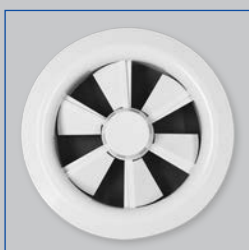


Ceiling swirl diffusers

Type VDL



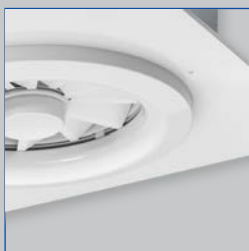
Horizontal swirling air discharge



Adjustable blades



Protective cage



Extended border



For high rooms, with adjustable air control blades

Circular ceiling swirl diffusers, with manual or motorised adjustment of the air pattern to ensure draught-free ventilation of the occupied zone both in heating and cooling modes

- Nominal sizes 315, 400, 630, 800
- Volume flow rate range 65 – 1080 l/s or 234 – 3888 m³/h
- Diffuser face made of galvanised, powder-coated sheet steel and of aluminium
- For supply air
- For variable and constant volume flows
- High induction results in a rapid reduction of the temperature difference and airflow velocity
- Discharge direction can be adjusted manually or with an actuator
- Diffuser face with aerodynamically optimised contours
- Ideal for high rooms

Optional equipment and accessories

- Exposed diffuser face available in RAL CLASSIC colours
- Horizontal or vertical duct connection
- An extended border improves the horizontal air discharge in cooling mode
- Protective cage for use in gymnasiums
- Actuators for adjusting the air discharge direction
- Diffuser face can be removed from the room side

Type		Page
VDL	General information	VDL – 2
	Function	VDL – 4
	Technical data	VDL – 6
	Quick sizing	VDL – 7
	Specification text	VDL – 9
	Order code	VDL – 10
	Variants	VDL – 11
	Accessories	VDL – 14
	Dimensions and weight	VDL – 16
	Product details	VDL – 18
	Installation examples	VDL – 19
	Installation details	VDL – 20
	Basic information and nomenclature	VDL – 23

Application

Application

- Type VDL ceiling swirl diffusers are used as supply air diffusers for high rooms in comfort and industrial zones
- For production halls, gymnasiums, theatres and conference rooms as well as for large internal spaces in airports, railway stations and shopping centres
- For mixed flow ventilation with different air patterns in heating and cooling modes
- Horizontal swirling supply air discharge in cooling mode
- The efficient swirl creates high induction levels, thereby rapidly reducing 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 –12 to +15 K
- For room heights exceeding 3.8 m
- With freely suspended installation, an extended border supports the horizontal air discharge in cooling mode

Special characteristics

- For high rooms, with adjustable air control blades
- Diffuser face with aerodynamically optimised contours
- The air pattern can be adjusted manually or with an actuator
- Horizontal or vertical duct connection

Nominal sizes

- 315, 400, 630, 800

Description

Variants

- A: Diffuser face without flange
- B: Diffuser face with flange

Connection

- F: Diffuser face only
- H: Horizontal duct connection, with plenum box
- V: Vertical duct connection, with plenum box

Diffuser face

- N: Non-removable diffuser face
- D: Removable diffuser face, only in variant with plenum box

Parts and characteristics

- Circular diffuser face
- Removable or non-removable diffuser face
- Radially arranged fixed or adjustable blades for air discharge from horizontal (0°) to vertical (90°)
- Diffuser face with or without flange
- Adjustment mechanism covered by decorative cap

Accessories

- Lip seal

- Electric actuators for adjusting the air discharge direction
- Extended border and protective cage

Useful additions

- TDC temperature difference control module

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

- Blades, casing, duct collar, extended border, plenum box and cross bar made of galvanised sheet steel
- Diffuser face and decorative cap made of aluminium
- Protective cage made of steel mesh
- Blades, duct collar, extended border, plenum box, diffuser face and decorative cap 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

Disclosure of Chemicals

- RoHS EU Directive 2011/65/EU (RoHS)
 - This product or single variants comply with EU Directive 2011/65/EU (RoHS) on the restriction of the use of certain hazardous substances in electrical and electronic equipment. For more information, please refer to our Environmental Product Declarations.
- REACH 1907/2006 (EC Regulation REACH)
 - This product or single variants comply with the provisions of EC Regulation No. 1907/2006, also known as REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals). For more information, please refer to our Environmental Product Declarations.

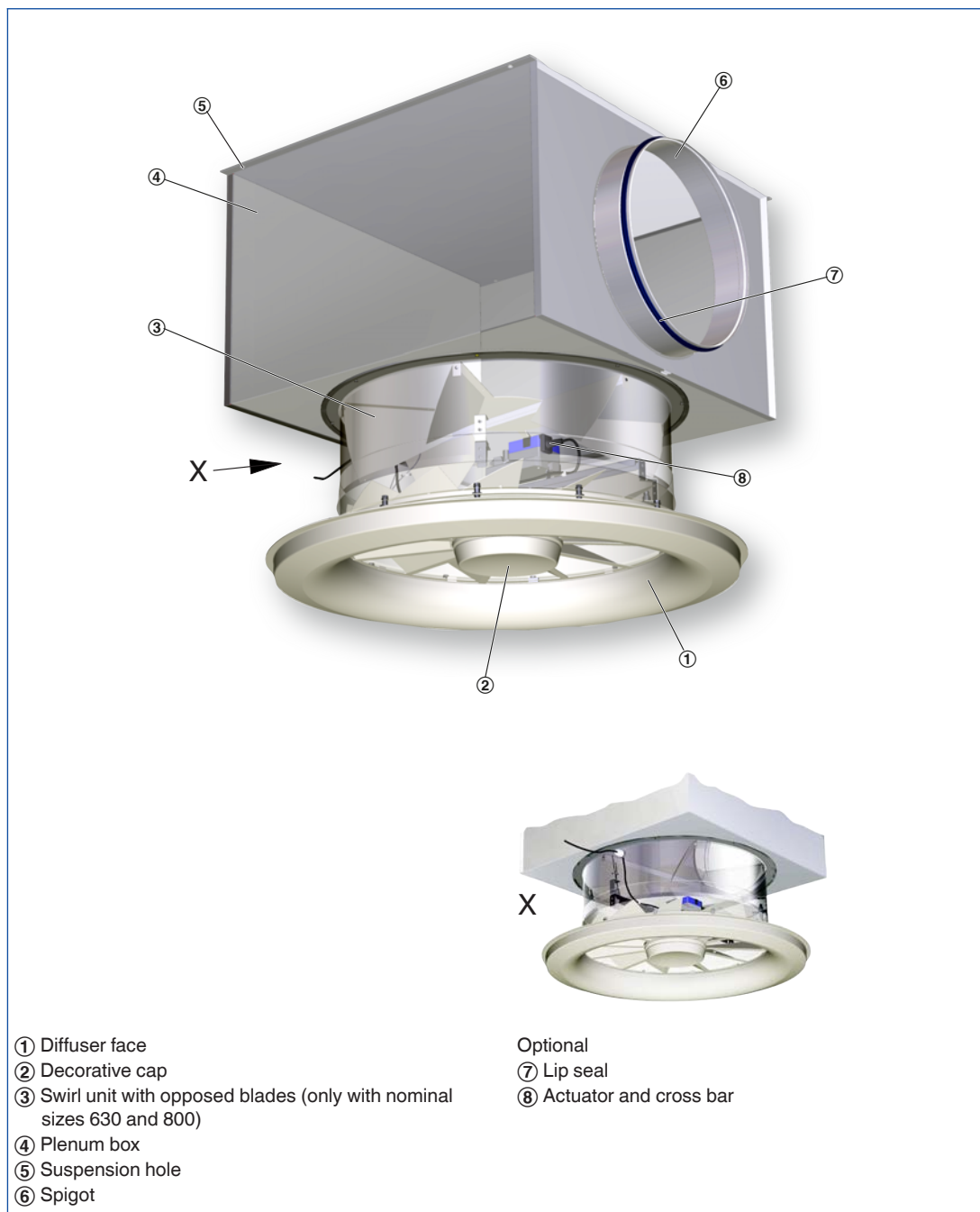
Functional description

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 VDL ceiling swirl diffusers have adjustable air control blades. Different air patterns allow for cooling or heating mode, or for the adjustment to varying loads. Horizontal air discharge is omnidirectional. Vertical air discharge is possible in heating mode. The supply air to room air temperature difference may range from -12 to $+15$ K.

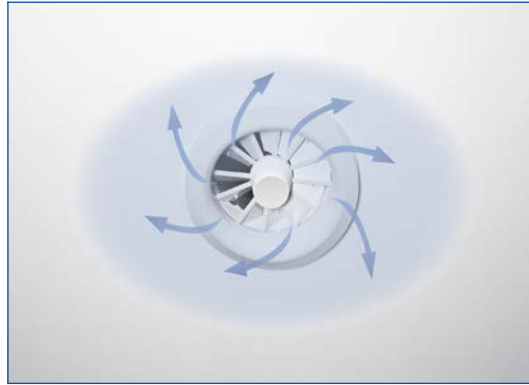
An actuator (optional) adjusts the blades based on demand.

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



Air patterns

Horizontal omni directional air discharge



Vertical air discharge



Nominal sizes	315, 400, 630, 800 mm
Minimum volume flow rate	65 – 320 l/s or 234 – 1152 m ³ /h
Maximum volume flow rate, with $L_{WA} \cong 50$ dB(A)	170 – 1080 l/s or 612 – 3888 m ³ /h
Supply air to room air temperature difference	-12 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) with damper blade position 0°.

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

VDL*-H-...-M, VDL*-H-...-E*, sound power level and total differential pressure

Nominal size	\dot{V}		Δp_t Pa	L_{WA} dB(A)
	l/s	m ³ /h		
315	65	234	9	22
	100	360	20	34
	135	486	37	43
	170	612	59	50
400	95	342	7	18
	170	612	22	32
	250	900	49	42
	325	1170	82	50
630	235	846	8	23
	365	1314	20	35
	495	1782	38	44
	625	2250	60	50
800	320	1152	8	24
	470	1692	18	35
	620	2232	31	43
	765	2754	47	50

VDL*-V-...-M, VDL*-V-...-E*, VDL*-F-M, sound power level and total differential pressure

Nominal size	\dot{V}		Δp_t Pa	L_{WA} dB(A)
	l/s	m ³ /h		
315	65	234	6	19
	115	414	19	33
	165	594	39	43
	215	774	66	50
400	95	342	5	15
	180	648	19	31
	265	954	41	41
	350	1260	71	50
630	235	846	6	16
	405	1458	18	32
	575	2070	36	43
	730	2628	58	50
800	320	1152	7	20
	500	1800	17	33
	680	2448	32	43
	865	3114	52	50

VDL-*-H-...-X, sound power level and total differential pressure

Nominal size	\dot{V}		Δp_t Pa	L_{WA} dB(A)
	l/s	m ³ /h		
315	65	234	7	16
	115	414	23	32
	165	594	48	43
	210	756	78	50
400	95	342	7	14
	180	648	26	32
	265	954	57	44
	325	1170	86	50
630	235	846	8	15
	405	1458	23	33
	575	2070	47	44
	685	2466	67	50
800	320	1152	7	19
	500	1800	17	32
	930	3348	58	50
	920	3312	57	50

VDL-*-V-...-X, VDL-*-F-X, sound power level and total differential pressure

Nominal size	\dot{V}		Δp_t Pa	L_{WA} dB(A)
	l/s	m ³ /h		
315	65	234	6	17
	115	414	19	32
	165	594	39	41
	225	810	72	50
400	95	342	5	13
	185	666	20	30
	275	990	45	41
	365	1314	79	50
630	235	846	5	15
	440	1584	17	31
	650	2700	49	47
	840	3024	62	50
800	320	1152	4	22
	570	2052	14	35
	820	2952	28	43
	1080	3888	49	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 swirl diffuser with circular diffuser face for high rooms in comfort and industrial zones. For supply air only. With fixed air control blades for horizontal supply air discharge and with adjustable blades for air discharge from horizontal (0°) to vertical (90°). Horizontal air discharge with high induction. For freely suspended installation and for suspended ceilings.

Ready-to-install component which consists of the diffuser face, blades, duct collar or plenum box with side entry or top entry spigot, and suspension holes. Removable or non-removable diffuser face. The removable diffuser face is fixed to the cross bar with a central screw, covered by a decorative cap.

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

- For high rooms, with adjustable air control blades
- Diffuser face with aerodynamically optimised contours
- The air pattern can be adjusted manually or with an actuator
- Horizontal or vertical duct connection

Materials and surfaces

- Blades, casing, duct collar, extended border,

plenum box and cross bar made of galvanised sheet steel

- Diffuser face and decorative cap made of aluminium
- Protective cage made of steel mesh
- Blades, duct collar, extended border, plenum box, diffuser face and decorative cap 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: 65 – 320 l/s or 234 – 1152 m³/h
- Maximum volume flow rate, with $L_{WA} \cong 50$ dB(A): 170 – 1080 l/s or 612 – 3888 m³/h
- Supply air to room air temperature difference: -12 to +15 K

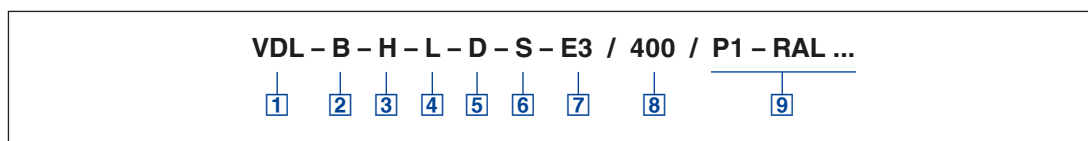
Sizing data

- \dot{V} _____
[m³/h]
- Δp_t _____
[Pa]

Air-regenerated noise

- L_{WA} _____
[dB(A)]

VDL



1 Type

VDL Swirl diffuser

2 Construction style – diffuser face

- A** Diffuser face without flange
- B** Diffuser face with flange

3 Connection

- F** Diffuser face only
- H** Horizontal, with plenum box
- V** Vertical, with plenum box

4 Accessories 1

- No entry: none
- L** With lip seal (only for connection types V and H)

5 Diffuser face

- Only in combination with connection H or V
- N** Non-removable
- D** Removable

6 Accessories 2

- Only in combination with diffuser face construction style B, supplied separately
- K** Extended border
- S** Protective cage

7 Adjustment

- M** Manual
- X** Without (fixed blades, only horizontal air discharge)
- 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

8 Nominal size [mm]

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

9 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: VDL–B–H–L–S–D–E3/400/P1-RAL 9016

Construction style – diffuser face	With flange
Connection	Horizontal
Accessories 1	Lip seal
Diffuser face	Removable
Accessories 2	Protective cage
Adjustment	Electric actuator 24 V AC, 2 – 10 V DC
Nominal size	400 mm
Exposed surface of diffuser face	RAL 9016, traffic white, gloss level 70 %

VDL-A



VDL-B



VDL-B-V-L



VDL-B-H-L



VDL-A

Diffuser face VDL-A

- Diffuser face without flange

Nominal sizes

- 315, 400, 630, 800

VDL-B

Diffuser face VDL-B

- Diffuser face with flange

Nominal sizes

- 315, 400, 630, 800

VDL*-F-X

Variant

- Diffuser face with fixed air control blades

Nominal sizes

- 315, 400, 630, 800

Parts and characteristics

- Circular duct collar for connection to a vertical duct

Construction features

- Spigot suitable for circular ducts to EN 1506 or

VDL*-F-M

Variant

- Diffuser face with alternately fixed and adjustable blades, for air discharge from horizontal (0°) to vertical (90°)

Nominal sizes

- 315, 400, 630, 800

Parts and characteristics

- Circular duct collar for connection to a vertical duct

Construction features

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

VDL*-H-N

Variant

- With plenum box for horizontal duct connection
- Non-removable diffuser face

Nominal sizes

- 315, 400, 630, 800

Parts and characteristics

- Plenum box for horizontal duct connection
- 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)

VDL*-H-D

Variant

- With plenum box for horizontal duct connection
- Removable diffuser face
- Actuator for blade adjustment, optional

Nominal sizes

- 315, 400, 630, 800

Parts and characteristics

- Plenum box for horizontal duct connection
- 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)

VDL*-V-N

Variant

- With plenum box for vertical duct connection
- Non-removable diffuser face

Nominal sizes

- 630, 800

Parts and characteristics

- Plenum box for vertical duct connection
- 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)

VDL*-V-D

Variant

- With plenum box for vertical duct connection
- Removable diffuser face
- Actuator for blade adjustment, optional

Nominal sizes

- 315, 400, 630, 800

Parts and characteristics

- Plenum box for vertical duct connection
- 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)

VDL-...-X, fixed

Variant	Nominal size				Variant		
	mm				①	②	③
	315	400	630	800	-L-	-K-	-S-
VDL-A-F-X	+	+	+	+	-	-	-
VDL-A-H*-D-X	+	+	+	+	+	-	-
VDL-A-H*-N-X	+	+	+	+	+	-	-
VDL-B-F*-X	+	+	+	+	-	+	+
VDL-B-H*-D*-X	+	+	+	+	+	+	+
VDL-B-H*-N*-X	+	+	+	+	+	+	+

- ① Lip seal
 ② Extended border
 ③ Protective cage
 + Possible
 - Not possible

VDL-...-M, manually adjustable

Variant	Nominal size				Variant		
	mm				①	②	③
	315	400	630	800	-L-	-K-	-S-
VDL-A-F-M	+	+	-	-	-	-	-
VDL-A-V*-D-M	+	+	+	+	+	-	-
VDL-A-V*-N-M	-	-	+	+	+	-	-
VDL-A-H*-D-M	+	+	+	+	+	-	-
VDL-A-H*-N-M	+	+	+	+	+	-	-
VDL-B-F*-M	+	+	-	-	-	+	+
VDL-B-V*-D*-M	+	+	+	+	+	+	+
VDL-B-V*-N*-M	-	-	+	+	+	+	+
VDL-B-H*-D*-M	+	+	+	+	+	+	+
VDL-B-H*-N*-M	+	+	+	+	+	+	+

- ① Lip seal
 ② Extended border
 ③ Protective cage
 + Possible
 - Not possible

VDL-...-E*, with actuator

Variant	Nominal size				Variant		
	mm				①	②	③
	315	400	630	800	-L-	-K-	-S-
VDL-A-V*-D-E*	+	+	+	+	+	-	-
VDL-A-H*-D-E*	+	+	+	+	+	-	-
VDL-B-V*-D*-E*	+	+	+	+	+	+	+
VDL-B-H*-D*-E*	+	+	+	+	+	+	+

- ① Lip seal
 ② Extended border
 ③ Protective cage
 + Possible
 - Not possible

VDL-B-H-L- K



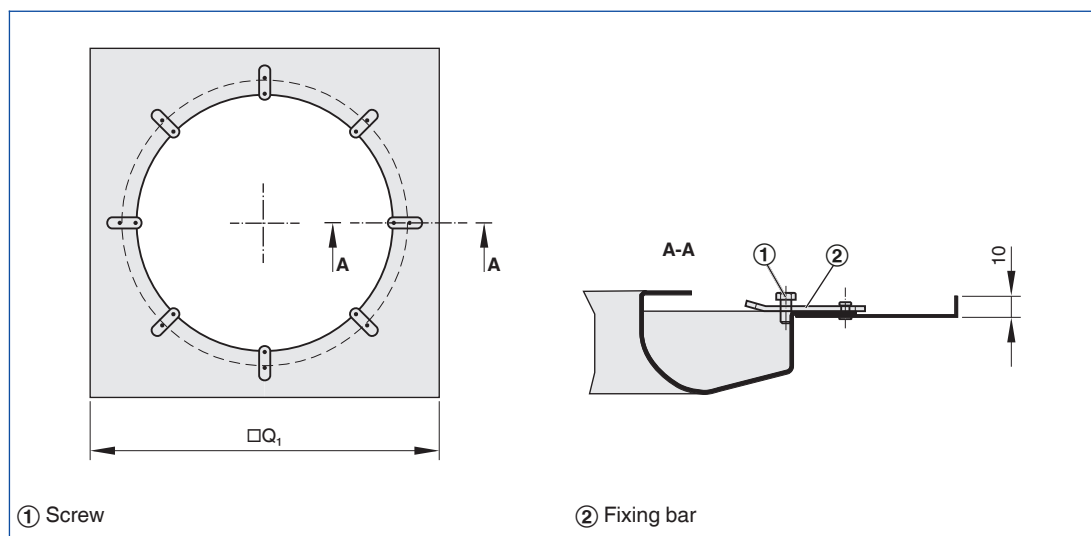
VDL-B-...-K

Accessories

- Extended border
- Only for diffuser faces with flange (VDL-B)

Nominal sizes

Extended border



- 315, 400, 630, 800

Parts and characteristics

- An extended border supports the horizontal air discharge in cooling mode

VDL-B-...-K

Nominal size	$\square Q_1$	m	
	mm		kg
315	630		2
400	800		3
630	1260		8
800	1600		13

VDL-B-H-L- S



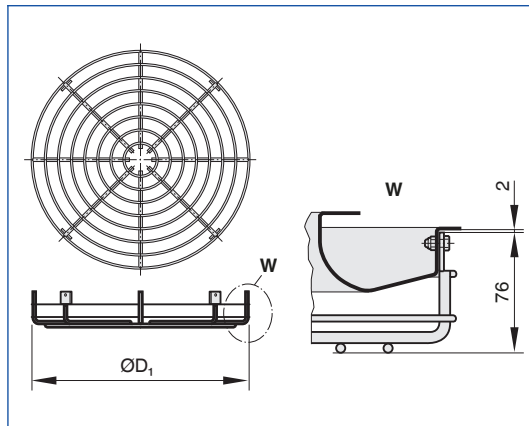
VDL-B...-S

Accessories

- Protective cage
- Only for diffuser faces with flange (VDL-B)

Nominal sizes

Protective cage



- 315, 400, 630, 800

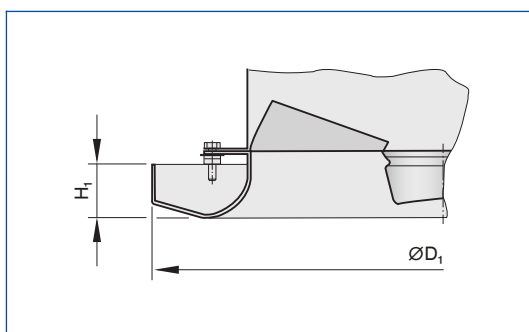
Parts and characteristics

- A protective cage protects the blades, e.g. in gymnasiums

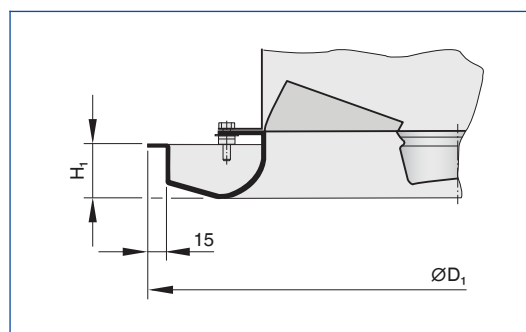
VDL-B...-S

Nominal size	$\varnothing D_1$	m	
	mm		kg
315	488		3
400	591		3
630	895		6
800	1101		9

VDL-A



VDL-B



VDL-A, VDL-B

Nominal size	VDL-A	VDL-B	H ₁ mm	A _{eff} m ²
	ØD ₁			
	mm	mm		
315	464	494	42	0.022
400	567	597	45	0.031
630	871	901	51	0.077
800	1077	1107	55	0.106

VDL*-F-X

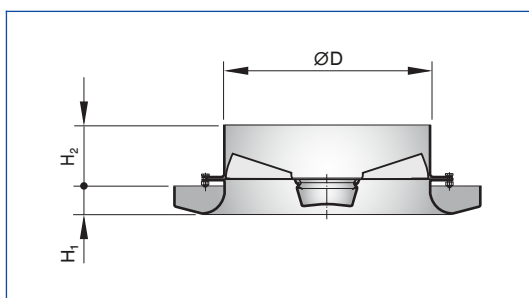


Illustration shows VDL-A-F-X

VDL*-F-M

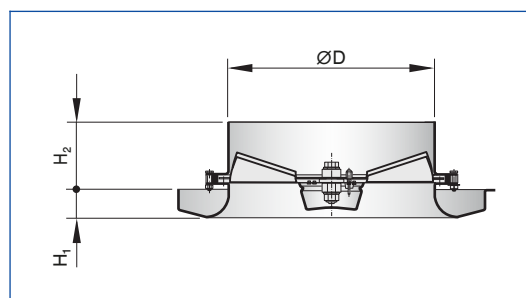


Illustration shows VDL-A-F-M

VDL*-F-X, VDL*-F-M

Nominal size	H ₁	H ₂	ØD	m
	mm	mm	mm	kg
315	42	103	313	3
400	45	112	398	4
630	51	153	628	11
800	55	174	798	19

VDL*-F-M only nominal sizes 315, 400

VDL-*-H-N

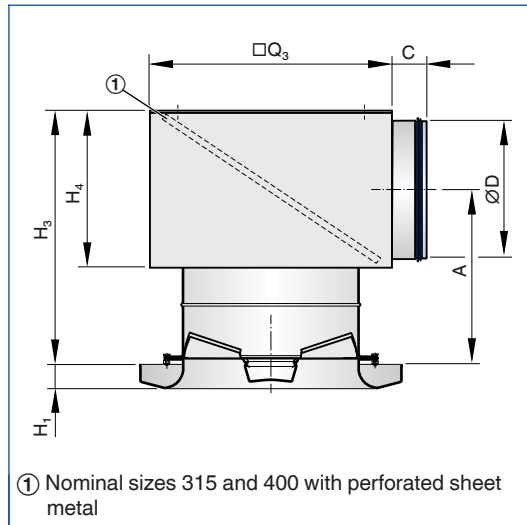


Illustration shows VDL-A-H-L-N-M

VDL-*-H-D

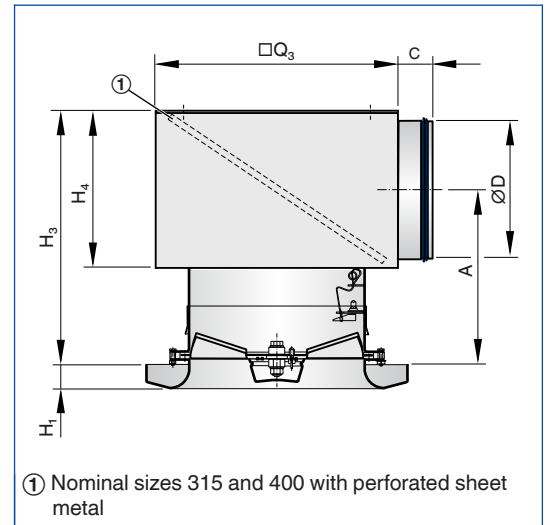


Illustration shows VDL-A-H-L-D-M

VDL-*-H-N, VDL-*-H-D

Nominal size	H ₁	□Q ₃	H ₃	H ₄	ØD	A	C	m
	mm	mm	mm	mm	mm	mm	mm	
315	42	435	432	282	248	290	65	11
400	45	500	536	368	313	351	65	16
630	51	750	761	468	398	526	65	35
800	55	1000	1026	568	498	741	65	59

Weights apply to the variant with actuator

VDL-*-V-N

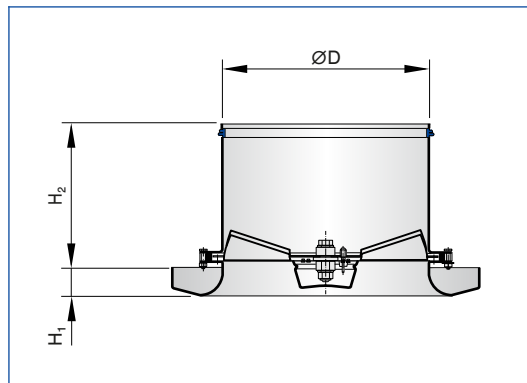


Illustration shows VDL-A-V-L-N-M

VDL-*-V-D

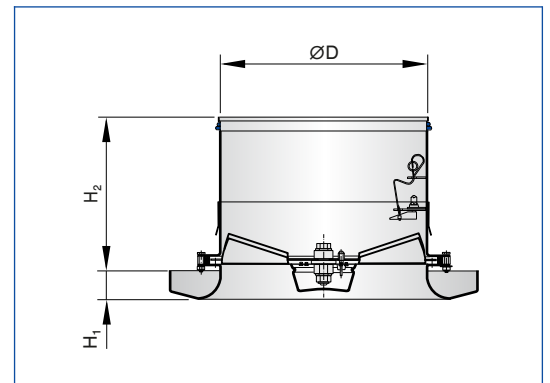


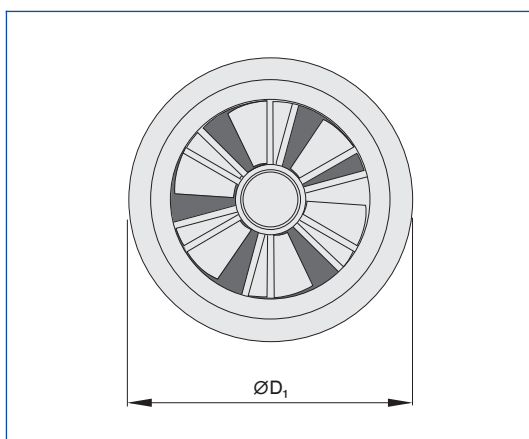
Illustration shows VDL-A-V-L-D-M

VDL-*-V-N, VDL-*-V-D

Nominal size	VDL-*-V-N	VDL-*-V-D	H ₁	ØD	m		
	H ₂					mm	kg
	mm	mm					
315		219	42	313	6		
400		228	45	398	8		
630	316	316	51	628	19		
800	483	483	55	798	33		

Weights apply to the variant with actuator

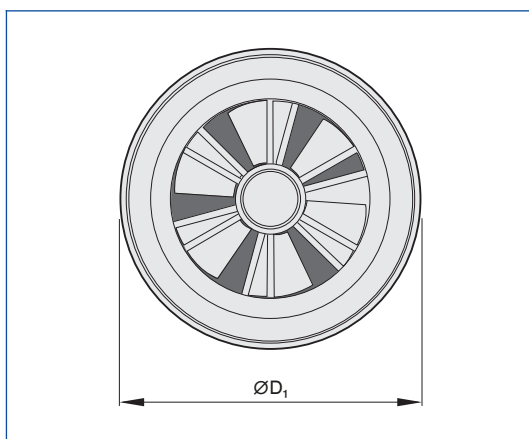
VDL-A



VDL-A

Nominal size	ØD ₁	A _{eff}
	mm	m ²
315	464	0.022
400	567	0.031
630	871	0.077
800	1077	0.106

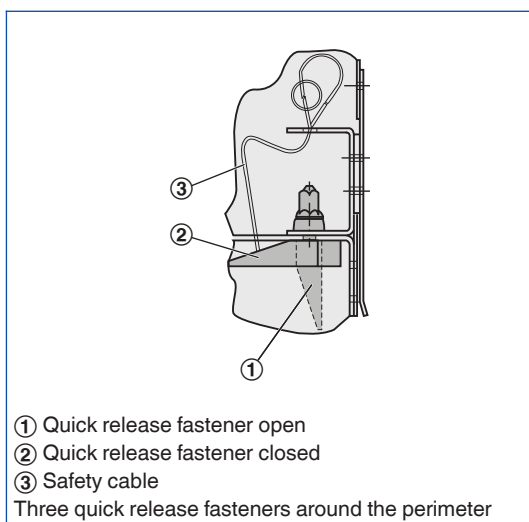
VDL-B



VDL-B

Nominal size	ØD ₁	A _{eff}
	mm	m ²
315	494	0.022
400	597	0.031
630	901	0.077
800	1107	0.106

Removable diffuser face



Freely suspended installation



Installation in continuous ceilings



Installation and commissioning

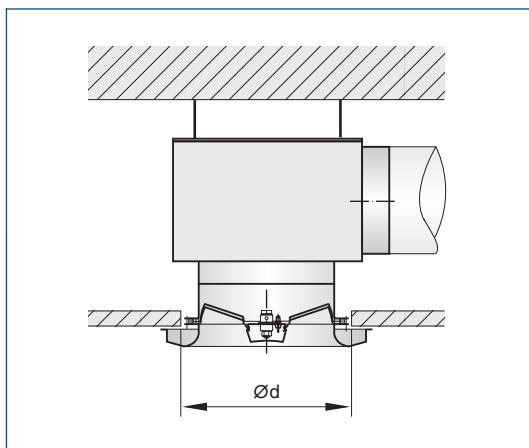
- Preferably for rooms with a clear height from 3.8 m
- Flush ceiling installation
- VDL-...-K: Also freely suspended installation
- Ceiling distance of at least 300 mm allows for continuous adjustment of the air pattern
- Horizontal or vertical duct connection

Installation information

- Installation can be flush with the ceiling or freely suspended
- If the VDL is mounted flush with an open cell ceiling, the resulting air pattern is the same as with freely suspended installation
- Continuous adjustment of the air pattern using an actuator is only possible with freely suspended installation, installation flush with an open cell ceiling, or installation with the diffuser protruding from an open cell ceiling
- Installation and making connections to be performed by others

These are only schematic diagrams to illustrate installation details.

Flush ceiling installation

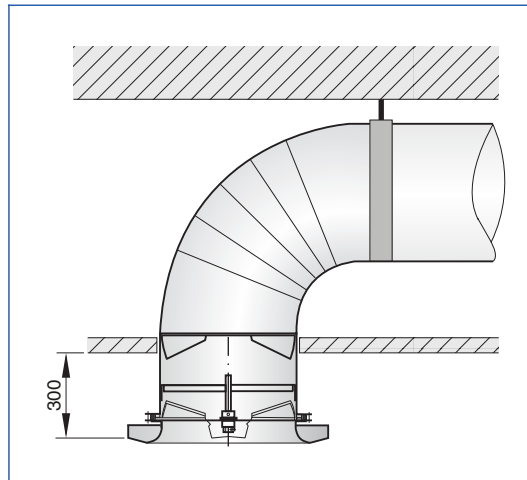


- Two discharge directions, horizontal and vertical
- Horizontal or vertical duct connection

Ceiling cut-out

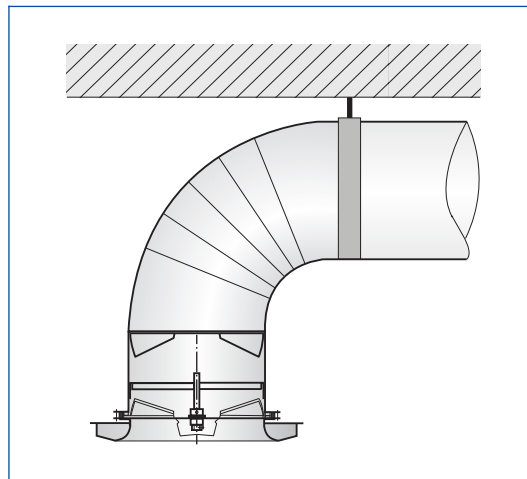
Nominal size	Ød	
	mm	
315		400
400		500
630		750
800		950

Protruding installation



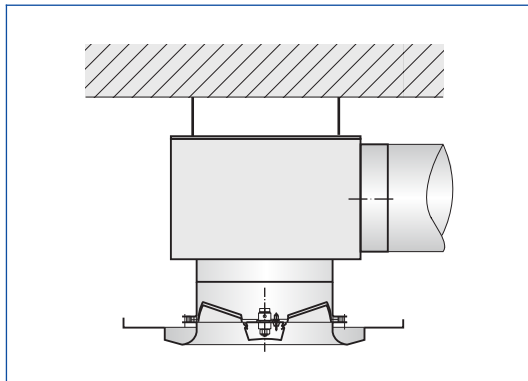
- Continuous adjustment of the discharge direction
- Vertical duct connection
- 300 mm minimum distance to the suspended ceiling

Freely suspended installation



- Continuous adjustment of the discharge direction
- Horizontal or vertical duct connection
- Preferably for industrial zones

Freely suspended installation of VDL-...-K



- Two discharge directions, horizontal and vertical
- An extended border supports the horizontal air discharge
- Horizontal or vertical duct connection
- Preferably for comfort zones

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

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 to room air temperature difference, i.e.

supply air temperature minus room temperature

Δp_t [Pa]

Total differential pressure

A_{eff} [m^2]

Effective air discharge area

All sound power levels are based on 1 pW.