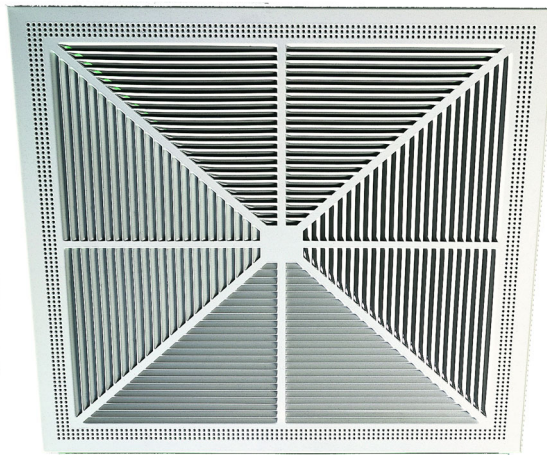




# Ceiling diffuser

## DQDL



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## Ceiling diffuser DQDL

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## Ceiling diffuser DQDL

### Description

The ceiling diffuser type DQDL is suitable for installation in supply or return air systems. Because of its **horizontal air throw pattern**, it can be used for isothermal and cooling applications. The air is blown horizontally into the room through **fixed blades**. Owing to the perforations in the edge area, **part of the air flow exits as laminar flow**. This laminar flow is also deflected in horizontal direction as a result of the horizontal air jet produced by the blades.

If required, each blade section can be supplied with a cover plate, so that one or more sides can be covered. This allows the air to be blown into the room in 2, 3 or 4 directions.

The plenum box allows the air to be blown uniformly over the entire diffuser area. In the spigot of the plenum box, a volumetric flow meter can be integrated 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-Q-..., the damper can be mounted on the room side with mounted diffuser.

The damper, equalising grid and volume flow measuring device can easily be removed from the plenum type SK-Q-... model for easy cleaning from the room side.

### 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)

### Model

- |           |                         |
|-----------|-------------------------|
| DQDL-...  | - with square faceplate |
| ...-Z-... | - for supply air:       |
| ...-A-... | - for return air        |

### Accessories

#### Plenum box (SK-Q-17-...)

- for square air diffusers
- Housing made of galvanised sheet steel (-SV), with fixing lugs.
- Model:
  - for supply air (-Z), with integrated perforated straightener.
  - for return air (-A), inside painted to RAL 9005 (black).
- Fastening:
  - Screw mounting (-SM, standard)
  - Concealed mounting (-VM), 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 + 102 mm, but at least 200 mm) (For SK-Q-17-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), for SK-...

- Throttle damper made of galvanised sheet steel
- Damper fastening made of plastic

#### Damper (-DK2), for SK-...

- same as -DK1, but with cable-operated adjustment

#### 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

#### ROB version (-ROB1), for SK-...

- Removable perforated diffuser plate, throttle damper and volumetric flow meter

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

- at the connection spigot.
- Special rubber

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

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

#### 1/4 cover plate (-AD)

- For covering blade sections to achieve a selective air throw pattern
- only supply air version possible
- galvanised sheet steel

## Ceiling diffuser DQDL

### Ball-impact guard (-BS)

- only possible with screw mounting (SM).
- 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).

### Fastening

#### Screw mounting (-SM)

- Standard (screws must be provided on-site)
- for model with ball-impact guard

#### Concealed mounting (-VM)

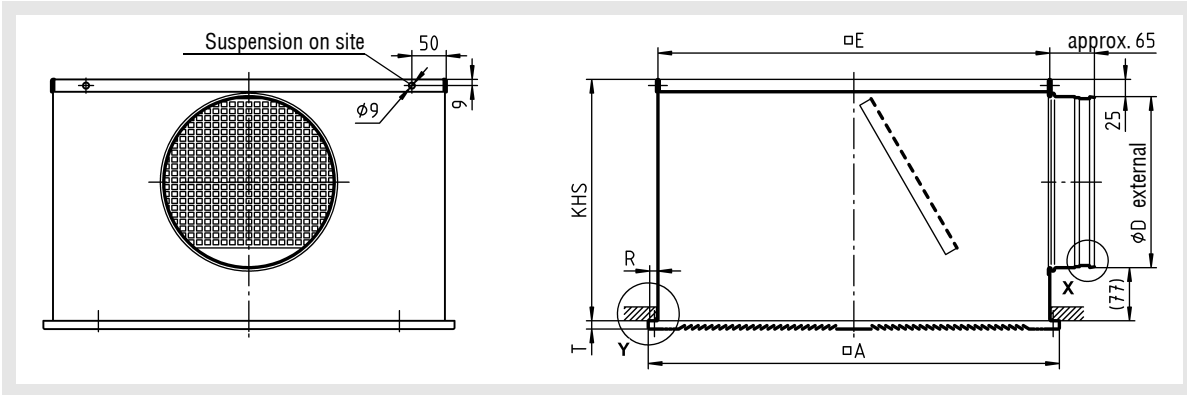
- only available in connection with plenum box type SK-Q-17-... at an extra charge.
- Traverse fixing by a M6 screw according to DIN EN ISO 10642 for mounting at the plenum box.

## Ceiling diffuser DQDL

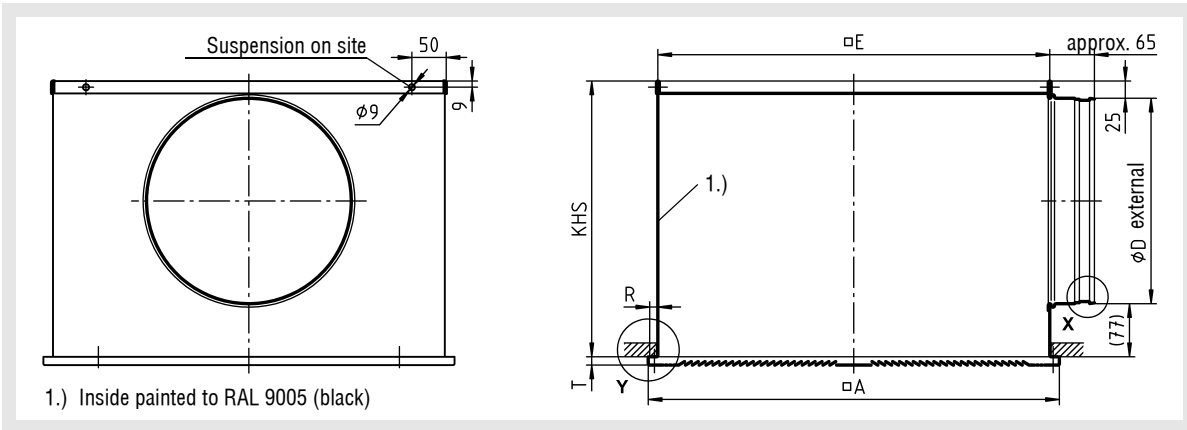
### Models and dimensions

#### Dimensions

DQDL-Z... with SK-Q-17-Z... (for supply air)



DQDL-A... with SK-Q-17-A... (for return air)



1.) Inside painted to RAL 9005 (black)

#### Available sizes

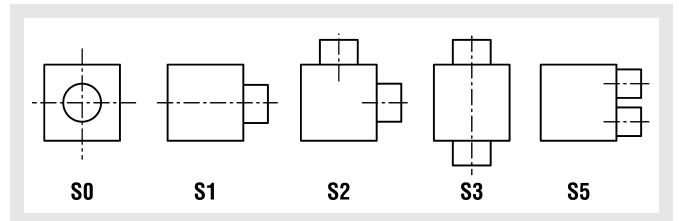
NW	□A	□E	R	T	SK-Q-17-Z... (supply air)		SK-Q-17-A... (return air)		øD <sub>max</sub> for ...-S5
					KHS	øD	KHS	øD	
310	308	290	8	7	260	158	300	198	98
400	398	370	12	12	260	158	300	198	138
500	498	470			300	198	350	248	198
600	598	570			350	248	400	298	248
625	623	570			24	350	248	400	298

KHS= standard height of plenum box

Special height of plenum box = øD + 102mm, but at least 200mm

Note: For SK-Q-17-Z...-DK1/-DK2...-S0, the height of plenum box changes to KHS=280 mm for NW310 and NW400 (see p. 6).

#### Spigot position



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

See page 5 for detail X.

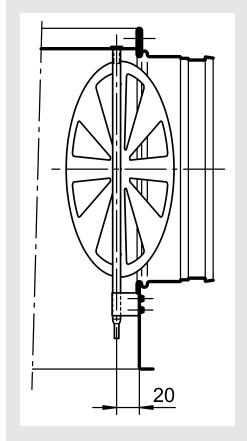
See page 6 for detail Y.

## Ceiling diffuser DQDL

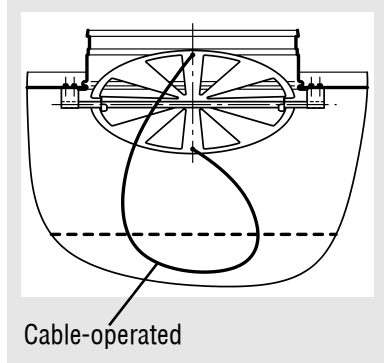
### Accessories - dimensions

(at an extra charge):

#### Damper (-DK1)



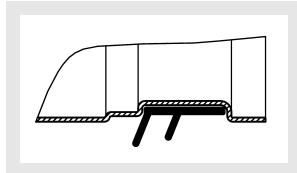
#### Damper with cable-operated adjustment (-DK2) (spigot position -S0)



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

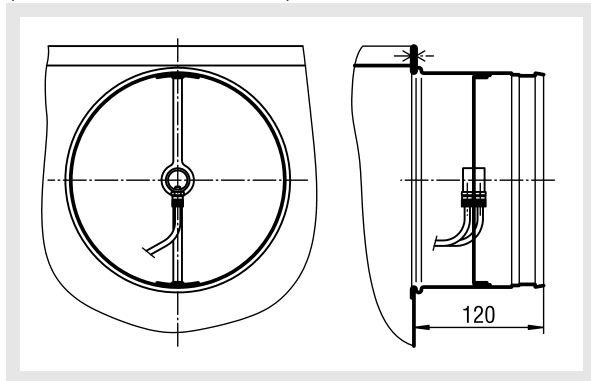
NW	SK-Q-17-Z-...	
	KHS	øD
310	280	158
400	280	158

#### Rubber lip seal (-GD1), for SK-... Detail X

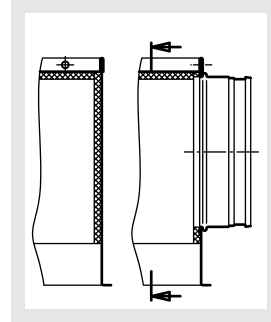


**ROB version (-ROB1)**, for SK-Q-...  
(only possible for SK-Q-17-... plenum box)  
Removable diffuser plate, damper and volumetric flow meter.

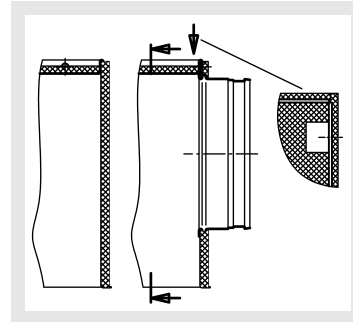
**Volumetric flow meter (-VME1)**, for SK-...  
(not for use with a damper)



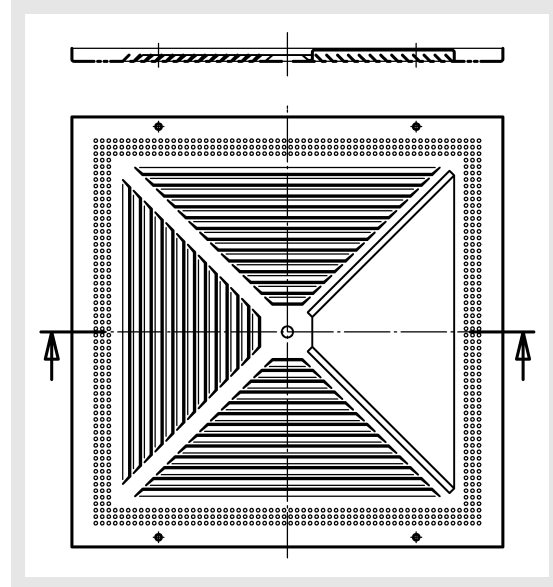
#### Thermal insulation, for SK-Q-... internal (-li)



#### outside(-la)



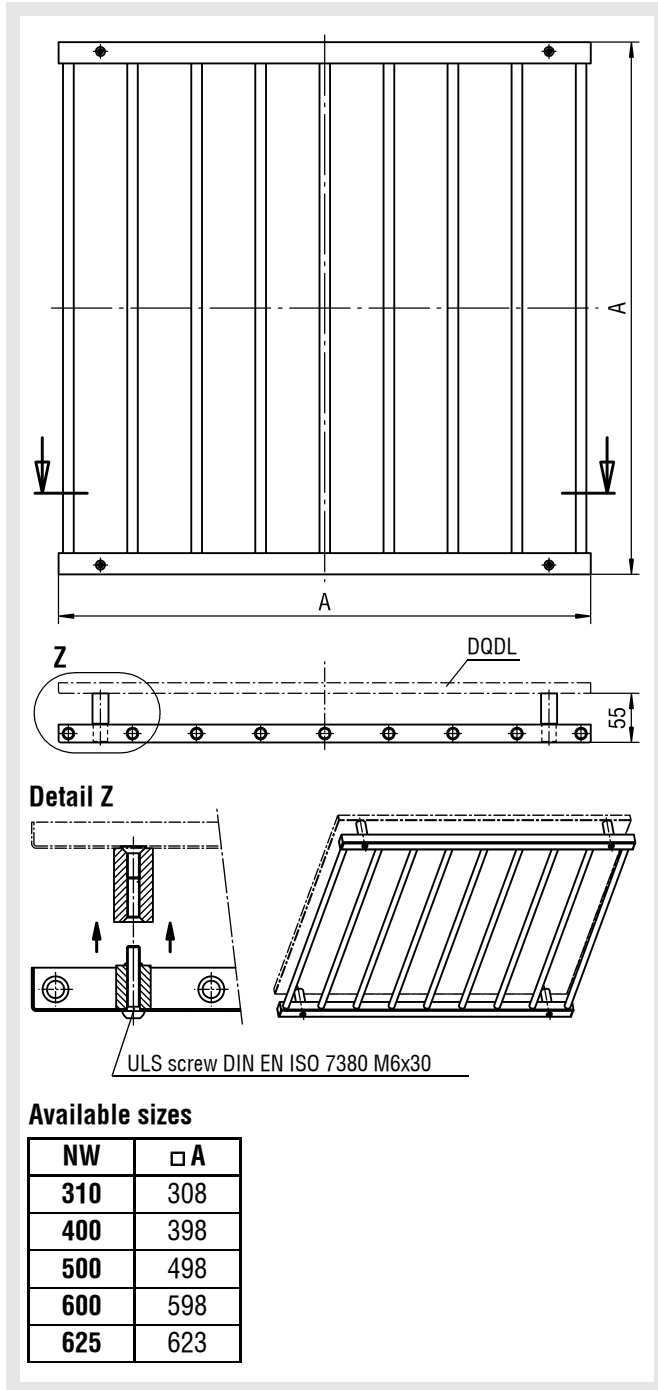
#### 1/4 cover plate (-AD) (only supply air version possible)



## Ceiling diffuser DQDL

### Ball-impact guard (-BS)

(only possible with screw mounting SM)



#### Available sizes

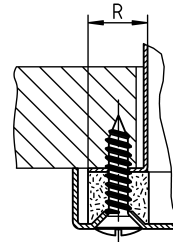
NW	□ A
310	308
400	398
500	498
600	598
625	623

### Fastening methods

#### Screw mounting (-SM)

For screw mounting, the ceiling diffuser is fixed to the plenum box with 4 on-site countersunk screws.

#### Detail Y

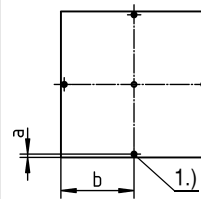


NW	R
310	8
400	12
500	12
600	12
625	24

#### Arrangement of SM mounting

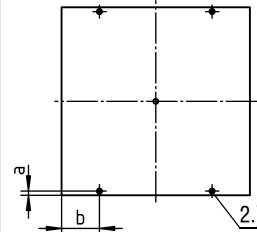
Indentation for slotted shallow-raised countersunk-head tapping screw  
(shown without perforation)

#### DQDL-...-310-...



NW	a	b
310	7	154
400	9	80
500		
600	21,5	
625		

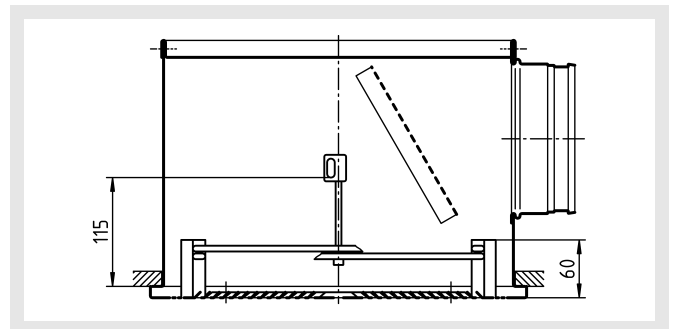
#### DQDL-...-400 to 625-...



- 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)

#### Concealed mounting (-VM)

In concealed mounting (-VM), the ceiling diffuser is fixed to the plenum box with a pole brace and an M6 screw to DIN EN ISO 4762.



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

## Ceiling diffuser DQDL

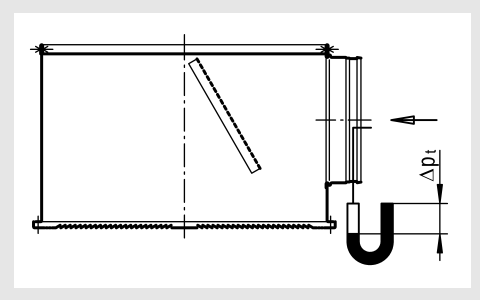
### Technical data

#### Pressure loss and noise level

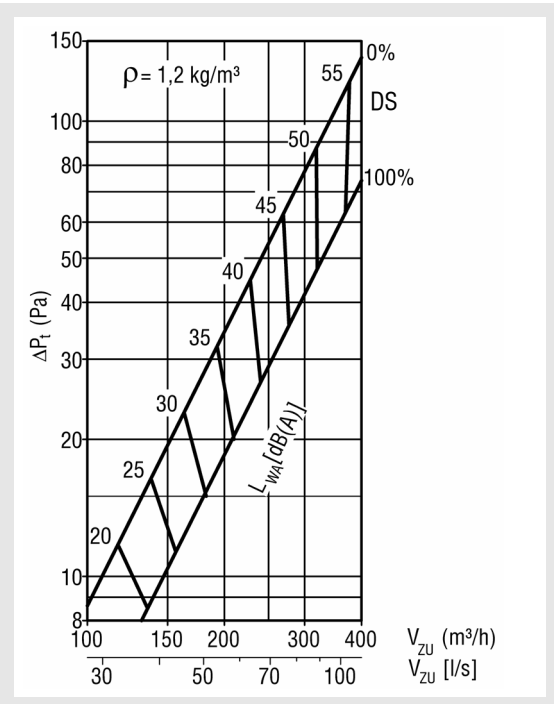
DQDL-Z-... (for supply air)

Damper position (DS):

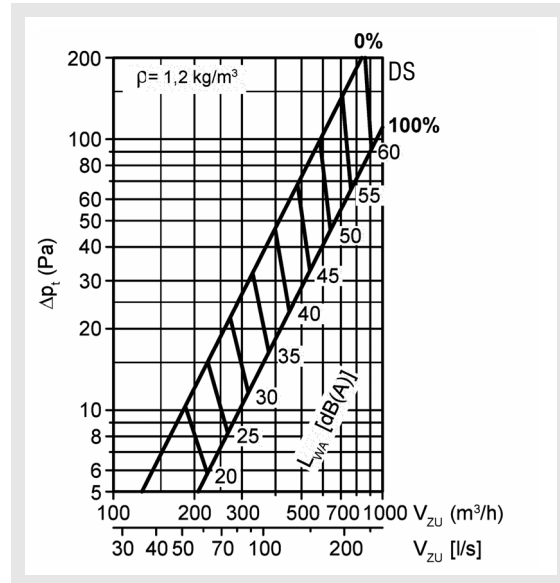
- 0% = Damper CLOSED
- 100% = Damper OPEN



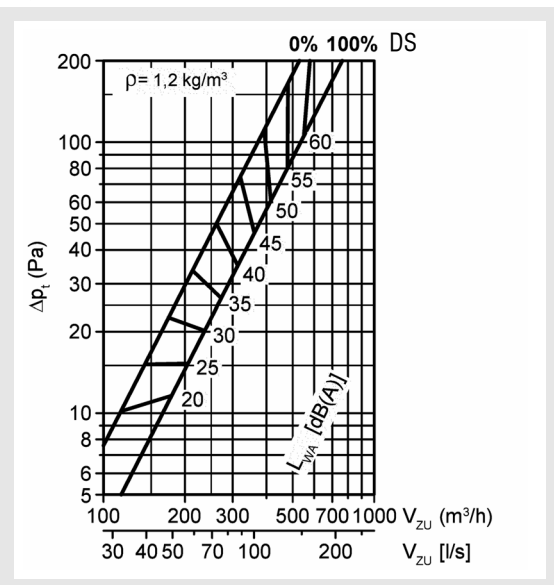
#### DQDL-Z-310-...



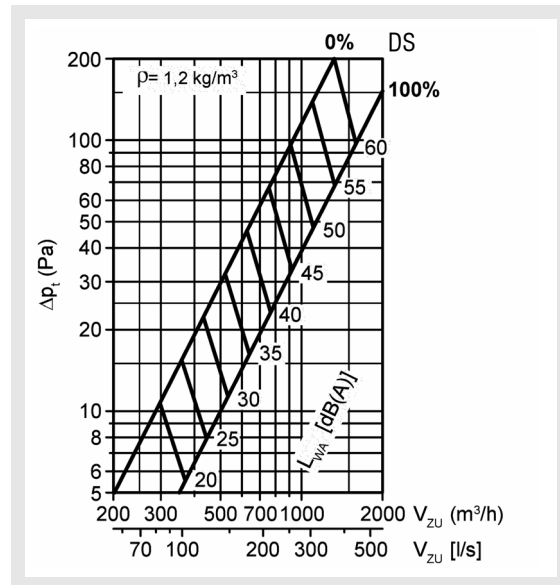
#### DQDL-Z-500-...



#### DQDL-Z-400-...



#### DQDL-Z-600-... / DQDL-Z-625-...

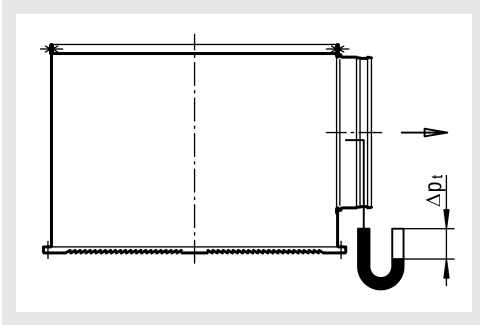




## Ceiling diffuser QDDL

### Pressure loss and noise level

QDDL-A-... (for return air)



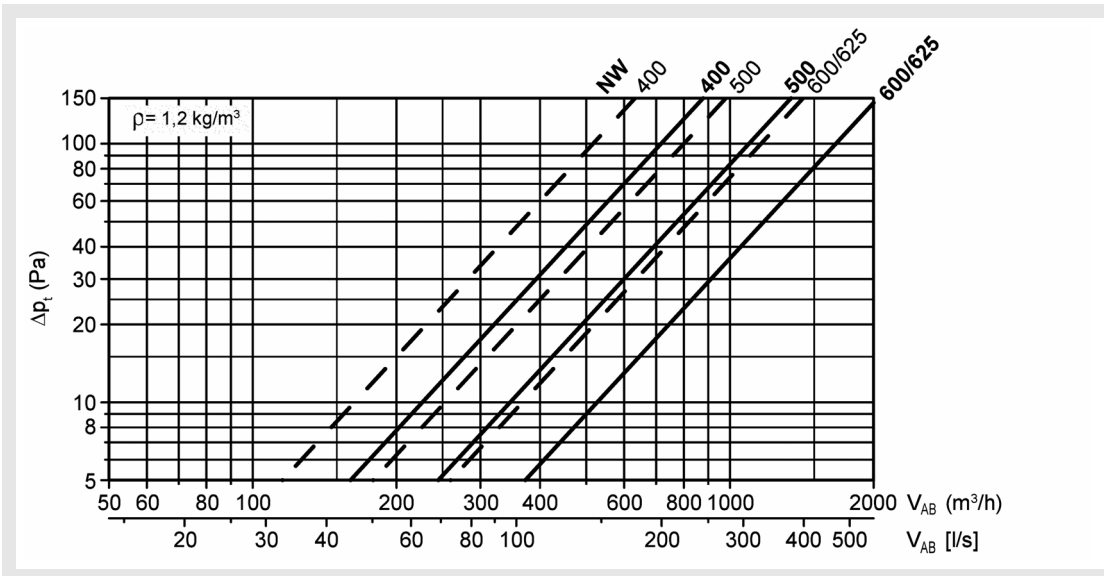
Damper position:

- Damper OPEN
- - - Damper CLOSED

During baffling the noise level is not increased.

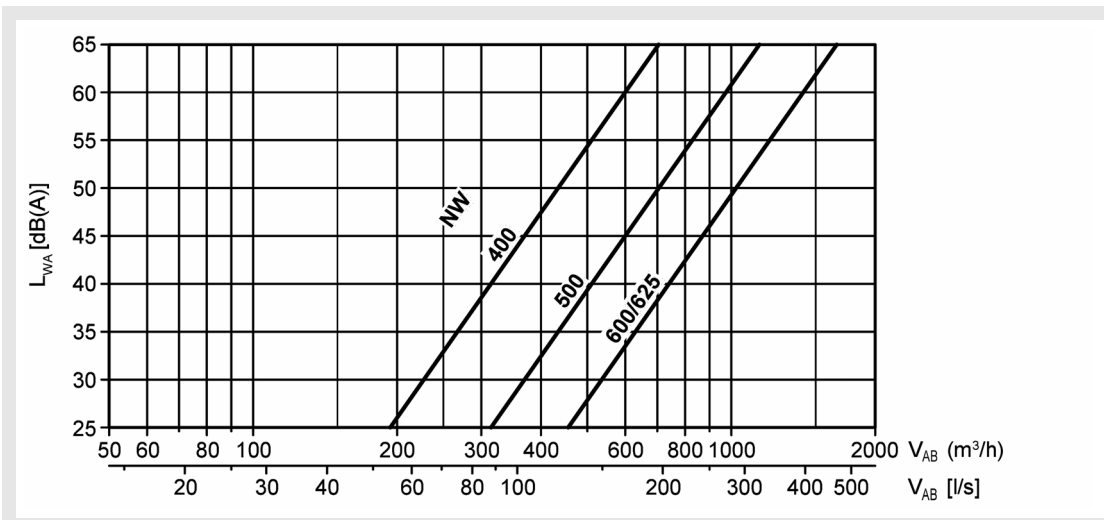
### Pressure loss

QDDL-A-400 to 625-...



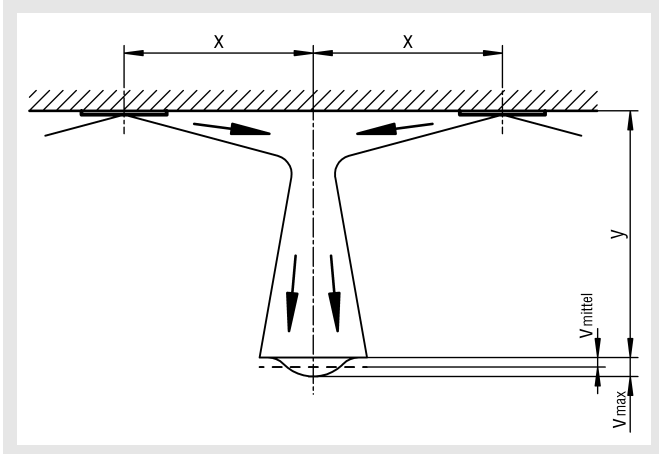
### Sound level

QDDL-A-400 to 625-...

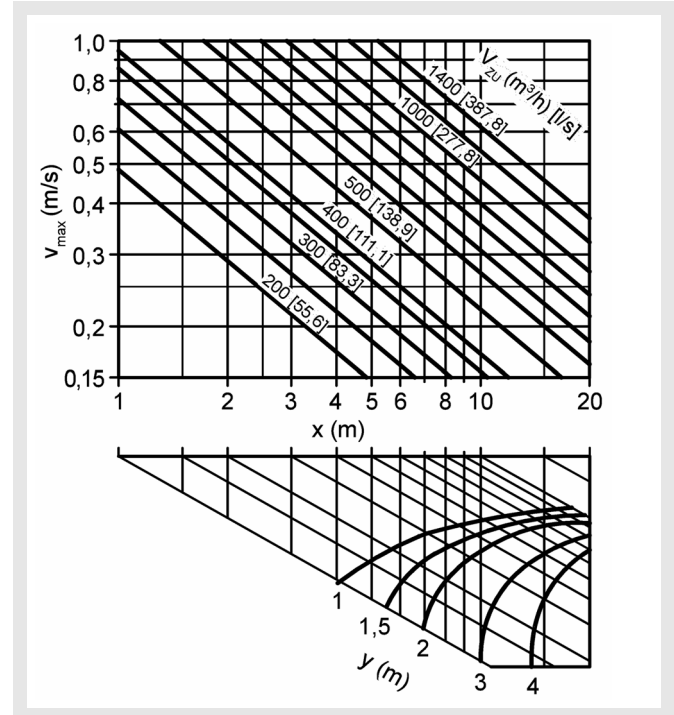


## Ceiling diffuser DQDL

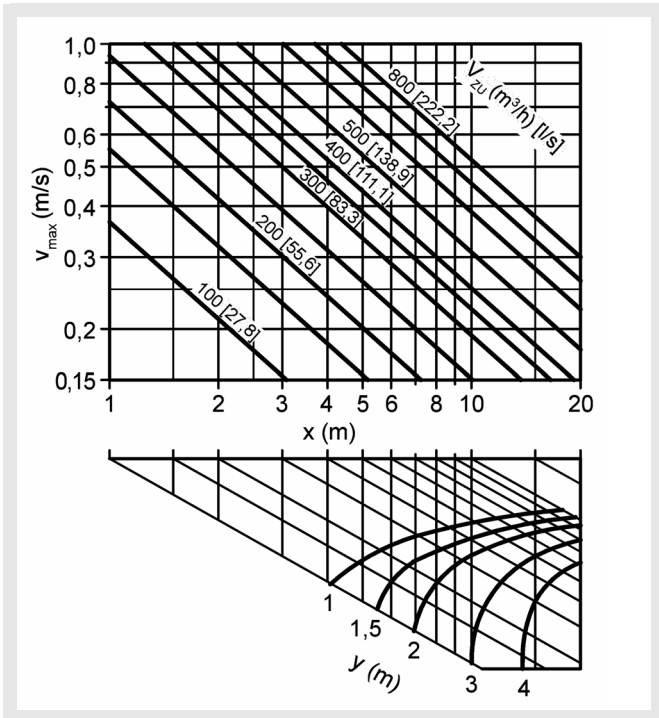
### Maximum end velocity of jet



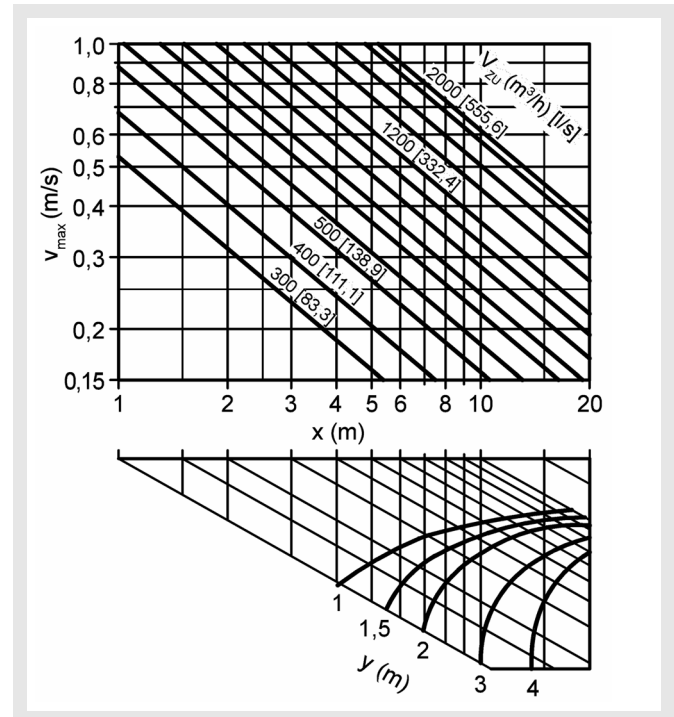
### DQDL-...-500-...



### DQDL-...-400-...

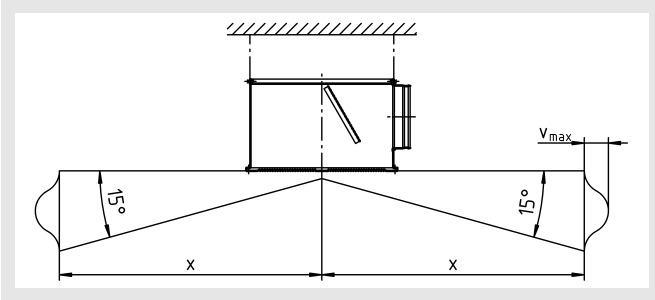


### DQDL-...-600-... / DQDL-...-625-...

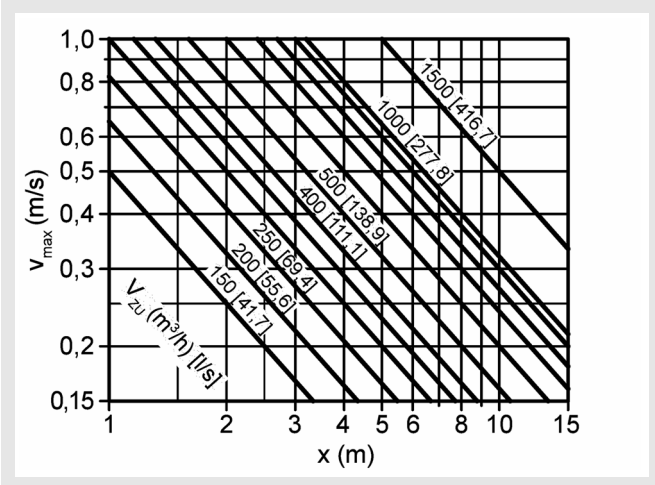


## Ceiling diffuser DQDL

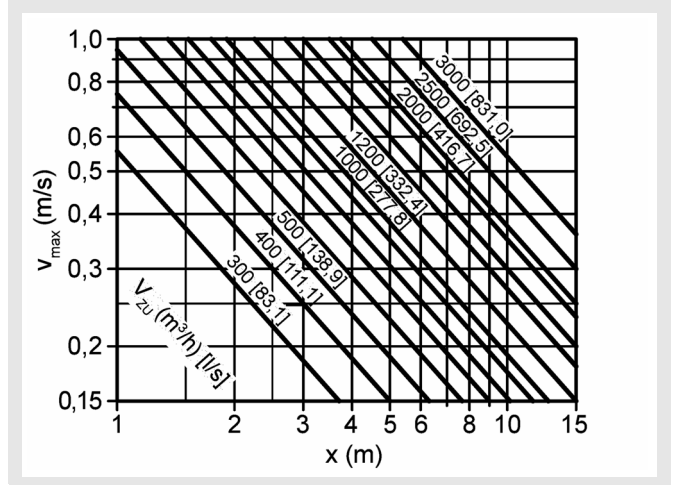
Maximum end velocity of jet  
(suspended)



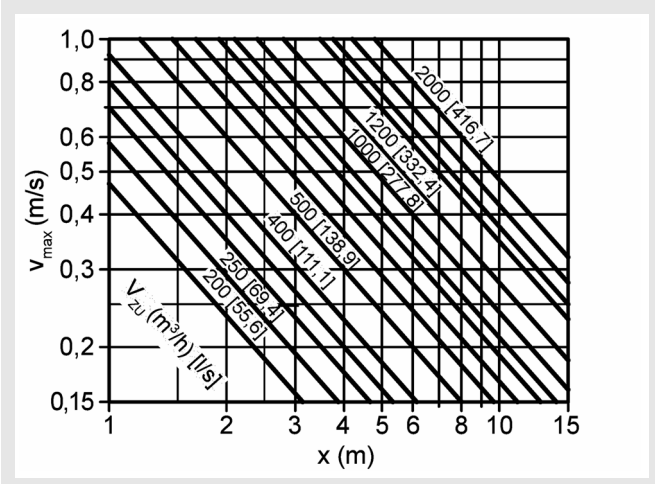
DQDL-...-400-...



DQDL-...-600-... / DQDL-...-625-...



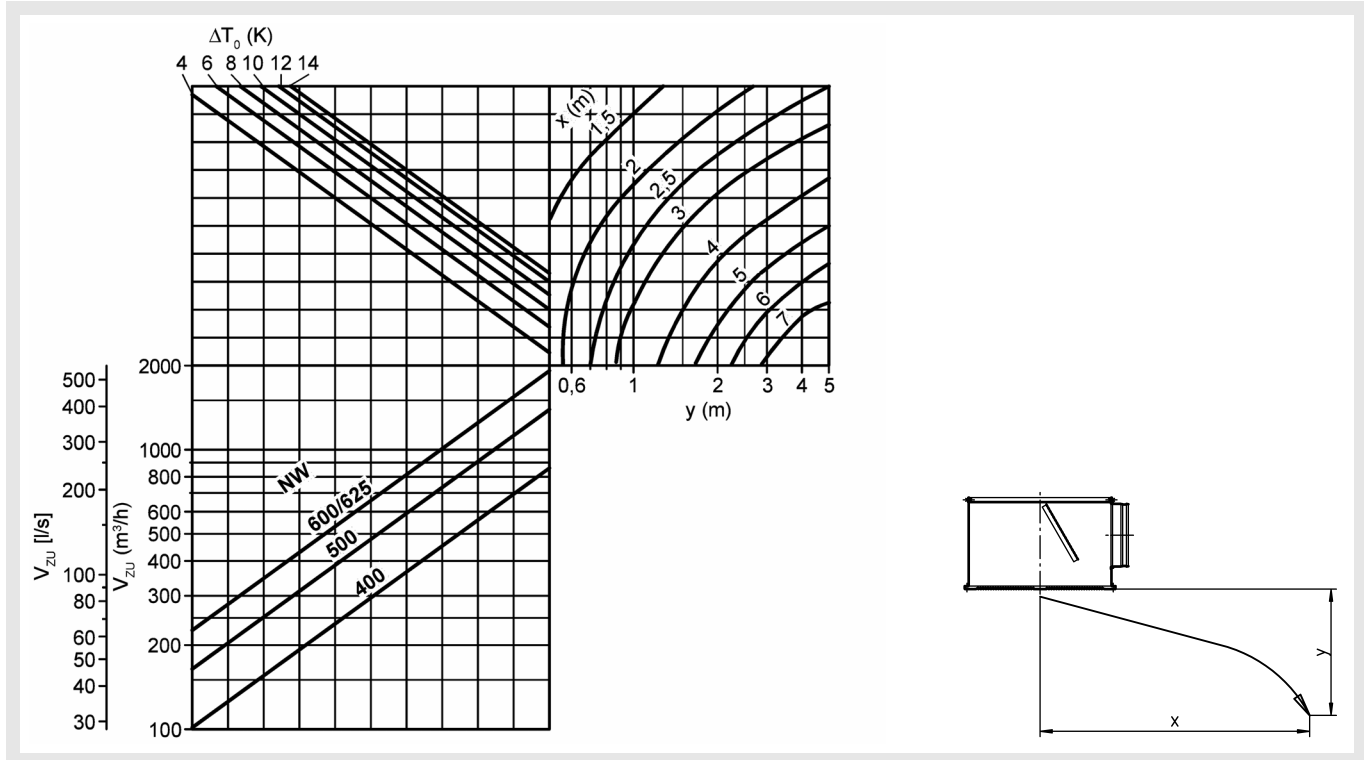
DQDL-...-500-...



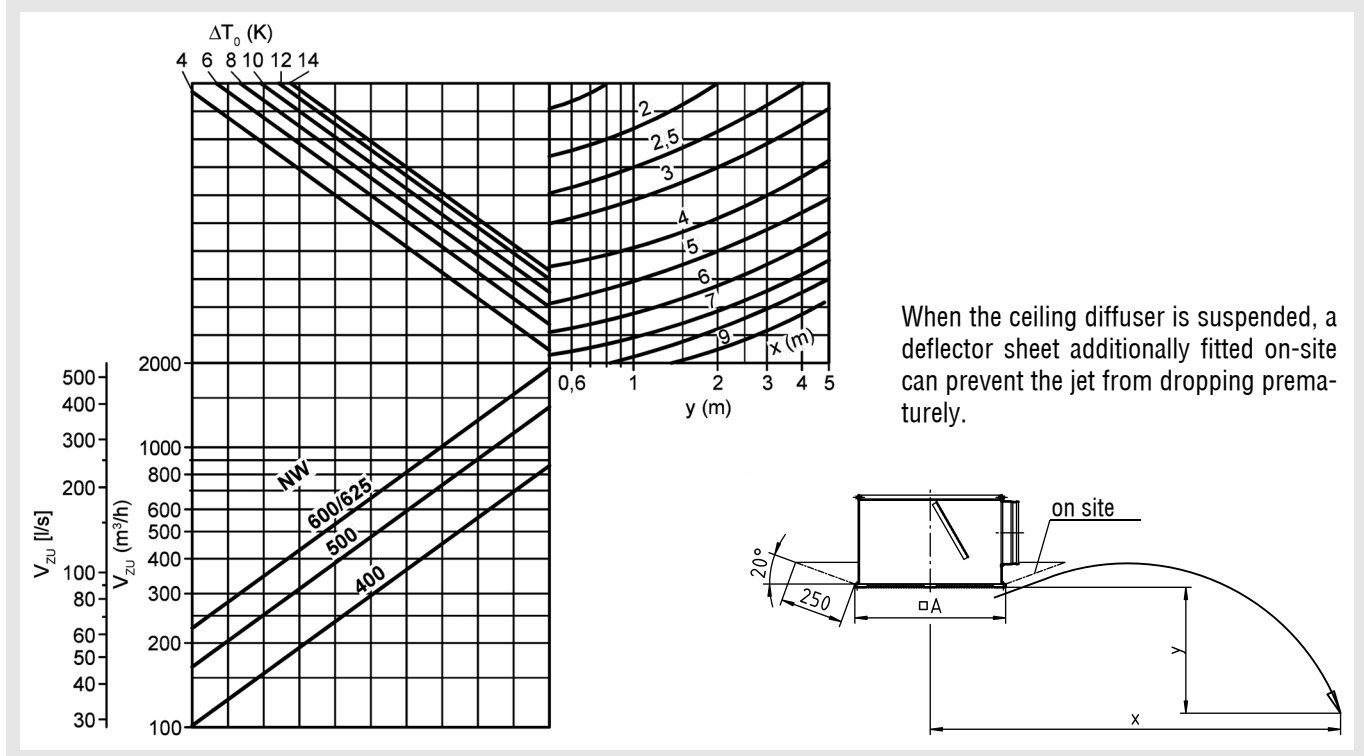
## Ceiling diffuser DQDL

### Jet path

DQDL (without deflection sheets)



DQDL (with deflection sheets)

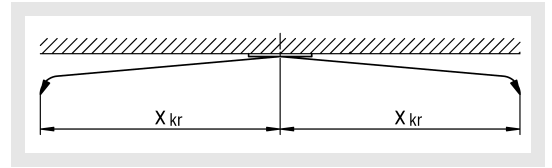
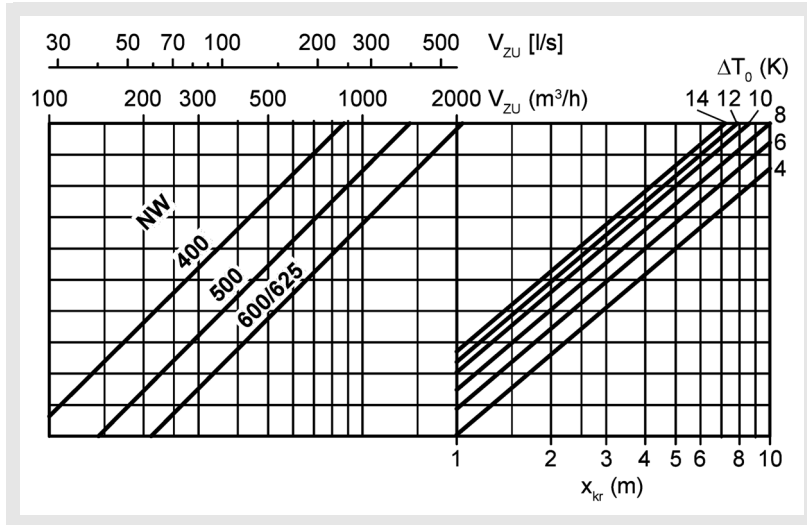


When the ceiling diffuser is suspended, a deflector sheet additionally fitted on-site can prevent the jet from dropping prematurely.

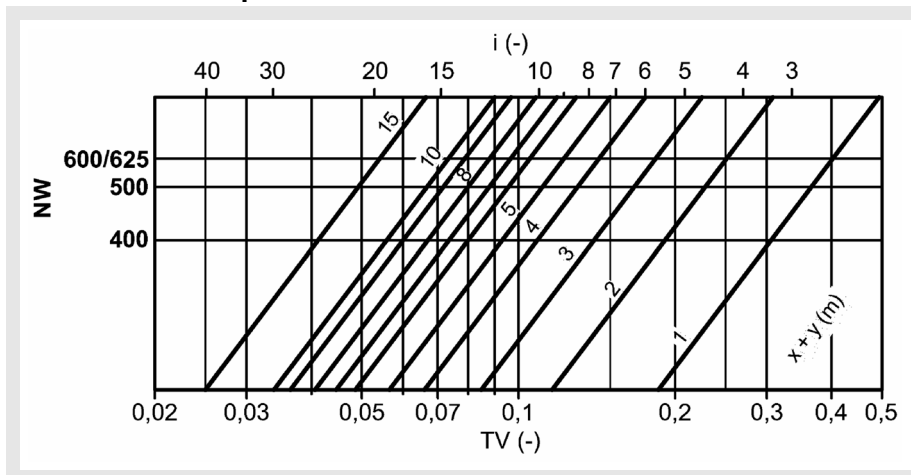
# Ceiling diffuser DQDL

## Critical throw

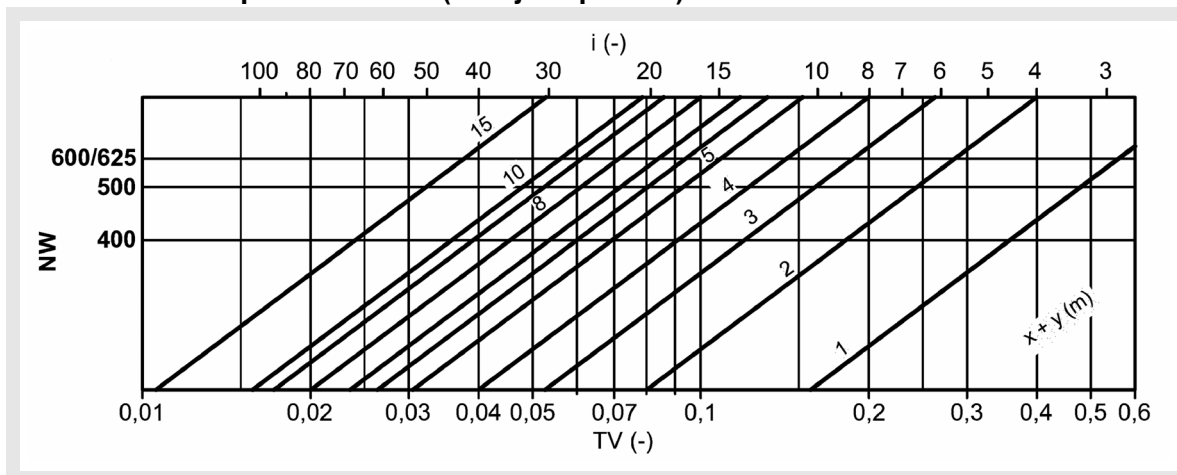
DQDL in cooling mode



## Induction and temperature ratios



## Induction and temperature ratios (freely suspended)



## Ceiling diffuser DQDL

### Legend

$V_{ZU}$	(m <sup>3</sup> /h) [l/s]	= Supply air volume
$V_{AB}$	(m <sup>3</sup> /h) [l/s]	= Return air volume
$v_{max}$	(m/s)	= Maximum end velocity of jet
$v$	(m/s)	= Average end velocity of jet
$x$	(m)	= horizontal throw
$y$	(m)	= vertical throw
$x+y$	(m)	= Horizontal and vertical throw
$x_{kr}$	(m)	= Critical jet path
$\rho$	(kg/m <sup>3</sup> )	= Density
$\Delta p_t$	(Pa)	= Pressure loss
$L_{WA}$	[dB(A)]	= A-weighted sound power level
$\Delta T_0$	(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
$i$	(-)	= Induction ratio ( $i = V_X / V_{ZU}$ )
$TV$	(-)	= Temperature ratio ( $TV = \Delta T_X / \Delta T_0$ )
$NW$	(mm)	= Nominal width
$\Delta T_X$	(K)	= Temperature difference at point x
$V_X$	(m <sup>3</sup> /h) [l/s]	= total air jet volume at point x

## Ceiling diffuser DQDL

### Order code DQDL

01	02	03	04	05	06	07	08
Type	Air throw	Nominal size	Material	Paint	Mounting	Cover	Ball-impact guard
<b>Example</b>							
DQDL	-Z	-500	-SB	-9010	-VM	-A0	-B0

#### Sample

#### DQDL-Z-500-SB-9010-VM-A0-B0

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

#### Order details

##### 01 - Type

DQDL = ceiling diffuser with square faceplate

##### 02 - Air throw

Z = Supply air

A = Return air

##### 03 – Nominal size

310 = NW310

400 = NW400

500 = NW500

600 = NW600

625 = NW625

##### 04 - Material

SB = Sheet steel (standard)

##### 05 - Paint

9010 = RAL colour white (standard, only possible for -SB model)

xxxx = RAL colour can be freely selected (only possible for -SB model)

##### 06 - Mounting

VM = Concealed mounting (only in combination with SK-..., not possible with ball-impact guard)

SM = screw mounting (standard)

##### 07 - Cover

A0 = without cover (standard)

AD = with ¼ cover (only possible for supply air model)

##### 08 – Ball-impact guard

B0 = without ball-impact guard (standard)

BS = with ball-impact guard, painted same as faceplate

## Ceiling diffuser DQDL

### Order code SK

01	02	03	04	05	06	07	08
Plenum box	Model	Air diffuser	Type of air	Nominal size	Fastening	Material	Damper
<b>Example</b>							
SK	-Q	-17	-Z	-600	-SM	-SV	-DK1

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-Q-17-Z-600-SM-SV-DK1-GD1-VME1-ROB0-I0-KHS-SDS-S1**

Plenum box, square design I for square air diffusers I air diffuser DQDL I supply air I NW600 I with screw mounting I galvanised sheet steel I with damper 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

Q = for square air diffusers

##### 03 - Air diffuser (must be ordered separately)

17 = suitable for DQDL-...

##### 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

SM = screw mounting (standard)

##### 07 - Material

SV = Galvanised sheet steel (standard)

##### 08 - Damper

DK0 = without damper (standard)

DK1 = with damper

DK2 = with damper + cable-operated adjustment

##### 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 version (standard)

ROB1 = With ROB version

##### 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<sub>min</sub> = spigot diameter + 102 mm, but at least 200 mm) (For SK-Q-17-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 (standard)

S2 = 2 lateral spigots, offset by 90°

S3 = 2 lateral spigots, offset by 180°

S5 = 2 spigots arranged next to each other



## Ceiling diffuser DQDL

### Specification texts

Ceiling diffuser type DQDL... for supply or return air, with square faceplate. Suitable for isothermal and cooling applications. Especially for installation in comfort rooms. Consisting of faceplate with fixed blades for horizontal air throw and perforated edges

Product: SCHAKO type DQDL-...

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).

Mounting:

- Concealed mounting (-VM) (only in combination with SK-..., not possible with ball-impact guard)
- Screw mounting (-SM) (standard)

**Accessories:**

- Plenum box (SK-Q-17-...-SV), for square air diffusers, made of galvanised sheet steel, with fixing lugs.
  - Model:
    - for supply air (-Z), with integrated perforated straightener.
    - for return air (-A), inside painted to black, RAL 9005.
  - Fastening:
    - Screw mounting (-SM, standard)
    - Concealed mounting (-VM), 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 + 102 mm, but at least 200 mm) (For SK-Q-17-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 ROB model (-ROB1), removable diffuser plate, damper and volumetric flow meter.
  - with thermal insulation:
    - internal (-li), inside the plenum box
    - external (-la), at the outside of the plenum box
- 1/4 cover (-AD), made of galvanised sheet steel. For covering blade sections to achieve a selective air throw pattern (only possible for supply air model).
- 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 screw mounting).