



Square face style with square plenum box



Circular face style with circular plenum box



Circular swirl diffuser with spigot for connection to a vertical duct



Gently sloped, flat border (shown in a continuous ceiling)



Three-dimensional blade contour

# Ceiling diffusers

## AIRNAMIC



### For the most demanding requirements of technical function, comfort, and design

Circular and square ceiling swirl diffusers with fixed air control blades, for high volume flow rates at low sound power levels and low differential pressure due to innovative polymer technology

- Nominal sizes 160, 250, 300, 400, 600, 625
- Volume flow rate range 5 – 385 l/s or 16 – 1386 m<sup>3</sup>/h
- Plastic diffuser face with overlapping, three-dimensionally contoured blades, for the most efficient swirl and high induction
- For supply and extract air
- For variable and constant volume flows
- For all types of ceiling systems, and with an extended border also suitable for freely suspended installation
- Diffuser face with gently sloped, flat border – only 3 mm high
- Plenum box with acoustically optimised and lockable damper blade
- Spigot for nominal sizes 160 and 250 allows for quick, simple and direct connection to the ductwork
- Diffuser face with bayonet fixing (no tools required) available for nominal size 160 or 250 and with a spigot

#### Optional equipment and accessories

- Exposed diffuser face available in RAL CLASSIC colours

General information	2	Order code	9
Function	3	Variants	10
Technical data	6	Dimensions	12
Quick sizing	6	Product details	15
Specification text	8	Nomenclature	19

## General information

### Application

- Ceiling swirl diffusers are used as supply air or extract air diffusers for comfort zones
- Attractive design element for building owners and architects with demanding aesthetic requirements
- Horizontal swirling supply 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 -12 – +10 K
- For room heights up to 4 m (lower edge of suspended ceiling)
- For all types of ceiling systems
- With an extended border also suitable for freely suspended installation (supply air variant)

### Special characteristics

- Plastic diffuser face with overlapping, three-dimensionally profiled blades, for the most efficient swirl and high induction
- For all types of ceiling systems, and with an extended border also suitable for freely suspended installation
- Diffuser face with gently sloped, flat border – only 3 mm high
- Plenum box with side entry spigot, for supply air, with an optimised equalising element that ensures a uniform airflow through the diffuser face
- Vertical spigot for nominal sizes 160 and 250
- Diffuser face with bayonet fixing (no tools required) available for nominal size 160 or 250 and with a spigot

### Nominal sizes

- Q: 300L, 300H, 600, 625
- R: 160, 250, 400L, 400H, 600

### Variants

- AIRNAMIC-Q: square diffuser face with rectangular plenum box (nominal sizes 300, 600 and 625)
- AIRNAMIC-R: circular diffuser face with circular plenum box (nominal sizes 250, 400 and 600) or spigot (nominal sizes 160 and 250)
- AIRNAMIC-\*-Z: Supply air
- AIRNAMIC-\*-A: Extract air

### Connection

- Horizontal duct connection

- Vertical (direct) duct connection

### Construction features

- Spigot suitable for circular ducts to EN 1506 or EN 13180
- Square plenum boxes with horizontal spigot for nominal sizes 300, 300L, 600H and 625
- Spigot made of black ABS
  - Spigots are fitted with a groove for a lip seal
  - Lip seal and damper blade are factory fitted
  - Plenum box for supply air, with an optimised equalising element that ensures a uniform airflow through the diffuser face
  - Simple installation of the diffuser face due to central fixing screw with cap

Circular plenum boxes with horizontal spigot for nominal sizes 250, 400L, 400H and 600

- Spigot made of black ABS
- Spigots are fitted with a groove for a lip seal
- Retrofitting of the lip seal is possible at a later stage
- Damper blade and lip seal (optional) are factory fitted
- Plenum box for supply air, with an optimised equalising element that ensures a uniform airflow through the diffuser face
- Simple installation of the diffuser face due to central fixing screw with cap

Spigot for nominal sizes 160 and 250 and vertical connection to the ductwork

- Spigot made of black ABS
- Diffuser face fixing with bayonet, no tools required
- Particularly suitable for installation into continuous ceilings

### Materials and surfaces

- Diffuser face, spigot and damper blade made of ABS plastic, UL 94, V-0, flame retardant
- Plenum box and cross bar made of galvanised sheet steel
- Equalising element made of polyester
- Diffuser face coated RAL 9010, pure white
- P1: Painted, RAL CLASSIC colour

### Standards and guidelines

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

### Maintenance

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

## Function

Ceiling 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. Ceiling swirl diffusers allow for large volume flow rates. The result is a mixed flow ventilation in comfort zones, with good overall room ventilation, creating only very little turbulence in the occupied zone.

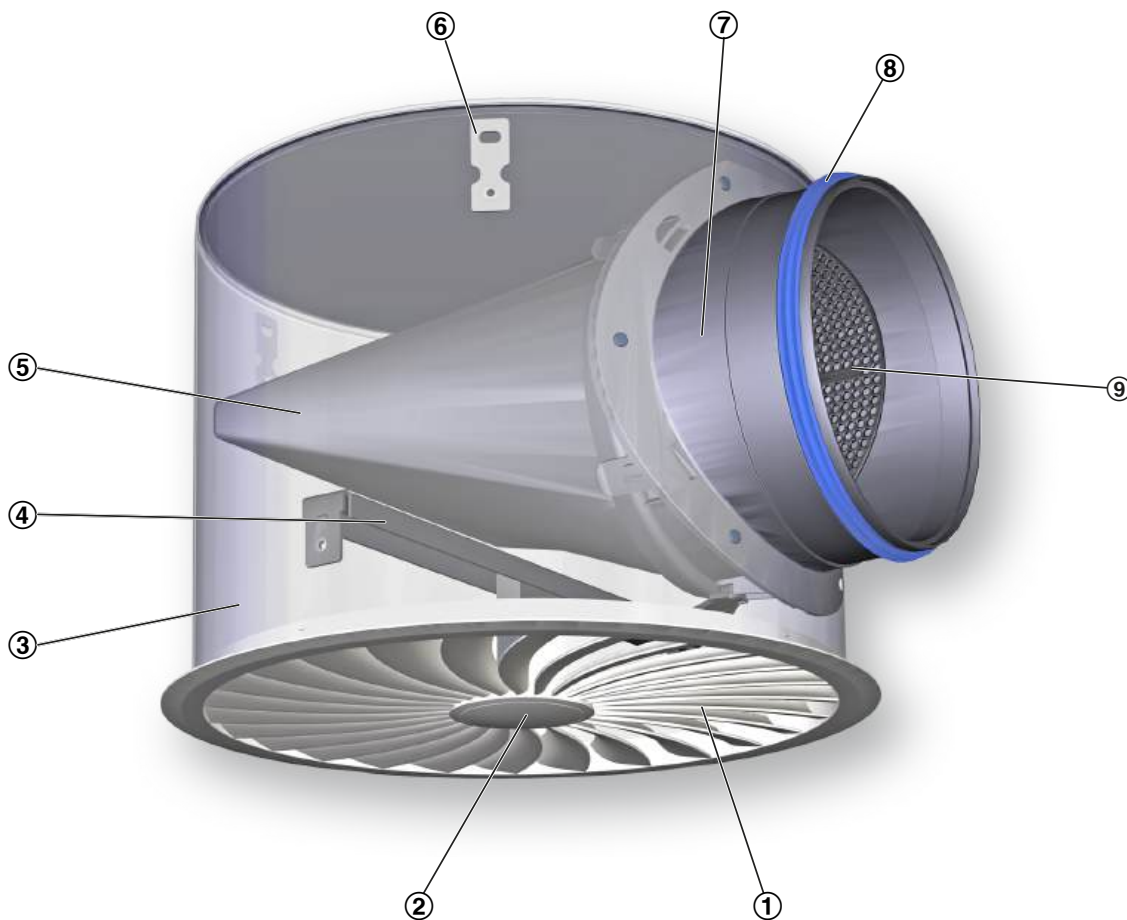
Type AIRNAMIC ceiling swirl diffusers have fixed blades with three-dimensionally profiled contours. This allows for high volume

flow rates and low sound power levels. The supply air to room air temperature difference can range from -12 to +10 K.

A damper blade simplifies volume flow rate balancing for commissioning.

To give rooms an aesthetic, uniform look, Type AIRNAMIC diffusers may also be used for extract air. There is then no equalising element.

### Schematic illustration of AIRNAMIC, with plenum box for horizontal duct connection



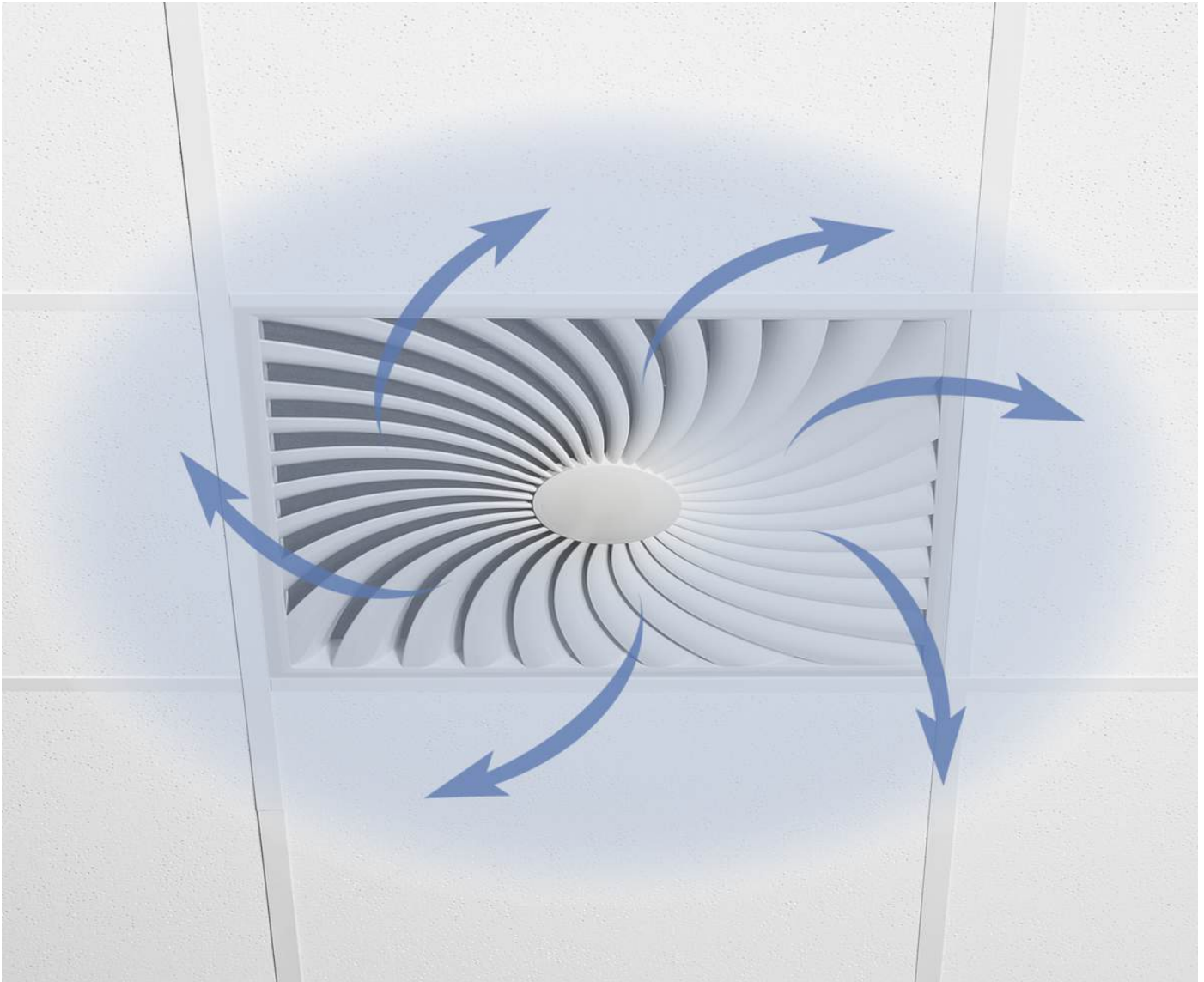
- 1 Diffuser face
- 2 Central fixing screw with decorative cap
- 3 Plenum box
- 4 Cross bar
- 5 Equalising element (Z: for supply air)
- 6 Suspension lug
- 7 Spigot
- 8 Double lip seal
- 9 Damper blade for volume flow rate balancing

Schematic illustration of AIRNAMIC with spigot for connection to a vertical duct



- 1 Diffuser face
- 2 Bayonet fixing
- 3 Spigot
- 4 Screw fixing of the spigot

Horizontal omni directional air discharge



## Technical data

Nominal sizes	160, 250, 300, 400, 600, 625 mm
minimum volume flow rate, with $\Delta t_z = -6$ K	5 – 76 l/s or 16 – 274 m <sup>3</sup> /h
maximum volume flow rate, at $L_{WA} \cong 50$ dB(A)	44 – 385 l/s or 159 – 1386 m <sup>3</sup> /h
Supply air to room air temperature difference	-12 – 10 K

## Quick sizing

The quick sizing tables give a good overview of the volume flow rates and the corresponding sound power levels and differential pressures. The minimum volume flow rates apply to a supply air to room air temperature difference of -6 K. The maximum volume flow rates apply to a sound power level of approx. 50 dB (A) with damper blade position 0°. Exact values for all parameters can be determined with our Easy Product Finder design program.

### AIRNAMIC-Q-Z-H (supply air) sound power level and total differential pressure

NS	$q_v$ [l/s]	$q_v$ [m <sup>3</sup> /h]	0°		45°		90°	
			$\Delta p_t$ [Pa]	$L_{WA}$ [dB(A)]	$\Delta p_t$ [Pa]	$L_{WA}$ [dB(A)]	$\Delta p_t$ [Pa]	$L_{WA}$ [dB(A)]
300L	13	47	1	<15	2	<15	2	<15
300L	40	144	9	24	16	24	23	24
300L	68	245	27	37	45	38	65	39
300L	95	342	539	50	89	51	127	51
300H	16	58	1	<15	2	<15	4	<15
300H	55	198	15	22	27	24	41	27
300H	90	324	41	37	72	39	111	42
300H	130	468	86	50	150	51	232	54
600, 625	76	274	3	<15	7	<15	13	18
600, 625	180	648	18	24	41	31	72	41
600, 625	285	1026	44	40	102	47	180	58
600, 625	385	1386	80	50	185	59	329	71

0°, 45°, 90°: Damper blade position

### AIRNAMIC-R-Z-H (supply air), sound power level and total differential pressure

NG	$q_v$ [l/s]	$q_v$ [m <sup>3</sup> /h]	0°		45°		90°	
			$\Delta p_t$ [Pa]	$L_{WA}$ [dB(A)]	$\Delta p_t$ [Pa]	$L_{WA}$ [dB(A)]	$\Delta p_t$ [Pa]	$L_{WA}$ [dB(A)]
250	12	42	2	<15	2	<15	2	<15
250	42	152	20	29	25	29	32	29
250	73	262	59	42	75	42	95	42
250	103	373	119	50	151	50	191	50
400L	17	61	1	<15	1	<15	2	<15
400L	55	198	9	25	14	25	20	29
400L	95	342	27	38	41	39	59	41
400L	135	486	55	50	82	51	118	52
400H	24	86	1	<15	2	<15	4	<15
400H	75	270	14	26	21	28	34	28
400H	130	468	41	40	64	40	101	44
400H	180	648	79	50	123	50	193	54
600, 625	57	205	2	<15	4	<15	8	<15
600, 625	160	576	17	27	35	28	60	36
600, 625	265	954	47	40	97	45	163	54
600, 625	365	1314	89	50	185	58	310	66

0°, 45°, 90°: Damper blade position



**AIRNAMIC-R-Z-V (supply air), sound power level and total differential pressure**

NS	qv [l/s]	qv [m³/h]	Δp <sub>t</sub> [Pa]	LWA [dB(A)]
160	5	16	1	<15
160	18	64	13	26
160	31	111	39	40
160	44	159	80	50
250	12	42	1	<15
250	44	159	11	24
250	77	277	33	40
250	109	394	68	50

## Specification text

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

### Specification text

Ceiling swirl diffusers with square or circular diffuser face, for comfort zones with particularly demanding requirements of aesthetics and design. Supply air and extract air variants. Excellent aerodynamic and acoustic function due to air control blades with optimised aerofoil contours, for horizontal swirling air discharge, creating high levels of induction. For installation into all types of suspended ceilings. Ready-to-install component that consists of a diffuser face with either a plenum box or a spigot. Plenum box with horizontal spigot, cross bar and either drilled holes or suspension lugs, with a damper blade for volume flow rate balancing and a lip seal on the spigot, supply air spigot with equalising element. Alternatively, spigot for nominal sizes 160 and 250 for the direct connection to ductwork, diffuser face fixing without any tools. The diffuser face can be fixed to the cross bar with a central screw, concealed with a cap. Spigots are suitable for ducting according to EN 1506 or EN 13180. Sound power level of the air-regenerated noise measured according to EN ISO 5135.

### Special characteristics

- Plastic diffuser face with overlapping, three-dimensionally profiled blades, for the most efficient swirl and high induction
- For all types of ceiling systems, and with an extended border also suitable for freely suspended installation
- Diffuser face with gently sloped, flat border – only 3 mm high
- Plenum box with side entry spigot, for supply air, with an optimised equalising element that ensures a uniform airflow through the diffuser face
- Vertical spigot for nominal sizes 160 and 250
- Diffuser face with bayonet fixing (no tools required) available for nominal size 160 or 250 and with a spigot

### Materials and surfaces

- Diffuser face, spigot and damper blade made of ABS plastic, UL 94, V-0, flame retardant
- Plenum box and cross bar made of galvanised sheet steel
- Equalising element made of polyester
- Diffuser face coated RAL 9010, pure white
- P1: Painted, RAL CLASSIC colour

### Technical data

- Nominal size: 160, 250, 300, 400, 600, 625 mm
- Minimum volume flow rate, with  $\Delta t_z = -6 \text{ K}$ : 5 – 76 l/s or 16 – 102 m<sup>3</sup>/h
- Maximum volume flow rate, with LWA  $\cong 50 \text{ dB(A)}$ : 44 – 385 l/s or 159 – 1386 m<sup>3</sup>/h
- Supply air to room air temperature difference: -12 to +10 K



Order code

AIRNAMIC-R-Z-H/400H/S1 - RAL 9016
| 1 | 2 | 3 | 4 | 5 | 6

1 Type

AIRNAMIC Swirl diffuser

2 Construction style

Determines the variant of the plenum box

R circular

Q square

3 System

Z Supply air

A Extract air

4 Connection

V vertical

H horizontal

Order example: AIRNAMIC-R-Z-H/400H

Table with 2 columns: Attribute (Style, Air conditioning system, Connection, Nominal size, Surface) and Value (Circular, Supply air, horizontal, 400H, RAL 9010, pure white)

5 Nominal size [mm]

Only with construction style R

160, 250, 400L, 400H, 600

Only with construction style Q

300L, 300H, 600, 625

L - low volume flow rate

H - high volume flow rate

6 Surface

No entry: painted, similar to RAL 9010 (pure white)

S1 painted, specify RAL CLASSIC colour

## Variants

### AIRNAMIC-Q/600



#### Variant

- Ceiling swirl diffuser with square diffuser face
- With plenum box for horizontal duct connection

#### Nominal sizes

- 300L, 300H, 600, 625

#### Parts and characteristics

- Square diffuser face
- Plenum box for horizontal duct connection
- Square opening to accommodate the diffuser face
- Optimised equalising element that ensures a uniform airflow through the diffuser face (supply air variant)
- Damper unit for volume flow rate balancing, can be set in 15° intervals between 0 and 90°
- Spigot with double lip seal
- Simple installation of the diffuser face due to central fixing screw with decorative cap

#### Construction features

- Spigot suitable for circular ducts to EN 1506 or EN 13180
- Spigot with double lip seal

**AIRNAMIC-R/600****Variant**

- Ceiling swirl diffuser with circular diffuser face
- With plenum box for connection to a horizontal duct, nominal size 250 – 600
- With spigot for connection to a vertical duct, nominal sizes 160 and 250

**Nominal sizes**

- 160, 250, 400L, 400H, 600

**Parts and characteristics**

- Circular diffuser face
- Gently sloped, flat border, only 3 mm high
- Sizes 160 and 250 are prepared for fixing with bayonet (with spigot) or with a central fixing screw
- Sizes 400 and 600 are prepared for fixing with a central fixing screw (eventually concealed with a cap)

**Plenum box for horizontal duct connection**

- Plenum box with a circular opening to accommodate the diffuser face
- Optimised equalising element that ensures a uniform airflow through the diffuser face (supply air variant)
- Damper blade for volume flow rate balancing, can be set in 15° intervals between 0 and 90°
- Spigot with double lip seal
- Simple installation of the diffuser face due to central fixing screw

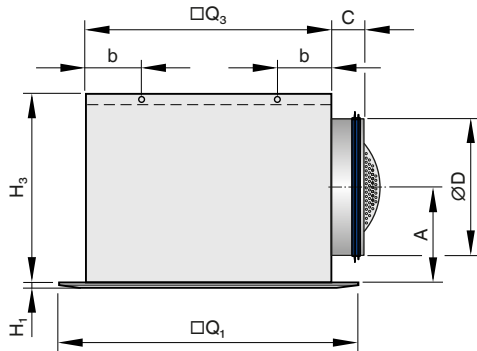
**Spigot for connection to a vertical duct**

- Diffuser face with bayonet for fixing it to the spigot (no tools required)
- Spigot with 3 fixing points for fixing it to the ceiling

**Construction features**

- Spigot suitable for circular ducts to EN 1506 or EN 13180
- Spigot on the plenum box with double lip seal

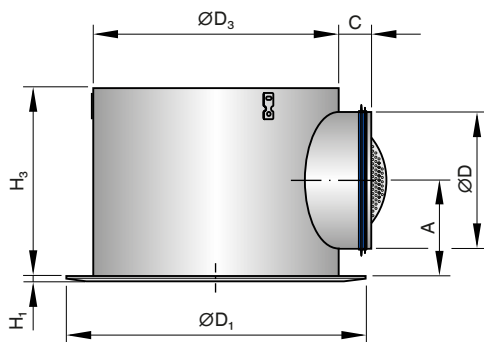
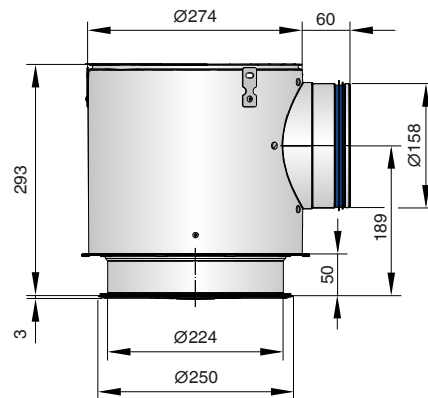
## Dimensions

**AIRNAMIC-Q with plenum box for horizontal duct connection**

**AIRNAMIC-Q-\*-H**

NS	□Q <sub>1</sub>	H <sub>1</sub>	□Q <sub>3</sub>	H <sub>3</sub>	ØD	A	C	1	m [kg]
300L	298	3	290	250	158	139	60	AK-H-Q/300	3
300H	298	3	290	250	158	139	60	AK-H-Q/300	3
600	598	3	567	345	248	194	60	AK-H-Q/600	8.7
625	623	3	567	345	248	194	60	AK-H-Q/600	8.7

1 Plenum box

Weights apply to the supply air variant.

**AIRNAMIC-R with plenum box for horizontal duct connection**

**AIRNAMIC-R with plenum box for horizontal duct connection, nominal size 250**

**AIRNAMIC-R-\*-H**

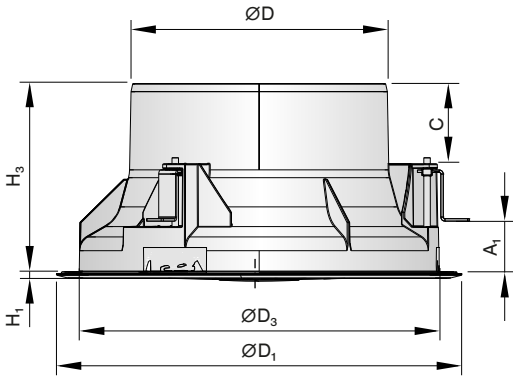
NS	ØD <sub>1</sub>	H <sub>1</sub>	ØD <sub>3</sub>	H <sub>3</sub>	ØD	A	C	1	m [kg]
250	250	3	274	293	158	189	60	AKR1*	2,4
400L	400	3	362	290	198	166	60	AKR2	4
400H	400	3	362	290	198	166	60	AKR2	4
600	600	3	573	344	248	195	60	AKR5	7,5

1 Plenum box

\* AIRNAMIC 250 is fitted with a transition piece.

Weights apply to the supply air variant.

**AIRNAMIC-R\*-V**

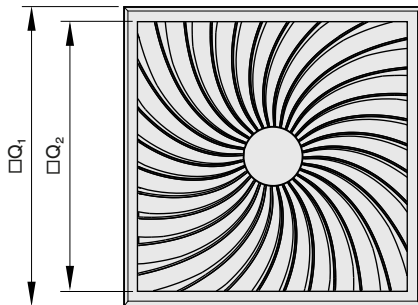


**AIRNAMIC-R\*-V**

NS	ØD <sub>1</sub>	H <sub>1</sub>	ØD <sub>3</sub>	H <sub>3</sub>	ØD <sub>4</sub>	A <sub>1</sub>	ØD	C
160	160	3	144	117	146	0,5 – 30	98	50
250	250	3	222	117	225	0,5 – 30	158	50

ØD<sub>4</sub> is the size of the installation opening, which can be made with a hole saw, for example.

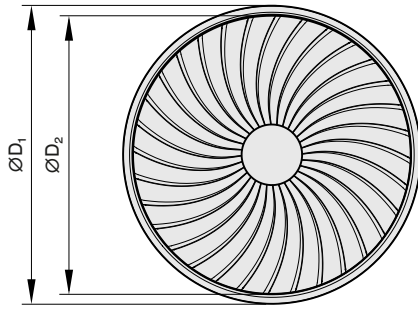
**Diffuser face AIRNAMIC-Q**



**AIRNAMIC-Q**

NS	□Q <sub>2</sub>	□Q <sub>1</sub>	A <sub>eff</sub> [m <sup>2</sup> ]
300L	262	298	0.0139
300H	262	298	0.0175
600	539	598	0.0616
625	539	623	0.0616

Diffuser face AIRNAMIC-R



AIRNAMIC-R

NS	ØD <sub>1</sub>	ØD <sub>2</sub>	A <sub>eff</sub> [m <sup>2</sup> ]
160	160	132	0.0036
250	250	210	0.0098
400L	400	352	0.0186
400H	400	352	0.0258
600	600	546	0.0504

## Product details

### Innovation

Type AIRNAMIC swirl diffusers meet the most demanding requirements of technical function, comfort, and design.

The unique design of the air control blades, a specially developed equalising element, and the innovative plenum box result in high volume flow rates, a low sound power level and low differential pressure.

The air control blades have three-dimensionally profiled contours to create an efficient swirl. As a consequence, the airflow velocities and temperature differences in the occupied zone are very low, and the level of comfort is excellent.

The production of these unusually contoured blades is only possible by the use of high-quality plastics and by applying innovative production technology.

The exceptionally aesthetic air control blades allow for perfect architectural integration of the circular or square swirl diffuser and therefore make for an important design element for building owners and architects.

A spigot with double lip seal provides a low-leakage connection of the plenum box to the ducting, and a lockable damper blade for volume flow rate balancing simplifies commissioning.

### Installation in T-bar ceilings



### Installation in continuous ceilings

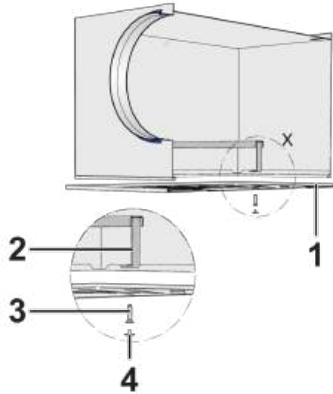


### Installation and commissioning

- Preferably for rooms with a clear height up to 4.0 m
- Flush ceiling installation
- Freely suspended installation only with an extended border (supply air variant)
- If necessary, carry out volume flow rate balancing with the damper blade

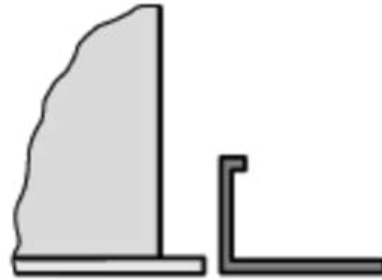
Note: These are schematic diagrams to illustrate the installation details.

**Diffuser face – central screw fixing**



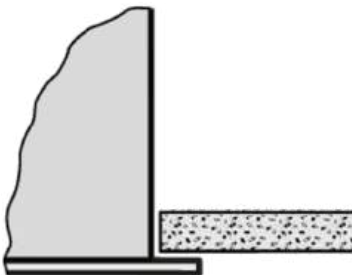
- ① Diffuser face
  - ② Cross bar
  - ③ Central fixing screw
  - ④ Decorative cap
- Using the central fixing screw, fix the diffuser face to the cross bar of the plenum box
  - Attach the decorative cap

**Installation in metal ceilings**



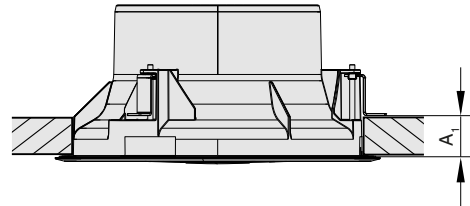
- Fix the plenum box to the ceiling
- The ceiling tile of a metal ceiling has no contact with the diffuser
- Fix the diffuser face after the ceiling has been completed

**Installation in continuous ceilings**



- Fix the plenum box (including diffuser face, if necessary) to the ceiling
- Adjust ceiling tile as required (flush or offset)
- If necessary, fix the diffuser face only after the ceiling has been completed

**Installation with spigot**



- Installation into ceiling tiles of thickness ( $A_1$  0.5 – 30.0 mm)

**Spigot fixing points**

- 3 spigot fixing points
- The spigot is fitted with 3 screws to clamp it to the ceiling tile.

**Bayonet fixing**

- No tools required to fix the diffuser face, nominal sizes 160 and 250
- 3 fixing points

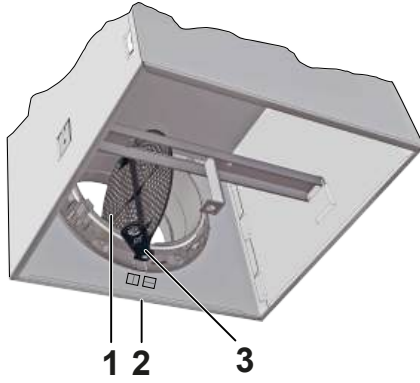
**Volume flow rate balancing**

When several diffusers are connected to just one volume flow controller, it may be necessary to balance the volume flow rates.

- The diffuser face can be removed to access the damper blade; the damper blade can then be set in 15° intervals between 0 and 90°

**AIRNAMIC, XARTO Volume flow rate balancing**

**AIRNAMIC, XARTO Volume flow rate balancing**



- 1 Damper blade
- 2 Sticker explaining the damper blade position
- 3 Setting lever

Open, 0°

- 1 Damper blade
- 2 Sticker explaining the damper blade position
- 3 Setting lever

Maximum restriction, 90°

## Nomenclature

**A** [mm]

Position of the spigot, defined by the distance of the spigot centre line to the lower edge of the suspended ceiling

**A<sub>eff</sub>** [m<sup>2</sup>]

Effective air discharge area

**C** [mm]

Length of the spigot

**∅D** [mm]

Outer diameter of the spigot

**∅D<sub>1</sub>** [mm]

Outer diameter of a circular diffuser face

**∅D<sub>2</sub>** [mm]

Diameter of a circular diffuser face style

**∅D<sub>3</sub>** [mm]

Diameter of a circular plenum box

**H<sub>1</sub>** [mm]

Height of diffuser face

**H<sub>2</sub>** [mm]

Height of a ceiling diffuser, from the lower edge of the suspended ceiling to the upper edge of the spigot

**H<sub>3</sub>** [mm]

Height of a ceiling diffuser with plenum box, from the lower edge of the suspended ceiling to the upper edge of the plenum box or of the spigot

**L<sub>WA</sub>** [dB(A)]

A-weighted sound power level of air-regenerated noise

**m** [kg]

Weight

**NS** [mm]

Nominal size

**Δp<sub>t</sub>** [Pa]

Total differential pressure

**□Q<sub>1</sub>** [mm]

Outer diameter of a square diffuser face

**□Q<sub>2</sub>** [mm]

Dimensions of a square diffuser face style

**□Q<sub>3</sub>** [mm]

Dimensions of a square plenum box

**q<sub>v</sub>** [m<sup>3</sup>/h]; [l/s]

Volume flow rate

**Δt<sub>z</sub>** [K]

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

**Lengths**

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

All sound power levels are based on 1 pW.

**A<sub>1</sub>** [mm]

Ceiling tile thickness

**D<sub>4</sub>** [mm]

Diameter of the installation opening