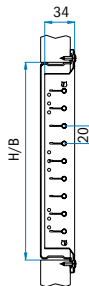IMP KLIMA

Steel grilles

- Visible or hidden screw installation
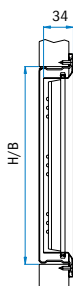- Steel sheet powder painted in standard RAL 9010 colour

JR-3, JRP-3

- Individually adjustable horizontal blades
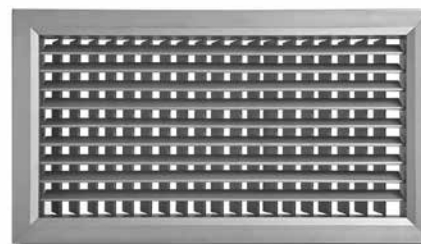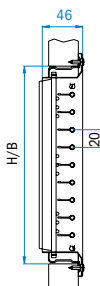- JRP-3: galvanised steel sheet

JR-4, JRP-4

- Individually adjustable vertical blades
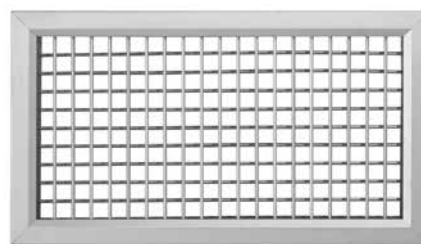- JRP-4: galvanised steel sheet

JR-7, JRP-7

- Individually adjustable horizontal and vertical blades
- JRP-7: galvanised steel sheet
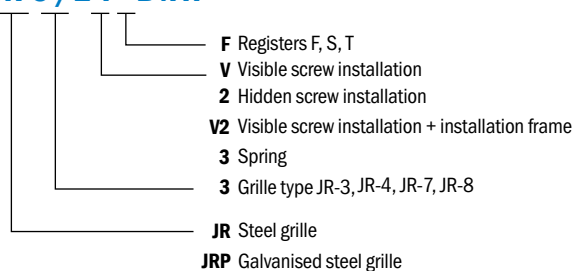
JR-8, JRP-8

- Individually adjustable horizontal and vertical blades
- JRP-8: galvanised steel sheet

Ordering key

JR-3 /2-F B x H

F Registers F, S, T
V Visible screw installation
2 Hidden screw installation
V2 Visible screw installation + installation frame
3 Spring
3 Grille type JR-3, JR-4, JR-7, JR-8
JR Steel grille
JRP Galvanised steel grille
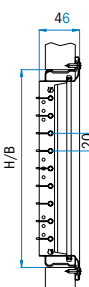
Grille standard dimensions and cross-sections (m²) for JR-3, JR-4:

B/H	75	125	175	225	325	425	525
225	0.007	0.015	0.021	0.029			
325	0.011	0.023	0.033	0.044	0.066		
425	0.015	0.031	0.044	0.060	0.089	0.118	
525	0.019	0.038	0.055	0.075	0.112	0.148	0.185
625	0.022	0.046	0.067	0.090	0.134	0.179	0.223
725	0.026	0.054	0.078	0.106	0.157	0.209	0.261
825	0.030	0.062	0.089	0.121	0.180	0.239	0.298
925	0.034	0.070	0.101	0.136	0.203	0.270	0.336
1025	0.038	0.077	0.112	0.151	0.226	0.300	0.374
1125	0.041	0.085	0.123	0.167	0.248	0.330	0.412
1225	0.045	0.093	0.134	0.182	0.271	0.360	0.450

B/H	100	150	200	250	300	350	400	500
150	0.007	0.011						
200	0.010	0.016	0.022					
250	0.013	0.021	0.029	0.037				
300	0.015	0.026	0.035	0.046	0.055			
350	0.018	0.031	0.042	0.055	0.065	0.078		
400	0.021	0.036	0.049	0.063	0.076	0.090	0.103	
450	0.024	0.041	0.055	0.072	0.086	0.103	0.117	
500	0.027	0.046	0.062	0.080	0.097	0.115	0.131	0.166
600	0.033	0.055	0.075	0.098	0.117	0.140	0.160	0.202
700	0.039	0.065	0.088	0.115	0.138	0.165	0.188	0.238
800	0.044	0.075	0.102	0.132	0.159	0.190	0.216	0.274
900	0.050	0.085	0.115	0.150	0.180	0.214	0.245	0.309
1000	0.056	0.095	0.128	0.167	0.201	0.239	0.273	0.345
1100	0.062	0.104	0.142	0.184	0.221	0.264	0.301	0.381
1200	0.068	0.114	0.155	0.202	0.242	0.289	0.330	0.417

Grille standard dimensions and cross-sections (m²) for JR-7, JR-8:

B/H	75	125	175	225	325	425	525
225	0.006	0.014	0.021	0.029			
325	0.009	0.020	0.032	0.043	0.066		
425	0.012	0.027	0.042	0.057	0.088	0.118	
525	0.015	0.034	0.053	0.072	0.109	0.147	0.185
625	0.018	0.040	0.063	0.086	0.131	0.176	0.222
725	0.021	0.047	0.074	0.100	0.153	0.206	0.258
825	0.024	0.054	0.084	0.114	0.174	0.235	0.295
925	0.027	0.061	0.094	0.128	0.196	0.264	0.332
1025	0.030	0.067	0.105	0.142	0.218	0.293	0.368
1125	0.032	0.074	0.115	0.157	0.239	0.322	0.405
1225	0.035	0.081	0.126	0.171	0.261	0.351	0.442

| B/H	100	150	200	250	300	350	400	500
150	0.006	0.011						
200	0.009	0.015	0.022					
250	0.011	0.020	0.029	0.037				
300	0.013	0.024	0.034	0.045	0.055			
350	0.016	0.028	0.041	0.053	0.066	0.078		
400	0.018	0.032	0.047	0.061	0.075	0.089	0.103	
450	0.021	0.037	0.053	0.069	0.085	0.102	0.118	
500	0.023	0.041	0.059	0.077	0.095	0.113	0.130	0.166
600	0.028	0.049	0.071	0.093	0.114	0.136	0.158	0.201
700	0.033	0.058	0.083	0.109	0.134	0.160	0.185	0.236
800	0.037	0.067	0.096	0.125	0.154	0.183	0.212	0.271
900	0.042	0.075	0.108	0.141	0.174	0.207	0.240	0.305
1000	0.047	0.084	0.120	0.157	0.194	0.230	0.267	0.340
1100	0.052	0.092	0.133	0.173	0.213	0.254	0.294	0.375
1200	0.057	0.101	0.145	0.189	0.233	0.277	0.322	0.410

Hidden screw fixing / 2 (lock)

B1 = B-27 H1 = H-27

JR-3, JR-4 h = 34 mm

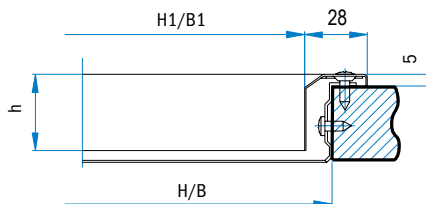JR-7, JR-8 h = 46 mm

Marking: JR-3/2, JR-4/2, JR-7/2, JR-8/2
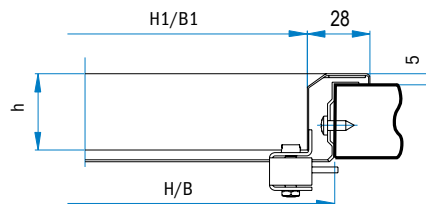
Visible screw fixing + installation frame / V2

B1 = B-27 H1 = H-27

JR-3, JR-4 h = 34 mm

JR-7, JR-8 h = 46 mm

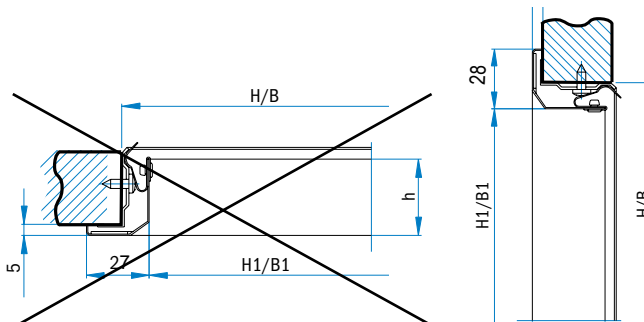Marking: JR-3/V2, JR-4/V2, JR-7/V2, JR-8/V2

Hidden fixing / 3 (spring)
Warning: only for wall installation

B1 = B-27 H1 = H-27

JR-3, JR-4 h = 34 mm

JR-7, JR-8 h = 46 mm

Marking: JR-3/3, JR-4/3, JR-7/3, JR-8/3

Mounting of grilles without installation frame

Visible screw installation / V
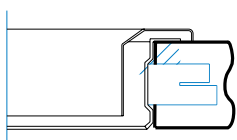
B1 = B-27 H1 = H-27

JR-3, JR-4 h = 34 mm

JR-7, JR-8 h = 46 mm

Marking: JR-3/V, JR-4/V, JR-7/V, JR-8/V
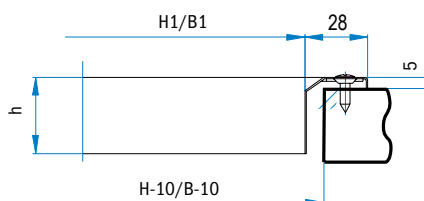
Mounting of grilles with installation frame

The installation frame may be mortar-mounted (in concrete or brick walls) or fixed with screws (walls, ceilings, ducts, ...).
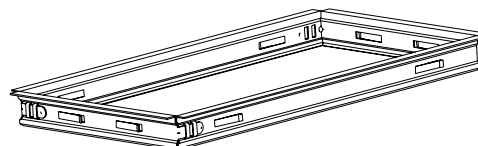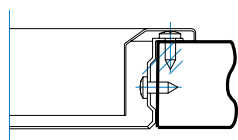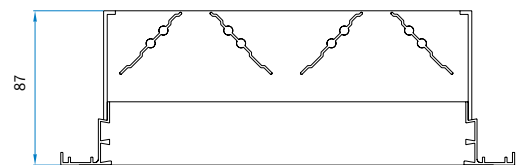
Registers

When adjusting the system, desired operating conditions are obtained by the means of ventilation elements control. Registers are installed for additional air volume control, thus influencing air velocity and throw distance as well. All types of registers, except type of register F, are made of sheet steel and corrosion protected with dipcoat processing in blackwater soluble colour. Upon customer's request registers can be made of galvanised sheet steel and coloured in any colour. Typ of register F is made of plastics.

F

Register has wide counter-directional blades which can be moved with screw-driver via the gear wheel. It is used to control the air flow volume.Blades are made of plastics.
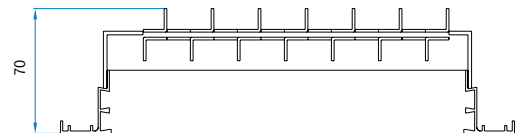
S

Register has fixed deflector and slider which opens and closes the slots. Due to inclined deflection, air volume damper S is particularly useful for longer grilles, because air flow is evenly distributed throughout the grille.
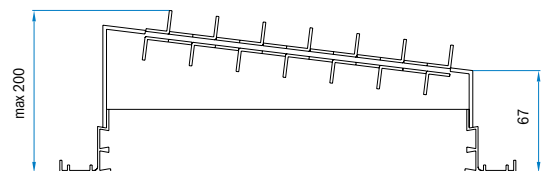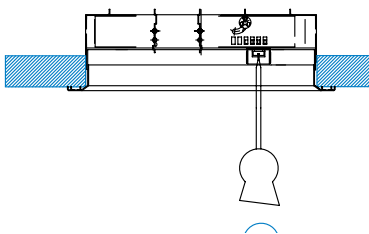
T

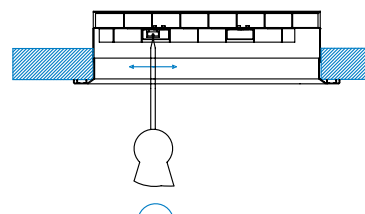Register has fixed deflector and slider which opens and closes the slots. It isused to control and deflect the air flow from the duct.

Set-up of different registers

Register F

Register T

Ventilating grilles/registers combinations

Grille	F	F2	S	T
JR-3	■		■	■
JR-4	■		■	■
JR-7	■		■	■
JR-8	■		■	■

Ventilating grilles JR-3, 4, 7, 8; without ceiling effect (distance from ceiling ≥ 0.8 m)

Chart for determining the size, induction and temperature of the air flow
valid for B/H ≤ 12 – fully opened blades

Definition of Symbols

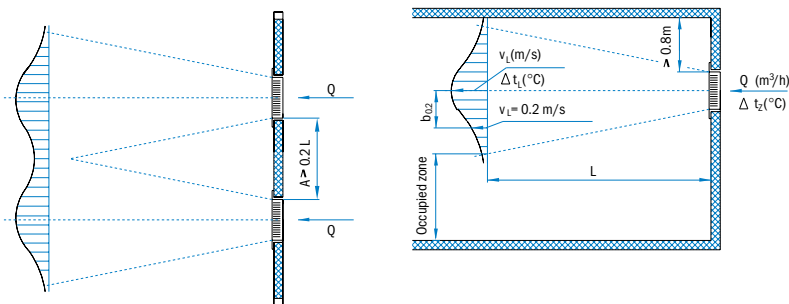|	
Q (m³/h)	Air flow
L (m)	Throw distance
V_{ef} (m/s)	Effective discharge air velocity
V_L (m/s)	Max. air velocity at the throw distance L
Δt_z (K)	Temperature difference between supply and room air
Δt_L (K)	Temperature difference between air jet and room temperature
i	Induction rate = total airstream volume flow / volume flow at diffuser discharge
$b_{0.2}$ (m)	Width of air jet is measured at a distance from ceiling where air flow velocity 0.2 m/s

Ventilating grilles JR-3, 4, 7, 8 without ceiling effect
(distance from ceiling ≥ 0.8 m)

Chart for determining the size, induction and temperature of the air flow
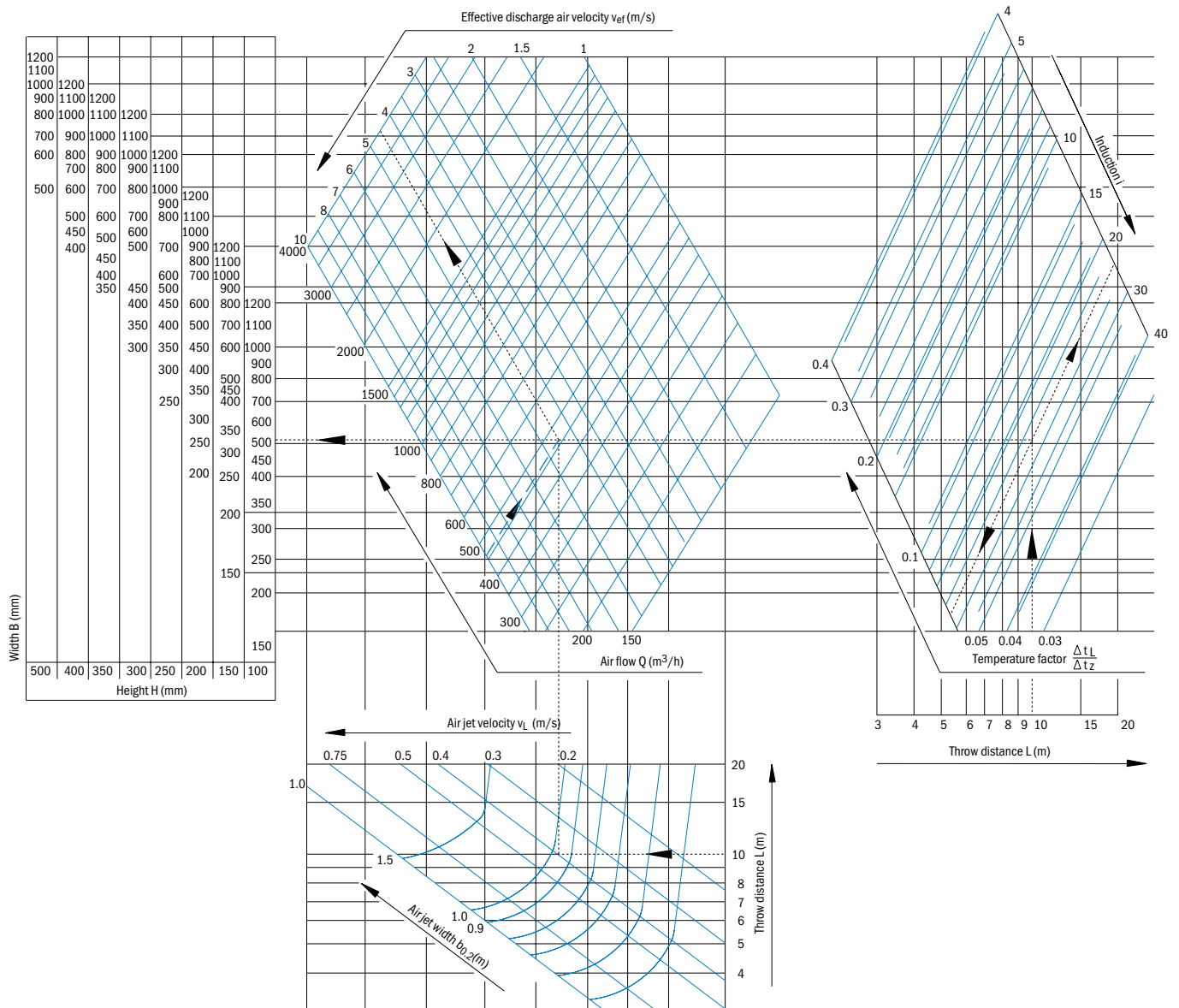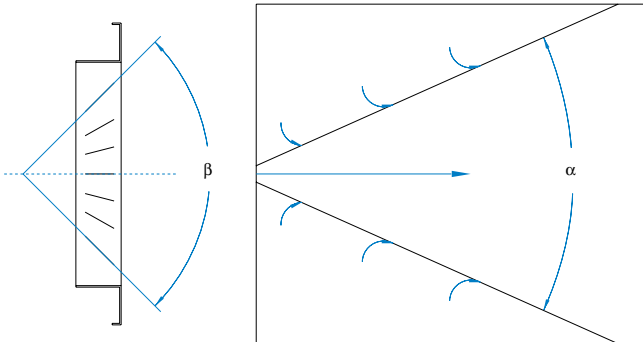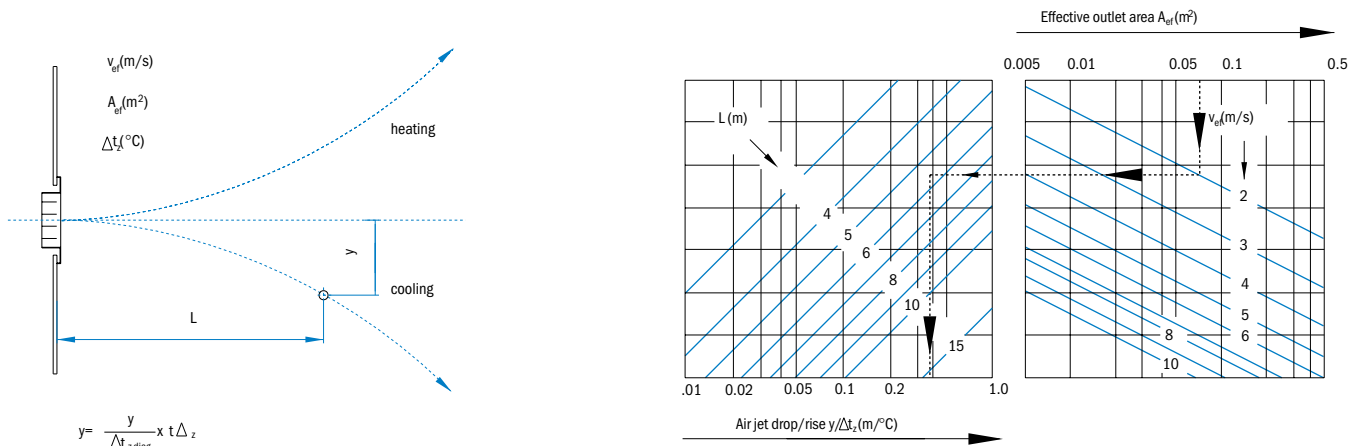valid for B/H ≤ 12 – fully opened blades

Ventilating grilles JR-3, 4, 7, 8;
without ceiling effect (distance from ceiling ≥ 0.8 m)

Table with correcting factors for horizontal air jet deflection:

		45°	90°
Blade adjusting angle	β	45°	90°
Air jet spread angle	α	35°	60°
Air flow velocity	V_L	V_L diag. x 0.7	x 0.5
Temperature factor $\Delta t_L / \Delta t_Z$		$(\Delta t_L / \Delta t_Z$ diag.) x 0.7	x 0.5
Induction	i	i diag. x 1.4	x 2.0
Air jet drop	y	y diag. x 1.4	x 2.0
Distance between grilles	A	0.25 L	0.3 L

Chart for determining air jet deflection:

v_{ef} (m/s)

A_{ef} (m²)

Δt_z (°C)

heating

cooling

L

y

$$y = \frac{y}{\Delta t_{z\,diag.}} \times t\,\Delta_z$$

Effective outlet area A_{ef} (m²)

0.005   0.01   0.05   0.1   0.5

L (m)

v_{ef} (m/s)

4
5
6
8
10
15

2
3
4
5
6
8
10

.01   0.02   0.05   0.1   0.2   1.0

Air jet drop/rise $y/\Delta t_z$ (m/°C)

Example

Given:

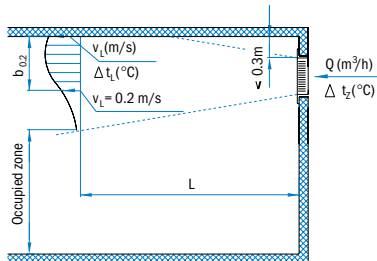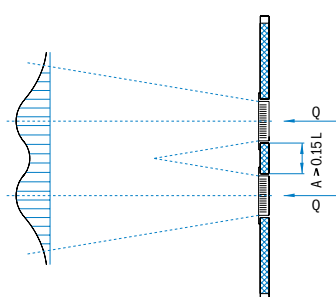|	
Air flow:	**Q = 460 m³/h, L = 10m**
Air flow velocity:	**VL = 0.4 m/s**
Temperature difference:	**Δt$_Z$ = 5 °C**

Solution:

Use the chart, distance from ceiling ≥ 0.8 m
and select the grille type JR-3 size B = 425, H = 125

Effective outlet air velocity	**V$_{ef}$ = 4.5 m/s**
Temperature factor	**Δt$_L$/Δt$_Z$ = 0.065**
Temperature difference	**Δt$_L$ = 0.065 x 5 = 0.32 °C**
Induction	**i = 23**
Width of the air jet	**b$_{0.2}$ = 1.0 m**
Min. distance between grilles	**A = 2 m**

Ventilating grilles JR-3, 4, 7, 8; with ceiling effect
(distance from ceiling ≤ 0.3 m)

Chart for determining the size, induction and temperature of the air flow
valid for B/H ≤ 12 – fully opened blades

Definition of symbols

Q (m³/h)	Air flow
L (m)	Throw distance
V_{ef} (m/s)	Effective discharge air velocity
V_L (m/s)	Max. air velocity at the throw distance L
Δt_z (K)	Temperature difference between supply and room air
Δt_L (K)	Temperature difference between air jet and room temperature
i	Induction rate = total airstream volume flow / volume flow at diffuser discharge
$b_{0.2}$ (m)	Width of air jet is measured at a distance from ceiling where air flow velocity 0.2 m/s

33

Ventilating grilles JR-3, 4, 7, 8; with ceiling effect
(distance from ceiling ≤ 0.3 m)

Chart for determining the size, induction and temperature of the air flow
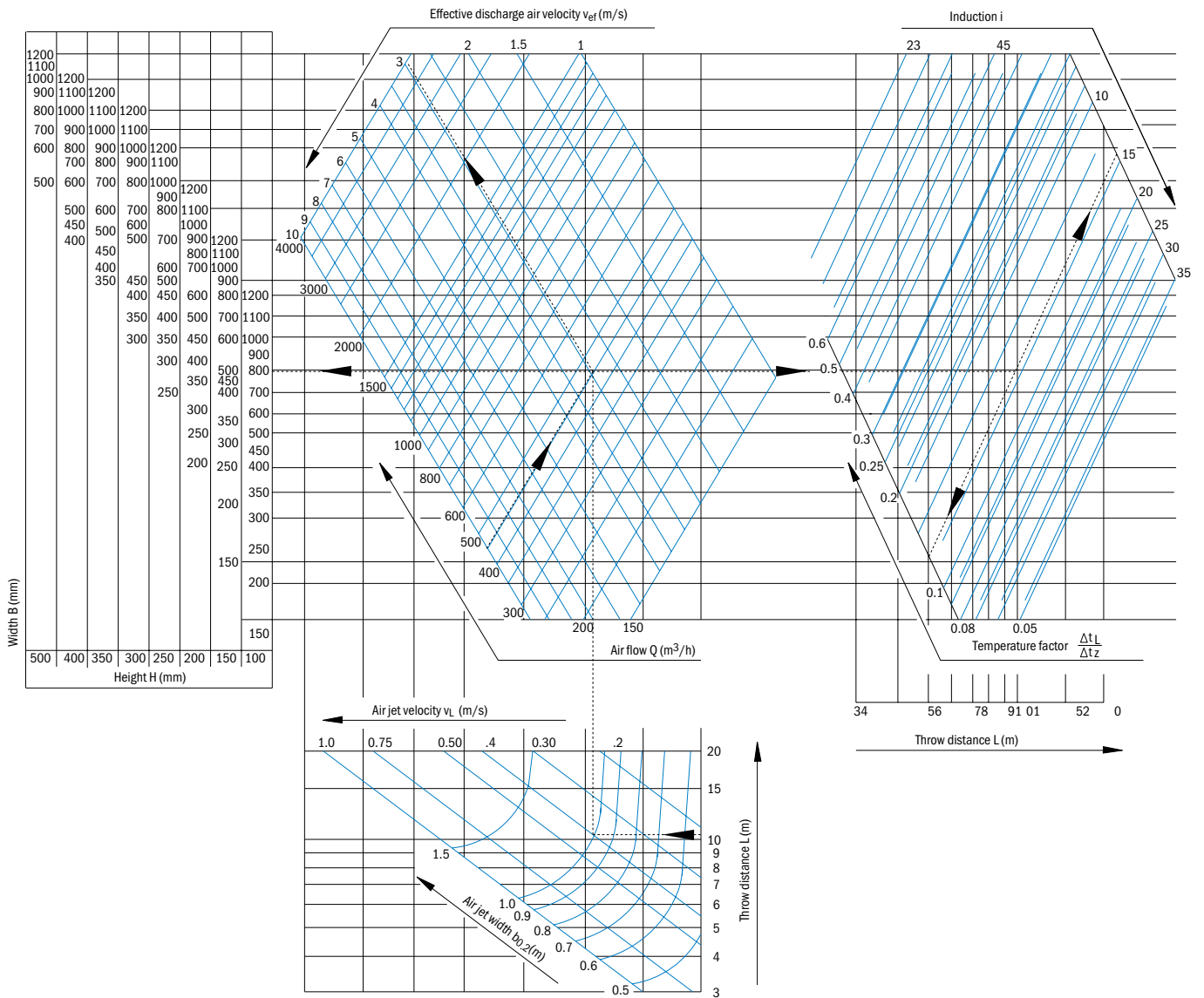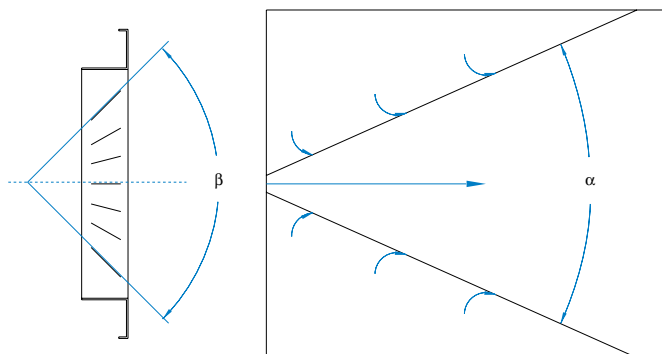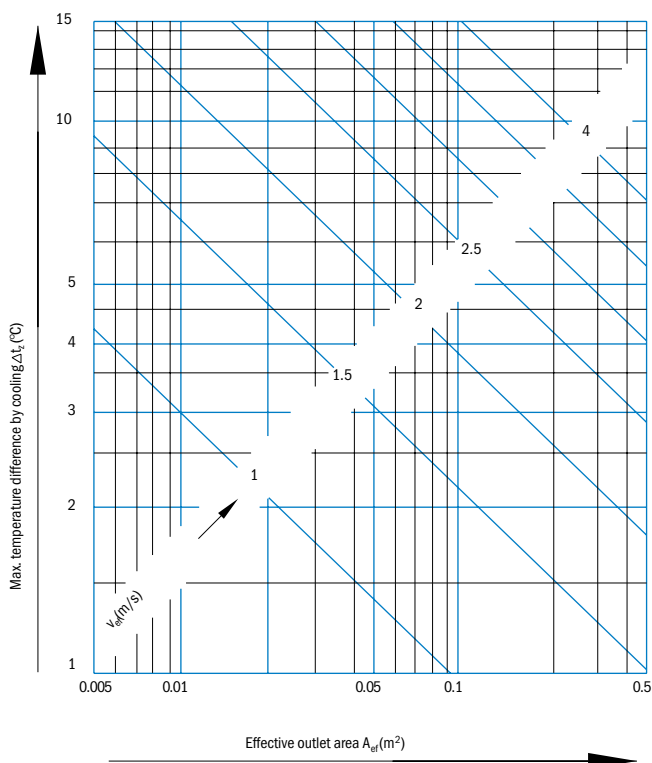valid for B/H ≤ 12 – fully opened blades

Table with correcting factors for horizontal air jet deflection

Blade adjusting angle	β	45°	90°
Air jet spread angle	α	35°	60°
Air flow velocity	V_L	V_L diag. x 0.7	x 0.5
Temperature factor $\Delta t_L / \Delta t_Z$	($\Delta t_L / \Delta t_Z$ diag.)	x 0.7	x 0.5
Induction	i	i diag. x 1.4	x 2.0
Air jet drop	y	y diag. x 1.4	x 2.0
Distance between grilles	A	0.25 L	0.3 L

Chart for determining air jet deflection

Max. temperature difference by cooling Δt_Z (°C)

V_{ef} (m/s)

Effective outlet area A_{ef} (m²)

Example

Given:

Air flow:	**Q = 460 m³/h, L = 10m**
Air flow velocity:	**V_L = 0.4 m/s**
Temperature difference:	**Δt_Z = 5 °C**

Solution:

Use the chart, distance from ceiling ≤ 0.3 m
and select the grille type JR-3 size B = 625, H = 125

Effective outlet air velocity	**V_{ef} = 2.8 m/s**
Temperature factor	**$\Delta t_L / \Delta t_Z$ = 0.13**
Temperature difference	**Δt_L = 0.13 x 5 = 0.65 °C**
Induction	**i = 15**
Width of the air jet	**$b_{0.2}$ = 1.0 m**
Min. distance between grilles	**A = 1.5 m**

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Technical data for ventilating grilles

Pressure drop and sound power level diagram for grilles JR-3, 4, 7, 8 with volume control damper F
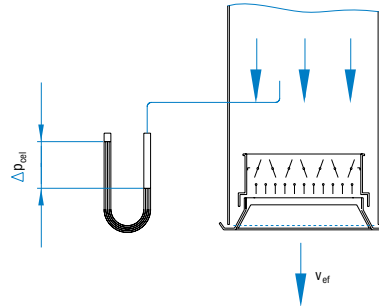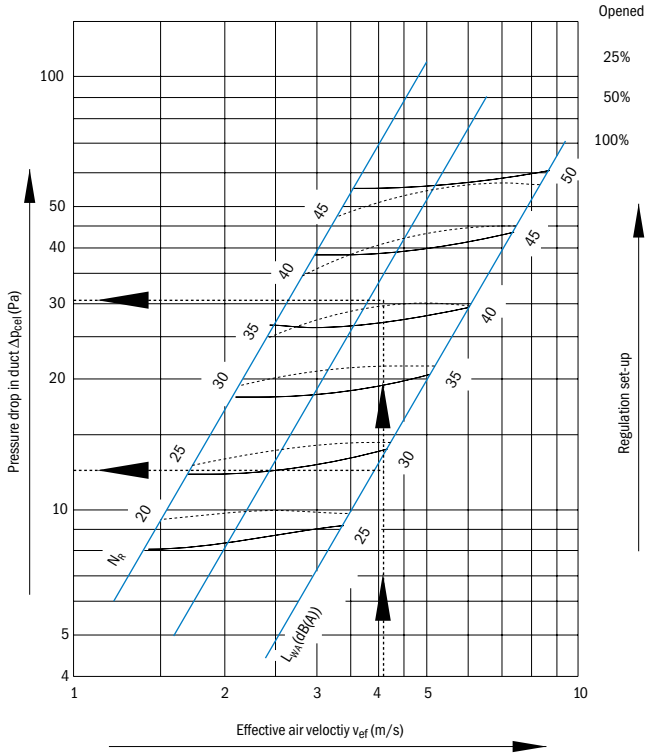
Fully opened blades

Opened

25%

50%

100%

Regulation set-up

Pressure drop in duct Δp_{cel} (Pa)

N_R

L_{WA} (dB(A))

Effective air veloctiy v_{ef} (m/s)

Δp_{cel}

v_{ef}

Table of correction factors for acoustic data

A_{ef} (m²)	0.01	0.02	0.05	0.1	0.2	0.4
Correction (dB(A)) N_R	-10	-7	-3	0	+3	+6

Definition of symbols

A_{ef}	Effective outlet area
Δp_{cel} **(Pa)**	Pressure drop
L_{WA} **(dB(A))**	Sound power level
N_R	Max. value acc. to ISO

Room sound attenuation diagram
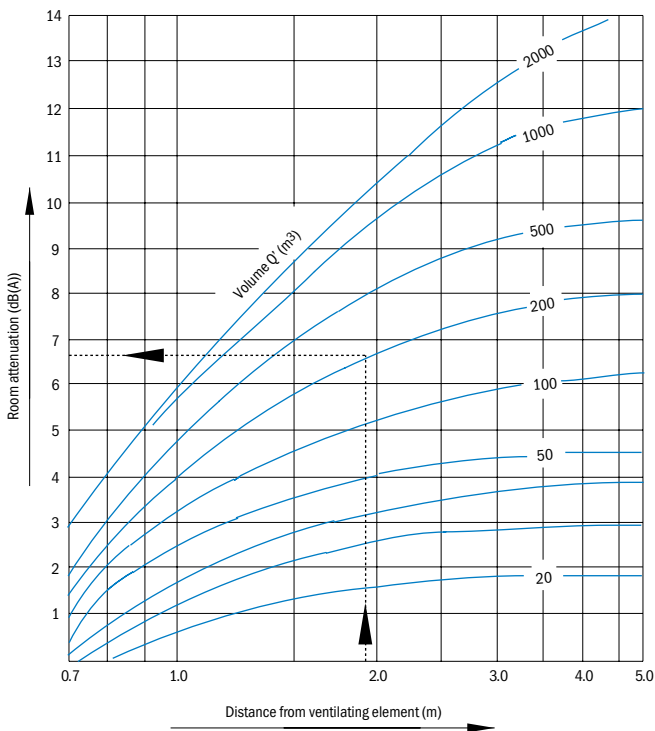
Room attenuation (dB(A))

Volume Q' (m³)

Distance from ventilating element (m)

The following data are necessary to calculate the volume Q':

1. Normal rooms	Q' = Q
2. Rooms with highly reflective walls	Q' = 0.5Q
3. Rooms with absorption walls	Q' = 2Q

Definition of symbols

Q' (m³)	Calculated volume, depending on room reflectance
Q (m³)	Actual room volume

Technical data for extracting grilles

Presure drop and sound power level for grilles JR-3, 4, 7, 8 with volume control damper F
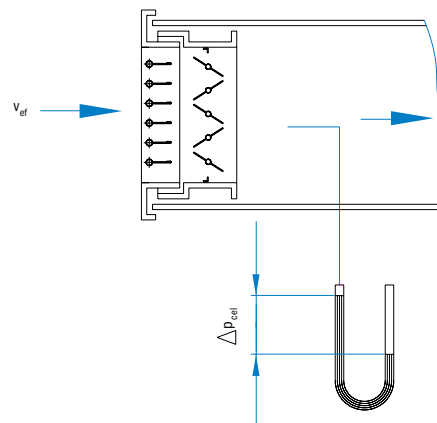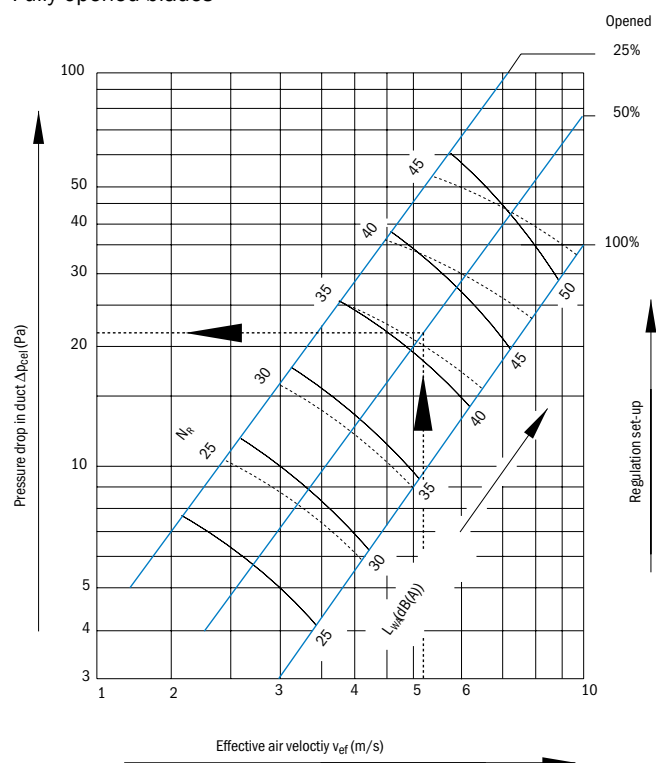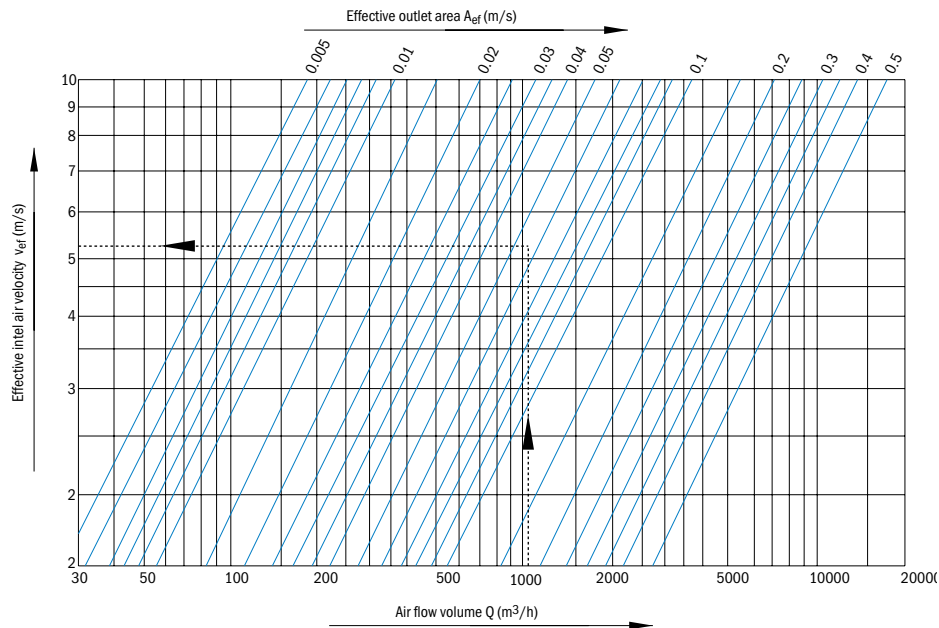Fully opened blades

Table of correction factors for acoustic data

A_{ef} (m²)	0.005	0.01	0.02	0.05	0.1	0.2	0.4
Correction (dB(A)) N_R	-13	-10	-7	-3	0	+3	+6

Definition of symbols

$\triangle p_{cel}$ **(Pa)**	Pressure drop
L_{WA} **(dB(A))**	Sound power level
N_R	Max. value acc. to ISO

Effective supply air velocity diagram

Effective outlet area A_{ef} (m/s)

0.005 0.01 0.02 0.03 0.04 0.05 0.1 0.2 0.3 0.4 0.5
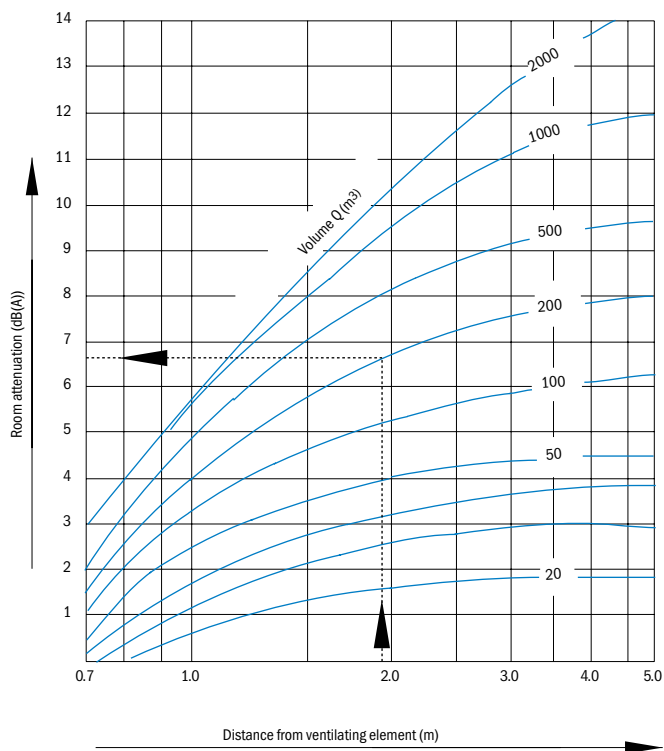
Effective intel air velocity v_{ef} (m/s)

Air flow volume Q (m³/h)

Example

Q = 1000 m³/h

A_{ef} = 0.05 m³ (from the Effective area table)

As follows from the diagram.

V_{ef} = 5.3 m/s

Room sound attenuation diagram

Room attenuation (dB(A))

Volume Q (m³)

2000
1000
500
200
100
50
20

Distance from ventilating element (m)

The following data are necessary to calculate the volume Q':

1. Normal rooms	Q' = Q
2. Rooms with highly reflective walls	Q' = 0.5Q
3. Rooms with absorption walls	Q' = 2Q

Definition of symbols

Q' (m³)	Calculated volume, depending on room reflectance
Q (m³)	Actual room volume