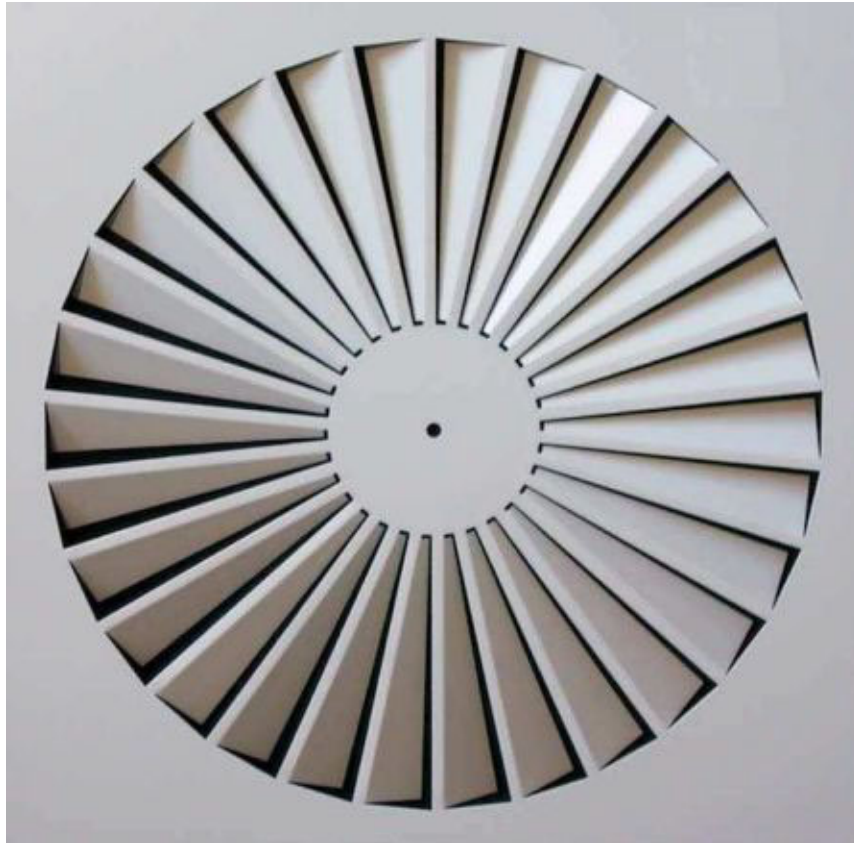




Swirl Diffuser

Model DQF



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Swirl Diffuser DQF

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Swirl Diffuser DQF

Description

The ceiling swirl diffuser type DQF-... has been developed in particular **for comfort rooms with a high air change rate**. The swirl diffuser is made either with a square faceplate (type DQF-Q-...) or a round faceplate (type DQF-R-...) with integrated **air deflection blade**. The diffuser plate achieves a horizontal swirl jet. The diffuser can be used for both **supply and return air installations**.

The swirl diffuser is suitable in particular for installations with variable volumetric flow. A **stable jet pattern** is guaranteed by the high exit velocities. Even at a low volumetric flow the jet does not sink abruptly from the ceiling.

If the "critical throw" x_{kr} (m) parameter is smaller than the "horizontal throw" x (m) parameter for your model, then the calculation for the maximum end velocity of jet V_{max} (m/s) is based on the "critical throw" x_{kr} and not on the "horizontal throw" x (m).

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 $\pm 5\%$ at a spigot velocity of 2-5 m/s and a straight flow pattern of at least $1 \times D$. 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. For plenum boxes SK-R-..., the ceiling diffuser must be removed, before the damper can be adjusted. Alternatively, a cable-operated adjustment can be attached, which allows the damper (-DK2) to be adjusted on the room side even with mounted diffuser.

Attention:

The swirl diffuser type DQF-... must only be fitted with a plenum box type SK-R-11-...

The swirl diffuser type DQF is not suitable for installation in fire protection boxes and particle filter boxes.

Construction

Faceplate

- Sheet steel painted to RAL 9010 (-SB-9010) (white, standard)
- Sheet steel painted to a different RAL colour (-SB-xxxx) (at an extra charge)
- Natural colour anodised aluminium (-AL-ELOX) (E6/EV1, only possible with concealed mounting, at an extra charge) (not available for DQF-R-... model).

Model

- | | |
|---------------|-------------------------|
| DQF-Q-... | - with square faceplate |
| DQF-R-... | - with round faceplate |
| DQF-...-Z-... | - for supply air: |
| DQF-...-A-... | - for return air |

Accessories

Plenum box (SK-R-11-...)

- for round air diffusers with round diffuser support
- Housing made of galvanised sheet steel (-SV), with fixing lugs.
- Model:
 - for supply air (-Z), with integrated perforated straightener.
 - for return air (-A).
- Fastening swirl diffuser:
 - Screw mounting (-SM) (only for the model with ball-impact guard)
 - Concealed mounting (-VM, standard), additionally with pole brace made of aluminium and pole brace holder made of plastic.
- Height of plenum box standard (-KHS) or freely selectable (-xxx, in mm) (minimum height = spigot diameter + 137 mm, but at least 235 mm) (For SK-R-11-Z-...-DK1/-DK2-...-S0, observe special height of plenum box (see p. 6))
- Spigot diameter: standard (-SDS) or freely selectable (-xxx, in mm).
- Spigot position:
 - 1 spigot from above (-S0)
 - 1 lateral spigot (-S1) (standard)
 - 2 lateral spigots, offset by 90° (-S2)
 - 2 lateral spigots, offset by 180° (-S3)
 - 2 spigots arranged next to each other (-S5)

Damper (-DK1 / -DK2), for SK-R-...

- Model:
 - without cable-operated adjustment (-DK1)
 - with cable-operated adjustment (-DK2, at an extra charge)
- Throttle damper made of galvanised sheet steel
- Damper fastening made of plastic

Volumetric flow meter (-VME1), for SK-... (not for use with a damper)

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

Rubber lip seal (-GD1), for SK-...

- at the connection spigot.
- Special rubber

Thermal insulation (-li / -la), for SK-R-...

- internal (-li), inside the plenum box
- external (-la), at the outside of the plenum box

Ball-impact guard (-BS)

- only possible for DQF-Q-... with SM mounting.
- made of steel with high-quality powder coating, painted to the same colour as the faceplate (RAL 9010 [white], other RAL colours possible at an extra charge) (only possible for screw mounting).

Swirl Diffuser DQF

Fastening

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

- for model with ball-impact guard only (-BS)
- with 4 raised countersunk head tapping screws (on-site)

Concealed mounting (-VM, as standard)

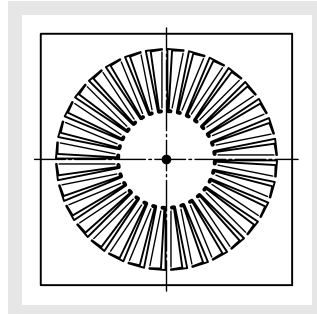
- only possible in connection with plenum box type SK-R-11-...
- Traverse fixing by a M6 screw according to DIN EN ISO 10642 for mounting at the plenum box.

Models and dimensions

Models

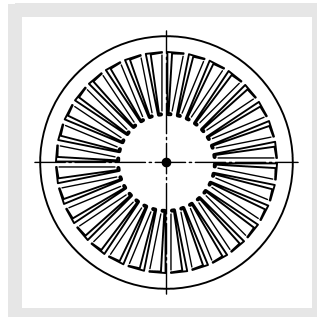
Square faceplate

DQF-Q-...



round faceplate

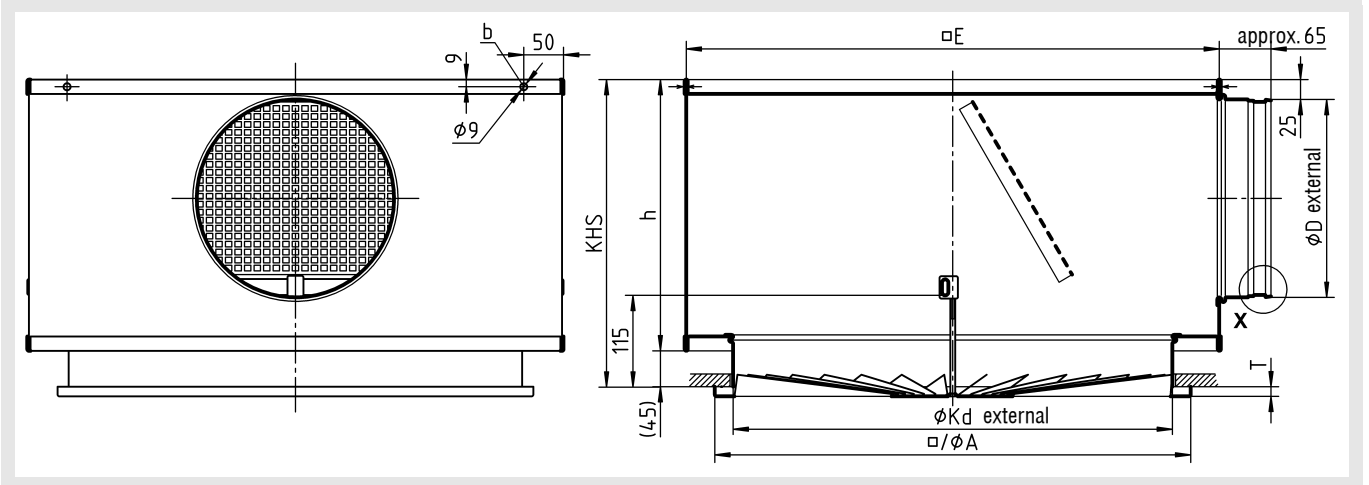
DQF-R-...



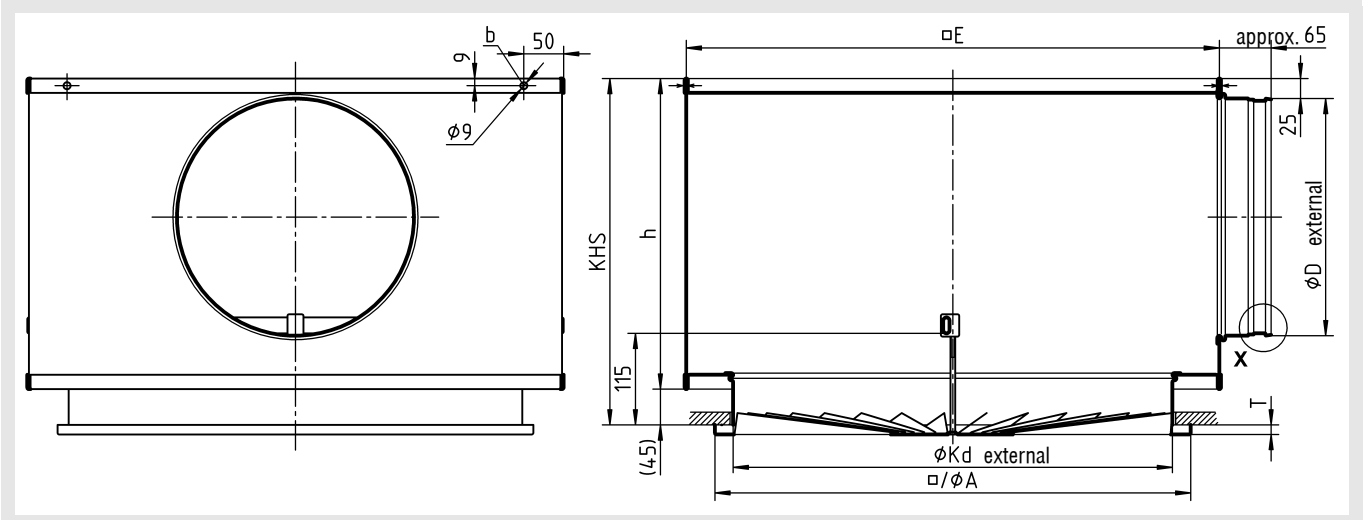
Swirl Diffuser DQF

Dimensions

DQF-...-Z-... with SK-R-11-Z-... (for supply air, with concealed mounting)



DQF-...-A-... with SK-R-11-A-... (for return air, with concealed mounting)

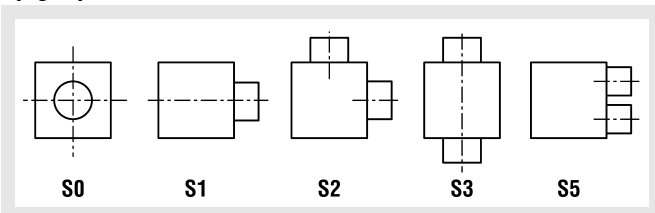


b = suspension on-site

Available sizes

NW	DQF-Q-...		DQF-R-...		SK-R-11-Z-... (supply air)					SK-R-11-A-... (return air)					ϕD _{max} for ...-S5
	□A	T	ϕA	T	□E	ϕKd	KHS	h	ϕD	□E	ϕKd	KHS	h	ϕD	
310	308	7	310	7	405	283	295	250	158	405	283	335	290	198	158
400	398	12	400		445	353	295	250	158	445	353	335	290	198	178
500	498		500		545	453	335	290	198	545	453	385	340	248	198
600	598		600		670	553	385	340	248	670	553	435	390	298	298
625	623		625		670	553	385	340	248	670	553	435	390	298	298

Spigot position



KHS= standard height of plenum box

Special height of plenum box = $\phi D + 137$ mm, but at least 235 mm

Note: For SK-R-11-Z-...-DK1/-DK2-...-S0, the height of plenum box changes to $h=280$ mm for NW300 and NW400 and to $h=300$ mm for NW500 (see p. 6)

Dimension of plenum box SK-... for spigot position S0 / S2 / S3 / S5 on request.

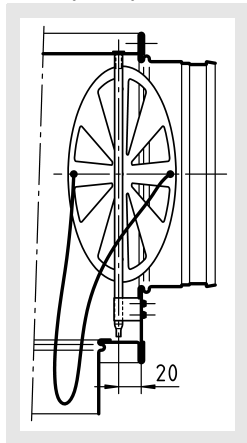
Swirl Diffuser DQF

See page 6 for detail X.

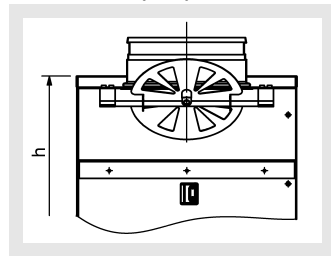
Dimensions of accessories

(at an extra charge)

Damper (-DK1) with Cable-operated adjustment (-DK2)



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

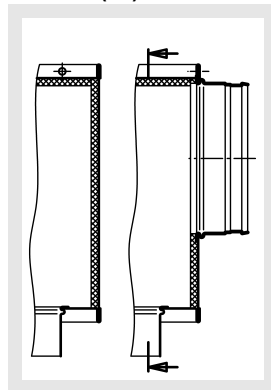


For the model with spigot from above (-S0) in combination with damper (-DK1 / -DK2), the height of plenum box h changes for the following NW as follows.

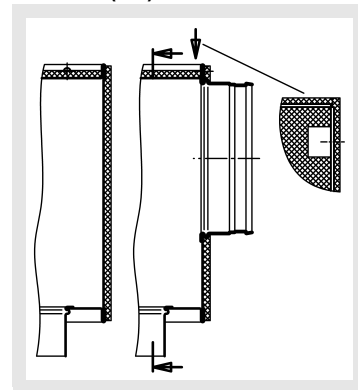
NW	SK-R-11-Z...		
	KHS	h	$\varnothing D$
310	325	280	158
400	325	280	158
500	345	300	198

Thermal insulation, for SK-R-...

internal (-li)

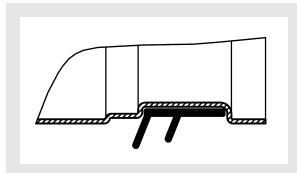


external (-la)



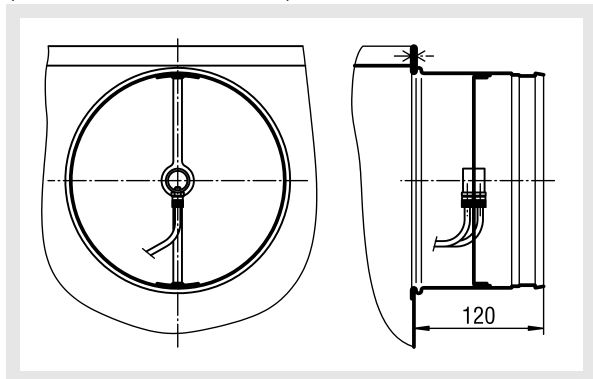
Rubber lip seal (-GD1), for SK-...

Detail X



Volumetric flow meter (-VME1), for SK-...

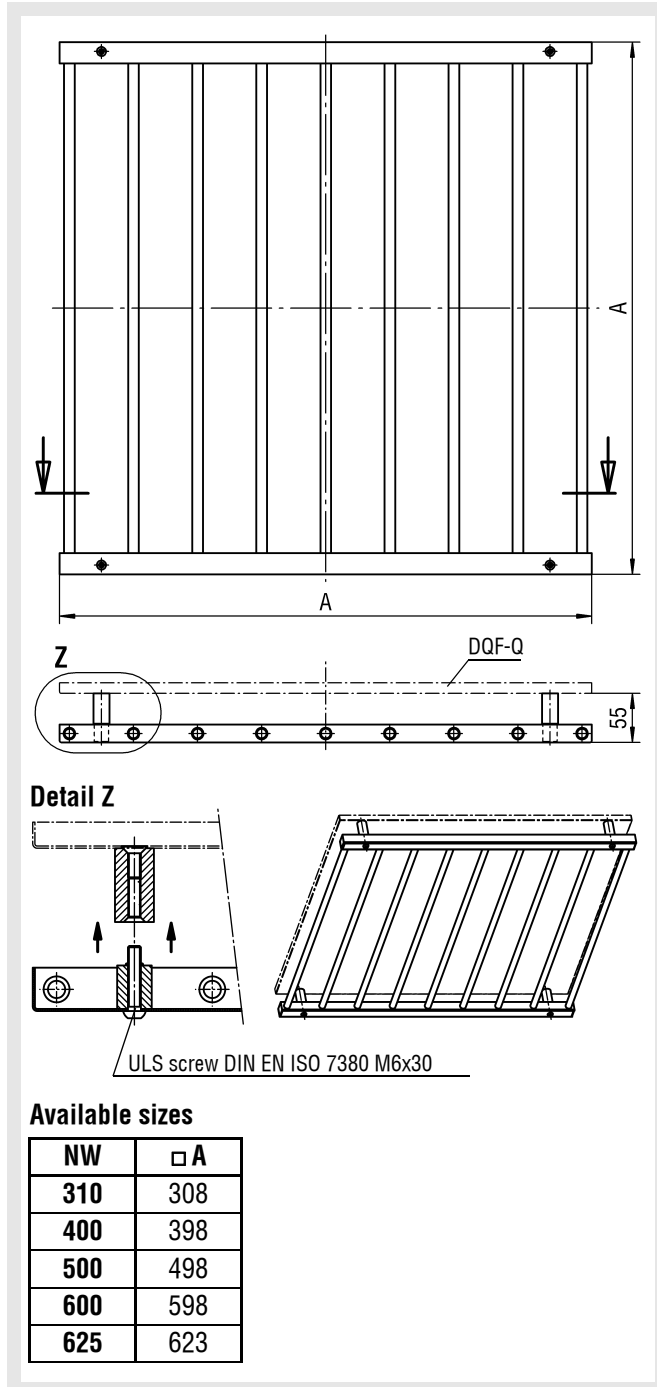
(not for use with a damper)



Swirl Diffuser DQF

Ball-impact guard (-BS)

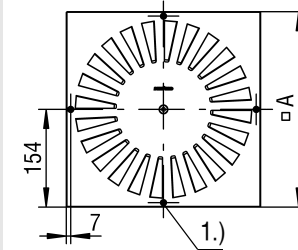
(only possible for DQF-Q-... with SM mounting)



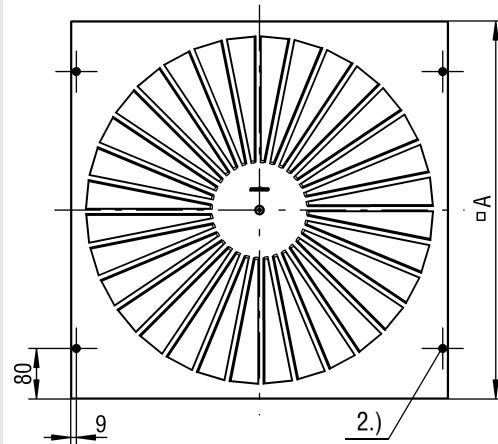
Fastening methods

Screw mounting (-SM) (DQF-Q-... only)
for model with ball-impact guard only

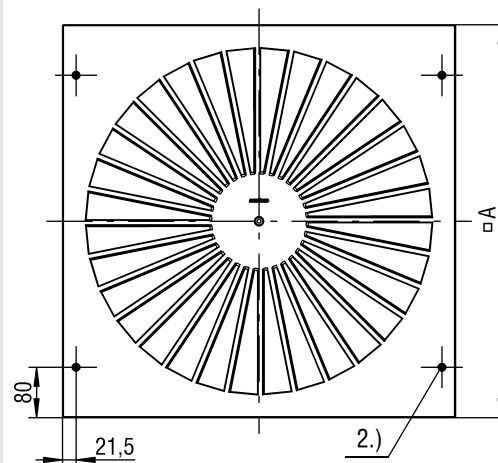
NW 310



NW 400-600



NW 625



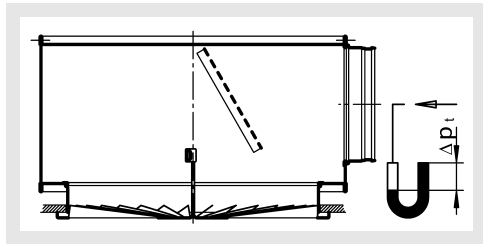
1.) Indentation for slotted shallow-raised countersunk-head tapping screw DIN ISO 7051 pitch 3.9 (screws provided on site)

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

Swirl Diffuser DQF

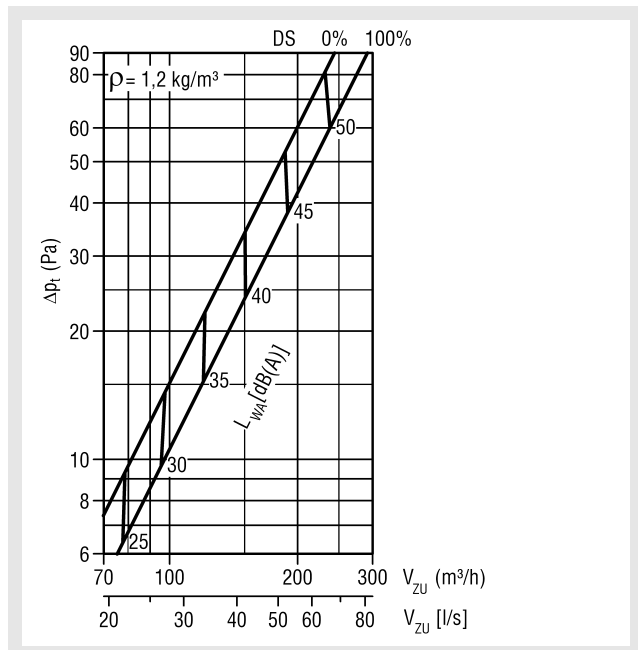
Technical data

Pressure loss and noise level (supply air), with plenum box

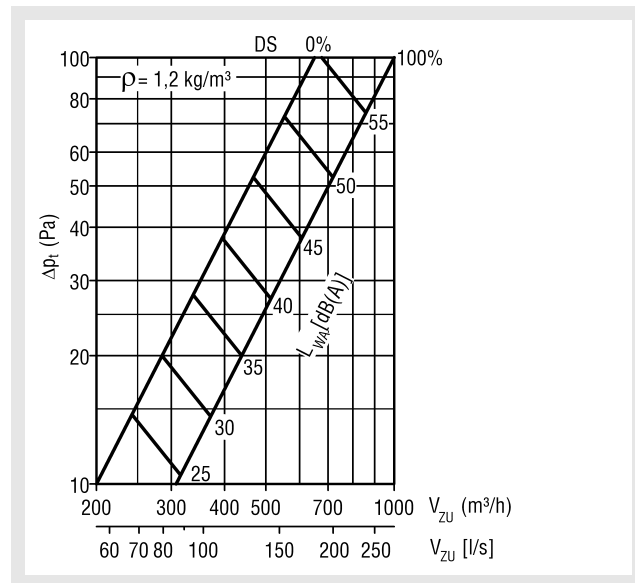


Damper position (DS):
0% = CLOSED / 100% = OPEN

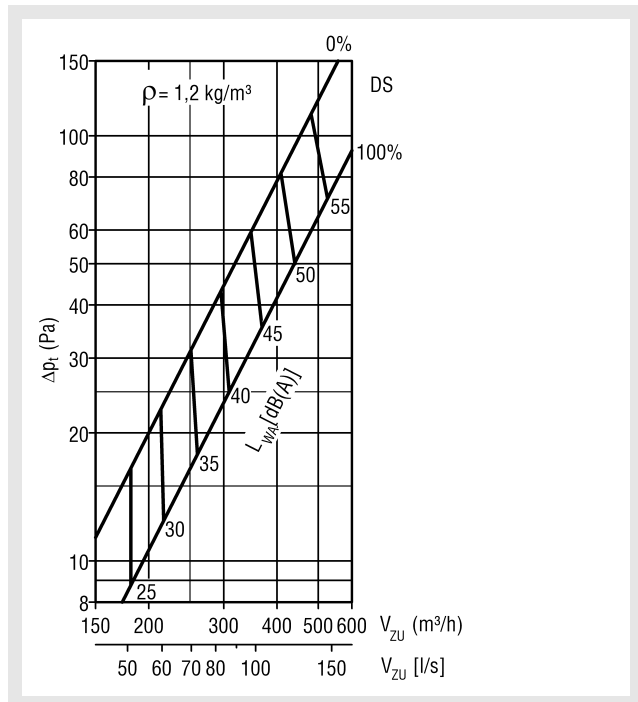
DQF-...-Z-310-... with SK-R-11-Z-...



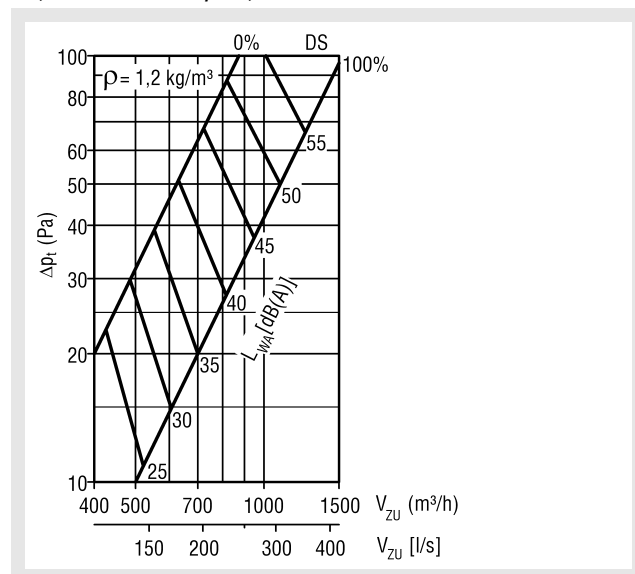
DQF-...-Z-500-... with SK-R-11-Z-...



DQF-...-Z-400-... with SK-R-11-Z-...

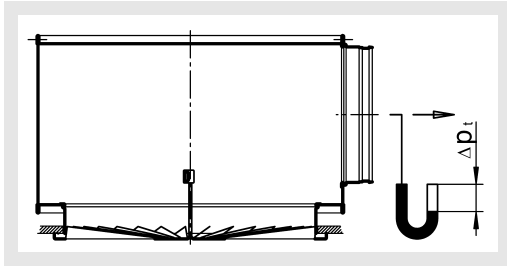


DQF-...-Z-600-... / DQF-...-Z-625-... with SK-R-11-Z-...



Swirl Diffuser DQF

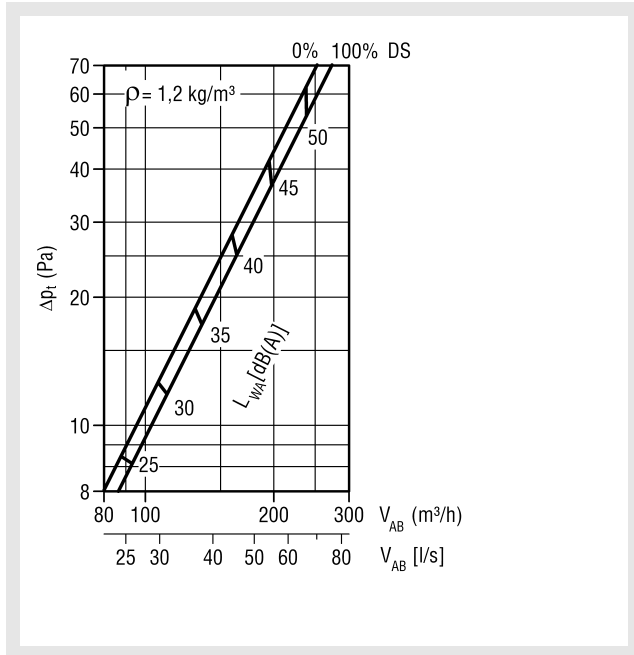
(return air) with plenum box and damper



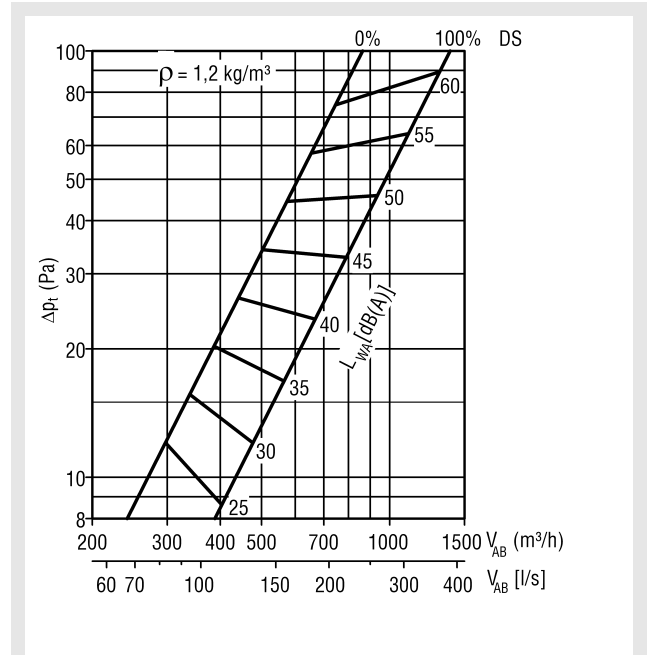
Damper position (DS):

0% = CLOSED / 100% = OPEN

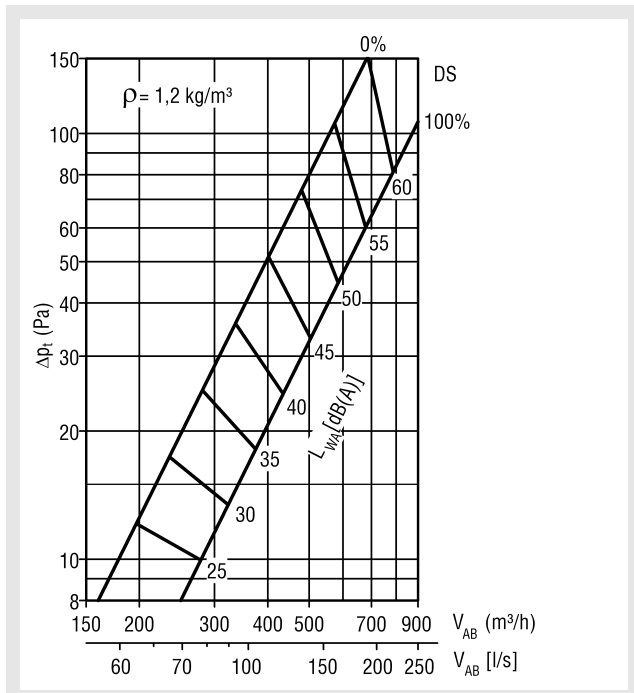
DQF-...-A-310-... with SK-R-11-A-...



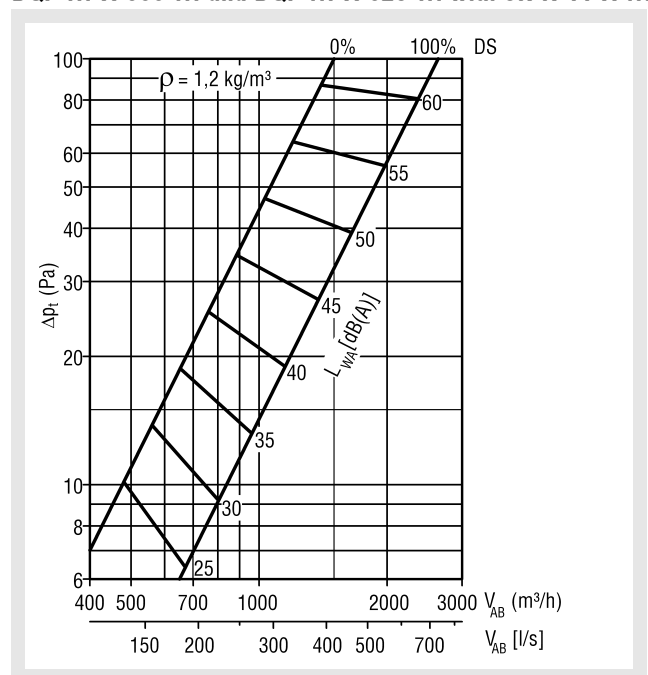
DQF-...-A-500-... with SK-R-11-A-...



DQF-...-A-400-... with SK-R-11-A-...

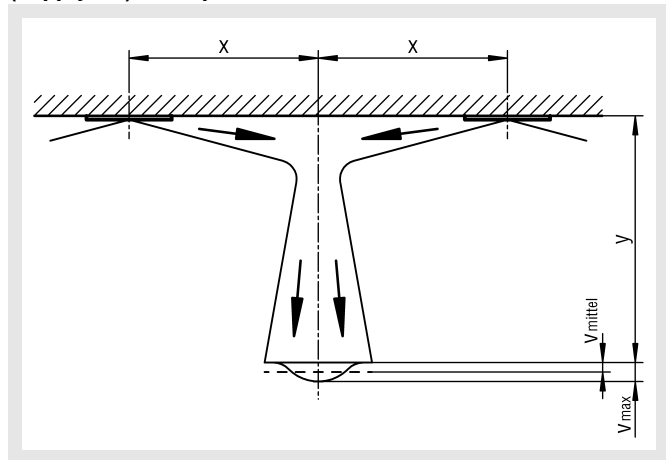


DQF-...-A-600-... and DQF-...-A-625-... with SK-R-11-A-...

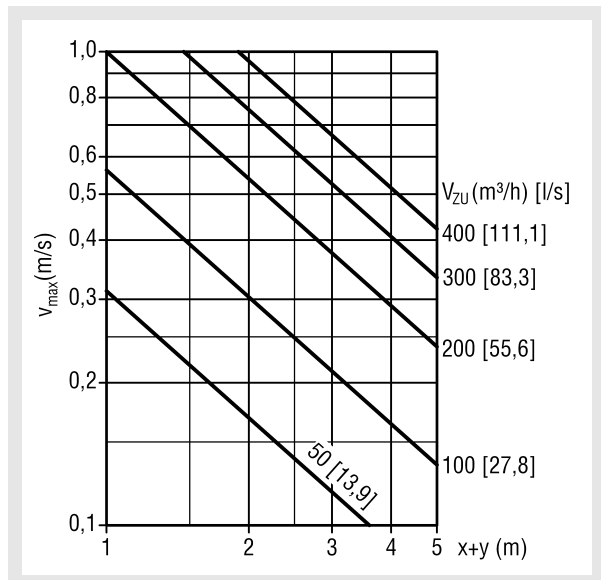


Swirl Diffuser DQF

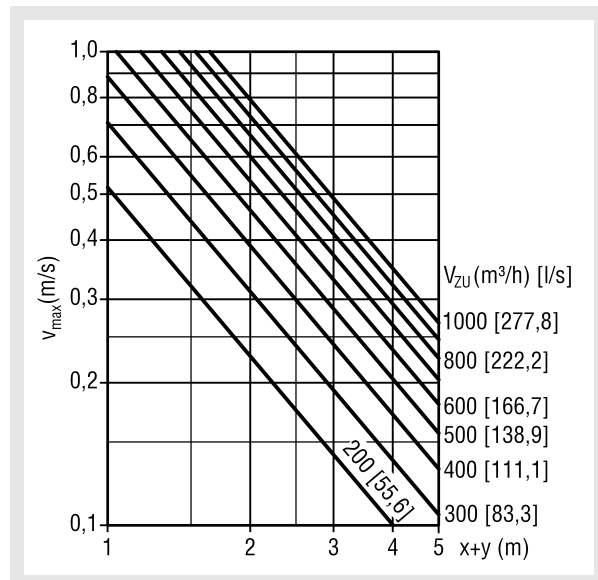
Maximum end velocity of jet
(supply air), with plenum box



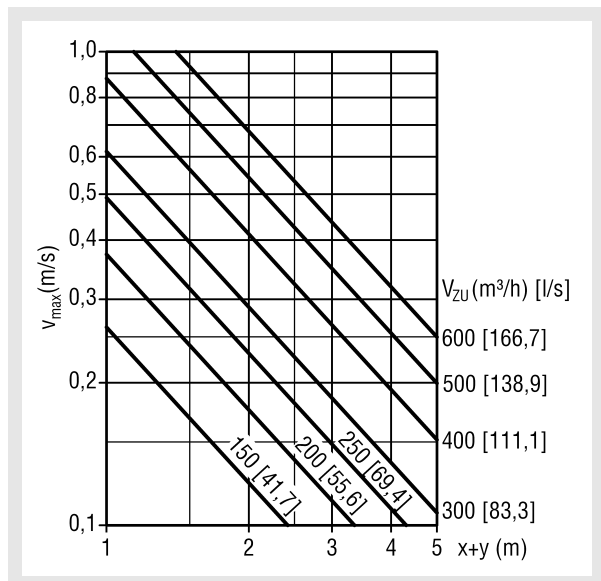
DQF-...-Z-310-...



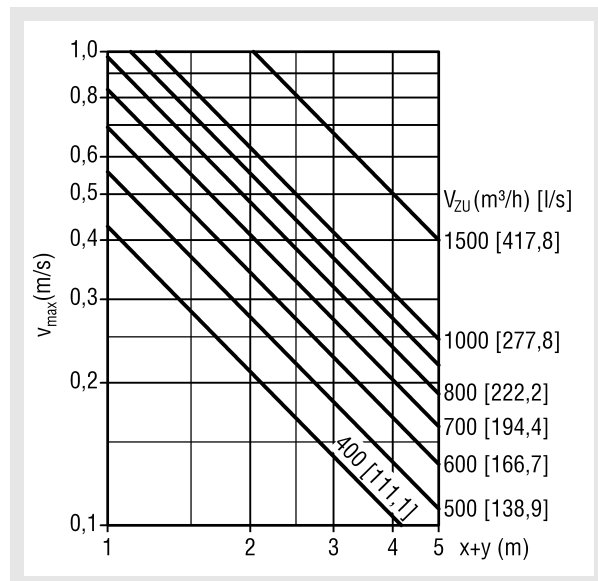
DQF-...-Z-500-...



DQF-...-Z-400-...

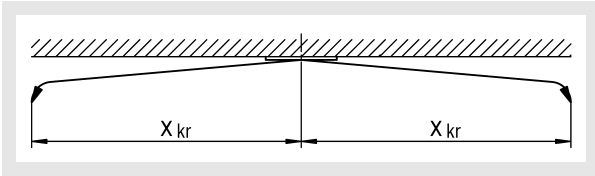


DQF-...-Z-600-... and DQF-...-Z-625-...

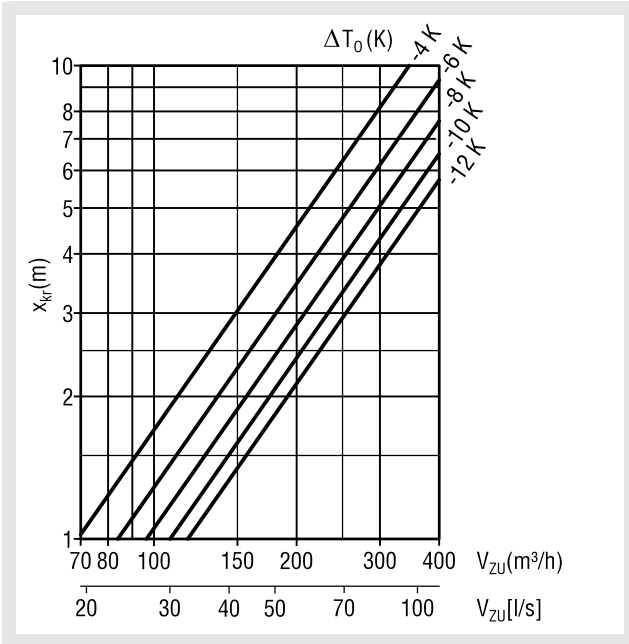


Swirl Diffuser DQF

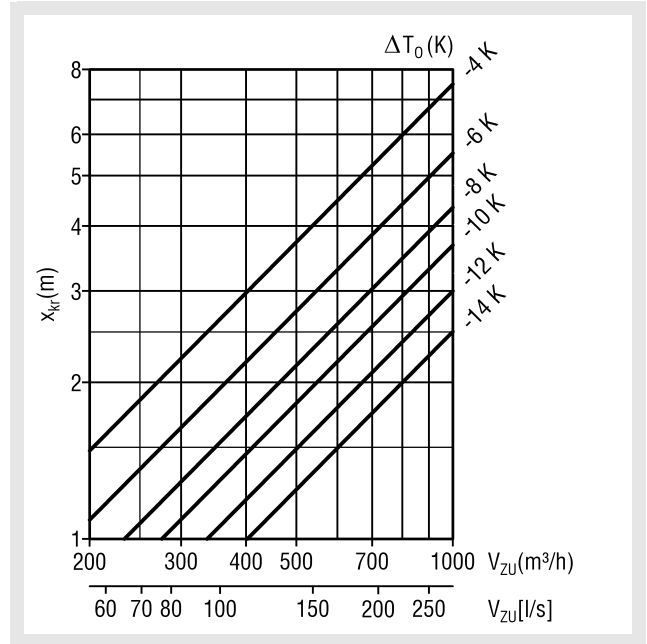
Critical throw



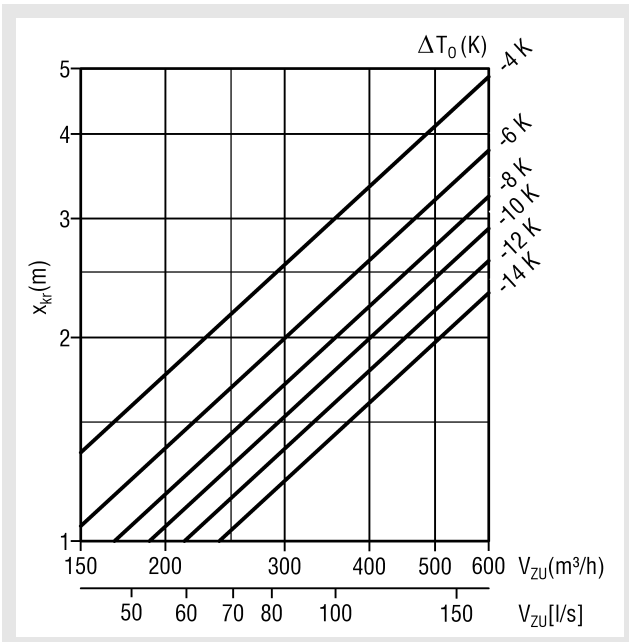
DQF-...-Z-310-...



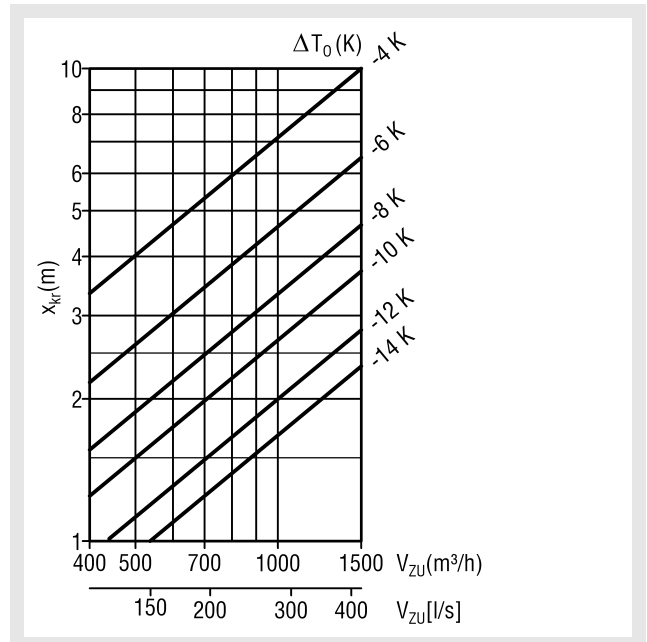
DQF-...-Z-500-...



DQF-...-Z-400-...

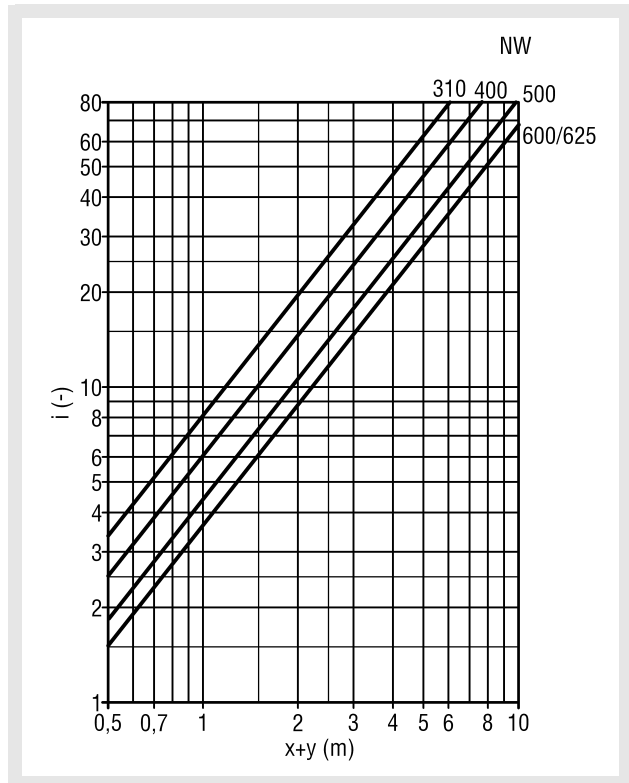


DQF-...-Z-600-... and DQF-...-Z-625-...



Swirl Diffuser DQF

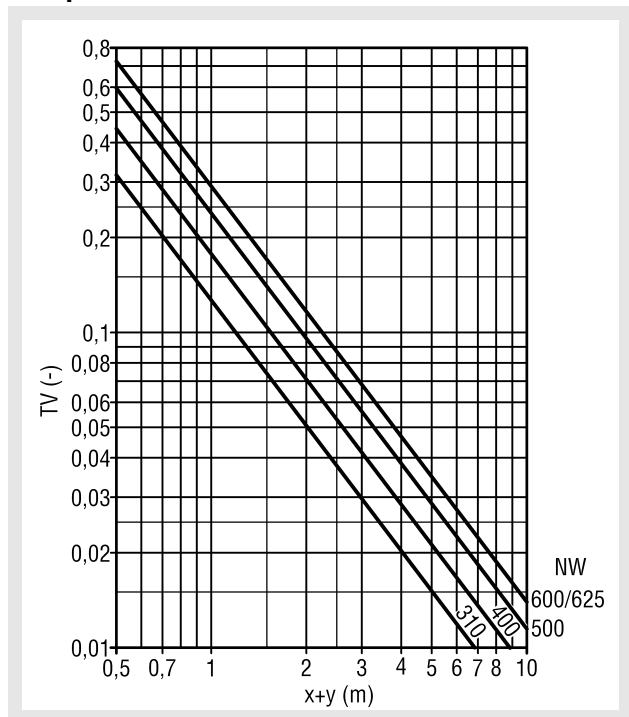
Induction ratio



Legend

V_{ZU}	(m ³ /h)	= Supply air volume
V_{ZU}	[l/s]	= Supply air volume
Δp_t	(Pa)	= Pressure loss
L_{WA}	[dB(A)]	= A-weighted sound power level
ρ	(kg/m ³)	= Density
v_{max}	(m/s)	= Maximum end velocity of jet
v_{mittel}	(m/s)	= Average end velocity of jet
		$v_{mittel} = v_{max} \times 0.5$
$x+y$	(m)	= horizontal + vertical throw
ΔT_0	(K)	= Temperature difference between supply air temperature and room temperature ($\Delta T_0 = t_{ZU} - t_R$)
x_{kr}	(m)	= Critical throw
TV	(-)	= Temperature ratio ($TV = \Delta T_x / \Delta T_0$)
i	(-)	= Induction ratio ($i = V_x / V_{ZU}$)
NW	(-)	= Nominal width
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
t_{zu}	(°C)	= Supply air temperature
t_R	(°C)	= Room temperature

Temperature ratio



Swirl Diffuser DQF

Order details DQF

01	02	03	04	05	06	07	08
Type	Model	Air throw	Nominal size	Material	Paint	Mounting	Ball-impact guard
Example							
DQF	-Q	-Z	-500	-SB	-9010	-VM	-B0

Sample

DQF-Q-Z-500-SB-9010-VM-B0

Ceiling swirl diffuser type DQF | square faceplate | supply air | NW500 | faceplate made of sheet steel | faceplate painted to RAL9010 | concealed mounting | without ball-impact guard

Order details

01 - Type

DQF = ceiling swirl 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

05 - Material

SB = Sheet steel

AL = Aluminium (only available with VM)

06- Paint

9010 = RAL colour white (standard)

xxxx = RAL colour can be freely selected

ELOX = Natural colour anodised (only for AL)

07 - Mounting

VM = concealed mounting (standard, only possible with plenum box)

SM = screw mounting (only DQF-Q-... and only possible for model with ball-impact guard)

08 – Ball-impact guard

B0 = without ball-impact guard (standard)

BS = With ball-impact guard, painted same as faceplate (only for DQF-Q-...)

Swirl Diffuser DQF

Order details 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	-11	-Z	-500	-VM	-SV	-DK2

09	10	11	12	13	14	15
Rubber lip seal	Volumetric flow meter	ROB version	Insulation	Height of plenum box	Spigot diameter	Spigot position
-GD1	-VME1	-ROB0	-I0	-KHS	-SDS	-S1

Sample

SK-R-11-Z-500-VM-SV-DK2-GD1-VME1-ROB0-I0-KHS-SDS-S1

Plenum box, square design I for round air diffusers I air diffuser DQF I supply air I NW500 I 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 I

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)

11 = suitable for DQF-...

04 - Type of air

Z = Supply air (with integrated perforated straightener)

A = Return air (inside painted to black, RAL 9005)

05 - Nominal size

310 = NW310

400 = NW400

500 = NW500

600 = NW600

625 = NW625

06 - Fastening

VM = Concealed mounting (standard)

SM = Screw mounting (only for the model 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 volume flow measuring device

11 - ROB version

ROB0 = Without ROB version (standard)

12 - Insulation

I0 = without insulation (standard)

Ii = with box insulation inside

Ia = With box insulation outside

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-11-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 = 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

Swirl Diffuser DQF

Specification texts

Ceiling swirl diffuser type **DQF-Q-...** for square supply and return air models. Especially suitable for use in comfort rooms with a high air change rate and for VAV installations with variable volumetric flows (between 40 and 100%). Consisting of square faceplate made of sheet steel, with integrated fixed air deflection blades. For use up to -14 K. Sophisticated design allows easy cleaning to VDI 6022.

Product: SCHAKO **type DQF-Q-...**

- with round faceplate.

Product: SCHAKO **type DQF-R-...**

Air throw:

- Supply air (-Z)
- Return air (-A)

Nominal size:

- NW310 (-310)
- NW400 (-400)
- NW500 (-500)
- NW600 (-600)
- NW625 (-625)

Material:

- Sheet steel painted with a high-quality powder coating to the RAL colour 9010 (-SB-9010, white) (standard)
- Sheet steel painted with a high-quality powder, RAL colour can be freely selected (-SB-xxxx).
- Natural colour anodised aluminium E6/EV1 (-AL-ELOX) (only possible with concealed mounting) (not available for DQF-R model).

Mounting:

- Concealed mounting (-VM) (standard for -AL model, only in combination with SK-..., not possible with ball-impact guard)
- Screw mounting (-SM) (only possible for DQF-Q and for model with ball-impact guard)

Accessories:

- Plenum box (SK-R-11-...) made of galvanised sheet steel, for round air diffusers with round diffuser support, with fixing lugs (only available in conjunction with concealed mounting).
 - Model:
 - for supply air (-Z), with integrated perforated straightener.
 - for return air (-A)
 - Fastening:
 - Screw mounting (-SM) (only for the model with ball-impact guard)
 - Concealed mounting (-VM, standard), additionally with pole brace made of aluminium and pole brace holder made of plastic.
 - Height of plenum box standard (-KHS) or freely selectable (-xxx, in mm) (minimum height = spigot diameter + 137 mm, but at least 235 mm) (For SK-R-11-Z-...-DK1/-DK2-...-S0, observe special height of plenum box (see p. 6))
 - Spigot diameter: standard (-SDS) or freely selectable (-xxx, in mm).
 - Spigot position:
 - Spigot from above (-S0)
 - 1 lateral spigot (-S1) (standard)
 - 2 lateral spigots, offset by 90° (-S2)
 - 2 lateral spigots, offset by 180° (-S3)
 - 2 spigots arranged next to each other (-S5)
 - with damper (-DK1/-DK2) in plenum box, adjustable from below, for simple air volume regulation without dismantling the faceplate.
 - with damper without cable-operated adjustment (-DK1)
 - with damper with cable-operated adjustment (-DK2)
 - with rubber lip seal (-GD1), at the connection spigot made of special rubber
 - with volumetric flow meter (-VME1). (not for use with a damper)
 - with thermal insulation:
 - internal (-li), inside the plenum box
 - external (-la), at the outside of the plenum box
- Ball-impact guard (-BS), made of steel with high-quality powder coating, painted to the same colour as the faceplate (RAL 9010 [white], other RAL colours possible at an extra charge) (only possible for DQF-Q-... with screw mounting).