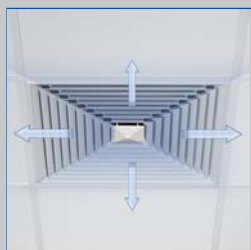


# Ceiling diffusers

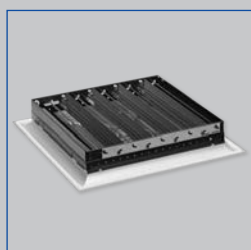
## Type ADLQ



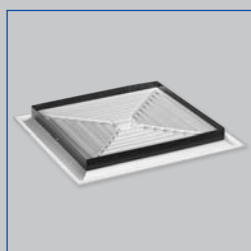
Horizontal air discharge



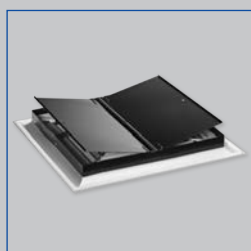
With plenum box



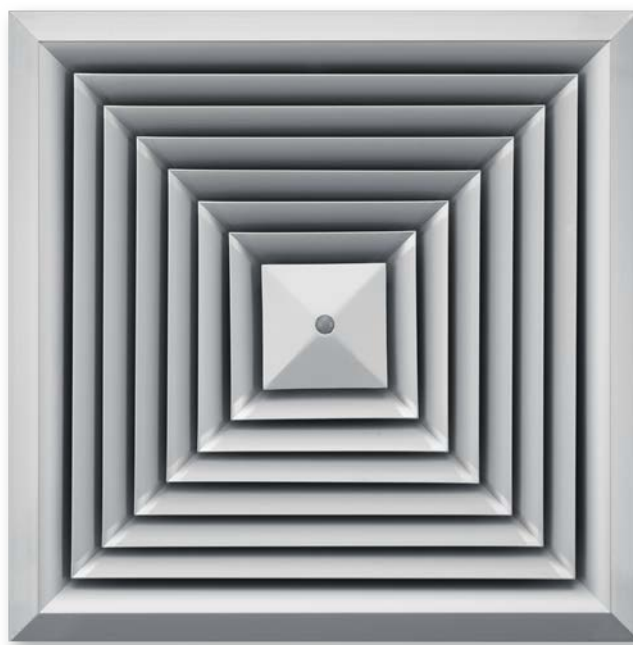
With damper blade



With connecting frame



With butterfly damper



### For four-way horizontal supply air discharge, with fixed air control blades – aluminium diffuser face

#### Square ceiling diffusers

- Nominal sizes 250, 300, 400, 500, 600, 625
- Volume flow rate range 20 – 665 l/s or 72 – 2394 m<sup>3</sup>/h
- Square diffuser face
- Diffuser face made of aluminium with anodised finish
- For supply and extract air
- For variable and constant volume flows
- For all types of ceiling systems
- High induction results in a rapid reduction of the temperature difference and airflow velocity

#### Optional equipment and accessories

- Exposed diffuser face available in RAL CLASSIC colours
- Horizontal or vertical duct connection
- Blanking plates for adjusting the discharge direction
- Duct cross bar for installation without plenum box
- Plenum box with cord-operated damper blade and pressure tap

Type		Page
ADLQ	General information	ADLQ – 2
	Function	ADLQ – 3
	Technical data	ADLQ – 4
	Quick sizing	ADLQ – 5
	Specification text	ADLQ – 7
	Order code	ADLQ – 8
	Variants	ADLQ – 9
	Dimensions and weight	ADLQ – 11
	Product details	ADLQ – 14
	Installation examples	ADLQ – 15
	Installation details	ADLQ – 16
	Commissioning	ADLQ – 18
	Basic information and nomenclature	ADLQ – 20

## Application

### Application

- Type ADLQ ceiling 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 four-way supply air discharge for mixed flow ventilation
- High induction results in a rapid reduction of the temperature difference and airflow velocity (supply air variant)
- For variable and constant volume flows
- For supply air to room air temperature differences from –10 to +10 K
- For room heights up to 4 m (lower edge of suspended ceiling)
- For all types of ceiling systems

### Special characteristics

- Horizontal four-way supply air discharge
- Diffuser face made of aluminium
- For all types of ceiling systems
- Horizontal or vertical duct connection

### Nominal sizes

- 250, 300, 400, 500, 600, 625

## Description

### Variant

- Square diffuser face

### Connection

- A: Diffuser face only
- AR: Vertical duct connection, with connecting frame
- AG: Vertical duct connection, with blades
- C: Vertical duct connection with butterfly damper
- AK: Horizontal duct connection, with plenum box

### Parts and characteristics

- Square diffuser face with fixed air control blades
- Diffuser front frame
- Simple installation of the diffuser face due to central fixing screw with decorative cap

### Accessories

- Lip seal

### Construction features

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

### Materials and surfaces

- Diffuser face made of extruded aluminium sections
- AK: Plenum box and cross bar made of galvanised sheet steel
- X: Plenum box made of plastic and galvanised sheet steel
- Connecting frame and butterfly damper made of sheet steel
- Lip seal made of rubber
- Attachments are dip coated RAL 9005, jet black
- Diffuser face with anodised finish, E6-C-0, natural colour
- 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

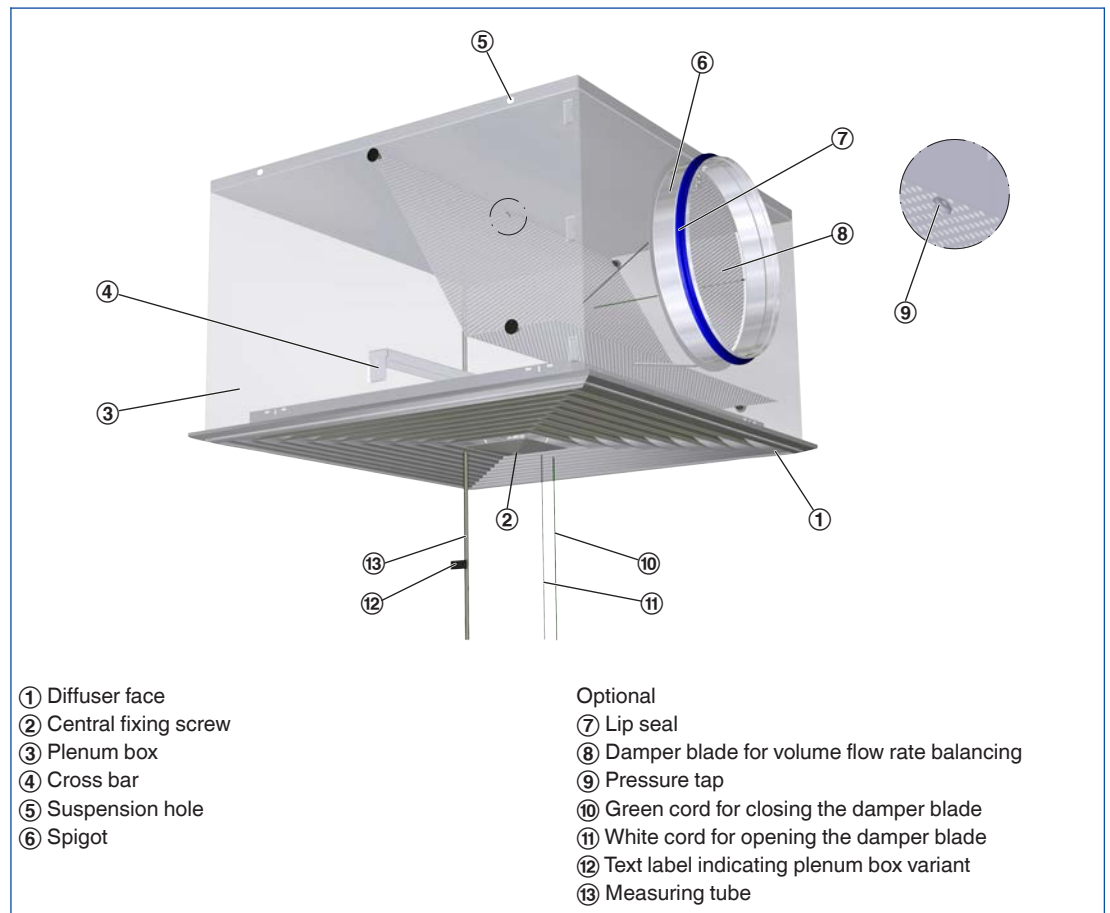
**Functional description**

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 in comfort zones, with good overall room ventilation, creating

only very little turbulence in the occupied zone. Type ADLQ ceiling diffusers have fixed blades. Horizontal air discharge is four-way. The supply air to room air temperature difference may range from  $-10$  to  $+10$  K.

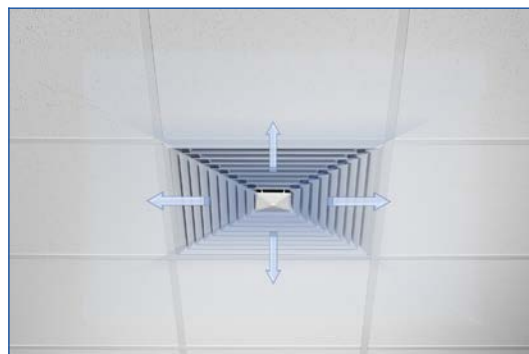
To give rooms an aesthetic, uniform look, Type ADLQ diffusers may also be used for extract air.

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



**Air patterns**

**Horizontal air discharge**



<b>Nominal sizes</b>	250, 300, 400, 500, 600, 625 mm
<b>Minimum volume flow rate</b>	20 – 250 l/s or 72 – 900 m <sup>3</sup> /h
<b>Maximum volume flow rate, with <math>L_{WA} \cong 50</math> dB(A)</b>	575 – 665 l/s or 2070 – 2394 m <sup>3</sup> /h
<b>Supply air to room air temperature difference</b>	-10 to +10 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.

**ADLQ-A, ADLQ-AR (supply air), sound power level and total differential pressure**

Nominal size	$\dot{V}$		$\Delta p_t$	$L_{WA}$
	l/s	m <sup>3</sup> /h	Pa	dB(A)
250	20	72	3	18
	50	180	20	30
	80	288	50	41
	105	378	86	50
300	35	126	3	<15
	80	288	14	24
	125	450	35	35
	175	630	68	50
400	75	270	2	<15
	175	630	13	25
	280	1008	34	38
	385	1386	65	50
500	135	486	3	<15
	270	972	10	25
	505	1818	36	47
	545	1962	42	50
600	220	792	3	21
	380	1368	9	33
	535	1926	17	42
	675	2430	27	50
625	250	900	3	20
	390	1404	7	33
	540	1944	13	43
	665	2394	19	50

ADLQ-AK (supply air), sound power level and total differential pressure

Nominal size	$\dot{V}$ l/s	$\dot{V}$ m <sup>3</sup> /h	Damper blade position					
			0°		45°		90°	
			$\Delta p_t$	$L_{WA}$	$\Delta p_t$	$L_{WA}$	$\Delta p_t$	$L_{WA}$
			Pa	dB(A)	Pa	dB(A)	Pa	dB(A)
250	20	72	5	<15	6	<15	11	<15
	40	144	20	30	24	29	42	30
	60	216	46	42	54	41	95	42
	85	306	92	51	108	51	190	52
300	35	126	6	<15	9	<15	20	18
	70	252	26	30	37	32	81	38
	100	360	52	41	75	43	166	48
	130	468	89	50	126	51	280	57
400	75	270	9	<15	15	19	32	29
	130	468	27	31	44	38	95	45
	185	666	54	42	90	48	192	58
	230	828	84	50	138	56	297	69
500	135	486	12	15	18	23	42	35
	210	756	29	32	45	39	101	49
	285	1026	53	42	82	48	185	60
	360	1296	84	50	131	57	295	71
600	220	792	12	22	19	25	50	34
	330	1188	27	33	43	39	112	46
	440	1584	48	43	77	49	198	55
	540	1944	72	50	116	56	299	63
625	250	900	14	22	27	33	63	39
	330	1188	25	32	47	42	110	47
	410	1476	38	39	73	50	170	53
	575	2070	75	50	143	64	333	67

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 square diffuser face. Supply air and extract air variants for comfort zones. Diffuser face with fixed air control blades for horizontal four-way air discharge. For installation into all types of suspended ceilings. Ready-to-install component which consists of the aluminium diffuser face with fixed air control blades, a diffuser front frame with perimeter seal and a connecting frame, opposed action blades, butterfly damper or a plenum box. Diffuser face suitable for central screw fixing. Sound power level of the air-regenerated noise measured according to EN ISO 5135.

#### Special characteristics

- Horizontal four-way supply air discharge
- Diffuser face made of aluminium
- For all types of ceiling systems
- Horizontal or vertical duct connection

#### Materials and surfaces

- Diffuser face made of extruded aluminium sections
- AK: Plenum box and cross bar made of galvanised sheet steel
- X: Plenum box made of plastic and galvanised sheet steel
- Connecting frame and butterfly damper made

- of sheet steel
- Lip seal made of rubber
- Attachments are dip coated RAL 9005, jet black
- Diffuser face with anodised finish, E6-C-0, natural colour
- P1: Powder-coated, RAL CLASSIC colour

#### Technical data

- Nominal sizes: 250, 300, 400, 500, 600, 625 mm
- Minimum volume flow rate: 20 – 250 l/s or 72 – 900 m<sup>3</sup>/h
- Maximum volume flow rate, with  $L_{WA} \approx 50$  dB(A): 575 – 665 l/s or 2070 – 2394 m<sup>3</sup>/h
- Supply air to room air temperature difference: -10 to +10 K

#### Sizing data

- $\dot{V}$  \_\_\_\_\_  
[m<sup>3</sup>/h]
  - $\Delta p_t$  \_\_\_\_\_  
[Pa]
- Air-regenerated noise
- $L_{WA}$  \_\_\_\_\_  
[dB(A)]

ADLQ

<b>ADLQ – ZH – M – L / 500 / P1 – RAL ...</b>					
↓ <b>1</b>	↓ <b>2</b>	↓ <b>3</b>	↓ <b>4</b>	↓ <b>5</b>	↓ <b>6</b>

**1** Type

**ADLQ** Ceiling diffuser

**2** Connection

- A** Diffuser face only
- AR** Vertical, with connecting frame
- AG** Vertical, with blades (not for nominal size 250)
- C** Vertical, with butterfly damper
- ZH** Horizontal, supply air, with plenum box
- AH** Horizontal, extract air, with plenum box

**3** Damper blade for volume flow rate balancing

- No entry: without damper blade  
Only for connections ZH, AH
- M** With damper blade
- MN** With cords and pressure tap

**4** Accessories

- No entry: without accessories
- L** With lip seal (only with plenum box)

**5** Nominal size [mm]

- 250**
- 300**
- 400**
- 500**
- 600**
- 625**

**6** Exposed surface

- No entry: anodised, E6-C-0, natural colour
  - P1** Powder-coated, specify RAL CLASSIC colour
- Gloss level
- RAL 9010 50 %
  - RAL 9006 30 %
  - All other RAL colours 70 %

**Order example: ADLQ-AK-M-L/500**

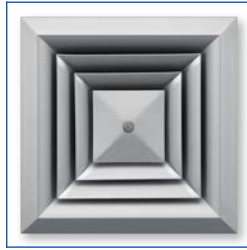
<b>Connection</b>	Horizontal, with plenum box
<b>Damper blade for volume flow rate balancing</b>	With damper blade
<b>Accessories</b>	With lip seal
<b>Nominal size</b>	500
<b>Exposed surface</b>	RAL 9010, pure white, gloss level 50 %



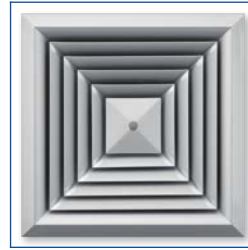
ADLQ/250



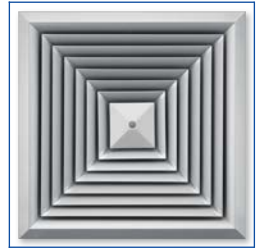
ADLQ/300



ADLQ/400



ADLQ/500



ADLQ/600



ADLQ/625



#### ADLQ-A

##### Variant

- Ceiling diffuser with square diffuser face

##### Nominal sizes

- 250, 300, 400, 500, 600, 625

#### Parts and characteristics

- Square diffuser face
- Simple installation of the diffuser face due to central fixing screw with decorative cap

#### ADLQ-AR

##### Variant

- Ceiling diffuser with square diffuser face
- With connecting frame

##### Nominal sizes

- 250, 300, 400, 500, 600, 625

#### Parts and characteristics

- Square diffuser face
- Connecting frame for installation of the diffuser into vertical ducts
- Simple installation of the diffuser face due to central fixing screw with decorative cap

#### ADLQ-C

##### Variant

- Ceiling diffuser with square diffuser face
- With connecting frame
- With butterfly damper

##### Nominal sizes

- 250, 300, 400, 500, 600, 625

#### Parts and characteristics

- Square diffuser face
- Connecting frame for installation of the diffuser into vertical ducts
- Butterfly damper for volume flow rate balancing
- Simple installation of the diffuser face due to central fixing screw with decorative cap

#### ADLQ-AG

##### Variant

- Ceiling diffuser with square diffuser face
- With connecting frame
- With opposed action blades

##### Nominal sizes

- 250, 300, 400, 500, 600, 625

#### Parts and characteristics

- Square diffuser face with fixed air control blades
- Diffuser front frame
- Simple installation of the diffuser face due to central fixing screw with decorative cap
- Connecting frame for installation of the diffuser into vertical ducts
- Damper blade for volume flow rate balancing

### ADLQ-AK

#### Variant

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

#### Nominal sizes

- 250, 300, 400, 500, 600, 625

#### 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

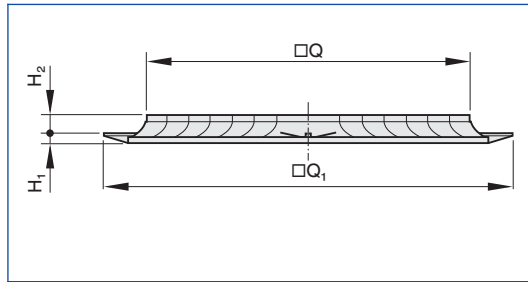
airflow through the diffuser face (supply air variant)

- 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

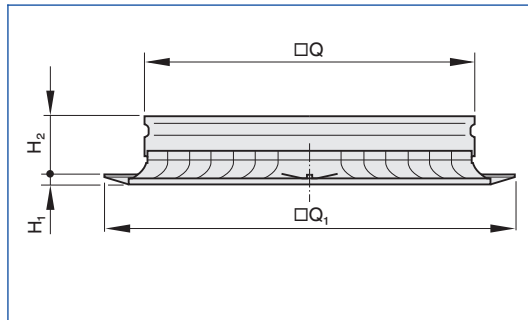
ADLQ-A



ADLQ-A

Nominal size	$\square Q$ mm	$\square Q_1$ mm	$H_1$ mm	$H_2$ mm	m kg
250	140	248	13	29	0.5
300	190	298	13	29	0.7
400	290	398	13	29	1.3
500	390	498	13	29	1.8
600	490	598	13	29	2.5
625	515	623	13	29	2.6

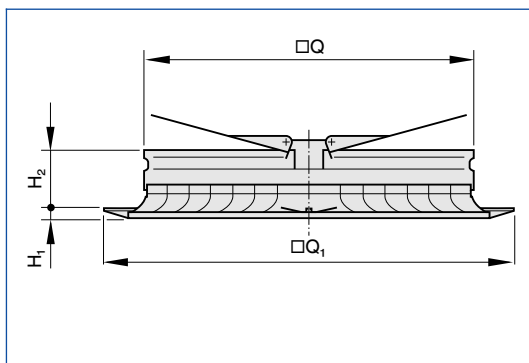
ADLQ-AR



ADLQ-AR

Nominal size	$\square Q$ mm	$\square Q_1$ mm	$H_1$ mm	$H_2$ mm	m kg
250	143	248	13	52	0.7
300	193	298	13	52	1.0
400	293	398	13	52	1.7
500	393	498	13	52	2.3
600	493	598	13	52	3.0
625	518	623	13	52	3.2

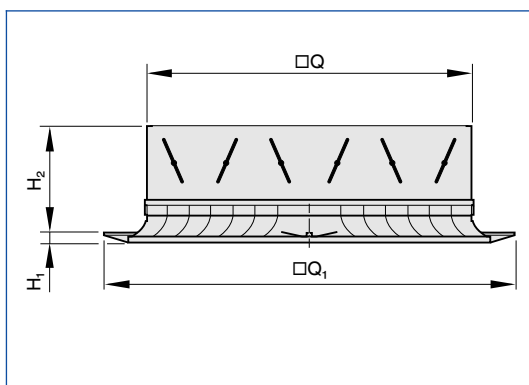
ADLQ-C



ADLQ-C

Nominal size	$\square Q$	$\square Q_1$	$H_1$	$H_2$	m kg
	mm	mm	mm	mm	
250	143	248	13	52	1.2
300	193	298	13	52	1.7
400	293	398	13	52	2.9
500	393	498	13	52	4.2
600	493	598	13	52	5.9
625	518	623	13	52	6.3

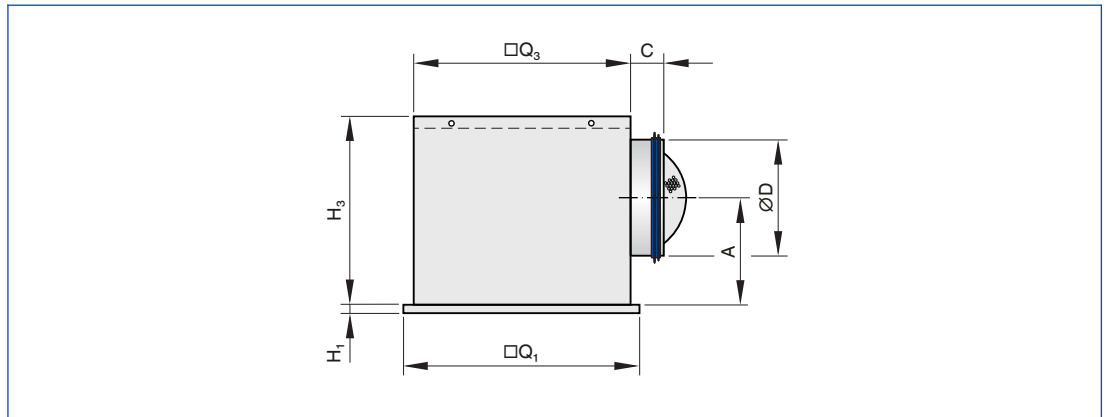
ADLQ-AG



ADLQ-AG

Nominal size	$\square Q$	$\square Q_1$	$H_1$	$H_2$	m kg
	mm	mm	mm	mm	
250	143	248	13	95	0.9
300	193	298	13	95	1.4
400	293	398	13	95	2.5
500	393	498	13	95	3.6
600	493	598	13	95	5.0
625	518	623	13	95	5.6

Square diffuser face with plenum box for horizontal duct connection

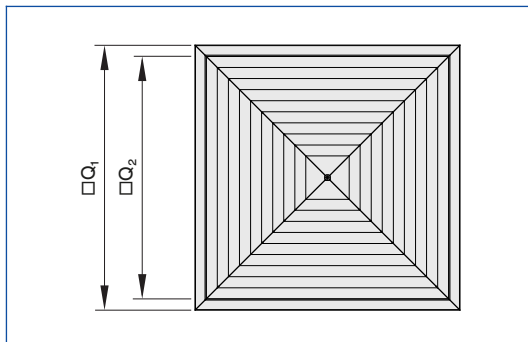


ADLQ-AK

Nominal size	□Q <sub>1</sub>	H <sub>1</sub>	□Q <sub>3</sub>	H <sub>3</sub>	ØD	A	C	Plenum box	m
	mm	mm	mm	mm	mm	mm	mm		kg
250	248	13	216	250	158	139	50	AK-Uni-008	2.7
300	298	13	266	250	158	139	50	AK-Uni-009	3.4
400	398	13	372	295	198	164	50	AK-Uni-002	5.8
500	498	13	476	345	248	189	48	AK-Uni-010	8.5
600	598	13	567	410	313	222	50	AK-Uni-011	11.6
625	623	13	567	410	313	222	50	AK-Uni-011	11.8

Weights apply to the supply air variant

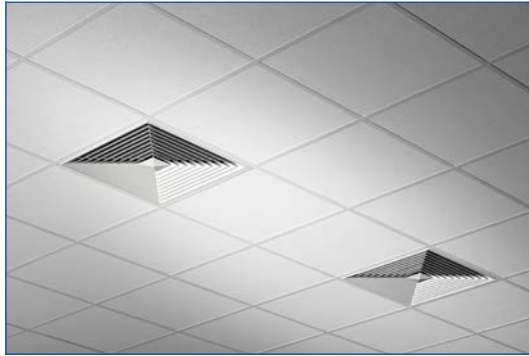
Diffuser face ADLQ



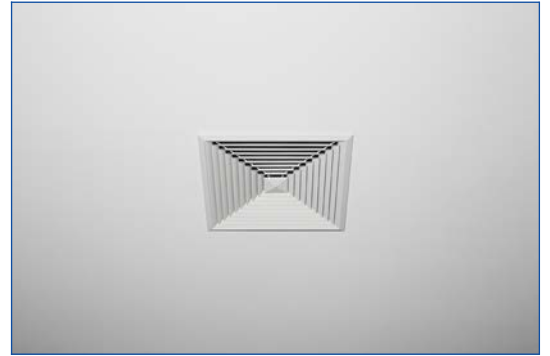
ADLQ

Nominal size	$Q_1$	$Q_2$	$A_{\text{eff}}$ m <sup>2</sup>
	mm	mm	
250	248	198	0.0095
300	298	248	0.0175
400	398	348	0.0370
500	498	448	0.0675
600	598	548	0.1100
625	623	573	0.1230

Installation in T-bar ceilings, arrangement in a row



Installation in continuous ceilings

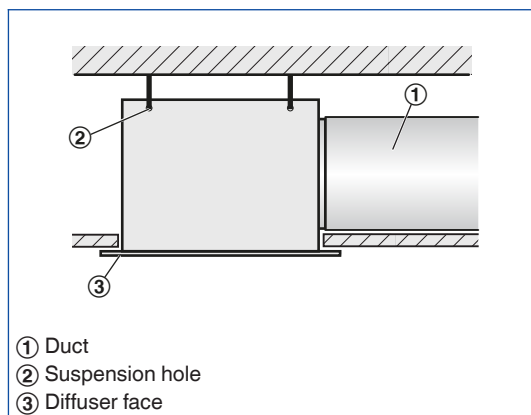


## Installation and commissioning

- Preferably for rooms with a clear height up to 4.0 m
- Flush ceiling installation
- Horizontal or vertical duct connection
- If necessary, carry out volume flow rate balancing with the damper blade

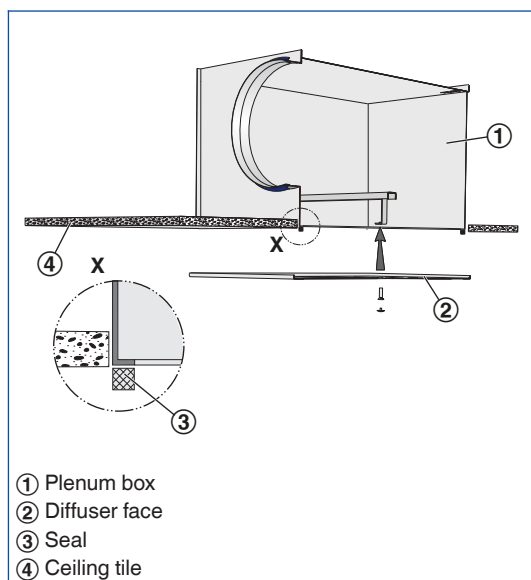
These are only schematic diagrams to illustrate installation details.

## Flush ceiling installation with square plenum box



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

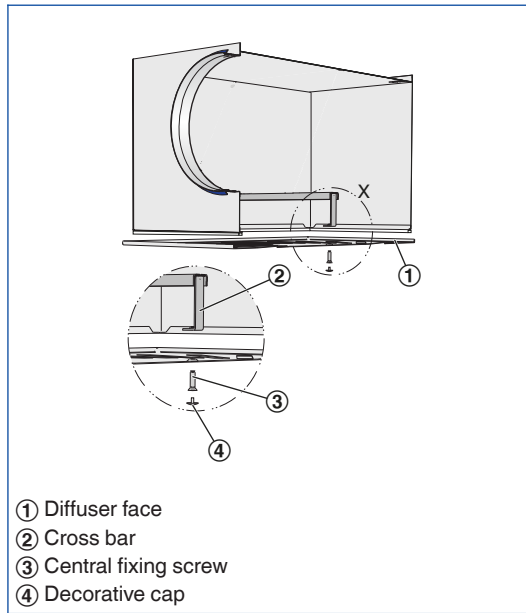
## Diffuser face – sealing



- The self-adhesive sealing tape (supplied) has to be applied to the return edges of the plenum box by others



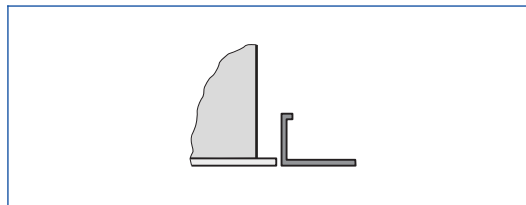
**Diffuser face – central screw fixing**



- Using the central fixing screw, fix the diffuser face to the cross bar of the plenum box
- Attach the decorative cap

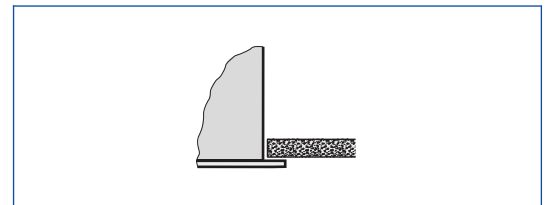
**Ceiling systems**

**Installation into grid ceilings**



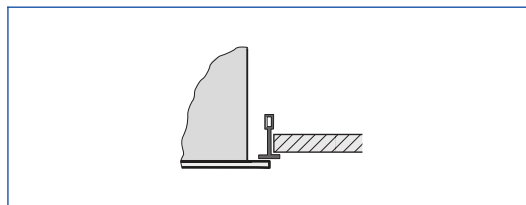
- Fix the plenum box to the ceiling
- The ceiling tile of the grid ceiling is independent of the ceiling diffuser
- Fix the diffuser face after the ceiling has been completed

**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

## 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.

- 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).

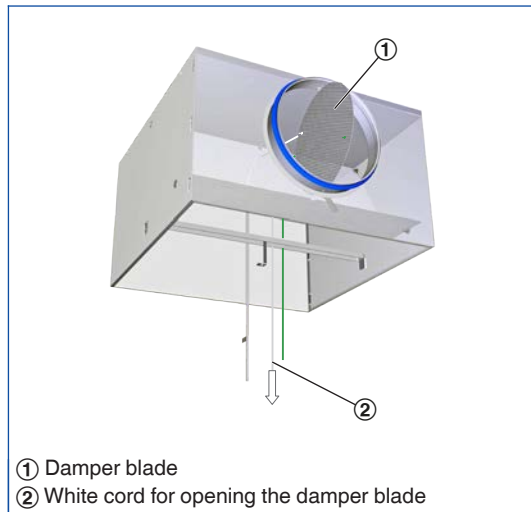
## Volume flow rate measurement

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

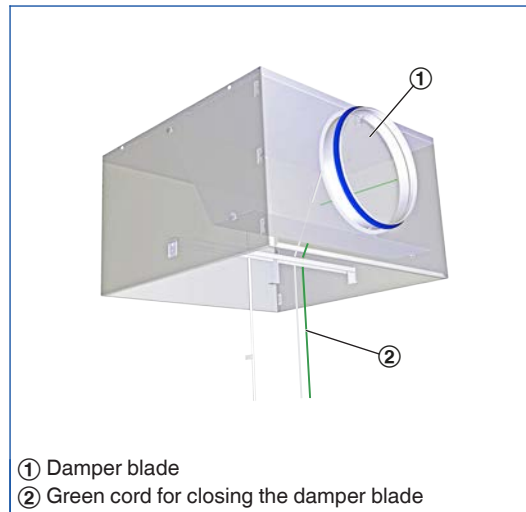
A characteristic is included with each AK-Uni plenum box.

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



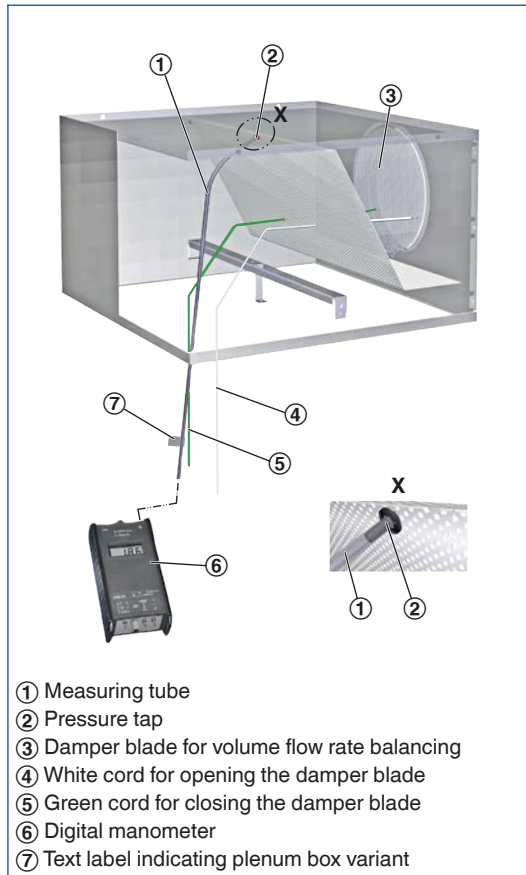
Open, 0°

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



Closed, 90°

AK-Uni-...-MN volume flow rate measurement



Volume flow rate calculation for air density  
1.2 kg/m<sup>3</sup>

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

Volume flow rate calculation for other air  
densities

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

### 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

#### $\Delta t_z$ [K]

Supply air to room air temperature difference, i.e.

supply air temperature minus room temperature

#### $\Delta p_t$ [Pa]

Total differential pressure

#### $A_{eff}$ [ $m^2$ ]

Effective air discharge area

All sound power levels are based on 1 pW.