

Floor swirl diffuser

Type FBA-OA



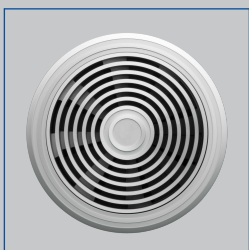
Supply diffusers, with an aluminium core, with additional variable swirl element

Single supply diffusers with high tensile strength

- Nominal sizes 200 mm
- Diffuser core made of aluminium with powder-coat or natural finish
- Trim ring and spring clip fixing that provides volume control
- Adjustable discharge with additional swirl element
- Dirt trap to protect the false floor



Surface option 3



Surface option 4

Type

FBA-OA

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Floor diffuser FBA



Surface option 3



Surface option 4



Description

Application

- Supply diffuser of Type FBA for comfort zones and industrial zones
- Directed supply air discharge for mixed flow ventilation
- Swirl element for horizontal or vertical discharge to meet different local requirements
- For variable and constant volume flows
- For supply air to room air temperature differences from –4 to –10 K
- For installation in floors

Variants

- FBA-OA: Single diffuser

Parts and characteristics

- Horizontal or vertical air discharge
- Radially arranged air control elements for optimum air discharge
- High tensile strength, even subject to an offset load

Nominal sizes

- Nominal size: 200 mm

Attachments

- Dirt trap to prevent contamination of false floor

Accessories

- Trim ring with spring clips for quick and simple installation with volume control damper

Special characteristics

- Diffuser core made of aluminium
- High mechanical rigidity
- Swirl element for optimum control of air discharge direction
- Short installation times due to trim ring and spring clip fixing
- Dirt trap prevents contamination of false floor

Description

Characteristics

- Horizontal or vertical air discharge
- Radially arranged air control elements for optimum air discharge
- High tensile strength, even subject to an offset load

Construction features

Trim ring

- With an anti-twist facility for the diffuser core
- Spring clips for large floor tile thicknesses
- Volume control from diffuser face

Swirl element

- Adjustable for horizontal or vertical discharge

Dirt trap

- To prevent contamination of false floor

Materials

- Diffuser core and trim ring made of die cast aluminium deburred and shot blasted with visible surfaces skimmed. (...4)
- Option for visible surfaces to be painted (...3)
- Spring clips made of stainless steel
- Swirl element made of polyamide (PA 6- V0) flame retardant according to UL 94
- Dirt trap made of plastic (PS) flame retardant according to UL 94
- Adjustment device made of galvanised steel
- Plenum box made of galvanised sheet steel. Option to be painted black RAL 9005 or foam lined

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	200 mm
Minimum volume flow rate	12 l/s or 43 m³/h
Maximum volume flow rate, with L_{WA} max. 40 dB(A)	40 l/s or 144 m³/h
Supply air to room air temperature difference	-4 to -10 K

Volume flow rates for single diffuser for supply air.

Supply air

Effective outlet area A_{eff} in m²	
Nominal size (mm)	200
Vertical air discharge	0.00560
Horizontal air discharge	0.00560

Function

Functional description

Supply diffusers are air terminal devices for the supply air of ventilation and air conditioning systems. They direct the supply air into the room. Supply diffusers with adjustable elements allow for adapting the discharge direction to the local conditions. The result is a mixed flow ventilation in comfort zones and industrial zones, with good overall room ventilation.

Induction slows the airflow down, i.e. the airflow velocity decreases as the distance from the grille increases. The distance at which the airflow velocity reaches a certain defined value, e.g. 0.5m/s, is called throw distance.

Principal dimensions

$\varnothing D1$ [mm]

Nominal diameter of diffuser face

$\varnothing D2$ [mm]

Nominal diameter of diffuser core

$\varnothing D6$ [mm]

Nominal diameter of hole required for installation

$\varnothing D3$ [mm]

Nominal diameter of dirt trap

m [kg]

Weight

Nomenclature

l_s [m]

Distance from centre of diffuser (throw distance)

y [m]

Height of measuring point 10 - 50 mm above floor level

h_1 [m]

Height above diffuser

h_{max} [m]

Maximum penetration height of supply air jet depending on Δt_z and V

V_l [l/s]

Maximum time average air velocity within 10 - 50 mm above floor level at distance l

V_{h1} [l/s]

Maximum time average air velocity at height h_1

V [m³/h] and [l/s]

Volume flow rate

Δp_t [Pa]

Total differential pressure

Δt_l [K]

Temperature difference between room air and core at distance l

Δt_{h1} [K]

Temperature difference between room air and core at height h_1

Δt_z [K]

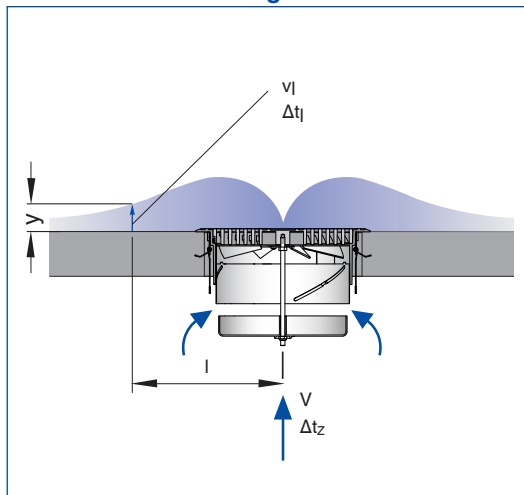
Temperature difference between supply air and room air

L_{WA} [dB(A)]

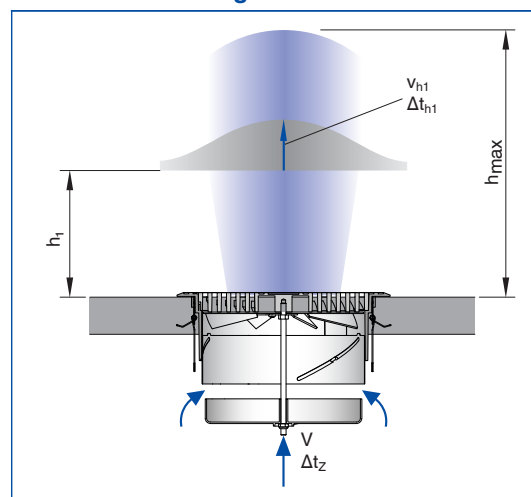
Sound power level of the air-regenerated noise

Air pattern

Horizontal air discharge



Vertical air discharge



Sizing with the help of this catalogue

This catalogue provides convenient quick sizing tables for supply diffusers. The volume flow rates apply to a nominal diffuser size of 200mm, maximum sound power level of the air-regenerated noise of 40 dB(A) with an open dirt trap (unrestricted airflow).

The tables below give pressure drop and sound power at various flowrates as well as V_L , V_{h1} and $\Delta t_i/\Delta t_z$ (as described in the nomenclature) at points along this discharge jet.

Correction factors for other configurations are provided below.

Technical data

Horizontal Discharge

Product code	V				V _L (m/s)			$\Delta t_i/\Delta t_z$		
	l/s	m ³ /h	Pa	L _{WA}	0.6m	0.8m	1.0m	0.6m	0.8m	1.0m
FBA-3/200	20	72	10	20	0.19	0.16	0.13	0.25	0.22	0.19
	25	90	16	26	0.24	0.20	0.16	0.25	0.22	0.19
	30	108	23	31	0.29	0.24	0.20	0.25	0.22	0.19
	35	126	31	36	0.34	0.28	0.23	0.25	0.22	0.19
	40	144	40	40	0.38	0.32	0.26	0.25	0.22	0.19

Vertical Discharge

Product code	V				V _{h1} (m/s)			$\Delta t_{h1}/\Delta t_z$		
	l/s	m ³ /h	Pa	L _{WA}	0.6m	0.8m	1.0m	0.6m	0.8m	1.0m
FBA-3/200	20	72	10	19	0.80	0.50	0.38	0.80	0.49	0.35
	25	90	15	27	0.98	0.62	0.40	0.80	0.49	0.35
	30	108	22	33	1.10	0.70	0.50	0.80	0.49	0.35
	35	126	29	37	1.32	0.81	0.61	0.80	0.49	0.35
	40	144	38	40	1.55	0.90	0.70	0.80	0.49	0.35

Pressure and sound power correction factors

Percentage open	Horizontal		Horizontal with AK		Vertical		Vertical with AK	
	Pa	L _{WA}	Pa	L _{WA}	Pa	L _{WA}	Pa	L _{WA}
100	—	—	x1.3	x1.1	—	—	x1.2	x1.2
40	x1.1	+1	x1.5	x1.2	x1.3	+4	x1.6	x1.2
20	x3.8	+8	x2.0	x1.3	x1.8	+8	x2.3	x1.3

V_{h1} correction factors

	Δt_z			
	-4	-6	-8	-10
V _{h1}	x1.2	x1.0	x0.85	x0.75

Order code

FBA

FBA - 3 - X / 200				
1	2	3	4	

1 Type

FBA Aluminium diffuser core

3 Swirl Element

X With adjustable swirl element

2 Surface of diffuser core and trim ring

3 Die cast, deburred, painted black, visible face skimmed

4 Die cast, deburred visible face skimmed

4 Size

200

Order example

FBA-3/200

Surface of diffuser core and trim	Die cast, deburred, painted black, visible face skimmed
Swirl element	With adjustable swirl element
Size	200

Plenum box

AK-FBA, plenum box

AK - FBA - M - D / 200 / P4 / RAL9005:20%				
1	2	3	4	5

1 Type

AK-FBA Plenum box to suit FBA

3 Internal lining

0 No lining

D 12mm foam lining

2 Damper type

0 Without damper

M Perforated spigot damper

4 Size

200

5 Finish

No entry: unpainted

P4 Powder-coated RAL 9005 20%, black*

*Only available with no internal lining

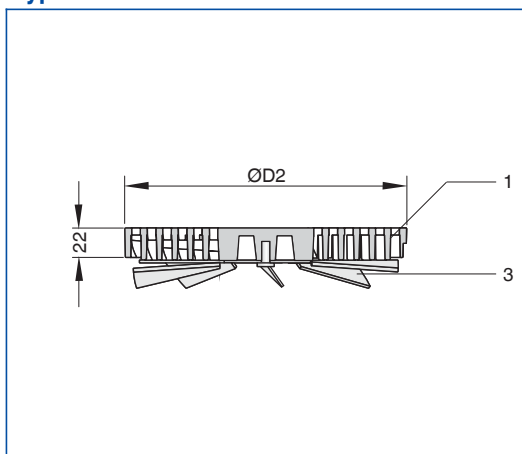
Order example

AK-FBA-M-D/200/P4/RAL9005:20%

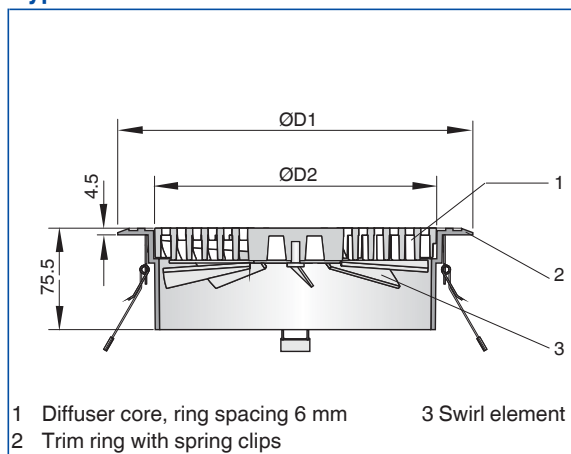
Damper type	Perforated spigot damper
Plenum lining	12mm foam lining
Size	200
Finish	Powder coated RAL 9005, black, gloss level 20%

Diffuser

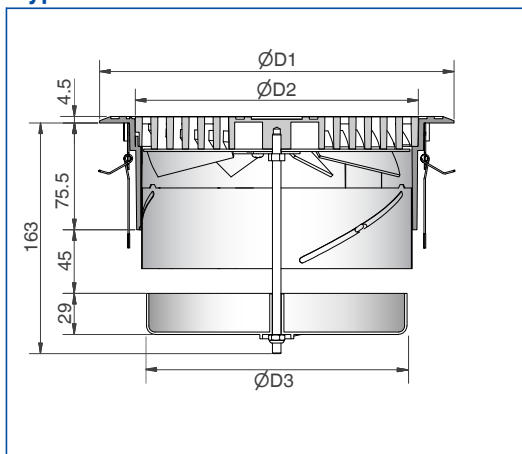
Type FBA



Type FBA



Type FBA



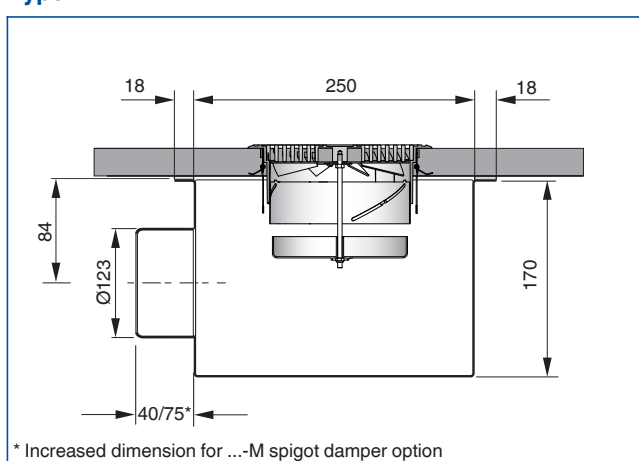
Dimensions in mm			
Nominal size	ØD1	ØD2	ØD3
200	250	199	187

Plenum box

Type AK plenum box is installed on the underside of the floor tile (screw fix to floor tile by others).

The seal between the plenum flange and floor tile must be provided by the customer.

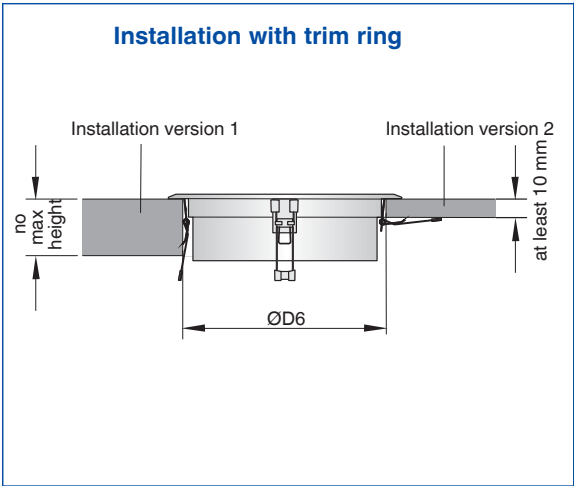
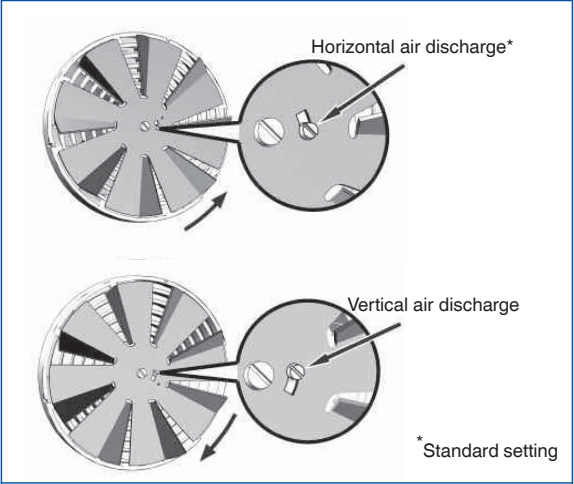
Type AK.....



Installation

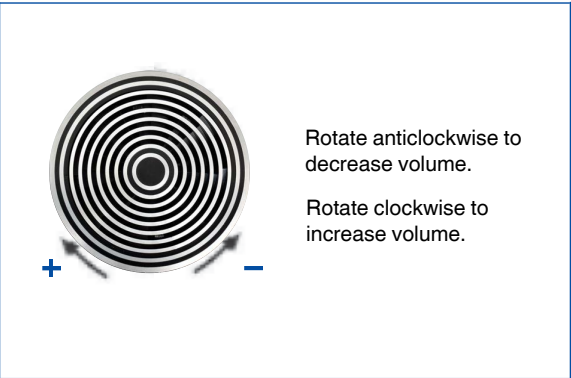
The use of trim rings is recommended for installation in false floors with carpeting due to the better edge protection. They can be used for all tile thickness ≥ 10 mm.

Adjustment of the swirl element



Dimensions in mm		Weight in kg
Nominal size	$\varnothing D6$	FBA
200	221 ± 1 mm	1.87

Adjustment of volume control



The volume flowrate of the diffuser can be adjusted by rotation of the core. This can be done by hand or by using a non-metallic blunt tool, so as not to damage the diffuser, to rotate the core from between the rings.

Installation examples

Positive pressure plenum floors

Positive plenums are preferred for large floor areas. Here, plenum boxes are not required due to the uniform under floor pressure distribution. It is not necessary to balance the air flow to individual diffusers.

Individual rooms

The use of plenum boxes is recommended for individual room temperature control. This guarantees that the air flow rate to each room can be controlled separately, e.g. by room thermostats.

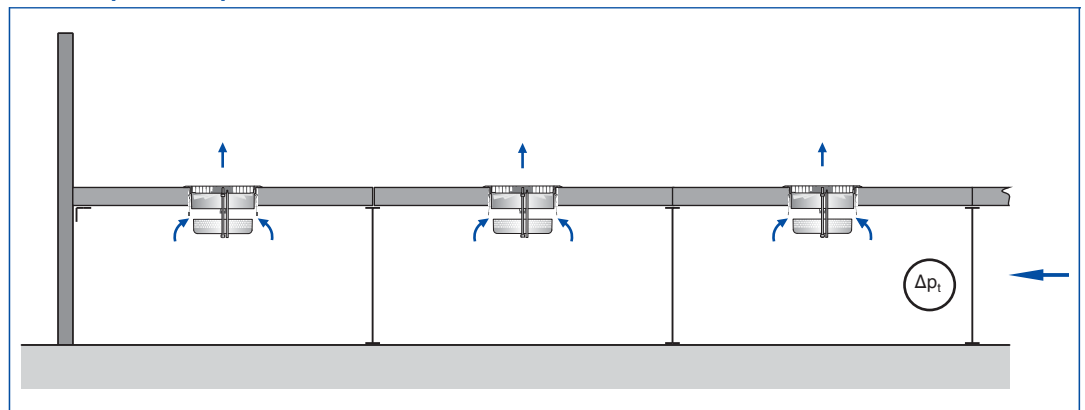
Positive pressure plenum floors and individual rooms

For a combination of zone and individual room control, the floor diffusers for the room should have a ducted supply to the plenum boxes. Individual rooms can then be controlled, e.g. by room thermostats. The air is distributed over the zone via a pressurised floor void and hence the floor diffusers will be nominally self balancing. For the individual room a number of multiple diffuser plenum boxes are shown.

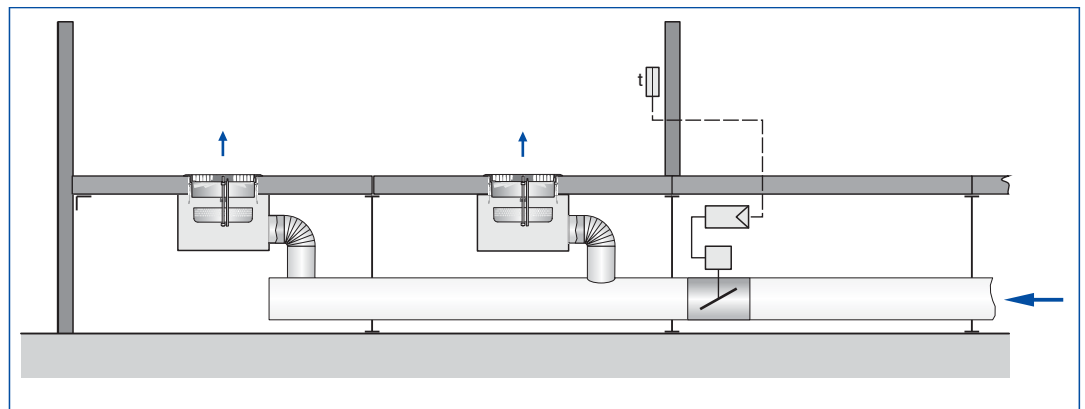
Comment

The use of the dirt trap is not absolutely necessary, dependent on the condition within the room or how the room is used. The aerodynamic performance of the diffuser is not influenced by the dirt trap.

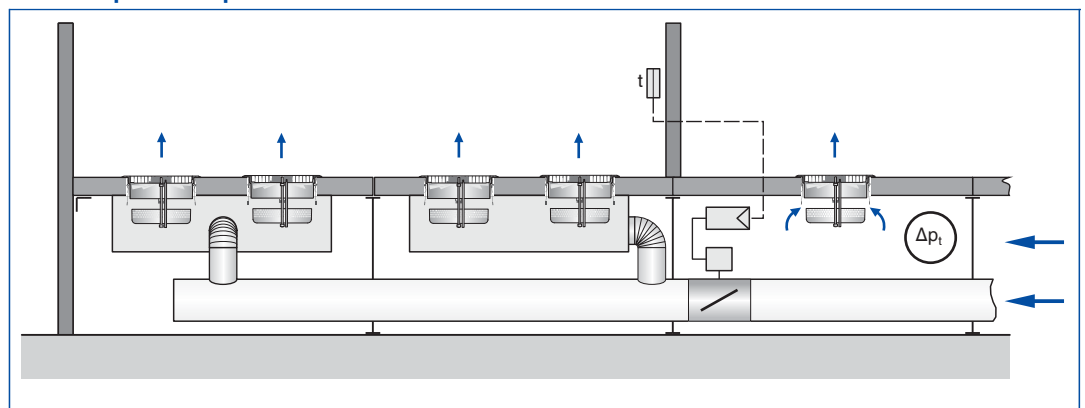
Positive pressure plenum floors



Individual rooms



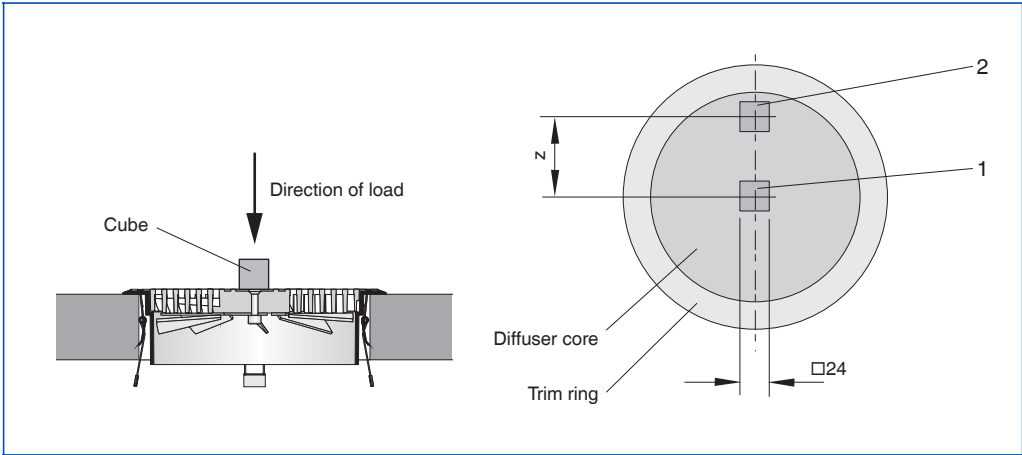
Positive pressure plenum floors and individual rooms



Load capacity

Construction		Rupture load in kN		Spacing z
		Position of cube 1	Position of cube 2	in mm
FBA	Nominal size 200 with trim ring	20	9	77

Load application with trim ring



Standard text

Floor diffuser made of aluminium with radially arranged ribs to provide optimum horizontal or vertical air discharge. Due to the high induction the core jet velocity and the supply air temperature differential rapidly reduce.

Special Characteristics

- Diffuser core made of aluminium
- High mechanical rigidity
- Additional swirl element for optimum control of air discharge direction
- Short installation times due to trim ring and spring clip fixing
- Dirt trap prevents contamination of the false floor

Trim ring with spring clips for easy installation; with anti-twist facility for the diffuser core, suitable for large floor tile thicknesses. Large cutout tolerances due to the spring clamping technique. Sound power level of the air-regenerated noise measured in accordance with EN ISO 5135.

Materials

- Diffuser core and trim ring made of die cast aluminium deburred and shot blasted with visible surfaces skimmed. (...4)
- Option for visible surfaces to be painted (...3)
- Spring clips made of stainless steel
- Swirl element made of polyamide (PA 6- V0) flame retardant according to UL 94
- Dirt trap made of plastic (PS) flame retardant according to UL 94
- Adjustment device made of galvanised steel
- Plenum box made of galvanised sheet steel. Option to be painted black RAL 9005 or foam lined

Order options

1 Type

FBA Aluminium diffuser core

2 Surface of diffuser core and trim ring

- 3** Die cast, deburred, painted black, visible face skimmed
- 4** Die cast, deburred visible face skimmed

3 Swirl Element

X With adjustable swirl element

4 Size

200

Plenum box

1 Type

AK-FBA Plenum box to suit FBA

2 Damper type

- 0** Without damper
- M** Perforated spigot damper

3 Internal lining

- 0** No lining
- D** 12mm foam lining

4 Size

200

5 Finish

- No entry: unpainted
- P4** Powder-coated RAL 9005 20%, black*

*Only available with no internal lining