

Ceiling diffusers

Type VDR



Vertical air discharge



Horizontal air discharge



Blade adjustment with actuator

For large temperature differences in heating mode, high penetration of air, with adjustable air control blades

Circular ceiling diffusers, with manual or motorised adjustment of the air discharge direction, particularly suitable for high rooms

- Nominal sizes 315, 400, 630, 800
- Volume flow rate range 175 – 1495 l/s or 630 – 5382 m³/h
- Diffuser face made of aluminium
- For supply air
- For variable and constant volume flows
- Discharge direction can be adjusted manually or with an actuator
- High penetration of air at low sound power level

Optional equipment and accessories

- Exposed diffuser face available in RAL CLASSIC colours
- Horizontal or vertical duct connection
- Actuators for adjusting the air discharge direction

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Application

Application

- Type VDR ceiling diffusers are used as supply air diffusers for high rooms in comfort and industrial zones
- For mixed flow ventilation with different air patterns in heating and cooling modes
- Horizontal two-way supply air discharge in cooling mode
- High induction results in a rapid reduction of the temperature difference and airflow velocity
- Angled or vertical air discharge in heating mode
- For variable and constant volume flows
- For supply air to room air temperature differences from –10 to +15 K
- For room heights exceeding 3.8 m
- For suspended ceilings
- Freely suspended installation

- Ideal for use with TDC temperature difference control module

Special characteristics

- High penetration of air at low sound power level
- Particularly suitable for rooms with varying heat loads
- Ideal adaptation of the air discharge pattern due to two sections of adjustable blades
- Discharge direction can be adjusted manually or with an actuator
- Plenum box with side entry or top entry spigot, and variant with electric actuator and inspection access

Nominal sizes

- 315, 400, 630, 800

Description

Variants

- Diffuser face only

Connection

- H: Horizontal duct connection
- V: Vertical duct connection

Parts and characteristics

- Circular diffuser face with two sections of adjustable blades
- Diffuser front frame
- Spigot ring

Attachments

- Electric actuators for adjusting the air discharge direction

Useful additions

- TDC temperature difference control module

Construction features

- Spigot suitable for circular ducts to EN 1506 or EN 13180

Materials and surfaces

- Blades, front frame and spigot ring made of aluminium
- Plenum box and cross bar made of galvanised sheet steel
- Front frame, blades and spigot ring powder-coated RAL 9010, pure white
- P1: Powder-coated, RAL CLASSIC colour

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

Functional description

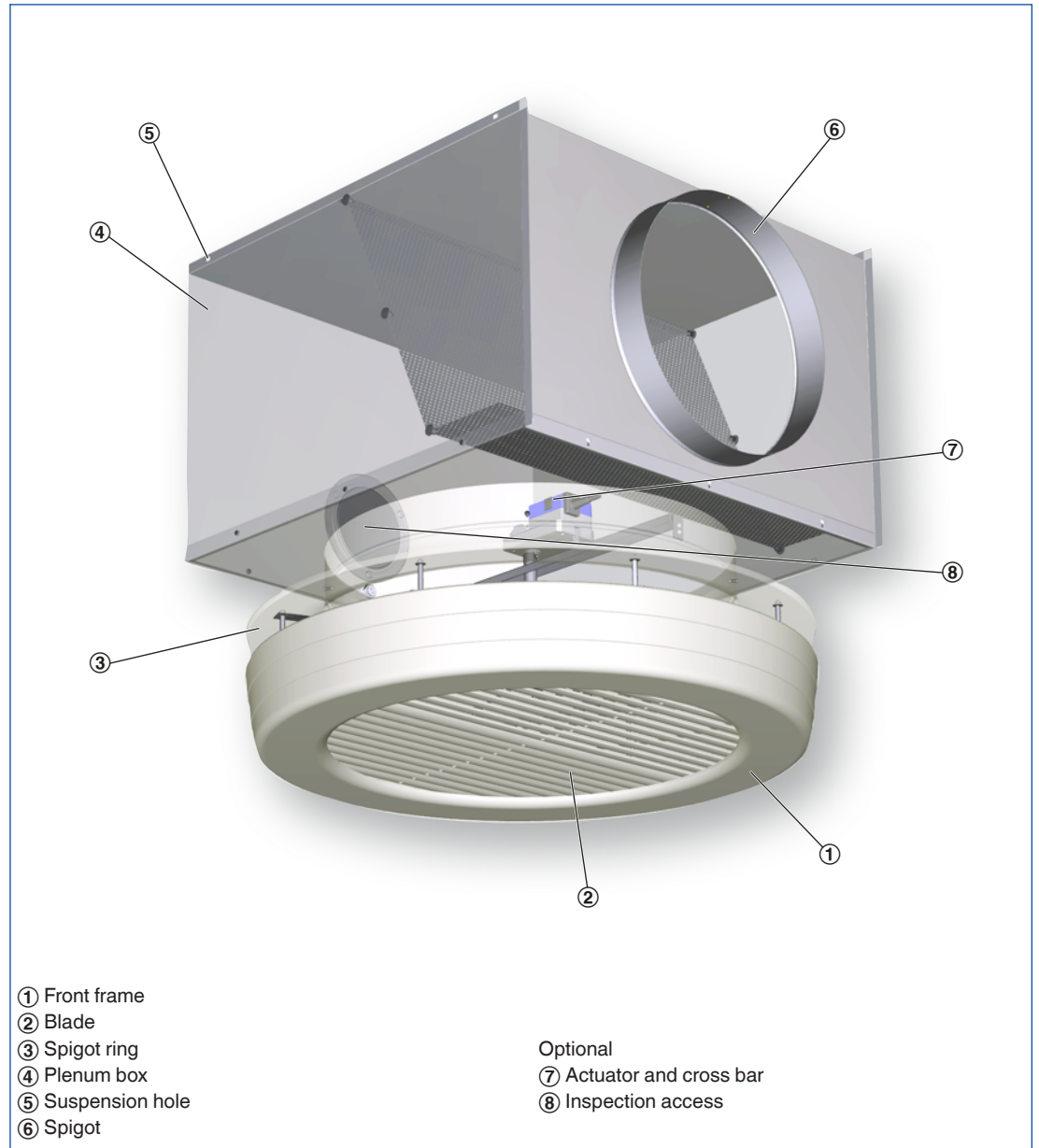
Ceiling diffusers direct the air from air conditioning systems into the room. The resulting airflow induces high levels of room air, thereby rapidly reducing the airflow velocity and the temperature difference between supply air and room air. Ceiling diffusers allow for large volume flow rates. The result is a mixed flow ventilation for industrial and comfort zones, with good overall room ventilation, creating only very little turbulence in

the occupied zone.

Type VDR ceiling diffusers have adjustable blades. The air pattern can be adjusted to meet different local requirements. Horizontal air discharge is omni directional. Vertical air discharge is possible in heating mode. The supply air to room air temperature difference may range from -10 to +15 K.

An actuator (optional) adjusts the blades based on demand.

Schematic illustration of the VDR, with actuator and plenum box for horizontal duct connection



Air patterns

VDR – cooling mode



VDR – heating mode



| | |
|--|---|
| Nominal sizes | 315, 400, 630, 800 mm |
| Minimum volume flow rate | 175 – 695 l/s or 630 – 2502 m ³ /h |
| Maximum volume flow rate, with $L_{WA} \cong 50$ dB(A) | 320 – 1495 l/s or 1152 – 5382 m ³ /h |
| Supply air to room air temperature difference | -10 to +15 K |

Quick sizing tables provide a good overview of the volume flow rates and corresponding sound power levels and differential pressures.

The maximum volume flow rates apply to a sound power level of approx. 50 dB (A).

Exact values for all parameters can be determined with our Easy Product Finder design programme.

VDR, sound power level and total differential pressure

| Nominal size | \dot{V} | | Δp_t | L_{WA} |
|--------------|-----------|-------------------|--------------|----------|
| | l/s | m ³ /h | Pa | dB(A) |
| 315 | 175 | 630 | 5 | 19 |
| | 255 | 918 | 10 | 32 |
| | 335 | 1206 | 17 | 42 |
| | 420 | 1512 | 27 | 50 |
| 400 | 250 | 900 | 5 | 18 |
| | 400 | 1440 | 14 | 32 |
| | 550 | 1980 | 26 | 44 |
| | 650 | 2340 | 36 | 50 |
| 630 | 555 | 1998 | 7 | 30 |
| | 680 | 2448 | 11 | 38 |
| | 805 | 2898 | 15 | 45 |
| | 925 | 3330 | 20 | 50 |
| 800 | 556 | 2500 | 6 | 27 |
| | 870 | 3132 | 8 | 33 |
| | 1185 | 4266 | 16 | 42 |
| | 1495 | 5382 | 25 | 50 |

VDR-H, sound power level and total differential pressure

| Nominal size | \dot{V} | | Δp_t | L_{WA} |
|--------------|-----------|-------------------|--------------|----------|
| | l/s | m ³ /h | Pa | dB(A) |
| 315 | 175 | 630 | 22 | 28 |
| | 230 | 828 | 38 | 37 |
| | 280 | 1008 | 57 | 45 |
| | 320 | 1152 | 74 | 50 |
| 400 | 250 | 900 | 19 | 27 |
| | 320 | 1152 | 31 | 36 |
| | 390 | 1404 | 46 | 43 |
| | 465 | 1674 | 65 | 50 |
| 630 | 490 | 1764 | 24 | 28 |
| | 615 | 2214 | 38 | 36 |
| | 740 | 2664 | 55 | 44 |
| | 870 | 3132 | 75 | 50 |
| 800 | 695 | 2502 | 21 | 30 |
| | 855 | 3078 | 31 | 37 |
| | 1015 | 3654 | 44 | 44 |
| | 1180 | 4248 | 59 | 50 |

VDR-V, sound power level and total differential pressure

| Nominal size | \dot{V} | | Δp_t | L_{WA} |
|--------------|-----------|-------------------|--------------|----------|
| | l/s | m ³ /h | Pa | dB(A) |
| 315 | 175 | 630 | 10 | 29 |
| | 230 | 828 | 18 | 38 |
| | 280 | 1008 | 27 | 45 |
| | 320 | 1152 | 35 | 50 |
| 400 | 250 | 900 | 9 | 30 |
| | 330 | 1188 | 16 | 38 |
| | 405 | 1458 | 24 | 45 |
| | 480 | 1728 | 33 | 50 |
| 630 | 490 | 1764 | 18 | 27 |
| | 650 | 2340 | 32 | 36 |
| | 810 | 2916 | 49 | 44 |
| | 970 | 3492 | 71 | 50 |
| 800 | 695 | 2502 | 15 | 28 |
| | 940 | 3384 | 27 | 36 |
| | 1190 | 4284 | 43 | 44 |
| | 1450 | 5220 | 64 | 50 |

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

Ceiling diffusers with circular diffuser front frame, for comfort and industrial zones. For supply air only. Diffuser face with adjustable air control blades for air discharge from horizontal (0°) to vertical (90°) For freely suspended installation and for suspended ceilings.

Ready-to-install component which consists of the diffuser face with diffuser front frame and adjustable air control blades, a plenum box with equalising element, side entry or top entry spigot, and suspension holes or suspension lugs. 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 penetration of air at low sound power level
- Particularly suitable for rooms with varying heat loads
- Ideal adaptation of the air discharge pattern due to two sections of adjustable blades
- Discharge direction can be adjusted manually or with an actuator
- Plenum box with side entry or top entry spigot, and variant with electric actuator and inspection access

Materials and surfaces

- Blades, front frame and spigot ring made of aluminium
- Plenum box and cross bar made of galvanised sheet steel
- Front frame, blades and spigot ring powder-coated RAL 9010, pure white
- P1: Powder-coated, RAL CLASSIC colour

Technical data

- Nominal sizes: 315, 400, 630, 800 mm
- Minimum volume flow rate: 175 – 695 l/s or 630 – 2502 m³/h
- Maximum volume flow rate, with $L_{WA} \cong 50$ dB(A): 320 – 1495 l/s or 1152 – 5382 m³/h
- Supply air to room air temperature difference: -10 to +15 K

Sizing data

- \dot{V} _____
[m³/h]
 - Δp_t _____
[Pa]
- Air-regenerated noise
- L_{WA} _____
[dB(A)]

VDR

| | | | | |
|--|----------|----------|----------|----------|
| VDR – V – E1 / 630 / P1 – RAL ... | | | | |
| 1 | 2 | 3 | 4 | 5 |

1 Type

VDR Ceiling diffuser

2 Connection

- No entry: diffuser face only
- H** Horizontal, with plenum box
- V** Vertical, with plenum box

3 Adjustment

- No entry: manual
- Electric actuator
- E1** 230 V AC, 3-point
- E2** 24 V AC/DC, 3-point
- E3** 24 V AC/DC, modulating 2 – 10 V DC

4 Nominal size [mm]

- 315**
- 400**
- 630**
- 800**

5 Exposed surface of diffuser face

- 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: VDR-H-E2/800

| | |
|---|--|
| Connection | Horizontal |
| Adjustment | Actuator 24 V AC |
| Nominal size | 800 |
| Exposed surface of diffuser face | RAL 9010, pure white, gloss level 50 % |

VDR



VDR

Variant

- Ceiling diffuser with circular diffuser face
- Manual adjustment

Nominal sizes

- 315, 400, 630, 800

VDR-E*



VDR-E*

Variant

- Ceiling diffuser with circular diffuser face
- Actuator for blade adjustment

Nominal sizes

- 315, 400, 630, 800

VDR-H



VDR-H

Variant

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

Nominal sizes

- 315, 400, 630, 800

Parts and characteristics

Parts and characteristics

- Top entry spigot

Construction features

- Spigot suitable for circular ducts to EN 1506 or EN 13180

VDR-V



VDR-V

Variant

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

Nominal sizes

- 315, 400, 630, 800

Parts and characteristics

Parts and characteristics

- Top entry spigot

Construction features

- Spigot suitable for circular ducts to EN 1506 or EN 13180

- Plenum box for horizontal duct connection
- Actuator for blade adjustment, optional
- Variant with actuator has an inspection access at the side

Construction features

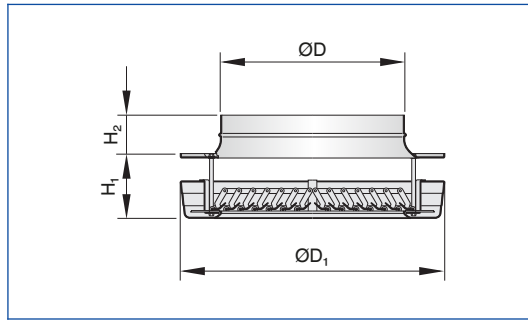
- Spigot suitable for circular ducts to EN 1506 or EN 13180

- Plenum box for vertical duct connection
- Actuator for blade adjustment, optional
- Variant with actuator has an inspection access

Construction features

- Spigot suitable for circular ducts to EN 1506 or EN 13180

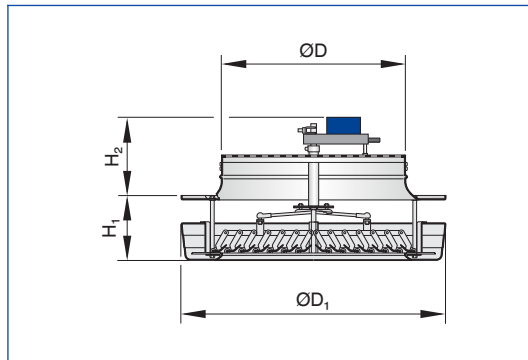
VDR



VDR

| Nominal size | ØD mm | ØD ₁ mm | H ₁ mm | H ₂ mm | m kg |
|--------------|----------|-----------------------|----------------------|----------------------|---------|
| 315 | 313 | 450 | 122 | 77 | 3 |
| 400 | 398 | 570 | 139 | 84 | 5 |
| 630 | 628 | 870 | 184 | 114 | 11 |
| 800 | 798 | 1070 | 220 | 135 | 15 |

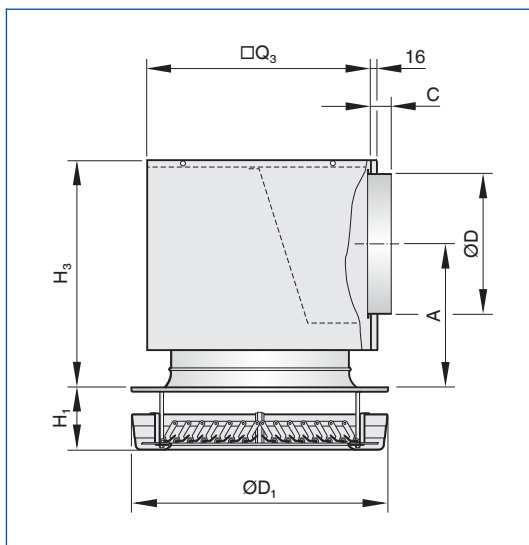
VDR-E*



VDR-E*

| Nominal size | ØD mm | ØD ₁ mm | H ₁ mm | H ₂ mm | m kg |
|--------------|----------|-----------------------|----------------------|----------------------|---------|
| 315 | 313 | 450 | 122 | 158 | 5 |
| 400 | 398 | 570 | 139 | 166 | 7 |
| 630 | 628 | 870 | 184 | 196 | 13 |
| 800 | 798 | 1070 | 220 | 218 | 18 |

VDR-H

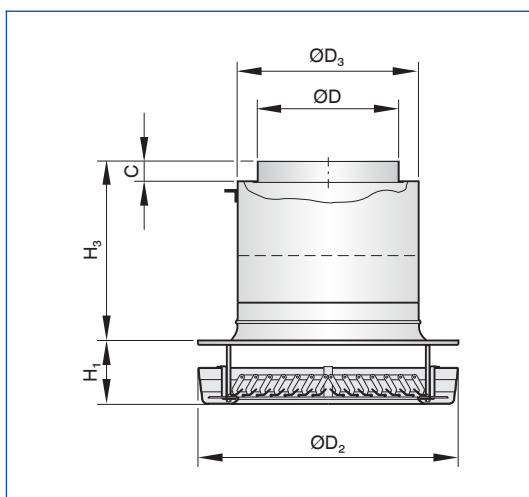


VDR-H

| Nominal size | ØD | ØD ₁ | H ₁ | H ₃ | □Q ₃ | C | A | m |
|--------------|-----|-----------------|----------------|----------------|-----------------|----|-----|----|
| | mm | mm | mm | mm | mm | mm | mm | kg |
| 315 | 248 | 450 | 122 | 448 | 415 | 45 | 292 | 12 |
| 400 | 313 | 570 | 139 | 528 | 500 | 45 | 339 | 16 |
| 630 | 398 | 870 | 184 | 623 | 750 | 45 | 392 | 31 |
| 800 | 498 | 1070 | 220 | 745 | 920 | 45 | 464 | 43 |

Weights apply to the variant with actuator

VDR-V

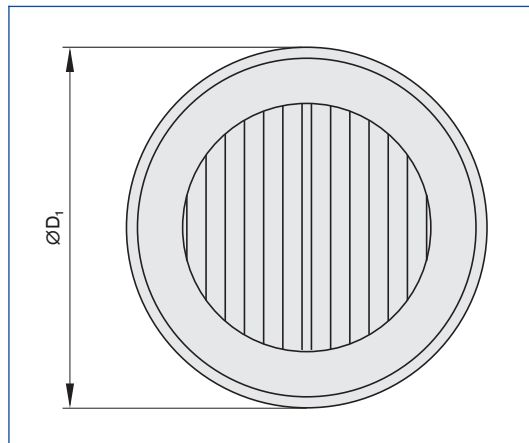


VDR-V

| Nominal size | ØD | ØD ₁ | H ₁ | A _{eff} | H ₃ | ØD ₃ | C | m |
|--------------|-----|-----------------|----------------|------------------|----------------|-----------------|----|----|
| | mm | mm | mm | m ² | mm | mm | mm | kg |
| 315 | 248 | 450 | 122 | 0.0885 | 305 | 314 | 45 | 8 |
| 400 | 313 | 570 | 139 | 0.1260 | 411 | 399 | 45 | 12 |
| 630 | 398 | 870 | 184 | 0.2450 | 486 | 629 | 45 | 22 |
| 800 | 498 | 1070 | 220 | 0.3480 | 570 | 799 | 45 | 32 |

Weights apply to the variant with actuator

Diffuser face VDR



VDR

| Nominal size | $\varnothing D_1$ | A_{eff} |
|--------------|-------------------|------------------|
| | mm | m^2 |
| 315 | 450 | 0.0885 |
| 400 | 570 | 0.1260 |
| 630 | 870 | 0.2450 |
| 800 | 1070 | 0.3480 |

VDR heating mode



Installation and commissioning

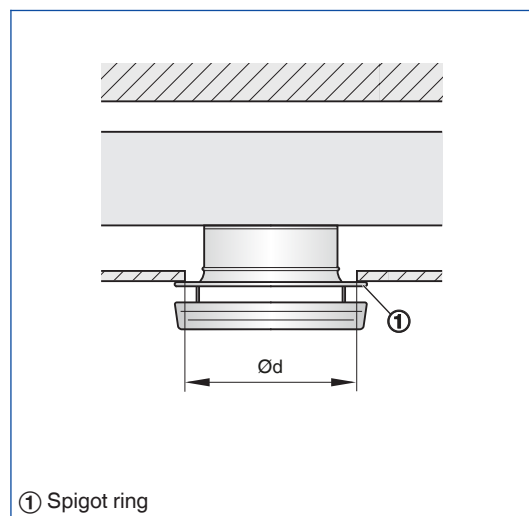
- Preferably for rooms with a clear height from 3.8 m
- Freely suspended and flush ceiling installation
- Horizontal or vertical duct connection

Installation information

- Installation with spigot ring can be flush with the ceiling or freely suspended
- Continuous adjustment of the air pattern using an actuator is possible with flush or freely suspended installation
- Installation and making connections to be performed by others

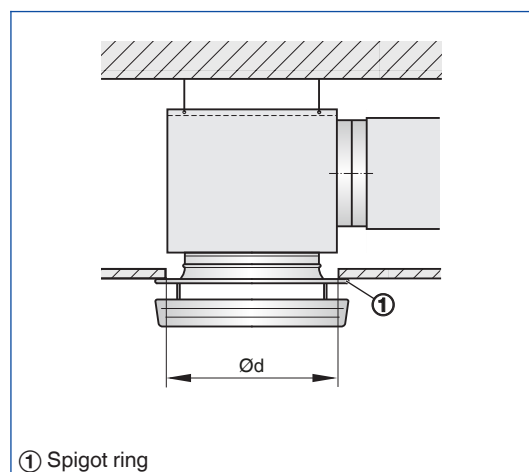
These are only schematic diagrams to illustrate installation details.

Ceiling installation without plenum box



- Continuous adjustment of the discharge direction
- Vertical duct connection
- Spigot on the rectangular duct is to be provided by others

Ceiling installation with plenum box for horizontal duct connection

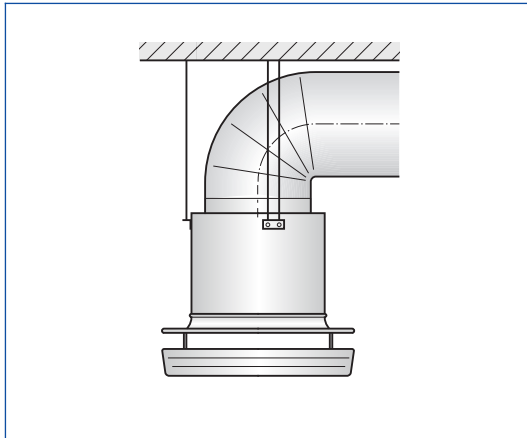


- Continuous adjustment of the discharge direction
- Horizontal duct connection

Ceiling cut-out

| Nominal size | Ød | |
|--------------|----|------|
| | mm | |
| 315 | | 398 |
| 400 | | 518 |
| 630 | | 808 |
| 800 | | 1008 |

Freely suspended installation with plenum box for vertical duct connection



- Continuous adjustment of the discharge direction
- Horizontal or vertical duct connection

Principal dimensions

$\varnothing D$ [mm]

Outer diameter of the spigot

$\varnothing D_1$ [mm]

Outer diameter of a circular diffuser face

$\varnothing D_2$ [mm]

Diameter of a circular diffuser face style

$\varnothing D_3$ [mm]

Diameter of a circular plenum box

$\square Q_1$ [mm]

Outer diameter of a square diffuser face

$\square Q_2$ [mm]

Dimensions of a square diffuser face style

$\square Q_3$ [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

Definitionen

L_{WA} [dB(A)]

Schalleistungspegel des Strömungsgeräusches, A-bewertet

\dot{V} [m³/h] und [l/s]

Volumenstrom

Δt_z [K]

Zulufttemperaturdifferenz, Zulufttemperatur minus Raumtemperatur

Δp_t [Pa]

Gesamtdruckdifferenz

Alle Schalleistungspegel basieren auf 1 pW.