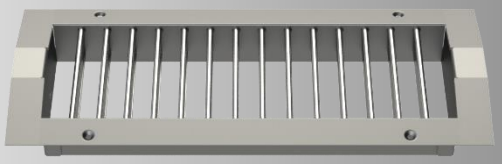
Technical documentation



IB-R

Ventilation grille

Contents

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FUNCTION AND USE

Supply and return air grille especially suitable **for duct connection** with **horizontal or vertical, pivoting, individually adjustable air deflection blades** on the front side. With hit-and-miss damper for air volume regulation

MODELS

IB-R-…	for duct installation
IB-R-01-…	horizontal, pivoting air deflection blades on the front side.
IB-R-08-…	same as IB-R-01-…, additionally with hit-and-miss damper.
IB-R-8c-…	same as IB-R-01-…, additionally with vertical, pivoting air deflection blades and hit-and-miss damper.
IB-R-10-…	vertical, pivoting air deflection blades on the front side.
IB-R-15-…	same as IB-R-10-…, additionally with hit-and-miss damper.
IB-R-16-…	same as IB-R-10-…, additionally with horizontal, pivoting air deflection blades and hit-and-miss damper.
IB-R-…-N-…	single design

Air throw pattern:

…-L000-…	blade position straight (standard)
…-L044-…	blade position 44 diverging
…-L084-…	blade position 84 diverging
…-L110-…	blade position 110° diverging (only for IB-R-10 / IB-R-15 / IB-R-16)
…-L140-…	blade position 140° diverging (only for IB-R-10 / IB-R-15 / IB-R-16)
…-LGEG-…	blade position opposite to one another

MOUNTING

-- Screw mounting (-SM, standard)
  - screws must be provided on site.
-- Concealed mounting (-VM) (-VM) and clamp mounting (-KB)
  - not possible!

PROCESSING

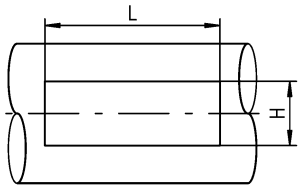
Frame and blades

-- Galvanised sheet steel (-SV-0000) (standard).
-- Sheet steel (-SB):
  - painted to the colour RAL 9010 (white) (-9010).
  - painted to a RAL colour of your choice (-xxxx, at an extra charge).

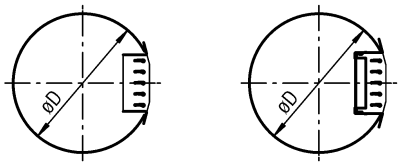
Hit-and-miss damper

-- Electrolytically galvanised sheet steel (only IB-R-08-… and IB-R-15-…).

INSTALLATION SITUATION



IB-R-01 / 10-… **IB-R-08 / 8c / 15 / 16-...**



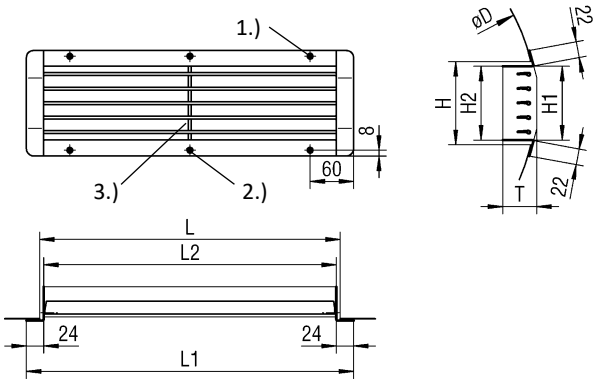
The curved flange and the three height dimensions, apart from providing high stability and torsional rigidity, allow optimum adaptation of the ventilation grille type Ib-R to sheet metal and spiral ducts. The selection of the grille height depends on the duct measures shown in the table. The grille frames only make optimum contact when the ideal duct diameter is used.

Duct diameter

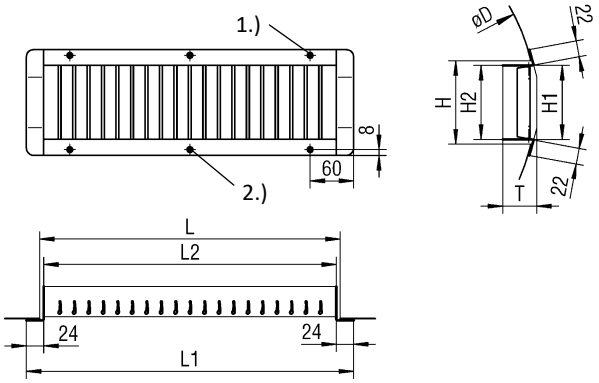
IB-R	øD		
H	Min.	Ideal	Max. number of
65	140	250	400
115	300	500	800
215	600	750	1250

DIMENSIONS

Without hit-and-miss damper
IB-R-01-...



IB-R-10-...



Available sizes IB-R-01 / IB-R-10

L	L1	L2
315	352	306
415	452	406
515	552	506
615	652	606
815	852	806
1015	1052	1006
1215	1252	1206

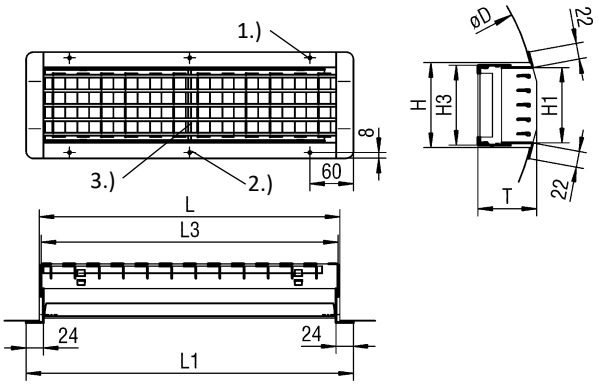
H	H1	H2	T
65	52	54	42
115	102	104	47
215	202	204	56

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

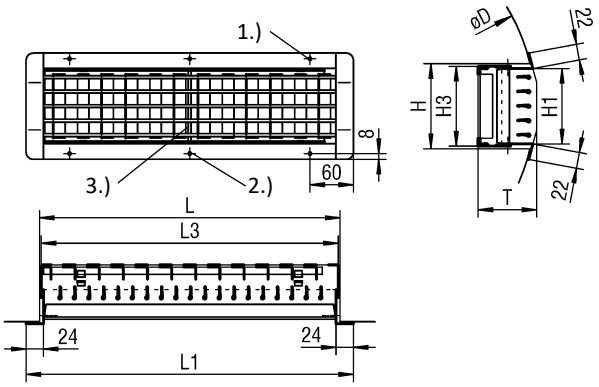
1.) Indentation for slotted shallow-raised countersunk-head tapping screw DIN ISO 7051 pitch 3.9 (on site).
2.) From L ≥ 515
3.) Intermediate rail from L ≥ 815

With hit-and-miss damper

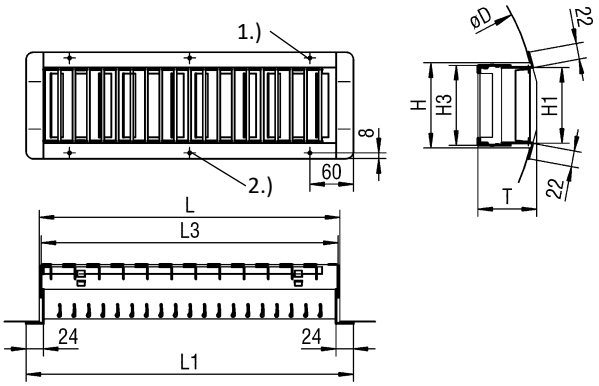
IB-R-08-…



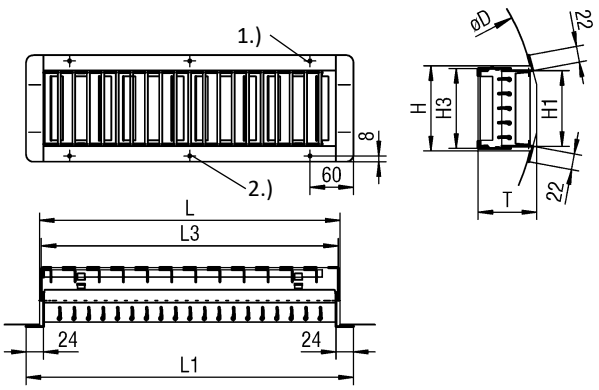
IB-R-8c-…



IB-R-15-…



IB-R-16-…



Available sizes IB-R-08 / IB-R-8c / IB-R-15 / IB-R-16

L	L1	L3
315	352	310
415	452	410
515	552	510
615	652	610
815	852	810
1015	1052	1010
1215	1252	1210

H	H1	H3	T
65	58	60	85
115	108	110	91
215	208	210	95

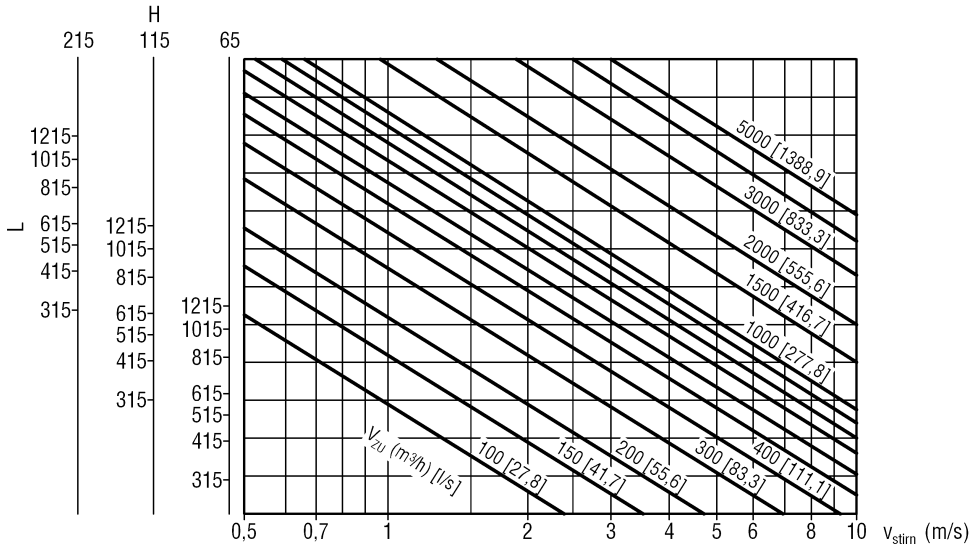
All combined lengths and heights available!
Other sizes available on request.

1.) Indentation for slotted shallow-raised countersunk-head tapping screw DIN ISO 7051 pitch 3.9 (on site).
2.) From L ≥ 515
3.) Intermediate rail from L ≥ 815

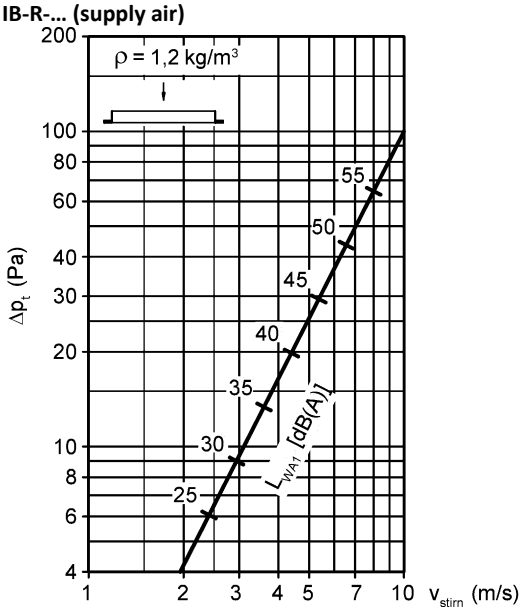
TECHNICAL DATA

Pressure loss and noise level

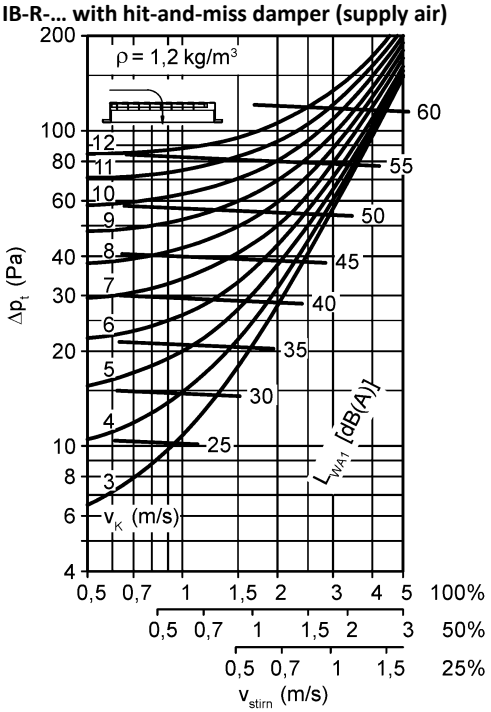
Supply air face velocity



IB-R-... (supply air)



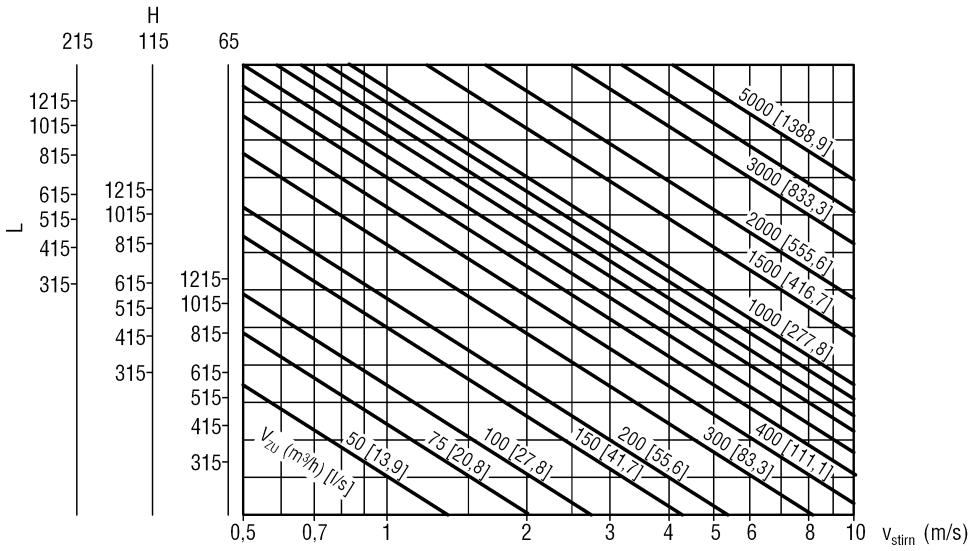
IB-R-... with hit-and-miss damper (supply air)



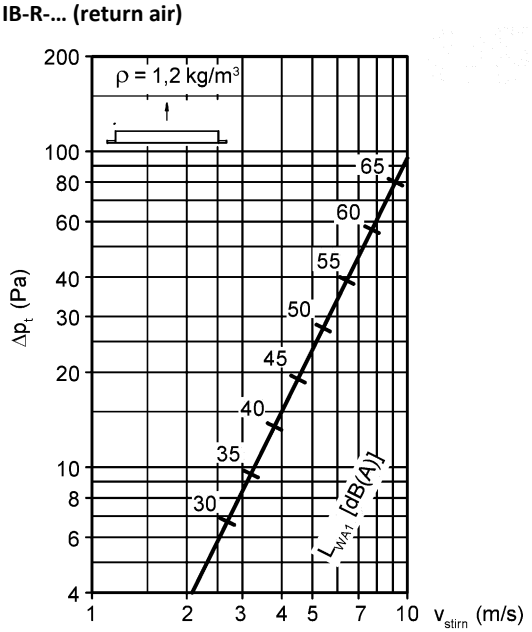
Hit-and-miss damper position OPEN in %

Pressure loss and noise level

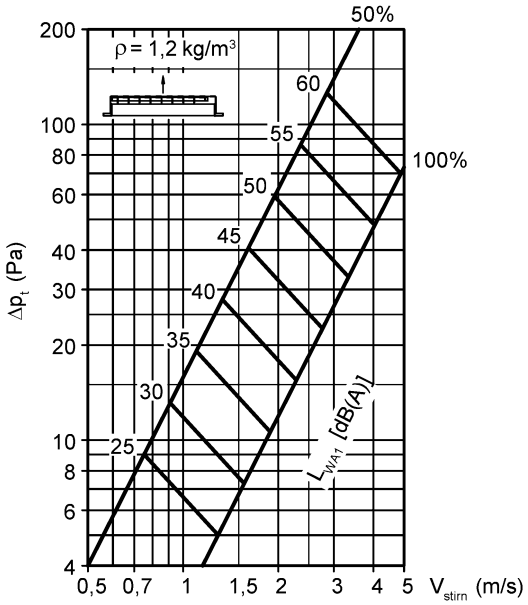
Return air face velocity



IB-R-... (return air)



IB-R-... with hit-and-miss damper (return air)



Hit-and-miss damper position OPEN in %

Face area

Supply and return air (m²)

Height H	Length L 325	425	525	625	825	1025	1225
65	0.016	0.021	0.026	0.031	0.042	0.052	0.063
115	0.031	0.041	0.051	0.062	0.082	0.102	0.123
215	0.061	0.081	0.102	0.122	0.162	0.203	0.243

A_{Stirn} (m²)

Supply air correction factor

A_{Stirn} (m²)	0.012	0.025	0.05	0.1	0.16	0.2	0.4
KF (-)	-9	-6	-3	0	+2	+3	+6

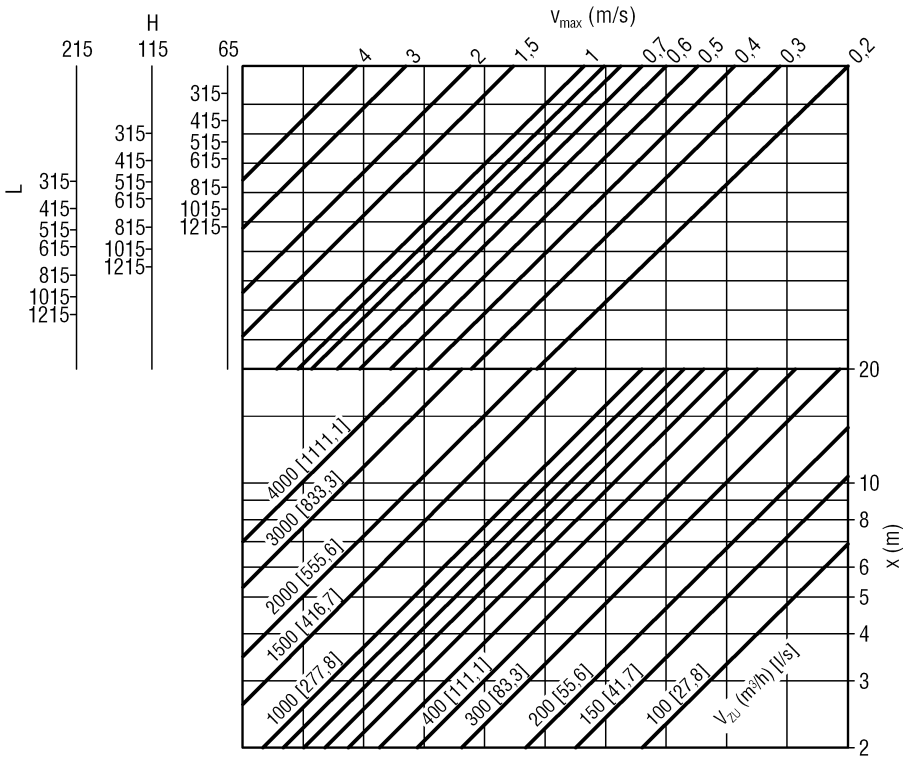
Return air correction factor

A_{Stirn} (m²)	0.01	0.02	0.04	0.08	0.16	0.32	0.4
KF (-)	-9	-6	-3	0	+3	+6	+7

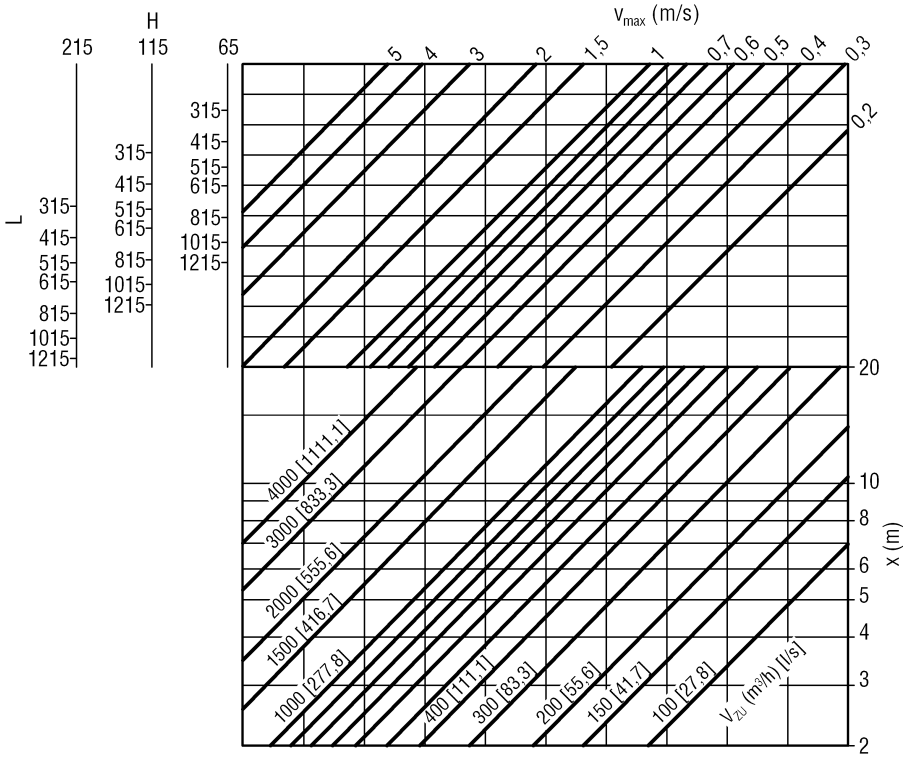
$L_{WA} = L_{WA1} + KF$

Maximum end velocity of jet

Supply air without coanda effect

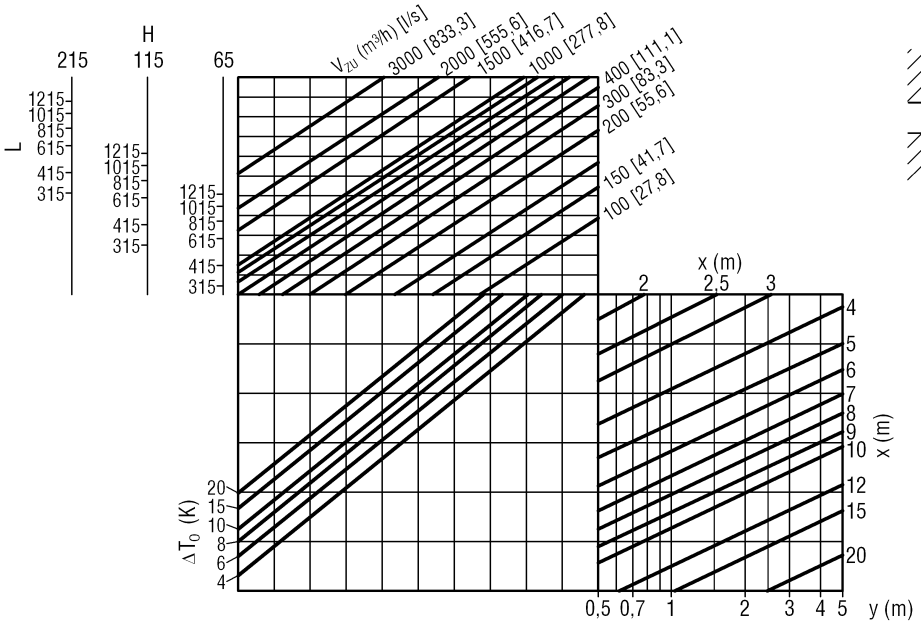


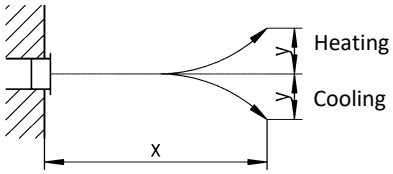
Supply air with coanda effect



Jet path

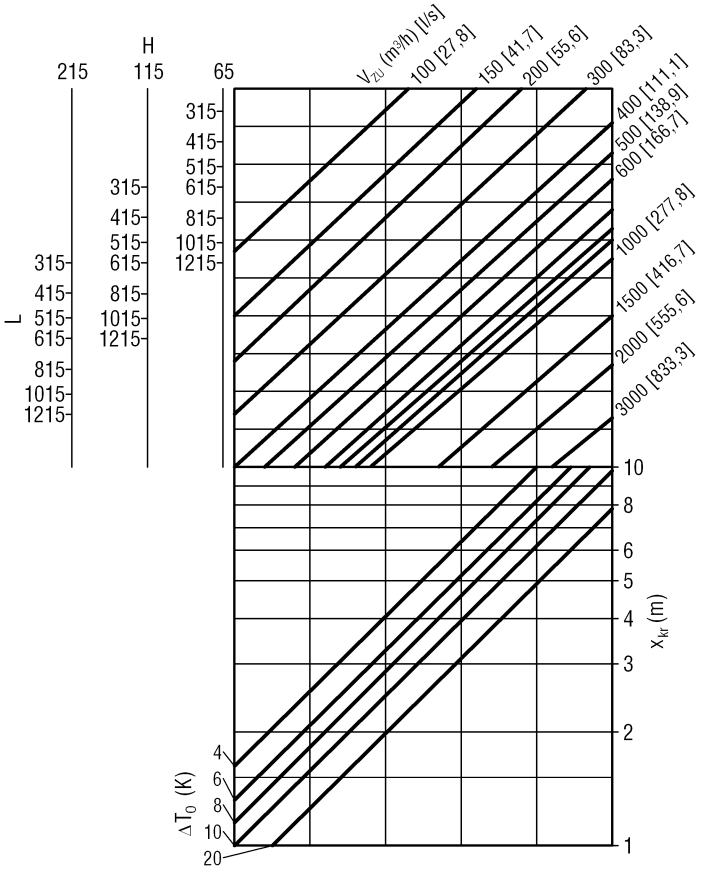
Supply air without coanda effect



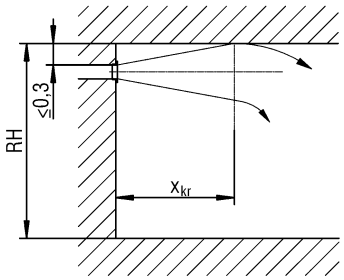


Critical throw

Supply air with coanda effect

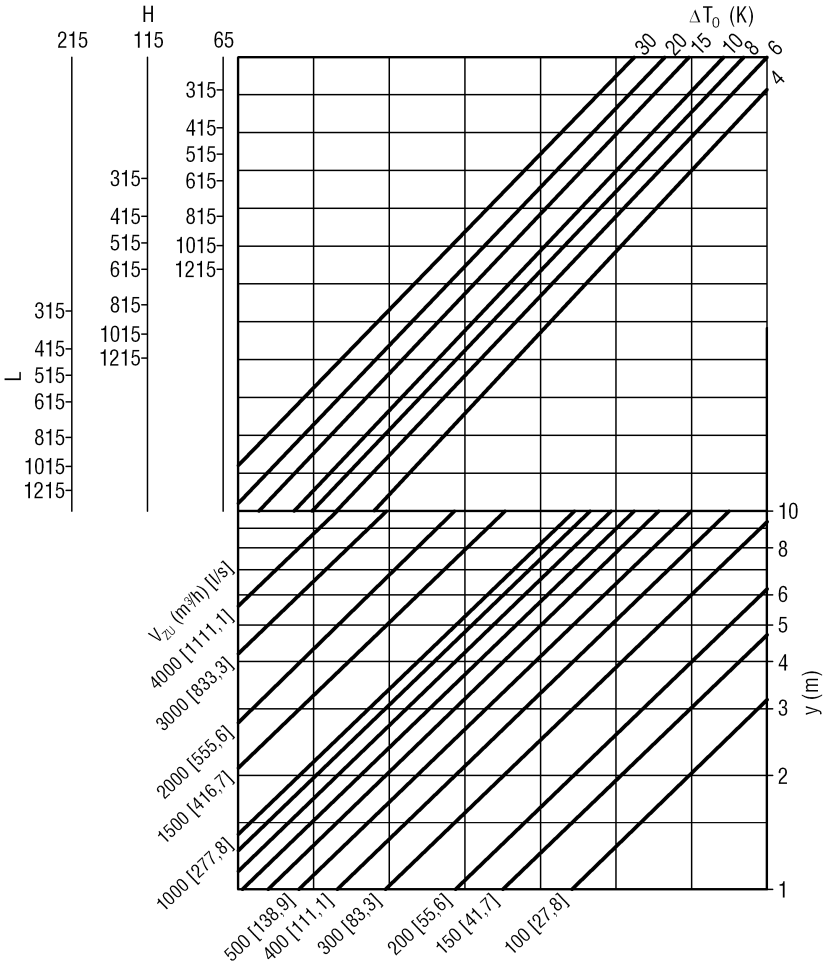


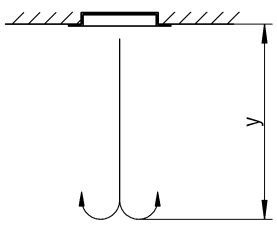
Jet detachment



Maximum penetration

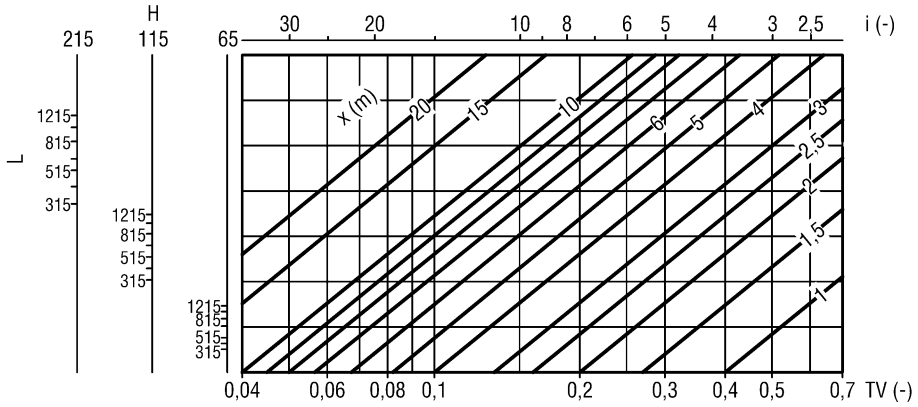
In heating mode



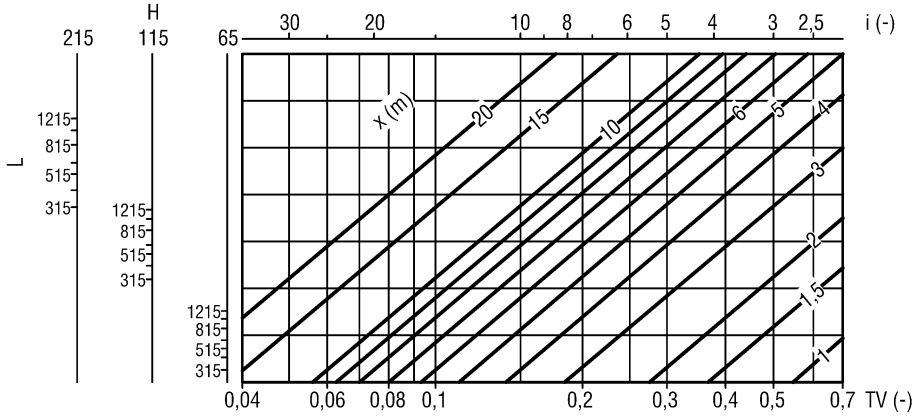


Temperature and induction ratios

Supply air without coanda effect

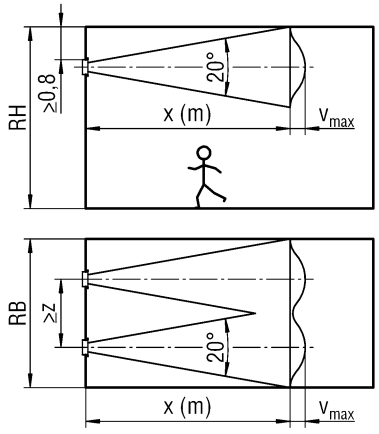


Supply air with coanda effect

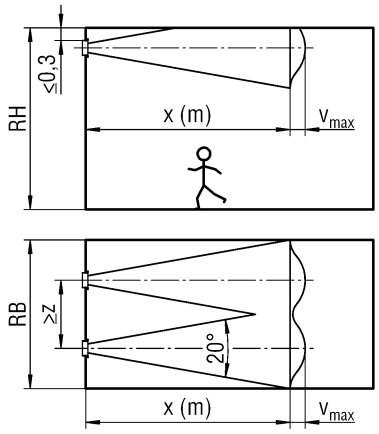


Minimum distances

Supply air without coanda effect:



Supply air with coanda effect:

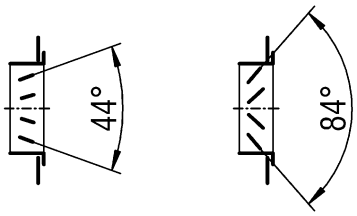


For the diagrams to be correct, the distance z between two grilles must be ≥ x (m) x 0.2.
If the selected minimum distance "z" is less than (x • 0.2), the grille is referred to as a grille band.

Correction factor

(for scattered air jet)

with or without coanda effect



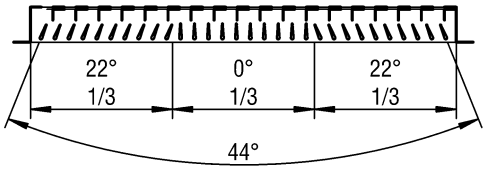
Blade position	44°	84°
End velocity of jet	v_{max} (m/s) × 0.65	v_{max} (m/s) × 0.5
TV = ΔT_x / ΔT_0	× 0.65	× 0.5
Induction ratio	i × 1.3	i × 2
Jet drop - Jet rise	y × 1.3	y × 2
Grille spacing z(m)	x × 0.20	x × 0.25

Blade position

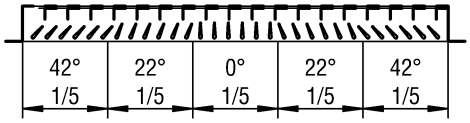
Blade position straight (-L000)

Blade position opposite to one another (-LGEG)

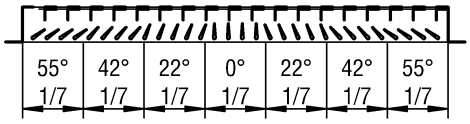
Blade position 44° diverging (-L044)



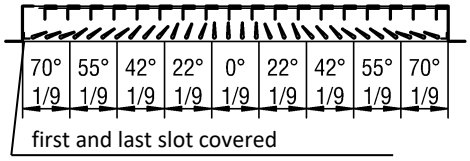
Blade position 84° diverging (-L084)



Blade position 110° diverging (-L110)
(only for IB-R-10 / IB-R-15 / IB-R-16)

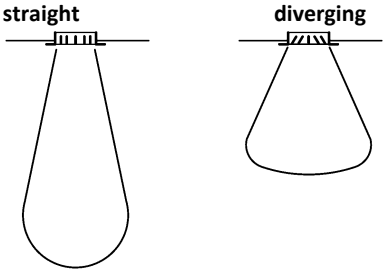


Blade position 140° diverging (-L140)
(only for IB-R-10 / IB-R-15 / IB-R-16)



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

Blade position:



Layout example:
Assume:
Ventilation grille IB-R-08-...
H = 115 mm
L = 615 m (with coanda effect)
V_{ZU} = 400 m³/h
Δt = 4 K
X = 6.0 m

Find:
- Pressure loss
- Sound level
- End velocity of jet
- Critical throw
- Induction and temperature ratio

Solution:
- pressure loss (page 5):
  Δp_t = 22 Pa
- weighted sound power level page 5/6:
  v_{stirn} = 1.8 m/s
  L_{WA1} = 36 dB(A)
  L_{WA} = 36 dB(A) - 2 = 34 dB(A)
- end velocity of jet (page 7):
  v_{max} = 0.5 m/s
- critical throw (page 8):
  x_{kr} = 5.80 m
- induction ratio (page 10):
  I = 7.5
- temperature ratio (page 10):
  TV = 0.2

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)	=	max. End velocity of jet
v_K	(m/s)	=	duct velocity
v_{stirn}	(m/s)	=	intake velocity, blower stream velocity, outflow velocity, relative to A_{stirn}
A_{stirn}	(m²)	=	face area
x	(m)	=	horizontal throw
y	(m)	=	vertical throw
x_{kr}	(m)	=	critical throw
ρ	(kg/m³)	=	Density
Δp_t	(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_{stirn} = 0.08 m²
KF	(-)	=	Correction factor
ΔT_O	(K)	=	Temperature difference between supply air and room temperature ($\Delta T_O = t_{ZU} - t_R$)
ΔT_{OH}	(K)	=	Temperature difference between air supply and ambient temperature in heating mode ($\Delta T_{OH} = t_{ZU} - t_{RH}$)
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) × 0.2
RH	(mm)	=	room height
RB	(mm)	=	room width
L	(mm)	=	length
H	(mm)	=	Height

ORDER CODE IB-R

01	02	03	04	05	06
Type	Model	Blades	Length	Height	Single / band design
Example					
IB	-R	-01	-0615	-115	-N

07	08	09	10	11
Air throw pattern	Material	Paint	Mounting	Installation frame
-L000	-SB	-9010	-SM	-ER0

All fields must be filled when ordering.

Sample
IB-R-01-0615-115-N-L000-SB-9010-SM-ER0

Ventilation grille type IB | for duct installation | horizontal, pivoting air deflection blades on the front side | grille length 615 mm | grille height 115 mm | single design | blade position straight | sheet steel | painted to RAL 9010 (white) | with screw mounting | without installation frame

ORDER DETAILS

01 - Type
IB = ventilation grille type IB

02 - Model
R = for duct installation

03 – Blades
01 = horizontal pivoting air deflection blades on the front side
08 = same as IB-R-01, additionally with hit-and-miss damper
8c = same as IB-R-01, additionally with vertical, pivoting air deflection blades and hit-and-miss damper
10 = vertical, pivoting air deflection blades on the front side
15 = same as IB-R-10, additionally with hit-and-miss damper
16 = same as IB-R-10, additionally with horizontal, pivoting air deflection blades and hit-and-miss damper

04 - Length
0315 = grille length 315 mm
0415 = grille length 415 mm
0515 = grille length 515 mm
0615 = grille length 615 mm
0815 = grille length 815 mm
1015 = grille length 1015 mm
1215 = grille length 1215 mm

05 - Height
065 = grille height 65 mm
115 = grille height 115 mm
215 = grille height 215 mm

06 - Single / band design
N = single design

07 - Air throw pattern
L000 = blade position straight (standard)
L044 = blade position 44° diverging
L084 = blade position 84° diverging
L110 = blade position 110 diverging (only for IB-R-10/ IB-R-15 / IB-R-16)
L140 = blade position 140 diverging (only for IB-R-10/ IB-R-15 / IB-R-16)
LGEG = blade position opposite to one another

08 - Material
SV = galvanised sheet steel (standard)
SB = sheet steel (only available with paint)

09 – Paint
0000 = without paint (only -SV possible)
9010 = painted to the colour RAL 9010 (white)
xxxx = painted to a RAL colour of your choice (always with 4 digits)

10 - Mounting
SM = with screw mounting (standard)

11 - Installation frame
ER0 = without installation frame (standard)

SPECIFICATION TEXT

Ventilation grille **type IB-R-...** for supply and return air, for installation in sheet metal / spiral ducts, with **horizontal or vertical, pivoting, individually adjustable air deflection blades** on the front side. For description of frames and blades, see "Material / paint". Assembly parts made of electrolytically galvanised sheet steel.
In single design. With screw mounting (**-SM**, standard), screws must be provided on site. Without installation frame.
Product: SCHAKO **type IB-R-...-N-...-SM-ER0**

Blades (design):
- horizontal, pivoting air deflection blades on the front side (**-IB-R-01-…).**
- same as IB-R-01-…, additionally with hit-and-miss damper (**-IB-R-08-…**).
- same as IB-R-01-…, additionally with vertical, pivoting air deflection blades and hit-and-miss damper (**-IB-R-8c-…**).
- vertical, pivoting air deflection blades on the front side (**-IB-R-10-…**).
- same as IB-R-10-…, additionally with hit-and-miss damper (**-IB-R-15-…**).
- same as IB-R-10-…, additionally with horizontal, pivoting air deflection blades and hit-and-miss damper (**-IB-R-16-…**).

Length:
- 315 mm (-**0315**)
- 415 mm (-**0415**)
- 515 mm (-**0515**)
- 615 mm (-**0615**)
- 815 mm (-**0815**)
- 1015 mm (-**1015**)
- 1215 mm (-**1215**)

Height:
- 65 mm (**-065**)
- 115 mm (**-115**)
- 215 mm (**-215**)

Air throw pattern:
- blade position straight (**-L000**, standard).
- blade position 44° diverging (**-L044**).
- blade position 84° diverging (**-L084**).
- blade position 110° diverging (only for IB-R-10 / IB-R-15 / IB-R-16) (**-L110**).
- blade position 140° diverging (only for IB-R-10 / IB-R-15 / IB-R-16) (**-L140**).
- blade position opposite to one another (**-LGEG**).

Material / paint (frames and blades)**:**
- Galvanised sheet steel (-**SV**) (standard).
- Sheet steel (-**SB**):
  - painted to the colour RAL 9010 (white) (**-9010**).
  - painted to a RAL colour of your choice (**-xxxx,** at an extra charge).