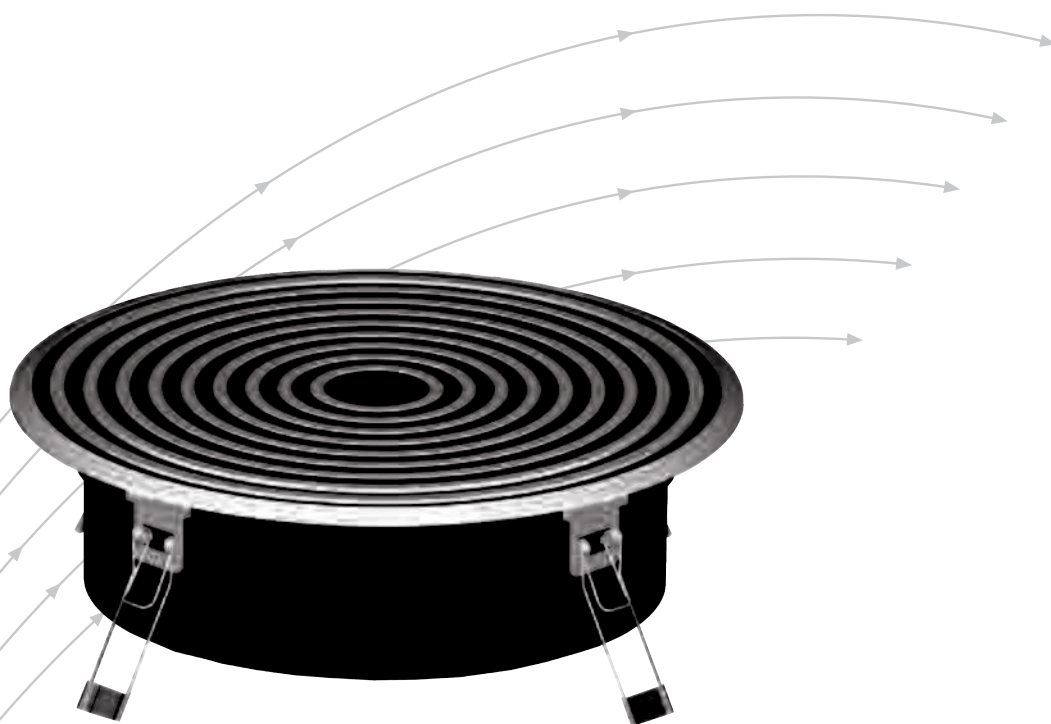


Floor diffusers

Type FB

In aluminium and plastic



TROX[®] TECHNIK

The art of handling air

| | | | |
|--|----|--|----|
| Description | 2 | Aerodynamic data | |
| Installation examples | 3 | Horizontal air discharge (H) | 13 |
| Construction · Dimensions | 4 | Vertical air discharge (V) | 14 |
| Plenum box | 5 | Technical data | |
| Load capacity | 6 | Nominal size 150, vertical discharge, multiple diffusers | 15 |
| Installation | 7 | Order Details | 16 |
| Nomenclature · Technical Data | 8 | | |
| Acoustic data | | | |
| Nominal size 150, horizontal air discharge (H) | 9 | | |
| Nominal size 200, horizontal air discharge (H) | 10 | | |
| Nominal size 150 and 200, vertical air discharge (V) | 11 | | |
| Nominal size 200, vertical discharge (VF) | 12 | | |

Floor diffuser FBA



Diffuser core FBA



Floor diffusers type FB can provide comfortable and energy-efficient air discharge into the space, by complementing existing upward convection streams present in the occupied zone. This principle allows the local heat loads to be targeted directly. They are suitable for all types of false floors. The diffusers form attractive design elements for architects and building owners due to the excellent range of surface finishes and colours available.

Special characteristics

- Diffuser core made of aluminium or plastic
- High mechanical rigidity / tensile strength
- Additional swirl element for optimum control of air discharge direction
- Short installation times for floor diffusers with a trim ring and spring clip fixing
- An additional dirt trap prevents contamination of the false floor and facilitates easy flow rate control

All variations of the type FB are designed so that installation and removal for cleaning purposes can be performed quickly and easily.

Single or multiple diffusers can have plenum boxes with side entry circular spigots for duct connection.

Our “Easy Product Finder” online design programme is also available on the Internet for the design and selection of our floor diffusers.

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

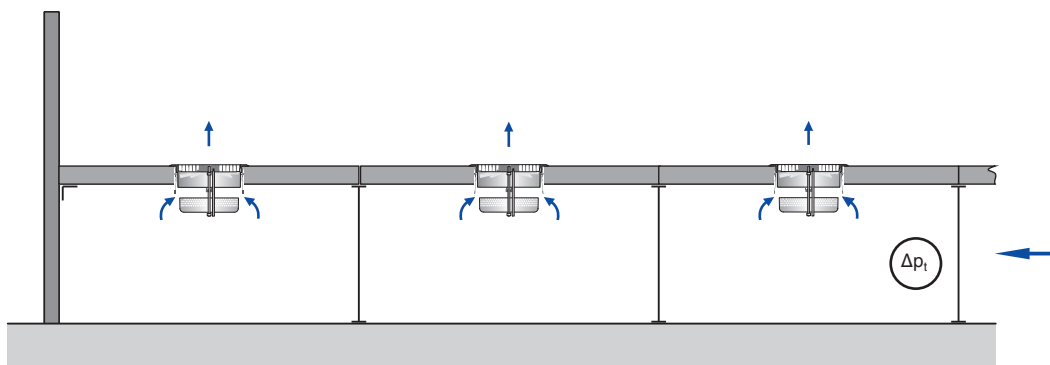
The use of plenum boxes is recommended for individual room temperature control. This guarantees that the air flow rate to each room can be controlled separately, e.g. by room thermostats.

Positive pressure plenum floors and individual rooms

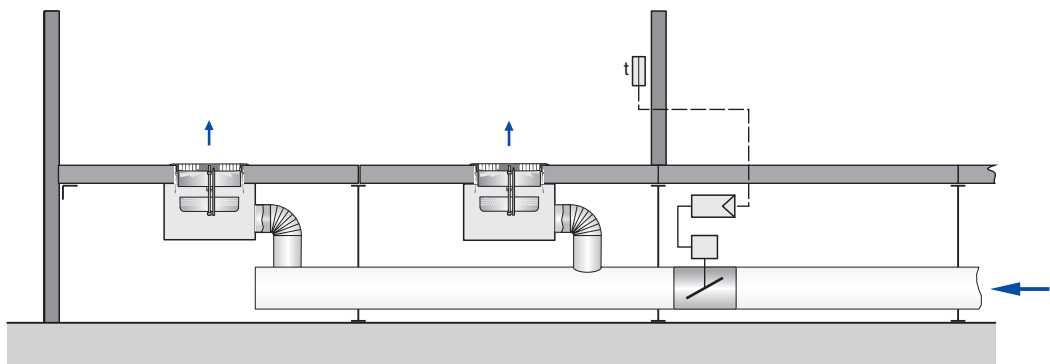
For a combination of zone and individual room control, the floor diffusers for the room should have a ducted supply to the plenum boxes. Individual rooms can then be controlled, e.g. by room thermostats. The air is distributed over the zone via a pressurised floor void and hence the floor diffusers will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

Comment

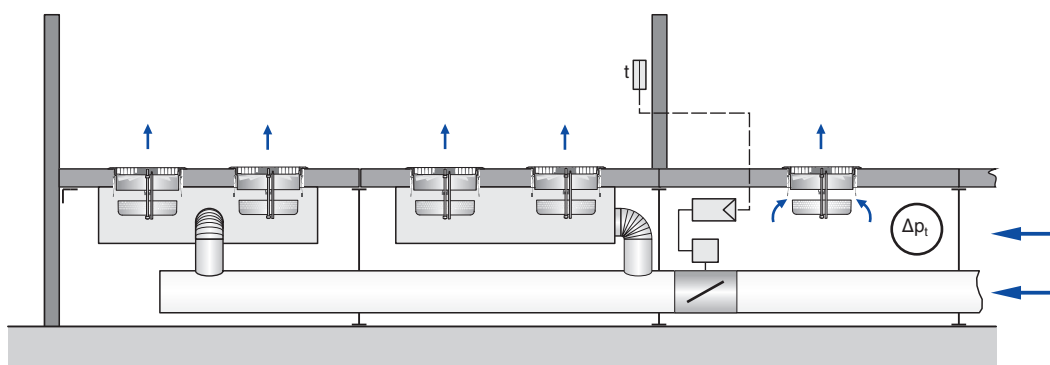
The use of the dirt trap is not absolutely necessary, dependent on the condition within the room or how the room is used. The aerodynamic performance of the diffuser is not influenced by the dirt trap.



Positive pressure plenum floors



Individual rooms



Positive pressure plenum floors and individual rooms

Construction · Dimensions

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 accommodates large cutout tolerances and large floor tile thicknesses

Swirl element

- Fixed for vertical air discharge
- Adjustable for horizontal or vertical discharge

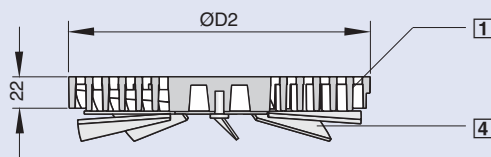
Dirt trap

- To control air flow rate the height of the dirt trap is adjustable either from the face of the diffuser or from the underside

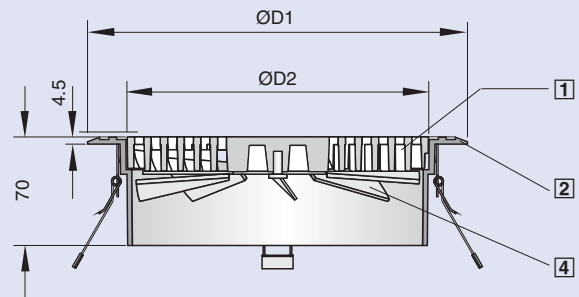
| Diffuser core and trim ring | | Order code |
|---|---------------------------------------|------------|
| Materials | Surface | |
| Aluminium die cast, deburred and shot blasted | – | FBA-1 |
| | – painted black, visible face skimmed | FBA-3 |
| | – visible face skimmed | FBA-4 |
| Polyamide | dusty grey, similar to RAL 7037 | FBK-1//0 |
| | black, similar to RAL 9005 | FBK-2//0 |
| Polyamide flame retardant to UL 94 | dusty grey, similar to RAL 7037 | FBK-1//V00 |
| | black, similar to RAL 9005 | FBK-2//V00 |

- Spring clips made of stainless steel
- Swirl element and spacing ring made of polyamide (PA 6- V0) flame retardant according to UL 94
- Dirt trap made of plastic (ABS) flame retardant according to UL 94
- Adjustment device and stabilising rod made of galvanised steel

Type FBA/FBK

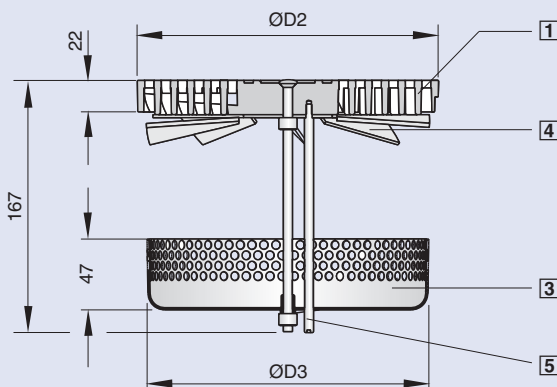


Type FBA/FBK...-KF



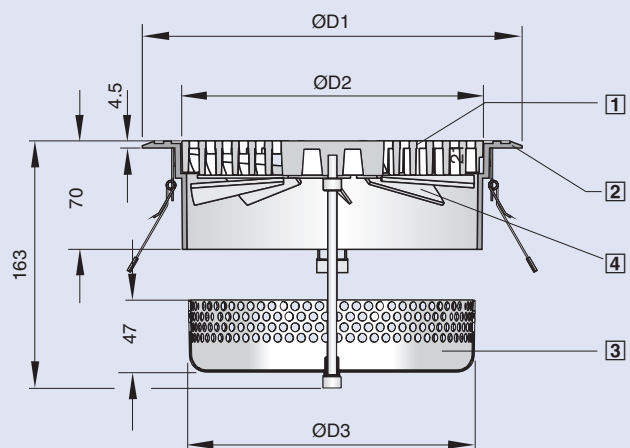
Type FBA/FBK...-SV

With flow rate control adjustment from diffuser face



Type FBA/FBK...-KF-SM

With flow rate control adjustment from the rear



- 1 Diffuser core, ring spacing 6 mm
- 2 Trim ring with spring clips
- 3 Height adjustable dirt trap
- 4 Swirl element
- 5 Stabilising rod

Dimensions in mm

| Nominal size | ØD1 | ØD2 | ØD3 |
|--------------|-----|-----|-----|
| 150 | 200 | 149 | 137 |
| 200 | 250 | 199 | 187 |

Plenum boxes for installation in floors that are not designed as positive pressure plenum

Type A, GA/GAM

They consist of the casing with a side entry spigot and are available as single plenum boxes (type A) or as multiple diffuser plenum boxes (type GA/GAM).

The plenum box is installed on the underside of the floor tile. The sealing between the plenum box flange and floor tile must be provided by the customer.

Type GA/GAM

The multiple diffuser plenum box is suitable for installation of 4 diffusers nominal size 150 in the layout shown below.

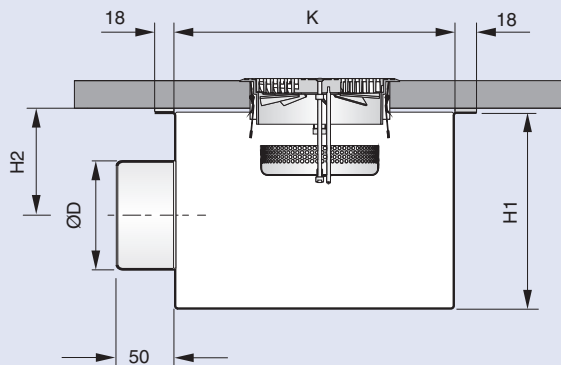
As it is not normally necessary to balance individual diffusers a damper is provided in the side entry spigot of the plenum box.

| Plenum box | Order code |
|---|------------|
| Single diffuser | FB.-A |
| Multiple diffusers | GA |
| Multiple diffusers with a spigot mounted damper for flow rate control | GAM |

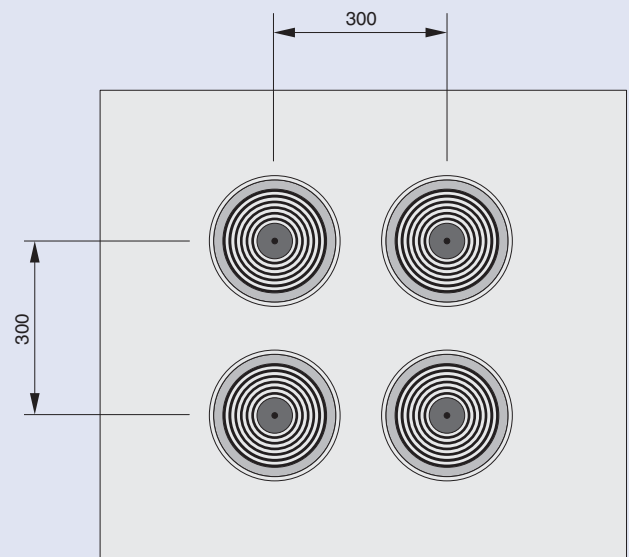
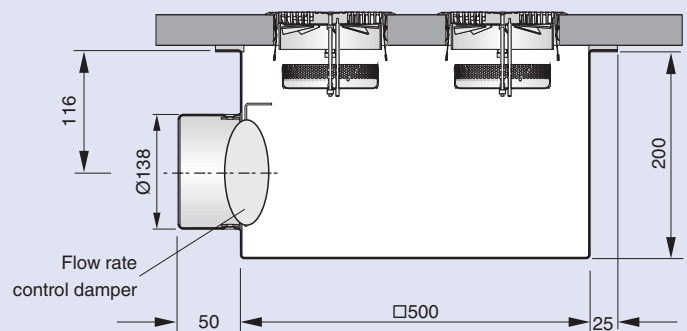
Materials

- Plenum box made of galvanised sheet steel, painted black RAL 9005

Plenum box type A



Plenum box type GA/GAM

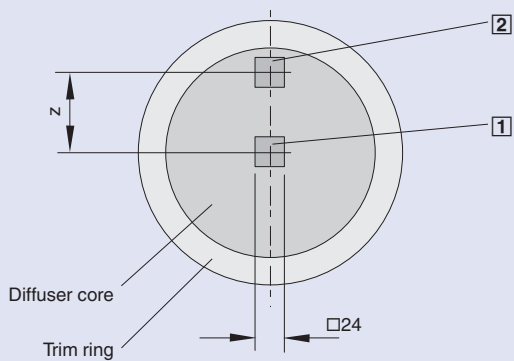
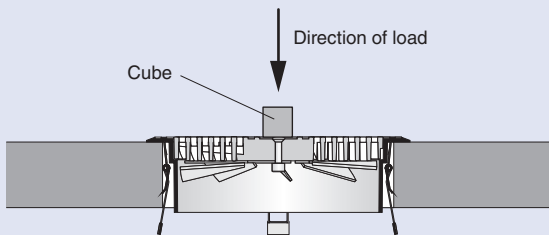


| Dimensions in mm | | | | |
|------------------|-----|-----|-----|----|
| Nominal size | ØD | □K | H1 | H2 |
| 150 | 98 | 200 | 125 | 72 |
| 200 | 123 | 250 | 150 | 84 |

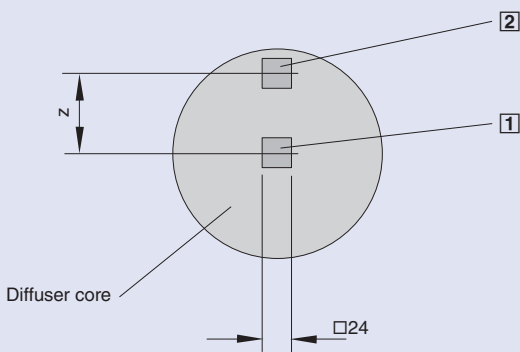
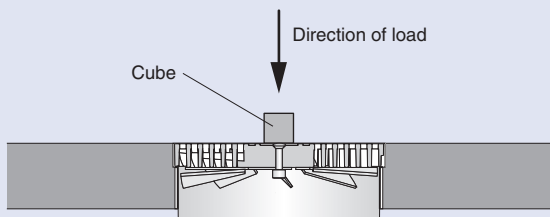
Load capacity

| Construction | | Rupture load in kN | | Spacing z |
|------------------|------------------------------------|-----------------------|-----------------------|-----------|
| | | Position of cube 1 | Position of cube 2 | in mm |
| FBA Aluminium | Nominal size 150 without trim ring | 27 | 15 | 52 |
| | Nominal size 200 without trim ring | 25 | 8 | 77 |
| | Nominal size 150 with trim ring | 28 | 14 | 52 |
| | Nominal size 200 with trim ring | 20 | 9 | 77 |
| FBK Plastic | Nominal size 150 without trim ring | 15 | 6 | 52 |
| | Nominal size 200 without trim ring | 6 | 3 | 77 |
| | Nominal size 150 with trim ring | 12 | 5 | 52 |
| | Nominal size 200 with trim ring | 6 | 2 | 77 |

Load application
with trim ring



Load application
without trim ring



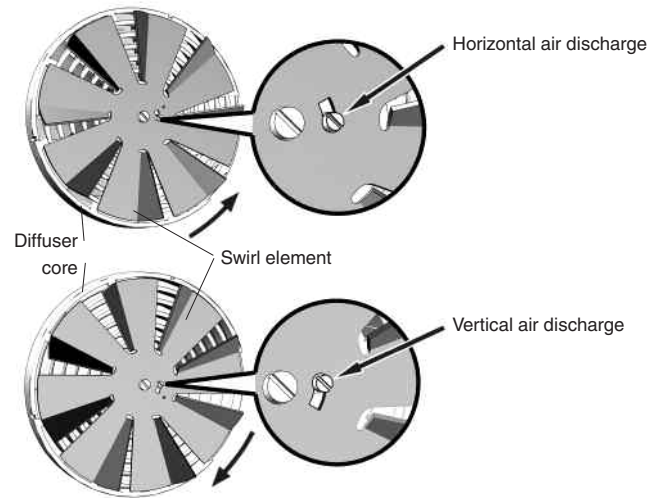
Installation

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.

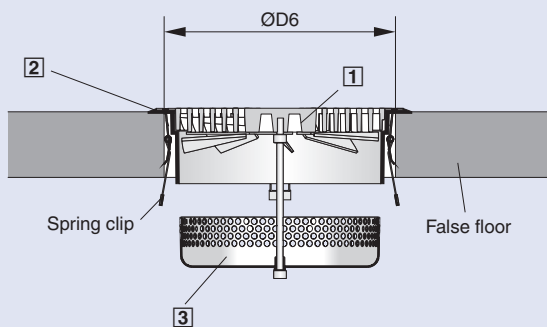
A trim ring [2] is not required for installation in false floors with hard floor covering. If installed without a trim ring, the spacing ring supplied [4] has to be used for functional reasons and for height correction. A stepped hole is required for this.

The installation openings required for the versions with or without a trim ring are shown in the illustrations below.

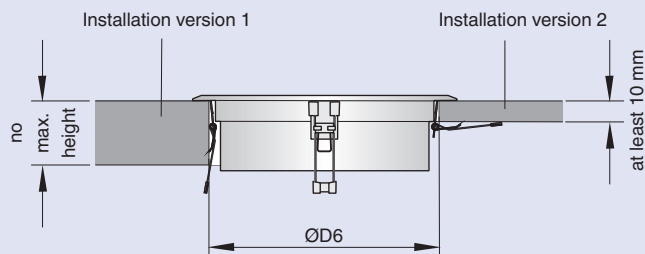
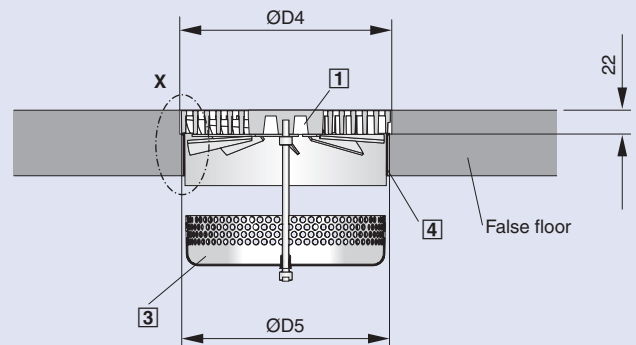
Adjustment of the swirl element



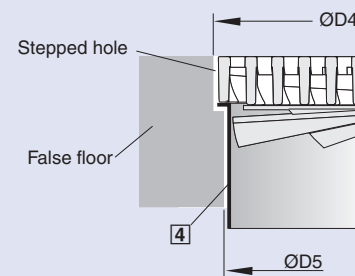
Installation with trim ring



Installation without trim ring



Detail X



- 1 Diffuser core with swirl element
- 2 Trim ring with spring clips
- 3 Dirt trap with height adjustable from the rear to control the air flow rate
- 4 Spacing ring (supplied for floor diffusers without a trim ring for functional reasons and for height correction)

| Dimensions in mm | | | | Weight in kg | | | | | |
|------------------|--------------|--------------|--------------|---------------|-----------|---------|---------------|-----------|---------|
| Nominal size | ØD4 | ØD5 | ØD6 | FBK | | | FBA | | |
| | | | | Diffuser core | Trim ring | SM / SV | Diffuser core | Trim ring | SM / SV |
| 150 | 151 | 143 | 170 – 180 | 0.3 | 0.2 | 0.1 | 0.5 | 0.5 | 0.1 |
| 200 | 201 | 193 | 220 – 230 | 0.4 | 0.2 | 0.1 | 1 | 0.6 | 0.1 |

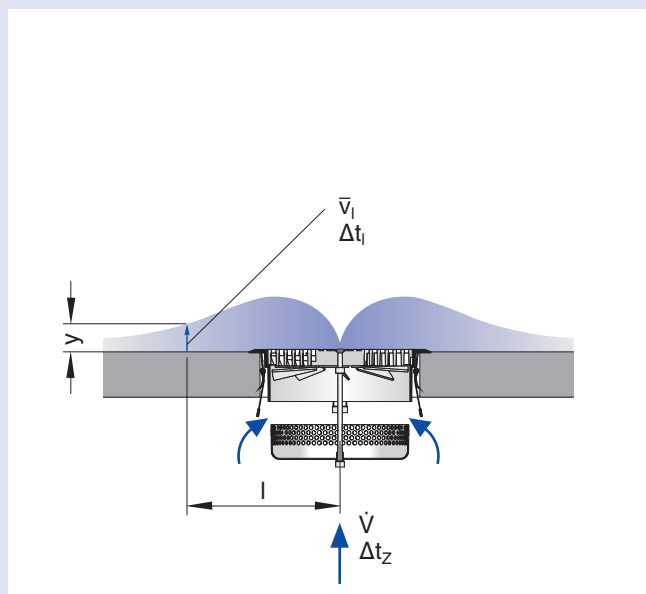
Nomenclature · Technical Data

Nomenclature

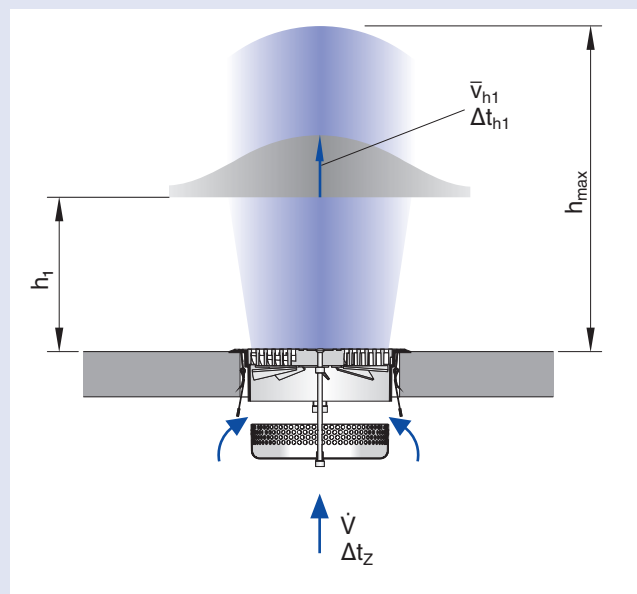
| | | |
|------------------|------------------------------|--|
| \dot{V} | in l/s and m ³ /h | Flow rate per diffuser |
| A_{eff} | in m ² | Effective outlet area |
| l | in m | Distance from centre of diffuser |
| y | in m | Height of measuring point 10 – 50 mm above floor level |
| h_1 | in m | Height above diffuser |
| h_{max} | in m | Maximum penetration height of supply air jet depending on Δt_z and \dot{V} |
| \bar{v}_l | in m/s | Maximum time average air velocity within 10 – 50 mm above floor level |
| \bar{v}_{h1} | in m/s | Maximum time average air velocity at height h_1 above floor level |
| Δt_z | in K | Temperature difference between supply air and room air |
| Δt_{h1} | in K | Temperature difference between room air and core at height h_1 |
| Δt_l | in K | Temperature difference between room air and core at distance l |

| | | |
|------------------|----------|------------------------------------|
| Δp_t | in Pa | Total differential pressure |
| L_{WA} | in dB(A) | A-weighted sound power level |
| L_{WNC} | | NC rating of the sound power level |

Horizontal air discharge



Vertical air discharge



Effective outlet area A_{eff} in m²

| Nominal size | | 150 | 200 |
|------------------------------|--|---------|---------|
| Vertical air discharge (V) | | 0.00394 | 0.00560 |
| Horizontal air discharge (H) | | 0.00334 | 0.00560 |
| Vertical fixed (VF) | | – | 0.00820 |

Acoustic data

Nominal size 150, horizontal air discharge (H)

Correction to diagram 1

Flow rate control using the dirt trap

| open | Δp_t | | L_{WA}/L_{WNC} | |
|------|--------------|--------------|------------------|---------|
| | without AK | with AK | without AK | with AK |
| 100% | $\times 1.0$ | $\times 1.0$ | – | – |
| 40% | $\times 1.1$ | $\times 1.1$ | +1 | +1 |
| 20% | $\times 1.8$ | $\times 1.4$ | +10 | +6 |

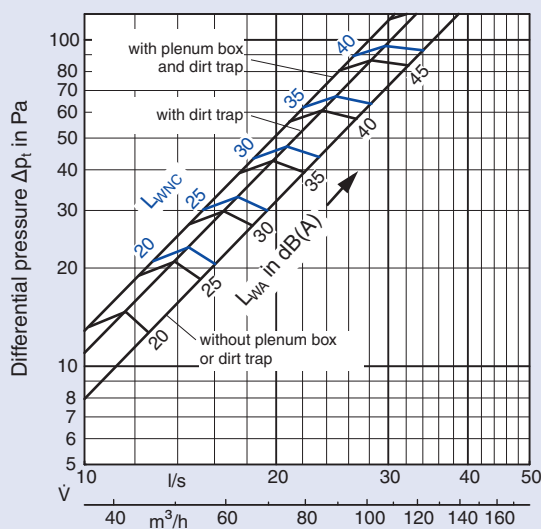
Correction to diagram 2

Flow rate control using the dirt trap

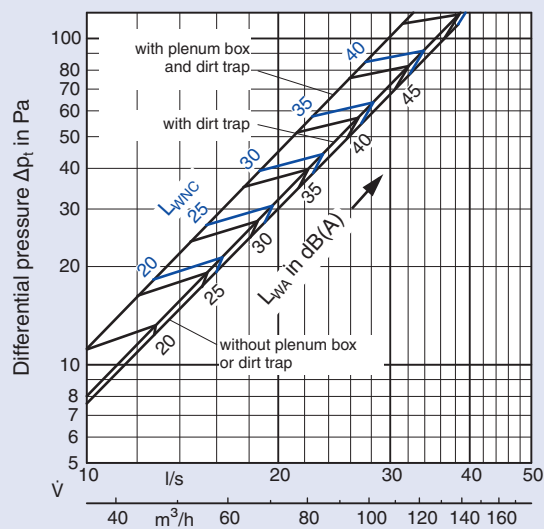
| open | Δp_t | | L_{WA}/L_{WNC} | |
|------|--------------|--------------|------------------|---------|
| | without AK | with AK | without AK | with AK |
| 100% | $\times 1.0$ | $\times 1.0$ | – | – |
| 40% | $\times 1.1$ | $\times 1.1$ | +2 | 0 |
| 20% | $\times 1.4$ | $\times 1.6$ | +5 | +10 |

Sound power level and differential pressure

1 FBA...-H/nominal size 150



2 FBK...-H/nominal size 150



The technical data for variants with a dirt trap (... SM/SV) is valid for floor tiles of up to 70 mm in thickness.

Acoustic data

Nominal size 200, horizontal air discharge (H)

Example

Given:

Type **FBA ... - H - SM / 200**

Flow rate control 40% open

Flow rate $\dot{V} = 35 \text{ l/s}$

Required: Sound power level and differential pressure

Diagram 3:

$$L_{WA} = 35 + 1 = 36 \text{ dB(A)}$$

$$\Delta p_t = 30 \times 1.1 = 33 \text{ Pa}$$

Correction to diagram 3

Flow rate control using the dirt trap

| open | Δp_t | | L_{WA}/L_{WNC} | |
|------|--------------|--------------|------------------|---------|
| | without AK | with AK | without AK | with AK |
| 100% | $\times 1.0$ | $\times 1.0$ | – | – |
| 40% | $\times 1.1$ | $\times 1.2$ | + 1 | + 1 |
| 20% | $\times 3.8$ | $\times 1.6$ | + 8 | + 6 |

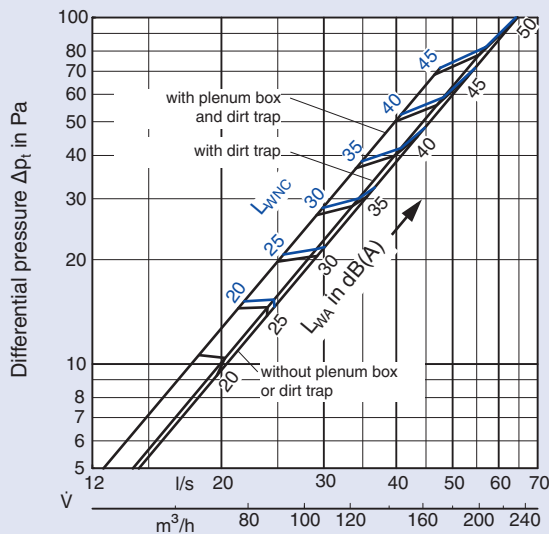
Correction to diagram 4

Flow rate control using the dirt trap

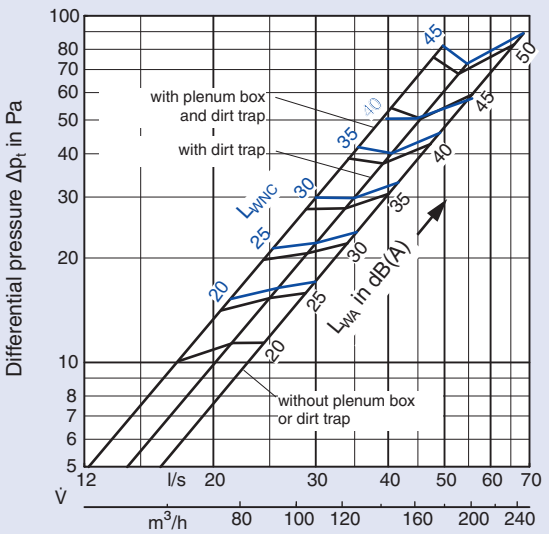
| open | Δp_t | | L_{WA}/L_{WNC} | |
|------|--------------|--------------|------------------|---------|
| | without AK | with AK | without AK | with AK |
| 100% | $\times 1.0$ | $\times 1.0$ | – | – |
| 40% | $\times 1.3$ | $\times 1.3$ | + 2 | + 1 |
| 20% | $\times 2.1$ | $\times 1.8$ | + 9 | + 7 |

Sound power level and differential pressure

3 FBA...-H/nominal size 200



4 FBK...-H/nominal size 200



The technical data for variants with a dirt trap (... SM/SV) is valid for floor tiles of up to 70 mm in thickness.

Acoustic data

Nominal size 150 and 200, vertical air discharge (V)

Correction to diagram 5

Flow rate control using the dirt trap

| open | Δp_t | | L_{WA}/L_{WNC} | |
|------|--------------|--------------|------------------|---------|
| | without AK | with AK | without AK | with AK |
| 100% | $\times 1.0$ | $\times 1.0$ | – | – |
| 40% | $\times 1.2$ | $\times 1.2$ | +1 | +1 |
| 20% | $\times 1.8$ | $\times 1.8$ | +8 | +7 |

Correction to diagram 6

Flow rate control using the dirt trap

| open | Δp_t | | L_{WA}/L_{WNC} | |
|------|--------------|--------------|------------------|---------|
| | without AK | with AK | without AK | with AK |
| 100% | $\times 1.0$ | $\times 1.0$ | – | – |
| 40% | $\times 1.2$ | $\times 1.2$ | +3 | 0 |
| 20% | $\times 1.7$ | $\times 1.7$ | +7 | +5 |

Correction to diagram 7

Flow rate control using the dirt trap

| open | Δp_t | | L_{WA}/L_{WNC} | |
|------|--------------|--------------|------------------|---------|
| | without AK | with AK | without AK | with AK |
| 100% | $\times 1.0$ | $\times 1.0$ | – | – |
| 40% | $\times 1.3$ | $\times 1.3$ | +4 | 0 |
| 20% | $\times 1.8$ | $\times 1.9$ | +8 | +5 |

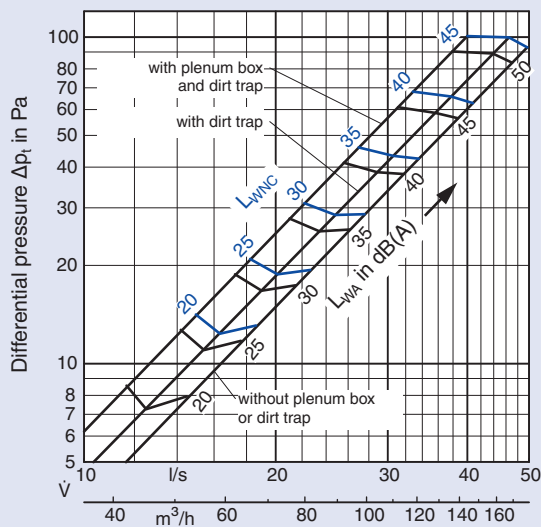
Correction to diagram 8

Flow rate control using the dirt trap

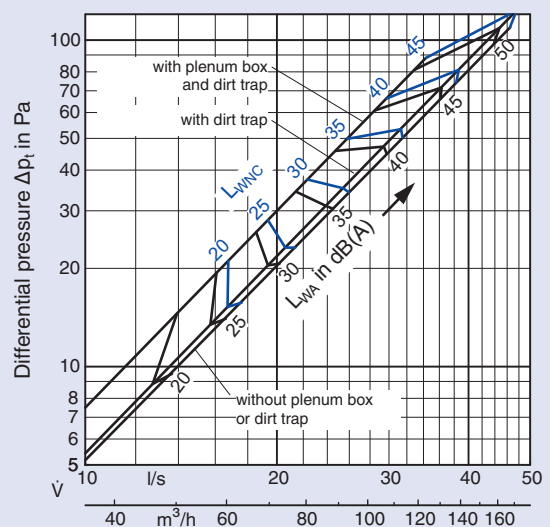
| open | Δp_t | | L_{WA}/L_{WNC} | |
|------|--------------|--------------|------------------|---------|
| | without AK | with AK | without AK | with AK |
| 100% | $\times 1.0$ | $\times 1.0$ | – | – |
| 40% | $\times 1.1$ | $\times 1.3$ | +3 | +2 |
| 20% | $\times 1.6$ | $\times 1.9$ | +8 | +8 |

Sound power level and differential pressure

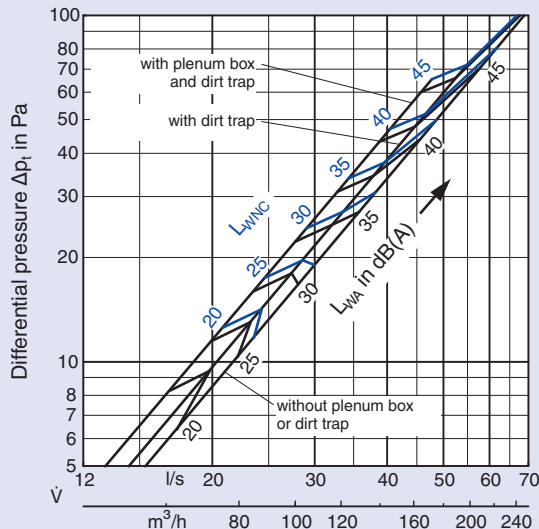
5 FBA...-V/nominal size 150



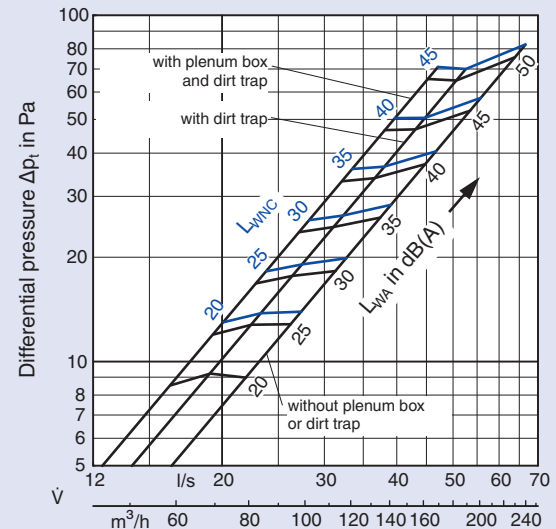
6 FBK...-V/nominal size 150



7 FBA...-V/nominal size 200



8 FBK...-V/nominal size 200



The technical data for variants with a dirt trap (... SM/SV) is valid for floor tiles of up to 70 mm in thickness.

Acoustic data

Nominal size 200, vertical discharge (VF)

Correction to diagram 9
Flow rate control using the dirt trap

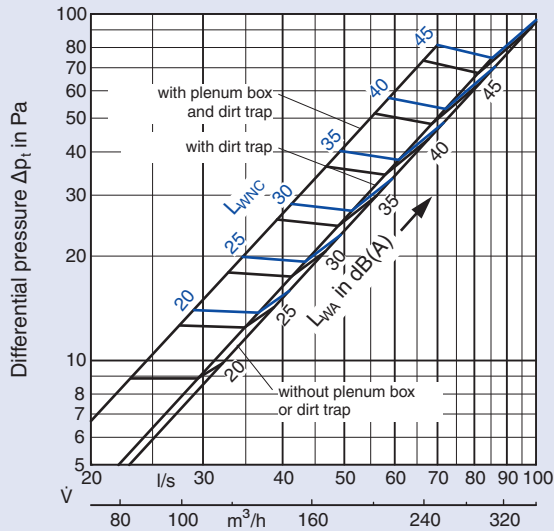
| open | Δp_t | | L_{WA}/L_{WNC} | |
|------|--------------|--------------|------------------|---------|
| | without AK | with AK | without AK | with AK |
| 100% | $\times 1.0$ | $\times 1.0$ | – | – |
| 40% | $\times 1.6$ | $\times 1.6$ | + 3 | + 4 |
| 20% | $\times 1.9$ | $\times 2.9$ | + 4 | + 8 |

Correction to diagram 10
Flow rate control using the dirt trap

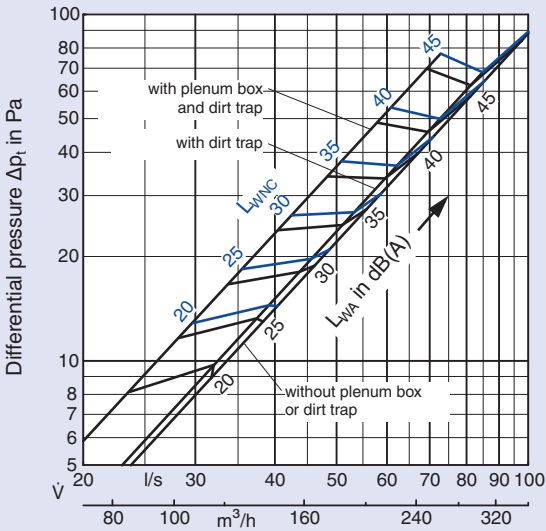
| open | Δp_t | | L_{WA}/L_{WNC} | |
|------|--------------|--------------|------------------|---------|
| | without AK | with AK | without AK | with AK |
| 100% | $\times 1.0$ | $\times 1.0$ | – | – |
| 40% | $\times 1.9$ | $\times 1.6$ | + 7 | + 4 |
| 20% | $\times 4.7$ | $\times 3.2$ | + 10 | + 9 |

Sound power level and differential pressure

9 FBA...-VF/nominal size 200



10 FBK...-VF/nominal size 200



The technical data for variants with a dirt trap (... SM/SV) is valid for floor tiles of up to 70 mm in thickness.

Example

Given:

Type FBA ... - H - SM / 200

Flow rate $\dot{V} = 30 \text{ l/s}$

Supply air temperature differential $\Delta t_z = -6 \text{ K}$

Distance from centre of diffuser $l = 0.7 \text{ m}$

Diagram 3, page 10:

$L_{WA} = 30 \text{ dB(A)}$, ($L_{WNC} = 24 \text{ dB}$)

$\Delta p_t = 20 \text{ Pa}$

Diagram 13:

max. air velocity $\bar{v}_l = 0.26 \text{ m/s}$

Diagram 14:

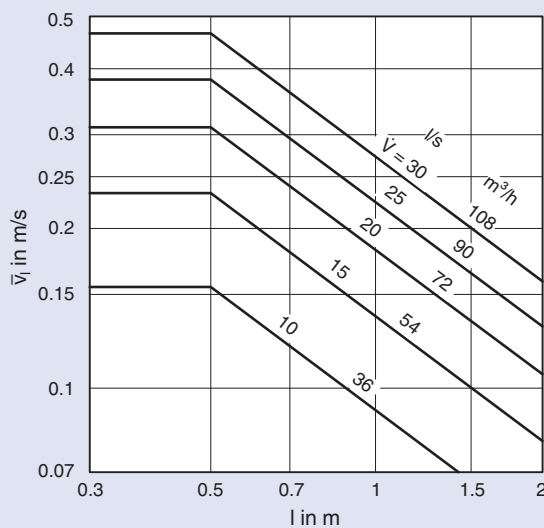
Temperature quotient

$\Delta t_l / \Delta t_z = 0.23$

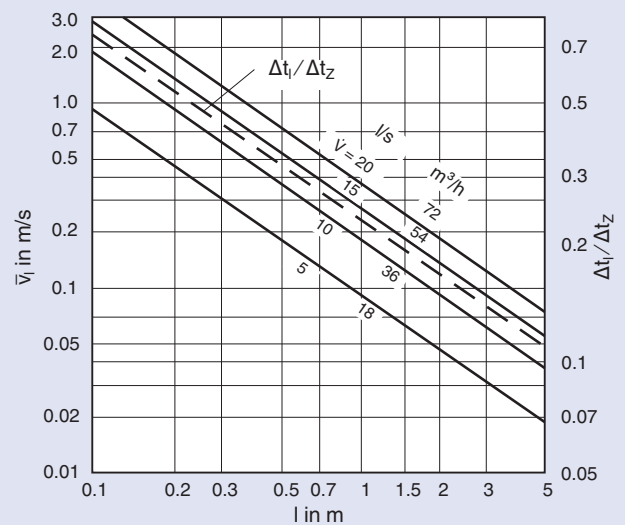
$\Delta t_l = 0.23 \times (-6 \text{ K}) = -1.4 \text{ K}$

Air velocity

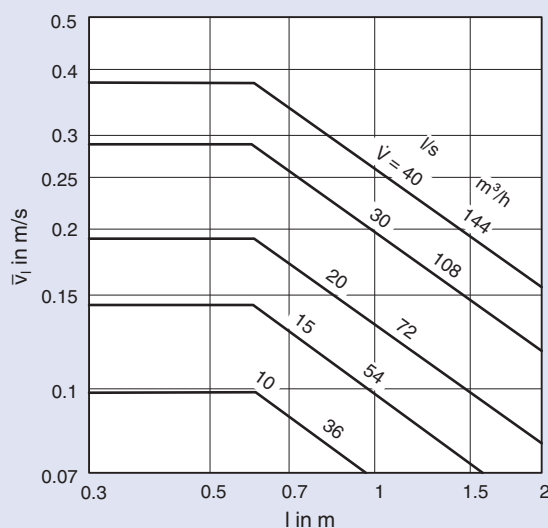
11 FBA...-H/nominal size 150



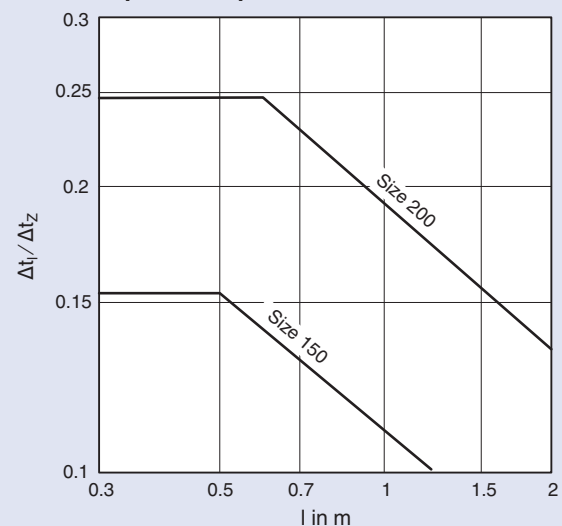
12 FBK...-H/nominal size 150



13 FBA/FBK...-H/nominal size 200



14 Temperature quotient



The technical data for variants with a dirt trap (... SM/SV) is valid for floor tiles of up to 70 mm in thickness.

Aerodynamic data

Vertical air discharge (V)

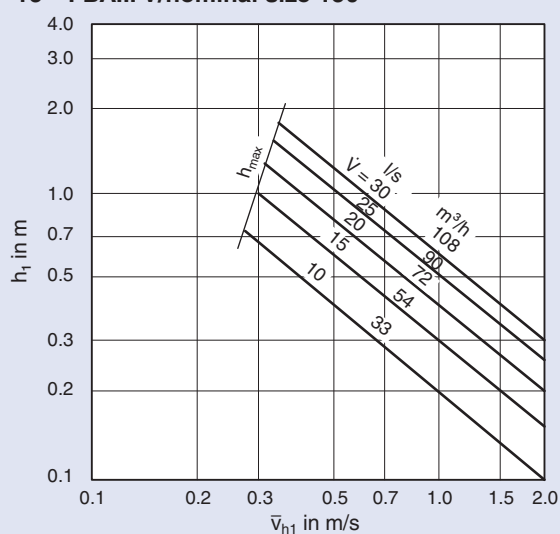
Diagrams 15, 16 and 17 refer to $\Delta t_z = -6K$

Correction values for other supply air temperature differentials

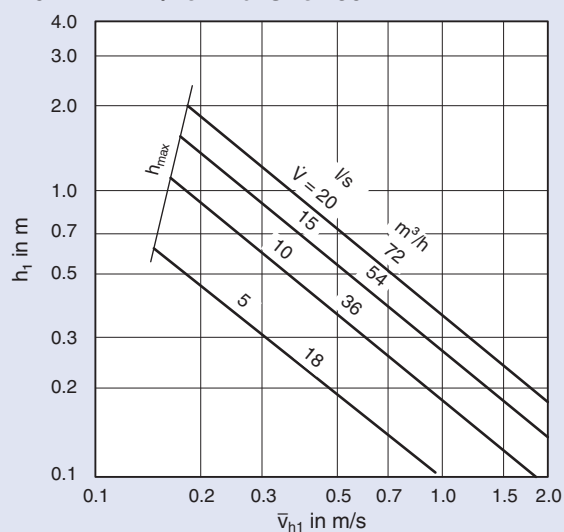
| Δt_z | -4 | -6 | -8 | -10 |
|----------------|--------------|--------------|---------------|---------------|
| h_{max} | $\times 1.2$ | $\times 1.0$ | $\times 0.85$ | $\times 0.75$ |
| \bar{v}_{h1} | $\times 1.2$ | $\times 1.0$ | $\times 0.85$ | $\times 0.75$ |

Air velocity

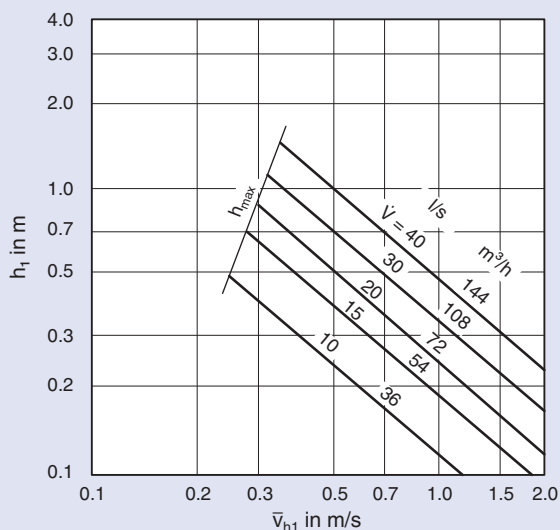
15 FBA...-V/nominal size 150



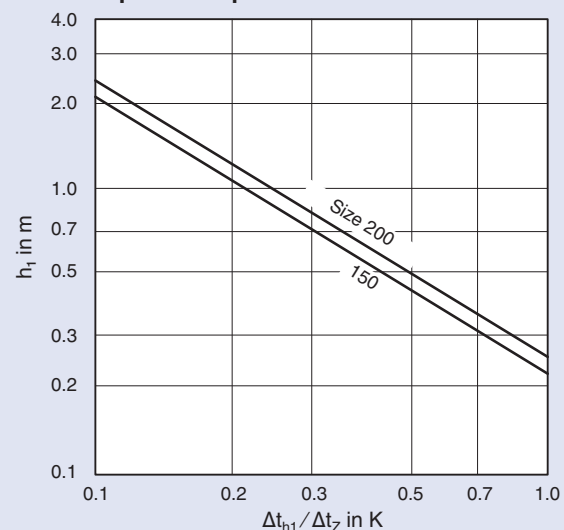
16 FBK...-V/nominal size 150



17 FBA/FBK...-V/nominal size 200



18 Temperature quotient



The technical data for variants with a dirt trap (... SM/SV) is valid for floor tiles of up to 70 mm in thickness.

Correction to diagram 19

Flow rate control using the dirt trap

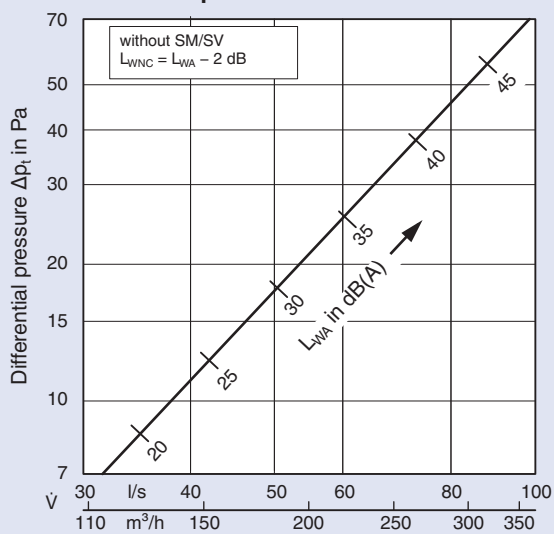
| Flow rate balancing "open" | Δp_t | L_{WA}/L_{WNC} |
|-------------------------------|--------------|------------------|
| 90° | $\times 1.0$ | 0 |
| 45° | $\times 1.6$ | 2 |
| 0° | $\times 4.1$ | 5 |

Diagram 20 refers to $\Delta t_z = -6K$

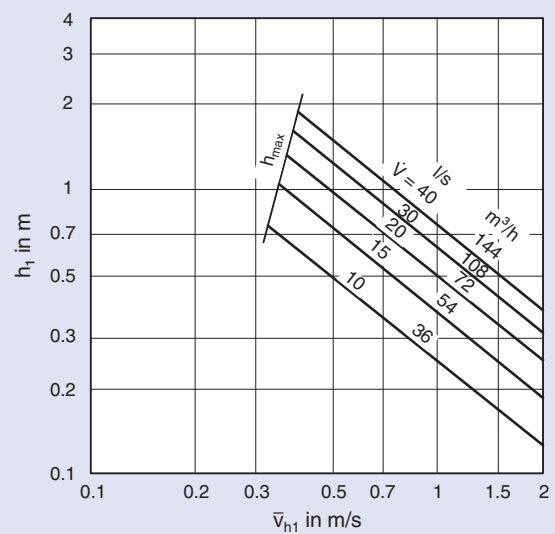
Correction values for other supply air temperature differentials

| Δt_z | -4 | -6 | -8 | -10 |
|----------------|--------------|--------------|---------------|---------------|
| h_{max} | $\times 1.2$ | $\times 1.0$ | $\times 0.85$ | $\times 0.75$ |
| \bar{v}_{h1} | $\times 1.2$ | $\times 1.0$ | $\times 0.85$ | $\times 0.75$ |

19 Sound power level and differential pressure



20 Air velocity



Order Details



Specification 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 and makes easy flow rate control possible

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:

Floor diffuser and trim ring made of die cast aluminium, surface deburred and shot blasted, spring clips made of stainless steel. Swirl element and spacing ring made of polyamide (PA 6-V0), flame retardant according to UL 94. Dirt trap made of plastic (ABS), flame retardant according to UL 94. Adjustment device and stabilising rod made of galvanised steel.

Floor diffuser option:

Floor diffuser with plenum box for a single connection, made of galvanised sheet steel, powder-coated black (RAL 9005).

* Text for an FBA with swirl element and trim ring with spring clip fixings, dirt trap and plenum box for single diffuser
Text for construction variants and multiple diffuser plenum boxes see our design programme or our home page

Order code

| | | | | | | | | | |
|---------------------------|---|---|---|---|---|---|-----|---|-----|
| FBA - 1 - V - KF - SM - A | | | | | | / | 150 | / | V00 |
| 1 | 2 | 3 | 4 | 5 | 6 | | 7 | | 8 |

1 Type

FBA Aluminium diffuser core
FBK Plastic diffuser core

2 Surface of diffuser core and trim ring

FBA:

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

FBK:

- 1 Dusty grey (similar to RAL 7037)
- 2 Black (similar to RAL 9005)

3 Swirl element, discharge direction¹

- V Vertical, adjustable
- H Horizontal, adjustable
- VF Vertical, fixed²

4 Trim ring with spring clips³

- None, no entry required
- KF With trim ring

5 Dirt trap

- None, no entry required
- SM Flow rate control adjustment from rear
- SV Flow rate control adjustment from diffuser face

6 Plenum box

- None, no entry required
- A With plenum box

7 Nominal size

- 150
- 200

8 Diffuser core and trim ring Only for FBK:

- Polyamide (PA 6), no entry required
- V00 Polyamide (PA 6-V0), flame retardant in accordance with UL 94

Accessories for type FBA and FBK nominal size 150

- GA Multiple diffuser plenum box for 4 diffusers
- GAM As GA, with flow rate control damper in side entry spigot

¹ Floor diffusers without swirl element only have vertical air discharge

² Available only for the nominal size 200

³ Floor diffusers without a trim ring are supplied with a spacing ring for functional reasons and for height correction

Order example

Make: TROX
Type: FBA-3-V-KF-SM-A/150