

# Ceiling swirl diffusers

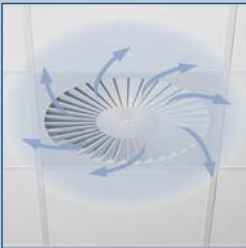
## Type FD



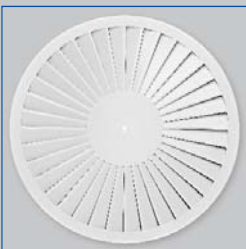
Flexible plenum box  
with circular diffuser face



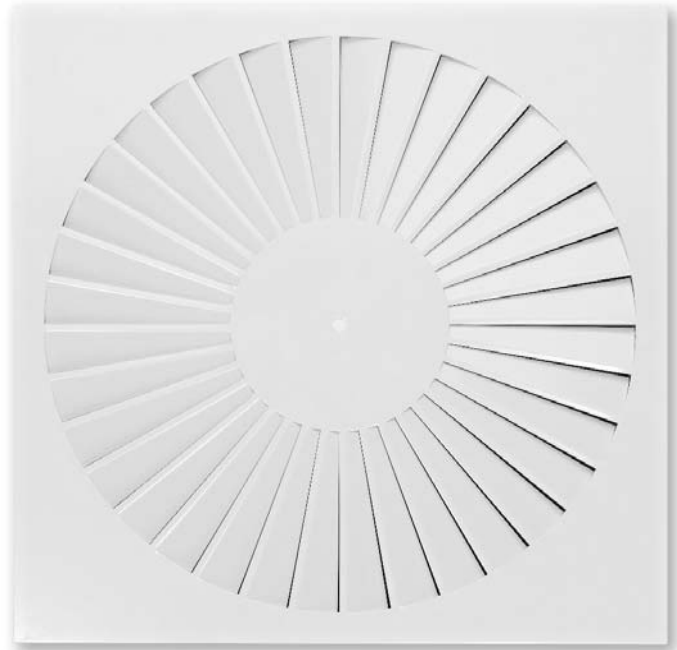
Plenum box  
with damper blade  
and square diffuser face



Horizontal  
swirling air discharge



Circular diffuser face



### For comfort zones, with fixed air control blades

Circular and square ceiling swirl diffusers that create high induction levels, for high room air change rates

- Nominal sizes 300, 400, 500, 600, 625
- Volume flow rate range 9 – 235 l/s or 31 – 846 m<sup>3</sup>/h
- Diffuser face made of galvanised sheet steel, powder-coated
- 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
- High induction results in a rapid reduction of temperature differences  
and airflow velocities
- Air change rates of up to 35 per hour can be achieved by arranging several  
diffusers in a row with a minimum pitch of 0.9 m (centre line to centre line)
- Ideal for comfort zones

#### Optional equipment and accessories

- Exposed diffuser face available in RAL CLASSIC colours
- Plenum box with cord-operated damper blade and pressure tap
- Acoustically optimised plenum box FLEXTRO

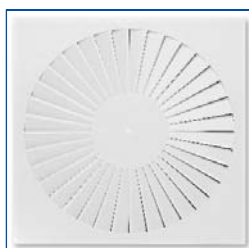
1

Type		Page
FD	General information	1.1 – 84
	Order code	1.1 – 88
	Quick sizing	1.1 – 89
	Dimensions and weight – FD-Q	1.1 – 90
	Dimensions and weight – FD-R	1.1 – 94
	Installation details	1.1 – 98
	Specification text	1.1 – 99
	Basic information and nomenclature	1.6 – 1

### Diffuser faces

Product examples

**FD-Q**

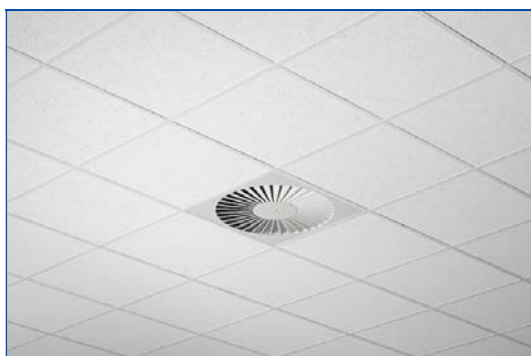


**FD-R**

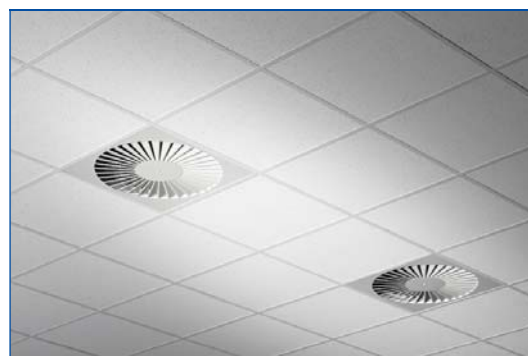


### Installation examples

#### Installation in T-bar ceilings



#### Installation in T-bar ceilings, arrangement in a row



#### Installation in continuous ceilings



### Description

For detailed information on plenum boxes see Chapter K1 – 1.5.

### Application

- Type FD 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 temperature differences and airflow velocities (supply air variant)
- For variable and constant volume flows
- For supply air to room air temperature differences from –12 to +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)

### Variants

- FD-Q: Square diffuser face
- FD-R: Circular diffuser face
- FD-\*-Z: Supply air
- FD-\*-A: Extract air

### Connection

- H: Horizontal duct connection
- V: Vertical duct connection
- X: Flexible plenum box FLEXTRO

### Nominal sizes

- 300, 400, 500, 600, 625

### Attachments

- M: Damper blade for volume flow rate balancing
- MN: Pressure tap and cord-operated damper blade for volume flow rate balancing with the diffuser face in place

### Accessories

- Lip seal

### Special characteristics

- High induction results in a rapid reduction of temperature differences and airflow velocities
- For all types of ceiling systems, and with an extended border also suitable for freely suspended installation
- Horizontal or vertical duct connection
- Air change rates of up to 35 per hour can be achieved by arranging several diffusers in a row with a minimum pitch of 0.9 m (centre line to centre line)

### Parts and characteristics

- Circular or square diffuser face
- Diffuser face with radially arranged fixed air control blades
- 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 decorative cap
- Damper blade for volume flow rate balancing (optional)

### Construction features

- Spigot suitable for circular ducts to EN 1506 or EN 13180
- Spigot with groove for lip seal (if accessory lip seal has been ordered)

### Materials and surfaces

- Diffuser face made of galvanised sheet steel
- V, H: Plenum box and cross bar made of galvanised sheet steel
- X: Plenum box made of plastic and galvanised sheet steel
- Lip seal made of rubber
- Diffuser face powder-coated RAL 9010, pure white
- P1: Powder-coated, RAL CLASSIC colour

### 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)
- Horizontal or vertical duct connection
- If necessary, carry out volume flow rate balancing with damper blade

### Standards and guidelines

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

### Maintenance

- Maintenance-free as construction and materials are not subject to wear
- Inspection and cleaning to VDI 6022

### Technical data

Nominal sizes	300, 400, 500, 600, 625 mm
Minimum volume flow rate, with $\Delta t_z = -6 \text{ K}$	9 – 28 l/s or 31 – 102 m <sup>3</sup> /h
Maximum volume flow rate, with $L_{WA} \cong 50 \text{ dB(A)}$	70 – 235 l/s or 252 – 846 m <sup>3</sup> /h
Supply air to room air temperature difference	–12 to +10 K

### Function

#### Functional description

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.

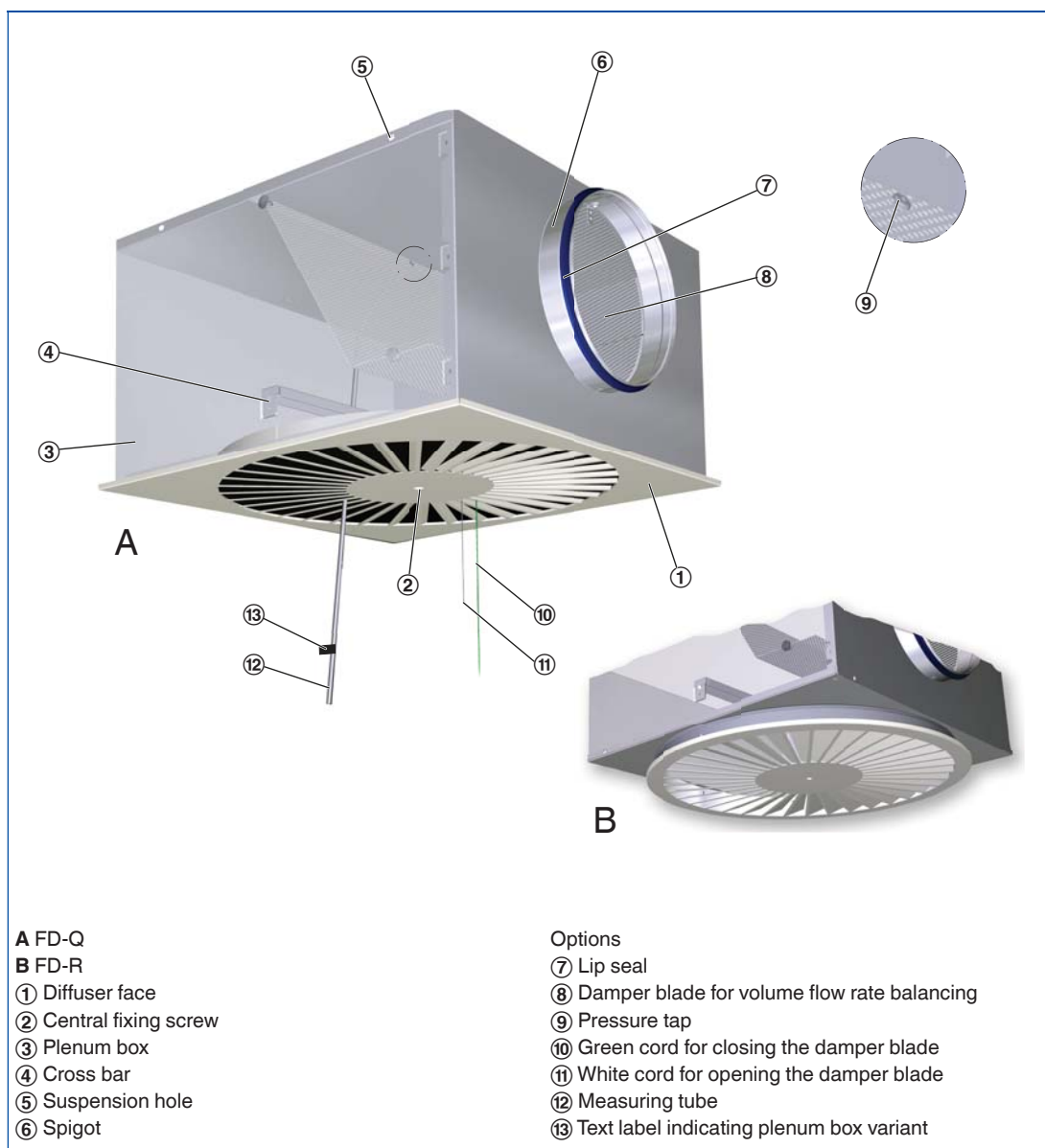
Type FD ceiling swirl diffusers have fixed blades. Air discharge is horizontal omni directional.

The supply air to room air temperature difference may range from  $-12$  to  $+10$  K.

A damper blade (optional) simplifies volume flow rate balancing for commissioning. Pressure tap and cord-operated damper blade (optional) allow for volume flow rate balancing with the diffuser face in place.

To give rooms an aesthetic, uniform look, Type FD diffusers may also be used for extract air.

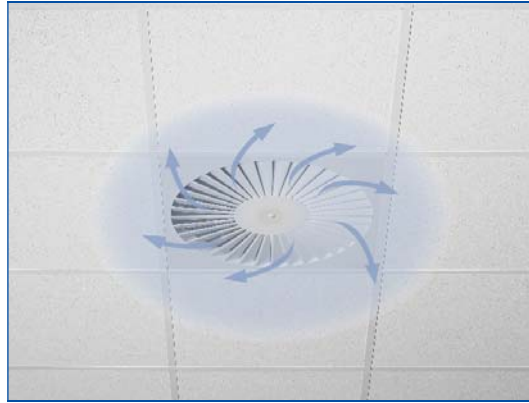
#### Schematic illustration of the FD, with plenum box for horizontal duct connection



Air patterns

Horizontal air discharge

Horizontal omni directional air discharge



Order code

FD

FD - Q - Z - H - M - L / 500 / P1 - RAL ...

1 2 3 4 5 6 7 8

**1 Type**

**FD** Swirl diffuser

**2 Construction style**

**R** Circular

**Q** Square

**3 System**

**Z** Supply air

**A** Extract air

**4 Connection**

**H** Horizontal

**V** Vertical

**X** Flexible plenum box FLEXTRO  
(Only for nominal sizes 600 and 625)

**5 Damper blade for volume flow rate balancing**

Included with connection X

No entry: without damper blade

**M** With damper blade

**MN** With cords and pressure tap  
(only for connection type H)

**6 Accessories**

Connection X includes a double lip seal

No entry: without accessories

**L** With lip seal

**7 Nominal size [mm]**

**300**

**400**

**500**

**600**

**625**

**8 Exposed surface**

No entry: powder-coated RAL 9010,  
pure white

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

Gloss level

RAL 9010 50 %

RAL 9006 30 %

All other RAL colours 70 %

Order example

FD-Q-Z-H-MN/500/P1-RAL 9016

Construction style	Square
System	Supply air
Connection	Horizontal
Damper blade for volume flow rate balancing	With cords and pressure tap
Accessories	Without accessories
Nominal size	500
Exposed surface	RAL 9016, traffic white, gloss level 70 %

### FD\*-Z-H (supply air)

Quick sizing tables provide a good overview of the volume flow rates and 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 programme.

### Quick sizing – sound power level and total differential pressure

Nominal size	$\dot{V}$		Damper blade position					
			0°		45°		90°	
			$\Delta p_t$	$L_{WA}$	$\Delta p_t$	$L_{WA}$	$\Delta p_t$	$L_{WA}$
	l/s	m <sup>3</sup> /h	Pa	dB(A)	Pa	dB(A)	Pa	dB(A)
300	9	31	1	<15	1	<15	2	<15
	35	126	13	28	17	27	27	27
	55	198	31	39	41	40	67	39
	80	288	67	50	87	54	142	54
400	16	59	1	<15	1	<15	2	<15
	60	216	10	24	14	25	27	26
	105	378	32	39	42	40	83	44
	145	522	60	50	81	53	158	57
500	24	85	1	<15	2	<15	4	<15
	80	288	12	24	19	26	43	29
	135	486	33	39	53	41	123	45
	185	666	62	50	99	54	231	58
600, 625	28	102	1	<15	1	<15	3	<15
	95	342	10	25	15	25	29	24
	160	576	28	39	41	40	81	39
	225	810	55	50	81	52	160	53

### FD\*-Z-V (supply air)

### Quick sizing – sound power level and total differential pressure

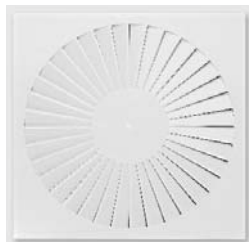
Nominal size	$\dot{V}$		Damper blade position					
			0°		45°		90°	
			$\Delta p_t$	$L_{WA}$	$\Delta p_t$	$L_{WA}$	$\Delta p_t$	$L_{WA}$
	l/s	m <sup>3</sup> /h	Pa	dB(A)	Pa	dB(A)	Pa	dB(A)
300	9	31	1	<15	1	<15	2	<15
	30	108	9	25	11	25	19	25
	50	180	26	38	32	38	54	38
	70	252	51	49	62	49	106	49
400	16	59	1	<15	1	<15	2	<15
	60	216	10	24	13	23	23	24
	105	378	31	39	40	39	72	42
	145	522	60	50	77	51	138	55
500	24	85	1	<15	1	<15	4	<15
	80	288	11	24	14	23	44	29
	130	468	28	38	36	39	117	44
	180	648	54	50	70	53	223	56
600, 625	28	102	1	<15	1	<15	2	<15
	95	342	9	25	12	24	28	27
	160	576	26	40	35	41	78	44
	220	792	50	51	67	55	148	57

### FD\*-Z-X (supply air)

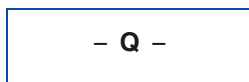
### Quick sizing – sound power level and total differential pressure

Nominal size	$\dot{V}$		Damper blade position					
			0°		45°		90°	
			$\Delta p_t$	$L_{WA}$	$\Delta p_t$	$L_{WA}$	$\Delta p_t$	$L_{WA}$
	l/s	m <sup>3</sup> /h	Pa	dB(A)	Pa	dB(A)	Pa	dB(A)
600, 625	28	102	1	<15	2	<15	3	<15
	100	360	13	23	20	25	32	28
	170	612	39	38	58	40	92	42
	235	846	74	50	111	55	175	53

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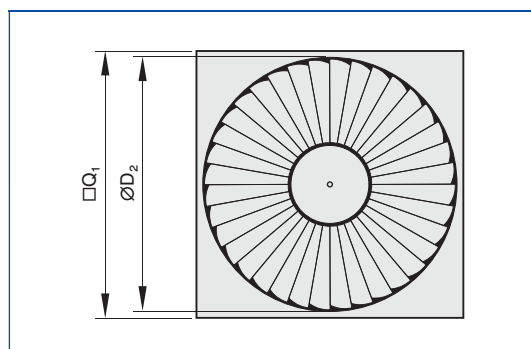


FD-Q



Order code detail

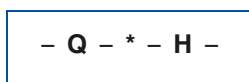
### Diffuser face FD-Q



### Dimensions

Nominal size	□Q <sub>1</sub>	ØD <sub>2</sub>	A <sub>eff</sub>
	mm		m <sup>2</sup>
300	298	250	0.0088
400	398	350	0.0180
500	498	450	0.0251
600	598	538	0.0295
625	623	538	0.0295

### FD-Q\*-H



Order code detail

### Variant

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

### Nominal sizes

- 300, 400, 500, 600, 625

### Parts and characteristics

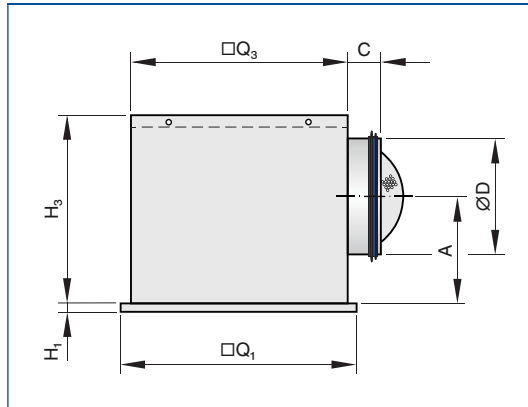
- Square diffuser face
- Plenum box for horizontal duct connection
- Square opening to accommodate the diffuser face
- Equalising element that ensures a uniform airflow through the diffuser face (supply air variant)
- Simple installation of the diffuser face due to central fixing screw with decorative cap
- Damper blade for volume flow rate balancing (optional)
- Pressure tap and cord-operated damper blade for volume flow rate balancing (optional)
- Lip seal (optional)

### Construction features

- Spigot suitable for circular ducts to EN 1506 or EN 13180
- Spigot with groove for lip seal (if accessory lip seal has been ordered)



Square diffuser face with plenum box  
for horizontal duct connection



Dimensions [mm] and weight [kg]

Nominal size	□Q <sub>1</sub>	H <sub>1</sub>	□Q <sub>3</sub>	H <sub>3</sub>	ØD	A	C	Plenum box	m
	mm								kg
300	298	8	290	250	158	139	50	AK-Uni-001	4.0
400	398	8	372	295	198	164	50	AK-Uni-002	6.2
500	498	8	476	295	198	164	50	AK-Uni-003	8.5
600	598	8	567	345	248	199	48	AK-Uni-004	11.6
625	623	8	567	345	248	199	48	AK-Uni-004	11.9

Weights apply to the supply air variant

### FD-Q-\*-V

- Q - \* - V -

Order code detail

### Variant

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

### Nominal sizes

- 300, 400, 500, 600, 625

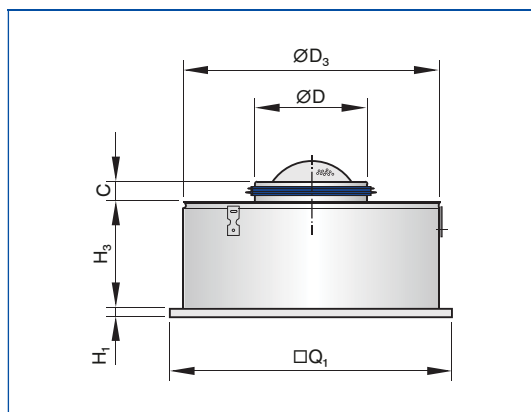
### Parts and characteristics

- Square diffuser face
- Plenum box for vertical duct connection
- Circular opening to accommodate the diffuser face
- Equalising element that ensures a uniform airflow through the diffuser face (supply air variant)
- Simple installation of the diffuser face due to central fixing screw with decorative cap
- Damper blade for volume flow rate balancing (optional)
- Lip seal (optional)

### Construction features

- Spigot suitable for circular ducts to EN 1506 or EN 13180
- Spigot with groove for lip seal (if accessory lip seal has been ordered)

### Square diffuser face with plenum box for vertical duct connection

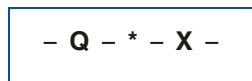


### Dimensions [mm] and weight [kg]

Nominal size	□Q <sub>1</sub>	H <sub>1</sub>	ØD <sub>3</sub>	H <sub>3</sub>	ØD	C	m
	mm						kg
300	298	8	275	200	158	50	3.0
400	398	8	364	200	198	50	4.7
500	498	8	462	200	198	50	6.7
600	598	8	559	200	248	48	8.9
625	623	8	559	200	248	48	9.2

Weights apply to the supply air variant

## FD-Q-\***X**



Order code detail

### Variant

- Ceiling swirl diffuser with square diffuser face
- With flexible plenum box FLEXTRO

### Nominal sizes

- 600, 625

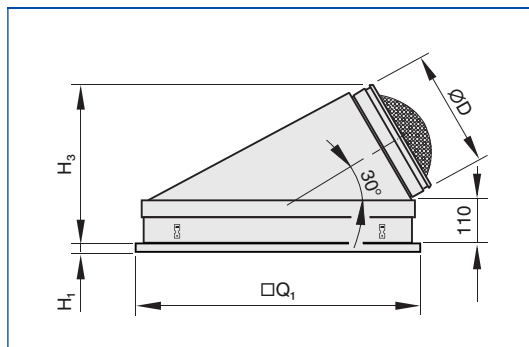
### Parts and characteristics

- Square diffuser face
- Flexible plenum box FLEXTRO
- Square opening to accommodate the diffuser face
- 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 with decorative cap

### Construction features

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

### Square diffuser face with flexible plenum box FLEXTRO



### Dimensions [mm] and weight [kg]

Nominal size	□Q <sub>1</sub>	H <sub>1</sub>	H <sub>3</sub>	ØD	Plenum box	m
	mm					kg
600	598	8	365	248	FLEXTRO-Q-*	7.4
625	623	8	365	248	FLEXTRO-Q-*	7.7

Weights apply to the supply air variant

# 1

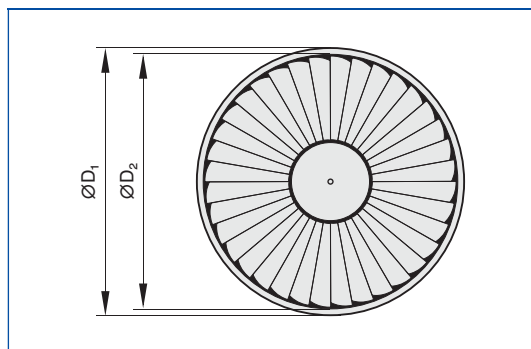


FD-R

- R -

Order code detail

### Diffuser face FD-R



### Dimensions

Nominal size	ØD <sub>1</sub>	ØD <sub>2</sub>	A <sub>eff</sub>
	mm		m <sup>2</sup>
300	300	250	0.0088
400	400	350	0.0180
500	500	450	0.0251
600	600	538	0.0295
625	625	538	0.0295

### FD-R\*-H

- R - \* - H -

Order code detail

### Variant

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

### Nominal sizes

- 300, 400, 500, 600, 625

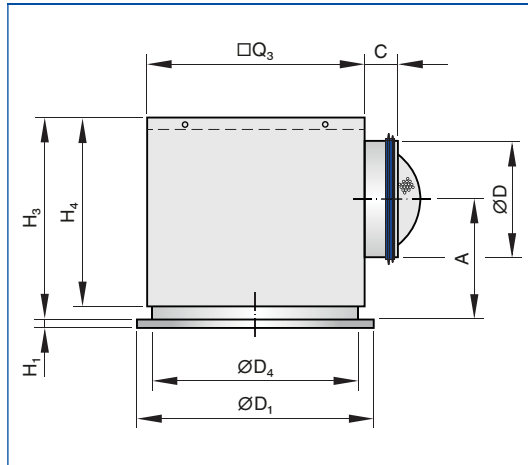
### Parts and characteristics

- Circular diffuser face
- Plenum box for horizontal duct connection
- Circular opening to accommodate the diffuser face
- Equalising element that ensures a uniform airflow through the diffuser face (supply air variant)
- Simple installation of the diffuser face due to central fixing screw with decorative cap
- Damper blade for volume flow rate balancing (optional)
- Pressure tap and cord-operated damper blade for volume flow rate balancing (optional)
- Lip seal (optional)

### Construction features

- Spigot suitable for circular ducts to EN 1506 or EN 13180
- Spigot with groove for lip seal (if accessory lip seal has been ordered)

Circular diffuser face with plenum box  
for horizontal duct connection



Dimensions [mm] and weight [kg]

Nominal size	ØD <sub>1</sub>	H <sub>1</sub>	□Q <sub>3</sub>	H <sub>3</sub>	ØD <sub>4</sub>	H <sub>4</sub>	ØD	A	C	Plenum box	m
	mm										kg
300	300	8	290	285	278	250	158	174	50	AK-Uni-013	4.2
400	400	8	372	330	362	295	198	199	50	AK-Uni-014	6.5
500	500	8	476	330	460	295	198	199	50	AK-Uni-015	9.0
600	600	8	567	380	557	345	248	234	48	AK-Uni-016	12.3
625	625	8	567	380	557	345	248	234	48	AK-Uni-016	12.5

Weights apply to the supply air variant

## FD-R-\* -V

- R - \* - V -

Order code detail

### Variant

- Ceiling swirl diffuser with circular diffuser face
- With plenum box for vertical duct connection

### Nominal sizes

- 300, 400, 500, 600, 625

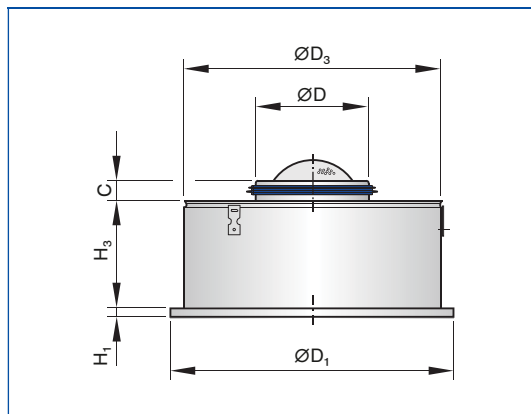
### Parts and characteristics

- Circular diffuser face
- Plenum box for vertical duct connection
- Circular opening to accommodate the diffuser face
- Equalising element that ensures a uniform airflow through the diffuser face (supply air variant)
- Simple installation of the diffuser face due to central fixing screw with decorative cap
- Damper blade for volume flow rate balancing (optional)
- Lip seal (optional)

### Construction features

- Spigot suitable for circular ducts to EN 1506 or EN 13180
- Spigot with groove for lip seal (if accessory lip seal has been ordered)

### Circular diffuser face with plenum box for vertical duct connection

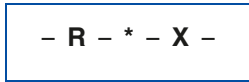


### Dimensions [mm] and weight [kg]

Nominal size	ØD <sub>1</sub>	H <sub>1</sub>	ØD <sub>3</sub>	H <sub>3</sub>	ØD	C	m
	mm						kg
300	300	8	275	200	158	50	2.8
400	400	8	364	200	198	50	4.4
500	500	8	462	200	198	50	6.3
600	600	8	559	200	248	48	8.5
625	625	8	559	200	248	48	8.7

Weights apply to the supply air variant

**FD-R-\*X**



Order code detail

**Variant**

- Ceiling swirl diffuser with circular diffuser face
- With flexible plenum box FLEXTRO

**Nominal sizes**

- 600, 625

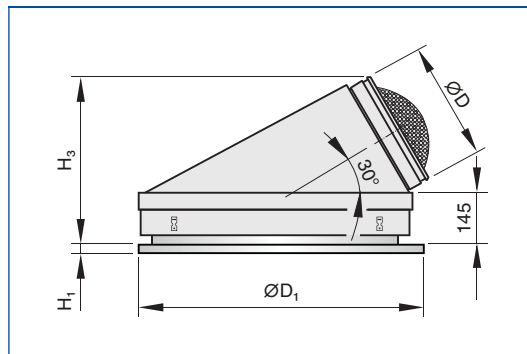
**Parts and characteristics**

- Circular diffuser face
- Flexible plenum box FLEXTRO
- Circular opening to accommodate the diffuser face
- Damper blade for volume flow rate balancing, can be set in 15° intervals between 0 and 90°
- Simple installation of the diffuser face due to central fixing screw with decorative cap
- Spigot with double lip seal

**Construction features**

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

**Circular diffuser face  
with flexible plenum box FLEXTRO/600**



**Dimensions [mm] and weight [kg]**

Nominal size	ØD <sub>1</sub>	H <sub>1</sub>	H <sub>3</sub>	ØD	Plenum box	m
	mm					kg
600	600	8	400	248	FLEXTRO-R-*/600	7.0
625	625	8	400	248	FLEXTRO-R-*/600	7.2

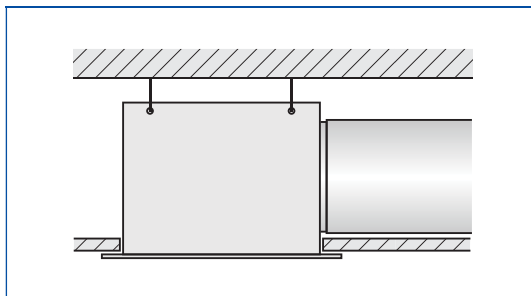
Weights apply to the supply air variant

## 1 Installation types

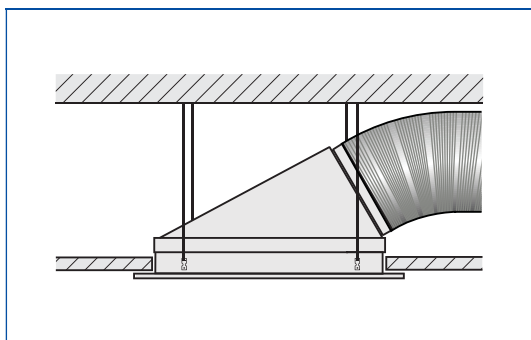
For more installation details see Chapter K1 – 1.6.

These are only schematic diagrams to illustrate installation details.

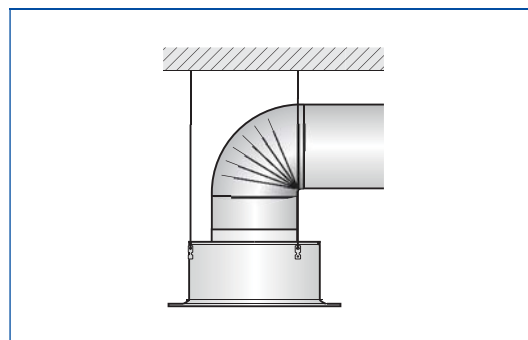
### Flush ceiling installation with square plenum box



### Flush ceiling installation with plenum box FLEXTRO

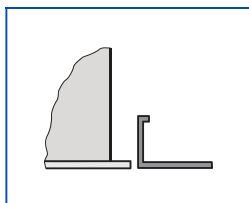


### Freely suspended installation

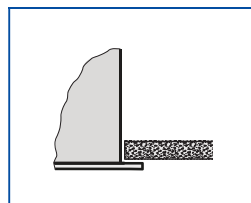


## Ceiling systems

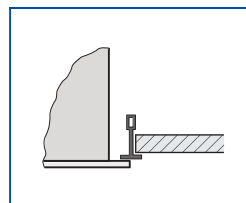
### Grid ceiling



### Continuous ceiling

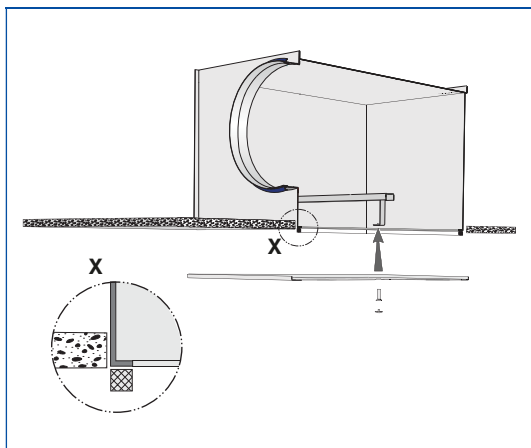


### T-bar ceiling

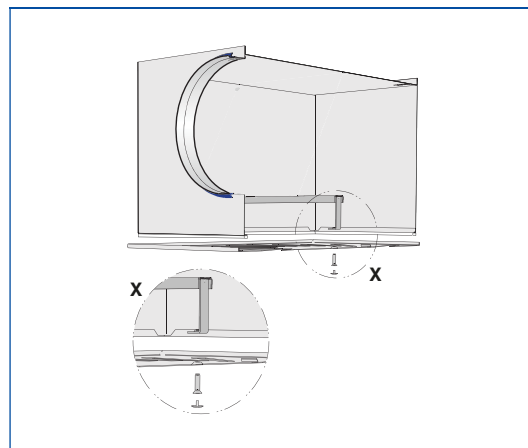


## Diffuser face sealing and fixing

### Diffuser face – sealing



### Diffuser face – central screw fixing





### Standard text

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

Ceiling swirl diffusers with square or circular diffuser face. Supply air and extract air variants for comfort zones. Diffuser face with fixed air control blades for horizontal swirling supply air discharge creating high induction levels. For installation into all types of suspended ceilings.

Ready-to-install component which consists of the casing, diffuser face, spigot, and a cross bar to which the diffuser face is fixed. The diffuser face is fixed to the cross bar with a central screw.

Spigot suitable for ducts to EN 1506 or EN 13180.

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

### Special characteristics

- High induction results in a rapid reduction of temperature differences and airflow velocities
- For all types of ceiling systems, and with an extended border also suitable for freely suspended installation
- Horizontal or vertical duct connection
- Air change rates of up to 35 per hour can be achieved by arranging several diffusers in a row with a minimum pitch of 0.9 m (centre line to centre line)

### Materials and surfaces

- Diffuser face made of galvanised sheet steel
- V, H: Plenum box and cross bar made of galvanised sheet steel
- X: Plenum box made of plastic and galvanised sheet steel
- Lip seal made of rubber
- Diffuser face powder-coated RAL 9010, pure white
- P1: Powder-coated, RAL CLASSIC colour

### Technical data

- Nominal sizes: 300, 400, 500, 600, 625 mm
- Minimum volume flow rate, with  $\Delta t_z = -6$  K: 9 – 28 l/s or 31 – 102 m<sup>3</sup>/h
- Maximum volume flow rate, with  $L_{WA} \cong 50$  dB(A): 70 – 235 l/s or 252 – 846 m<sup>3</sup>/h
- Supply air to room air temperature difference: -12 to +10 K

### Sizing data

- $\dot{V}$  \_\_\_\_\_ [m<sup>3</sup>/h]
- $\Delta p_t$  \_\_\_\_\_ [Pa]
- $L_{WA}$  Air-regenerated noise \_\_\_\_\_ [dB(A)]

### Order options

#### 1 Type

**FD** Swirl diffuser

#### 2 Construction style

- R** Circular
- Q** Square

#### 3 System

- Z** Supply air
- A** Extract air

#### 4 Connection

- H** Horizontal
- V** Vertical
- X** Flexible plenum box FLEXTRO (Only for nominal sizes 600 and 625)

#### 5 Damper blade for volume flow rate balancing

- Included with connection X
- No entry: without damper blade
- M** With damper blade
  - MN** With cords and pressure tap (only for connection type H)

#### 6 Accessories

- Connection X includes a double lip seal
- No entry: without accessories
- L** With lip seal

#### 7 Nominal size [mm]

- 300**
- 400**
- 500**
- 600**
- 625**

#### 8 Exposed surface

- No entry: powder-coated RAL 9010, pure white
- P1** Powder-coated, specify RAL CLASSIC colour
- Gloss level
- RAL 9010 50 %
- RAL 9006 30 %
- All other RAL colours 70 %

# Ceiling diffusers

## Basic information and nomenclature



- Product selection
- Principal dimensions
- Nomenclature
- Sizing and sizing example
- Installation information
- Commissioning

# Ceiling diffusers

## Basic information and nomenclature

### Product selection

	Ceiling swirl diffusers								
	AIRNAMIC	VDW	TDV-SilentAIR	RFD	FD	TDF-SilentAIR	VD	VDL	FDE
<b>Diffuser face style</b>									
Circular	●	●	●	●	●	●		●	
Square	●						●		●
<b>Diffuser face</b>									
Circular	●	●	●	●	●	●		●	
Square	●	●	●	●	●	●	●		●
Galvanised sheet steel		●	●	●	●	●		●	●
Aluminium				●			●		
Plastic	●								
<b>Air control blades</b>									
Fixed	●			●	●	●			●
Adjustable		●	●				●	●	
Plastic, black and white		●	●						
<b>Duct connection</b>									
Horizontal	●	●	●	●	●	●	●	●	●
Vertical		●	●	●	●	●	●	●	
FLEXTRO	●	●	●		●	●			
<b>Attachments</b>									
Damper blade	●	●	●	●	●	●			●
Pressure tap		●	●	●	●	●			●
Actuator							●	●	
<b>Accessories</b>									
Lip seal	●	●	●	●	●	●			●
Protective cage							●	●	
Extended border							●	●	
<b>Nominal sizes</b>									
Circular diffuser face	400, 600	300, 400, 500, 600, 625	300, 400, 500, 600, 625		300, 400, 500, 600, 625	300, 400, 500, 600, 625			
Square diffuser face	300, 600, 625	300, 400, 500, 600, 625, 825					425, 600, 775, 1050		600, 625
Spigot*				125, 160, 200, 250, 315, 400				315, 400, 630, 800	250, 315
<b>Technical data</b>									
Volume flow rate range [l/s]	13 – 385	7 – 470	11 – 315	4 – 330	9 – 235	10 – 295	95 – 1490	65 – 1080	51 – 365
Volume flow rate range [m <sup>3</sup> /h]	47 – 1386	25 – 1692	40 – 1134	14 – 1188	31 – 846	36 – 1026	342 – 5364	234 – 3888	184 – 1314
Supply air to room air temperature difference	-12 – +10 K						-12 – +15 K		-12 – +10 K
●	Possible								
	Not possible								

\*Nominal diameter

# Ceiling diffusers

## Basic information and nomenclature

### Product selection

1

	Design ceiling swirl diffusers		Ceiling swirl diffusers with perforated face plate
	XARTO	ADD	DCS
<b>Diffuser face style</b>			
Circular	●	●	●
Square	●		●
<b>Diffuser face</b>			
Circular	●	●	
Square	●	●	●
Galvanised sheet steel	●	●	●
Aluminium			
Plastic			
<b>Air control blades</b>			
Fixed	●	●	●
Adjustable			
Plastic, black and white			
<b>Duct connection</b>			
Horizontal	●	●	●
Vertical		●	●
FLEXTRO			
<b>Attachments</b>			
Damper blade	●	●	
Pressure tap		●	
Actuator			
<b>Accessories</b>			
Lip seal	●	●	
Protective cage			
Extended border			
<b>Nominal sizes</b>			
Circular diffuser face	600	250, 300, 450, 500, 600	
Square diffuser face	600, 625	250, 300, 450, 500, 600, 625	600, 625
Spigot*		125, 160, 200, 250, 315	125, 160, 200, 250, 315, 400
<b>Technical data</b>			
Volume flow rate range [l/s]	31 – 265	20 – 465	4 – 260
Volume flow rate range [m <sup>3</sup> /h]	110 – 954	72 – 1674	16 – 936
Supply air to room air temperature difference	-12 – +10 K		
●	Possible		
	Not possible		

\*Nominal diameter

# Ceiling diffusers

## Basic information and nomenclature

### Product selection

1

	Ceiling diffusers						
	VDR	ADLQ	DLQ	ADLR	DLQL	DLQ-AK	DLK-Fb
<b>Diffuser face style</b>							
Circular	●			●			
Square		●	●		●	●	●
<b>Diffuser face</b>							
Circular	●			●			
Square		●	●	●	●	●	●
Galvanised sheet steel			●		●	●	●
Aluminium	●	●		●			
Plastic							
<b>Air control blades</b>							
Fixed		●	●	●	●	●	●
Adjustable	●						
Plastic, black and white							
<b>Duct connection</b>							
Horizontal	●	●	●	●	●	●	●
Vertical	●			●	●		
FLEXTRO		●					
<b>Attachments</b>							
Damper blade		●	●	●	●		
Pressure tap		●	●	●			
Actuator	●						
<b>Accessories</b>							
Lip seal		●	●	●	●		
Protective cage							
Extended border							
<b>Nominal sizes</b>							
Circular diffuser face	630, 800			244, 300, 356, 412, 468, 542, 598, 654			
Square diffuser face		250, 300, 400, 500, 600, 625	250, 300, 400, 500, 600, 625	600 625	250, 300, 400, 500, 600	300, 400, 500, 600, 625	600, 625
Spigot*	315, 400, 630, 800						
<b>Technical data</b>							
Volume flow rate range [l/s]	175 – 1495	20 – 665	20 – 700	20 – 650	6 – 285	40 – 565	220 – 460
Volume flow rate range [m³/h]	630 – 5382	72 – 2394	72 – 2520	72 – 2340	22 – 1026	144 – 2034	792 – 1656
Supply air to room air temperature difference	-10 to +15 K	-10 to +10 K					
●	Possible						
○	Not possible						

\*Nominal diameter

# Ceiling diffusers

## Basic information and nomenclature

### Principal dimensions

**ØD [mm]**

Outside diameter of the spigot

**ØD<sub>1</sub> [mm]**

Outer diameter of a circular diffuser face

**ØD<sub>2</sub> [mm]**

Diameter of a circular diffuser face style

**ØD<sub>3</sub> [mm]**

Diameter of a circular plenum box

**□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

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

Distance (height) from the lower edge of the suspended ceiling to the lower edge of the 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

**A [mm]**

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

**C [mm]**

Length of the spigot

**m [kg]**

Weight

### Nomenclature

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

A-weighted sound power level of air-regenerated noise

 **$\dot{V}$  [m<sup>3</sup>/h] and [l/s]**

Volume flow rate

**Δt<sub>z</sub> [K]**

Supply air temperature difference

**Δp<sub>t</sub> [Pa]**

Total differential pressure

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

Effective air discharge area

All sound power levels are based on 1 pW.

# Ceiling diffusers

## Basic information and nomenclature

### 1 Sizing with the help of this catalogue

This catalogue provides convenient quick sizing tables for ceiling diffusers. The tables give supply air volume flow rates for all nominal sizes. The maximum volume flow rates are for an open damper blade. A smaller opening of the damper blade results in higher sound power levels and a higher total differential pressure. The tables show values for damper blade positions 45° and 90°.

Sizing data for other volume flow rates and damper blade positions can be determined quickly and precisely using the Easy Product Finder design programme.

### Sizing example

#### Given data

$\dot{V} = 300 \text{ l/s}$  (1280 m<sup>3</sup>/h)  
 Square ceiling diffuser, steel,  
 with fixed air control blades  
 Maximum sound power level 40 dB(A)  
 with damper blade position 45°  
 Four-way air discharge

#### Quick sizing

Type DLQ  
 Nominal sizes: 600, 625  
 Selected: DLQ/600

### Easy Product Finder



The Easy Product Finder allows you to size products using your project-specific data.

You will find the Easy Product Finder on our website.

The screenshot shows the 'Easy Product Finder' software interface. The main window displays the following information:

- Project Structure:** Projekt 1
- Product Selection:** DLQ AK // 600 // 0 // 0 // 0 // RAL 9010
- Input Parameters:**
  - Volume flow rate  $\dot{V}$ : 1.280 [792..2795]
  - Room dimensions:  $a = 6.00$  [x2.0],  $b_1 = 1.20$  [1.0..2.0],  $x = 3.00$  [x1.2]
  - Temperature difference  $\Delta T$ : -8.0 [-12.0..4.0]
- Technical Results:**

Parameter	Value	Unit
$v_{10}$	0.15	m/s
$\Delta p_{10}$	-1.3	K
$v_1$	0.32	m/s
$\Delta p_1$	-1.3	K
- Acoustic Results (0° = 'komplett geöffnet'):**

Parameter	Value	Unit
$L_{WA}$	34	dB(A)
$L_{WNC}$	38	dB(A)
$L_{WNC}$	32	dB(A)

# Ceiling diffusers

## Basic information and nomenclature

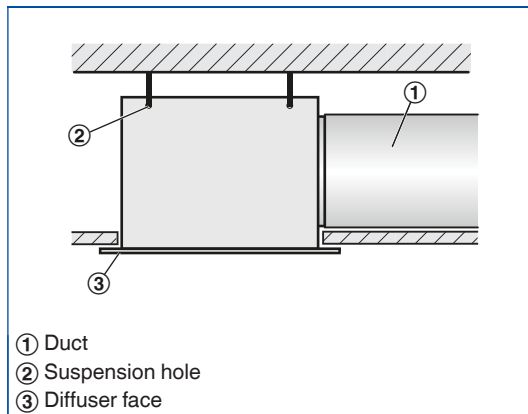
### Description

### Installation information

- Installation and making connections to be performed by others
- The optimum aerodynamic function is only achieved with flush ceiling installation
- The diffuser face is fixed to the plenum box cross bar using the central fixing screw
- Central fixing screw is concealed by a decorative cap

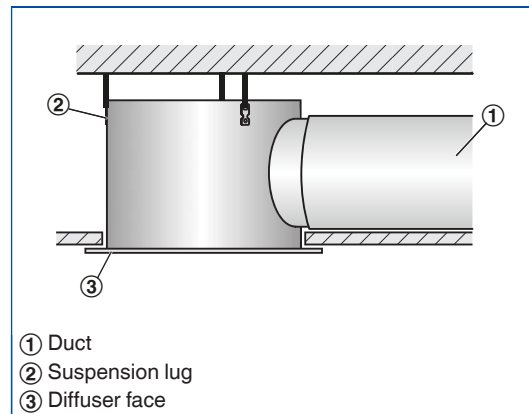
### Installation types

#### Flush ceiling installation with square plenum box



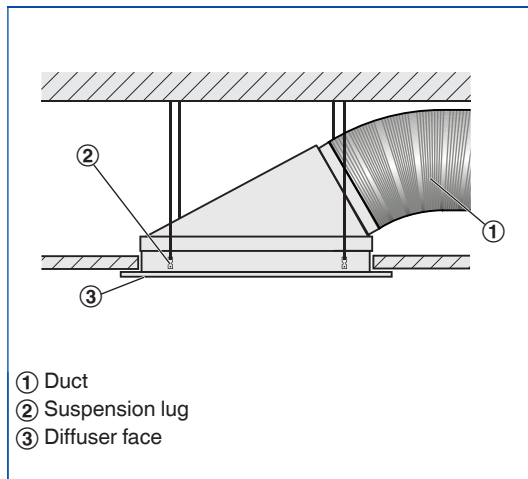
- Horizontal duct connection
- Four suspension holes
- Suspension with cords, wires or hangers, to be provided by others

#### Flush ceiling installation with circular plenum box



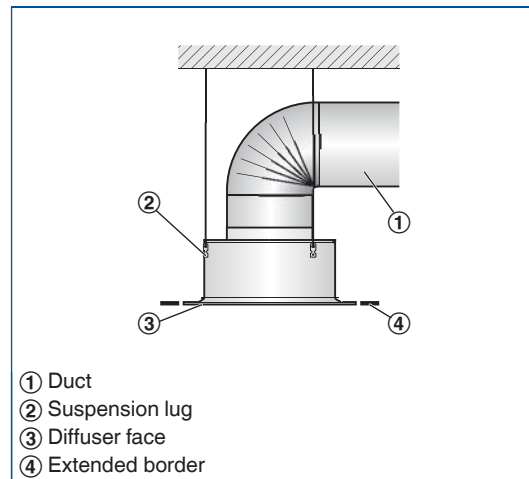
- Horizontal duct connection
- Three suspension lugs
- Suspension with cords, wires or hangers, to be provided by others

#### Flush ceiling installation with plenum box FLEXTRO



- Spigot at 30° angle
- Four suspension lugs
- Suspension with cords, wires or hangers, to be provided by others

#### Freely suspended installation



- Vertical duct connection
- Three suspension lugs
- Suspension with cords, wires or hangers, to be provided by others

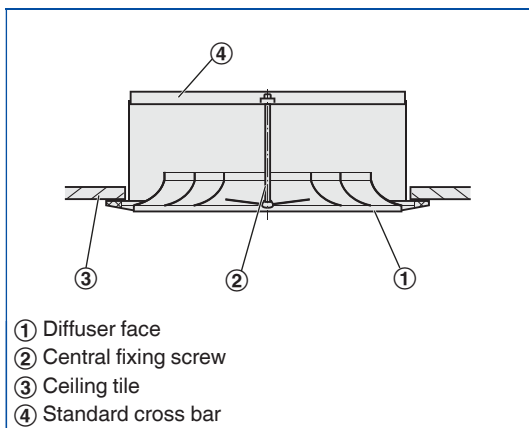


# Ceiling diffusers

## Basic information and nomenclature

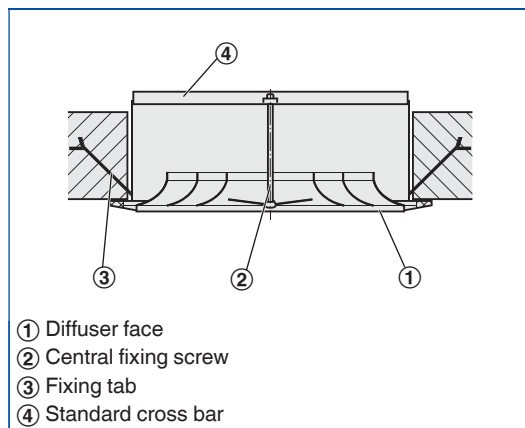
### 1 Installation without plenum box

#### Flush ceiling installation with standard cross bar G1, screw-fixed to ceiling



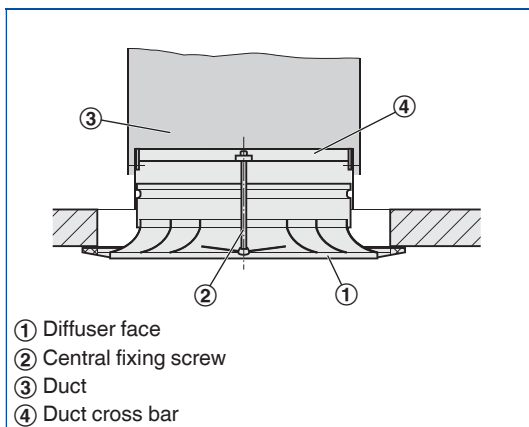
- No spigot
- Fixing of the standard cross bar to the ceiling tile is to be performed by others

#### Flush ceiling installation with standard cross bar G1, with fixing tabs mortared in



- No spigot
- The standard cross bar has to be mortared into the ceiling by others

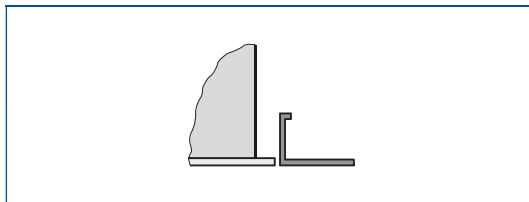
#### Flush ceiling installation with duct cross bar E1



- Vertical duct connection
- Fixing of the duct cross bar to the duct is to be performed by others

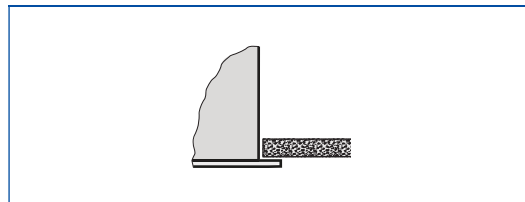
### Ceiling systems

#### Installation into grid ceilings



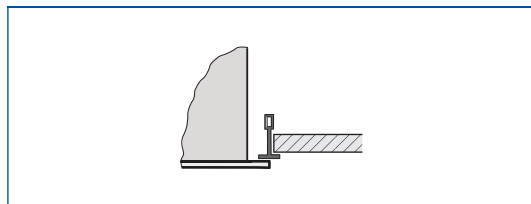
- Fix the plenum box to the ceiling
- The ceiling tile of the grid ceiling is independent of the ceiling diffuser
- Fix the diffuser face after the ceiling has been completed

#### Installation in continuous ceilings



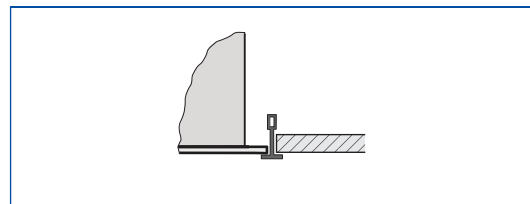
- Fix plenum box (including diffuser face, if necessary) to the ceiling
- Adjust plasterboard ceiling tile as required
- If necessary, fix the diffuser face after the ceiling has been completed

### Installation in T-bar ceilings



- Fix the plenum box to the ceiling
- The T-bar ceiling is independent of the ceiling diffuser
- Fix the diffuser face below the T-bars after the ceiling has been completed

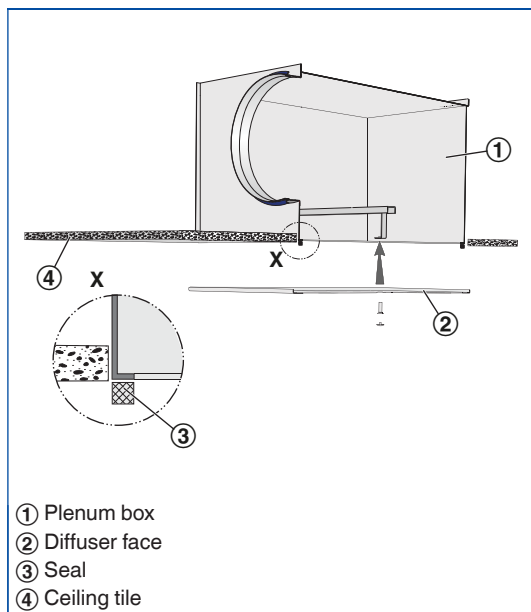
### Installation in T-bar ceilings, diffuser face rests on T-bars



- Fix the plenum box to the ceiling, if necessary
- The diffuser rests on the T-bars

### Diffuser face sealing and fixing

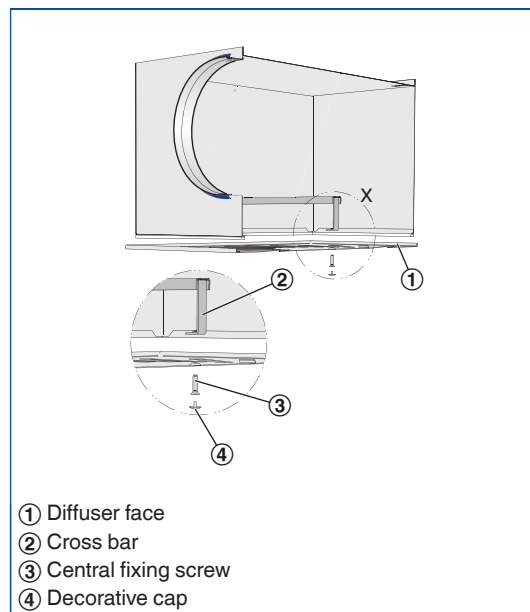
#### Diffuser face – sealing



- ① Plenum box
- ② Diffuser face
- ③ Seal
- ④ Ceiling tile

- The self-adhesive sealing tape (supplied) has to be applied to the return edges of the plenum box by others

#### 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

### Commissioning

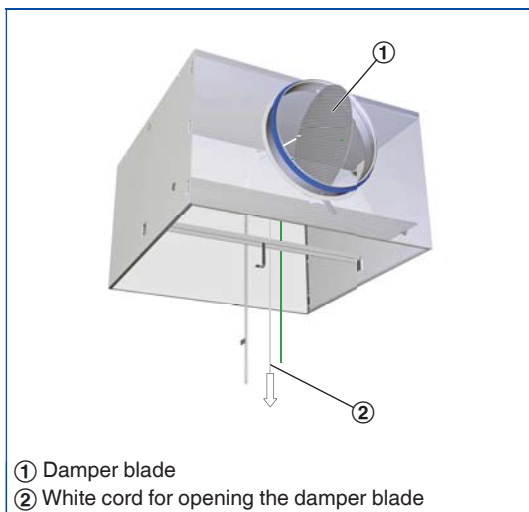
1

#### 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.

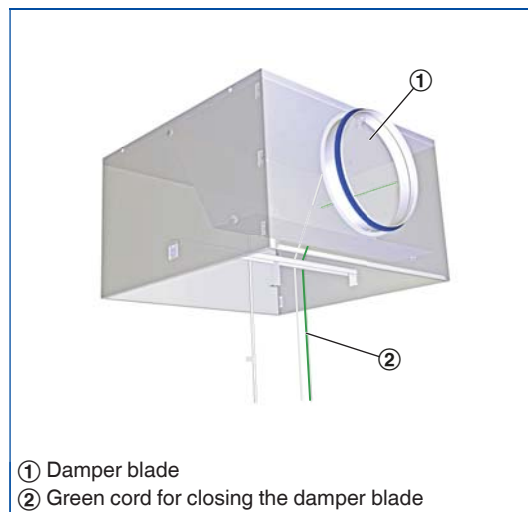
- AIRNAMIC, XARTO, FLEXTRO:  
The diffuser face can be removed to access the damper blade; the damper blade can then be set in 15° intervals between 0 and 90°
- Ceiling diffusers with universal plenum box and damper blade (variant -M):  
The diffuser face can be removed to access the damper blade; the damper blade can then be set to any position between 0 and 90°
- Ceiling diffusers with universal plenum box, damper blade and pressure tap (variant -MN):  
The diffuser face need not be removed since the damper blade can be set with two cords (white and green).

#### AK-Uni-...-MN Volume flow rate balancing



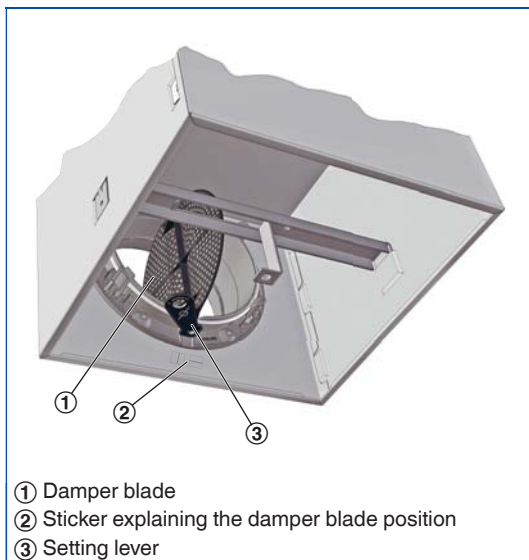
Open, 0°

#### AK-Uni-...-MN Volume flow rate balancing



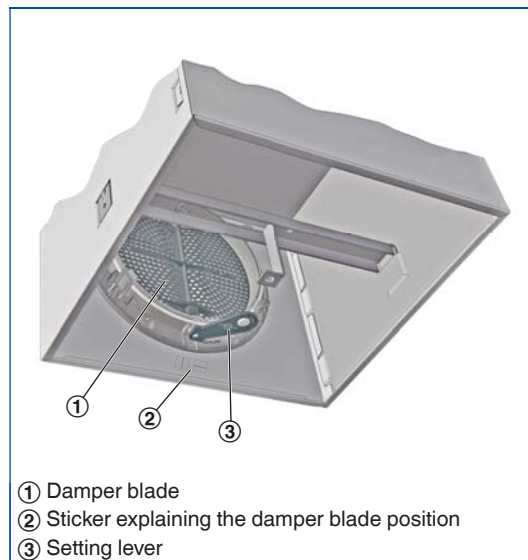
Closed, 90°

#### AIRNAMIC, XARTO, FLEXTRO Volume flow rate balancing



Open, 0°

#### AIRNAMIC, XARTO, FLEXTRO Volume flow rate balancing



Closed, 90°

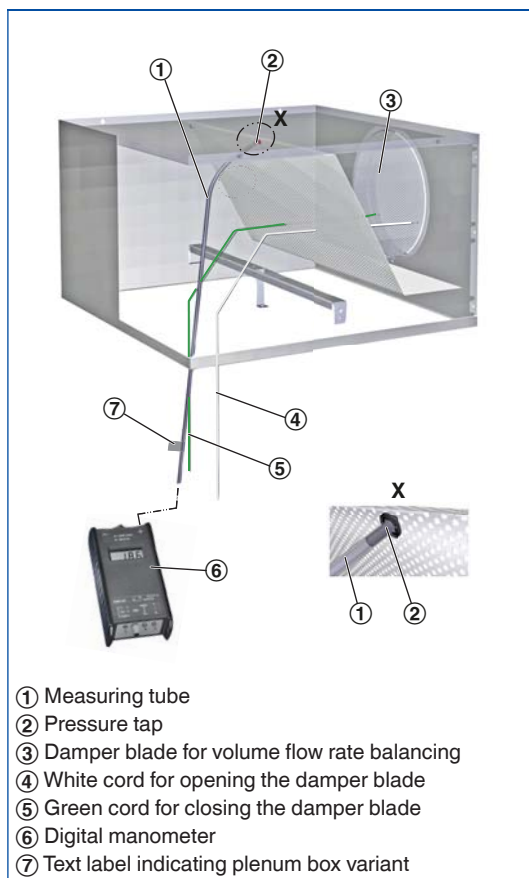
### Volume flow rate measurement

Ceiling diffusers with universal plenum box, damper blade and pressure tap (variant -MN) allow for volume flow rate balancing even with the diffuser face in place.

- Connect the measuring tube to the digital manometer
- Read the effective pressure
- Read the volume flow rate off the characteristic or calculate it
- If necessary, adjust the damper blade position with the cords

A characteristic is included with each AK-Uni plenum box.

### AK-Uni...-MN volume flow rate measurement



For K values for the AK-Uni plenum boxes refer to Chapter K1 – 1.5.

### Volume flow rate calculation for air density 1.2 kg/m<sup>3</sup>

$$\dot{V} = C \times \sqrt{\Delta p_w}$$

### Volume flow rate calculation for other air densities

$$\dot{V} = C \times \sqrt{\Delta p_w} \times \sqrt{\frac{1.2}{\rho}}$$