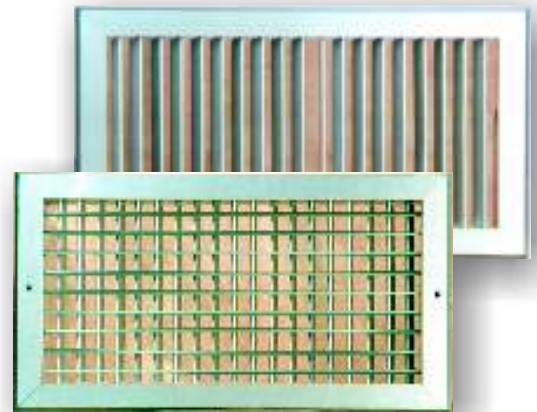


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GENERAL FEATURES

Air terminal devices of group T are air grilles (diffusers) with rectangular cross sections mounted on walls. Series T grilles have either one or two series of blades. They are manufactured in four main types :

- T1H: With one series of adjustable blades, aligned parallel to their larger dimension
- T1V: With one series of adjustable blades, aligned perpendicular to their larger dimension
- T2H: With two series of adjustable blades, with the first series aligned parallel to their larger dimension
- T2V: With two series of adjustable blades, with the first series aligned perpendicular to their larger dimension.

Air grilles of series T are mainly used for air supply from vertical planes, e.g. walls, sides of air ducts, etc. They can also be mounted on horizontal or inclined surfaces for vertical or inclined air supply. Their blades may be adjusted, making it possible for the air jet direction and morphology to be manipulated, resulting in more efficient operation for any room geometry. They may be equipped with volume flow regulating dampers of D series, and/or air filter of series F. They are manufactured at any size, however their usual dimensions are shown in the table of p. T2.

Anodized aluminum profile is used for their construction providing long life. Along their perimeter they are equipped with an aluminum gasket and a foamy elastic sealing strip.

The vertical series of blades of the T2 series grilles may be adjusted in three different angles, namely 0°, 22,5° and 45°, as can be seen from the next figure. The resulting air jet morphology varies with the inclination angle, increasing the jet span.

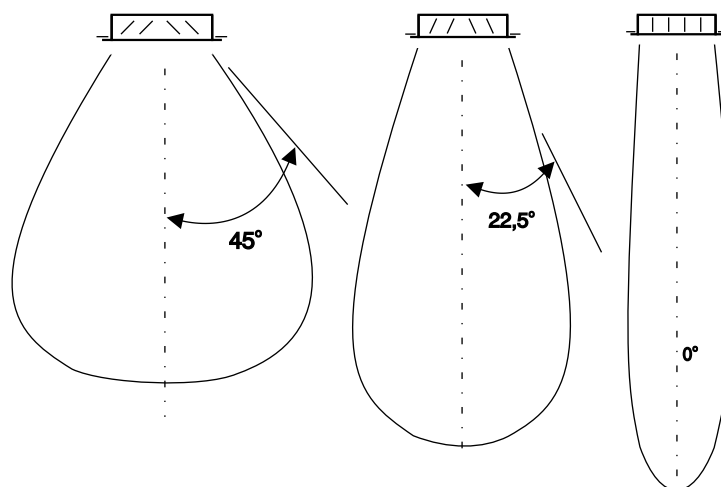


Figure T1: Jet span related to vertical blades inclination angle.

VENTILATION GRILLES - SERIES T - Dimensions



The dimensions of the grilles of series T are shown in the following figure. For selection and ordering purposes their nominal opening dimensions AXB are used.

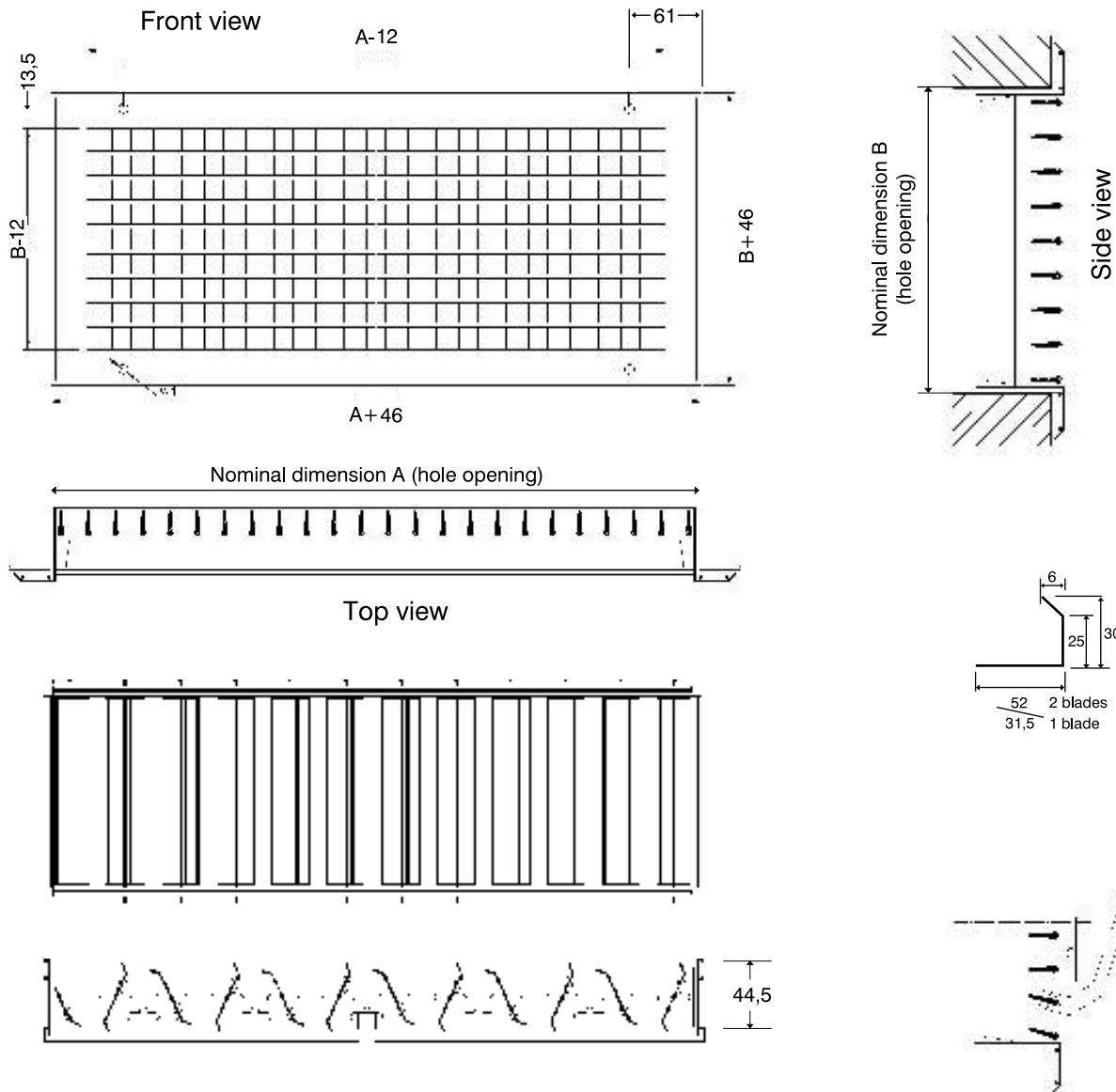


Table of the most common nominal dimensions of series T grilles. **The table shows also the appropriate diagrams to be used for the estimation of the grilles' characteristics.**

W[cm]

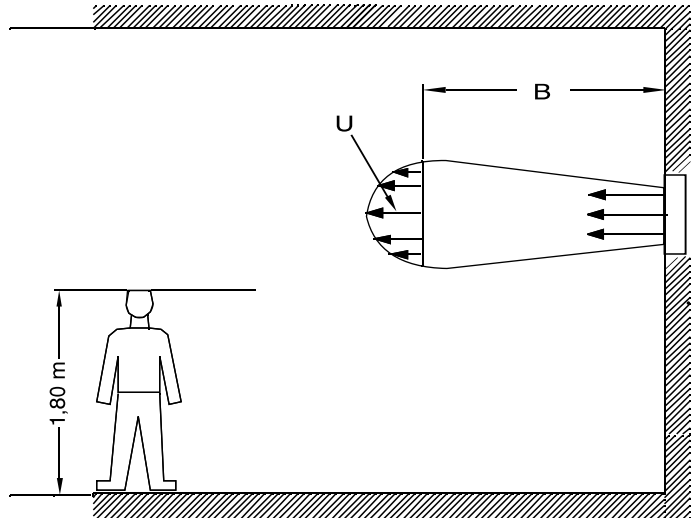
B [cm]

- Diagrams of page T5
- Diagrams of page T6
- Diagrams of page T7
- Diagrams of page T8
- Diagrams of page T9

	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
10	11	14	16	18	20	21	23	24	25	26	28	29	30	31	32	33	34	35	36
15	14	17	20	22	24	26	28	29	31	32	34	35	37	38	39	40	41	43	44
20	16	20	23	25	28	30	32	34	36	37	39	41	42	44	45	47	48	49	50
25	18	22	25	28	31	33	36	38	40	42	44	45	47	49	50	52	54	55	56
30	20	24	28	31	34	37	39	41	44	46	48	50	52	54	55	57	59	60	62
35	21	26	30	33	37	40	42	45	47	50	52	54	56	58	60	62	63	65	67
40	23	28	32	36	39	42	45	48	50	53	55	58	60	62	64	66	68	70	71
45	24	29	34	38	41	45	48	51	54	56	59	61	63	66	68	70	72	74	76
50	25	31	36	40	44	47	50	54	56	59	62	64	67	69	71	74	76	78	80
55	26	32	37	42	46	50	53	56	59	62	65	67	70	72	75	77	79	82	84
60	28	34	39	44	48	52	55	59	62	65	68	70	73	76	78	81	83	85	87
65	29	35	41	45	50	54	58	61	64	67	70	73	76	79	81	84	86	89	91
70	30	37	42	47	52	56	60	63	67	70	73	76	79	82	84	87	90	92	94
75	31	38	44	49	54	58	62	66	69	72	76	79	82	85	87	90	93	95	98
80	32	39	45	50	55	60	64	68	71	75	78	81	84	87	90	93	96	98	101
85	33	40	47	52	57	62	66	70	74	77	81	84	87	90	93	96	99	101	104
90	34	41	48	54	59	63	68	72	76	79	83	86	90	93	96	99	102	104	107
95	35	43	49	55	60	65	70	74	78	82	85	89	92	95	98	101	104	107	110
100	36	44	50	56	62	67	71	76	80	84	87	91	94	98	101	104	107	110	113

Shape of the air jet

Possible air jet configurations using T series grilles are shown in the adjacent figures. The blades of the grilles may be adjusted in order to produce an inclined or a dispersed air jet. For heating purposes the T series grilles may also be mounted on ceilings.



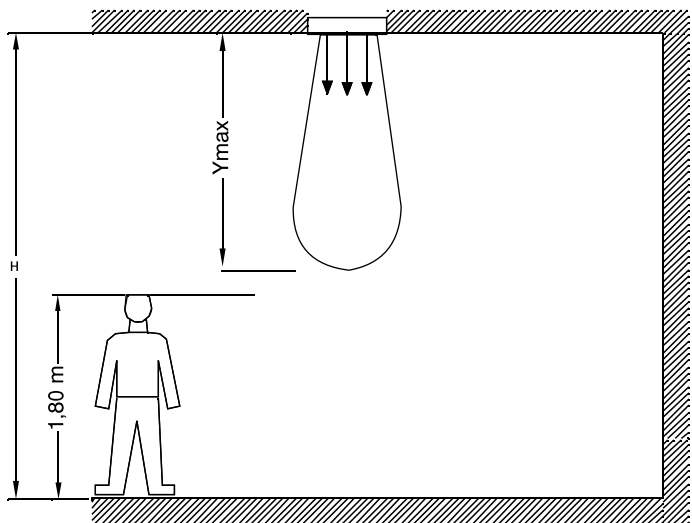
Selection of series T grilles

While selecting grilles of T series it is important that the air jet conditions, i.e temperatures and velocities in the occupied zone are within specifications (e.g. CEN-CR-1752).

For the selection of T2 series grilles the diagrams of pages T5 - T9 are used. The grilles' selection is based on their equivalent diameter. The equivalent diameter can be found for each grille from table on page T2.

The equivalent diameter table may be used for identifying the diagrams to be used for the determination of the grille's characteristics. The selection diagrams provide data for the following parameters:

- Throw of horizontal air jets (isothermal jet and 0,5 m/s final velocity)
- Pressure drop.
- Mean air velocity at the grille.
- Noise.
- Drop/rise of a non-isothermal horizontal air jet
- Maximum throw of vertical non-isothermal air jets.



For T1 grille characteristics one may use the diagrams of pages T5 - T9, but the noise level Θ should be reduced by 0,2 dBA and the pressure drop ΔP by 0,5 Pa. The throw remains the same for both grille types.

For return air applications using T series grilles the diagrams of pages T5 - T9 may be used for the estimation of the required pressure drop. From the same diagrams the resulting noise should be reduced by 3 dBA.

The recommended noise levels to be used for grille selection are depicted in the following table :

Nomenclature

Vo[m³/h]: Air volume flow

Uo [m/s]: Air velocity at the grille

Deq [m]: Grille equivalent diameter

B [m] : Horizontal air throw (distance from the grille where the air jet has a velocity of 0,5 m/s)

X [m] : Horizontal distance from the grille

Y [m] : Vertical air throw or drop/rise

ΔP [Pa]: Pressure drop

Θ [dBA]: Noise level

ΔT [°C] : Temperature difference (air jet temperature - return air temperature)

Sound rooms, libraries, studios	under 30dBA
Offices, homes, hospital rooms, churches, hotel rooms, theaters	25 to 35dBA
Public buildings, restaurants, public places, banks	30 to 40dBA
Factories, gyms, shops, etc.	35 to 50dBA

The values are indicative and may not represent every case.

Selection examples

For a space to be properly ventilated 5000 m³/h of air are required. The space hosts offices and the acceptable noise level is 35 dBA. What is the appropriate size of ten identical type T2H square grilles vertically mounted to cover the previous need? What are their operational characteristics?

From the equivalent diameter table of page T2 and for square grilles the corresponding diagrams are the ones on page T5. From the noise level diagram T5.2 one may find that by using ten identical T2H grilles with 500 m³/h air flow each, the equivalent diameter of the grilles should be $D_{eq} = 0,26$ m. Thus, from the equivalent diameter table one may select grilles of dimensions 250x250mm or better 230x230 mm.

The operation data for these grilles are :

Pressure drop around $\Delta P = 11,5$ Pa (Diagram T5.2),

Air velocity at the grille around $U_o = 3,8$ m/s (Diagram T5.1),

Air throw around $B = 12,8$ m (Diagram T5.1).

What is the appropriate height for the above grilles to be mounted on sidewalls, when they operate with cool air of 500m³/h each and with $\Delta T = 10^{\circ}C$, so that the air jet would not enter the occupied zone for a distance less than 4 m away from the walls?

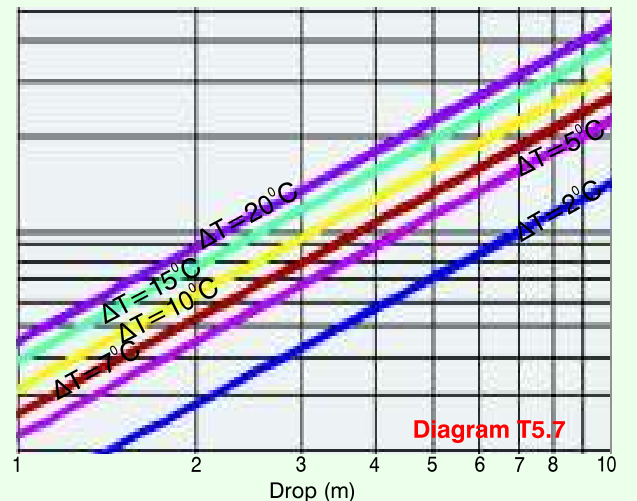
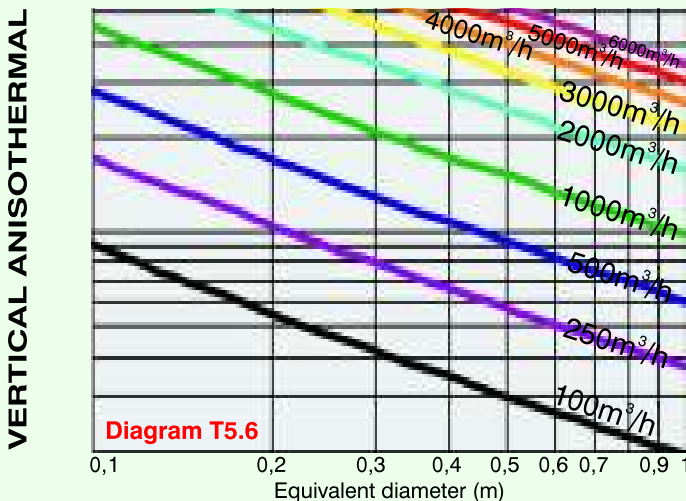
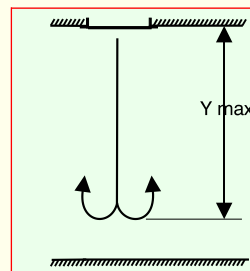
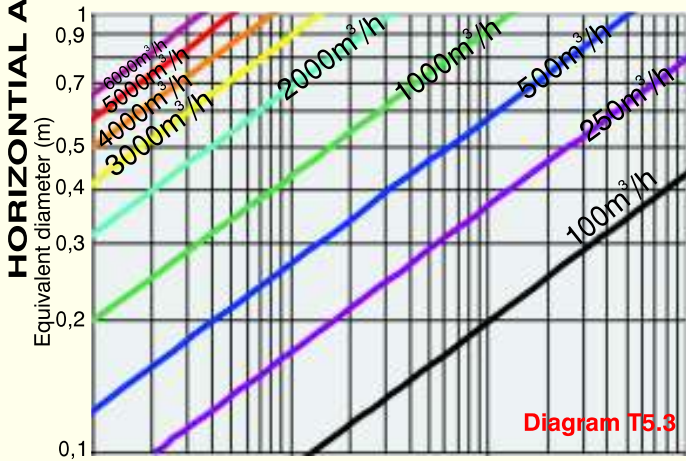
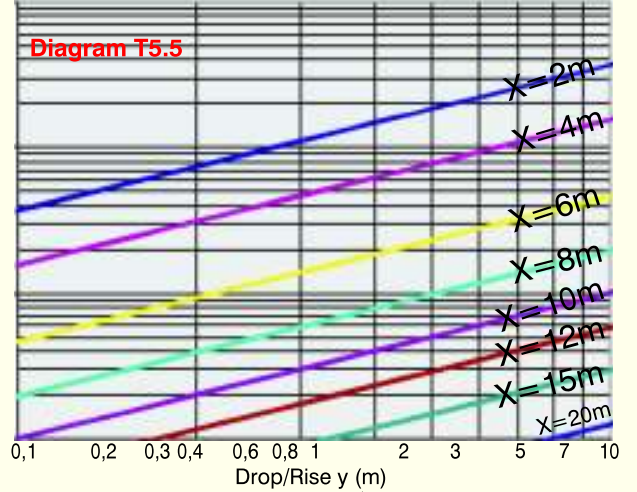
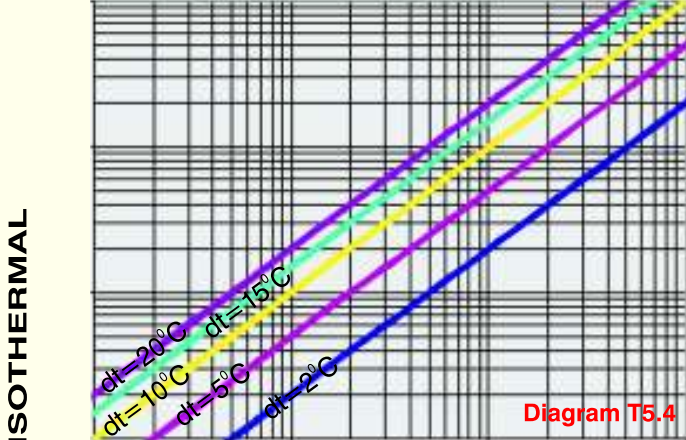
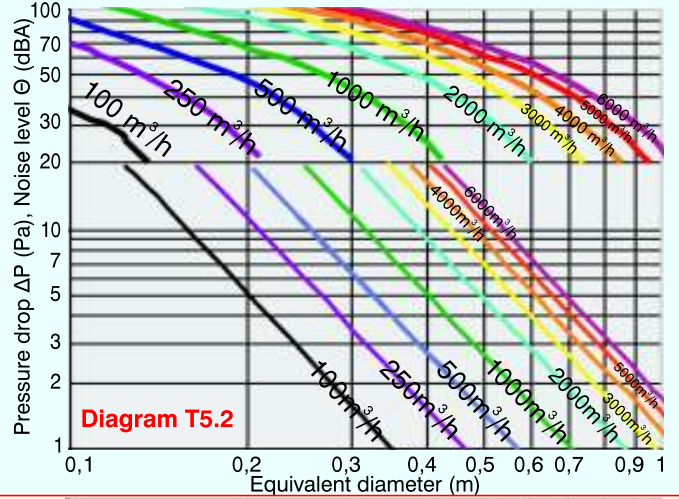
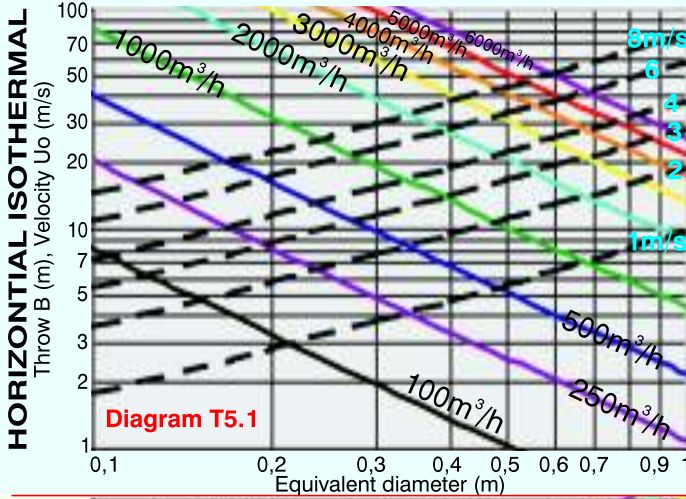
From Diagram T5.3 and for $D_{eq} = 0,26$ m, moving first vertically to Diagram T5.4 and curve corresponding to $\Delta T = 10^{\circ}C$, and then horizontally to Diagram T5.5 and curve corresponding to distance 4 m from the sidewall, one reads a drop of 0,5 m. This means that since the occupied zone is 1,8 m from the floor, the grilles should be mounted at a height greater than $H = 1,8 + 0,5 = 2,3$ m.

For heating the same office space T2H ventilation grilles of size 500x100 have been chosen and are to be mounted on the ceiling. Which is the appropriate air flow rate for a grille supplying hot air of a $\Delta T = 5^{\circ}C$, keeping the maximum throw below 2 m?

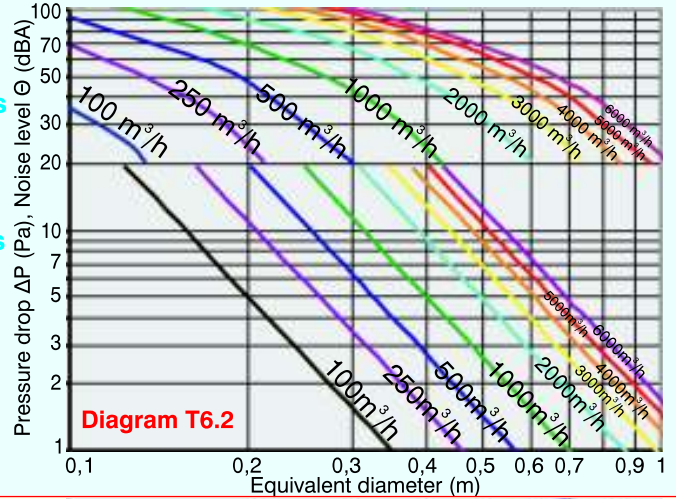
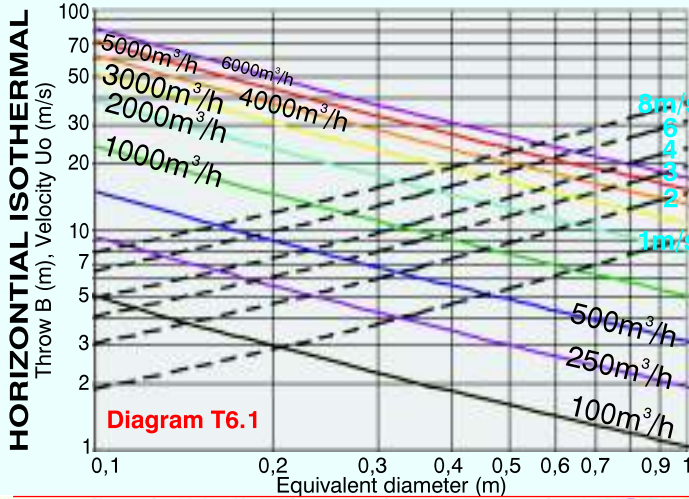
From the equivalent diameter table of page T2 the equivalent diameter is found to be $Deq = 0,25$ m while the corresponding diagrams are the ones on page T7. From Diagrams T7.6 and T7.7 it can be found that for $Deq = 0,25$ m and 100 m³/h the maximum throw is around 2,1 m to $\Delta T = 5^{\circ}C$. For the same grille dimensions and from Diagrams T7.1 and T7.2, the velocity at the grille is below 1 m/s, the pressure drop $\Delta P = 2,5$ Pa and the corresponding noise Θ is below 20 dBA, and well below the 35 dBA noise level appropriate for office ventilation.

The following selection diagrams may be used for grille selection as good approximation.
For more accurate grill selection please refer to Breezemaster software program
at www.aerogrammi.gr

LINEAR GRILLES - SERIES T - Selection Diagrams



LINEAR GRILLES - SERIES T - Selection Diagrams



HORIZONTAL ANISOTHERMAL

