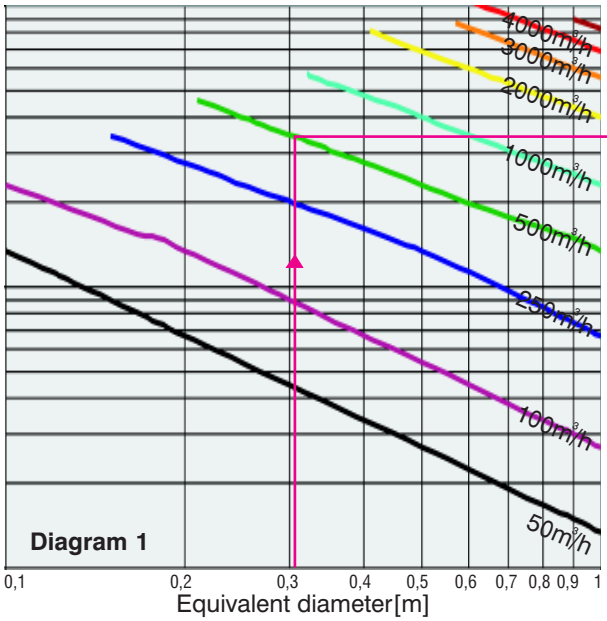
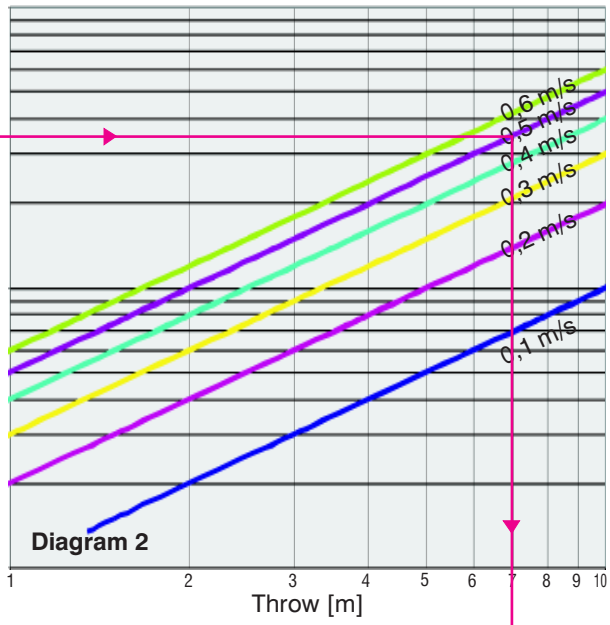
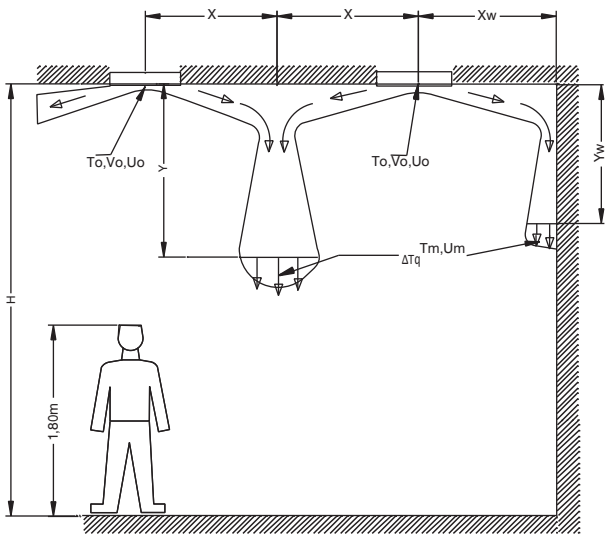
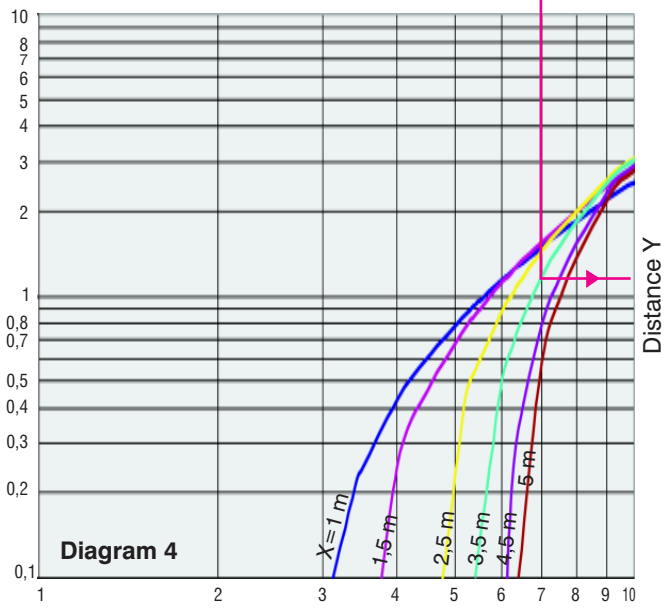
Air discharge parallel to the ceiling - 8 mm blade opening

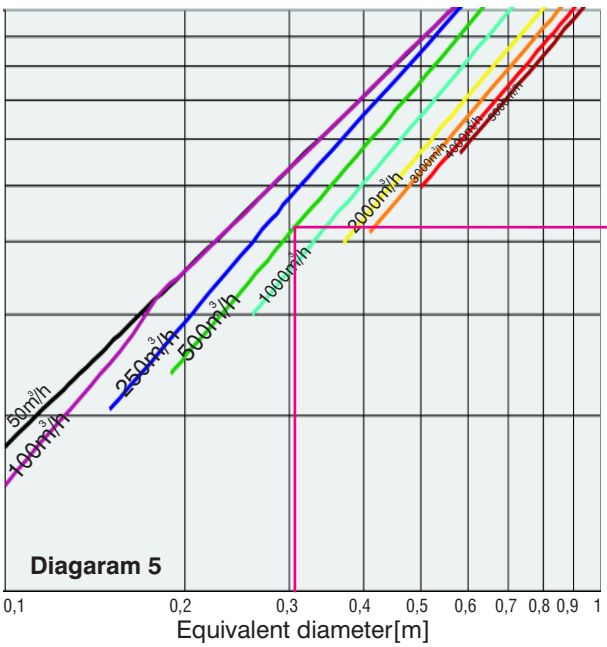


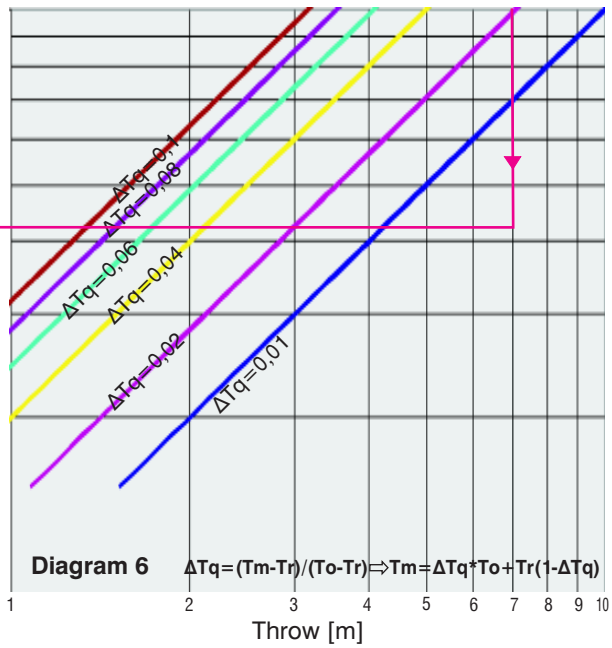




Horizintal air discharge - cooling mode -







Selection example - detailed calculation of the air jet characteristics

What are the jet characteristics resulting from the use of OK2 grilles with nominal dimensions 450X450 mm and for air volume flow rate of 500 m^3/h ? What should be the distance between these grilles so that at distance Y = 0,9m from the ceiling the air velocity Um = 0,3 m/s and what is the temperature Tm at this point if the air inlet temperature is To=18°C and the room temperature Tr=25°C?

The equivalent diameter of the 450x450 mm OK2 grille is found from table OK2 to be≃ 0,36 m. From Diagram 1 for an equivalent diameter of D_{eq} = 0,36 m and flow rate of Vo = 500/2=250 m^3/h, moving horizontally to Diagram 2 we reach the line corresponding to Um = 0,3 m/s at horizontal distance from the grille of 5,6 m. From this position moving vertically towards Diagram 4, distance 2X = 3 m is found for Y = 0,9 m. From Diagram 5 for D_{eq} = 0,36 m and Vo = 250 m^3/h, moving horizontally to Diagram 6 and for distance 5,6 m, ΔT_q is calculated around 0,01. Thus, Tm is almost the same as the room temperature.

What are the adequate square OK2 grille dimensions for ventilating a space of height H = 4,1 m placed at a distance 2X = 3m, with Vo = 500 m^3/h, so that the final air jet velocity to be 0,2 m/s at height 0,3m over the people moving area - 1,8 m from the floor - ?

The vertical distance from the ceiling Y should be less than 4,1 - 0,3 - 1,8 = 2 m. For this distance and from the line corresponding to distance 2X = 3m (X=1,5m) from Diagram 4, moving vertically to Diagram 2 up to Um = 0,2 m/s and then horizontally to Diagram 1, one reads for Vo = 250 m^3/h an equivalent diameter D_{eq} = 0,36 m. From Table OK2 and for this diameter it is found that the grille should be of dimensions 450X450mm.

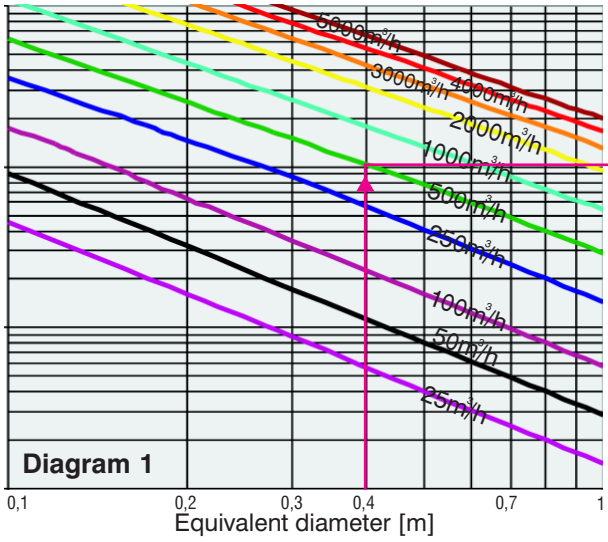
Vertical air discharge - Heating mode

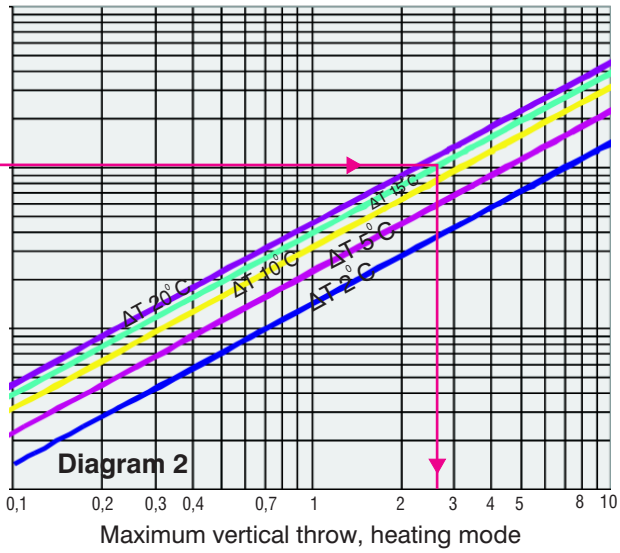
What is the maximum throw using a series OK2 grille of dimensions 450X600mm for vertical air stream of 1000 m^3/h and ΔT = 15° *C?*

From Table OK2 the equivalent diameter is found to be 0,4 m. For this diameter and Vo = 500 m^3/h moving horizontally from Diagram 1 to Diagram 2 and for ΔT = 15° C, a vertical throw of Y = 2,6 m is calculated.

Yw=0,532 y

Vertical throw - 14 mm Blade opening





	15	20	25	30	35	40	45	50	60	70	80	90	100
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20	14	16	18	20	21	23	24	25	28	30	32		
25	15	18	20	22	24	25	27	28	31	33	36	38	40
30	17	20	22	24	26	28	29	31	34	37	39	41	44
35	18	21	24	26	28	30	32	33	37	40	42	45	47
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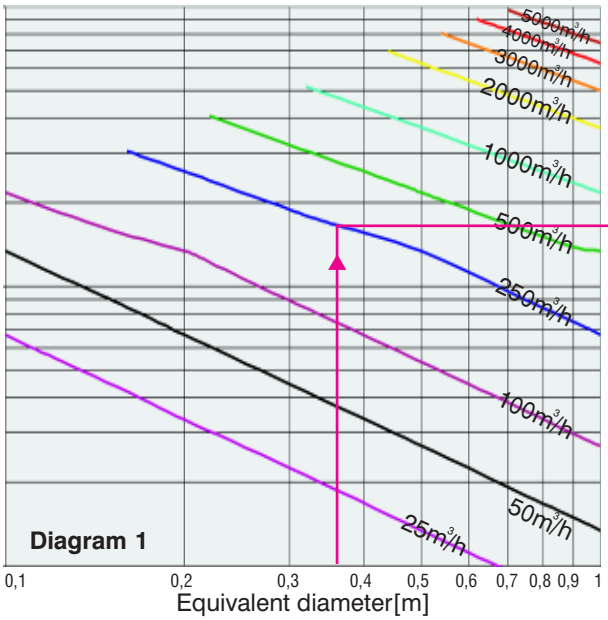
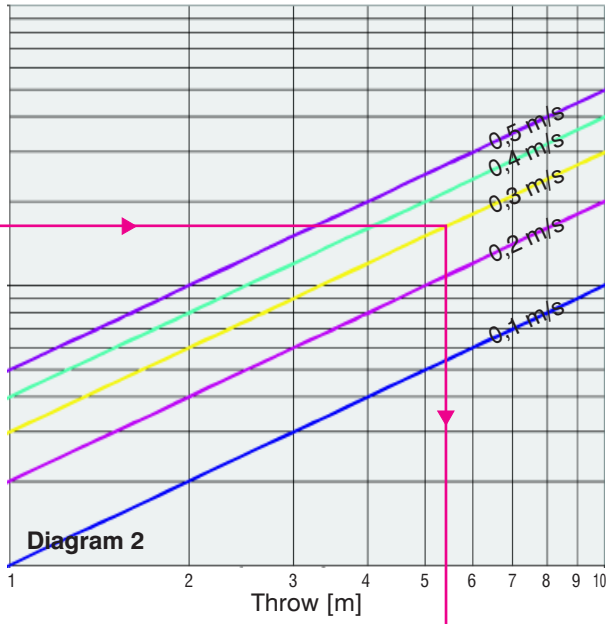
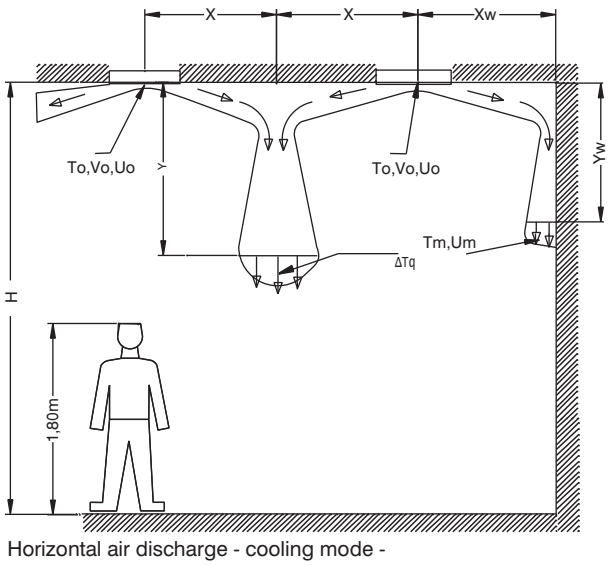
45	21	24	27	29	32	34	36	38	41	45	48	51	54
50	22	25	28	31	33	36	38	40	44	47	50	54	56
60	24	28	31	34	37	39	41	44	48	52	55	59	62
70		30	33	37	40	42	45	47	52	56	60	63	67
80		32	36	39	42	45	48	50	55	60	64	68	71
90			38	41	45	48	51	54	59	63	68	72	76
100			40	44	47	50	54	56	62	67	71	76	80

TABLE OK2 : EQUIVALENT DIAMETER (in cm)

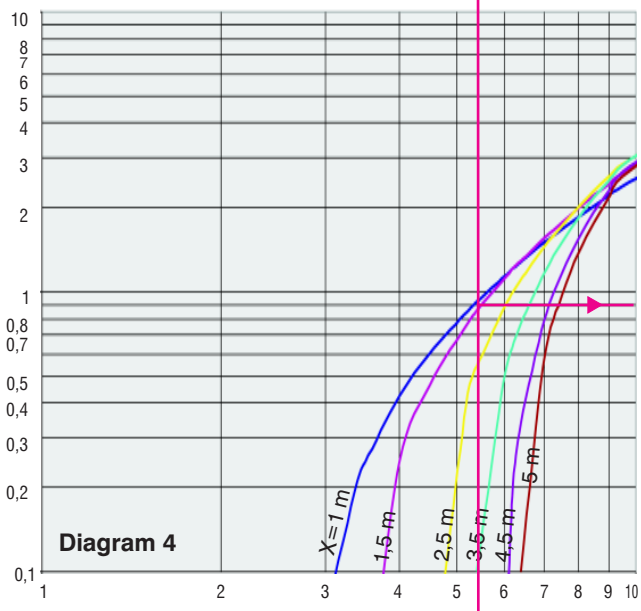
Air discharge parallel to the ceiling Blade opening of 8 mm

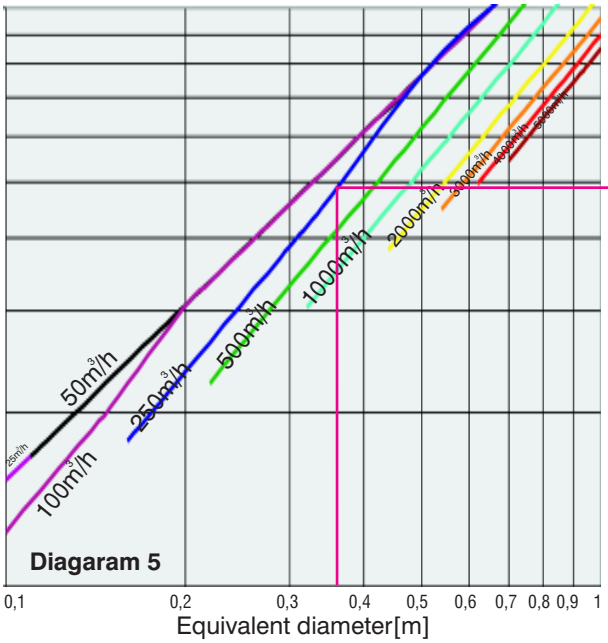


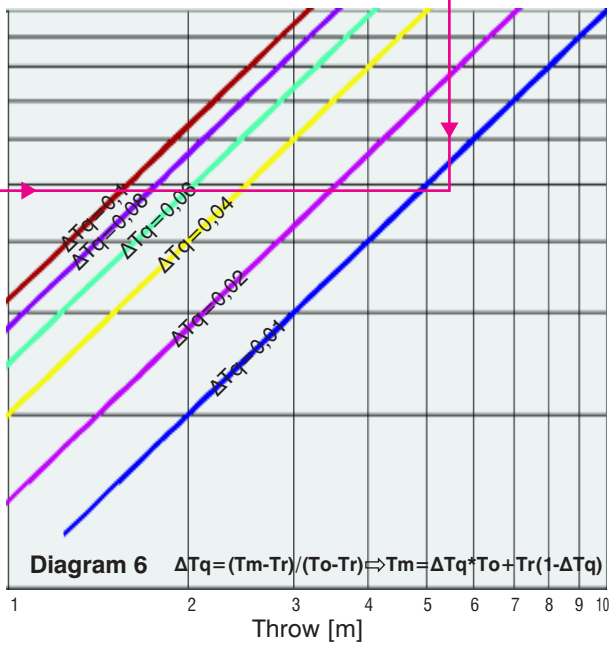




Horizontal air discharge - cooling mode -







Selection example - detailed calculation of the air jet characteristics

What are the jet characteristics resulting from the use of OK3 grilles with nominal dimensions 450X450 mm and for air volume flow rate of 500 m³/h ? What is the appropriate distance between these grilles so that at distance Y = 1 m from the ceiling the air velocity Um = 0,2 m/s and what is the temperature ratio ΔTq at that position?

The equivalent diameter of the 450x450 mm OK3 grille is found from table OK3 to be ≃0,29 m. From Diagram 1 for an equivalent diameter of D_{eq} = 0,29 m and flow rate of Vo = 167 m³/h (1/3 of the total flow rate), moving horizontally to Diagram 2 we reach the line corresponding to Um = 0,2 m/s at horizontal distance from the grille of 5,5 m. From this position moving vertically towards Diagram 4, distance 2X = 2 m (X=1m) is found for Y = 1 m. From Diagram 5 for D_{eq} = 0,29 m and Vo = 167 m³/h, moving horizontally to Diagram 6 and for distance 5,5 m, ΔT_q is calculated less than 0,01.

What are the adequate square OK3 grille dimensions for ventilating a room of height H = 3 m, placed at a distance 2X = 3 m , with Vo = 750 m³/h, so that the final air jet velocity to be 0,2 m/s at height 0,5 m over the people moving area - 1,8 m from the floor - ?

The vertical distance from the ceiling Y should be less than 3 - 0,5 - 1,8 = 0,7 m. For this distance and from the line corresponding to distance 2X = 3 m from Diagram 4, moving vertically to Diagram 2 up to Um = 0,2 m/s and then horizontally to Diagram 1, one reads for Vo = 250 m³/h an equivalent diameter D_{eq} = 0,59 m. From Table OK3 and for this diameter it is found that the appropriate grille dimensions are 900X900mm.

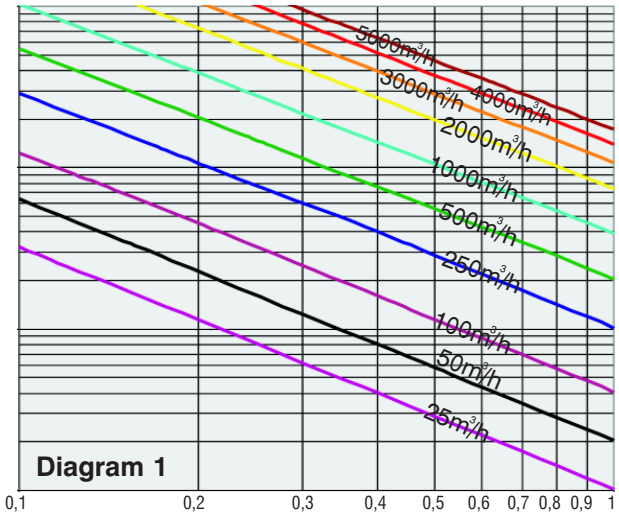
Vertical air discharge - Heating mode

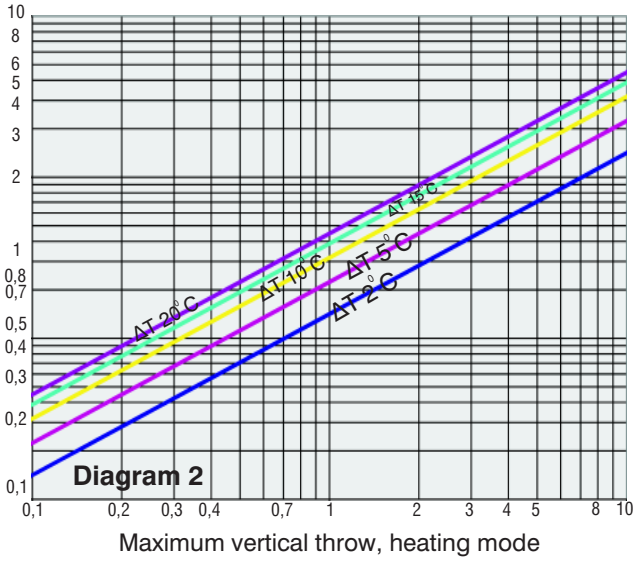
What is the maximum throw using a series OK3 grille of dimensions 150X600mm for vertical air stream of 750 m³/h and ΔT = 20° C?

From Table OK3 the equivalent diameter is found to be 0,2 m. For this diameter and Vo = 250 m³/h moving horizontally from Diagram 1 to Diagram 2 and for ΔT = 20° C, a vertical throw of Y = 2,2 m is calculated.

Yw=0,532 y

Vertical air jet projection Blade opening of 14 mm





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20	11	13	15	16	17	18	20	21	23	24	26		
25	13	15	16	18	19	21	22	23	25	27	29	31	33
30	14	16	18	20	21	23	24	25	28	30	32	34	36
35	15	17	19	21	23	24	26	27	30	32	34	37	39
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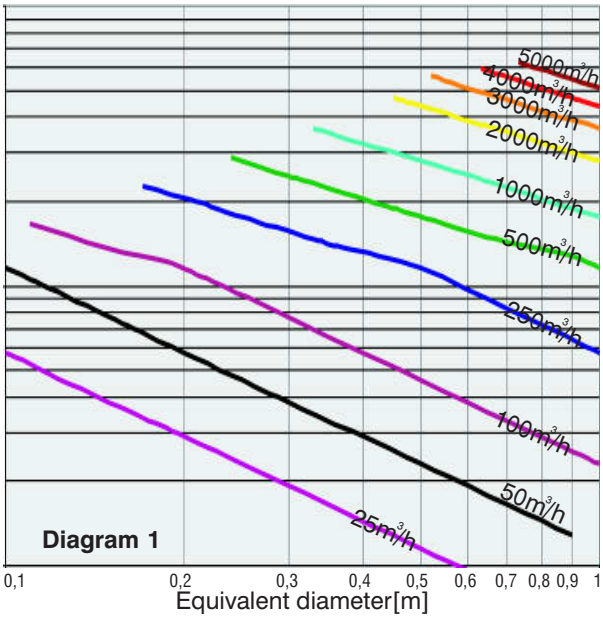
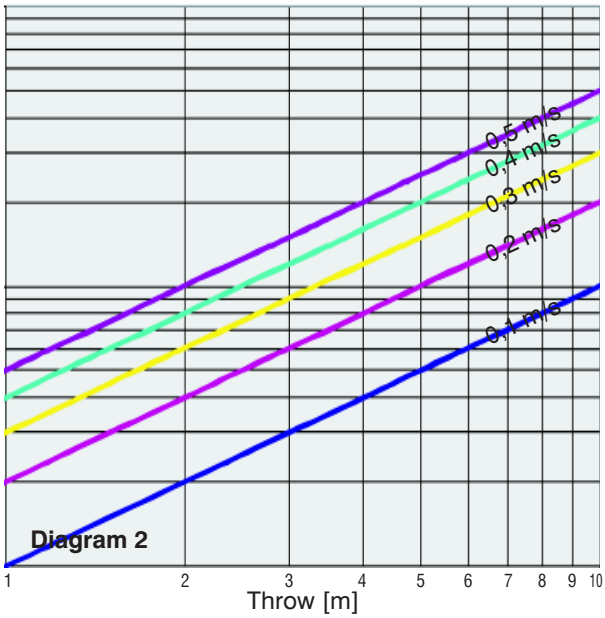
60	20	23	25	28	30	32	34	36	39	42	45	48	50
70		24	27	30	32	34	37	39	42	46	49	52	55
80		26	29	32	34	37	39	41	45	49	52	55	58
90			31	34	37	39	41	44	48	52	55	59	62
100			33	36	39	41	44	46	50	55	58	62	65

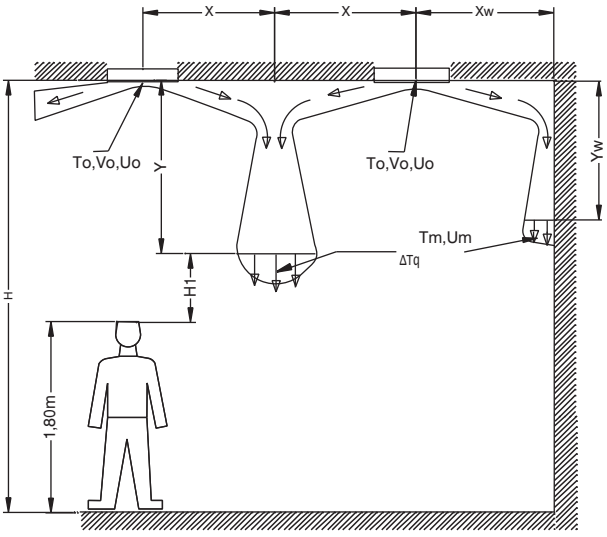
TABLE OK3 : EQUIVALENT DIAMETER (in cm)

Due to continuous development of its products, AEROGRAMMI reserves the right of modifications without prior notice.

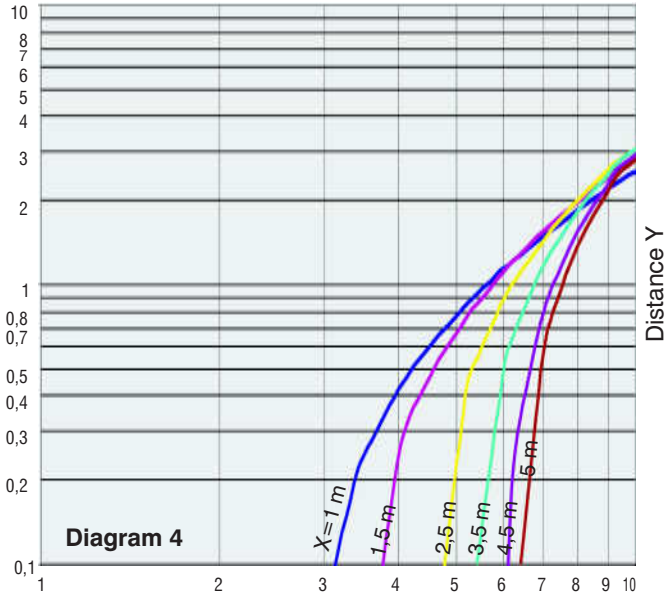
Air discharge parallel to the ceiling Blade opening of 8 mm

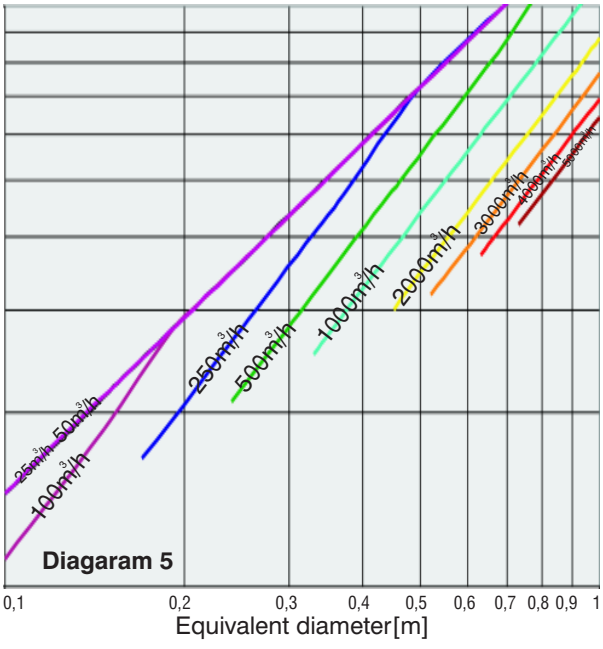


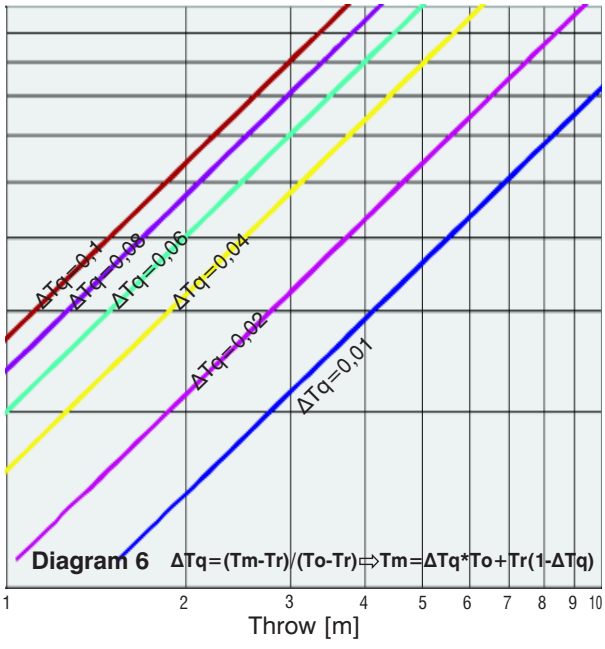




Horizontal air discharge - cooling mode -







Selection example - detailed calculation of the air jet characteristics

What are the jet characteristics resulting from the use of OK4 grilles with nominal dimensions 350X400 mm and for air volume flow rate of 500 m^3/h ? What is the appropriate distance between these grilles so that at distance Y = 1 m from the ceiling the air velocity Um = 0,2 m/s and what is the temperature ratio ΔTq at that position?

The equivalent diameter of the 350X400 mm OK4 grille is found from table OK4 to be $D_{eq} \simeq 0,21$ m. From Diagram 1 for an equivalent diameter of $D_{eq} = 0,21$ m and flow rate of Vo = 125 m^3/h (1/4 of the total flow rate), moving horizontally to Diagram 2 we reach the line corresponding to Um = 0,2 m/s at horizontal distance from the grille of 7 m. From this position moving vertically towards Diagram 4, distance 2X = 8 m is found for Y = 1 m. From Diagram 5 for $D_{eq} = 0,21$ m and Vo = 125 m^3/h, moving horizontally to Diagram 6 and for distance 7 m, ΔT_q is calculated less than 0,01.

What are the adequate square OK4 grille dimensions for ventilating a room of height H = 3,5 m while placed at a distance 2X = 5 m, with Vo = 1000 m^3/h, so that the final air jet velocity to be 0,3 m/s at height 0,2m over the people moving area - 1,8 m from the floor - ?

The vertical distance from the ceiling Y should be less than 3,5 - 0,2 - 1,8 = 1,5 m. For this distance and from the line corresponding to distance 2X = 5 m from Diagram 4, moving vertically to Diagram 2 up to Um = 0,3 m/s and then horizontally to Diagram 1, one reads for Vo = 250 m^3/h (1/4 of the total flow rate) an equivalent diameter $D_{eq} = 0,22$ m. From Table OK4 and for this diameter it is found that the appropriate grille dimensions are 450X350 or even 500X300mm.

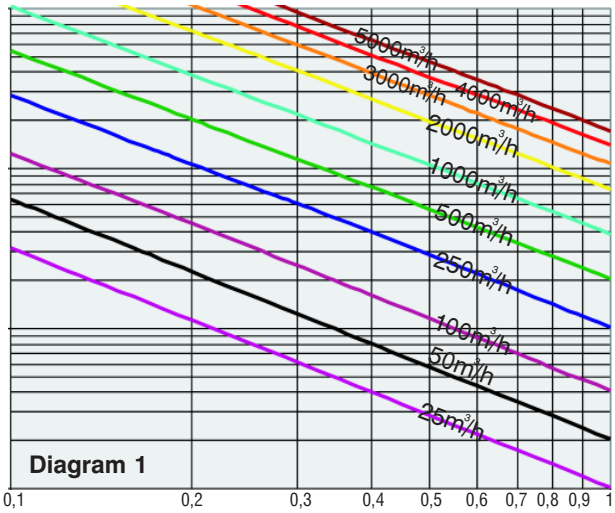
Vertical air discharge - Heating mode

What is the maximum vertical throw during heating using a series OK4 grille of dimensions 350X350mm for vertical air stream of 1000 m^3/h and ΔT = 20° C?

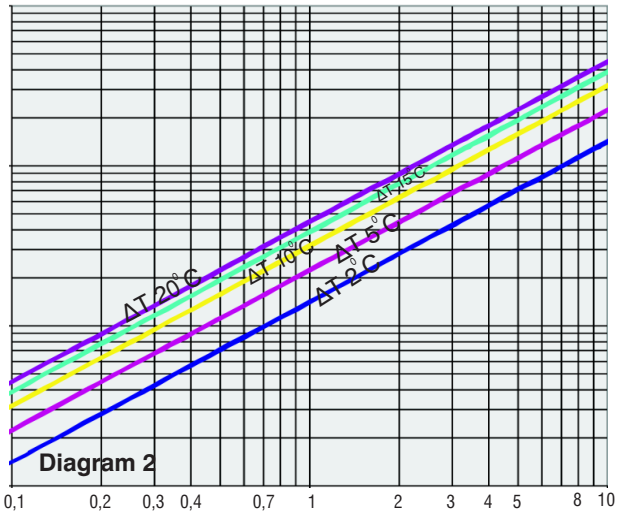
From Table OK4 the equivalent diameter is found to be 0,2 m. For this diameter and Vo = 250 m^3/h (1/4 of the total flow rate) moving horizontally from Diagram 1 to Diagram 2 and for ΔT = 20° C, a vertical throw of Y = 2,3 m is calculated.

Yw=0,532 y

Vertical discharge - 14 mm Blade opening -



Equivalent diameter [m]

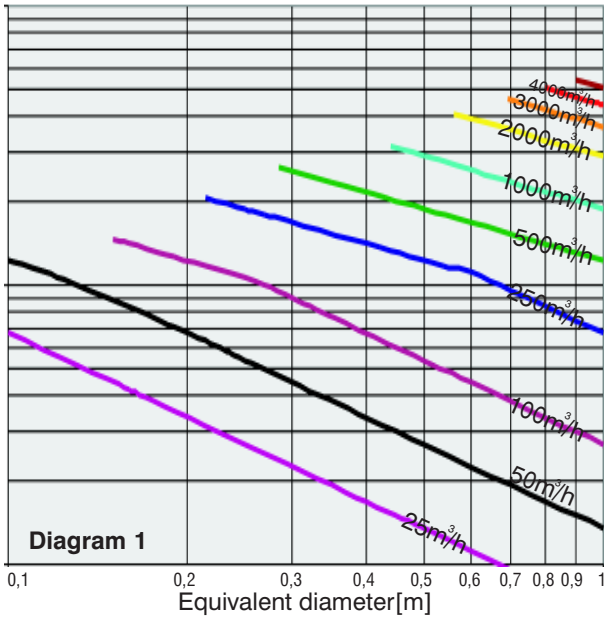


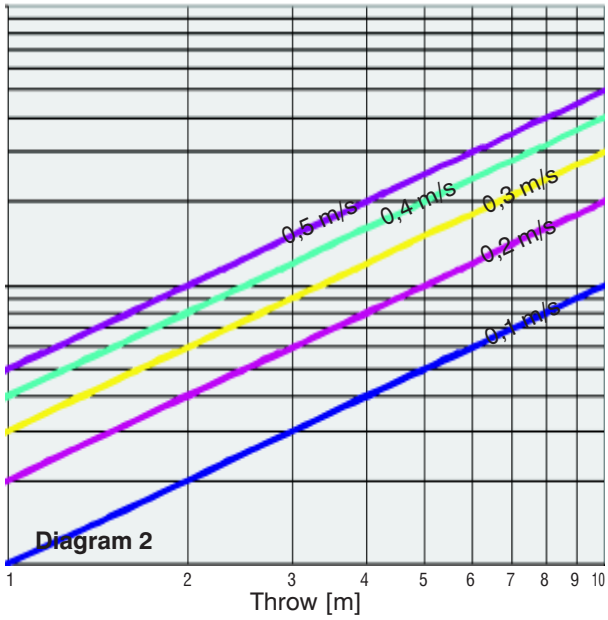
Maximum vertical throw, heating mode

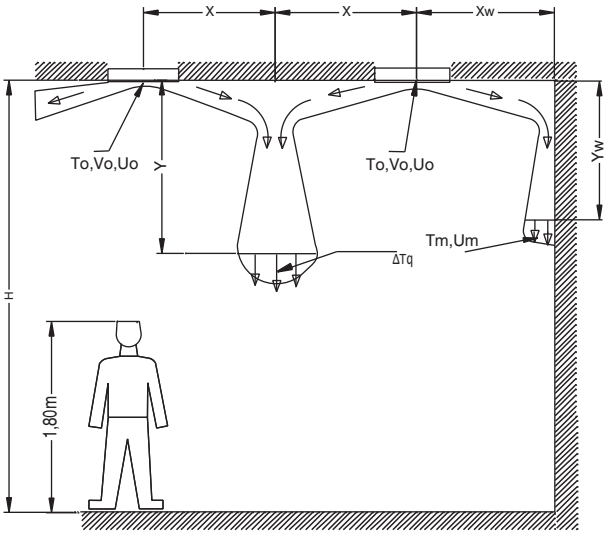
	15	20	25	30	35	40	45	50	60	70	80	90	100
15	8	10	11	12	13	14	15	15	17				
20	10	11	13	14	15	16	17	18	20	21	23		
25	11	13	14	15	17	18	19	20	22	24	25	27	28
30	12	14	15	17	18	20	21	22	24	26	28	29	31
35	13	15	17	18	20	21	22	24	26	28	30	32	33
40	14	16	18	20	21	23	24	25	28	30	32	34	36
45	15	17	19	21	22	24	25	27	29	32	34	36	38
50	15	18	20	22	24	25	27	28	31	33	36	38	40
60	17	20	22	24	26	28	29	31	34	37	39	41	44
70		21	24	26	28	30	32	33	37	40	42	45	47
80		23	25	28	30	32	34	36	39	42	45	48	50
90			27	29	32	34	36	38	41	45	48	51	54
100			28	31	33	36	38	40	44	47	50	54	56

TABLE OK4 : EQUIVALENT DIAMETER (in cm)

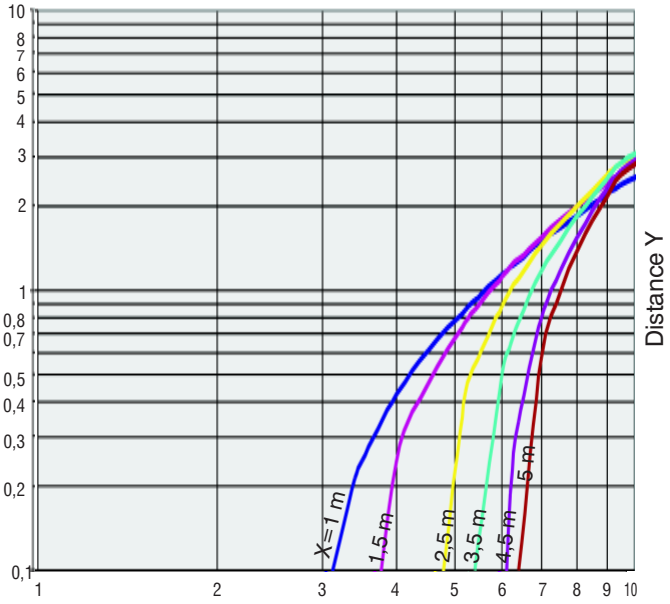
Air discharge parallel to the ceiling -Blade opening of 8 mm-

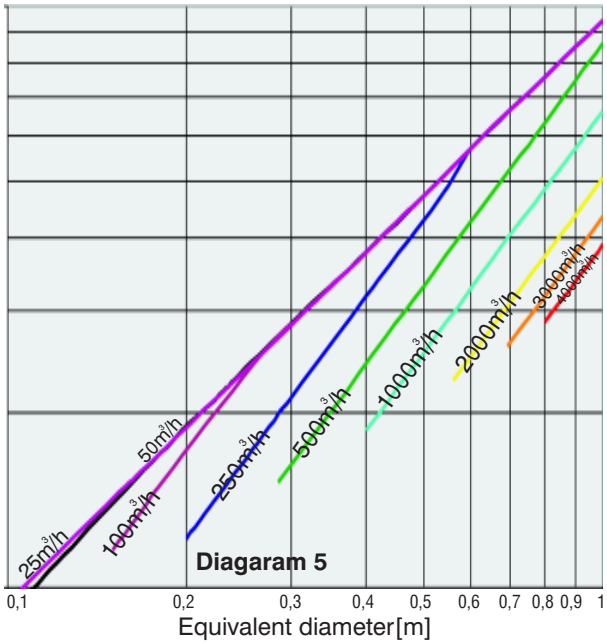


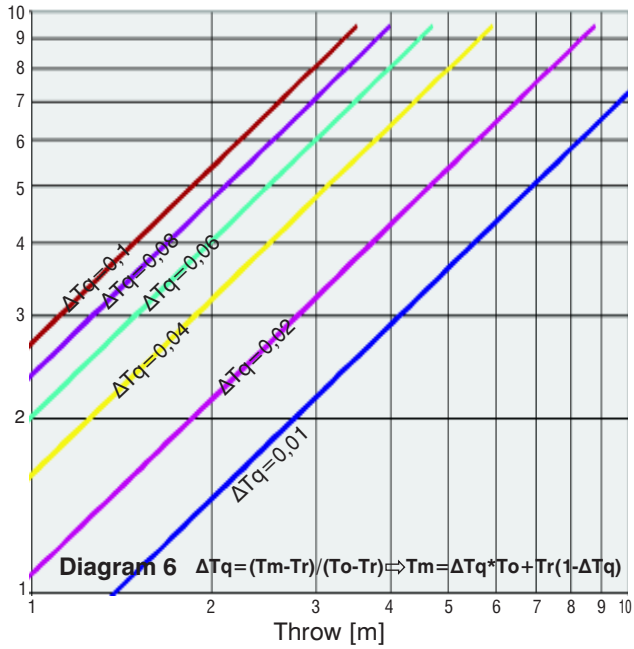




Horizontal air discharge -cooling mode-

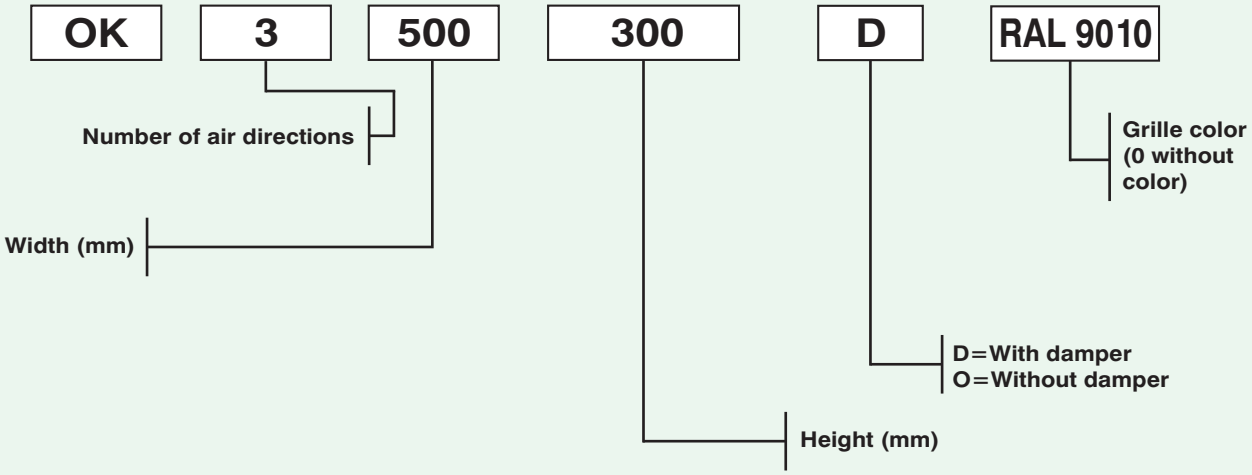






ORDER GUIDELINES

A series of numbers and letters is used to order OK series grilles. The characteristics of the air grille are defined according to the following code:



Order example

Air grille type OK3, dimensions 500X300 mm, three ways jet stream with damper and no color : **OK3 500X300 D**

Technical description

Manufactured by anodized aluminum profile of 12 μm anodic depth (or electrostatically painted, RAL...) ceiling grilles with adjustable blades, adequate for vertical or with an angle in respect to the ceiling air discharge. Totally air-tight. Could be optionally accompanied with flow regulating dampers. The damper adjustment should be possible after it has been mounted without any further action, e.g. unmounting the grille or removing part of the ceiling, etc. Their blades could be optionally moving all together in a uniform way.
Their operational characteristics should be :

SUPPLY AIR

Horizontal parallel to the ceiling air discharge.

Air supply : ..... [m^3/h]
Pressure drop (total) : ..... [Pa]
Maximum penetration distance Y with velocity Um = ... m/s and overtemperature of supplied air...°C : .... [m]
Distance between grilles for Y = ... [m] penetration of colliding jets : .... [m]
Noise level : ... [dBA]

Vertical air discharge

Air supply : ..... [m^3/h]
Pressure drop (total) : ..... [Pa]
Maximum penetration distance Y with velocity Um = ... m/s and overtemperature of supplied air.....°C :....[m]
Noise level : ... [dBA]
For more than one directions the above data should be provided for each direction separately.

RETURN AIR

Air supply :..... [m^3/h]
Pressure drop (total) : ..... [Pa]
Noise level : ... [dBA]

End of Makrigianni street (Thessaloniki's ring-road)
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www.aerogrammi.gr , e-mail:info@aerogrammi.gr