Plenum boxes
Type FLEXTRO

Flexible plenum boxes requiring less transport and storage space

Flexible plenum boxes for supply air and extract air

- For circular and square diffuser faces
- Plenum box made of plastic and galvanised sheet steel
- For supply and extract air
- For all types of ceiling systems
- Horizontal duct connection
- Equalising element that ensures a uniform airflow through the diffuser face (supply air variant)
- With acoustically optimised and lockable damper blade
- Spigot with double lip seal
- Up to 50 % less weight
- Approximately 60 % less transport and storage space required
- For comfort zones and industrial zones

FLEXTRO with circular diffuser face

FLEXTRO with square diffuser face

1

Variants

Product examples

FLEXTRO with square diffuser face

FLEXTRO with circular diffuser face

Description

Application
- Type FLEXTRO flexible plenum boxes for the connection of circular and square diffuser faces to circular ducts, suitable for supply air or extract air applications in comfort and industrial zones
- For certain nominal sizes of Type AIRNAMIC, VDW, TDV, FD, TDF, ADLQ or DLQ diffuser faces with central screw fixing
- Less transport and storage space required
- For variable and constant volume flows
- For all types of ceiling systems

Variants
- FLEXTRO-R: Plenum box for circular diffuser faces
- FLEXTRO-Q: Plenum box for square diffuser faces
- FLEXTRO-*-Z: Supply air
- FLEXTRO-*-A: Extract air

Nominal sizes
- Q: 600
- R: 400, 600

Special characteristics
- Plenum box made of plastic and galvanised sheet steel
- For all types of ceiling systems
- For circular and square diffuser faces
- Easy to transport; easy and quick to erect for installation
- Newly developed equalising element that ensures a uniform airflow through the diffuser face
- Acoustically optimised damper blade for volume flow rate balancing, can be set in 15° intervals between 0 and 90°
- Up to 50 % less weight
- Approximately 60 % less transport and storage space required

Parts and characteristics
- Flexible fold-up casing for aerodynamic air patterns
- Spigot with double lip seal
- Damper blade for volume flow rate balancing, can be set in 15° intervals between 0 and 90°
- Equalising element that ensures the best possible airflow through the diffuser face (supply air)
- Cross bar for fixing the diffuser face
- Metal angled support rod, with interlock, to erect the plenum box
- Frame with suspension lugs

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

Materials and surfaces
- Frame made of galvanised sheet steel
- Linkage and cross bar made of galvanised steel
- Spigot, spigot mounting plate and damper blade made of ABS plastic, UL 94, V-0, flame retardant
- Flexible walls of the plenum box are made of polyester fabric, to DIN 4102, fire rating class B1
- Equalising element made of synthetic fibre

Installation and commissioning
- Note the installation details for ceiling diffusers
- Simply erect the the plenum box
- Make the duct connection
- If necessary, carry out volume flow rate balancing with damper blade

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

Plenum boxes for square diffuser faces

Standard combinations

Variant	Diffuser face Variant					
	AIRNAMIC-Q	VDW-Q	TDV-SA-Q	FD-Q	TDF-SA-Q	ADLQ DLQ
FLEXTRO-Q	600 625	600 × 24 625 × 24	600 625	600 625	600 625	600 625

Plenum boxes for circular diffuser faces

Standard combinations

Variant	Diffuser face Variant				
	AIRNAMIC-R	VDW-R	TDV-SA-R	FD-R	TDF-SA-R
FLEXTRO-R-*/400	400L 400H				
FLEXTRO-R-*/600	600	600 × 24 625 × 24	600 625	600 625	600 625

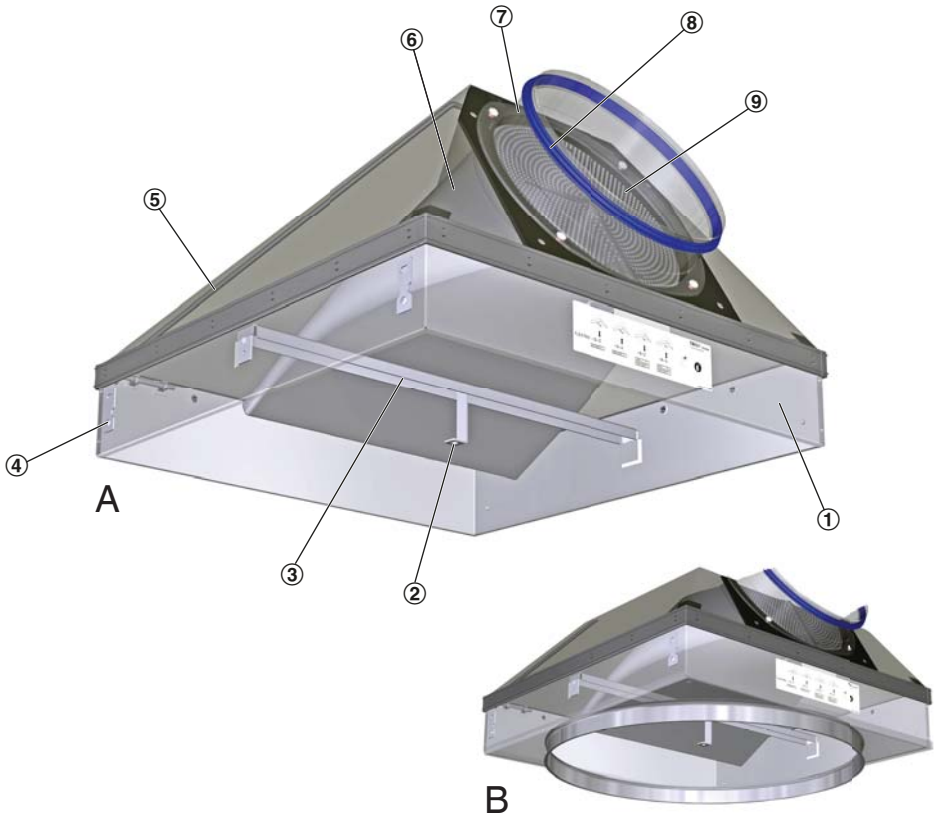
1 Function

Functional description

Plenum boxes are used to connect ceiling diffusers to circular ducts and to fix the diffuser face.

Type FLEXTRO plenum boxes are fitted with an equalising element that ensures that the air is evenly distributed to the room. A damper blade simplifies volume flow rate balancing for commissioning.

Schematic illustration



A Plenum box for square diffuser faces
B Plenum box for circular diffuser faces
① Plenum box
② Central fixing screw
③ Cross bar
④ Suspension lug
⑤ Metal angled support rod
⑥ Equalising element (for supply air only)
⑦ Spigot
⑧ Lip seal
⑨ Damper blade for volume flow rate balancing

Order code

FLEXTRO

FLEXTRO – R – Z / 400
1 2 3 4

1 Type
FLEXTRO Plenum box

2 Diffuser face
R Circular
Q Square

3 System
Z Supply air
A Extract air

4 Nominal size [mm]
Specify only for circular diffuser faces
400
600

Order example

FLEXTRO-Q-A/600

Diffuser face	Square
System	Extract air
Nominal size	600

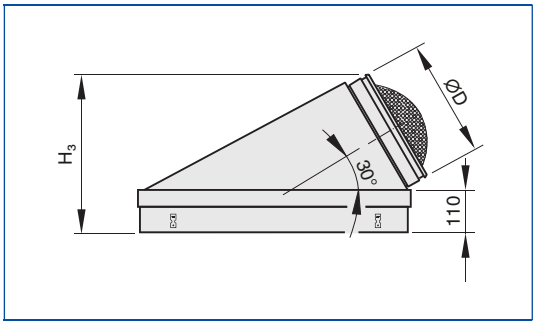
1

FLEXTRO
with square diffuser face

– Q –

Order code detail

Flexible plenum box FLEXTRO-Q for square diffuser faces



Dimensions [mm] and weight [kg]

Variant	H_3	ØD	m
	mm		kg
FLEXTRO-Q	365	248	4.0

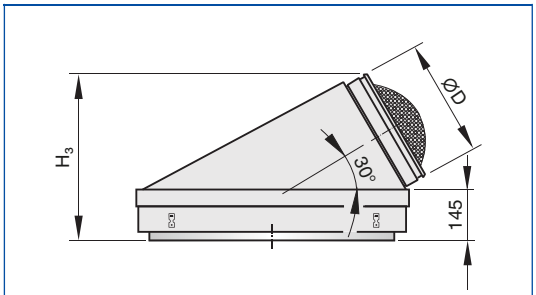
Weights apply to the supply air variant

FLEXTRO
with circular diffuser face

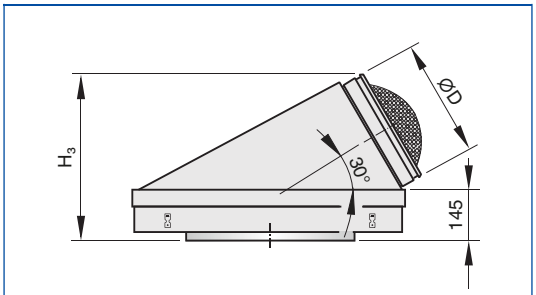
– R –

Order code detail

Flexible plenum box FLEXTRO-R/600 for circular diffuser faces of nominal size 600



Flexible plenum box FLEXTRO-R/400 for circular diffuser faces of nominal size 400



Dimensions [mm] and weight [kg]

Variant	H_3	ØD	m
	mm		kg
FLEXTRO-R-*/400	400	248	4.1
FLEXTRO-R-*/600	400	248	4.0

Weights apply to the supply air variant

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.

Type FLEXTRO flexible plenum boxes for the connection of circular and square diffuser faces to circular ducts, suitable for supply air or extract air applications. For installation into all types of suspended ceilings.
The plenum box folds flat for transport and storage. Component which consists of the frame with suspension lugs, flexible walls, equalising element (only for supply air), spigot at an angle of 45° and with an acoustically optimised damper blade, and a cross bar.
The diffuser face is fixed to the cross bar with a central screw, concealed by a decorative cap.
Spigot suitable for ducts to EN 1506 or EN 13180.

Special characteristics

- Plenum box made of plastic and galvanised sheet steel
- For all types of ceiling systems
- For circular and square diffuser faces
- Easy to transport; easy and quick to erect for installation
- Newly developed equalising element that ensures a uniform airflow through the diffuser face
- Acoustically optimised damper blade for volume flow rate balancing, can be set in 15° intervals between 0 and 90°
- Up to 50 % less weight
- Approximately 60 % less transport and storage space required

Materials and surfaces

- Frame made of galvanised sheet steel
- Linkage and cross bar made of galvanised steel
- Spigot, spigot mounting plate and damper blade made of ABS plastic, UL 94, V-0, flame retardant
- Flexible walls of the plenum box are made of polyester fabric, to DIN 4102, fire rating class B1
- Equalising element made of synthetic fibre

Order options

1 Type
FLEXTRO Plenum box

2 Diffuser face
☐ **R** Circular
☐ **Q** Square

3 System
☐ **Z** Supply air
☐ **A** Extract air

4 Nominal size [mm]
Specify only for circular diffuser faces
☐ **400**
☐ **600**

Ceiling diffusers

Basic information and nomenclature

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

1

Product selection

	Ceiling swirl diffusers								
	AIRNAMIC	VDW	TDV-SilentAIR	RFD	FD	TDF-SilentAIR	VD	VDL	FDE
Diffuser face style									
Circular	●	●	●	●	●	●		●	
Square	●						●		●
Diffuser face									
Circular	●	●	●	●	●	●		●	
Square	●	●	●	●	●	●	●		●
Galvanised sheet steel		●	●	●	●	●		●	●
Aluminium				●			●		
Plastic	●								
Air control blades									
Fixed	●			●	●	●			●
Adjustable		●	●				●	●	
Plastic, black and white		●	●						
Duct connection									
Horizontal	●	●	●	●	●	●	●	●	●
Vertical		●	●	●	●	●	●	●	
FLEXTRO	●	●	●		●	●			
Attachments									
Damper blade	●	●	●	●	●	●			●
Pressure tap		●	●	●	●	●			●
Actuator							●	●	
Accessories									
Lip seal	●	●	●	●	●	●			●
Protective cage							●	●	
Extended border							●	●	
Nominal sizes									
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
Technical data									
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^3/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**

Product selection

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

***Nominal diameter**

1

Product selection

	Ceiling diffusers						
	VDR	ADLQ	DLQ	ADLR	DLQL	DLQ-AK	DLK-Fb
Diffuser face style							
Circular	●			●			
Square		●	●		●	●	●
Diffuser face							
Circular	●			●			
Square		●	●	●	●	●	●
Galvanised sheet steel			●		●	●	●
Aluminium	●	●		●			
Plastic							
Air control blades							
Fixed		●	●	●	●	●	●
Adjustable	●						
Plastic, black and white							
Duct connection							
Horizontal	●	●	●	●	●	●	●
Vertical	●			●	●		
FLEXTRO		●					
Attachments							
Damper blade		●	●	●	●		
Pressure tap		●	●	●			
Actuator	●						
Accessories							
Lip seal		●	●	●	●		
Protective cage							
Extended border							
Nominal sizes							
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						
Technical data							
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**

Principal dimensions

ØD [mm]
Outside diameter of the spigot

$ØD_1$ [mm]
Outer diameter of a circular diffuser face

$ØD_2$ [mm]
Diameter of a circular diffuser face style

$ØD_3$ [mm]
Diameter of a circular plenum box

$□Q_1$ [mm]
Outer diameter of a square diffuser face

$□Q_2$ [mm]
Dimensions of a square diffuser face style

$□Q_3$ [mm]
Dimensions of a square plenum box

H_1 [mm]
Distance (height) from the lower edge of the suspended ceiling to the lower edge of the diffuser face

H_2 [mm]
Height of a ceiling diffuser, from the lower edge of the suspended ceiling to the upper edge of the spigot

H_3 [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_{WA} [dB(A)]
A-weighted sound power level of air-regenerated noise

$\dot{V}$ [m^3/h] and [l/s]
Volume flow rate

Δt_z [K]
Supply air temperature difference

Δp_t [Pa]
Total differential pressure

A_{eff} [m^2]
Effective air discharge area

All sound power levels are based on 1 pW.

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 l/s (1280 m³/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

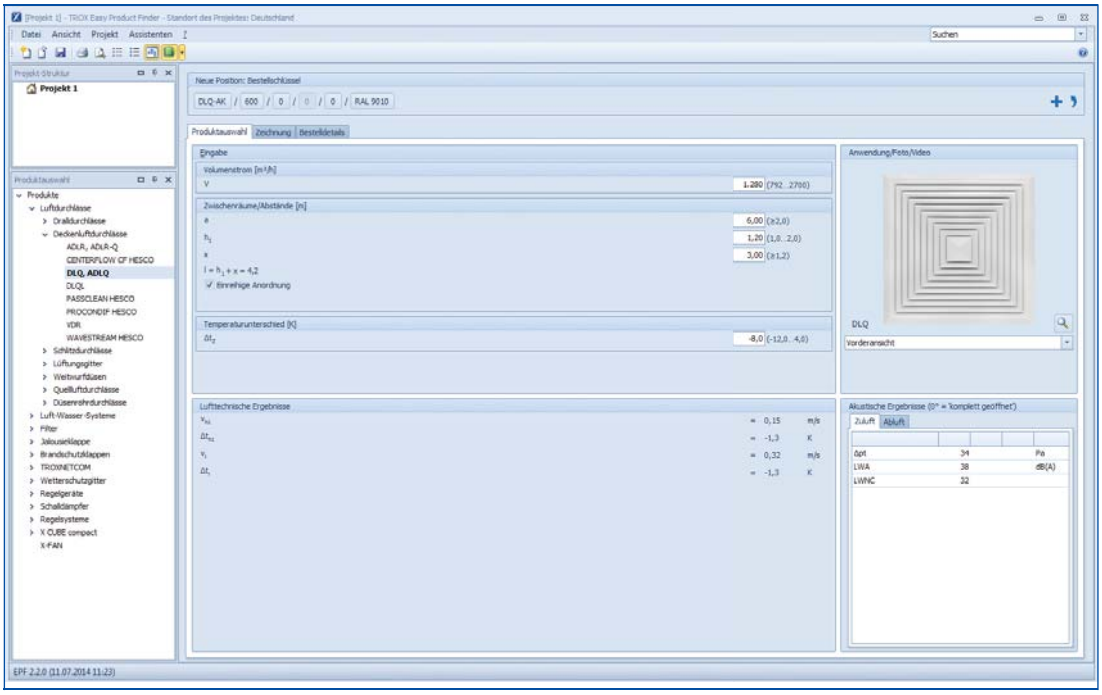
Quick sizing

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.



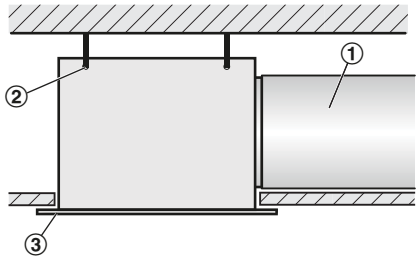
Description

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

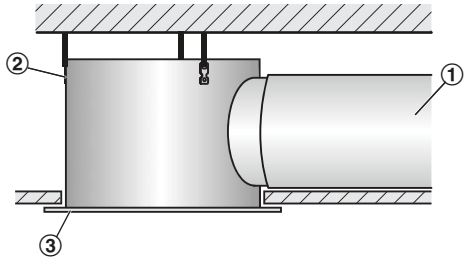
Flush ceiling installation with square plenum box



① Duct
② Suspension hole
③ Diffuser face

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

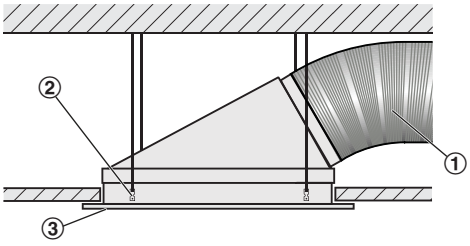
Flush ceiling installation with circular plenum box



① Duct
② Suspension lug
③ Diffuser face

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

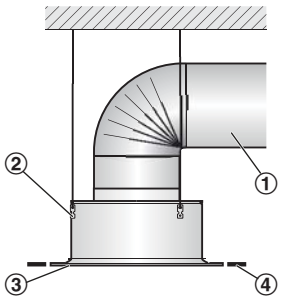
Flush ceiling installation with plenum box FLEXTRO



① Duct
② Suspension lug
③ Diffuser face

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

Freely suspended installation



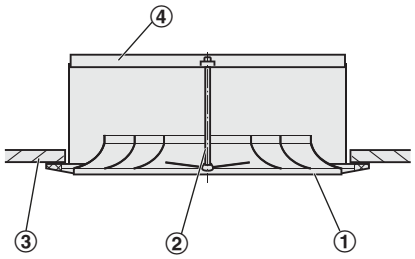
① Duct
② Suspension lug
③ Diffuser face
④ Extended border

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

1

Installation without plenum box

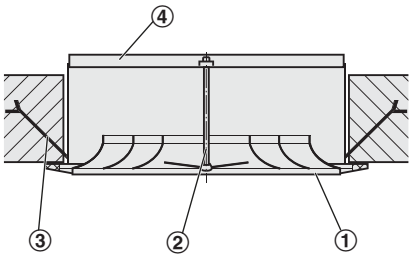
Flush ceiling installation with standard cross bar G1, screw-fixed to ceiling



① Diffuser face
② Central fixing screw
③ Ceiling tile
④ Standard cross bar

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

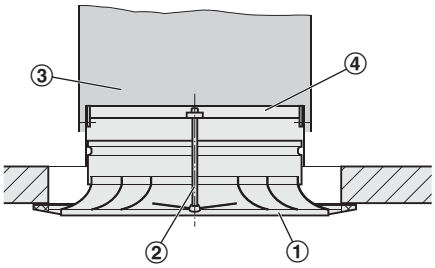
Flush ceiling installation with standard cross bar G1, with fixing tabs mortared in



① Diffuser face
② Central fixing screw
③ Fixing tab
④ Standard cross bar

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

Flush ceiling installation with duct cross bar E1

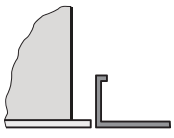


① Diffuser face
② Central fixing screw
③ Duct
④ Duct cross bar

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

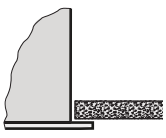
Ceiling systems

Installation into grid ceilings



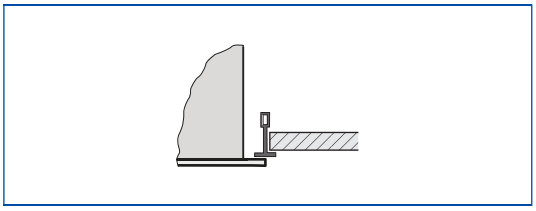
– Fix the plenum box to the ceiling
– The ceiling tile of the grid ceiling is independent of the ceiling diffuser
– Fix the diffuser face after the ceiling has been completed

Installation in continuous ceilings



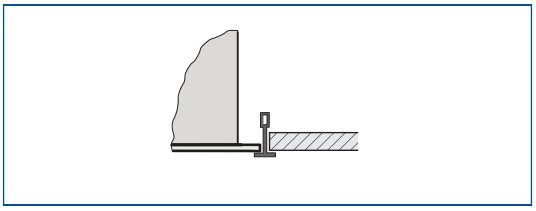
– Fix plenum box (including diffuser face, if necessary) to the ceiling
– Adjust plasterboard ceiling tile as required
– If necessary, fix the diffuser face after the ceiling has been completed

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

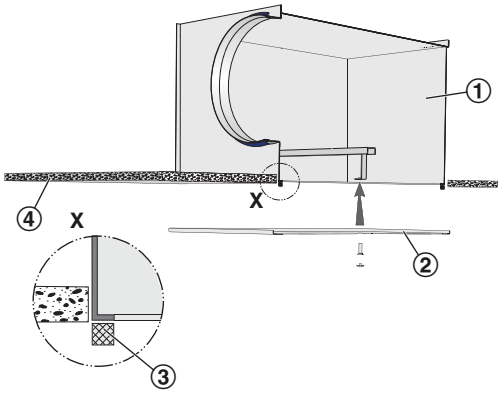
Installation in T-bar ceilings, diffuser face rests on T-bars



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

Diffuser face sealing and fixing

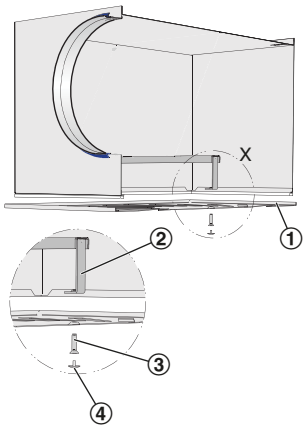
Diffuser face – sealing



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

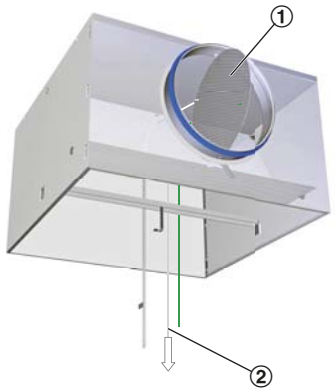
- Using the central fixing screw, fix the diffuser face to the cross bar of the plenum box
- Attach the decorative cap

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).

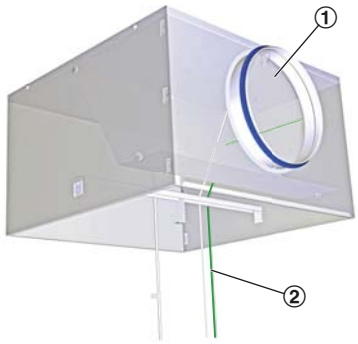
AK-Uni-...-MN Volume flow rate balancing



① Damper blade
② White cord for opening the damper blade

Open, 0°

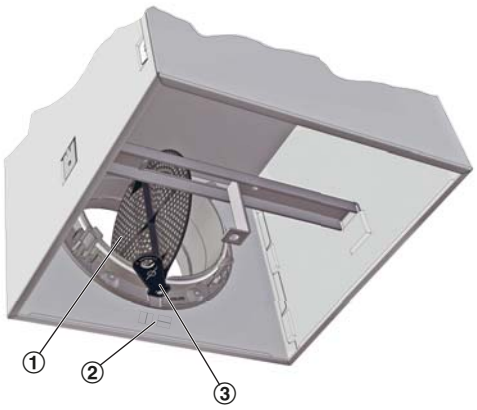
AK-Uni-...-MN Volume flow rate balancing



① Damper blade
② Green cord for closing the damper blade

Closed, 90°

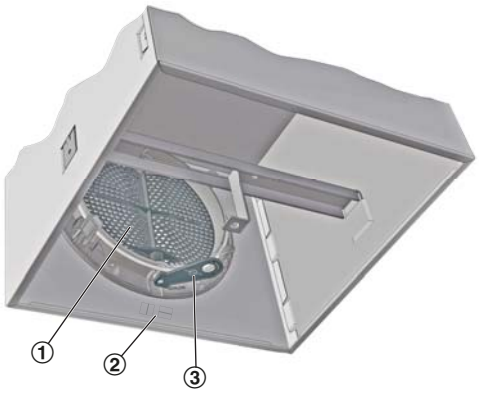
AIRNAMIC, XARTO, FLEXTRO Volume flow rate balancing



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

Open, 0°

AIRNAMIC, XARTO, FLEXTRO Volume flow rate balancing



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

Closed, 90°

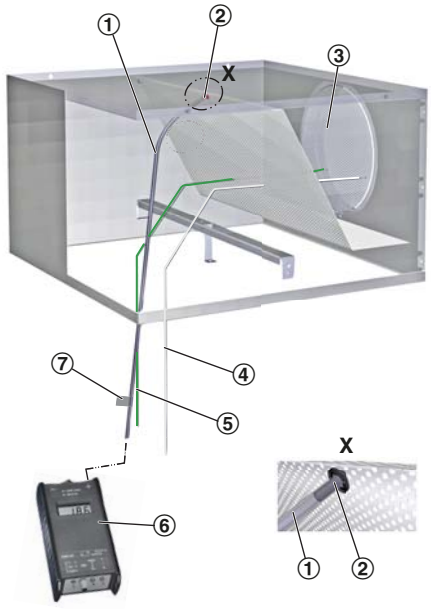
Volume flow rate measurement

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



① Measuring tube
② Pressure tap
③ Damper blade for volume flow rate balancing
④ White cord for opening the damper blade
⑤ Green cord for closing the damper blade
⑥ Digital manometer
⑦ Text label indicating plenum box variant

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/m³

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

Volume flow rate calculation for other air densities

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