GERHMAN

Ceiling Diffusers

IOTA

At Gerhman we are driven by a strong desire to continuously generate improvements. We do that by developing products and systems that are easy to use and energy efficient, together with industry-leading knowledge, support, logistics and efficient availability.

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Ceiling Diffusers

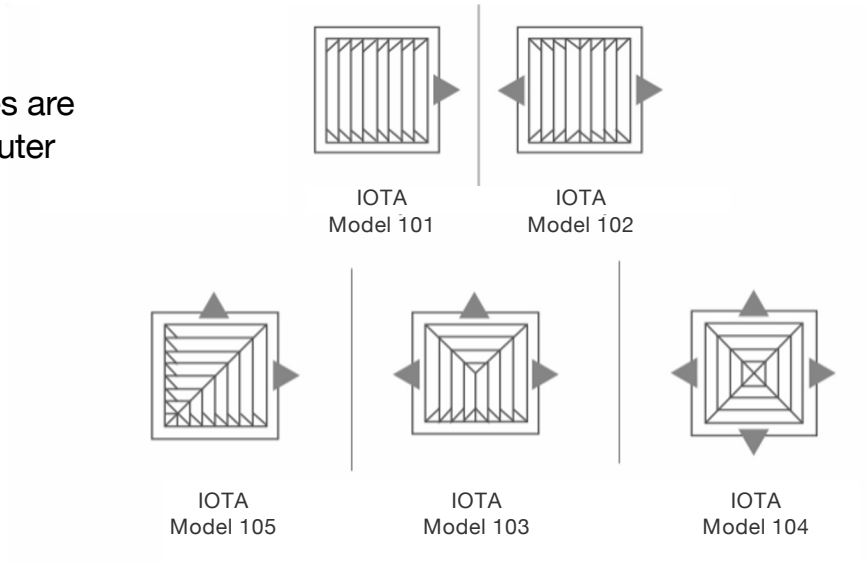
IOTA

IOTA ceiling diffusers are compatible with low and medium pressure ventilation systems as well as A/C air supply and exhaust ducts. Aerodynamically designed blades provide a tight horizontal pattern that maintains stability even at low airflow rates. Excellent for architectural applications.

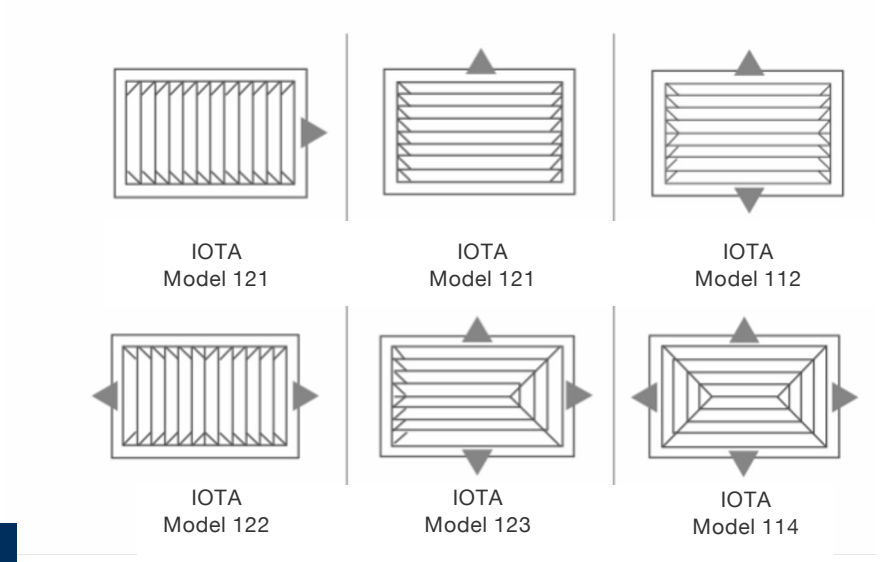
- **Recommended for spaces with a maximum ceiling height of 4 - 6 m.**
- **Easy-to-install**
- **The diffuser vanes can be removed**
- **The diffuser provides air supply in four directions**
- **Optionally available in square and rectangular shapes, with different directions of discharging core styles for 1, 2, 3 and 4 way in horizontal path**
- **Rear dampers and ancillaries are of aluminum mill finish. Available with black matt finish in color on request.**
- **Available with optional extended panels to suit modular ceilings.**

Types

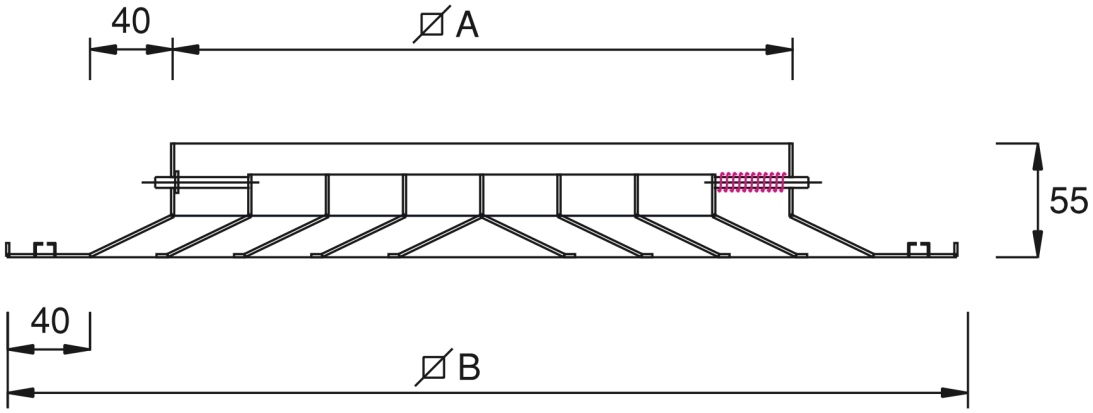
IOTA models of square diffusing cores are interchangeable between standard outer frames of the same size



IOTA models of rectangular diffusing cores are interchangeable between standard outer frames of the same size

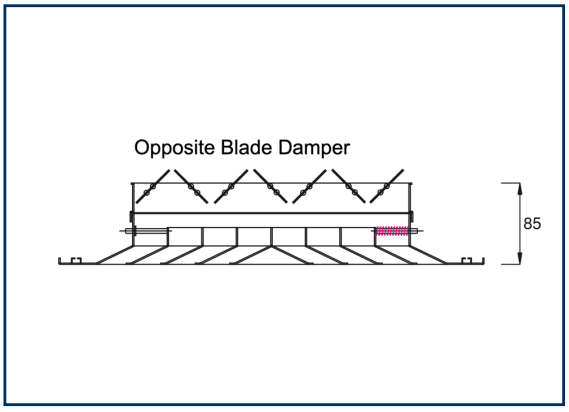


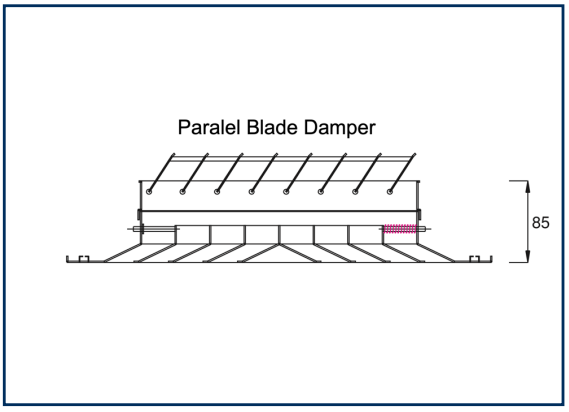
Sizes



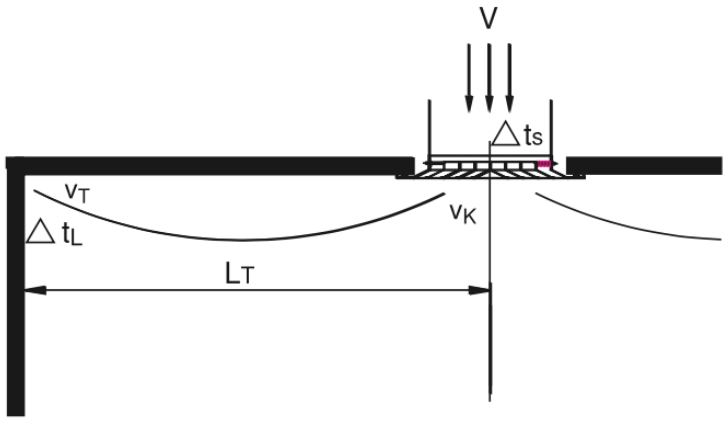
AXA	150	225	300	375	450	525	600	750
BXB	310	385	460	525	595	685	760	910

- Sizes: mm
- Any combination



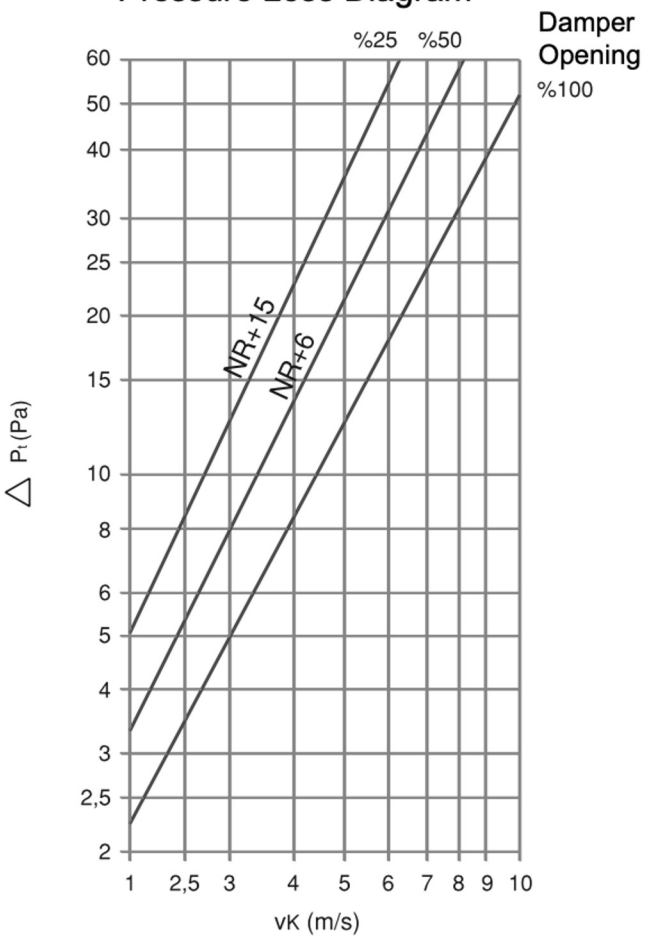


Performance Data

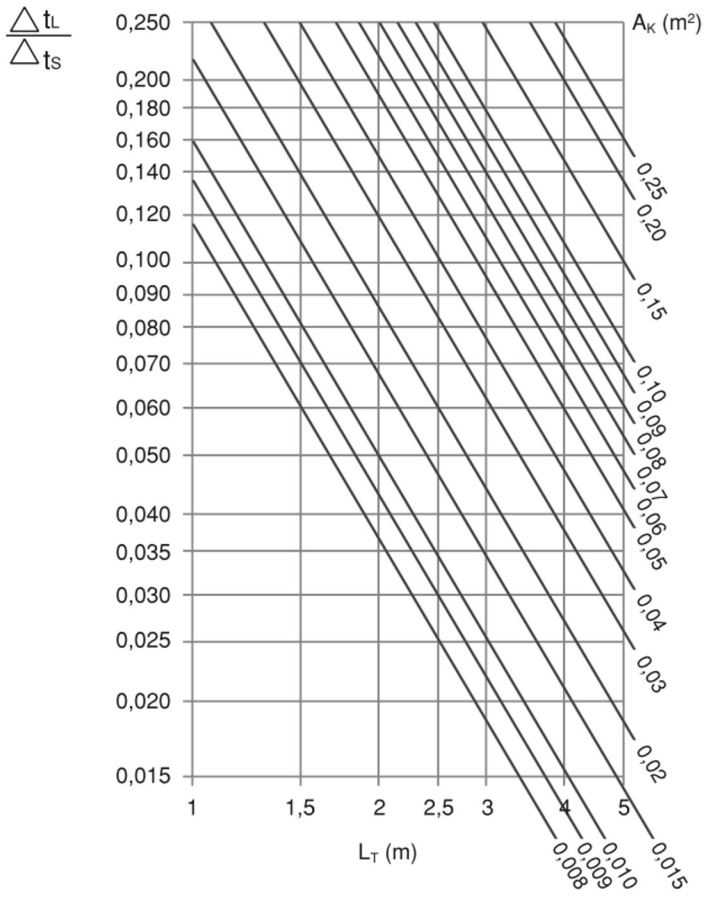


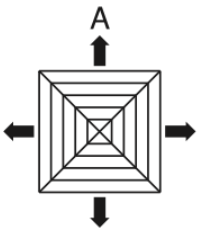
V (m^3/h)	:	Flow Rate
△Pt (Pa)	:	Pressure Loss
v_K (m/s)	:	Outlet Velocity
A_K (m^2)	:	Effective Area
L_T (m)	:	Horizontal Throwing Distance
v_T (m)	:	Velocity at the Comfort Zone
NR	:	Sound Level

Pressure Loss Diagram



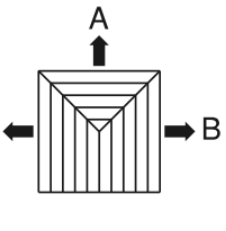
Thermal Diagram





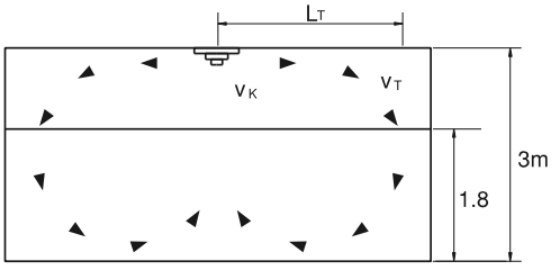
IOTA

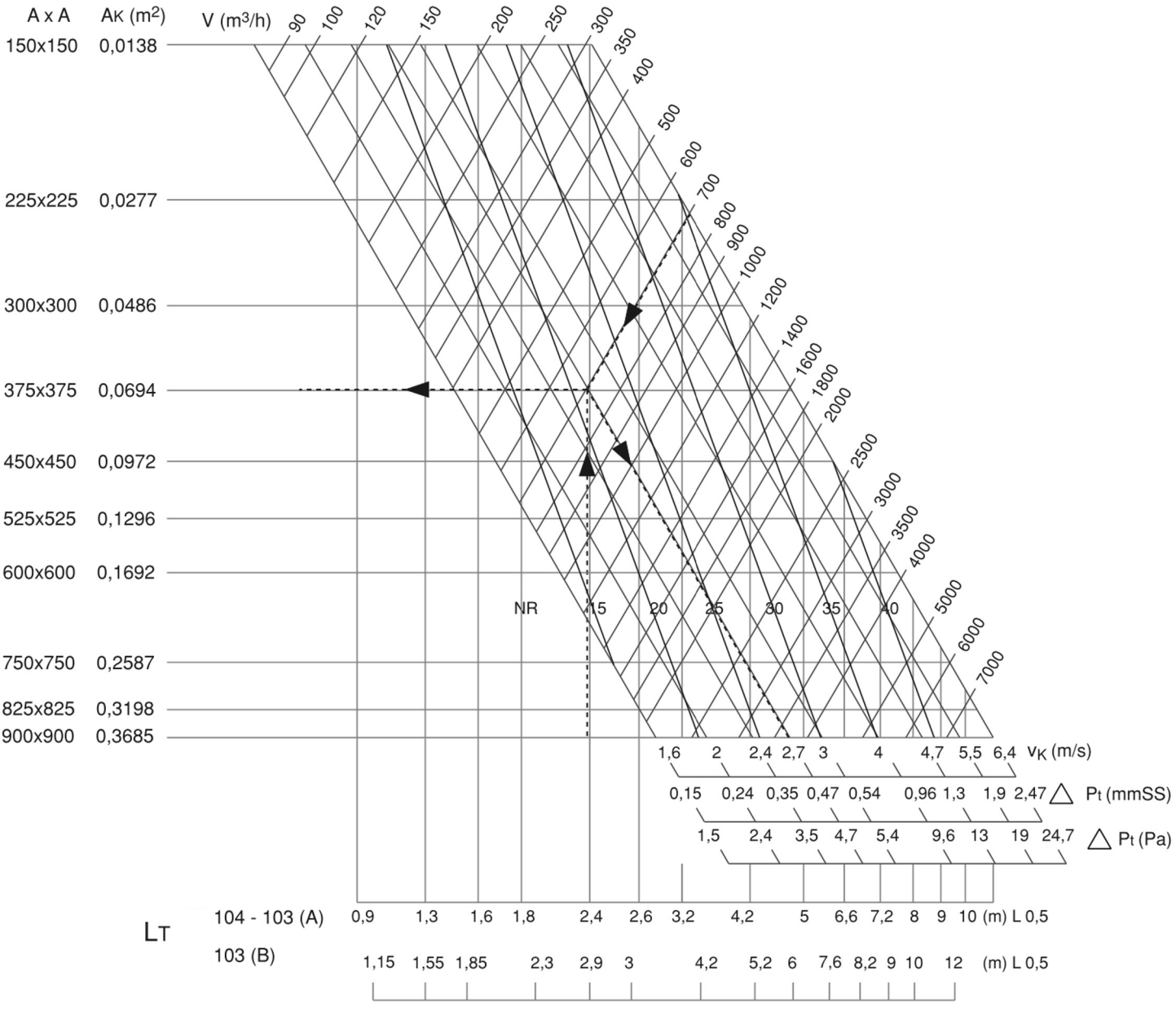
Model 104



IOTA

Model 103





Example Selection

Needs:

Flow Rate : V=700m3/h

Throw : LT= 2,4m (vT=0,5 m/s)

Choise:

Choosed Size : 375x375

Outlet Velocity : vK=2,7m/s

Pressure Loss : ΔPt=4,7Pa

Sound Level : 22 NR

If needed 50% Damper Opening:

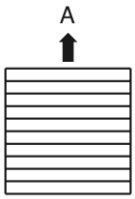
Pressure Loss : ΔPt=+10Pa

Sound Level : +6 NR

Total ΔPt and NR:

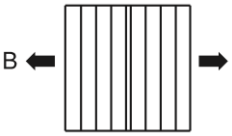
Pressure Loss : ΔPt=14,7 Pa

Sound Level : 28 NR



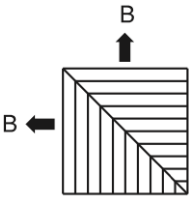
IOTA

Model 101



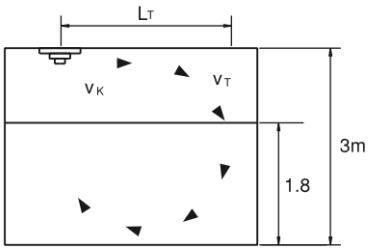
IOTA

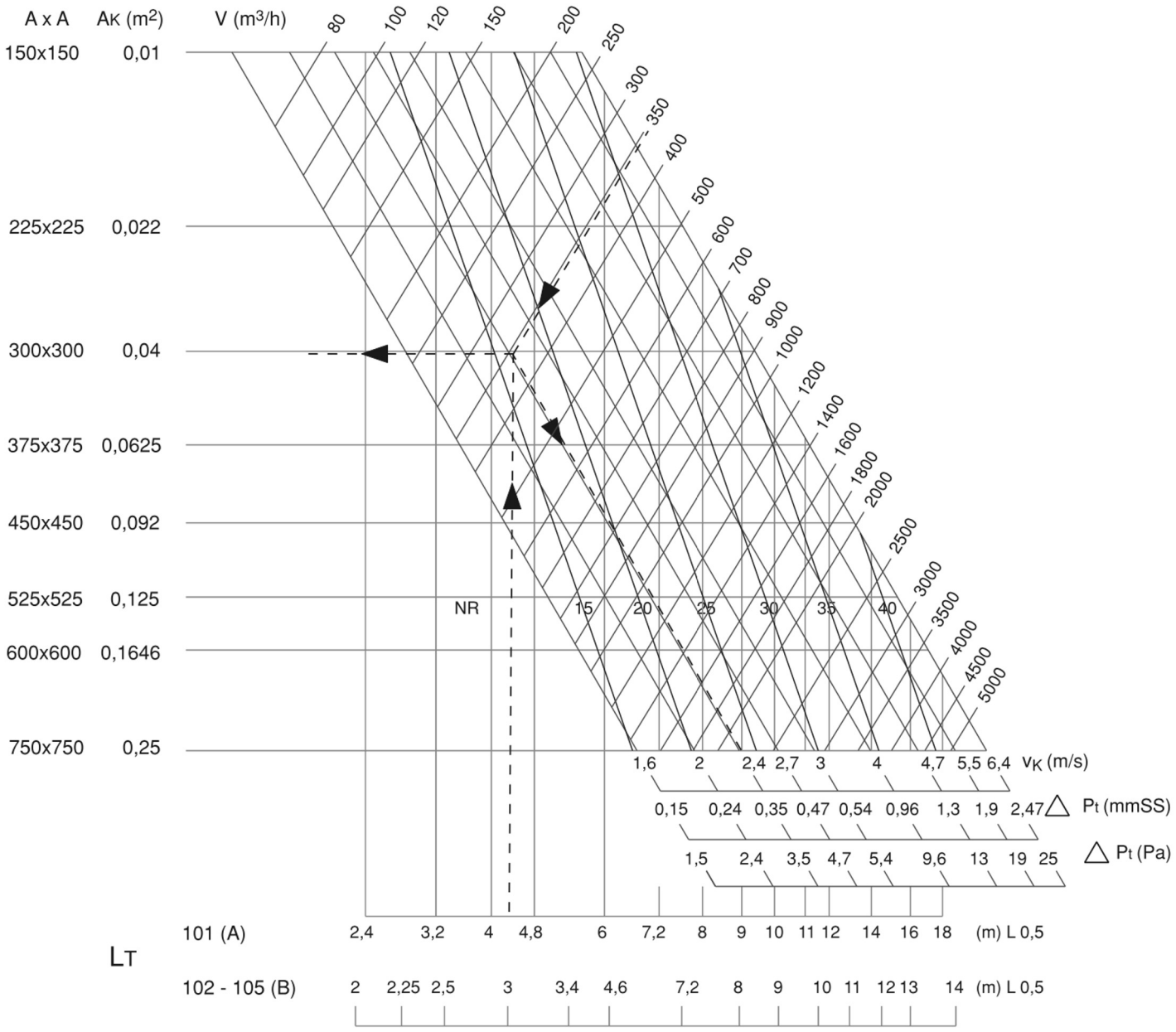
Model 102



IOTA

Model 105





Example Selection

Needs:

Flow Rate : V = 300m^3/h

Throw : L_T = 4,5m (v_T=0,5 m/s)

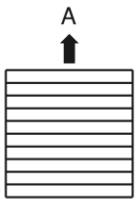
Choise:

Choosed Size : 300x300

Outlet Velocity : v_K = 2,4m/s

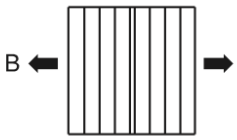
Pressure Loss : ΔPt=3,5 Pa

Sound Level : 23 NR



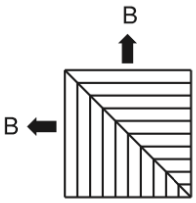
IOTA

Model 101



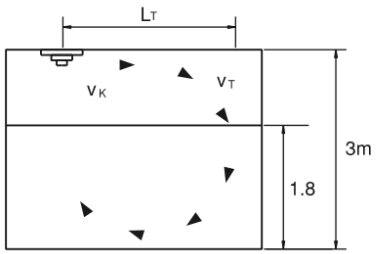
IOTA

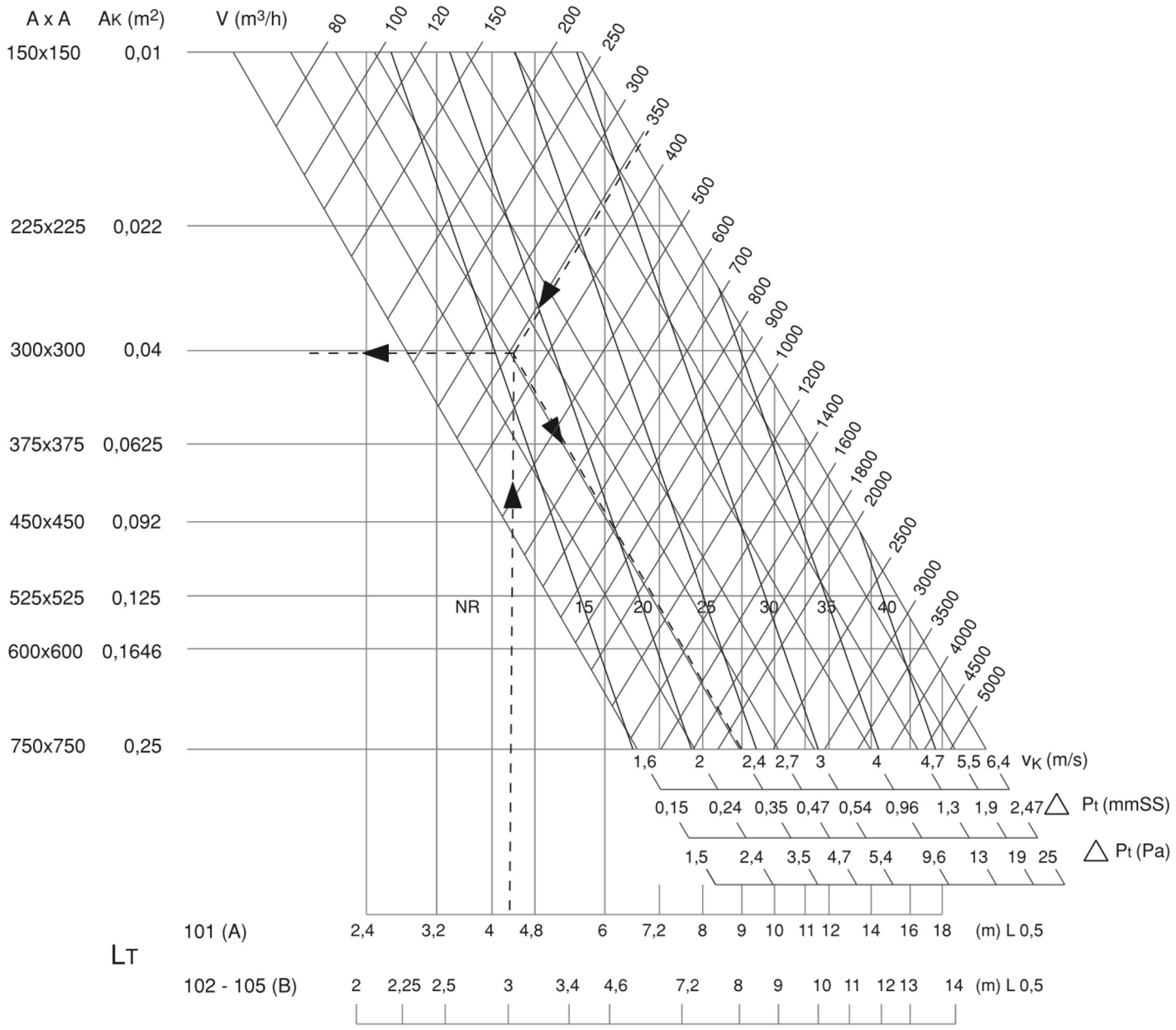
Model 102



IOTA

Model 105





Example Selection

Needs:

Flow Rate : V = 300m^3/h

Throw : L_T = 4,5m (v_T=0,5 m/s)

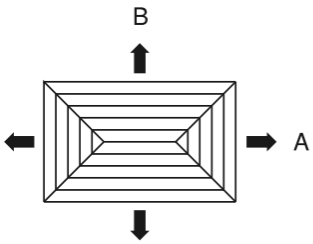
Choise:

Choosed Size : 300x300

Outlet Velocity : v_K = 2,4m/s

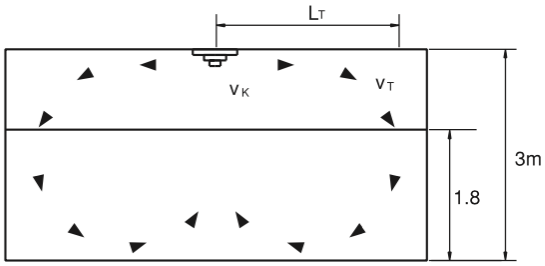
Pressure Loss : ΔPt=3,5 Pa

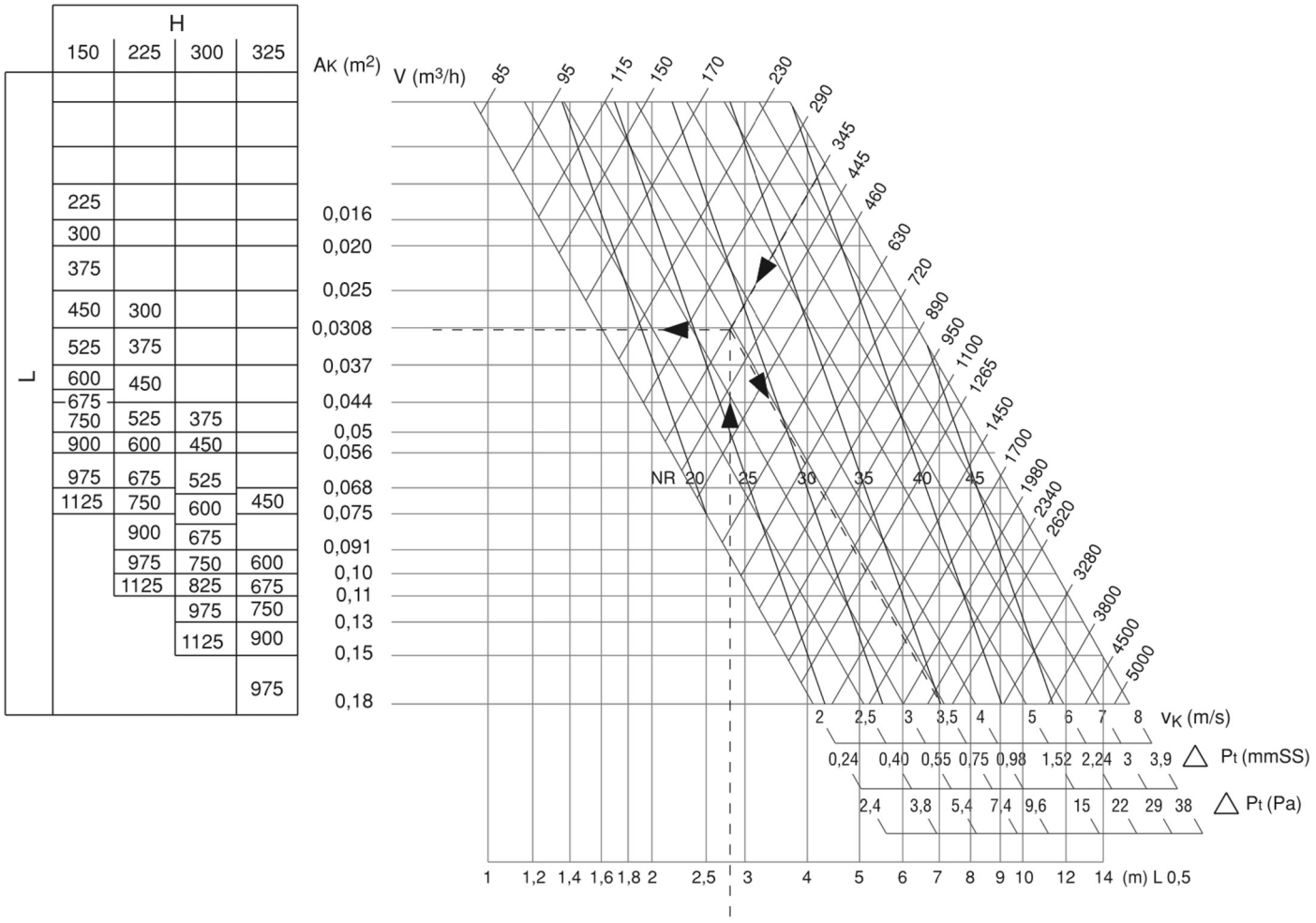
Sound Level : 23 NR



IOTA

Model 114





Example Selection

Needs:

Flow Rate : V=300m^3/h

Throw : LT (A)= 2,8m (vT=0,5 m/s)

Throw : LT (B)= 2,1m (vT=0,5 m/s)

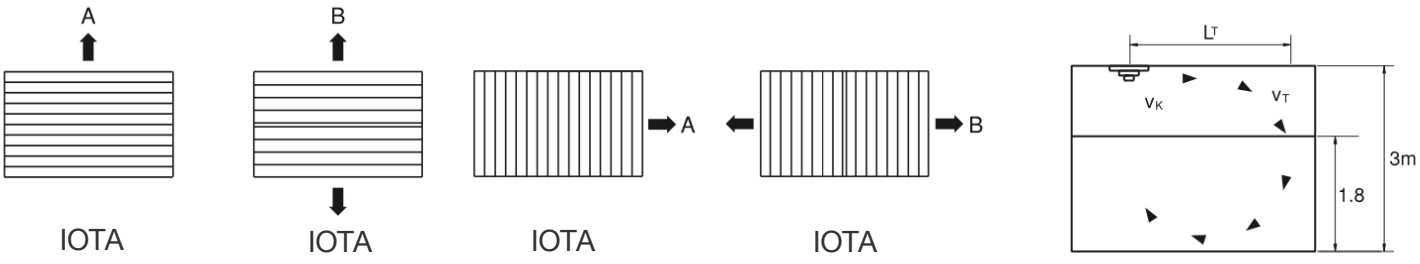
Choise:

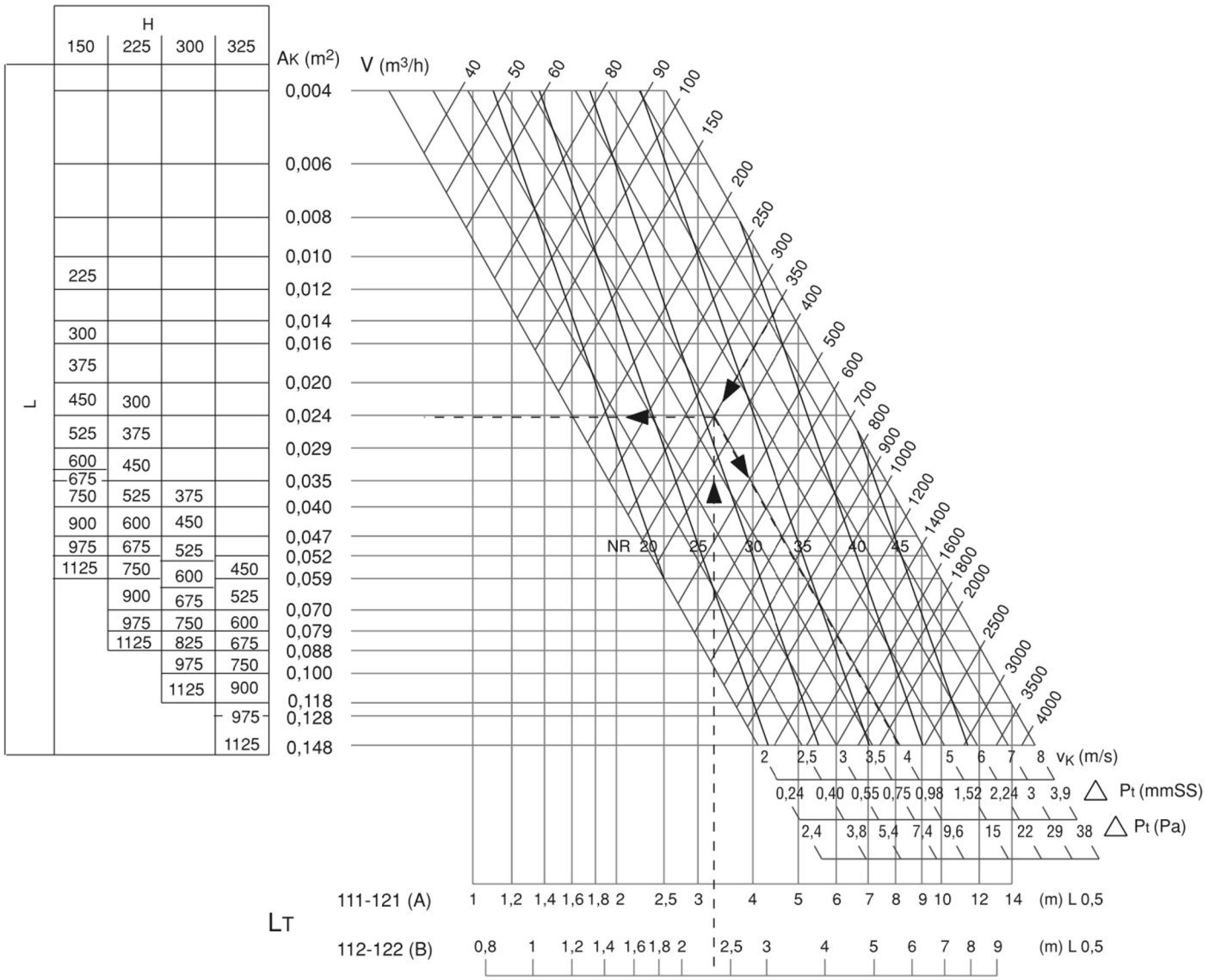
Choosed Size : 300 x 225

Outlet Velocity : v_K = 3,5m/s

Pressure Loss : ΔPt=7,4 Pa

Sound Level : 28 NR





Example Selection

Needs:

Flow Rate : V=350m^3/h

Throw(1 Way) : L_T (A)= 3,2m (v_T=0,5 m/s)

Throw(2 Way) : L_T (B)= 2,4m (v_T=0,5 m/s)

Choise:

Choosed Size : 450 x 150

Outlet Velocity : v_K = 4m/s

Pressure Loss : ΔPt = 9,6 Pa

Sound Level : 31 NR

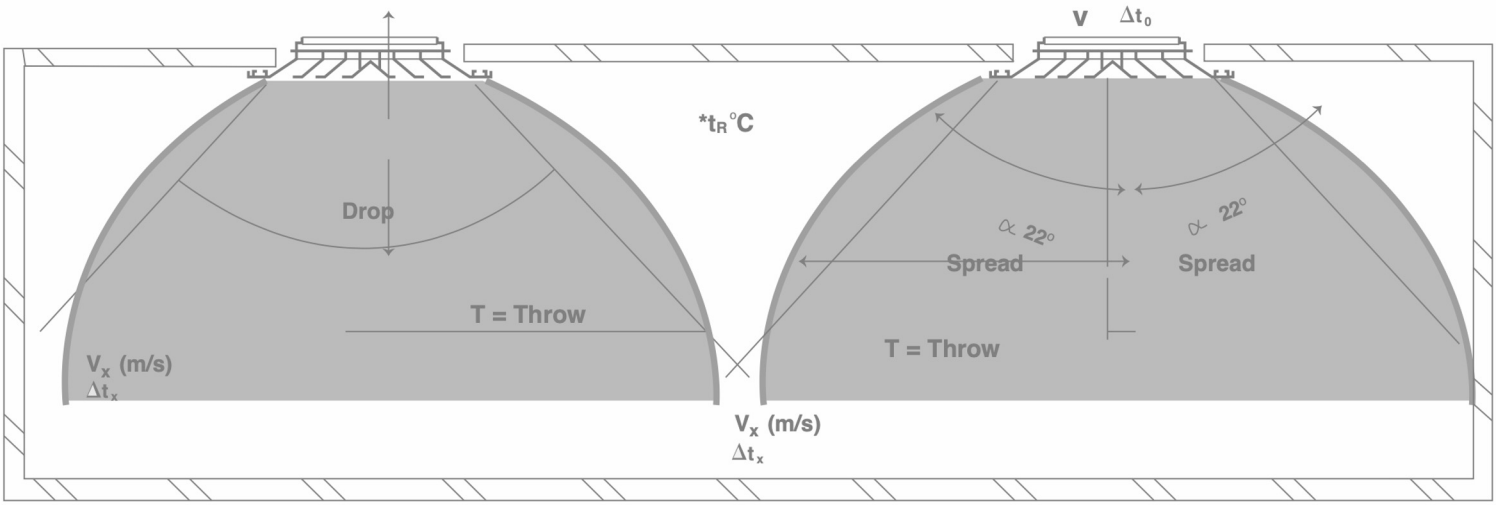
Engineering and Performance Data

Notes on Selection

Throw data are based on terminal velocities (Vt) at the ceiling for supply air temperatures of 11oC below room temperatures. To determine throw for isothermal and t 11oC temperature differential, use factors in following table.

Vt m/s	Isothermal air flow	dt = 11°c
0,75	1	1,00
0,5	1,05	1,10
0,25	1,11	1,22

Maximum throw show is based on a Vt of 0.25 m/s, and minimum throw on a Vt of 0.75 m/s. With diffusers mounted on a 2.7 m high ceiling and supplying air at 11oC below room temperature, the approximate average room velocities will be 0.175 m/s and 0.33 m/s respectively.



Air diffusion without side wall effect with model 104

- When two diffusers are discharging air towards each other, selection should be based on the diffuser size which will produce the required throw (one half the distance between diffuser centers) within the medium to maximum throw range at the air volume requirements.

- When diffusers are mounted on an exposed duct, or used with drop collars, the throw is decreased by approximately 40%. Air will be discharged downwards at an angle of approximately 20° from the horizontal. Horizontal air thrown can be obtained by extending a surface minimum of 300 mm beyond the periphery of the diffuser.

- For heating application, maximum mounting height is 3.7 metres at 16.5°C temperature differential with returns mounted at or near floor level.

- NC data are measured at a location from the diffuser of 1.5 metres and 45° angle from the face with an allowance of 10 dB for room effect and for diffusers without dampers or with dampers fully open. A blank space indicates no significant sound.

- Dampers fitted to diffusers are intended for fine balancing purposes. Excessive dampering to overcome high duct pressures will result in an increased sound level of approximately 8dB per doubling of pressure drop.

Engineering and Performance Data

Air Distribution

For ceiling diffusers, in addition to air flow, air throw and induction characteristics are the principle actors for selection.

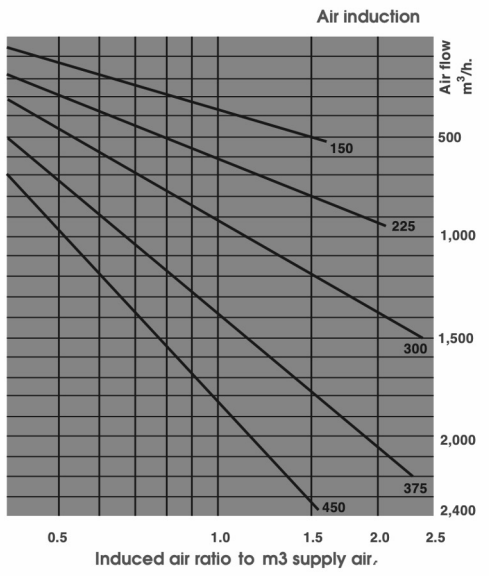
The induction factor and the throw can be adjusted by the individual internal setting blades for slot diffusers but they are mostly fixed for ceiling diffusers.

For such reason, the selection of ceiling diffuser must be made with precision, taking into consideration, the following procedure:

- Calculate the total air flow for the specific area.
- locate diffusers uniformly and co-ordinate with lighting fixtures.
- If diffusers cannot be located in the center of the area, select random diffusers with 1, 2 or 3 way pattern. Suggest diffuser locations considering ceiling height.
- Find maximum air flow rate per side of diffuser.
- Control the total air flow rate permissible per diffuser.
- Select the number of supply and return diffusers.
- Control sound level for the type of application.
- Select the size of diffusers from the air flow data and recontrol the horizontal throw of the selected diffusers.

Air Induction

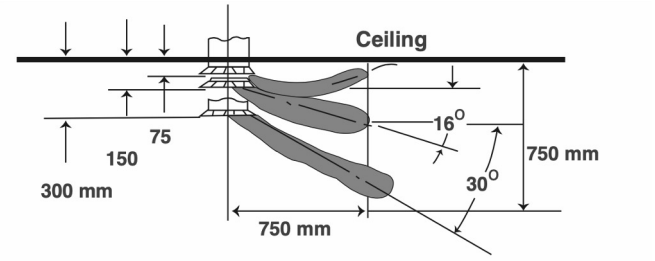
Air induction is an important factor in air conditioning distributing systems. The energy produced by the volume flow through diffuser and the discharge velocity at the diffusers outlet induces the air in the room and is the principle reason for the drop in temperature between supply air and room air. At high neck velocity, the induced air capacity can become more important than the original air flow, and throw is increasing in function of induced air ratio. Testing results for throw includes the influence of air induction.



Engineering and Performance Data

Ceiling Effect

Performance data as published in this catalogue is based on the diffuser being mounted at the ceiling. The published performance for the directional air pattern benefits from the ceiling coanda effect. When the diffuser is mounted remote from the ceiling, the air patterns to be anticipated are illustrated in Figure.



Sound data

- NC values are based on a room absorption of 10 db, re 10-12 watts.
- Performance data as tabulated is for supply air applications.
- Performance data assumes that IOTA is mounted on the ceiling for maximum ceiling effect.
- When no ceiling effect is present, the horizontal throw will be reduced approximately by 25%.

Outlet size

Outlet sizes are mentioned on the left side of each row within a tolerance of 10%

Accessories

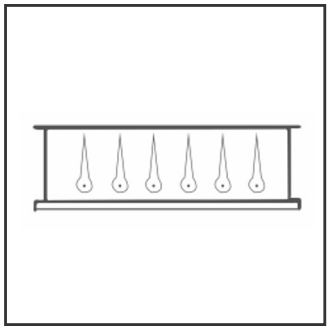
IOTA

Opposite Blade Damper

OD

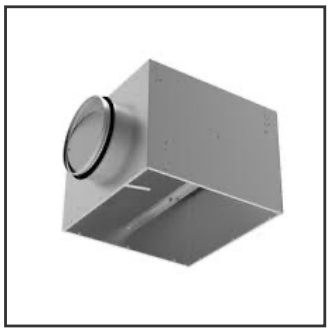
Equalizing Grid

EG



Plenum Box

PB



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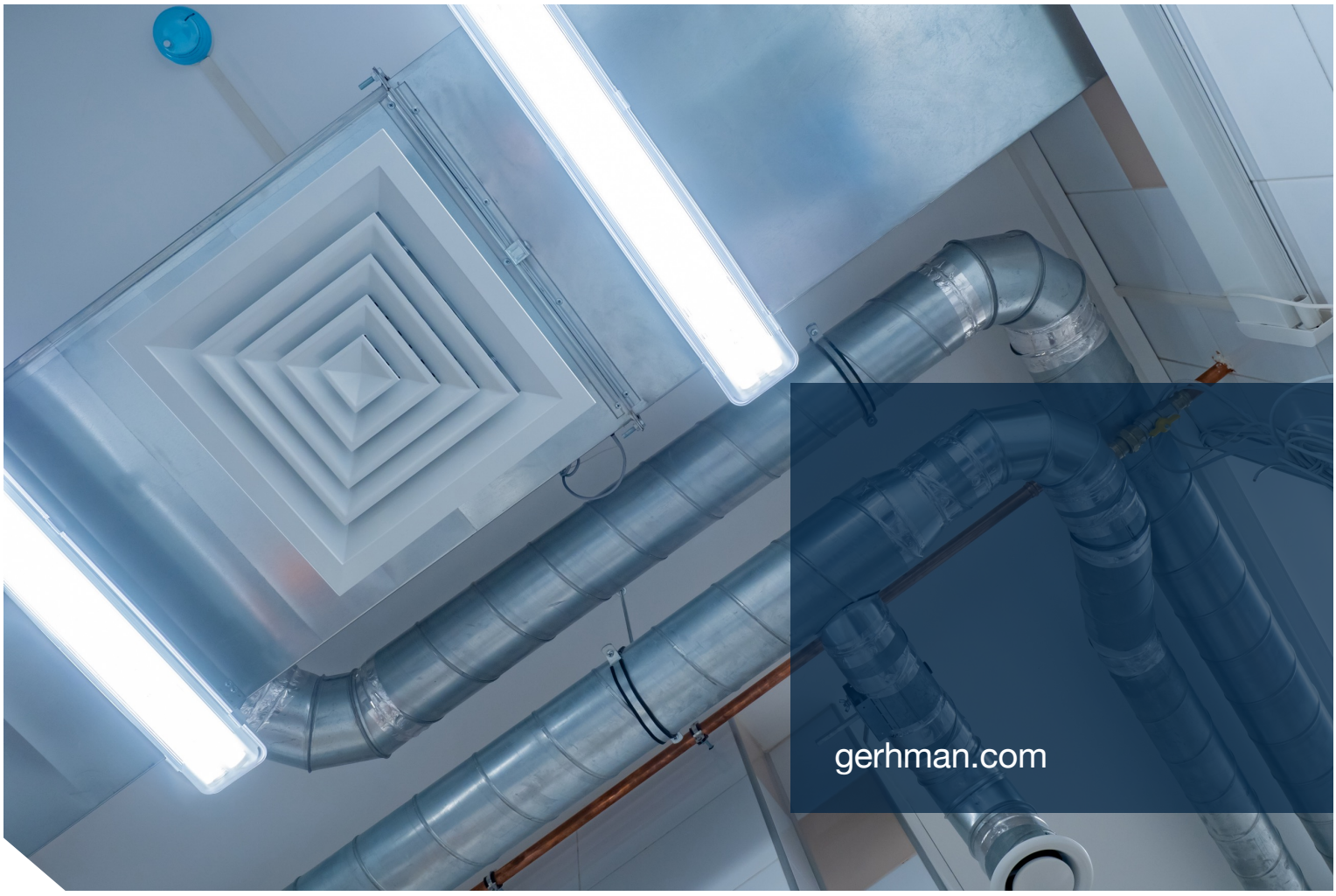

Ceiling Diffuser

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+90 0850 303 4766 • info@gerhman.com • gerhman.com