CEILING DIFFUSERS -SERIES GR- Selection examples

AEROGRAMMI

For the GR diffuser selection the diagrams of the following pages are used, depending on the diffuser type.

Selection example.

For a space to be properly ventilated 5000 m3/h of air are required. The space has a height of 4 m. The acceptable noise level is 45 dBA and the selected diffusers are of GR-AA type.

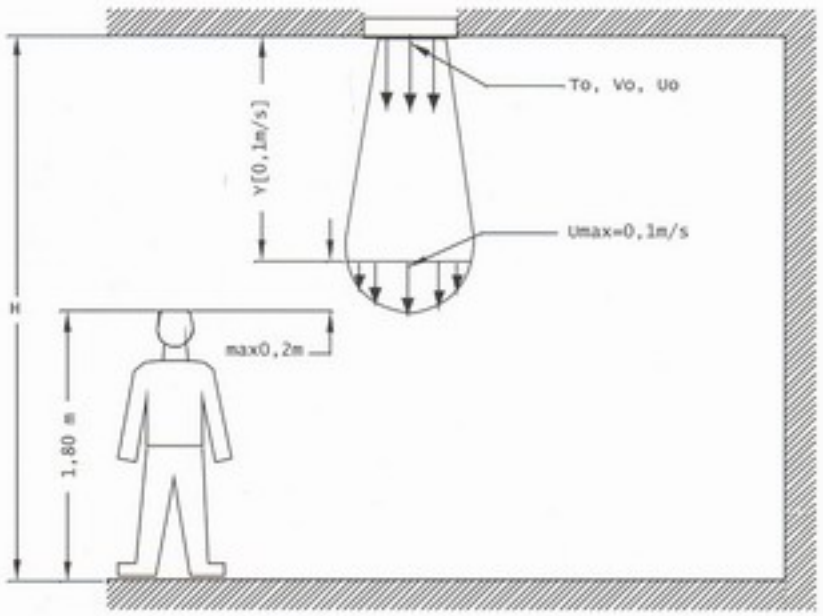
Heating application.

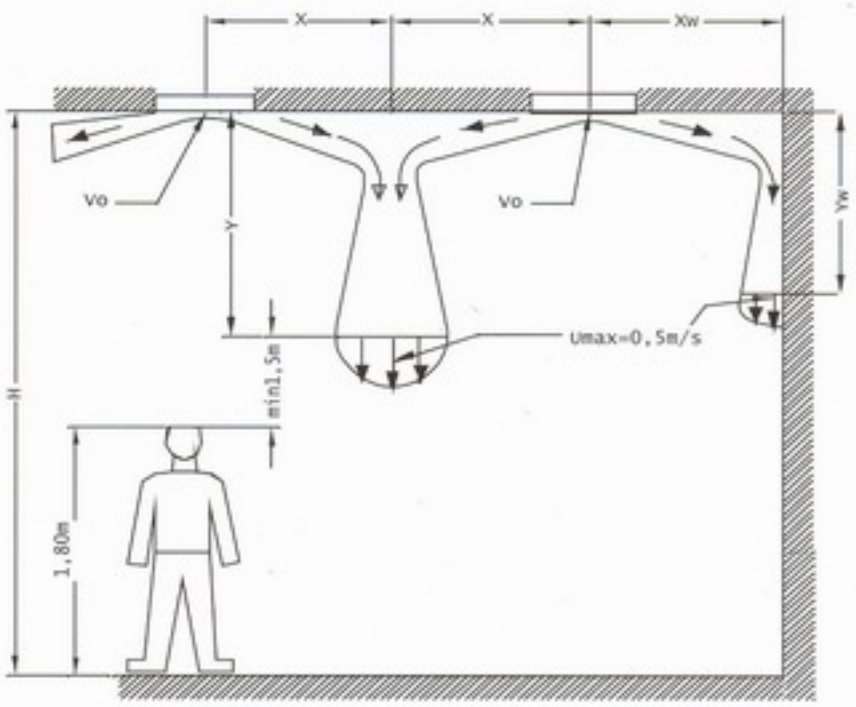
5 identical GR-AA diffusers are selected to be mounted on the ceiling, each providing 1000 m³/h of hot air -throw type A-. From the noise level diagrams it is evident that for 45 dBA the diffusers to be used are GR-AA-500 or larger.

The hot air should be entering the people moving area 1,8 m from the floor- that is 2,2 m from the ceiling. From the non-isothermal air jet diagram of the GR-AA-500 diffuser in vertical air projection for 1000 ³/h and for ΔT = 20°C, we get a throw of 2,5 m (for terminal velocity 0,1 m/s). Thus, the GR-AA-500 diffuser may be safely used to cover the previous need. For room temperature 25°C, the supply air temperature may rise up to 45°C.

Cooling application

During the summer period we should make sure that no direct cool air streams enter the people moving area. Thus, throw type C should be used. From this throw type selection diagrams the adequate distance X between diffusers for vertical throw not more than 0,5 m is estimated to be less than 1,4 + 1,4 = 2,8 m. In this way we are sure that there are no intense downward flowing air streams due to air jet impingement from neighboring diffusers. The pressure requirement in this case 1000 m³/h is 49 Pa.

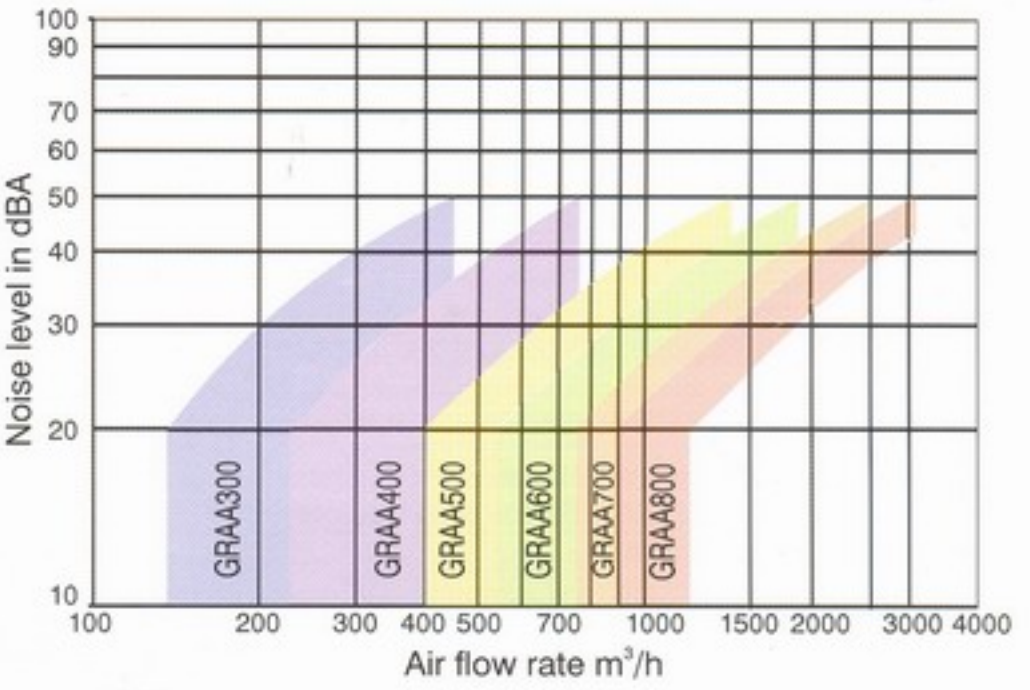




Fast selection.

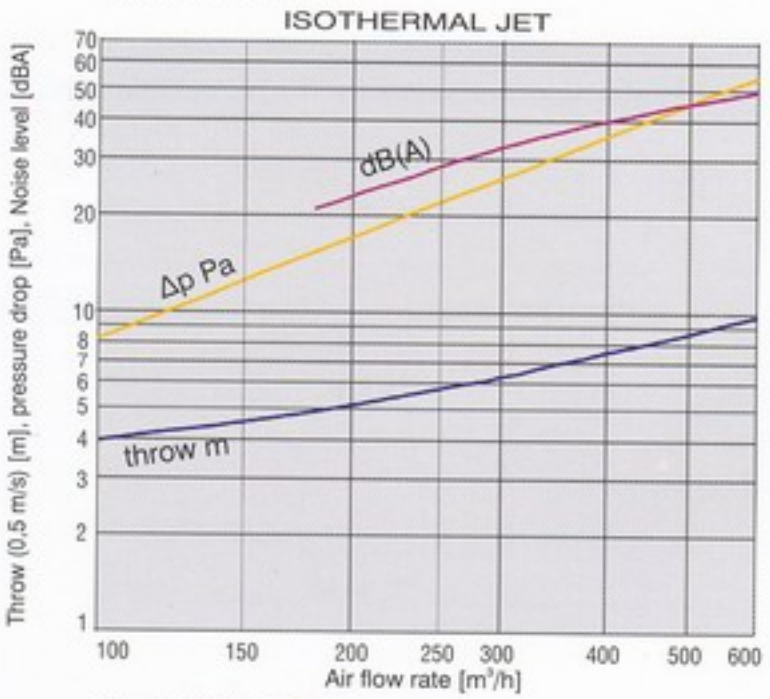
For fast selection of series GR diffusers the adjacent noise level diagram should be used. The way to make a selection is to estimate the adequate flow rate depending on the acceptable noise level.

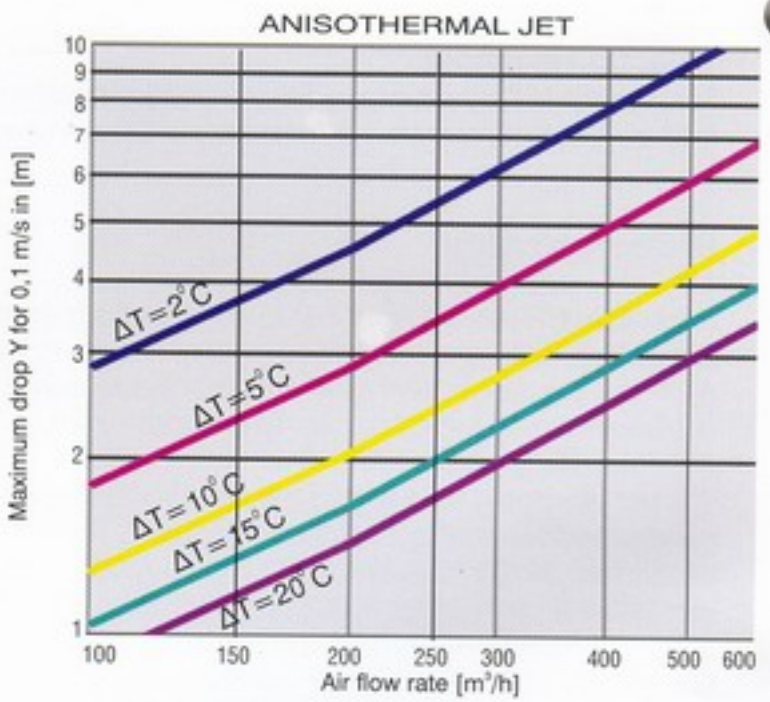
In case GR diffusers are used in return air applications, the value estimated from the adjacent diagram should be reduced by 9 dBA.



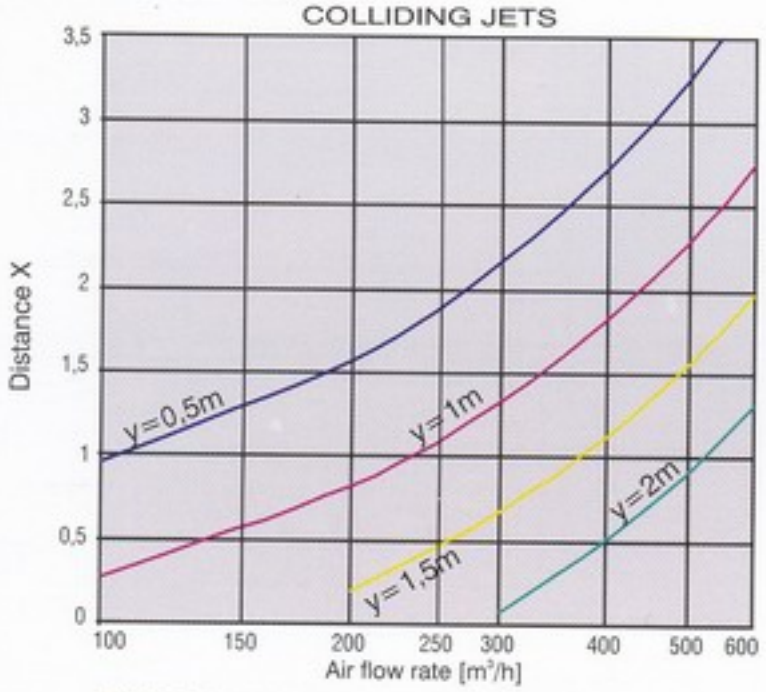
AEROGRAMMI

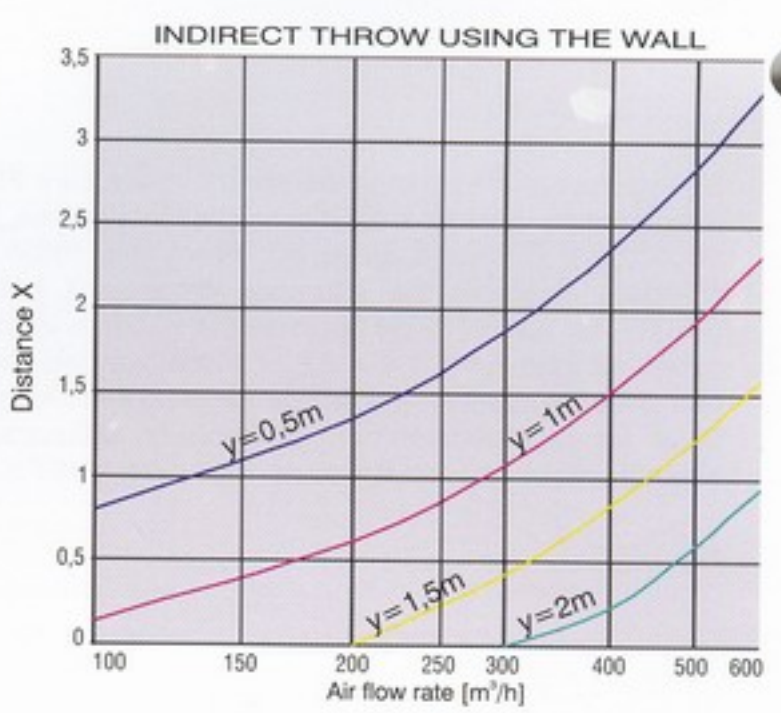
THROW TYPE A



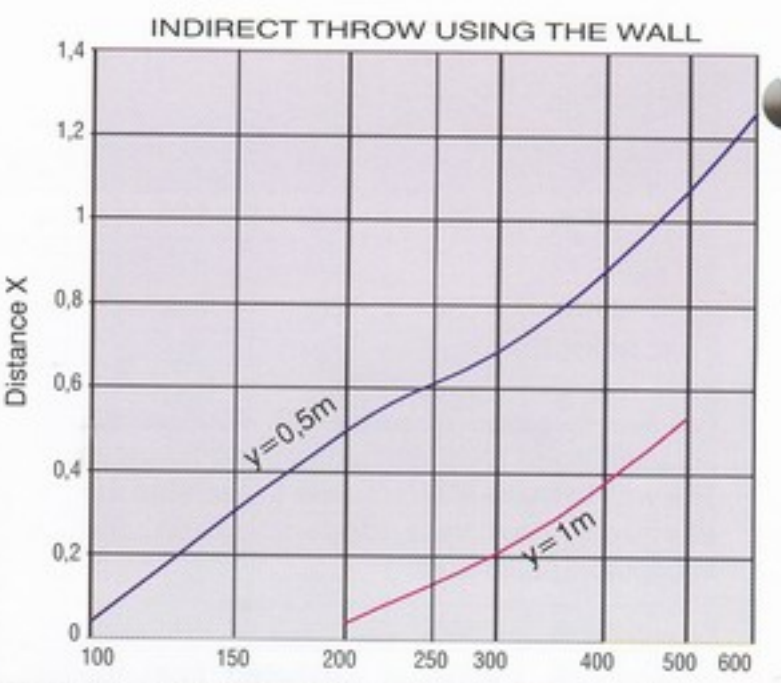


THROW TYPE B





THROW TYPE C

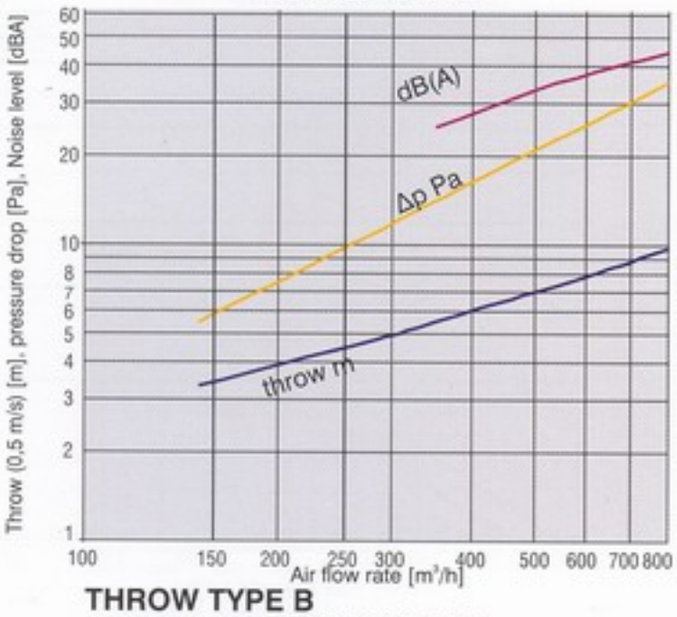


CIRCULAR OPENING DISTRIBUTION				
TYPE GR-AR300	Pressure coefficient	Throw coefficient	Anisoth. jet coefficient	Quantity to be added for noise level [dBA]
	1,48	1,1	1,1	5,8
RECTANGLE FRAME DIFFUSERS				
TYPE GR400X250 B	Pressure coefficient	Throw coefficient	Anisoth. jet coefficient	Quantity to be added for noise level [dBA]
	0,8	0,95	0,95	-2,7

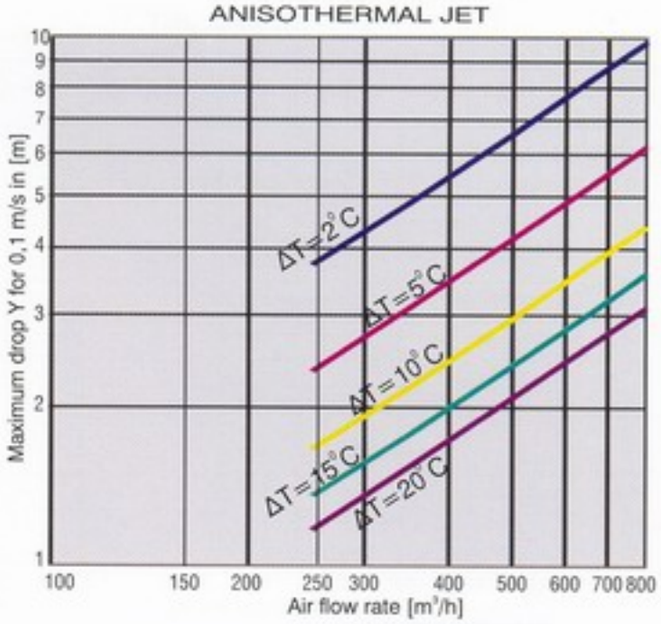
For determining the characteristics of GR diffusers of types other than GR-AA-, the correction factors of the table(s) should be used

THROW TYPE A

ISOTHERMAL JET

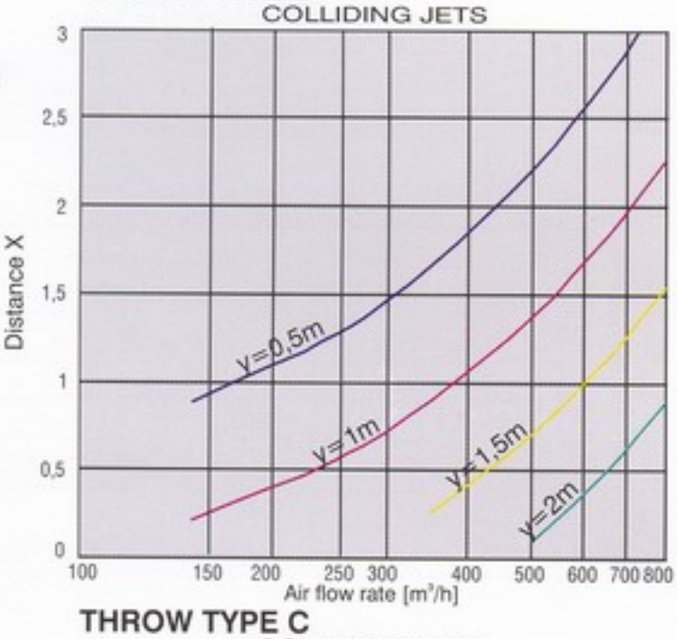


ANISOTHERMAL JET

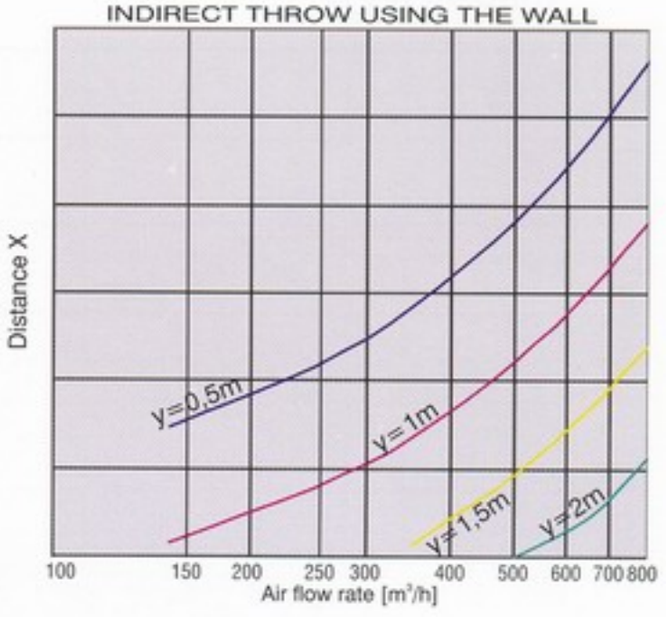


THROW TYPE B

COLLIDING JETS

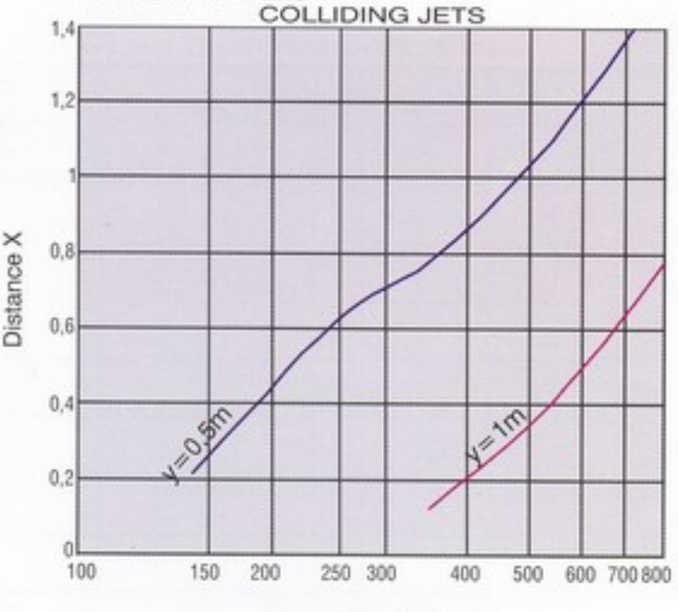


INDIRECT THROW USING THE WALL



THROW TYPE C

COLLIDING JETS



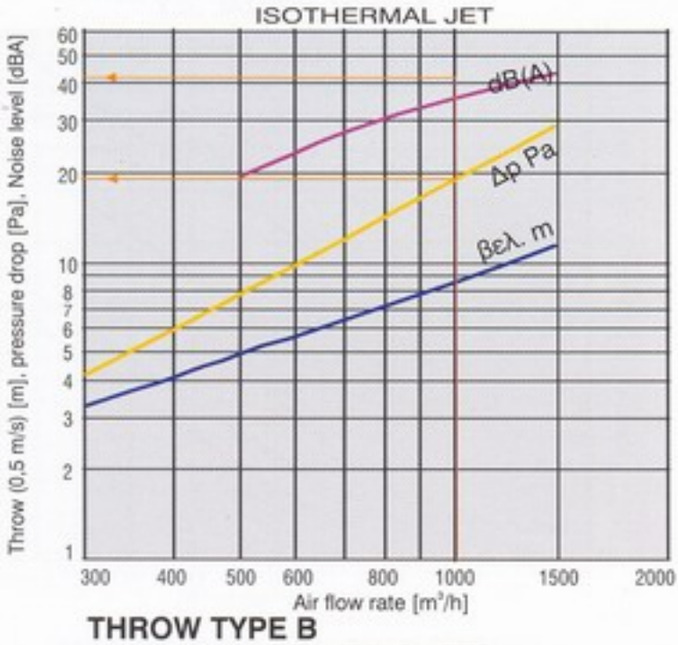
INDIRECT THROW USING THE WALL

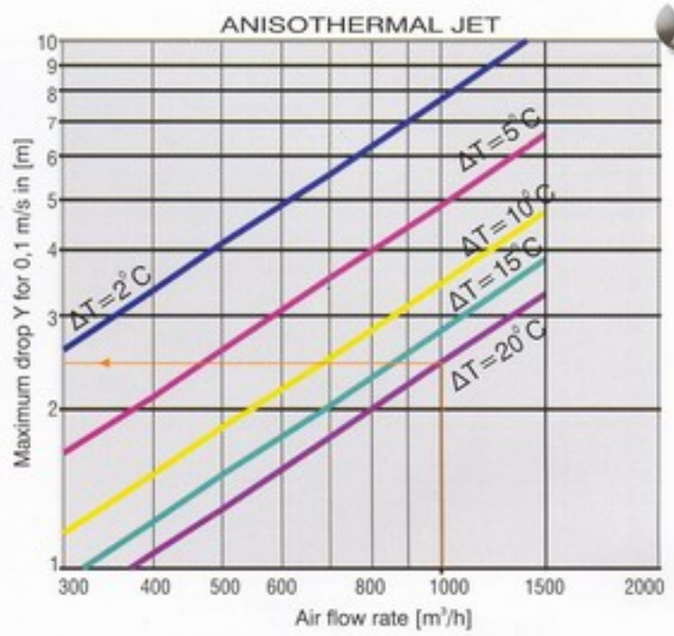
For determining the characteristics of GR diffusers of types other than GR-AA-, the correction factors of the table(s) should be used

GR-AR400 CIRCULAR OPENING DISTRIBUTION				
TYPE GR-AR400	Pressure coefficient	Throw coefficient	Anisoth. jet coefficient	Quantity to be added for noise level [dBA]
	1,45	1,1	1,1	5,5

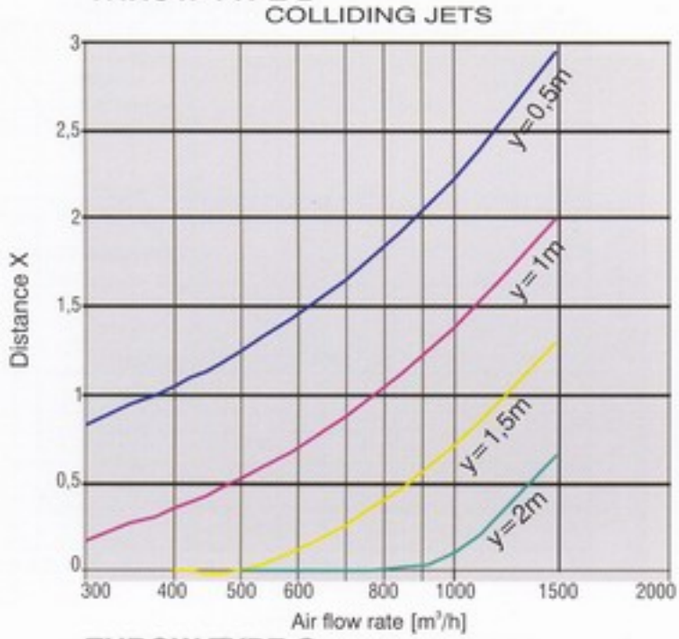
RECTANGLE FRAME DIFFUSERS				
TYPE	Pressure coefficient	Throw coefficient	Anisoth. jet coefficient	Quantity to be added for noise level [dBA]
GR400X300 B	1,4	1,1	1,1	4,9
GR400X350 B	1,1	1	1	1,6
GR500X250 B	1,35	1,1	1,1	4,5
GR500X300 B	1,1	1	1	1,4
GR500X350 B	0,9	0,95	0,95	-1,8
GR600X250 B	1,2	1,05	1,05	2,8
GR600X300 B	1	1	1	-0,3
Gr600X350 B	0,8	0,92	0,92	-3,5

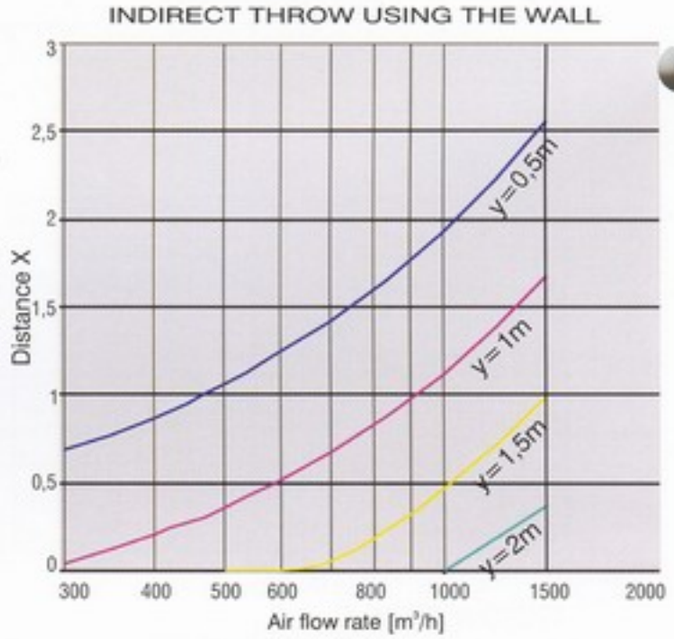
THROW TYPE A



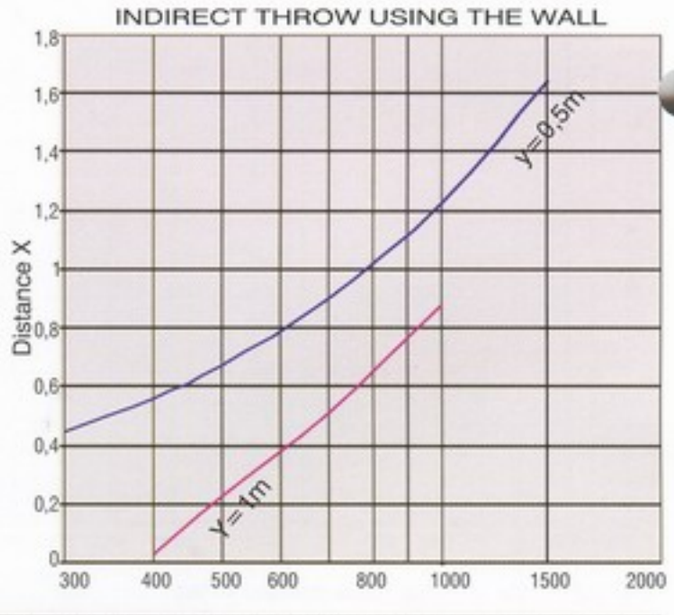


THROW TYPE B





THROW TYPE C

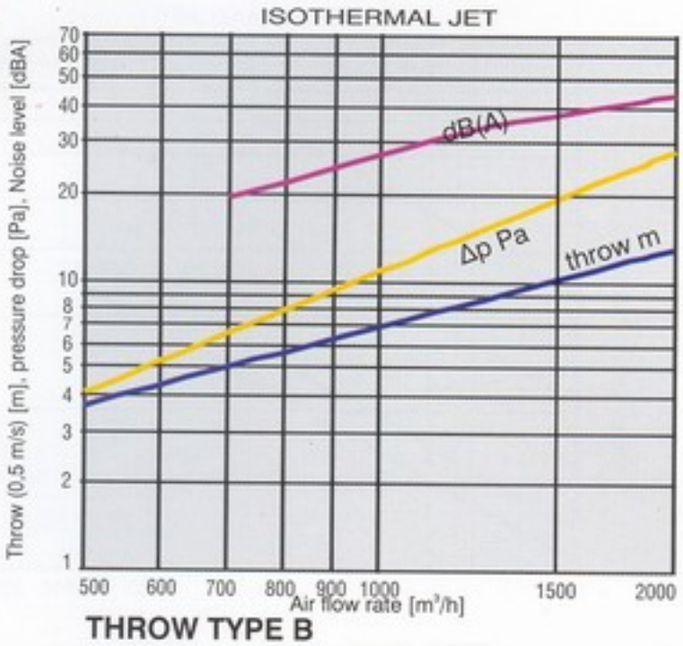


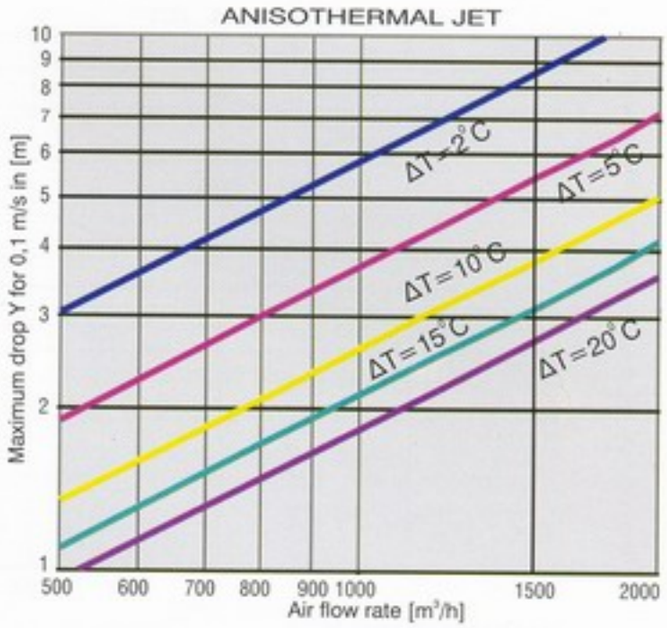
For determining the characteristics of GR diffusers of types other than GR-AA-, the correction factors of the table(s) should be used

GR-AR500 CIRCULAR OPENING DISTRIBUTION				
TYPE GR-AR500	Pressure coefficient	Throw coefficient	Anisoth. jet coefficient	Quantity to be added for noise level [dBA]
	1,42	1,1	1,1	5,2

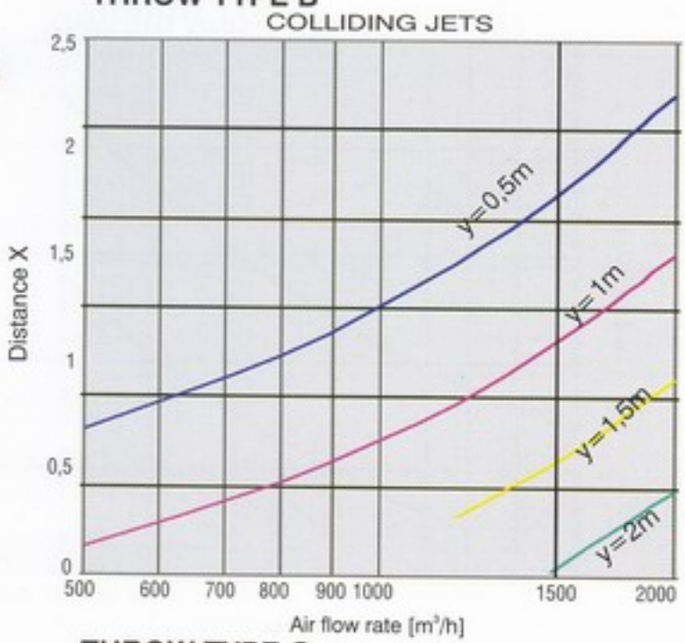
RECTANGLE FRAME DIFFUSERS				
TYPE	Pressure coefficient	Throw coefficient	Anisoth. jet coefficient	Quantity to be added for noise level [dBA]
GR700X250 B	2	1,25	1,25	10,4
GR700X300 B	1,6	1,15	1,15	7,2
Gr700X350 B	1,35	1,1	1,1	4,4
GR800X250 B	1,8	1,2	1,2	8,9
GR800X300 B	1,5	1,12	1,12	5,7
Gr800X350 B	1,2	1,05	1,05	3,0

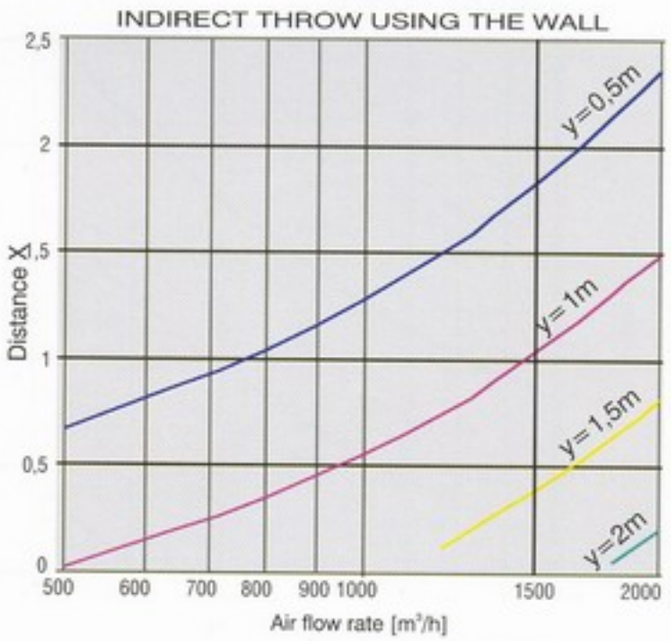
THROW TYPE A



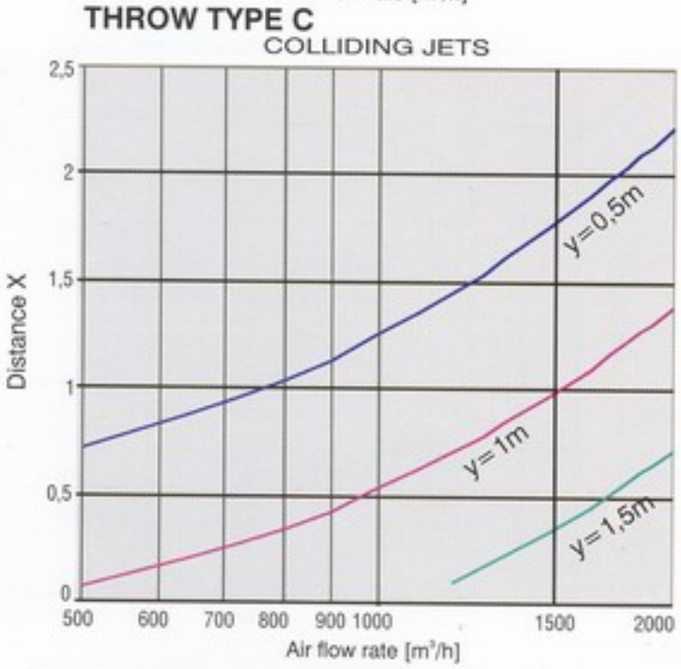


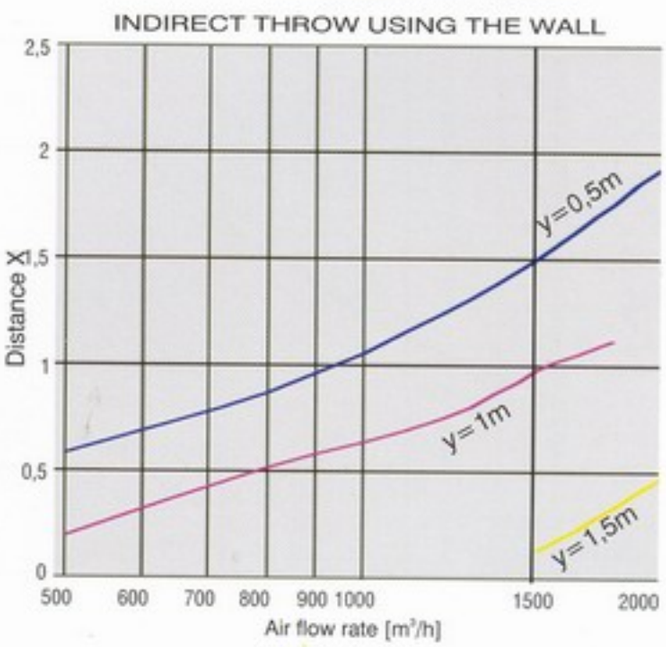
THROW TYPE B





THROW TYPE C





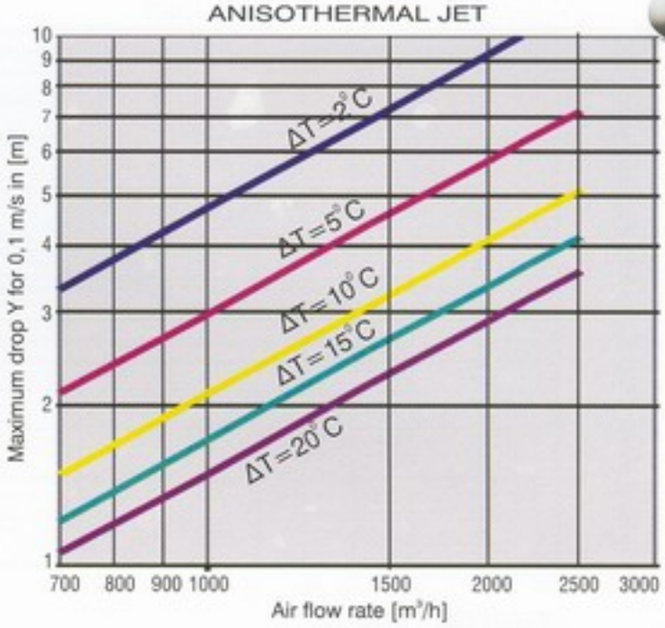
For determining the characteristics of GR diffusers of types other than GR-AA-, the correction factors of the table(s) should be used

GR-AR600 CIRCULAR OPENING DISTRIBUTION				
TYPE GR-AR600	Pressure coefficient	Throw coefficient	Anisoth. jet coefficient	Quantity to be added for noise level [dBA]
	1,4	1,1	1,1	4,7

THROW TYPE A

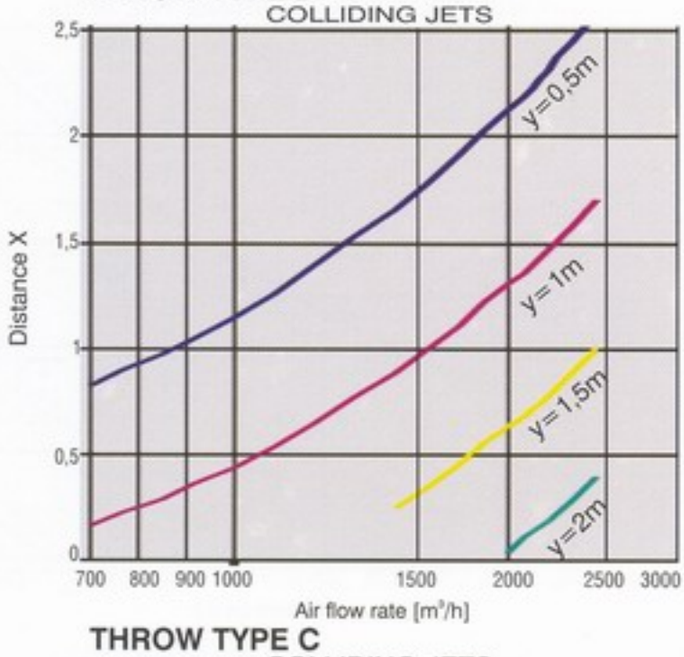
ISOTHERMAL JET

ANISOTHERMAL JET

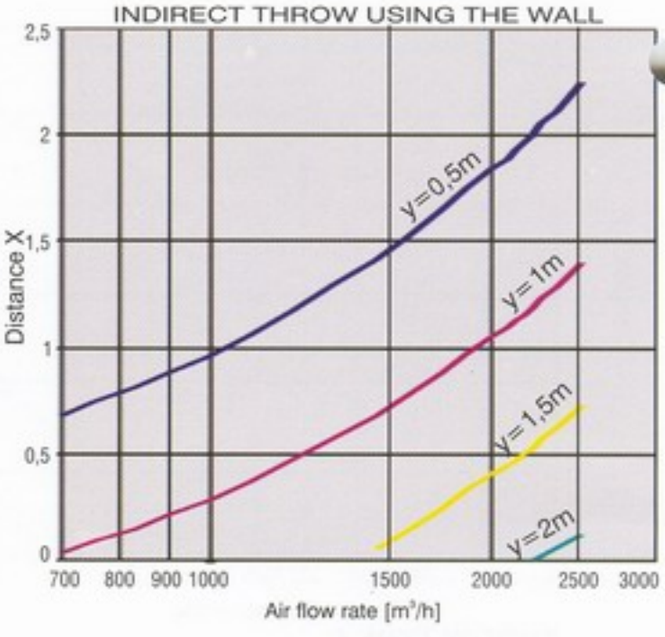


THROW TYPE B

COLLIDING JETS

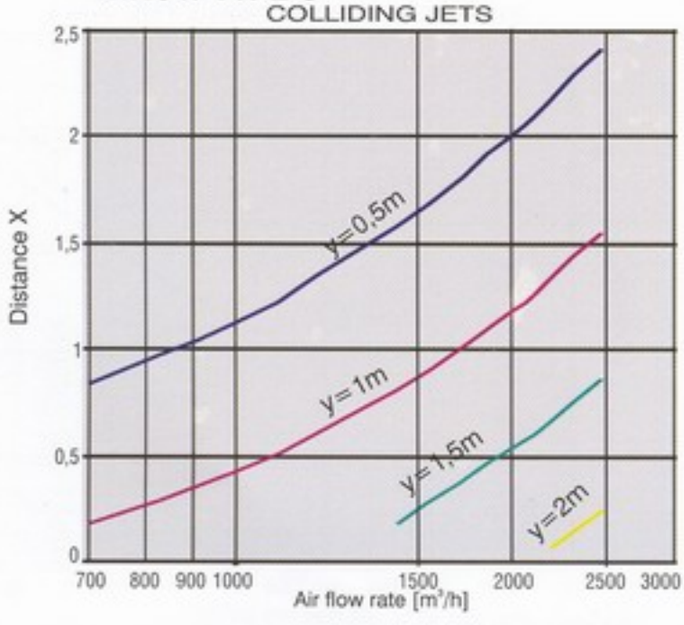


INDIRECT THROW USING THE WALL

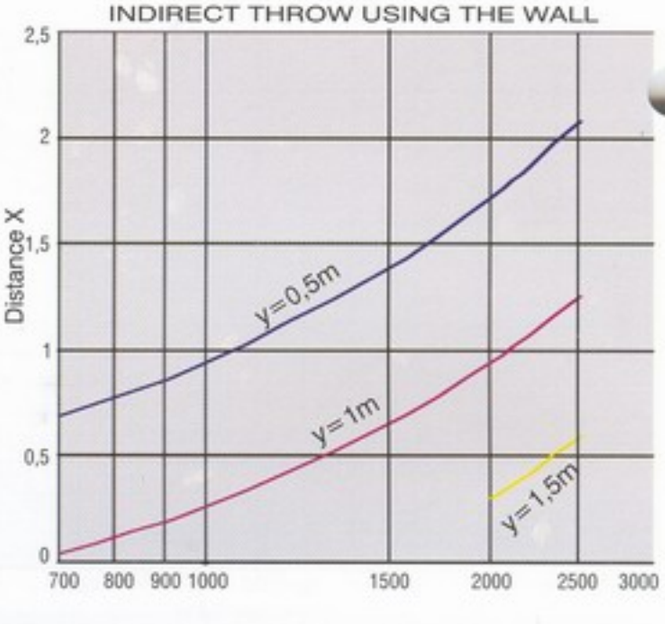


THROW TYPE C

COLLIDING JETS



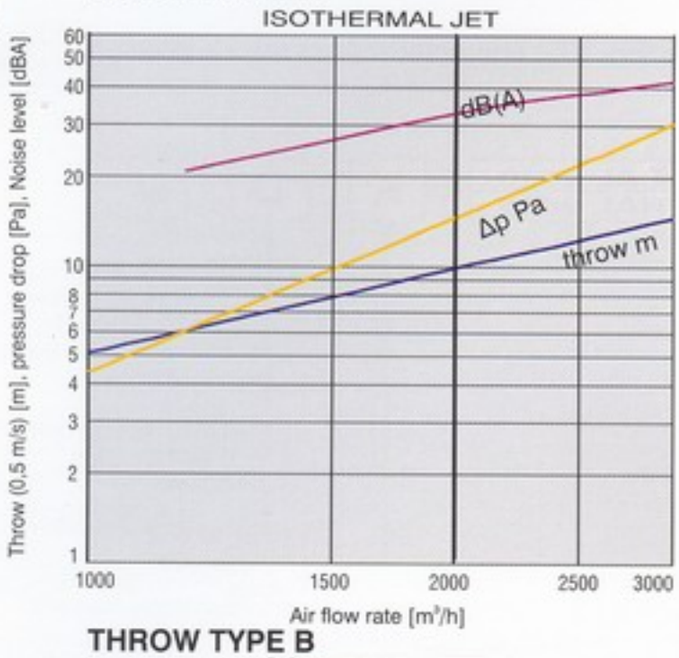
INDIRECT THROW USING THE WALL

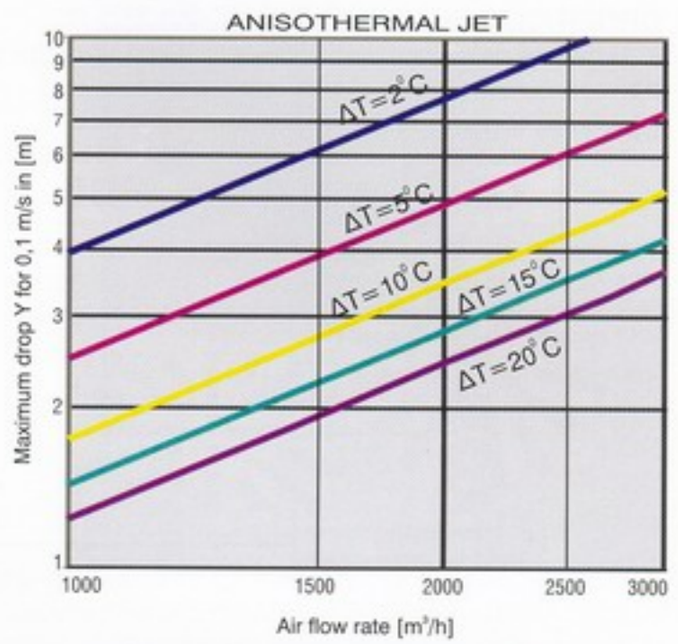


For determining the characteristics of GR diffusers of types other than GR-AA-, the correction factors of the table(s) should be used

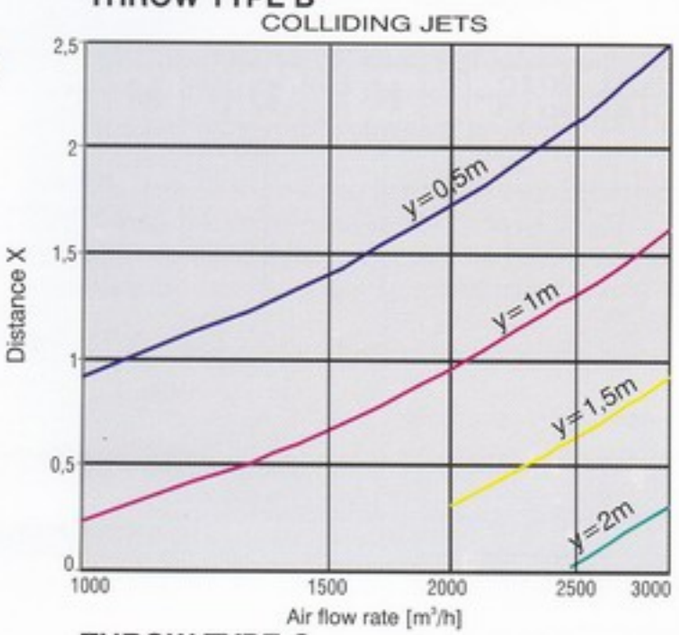
GR-AR700 CIRCULAR OPENING DISTRIBUTION				
TYPE GR-AR700	Pressure coefficient	Throw coefficient	Anisoth. jet coefficient	Quantity to be added for noise level [dBA]
	1,4	1,1	1,1	4

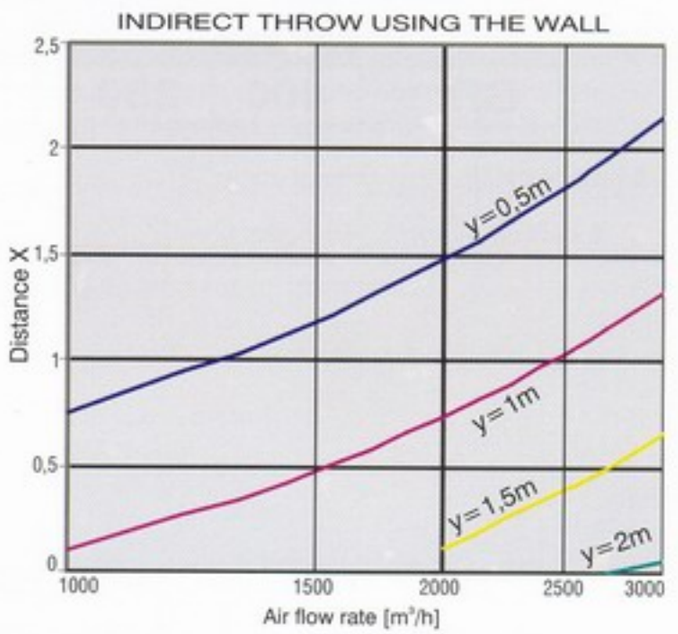
THROW TYPE A



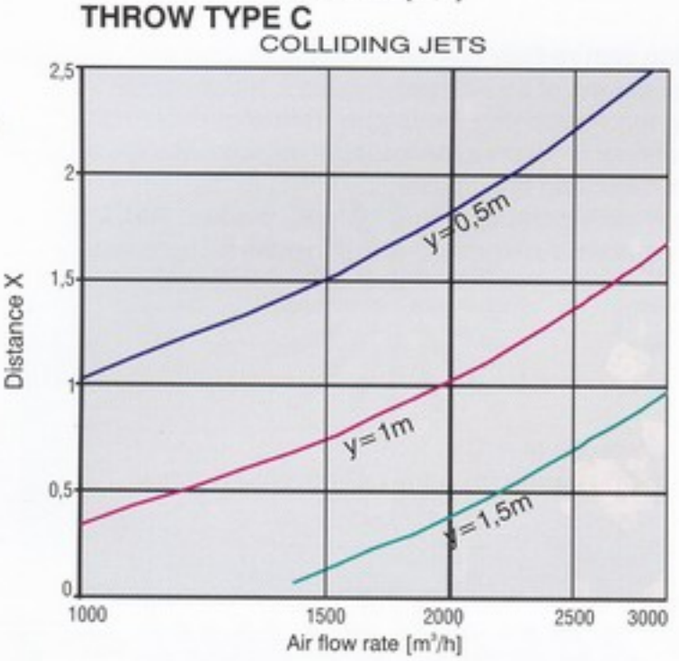


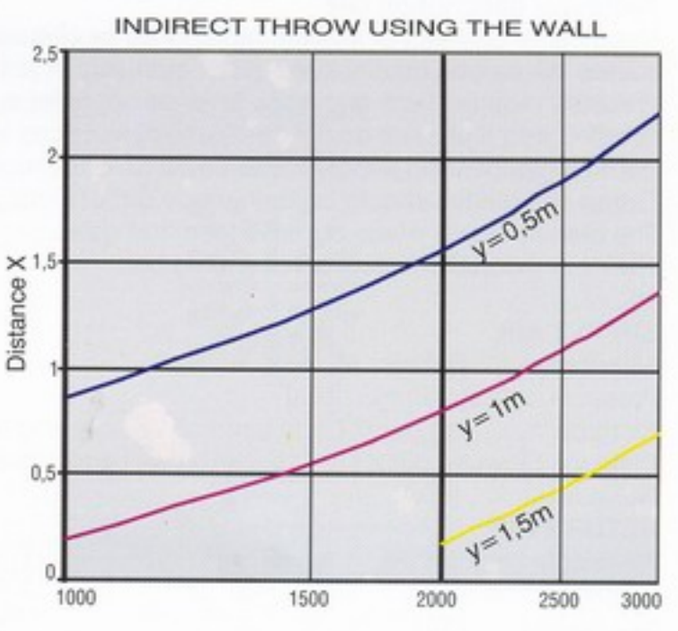
THROW TYPE B





THROW TYPE C





For determining the characteristics of GR diffusers of types other than GR-AA-, the correction factors of the table(s) should be used

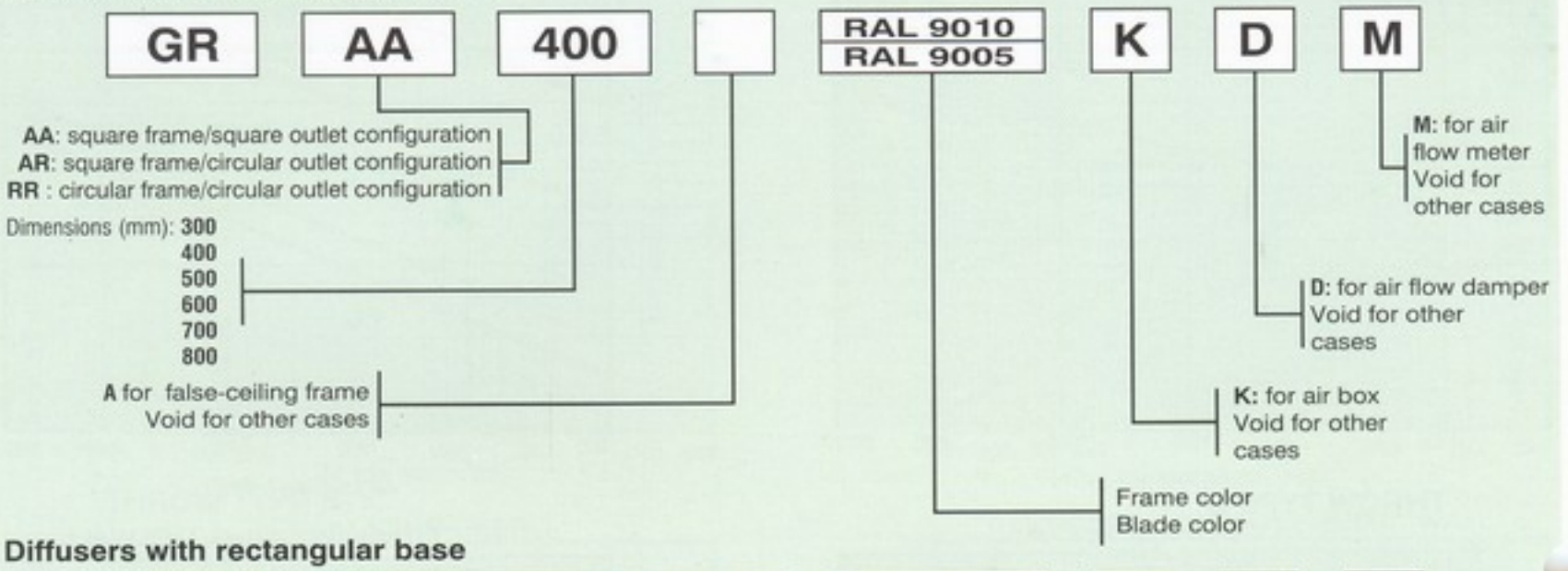
GR-AR800	CIRCULAR OPENING DISTRIBUTION			
TYPE GR-AR800	Pressure coefficient	Throw coefficient	Anisoth. jet coefficient	Quantity to be added for noise level [dBA]
	1,35	1,1	1,1	3,8

technical description

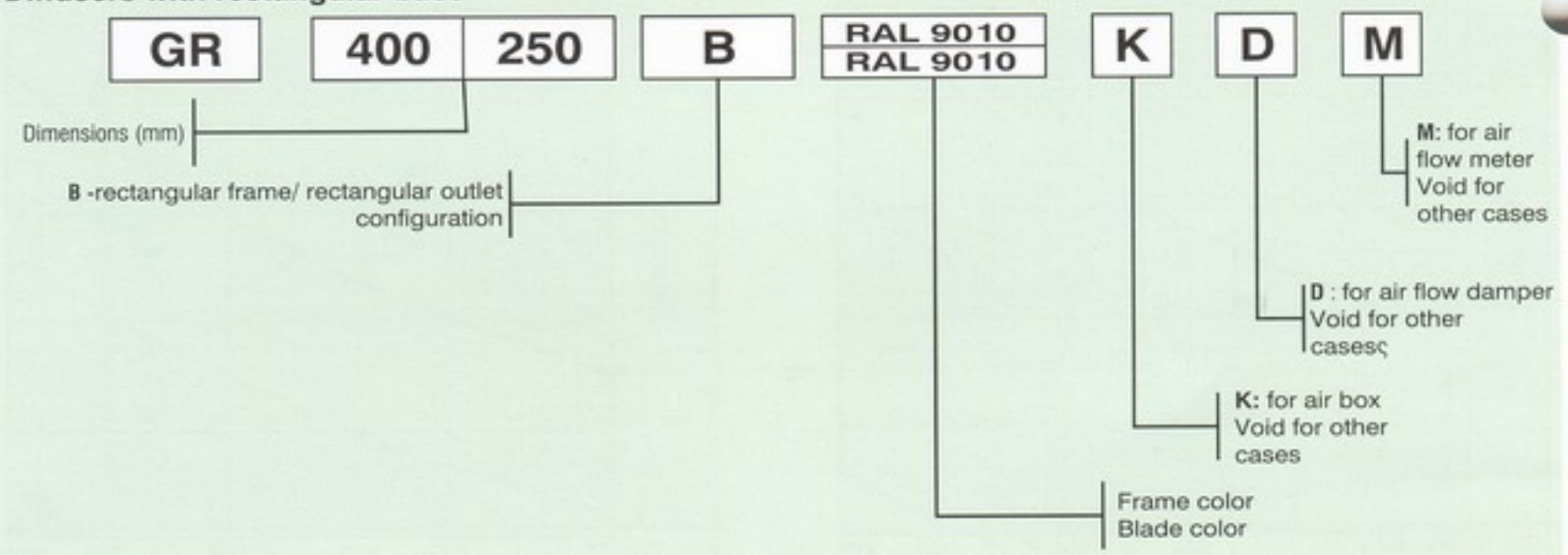
ORDER GUIDELINES GR-AA 400 $^{\text{RAL 9010}}_{\text{RAL 9005}}$ D

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

Diffusers with square/round base



Diffusers with rectangular base



Technical description GR

Metal frame diffusers of square, rectangular or circular cross-section with radially placed outlets equipped with adjustable blades. Air can be manipulated either manually or automatically by means of an internally installed mechanism. Pressure requirements and noise level do not differ substantially when positioning the blades. Diffusers should be coupled with a plenum box of adequate dimensions with or without flow measuring and control devices. Manipulation of the flow damper and supply meter could be done easily even after mounting the diffuser.
Frame and blades should be both made out of metal and electrostatically painted (frame : RAL..., blades : RAL.....).
The plenum box is made out of Zinced and galvanized 0,7 mm thick plate. An isolating strip provides air tightness.
Their operational characteristics should be :

SUPPLY AIR

Air supply : ..... [m^3/h]
Pressure drop (total) : ..... [Pa]
Air throw : ..... [m] (for 0,1 m/s terminal velocity and temperature difference of .. °C)
Distance between diffusers or between wall and diffuser : ... [m] (for 0,5 m drop from the ceiling, type C throw)
Noise level : .... [dBA]

RETURN AIR

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

AEROGRAMMI
AIR CONTITIONING COMPONENTS
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