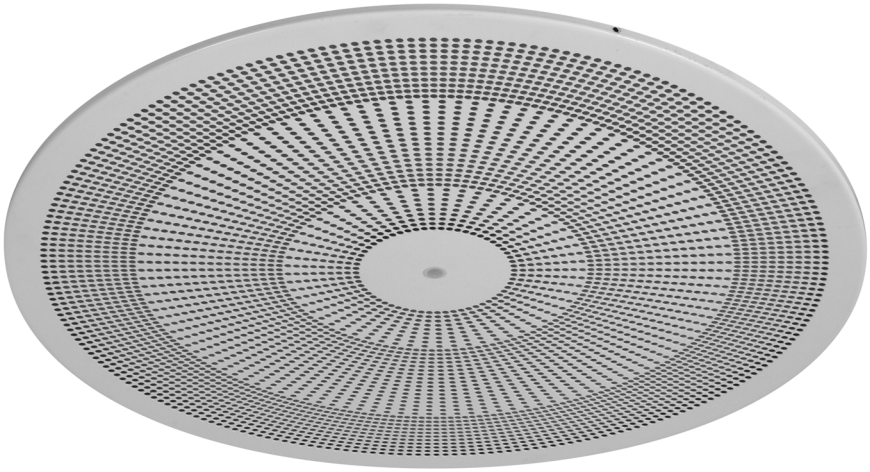
Ceiling Displacement Diffuser

DAV



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Ceiling Displacement Diffuser DAV

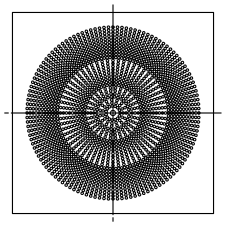
Contents

Ceiling Displacement Diffuser DAV

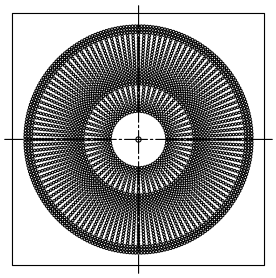
Description

The ceiling displacement diffuser type DAV can be used wherever low-induction **supply air** is to be introduced **from the ceiling**: sales rooms, production halls, kitchens, etc.
The mounting height is up to 4 m for installation flush with the ceiling or freely suspended installation.
It produces a **bell-shaped displacement flow**, in order to form **fresh air zones** in rooms contaminated with hazardous substances or odours. The local fresh air zones allow the supply air volume to be reduced compared with mixed air systems. Its **low-induction flow** reduces the amount of cleaning required since the ceilings are soiled less. That's because a mixed flow is created near the diffuser, which means that the ceiling and diffuser itself are less prone to particles being deposited on the diffuser or near the ceiling. This is also supported by the **easy-to-clean faceplate**.
An integrated air guide funnel ensures that the supply air is discharged uniformly across the whole diffuser area. The diffuser can be used for cooling up to a maximum temperature difference of -6 K.
The ceiling displacement diffuser can be used both for supply air and return air. The connection of the ceiling displacement diffuser to the duct system takes place via the plenum box type SK-R-.... The supply air plenum box is fitted with an equalising grid, to ensure an admission pressure for optimal air distribution. At an extra charge, a throttle damper can be installed for air volume regulation. For plenum boxes type SK-R-..., the ceiling diffuser must be removed, before the damper can be adjusted. Alternatively, a cable-operated adjustment can be ordered at an extra charge, which allows the damper to be adjusted on the room side even with mounted diffuser.
Normally the ceiling diffuser is fitted to a traverse in the plenum box type SK-R-... with a central screw for a concealed mounting (concealed mounting). The funnel shaped VM holder on the pole brace makes assembly of the ceiling diffuser much easier. A volumetric flow meter can be integrated into the spigot of the plenum box at an extra charge. The measurement error of the volumetric flow meter is ± 5 % at a spigot velocity of 2-5 m/s and a straight flow pattern of at least 1 x D. The measurement is carried out with integrated diffuser. By adjusting the throttle damper, the required air volume of each diffuser can be set quickly and correctly.

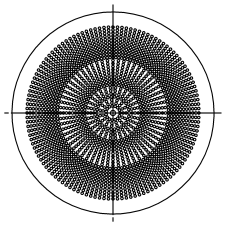
Models
DAV-Q-..., square model
NW 400 / 800



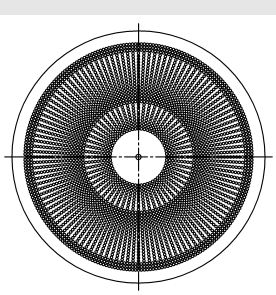
NW 310 / 500 / 600 / 625



DAV-R-..., round model
NW 400 / 800



NW 310 / 500 / 600 / 625



Ceiling Displacement Diffuser DAV

Construction

Faceplate

- perforated sheet steel painted RAL 9010 (white)

baffle plate

- Sheet steel painted to RAL 9005 (black), only for supply air model

Funnel

- Sheet steel painted to RAL 9005 (black), only for supply air model

Model

DAV-Q-... - Square model
DAV-R-... - Round model
DAV-...-Z-... - Supply air
DAV-...-A-... - Return air

Accessories

Plenum box (SK-R-05-...)

- Galvanised sheet steel, with integrated perforated straightener (supply air model only) and fixing lugs.

Damper (-DK1)

- Damper fastening made of plastic
- galvanised sheet steel

Damper (-DK2)

- same as DK1 with cable-operated adjustment

Rubber lip seal (-GD1)

- Special rubber

Volumetric flow meter (-VME1)

- Aluminium connections
- Measuring sensor made of plastic
- Holder made of galvanised sheet steel

ball-impact guard (-BS)

- only possible for DAV-Q-... with screw mounting and for NW800 only with concealed mounting.
- Steel painted to RAL 9010 (white), other RAL colours possible at an extra charge.

Internal insulation (-Ii)

- thermal insulation at the inside of the plenum box

External insulation (-Ia)

- thermal insulation at the outside of the plenum box

Fastening

Concealed mounting (-VM)

- Traverse fixing, by means of M6 cylinder screw (to DIN EN ISO 4762) at the plenum box.

Screw mounting (-SM)

- for model with ball-impact guard only
- with raised countersunk head tapping screws (on site)

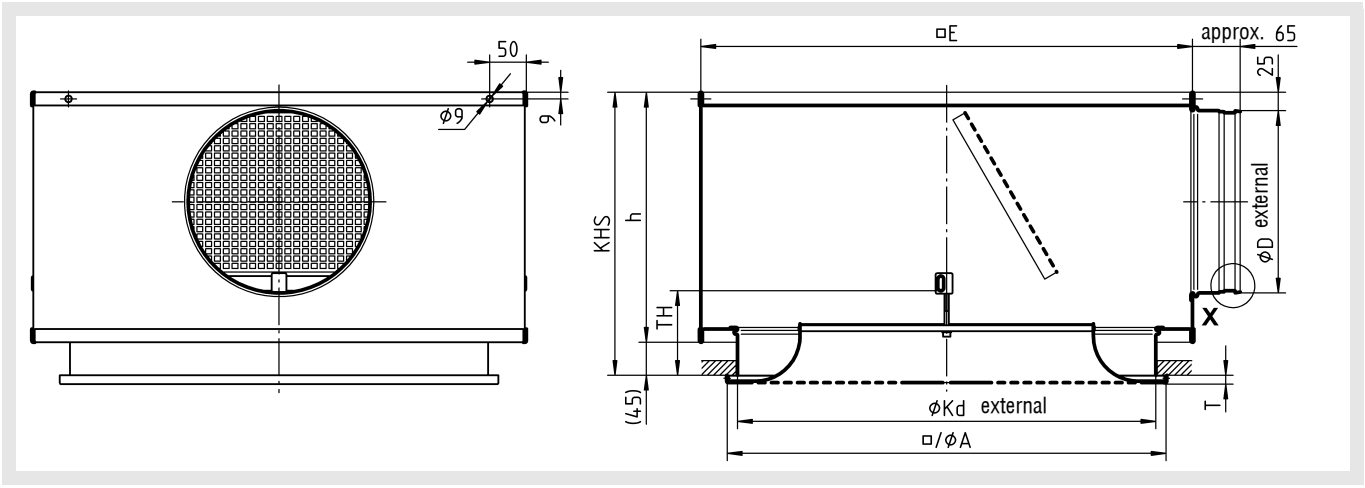
Screw mounting with concealed mounting (-VS)

- Screw mounting (-SM) in combination with concealed mounting (-VM)
- only possible for NW 800 in conjunction with ball-impact guard (-BS)

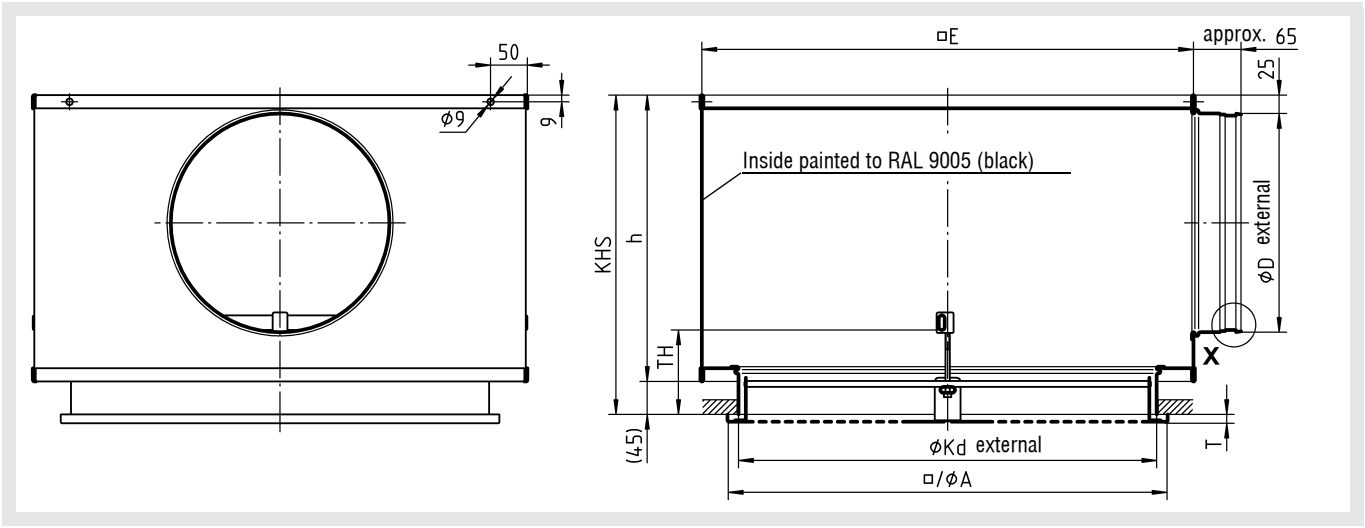
Ceiling Displacement Diffuser DAV

Models and dimensions

DAV-Q-Z-... with SK-R-05-Z -...
DAV-R-Z-... with SK-R-05-Z-...



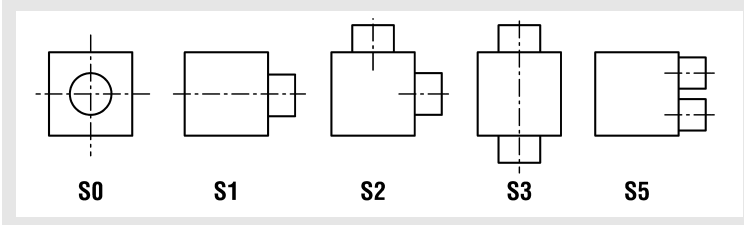
DAV-Q-A-... with SK-R-05-A -...
DAV-R-A-... with SK-R-05-A -...



Available sizes

NW	DAV-Q-...		DAV-R-...		øKd	□E	TH	SK-R-05-Z-...			SK-R-05-A-...			$øD_{max}$
	□A	T	øA	T				KHS	øD	h	KHS	øD	h	for ...-S5
310	308	12	310	10	298	405	115	295	158	250	335	198	290	158
400	398		400		370	445		295	158	250	335	198	290	178
500	498		500		470	545		335	198	290	385	248	340	198
600	598		600		570	670		385	248	340	435	298	390	298
625	623		625		570	670		385	248	340	435	298	390	298
800	798		800		770	845	135	490	353	445	490	353	445	353

Spigot position

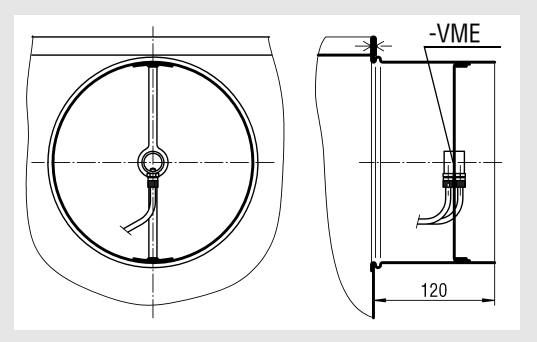


KHS= standard height of plenum box
Special height = øD + 137 mm, but at least 235 mm
Note: For SK-R-05-Z-...-DK1/-DK2-...-S0, the height of the plenum box changes to h=280 mm for NW310 and NW400 and to h=300 for NW500 mm (see p. 6)

Ceiling Displacement Diffuser DAV

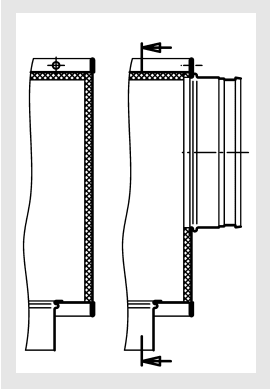
Dimensions of accessories

Volumetric flow meter (-VME1)

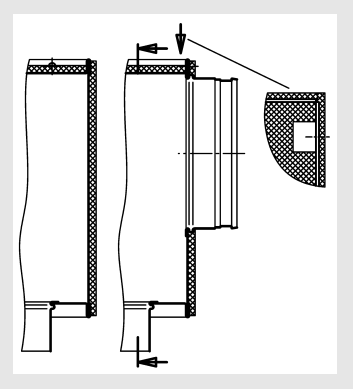


Insulation for SK-R-...

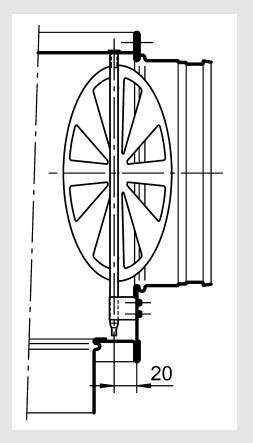
internal (-Ii)



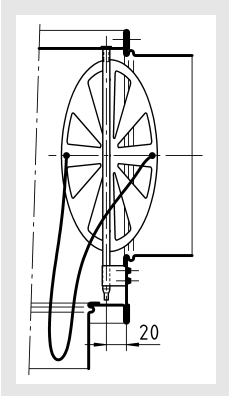
external (-Ia)



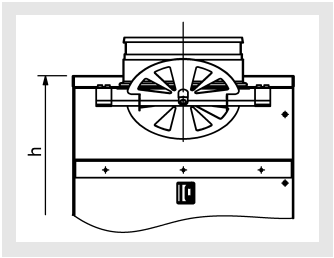
Damper (-DK1)



Damper (-DK2), with cable adjustment



Height of plenum box with spigot from above (-S0)

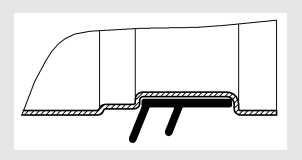


For the model with spigot from above (-S0) in combination with damper (-DK1 / -DK2), the height of plenum box h changes for the following NW as follows.

	SK-R-05-Z-...		
NW	KHS	h	øD
310	325	280	158
400	325	280	158
500	345	300	198

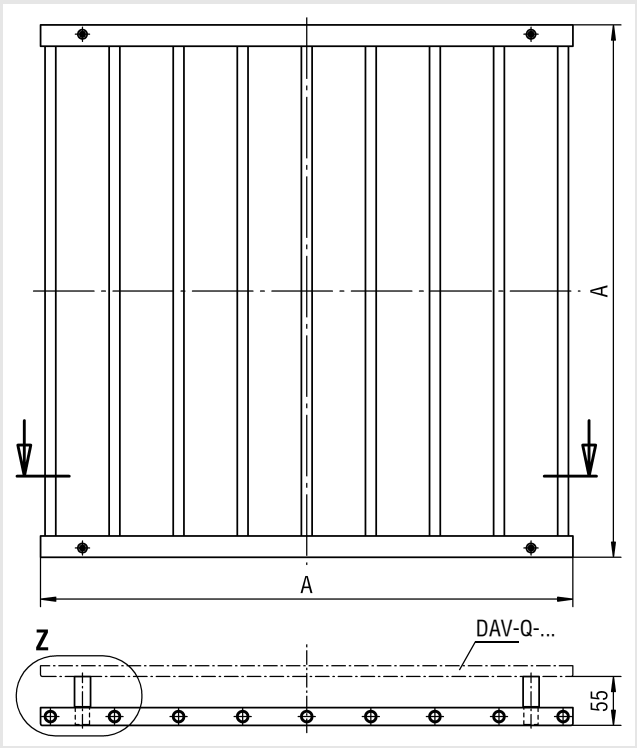
Rubber lip seal (-GD1)

Detail X

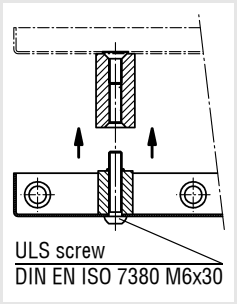


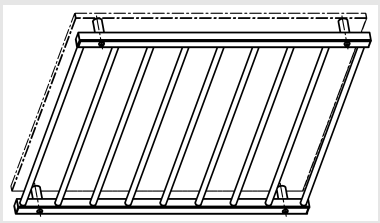
Ceiling Displacement Diffuser DAV

ball-impact guard (-BS). (only possible for DAV-Q-... with screw mounting and for NW 800 with concealed mounting).



Detail Z



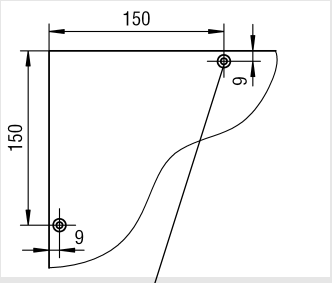


Available sizes

NW	□ A
310	308
400	398
500	498
600	598
625	623
800*	798

* NW 800:
with VS mounting

Dimensions VS mounting (for NW 800 only)
SM mounting for NW 310-625, see p. 7.

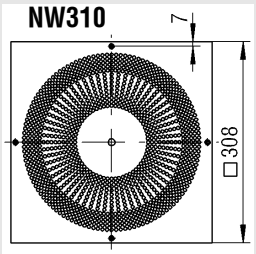


Indentation for slotted shallow-raised countersunk-head tapping screw DIN

Ceiling Displacement Diffuser DAV

for model with ball-impact guard only

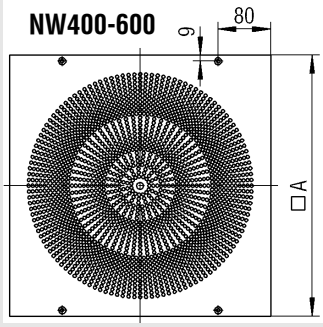
NW310



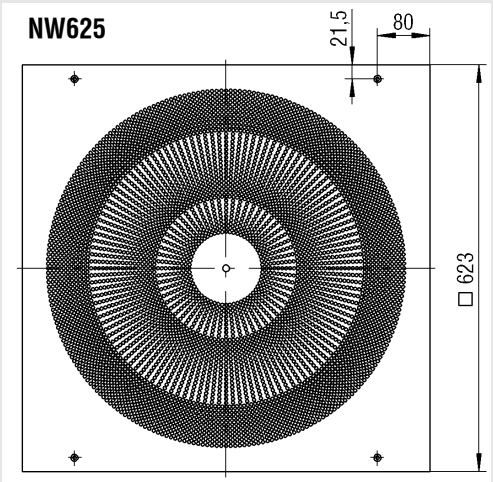
with indentation for slotted shallow-raised countersunk-head tapping screw (on-site)

- NW 310: DIN ISO 7051 pitch 3.9
- NW 400-800: DIN ISO 7051 pitch 4.8

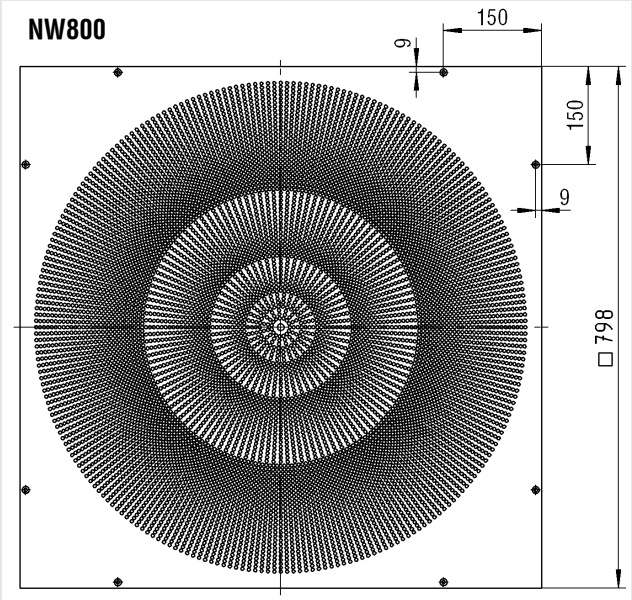
NW400-600



NW625



NW800



Concealed mounting (-VM)

In concealed mounting, the ceiling displacement diffuser type DAV-...-Z/A-... is fastened on the plenum box with a pole brace and an M6 cylinder head screw (to DIN EN ISO 4762).

Attention: The max. torque of the fastening screw is 0.4 Nm

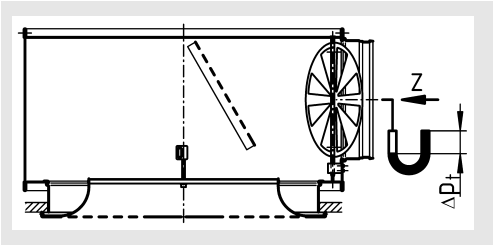
Ceiling Displacement Diffuser DAV

Technical data

Pressure loss and noise level

DAV-...-Z-...

for supply air, with plenum box

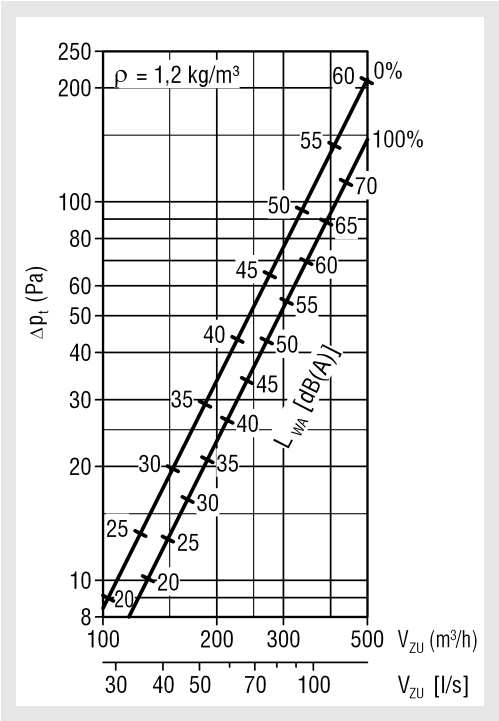


Damper position:

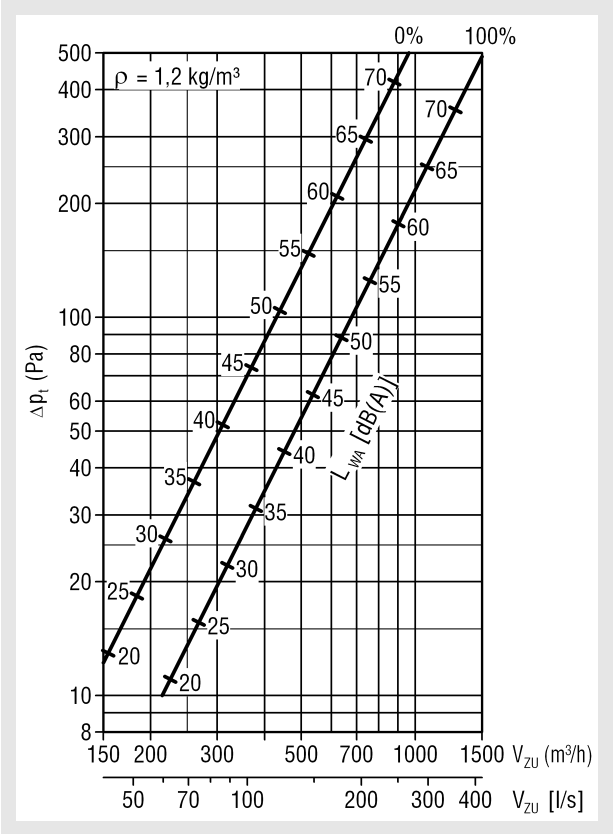
0% = CLOSED

100% = OPEN

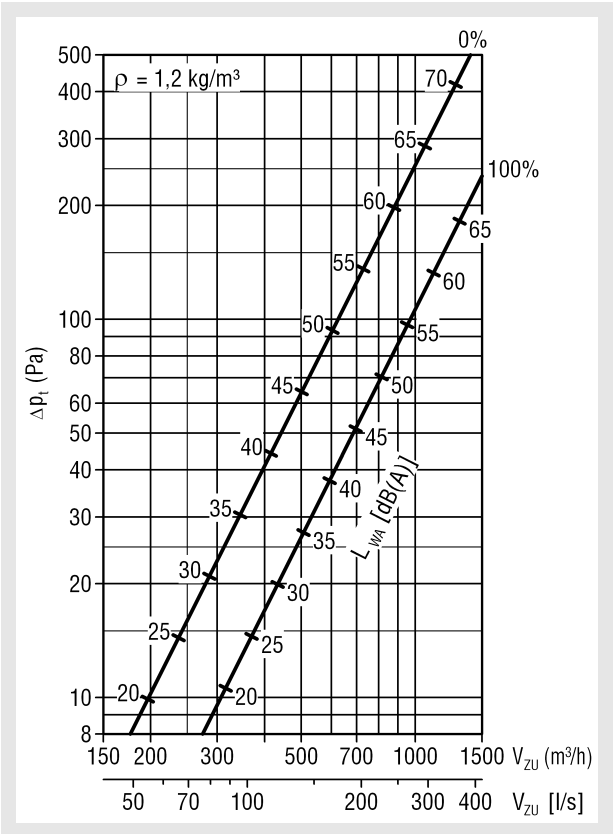
DAV-...-Z-310-... with SK-R-05-Z-...



DAV-...-Z-400-... with SK-R-05-Z-...

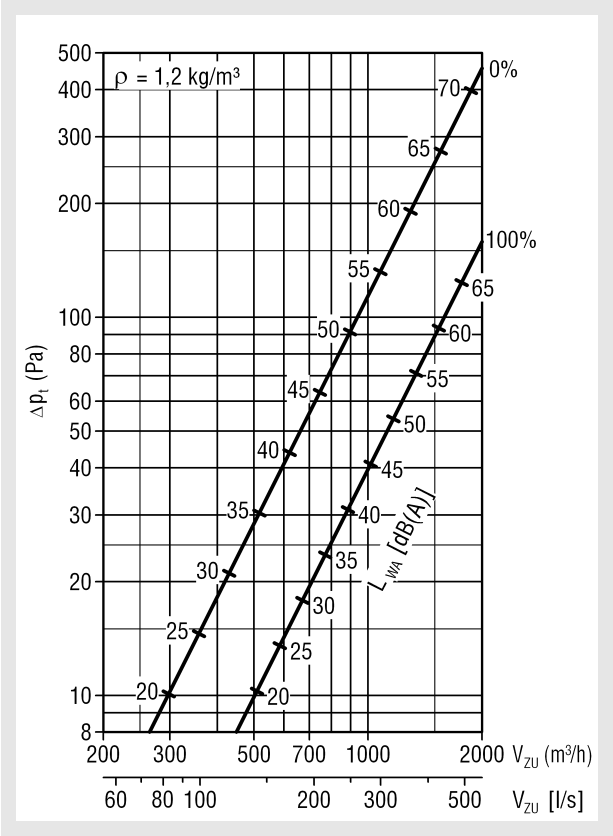


DAV-...-Z-500-... with SK-R-05-Z-...

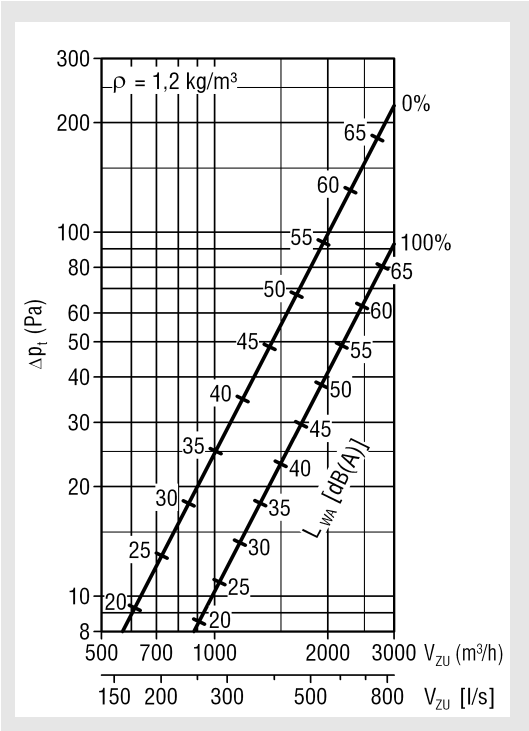


Ceiling Displacement Diffuser DAV

DAV-...-Z-600/625-... with SK-R-05-Z-...

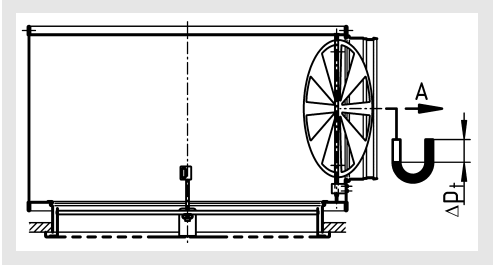


DAV-...-Z-800-... with SK-R-05-Z-...



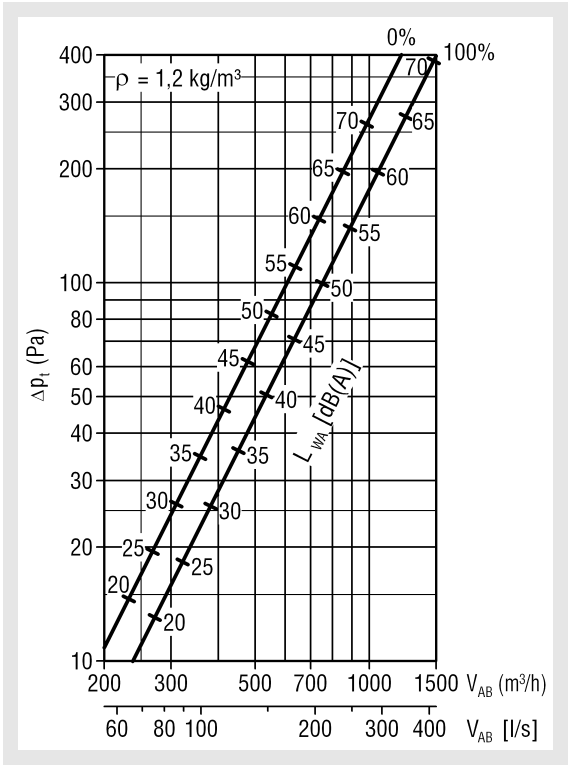
Damper position:
0% = CLOSED
100% = OPEN

DAV-...-A-...
for return air, with plenum box



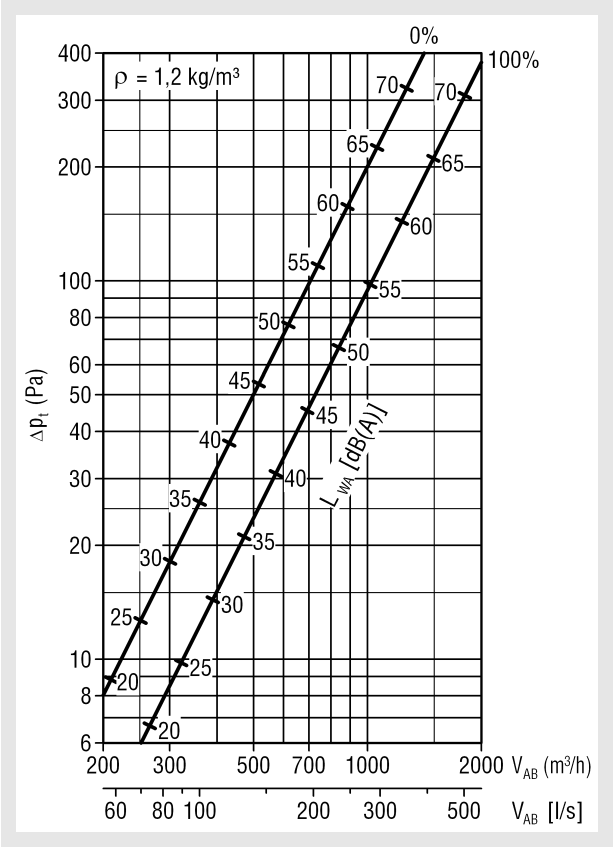
Damper position:
0% = CLOSED
100% = OPEN

DAV-...-A-310-... with SK-R-05-A-...

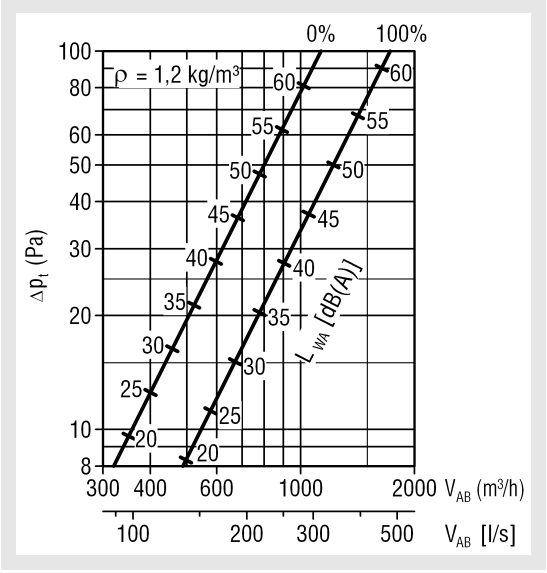


Ceiling Displacement Diffuser DAV

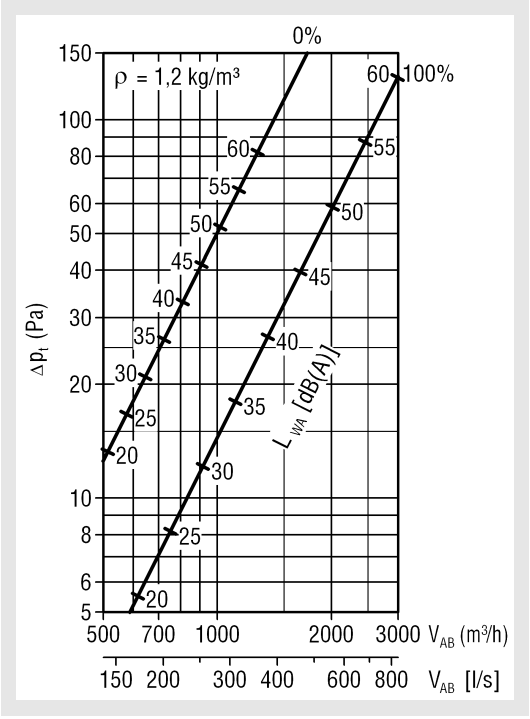
DAV-...-A-400-... with SK-R-05-A-...



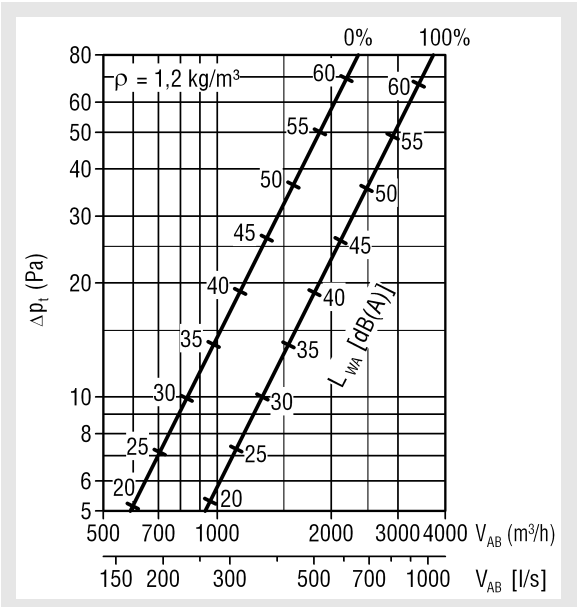
DAV-...-A-500-... with SK-R-05-A-...



DAV-...-A-600/625-... with SK-R-05-A-...



DAV-...-A-800-... with SK-R-05-A-...



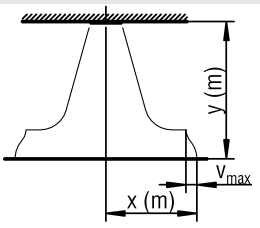
Damper position:

0% = CLOSED

100% = OPEN

Ceiling Displacement Diffuser DAV

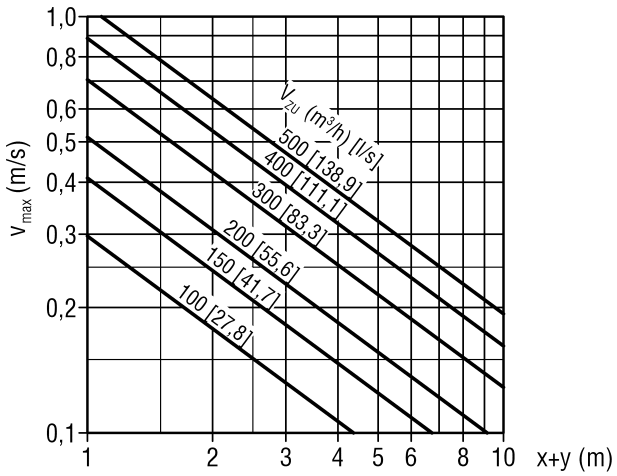
Maximum end velocity of jet (isotherm)



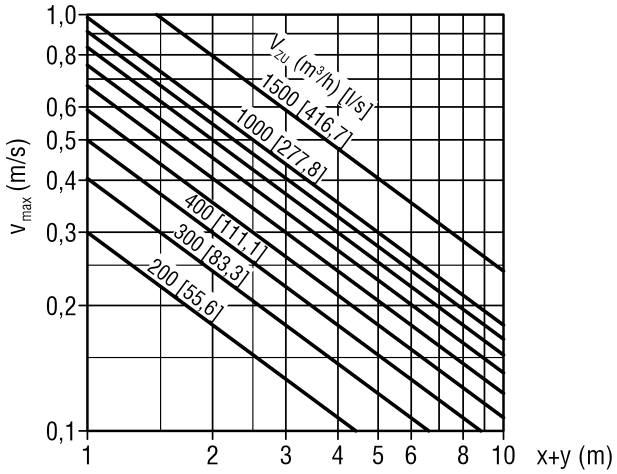
Correction factor for cooling mode

-2 K	=	v_{max} x 1.05
-4 K	=	v_{max} x 1.18
-6 K	=	v_{max} x 1.29

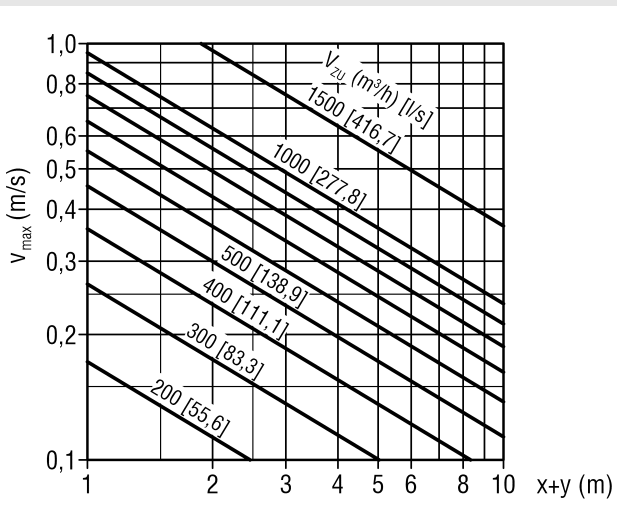
DAV-...-Z-310-...



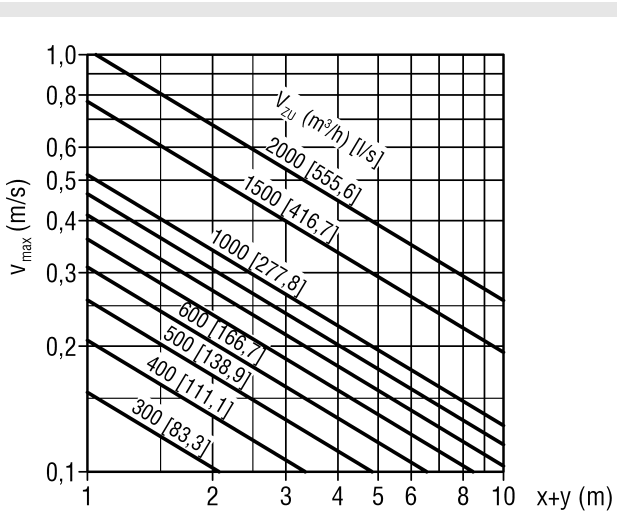
DAV-...-Z-400-...



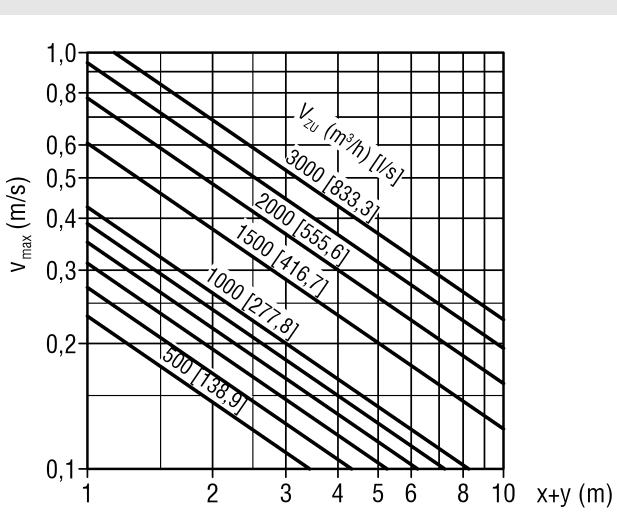
DAV-...-Z-500-...



DAV-...-Z-600/625-...

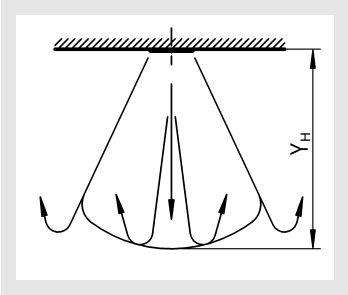


DAV-...-Z-800-...

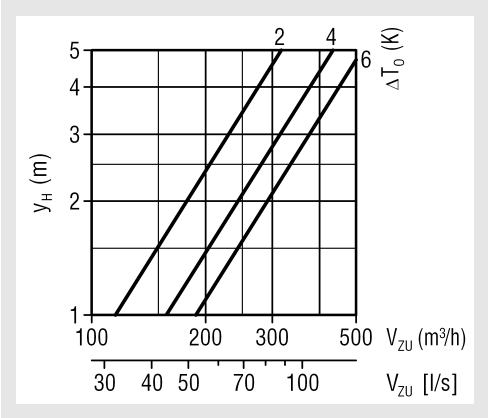


Ceiling Displacement Diffuser DAV

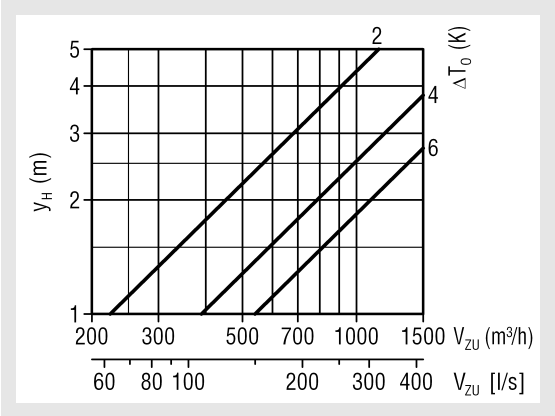
Maximum penetration



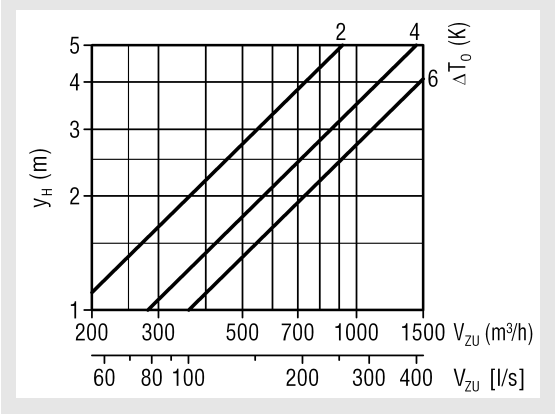
DAV-...-Z-310-...



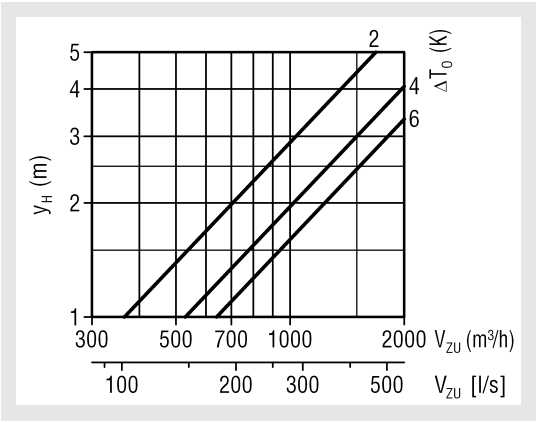
DAV-...-Z-400-...



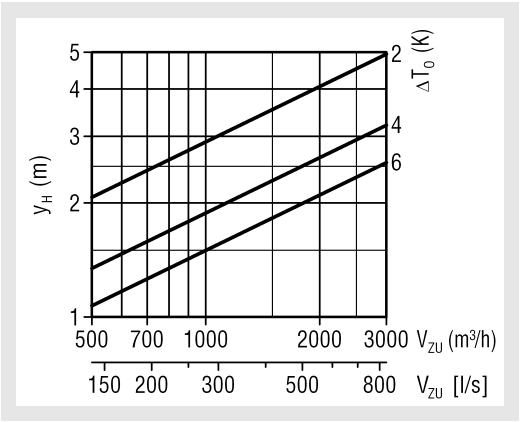
DAV-...-Z-500-...



DAV-...-Z-600/625-...

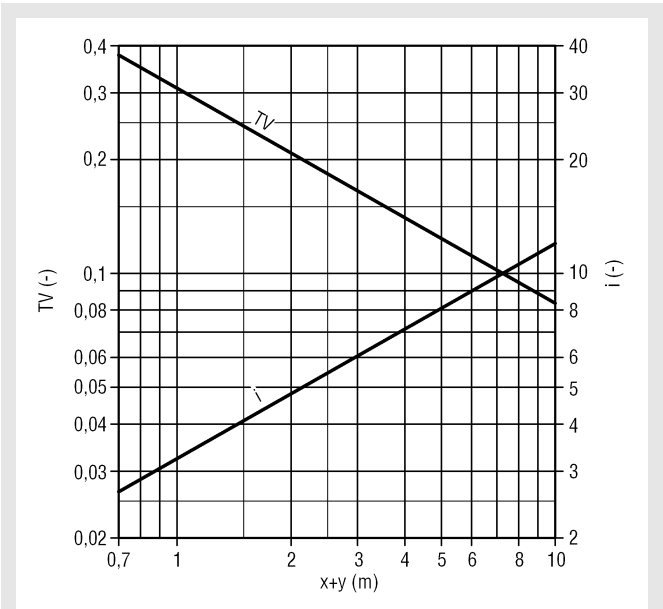


DAV-...-Z-800-...



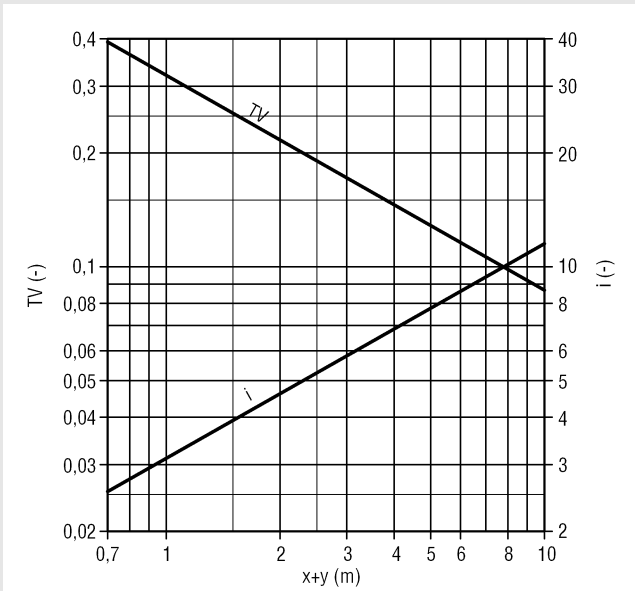
Temperature and induction ratios

DAV-...-Z-310-...

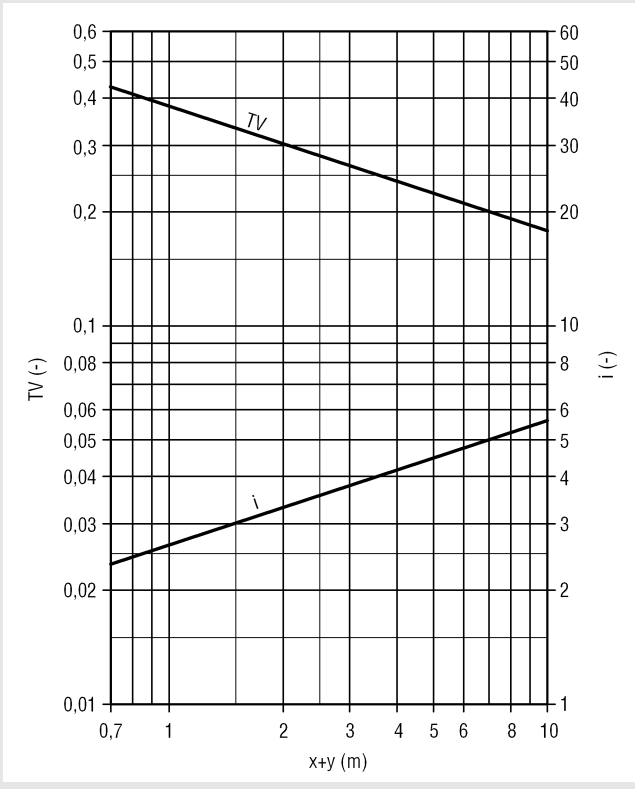


Ceiling Displacement Diffuser DAV

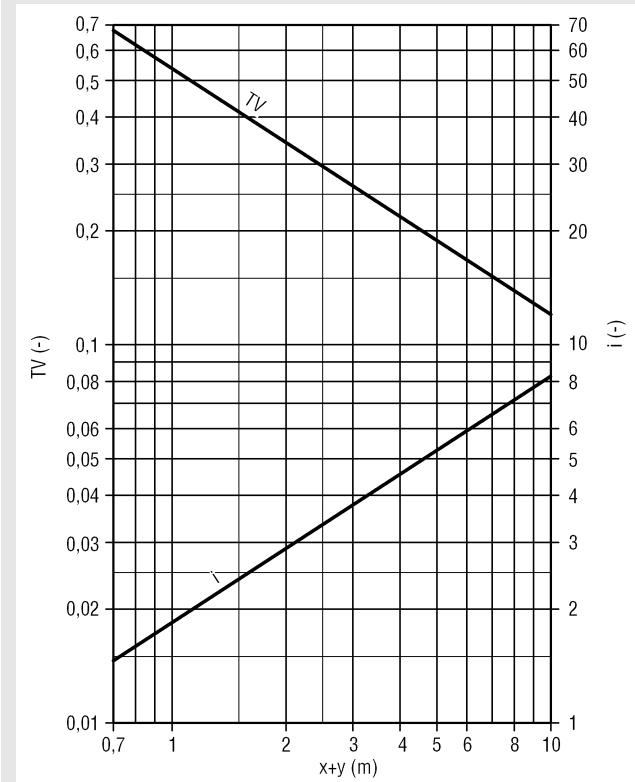
DAV-...-Z-400-...



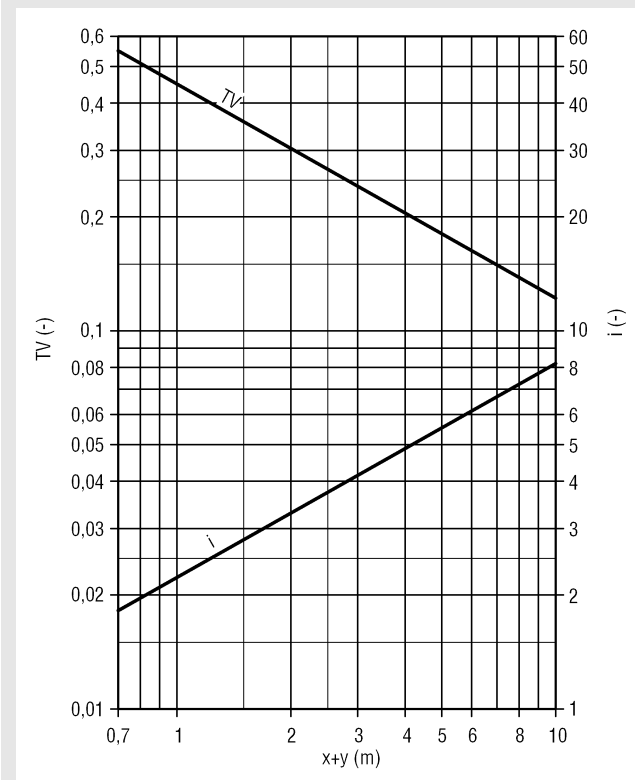
DAV-...-Z-500-...



DAV-...-Z-600/625-...

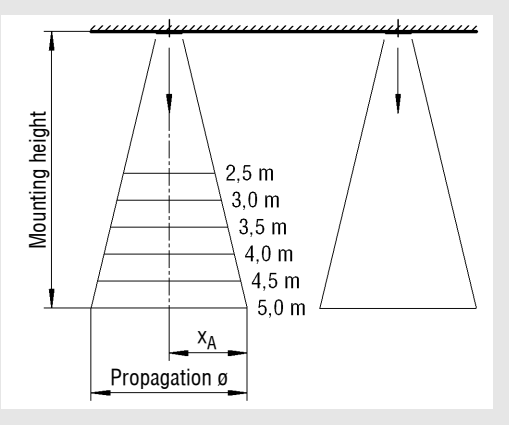


DAV-...-Z-800-...



Ceiling Displacement Diffuser DAV

Propagation diameter



The spacing of the diffusers should be selected such that the jets do not intersect.

Layout example:
DAV-...-Z-500-...

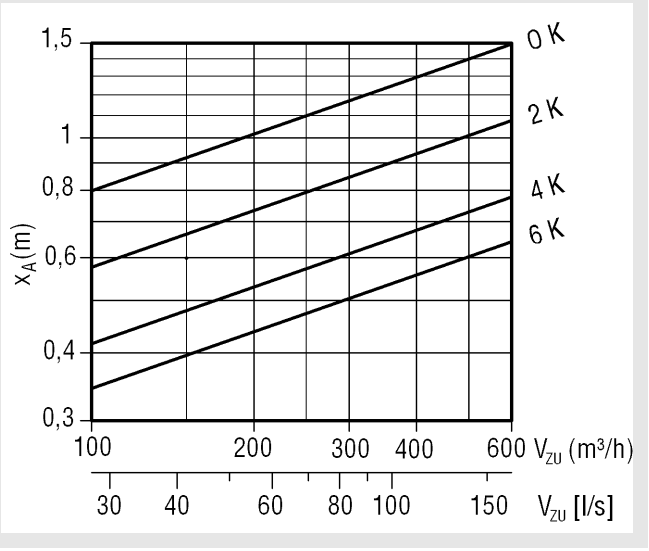
Mounting height = V_{ZU} = 600 m³/h ΔT = 4K
4 m

Required: distance x_A (m)

x_A distance at 600m³/h and ΔT= 4K = 0.92m
Multiply by the corrrection factor of 1.38 (4 m mounting height).
x_A distance = 0.92 m x 1.38

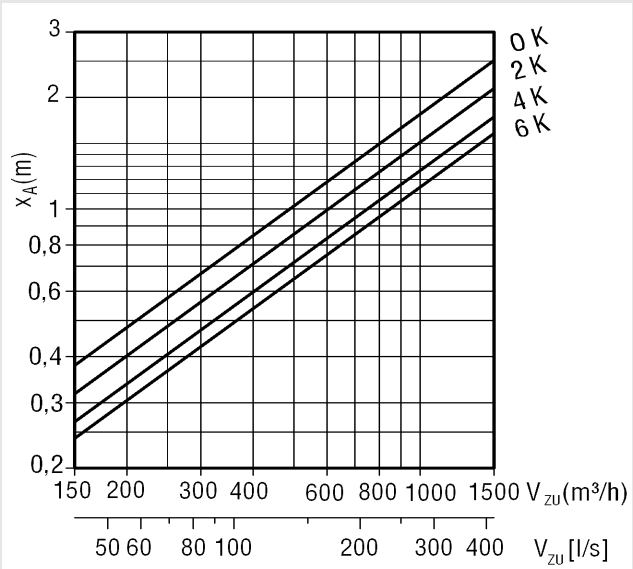
Result:
x_A distance = 1.27 m

DAV-...-Z-310-...



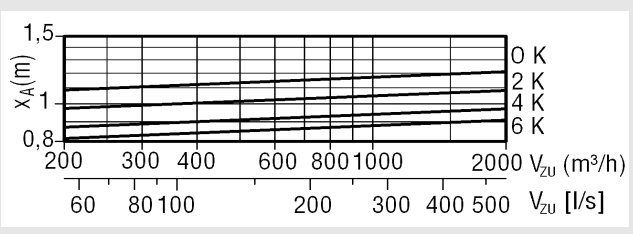
Mounting height (m)	2,5	3,0	3,5	4,0	4,5	5,0
Correction factor	1,0	1,19	1,29	1,42	1,56	1,70

DAV-...-Z-400-...



Mounting height (m)	2,5	3,0	3,5	4,0	4,5	5,0
Correction factor	1,0	1,13	1,26	1,38	1,54	1,67

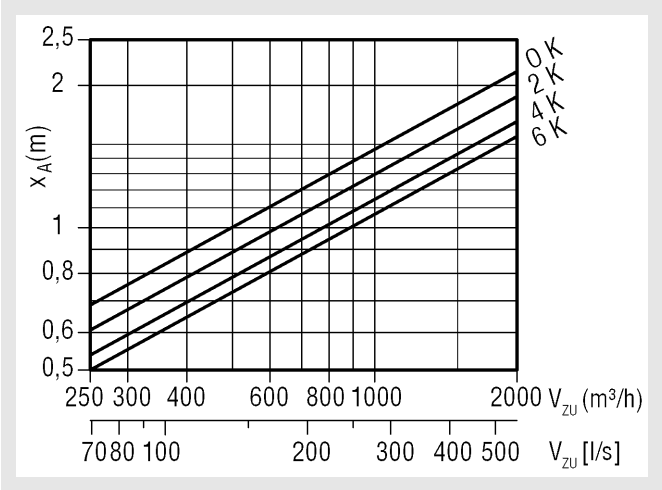
DAV-...-Z-500-...



Mounting height (m)	2,5	3,0	3,5	4,0	4,5	5,0
Correction factor	1,0	1,13	1,27	1,38	1,55	1,67

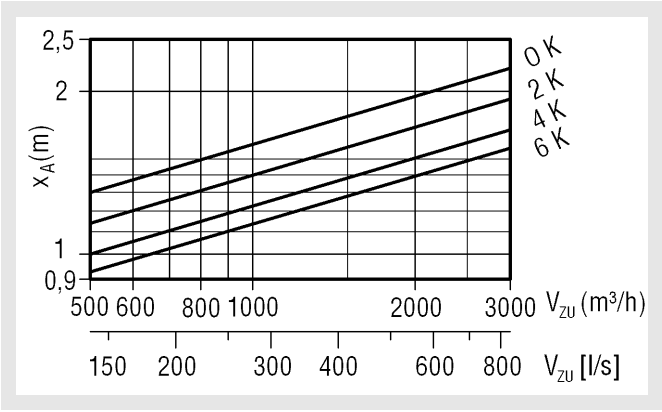
Ceiling Displacement Diffuser DAV

DAV-...-Z-600/625-...



Mounting height (m)	2,5	3,0	3,5	4,0	4,5	5,0
Correction factor	1,0	1,16	1,33	1,5	1,66	1,79

DAV-...-Z-800-...



Mounting height (m)	2,5	3,0	3,5	4,0	4,5	5,0
Correction factor	1,0	1,15	1,33	1,49	1,64	1,79

Legend

V_{ZU}	(m³/h)	=	Supply air volume
V_{ZU}	[l/s]	=	Supply air volume
V_{AB}	(m³/h)	=	Return air volume
V_{AB}	[l/s]	=	Return air volume
Δp_t	(Pa)	=	Pressure loss
L_{WA}	[dB(A)]	=	A-weighted sound power level
ρ	(kg/m³)	=	Density
x	(m)	=	horizontal throw
y	(m)	=	vertical throw
x+y	(m)	=	Horizontal + vertical throw
v_{max}	(m/s)	=	Maximum end velocity of jet ($v_{max} = v_{mittel}$)
v_{mittel}	(m/s)	=	Average end velocity of jet
y_H	(m)	=	Maximum penetration in heating mode
ΔT_0	(K)	=	Temperature difference between supply air temperature and room temperature ($\Delta T_0 = t_{ZU} - t_R$)
t_{zu}	(°C)	=	Supply air temperature
t_R	(°C)	=	Room temperature
TV	(-)	=	Temperature ratio ($TV = \Delta T_X / \Delta T_0$)
i	(-)	=	Induction ratio ($i = V_X / V_{ZU}$)
NW	(mm)	=	Nominal width
ΔT_X	(K)	=	Temperature difference at point x
V_X	(m³/h)	=	total air jet volume at point x
V_X	[l/s]	=	total air jet volume at point x
x_A	(m)	=	half the diffuser distance

Ceiling Displacement Diffuser DAV

Order code DAV

01	02	03	04	05	06
Type	Model	Air throw	Nominal size	Material	Paint
Example					
DAV	-Q	-Z	-500	-SB	-9010

07	08	09
Drill pattern reduced	Mounting	Ball-impact guard
-000	-VM	-BO

Sample
DAV-Q-Z-500-SB-9010-000-VM-BO

Ceiling displacement diffuser type DAV I square faceplate I supply air I NW500 I faceplate made of sheet steel I faceplate painted to RAL 9010 I drill pattern not reduced I concealed mounting I without ball-impact guard

Order details

01 - Type

DAV = Ceiling displacement diffuser

02 – Model

Q = Square faceplate
R = round faceplate

03 - Air throw

Z = Supply air
A = Return air

04 – Nominal size

310 = NW310
400 = NW400
500 = NW500
600 = NW600
625 = NW625
800 = NW800

05 - Material

SB = Sheet steel

06 - Paint

9010 = RAL colour white
xxxx = RAL colour can be freely selected

07 - Drill pattern reduced

000 = Drill pattern not reduced (standard)
310 = reduced drill pattern 310
400 = reduced drill pattern 400
500 = reduced drill pattern 500
600 = reduced drill pattern 600

The drill pattern selected must be smaller than the nominal size selected.

08 - Mounting

VM = Concealed mounting (standard)
SM = Screw mounting (only in connection with ball-impact guard)
VS = Screw mounting with concealed mounting (available only for NW800 in conjunction with ball-impact guard)

09 – Ball-impact guard

BO = without ball-impact guard (standard)
BS = with ball-impact guard, painted to the same colour as the faceplate (for -Q model only)

Ceiling Displacement Diffuser DAV

Order code SK

01	02	03	04	05	06	07	08
Plenum box	Model	Air diffuser	Type of air	Nominal size	Fastening	Material	Damper
Example							
SK	-R	-05	-Z	-500	-VM	-SV	-DK2

09	10	11	12	13	14	15
Rubber lip seal	Measuring device for volumetric flow	ROB version	Insulation	Height of plenum box	Spigot diame-ter	Spigot posi-tion
-GD1	-VME1	-ROB0	-I0	-KHS	-SDS	-S1

Sample
SK-R-05-Z-500-VM-SV-DK2-GD1-VME1-ROB0-I0-KHS-SDS-S1

Plenum box, square design I for round air diffusers I air diffuser DAV I supply air I NW500 I with concealed mounting I galvanised sheet steel I with damper with cable I with rubber lip seal I with volumetric flow meter I without ROB model I without box insulation I standard height of plenum box I standard spigot diameter I 1 lateral spigot

Order details

01 - Plenum box

SK = Plenum box, square design

02 – Model

R = for round air diffusers with round diffuser support

03 - Air diffuser (must be ordered separately)

05 = suitable for DAV-...

04 - Type of air

Z = Supply air
A = Return air

05 – Nominal size

310 = NW310
400 = NW400
500 = NW500
600 = NW600
625 = NW625
800 = NW800

06 - Fastening

VM = Concealed mounting (standard)
SM = Screw mounting (only for the model with ball-impact guard)
VS = Screw mounting with concealed mounting (only for NW800 in connection with ball-impact guard)

07 - Material

SV = Galvanised sheet steel (standard)

08 - Damper

DK0 = without damper (standard)
DK1 = with damper
DK2 = with damper and cable

09 - Rubber lip seal

GD0 = without rubber lip seal (standard)
GD1 = with rubber lip seal

10 – Volumetric flow meter

VME0 = without volumetric flow meter (standard)
VME1 = With volumetric flow meter

11 - ROB version

ROB0 = without ROB model

12- Insulation

I0 = without insulation (standard)
Ii = with box insulation inside
Ia = With box insulation outside

Ceiling Displacement Diffuser DAV

13 – Height of plenum box

KHS = Height of plenum box standard

xxx = height of plenum box in mm ($height_{min}$= spigot diameter + 137 mm, but at least 235 mm) (For SK-R-05-Z-...-DK1/-DK2-...-S0, observe special height of plenum box (see p. 6))

14 – Spigot diameter

SDS = Standard spigot diameter

xxx = Spigot diameter in mm

15 – Spigot position

S0 = Spigot from above

S1 = lateral spigot on the box (standard)

S2 = 2 spigots offset by 90°

S3 = 2 spigots offset by 180°

S5 = 2 spigots arranged next to each other

Ceiling Displacement Diffuser DAV

Specification texts

Square ceiling displacement diffuser for use in supply and return air installations of sales rooms, production halls, kitchens, etc. up to 4 m in height. For low-induction introduction of supply air from the ceiling, for installation flush with the ceiling or freely suspended. It produces a bell-shaped displacement flow, in order to form fresh air zones in rooms contaminated with hazardous substances or odours.
Consisting of a square faceplate easy to clean, with star-shaped perforation, made of perforated sheet steel painted to RAL 9010 (white). The supply air model is additionally provided with a baffle plate and a sheet steel air guide funnel painted to RAL 9005 (black). It is fastened by concealed mounting (-VM) using a central fastening screw.
Product: SCHAKO **type DAV-Q-Z-...**

- Return air version without baffle plate and without air guide funnel
  Product: SCHAKO **type DAV-Q-A-...**

- with screw mounting (-SM), only for model with ball-impact guard (-BS)
- Screw mounting with concealed mounting (-VS), only for model with ball-impact guard (-BS) (only for NW 800)

Round ceiling displacement diffuser for use in supply and return air installations of sales rooms, production halls, kitchens, etc. up to 4 m in height. For installation flush with the ceiling or freely suspended. For low-induction introduction of supply air from the ceiling, for installation flush with the ceiling or freely suspended. It produces a bell-shaped displacement flow, in order to form fresh air zones in rooms contaminated with hazardous substances or odours.
Consisting of a round faceplate easy to clean, with star-shaped perforation, made of perforated sheet steel painted to RAL 9010 (white). The supply air model is additionally provided with a baffle plate and a sheet steel air guide funnel painted to RAL 9005 (black). It is fastened by concealed mounting (-VM) using a central fastening screw.
Product: SCHAKO **type DAV-R-Z-...**

- Return air version without baffle plate and without air guide funnel
  Product: SCHAKO **type DAV-R-A-...**

Accessories:

- with plenum box (SK-R-05-Z-...) made of galvanised sheet steel, with integrated perforated straightener, lateral connection spigot and fixing lugs.
  - includes a damper adjustable at the front side in the plenum box for air volume regulation (-DK1)
    - with cable-operated adjustment (-DK2)
  - Volumetric flow meter (-VME1) in connection spigot
  - With rubber lip seal (-GD1) at the connection spigot
  - with thermal insulation
    - internal (-Ii)
    - external (-Ia)
  - Height of plenum box can be freely selected, xxx in mm, minimum height = spigot diameter + 137 mm, but at least 235 mm
  - Spigot diameter can be freely selected, xxx in mm
  - Spigot position:
    - S0 = spigot from above
    - S1 = 1 lateral spigot on the box (standard)
    - S2 = 2 spigots offset by 90°
    - S3 = 2 spigots offset by 180°
    - S5 = 2 spigots arranged next to each other

- with plenum box (SK-R-05-A-...) made of galvanised sheet steel, with lateral connection spigot and fixing lugs
  - includes a damper adjustable at the front side in the plenum box for air volume regulation (-DK1)
    - with cable-operated adjustment (-DK2)
  - Volumetric flow meter (-VME1) in connection spigot
  - With rubber lip seal (-GD1) at the connection spigot
  - with thermal insulation
    - internal (-Ii)
    - external (-Ia)
  - Height of plenum box can be freely selected, xxx in mm, minimum height = spigot diameter + 137 mm, but at least 235 mm (For SK-R-05-Z-...-DK1/-DK2-...-S0, observe special height of plenum box (see p. 6))
  - Spigot diameter can be freely selected, xxx in mm
  - Spigot position:
    - S0 = spigot from above
    - S1 = 1 lateral spigot on the box (standard)
    - S2 = 2 spigots offset by 90°
    - S3 = 2 spigots offset by 180°
    - S5 = 2 spigots arranged next to each other

- Ball-impact guard (-BS), made of steel with high-quality powder coating in RAL 9010 (white), other RAL colours possible at an extra charge (possible only for DAV-Q-... with screw mounting and for NW 800 only with concealed mounting).