

1/S1
v 3.3 (en)

VENTILATION GRILLES

OAH, OAV, OAB, OAK, OAN, OAS, OAM,
OCM, PCR, ORP, PTR, CCH, CCV, NRA,
NRK



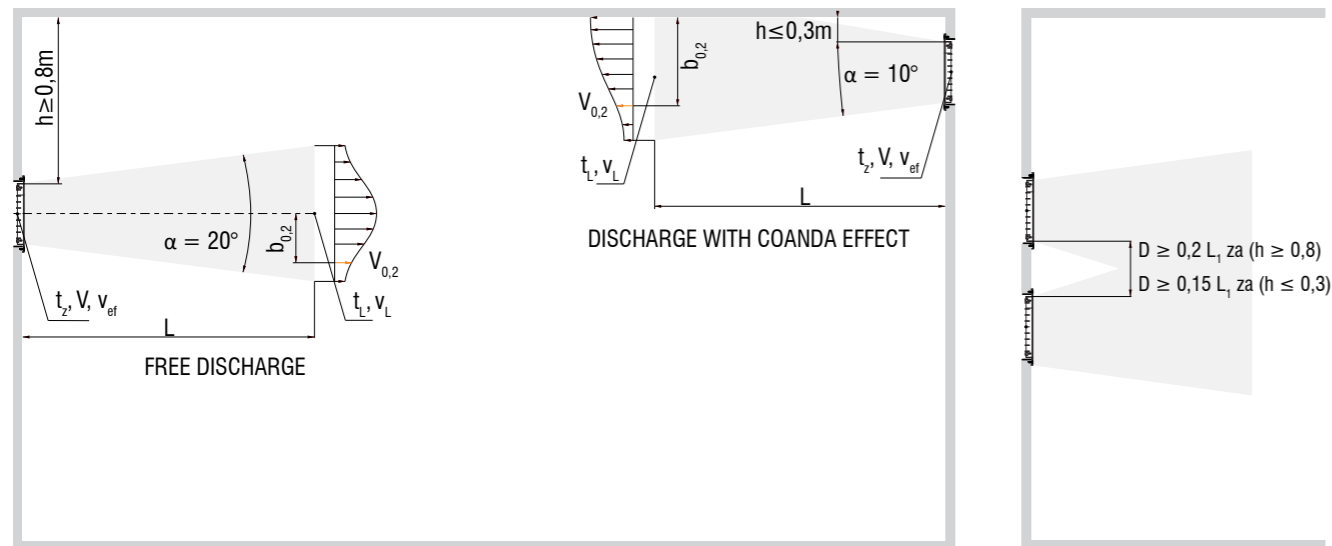
TABLE OF CONTENTS

Aluminium grilles.....9
 Special grilles.....12
 Fancoilgrilles.....13
 Steelgrilles.....14
 Lineargrilles.....15
 Dampers.....18
 Ordering key.....19
 Installation instructions.....20
 Plenum boxes.....23
 Effective discharge areas.....26
 Selection diagrams.....29

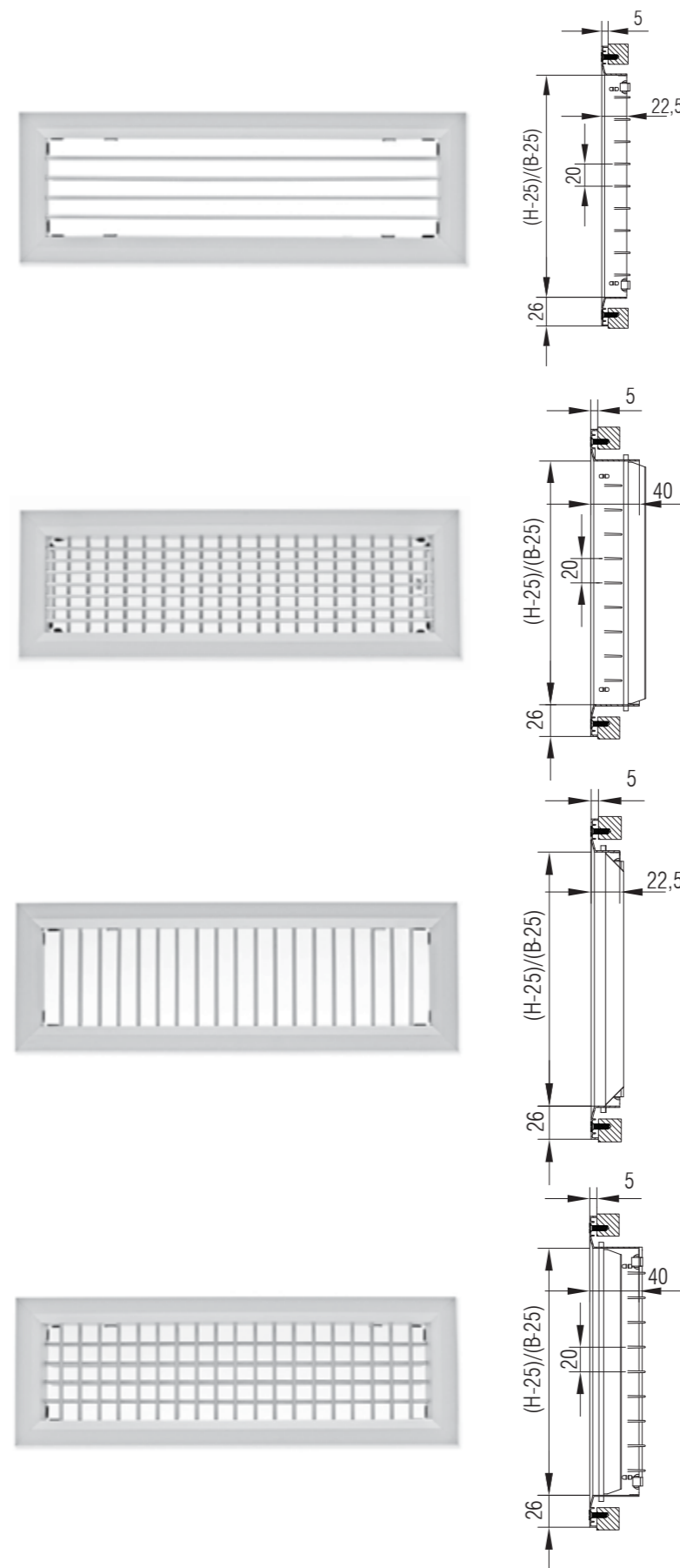
Definition of symbols

| | |
|----------------------------|---|
| V (m ³ /h) | - Air flow |
| v_{ef} (m/s) | - Effective air velocity |
| v_L (m/s) | - Maximum air velocity on a distance L |
| $B \times H$ (mm) | - Standard grille dimensions |
| A_{ef} (m ²) | - Effective discharge area |
| h (m) | - Vertical distance from grille to ceiling |
| D (m) | - Horizontal distance between two grilles |
| L (m) | - Air throw |
| i | - Air induction |
| t_z (°C) | - Supply air temperature |
| t_r (°C) | - Room air temperature |
| t_p (°C) | - Core temperature on a distance L |
| Δt_z (°C) | - ($t_z - t_r$) |
| Δt_L (°C) | - ($t_r - t_p$) |
| $b_{0,2}$ (m) | - Jet width - distance between jet core and point where velocity equals 0,2 m/s |
| yt (m) | - Air jet deflection |
| α (°) | - Jet dissipation angle |
| β (°) | - Blade angle |
| L_{WA} (dB(A)) | - Sound power level |
| Δp (Pa) | - Pressure drop |

Discharge scheme



ALUMINIUM GRILLES



OAH 1

- frame and blades made out of anodized aluminium profiles
- one row of horizontal individually adjustable blades
- fixing with visible screws (wall and ceiling)
- fixing with mounting frame (UR) only in wall

OAH 2

- frame and blades made out of anodized aluminium profiles
- front row of horizontal individually adjustable blades
- back row of vertical individually adjustable blades
- fixing with visible screws (wall and ceiling)
- fixing with mounting frame (UR) only in wall

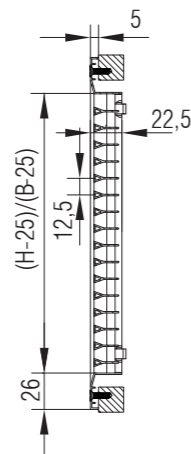
OAV 1

- frame and blades made out of anodized aluminium profiles
- one row of vertical individually adjustable blades
- fixing with visible screws (wall and ceiling)
- fixing with mounting frame (UR) only in wall

OAV 2

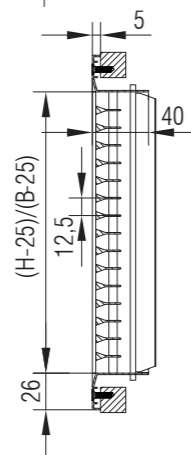
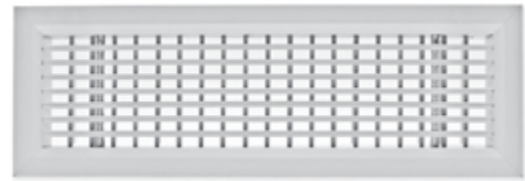
- frame and blades made out of anodized aluminium profiles
- front row of vertical individually adjustable blades
- back row of horizontal individually adjustable blades
- fixing with visible screws (wall and ceiling)
- fixing with mounting frame (UR) only in wall

*Options pg. 20
 **Installation pg. 21
 ***Standard dimensions pg. 13



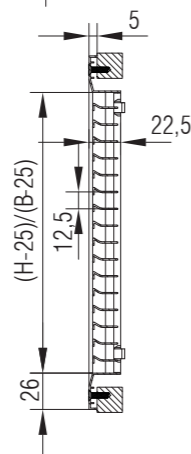
OAB 1-0

- frame and blades made out of anodized aluminium profiles
- one row of horizontal fixed blades
- fixing with visible screws (wall and ceiling)
- fixing with mounting frame (UR) only in wall



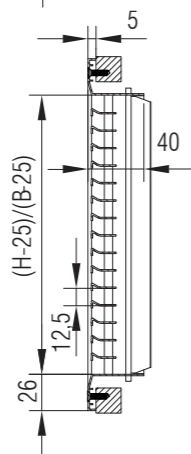
OAB 2-0

- frame and blades made out of anodized aluminium profiles
- front row of horizontal adjustable blades
- back row of vertical adjustable blades
- fixing with visible screws (wall and ceiling)
- fixing with mounting frame (UR) only in wall



OAB 1-15

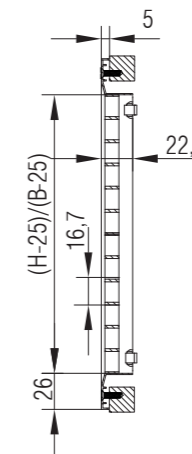
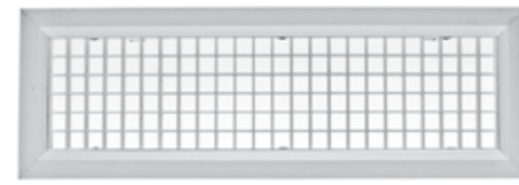
- frame and blades made out of anodized aluminium profiles
- one row of horizontal fixed blades with deflection angle 15°
- fixing with visible screws (wall and ceiling)
- fixing with mounting frame (UR) only in wall



OAB 2-15

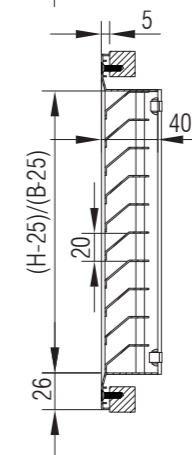
- frame and blades made out of anodized aluminium profiles
- front row of horizontal fixed blades
- back row of vertical adjustable blades
- fixing with visible screws (wall and ceiling)
- fixing with mounting frame (UR) only in wall

*Options pg. 20
 **Installation pg. 21
 ***Standard dimensions pg. 13



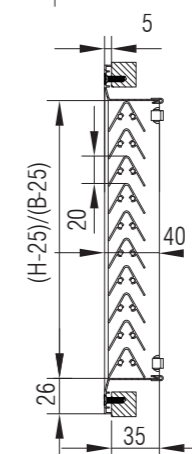
OAK

- frame made out of anodized aluminium profiles
- fixed plastic rectangular mesh
- fixing with visible screws (wall and ceiling)
- fixing with mounting frame (UR) only in wall



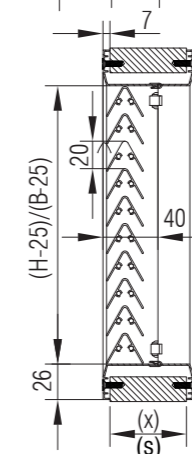
OAN

- frame and blades made out of anodized aluminium profiles
- one row of horizontal fixed blades
- fixing with visible screws (wall and ceiling)
- fixing with mounting frame (UR) only in wall



OAS

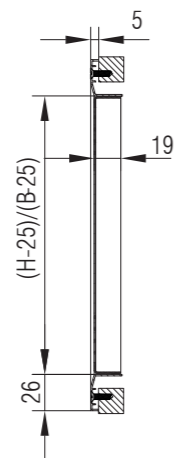
- frame and blades made out of anodized aluminium profiles
- one row of horizontal fixed blades
- fixing with visible screws (wall and ceiling)
- fixing with mounting frame (UR) only in wall



OAS - R

- frame, counterframe and blades made out of anodized aluminium profiles
- one row of horizontal fixed blades
- counterframe for back side of the door
- fixing with visible screws (wall and ceiling)
- known door width (s=35 - 50 mm)

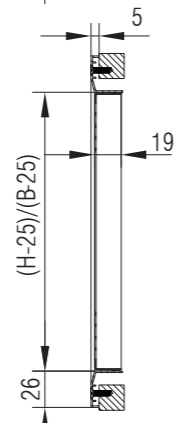
*Options pg. 20
 **Installation pg. 21
 ***Standard dimensions pg. 13



SPECIAL GRILLE

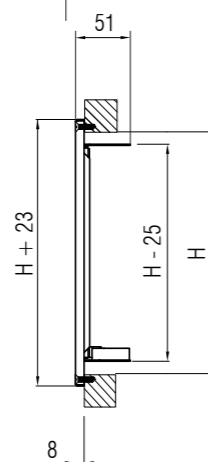
OAM

- frame made out of anodized aluminium profiles
- fixed mesh made out of aluminium sheet
- fixing with visible screws (wall and ceiling)
- fixing with mounting frame (UR) only in wall



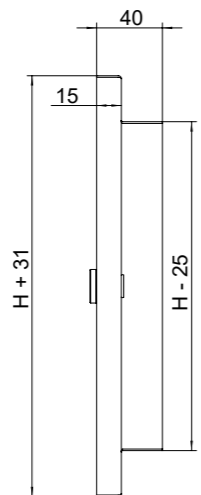
OCM

- frame made out of anodized aluminium profiles
- fixed mesh of perforated steel sheet
- perforation 6x6mm, step 8,5mm
- powder coated in white RAL 9010
- fixing with visible screws (wall and ceiling)
- fixing with mounting frame (UR) only in wall



PCR

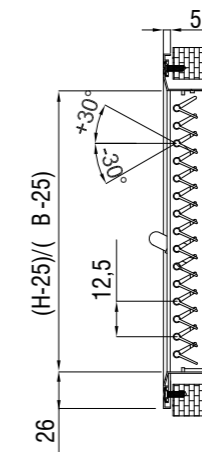
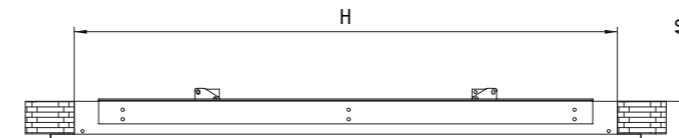
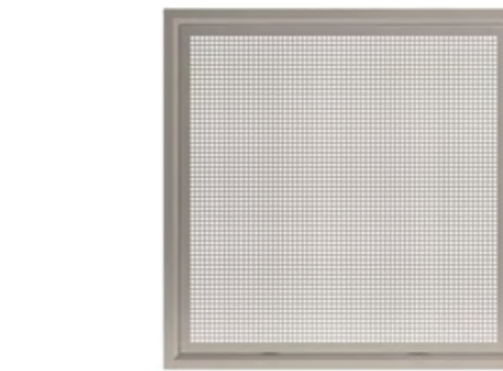
- frame made out of steel sheet profiles
- fixed mesh of perforated steel sheet
- round perforation 4mm, 40%
- powder coated in white RAL 9010
- fixing with visible screws
- perforated cover opens around axis on B side
- closing mechanism on back side of the cover



OCP

- frame made out of stainless steel
- fixed mesh of perforated steel sheet
- round perforation
- fixing with screws (only in wall)

*Options pg. 20
**Installation pg. 21



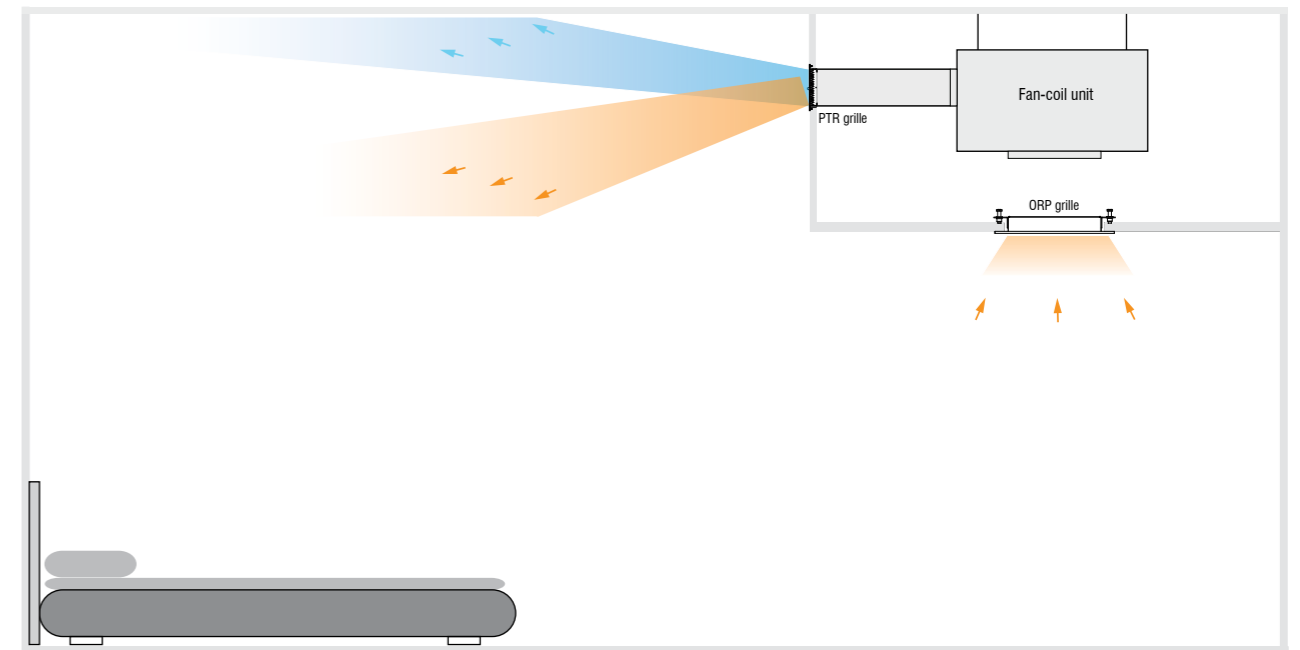
FAN-COIL GRILLE

ORP

- frame and screen made out of anodized aluminium profiles
- installation in suspended ceiling
- free hanging perforated screen with click lock
- fixed with angle and M6 screws
- standard dimensions: 500 x 500
600 x 600
700 x 700

Adjustable supply grille PTR

- frame and blades made out of anodized aluminium profiles
- front row of horizontal adjustable, interconnected blades (deflection angle $\pm 30^\circ$)
- fixing with visible screws (wall and ceiling)
- fixing with mounting frame (UR) only in wall
- standard dimensions pg. 12

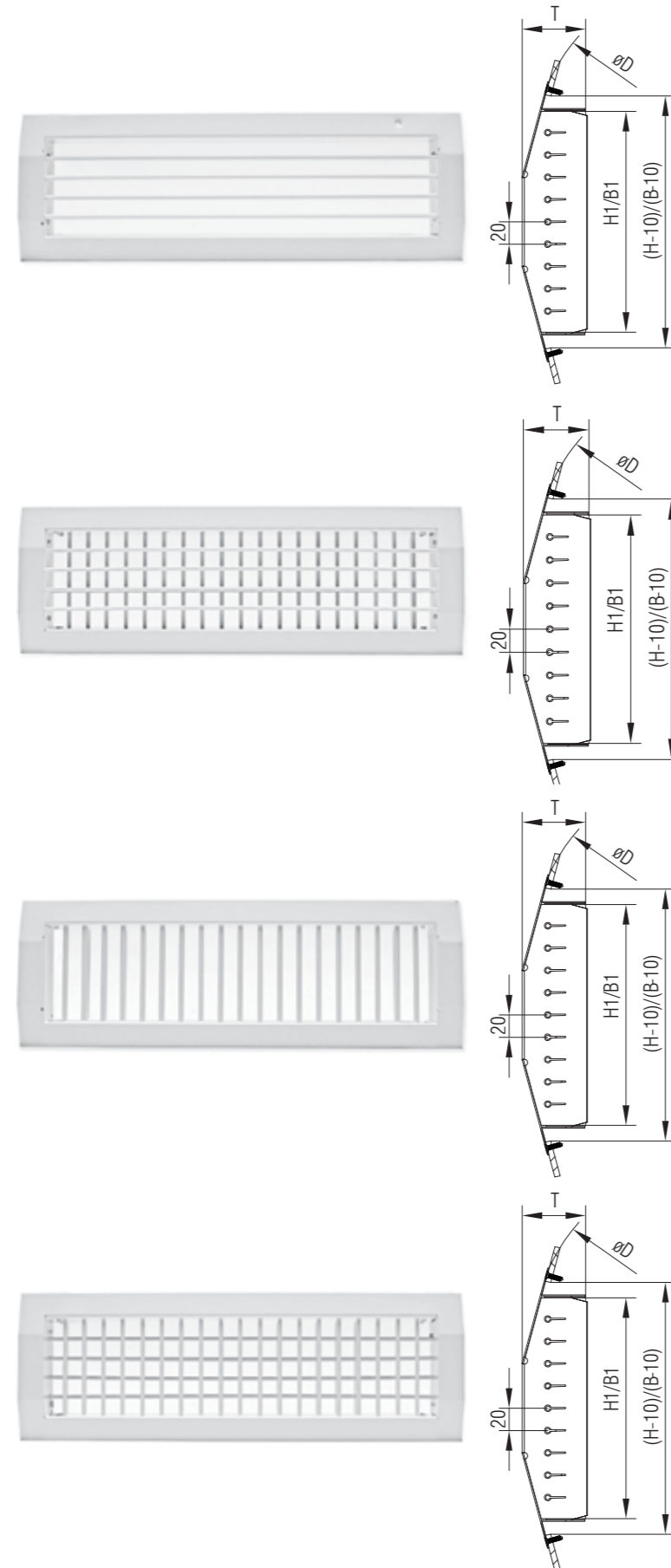


Standard dimensions for aluminium grilles

| | |
|---|------------------------------------|
| B | 225 - 1225 mm, in increments 100mm |
| H | 125 - 525 mm, in increments 100mm |

* B > H

*Options pg. 20
**Installation pg. 21



STEEL GRILLES FOR ROUND DUCT

CCH 1

- one row of horizontal individually adjustable blades
- frame and blades made out of galvanized steel
- fixing with screws
- installation on round duct

CCH 2

- front row of horizontal individually adjustable blades
- back row of vertical individually adjustable blades
- frame and blades made out of galvanized steel
- fixing with screws
- installation on round duct

CCV 1

- one row of vertical individually adjustable blades
- frame and blades made out of galvanized steel
- fixing with screws
- installation on round duct

CCV 2

- front row of vertical individually adjustable blades
- back row of horizontal individually adjustable blades
- frame and blades made out of galvanized steel
- fixing with screws
- installation on round duct

Standard dimensions steel grille

| | |
|---|------------------------------------|
| B | 225 - 1225 mm, in increments 100mm |
| H | 75, 125 or 225 mm |

* B > H

*Options
**Installation

pg. 19
pg. 20

LINEAR GRILLES

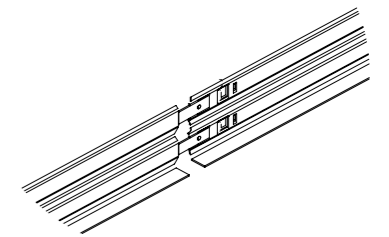
OAV, OAB

- for width more than 1225mm
- fixing with screws
- standard sizes H: 75, 125, 225, 325

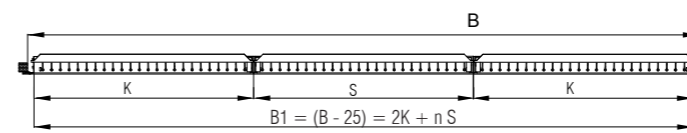
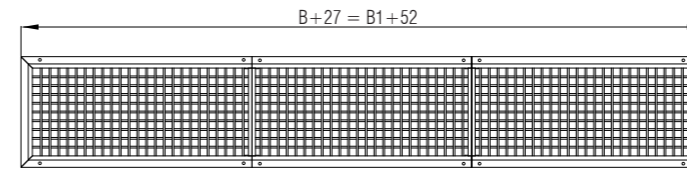
Options

- installation subframe
- flow damper
- plenum box
- installation subframe and damper made from multiple parts

Detail A (subframe joint)

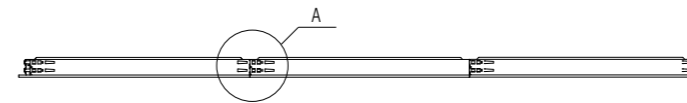


Linear grille (B > 1225mm)

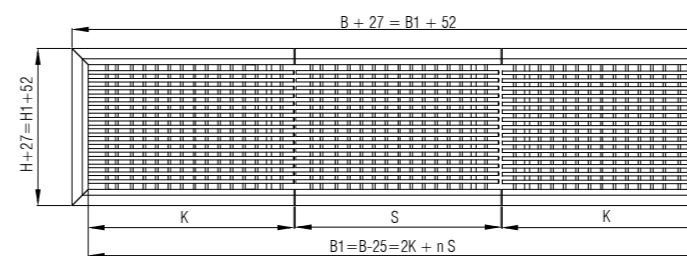


* K – end section
S – connecting section
n – number of connecting sections
(1200 < B1 < 2400) – two end sections
(B1 > 2400) – two end sections and n connecting sections

Inline connection of subframes



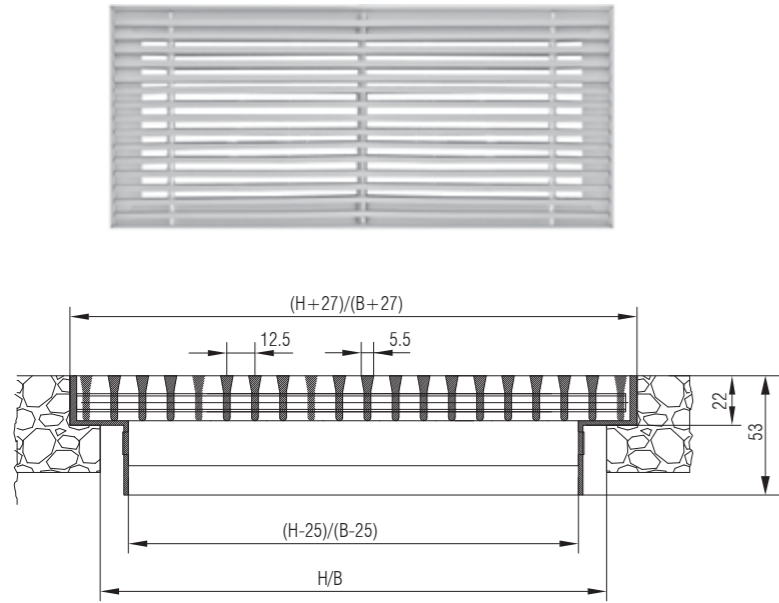
Linear grille OAB1-0 + BxH (B1 > 2400mm)



FLOOR GRILLES

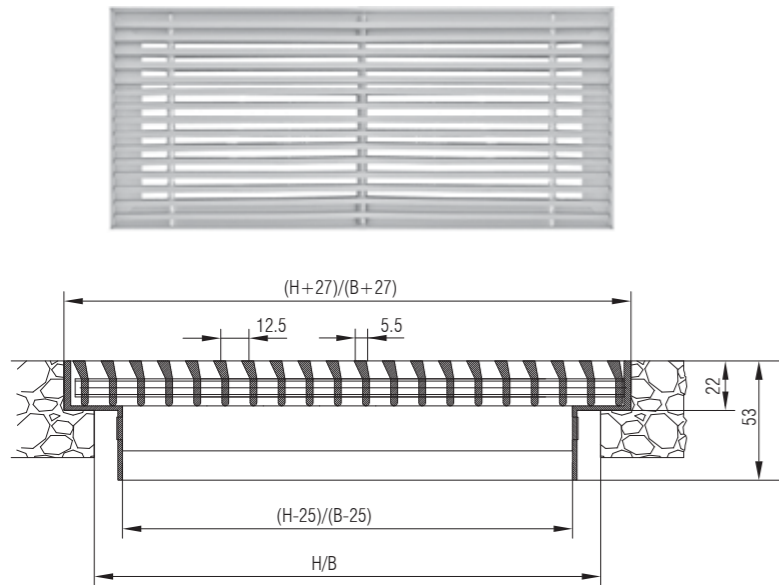
NRA 0

- frame and blades made out of anodized aluminium profiles
- one row of fixed horizontal blades
- blade insert detachable from the frame
- fixing in floor



NRA 15

- frame and blades made out of anodized aluminium profiles
- one row of fixed horizontal blades
- blade insert detachable from the frame
- fixing in floor



Standard dimensions for floor grilles NRA

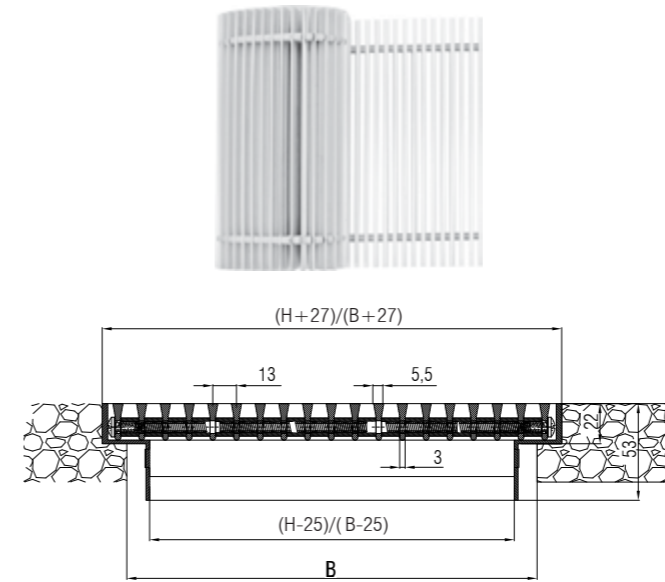
| | |
|---|---------------------------------------|
| B | 225 - 1225 mm, in increments of 100mm |
| H | 125 - 525 mm, in increments of 100mm |

* B > H

FLOOR GRILLES

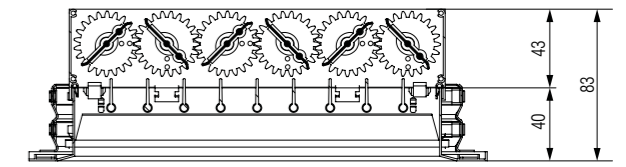
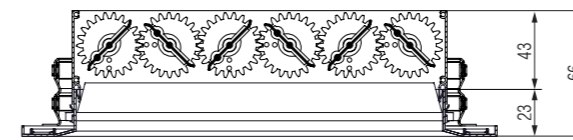
NRK

- frame and blades made out of anodized aluminium profiles
- one row of fixed horizontal blades
- blade insert detachable from the frame
- fixing in floor
- standard widths: 254, 344, 444 mm, other widths on special demand
- maximum grille length, 6m

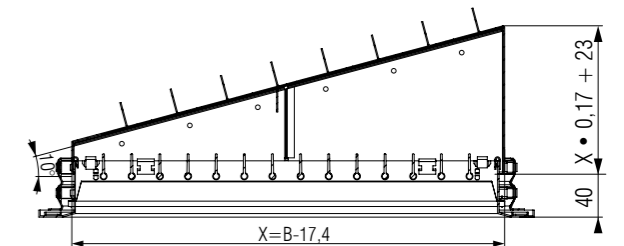
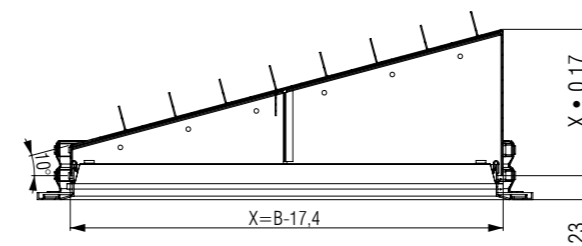


DAMPERS

L - damper



S - damper

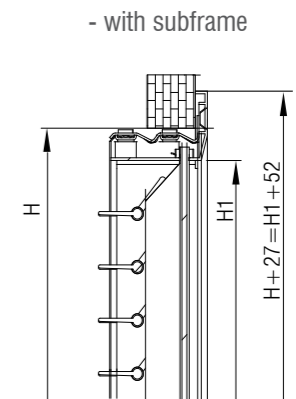
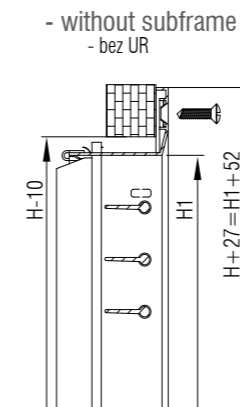


| (1) Grille type | (2) Damper | (3) Installation frame | (4) Dimensions [mm] | (5) Filter | (6) Color |
|---|------------|------------------------|---------------------|------------|---------------|
| OAH | L | UR | 425x125 | G2 | RAL... |
| (1) Grille type: OAH, OAV, OAB, OAS, OAS-R, OAK, OAN, OAM, OCM, CCH, CCV, CRH, CRV, NRA, NRK, PCR, ORP, PTR (2) Damper: L, S (3) Installation frame: UR (4) Dimensions: 225-1225x125-525 [mm] (5) Filter: G2 ili G4 (6) RAL | | | | | |

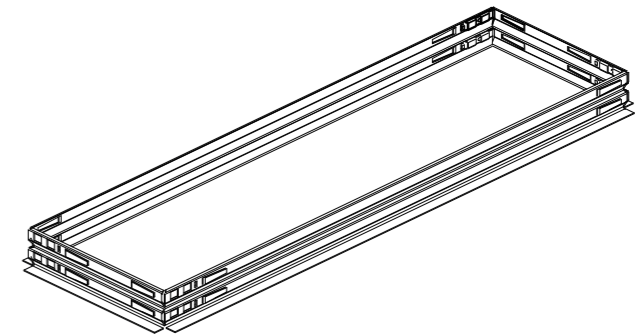
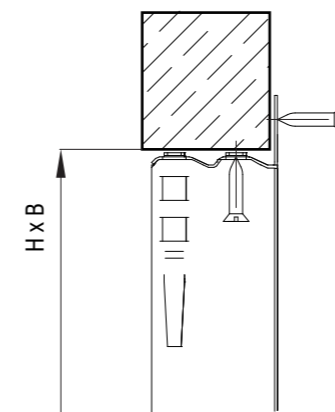
| | L damper | S damper | UR | RAL | Plenum box: PK1, PK2, PK3 | G2/G4 Filter |
|-------|----------|----------|----|-----|---------------------------|--------------|
| OAH | + | + | + | + | + | |
| OAV | + | + | + | + | + | |
| OAB | + | + | + | + | + | |
| OAS | | | + | + | | |
| OAS-R | | | | + | | |
| OAK | + | + | + | + | + | |
| OAN | + | | + | + | + | |
| OAM | + | + | + | + | + | |
| OCM | + | + | + | + | + | + |
| CCH | + | + | | + | | |
| CCV | + | + | | + | | |
| NRA | + | | | + | + | |
| NRK | | | + | + | + | |
| PCR | | | | + | | + |
| ORP | | | | + | | + |
| PTR | | | + | + | | |

INSTALLATION INSTRUCTIONS

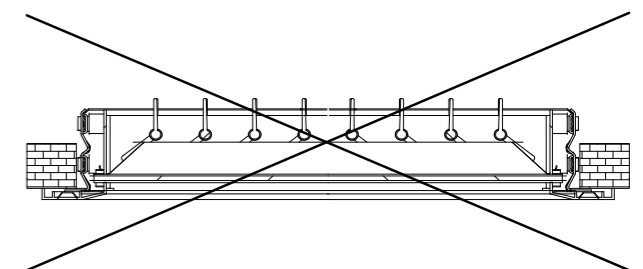
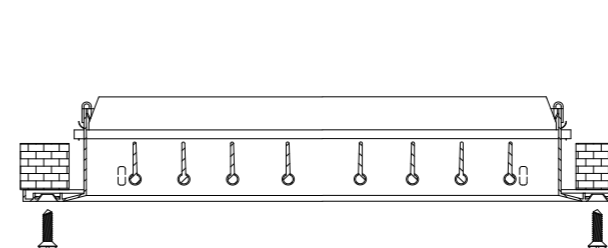
Wall installation



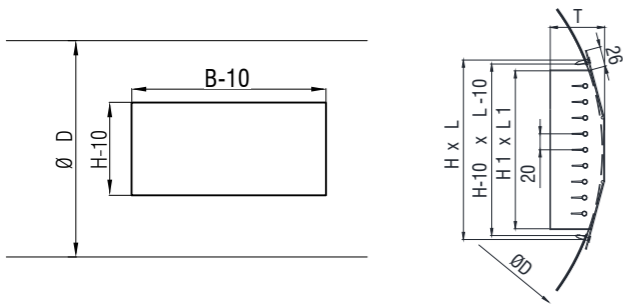
Subframe installation



Ceiling installation



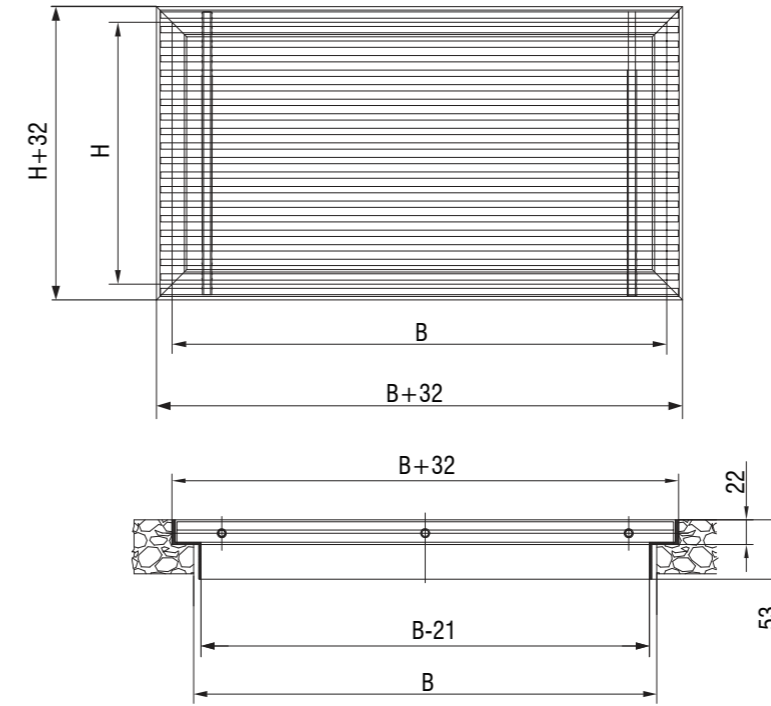
* Screws are not supplied with grilles
 * Screws for grille fastening 3,9xL (DIN 7972, 7973, 7982, 7983)



Installation CCV, CCH

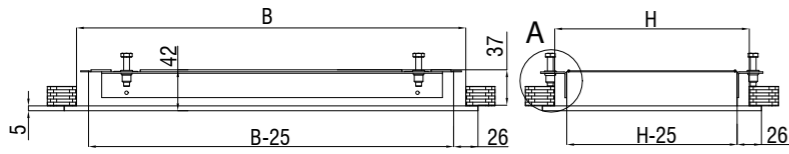
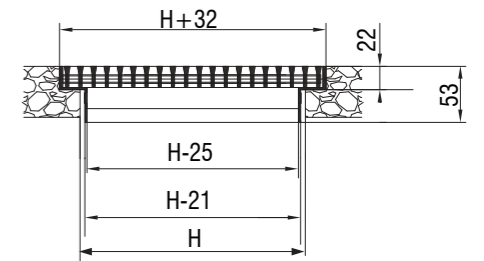
- Note: make sure that the grille height H fits for installation on a round duct with diameter ϕD

| B [mm] | H [mm] | T [mm] | ϕD [mm] | B [mm] | H [mm] | T [mm] | ϕD [mm] | B [mm] | H [mm] | T [mm] | ϕD [mm] | | | |
|--------|--------|--------|---------------|--------|--------|--------|---------------|--------|--------|--------|---------------|------|----|-----|
| 225 | x | 75 | 40 | 150 | 225 | x | 125 | 45 | 300 | 225 | x | 225 | 55 | 600 |
| 325 | x | 75 | | 325 | x | 125 | 325 | | x | 225 | | | | |
| 425 | x | 75 | | 425 | x | 125 | 425 | | x | 225 | | | | |
| 525 | x | 75 | | 525 | x | 125 | 525 | | x | 225 | | | | |
| 625 | x | 75 | | 625 | x | 125 | 625 | | x | 225 | | | | |
| 825 | x | 75 | | 825 | x | 125 | 825 | | x | 225 | | | | |
| 1125 | x | 75 | 400 | 900 | 1125 | x | 125 | 900 | 1125 | x | 225 | 2400 | | |



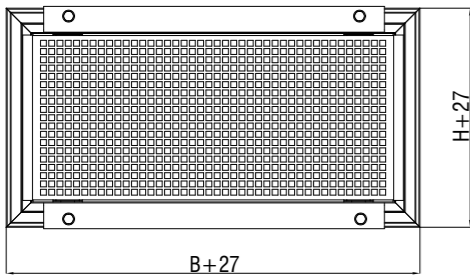
NRA and NRK installation

- fix the frame in the floor opening
- grille core is laid loose in the frame so it can be easily removed

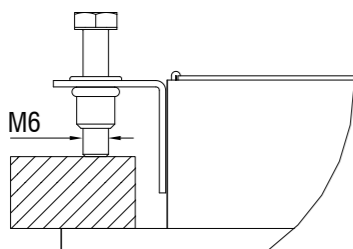


ORP installation

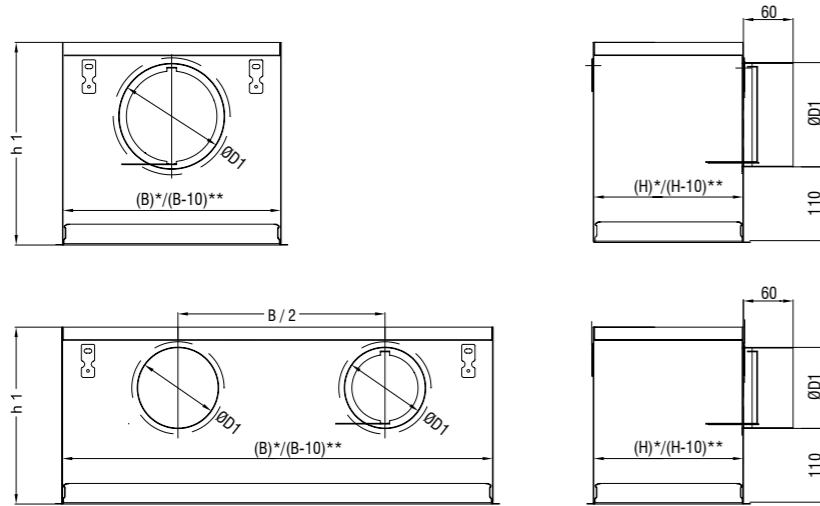
- First, the grille subframe is placed into the ceiling and then the bracelets suspension are fixed to the inner side of the ceiling.
- Perforated plate is then pushed through the installation subframe above the ceiling, to be finally lowered to the frame.



Detail A



PLENUM BOX - PK1



| PK1 / PK1-UR | | | | |
|--------------|------|-------|-----------------------|-------|
| B mm | H mm | ØD mm | Number of connections | h1 mm |
| 225 | 75 | 123 | 1 | 265 |
| 325 | 75 | 158 | 1 | 300 |
| 425 | 75 | 158 | 1 | 300 |
| 525 | 75 | 158 | 1 | 300 |
| 625 | 75 | 158 | 1 | 300 |
| 725 | 75 | 158 | 1 | 300 |
| 825 | 75 | 158 | 2 | 300 |
| 925 | 75 | 158 | 2 | 300 |
| 1025 | 75 | 158 | 2 | 300 |
| 1125 | 75 | 158 | 2 | 300 |
| 1225 | 75 | 158 | 2 | 300 |
| 225 | 125 | 158 | 1 | 300 |
| 325 | 125 | 158 | 1 | 300 |
| 425 | 125 | 158 | 1 | 300 |
| 525 | 125 | 158 | 1 | 300 |
| 625 | 125 | 158 | 1 | 300 |
| 725 | 125 | 158 | 1 | 300 |
| 825 | 125 | 158 | 2 | 300 |
| 925 | 125 | 158 | 2 | 300 |
| 1025 | 125 | 158 | 2 | 300 |
| 1125 | 125 | 158 | 2 | 300 |
| 1225 | 125 | 158 | 2 | 300 |
| 225 | 225 | 158 | 1 | 300 |
| 325 | 225 | 158 | 1 | 300 |
| 425 | 225 | 198 | 1 | 340 |
| 525 | 225 | 198 | 1 | 340 |
| 625 | 225 | 198 | 1 | 340 |
| 725 | 225 | 198 | 1 | 340 |
| 825 | 225 | 198 | 2 | 340 |
| 925 | 225 | 198 | 2 | 340 |
| 1025 | 225 | 198 | 2 | 340 |
| 1125 | 225 | 198 | 2 | 340 |
| 1225 | 225 | 198 | 2 | 340 |

Note:

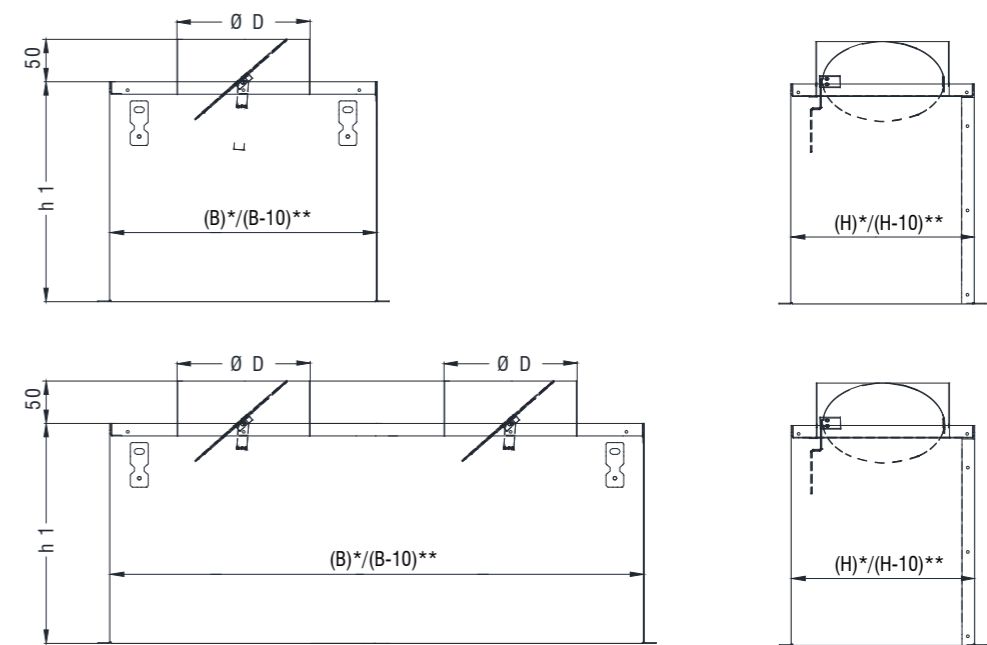
- * Dimensions PK for installation with subframe
- ** Dimensions PK for installation without subframe

| PK1 / PK1-UR | | | | |
|--------------|------|-------|-----------------------|-------|
| B mm | H mm | ØD mm | Number of connections | h1 mm |
| 325 | 325 | 248 | 1 | 390 |
| 425 | 325 | 248 | 1 | 390 |
| 525 | 325 | 248 | 1 | 390 |
| 625 | 325 | 248 | 1 | 390 |
| 725 | 325 | 248 | 1 | 390 |
| 825 | 325 | 248 | 2 | 390 |
| 925 | 325 | 248 | 2 | 390 |
| 1025 | 325 | 248 | 2 | 390 |
| 1125 | 325 | 248 | 2 | 390 |
| 1225 | 325 | 248 | 2 | 390 |
| 425 | 425 | 248 | 1 | 390 |
| 525 | 425 | 248 | 1 | 390 |
| 625 | 425 | 248 | 1 | 390 |
| 725 | 425 | 248 | 1 | 390 |
| 825 | 425 | 248 | 2 | 390 |
| 925 | 425 | 248 | 2 | 390 |
| 1025 | 425 | 248 | 2 | 390 |
| 1125 | 425 | 248 | 2 | 390 |
| 1225 | 425 | 248 | 2 | 390 |
| 525 | 525 | 313 | 1 | 455 |
| 625 | 525 | 313 | 1 | 455 |
| 725 | 525 | 313 | 1 | 455 |
| 825 | 525 | 313 | 2 | 455 |
| 925 | 525 | 313 | 2 | 455 |
| 1025 | 525 | 313 | 2 | 455 |
| 1125 | 525 | 313 | 2 | 455 |
| 1225 | 525 | 313 | 2 | 455 |

Ordering key:

Plenum box type **PK1 - UR - 525x225 - Z**
 Installation subframe
 Dimensions
 Insulation

PLENUM BOX - PK2



| PK2 / PK2-UR | | | | |
|--------------|------|-------|-----------------------|-------|
| B mm | H mm | ØD mm | Number of connections | h1 mm |
| 225 | 125 | 98 | 2 | 250 |
| 325 | 125 | 98 | 2 | 250 |
| 425 | 125 | 98 | 2 | 250 |
| 525 | 125 | 98 | 3 | 250 |
| 625 | 125 | 98 | 3 | 250 |
| 725 | 125 | 98 | 3 | 250 |
| 825 | 125 | 98 | 3 | 250 |
| 925 | 125 | 98 | 3 | 250 |
| 1025 | 125 | 98 | 3 | 250 |
| 1125 | 125 | 98 | 3 | 250 |
| 1225 | 125 | 98 | 3 | 250 |
| 225 | 225 | 158 | 1 | 300 |
| 325 | 225 | 198 | 1 | 340 |
| 425 | 225 | 198 | 1 | 340 |
| 525 | 225 | 198 | 1 | 340 |
| 625 | 225 | 198 | 2 | 340 |
| 725 | 225 | 198 | 2 | 340 |
| 825 | 225 | 198 | 2 | 340 |
| 925 | 225 | 198 | 2 | 340 |
| 1025 | 225 | 198 | 2 | 340 |
| 1125 | 225 | 198 | 2 | 340 |
| 1225 | 225 | 198 | 2 | 340 |
| 325 | 325 | 248 | 1 | 390 |
| 425 | 325 | 248 | 1 | 390 |
| 525 | 325 | 248 | 1 | 390 |
| 625 | 325 | 248 | 1 | 390 |
| 725 | 325 | 248 | 1 | 390 |
| 825 | 325 | 248 | 2 | 390 |
| 925 | 325 | 248 | 2 | 390 |
| 1025 | 325 | 248 | 2 | 390 |
| 1125 | 325 | 248 | 2 | 390 |
| 1225 | 325 | 248 | 2 | 390 |

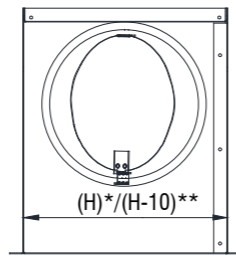
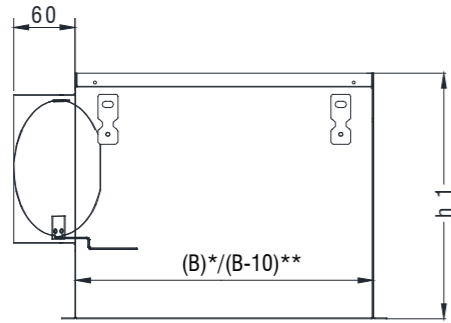
| PK2 / PK2-UR | | | | |
|--------------|------|-------|-----------------------|-------|
| B mm | H mm | ØD mm | Number of connections | h1 mm |
| 425 | 425 | 248 | 1 | 390 |
| 525 | 425 | 248 | 1 | 390 |
| 625 | 425 | 248 | 1 | 390 |
| 725 | 425 | 248 | 1 | 390 |
| 825 | 425 | 248 | 2 | 390 |
| 925 | 425 | 248 | 2 | 390 |
| 1025 | 425 | 248 | 2 | 390 |
| 1125 | 425 | 248 | 2 | 390 |
| 525 | 525 | 313 | 1 | 455 |
| 625 | 525 | 313 | 1 | 455 |
| 725 | 525 | 313 | 1 | 455 |
| 825 | 525 | 313 | 2 | 455 |
| 925 | 525 | 313 | 2 | 455 |
| 1025 | 525 | 313 | 2 | 455 |
| 1125 | 525 | 313 | 2 | 455 |
| 1225 | 525 | 313 | 2 | 455 |

Ordering key:

Plenum box type **PK2 - UR - 525x225 - Z**
 Installation subframe
 Dimensions
 Insulation
 Note:

- * Dimensions PK for installation with subframe
- ** Dimensions PK for installation without subframe

PLENUM BOX - PK3



| PK3 / PK3-UR | | | | |
|--------------|------|-------|-----------------------|-------|
| B mm | H mm | øD mm | Number of connections | h1 mm |
| 225 | 125 | 98 | 2 | 250 |
| 325 | 125 | 98 | 2 | 250 |
| 425 | 125 | 98 | 2 | 250 |
| 525 | 125 | 98 | 3 | 250 |
| 625 | 125 | 98 | 3 | 250 |
| 725 | 125 | 98 | 3 | 250 |
| 825 | 125 | 98 | 3 | 250 |
| 925 | 125 | 98 | 3 | 250 |
| 1025 | 125 | 98 | 3 | 250 |
| 1125 | 125 | 98 | 3 | 250 |
| 1225 | 125 | 98 | 3 | 250 |
| 225 | 225 | 158 | 1 | 300 |
| 325 | 225 | 198 | 1 | 340 |
| 425 | 225 | 198 | 1 | 340 |
| 525 | 225 | 198 | 1 | 340 |
| 625 | 225 | 198 | 2 | 340 |
| 725 | 225 | 198 | 2 | 340 |
| 825 | 225 | 198 | 2 | 340 |
| 925 | 225 | 198 | 2 | 340 |
| 1025 | 225 | 198 | 2 | 340 |
| 1125 | 225 | 198 | 2 | 340 |
| 1225 | 225 | 198 | 2 | 340 |
| 325 | 325 | 248 | 1 | 390 |
| 425 | 325 | 248 | 1 | 390 |
| 525 | 325 | 248 | 1 | 390 |
| 625 | 325 | 248 | 1 | 390 |
| 725 | 325 | 248 | 1 | 390 |
| 825 | 325 | 248 | 2 | 390 |
| 925 | 325 | 248 | 2 | 390 |
| 1025 | 325 | 248 | 2 | 390 |
| 1125 | 325 | 248 | 2 | 390 |
| 1225 | 325 | 248 | 2 | 390 |

| PK3 / PK3-UR | | | | |
|--------------|------|-------|-----------------------|-------|
| B mm | H mm | øD mm | Number of connections | h1 mm |
| 425 | 425 | 248 | 1 | 390 |
| 525 | 425 | 248 | 1 | 390 |
| 625 | 425 | 248 | 1 | 390 |
| 725 | 425 | 248 | 1 | 390 |
| 825 | 425 | 248 | 2 | 390 |
| 925 | 425 | 248 | 2 | 390 |
| 1025 | 425 | 248 | 2 | 390 |
| 1125 | 425 | 248 | 2 | 390 |
| 1225 | 425 | 248 | 2 | 390 |
| 525 | 525 | 313 | 1 | 455 |
| 625 | 525 | 313 | 1 | 455 |
| 725 | 525 | 313 | 1 | 455 |
| 825 | 525 | 313 | 2 | 455 |
| 925 | 525 | 313 | 2 | 455 |
| 1025 | 525 | 313 | 2 | 455 |
| 1125 | 525 | 313 | 2 | 455 |
| 1225 | 525 | 313 | 2 | 455 |

Ordering key:

Plenum box type **PK3 - UR - 525x225 - Z**

Installation subframe

Dimensions

Insulation

Note:

* Dimensions PK for installation with subframe

** Dimensions PK for installation without subframe

EFFECTIVE SUPPLY AREA TABLE - A_{ef} (m²)

| OAH, OAV, CCH, CCV | | | | | | | | |
|--------------------|--------|--------|--------|--------|--------|--------|--------|--------|
| H ↓ B → | 225 | 325 | 425 | 525 | 625 | 825 | 1025 | 1225 |
| 75 | 0,0070 | 0,0110 | 0,0150 | 0,0180 | 0,0220 | 0,0290 | 0,0360 | 0,0430 |
| 125 | 0,0150 | 0,0220 | 0,0290 | 0,0360 | 0,0440 | 0,0580 | 0,0730 | 0,0870 |
| 225 | - | 0,0410 | 0,0590 | 0,0730 | 0,0870 | 0,1160 | 0,1450 | 0,1740 |
| 325 | - | - | 0,0880 | 0,1090 | 0,1310 | 0,1740 | 0,2170 | 0,2610 |
| 425 | - | - | - | - | 0,1750 | 0,2320 | 0,2900 | 0,3480 |
| 525 | - | - | - | - | - | - | 0,3620 | 0,4340 |

| OAB, NRA | | | | | | | | |
|----------|--------|--------|--------|--------|--------|--------|--------|--------|
| H ↓ B → | 225 | 325 | 425 | 525 | 625 | 825 | 1025 | 1225 |
| 75 | 0,0060 | 0,0090 | 0,0110 | 0,0140 | 0,0170 | 0,0220 | 0,0280 | 0,0340 |
| 125 | 0,0110 | 0,0170 | 0,0220 | 0,0280 | 0,0340 | 0,0440 | 0,0550 | 0,0660 |
| 225 | - | 0,0340 | 0,0440 | 0,0550 | 0,0660 | 0,0870 | 0,1080 | 0,1290 |
| 325 | - | - | 0,0660 | 0,0810 | 0,0960 | 0,1290 | 0,1690 | 0,1930 |
| 425 | - | - | - | - | 0,1290 | 0,1690 | 0,2140 | 0,2560 |
| 525 | - | - | - | - | - | - | 0,2688 | 0,3264 |

| OCM | | | | | | | | |
|---------|--------|--------|--------|--------|--------|--------|--------|--------|
| H ↓ B → | 225 | 325 | 425 | 525 | 625 | 825 | 1025 | 1225 |
| 75 | - | - | - | - | - | - | - | - |
| 125 | 0,0085 | 0,0128 | 0,0170 | 0,0213 | 0,0255 | 0,0340 | 0,0425 | 0,0510 |
| 225 | 0,0170 | 0,0255 | 0,0340 | 0,0425 | 0,0510 | 0,0680 | 0,0850 | 0,1020 |
| 325 | 0,0255 | 0,0383 | 0,0510 | 0,0638 | 0,0765 | 0,1020 | 0,1275 | 0,1530 |
| 425 | 0,034 | 0,0510 | 0,0680 | 0,0850 | 0,1020 | 0,1360 | 0,1700 | 0,2040 |
| 525 | - | - | - | 0,1063 | 0,1275 | 0,1700 | 0,2125 | 0,2550 |

| OAM | | | | | | | | |
|---------|--------|--------|--------|--------|--------|--------|--------|--------|
| H ↓ B → | 225 | 325 | 425 | 525 | 625 | 825 | 1025 | 1225 |
| 75 | - | - | - | - | - | - | - | - |
| 125 | 0,0033 | 0,0050 | 0,0067 | 0,0083 | 0,0100 | 0,0133 | 0,0166 | 0,0200 |
| 225 | 0,0067 | 0,0100 | 0,0133 | 0,0166 | 0,0200 | 0,0266 | 0,0333 | 0,0399 |
| 325 | 0,0100 | 0,0150 | 0,0200 | 0,0250 | 0,0300 | 0,0399 | 0,0499 | 0,0599 |
| 425 | 0,0133 | 0,0200 | 0,0266 | 0,0333 | 0,0399 | 0,0533 | 0,0666 | 0,0799 |
| 525 | - | - | - | 0,0416 | 0,0499 | 0,0667 | 0,0832 | 0,0998 |

| PTR | | | | | | | | |
|---------|--------|--------|--------|--------|--------|--------|--------|--------|
| H ↓ B → | 225 | 325 | 425 | 525 | 625 | 825 | 1025 | 1225 |
| 75 | 0,0070 | 0,0100 | 0,0140 | 0,0170 | 0,0210 | 0,0260 | 0,0340 | 0,0390 |
| 125 | 0,0130 | 0,0190 | 0,0250 | 0,0310 | 0,0380 | 0,0500 | 0,0630 | 0,0750 |
| 225 | 0,0240 | 0,0340 | 0,0500 | 0,0610 | 0,0740 | 0,0970 | 0,1210 | 0,1460 |
| 325 | - | 0,0520 | 0,0720 | 0,0880 | 0,1060 | 0,1390 | 0,1740 | 0,2080 |
| 425 | - | - | 0,0970 | 0,1200 | 0,1420 | 0,1880 | 0,2340 | 0,2610 |
| 525 | - | - | - | 0,1520 | 0,1800 | 0,2360 | 0,2920 | 0,3510 |

EFFECTIVE EXHAUST AREA TABLE - A_{ef} (m²)

| OAH, OAV, CCH, CCV | | | | | | | | |
|--------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| H ↓ B → | 225 | 325 | 425 | 525 | 625 | 825 | 1025 | 1225 |
| 75 | 0,006 | 0,009 | 0,011 | 0,014 | 0,016 | 0,022 | 0,028 | 0,033 |
| 125 | 0,011 | 0,016 | 0,022 | 0,028 | 0,033 | 0,044 | 0,055 | 0,066 |
| 225 | - | 0,033 | 0,044 | 0,055 | 0,066 | 0,090 | 0,110 | 0,134 |
| 325 | - | - | 0,066 | 0,083 | 0,100 | 0,134 | 0,170 | 0,200 |
| 425 | - | - | - | - | 0,134 | 0,180 | 0,220 | 0,270 |
| 525 | - | - | - | - | - | - | 0,280 | 0,340 |

| OAB, NRA | | | | | | | | |
|----------|-------|-------|-------|-------|-------|-------|-------|-------|
| H ↓ B → | 225 | 325 | 425 | 525 | 625 | 825 | 1025 | 1225 |
| 75 | 0,006 | 0,009 | 0,011 | 0,014 | 0,016 | 0,022 | 0,028 | 0,033 |
| 125 | 0,011 | 0,016 | 0,022 | 0,028 | 0,033 | 0,044 | 0,055 | 0,066 |
| 225 | - | 0,033 | 0,044 | 0,055 | 0,066 | 0,090 | 0,110 | 0,134 |
| 325 | - | - | 0,066 | 0,083 | 0,100 | 0,134 | 0,170 | 0,200 |
| 425 | - | - | - | - | 0,134 | 0,180 | 0,220 | 0,270 |
| 525 | - | - | - | - | - | - | 0,280 | 0,340 |

| OAK | | | | | | | | |
|---------|-------|-------|-------|-------|-------|-------|-------|-------|
| H ↓ B → | 225 | 325 | 425 | 525 | 625 | 825 | 1025 | 1225 |
| 75 | | | | | | | | |
| 125 | 0,012 | 0,018 | 0,025 | 0,031 | 0,038 | 0,050 | 0,063 | 0,075 |
| 225 | - | 0,038 | 0,050 | 0,063 | 0,075 | 0,105 | 0,126 | 0,155 |
| 325 | - | - | 0,075 | 0,096 | 0,117 | 0,155 | 0,197 | 0,236 |
| 425 | - | - | - | - | 0,155 | 0,210 | 0,260 | 0,310 |
| 525 | - | - | - | - | - | - | 0,330 | 0,400 |

| OAN | | | | | | | | |
|---------|-------|-------|-------|-------|-------|-------|-------|-------|
| H ↓ B → | 225 | 325 | 425 | 525 | 625 | 825 | 1025 | 1225 |
| 75 | 0,006 | 0,01 | 0,013 | 0,016 | 0,019 | 0,026 | 0,032 | 0,038 |
| 125 | 0,009 | 0,014 | 0,019 | 0,024 | 0,029 | 0,038 | 0,048 | 0,057 |
| 225 | - | 0,032 | 0,043 | 0,053 | 0,064 | 0,086 | 0,107 | 0,129 |
| 325 | - | - | 0,066 | 0,083 | 0,100 | 0,134 | 0,167 | 0,200 |
| 425 | - | - | - | - | 0,136 | 0,181 | 0,227 | 0,272 |
| 525 | - | - | - | - | - | - | 0,287 | 0,344 |

EFFECTIVE EXHAUST AREA TABLE - A_{ef} (m²)

| OCM | | | | | | | | |
|---------|--------|--------|--------|--------|--------|--------|--------|--------|
| H ↓ B → | 225 | 325 | 425 | 525 | 625 | 825 | 1025 | 1225 |
| 75 | - | - | - | - | - | - | - | - |
| 125 | 0,0085 | 0,0128 | 0,0170 | 0,0213 | 0,0255 | 0,0340 | 0,0425 | 0,0510 |
| 225 | 0,0170 | 0,0255 | 0,0340 | 0,0425 | 0,0510 | 0,0680 | 0,0850 | 0,1020 |
| 325 | 0,0255 | 0,0383 | 0,0510 | 0,0638 | 0,0765 | 0,1020 | 0,1275 | 0,1530 |
| 425 | 0,0340 | 0,0510 | 0,0680 | 0,0850 | 0,1020 | 0,1360 | 0,1700 | 0,2040 |
| 525 | - | - | - | 0,1063 | 0,1275 | 0,1700 | 0,2125 | 0,2550 |

| PCR | | | | | | | | |
|---------|--------|--------|--------|--------|--------|--------|--------|--------|
| H ↓ B → | 225 | 325 | 425 | 525 | 625 | 825 | 1025 | 1225 |
| 75 | - | - | - | - | - | - | - | - |
| 125 | 0,0049 | 0,0076 | 0,0103 | 0,0130 | 0,0158 | 0,0212 | 0,0266 | 0,320 |
| 225 | - | 0,0171 | 0,0232 | 0,0293 | 0,0354 | 0,0477 | 0,0599 | 0,0721 |
| 325 | - | - | 0,0361 | 0,0456 | 0,0551 | 0,0741 | 0,0932 | 0,1122 |
| 425 | - | - | - | 0,0619 | 0,0748 | 0,1006 | 0,1264 | 0,1522 |
| 525 | - | - | - | 0,0782 | 0,0945 | 0,1271 | 0,1597 | 0,1923 |

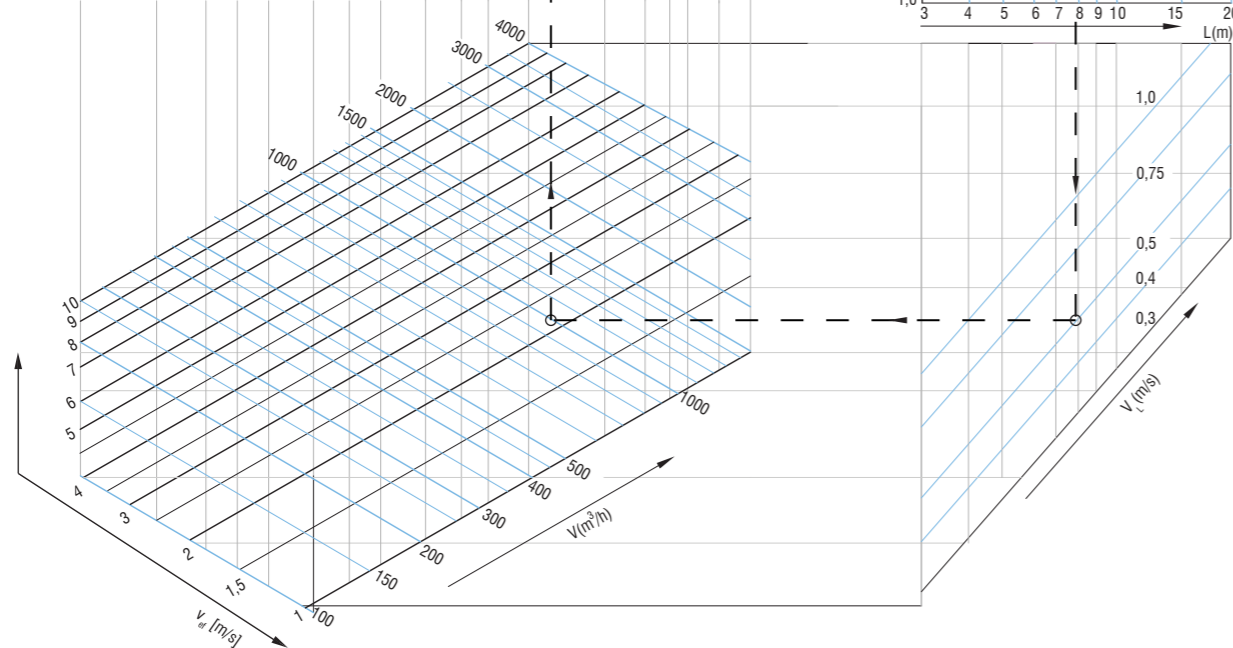
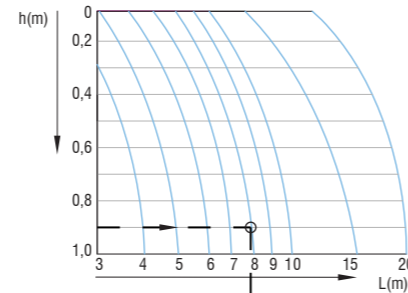
| OAS | | | | | | | | |
|---------|--------|--------|--------|--------|--------|--------|--------|--------|
| H ↓ B → | 225 | 325 | 425 | 525 | 625 | 825 | 1025 | 1225 |
| 75 | 0,0040 | 0,0059 | 0,0079 | 0,0099 | 0,0119 | 0,0158 | 0,0199 | 0,0239 |
| 125 | 0,0079 | 0,0119 | 0,0158 | 0,0199 | 0,0239 | 0,0321 | 0,0397 | 0,0476 |
| 225 | 0,0158 | 0,0239 | 0,0318 | 0,0397 | 0,0476 | 0,0635 | 0,0794 | 0,0952 |
| 325 | - | 0,0357 | 0,0476 | 0,0598 | 0,0715 | 0,0952 | 0,1191 | 0,1429 |
| 425 | - | - | 0,0635 | 0,0794 | 0,0952 | 0,1270 | 0,1588 | 0,1905 |
| 525 | - | - | - | 0,1042 | 0,1240 | 0,1637 | 0,2034 | 0,2431 |

| ORP | | | | | | | | |
|----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| B [mm] | 500 | 600 | 700 | 800 | 900 | 1000 | 1100 | 1200 |
| H [mm] | 500 | 600 | 700 | 800 | 900 | 1000 | 1100 | 1200 |
| A_{ef} [m ²] | 0,099 | 0,147 | 0,204 | 0,270 | 0,346 | 0,431 | 0,525 | 0,629 |

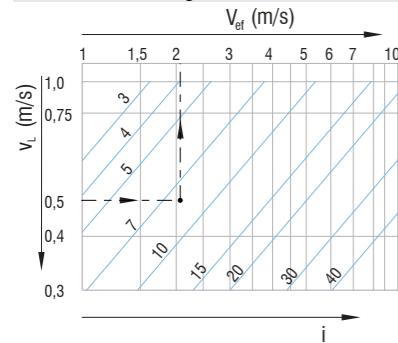
SELECTION DIAGRAMS

1.1 Selection diagrams for supply air grilles: OAH, OAV, CCH, CCV

| H | B → |
|-----|-----------------------------------|
| 525 | 1025 1225 |
| 425 | 625 825 1025 1225 |
| 325 | 425 525 625 825 1025 1225 |
| 225 | 325 425 525 625 825 1025 1225 |
| 125 | 225 325 425 525 625 825 1025 1225 |
| 75 | 225 325 425 525 625 825 1025 1225 |



1.2 Induction diagram



Example:

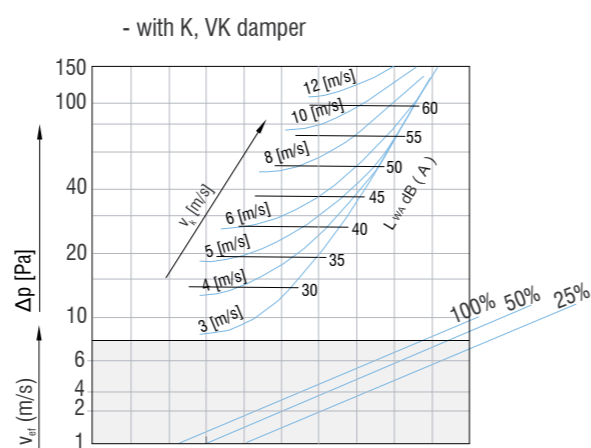
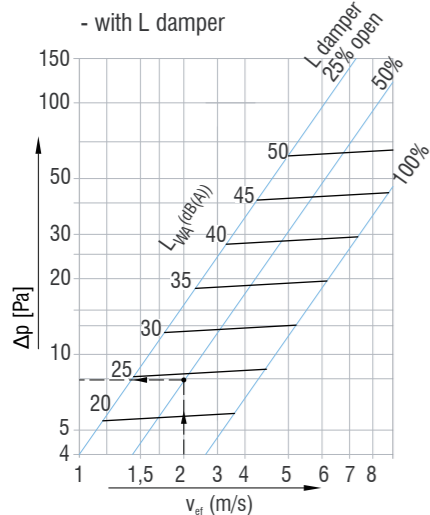
Given:
 L = 8 m
 V = 1000 m³/h
 v_L = 0,5 m/s
 Δt_z = 4K
 h = 0,9 m
 Grille type : OAV

Select:

From 1.1 :
 BxH 625x325;
 A_{ef} = 0,131 m²;
 v_{ef} = 2,2 m/s;
 From 1.2 :
 i = 8;
 From 1.3 :
 Sound power level
 (50% open): 24 dB (A);
 Correction: 24+1 = 25 dB(A);

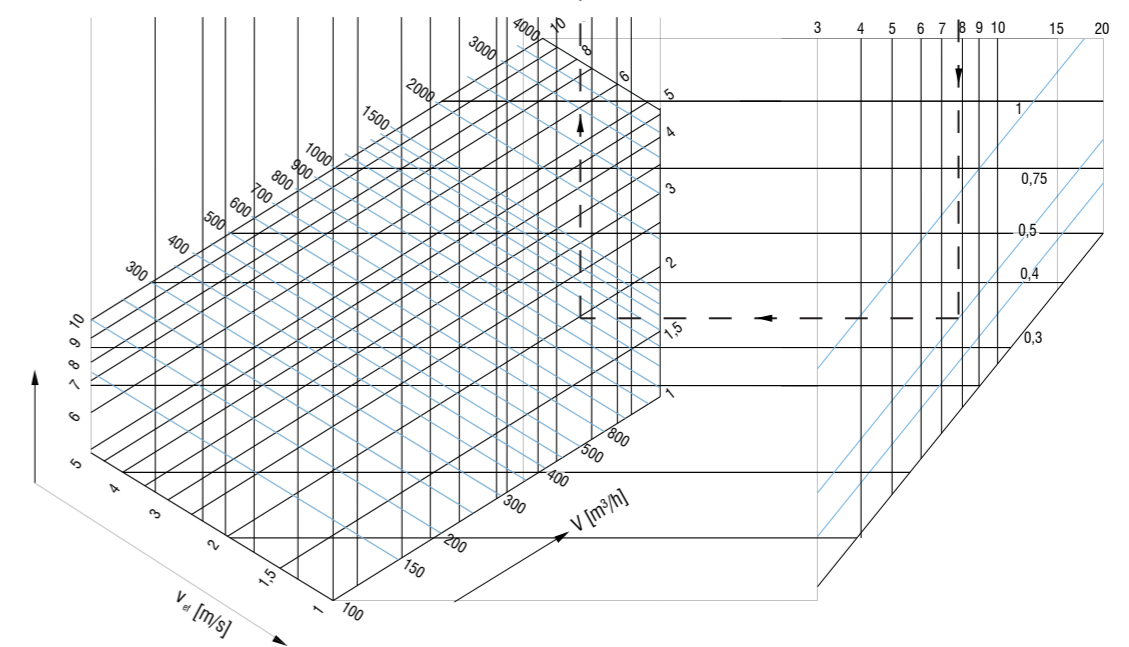
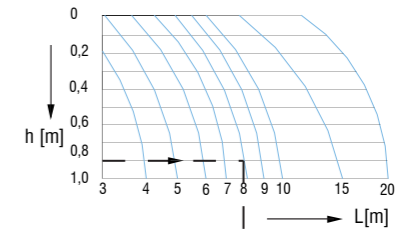
From 2.6 :
 b_{0,2} = 0,9 m;
 From Δt_L = k₁ * Δt_z * (v_L / v_{ef})
 Δt_L = 0,68 K;
 From 2.7 and 2.8:
 k = 0,85
 y = k * Δt_L = 3,4 m
 Horizontal distance
 D > 0,2 L > 1,6m

1.3 Air pressure drop and sound power level OAH, OAV, CCH, CCV

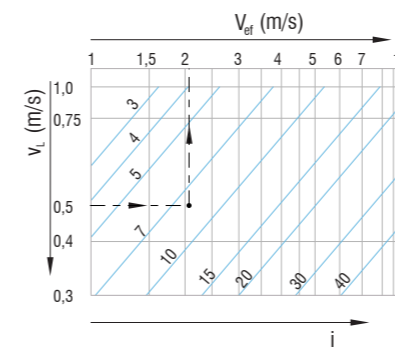


1.4 Selection diagrams for exhaust air grilles: OAB, NRA, NRK

| H | B → |
|-----|-----------------------------------|
| 425 | 625 825 1025 1225 |
| 325 | 425 525 625 825 1025 1225 |
| 225 | 325 425 525 625 825 1025 1225 |
| 125 | 225 325 425 525 625 825 1025 1225 |
| 75 | 225 325 425 525 625 825 1025 1225 |



1.5 Induction diagram



Example:

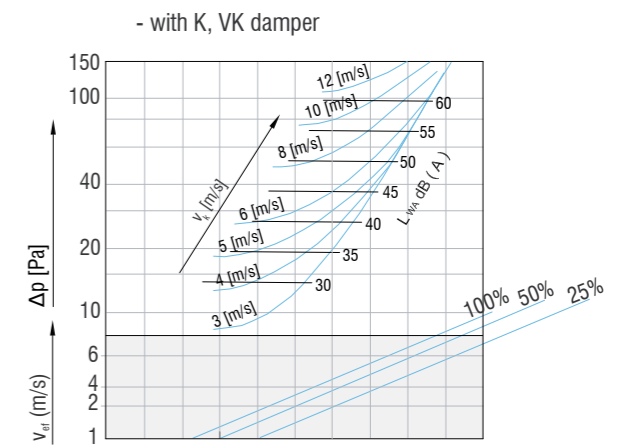
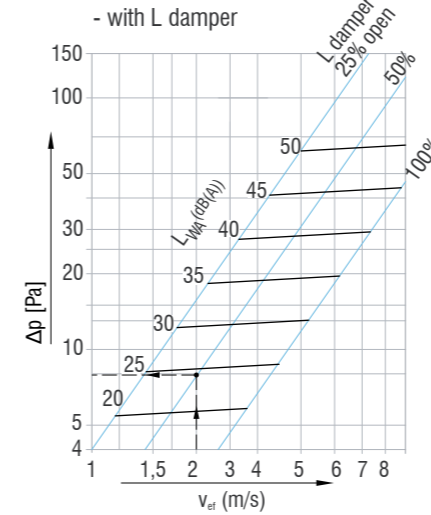
Given:
 L = 8 m
 V = 1000 m³/h
 v_L = 0,5 m/s
 Δt_z = 4K
 h = 0,9 m
 Grille type : OAB

Select:

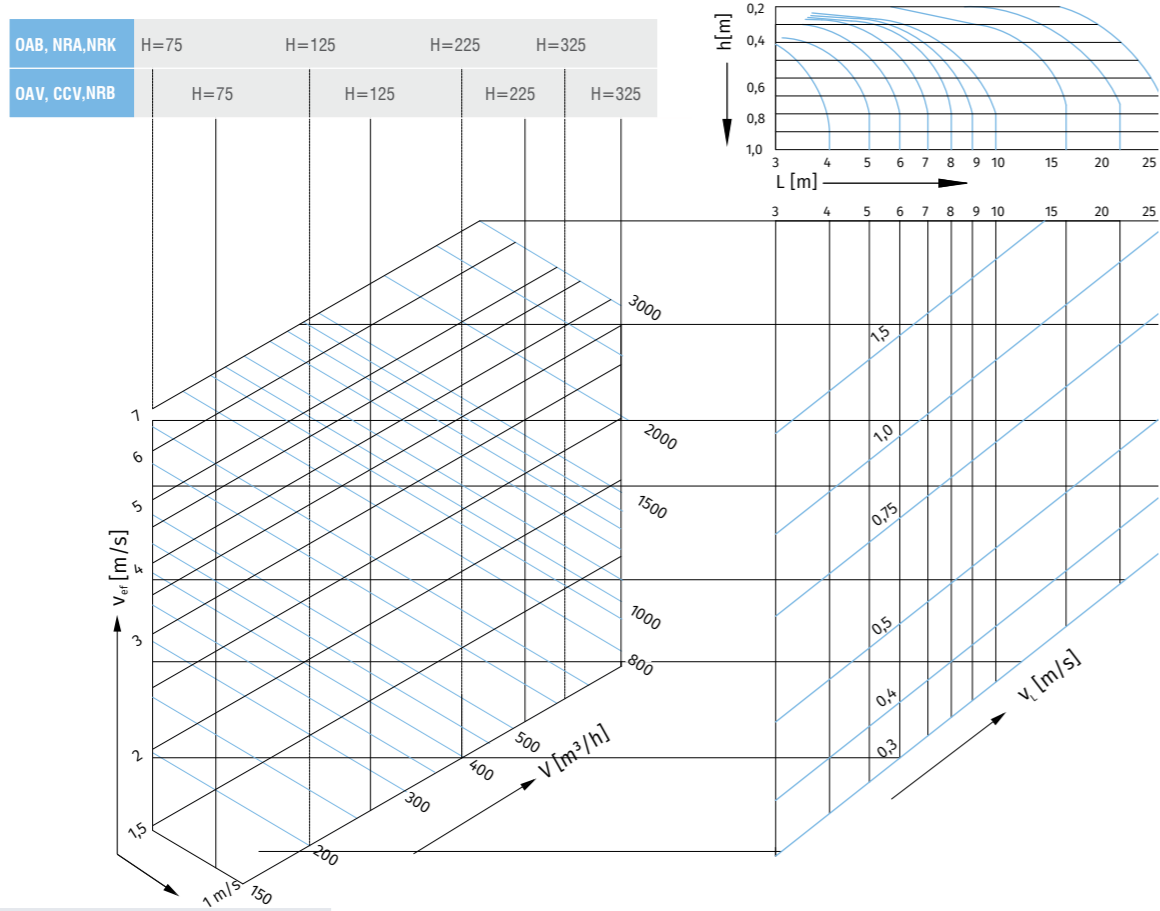
From 1.1 :
 BxH 825x325;
 A_{ef} = 0,129 m²;
 v_{ef} = 2 m/s;
 From 1.2 :
 i = 8;
 From 1.3 :
 Sound power level
 (50% open): 24 dB (A);
 Correction: 24+0 = 24 dB(A);

From 2.6 :
 b_{0,2} = 0,9 m;
 From Δt_L = k₁ * Δt_z * (v_L / v_{ef})
 Δt_L = 0,68 K;
 From 2.7 and 2.8:
 k = 0,85
 y = k * Δt_L = 3,4 m
 Horizontal distance
 D > 0,2 L > 1,6m

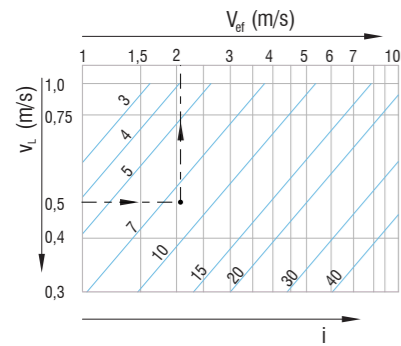
1.6 Air pressure drop and sound power level OAB, NRA, NRK



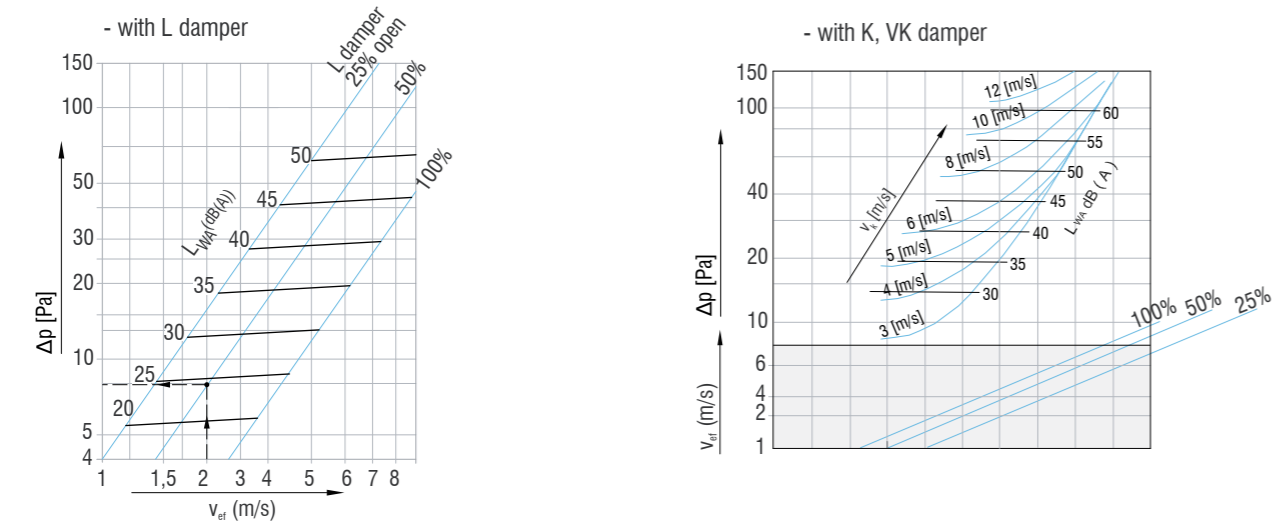
1.7 Selection diagrams for supply air grilles: OAB, NRA, NRK



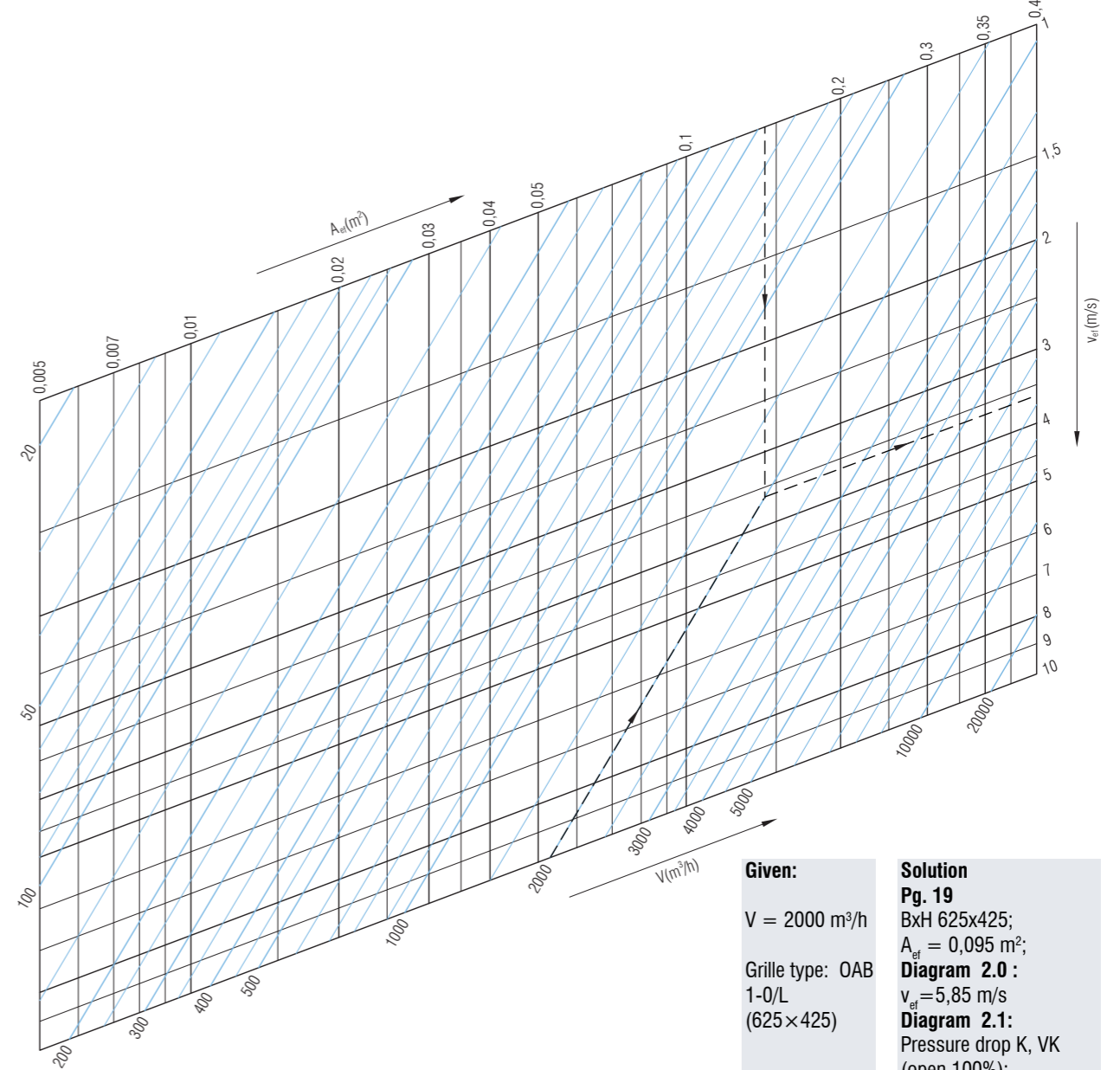
1.8 Induction diagram



1.9 Air pressure drop and sound power level for linear grilles OAB, NRA, NRK



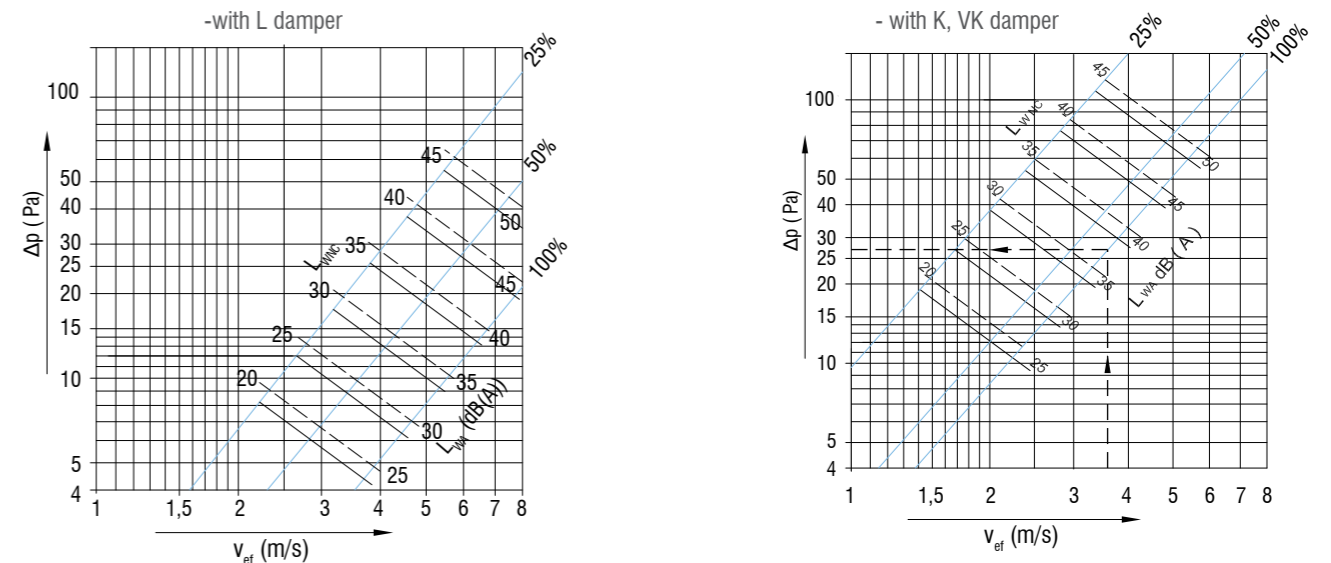
2.0 Selection diagrams for exhaust air grilles: OAH, OAV, CCH, CCV, OAB OAN, NRA, NRK



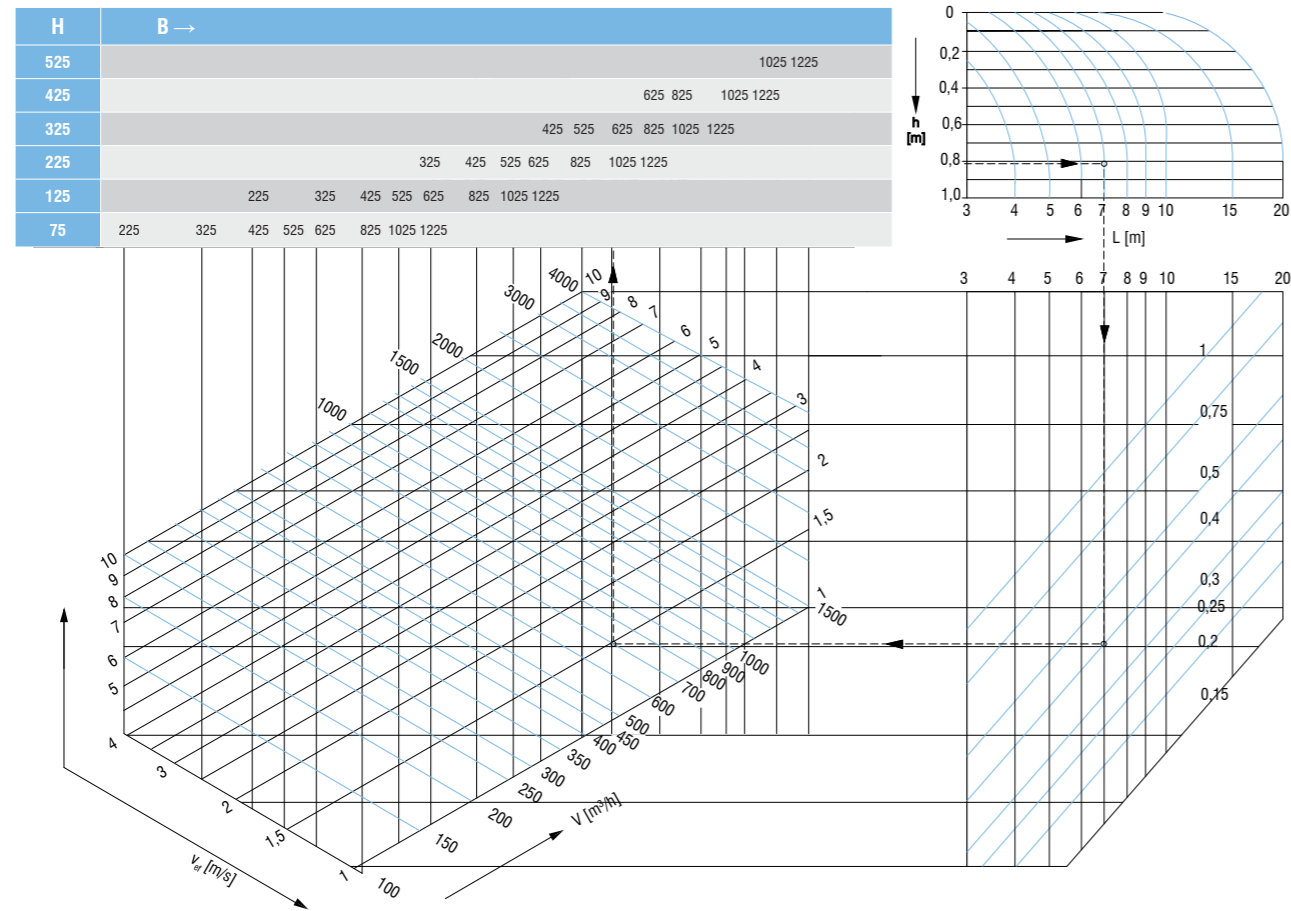
Given:
 $V = 2000 \text{ m}^3/\text{h}$
 Grille type: OAB
 1-0/L
 (625x425)

Solution
Pg. 19
 BxH 625x425;
 $A_{gf} = 0,095 \text{ m}^2$;
Diagram 2.0:
 $v_{gf} = 5,85 \text{ m/s}$
Diagram 2.1:
 Pressure drop K, VK
 (open 100%):
 $\Delta p = 12 \text{ Pa}$

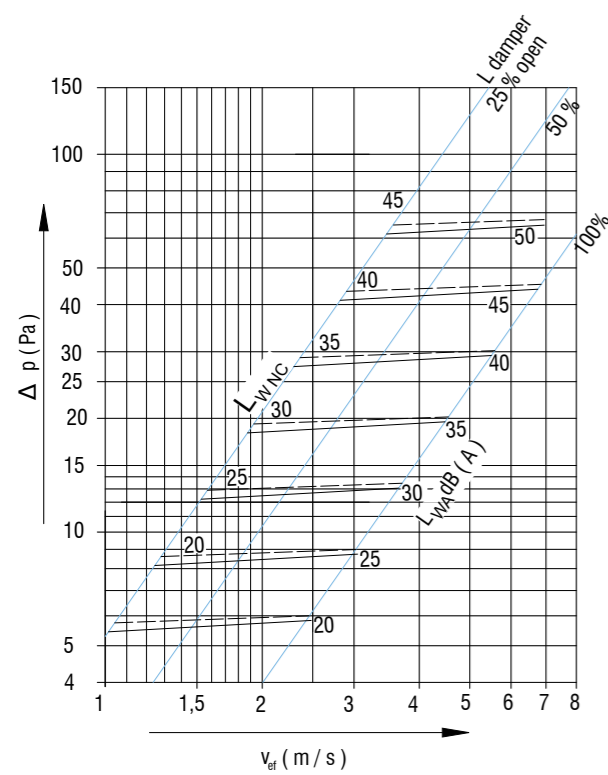
2.1 Air pressure drop and sound power level



2.2 Selection diagram for PTR grille



2.3 Air pressure drop and sound power level for PTR grille with L-damper



2.4 Pressure drop for PCR grille without filter

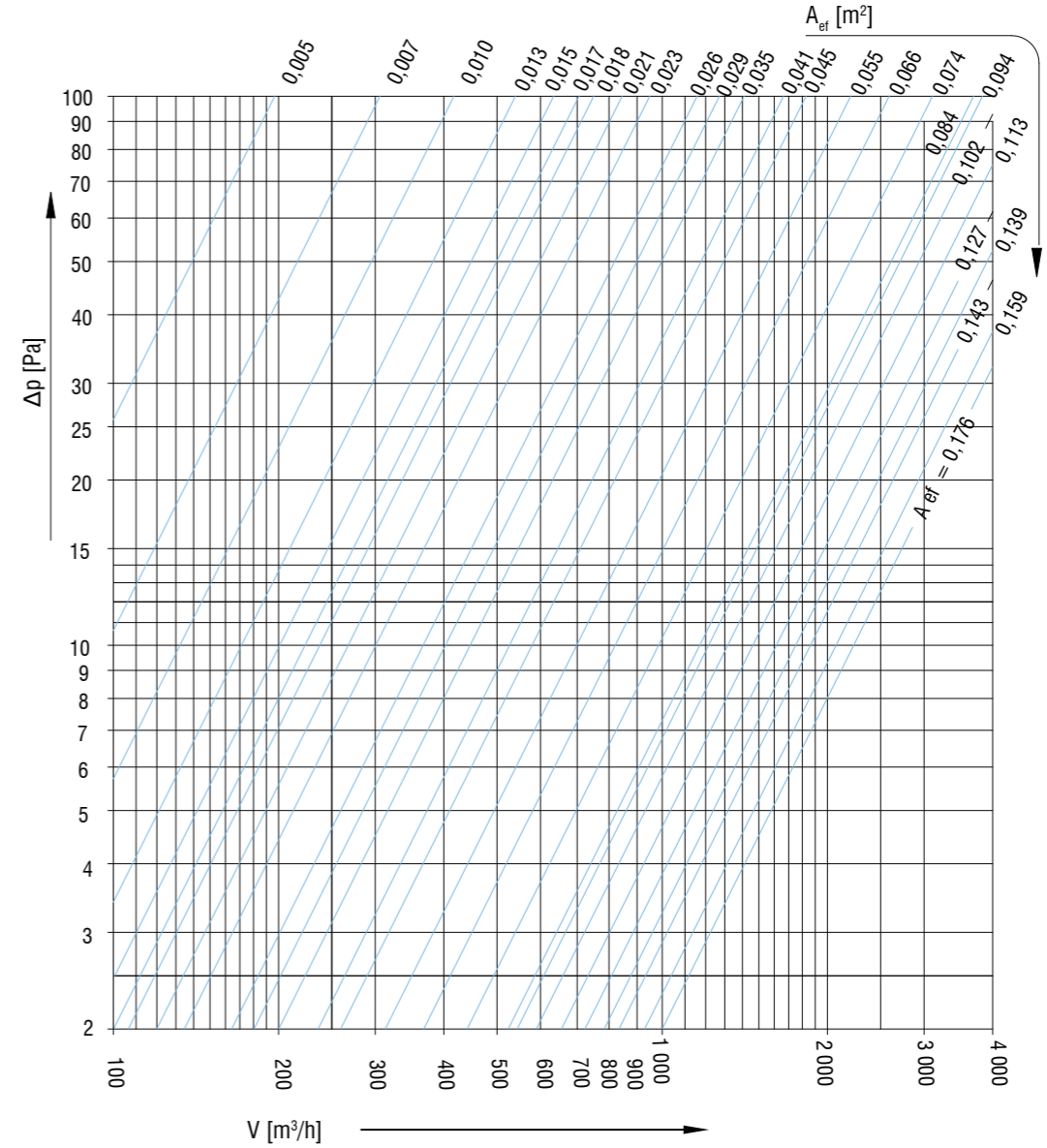
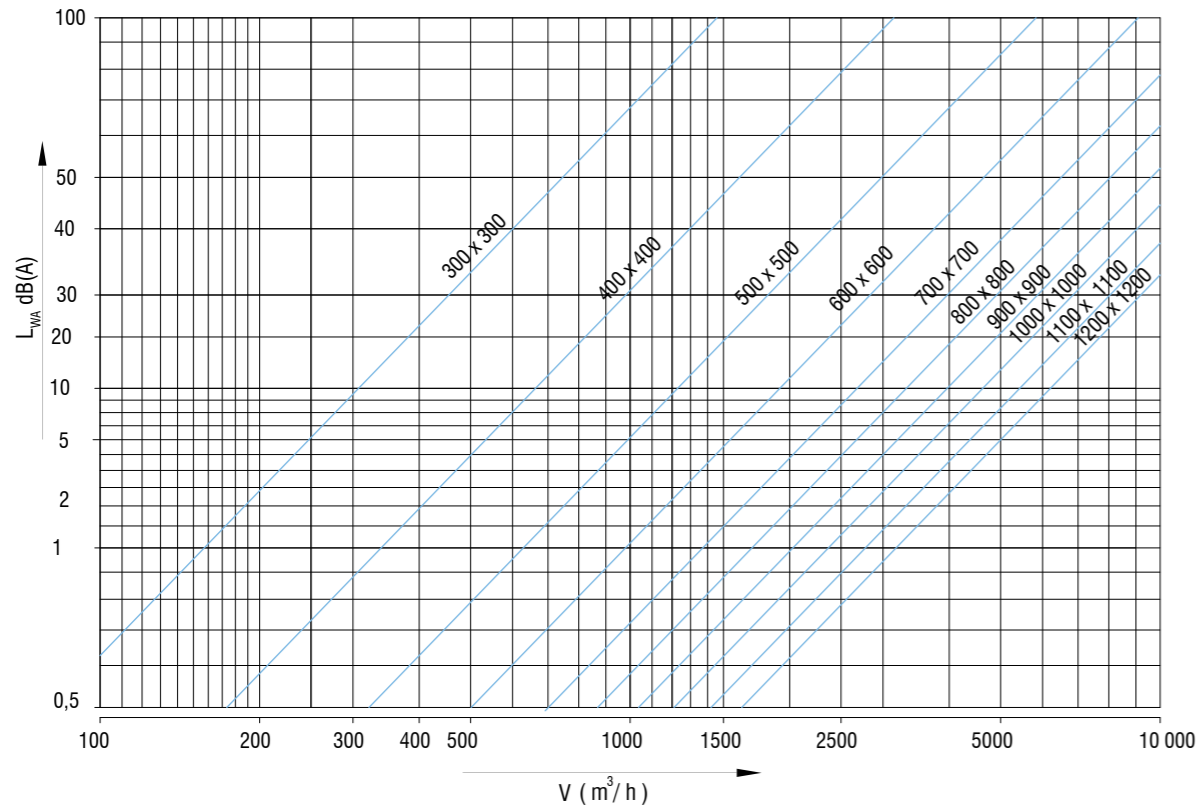


Table of additional pressure loss for PCR grille with filter

| V_{ef} (m/s) | Filter G2 | | Filter G4 | |
|----------------|-------------------|-------------------|-------------------|-------------------|
| | Δp_1 (Pa) | Δp_2 (Pa) | Δp_1 (Pa) | Δp_2 (Pa) |
| | Initial | End | Initial | End |
| 1 | 4 | 114 | 6 | 176 |
| 2 | 6 | 116 | 9 | 179 |
| 3 | 8 | 118 | 12 | 182 |
| 4 | 10 | 120 | 15 | 185 |
| 5 | 12 | 122 | 18 | 188 |
| 6 | 14 | 124 | 21 | 191 |
| 7 | 16 | 126 | 24 | 194 |
| 8 | 18 | 128 | 27 | 197 |
| 9 | 20 | 130 | 30 | 200 |
| 10 | 21 | 131 | 34 | 204 |
| 11 | 23 | 133 | 37 | 207 |
| 12 | 24 | 134 | 41 | 211 |

2.5 Diagram of sound power level for ORP grille



Correction table for sound power levels

| A_{ef} (m ²) | 0,005 | 0,01 | 0,02 | 0,05 | 0,1 | 0,2 | 0,4 |
|----------------------------|-------|------|------|------|-----|-----|-----|
| ΔL_s | -13 | -10 | -7 | -3 | 0 | 3 | 6 |

L_{WA} dB [A] - Sound power level on grille ($A_{ef} = 0,1$)

L_{WA} dB [A] = $L_{WA, 0,1 m^2} + \Delta L_s$

ΔL_s [dB] - Sound power correction $A_{ef} \neq 0,1$ (m²)

Correction values for blade deflection

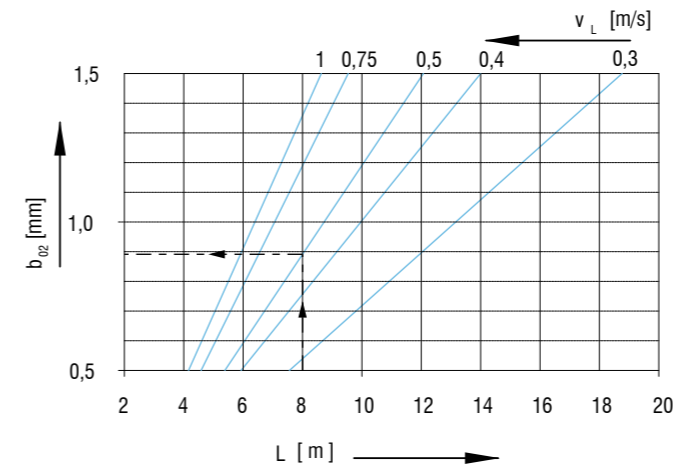
| | | | |
|--|---------------------------|-------------|-------------|
| Blade divergence angle | β | 90° | 45° |
| Jet dissipation angle | α | 60° | 35° |
| Max. jet velocity | v_L | 0,5 x v_L | 0,7 x v_L |
| Max. temperature difference | $\Delta t_L / \Delta t_z$ | 0,5 x | 0,7 x |
| Induction | i | 2 x i | 1,4 x i |
| Distance between two neighbouring grille. Case A - free discharge | D | > 0,3L | > 0,25L |
| Distance between two grille. Case B - discharge with Coanda effect | D | > 0,3L | > 0,25L |
| Jet deflection | y | 2 x y | 1,4 x y |

Pressure drop for grilles that are not mentioned in diagrams above (OAM, OCM and OAS)

OAM/OCM → $\Delta p = 0,67194 \times v_{ef}^2$

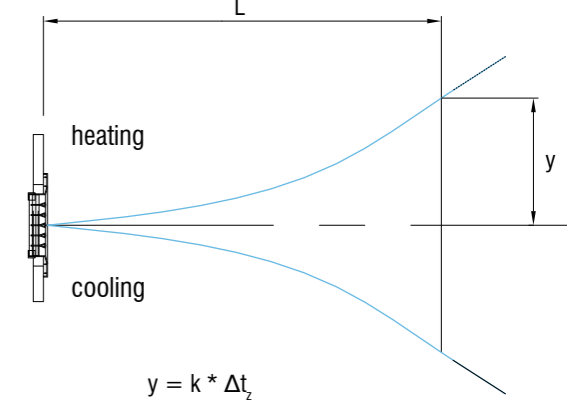
OAS → $\Delta p = 3,72 \times v_{ef}^2$

2.6 Jet width diagram $b_{0,2}$ (for $h > 0,8m$)

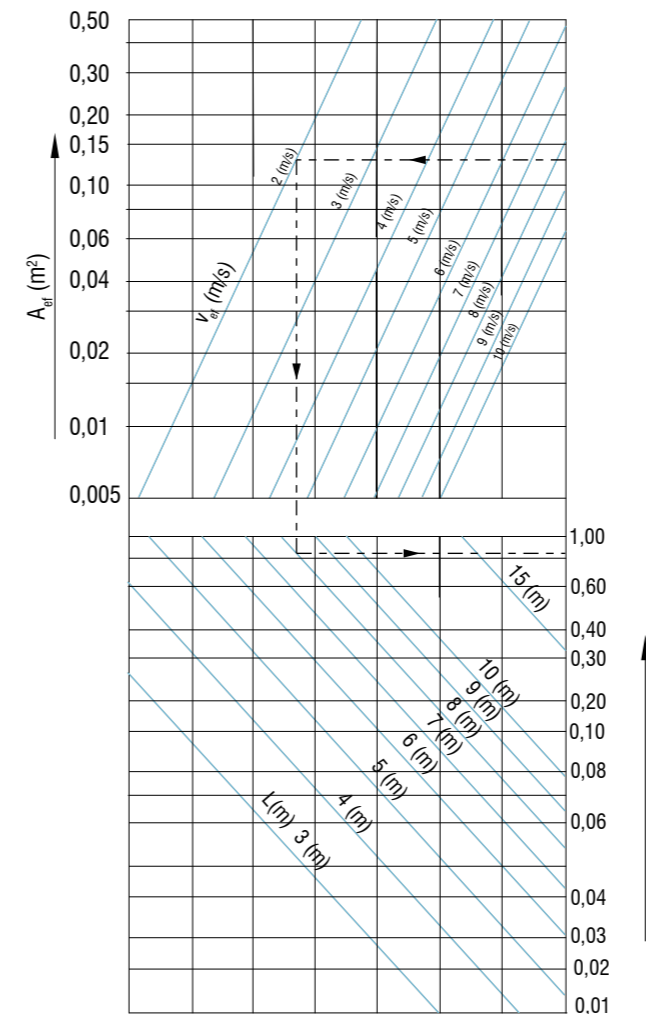


$\Delta t_L = k_1 \times \Delta t_z \times (v_L / v_{ef})$
 $k_1 = 0,9 \quad h \leq 0,3 \text{ m}$
 $k_1 = 0,75 \quad h \geq 0,8 \text{ m}$

2.6a Jet deflection because of Δt_z



2.7 Discharge with Coanda effect



2.8 Discharge without Coanda effect

