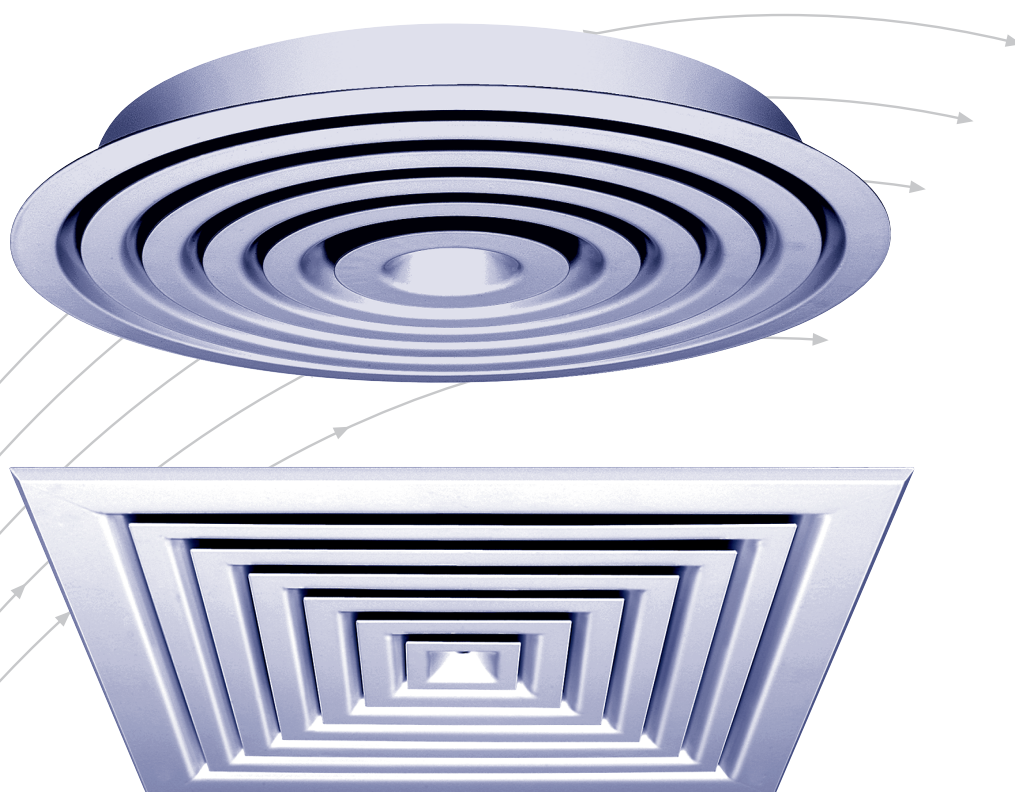


# Ceiling diffusers

Type DD / DDRQ / DDQ

circular and square



**TROX<sup>®</sup> TECHNIK**



The art of handling air

TROX HESCO Schweiz AG  
Walderstrasse 125  
Postfach 455  
CH-8630 Rüti ZH

Tel. +41 55 250 71 11  
Fax +41 55 250 73 10  
[www.troxhesco.ch](http://www.troxhesco.ch)  
[info@troxhesco.ch](mailto:info@troxhesco.ch)

# Contents · Application · Safety instructions · Realisation · Dimensions

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## Application

The square ceiling diffusers and the circular ceiling diffusers are suitable for the introduction of supply air or the removal of extract air in the ceiling. They are available with circular or square exterior frames. The two designs, flat (type F) and conical (type K), differ - above all - in their free cross-section. They blow the air flat along the ceiling and therefore can also be employed for rooms with a low height.

Ceiling diffusers are suitable for:

- Installations with constant flow rates
- Installations with variable air volumes (VAV)

## Safety instructions

### CAUTION!

**Damage to the product due to improper handling. Check the device for damage and contamination prior to operation!**

Improper handling may lead to considerable material damage of the product.

- Do not use any acid or abrasive cleaning agents.
- Adhesives from sticky tape may lead to colour damage.
- Excessive moisture may lead to colour damage and corrosion.
- Use only cleaning agents, greases and oils that are expressly specified.

### CAUTION!

**Risk of injury from sharp edges and corners, ridges and thin-walled sheet metal parts!**

- Proceed carefully with all work.
- Wear protective gloves, safety shoes and protective helmet.

### WARNING!

**Danger from incorrect use. Misuse of the product may lead to dangerous situations.**

The product must not be used:

- in areas subject to explosion hazards;
- in the open air without sufficient protection against weather effects;
- in atmospheres that may have a damaging and/or corrosive effect on the product due to scheduled or unscheduled chemical reactions.

## Realisation

### Circular with circular exterior frame type DD

#### Material and colour

Steel, powder-coated according to RAL 9010, matt, 25% brilliance

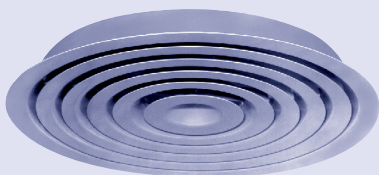
**Fixation:** by means of a central screw

#### Damper

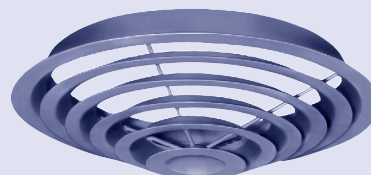
Sliding damper

Aluminium untreated  
(possibility of adjustment from below  
by means of a concealed lever)

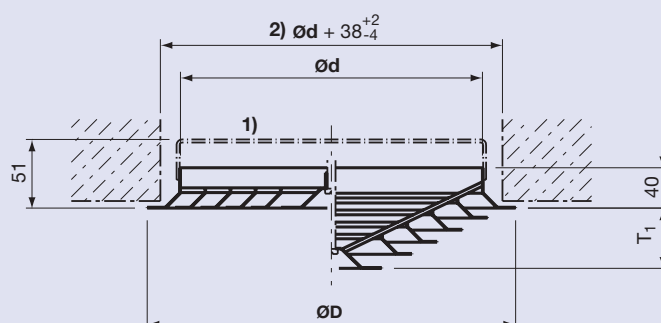
Type DD F




Type DD K



## Dimensions



- 1) Sliding damper
- 2) Recess

Type	ND	∅D [mm]	∅d (external) [mm]	T1 [mm]
 <b>DD</b>	150	216	152	24
	200	266	202	26
	250	316	252	48
	300	366	302	60
	400	466	402	84
	500	566	502	108

## Realisation

### Circular within square exterior ceiling plate type DDRQ

#### Material and colour

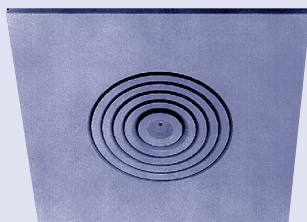
Steel, powder-coated according to RAL 9010, matt, 25% brilliance

**Fixation possibility:** by means of a central screw or inserted in the ceiling construction.

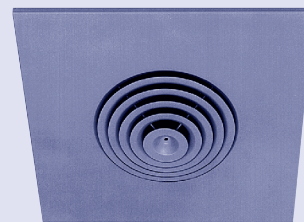
#### Damper

Sliding damper: Aluminium untreated  
(possibility of adjustment from below by means of a concealed lever)

Type DDRQ F



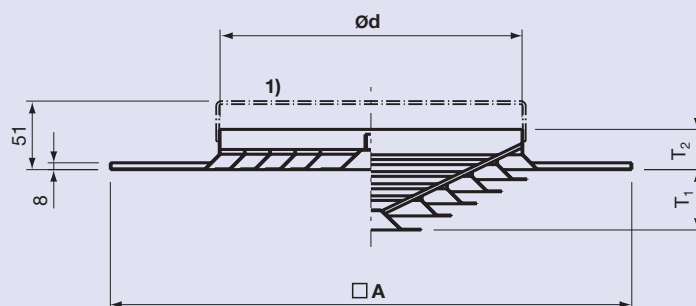
Type DDRQ K




## Dimensions



1) Sliding damper



Type	ND	□ A [mm]	∅d (external) [mm]	T1 [mm]	T2 [mm]
 <b>DDRQ</b>	150	598x	152	24	40
	200		202	26	40
	250		252	48	40
	300	623x	302	60	24
	400		402	84	24
	500		502	108	24

## Realisation

### Square type DDQ

#### Material and colour

Steel, powder-coated according to RAL 9010, matt, 25% brilliance

#### Fixation possibility

by means of a central screw

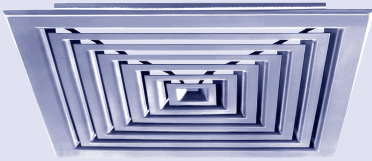
#### Damper

Sliding damper  
opposed blade damper

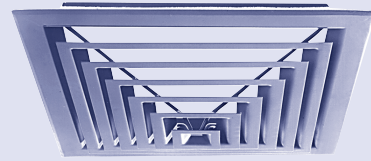
Aluminium untreated  
Frame: Hot galvanized steel  
Blades: Aluminium untreated  
(possibilities of adjustment from below by means of a concealed lever)

# Realisation · Dimensions · Accessories

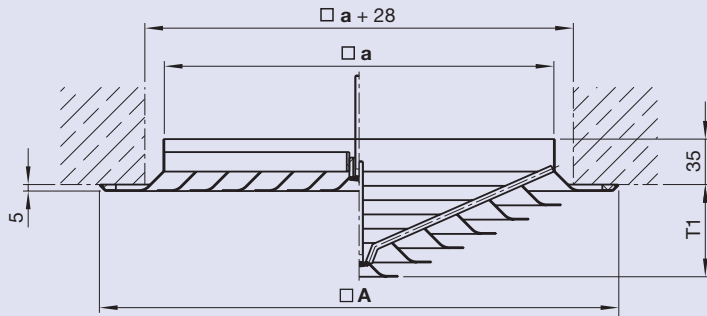
Type DDQ F



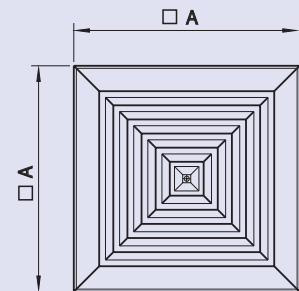
Type DDQ K



## Dimensions

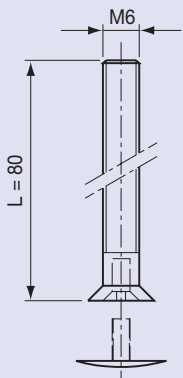


View from below

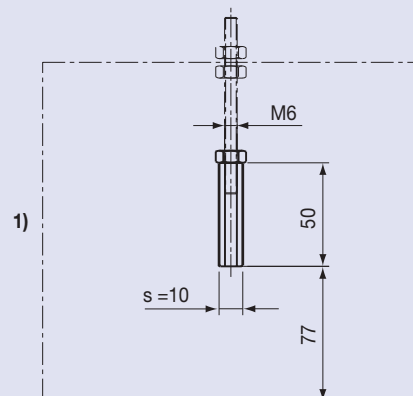


Type	ND	□ A [mm]	□ a (external) [mm]	T1 [mm]
	300×200	300	202	49
	400×300	400	302	71
	500×400	500	402	93
<b>DDQ</b>	600×500	600	502	115
	625×500	625	502	115

## Accessories

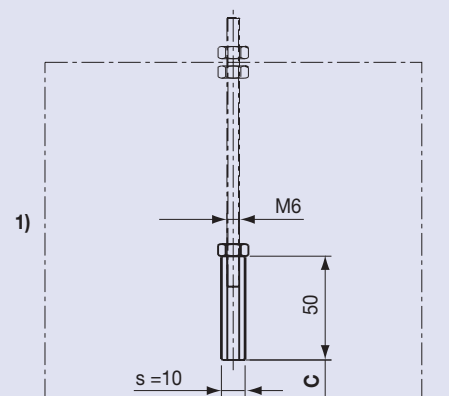


**Central screw with plastic plug**  
for type DDQ F, DD F and DDRQ F  
For the installation with the plenum box AKH... and the **conical** diffuser, **longer** central screws are provided.





**Threaded pipe coupling GRM6**  
for type DDQ F, DD F and DDRQ F

1) builder's supply (p.e. duct)



**Threaded pipe coupling GRM6**  
for type DDQ K, DD K and DDRQ K

1) builder's supply (p.e. duct)

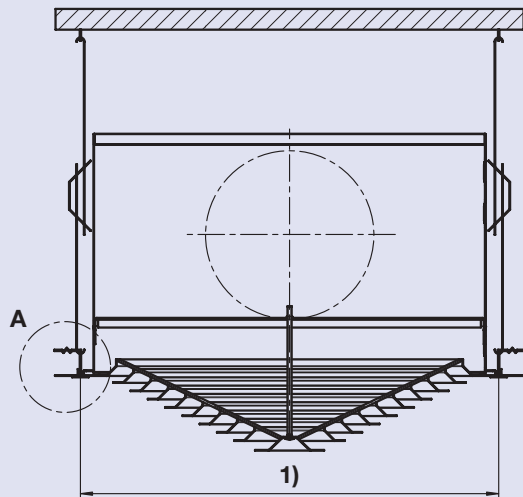
Type DD / DDRQ		Ød [mm]	152	202	252	302	402	502
		C [mm]	80	50	37	25	0	-22
Type DDQ		□ a [mm]	202	302	402	502		
		C [mm]	32	10	-12	-34		



## Circular with square exterior ceiling plate type DDRQ with plenum box

### Type DDRQ K

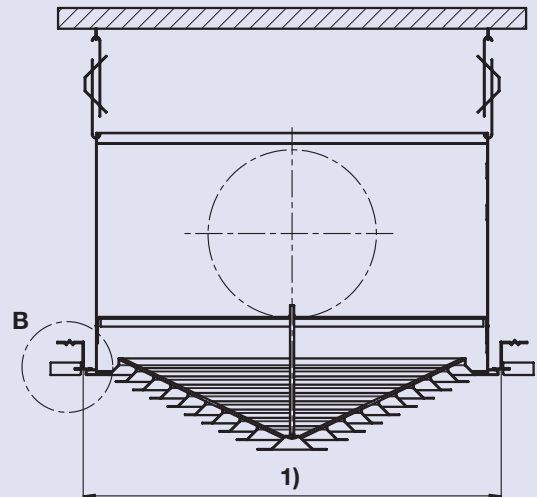
Inserted in ceiling profile from above.



1) Grid dimension

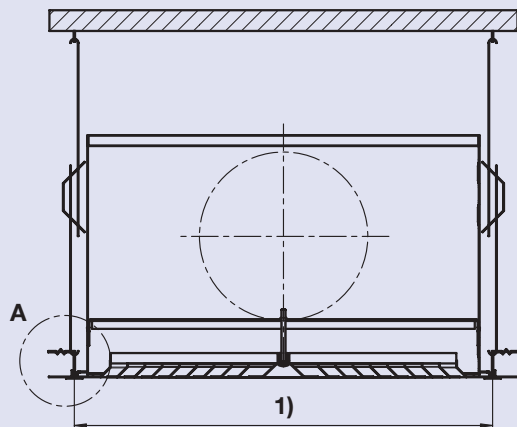
### Type DDRQ K

Pressed onto ceiling profile from below.



### Type DDRQ F

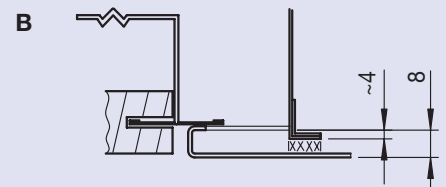
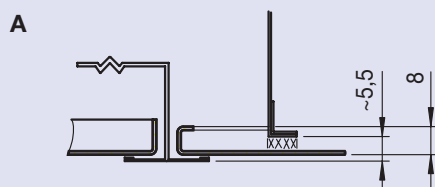
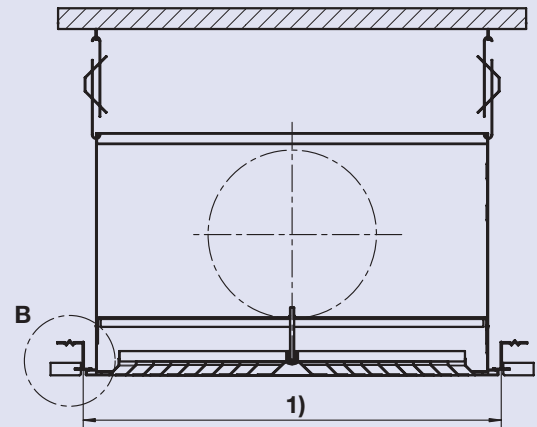
Inserted in ceiling profile from above.




1) Grid dimension

### Type DDRQ F

Pressed onto ceiling profile from below.



Type	ND	Grid dimension [mm]	Plenum box Details see prospect L-04-1-31e (TROX HESCO) or 2/16.4/... (TROX)
 <b>DDRQ</b>	598x...	600x600	
	623x...	625x625	

# Technical Data

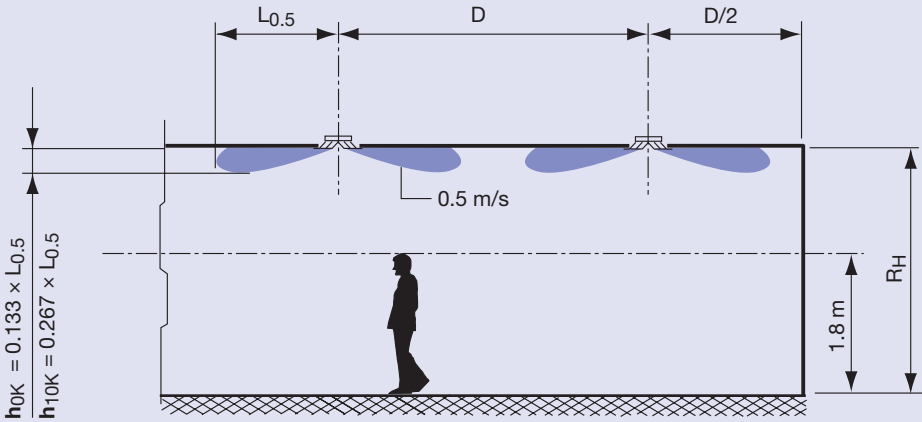
## Technical documentation

1. Our data are based on a maximum difference in temperature  $\Delta t$  of -10 K between room air and supply air temperature. The expected room air velocities are still within the comfort range. Columns located within the stream of air are to be protected by blocking the corresponding sector in the diffuser.
2. In the case of systems supplying hot air, it is advisable to locate the ceiling diffusers only up to a maximum room height  $R_H$  of 3.2 m.

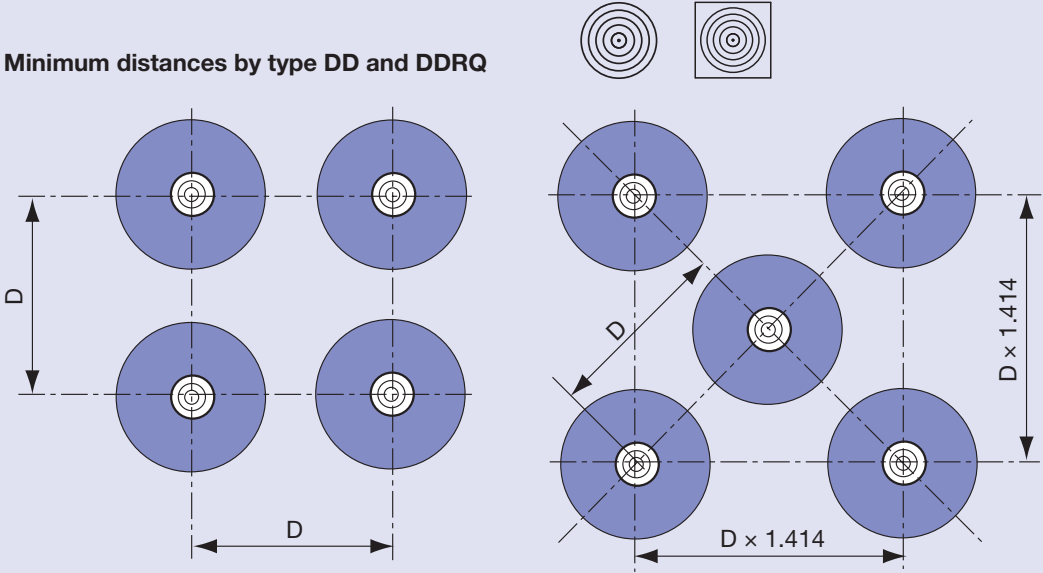
### Definitions

A	m <sup>2</sup>	Nominal area of diffuser
A <sub>eff</sub>	m <sup>2</sup>	Effective free area
A <sub>0</sub>	m <sup>2</sup>	Nominal reference area
Ød	mm	The diffuser size for circular ceiling diffuser
□a	mm	The diffuser size for square ceiling diffuser
b	mm	Width of jet for square ceiling diffuser
D	m	Distance between two ceiling diffusers
f	Hz	Octave-centre-frequencies
h <sub>0K</sub>	m	Thickness of jet (from ceiling) with isothermal air jet
h <sub>10K</sub>	m	Thickness of jet (from ceiling) with cold air stream $\Delta t = 10$ K(-)
L	m	Distance (by a final velocity of 0.5 m/s in the throw axis)
L <sub>w</sub>	dB(A)	Sound power level
L <sub>wA0</sub>	dB(A)	Sound power level in relation to the nominal reference area A <sub>0</sub>
ΔL <sub>w</sub>	dB	Correction "sound power level" [dB(A)] as a function of the diffuser size
Δp <sub>s</sub>	Pa	Static pressure drop
r <sub>ØF</sub>	-	Ratio A"/A with circular, flat ceiling diffuser = abt. 0.33 = abt. 33%
r <sub>ØK</sub>	-	Ratio A"/A with circular, conical ceiling diffuser = abt. 0.73 = abt. 73%
r <sub>∅F</sub>	-	Ratio A"/A with square, flat ceiling diffuser = env. 0.32 = env. 32%
r <sub>∅K</sub>	-	Ratio A"/A with square, conical ceiling diffuser = env. 0.575 = env. 57,5%
R <sub>H</sub>	m	Room height
v <sub>eff</sub>	m/s	Effective blow-out velocity
Ḃ	m <sup>3</sup> /h	Air flow rate

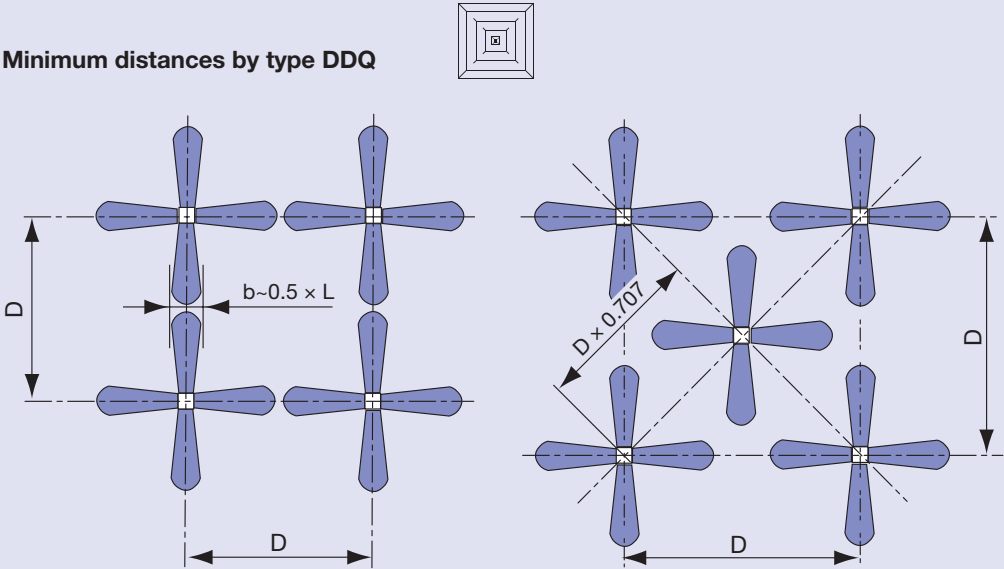
## Minimum distances



## Minimum distances by type DD and DDRQ

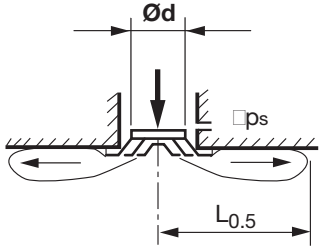
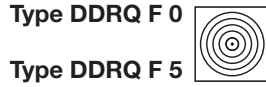
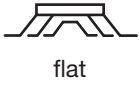


## Minimum distances by type DDQ



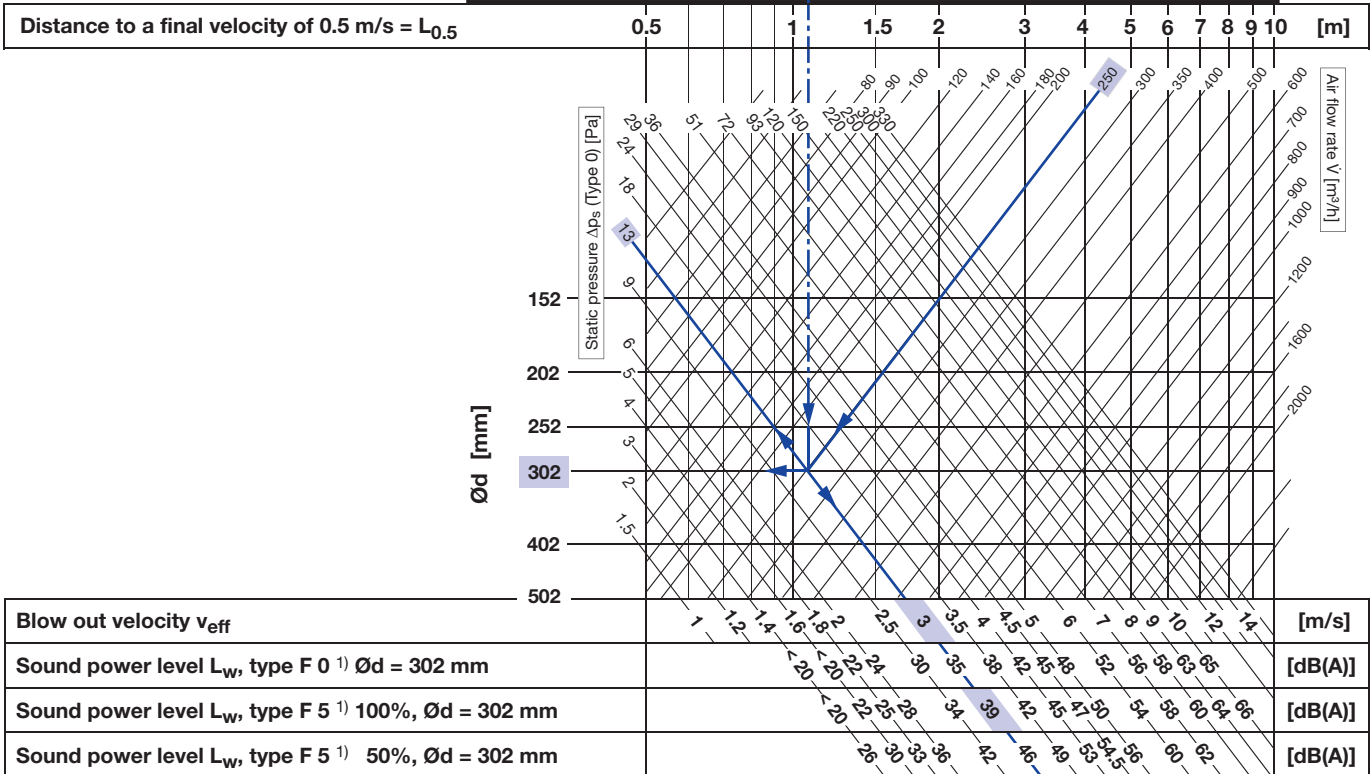
# Technical Data

## Selection diagram – supply air



eff. free cross section: ~33%

Room height $R_H$ [m]	Min. distance $D$ as a function of room height $R_H$ [m]
2.25 - 2.50	1.5 2 3 4 5 6 7 8 9 10 15
2.51 - 2.80	1.5 2 3 4 5 6 7 8 9 10 15
2.81 - 3.20	1.5 2 3 4 5 6 7 8 9 10 15
3.21 - 3.75	1.5 2 3 4 5 6 7 8 9 10 15
3.76 - 4.50	1 1.5 2 3 4 5 6 7 8 9 10 15



<sup>1)</sup> Data applicable for: supply air straight introduced, flat double ceiling; F 0 = flat without damper; F 5 = flat with sliding damper

## Corrections

### Correction 'pressure drop'

with F 5 - 100% open	$\Delta p_s = 1.32 \times \Delta p_{s0}$	[Pa]
with F 5 - 50% open	$\Delta p_s = 2.45 \times \Delta p_{s0}$	[Pa]

$\Delta p_{s0}$  = static pressure drop without damper

### Correction 'sound power level' as a function of the diffuser size

$\Delta d$	152	202	252	302	402	502	[mm]
$\Delta L_w$	-3	-2	-1	0	+1	+2	[dB]

## Example given

Type DD F 5 (with sliding damper 100% open)  
 $R_H = 3.0$  m  
 $D = 2.4$  m  
 $\dot{V} = 250$  m³/h

**Solution**  
 $\Delta d = 302$  mm  
 $v_{eff} = 3.0$  m/s  
 $\Delta p_s = 13 \times 1.32 = 17$  Pa  
 $L_w = 39$  dB(A)  
 $L_{0.5} = 1.1$  m



## Selection diagram – supply air



Type DD K 0

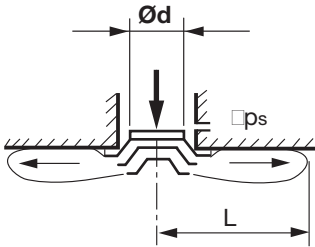


Type DD K 5

Type DDRQ K 0

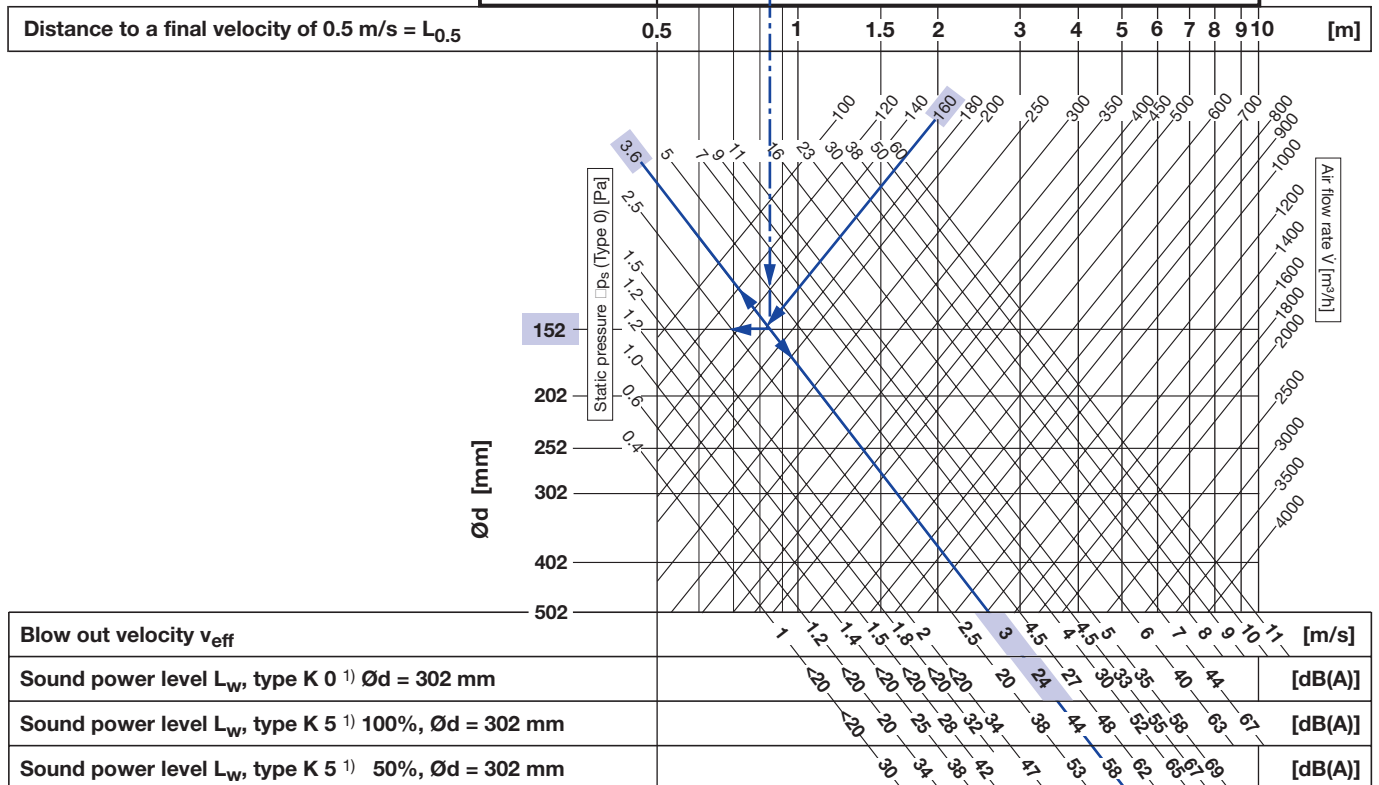


Type DDRQ K 5



eff. free cross section: ~73%

Room height $R_H$ [m]	Min. distance $D$ as a function of room height $R_H$ [m]
2.25 - 2.50	1.5 2 3 4 5 6 7 8 9 10 15
2.51 - 2.80	1.5 2 3 4 5 6 7 8 9 10 15
2.81 - 3.20	1.5 2 3 4 5 6 7 8 9 10 15
3.21 - 3.75	1.5 2 3 4 5 6 7 8 9 10 15
3.76 - 4.50	1 1.5 2 3 4 5 6 7 8 9 10 15



<sup>1)</sup> Data applicable for: supply air straight introduced, flat double ceiling; K 0 = conical without damper; K 5 = conical with sliding damper

## Corrections

### Correction 'pressure drop'

with K 5 - 100% open	$\square p_s = 1.32 \times \square p_{s0}$	[Pa]
with K 5 - 50% open	$\square p_s = 2.45 \times \square p_{s0}$	[Pa]

$\square p_{s0}$  = static pressure drop without damper

### Correction 'sound power level' as a function of the diffuser size

$\varnothing d$	152	202	252	302	402	502	[mm]
$\square L_w$	-3	-2	-1	0	+1	+2	[dB]

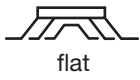
## Example given

Type DD K 0 (with sliding damper 100% open)  
 $R_H = 2.3$  m  
 $D = 2.2$  m  
 $\dot{V} = 160$  m<sup>3</sup>/h

**Solution**  
 $\varnothing d = 152$  mm  
 $v_{eff} = 3.0$  m/s  
 $\Delta p_s = 4$  Pa  
 $L_w = 24 - 3 = 21$  dB(A)  
 $L_{0.5} = 0.85$  m

# Technical Data

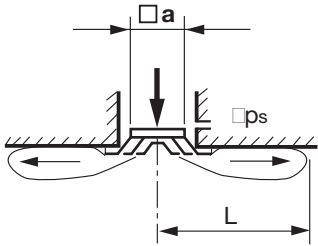
## Selection diagram – supply air



Type DDQ F 0

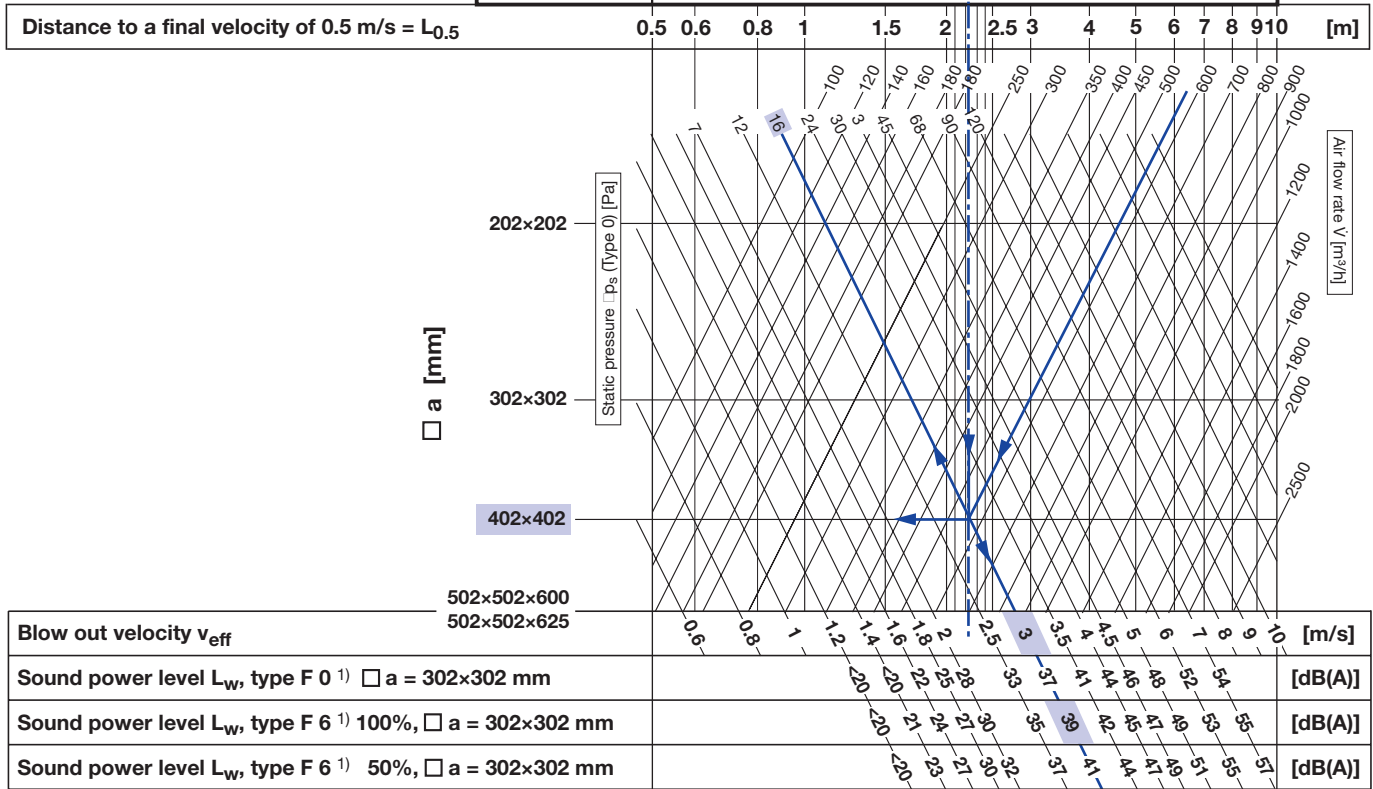


Type DDQ F 6



eff. free cross section: ~32%

Room height $R_H$ [m]	Min. distance $D$ as a function of room height $R_H$ [m]
2.25 - 2.50	1.5 2 3 4 5 6 7 8 9 10 15
2.51 - 2.80	1.5 2 3 4 5 6 7 8 9 10 15
2.81 - 3.20	1.5 2 3 4 5 6 7 8 9 10 15
3.21 - 3.75	1.5 2 3 4 5 6 7 8 9 10 15
3.76 - 4.50	1 1.5 2 3 4 5 6 7 8 9 10



<sup>1)</sup> Data applicable for: supply air straight introduced, flat double ceiling; F 0 = flat without damper; F 6 = flat with sliding damper

## Corrections

### Correction 'pressure drop'

with F 6 - 100% open	$\square p_s = 1.10 \times \square p_{s0}$	[Pa]
with F 6 - 50% open	$\square p_s = 1.50 \times \square p_{s0}$	[Pa]

$\square p_{s0}$  = static pressure drop without damper

### Correction 'sound power level' as a function of the diffuser size

□ a	202x202	302x302	402x402	502x502	[mm]
□ Lw	-1	0	+1	+2	[dB]

## Example given

Type DDQ F 6 (with opposed blade damper 100% open)  
 $R_H = 3.0$  m  
 $D = 5.0$  m  
 $\dot{V} = 560$  m<sup>3</sup>/h

## Solution

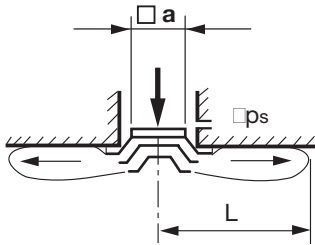
□ a = 402x402 mm  
 $v_{eff} = 3.0$  m/s  
 $\Delta p_s = 16 \times 1.1 = 18$  Pa  
 $L_w = 39 + 1 = 40$  dB(A)  
 $L_{0.5} = 2.2$  m

## Selection diagram – supply air



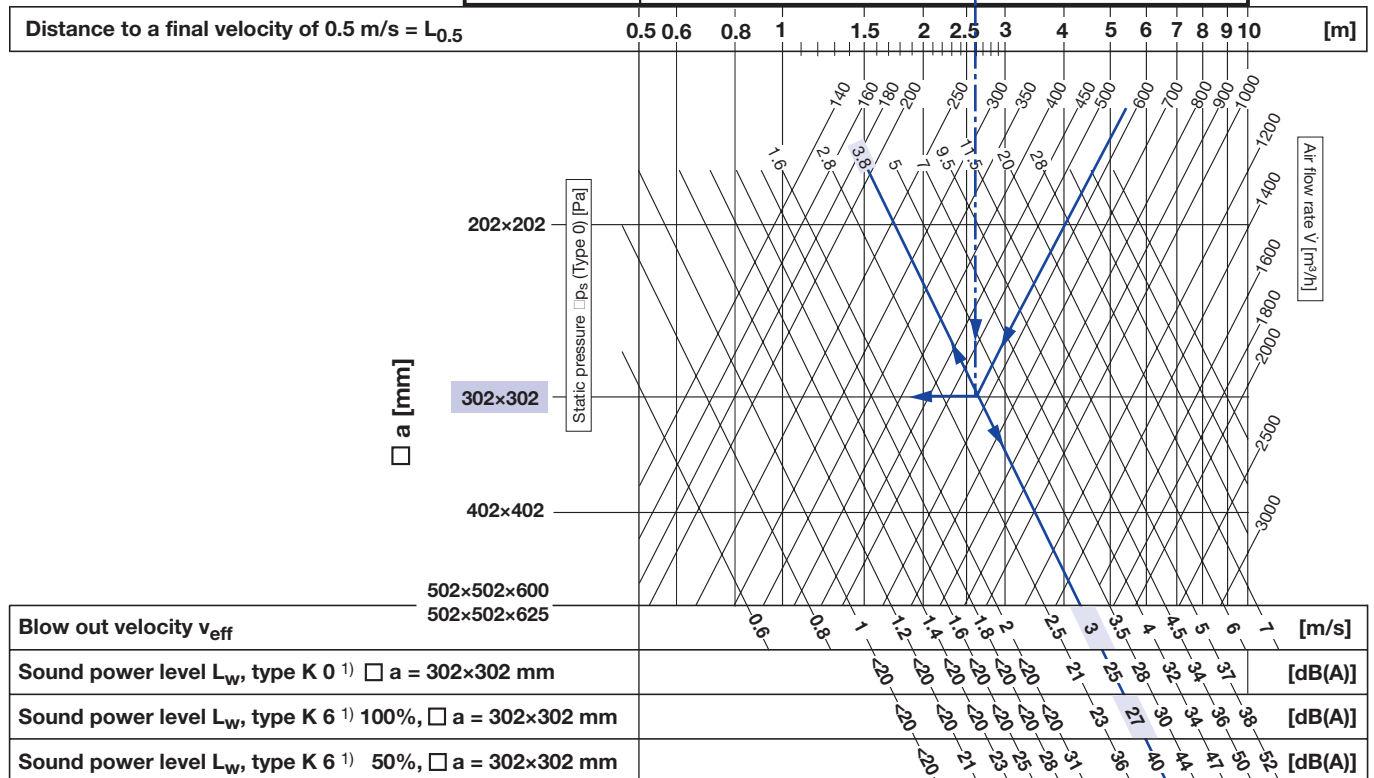
Type DDQ K 0

Type DDQ K 6



eff. free cross section: ~57.5%

Room height $R_H$ [m]	Min. distance D as a function of room height $R_H$ [m]
2.25 - 2.50	1.5 2 3 4 5 6 7 8 9 10 15
2.51 - 2.80	1.5 2 3 4 5 6 7 8 9 10 15
2.81 - 3.20	1.5 2 3 4 5 6 7 8 9 10 15
3.21 - 3.75	1.5 2 3 4 5 6 7 8 9 10 15
3.76 - 4.50	1 1.5 2 3 4 5 6 7 8 9 10 15



<sup>1)</sup> Data applicable for: supply air straight introduced, flat double ceiling; K 0 = conical without damper; K 6= conical with sliding damper

## Corrections

### Correction 'pressure drop'

with K 6 - 100% open	$\Delta p_s = 1.15 \times \Delta p_{s0}$	[Pa]
with K 6 - 50% open	$\Delta p_s = 5.60 \times \Delta p_{s0}$	[Pa]

$\Delta p_{s0}$  = static pressure drop without damper

### Correction 'sound power level' as a function of the diffuser size

□ a	202x202	302x302	402x402	502x502	[mm]
□ $L_w$	-1	0	+1	+2	[dB]





### Example given




Type DDQ K 6 (with opposed blade damper 100% open)  
 $R_H = 3.0$  m  
 $D = 5.8$  m  
 $\dot{V} = 560$  m<sup>3</sup>/h

**Solution**  
 □ a = 302x302 mm  
 $v_{eff} = 3.0$  m/s  
 $\Delta p_s = 3.8 \times 1.15 = 5$  Pa  
 $L_w = 27$  dB(A)  
 $L_{0.5} = 2.7$  m

# Technical Data

## Correction table for the octave centre frequencies

Type	Damper position	Type	f	125	250	500	1k	2k	4k	8k	[Hz]
 <b>DD</b>	<b>flat</b>  100, 75 and 50% open	<b>DD F 0</b> <b>DDRQ F 0</b>  <b>DD F 5</b> <b>DDRQ F 5</b>		-2	+1	0	-6	-12	-20	< (-22)	<b>[dB]</b>
	25% open	<b>DD F 5</b> <b>DDRQ F 5</b>		-2	+4	-2	-7	-9	-11	< (-20)	
 <b>DDRQ</b>	<b>conical</b>  100, 75, 50 and 25% open	<b>DD K 0</b> <b>DDRQ K 0</b>		+1	-1	-3	-5	< (-11)	< (-18)	< (-22)	
		<b>DD K 5</b> <b>DDRQ K 5</b>		+2	+4	0	-5	-5	-8	< (-22)	
<b>Tolerances of the octave corrections: ±4 [dB]</b>											

Type	Damper position	Type	f	125	250	500	1k	2k	4k	8k	[Hz]
 <b>DDQ</b>	<b>flat</b>  100, 75, 50 and 25% open	<b>DDQ F 0</b> <b>DDQ F 6</b>		0	+2	-3	-7	-14	< (-20)	< (-20)	<b>[dB]</b>
	<b>conical</b>  100, 75 and 50% open	<b>DDQ K 0</b> <b>DDQ K 6</b>		+4	+6	-2	-5	-12	< (-20)	< (-20)	
	25% open	<b>DD K 6</b>		-6	-4	-7	-3	-7	-13	< (-20)	
<b>Tolerances of the octave corrections: ±4 [dB]</b>											

### Example

#### Given

Example from page 8, (DD F 5, 100% open, instead of  $\varnothing d = 302 \text{ mm}$   $\varnothing d = 402 \text{ mm}$  is selected)

#### Sought

Level of the octave centre frequencies

#### Solution

##### Step 1:

Make size correction, i.e.:

$$L_w = L_w \varnothing d 302 \text{ mm} = 39 \text{ dB(A)}$$

correction for  $\varnothing d 402 \text{ mm} = +1$




$$L_w = 39 + 1 = 40 \text{ dB(A)}$$

##### Step 2:

Calculate level of the octave centre frequencies

	f	125	250	500	1k	2k	4k	8k	[Hz]
$L_{wA} \varnothing d = 402 \text{ mm}$		40	40	40	40	40	40	40	<b>[dB(A)]</b>
$L_A$		-2	+1	0	-6	-12	-20	< (-22)	<b>[dB]</b>
$L_{wOkt}$		38	41	40	34	28	20	< 18	<b>[dB]</b>

## 1. Supply air with plenum box

Type	Ød	Plenum box Type	DD / DDRQ				DD K / DDRQ K							
			flat				conical							
			fL <sub>w</sub>	f <sub>p</sub>	fL <sub>w</sub>	f <sub>p</sub>	fL <sub>w</sub>	f <sub>p</sub>	fL <sub>w</sub>	f <sub>p</sub>				
 DD DDRQ	152	AKH08 ZL-Ø160	0.97	2.7			1.12	2.7						
	202	AKH09 ZL-Ø160	1.00	2.8			1.50	3.6						
	252	AKH01 ZL-Ø160	1.09	3.1			2.01	5.1						
	302	AKH02 ZL-Ø200	1.09	3.1			1.89	4.6						
	402	AKH03 ZL-Ø200	1.21	4.4			2.63	8.4						
	502	AKH04 ZL-Ø250	1.27	4.2			2.52	7.3						

Note: With DDRQ and DDRQ K a plenum box up to size AKH04 can be selected.

### Example

#### Given

- Supply air
- DDRQ K 0 / 623x500 with AKH04 ZL..., 1 x Ø 248 mm
- $v_{eff} = 2.5$  m/s

#### Sought




- a)  $L_w = ?$   
b)  $\Delta p_s = ?$

**Solution** from diagram page 9

a)  $L_w = 20$  dB(A)  
correction for AKH04 ZL:  $fL_w = 2.52$   
 $L_w = 20 \times 2.52 = 50$  dB(A)

b)  $\Delta p_s = 2.5$  Pa  
correction for AKH04 ZL:  $f\Delta p_s = 7.3$   
 $\Delta p_s = 2.5 \times 7.3 = 18$  Pa

## 2. Extract air with plenum box

Type	Ød	Plenum box Type	DD / DDRQ						DD K / DDRQ K					
			flat						conical					
			F 0		F 5 – 100%		F 5 – 50%		K 0		K 5 – 100%		K 5 – 50%	
			L <sub>w</sub>	f <sub>ps</sub>	L <sub>w</sub>	f <sub>ps</sub>	L <sub>w</sub>	f <sub>ps</sub>	L <sub>w</sub>	f <sub>ps</sub>	L <sub>w</sub>	f <sub>ps</sub>	L <sub>w</sub>	f <sub>ps</sub>
 DD DDRQ	152	AKH08 AL-Ø160	-5	1.10	-7	1.60	-7	1.80	+9	6.00	-5	11.00	-8	29.00
	202	AKH09 AL-Ø160	-3	1.40	-5	1.85	-5	2.10	+10	6.10	-4	11.20	-6	29.40
	252	AKH01 AL-Ø160	+3	1.70	-2	2.13	-2	2.40	+11	6.10	-3	11.45	0	29.60
	302	AKH02 AL-Ø200	+7	2.20	0	2.45	-1	2.80	+12	6.15	-3	11.60	+3	33.60
	402	AKH03 AL-Ø200	+9	3.30	0	3.45	+4	4.55	+21	17.75	+8	22.00	+8	40.40
	502	AKH04 AL-Ø250	+8	2.10	-1	2.40	+1	2.95	+22	17.50	+10	19.50	+10	40.40

Note: With DDRQ and DDRQ K a plenum box up to size AKH04 can be selected.

### Example

#### Given

- Extract air
- DDRQ K 5 / 598x200 (with sliding damper 100% open) with AKH09 AL, 1 x Ø 160 mm
- $v_{eff} = 3.0$  m/s

#### Sought

- a)  $L_w = ?$   
b)  $\Delta p_s = ?$

**Solution** from diagram page 9

a)  $L_w = 44$  dB(A)  
correction for AKH09 AL:  $\Delta L_w = -4$   
 $L_w = 44 - 4 = 40$  dB(A)

b)  $\Delta p_s = 3.6$  Pa  
correction for AKH09 AL:  $f\Delta p_s = 11.2$   
 $\Delta p_s = 3.6 \times 11.2 = 40$  Pa

# Technical Data

## 3. Extract air without plenum box

Extract air (only diffusers with and without damper)

### Correction table for circular ceiling diffusers

Circular with circular exterior frames Type DD

Circular within square exterior ceiling plate Type DDRQ

#### Basis:





Diagram values of DD-dimensions (supply air)

a) Sound power level  $L_{WA AL} = L_{WA ZL} + \Delta L_w$

b) Static pressure drop:  $\Delta p_{SAL} = \Delta p_{SZL} \times f \Delta p_s$



### Extract air

Type	Ød	flat 						conical 					
		F 0		F 5 – 100%		F 5 – 50%		K 0		K 5 – 100%		K 5 – 50%	
		ΔL <sub>w</sub>	fΔp <sub>s</sub>	ΔL <sub>w</sub>	fΔp <sub>s</sub>	ΔL <sub>w</sub>	fΔp <sub>s</sub>	ΔL <sub>w</sub>	fΔp <sub>s</sub>	ΔL <sub>w</sub>	fΔp <sub>s</sub>	ΔL <sub>w</sub>	fΔp <sub>s</sub>
DD 	152	-14	1.10	-10	2.00	-7	7.50	-11	3.30	-8	3.80	-7	8.10
	202	-12	1.15	-8	2.25	-5	8.10	-9	3.55	-6	4.05	-5	8.40
	252	-5	1.20	-5	2.55	-3.5	8.95	-4	3.85	-3.5	4.35	-3	8.95
DDRQ 	302	+1	1.25	-3	2.85	-2	9.70	+1	4.25	-2	5.00	-1	9.50
	402	+6	1.35	-1	3.1	0	10.55	+6	5.00	0	5.30	+1	10.35
	502	+7	1.60	+1	2.85	+2	10.40	+7	6.15	+1	6.65	+2	10.35

#### Example

##### Given

- Extract air
- DD F 5 / 300 (with sliding damper 50% open)
- $v_{eff} = 2.0$  m/s

##### Solution from diagram page 8




- a)  $L_w = 36$  dB(A)  
 correction for AKH... AL:  $\Delta L_w = -2$   
 $L_w = 36 - 2 = 34$  dB(A)

##### Sought

- a)  $L_w = ?$   
 b)  $\Delta p_s = ?$

- b)  $\Delta p_s = 6$  Pa  
 correction for AKH... AL:  $f \Delta p_s = 9.70$   
 $\Delta p_s = 6 \times 9.70 = 58$  Pa

## 1. Supply air with plenum box

Type	□ a	Plenum box Type	flat 		conical 	
			fL <sub>w</sub>	f□p	fL <sub>w</sub>	f□p
DDQ 	202	AKH09 ZL-Ø160	1.05	2.8	1.71	3.9
	302	AKH02 ZL-Ø200	1.11	3.1	2.17	5.3
	402	AKH03 ZL-Ø200	1.24	3.6	2.95	7.4
	502	AKH04 ZL-Ø250	1.34	3.8	2.93	7.2

#### Example

##### Given

- Supply air
- DDQ F 0 / 300x200 with AKH09 ZL..., 1 x Ø 160 mm
- $v_{eff} = 3.5$  m/s

##### Solution from diagram page 10




- a)  $L_w = 41$  dB(A)  
 correction for AKH09 ZL:  $fL_w = 1.05$   
 $L_w = 41 \times 1.05 = 43$  dB(A)

##### Sought

- a)  $L_w = ?$   
 b)  $\Delta p_s = ?$

- b)  $\Delta p_s = 24$  Pa  
 correction for AKH09 ZL:  $f \Delta p_s = 2.8$   
 $\Delta p_s = 24 \times 2.8 = 67$  Pa

## 2. Extract air with plenum box

Type	□ a	Plenum box Type	flat 						conical 					
			F 0		F 6 - 100%		F 6 - 50%		K 0		K 6 - 100%		K 6 - 50%	
			□L <sub>w</sub>	f□p <sub>s</sub>	□L <sub>w</sub>	f□p <sub>s</sub>	□L <sub>w</sub>	f□p <sub>s</sub>	□L <sub>w</sub>	f□p <sub>s</sub>	□L <sub>w</sub>	f□p <sub>s</sub>	□L <sub>w</sub>	f□p <sub>s</sub>
 DDQ	202	AKH09 AL-Ø160	-17	0.85	-17	0.85	-18	0.90	+3	3.80	+2	3.80	-10	5.90
	302	AKH02 AL-Ø200	-6	1.35	-6	1.30	-8	1.43	+4	3.80	+3	3.80	-9	5.60
	402	AKH03 AL-Ø200	-3	2.60	-3	2.55	-6	0.78	+21	23.0	+12	26.0	+17	54.0
	502	AKH04 AL-Ø250	-2	1.85	-2	1.75	-5	1.95	+23	22.0	+15	32.0	+20	54.0

### Example

#### Given

- Extract air
- DDQ K 0 / 300x200 with AKH04 AL..., 1 x Ø 160 mm
- $v_{eff} = 3.0$  m/s

#### Sought

- a)  $L_w = ?$   
b)  $\Delta p_s = ?$

**Solution** from diagram page 11

a)  $L_w = 25$  dB(A)  
correction for AKH09 AL:  $\Delta L_w = +3$   
 $L_w = 25 + 3 = 28$  dB(A)

b)  $\Delta p_s = 3.8$  Pa  
correction for AKH09 AL:  $f\Delta p_s = 3.8$   
 $\Delta p_s = 3.8 \times 3.8 = 15$  Pa

## 3. Extract air without plenum box

### Correction table for square ceiling diffusers

#### Square Type DDQ






#### Base:

Diagram values of DDQ - dimensions (supply air)

- a) Sound power level  $L_{wA AL} = L_{wA ZL} + \Delta L_w$   
b) Static pressure drop:  $\Delta p_{SAL} = \Delta p_{SZL} \times f\Delta p_s$

Extract air (only diffusers with and without dampers)

### Extract air without plenum box

Type	□ a	flat 						conical 					
		F 0		F 6 - 100%		F 6 - 50%		K 0		K 6 - 100%		K 6 - 50%	
		□L <sub>w</sub>	f□p <sub>s</sub>	□L <sub>w</sub>	f□p <sub>s</sub>	□L <sub>w</sub>	f□p <sub>s</sub>	□L <sub>w</sub>	f□p <sub>s</sub>	□L <sub>w</sub>	f□p <sub>s</sub>	□L <sub>w</sub>	f□p <sub>s</sub>
 DDQ	202	< (-10)	0.85	< (-10)	0.85	< (-10)	0.90	< (-10)	1.50	-3	1.45	-9	1.95
	302	-5	1.05	-5	1.0	-8	1.13	< (-10)	1.70	-2	1.60	-8	2.80
	402	-2	1.30	-5	1.20	-6	1.28	< (-10)	1.90	0	1.85	-6	3.65
	502	-1	1.30	-4	1.20	-5	1.28	< (-10)	1.90	+4	1.85	0	3.65

### Example

#### Given

- Extract air
- DDQ K 6 / 400x300 (with opposed blade damper 100% open)
- $v_{eff} = 3$  m/s

#### Sought

- a)  $L_w = ?$   
b)  $\Delta p_s = ?$

**Solution** from diagram page 11

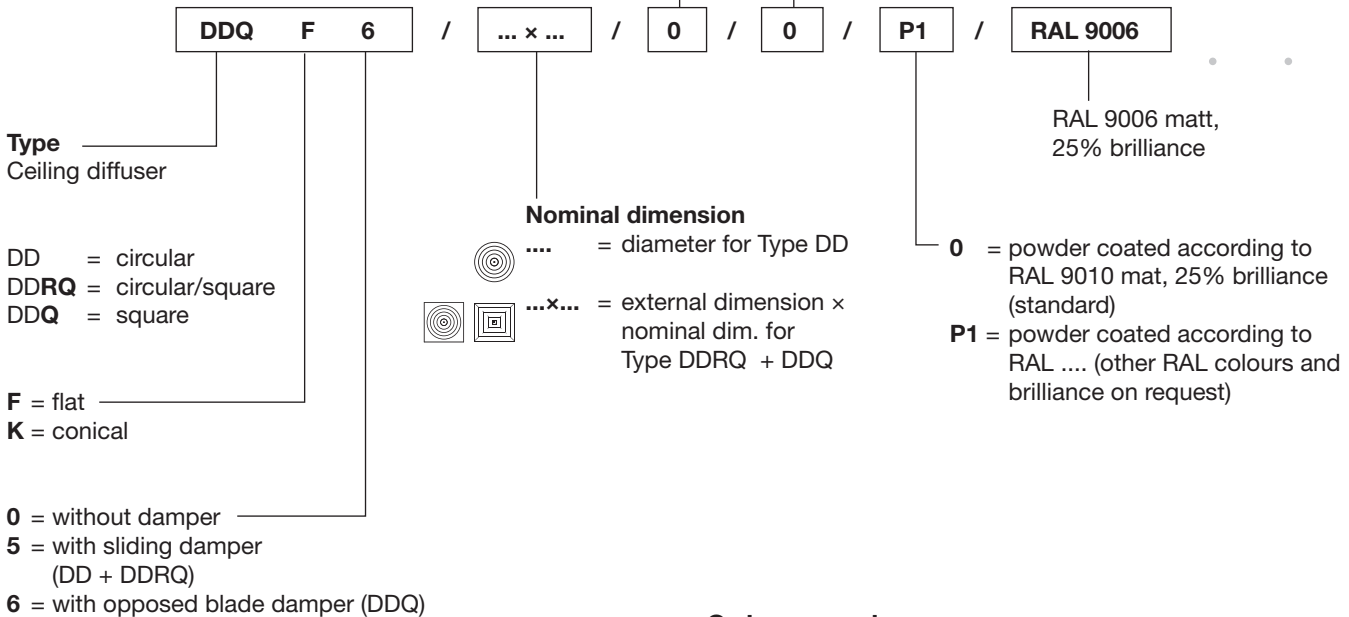
a)  $L_w = 27$  dB(A)  
correction for AKH... AL:  $\Delta L_w = -2$   
 $L_w = 27 - 2 = 25$  dB(A)

b)  $\Delta p_s = 3.8$  Pa  
correction for AKH... AL:  $f\Delta p_s = 1.60$   
 $\Delta p_s = 3.8 \times 1.60 = 6$  Pa

# Order details

## Order codes

No details for standard products



## Order examples

- 15 off DDQ F 0 / 500x400 / P1 / RAL 9006
- 20 off DDQ K 6 / 600x500
- 15 off DD F 5 / 500 / P1 / RAL 9006
- 20 off DDRQ K 5 / 623x400

## Text for tendering purposes

### Type DD / DDRQ

Circular ceiling diffusers with or without square exterior frames for installation flush with the ceiling and uniform, circular air circulation. Comprising conical circular blades and flat exterior frames flush with the ceiling. Flat or conical design. With or without sliding damper for air volume control. Fixation by means of central screw.

### Type DDQ

Square ceiling diffusers, blowing on all four sides, suitable for the horizontal introduction of air (or the removal of extract air). Flat or conical design. Comprising a front frame with plastic foam sealing and suitably-formed air-guidance blades. With or without opposed volume control (opposed blade damper). Fixation by means of central screw.

### Plenum box for type DD / DDRQ and DDQ (see prospect L-04-1-31e)

A standard plenum box of galvanised steel, with integrated cross bar for the M6 central screw, for quick and simple installation of the ceiling panel air diffuser. A connection with volume control for connecting a spiral tube or hose is included; the inlet box also contains an air distributor element.

### Material Diffuser

Steel, powder-coated according to RAL 9010, matt, 25% brilliance

### Damper

Sliding damper Aluminium untreated  
Opposed blade damper Frame: Hot galvanized steel  
Blades: Aluminium untreated

### Plenum box

- Galvanised steel plate
- **Please note: deliveries with AKH ZL MO and AK1 ZL MO are without opposed blade damper.**

### Option

- Other RAL-colours