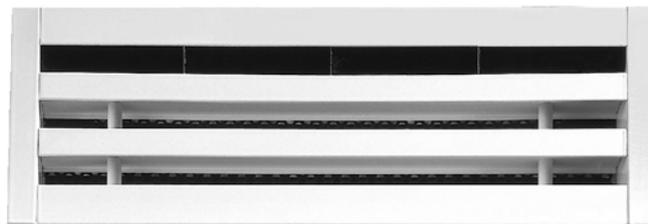




# Combined supply and return air diffuser KWB



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## Combined Supply and Return Air Diffuser Model KWB

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## Combined Supply and Return Air Diffuser Model KWB

### Description

#### Application

Ceiling diffusers often cannot be installed in rooms due to low ceilings. In this case, rooms are **ventilated with combined supply and return air diffusers installed in the wall**.

**Supply air** is delivered into the room **at an angle** from one side. The **developing forced air circulation enables optimum room flow** and fresh supply air is distributed **uniformly over the entire room**.

In all KWB models, a stable air jet is produced, which is stable even at a temperature difference  $\Delta T_0 = -10 \text{ K}$  and does not drop uncontrollably into the occupied area.

The admissible supply air jet depends on the permissible back flow velocity in the occupied zone. Air change rates up to max. 5 are possible.

Supply air should be delivered diagonally upwards if the distance between upper edge of the diffuser and ceiling is greater than 100 mm. For the models KWB-D / KWB-DSX / KWB-KL, the distance between the upper edge of the diffuser and the ceiling should not be greater than 0.1 m.

### Construction

#### Plenum box

- Galvanised sheet steel

#### nozzles

- Plastic, similar to RAL colour 9010 (-DW, white) or RAL 9005 (-DS, black) (KWB-D)

#### Faceplate

- painted sheet steel RAL 9010 (white) (KWB-KL / KWB-D / KWB-DSX).

#### Blades

- Plastic, similar to RAL colour 9010 (-LW, white) or RAL 9005 (-LS, black) KWB-S / KWB-DSX).
- Aluminium painted to the RAL colour of the frame profile. Painted blades can not be adjusted in situ (at extra cost) (KWB-S).

#### Slot rails

- Natural colour anodised aluminium E6/EV1 (KWB-S)
- Aluminium painted to RAL 9010 (white) at an extra charge (KWB-S)

### Model

- |                 |   |
|-----------------|---|
| KWB-KL          | - Front plate with fixed deflection blades for supply air, slot diffuser for extract air                      |
| KWB-D-1/2       | - Front plate with integrated fixed nozzles (1 or 2 rows) for supply air, punched out grille for extract air. |
| KWB-DSX-1/-2/-3 | - Slot rail with blades (1-, 2- or 3-slot) for supply air, slot diffuser in faceplate for return air.         |
| KWB-S           | - Slot rail with blades for supply air, slot rail without blades for extract air.                             |

### Accessories

#### Damper (-DK)

- adjustable after dismantling the faceplate
- galvanised sheet steel, in plenum box (ASK)
- Damper fastening made of plastic
- with cable-operated adjustment (-SZV, at an extra charge)

#### Rubber lip seal (-GD)

- Special rubber

### Fastening

#### Rivet joint

- KWB-DSX

#### Screw mounting (-SM)

- KWB-KL
- on special request for KWB-D, KWB-S

#### Concealed mounting (-VM)

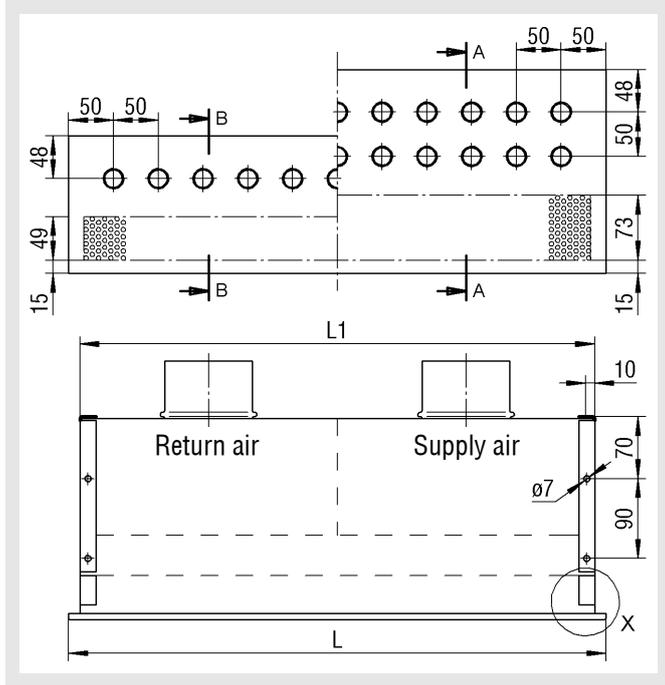
- KWB-D, KWB-S (standard)

# Combined Supply and Return Air Diffuser Model KWB

## Models and dimensions

### Dimensions

#### KWB-D-1/-2



### Available sizes

NW	nozzles / rows	KWB-D-1		KWB-D-2		L	L1
		øD	KB	øD	KB		
600	11	98	132	158	207	600	575
800	15					800	775
1000	19					1000	975
1200	23	2x98				1200	1175

### Installation opening (see Page°9)

$$E\ddot{O}B = KB + 4$$

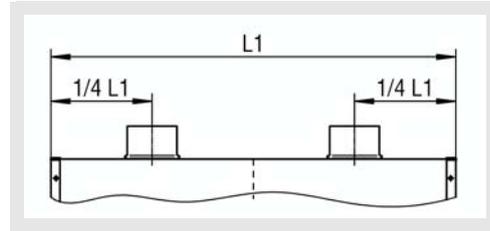
$$E\ddot{O}L = L1 + 4$$

### Spigot arrangement

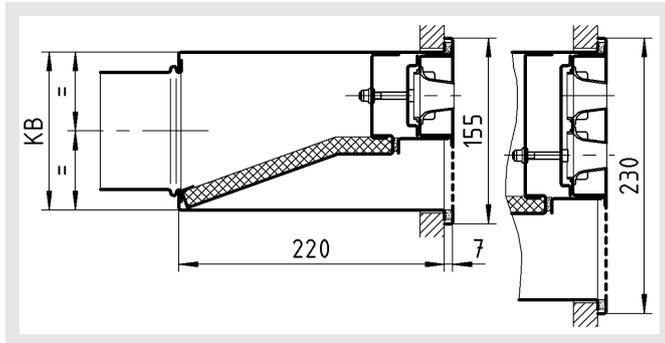
with 1 connection spigot each for supply and return air

KWB-D-1 = NW 600-1000

KWB-D-2 = NW 600-1200

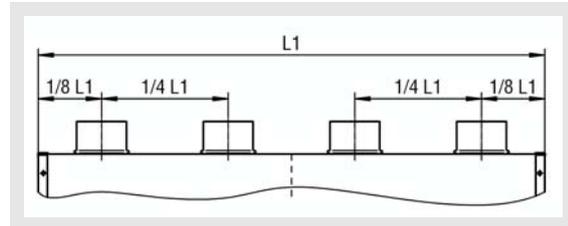


### Section A-A / for supply air

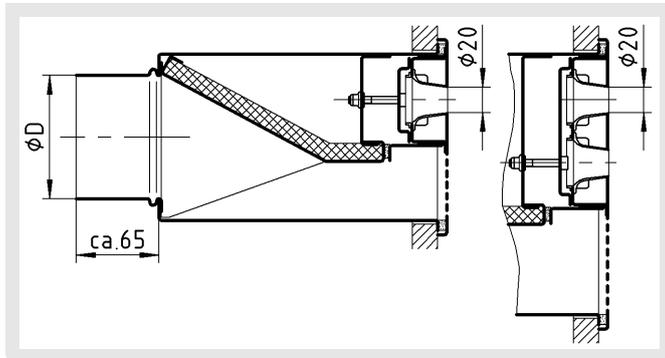


with 2 connection spigot each for supply and return air

KWB-D-1 = NW 1200

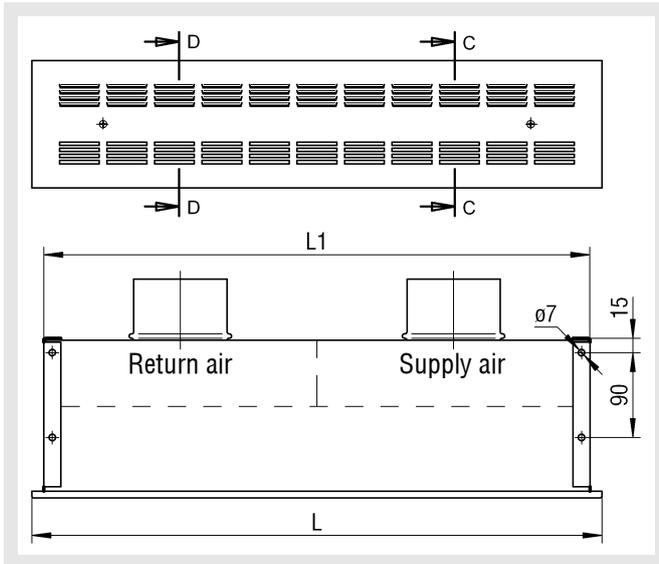


### Section B-B / for return air



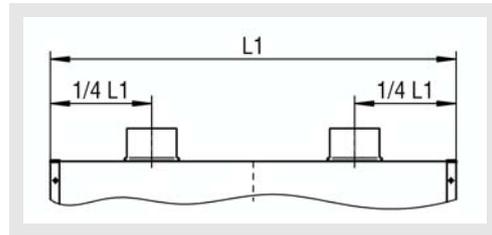
# Combined Supply and Return Air Diffuser Model KWB

KWB-KL

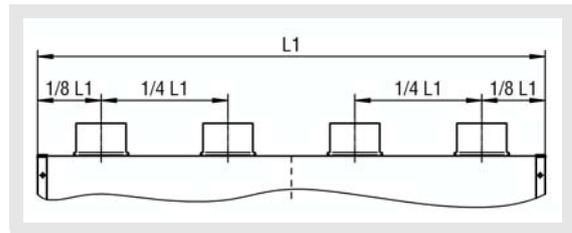


Spigot arrangement

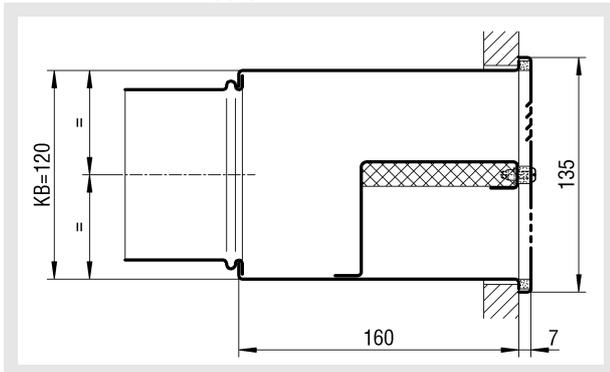
with 1 connection spigot each for supply and return air  
NW 600-1000



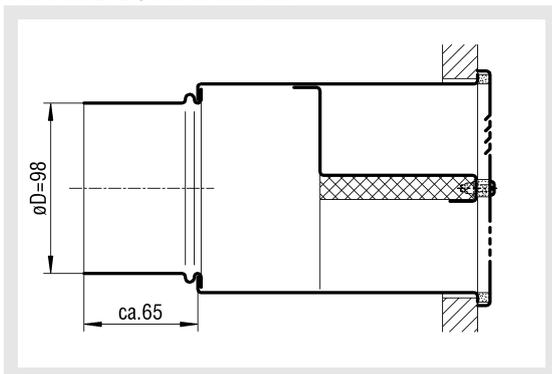
with 2 connection spigot each for supply and return air  
NW 1200



Section C-C / for supply air



Section D-D / for return air



Available sizes

NW	L	L1
600	600	575
800	800	775
1000	1000	975
1200	1200	1175

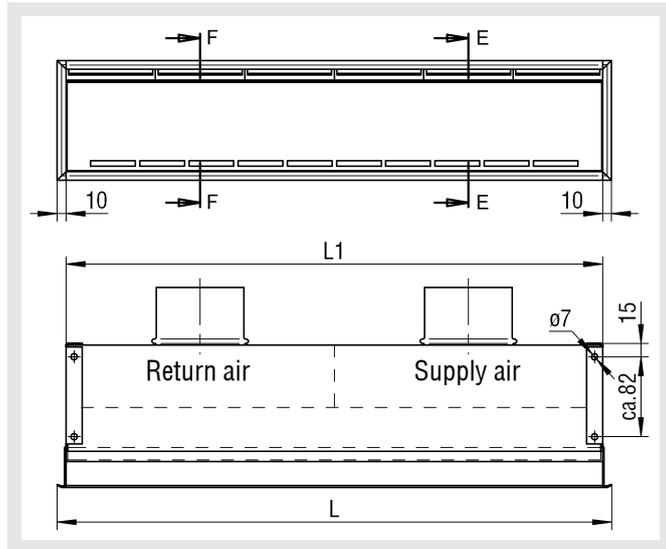
Installation opening (see Page 9)

$$E\ddot{O}B = KB + 4$$

$$E\ddot{O}L = L1 + 4$$

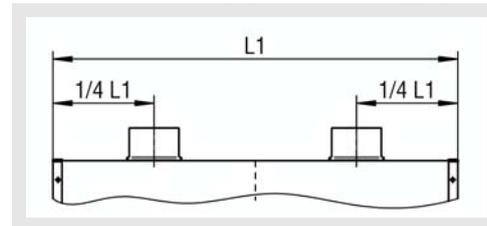
## Combined Supply and Return Air Diffuser Model KWB

KWB-DSX-1/-2/-3

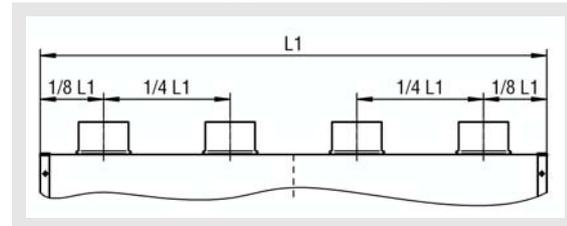


Spigot arrangement

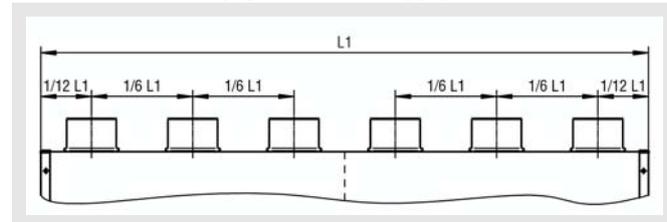
with 1 connection spigot each for supply and return air



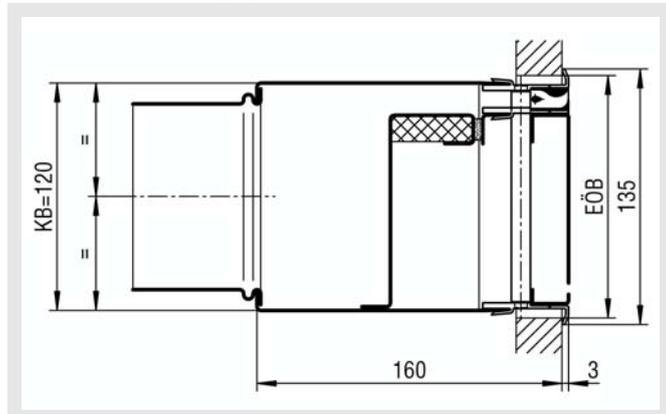
with 2 connection spigot each for supply and return air



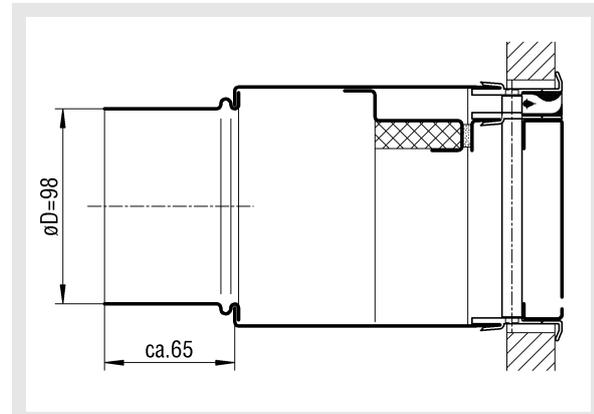
with 3 connection spigot each for supply and return air



Section E-E / for supply air



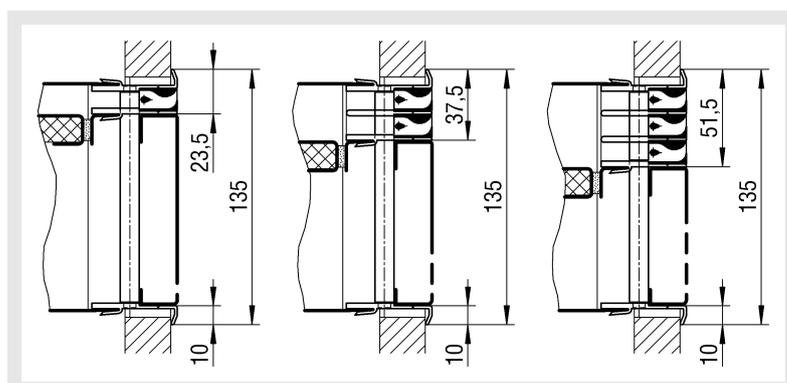
Section F-F / for return air



KWB-DSX-1

KWB-DSX-2

KWB-DSX-3



Available sizes

NW	L	L1	Number of connection pieces (*)		
			DSX-1	DSX-2	DSX-3
600	620	598	1	2	2
800	820	798	1	2	2
1000	1020	998	1	2	2
1200	1220	1198	2	3	3

\* Relative to the supply and return air sides.

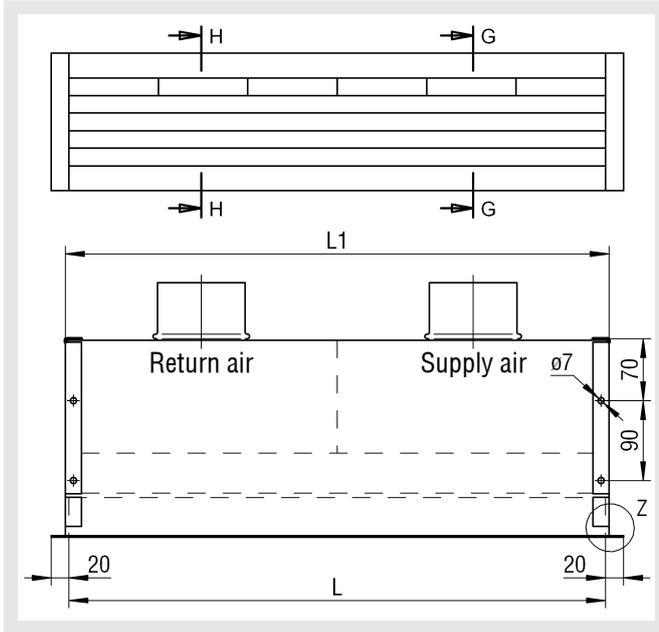
Installation opening (see Page 9)

EÖB = KB + 8

EÖL = L1 + 4

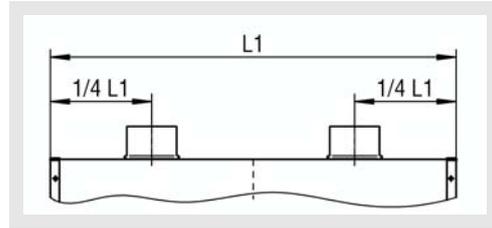
## Combined Supply and Return Air Diffuser Model KWB

KWB-S

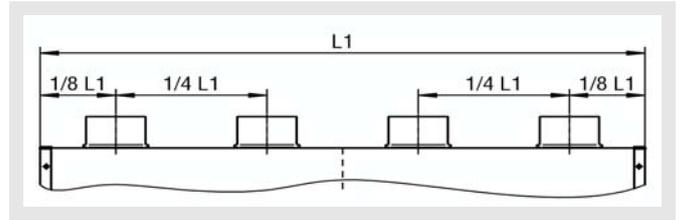


Spigot arrangement

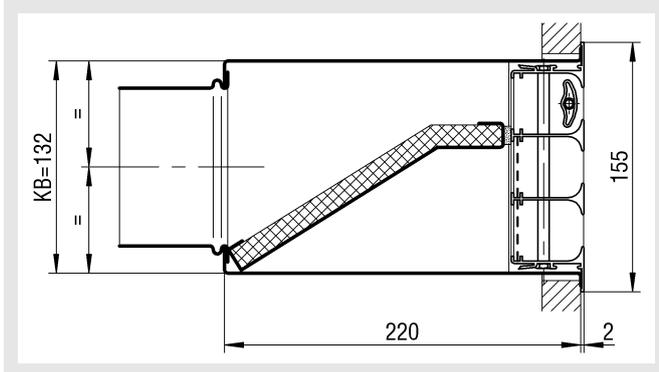
with 1 connection spigot each for supply and return air  
NW 600-1000



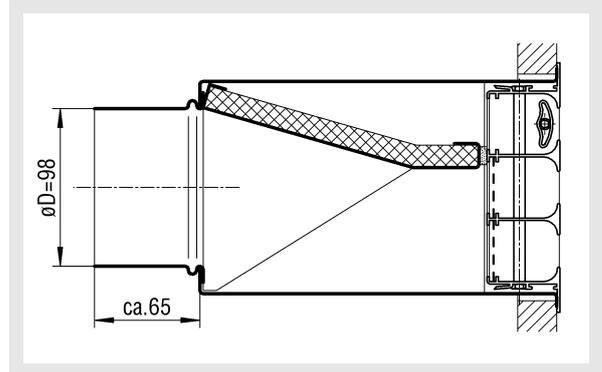
with 2 connection spigot each for supply and return air  
NW 1200



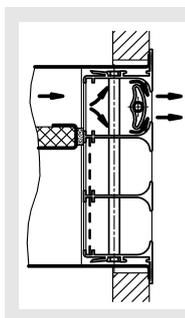
Section G-G / for supply air



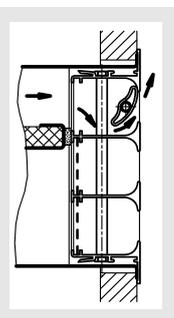
Section H-H / for return air



Blade position  
Horizontal throw  
KWB-S-H



Diagonal throw  
KWB-S-S



Available sizes

NW	L	L1
600	600	608
800	800	808
1000	1000	1008
1200	1200	1208

Installation opening (see Page 9)

$$E\ddot{O}B = KB + 4$$

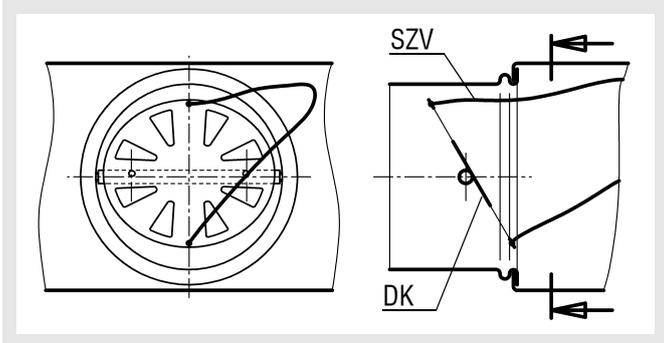
$$E\ddot{O}L = L1 + 4$$

## Combined Supply and Return Air Diffuser Model KWB

### Accessories - dimensions

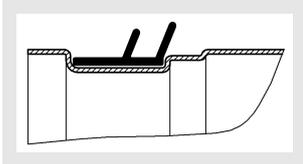
(at an extra charge)

**Damper (-DK, in the connection spigot)**  
adjustable after dismantling the faceplate



SZV = Cable-operated adjustment (at an extra charge)

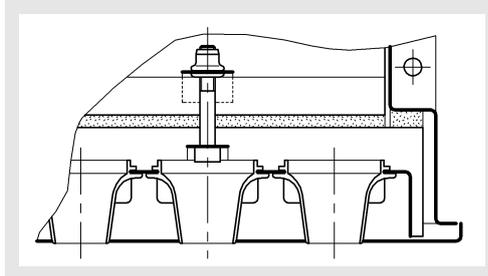
### Rubber lip seal (-GD)



at the connection spigot

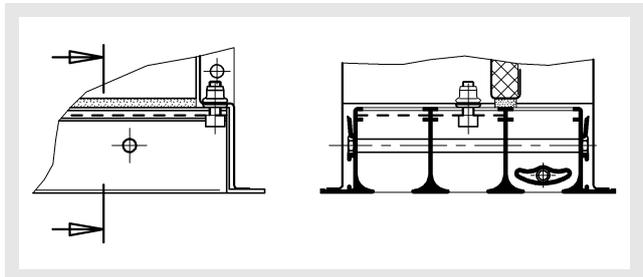
### Fastening methods

**Concealed mounting (-VM, standard)**  
KWB-D-1/-2, detail X



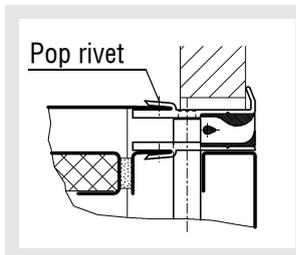
secret mounting (-SM) on special request

**Concealed mounting (-VM, standard)**  
KWB-S, Detail Z



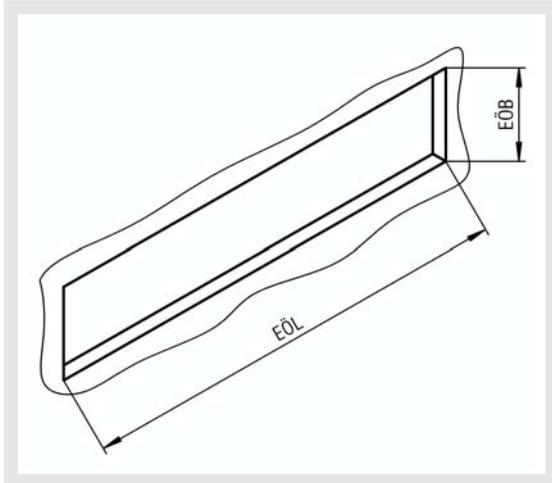
secret mounting (-SM) on special request

**Rivet joint**  
KWB-DSX



## Combined Supply and Return Air Diffuser Model KWB

### Installation opening



#### Installation opening in the width section

Model	EÖB
KWB-D-1	136
KWB-D-2	211
KWB-KL	124
KWB-DSX-1/-2/-3	128
KWB-S	136

#### Installation opening in the length section

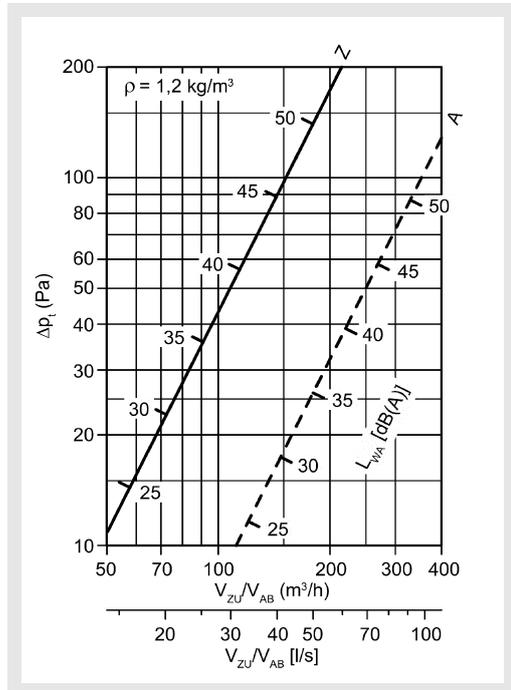
NW	Model	EÖL
600	KWB-D-1/-2	579
	KWB-KL	
	KWB-DSX-1/-2/-3	602
	KWB-S	612
800	KWB-D-1/-2	779
	KWB-KL	
	KWB-DSX-1/-2/-3	802
	KWB-S	812
1000	KWB-D-1/-2	979
	KWB-KL	
	KWB-DSX-1/-2/-3	1002
	KWB-S	1012
1200	KWB-D-1/-2	1179
	KWB-KL	
	KWB-DSX-1/-2/-3	1202
	KWB-S	1212

# Combined Supply and Return Air Diffuser Model KWB

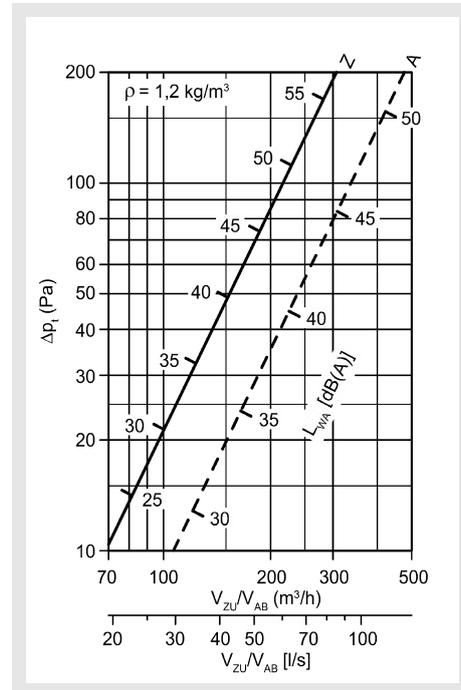
## Technical data

### Pressure loss and noise level

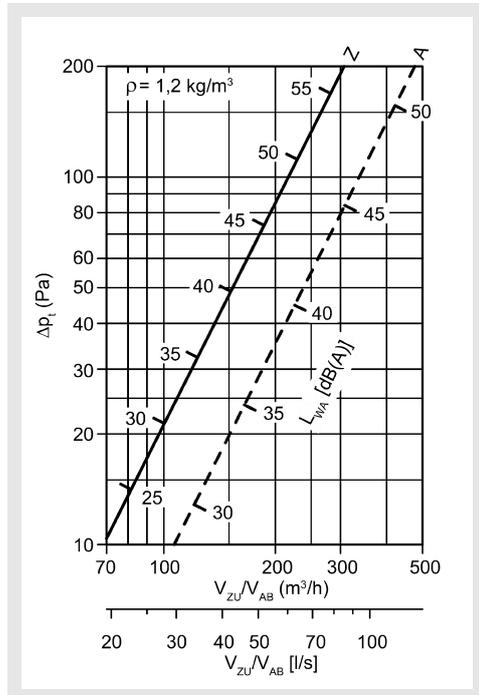
**KWB-D-1 600**



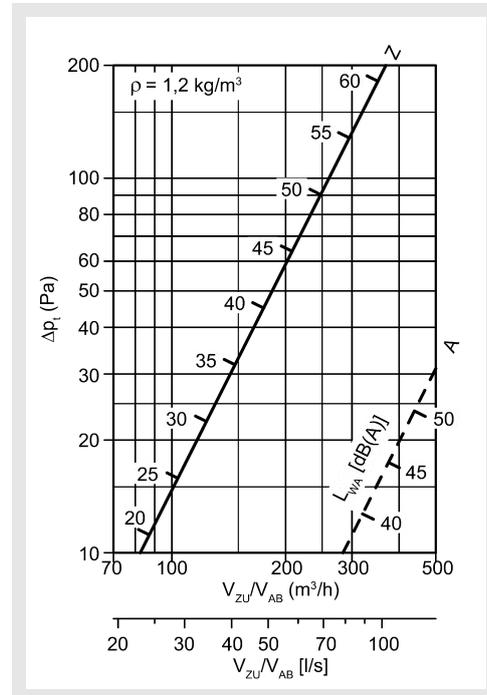
**KWB-D-1 800**



**KWB-D-1 1000**



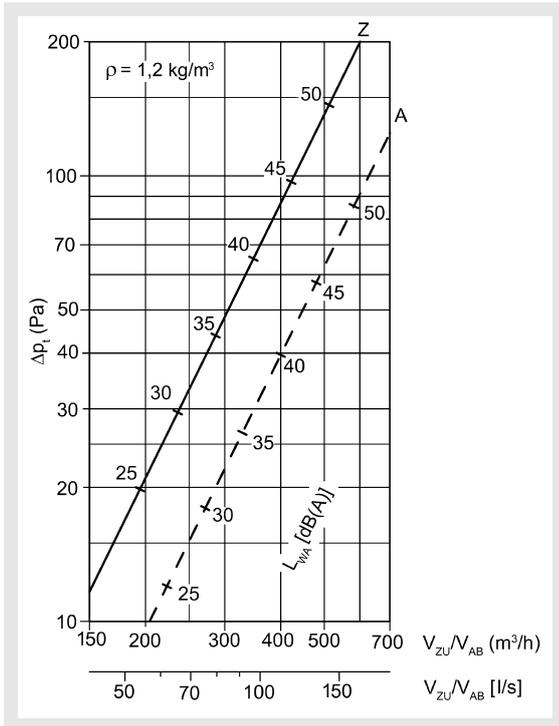
**KWB-D-1 1200**



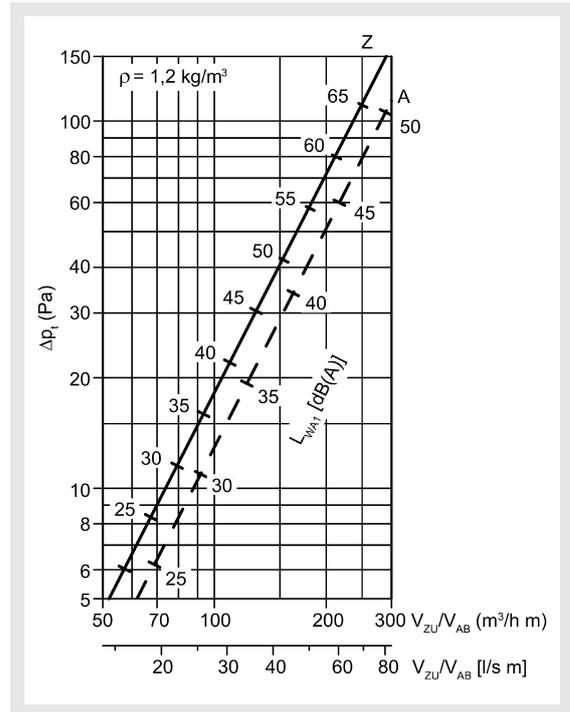
Z = Supply air  
A = Return air

# Combined Supply and Return Air Diffuser Model KWB

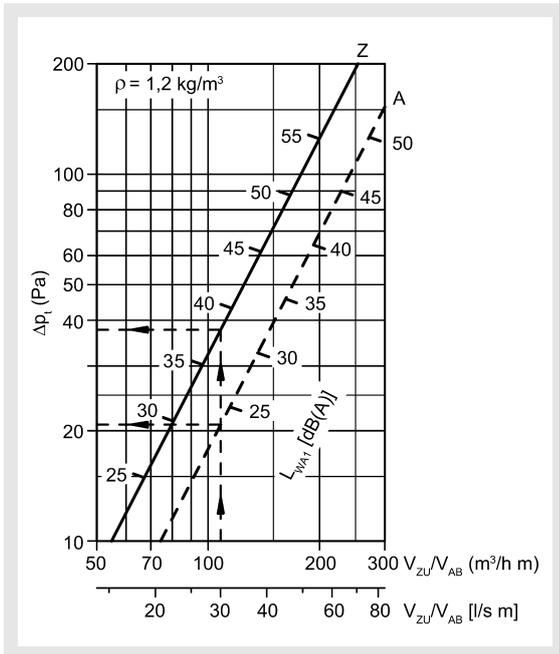
**KWB-D2 per metre**



**KWB-KL per metre**



**KWB-S per metre**



**Attention:**

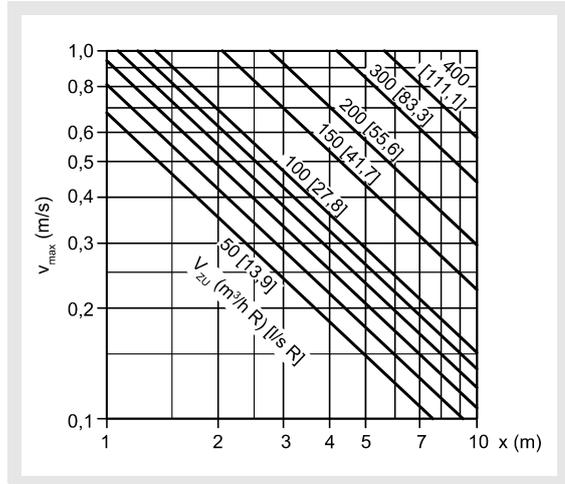
For the KWB-DSX-3 slotted module, make sure that the connection spigot velocity, at a connection spigot length of 98 mm, does not exceed 3 m/sec. If the 3 m/sec are exceeded due to a higher air volume, two connection pieces each (ø 98mm) must be planned for the supply and return air units, in order to avoid noise problems!

- Z = Supply air
- A = Return air

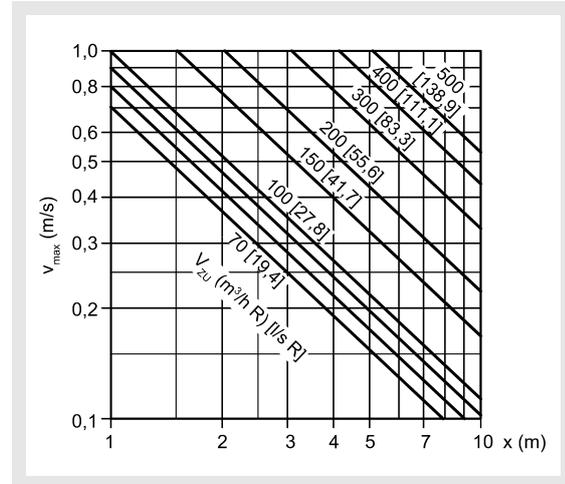
# Combined Supply and Return Air Diffuser Model KWB

## Maximum end velocity of jet

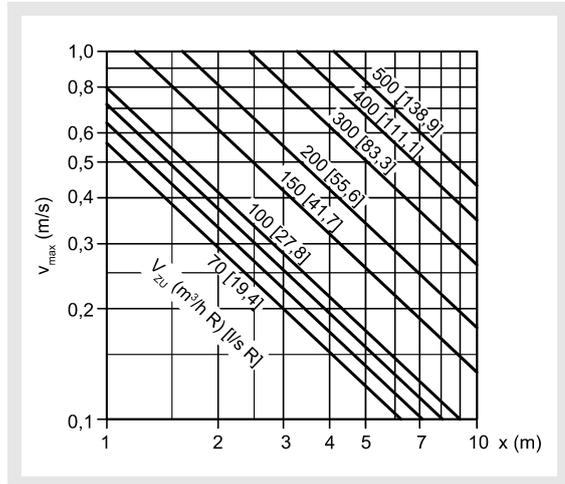
**KWB-D-1/-2 600**



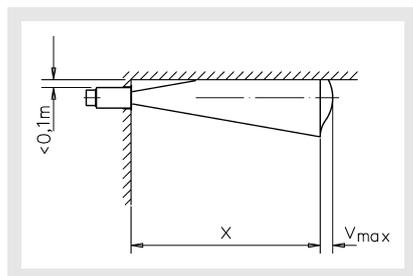
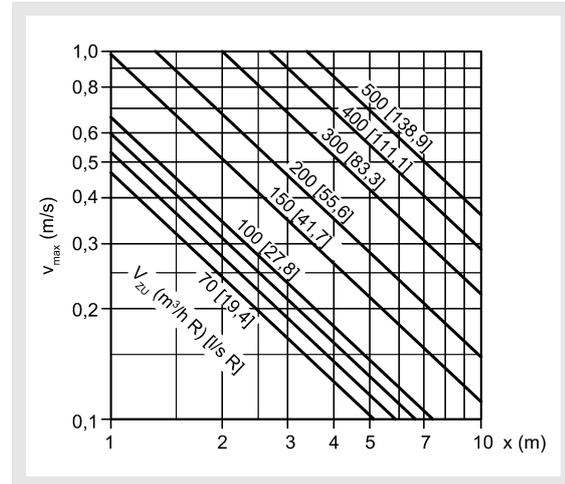
**KWB-D-1/-2 800**



**KWB-D-1/-2 1000**

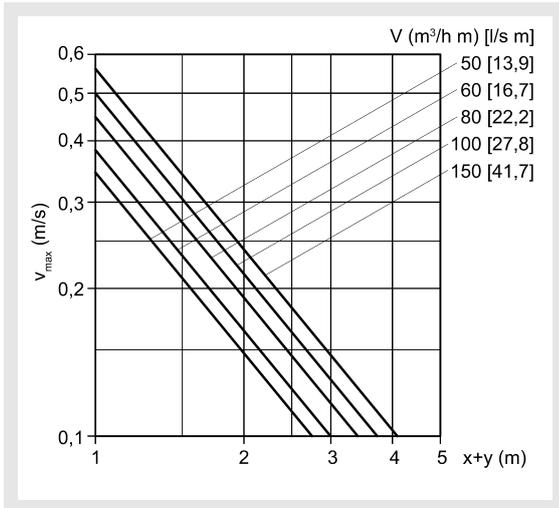


**KWB-D-1/-2 1200**

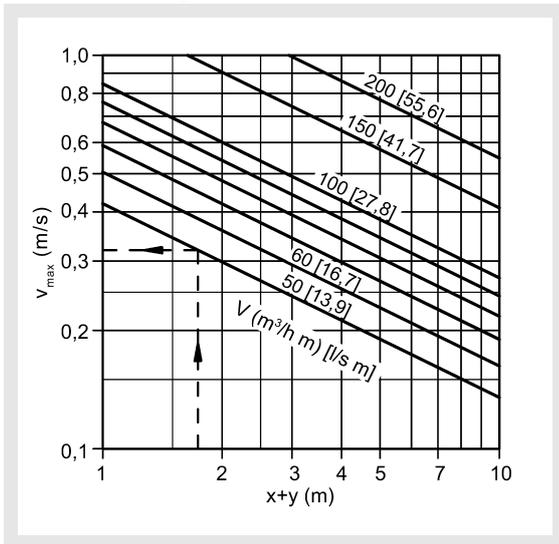


# Combined Supply and Return Air Diffuser Model KWB

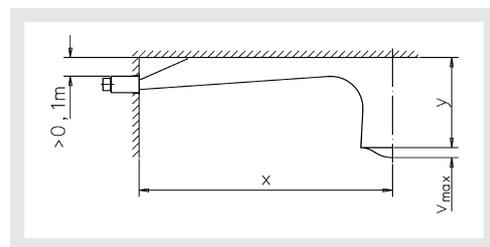
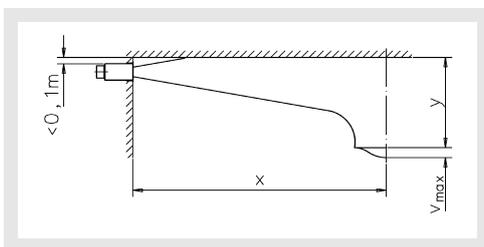
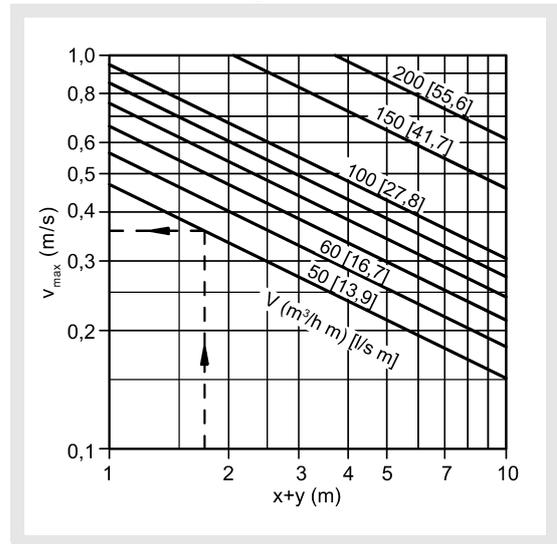
## KWB-KL per metre



## KWB-S per metre flush with ceiling



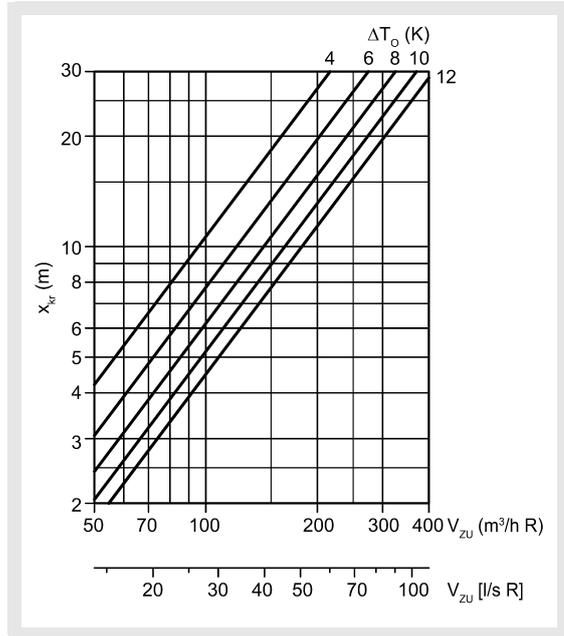
## KWB-S per metre with distance to ceiling



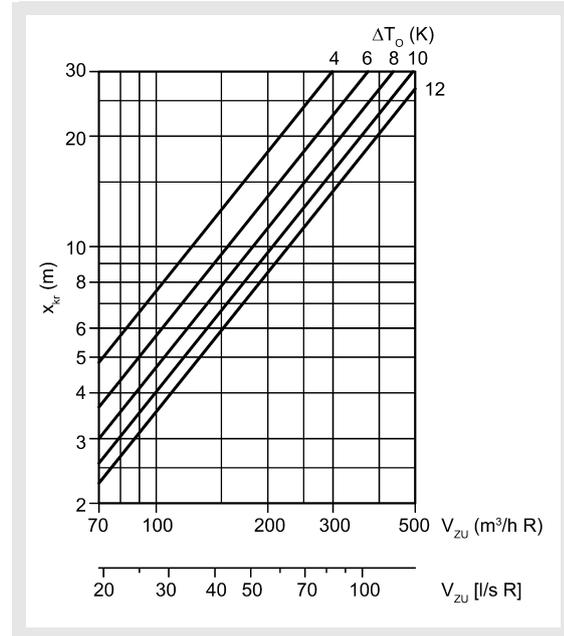
# Combined Supply and Return Air Diffuser Model KWB

## Critical throw

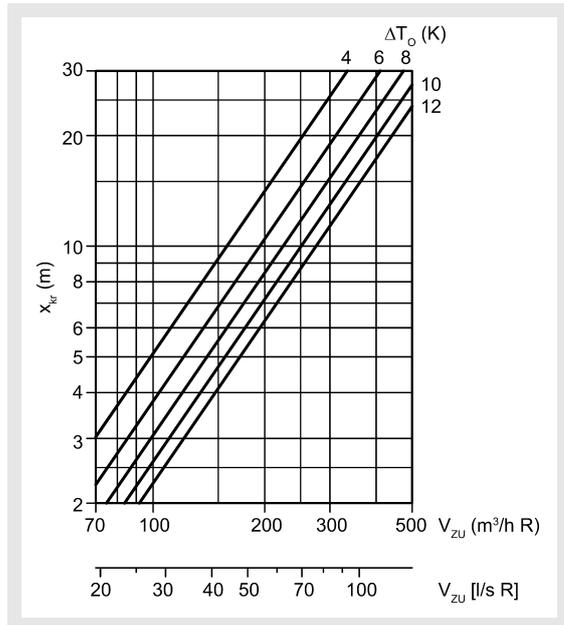
**KWB-D-1/-2 600**



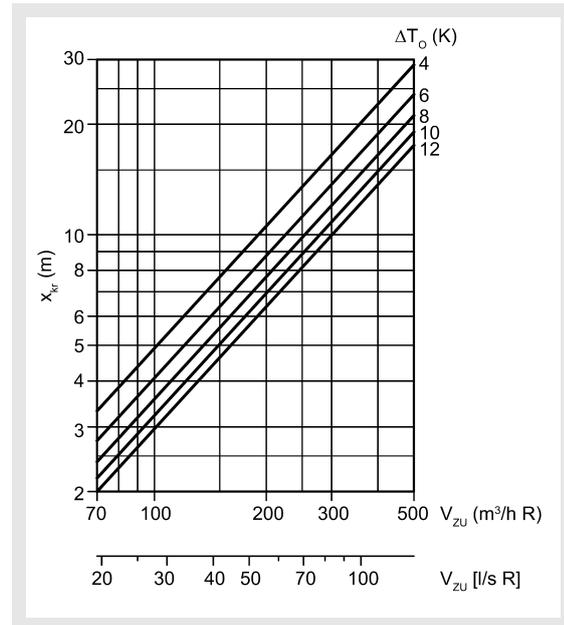
**KWB-D-1/-2 800**



**KWB-D-1/-2 1000**

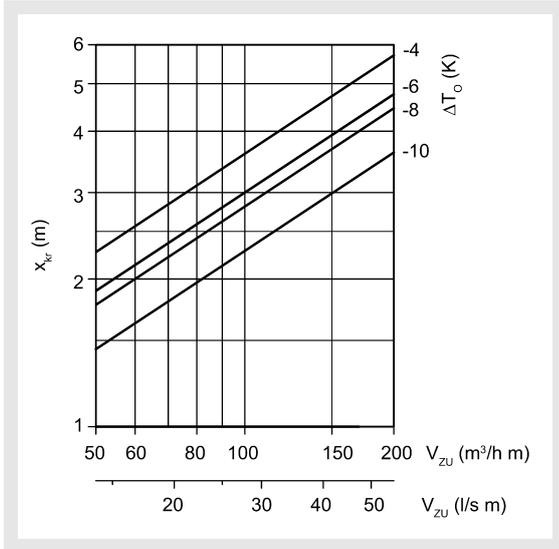


**KWB-D-1/-2 1200**

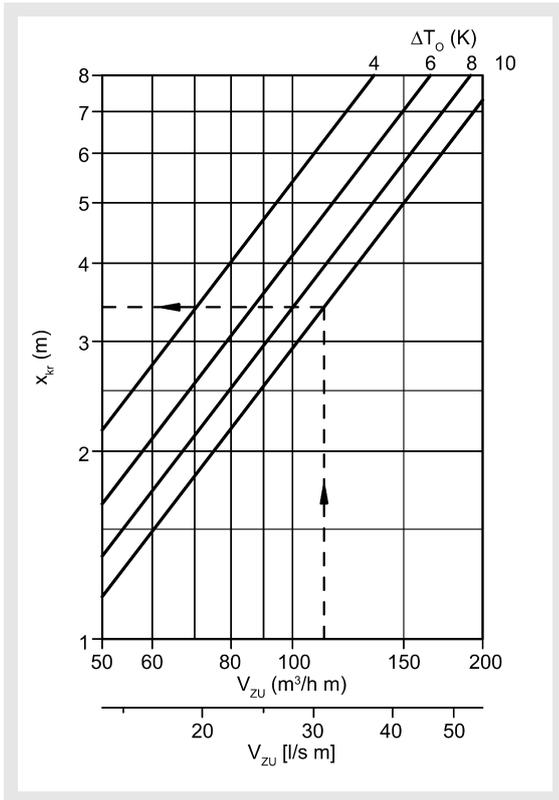


# Combined Supply and Return Air Diffuser Model KWB

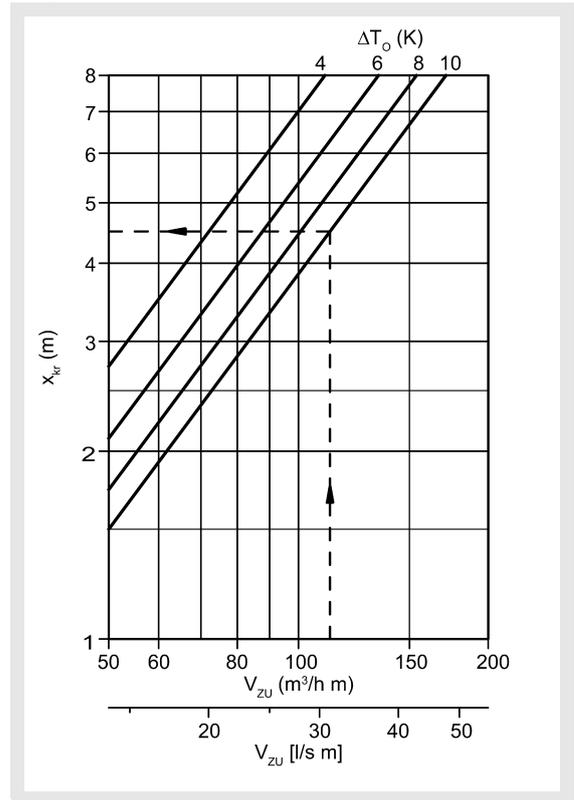
## KWB-KL per metre



## KWB-S-H per metre Horizontal throw



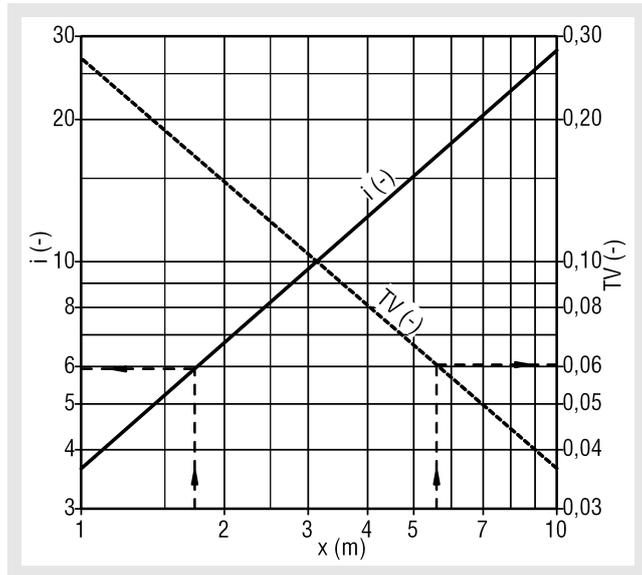
## KWB-S-S per metre Diagonal throw



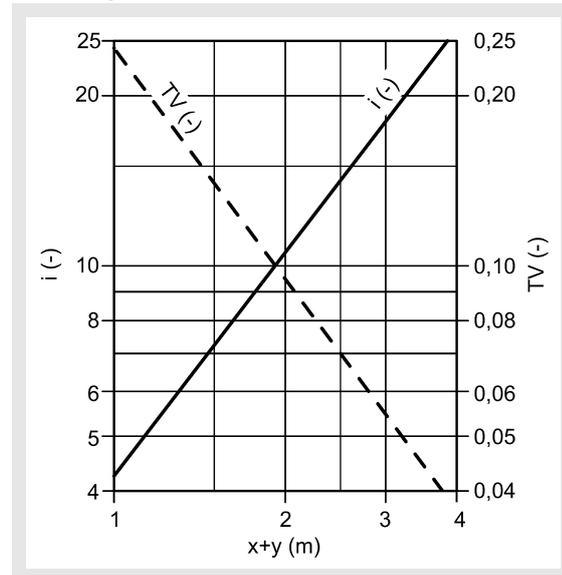
# Combined Supply and Return Air Diffuser Model KWB

## Temperature and induction ratios

**KWB-D-1/-2**

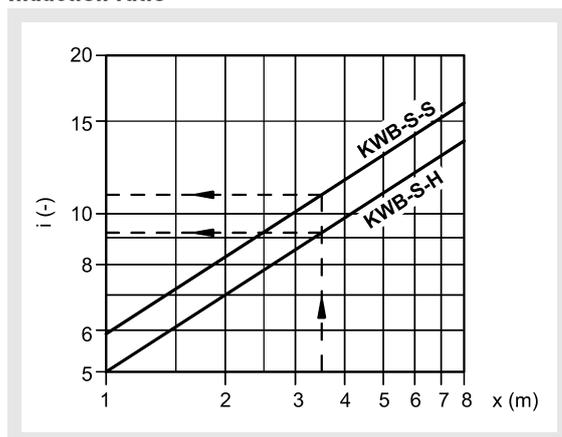


**KWB-KL per metre**

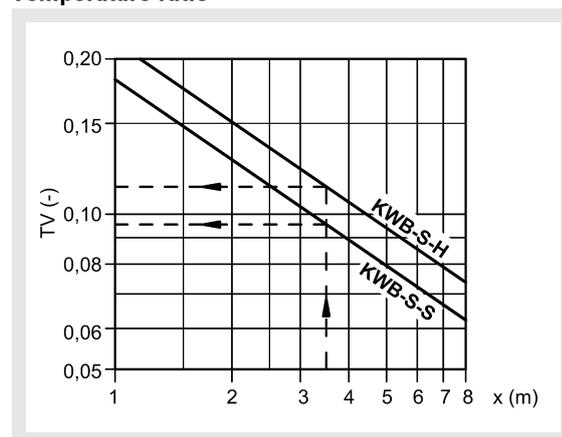


**KWB-S per metre**

## Induction ratio



**Temperature ratio**



KWB-S-H = Horizontal throw  
 KWB-S-S = vertical throw

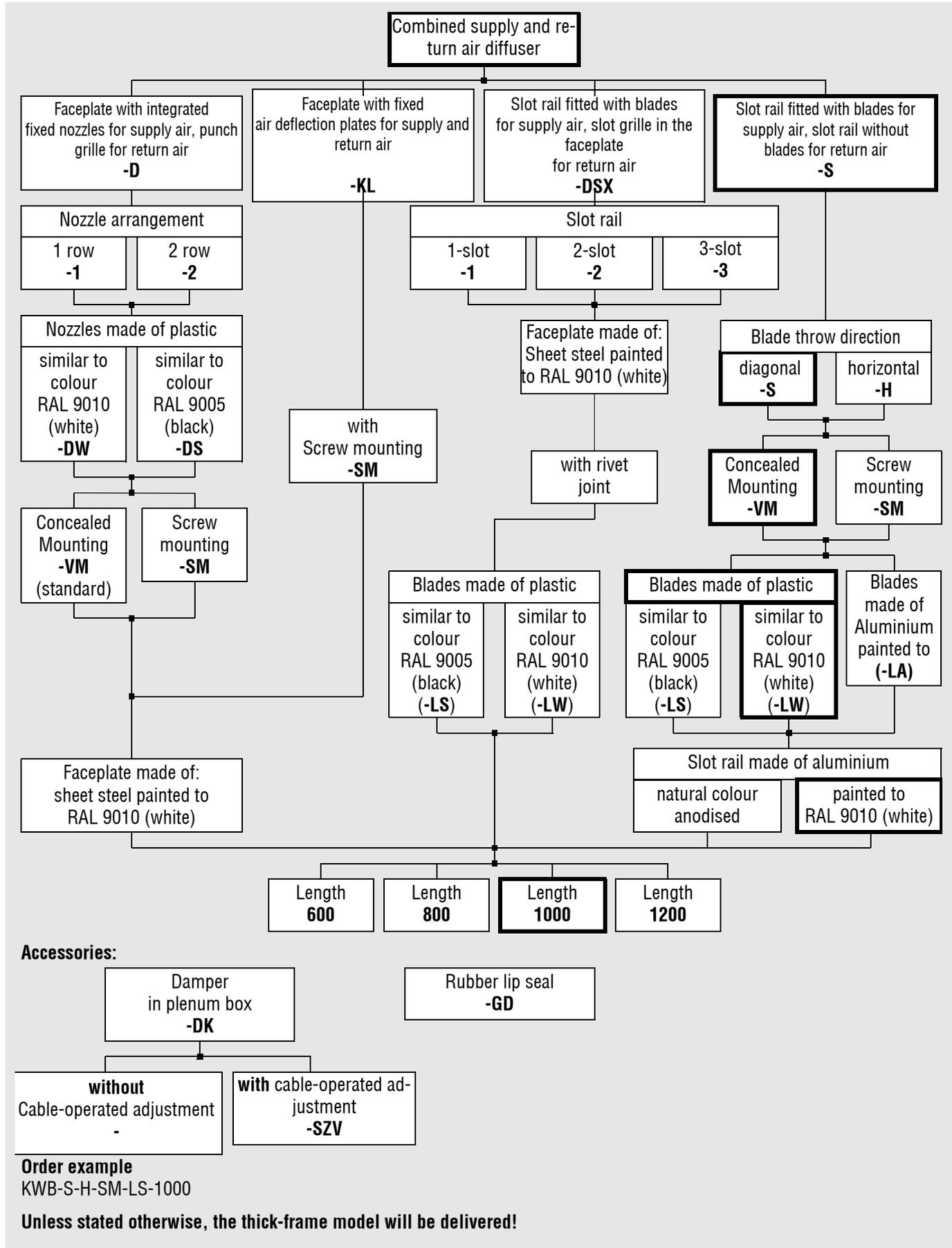
## Combined Supply and Return Air Diffuser Model KWB

### Legend

$V_{ZU}$	(m <sup>3</sup> /h)	=	Supply air volume
$V_{ZU}$	[l/s]	=	Supply air volume
$V_{ZU}$	(m <sup>3</sup> /h R)	=	Supply air volume per nozzle row
$V_{ZU}$	[l/s R]	=	Supply air volume per nozzle row
$V_{AB}$	(m <sup>3</sup> /h)	=	Return air volume
$V_{AB}$	[l/s]	=	Return air volume
Z	(-)	=	Supply air
A	(-)	=	Return air
H	(m)	=	Room height
L	(m)	=	Room length
$V_{ZU}$	(m <sup>3</sup> /h m)	=	Supply air volume per metre
$V_{ZU}$	[l/s m]	=	Supply air volume per metre
$V_{AB}$	(m <sup>3</sup> /h m)	=	Return air volume per metre
$V_{AB}$	[l/s m]	=	Return air volume per metre
$\rho$	(kg/m <sup>3</sup> )	=	Density
$\Delta p_t$	(Pa)	=	Pressure loss
$L_{WA}$	[dB(A)]	=	A-weighted sound power level
$L_{WA1}$	[dB(A)]	=	A-weighted sound power level, relative to supply or return air
x+y	(m)	=	Horizontal + vertical throw
i	(-)	=	Induction ratio ( $i = V_x / V_{ZU}$ )
TV	(-)	=	Temperature ratio ( $TV = \Delta T_x / \Delta T_0$ )
x	(m)	=	horizontal throw
$v_{max}$	(m/s)	=	Maximum end velocity of jet
$x_{kr}$	(m)	=	Critical jet path
$\Delta T_0$	(K)	=	Temperature difference between supply air temperature and room temperature ( $\Delta T_0 = t_{ZU} - t_R$ )
$t_{ZU}$	(K)	=	Supply air temperature
$t_R$	(K)	=	Room temperature
NW	(mm)	=	Nominal value
$\Delta T_x$	(K)	=	Temperature difference at point x
$V_x$	(m <sup>3</sup> /h)	=	Total air jet volume at point x
$V_x$	[l/s]	=	Total air jet volume at point x

# Combined Supply and Return Air Diffuser Model KWB

## Order details



## Combined Supply and Return Air Diffuser Model KWB

### Specification texts

Combined supply and return air outlet suitable for wall installation. Consisting of sheet steel faceplate painted to RAL 9010 (white), with integrated fixed nozzles made of plastic similar to RAL colour 9010 (-DW, white) or 9005 (-DS, black), for supply air, with punch grille for return air. With plenum box made of galvanised sheet steel, with connection spigot for supply and return air and thermally insulated partition plate. Fixing with concealed mounting (VM).

Product: SCHAKO **type KWB-D**

Nozzle arrangement

- one row (-1)
- two rows (-2)
  
- Fastened with screw mounting (SM)

#### Accessories:

- with throttle damper (-DK) in plenum box, adjustable after dismantling the faceplate, made of galvanised sheet steel for air volume regulation.
  - with cable-operated adjustment (-SZV)
- with rubber lip seal (-GD)

Combined supply and return air outlet suitable for wall installation. Consists of fixed deflection blades from painted sheet steel RAL 9010 (white) for supply air, slot grille for extract air. With plenum box made of galvanised sheet steel, with connection spigot for supply and return air and thermally insulated partition plate. Fastened with screw mounting.

Product: SCHAKO **type KWB-KL**

#### Accessories:

- with throttle damper (-DK) in plenum box, adjustable after dismantling the faceplate, made of galvanised sheet steel for air volume regulation.
  - with cable-operated adjustment (-SZV)
- with rubber lip seal (-GD)

Combined supply and return air outlet suitable for wall installation. Consisting of slot rail made of extruded aluminium profile with blades made of plastic, similar to RAL colour 9010 (-LW, white, standard) or RAL 9005 (-LS, black) for supply air, with punch grille in faceplate made of sheet steel painted to RAL 9010 (white) for return air. With plenum box made of galvanised sheet steel, with connection spigot for supply and return air and thermally insulated partition plate. Fastened with rivet joint.

Product: SCHAKO **type KWB-DSX**

Slot rail

- 1-slot (-1)
- 2-slot (-2)
- 3-slot (-3)

#### Accessories:

- with throttle damper (-DK) in plenum box, adjustable after dismantling the faceplate, made of galvanised sheet steel for air volume regulation.
  - with cable-operated adjustment (-SZV)
- with rubber lip seal (-GD)

Combined supply and return air outlet suitable for wall installation. Consisting of slot rail made of aluminium natural colour anodised (E6/EV1, standard) or aluminium painted to RAL 9010 (white). With blades made of plastic, similar to RAL colour 9010 (-LW, white, standard), RAL 9005 (-LS, black) or made of aluminium painted to the RAL colour of the frame profile. Without blades for return air. With plenum box made of galvanised sheet steel, with connection spigot for supply and return air and thermally insulated partition plate. Fixing with concealed mounting (VM).

Product: SCHAKO **type KWB-S**

Blade throw direction

- horizontal
- vertical
  
- Fastened with screw mounting (SM)

#### Accessories:

- with throttle damper (-DK) in plenum box, adjustable after dismantling the faceplate, made of galvanised sheet steel for air volume regulation.
  - with cable-operated adjustment (-SZV)
- with rubber lip seal (-GD)