



AIRTECHNIC

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Air-Conditioning & Ventilation Components & Systems

Door grilles

DO



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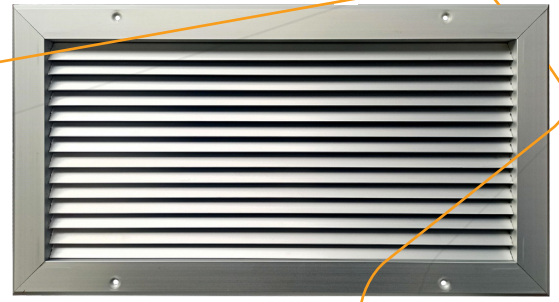


Door grilles DO

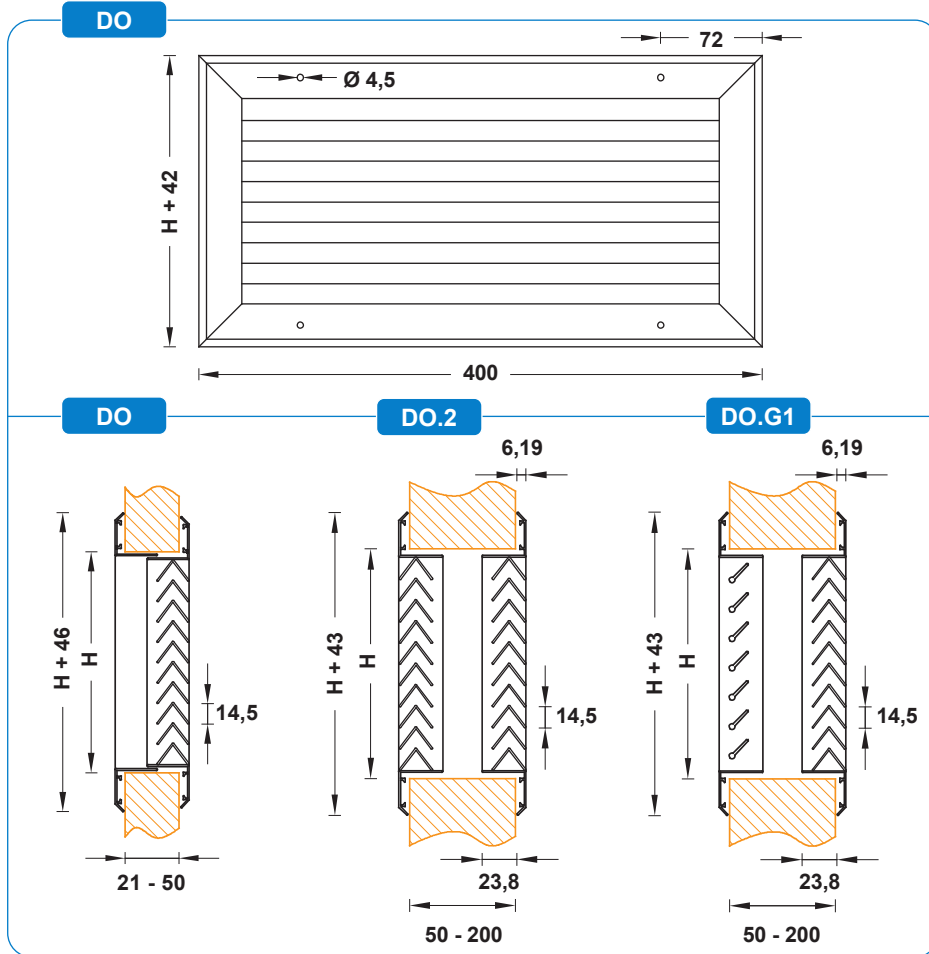
Door grilles **DO** have a special design with 1 row of **fixed Λ -shaped blades**, parallel to the 1st dimension, which offers zero visibility between 2 adjacent spaces. They are suitable for use in air-conditioning and ventilation systems and wall or door installation, for air transport (supply or exhaust) between 2 adjacent spaces.

Door grilles **DO** can be manufactured from anodized aluminium, aluminium painted in RAL color, from galvanized or stainless steel and copper :

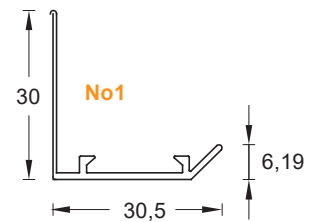
- DO...** : Blades & frame from **anodized aluminium or aluminium painted in RAL color.**
- DO... | C** : Blades & frame from **copper.**
- DO... | GL** : Blades & frame from **galvanized steel.**
- DO... | I** : Blades & frame from **stainless steel.**



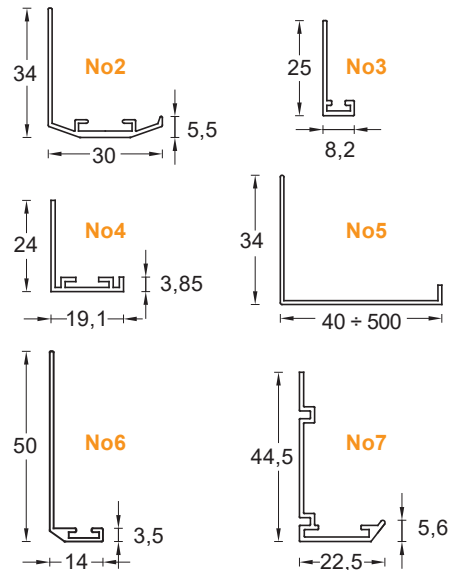
DO



Default frame



Available frames



DOOR GRILLE DO - TYPES

DO From **aluminium**. 1 Row of fixed Λ -shaped blades, parallel to the 1st dimension. **Plain frame on the other side.**

DO.2 From **aluminium**. 1 Row of fixed Λ -shaped blades, parallel to the 1st dimension. **On both sides.**

DO.G1 From **aluminium**. 1 Row of fixed Λ -shaped blades, parallel to the 1st dimension. **G1 grille with 1 row of blades parallel to the 1st dimension on the other side.**

SPECIAL CONSTRUCTION

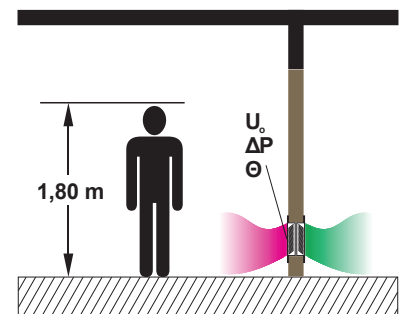
Under request, the additional frame can be manufactured with accessible face and filter. For more information please contact our sales department.

DOOR GRILLE DO - SIZE SELECTION

The selection of door grilles **DO** will be made using the following diagrams and in accordance with the guideline **CR 1752:1998** (Design criteria for the indoor environment).

The technical specifications for door grilles **DO** are the following:

Grille width	W [mm]
Grille height	H [mm]
Grille surface factor	Af
Pressure drop inside the grille	ΔP [Pa]
Maximum air velocity inside the grille	U_0 [m/s]
Noise level	Θ [dB(A)]



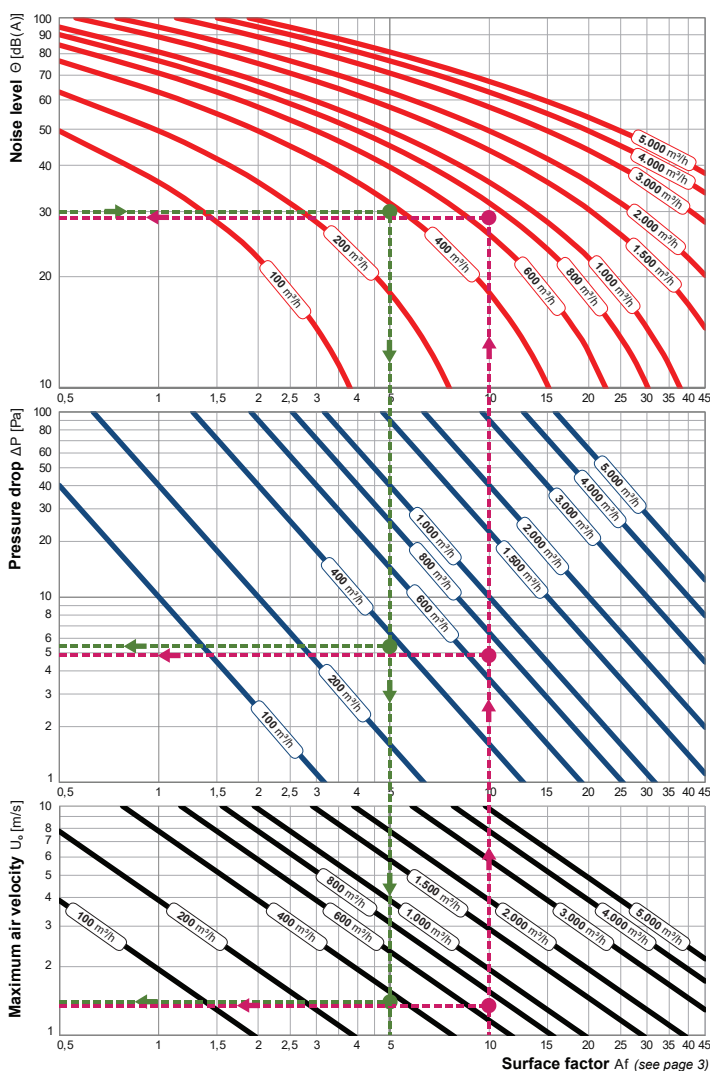


DIAGRAM 1.3

DIAGRAM 1.2

DIAGRAM 1.1

Selection example 1 :

Which are the dimensions of a DO door grille if the air flow is 370 m³/h the installation is in a coffee shop?

The grille will be installed in a coffee shop. From the guideline **CR 1752:1998** (types of spaces & permissible sound pressure levels) we establish that the maximum permissible noise level must be 35 dB(A). Therefore a produced noise level of 30 dB(A) is acceptable and from diagram 1.3, for air flow of 370 m³/h, we determine that the surface factor Af is 5,0. If the width, for construction reasons, is 600 mm then from the surface factor Af selection table we have that for grille width equal to 600 mm the grille height must be 200 mm. The maximum air velocity inside the grille 600 x 200, is estimated from diagram 1.1 and it's equal to 1,4 m/s, while from diagram 1.2 we calculate that the pressure drop is 5,4 Pa.

Selection example 2 :

Which is the pressure drop and the produced noise level in a DO grille with dimensions 750 x 300 mm, if the air flow is 700 m³/h?

From the surface factor Af selection table we establish that according to the grille's dimensions the surface factor Af is equal to 10. From diagrams 1.1, 1.2 και 1.3, for air flow of 700 m³/h and surface factor Af of 10 we estimate that the maximum air velocity inside the grille is 1,3 m/s, the pressure drop is 4,9 Pa and the produced noise level is 28,9 dB(A).

The diagrams are an approximate selection method for **DO** grilles. For more precise calculation, please use the **AIRTECHNIC** air grilles calculation software or contact us.

The standard dimensions of door grilles **DO** are listed in the following surface factor selection table, but it is possible to manufacture **DO** grilles in any dimension, under request.

	100	125	150	200	250	300	350	400	450	500	550	600
200	0,7	0,9	1,1	1,6	2,0	2,5	2,9	3,3	3,7	4,2	4,6	5,0
250	0,8	1,1	1,4	2,0	2,6	3,2	3,7	4,3	4,8	5,4	5,9	6,5
300	1,0	1,4	1,7	2,5	3,2	3,9	4,6	5,2	5,9	6,6	7,3	8,0
350	1,2	1,6	2,0	2,9	3,7	4,6	5,4	6,2	7,0	7,8	8,6	9,4
400	1,4	1,9	2,4	3,3	4,3	5,2	6,2	7,2	8,1	9,0	10,0	10,9
450	1,6	2,1	2,7	3,7	4,8	5,9	7,0	8,1	9,2	10,3	11,3	12,4
500	1,7	2,4	3,0	4,2	5,4	6,6	7,8	9,0	10,3	11,5	12,6	13,8
550	1,9	2,6	3,3	4,6	5,9	7,3	8,6	10,0	11,3	12,6	14,0	15,3
600	2,1	2,8	3,6	5,0	6,5	8,0	9,4	10,9	12,4	13,8	15,3	16,8
650	2,3	3,1	3,9	5,5	7,1	8,6	10,2	11,8	13,4	15,0	16,6	18,2
700	2,5	3,3	4,2	5,9	7,6	9,3	11,0	12,8	14,5	16,2	17,9	19,6
750	2,6	3,6	4,5	6,3	8,2	10,0	11,8	13,7	15,5	17,4	19,2	21,0
800	2,8	3,8	4,8	6,8	8,7	10,7	12,7	14,6	16,6	18,5	20,5	22,5
850	3,0	4,1	5,1	7,2	9,3	11,4	13,5	15,5	17,6	19,7	21,8	23,9
900	3,2	4,3	5,4	7,6	9,8	12,0	14,3	16,5	18,7	20,9	23,1	25,3
950	3,4	4,5	5,7	8,0	10,4	12,7	15,1	17,4	19,7	22,1	24,4	26,8
1.000	3,5	4,8	6,0	8,5	10,9	13,4	15,9	18,3	20,8	23,3	25,7	28,2
1.050	3,7	5,0	6,3	8,9	11,5	14,1	16,7	19,3	21,9	24,4	27,0	29,6
1.100	3,9	5,3	6,6	9,3	12,1	14,8	17,5	20,2	22,9	25,6	28,3	31,1
1.150	4,1	5,5	6,9	9,8	12,6	15,4	18,3	21,1	24,0	26,8	29,6	32,5
1.200	4,3	5,8	7,2	10,2	13,2	16,1	19,1	22,1	25,0	28,0	31,0	33,9
1.250	4,4	6,0	7,5	10,6	13,7	16,8	19,9	23,0	26,1	29,2	32,3	35,3
1.300	4,6	6,2	7,8	11,1	14,3	17,5	20,7	23,9	27,1	30,3	33,6	36,8
1.350	4,8	6,5	8,1	11,5	14,8	18,2	21,5	24,8	28,2	31,5	34,9	38,2
1.400	5,0	6,7	8,5	11,9	15,4	18,8	22,3	25,8	29,2	32,7	36,2	39,6
1.450	5,2	7,0	8,8	12,3	15,9	19,5	23,1	26,7	30,3	33,9	37,5	41,1
1.500	5,3	7,2	9,1	12,8	16,5	20,2	23,9	27,6	31,4	35,1	38,8	42,5



DO - PRESSURE DROP & NOISE LEVEL CALCULATION

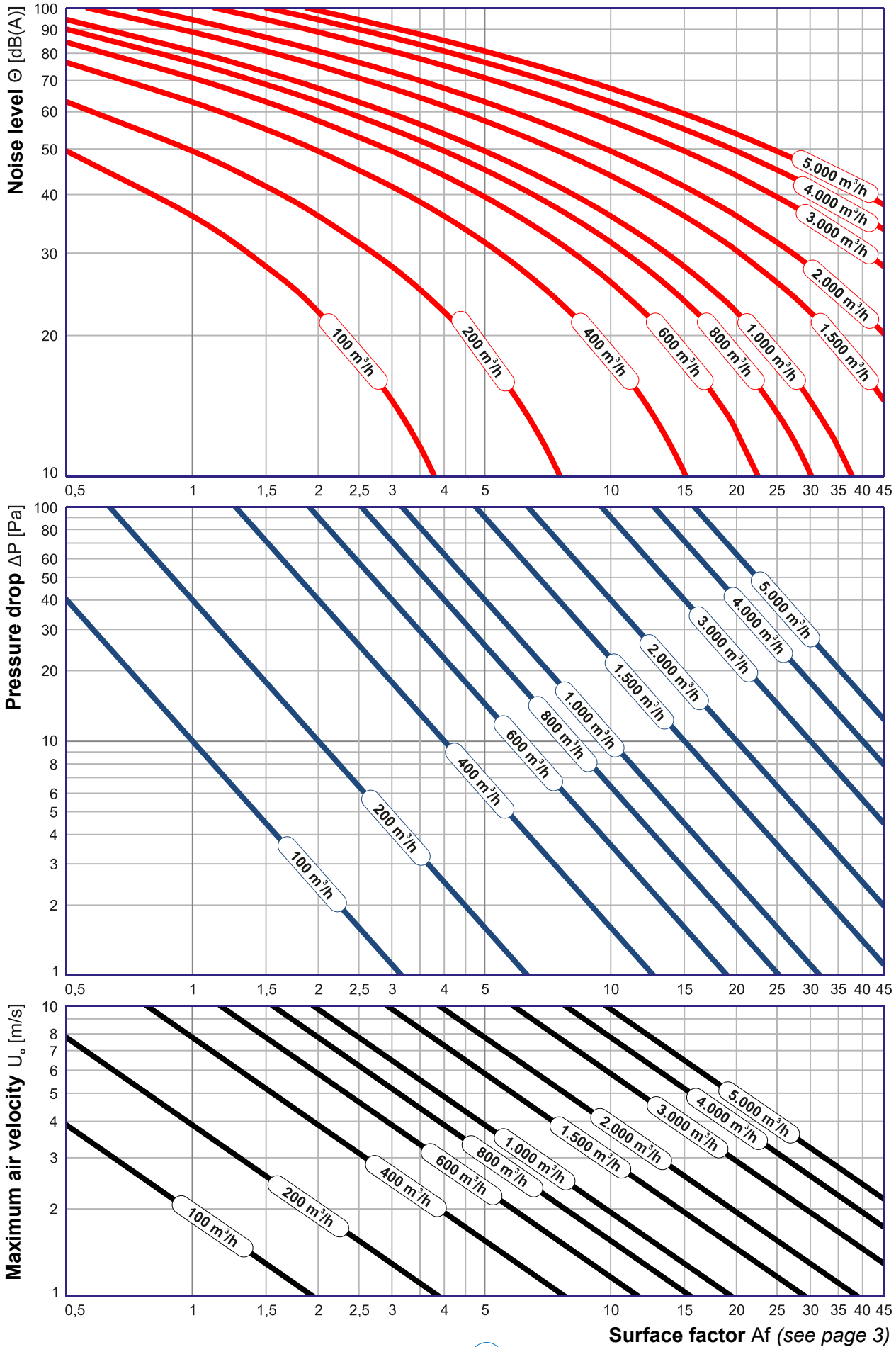


DIAGRAM 1.3

DIAGRAM 1.2

DIAGRAM 1.1



PRESSURE DROP & NOISE LEVEL - DO.2 & DO.G1

If we have a door grille **DO.2** and **DO.G1**, the calculation of the total pressure drop and noise level is made using the DO calculation diagrams (as shown on page 4), the G1S grille calculation diagrams (as listed in their respective technical document) and the following equations.

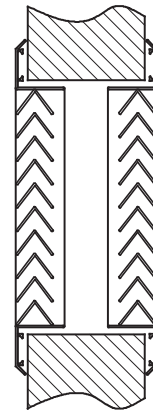
Calculation example 1 :

Pressure drop and noise level calculation in door grille DO.2.

We have a grille **DO.2** with dimensions **600 x 200** and an air flow of 350 m³/h. The grille **DO** with dimensions **600 x 200** has, according to page 4 diagrams, for air flow equal to 350 m³/h, a pressure drop of 4,8 Pa and a noise level of 28,8 dB.

The total pressure drop inside the grille **DO.2** with dimensions **600 x 200** is the algebraic sum of the pressure drop inside the 2 grilles DO: $\Delta p_{DO} + \Delta p_{DO} = 4,8 + 4,8 = 9,6$ Pa.

The total noise level is calculated by using the following equation: $L_{tot} = L_{DO} \oplus L_{DO} = L_{max} + C(\Delta L)$. The difference between the noise levels of the 2 independent sound sources (the 2 grilles **DO**) is $\Delta L = 0$. Therefore from the following diagram we determine that for $\Delta L = 0$ the correction factor $C(\Delta L)$ is equal to 3. So, the total noise level is $L_{tot} = L_{max} + C(\Delta L) = 28,8 + 3 = 31,8$ dB.



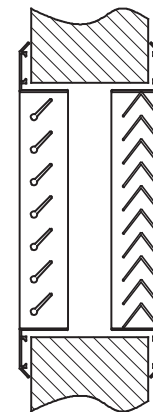
Calculation example 2 :

Pressure drop and noise level calculation in door grille DO.G1.

We have a grille **DO.G1** with dimensions **600 x 200** and an air flow of 400 m³/h. The grille **DO** with dimensions **600 x 200** has, according to page 4 diagrams, for air flow equal to 400 m³/h, a pressure drop of 6,3 Pa and a noise level of 31,4 dB. A grille **G1S** with dimensions **600 x 200** has, according to its respective selection diagrams, for air flow equal to 400 m³/h, a pressure drop of 3,8 Pa and a noise level of 10,7 dB.

The total pressure drop inside the grille **DO.G1** with dimensions **600 x 200** is the algebraic sum of the pressure drop inside the **DO** grille and the pressure drop inside the **G1S** grille : $\Delta p_{DO} + \Delta p_{G1S} = 6,3 + 3,8 = 10,1$ Pa.

The total noise level is calculated by using the following equation: $L_{tot} = L_{DO} \oplus L_{G1S} = L_{max} + C(\Delta L)$. The difference between the noise levels of the 2 independent sound sources (the **DO** grille and the **G1S** grille) is $\Delta L = 20,7$. Therefore from the following diagram we determine that for $\Delta L = 20,7$ the correction factor $C(\Delta L)$ is equal to 0,05. So, the total noise level is $L_{tot} = L_{max} + C(\Delta L) = 31,4 + 0,05 = 31,45$ dB.



CALCULATING THE TOTAL NOISE LEVEL BETWEEN 2 INDEPENDENT SOUND SOURCES

Since noise in [dB] is a quantity that is defined in logarithmic scale, when we have 2 (or more) independent sound sources, the total noise is not calculated by the algebraic sum of the 2 sources. The "sum" of 2 sound sources L1, L2 is symbolized by the internationally defined symbol \oplus and is calculated by using the following equation :

$L_{tot} = L1 \oplus L2 = 10 \times \log(10^{0,1 \times L1} + 10^{0,1 \times L2})$

Because of the previous equation requiring some complex calculations, we can define the sum of 2 sound sources with sufficient accuracy using the following approximate equation :

$L_{tot} = L1 \oplus L2 = L_{max} + C(\Delta L)$,

where L_{max} is the largest noise level between L1 and L2 and $C(\Delta L)$ a correction factor (in dB) which depends on the difference $\Delta L = |L2 - L1|$ and is calculated by using the following diagram.



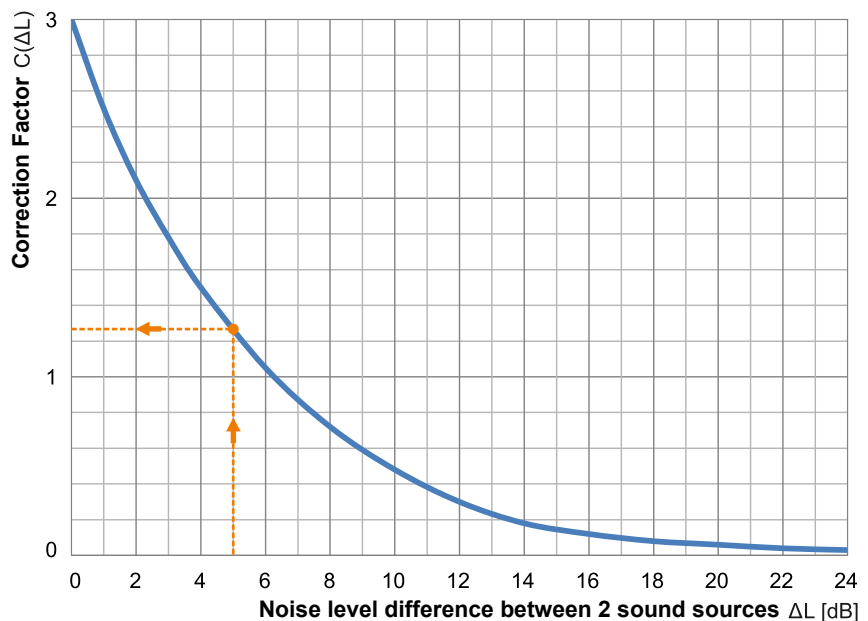
Calculation example

We have a grille which produces noise $L1 = 25$ dB in an area. If, in the same area, the noise produced from a 2nd independent grille is $L2 = 30$ dB, then the total noise level is calculated as follows:
 $L_{tot} = L1 \oplus L2 = L_{max} + C(\Delta L)$.

We have
 $L_{max} = L2 = 30$ dB and
 $\Delta L = L2 - L1 = 5$ dB

From the adjacent diagram we define that for ΔL equal to 5 dB the correction factor is $C(\Delta L) = 1,2$ dB.

Therefore the total noise level is:
 $L_{tot} = 25 \oplus 30 = 30 + C(5) \approx 30 + 1,2 = 31,2$ dB.



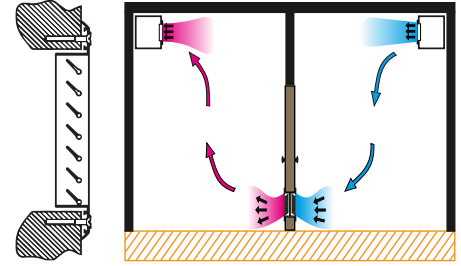


INSTALLATION METHODS

Door grilles **DO** can be installed with the following ways :

Visible installation with screws

For easy, quick and secure installation. The number of screws required depends on the size of the grille. Bigger grilles require greater number of screws.



APPLICATIONS

- ◆ Indirect air conditioning between 2 adjacent spaces.
- ◆ Indirect ventilation between 2 adjacent spaces.
- ◆ Ventilation of many spaces by a central ventilation system with no return air-ducts (like office or hotel spaces).

DO - ORDER CODIFICATION

For the proper order of return grilles **DO** please use the following codification :

DO + **400** x **400** | **RAL, I, C, GL**

RAL	= Blades & frame from aluminium painted in RAL color
C	= Blades & frame from copper
GL	= Blades & frame from galvanized steel
I	= Blades & frame from stainless steel
Blank	= Blades & frame from anodized aluminium
Grille height [mm]	
Grille width [mm]	
DO	= Standard construction with plain frame on the other side
DO.2	= DO grille on both sides
DO.G1	= DO grille and G1 grills with 1-row of blades on the other side

Examples

DO 600 x 400 =

Door grille **DO**, **600 mm** in width, **400 mm** in height, blades and frame from aluminium and additional plain frame.

DO.G1 600 x 400 | 9005 =

Door grille **DO** with additional **G1** grille, **600 mm** in width, **400 mm** in height, blades and frame from aluminium powder painted in RAL9005.

All grilles can be powder painted in any RAL color, under request.
For the full range of RAL colors please contact us.



Color examples



SPECIFICATIONS

Door grille, with additional frame, DO

Rectangular door grille, indicative type **DO** by **AIRTECHNIC**, manufactured of anodized aluminum / aluminum painted in RAL... color / copper / galvanized steel / stainless steel and 1 row of fixed Λ -shaped blades, parallel to the 1st dimension, for zero visibility between the 2 adjacent spaces. The manufacturer will have performed measurements of the technical characteristics of the grille, in an independent laboratory according to the standard ISO 5219-1984. It will have an additional plain frame for installation on the other side of the opening (wall or door). It will be suitable for wall or door placement, for air transfer (supply or exhaust) between 2 adjacent spaces and visible installation with screws. The factory will be certified according to **ISO 9001:2015** (Quality Management Systems) and according to **ISO 14001:2015** (Environmental Management Systems). It will be manufactured by **AIRTECHNIC** type **DO**

Door grille, with additional frame, DO.2

Rectangular door grille, indicative type **DO.2** by **AIRTECHNIC**, manufactured of anodized aluminum / aluminum painted in RAL... color / copper / galvanized steel / stainless steel and 1 row of fixed Λ -shaped blades, parallel to the 1st dimension, for zero visibility between the 2 adjacent spaces. The manufacturer will have performed measurements of the technical characteristics of the grille, in an independent laboratory according to the standard ISO 5219-1984. It will consist of 2 DO grilles which will be installed on each side of the opening (wall or door). It will be suitable for wall or door placement, for air transfer (supply or exhaust) between 2 adjacent spaces and visible installation with screws. The factory will be certified according to **ISO 9001:2015** (Quality Management Systems) and according to **ISO 14001:2015** (Environmental Management Systems). It will be manufactured by **AIRTECHNIC** type **DO.2**

Door grille, with additional frame, DO.G1

Rectangular door grille, indicative type **DO.G1** by **AIRTECHNIC**, manufactured of anodized aluminum / aluminum painted in RAL... color / copper / galvanized steel / stainless steel and 1 row of fixed Λ -shaped blades, parallel to the 1st dimension, for zero visibility between the 2 adjacent spaces. The manufacturer will have performed measurements of the technical characteristics of the grille, in an independent laboratory according to the standard ISO 5219-1984. It will have an additional G1 grille with 1 row of blades for installation on the other side of the opening (wall or door). It will be suitable for wall or door placement, for air transfer (supply or exhaust) between 2 adjacent spaces and visible installation with screws. The factory will be certified according to **ISO 9001:2015** (Quality Management Systems) and according to **ISO 14001:2015** (Environmental Management Systems). It will be manufactured by **AIRTECHNIC** type **DO.G1**





ISO 9001:2015



ISO 14001:2015

Management System
ISO 14001:2015
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2024-05-24



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