

CPL

Ceiling air diffuser

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FUNCTION AND USE

The ceiling air diffuser type CPL for supply and return air is suitable for use in rooms from 2.6 to 4 m high. With the supply air model, a special intake funnel behind an existing on-site perforated ceiling panel creates a horizontal air jet below the ceiling for cooling mode and isothermal ventilation mode. A high induction is achieved while the velocity and temperature difference of the supply air jet are effectively reduced. The stable air jet and high induction mean that the CPL ceiling air diffuser can be used in cooling mode up to $\Delta T_0 \leq -10$ K. This ceiling air diffuser is primarily used to supply the personal air requirement to the respective rooms.

The resistance created by the perforated ceiling panel ensures that the supply air is distributed equally across the whole surface of the ceiling air diffuser.

The following on-site ceiling panels are suitable for operation with the intake funnels:

- FQ 16.2% - RG-L15; \varnothing 2.5 mm
- FQ 25.0% - RV-L6; \varnothing 2.1 mm

The supply air and return air diffusers are supplied with air or connected to the duct system via a direct hose/duct connection or via a plenum box. At an extra charge, a damper non-adjustable from below can be installed in the spigot for air volume regulation. The plenum box can also be insulated either internally or externally.

MODELS

CPL-E-...	only ceiling air diffuser
CPL-...-Z-...	supply (standard)
CPL-...-A-...	return air
CPL-...-3-...	intake funnel NW 300
CPL-...-5-...	intake funnel NW 500
CPL-...-300-...	ceiling panel width 300 mm
CPL-...-312-...	ceiling panel width 312 mm
CPL-...-600-...	ceiling panel width 600 mm
CPL-...-625-...	ceiling panel width 625 mm

MOUNTING

- With the CPL-E-... model, the ceiling air diffuser is supplied loose (on-site installation)
- With the model with the plenum box, it is supplied loose (on-site installation)

PROCESSING

Adaptor plate

- aluminium painted to RAL 9005 (black)

Intake funnel

- aluminium painted to RAL 9005 (black)

Central disc (for CPL-...-Z only)

- sheet steel painted to RAL 9005 (black)

ACCESSORIES

Plenum box (-SK-R-71)

- galvanised sheet steel (-SV) (standard)
- rubber seal made of EPDM
- fastening on site
- 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)
- with supply air model with integrated air diffuser plate made of galvanised sheet steel
- with return air model, without air diffuser plate

Damper (-DK1/-DK2), for SK-R-71

- with damper (-DK1)
 - made of galvanised sheet steel
 - damper fastening made of plastic material
 - in the plenum box housing, for models with lateral spigots / spigots located on the opposite sides
 - in the connection spigot, for models with spigot from above
- with damper with cable-operated adjustment (-DK2)
 - same as -DK1, but with cable-operated adjustment

Rubber lip seal (-GD1), for SK-R-71

- Special rubber
- at the connection spigot

Volumetric flow meter (-VME1), for SK-R-71

- in connection spigot
- holder made of galvanised sheet steel
- aluminium connections
- measuring sensor made of plastic

Insulation (-li /-la), for SK-R-71

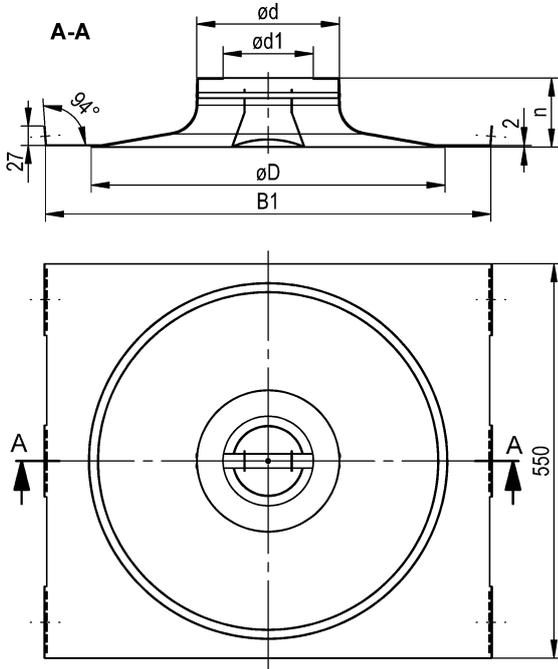
- inside (-li), thermal insulation at the inside of the plenum box
- outside (-la), thermal insulation at the outside of the plenum box

Connection elbow (-K030/-K045/-K090)

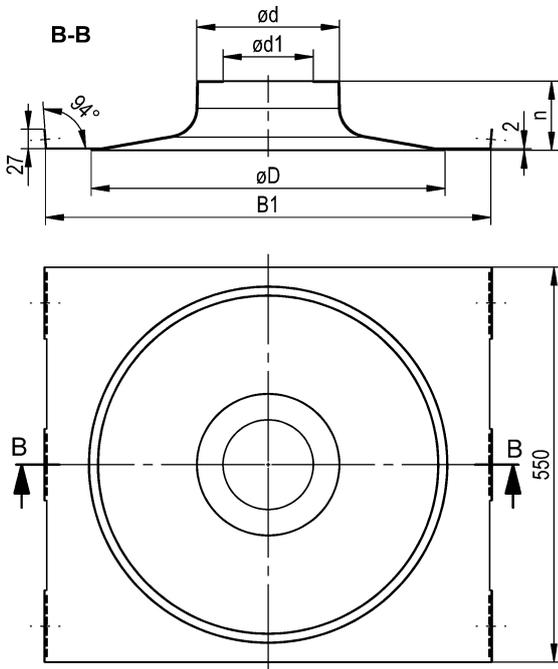
- consisting of a BGE bend with a connection sleeve made of galvanised sheet steel.
- Bend model:
 - as a pressed BGE bend with an angle degree $\alpha = 30^\circ$ (-K030) / $\alpha = 45^\circ$ (-K045) / $\alpha = 90^\circ$ (-K090)
- only possible without a plenum box

DIMENSIONS

CPL-E-Z (only ceiling air diffuser / for supply air)



CPL-E-A (only ceiling air diffuser / for return air)



Available sizes

NW	ød	ød1	øD	n	B1			
					DPB			
					300	312	600	625
300	124	105	286	82	292	305	592	617
500	198	125	490	97	-	-	592	617

DPB = ceiling panel width

DPL = ceiling panel length

- = not possible

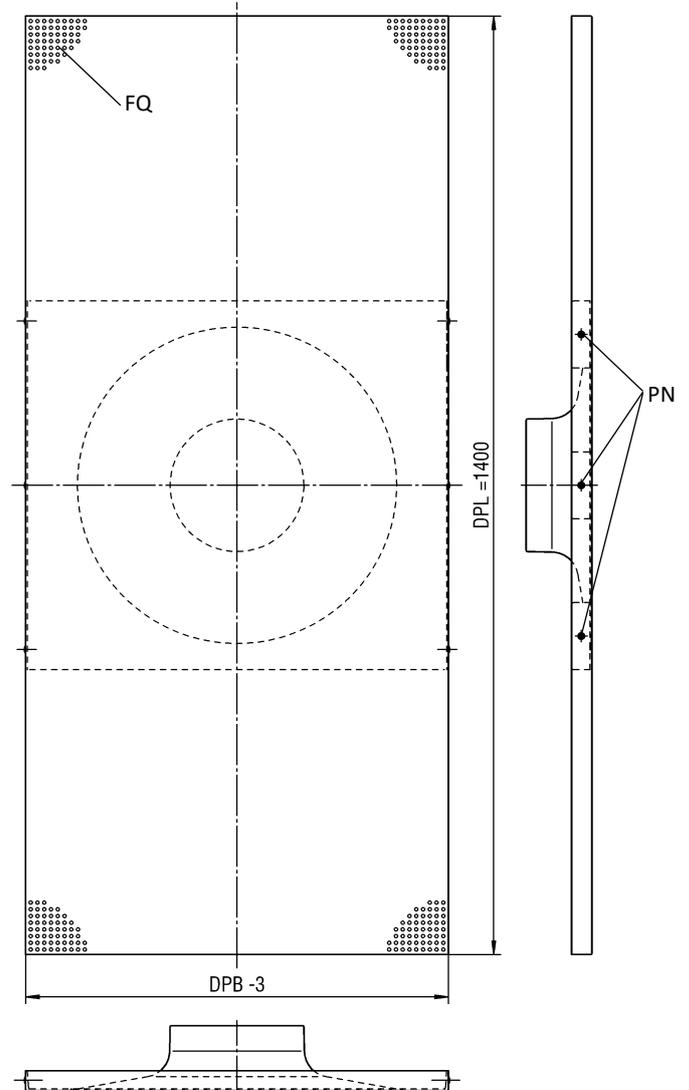
Construction subject to change
No return possible

CPL-E-...

(ceiling air diffuser mounted to the ceiling panel)

FQ = 16.2 % (RG-L15; ø2.5 mm)

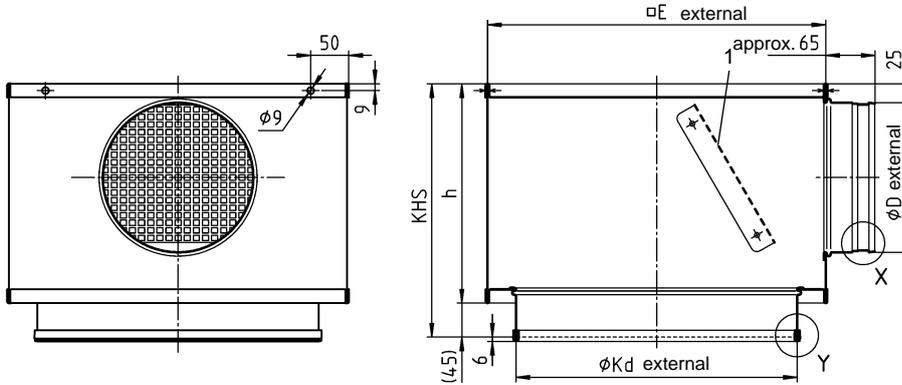
FQ = 25.0 % (RV-L6; ø2.1 mm)



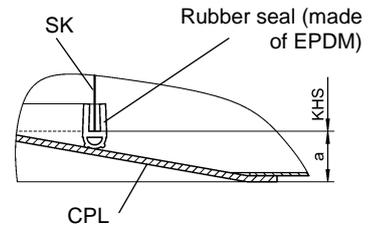
PN = Countersunk pop rivet

DIMENSIONS OF ACCESSORIES
Plenum box (-SK)

SK-...-S1 (standard), lateral spigot

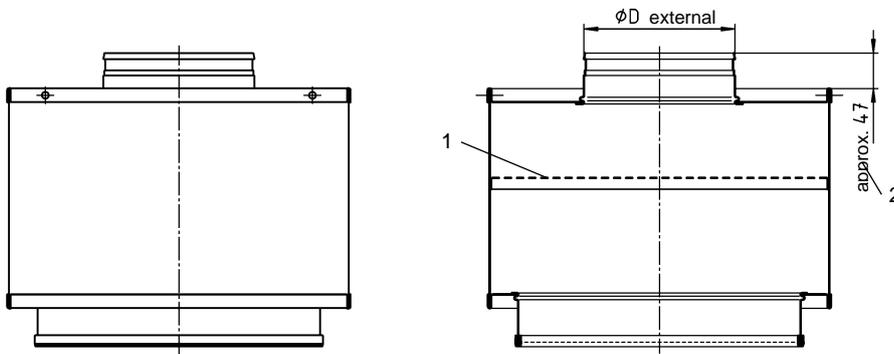

Detail Y

SK mounted to CPL



CPL and SK are not permanently connected to one another.

SK-...-S0, spigot from above



1 Air diffuser plate (for supply air model only)

2 With the VME1 model, the projection dimension is approx. 102 mm.

Available sizes

NW	□E	øKd	KHS	øD	h	a
300	290	222	295	158	250	13
500	445	370	335	198	290	17

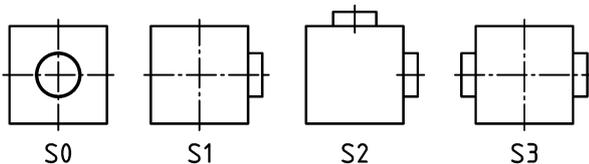
KHS= standard height of plenum box

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

 Note: For SK-R-71-Z-...-DK1/-DK2-...-S0, the height of plenum box changes to $h=280$ mm for NW300 and to $h=300$ mm for NW500 (see p. 5)

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)

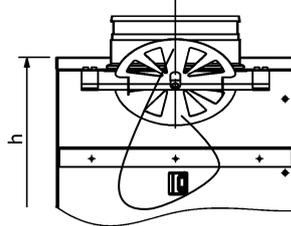
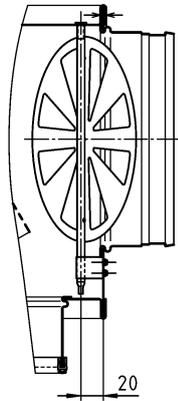


Damper (-DK1 / -DK2), for SK-R-71

SK-...-DK1-...-S1 / -S2 / -S3

SK-...-DK2-...-S0
(with cable-operated adjustment)
Spigot from above

Lateral spigot

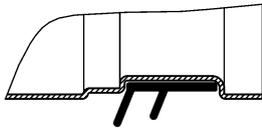


For the model with spigot from above (-S0) in combination with damper (-DK1 / -DK2), the height of plenum box h changes for the following NW as follows.

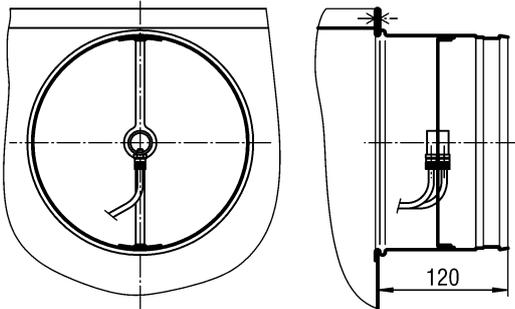
NW	SK-R-71-Z-...		
	KHS	h	øD
300	325	280	158
500	345	300	198

Rubber lip seal (-GD1), for SK

Detail X



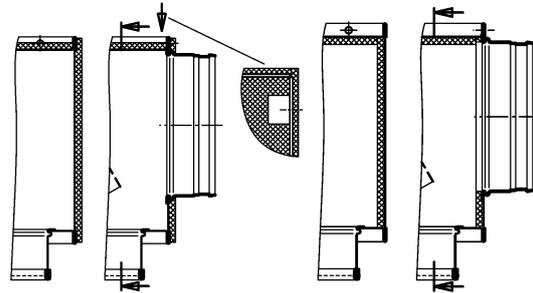
Volumetric flow meter (-VME1), for SK



Internal or external insulation (-li / -la), for SK

internal (-li)

external (-la)



Connection elbow (-K030/-K045/-K090)

according to DIN EN 1506, consisting of a BGE bend made of galvanised sheet steel.

Only possible without plenum box!

Bend model:

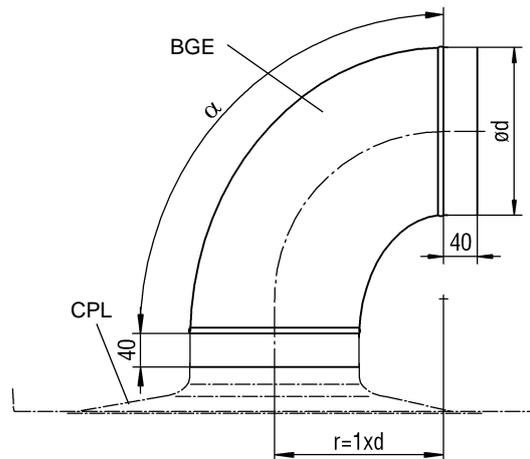
- as a pressed BGE bend

with an angle degree:

$\alpha = 30^\circ$ (-K030)

$\alpha = 45^\circ$ (-K045)

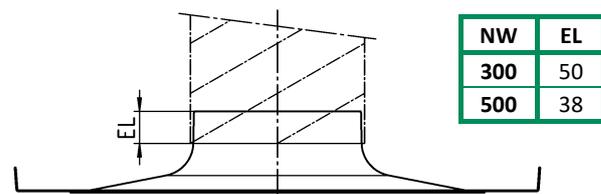
$\alpha = 90^\circ$ (-K090)



Bend supplied loose, inserted and screwed on site, screws provided on site

NW	ød	L2
300	125	40
500	200	

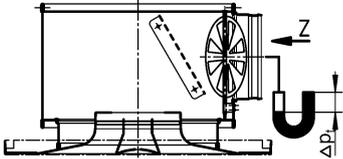
CONNECTION TO FLEXIBLE DUCT



NW	EL
300	50
500	38

TECHNICAL DATA
Pressure loss and noise level

for supply air / with plenum box and damper



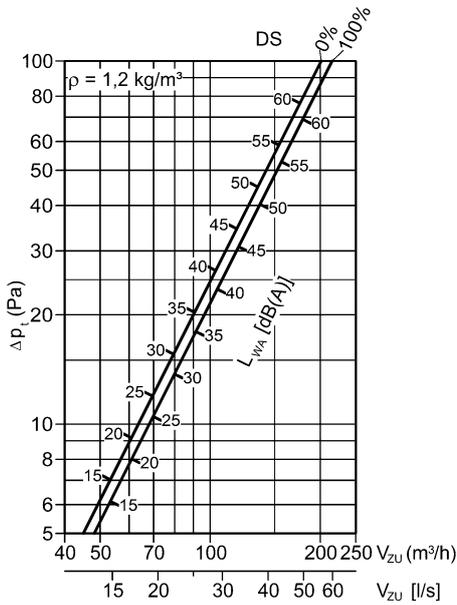
Damper position (DS):

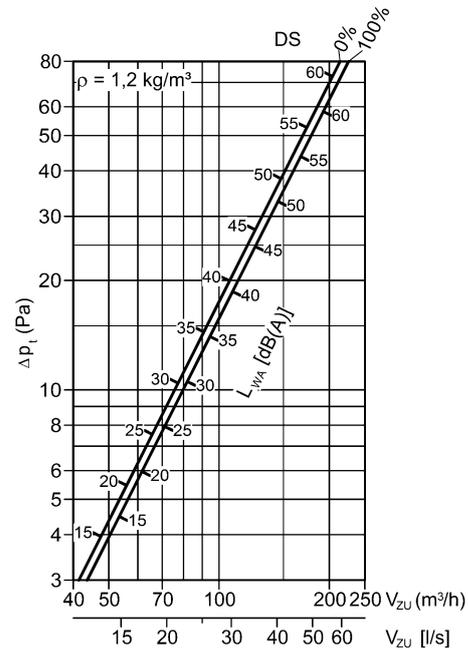
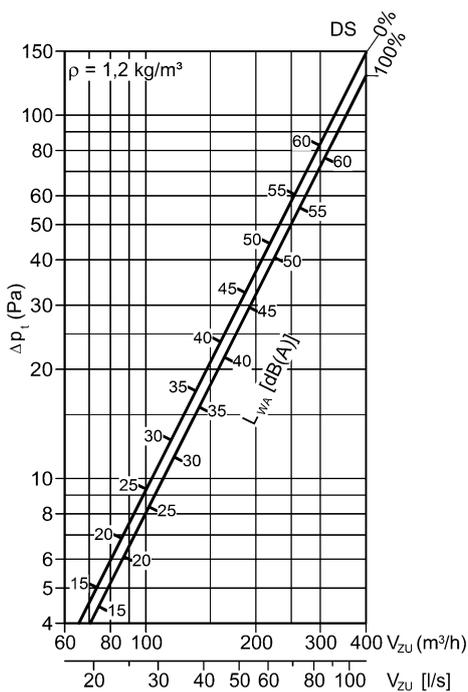
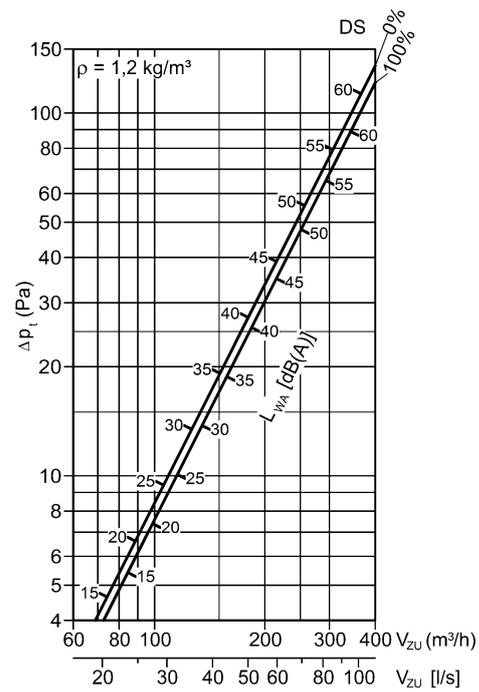
0% = CLOSED

100% = OPEN

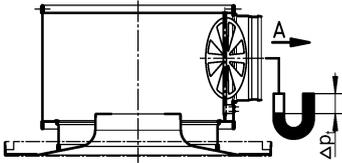
Z = supply air

 with on-site ceiling panel FQ 16.2% (RG-L15; $\phi 2.5$)

CPL-E-Z-3-...-SK-...-DK1

 with on-site ceiling panel FQ 25% (RV-L6; $\phi 2.1$)

CPL-E-Z-3-...-SK-...-DK1

CPL-E-Z-5-...-SK-...-DK1

CPL-E-Z-5-...-SK-...-DK1


for return air / with plenum box and damper



Damper position (DS):

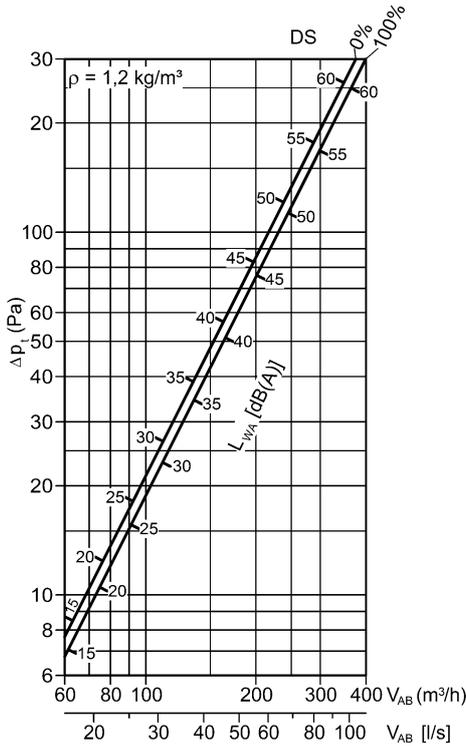
0% = CLOSED

100% = OPEN

A = return air

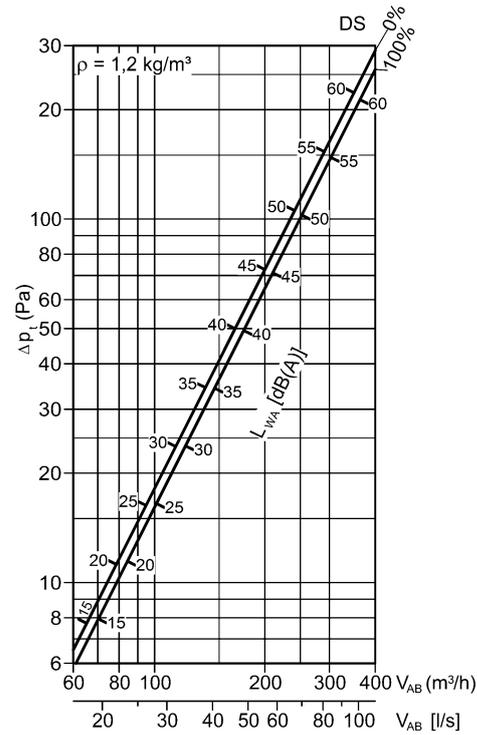
with on-site ceiling panel FQ 16.2% (RG-L15; $\phi 2.5$)

CPL-E-A-3-...-SK-...-DK1

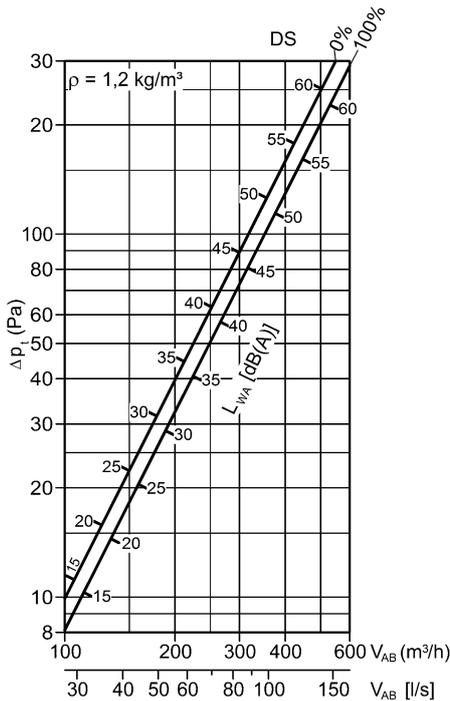


with on-site ceiling panel FQ 25% (RV-L6; $\phi 2.1$)

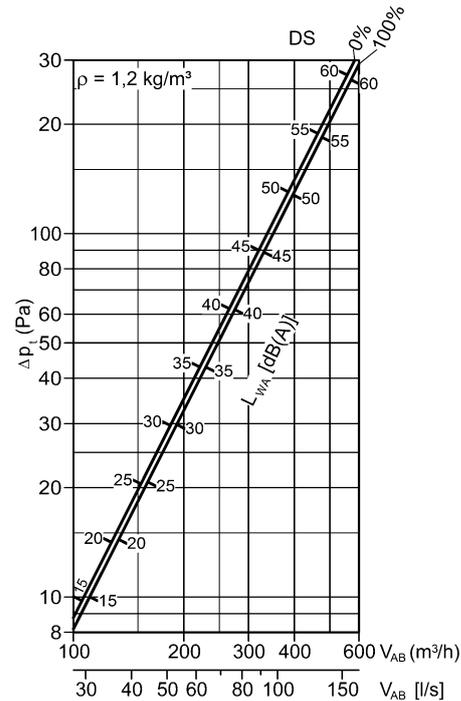
CPL-E-A-3-...-SK-...-DK1



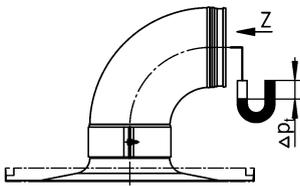
CPL-E-A-5-...-SK-...-DK1



CPL-E-A-5-...-SK-...-DK1

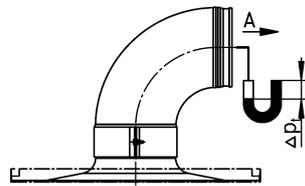


for supply air / with connection elbow
 with on-site ceiling panel



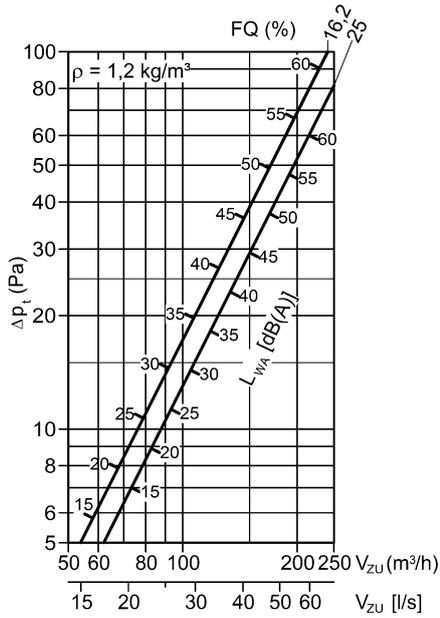
Z = supply air

for return air / with connection elbow
 with on-site ceiling panel

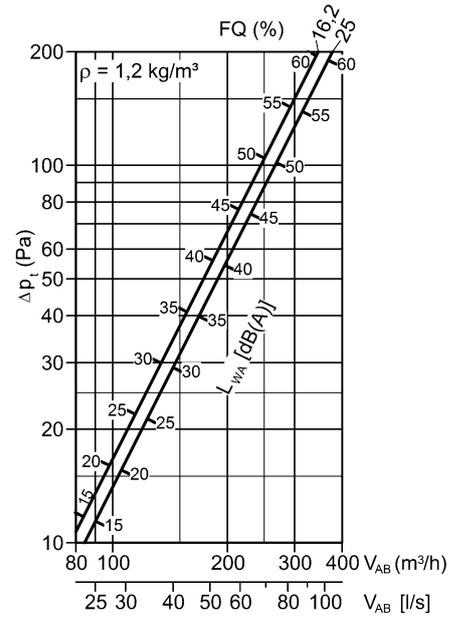


A = return air

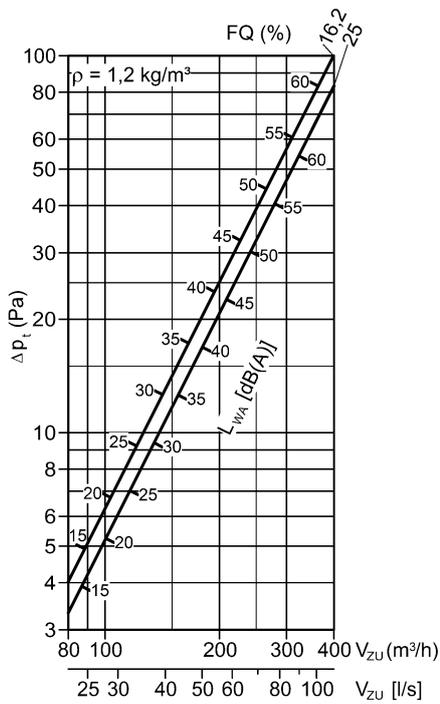
CPL-E-Z-3-K1



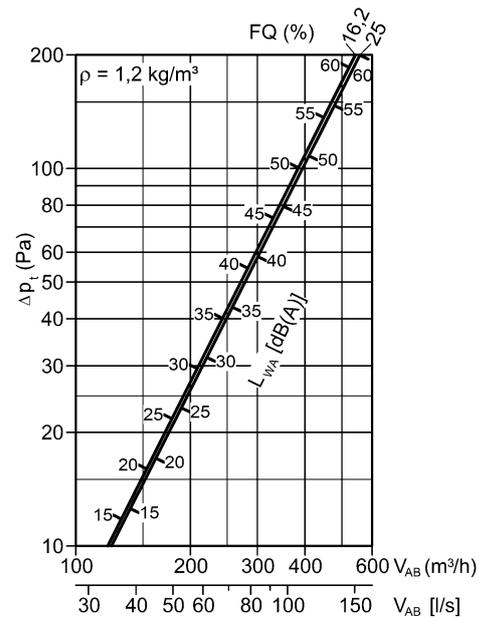
CPL-E-A-3-K1



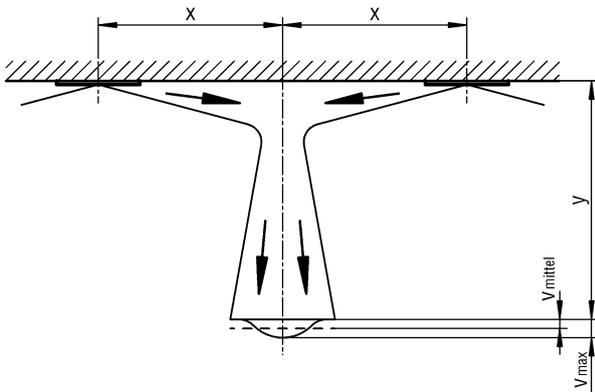
CPL-E-Z-5-K1



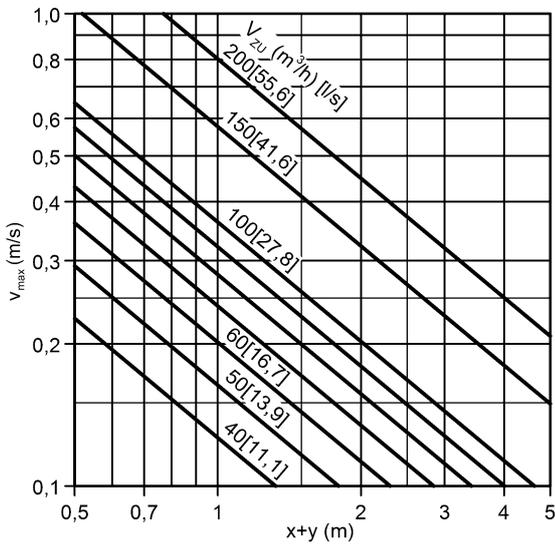
CPL-E-A-5-K1



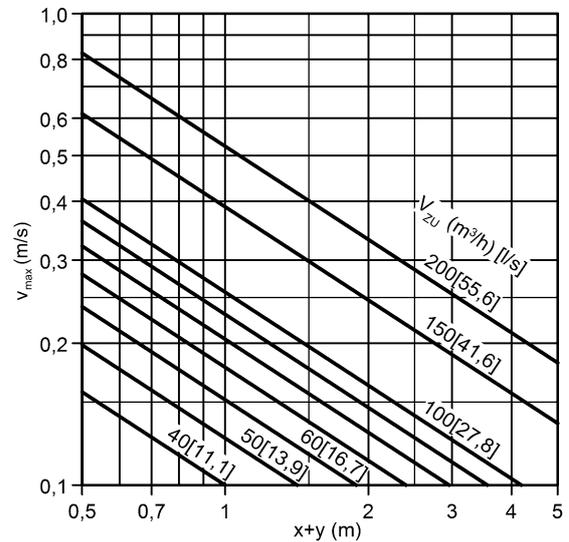
on-site ceiling panel:
 FQ 25% = RV-L6; $\varnothing 2.1$
 FQ 16.2% = RG-L15; $\varnothing 2.5$

Maximum end velocity of jet

 with on-site ceiling panel FQ 16.2% (RG-L15; $\phi 2.5$)

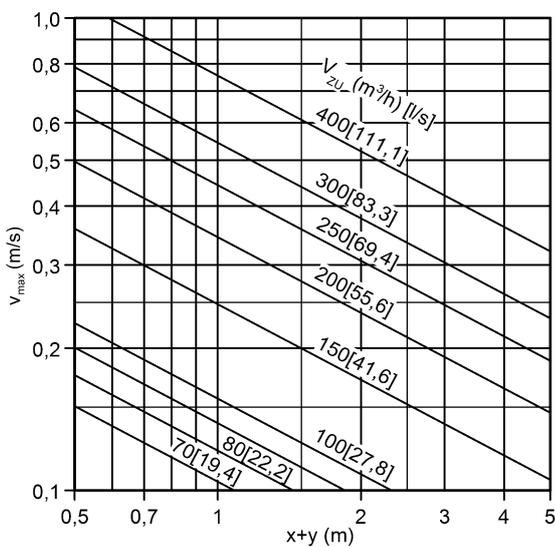
CPL-E-Z-3-...


 with on-site ceiling panel FQ 25% (RV-L6; $\phi 2.1$)

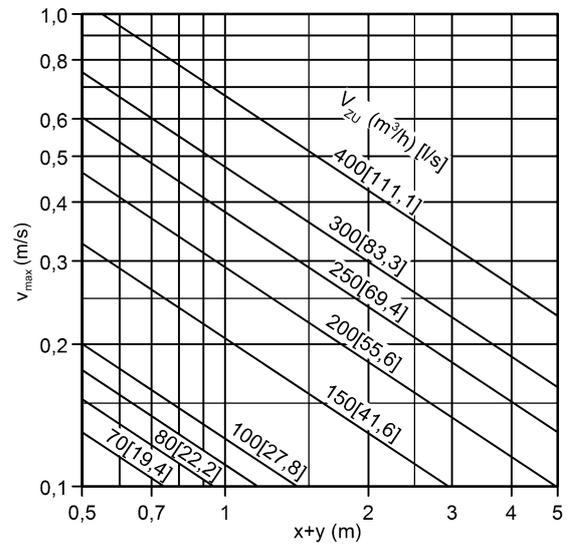
CPL-E-Z-3-...



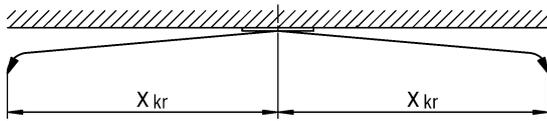
CPL-E-Z-5-...



CPL-E-Z-5-...

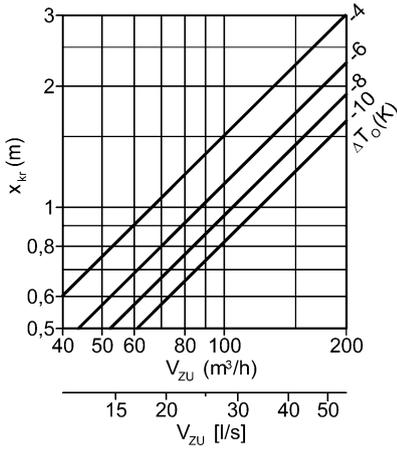


Critical throw



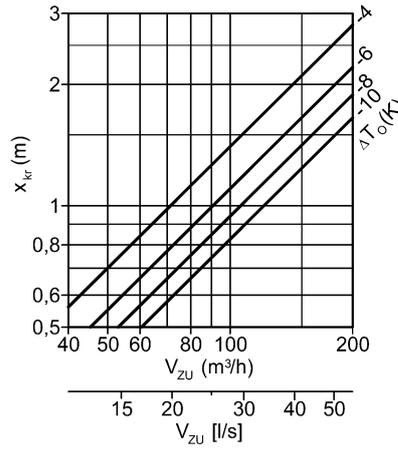
with on-site ceiling panel FQ 16.2% (RG-L15; ø2.5)

CPL-E-Z-3-...

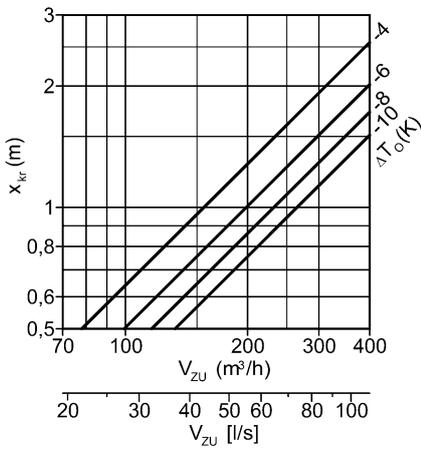


with on-site ceiling panel FQ 25% (RV-L6; ø2.1)

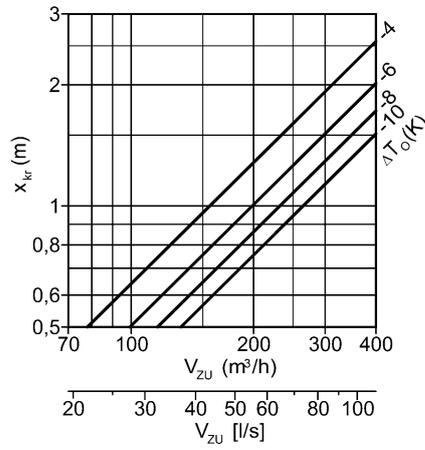
CPL-E-Z-3-...



CPL-E-Z-5-...



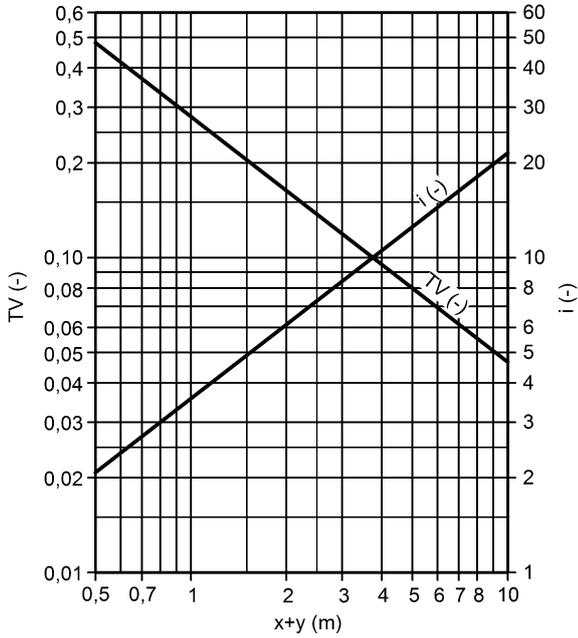
CPL-E-Z-5-...



Temperature and induction ratios

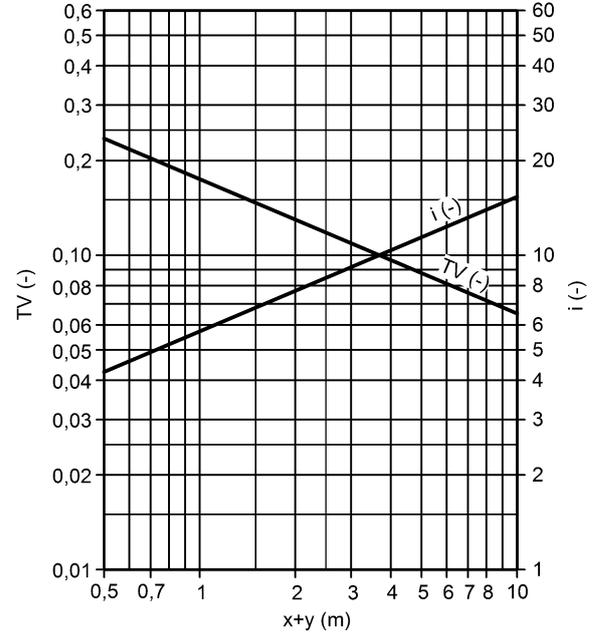
with on-site ceiling panel FQ 16.2% (RG-L15; $\phi 2.5$)

CPL-E-...-3-...

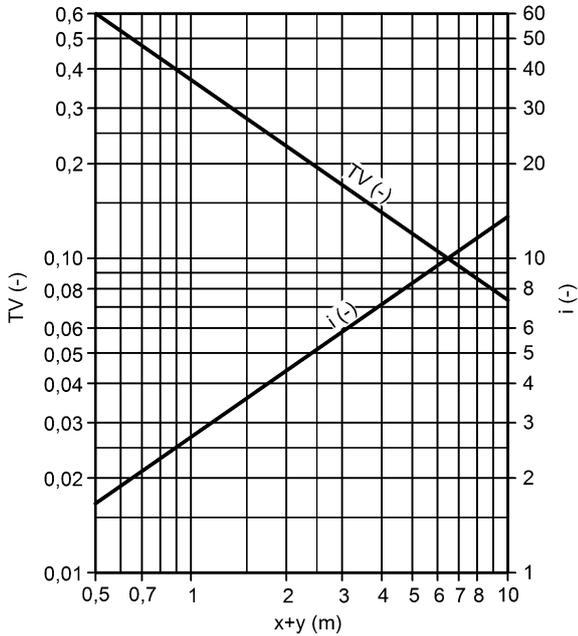


with on-site ceiling panel FQ 25% (RV-L6; $\phi 2.1$)

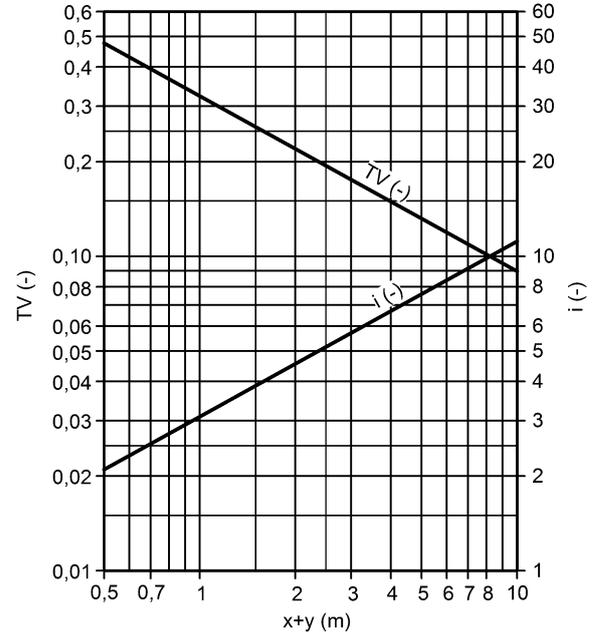
CPL-E-...-3-...



CPL-E-...-5-...



CPL-E-...-5-...



MINIMUM AIR VOLUMES

Ceiling air diffuser type CPL-Z (supply air) with on-site perforated ceiling panel

- FQ = 16.2% (RG-L15; ϕ 2.5)
- FQ = 25% (RV-L6; ϕ 2.1)

NW	ΔT_o (K)	V_{min}	
		(m ³ /h)	[l/s]
300	4	35	9.7
	6	45	12.5
	8	50	13.9
	10	60	16.7
500	4	90	25.0
	6	110	30.6
	8	130	36.1
	10	150	41.7

LEGEND

V_{ZU} (m ³ /h) [l/s]	= Supply air volume
V_{AB} (m ³ /h) [l/s]	= Return air volume
V_{min} (m ³ /h) [l/s]	= Minimum volume
L_{WA} [dB(A)]	= A-weighted sound power level
Δp_t (Pa)	= Total pressure loss
ρ (kg/m ³)	= Density
DS (%)	= Damper position
FQ (%)	= Free cross-section
v_{max} (m/s)	= Maximum end velocity of jet
x (m)	= horizontal throw
y (m)	= vertical throw
x+y (m)	= horizontal + vertical throw
v_{mittel} (m/s)	= Average end velocity of jet ($v_{mittel} = v_{max} \times 0.5$)
x_{kr} (m)	= critical throw
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 ($i = V_x / V_{ZU}$)
Z	= supply air
A	= return air
NW	= Nominal width
PN	= Countersunk pop rivet

ORDER CODE CPL

01	02	03	04	05	06	07
Type	Model	Air throw	Nominal size of intake funnel	Ceiling panel width	Material	Connection elbow
Example						
CPL	-E	-Z	-5	-600	-AL	-K000

Sample

CPL-E-Z-5-600-AL-K000

Ceiling air diffuser type CPL | only ceiling air diffuser | supply air | NW 500 | ceiling panel width 600 mm | aluminium painted to the RAL colour 9005 (black) | without connection elbow

ORDER DETAILS

01 - Type

CPL = ceiling air diffuser CPL

02 - Model

E = only ceiling air diffuser

03 - Air throw

Z = supply air (standard), with central disc

A = return air

04 – Nominal size of intake funnel

3 = NW 300

5 = NW 500

05 - Ceiling panel width

300 = Ceiling panel width 300 mm (not possible for NW 500)

312 = Ceiling panel width 312 mm (not possible for NW 500)

600 = Ceiling panel width 600 mm

625 = Ceiling panel width 625 mm

06 - Material

AL = Aluminium painted to the RAL colour 9005 (black)

07 - Connection elbow

K000 = without connection elbow (standard)

K030 = connection elbow consisting of a bend with a connection sleeve made of galvanised sheet steel.
Pressed BGE bend with an angle degree $\alpha = 30^\circ$

K045 = connection elbow consisting of a bend with a connection sleeve made of galvanised sheet steel.
Pressed BGE bend with an angle degree $\alpha = 45^\circ$

K090 = connection elbow consisting of a bend with a connection sleeve made of galvanised sheet steel.
Pressed BGE bend with an angle degree $\alpha = 90^\circ$

ORDER CODE SK

01	02	03	04	05	06	07
Type	Model	Air diffuser	Type of air	Nominal size	Fastening	Material
Example						
SK	-R	-71	-Z	-500	-OM	-SV

08	09	10	11	12	13	14	15
Damper	Rubber lip seal	Volumetric flow meter	ROB version	Insulation	Height of plenum box	Spigot diameter	Spigot position
-DK1	-GD1	-VME0	-ROB0	-I0	-KHS	-SDS	-S1

Sample
SK-R-71-Z-500-OM-SV-DK1-GD1-VME0-ROB0-I0-KHS-SDS-S1

Plenum box, square design | for round air diffusers with round diffuser support | air diffuser CPL | supply air | NW 500 | without mounting | galvanised sheet steel | with damper | with rubber lip seal | without volumetric flow meter | without ROB version | without box insulation | standard height of plenum box | standard spigot diameter | 1 lateral spigot

ORDER DETAILS
01 - Type

SK = plenum box, square design

02 - Model

R = for round air diffusers with round diffuser support

03 - Air diffuser (must be ordered separately)

71 = suitable for CPL-...

04 - Type of air

Z = supply air (with integrated perforated straightener)

A = return air (without air diffuser plate)

05 - Nominal size

300 = NW 300

500 = NW 500

06 - Fastening

OM = without mounting

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 in the connection spigot (standard)

VME1 = with volumetric flow meter in the connection spigot

11 - ROB version

ROB0 = without ROB version

12 - Insulation

I0 = without insulation (standard)

Ii = with box insulation inside

Ia = with box insulation outside

13 - Height of plenum box

KHS = standard height of plenum box

xxx = height of plenum box in mm (minimum height = spigot diameter + 137 mm) (For SK-R-71-Z-...-DK1/-DK2-...-S0, observe special height of plenum box, which is at least 235 mm (see p. 5)) (always with 3 digits)

14 - Spigot diameter

SDS = standard spigot diameter

xxx = spigot diameter in mm (always with 3 digits)

15 - Spigot position

S0 = 1 spigot from above

S1 = 1 lateral spigot (standard)

S2 = 2 lateral spigots, offset by 90°

S3 = 2 lateral spigots, offset by 180°

SPECIFICATION TEXT

Ceiling air diffuser type CPL for supply and return air for use in rooms from 2.6 to 4 m high. Highly inductive air diffuser, air velocity and temperature difference of the supply air jet are effectively reduced. The stable air jet and high induction mean that the CPL ceiling air diffuser can be used in cooling mode up to $\Delta T_0 \leq -10$ K.

Consists of an adaptor plate and intake funnel made of aluminium painted to the RAL colour RAL 9005 (black). With supply air model additionally with central disc made of galvanised sheet steel.

Product: SCHAKO type CPL-...-Z

- return air model without central disc.

Product: SCHAKO type CPL-...-A

Models:

- only ceiling air diffuser (-E), for on-site fitting to ceiling panel.

Nominal size of intake funnel:

- nominal width 300 (-3)
- nominal width 500 (-5)

Ceiling panel width:

- 300 mm (-300)
- 312 mm (-312)
- 600 mm (-600)
- 625 mm (-625)

The following on-site ceiling panels are suitable for operation with the intake funnels:

- FQ 16.2% - RG-L15; \emptyset 2.5 mm
- FQ 25.0% - RV-L6; \emptyset 2.1 mm

Can be connected to the duct system via a direct hose/duct connection or via a plenum box.

Accessories:

- Connection elbow (-K...) consisting of a bend BGE or BSE with a connection sleeve made of galvanised sheet steel. Only possible without plenum box.
Bend model:
 - as a pressed BGE bend with an angle degree $\alpha = 30^\circ$ (-K030) / $\alpha = 45^\circ$ (-K045) / $\alpha = 90^\circ$ (-K090).
- plenum box (SK-R-71-...) made of galvanised sheet steel, with fixing lugs.
 - supply air model with integrated air diffuser plate.
 - return air model without air diffuser plate.
 - rubber seal made of EPDM.
 - with damper (-DK1 / -DK2).
 - made of galvanised sheet steel. Damper fastening made of plastic for air volume regulation (not accessible on the room side) (-DK1).
 - made of galvanised sheet steel. Damper fastening made of plastic for air volume regulation with cable-operated adjustment (not accessible on the room side) (-DK2).
 - with rubber lip seal (-GD1), at the connection spigot made of special rubber.
 - with volumetric flow meter (-VME1) in the connection spigot. Consisting of a holder made of galvanised sheet steel, connections made of aluminium, and measuring sensor made of plastic.
 - with thermal insulation:
 - internal (-li)
 - external (-la)
 - Selection of the height of plenum box:
 - standard (-KHS)
 - freely selectable (-xxx), height of plenum box in mm (minimum height = spigot diameter + 137 mm) (For SK-R-71-Z-...-DK1/-DK2-...-S0, observe special height of plenum box, which is at least 235 mm (see p. 5)) (always with 3 digits).
 - Selection of the connection spigot diameter:
 - standard (-SDS)
 - can be freely selected (-xxx), spigot diameter in mm (always with 3 digits).
 - Spigot position:
 - S0 = 1 spigot from above
 - S1 = 1 lateral spigot (standard)
 - S2 = 2 lateral spigots, offset by 90°
 - S3 = 2 lateral spigots, offset by 180°