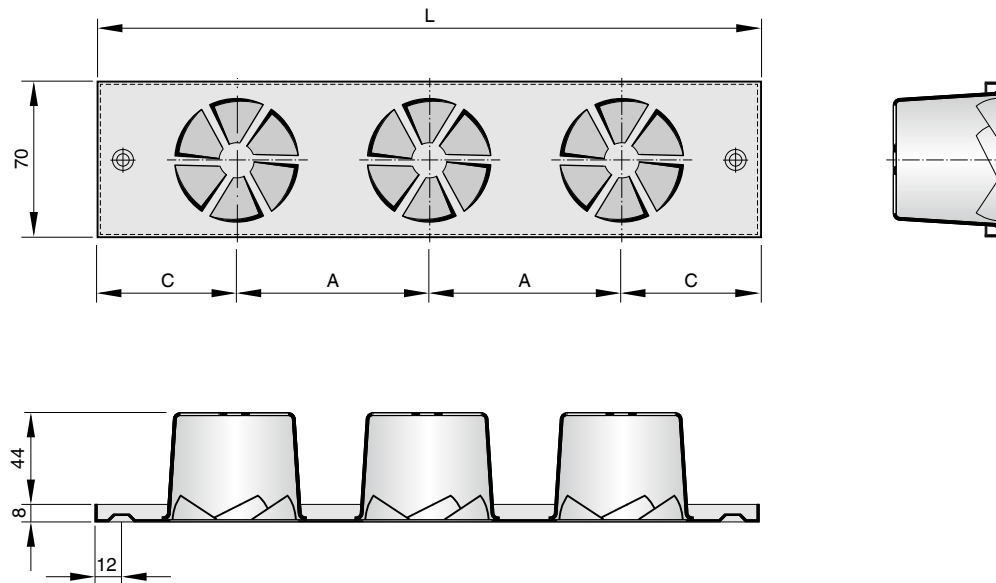


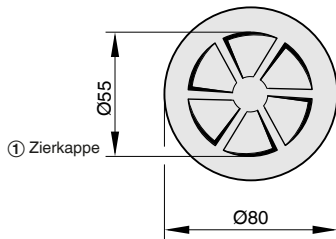
Illustration shows SDRF-S/3

**SDRF**

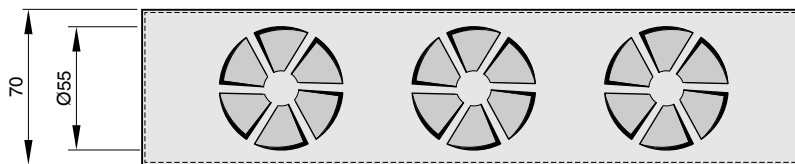
NS	L	A	C	m [kg]
2	200	74	63	0.15
3	300	87	63	0.25
4	400	86	71	0.35
5	500	92	66	0.45
6	500	74	65	0.5

Product details

Diffuser face of SDRF-\*/1



Diffuser face SDRF-\* (nominal sizes 2 to 6)



SDRF

NS	$A_{eff}$ [m <sup>2</sup> ]
1	0.000626
2	0.001252
3	0.001878
4	0.002504
5	0.00313
6	0.003756

SDRF-1, vertical installation into steps



SDRF-3, vertical installation into steps



**Installation and commissioning**

- Flush installation into vertical surfaces
- Installation with screw fixing or spring clip fixing

The schematic diagrams are provided to illustrate installation details.

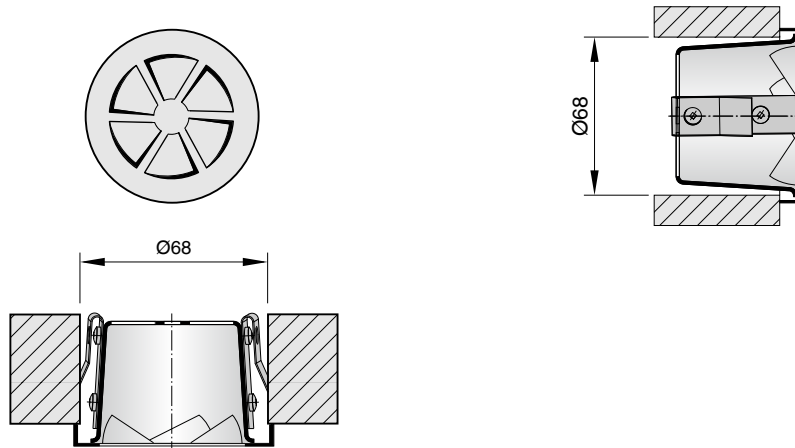
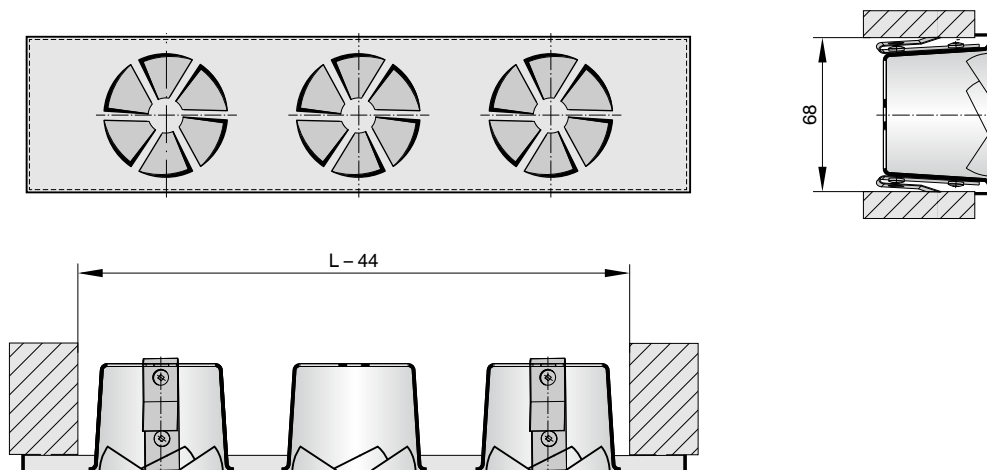
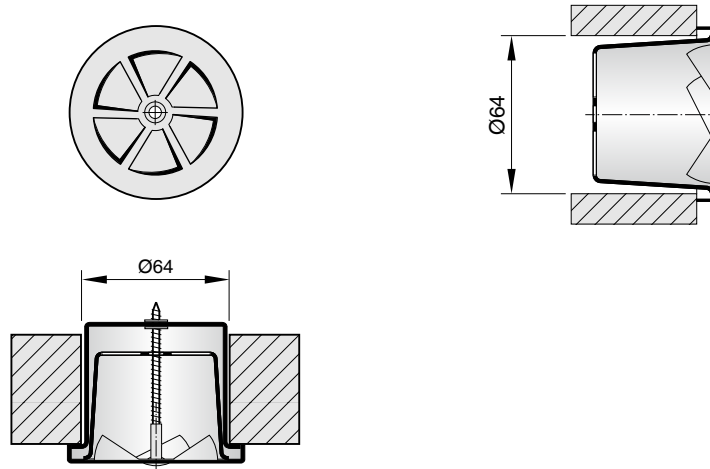
**SDRF-K/1, vertical installation into steps****SDRF-K, vertical installation into steps**

Illustration shows SDRF-K/3

**SDRF-S/1, vertical installation into steps**



**SDRF-S (nominal sizes 2 to 6), vertical installation into steps**

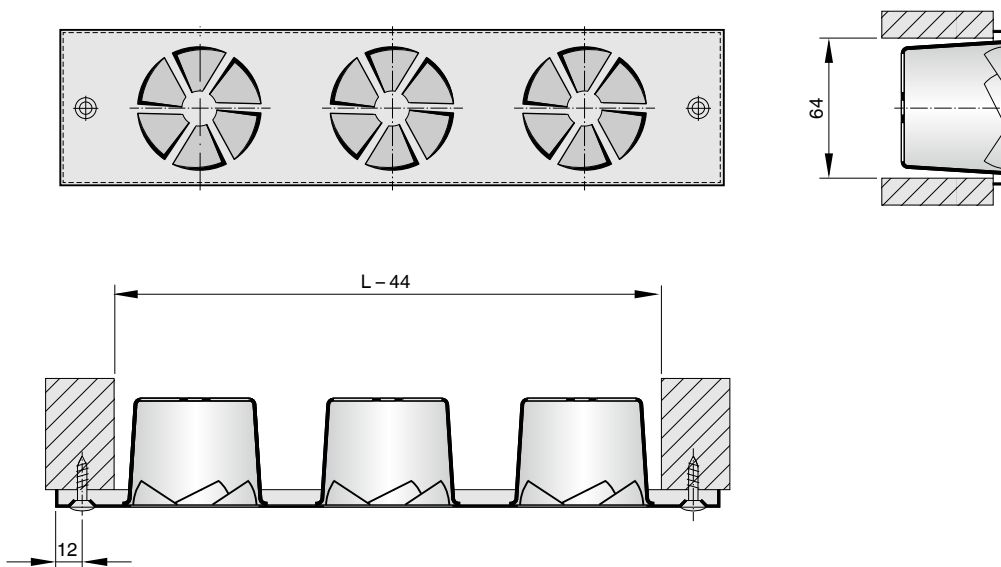


Illustration shows SDRF-S/3



## Explanation

$L_{WA}$  [dB(A)]

A-weighted sound power level of air-regenerated noise

$q_v$  [m<sup>3</sup>/h]; [l/s]

Volume flow rate

$\Delta t_z$  [K]

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

$\Delta p_t$  [Pa]

Total differential pressure

$A_{eff}$  [m<sup>2</sup>]

Effective air discharge area

All sound power levels are based on 1 pW.

### Lengths

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