# 05

Air displacement units

# Air displacement units

Air displacement units are suitable for both industrial and comfort air conditioning applications. They are suitable for rooms characterised by high heat loads or heavy air pollution. Supplied air forms a so called »fresh air pool« in the occupied zone. Air is lifted in convection currents from heat sources to the ceiling layer, from which it is extracted from the room. In this way, even temperature field is maintained in the room, free of draught.

# Overview

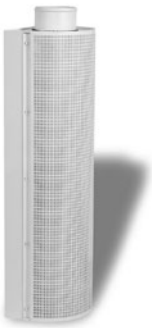
## Air displacement units

Air displacement units are suitable for both industrial and comfort air conditioning applications. They are suitable for rooms characterised by high heat loads or heavy air pollution. Air displacement units supply air at large flow rates (up to 10,000 m³/h), at low air velocities (in the range from 0.1 to 0.3 m/s). Supplied air forms a so called »fresh air pool« in the occupied zone. Air is lifted in convection currents from heat sources to the ceiling layer, from which it is extracted from the room. In this way, even temperature field is maintained in the room, free of draught. Diffusers can be installed suspended from the ceiling, standing on the floor or hanging immediately above the occupied zone.

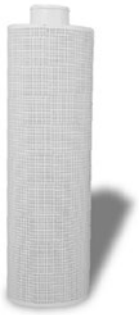
### Types

**SD-1:** corner
**SD-2:** semi-cylindrical
**SD-3:** cylindrical
**SD-6:** rectangular

SD-1



SD-2



SD-3

SD-6

# Content



## Legend of symbols

AI — Element is made of aluminium profiles, aluminium sheet or aluminium casting.

St — Element is made of steel sheet.

RAL 9010 — Element is powder painted in standard RAL 9010 colour. Other desired colour is to be specified in the order.

Shady symbol means possibility of optional material, surface protection, motor version, ...

Element is intended to be built in the floor.

Element is intended to be built in the wall.

Element is intended to be built in the ceiling or in the wall.

Element for air conditioning of rooms with floor to ceiling heights room up to 4 m.

Element for air conditioning of rooms with floor to ceiling heights from 6 to 15 m.

Element is suitable for the supply of warm air (heating).

Element is suitable for the supply of cool air (cooling).

M — Element allows regulation by electric motor (Belimo electric motors).

F EU... — Element is intended for air filtration. The filter of class ... is built in.

CD — The possibility of the automatic selection and calculation of the technical characteristics of grilles and difusers in regard to the given conditions with the assistance of the Klima ADE program.

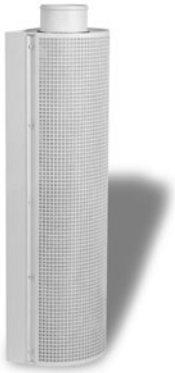
INOX — The element is made of stainless sheet steel AISI 304.

# Air displacement units

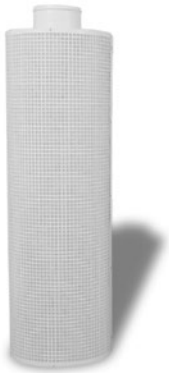
## Air displacement units SD-1, SD-2, SD-3, SD-6

**SD-1**

**SD-2**



**SD-3**



St

F EU...

RAL 9010

**SD-6**

### Types

**SD-1:** corner

**SD-2:** semi-cylindrical

**SD-3:** cylindrical

**SD-6:** rectangular

### Application

Air displacement units are suitable for both industrial and comfort air conditioning applications. They are suitable for rooms characterised by high heat loads or heavy air pollution. Air displacement units supply air at large flow rates (up to 10.000 m³/h), at low air velocities (in the range from 0.1 to 0.3 m/s). Supplied air forms a so called »fresh air pool« in the occupied zone. Air is lifted in convection currents from heat sources to the ceiling layer, from which it is extracted from the room. In this way, even temperature field is maintained in the room, free of draught. Diffusers can be installed suspended from the ceiling, standing on the floor or hanging immediately above the occupied zone.

### Description

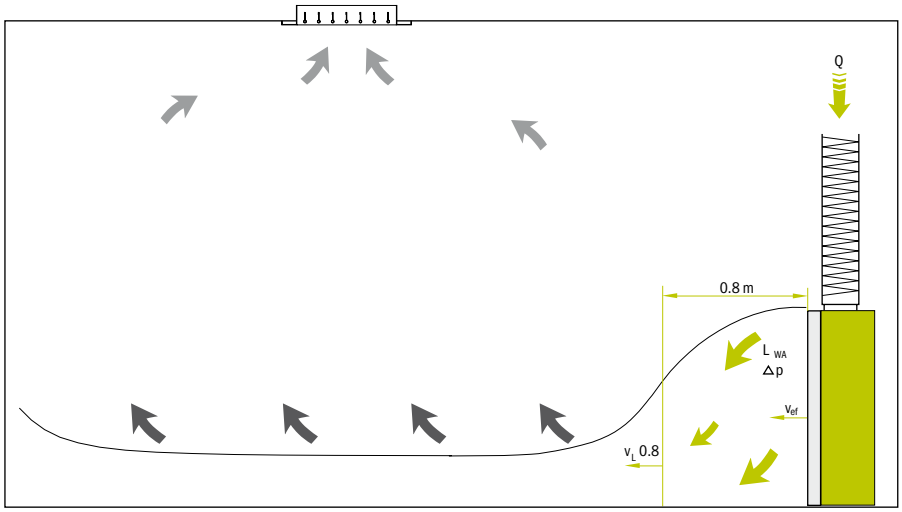
Air displacement units are made of sheet steel and painted in RAL 9010. They can be coloured in any other RAL colour at to the customer's request. They consist of a mantle, a bottom plate and a top plate equipped with an inlet spigot. The standard shape of the spigot is round. At the customer's request, it can be rectangular according to the dimension of the unit.

The air displacement unit mantle perforation is designed according to the version. The versions without a filter (F1, F2 and F5) have mantle perforation with round openings (ϕ 5.5 x 8 mm, 37 % free area). The versions with a filter (F3, F4 and F6) have square openings (10 x 10 x 2 mm, 69 % free area).

For air flow rate control in a round spigot of smaller sizes to fi 248 mm, an M – volume control damper is recommended. For air flow rate control in the spigot of smaller sizes, a DL-1/R volume control damper is recommended.

For air flow control in the rectangular spigot, an F register or an RŽ-1/B/R volume control damper is used.

To achieve a uniform distribution of air across the entire displacement surface, versions F3, F4 and F6 are recommended.



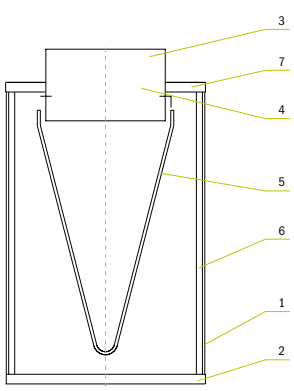

### Definition of symbols

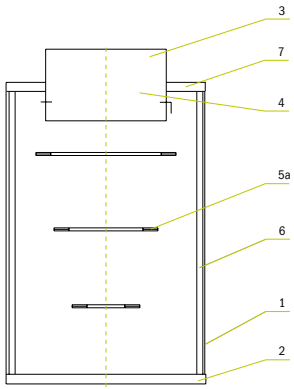
| | |
|---|---|
| **Q (m³/h)** | Air flow rate |
| **$v_L$ (m/s)** | Supplied air velocity at the throw distance L=0.8 m |
| **$v_{ef}$** | Effective dishcarge air velocity |
| **$\Delta t_z$ (K)** | Temperature difference between supply and room air |
| **$\Delta t_L$ (K)** | Temperature difference between air jet and room temperature |
| **$\Delta p_t$ (Pa)** | Pressure drop |
| **$L_{WA}$ (dB(A))** | Sound power level |

1. Perforated mantle
2. Bottom plate
3. Round inlet spigot
4. Control flap
5. Cone-shaped filter bag

5a. Dividing rings

6. Filter
7. Top plate




## Versions

**F1:** without filters

**F2**: with the filter bag

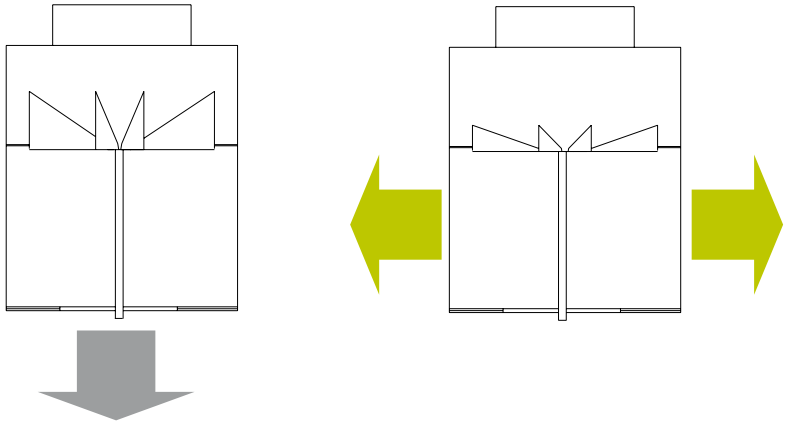
**F3:** with the peripheral filter

**F4:** with the filter bag and the peripheral filter

**F5:** without filters and jet dividing rings

**F6:** with the peripheral filter and dividing rings

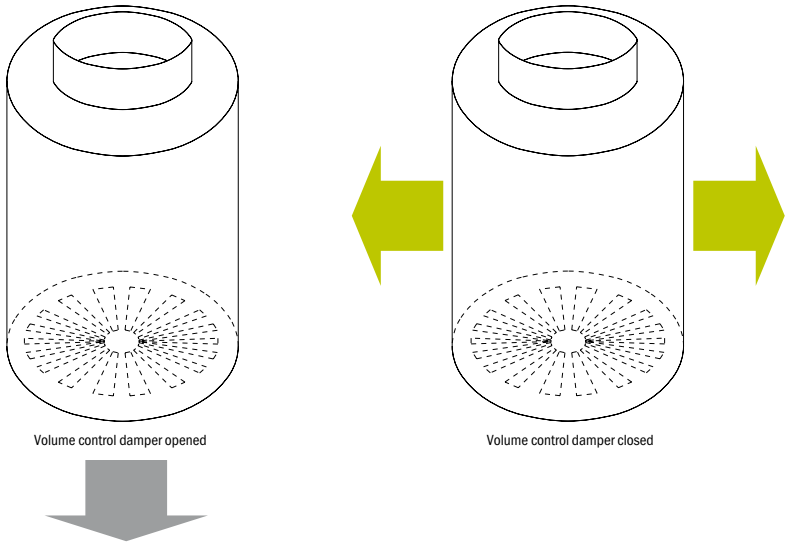
**(R1)** Air jet direction adjustment with blades (available with F1 and F5 version only).



## Special SD-3 version

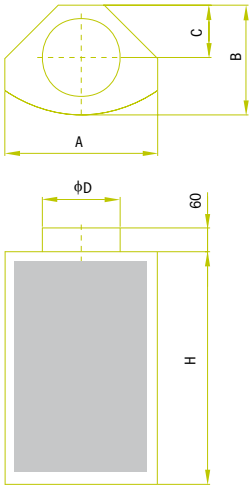
An air displacement unit with regulation R1 and R2 must be mounted under the ceiling for correct operation. On the top plate, there is a special nut for mounting on the ceiling with a threaded rod.

**(R2)** Air jet direction adjustment with a flow control damper (available with F1 and F3 version only).



## Dimensions

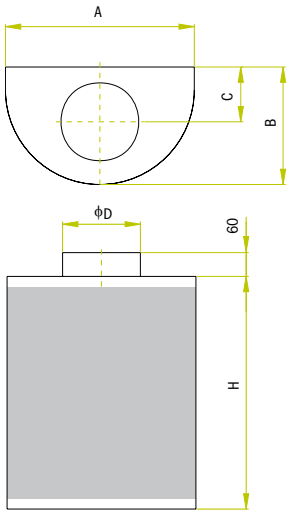
### SD-1




| H |
|---|
| 750 |
| 1000 |
| 1250 |
| 1500 |
| 2000 |
| 2500 |

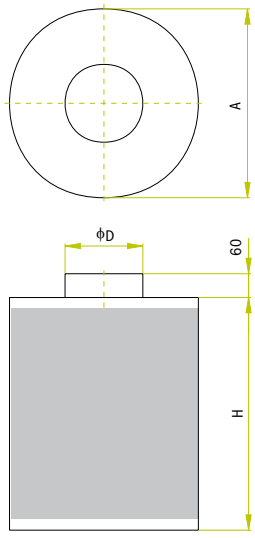
| Size | A | B | C | ϕD |
|---|---|---|---|---|
| **400** | 283 | 180 | 100 | 123 |
| **600** | 424 | 275 | 135 | 148 |
| **800** | 566 | 300 | 150 | 178 |
| **1000** | 707 | 400 | 200 | 198 |
| **1500** | 1061 | 450 | 220 | 248 |
| **2000** | 1414 | 700 | 350 | 298 |

### SD-2



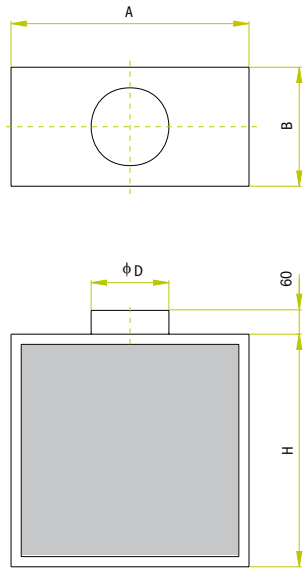

| Size | A | B | C | ϕD |
|---|---|---|---|---|
| **400** | 400 | 320 | 150 | 178 |
| **600** | 600 | 470 | 230 | 198 |
| **800** | 800 | 570 | 250 | 248 |
| **1000** | 1000 | 620 | 280 | 298 |
| **1500** | 1500 | 870 | 350 | 348 |
| **2000** | 2000 | 1120 | 430 | 398 |

### SD-3




| Size | A | ϕD |
|---|---|---|
| **400** | 400 | 248 |
| **600** | 600 | 298 |
| **800** | 800 | 348 |
| **1000** | 1000 | 398 |
| **1500** | 1500 | 498 |
| **2000** | 2000 | 548 |

### SD-6

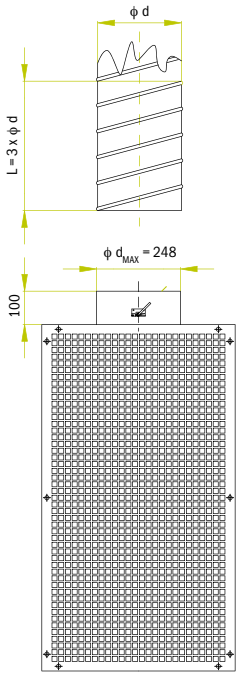



| H |
|---|
| 750 |
| 1000 |
| 1250 |
| 1500 |
| 2000 |
| 2500 |

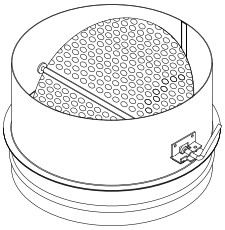
| Size | A | B | ϕD |
|---|---|---|---|
| **400** | 400 | 200 | 148 |
| **600** | 600 | 250 | 178 |
| **800** | 800 | 300 | 198 |
| **1000** | 1000 | 350 | 248 |
| **1500** | 1500 | 400 | 298 |
| **2000** | 2000 | 450 | 313 |

**Inlet spigot ϕd$_{max}$ = 248 mm**
The minimum straight duct length L = 3 x ϕd before the diffuser is sufficient to stabilise the airflow at the diffuser inlet.

In inlet spigots ϕd ≤ 248 mm the airflow is controlled using M-volume control damper consisting of a perforated flap and a braking element.




| ϕd (mm) | Q$_{max}$ (m³/h) | M reg. |
|---|---|---|
| **78** | 80 | |
| **98** | 130 | |
| **123** | 200 | |
| **138** | 260 | |
| **148** | 300 | √ |
| **158** | 340 | |
| **178** | 440 | |
| **198** | 540 | |
| **223** | 690 | |
| **248** | 850 | |



M-volume control damper in the inlet spigot with a height of 100 mm.

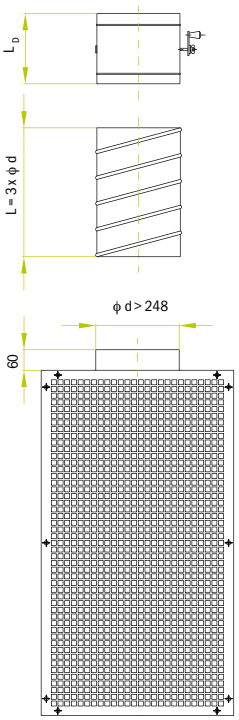
**Example of correct assembly of airflow regulation SD-1, 2, 3, 6**
Maximum airflow Q$_{max}$ for the chosen inlet spigot with a size of ϕd has been calculated for the maximum recommended air velocity in the spigot of V = 5 m/s. Optimum air velocity in the spigot is 2 – 3 m/s.

**Square spigot**
The possibility of installing the F register or the RŽ-1/B/R regulation damper in order to control airflow. The diagram and spigot selection for the given SD type shall be performed in line with the project based on the customer's request

**Inlet spigot ϕd > 248 mm**
Throttling damper DL-1/R

The minimum straight duct length L = 3 x ϕd before the diffuser and after the DL-1/R throttling damper is sufficient to stabilise the airflow at the diffuser inlet. We do not supply ducts for the DL-1/R version.

In spigots ϕd > 248 mm M-volume control damper can cause the airflow to be directed via the perforated flap. For this reason, the airflow is throttled by installing the DL-1/R throttling damper before the SD. If using M- volume control damper, the height of the spigot is 100 mm. If using DL-1/R, its height is 60 mm.




| ϕd (mm) | Q$_{max}$ (m³/h) | DL – 1 / R | | |
|---|---|---|---|---|
| | | Size | L$_d$ (mm) | Standard |
| **278** | 1080 | 280 | 230 | X |
| **298** | 1240 | 300 | 270 | X |
| **313** | 1370 | 315 | | √ |
| **353** | 1740 | 355 | | X |
| **398** | 2220 | 400 | | √ |
| **448** | 2810 | 450 | 330 | X |
| **498** | 3480 | 500 | | √ |
| **558** | 4370 | 560 | | X |
| **628** | 5540 | 630 | | √ |

## Ordering key:

**SD-3/F1/R1/M Size 400 H=750**

**H** **750, 1000, 1250, 1500, 2000, 2500** standard heights

**Size** **400, 600, 800, 1000, 1500, 2000** standard sizes

**Volume control in the spigot:**

**M** Volume control damper (for round spigots, sizes to ϕ 250 mm)
**DL-1/R** Throttling damper DL-1/R (for round spigots, size over ϕ 250 mm)
**F** Register (for rectangular spigots)
**RŽ-1/B/R** Volume control damper RŽ-1B/R (for rectangular spigots)

**Regulation:**

**R1** Regulation with blades (available with types SD-3, version F1 and F5 only)
**R2** Regulation with a flow control damper (available with types SD-3, version F1 and F3 only)

**Versions:**

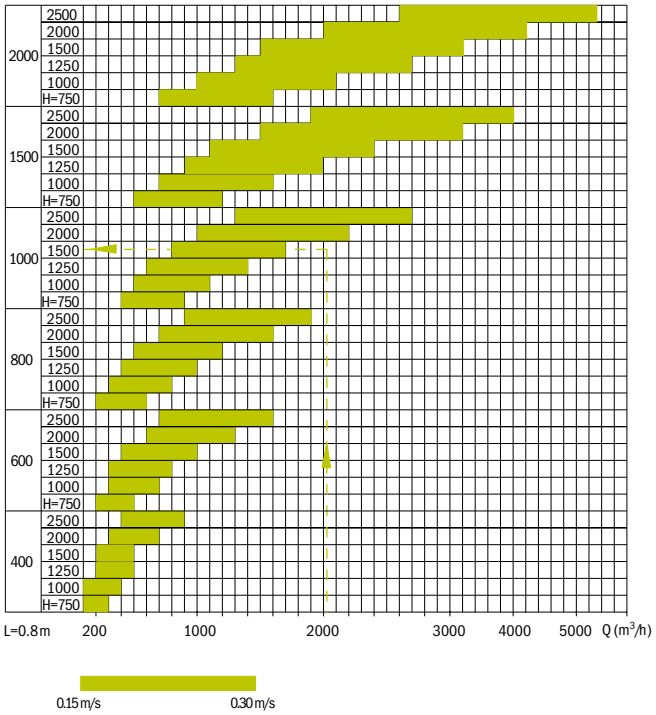
**F1** Without filters (perforation with round openings (ϕ 5.5 x 8 mm 37 % free area))
**F2** With the filter bag (perforation with round openings (ϕ 5.5 x 8 mm 37 % free area))
**F3** With the peripheral filter (perforation with square opening (10 x 10 x 2 mm, 69 % free area))
**F4** With the filter bag and the peripheral filter (perforation with square opening (10 x 10 x 2 mm, 69 % free area))
**F5** With dividing rings without filters (perforation with round openings (ϕ 5.5 x 8 mm 37 % free area))
**F6** With dividing rings and the peripheral filter (perforation with square opening (10 x 10 x 2 mm, 69 % free area))

**Types:**

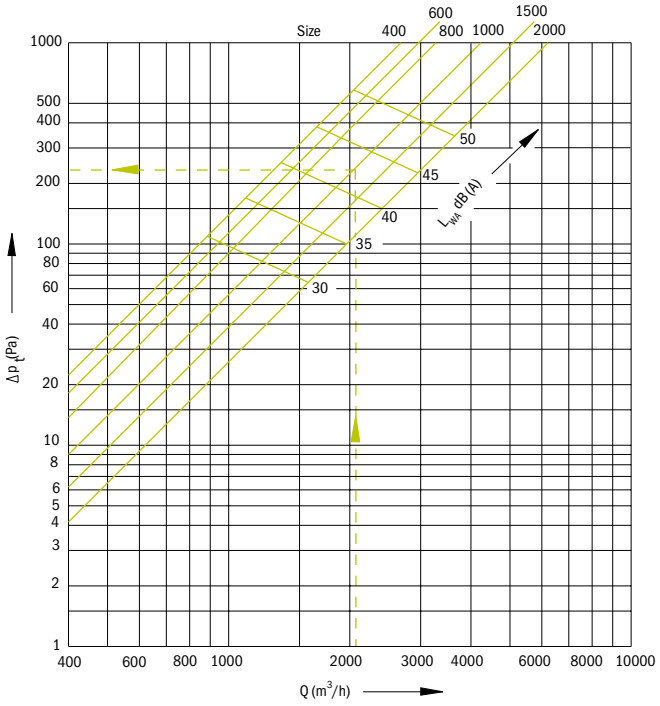
**SD-1** Corner
**SD-2** Semi-cylindrical
**SD-3** Cylindrical
**SD-6** Rectangular

## Technical data for SD-1

### Diagrams to determine the supplied air velocity at the throw distance L=0.8 m:




### Pressure drop and noise level diagram:




### KF correction factor table

| Correction | Size | 750 | 1000 | 1250 | 1500 | 2000 | 2500 |
|---|---|---|---|---|---|---|---|
| $\Delta p_t$ for the type F3 | **400** | 1.44 | 1.00 | 0.80 | 0.26 | 0.16 | 0.11 |
| | **600** | 1.10 | 1.00 | 0.96 | 0.28 | 0.26 | 0.25 |
| | **800** | 1.06 | 1.00 | 0.97 | 0.29 | 0.27 | 0.27 |
| | **1000** | 1.10 | 1.00 | 0.96 | **0.33** | 0.31 | 0.30 |
| | **1500** | 1.04 | 1.00 | 0.98 | 0.34 | 0.33 | 0.33 |
| | **2000** | 1.02 | 1.00 | 0.99 | 0.38 | 0.38 | 0.37 |
| $\Delta p_t$ for the type F1 | **400** | 0.55 | 0.51 | 0.50 | 0.05 | 0.04 | 0.04 |
| | **600** | 0.56 | 0.51 | 0.49 | 0.14 | 0.13 | 0.13 |
| | **800** | 0.93 | 0.93 | 0.93 | 0.26 | 0.26 | 0.26 |
| | **1000** | 0.90 | 0.89 | 0.89 | **0.28** | 0.28 | 0.28 |
| | **1500** | 0.96 | 0.95 | 0.95 | 0.32 | 0.32 | 0.32 |
| | **2000** | 0.98 | 0.98 | 0.98 | 0.37 | 0.37 | 0.37 |
| $\Delta p_t$ for the type F4 | **400** | 2.33 | 1.42 | 1.11 | 0.47 | 0.28 | 0.19 |
| | **600** | 1.30 | 1.11 | 1.03 | 0.33 | 0.28 | 0.26 |
| | **800** | 1.19 | 1.07 | 1.02 | 0.32 | 0.29 | 0.28 |
| | **1000** | 1.29 | 1.11 | 1.02 | **0.38** | 0.33 | 0.31 |
| | **1500** | 1.13 | 1.05 | 1.01 | 0.36 | 0.34 | 0.34 |
| | **2000** | 1.06 | 1.02 | 1.01 | 0.39 | 0.38 | 0.38 |

| Size | 400 | 600 | 800 | 1000 | 1500 | 2000 |
|---|---|---|---|---|---|---|
| L (m) | 0.214 | 0.406 | 0.502 | **0.718** | 1.066 | 1.400 |

## Definition of symbols

| | |
|---|---|
| **Q (m³/h)** | Air flow rate |
| **$v_L$ (m/s)** | Supplied air velocity at the throw distance L=0.8 m |
| **$\Delta p_t$ (Pa)** | Pressure drop |
| **$L_{WA}$ (dB(A))** | Sound power level |

## Example calculation

Q = 2000 m³/h
We select size 1000; H = 1500
$A_{ef}$ = 0.718 x 1.5 x 0.6944 = 0.748 (m²)
$v_{ef}$ = Q / ($A_{ef}$ x 3600) = 2000 / (0.748 x 3600) = 0.74 m/s
$L_{WA}$ = 42 dB(A)

Pressure drop:

**Tip F3**

$\Delta p_t$ = from the diagram x KF (za H = 1500) = 230 x 0.33 = 75.9 Pa

**Tip F1**

$\Delta p_t$ = from the diagram x KF (za H = 1500) = 230 x 0.28 = 64.4 Pa

**Tip F4**

$\Delta p_t$ = from the diagram x KF (za H = 1500) = 230 x 0.38 = 87.4 Pa

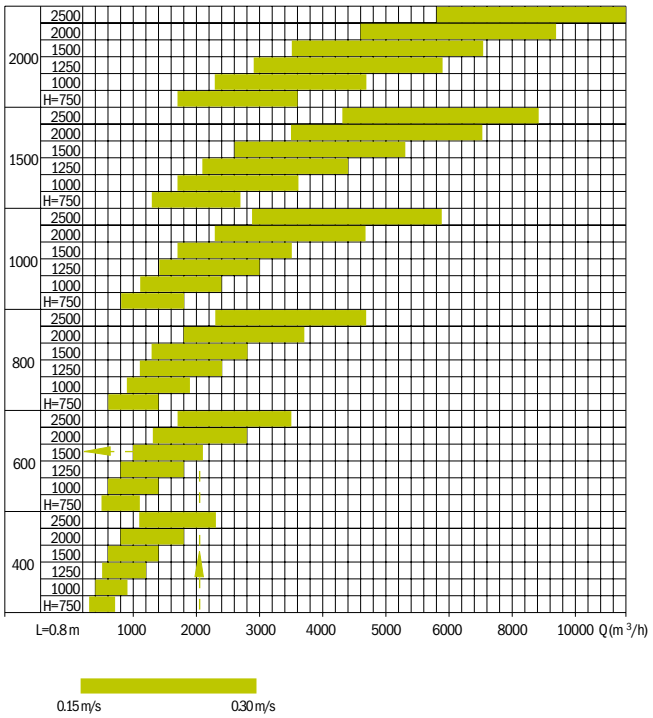
Free area $A_{ef}$:

$A_{ef}$ = L x H x 0.6944 (m²) L-from the table

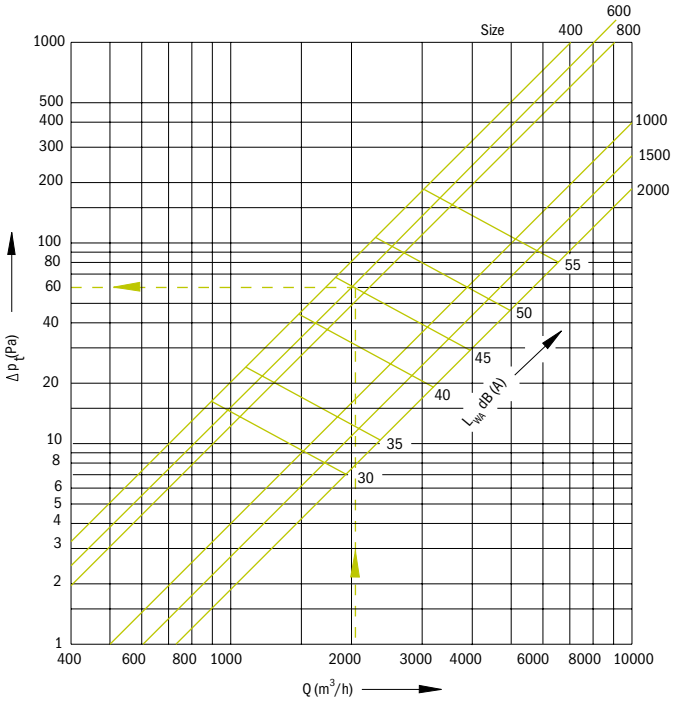
$A_{ef}$ = L x H x 0.37 (m²) for the versions F1, F2 and F5 (without filter) and mantle perforation with round openings

## Technical data for SD-2

### Diagrams to determine the supplied air velocity at the throw distance L=0.8 m:




### Pressure drop and noise level diagram:




### KF correction factor table

| Correction | Size | 750 | 1000 | 1250 | 1500 | 2000 | 2500 |
|---|---|---|---|---|---|---|---|
| $\Delta p_t$ for the type F3 | **400** | 1.43 | 1.00 | 0.81 | 0.28 | 0.18 | 0.13 |
| | **600** | 1.15 | 1.00 | 0.93 | **0.32** | 0.29 | 0.27 |
| | **800** | 1.08 | 1.00 | 0.97 | 0.35 | 0.33 | 0.33 |
| | **1000** | 1.30 | 1.00 | 0.87 | **0.33** | 0.26 | 0.23 |
| | **1500** | 1.13 | 1.00 | 0.94 | 0.36 | 0.33 | 0.32 |
| | **2000** | 1.07 | 1.00 | 0.97 | 0.38 | 0.36 | 0.36 |
| $\Delta p_t$ for the type F1 | **400** | 0.56 | 0.52 | 0.51 | 0.07 | 0.07 | 0.06 |
| | **600** | 0.58 | 0.84 | 0.83 | **0.25** | 0.25 | 0.25 |
| | **800** | 0.92 | 0.92 | 0.91 | 0.32 | 0.31 | 0.31 |
| | **1000** | 0.69 | 0.67 | 0.66 | **0.18** | 0.18 | 0.18 |
| | **1500** | 0.87 | 0.86 | 0.86 | 0.30 | 0.30 | 0.30 |
| | **2000** | 0.93 | 0.92 | 0.92 | 0.35 | 0.34 | 0.34 |
| $\Delta p_t$ for the type F4 | **400** | 2.30 | 1.48 | 1.11 | 0.19 | 0.29 | 0.21 |
| | **600** | 1.44 | 1.16 | 1.04 | **0.39** | 0.33 | 0.30 |
| | **800** | 1.23 | 1.08 | 1.02 | 0.39 | 0.35 | 0.34 |
| | **1000** | 1.91 | 1.33 | 1.08 | **0.47** | 0.34 | 0.28 |
| | **1500** | 1.38 | 1.14 | 1.03 | 0.42 | 0.36 | 0.34 |
| | **2000** | 1.21 | 1.08 | 1.02 | 0.41 | 0.36 | 0.37 |

| Size | 400 | 600 | 800 | 1000 | 1500 | 2000 |
|---|---|---|---|---|---|---|
| **L (m)** | 0.598 | 0.920 | 1.228 | 1.550 | 2.334 | 3.120 |

### Definition of symbols

| | |
|---|---|
| **Q (m³/h)** | Air flow rate |
| **$v_L$ (m/s)** | Supplied air velocity at the throw distance L=0.8 m |
| **$\Delta p_t$ (Pa)** | Pressure drop |
| **$L_{WA}$ (dB(A))** | Sound power level |

### Example calculation

Q = 2000 m³/h

We select size 600; H = 1500

$A_{ef}$ = 0.92 x 1.5 x 0.6944 = 0.958 (m²)

$v_{ef}$ = Q / ($A_{ef}$ x 3600) = 2000 / (0.958 x 3600) = 0.58 m/s

$L_{WA}$ = 45 dB(A)

Pressure drop:

**Tip F3**

$\Delta p_t$ = from the diagram x KF (za H = 1500) = 60 x 0.32 = 19.2 Pa

**Tip F1**

$\Delta p_t$ = from the diagram x KF (za H = 1500) = 60 x 0.25 = 15 Pa

**Tip F4**

$\Delta p_t$ = from the diagram x KF (za H = 1500) = 60 x 0.39 = 19.5 Pa

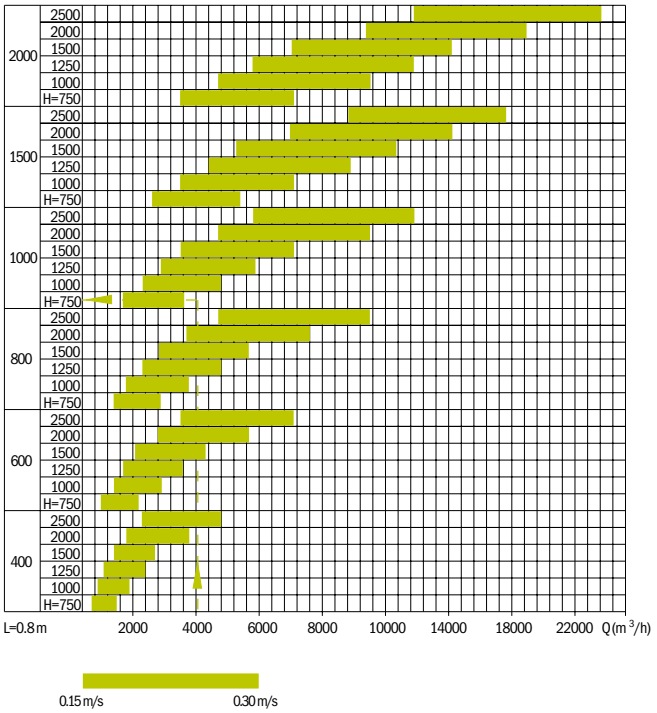
Free area $A_{ef}$:

$A_{ef}$= L x H x 0.6944 (m²) L-from the table

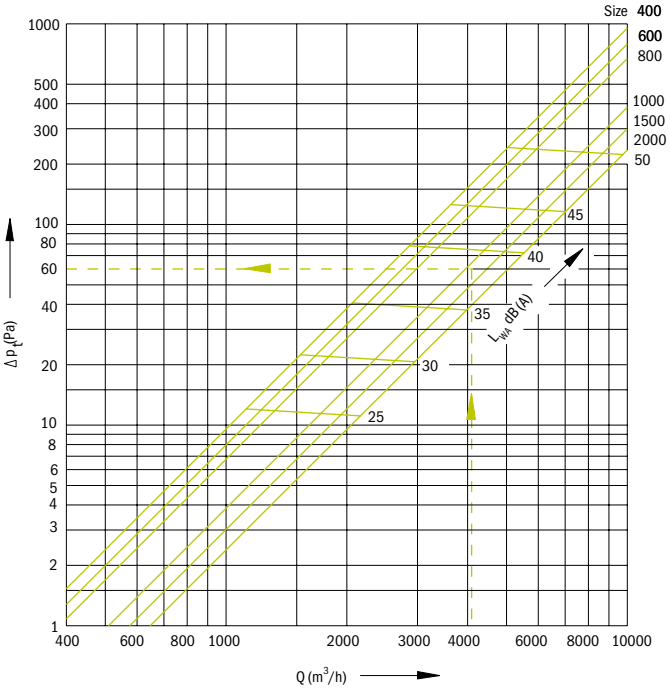
$A_{ef}$= L x H x 0.37 (m²) for the versions F1, F2 and F5 (without filter) and mantle perforation with round openings

# Technical data for SD-3

### Diagrams to determine the supplied air velocity at the throw distance L=0.8 m:




### Pressure drop and noise level diagram:




### KF correction factor table

| Correction | Size | 750 | 1000 | 1250 | 1500 | 2000 | 2500 |
|---|---|---|---|---|---|---|---|
| $\Delta p_t$ for the type F3 | **400** | 1.47 | 1.00 | 0.79 | 0.36 | 0.26 | 0.21 |
| | **600** | 1.11 | 1.00 | 0.95 | 0.55 | 0.52 | 0.51 |
| | **800** | 1.05 | 1.00 | 0.98 | 0.61 | 0.59 | 0.59 |
| | **1000** | **1.05** | 1.00 | 0.98 | 0.19 | 0.18 | 0.17 |
| | **1500** | 1.02 | 1.00 | 0.99 | 0.22 | 0.21 | 0.21 |
| | **2000** | 1.01 | 1.00 | 1.00 | 0.23 | 0.22 | 0.22 |
| $\Delta p_t$ for the type F1 | **400** | 0.51 | 0.48 | 0.46 | 0.14 | 0.13 | 0.13 |
| | **600** | 0.88 | 0.87 | 0.87 | 0.49 | 0.49 | 0.49 |
| | **800** | 0.95 | 0.94 | 0.94 | 0.58 | 0.58 | 0.58 |
| | **1000** | **0.95** | 0.95 | 0.95 | 0.17 | 0.17 | 0.17 |
| | **1500** | 0.98 | 0.98 | 0.98 | 0.21 | 0.21 | 0.21 |
| | **2000** | 0.99 | 0.99 | 0.99 | 0.22 | 0.22 | 0.22 |
| $\Delta p_t$ for the type F4 | **400** | 2.42 | 1.52 | 1.12 | 0.59 | 0.38 | 0.29 |
| | **600** | 1.34 | 1.13 | 1.03 | 0.60 | 0.55 | 0.53 |
| | **800** | 1.15 | 1.06 | 1.01 | 0.63 | 0.61 | 0.60 |
| | **1000** | **1.14** | 1.05 | 1.01 | 0.21 | 0.19 | 0.18 |
| | **1500** | 1.05 | 1.02 | 1.00 | 0.22 | 0.22 | 0.21 |
| | **2000** | 1.03 | 1.01 | 1.00 | 0.23 | 0.23 | 0.22 |

## Definition of symbols

| | |
|---|---|
| **Q (m³/h)** | Air flow rate |
| **$v_L$ (m/s)** | Supplied air velocity at the throw distance L=0.8 m |
| **$\Delta p_t$ (Pa)** | Pressure drop |
| **$L_{WA}$ (dB(A))** | Sound power level |

## Example calculation:

Q = 4000 m³/h
We select size 1000; H = 750
$A_{ef}$ = 1 x π x 0.75 x 0.6944 = 1.64 (m²)
$v_{ef}$ = Q / ($A_{ef}$ x 3600) = 4000 / (1.64 x 3600) = 0.68 m/s
$L_{WA}$ = 37 dB(A)

Pressure drop:

**Tip F3**

$\Delta p_t$ = from the diagram x KF (za H = 750) = 60 x 1.05 = 63.0 Pa

**Tip F1**

$\Delta p_t$ = from the diagram x KF (za H = 750) = 60 x 0.95 = 57.0 Pa

**Tip F4**

$\Delta p_t$ = from the diagram x KF (za H = 750) = 60 x 1.14 = 68.4 Pa

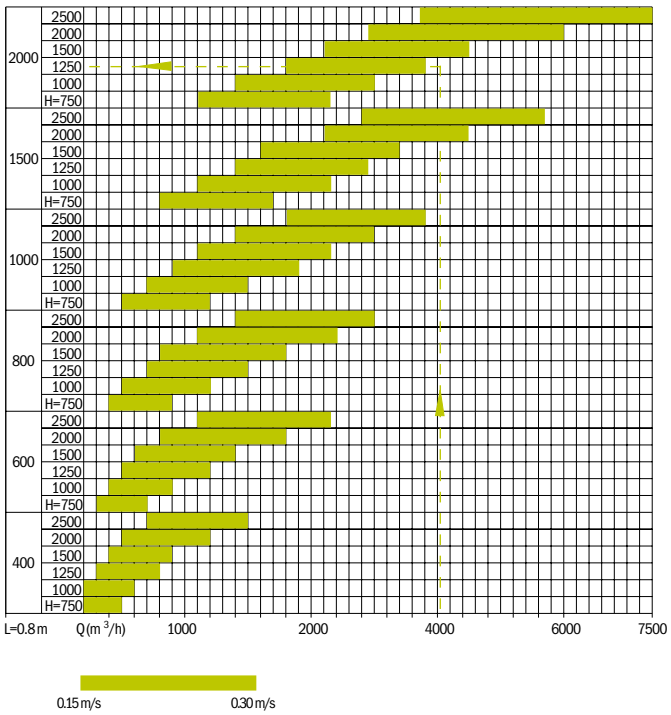
Free area $A_{ef}$:

$A_{ef}$ = A x π x H x 0.6944 (m²) A- Size (m)

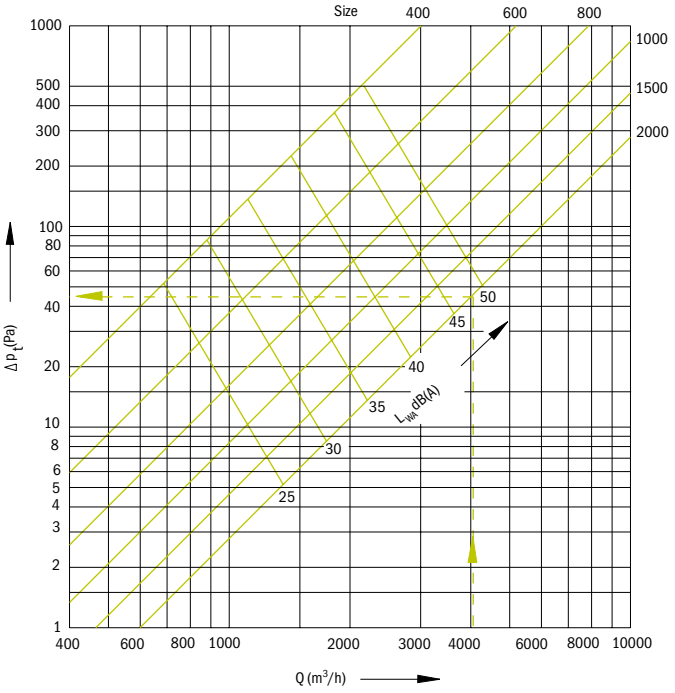
$A_{ef}$= A x π x H x 0.37 (m²) for the versions F1, F2 and F5 (without filter) and mantle perforation with round openings

## Technical data for SD-6

### Diagrams to determine the supplied air velocity at the throw distance L=0.8 m:




### Pressure drop and noise level diagram:




### KF correction factor table

| Correction | Size | 750 | 1000 | 1250 | 1500 | 2000 | 2500 |
|---|---|---|---|---|---|---|---|
| $\Delta p_t$ for the type F3 | **400** | 1.11 | 1.00 | 0.95 | 0.93 | 0.90 | 0.89 |
| | **600** | 1.14 | 1.00 | 0.94 | 0.90 | 0.87 | 0.86 |
| | **800** | 1.18 | 1.00 | 0.92 | 0.88 | 0.83 | 0.82 |
| | **1000** | 1.22 | 1.00 | 0.90 | 0.85 | 0.79 | 0.77 |
| | **1500** | 1.18 | 1.00 | 0.92 | 0.88 | 0.84 | 0.82 |
| | **2000** | 1.17 | 1.00 | **0.92** | 0.89 | 0.85 | 0.83 |
| $\Delta p_t$ for the type F1 | **400** | 0.89 | 0.88 | 0.88 | 0.88 | 0.87 | 0.87 |
| | **600** | 0.85 | 0.84 | 0.84 | 0.84 | 0.83 | 0.83 |
| | **800** | 0.81 | 0.80 | 0.79 | 0.79 | 0.79 | 0.78 |
| | **1000** | 0.77 | 0.75 | 0.74 | 0.74 | 0.74 | 0.83 |
| | **1500** | 0.81 | 0.80 | 0.79 | 0.79 | 0.79 | 0.78 |
| | **2000** | 0.83 | 0.81 | **0.81** | 0.80 | 0.80 | 0.73 |
| $\Delta p_t$ for the type F4 | **400** | 1.32 | 1.12 | 1.03 | 0.98 | 0.93 | 0.79 |
| | **600** | 1.42 | 1.16 | 1.04 | 0.97 | 0.91 | 0.80 |
| | **800** | 1.55 | 1.20 | 1.05 | 0.96 | 0.88 | 0.91 |
| | **1000** | 1.68 | 1.25 | 1.06 | 0.95 | 0.85 | 0.88 |
| | **1500** | 1.55 | 1.20 | 1.05 | 0.96 | 0.88 | 0.85 |
| | **2000** | 1.51 | 1.19 | **1.04** | 0.97 | 0.89 | 0.86 |

### Definition of symbols

| | |
|---|---|
| **Q (m³/h)** | Air flow rate |
| **$v_L$ (m/s)** | Supplied air velocity at the throw distance L=0.8 m |
| **$\Delta p_t$ (Pa)** | Pressure drop |
| **$L_{WA}$ (dB(A))** | Sound power level |

### Example calculation:

Q = 4000 m³/h
We select size 2000; H = 1250
$A_{ef}$ = 2 x 1.25 x 0.6944 = 1.74 (m²)
$v_{ef}$ = Q / ($A_{ef}$ x 3600) = 4000 / (1.74 x 3600) = 0.64 m/s
$L_{WA}$ = 48 dB(A)

Pressure drop:
**Tip F3**
$\Delta p_t$ = from the diagram x KF (za H = 1250) = 45 x 0.92 = 41.4 Pa
**Tip F1**
$\Delta p_t$ = from the diagram x KF (za H = 1250) = 45 x 0.81 = 36.4 Pa
**Tip F4**
$\Delta p_t$ = from the diagram x KF (za H = 1250) = 45 x 1.04 = 46.8 Pa

Free area $A_{ef}$:
$A_{ef}$ = A x H x 0.6944 (m²) A- Size (m)
$A_{ef}$= A x H x 0.37 (m²) for the versions F1, F2 and F5 (without filter) and mantle perforation with round openings