



Horizontal swirling air discharge



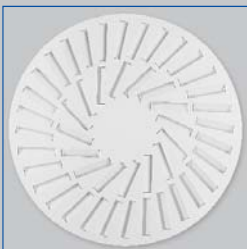
Horizontal one-way air discharge



Horizontal two-way air discharge



Plenum box with damper blade (optional)



Circular diffuser face with white air control blades

Ceiling swirl diffusers

Type VDW



With low sound power level for comfort zones, with individually manually adjustable air control blades

Circular and square ceiling swirl diffusers for high room air change rates

- Nominal sizes 300, 400, 500, 600, 625, 825
- Volume flow rate range 7 – 470 l/s or 25 – 1692 m³/h
- Diffuser face made of galvanised sheet steel, powder-coated
- For supply and extract air
- For variable and constant volume flows
- For all types of ceiling systems, and with an extended border also suitable for freely suspended installation
- High induction results in a rapid reduction of temperature differences and airflow velocities
- Air change rates of up to 35 per hour can be achieved by arranging several diffusers in a row with a minimum pitch of 0.9 m (centre line to centre line)
- Ideal for comfort zones

Optional equipment and accessories

- Exposed diffuser face available in RAL CLASSIC colours, air control blades in black or white
- Horizontal or vertical duct connection
- Plenum box with cord-operated damper blade and pressure tap
- Acoustically optimised plenum box FLEXTRO

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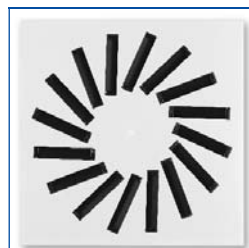
Diffuser faces

Product examples

VDW-Q-Z/300x8



VDW-Q-Z/400x16



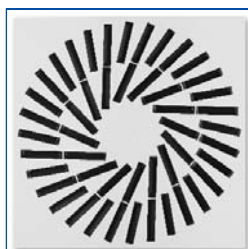
VDW-Q-Z/500x24



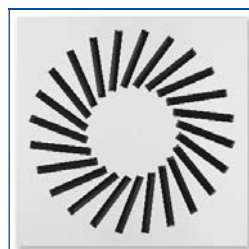
VDW-Q-Z/600x24



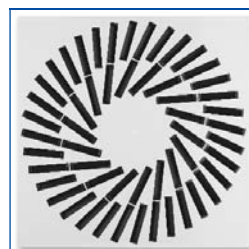
VDW-Q-Z/600x48



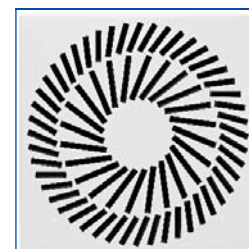
VDW-Q-Z/625x24



VDW-Q-Z/625x54



VDW-Q-Z/825x72



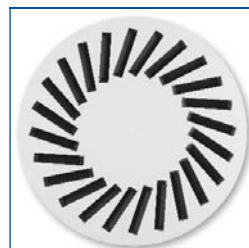
VDW-R-Z/300x8



VDW-R-Z/400x16



VDW-R-Z/500x24



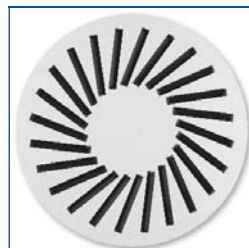
VDW-R-Z/600x24



VDW-R-Z/600x48



VDW-R-Z/625x24



Installation examples

Installation in T-bar ceilings



VDW-Q with black air control blades

Installation in T-bar ceilings



VDW-Q with white air control blades

Installation in T-bar ceilings,
arrangement in a row



Installation in continuous ceilings



Description

For detailed information on plenum boxes see Chapter K1 – 1.5.

Application

- Type VDW ceiling swirl diffusers are used as supply air or extract air diffusers for comfort zones
- Attractive design element for building owners and architects with demanding aesthetic requirements
- Horizontal swirling supply air discharge for mixed flow ventilation
- The efficient swirl creates high induction levels, thereby rapidly reducing temperature differences and airflow velocities (supply air variant)
- Individually adjustable air control blades to meet individual requirements
- For variable and constant volume flows
- For supply air to room air temperature differences from –12 to +10 K
- For room heights up to 4 m (lower edge of suspended ceiling)
- For all types of ceiling systems
- With an extended border also suitable for freely suspended installation (supply air variant)

Variants

- VDW-Q: Square diffuser face
- VDW-R: Circular diffuser face
- VDW-*-Z: Supply air
- VDW-*-A: Extract air

Connection

- H: Horizontal duct connection
- V: Vertical duct connection
- X: Flexible plenum box FLEXTRO

Nominal sizes

- 300 × 8, 400 × 16, 500 × 24, 600 × 24, 600 × 48, 625 × 24, 625 × 54, 825 × 72

Attachments

- M: Damper blade for volume flow rate balancing
- MN: Pressure tap and cord-operated damper blade for volume flow rate balancing with the diffuser face in place

Accessories

- Lip seal

Special characteristics

- Air control blades can be adjusted individually manually for adjusting the air pattern
- For all types of ceiling systems, and with an extended border also suitable for freely suspended installation
- Black or white air control blades
- Air change rates of up to 35 per hour can be achieved by arranging several diffusers in a row with a minimum pitch of 0.9 m (centre line to centre line)

Parts and characteristics

- Circular or square diffuser face
- Diffuser face with individually manually adjustable air control blades
- Simple installation of the diffuser face due to central fixing screw with decorative cap
- Damper blade for volume flow rate balancing (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)

Materials and surfaces

- Diffuser face made of galvanised sheet steel
- V, H: Plenum box and cross bar made of galvanised sheet steel
- X: Plenum box made of plastic and galvanised sheet steel
- Air control blades made of plastic, UL 94, V-0, flame retardant
- Lip seal made of rubber
- Exposed diffuser face powder-coated RAL 9010, pure white
- P1: Powder-coated, RAL CLASSIC colour
- Air control blades for supply air similar to RAL 9005, black; extract air variant without air control blades
- Q11: Air control blades for extract air similar to RAL 9005, black
- Q21: Air control blades for supply air and extract air similar to RAL 9010, white

Installation and commissioning

- Preferably for rooms with a clear height up to 4.0 m
- Flush ceiling installation
- Freely suspended installation only with an extended border (supply air variant)
- Horizontal or vertical duct connection
- If necessary, carry out volume flow rate balancing with damper blade

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	300, 400, 500, 600, 625, 825 mm
Minimum volume flow rate, with $\Delta t_z = -6$ K	7 – 99 l/s or 25 – 357 m ³ /h
Maximum volume flow rate, with $L_{WA} \cong 50$ dB(A)	80 – 470 l/s or 288 – 1692 m ³ /h
Supply air to room air temperature difference	-12 to +10 K

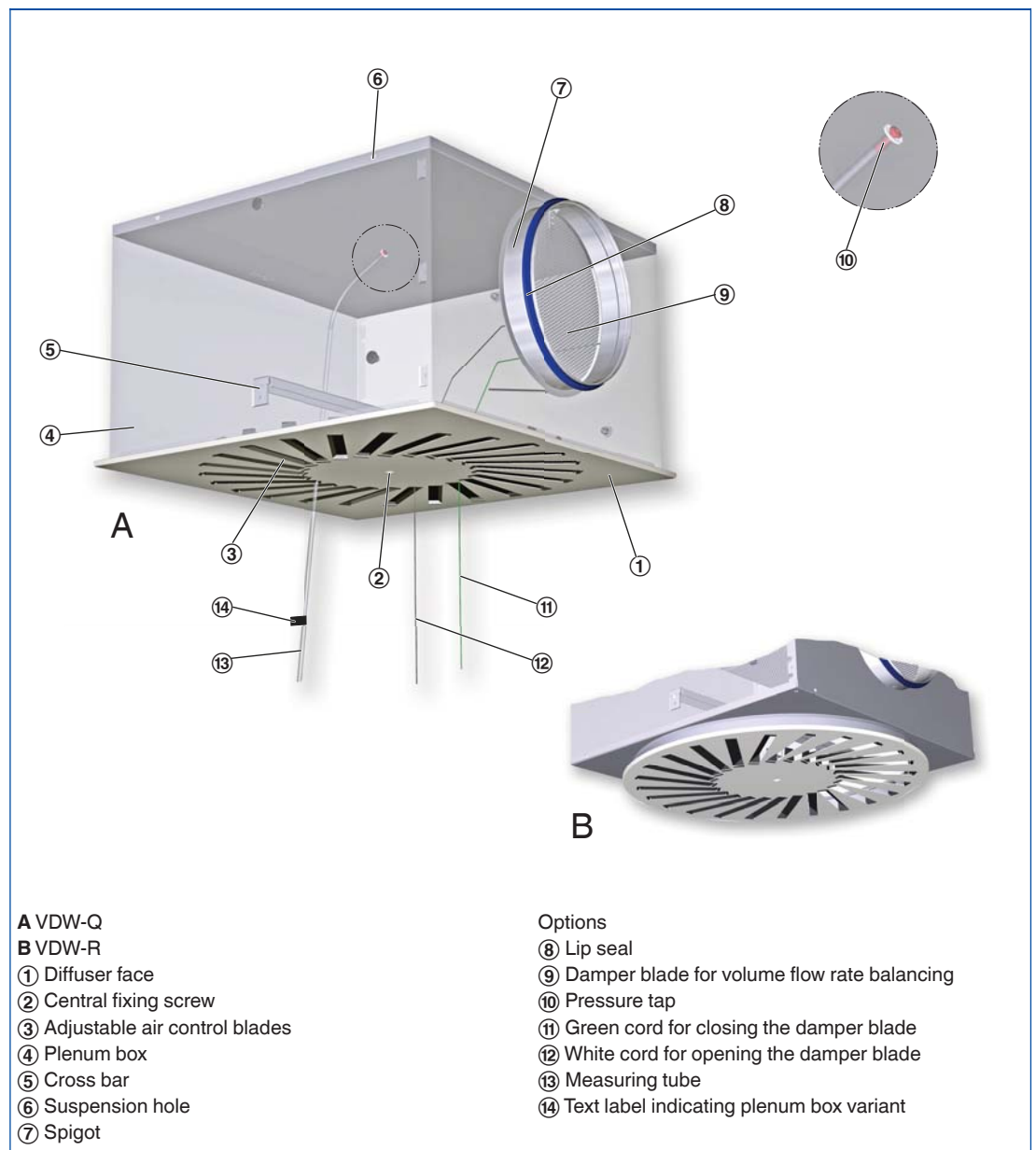
Function

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 VDW ceiling swirl diffusers have adjustable air control blades. The air pattern can be adjusted to meet different local requirements. Horizontal air discharge is one-way, two-way or omni directional. Vertical air discharge is possible but only for heating. The supply air to room air temperature difference may range from -12 to $+10$ K.

A damper blade (optional) simplifies volume flow rate balancing for commissioning. Pressure tap and cord-operated damper blade (optional) allow for volume flow rate balancing with the diffuser face in place. To give rooms an aesthetic, uniform look, Type VDW diffusers may also be used for extract air. Air control blades are not required for extract air applications.

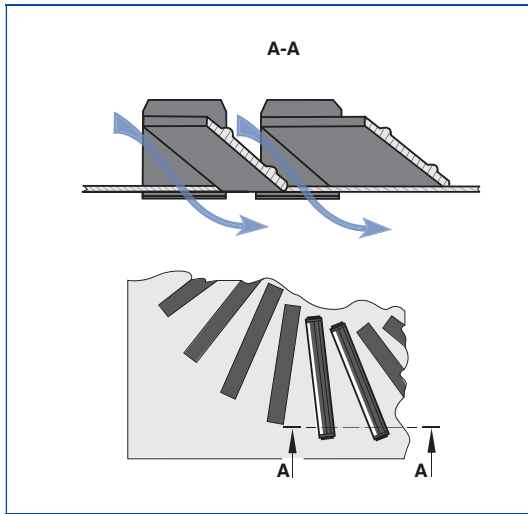
Schematic illustration of the VDW, with plenum box for horizontal duct connection



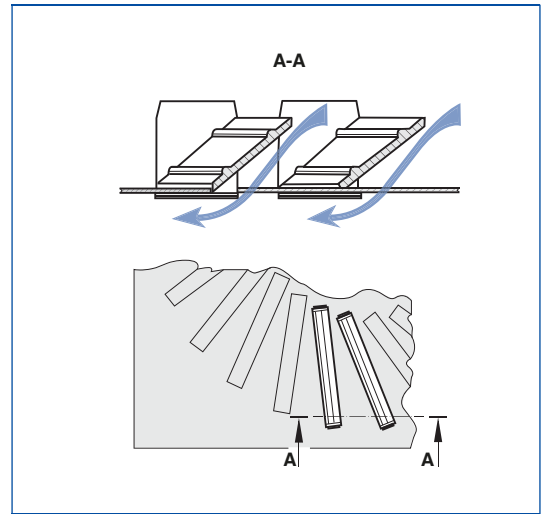
Air patterns

1

Air control blades set to external swirl

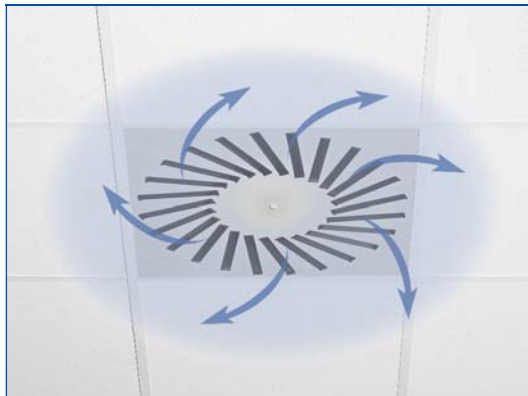


Air control blades set to internal swirl



Horizontal air discharge

Horizontal omni directional air discharge

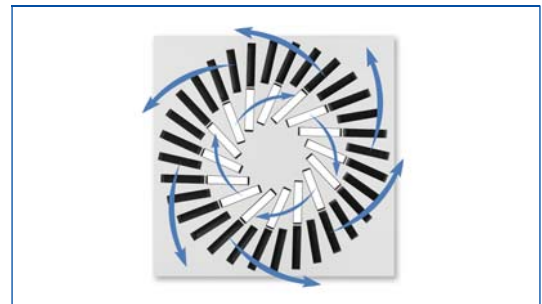


Setting of the air control blades



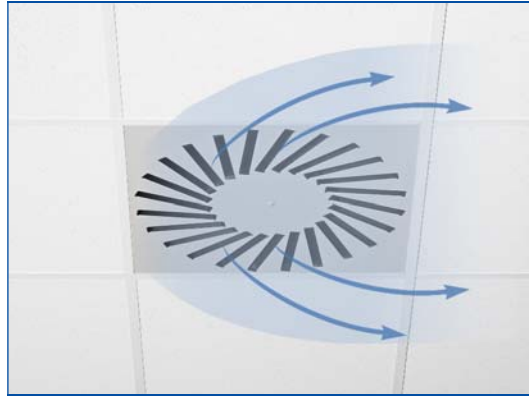
All air control blades set to external swirl

Setting of the air control blades

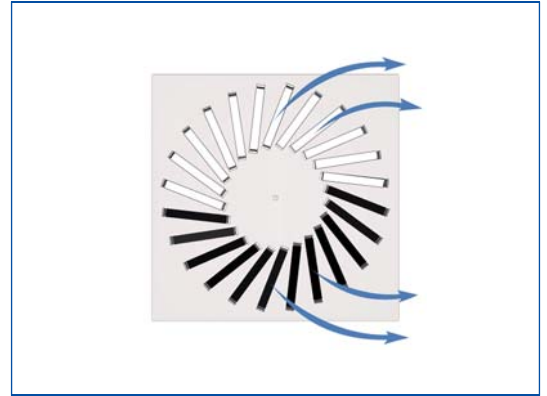


Outer air control blades set to external swirl, inner blades set to internal swirl

Horizontal one-way air discharge

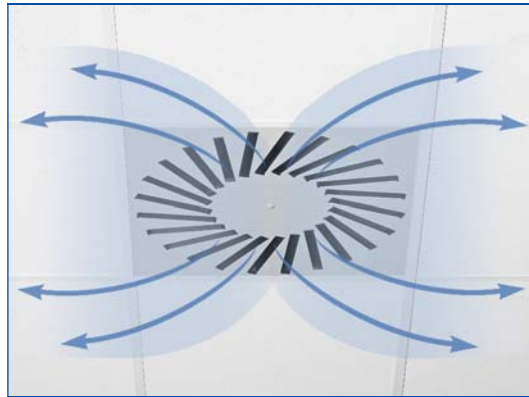


Setting of the air control blades

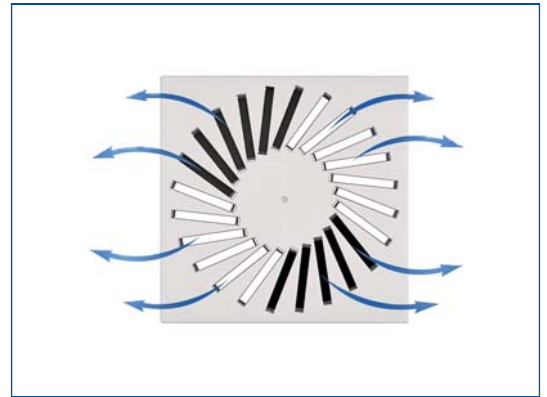


Air control blades set to internal and external swirl per half circle

Horizontal two-way air discharge



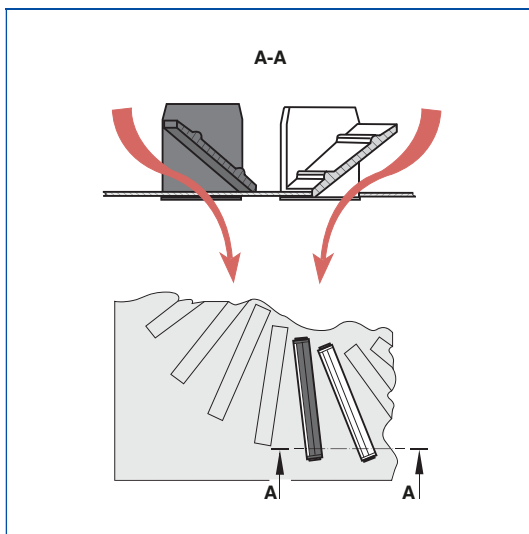
Setting of the air control blades



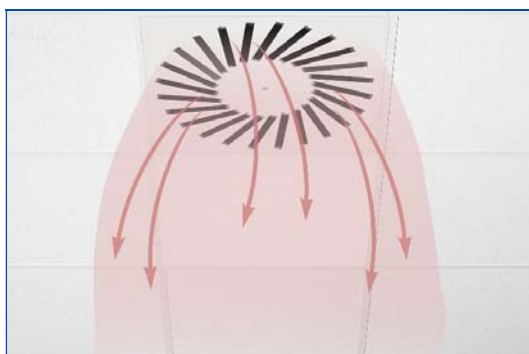
Air control blades set to internal and external swirl per quadrant

Vertical air discharge

Air control blades set to vertical air discharge



Vertical air discharge



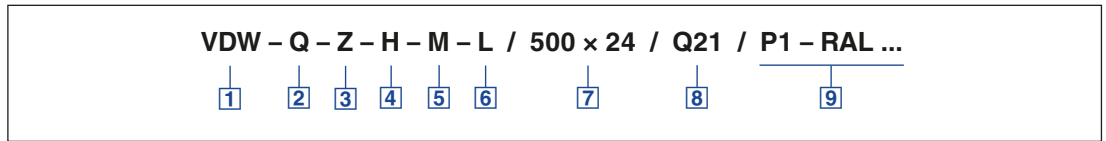
Setting of the air control blades



Air control blades set alternately to internal and external swirl

Order code

VDW



1 Type

VDW Swirl diffuser

2 Construction style

R Circular

Q Square

3 System

Z Supply air

A Extract air

4 Connection

H Horizontal

V Vertical

X Flexible plenum box FLEXTRO
(Only for nominal sizes 600 × 24
and 625 × 24)

5 Damper blade for volume flow rate balancing

Included with connection X

No entry: without damper blade

M With

MN With cords and pressure tap
(only for connection H)

6 Accessories

Connection X includes a double lip seal

No entry: without accessories

L With lip seal

7 Nominal size [mm]

300 × 8

400 × 16

500 × 24

600 × 24

600 × 48

625 × 24

VDW-Q only

625 × 54

825 × 72

8 Colour of air control blades

No entry: supply air – black air control
blades, extract air – no air control blades

Q11 Extract air – black air control blades

Q21 Supply air – white air control blades

Extract air – white air control blades

9 Exposed surface

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 examples

VDW-R-A-H/400×16

Construction style	Circular
System	Extract air
Connection	Horizontal
Damper blade for volume flow rate balancing	Without
Accessories	Without
Nominal size	400 × 16
Colour of air control blades	No air control blades
Exposed surface	RAL 9010, pure white, gloss level 50 %

VDW-Q-Z-H-MN-L/600×24/Q21/P1-RAL 9006

Construction style	Square
System	Supply air
Connection	Horizontal
Damper blade for volume flow rate balancing	With cords and pressure tap
Accessories	Lip seal
Nominal size	600 × 24
Colour of air control blades	White
Exposed surface	RAL 9006, white aluminium, gloss level 30%

VDW*-Z-H (supply air)

Quick sizing – sound power level and total differential pressure

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

The minimum volume flow rates apply to a supply air to room air temperature difference of -6 K.

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.

Nominal size	\dot{V}		Damper blade position					
			0°		45°		90°	
			Δp_t	L_{WA}	Δp_t	L_{WA}	Δp_t	L_{WA}
	l/s	m ³ /h	Pa	dB(A)	Pa	dB(A)	Pa	dB(A)
300 × 8	7	26	1	<15	1	<15	1	<15
	35	126	15	23	18	22	30	24
	60	216	45	39	53	38	87	40
	85	306	91	50	105	50	174	51
400 × 16	13	46	1	<15	1	<15	1	<15
	60	216	13	22	15	23	28	25
	100	360	36	38	42	39	78	42
	140	504	71	50	83	50	154	54
500 × 24	19	70	1	<15	1	<15	3	<15
	70	252	11	19	14	19	34	24
	125	450	35	38	45	37	108	42
	175	630	68	50	89	49	212	54
600 × 24, 625 × 24	28	102	1	<15	1	<15	2	<15
	105	378	11	20	15	21	33	22
	165	594	26	34	37	34	83	36
	260	936	65	50	91	51	205	55
600 × 48	40	145	1	<15	2	<15	5	<15
	130	468	12	21	18	23	50	29
	210	756	32	37	47	40	131	45
	305	1098	67	50	98	55	276	60
625 × 54	52	186	2	<15	2	<15	7	<15
	140	504	13	22	16	24	48	33
	225	810	34	38	41	39	125	51
	310	1116	64	50	77	52	238	64
825 × 72	99	357	2	<15	4	<15	10	<15
	225	810	13	24	21	27	51	33
	400	1440	41	44	65	49	161	54
	470	1692	56	50	90	57	222	61

VDW*-Z-V (supply air)

Quick sizing – sound power level and total differential pressure

Nominal size	\dot{V}		Damper blade position					
			0°		45°		90°	
	l/s	m³/h	Δp_t	L_{WA}	Δp_t	L_{WA}	Δp_t	L_{WA}
			Pa	dB(A)	Pa	dB(A)	Pa	dB(A)
300 × 8	7	26	1	<15	1	<15	1	<15
	30	108	12	20	14	20	22	21
	55	198	41	38	46	38	74	39
	80	288	87	50	98	51	157	52
400 × 16	13	46	1	<15	1	<15	1	<15
	55	198	11	21	13	20	26	20
	100	360	38	39	44	40	85	40
	140	504	74	50	86	51	167	52
500 × 24	19	70	1	<15	1	<15	3	<15
	70	252	10	18	14	21	35	24
	125	450	31	36	45	40	112	43
	180	648	65	50	94	54	233	59
600 × 24, 625 × 24	28	102	1	<15	1	<15	2	<15
	100	360	10	22	13	23	30	26
	170	612	28	38	38	40	87	43
	240	864	56	50	75	54	174	57
600 × 48	40	145	1	<15	2	<15	4	<15
	120	432	10	22	16	26	39	31
	200	720	27	38	43	44	109	48
	280	1008	53	50	85	58	214	63
625 × 54	52	186	2	<15	3	<15	7	<15
	130	468	10	23	16	26	42	33
	210	756	27	38	42	44	109	49
	290	1044	51	50	81	59	208	62
825 × 72	99	357	3	<15	4	<15	10	<15
	210	756	11	25	17	27	46	28
	320	1152	26	39	39	42	107	42
	430	1548	47	50	70	55	193	54

VDW*-Z-X (supply air)

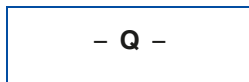
Quick sizing – sound power level and total differential pressure

Nominal size	\dot{V}		Damper blade position					
			0°		45°		90°	
	l/s	m³/h	Δp_t	L_{WA}	Δp_t	L_{WA}	Δp_t	L_{WA}
			Pa	dB(A)	Pa	dB(A)	Pa	dB(A)
600 × 24, 625 × 24	28	102	1	<15	1	<15	2	<15
	115	414	14	21	21	21	39	28
	200	720	41	37	65	39	117	44
	290	1044	87	50	136	52	245	57

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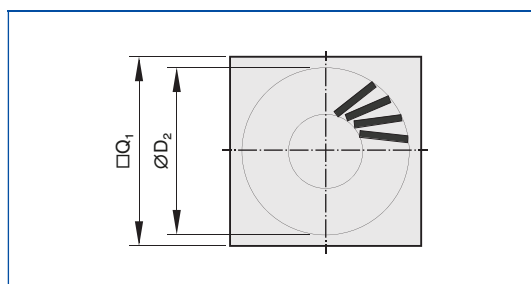


VDW-Q-Z/600x24



Order code detail

Diffuser face VDW-Q

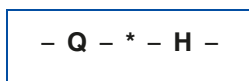


Dimensions

Nominal size	□Q ₁	∅D ₂	n	A _{eff}
	mm			m ²
300 × 8	298	269	8	0.0070
400 × 16	398	352	16	0.0140
500 × 24	498	440	24	0.0210
600 × 24	598	546	24	0.0295
600 × 48	598	568	48	0.0390
625 × 24	623	546	24	0.0295
625 × 54	623	594	54	0.0470
825 × 72	825	773	72	0.0730

n = no. of air control blades

VDW-Q*-H



Order code detail

Variant

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

Nominal sizes

- 300 × 8, 400 × 16, 500 × 24, 600 × 24, 600 × 48, 625 × 24, 625 × 54, 825 × 72

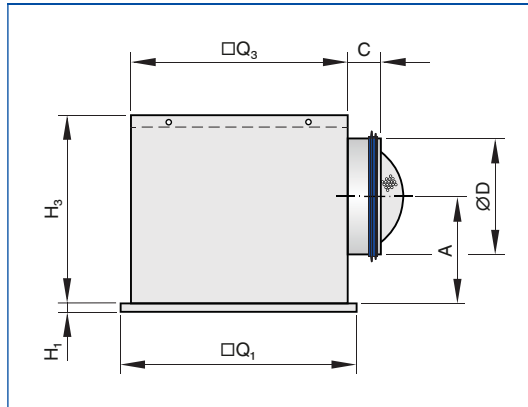
Parts and characteristics

- Square diffuser face
- Plenum box for horizontal duct connection
- Square opening to accommodate the diffuser face
- Equalising element that ensures a uniform airflow through the diffuser face (supply air variant)
- Simple installation of the diffuser face due to central fixing screw with decorative cap
- Damper blade for volume flow rate balancing (optional)
- Pressure tap and cord-operated damper blade for volume flow rate balancing (optional)
- 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)

Square diffuser face with plenum box
for horizontal duct connection



Dimensions [mm] and weight [kg]

Nominal size	□Q ₁	H ₁	□Q ₃	H ₃	ØD	A	C	Plenum box	m
	mm								kg
300 × 8	298	8	290	250	158	139	50	AK-Uni-001	3.7
400 × 16	398	8	372	295	198	164	50	AK-Uni-002	5.7
500 × 24	498	8	476	295	198	164	50	AK-Uni-003	7.8
600 × 24	598	8	567	345	248	199	48	AK-Uni-004	11.1
600 × 48	598	8	590	345	248	189	48	AK-Uni-005	11.4
625 × 24	623	8	567	345	248	199	48	AK-Uni-004	11.3
625 × 54	623	8	615	345	248	189	48	AK-Uni-006	12.0
825 × 72	825	8	806	410	313	222	50	AK-Uni-007	21.2

Weights apply to the supply air variant

VDW-Q-* -V

- Q - * - V -

Order code detail

Variant

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

Nominal sizes

- 300 × 8, 400 × 16, 500 × 24, 600 × 24, 600 × 48, 625 × 24, 625 × 54, 825 × 72

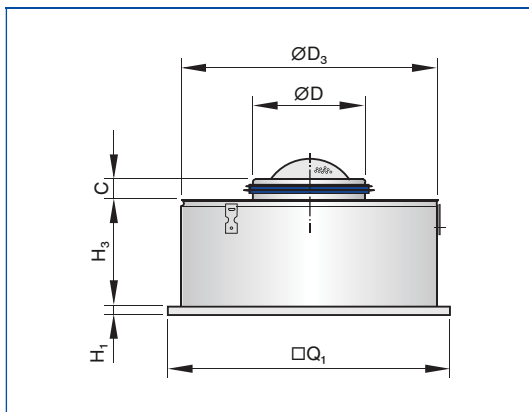
Parts and characteristics

- Square diffuser face
- Plenum box for vertical duct connection
- Circular opening to accommodate the diffuser face
- Equalising element that ensures a uniform airflow through the diffuser face (supply air variant)
- Simple installation of the diffuser face due to central fixing screw with decorative cap
- Damper blade for volume flow rate balancing (optional)
- 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)

Square diffuser face with plenum box for vertical duct connection

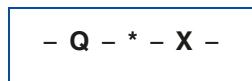


Dimensions [mm] and weight [kg]

Nominal size	□Q₁	H₁	ØD₃	H₃	ØD	C	m
	mm						kg
300 × 8	298	8	275	200	158	50	2.7
400 × 16	398	8	364	200	198	50	4.2
500 × 24	498	8	462	200	198	50	6.0
600 × 24	598	8	559	200	248	48	8.4
600 × 48	598	8	575	300	248	48	9.6
625 × 24	623	8	559	200	248	48	8.6
625 × 54	623	8	600	300	248	48	10.3
825 × 72	825	8	796	300	313	50	16.2

Weights apply to the supply air variant

VDW-Q-* - X



Order code detail

Variant

- Ceiling swirl diffuser with square diffuser face
- With flexible plenum box FLEXTRO

Nominal sizes

- 600 × 24, 625 × 24

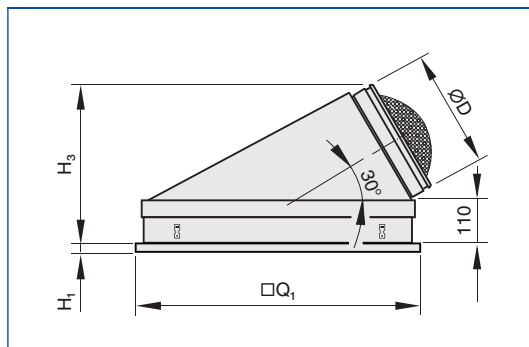
Parts and characteristics

- Square diffuser face
- Flexible plenum box FLEXTRO
- Square opening to accommodate the diffuser face
- Equalising element that ensures a uniform airflow through the diffuser face (supply air variant)
- Damper blade for volume flow rate balancing, can be set in 15° intervals between 0 and 90°
- Spigot with double lip seal
- Simple installation of the diffuser face due to central fixing screw with decorative cap

Construction features

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

Square diffuser face with flexible plenum box FLEXTRO



Dimensions [mm] and weight [kg]

Nominal size	□Q ₁	H ₁	H ₃	ØD	Plenum box	m
	mm					kg
600 × 24	598	8	365	248	FLEXTRO-Q-*	6.9
625 × 24	623	8	365	248	FLEXTRO-Q-*	7.1

Weights apply to the supply air variant

1

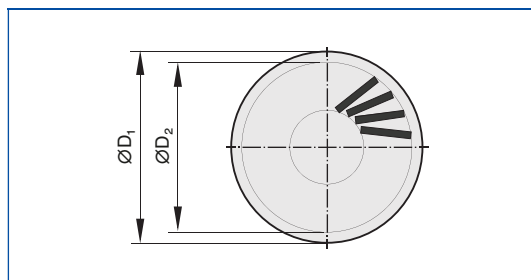


VDW-R-Z/600x24

- R -

Order code detail

Diffuser face VDW-R



Dimensions

Nominal size	ØD ₁	ØD ₂	n	A _{eff}
	mm			m ²
300 × 8	300	269	8	0.0070
400 × 16	400	352	16	0.0140
500 × 24	500	440	24	0.0210
600 × 24	600	546	24	0.0295
600 × 48	600	568	48	0.0390
625 × 24	625	546	24	0.0295

n = no. of air control blades

VDW-R*-H

- R - * - H -

Order code detail

Variant

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

Nominal sizes

- 300 × 8, 400 × 16, 500 × 24, 600 × 24, 600 × 48, 625 × 24

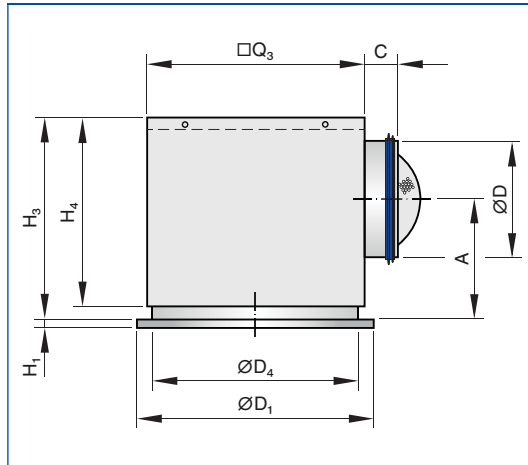
Parts and characteristics

- Circular diffuser face
- Plenum box for horizontal duct connection
- Circular opening to accommodate the diffuser face
- Equalising element that ensures a uniform airflow through the diffuser face (supply air variant)
- Simple installation of the diffuser face due to central fixing screw with decorative cap
- Damper blade for volume flow rate balancing (optional)
- Pressure tap and cord-operated damper blade for volume flow rate balancing (optional)
- 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)

Circular diffuser face with plenum box
for horizontal duct connection



Dimensions [mm] and weight [kg]

Nominal size	ØD ₁	H ₁	□Q ₃	H ₃	ØD ₄	H ₄	ØD	A	C	Plenum box	m
	mm										kg
300 × 8	300	8	290	285	278	250	158	174	50	AK-Uni-013	3.9
400 × 16	400	8	372	330	362	295	198	199	50	AK-Uni-014	6.0
500 × 24	500	8	476	330	460	295	198	199	50	AK-Uni-015	8.3
600 × 24	600	8	567	380	557	345	248	234	48	AK-Uni-016	11.3
600 × 48	600	8	590	380	578	345	248	224	48	AK-Uni-017	11.6
625 × 24	625	8	567	380	557	345	248	234	48	AK-Uni-016	11.5

Weights apply to the supply air variant

VDW-R-* -V

- R - * - V -

Order code detail

Variant

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

Nominal sizes

- 300 × 8, 400 × 16, 500 × 24, 600 × 24, 600 × 48, 625 × 24

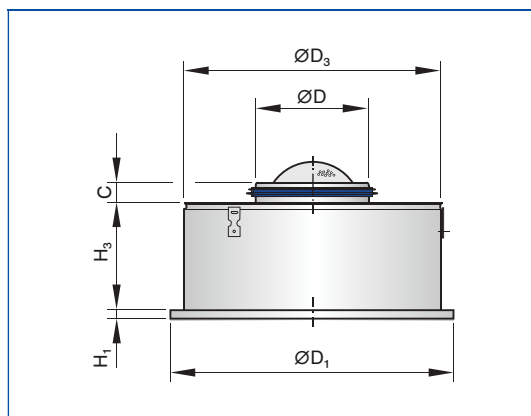
Parts and characteristics

- Circular diffuser face
- Plenum box for vertical duct connection
- Circular opening to accommodate the diffuser face
- Equalising element that ensures a uniform airflow through the diffuser face (supply air variant)
- Simple installation of the diffuser face due to central fixing screw with decorative cap
- Damper blade for volume flow rate balancing (optional)
- 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)

Circular diffuser face with plenum box for vertical duct connection



Dimensions [mm] and weight [kg]

Nominal size	ØD ₁	H ₁	ØD ₃	H ₃	ØD	C	m
	mm						kg
300 × 8	300	8	275	200	158	50	2.5
400 × 16	400	8	364	200	198	50	3.9
500 × 24	500	8	462	200	198	50	5.6
600 × 24	600	8	559	200	248	48	7.5
600 × 48	600	8	575	300	248	48	8.7
625 × 24	625	8	559	200	248	48	7.7

Weights apply to the supply air variant

VDW-R*-X

- R - * - X -

Order code detail

Variant

- Ceiling swirl diffuser with circular diffuser face
- With flexible plenum box FLEXTRO

Nominal sizes

- 600 × 24, 625 × 24

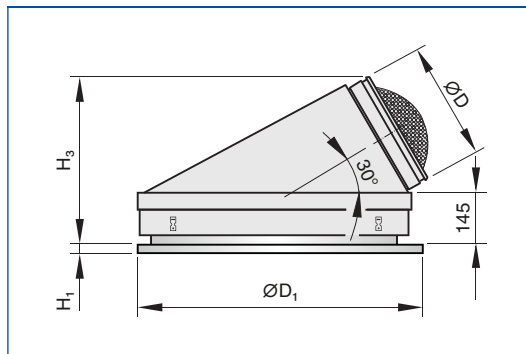
Parts and characteristics

- Circular diffuser face
- Flexible plenum box FLEXTRO
- Circular opening to accommodate the diffuser face
- Damper blade for volume flow rate balancing, can be set in 15° intervals between 0 and 90°
- Simple installation of the diffuser face due to central fixing screw with decorative cap
- Spigot with double lip seal

Construction features

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

**Circular diffuser face
with flexible plenum box FLEXTRO/600**



Dimensions [mm] and weight [kg]

Nominal size	ØD ₁	H ₁	H ₃	ØD	Plenum box	m
	mm					kg
600 × 24	600	8	400	248	FLEXTRO-R-*/600	7.0
625 × 24	625	8	400	248	FLEXTRO-R-*/600	7.2

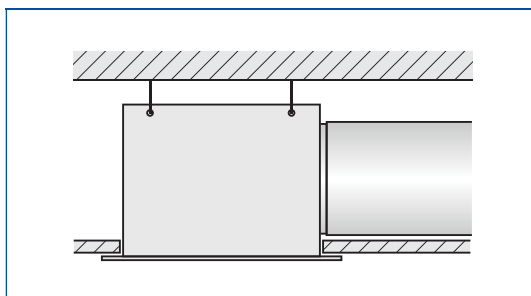
Weights apply to the supply air variant

1 Installation types

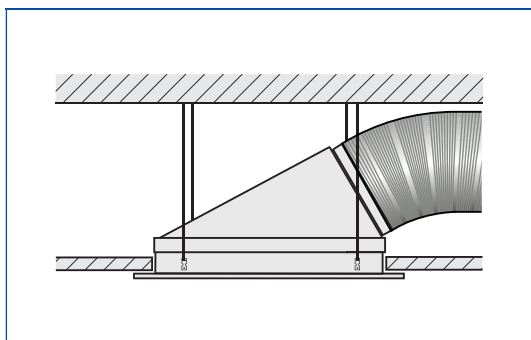
For more installation details see Chapter K1 – 1.6.

These are only schematic diagrams to illustrate installation details.

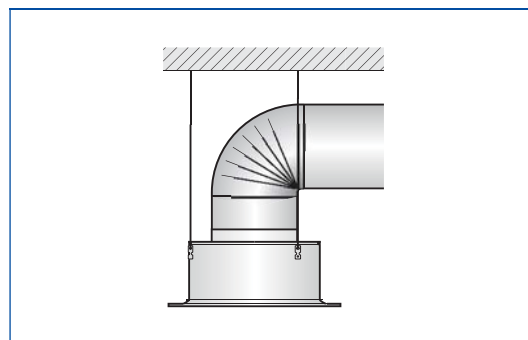
Flush ceiling installation with square plenum box



Flush ceiling installation with plenum box FLEXTRO

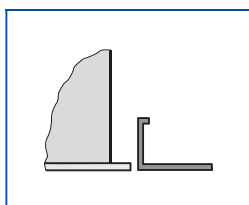


Freely suspended installation

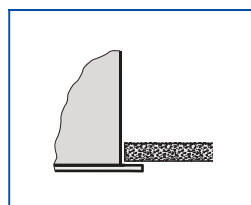


Ceiling systems

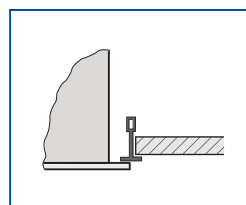
Grid ceiling



Continuous ceiling

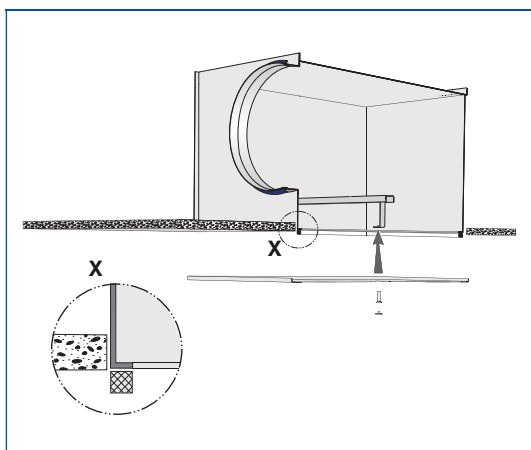


T-bar ceiling

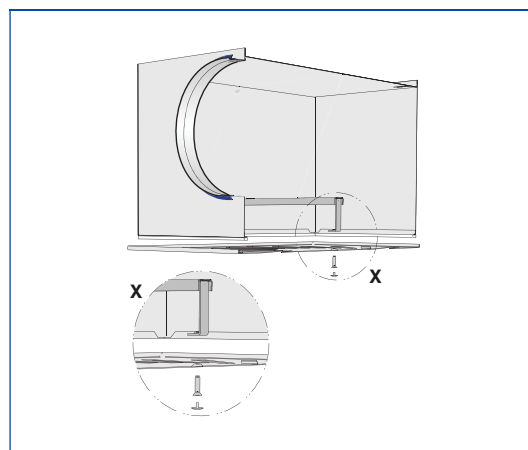


Diffuser face sealing and fixing

Diffuser face – sealing



Diffuser face – central screw fixing



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.

Ceiling swirl diffusers with square or circular diffuser face. Supply air and extract air variants for comfort zones, for a maximum air change rate of 35 per hour. Diffuser face with individually manually adjustable air control blades for horizontal swirling supply air discharge creating high induction levels. For installation into all types of suspended ceilings. Ready-to-install component which consists of the diffuser face with radially arranged, individually adjustable black or white air control blades, and of a plenum box, equalising element (only supply air variants), side entry or top entry spigot, cross bar, and suspension holes or suspension lugs. 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. Sound power level of the air-regenerated noise measured according to EN ISO 5135.

Special characteristics

- Air control blades can be adjusted individually manually for adjusting the air pattern
- For all types of ceiling systems, and with an extended border also suitable for freely suspended installation
- Black or white air control blades
- Air change rates of up to 35 per hour can be achieved by arranging several diffusers in a row with a minimum pitch of 0.9 m (centre line to centre line)

Materials and surfaces

- Diffuser face made of galvanised sheet steel
- V, H: Plenum box and cross bar made of galvanised sheet steel
- X: Plenum box made of plastic and galvanised sheet steel
- Air control blades made of plastic, UL 94, V-0, flame retardant
- Lip seal made of rubber
- Exposed diffuser face powder-coated RAL 9010, pure white
- P1: Powder-coated, RAL CLASSIC colour
- Air control blades for supply air similar to RAL 9005, black; extract air variant without air control blades
- Q11: Air control blades for extract air similar to RAL 9005, black
- Q21: Air control blades for supply air and extract air similar to RAL 9010, white

Technical data

- Nominal sizes: 300, 400, 500, 600, 625, 825 mm
- Minimum volume flow rate, with $\Delta t_z = -6$ K: 7 – 99 l/s or 25 – 357 m³/h
- Maximum volume flow rate, with $L_{WA} \approx 50$ dB(A): 80 – 470 l/s or 288 – 1692 m³/h
- Supply air to room air temperature difference: -12 to +10 K

Sizing data

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

1

Order options

1 Type

VDW Swirl diffuser

2 Construction style

R Circular

Q Square

3 System

Z Supply air

A Extract air

4 Connection

H Horizontal

V Vertical

X Flexible plenum box FLEXTRO
(Only for nominal sizes 600 × 24
and 625 × 24)

5 Damper blade for volume flow rate balancing

Included with connection X

No entry: without damper blade

M With

MN With cords and pressure tap
(only for connection H)

6 Accessories

Connection X includes a double lip seal

No entry: without accessories

L With lip seal

7 Nominal size [mm]

300 × 8

400 × 16

500 × 24

600 × 24

600 × 48

625 × 24

VDW-Q only

625 × 54

825 × 72

8 Colour of air control blades

No entry: supply air – black air control
blades, extract air – no air control blades

Q11 Extract air – black air control blades

Q21 Supply air – white air control blades

Extract air – white air control blades

9 Exposed surface

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 %

Ceiling diffusers

Basic information and nomenclature



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

Ceiling diffusers

Basic information and nomenclature

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

Ceiling diffusers

Basic information and nomenclature

Product selection

1

	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

Ceiling diffusers

Basic information and nomenclature

Product selection

1

	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

Ceiling diffusers

Basic information and nomenclature

Principal dimensions

ØD [mm]

Outside diameter of the spigot

ØD₁ [mm]

Outer diameter of a circular diffuser face

ØD₂ [mm]

Diameter of a circular diffuser face style

ØD₃ [mm]

Diameter of a circular plenum box

□Q₁ [mm]

Outer diameter of a square diffuser face

□Q₂ [mm]

Dimensions of a square diffuser face style

□Q₃ [mm]

Dimensions of a square plenum box

H₁ [mm]

Distance (height) from the lower edge of the suspended ceiling to the lower edge of the diffuser face

H₂ [mm]

Height of a ceiling diffuser, from the lower edge of the suspended ceiling to the upper edge of the spigot

H₃ [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} [m³/h] and [l/s]

Volume flow rate

Δt_z [K]

Supply air temperature difference

Δp_t [Pa]

Total differential pressure

A_{eff} [m²]

Effective air discharge area

All sound power levels are based on 1 pW.

Ceiling diffusers

Basic information and nomenclature

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

$\dot{V} = 300 \text{ l/s}$ (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.

The screenshot shows the 'Easy Product Finder' software interface. The main window displays the following information:

- Project Structure:** Projekt 1
- Product Selection:** DLQ AK // 600 // 0 // 0 // 0 // RAL 9010
- Input Parameters:**
 - Volumenstrom [m³/s]: 1.280 (792 - 2795)
 - Zwischenräume/Abstände [m]:
 - a: 6.00 (x2,0)
 - b₁: 1.20 (1,0 - 2,0)
 - x: 3.00 (x1,2)
 - l = b₁ + x = 4,2
 - Temperaturunterschied [K]:
 - ΔT_z: -8,0 (-12,0 - 4,4)
- Technical Results:**
 - v₁₀: 0,15 m/s
 - ΔP₁₀: -1,3 K
 - v₁: 0,32 m/s
 - ΔP₁: -1,3 K
- Acoustic Results (l² = Kompletz geöffnet):**

Zu/R	dB(A)	Pa
dot	34	
LWA	38	
LWNC	32	

Ceiling diffusers

Basic information and nomenclature

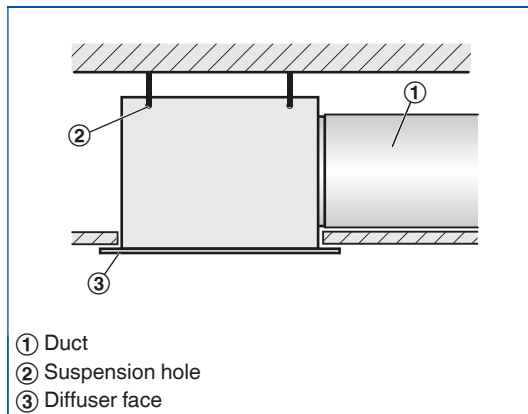
Description

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

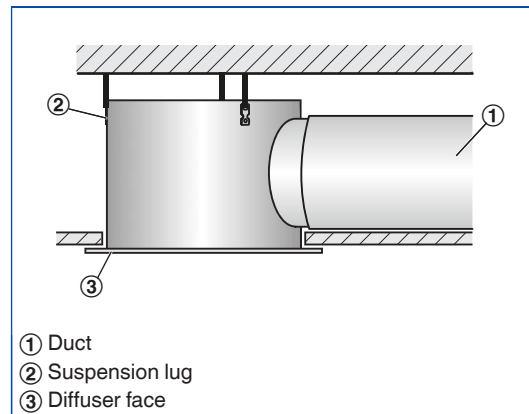
Installation types

Flush ceiling installation with square plenum box



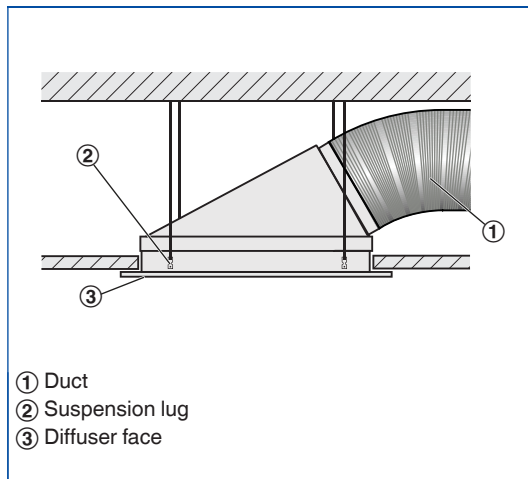
- Horizontal duct connection
- Four suspension holes
- Suspension with cords, wires or hangers, to be provided by others

Flush ceiling installation with circular plenum box



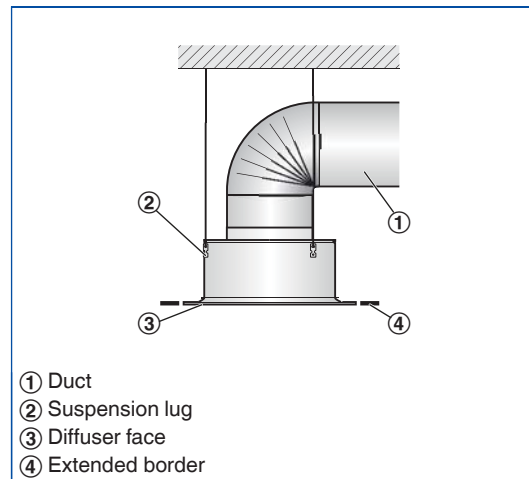
- Horizontal duct connection
- Three suspension lugs
- Suspension with cords, wires or hangers, to be provided by others

Flush ceiling installation with plenum box FLEXTRO



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

Freely suspended installation



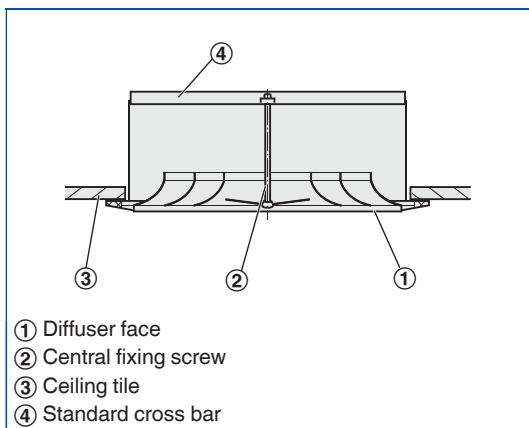
- Vertical duct connection
- Three suspension lugs
- Suspension with cords, wires or hangers, to be provided by others

Ceiling diffusers

Basic information and nomenclature

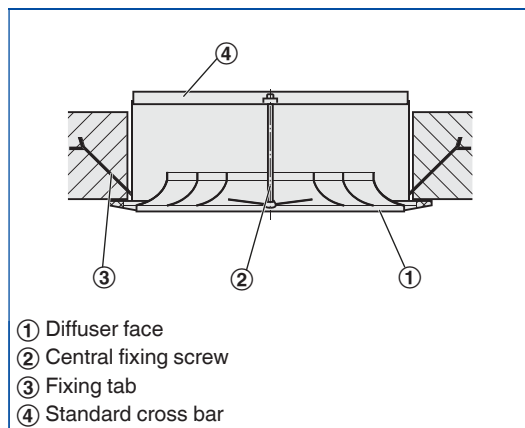
1 Installation without plenum box

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



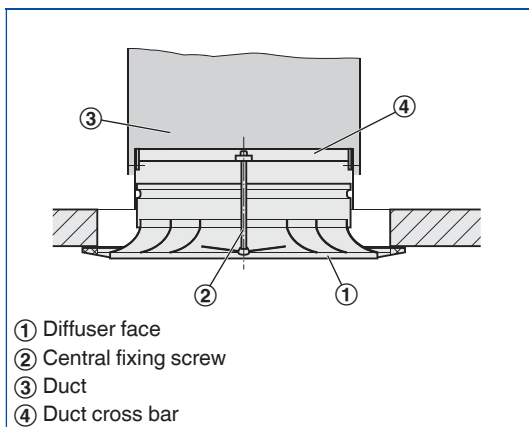
- No spigot
- Fixing of the standard cross bar to the ceiling tile is to be performed by others

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



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

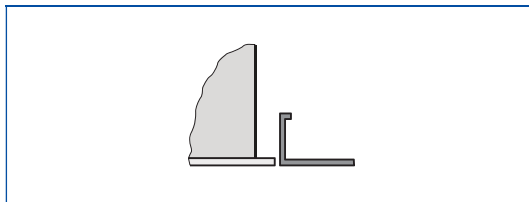
Flush ceiling installation with duct cross bar E1



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

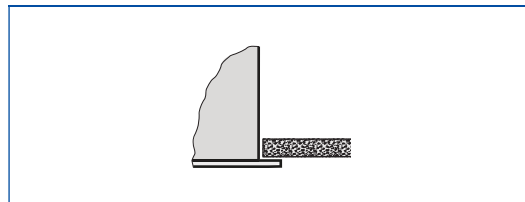
Ceiling systems

Installation into grid ceilings



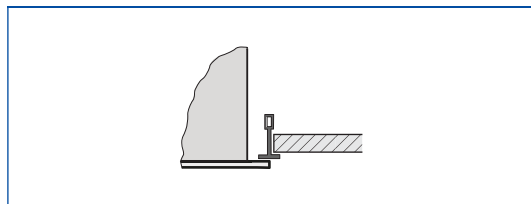
- Fix the plenum box to the ceiling
- The ceiling tile of the grid ceiling is independent of the ceiling diffuser
- Fix the diffuser face after the ceiling has been completed

Installation in continuous ceilings



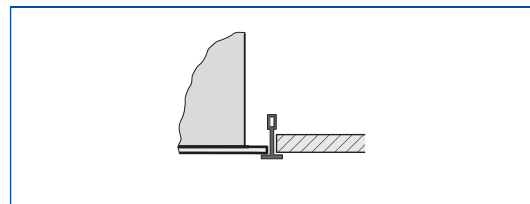
- Fix plenum box (including diffuser face, if necessary) to the ceiling
- Adjust plasterboard ceiling tile as required
- If necessary, fix the diffuser face after the ceiling has been completed

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

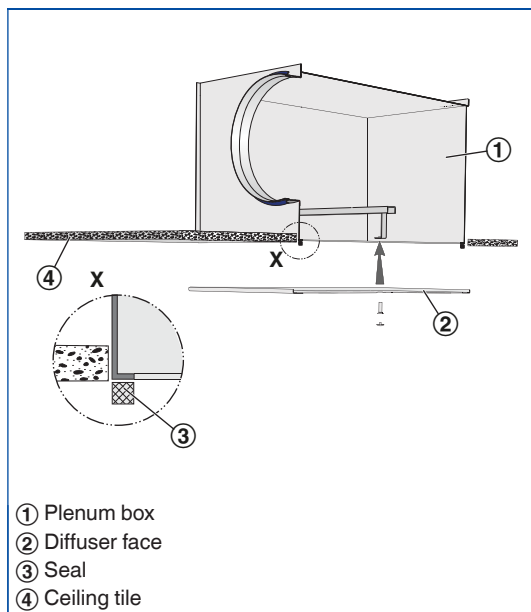
Installation in T-bar ceilings, diffuser face rests on T-bars



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

Diffuser face sealing and fixing

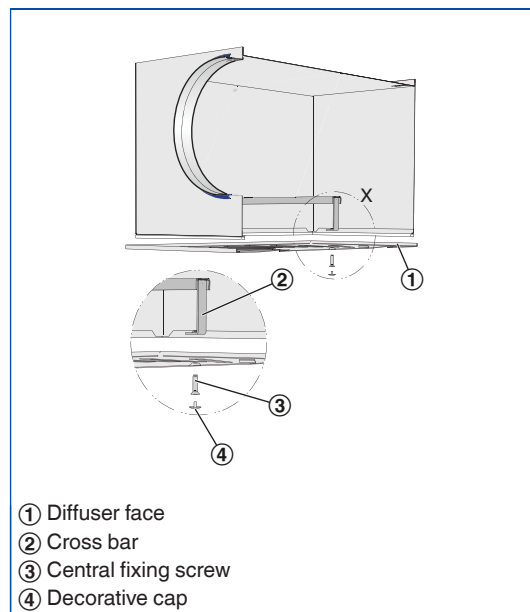
Diffuser face – sealing



- 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

Commissioning

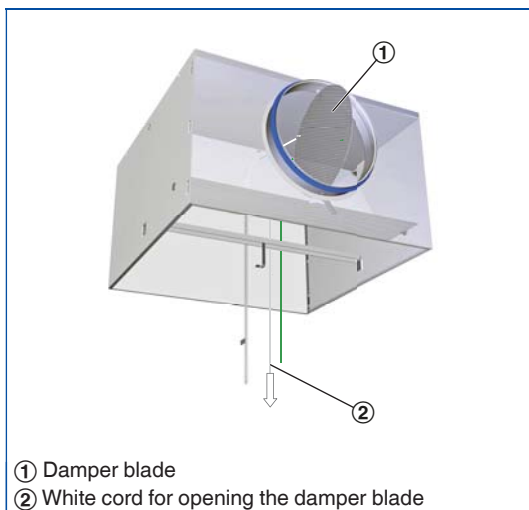
1

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.

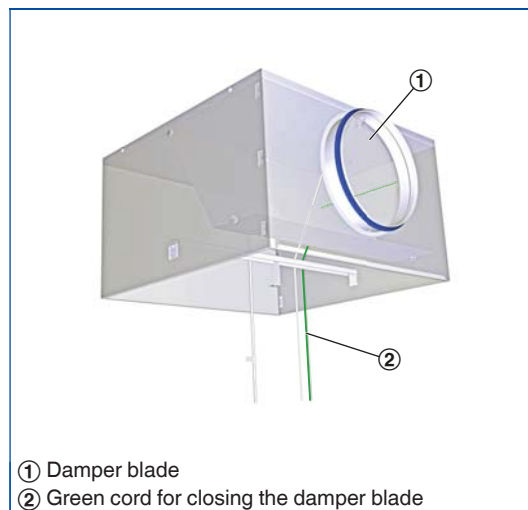
- AIRNAMIC, XARTO, FLEXTRO:
The diffuser face can be removed to access the damper blade; the damper blade can then be set in 15° intervals between 0 and 90°
- Ceiling diffusers with universal plenum box and damper blade (variant -M):
The diffuser face can be removed to access the damper blade; the damper 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



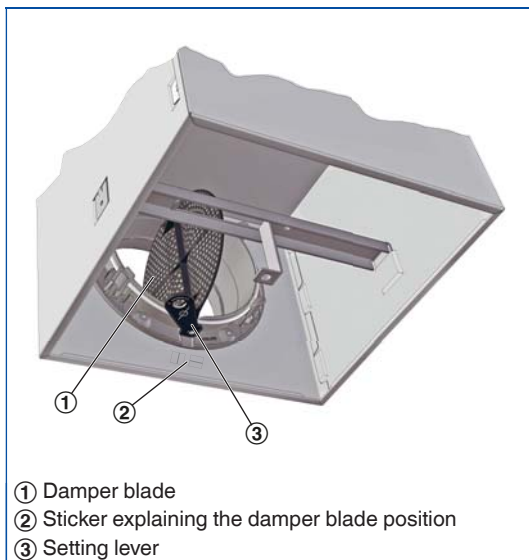
Open, 0°

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



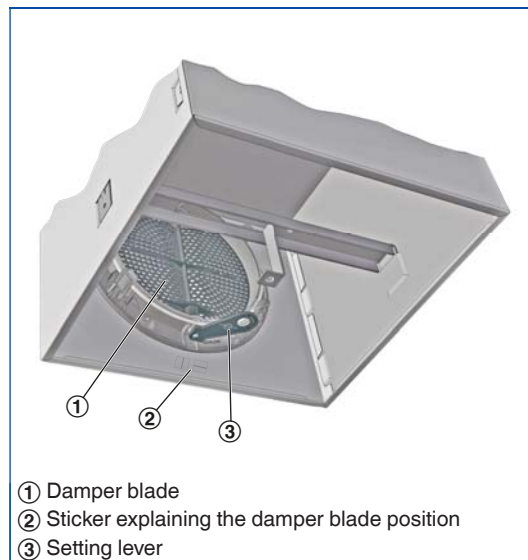
Closed, 90°

AIRNAMIC, XARTO, FLEXTRO Volume flow rate balancing



Open, 0°

AIRNAMIC, XARTO, FLEXTRO Volume flow rate balancing



Closed, 90°

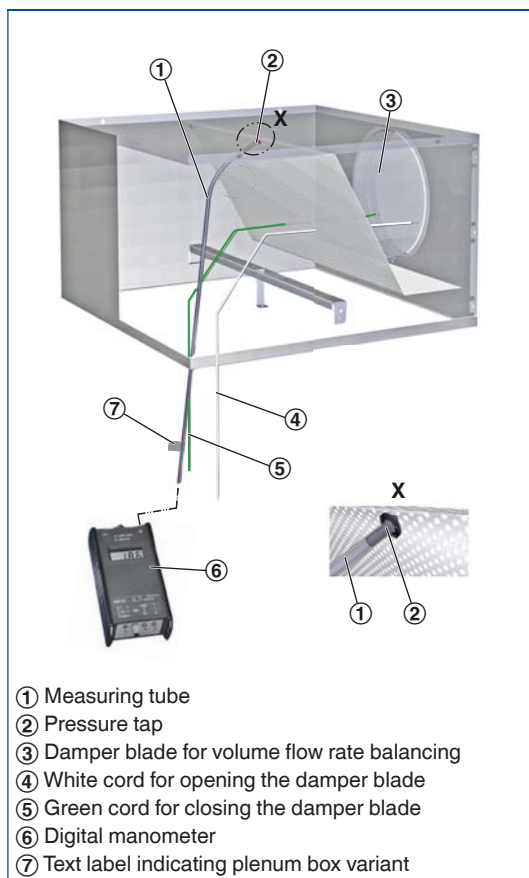
Volume flow rate measurement

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



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

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