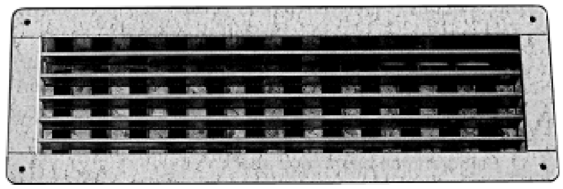
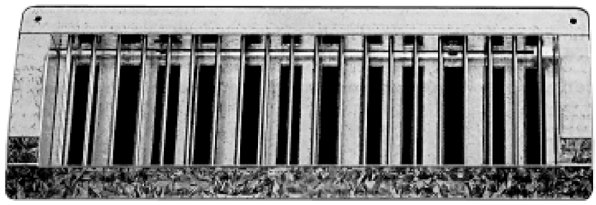
SCHAKO
KLIMA-LUFT

Compact Grille

KG / KG-R





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Compact Grille KG / KG-R

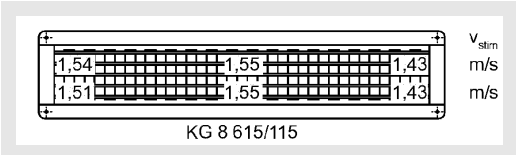
Contents

Compact Grille KG / KG-R

Description

The compact grille type KG can be used for both supply air and return air systems. Owing to its **compact construction** - the front frame and blades for air distribution and the hit-and-miss damper for air volume control consist of a single component - the compact grille requires only a **small mounting depth**. This small mounting depth reduces vortex formation at the hit-and-miss damper, thus ensuring a **uniform inflow of air** over the entire diffuser surface of the grille (see velocity profile). Moreover, the compact construction gives the grille **very high stability** and **torsional rigidity**. Its special frame shape allows the compact grille to make close contact with the ductwork. Modern production methods allow the grille to be **manufactured free of welding spots**, thus **minimising** the **susceptibility to corrosion** of the compact grille. The stainless steel design of the compact grille allows it to be used in areas containing aggressive air substances. The modern design of the **cover frame** allows concealed mounting (VM) of the grille. The stainless steel and aluminium models H=65 - 315 mm and the sheet steel model H=165 mm are delivered without raised ends of the hit-and-miss dampers. For the "hit-and-miss damper without raised ends" model, the diagram values were only achieved with inflow from behind. If the inflow is lateral, the values change.
At an extra charge, a plenum box can be mounted. **Unless stated otherwise, the KG grille is delivered in the galvanised sheet steel model!**
The installation of the KG-R into spiral ducts must take place free of stress. Avoid using unround or deformed spiral ducts, in order to protect the grilles from distortion.

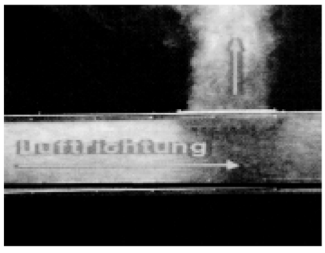
Velocity profile



KG 8 615/115

Exit velocities at a supply air volume V_{ZU} of 400 m³/h (corresponding to 111.1 l/s). Grille mounted in flow channel, inflow sideways.

Air duct comparison



The picture in the flow channel proves:

- uniform inflow of the air over the entire grille surface
- no air vortex formation

Construction

Frame and blades

- aluminium natural color anodised E6/EV1 (at an extra charge)
- Stainless steel 1.4301 (V2A) (at an extra charge).
- Stainless steel 1.4571 (V4A) (at an extra charge).
- Galvanised sheet steel (standard)
- Galvanised sheet steel, front side painted to RAL 9010 (white)

Model

KG 8 - horizontal blades, for installation in rectangular ductwork

KG 15 - vertical blades, for installation in rectangular ductwork

KG-R 8 - horizontal blades, for installation in sheet metal / spiral ductwork

KG-R 15 - vertical blades, for installation in sheet metal / spiral ductwork

Accessories

Plenum box (-ASK)

- only for type KG 8 / KG 15
- Galvanised sheet steel

Rubber lip seal (-GD)

- Special rubber, on plenum box connection piece

Cover frame (-BR)

- only for type KG 8 / KG 15
- aluminium painted to RAL 9010 (white)
- Aluminium natural colour anodised E6/EV1

Mounting frame (-E1)

- only for type KG 8 / KG 15
- Electrolytically galvanised sheet steel

Internal insulation (-Ii)

- Thermal insulation inside the plenum box

External insulation (-Ia)

- Thermal insulation on the outside of the plenum box

Fastening

Screw mounting (-SM)

- Standard, screws must be provided on-site

Concealed mounting (-VM) (only possible with type KG 8 / KG 15)

- At an extra charge: with cover frame

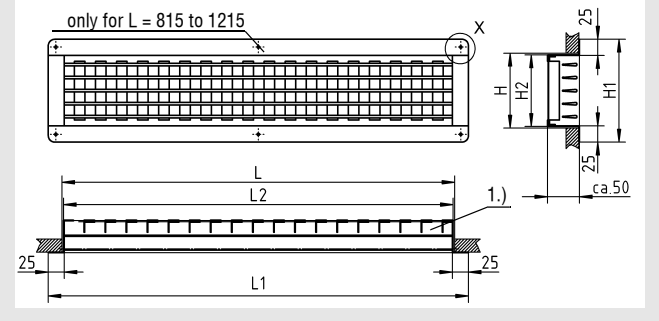
Attention!
We would like to point out that only suitable cleaning materials may be used for cleaning the stainless steel design!

Compact Grille KG / KG-R

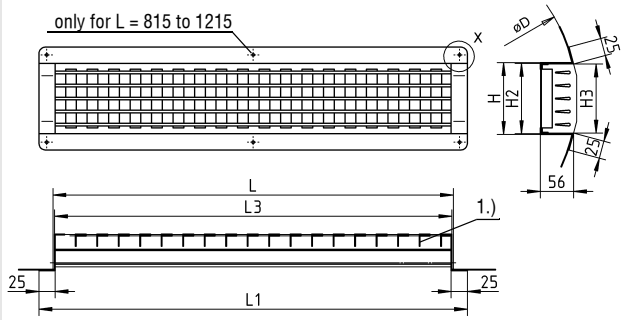
Models and dimensions

Dimensions

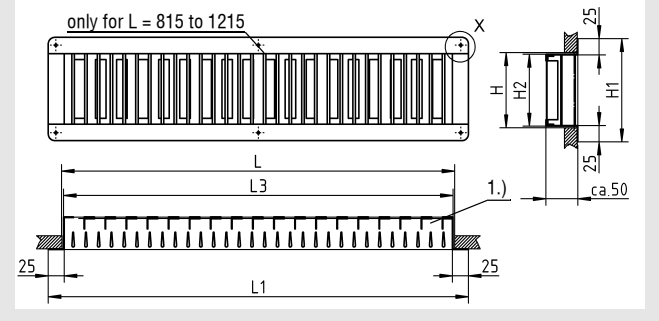
KG 8



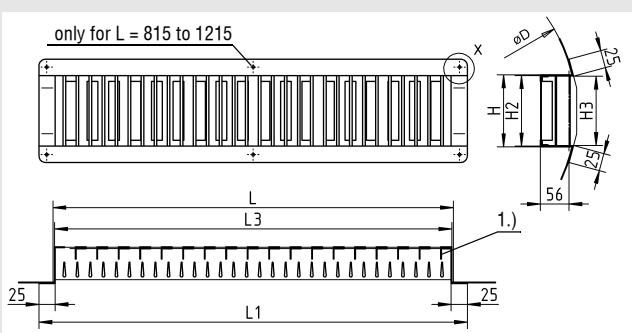
KG-R 8



KG 15



KG-R 15



Available sizes KG 8 / KG 15

L	L1	L2	L3
315	358	312	310
415	458	412	410
515	558	512	510
615	658	612	610
815	858	812	810
1015	1058	1012	1010
1215	1258	1212	1210

H	H1	H2
65	108	60
115	158	110
165	208	160
215	258	210
315	358	310

All lengths and heights can be combined!
Special dimensions are not possible!

Mounting dimensions of the aluminium model:

KG 8 $_{Alu}$ (L+10) x H
KG 15 $_{Alu}$ L x (H+10)

1.) The stainless steel and aluminium models H=65 - 315 mm and the sheet steel model H=165 mm are delivered without raised ends of the hit-and-miss dampers.

Available sizes KG-R 8 / KG-R 15

L	L1	L2	L3
315	358	312	310
415	458	412	410
515	558	512	510
615	658	612	610
815	858	812	810
1015	1058	1012	1010
1215	1258	1212	1210

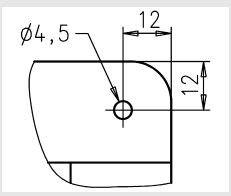
H	H2	H3
65	60	58
115	110	108
165	160	158
215	210	208
315	310	308

All lengths and heights can be combined!
Special dimensions are not possible!

Mounting dimensions of the aluminium model:

KG 8 $_{Alu}$ (L+10) x H
KG 15 $_{Alu}$ L x (H+10)

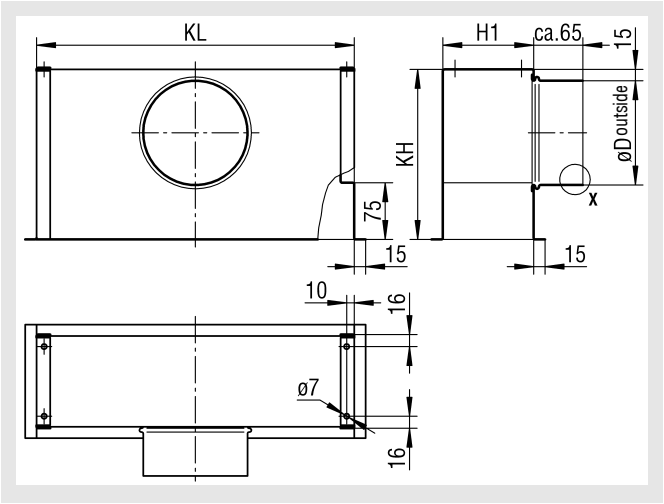
Detail X



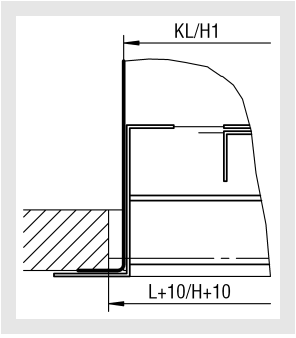
Compact Grille KG / KG-R

Dimensions of accessories

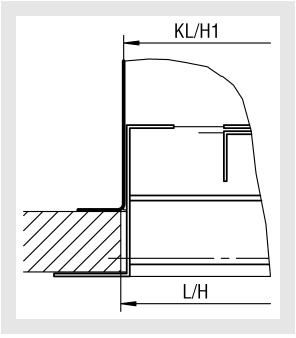
Plenum box (-ASK) for KG 8 / KG 15



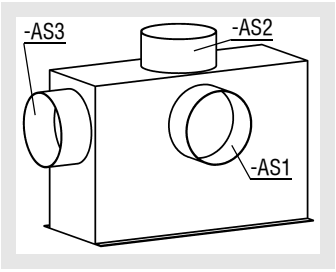
with plenum box below the ceiling / in front of the wall



with plenum box above the ceiling / behind the wall



Arrangement of connection pieces

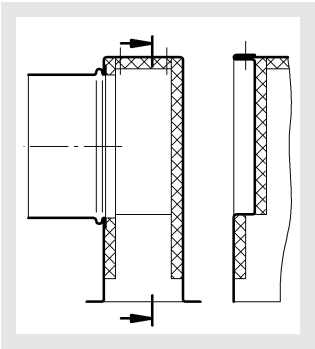


- Lateral connection piece (-AS1, standard)
- Connection piece from above (-AS2)
- Connection piece front side (-AS3)

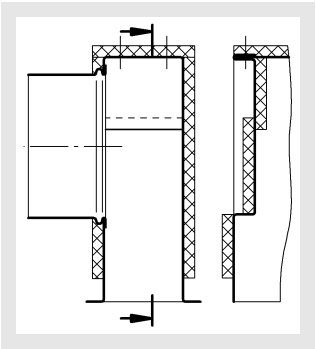
Dimensions and prices for connection piece from above (-AS2) and connection piece front side (-AS3) upon request.

Insulation for plenum box (ASK)

inside(-li)



outside(-la)



Available sizes ASK -AS1

L	H	KL[1.)]	H1[1.)]	KH	øD
315	**65**	320	68	210	123
415		420			
515		520			
615		620			
815		820		245	158
1015		1020			
1215		1220			

L	H	KL[1.)]	H1[1.)]	KH	øD
315	**115**	320	118	245	158
415		420			
515		520			
615		620			
815		820		285	198
1015		1020			
1215		1220			

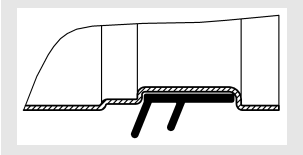
L	H	KL[1.)]	H1[1.)]	KH	øD
315	**165**	320	168	285	198
415		420			
515		520			
615		620			
815		820			
1015		1020			
1215		1220			

L	H	KL[1.)]	H1[1.)]	KH	øD
315	**215**	320	218	285	198
415		420			
515		520			
615		620		335	248
815		820			
1015		1020			
1215		1220			

L	H	KL[1.)]	H1[1.)]	KH	øD
315	**315**	320	318	335	248
415		420			
515		520			
615		620		400	313
815		820			
1015		1020			
1215		1220			

Rubber lip seal (-GD)

Detail X



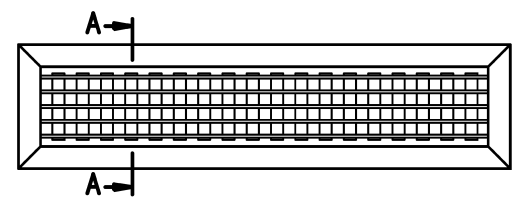
1.) **For aluminium model:**

KG 8 $_{Alu}$: (KL+10) x H1

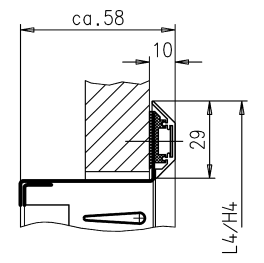
KG 15 $_{Alu}$: KL x (H1+10)

Compact Grille KG / KG-R

Cover frame (-BR)



Section A-A



Available sizes

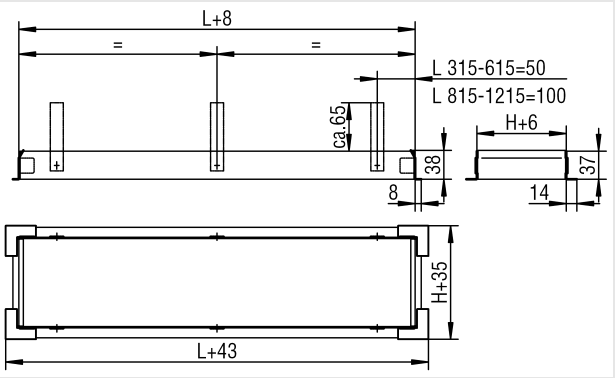
L	L4
315	368
415	468
515	568
615	668
815	868
1015	1068
1215	1268

H	H4
65	116
115	168
165	218
215	268
315	368

All lengths and heights can be combined!
Other sizes available on request..

The cover frame is only available for types KG 8 and KG 15!
A cover frame has been developed to allow concealed mounting,(VM), which, after slipping two plastic parts onto the longitudinal side of the grille, can be easily attached. This can also easily be done on grilles which have already been installed.

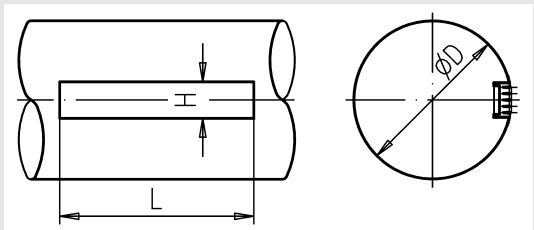
Mounting frame (-E1) for KG 8 / KG 15



Length L ≤ 815 mm - 4 wall anchors
Length L > 815 mm - 6 wall anchors
Mounting frames are only delivered with wall anchors on special request (at an extra charge).

Installation

Mounting situation KG-R



Duct diameter KG-R

H	øD		
	min.	ideal	max.
65	140	250	400
115	300	500	800
165	450	625	1025
215	600	750	1250
315	900	1000	1250

Installation opening:

- made of sheet steel / stainless steel : L x H
- made of aluminium
  KG 8 $_{Alu}$: (KL+10) x H1
  KG 15 $_{Alu}$: KL x (H1+10)

The curved flange and the four height dimensions, apart from providing high stability and torsional rigidity, allow optimum adaptation of the compact grille type KG-R to sheet metal and spiral ductwork. The selection of the grille height depends on the duct diameters listed in the table. The grille frames only make optimum contact when the ideal duct diameter is used.

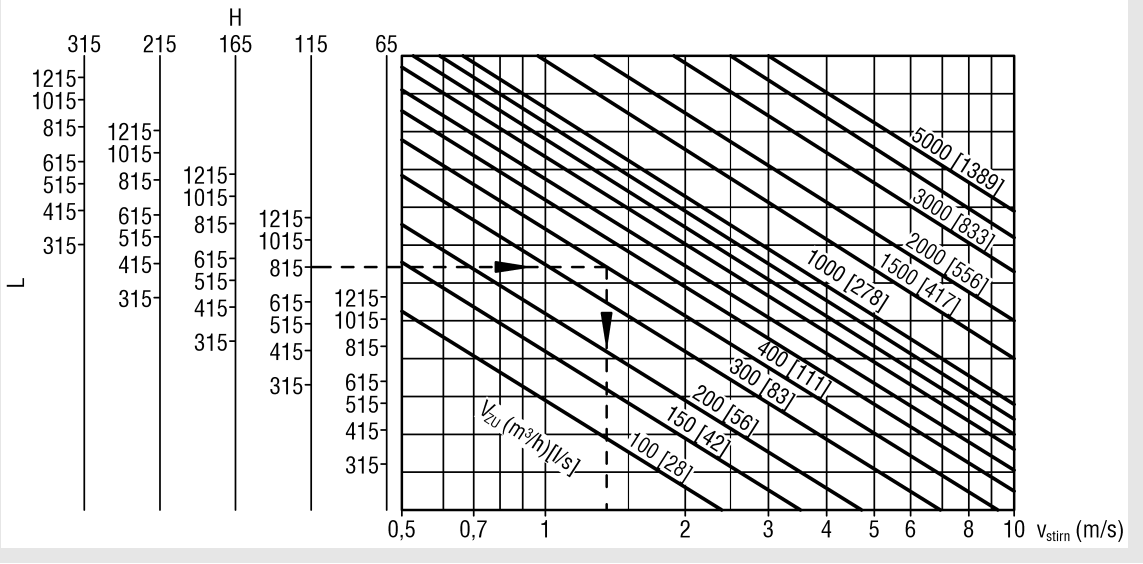
The installation of the KG-R into spiral ducts must take place free of stress. Avoid using unround or deformed spiral ducts, in order to protect the grilles from distortion.

Compact Grille KG / KG-R

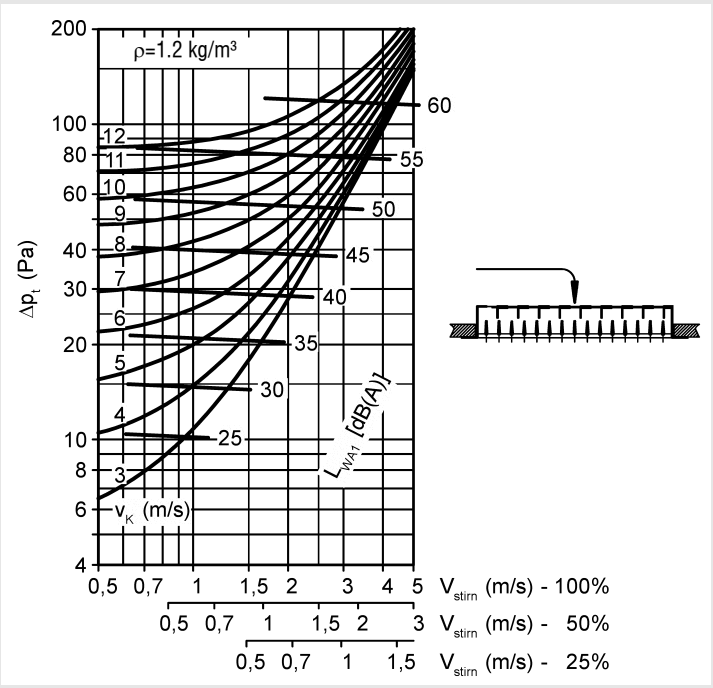
Technical Data

Pressure loss and noise level

ZU air face velocity



Supply air



Hit-and-miss damper position OPEN in %

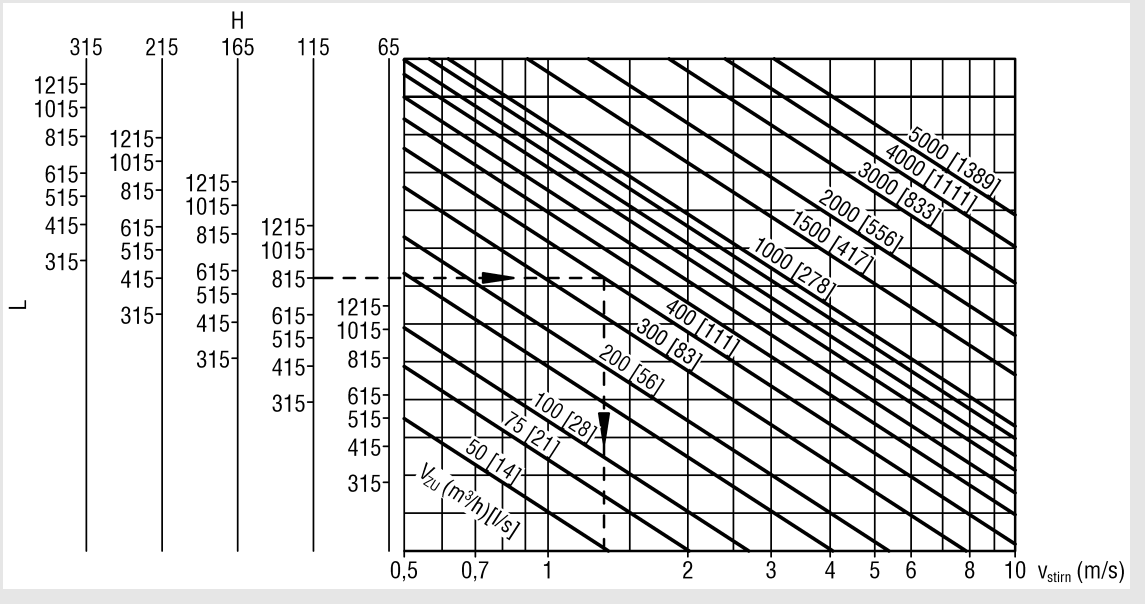
Zeta values (ζ)

position of hit and miss damper			
100%	**75%**	**50%**	**25%**
1,4	1,76	2,5	4,0
Applies to the standard KG grille of **heights 65, 115, 215 and 315 mm in all widths with lateral inflow!**			

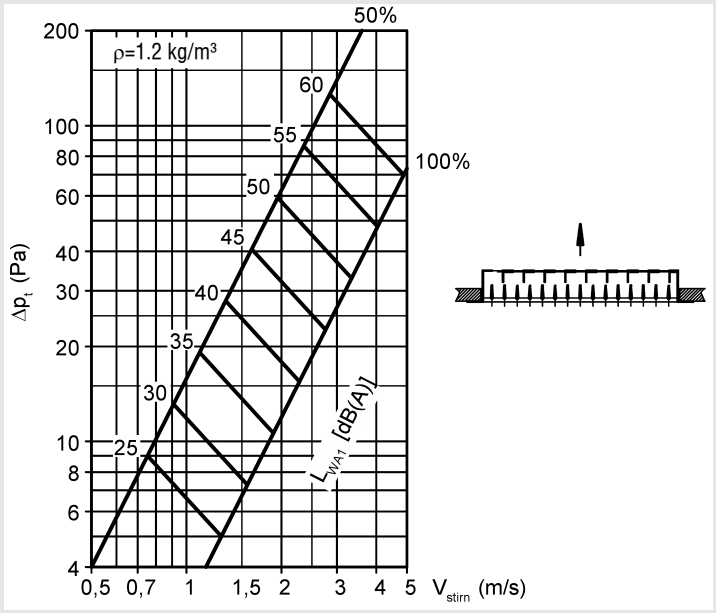
position of hit and miss damper			
100%	**75%**	**50%**	**25%**
2,0	3,4	5,2	11,9
Only applies to the **KG grille of height 165, or the stainless steel or aluminium model (all sizes) with direct inflow from behind!**			

Compact Grille KG / KG-R

Return air face velocity



Return air



Hit-and-miss damper position OPEN in %

Correction factor (supply air and return air)

A_{face} (m²)	0,01	0,02	0,04	0,08	0,16	0,32	0,40
KF (-)	-9	-6	-3	0	+3	+6	+7

$L_{WA} = L_{WA1} + KF$

FQ in m² at the hit-and-miss damper

Height (H) \ Length (L)	315	415	515	615	815	1015	1215
65	0,0067	0,0090	0,0120	0,0135	0,0180	0,0225	0,0270
115	0,0135	0,0180	0,0240	0,0270	0,0360	0,0450	0,0540
165	0,0201	0,0268	0,0358	0,0403	0,0537	0,0671	0,0805
215	0,0270	0,0360	0,0480	0,0540	0,0720	0,0900	0,1080
315	0,0405	0,0540	0,0720	0,0810	0,1080	0,1349	0,1619

FQ (m²)

Face area (m²)

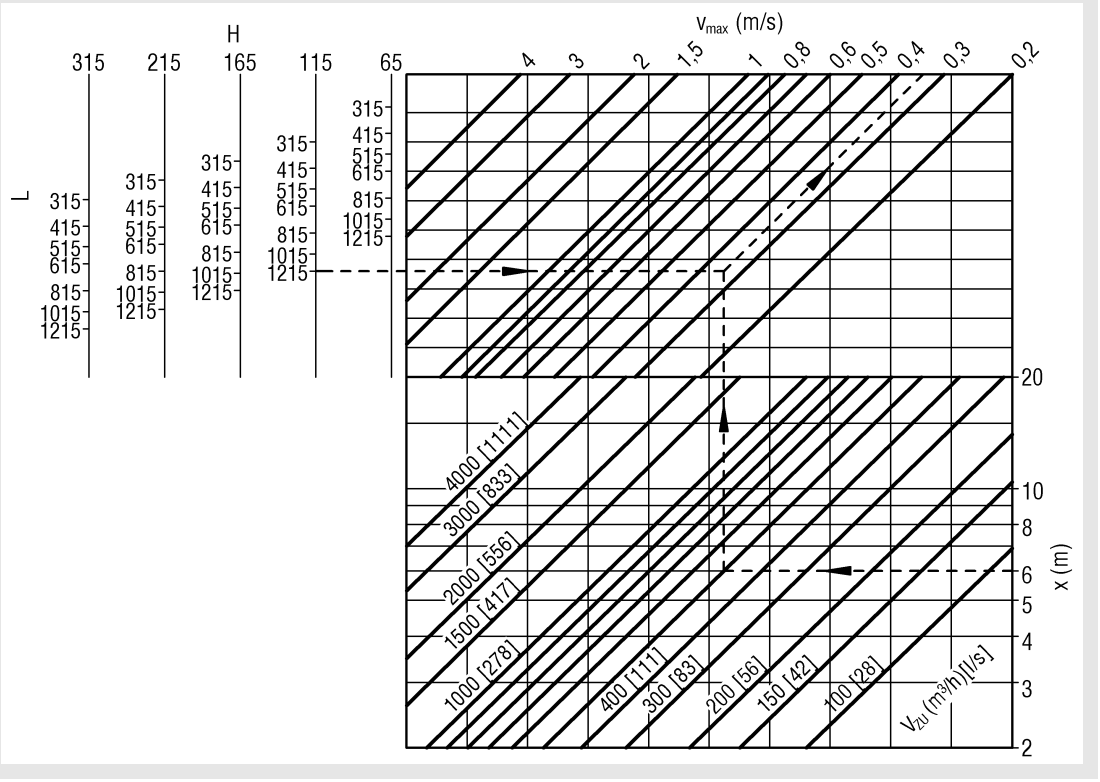
Height (H) \ Length (L)	315	415	515	615	815	1015	1215
65	0,018	0,024	0,029	0,035	0,047	0,058	0,070
115	0,033	0,044	0,055	0,066	0,087	0,109	0,130
165	0,049	0,064	0,080	0,096	0,128	0,159	0,191
215	0,064	0,085	0,106	0,126	0,168	0,210	0,251
315	0,095	0,126	0,156	0,187	0,248	0,310	0,372

A_{face} (m²)

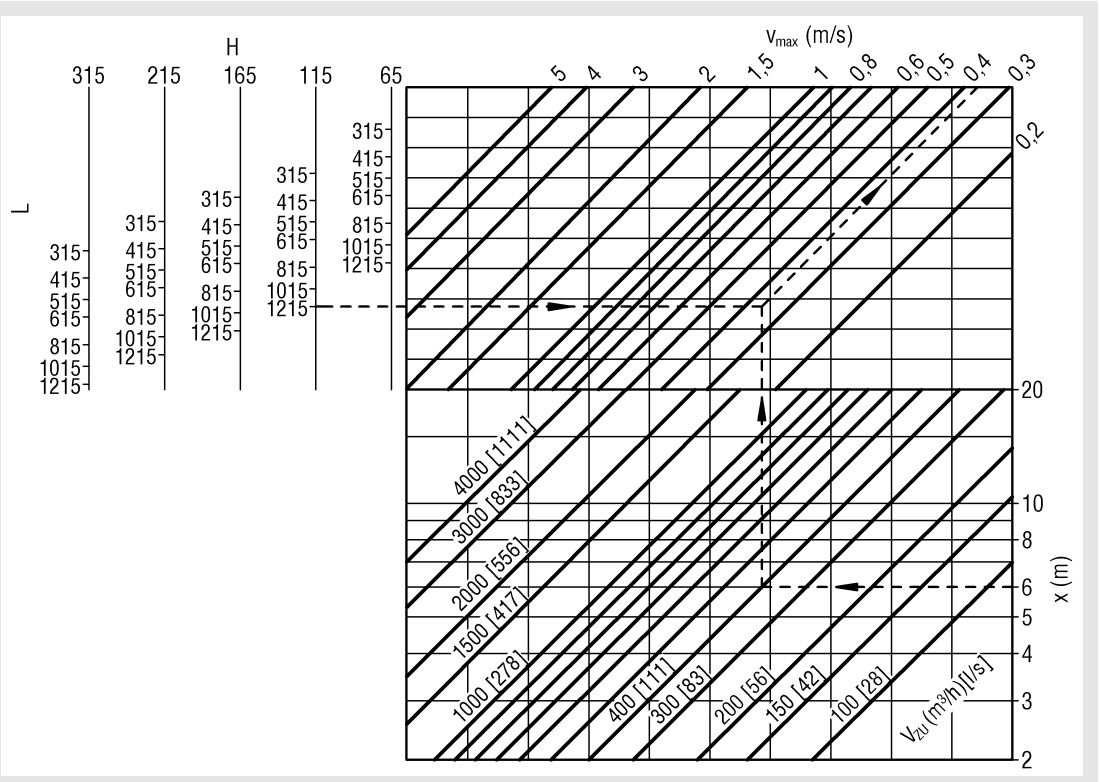
Compact Grille KG / KG-R

Maximum end velocity of jet

Supply air without coanda effect



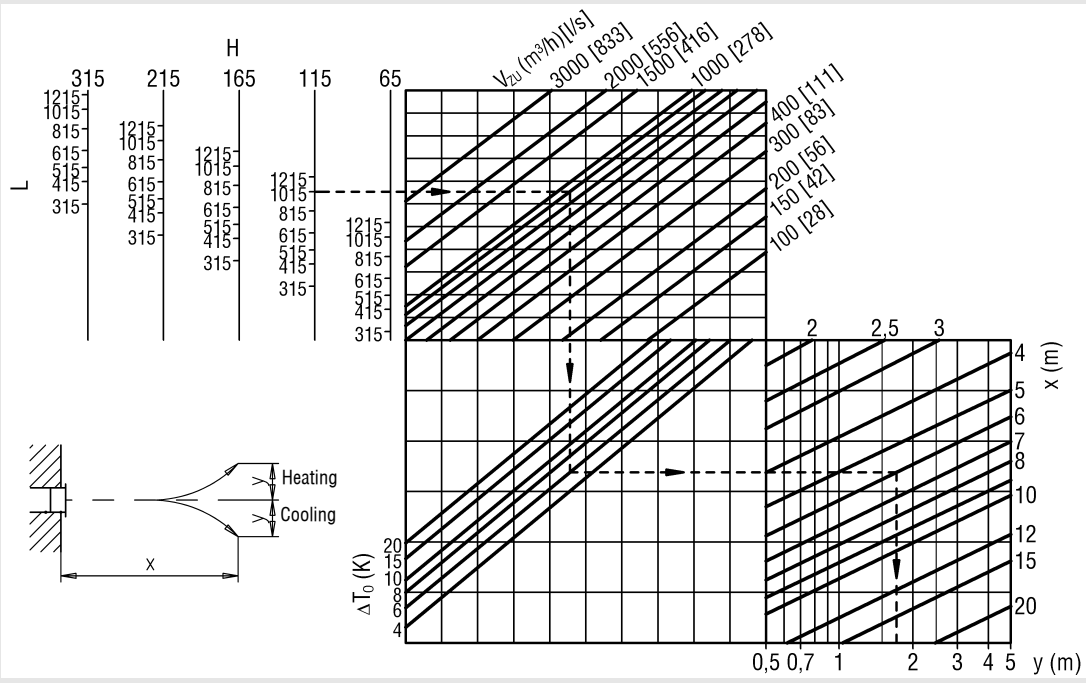
Supply air with coanda effect



Compact Grille KG / KG-R

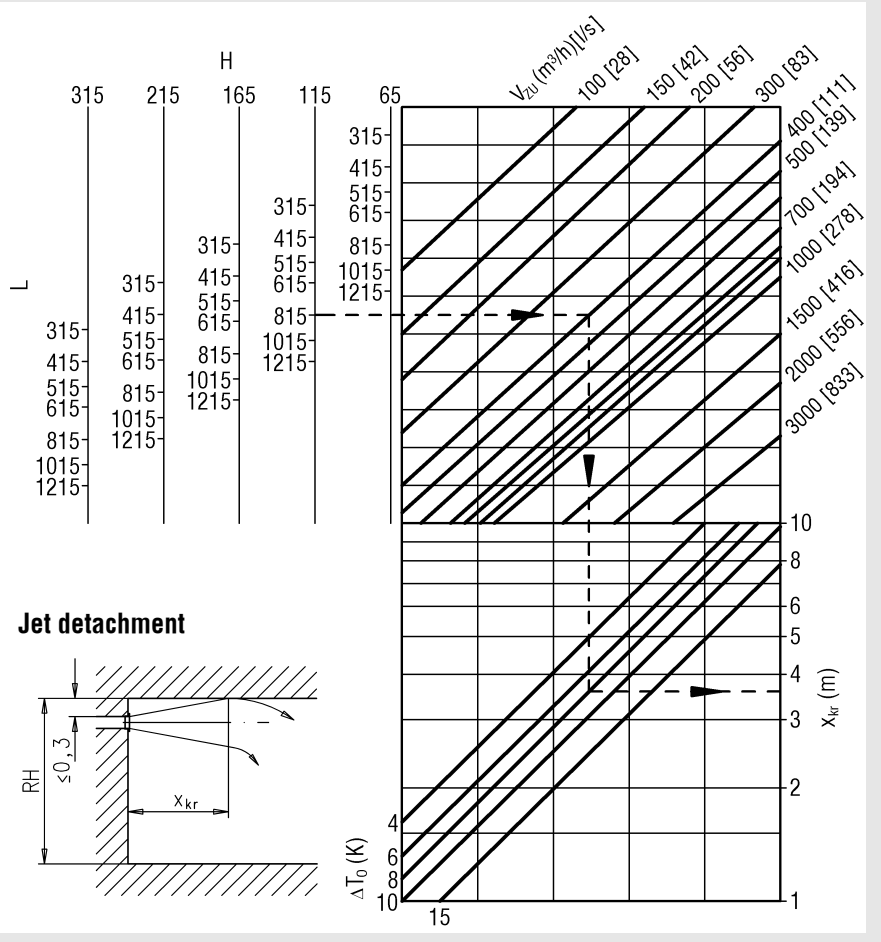
Jet path

Supply air without coanda effect



Critical throw

Supply air with coanda effect

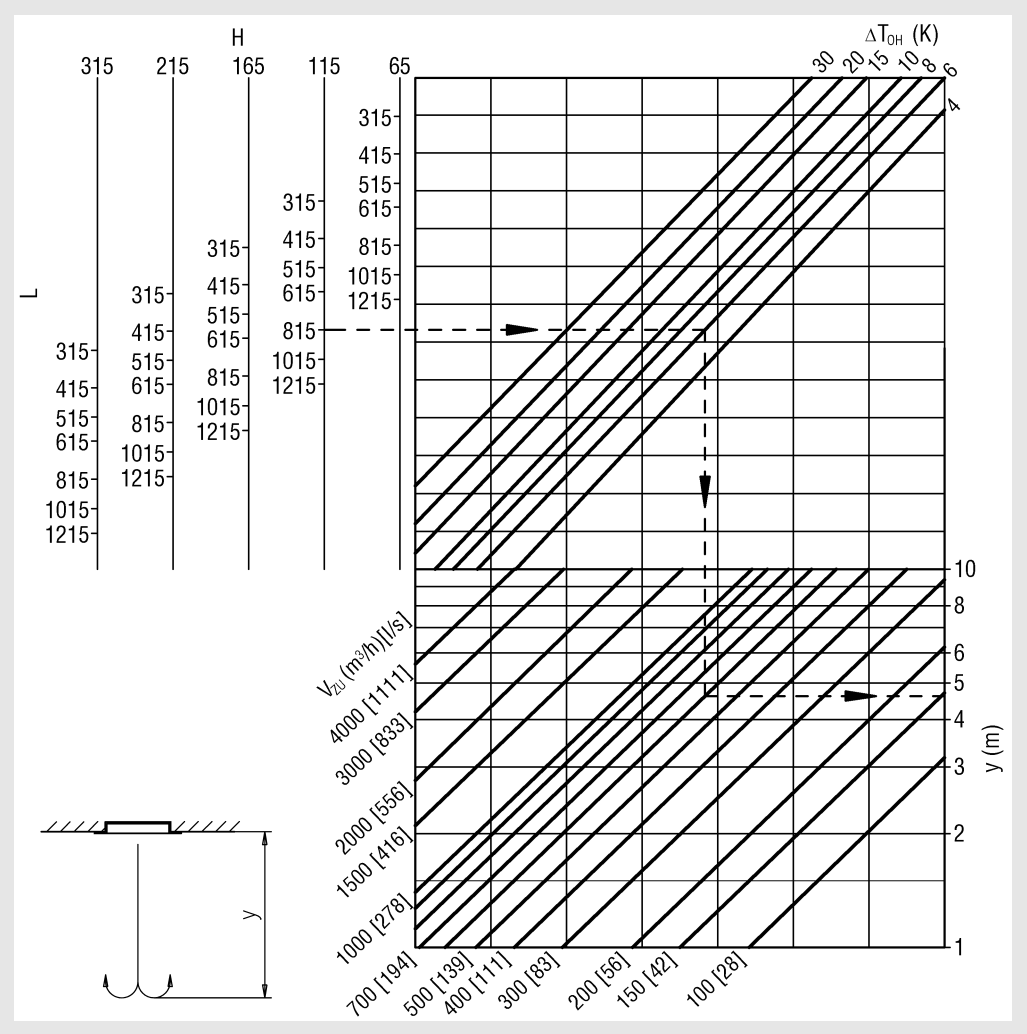


Jet detachment

Compact Grille KG / KG-R

Maximum penetration

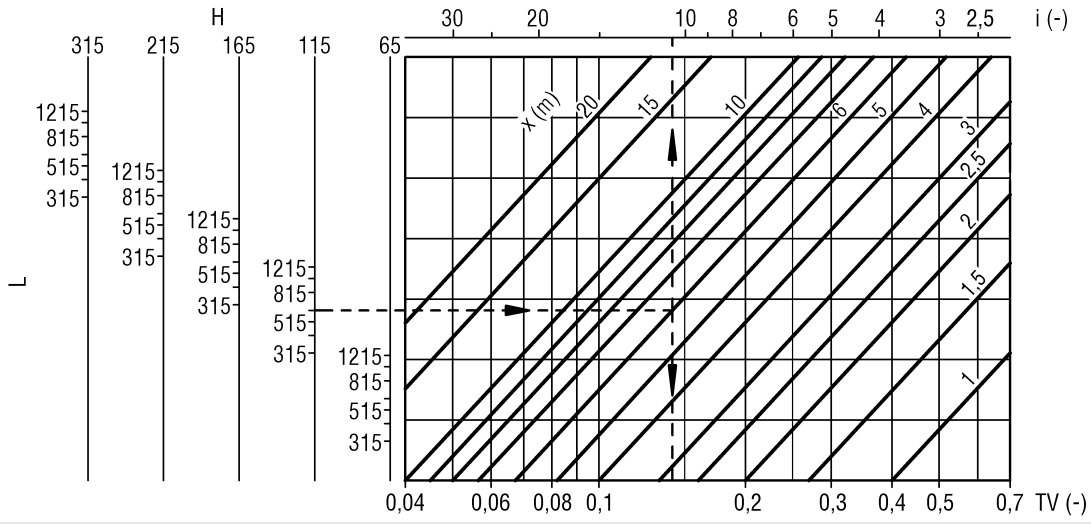
Max. vertical penetration (in heating mode):



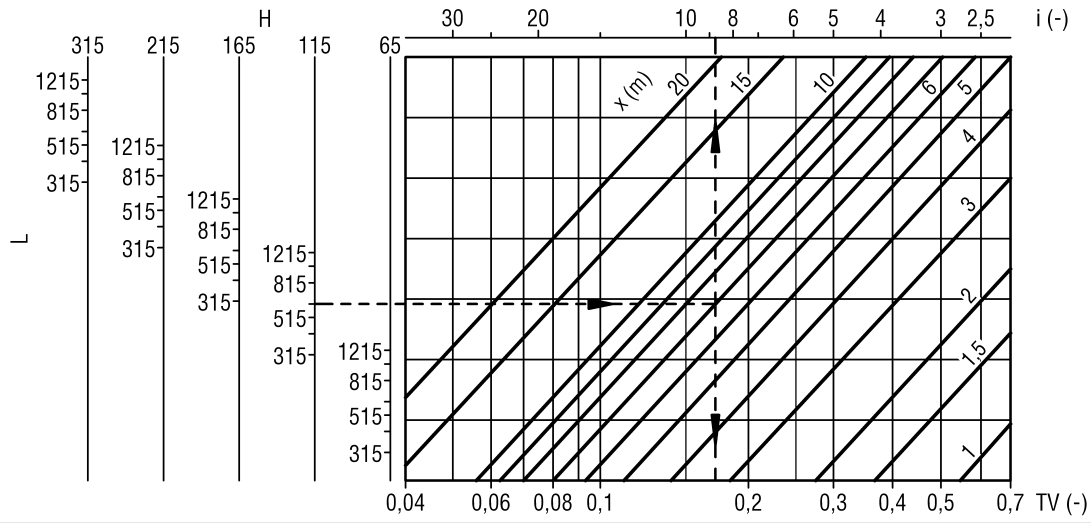
Compact Grille KG / KG-R

Temperature and induction ratios

Supply air without coanda effect



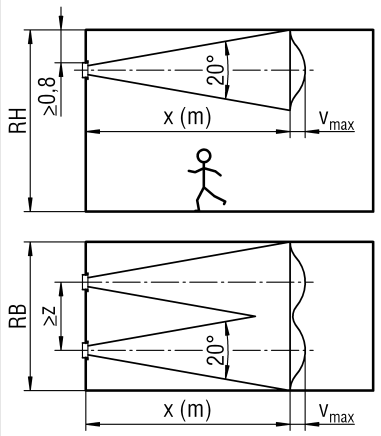
Supply air with coanda effect



Compact Grille KG / KG-R

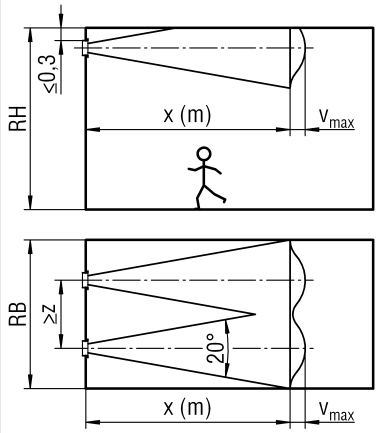
Minimum distances

Supply air without coanda effect



For the diagrams to be correct, the distance z between two grilles must be ≥ x (m) x 0.2.

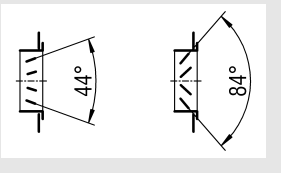
Supply air with coanda effect



For the diagrams to be correct, the distance z between two grilles must be ≥ x (m) x 0.2.

Correction factor (for scattered air jet)

with or without coanda effect



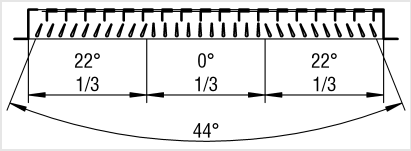
blade position	44°	84°
End velocity of jet	V_{max} (m/s) x 0,65	V_{max} (m/s) x 0,5
TV = $\Delta T_X/\Delta T_0$	× 0.65	× 0.5
Induction ratio	l x 1,3	l x 2
Jet drop - Jet rise	y x 1,3	y x 2
Grille distance z(m)>	X x 0,20	X x 0,25

blade position

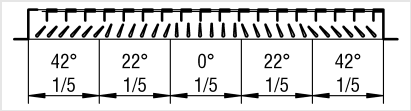
Blade position straight

Blade position opposite to one another

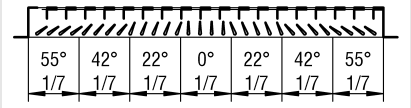
Blade position 44° diverging



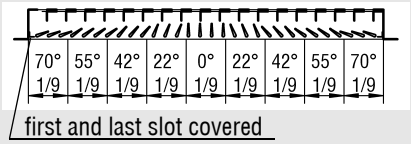
Blade position 84° diverging



Blade position 110° diverging



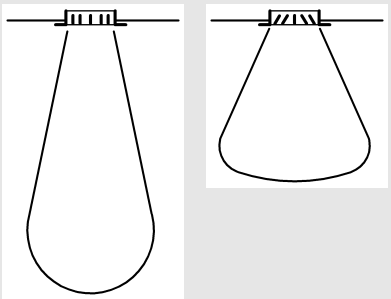
Blade position 140° diverging



The angle of propagation of the air jet and thus the length of throw can be affected by adjusting the vertical guiding blades.

Blade position

straight **diverging**



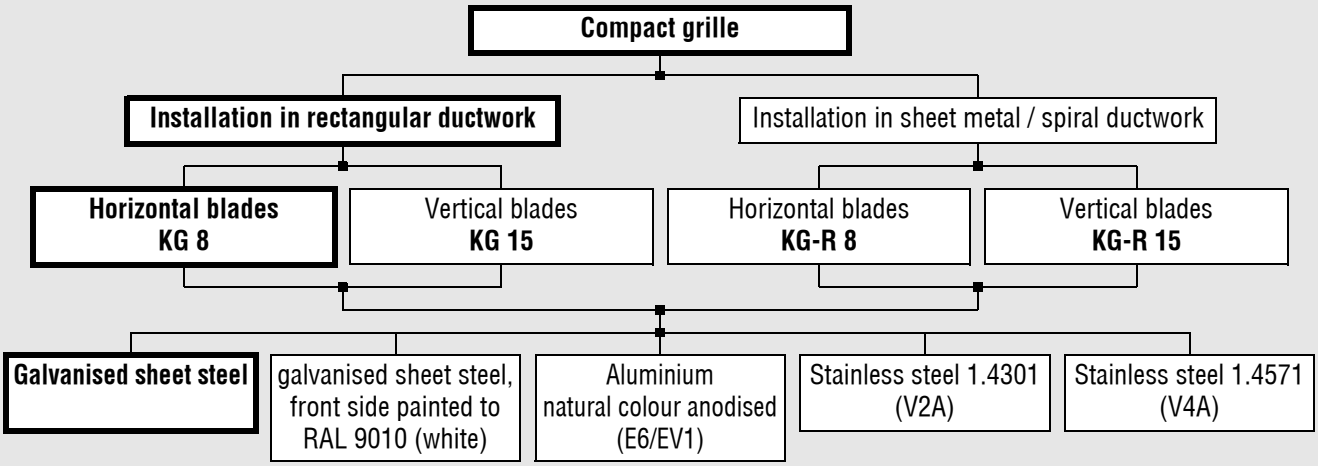
Compact Grille KG / KG-R

Legend

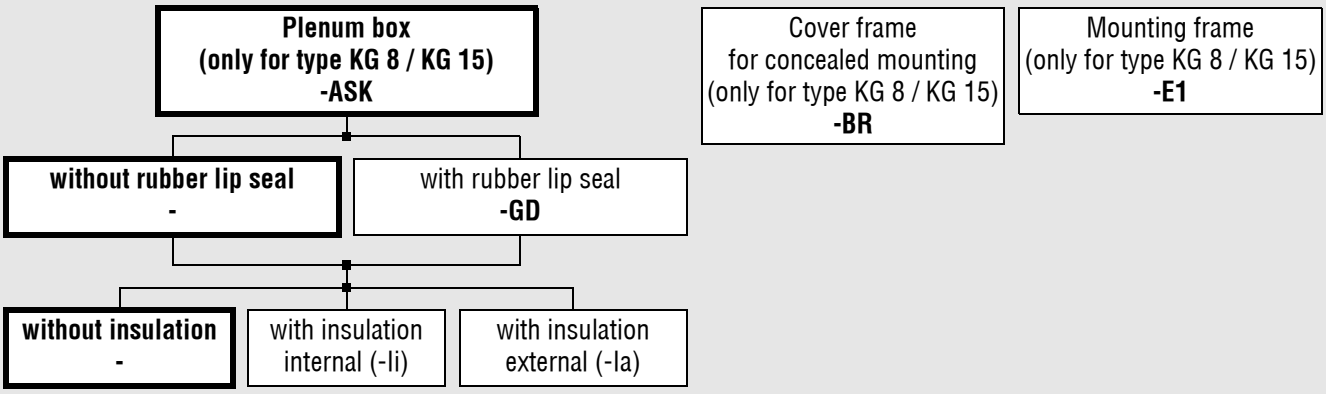
V_{ZU}	(m³/h) [l/s]	=	Supply air volume
V_{AB}	(m³/h) [l/s]	=	Return air volume
V_X	(m³/h) [l/s]	=	total air jet volume at point x
V_{max}	(m/s)	=	Maximum end velocity of jet
v_K	(m/s)	=	Duct velocity
v_{face}	(m/s)	=	Intake velocity, blower stream velocity, outflow velocity, relative to A_{face}
A_{face}	(m²)	=	Face area
x	(m)	=	Horizontal throw
y	(m)	=	Vertical throw
x_{kr}	(m)	=	Critical throw
ρ	(kg/m³)	=	Density
ΔT_O	(Pa)	=	Pressure loss
L_{WA}	[dB(A)]	=	A-weighted sound power level [$L_{WA} = L_{WA1} + KF$]
L_{WA1}	[dB(A)]	=	A-weighted sound power level, relative to $A_{face} = 0.08$ m²
KF	(-)	=	Correction factor
ΔT_O	(K)	=	Temperature difference between supply air temperature and room temperature ($\Delta T_O = t_{ZU} - t_R$)
ΔT_{OH}	(K)	=	Temperature difference between air supply and room temperature in heating mode ($\Delta T_{OH} = t_{ZUH} - t_{RH}$)
ΔT_X	(K)	=	Temperature difference at point x
t_{ZU}	(°C)	=	Supply air temperature
t_R	(°C)	=	Room temperature
i	(-)	=	Induction ratio ($i = V_X / V_{ZU}$)
TV	(-)	=	Temperature ratio ($TV = \Delta T_X / \Delta T_O$)
z	(m)	=	Minimum clearance between two grilles x (m) x 0.2
RH	(mm)	=	Room height
RB	(mm)	=	Room width
H	(mm)	=	Height
L	(mm)	=	Length

Compact Grille KG / KG-R

Order details



Accessories:



Order example:
KG 8 stainless steel V2A-ASK-DK-GD

Unless stated otherwise, the thick-frame model will be delivered!

Compact Grille KG / KG-R

Specification texts

Compact grille **type KG 8** for supply air and return air, for installation in rectangular ductwork. Owing to its compact construction - the housing and hit-and-miss damper consist of a single component - the grilles have very high stability and torsional rigidity and require only a small mounting depth (50 mm). This gives low flow generated noise and a uniform inflow of the supply air over the entire grille surface. Compared with grilles equipped with air throttle dampers, the air flow capacity is more than 20% higher at the same sound power level. The clinch joining technique without producing welding spots gives better anticorrosive protection. Consisting of a front frame with visible screw mounting (SM), with horizontal or vertical air deflection blades mounted on pivoting bearings and integrated hit-and-miss damper, adjustable on the room side, for simple air volume and ductwork regulation.
Product: SCHAKO **type KG 8**

- **Type KG 15**, with vertical air deflection blades mounted on pivoting bearings, adjustable from the room side.
  Product: SCHAKO **type KG 15**

- Compact grille consisting of:
  - Galvanised sheet steel (standard)
  - Galvanised sheet steel painted on the front with a high-quality powder coating to a RAL colour (RAL 9010 (white), standard).
  - Aluminium natural colour anodised E6/EV1
  - stainless steel 1.4301 (V2A)
  - stainless steel 1.4571 (V4A)

Accessories for KG 8 / KG 15:
- plenum box (-ASK) made of galvanised sheet steel, with lateral connection pipe
  - with rubber lip seal (-GD), made of special rubber, at the connection pipe.
  - with thermal insulation
    - internal (-Ii)
    - external (-Ia)
- Cover frame (-BR), for concealed mounting (VM), made of:
  - Aluminium natural colour anodised E6/EV1
  - aluminium painted with a high-quality powder coating to a RAL colour (RAL 9010 (white), standard).
- Mounting frame (-E1), comprising electrolytically galvanised sheet steel.

Compact grille **type KG 8** for supply air and return air, for installation in sheet metal / spiral ductwork. Owing to its compact construction - the housing and hit-and-miss damper consist of a single component - the grilles have very high stability and torsional rigidity and require only a small mounting depth (56 mm). This gives low flow generated noise and a uniform inflow of the supply air over the entire grille surface. Compared with grilles equipped with air throttle dampers, the air flow capacity is more than 20% higher at the same sound power level. The clinch joining technique without producing welding spots gives better anticorrosive protection. Consisting of a front frame with visible screw mounting (SM), with horizontal or vertical air deflection blades mounted on pivoting bearings and integrated hit-and-miss damper, adjustable on the room side, for simple air volume and ductwork regulation.
Product: SCHAKO **type KG-R 8**

- **Type KG-R 15**, with vertical air deflection blades mounted on pivoting bearings, adjustable from the room side.
  Product: SCHAKO **type KG-R 15**

- Compact grille consisting of:
  - Galvanised sheet steel (standard)
  - Galvanised sheet steel painted on the front with a high-quality powder coating to a RAL colour (RAL 9010 (white), standard).
  - Aluminium natural colour anodised E6/EV1
  - stainless steel 1.4301 (V2A)
  - stainless steel 1.4571 (V4A)

Compact Grille KG / KG-R