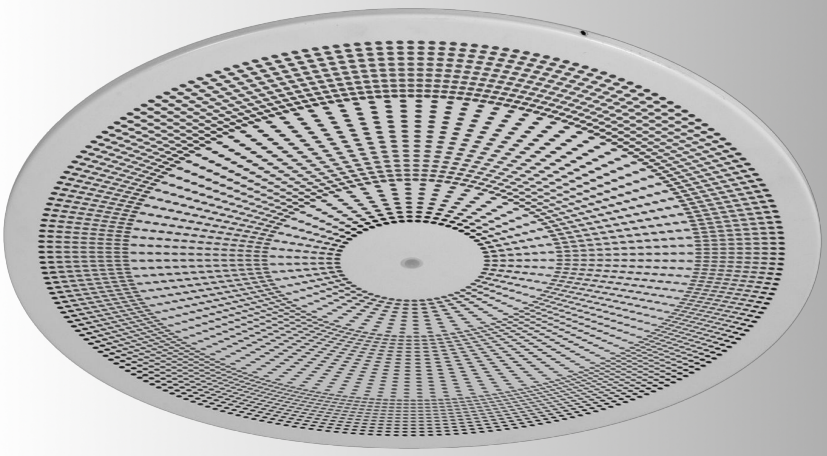


DAV

Ceiling displacement diffuser

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DESCRIPTION

The DAV ceiling displacement diffuser 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. This is due to the fact that a mixed flow is created near the diffuser, so that particles in the room air are less likely to be deposited on the diffuser or on the ceiling around the diffuser. 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 face of the diffuser. The diffuser can be used for cooling with a maximum temperature difference of -6K.

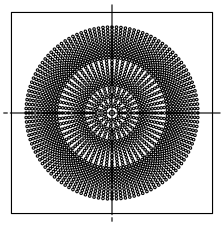
The ceiling impulse diffuser can be used for supply and exhaust air. The ceiling displacement diffuser is connected to the duct system via the plenum box type SK-R-.... For the supply air model, a perforated straightener is installed in the plenum box to create a pre-pressure and ensure that the diffuser is evenly pressurized with air. At an extra charge, a throttle damper can be installed for air volume regulation. For plenum boxes 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.

As standard, the ceiling air diffuser is attached using a central fixing screw to a crossbar located in the plenum box type SK-R-... (concealed mounting). The funnel-shaped recess for concealed mounting on the crossbar makes ceiling diffuser installation 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. Measurement is carried out with integrated diffuser. By adjusting the damper, the required air volume of each diffuser can be set quickly and correctly.

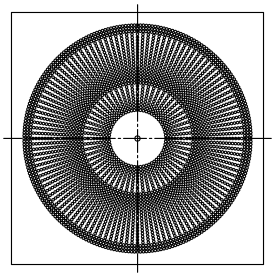
Models

DAV-Q-..., square model

NW 400 / 800

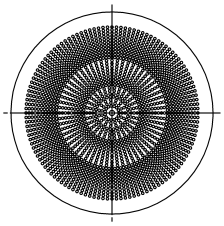


NW 310 / 500 / 600 / 625

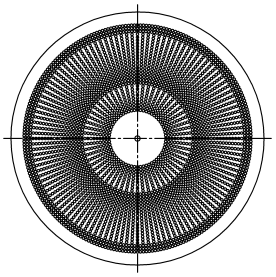


DAV-R-..., round model

NW 400 / 800



NW 310 / 500 / 600 / 625



Construction

- Faceplate
  - perforated sheet steel painted RAL 9010 (white)
- baffle plate
  - Sheet steel painted to RAL 9005 (black), only for supply air
- Funnel
  - Sheet steel painted to RAL 9005 (black), only for supply air

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 (only for supply air) 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)
- 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

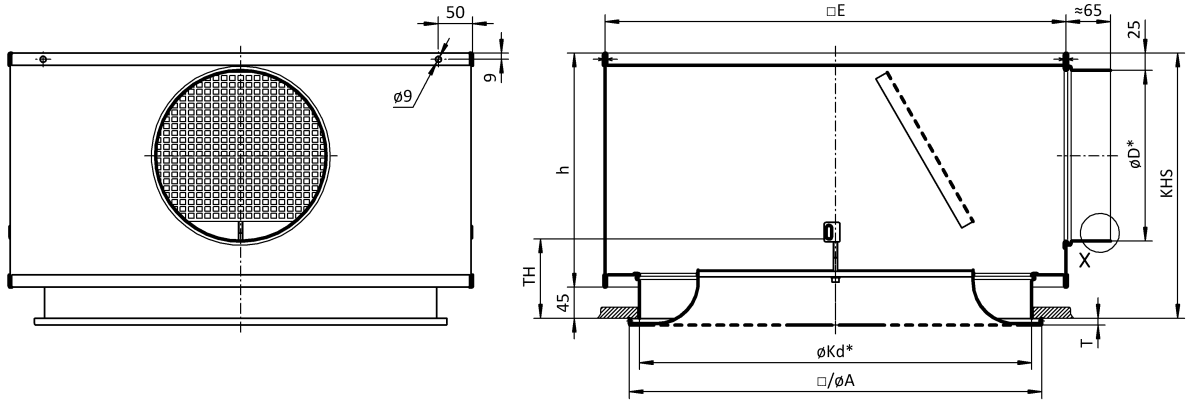
Fastening

- Concealed mounting (-VM)
  - Traverse fixing, by means of M6 cylinder screw (to DIN EN ISO 4762) at the plenum box.
- Screw mounting (-SM)
  - Only for model with ball-impact guard (-BS) and standard faceplate size
  - with raised countersunk head tapping screws (on site)
- Screw mounting with concealed mounting (-VS)
  - Screw mounting (-SM) in combination with concealed mounting (-VM)
  - Only for NW 800 in combination with ball-impact guard (-BS) and standard faceplate size

MODELS AND DIMENSIONS

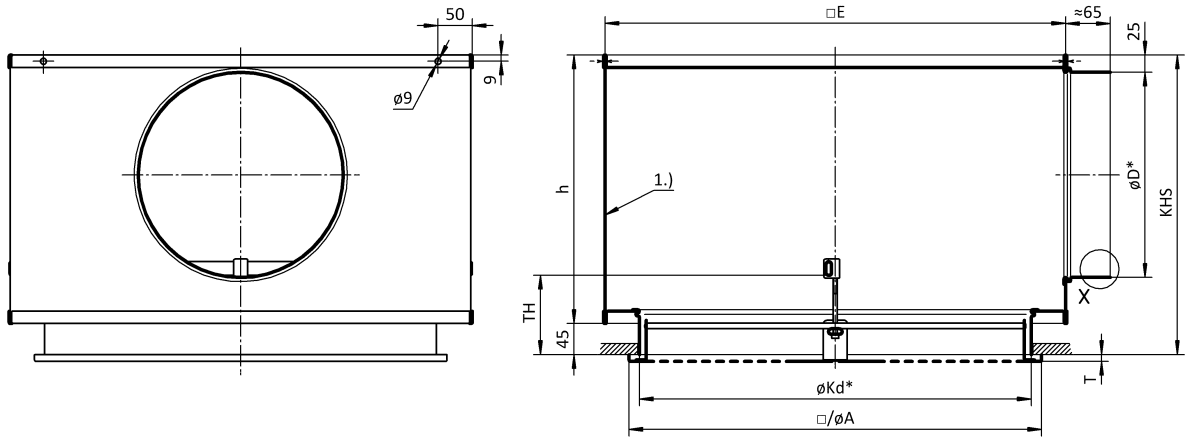
DAV-Q-Z-... with SK-R-05-Z -...

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



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

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



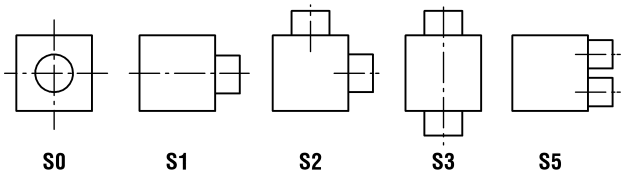
1.) Inside painted to RAL 9005 (black)

* external

Available sizes

NW	DAV-Q-...		DAV-R-...		øKd	□E	TH	SK-R-05-Z-...			SK-R-05-A-...			$øD_{max}$ for ...-S5
	□A	T	øA	T				KHS	øD	h	KHS	øD	h	
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



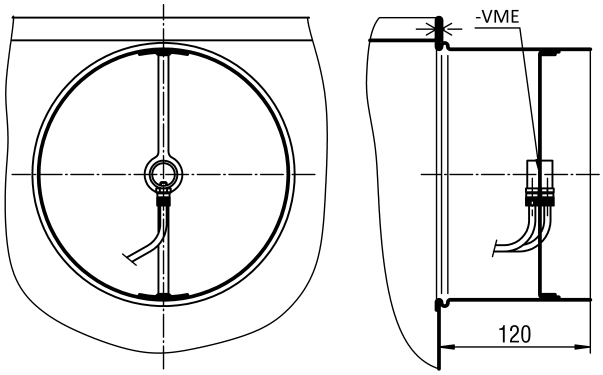
KHS = standard height of box

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

Construction subject to change. No return possible.

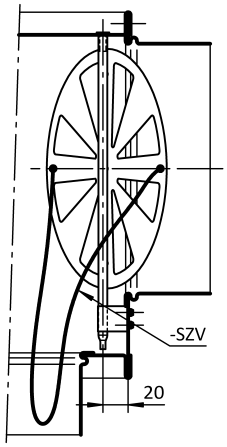
DIMENSIONS OF ACCESSORIES

Volumetric flow meter (-VME1)



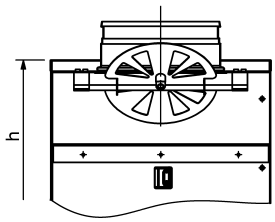
Damper (-DK0 / -DK1 / -DK2)

- Without damper (-DK0) (standard)
- with damper in plenum box (-DK1)
- with damper in the plenum box and cable-operated adjustment (-SZV) (-DK2)



SZV = cable-operated adjustment

Height of box with spigot from above (-S0)

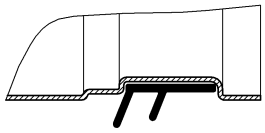


For the model with spigot from above (-S0) in combination with damper (-DK1 / -DK2), the height of plenum box h changes for the following NW as follows.

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

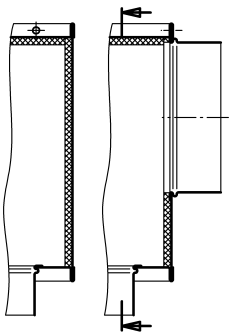
Rubber lip seal (-GD1)

Detail X

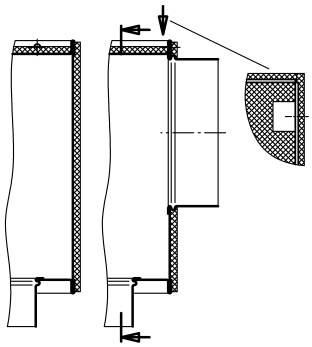


Insulation for SK-R-...

internal (-Ii)

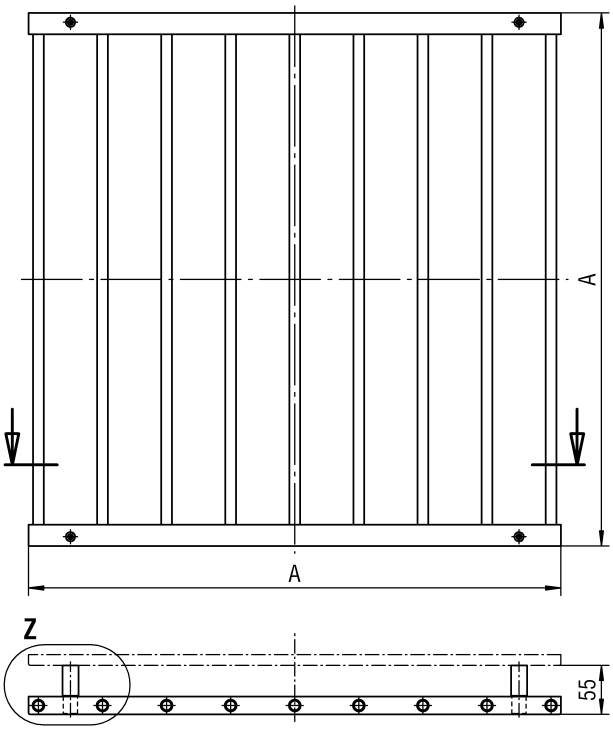


external (-Ia)

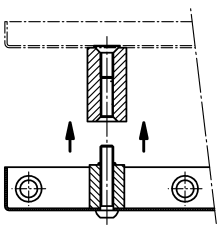


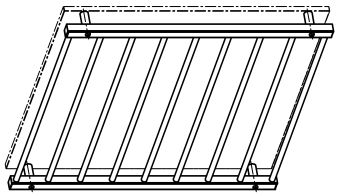
ball-impact guard (-BS)

(only possible for DAV-Q-... with screw mounting and for NW 800 with VS mounting)



Detail Z





1.) ULS standard DIN EN ISO 7380 M6x30

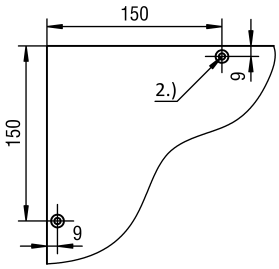
Available sizes

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

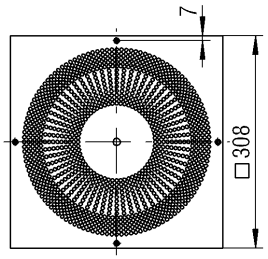


2.) Indentation for slotted shallow-raised countersunk-head tapping screw DIN ISO 7051 pitch 4.8 (on site)

FASTENING METHODS

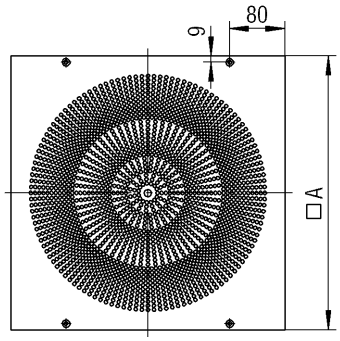
Screw mounting (-SM) (only DAV-Q-...)

NW310

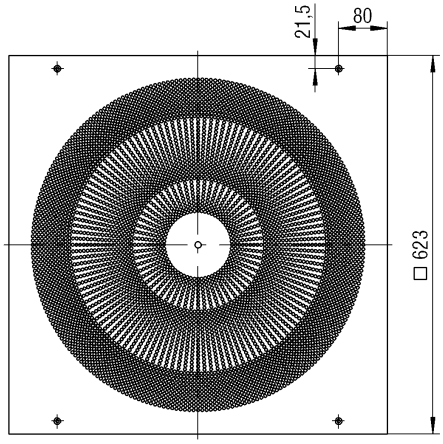


- for model with ball-impact guard only
- with indentation for slotted shallow-raised countersunk-head tapping screw (on site)
  - NW 310: DIN ISO 7051 pitch 3.9
  - NW 400-800: DIN ISO 7051 pitch 4.8

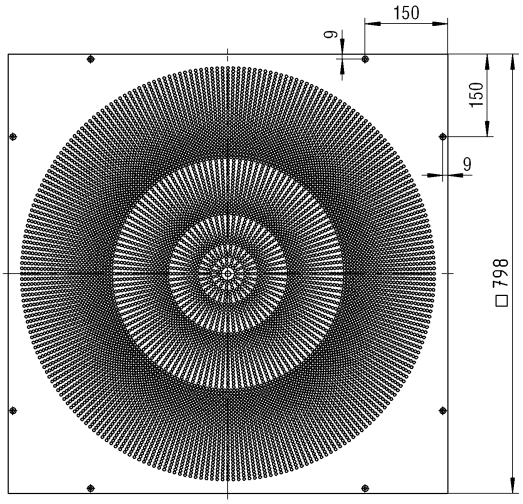
NW400-600



NW625



NW800 (-VS)



Concealed mounting (-VM)

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

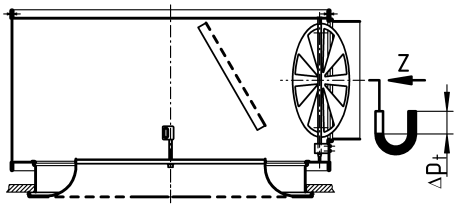
Attention: The max. torque of the fastening screw is 0.4 Nm

TECHNICAL DATA

Pressure loss and sound power level

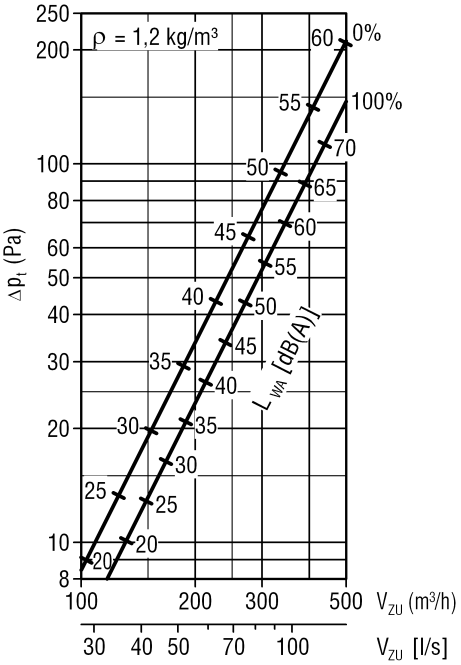
DAV-...-Z-...

for supply air, with plenum box

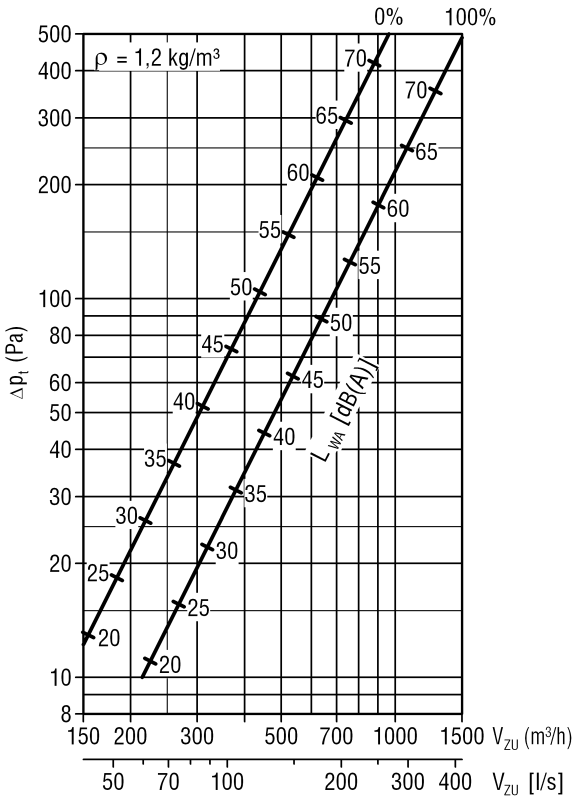


Damper position:
0% = CLOSED
100% = OPEN

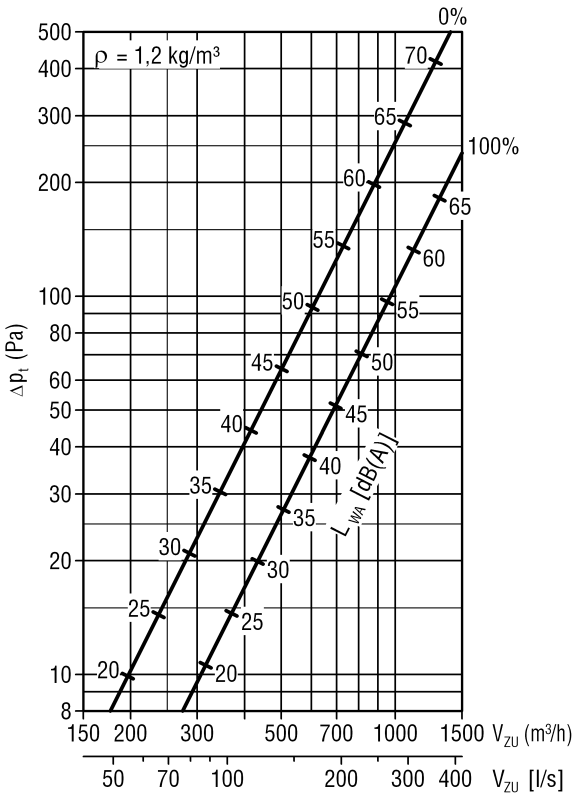
DAV-...-Z-...-310-... with SK-R-05-Z-...



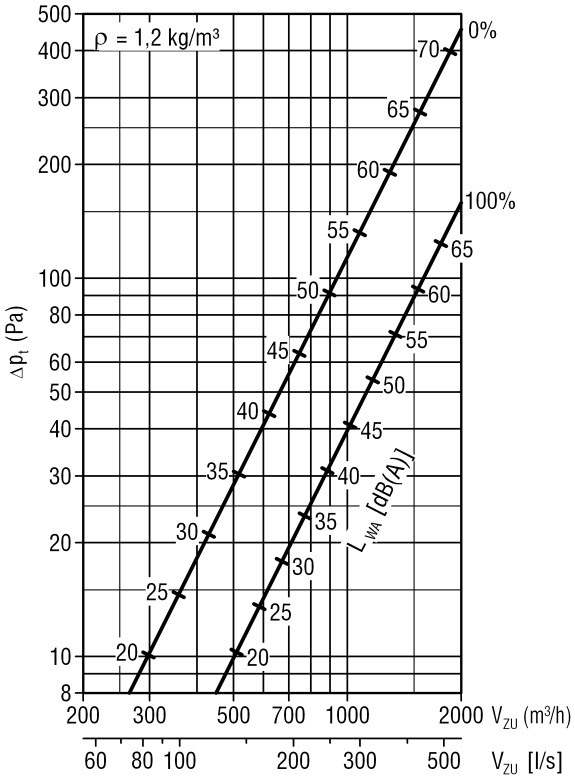
DAV-...-Z-...-400-... with SK-R-05-Z-...



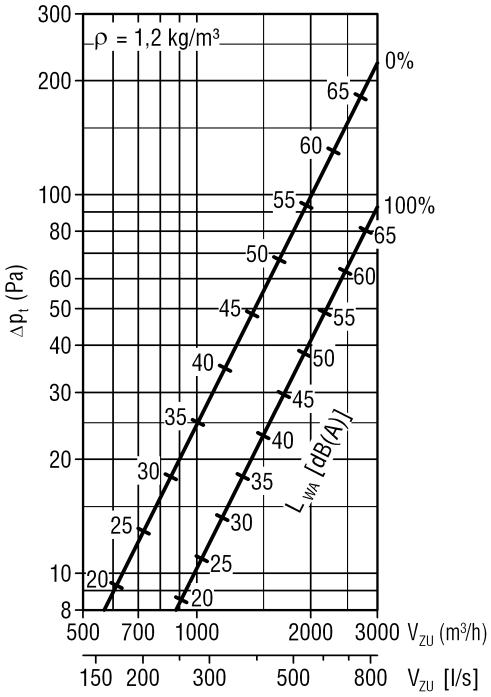
DAV-...-Z-...-500-... with SK-R-05-Z-...



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

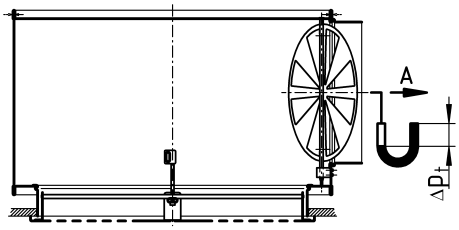


DAV-...-Z-...-800-... with SK-R-05-Z-...



DAV-...-A-...

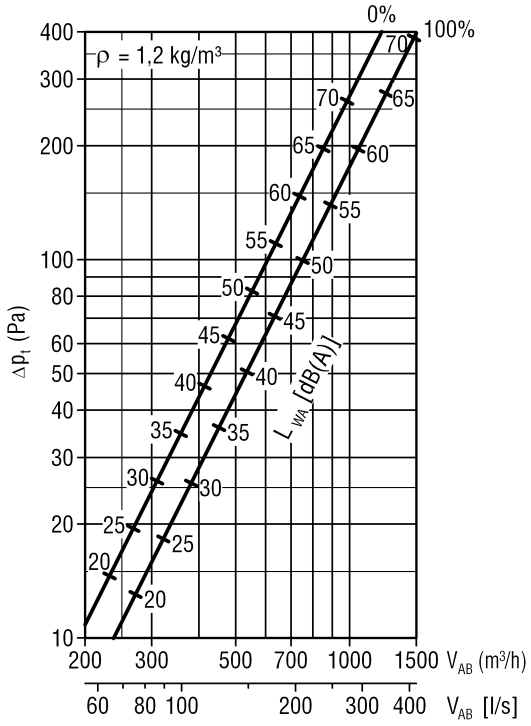
for return air, with plenum box



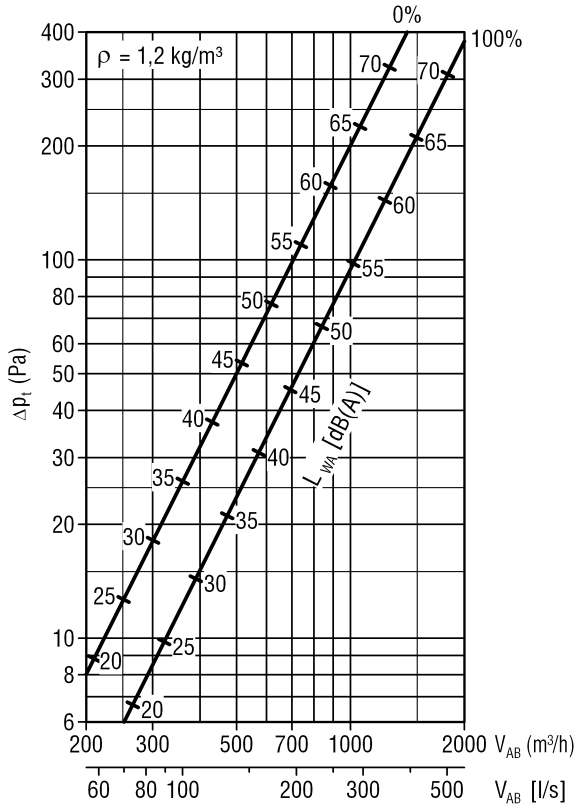
Damper position:

0% = CLOSED
100% = OPEN

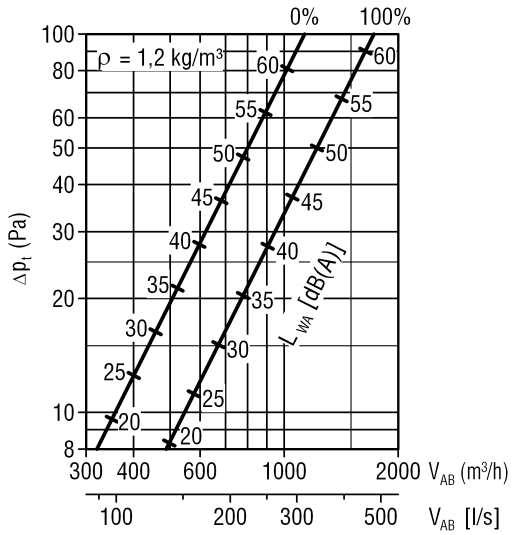
DAV-...-A-...-310-... with SK-R-05-Z-...



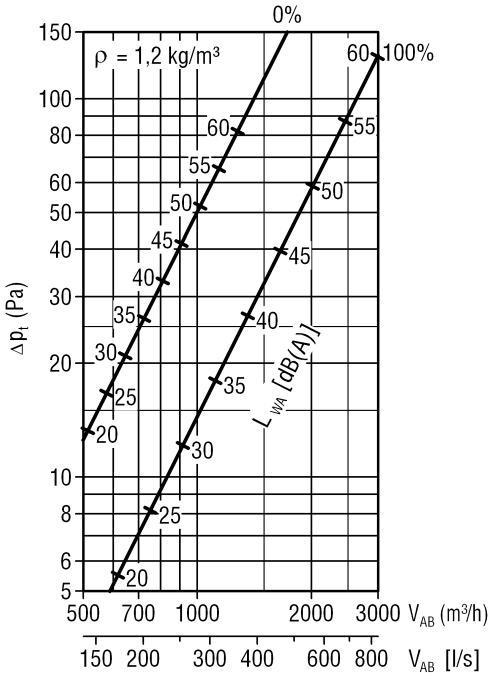
DAV-...-A-...-400-... with SK-R-05-Z-...



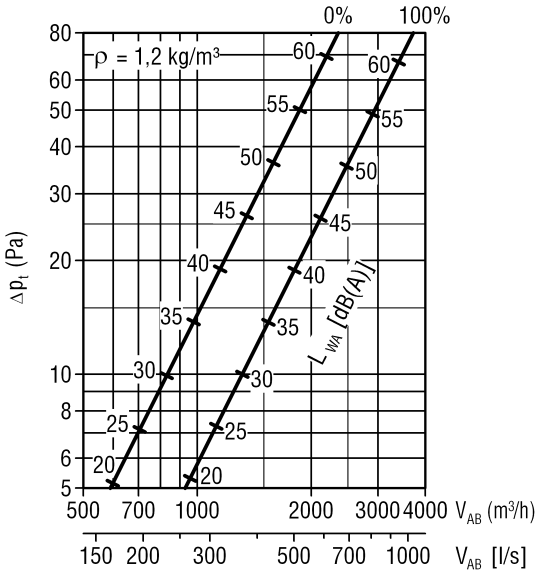
DAV-...-A-...-500-... with SK-R-05-Z-...



DAV-...-A-...-600-... with SK-R-05-Z-...

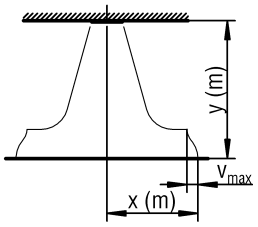


DAV-...-A-...-800-... with SK-R-05-Z-...



Damper position:
0% = CLOSED
100% = OPEN

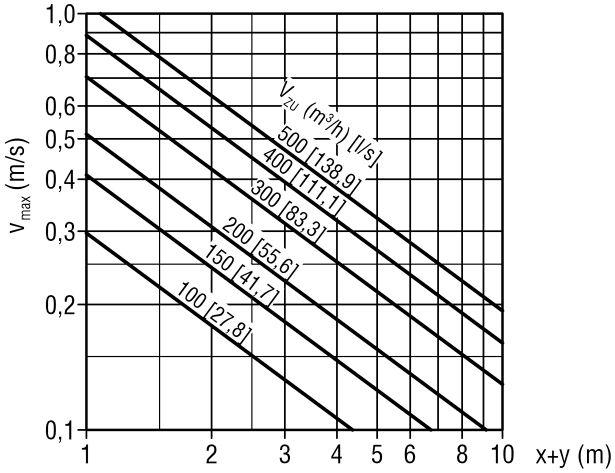
Maximum end velocity of jet (isotherm)



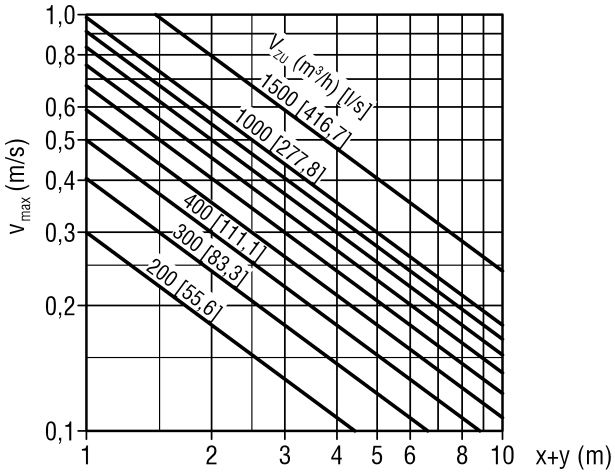
Correction factor for cooling mode

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

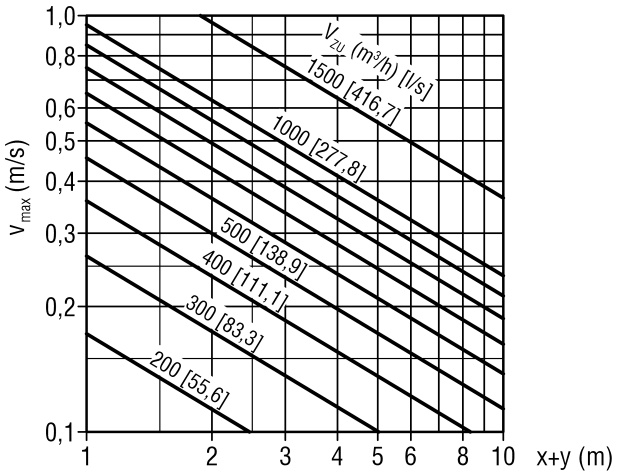
DAV-...-Z-...-310-...



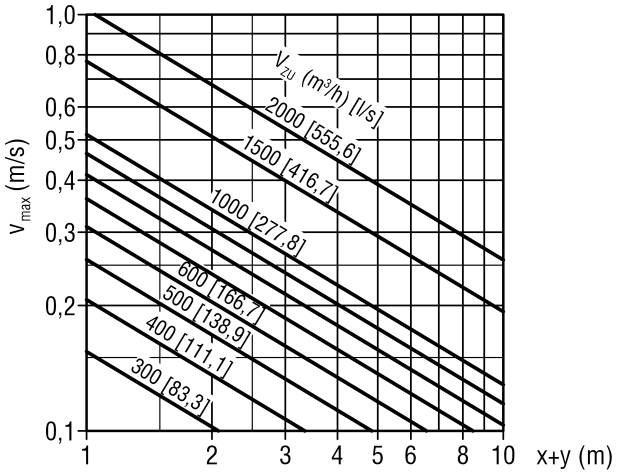
DAV-...-Z-...-400-...



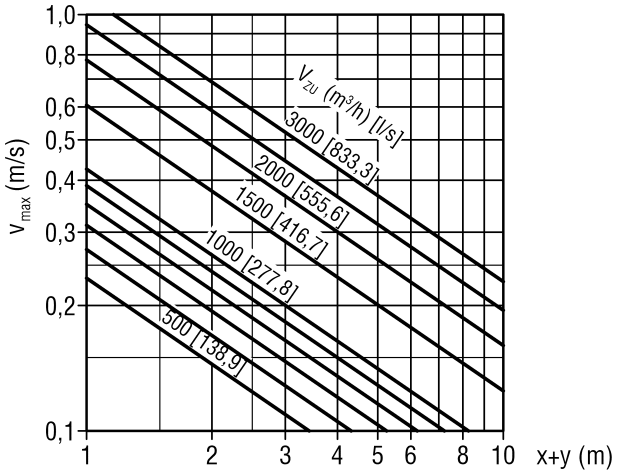
DAV-...-Z-...-500-...



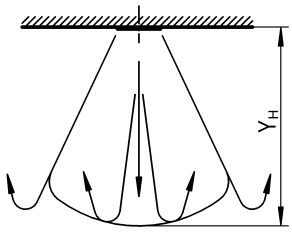
DAV-...-Z-...-600-...



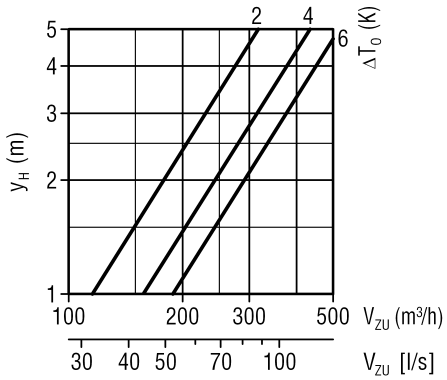
DAV-...-Z-...-800-...



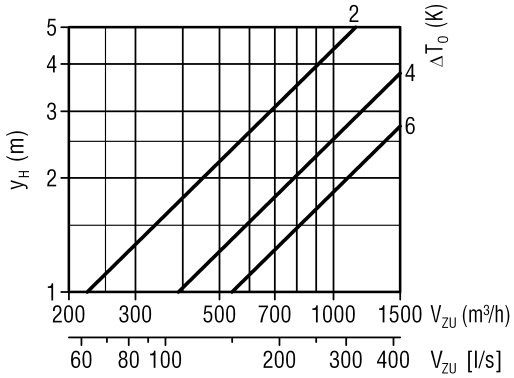
Maximum penetration



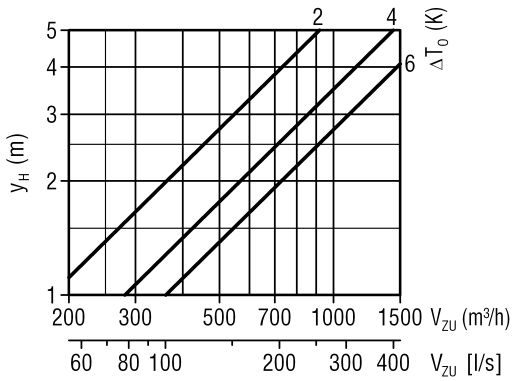
DAV-...-Z-310-...



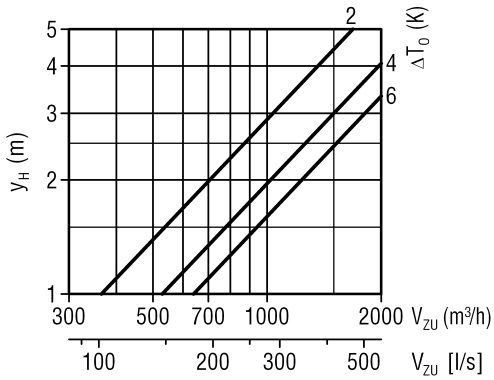
DAV-...-Z-400-...



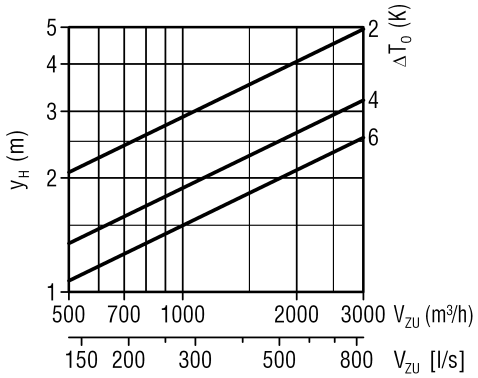
DAV-...-Z-500-...



DAV-...-Z-600-...

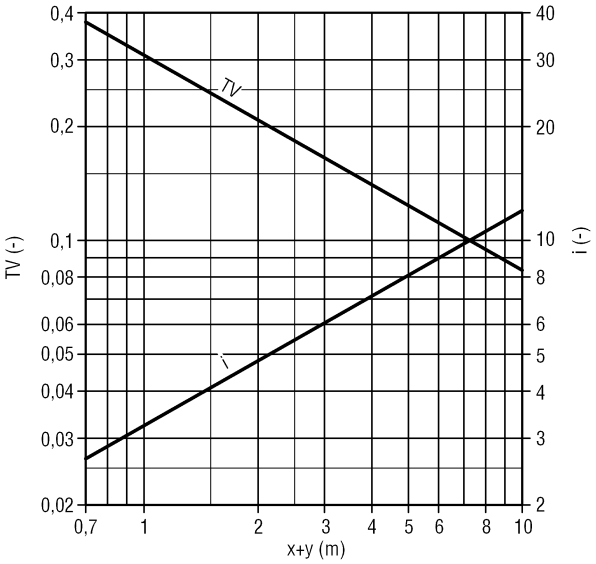


DAV-...-Z-800-...

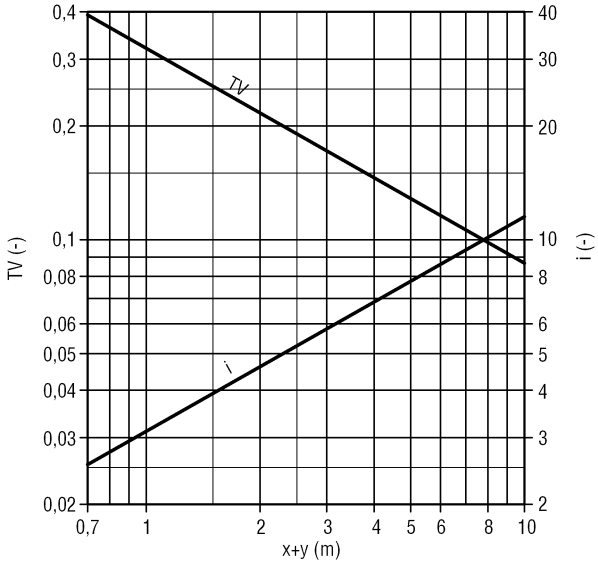


Temperature and induction ratios

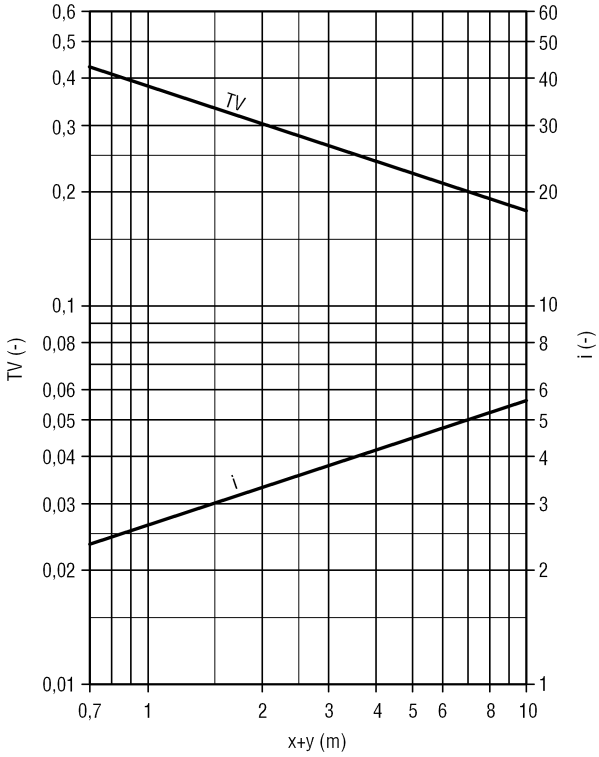
DAV-...-Z-...-310-...



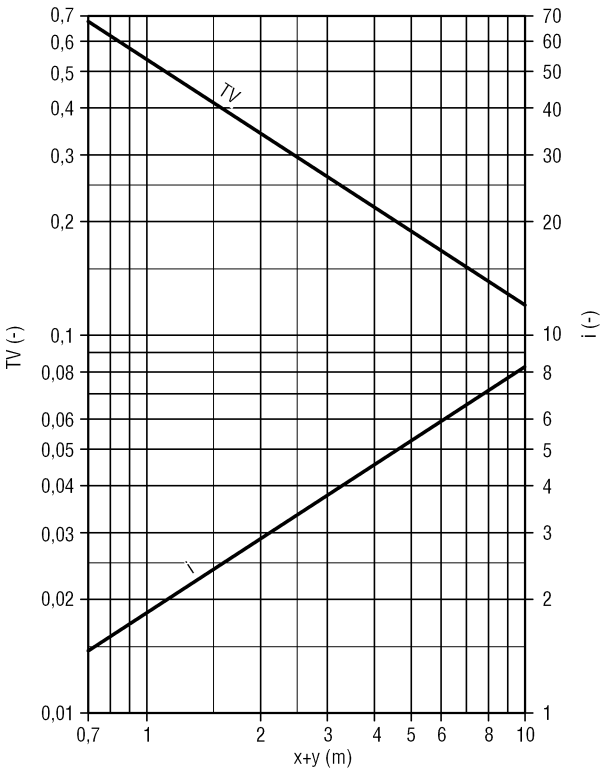
DAV-...-Z-...-400-...



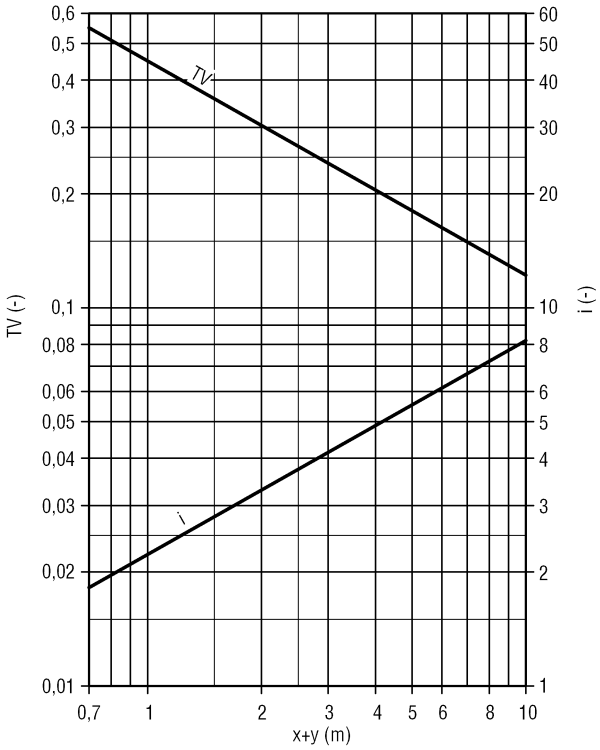
DAV-...-Z-...-500-...



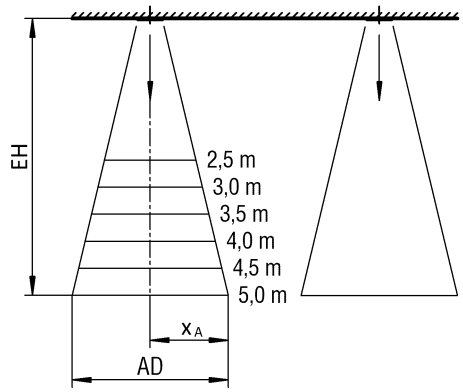
DAV-...-Z-...-600-...



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


0,6
0,5
0,4
0,3
0,2
0,1
0,08
0,06
0,05
0,04
0,03
0,02
0,01
TV (-)
60
50
40
30
20
10
8
6
5
4
3
2
1
i (-)
TV
i
0,7
1
2
3
4
5
6
8
10
x+y (m)

Propagation diameter



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

EH = Mounting height

AD = Propagation diameter

x_A = Half the distance to the diffuser

Layout example:

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

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

Required: distance x_A (m)

x_A distance at 600m³/h and ΔT= 4K = 0.92m

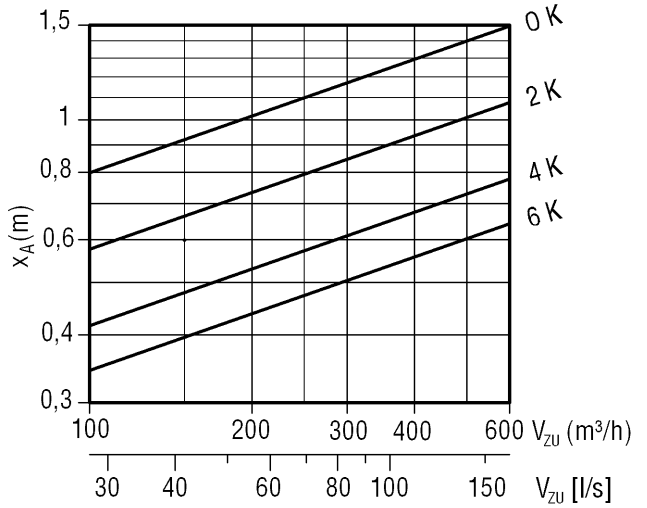
Multiply by the correction factor of 1.38 (4 m mounting height).

x_A distance = 0.92 m x 1.38

Result:

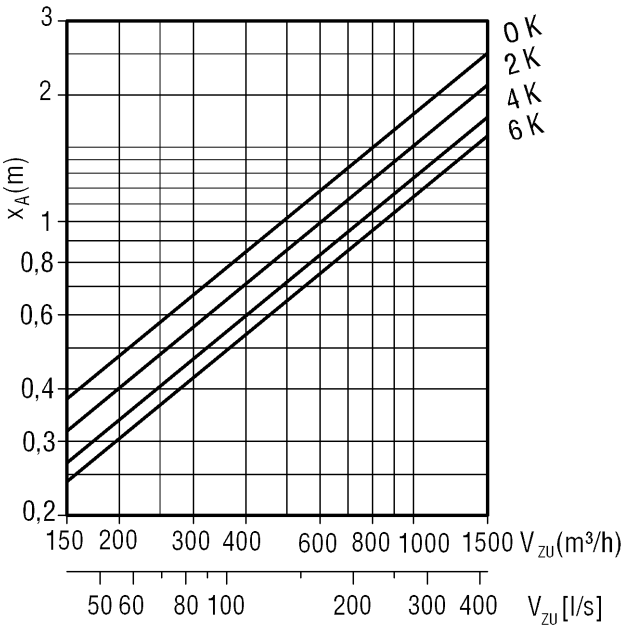
x_A distance = 1.27 m

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



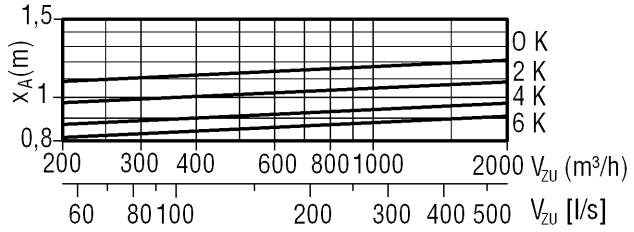
Mounting height (m)	2,5	3,0	3,5	4,0	4,5	5,0
Correction factor	1,0	1,19	1,29	1,42	1,56	1,70

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



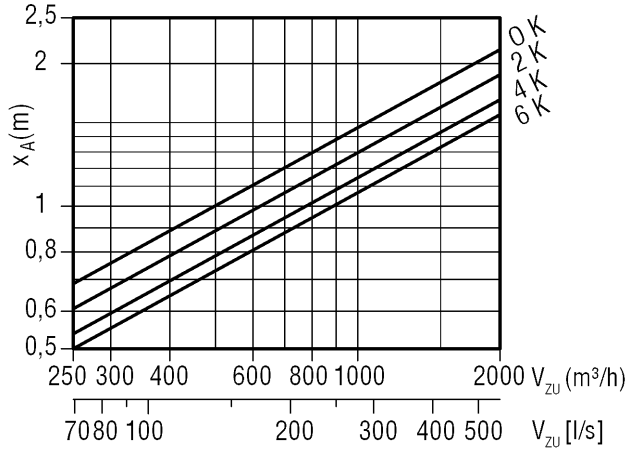
Mounting height (m)	2,5	3,0	3,5	4,0	4,5	5,0
Correction factor	1,0	1,13	1,26	1,38	1,54	1,67

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



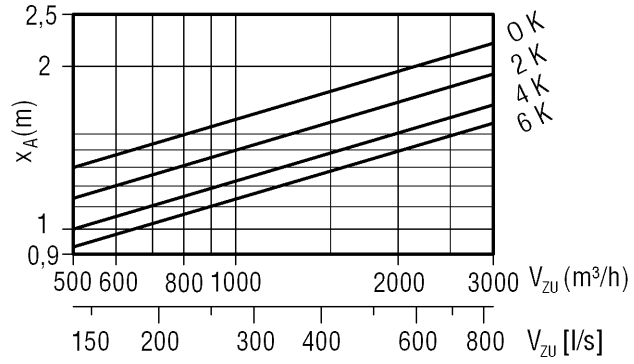
Mounting height (m)	2,5	3,0	3,5	4,0	4,5	5,0
Correction factor	1,0	1,13	1,27	1,38	1,55	1,67

DAV-...-Z-...-600-...



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}	(m^3/h)	=	Supply air volume
V_{ZU}	[l/s]	=	Supply air volume
V_{AB}	(m^3/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/m^3)	=	Density
x	(m)	=	horizontal jet path
y	(m)	=	Vertical throw
x+y	(m)	=	Horizontal + vertical throw
v_{max}	(m/s)	=	Maximum end velocity of jet ($v_{max} = v_{medium}$)
v_{medium}	(m/s)	=	Average end velocity of jet
y_H	(m)	=	Maximum penetration in heating mode
ΔT_O	(K)	=	Temperature difference between supply air temperature and room temperature ($\Delta T_O = t_{ZU} - t_R$)
t_{ZU}	(°C)	=	Supply air temperature
t_R	(°C)	=	Room temperature
TV	(-)	=	Temperature ratio ($TV = \Delta T_X / \Delta T_O$)
i	(-)	=	Induction ratio ($i = V_X / V_{ZU}$)
NW	(mm)	=	Nominal width = perforation
ΔT_X	(K)	=	Temperature difference at point x
V_X	(m^3/h)	=	Total air jet volume at point x
V_X	[l/s]	=	Total air jet volume at point x
x_A	(m)	=	Half the distance to the diffuser
EH		=	Mounting height
AD		=	Propagation diameter

ORDER CODE DAV

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

07	08	09
Perforation	Mounting	Ball-impact guard
-500	-VM	-BO

Sample

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

Ceiling swirl diffuser type DAV I square faceplate I supply air I NW 500 I faceplate made of sheet steel I faceplate painted to RAL9010 I NW 500 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 - Faceplate size

310 = NW 310
400 = NW 400
500 = NW 500
600 = NW 600
625 = NW 625
800 = NW 800

Note: If the faceplate is larger than the perforation, only concealed mounting is possible. The faceplate can never be smaller than the perforation!

05 - Material

SB = Sheet steel

06 – Paint

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

07 - Perforation

310 = NW 310 (standard for faceplate size 310)
400 = NW 400 (standard for faceplate size 400)
500 = NW 500 (standard for faceplate size 500)
600 = NW 600 (standard for faceplate size 600 and 625)
800 = NW 800 (standard for faceplate size 800)

08 - Mounting

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

09 – Ball-impact guard

B0 = without ball-impact guard (standard)
BS = with ball-impact guard, painted to the same colour as the faceplate (for -Q model only)

ORDER CODE SK

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

08	09	10	11	12	13	14	15
Damper	Rubber lip seal	Volumetric flow meter	ROB version	Insulation	Height of box	Spigot diameter	Spigot position
-DK2	-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 I square design with round diffuser mount I air diffuser DAV I supply air I NW500 I with concealed support I galvanised sheet steel I with damper with cable I with rubber lip seal I with volumetric flow meter I without ROB version 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 = NW 310
400 = NW 400
500 = NW 500
600 = NW 600
625 = NW 625
800 = NW 800

06 - Fastening

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

07 - Material

SV = Galvanised sheet steel (standard)

08 - Damper

DK0 = Without damper (standard)
DK1 = With damper
DK2 = With damper + 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

13 – Height of box

KHS = Height of plenum box standard
xxx = height of 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 = Spigot diameter standard
xxx = Spigot diameter in mm

15 – 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

SPECIFICATION TEXTS

Square ceiling displacement diffuser for use in supply and return air installations in 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-...**
- Screw mounting (-SM), only for model with ball-impact guard (-BS) and standard faceplate size
- Concealed screw mounting (-VS), only for model with ball-impact guard (-BS) and standard faceplate size (only for NW 800)

Round ceiling displacement diffuser for use in supply and return air installations in 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)
  - with volume flow measuring device (-VME1) in connection spigot
  - With rubber lip seal (-GD1) at the connection spigot
  - with thermal insulation
    - internal (-Ii)
    - external (-Ia)
  - Height of 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).