Lindab GTI Nozzle Diffuser User Manual

Contents

Lindab GTI Nozzle Diffuser

Description

GTI is a flexible supply air nozzle that is suitable for the ventilation of large areas. The nozzle can be used for both heated and cooled air and can be adjusted from diffused to concentrated supply air patterns. The supply air pattern can be adjusted by turning the insert in relation to the central line of the nozzle. The nozzle is equipped with Lindab Safe and can be installed directly into a circular duct, fitting, wall or duct side.

- Flexible nozzle for cooling and heating
- Adjustable dispersal pattern
- Simple installation

Maintenance

The visible parts of the diffuser can be wiped with a damp cloth.

Materials and finish

- **Insert:** Steel
- **Connection:** Galvanised steel
- **Standard finish:** Powder-coated
- **Standard color:** RAL 9003 or 9010, gloss 30

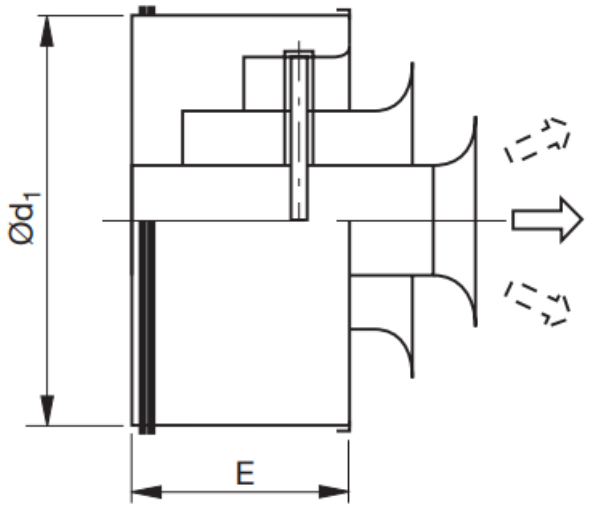
The diffuser is available in other colors. Please contact Lindab’s sales department for further information.

Order code

Product	GTI	aaa	A
Type			
GTI			
Size			
200 - 400			
Version			
A			

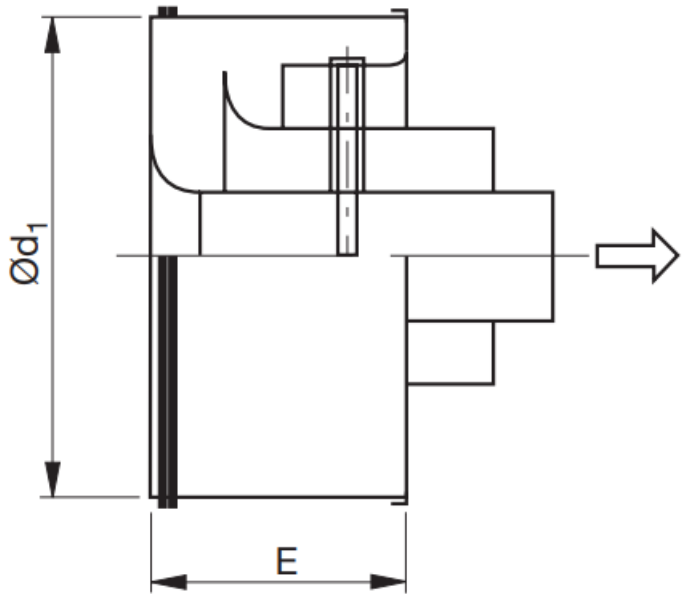
Dimensions

Installation 0



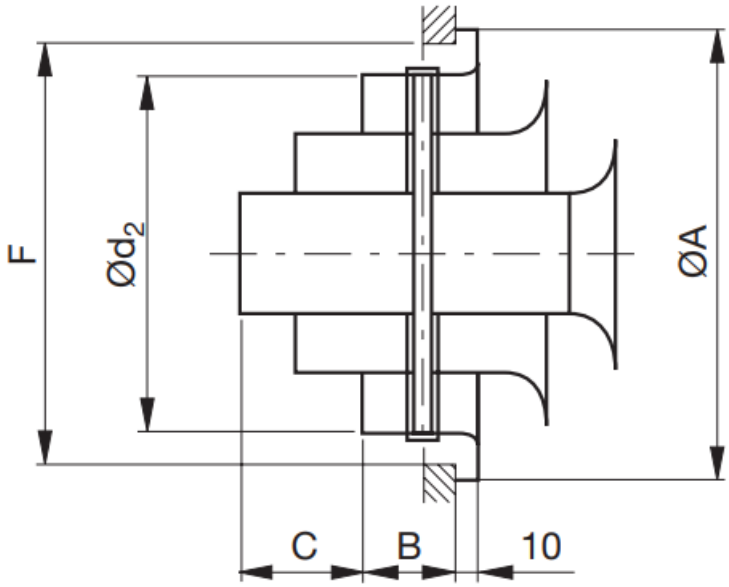
Diffused supply air – for installation in a circular duct or fitting. Supplied adapted to this form of installation as standard.

Installation 1



Concentrated supply air – for installation in a circular duct or fitting. The insert is turned 180 degrees.

Installation 2



Diffused supply air – for installation in a wall or duct side. Remove the external pipe.

Size	ØA mm	B mm	C mm	Ød1 mm	E mm	F mm	Ød2 mm	Weight kg
200	203	40	55	198	109	170	158	0,8
250	253	50	75	248	139	210	198	1,3
315	318	60	95	313	169	260	248	2,0
400	403	70	115	398	199	321	313	2,8

Technical data

Capacity
Volume flow qv [l/s] and [m3/h], total pressure Δpt [Pa], throw l0.3 [m] and sound power level LWA [dB(A)] can be seen in the diagrams.

Throw l0.3
Throw l0.3 can be seen in the diagrams for isothermal air at a terminal velocity of 0.3 m/s.

Resulting sound effect level
The sound effect level from the nozzles must be added logarithmically to the sound effect level from the flow noise in the duct. See sample calculation, section Nozzle calculations.

The frequency-related sound effect level
The sound effect level in the frequency band is defined as LWA + Kok Kok values are given in charts beneath the diagrams on the following pages.

Table 1 – diffused supply air

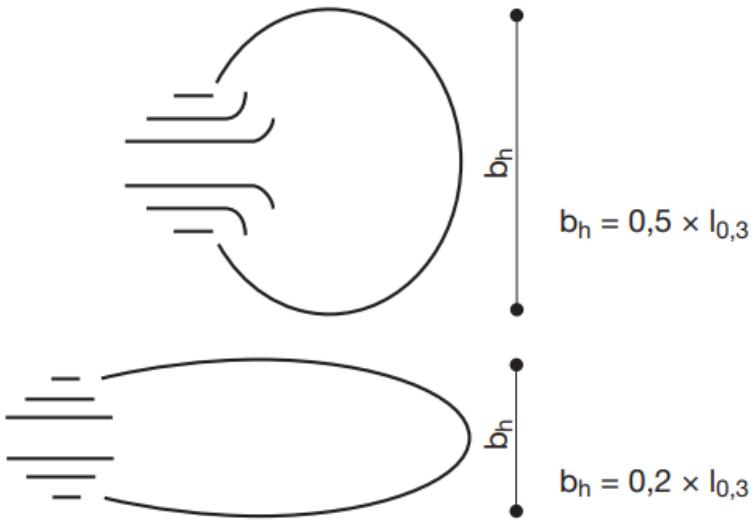
Centre frequency Hz Size 63 125 250 500 1K 2K 4K 8K								
200	15	0	-5	-6	-2	-10	-22	-32
250	13	-3	-6	-6	-1	-14	-14	-33
315	16	-1	-6	-2	-3	-15	-26	-35
400	14	-1	-3	0	-5	-16	-27	-32

Table 2 – concentrated supply air

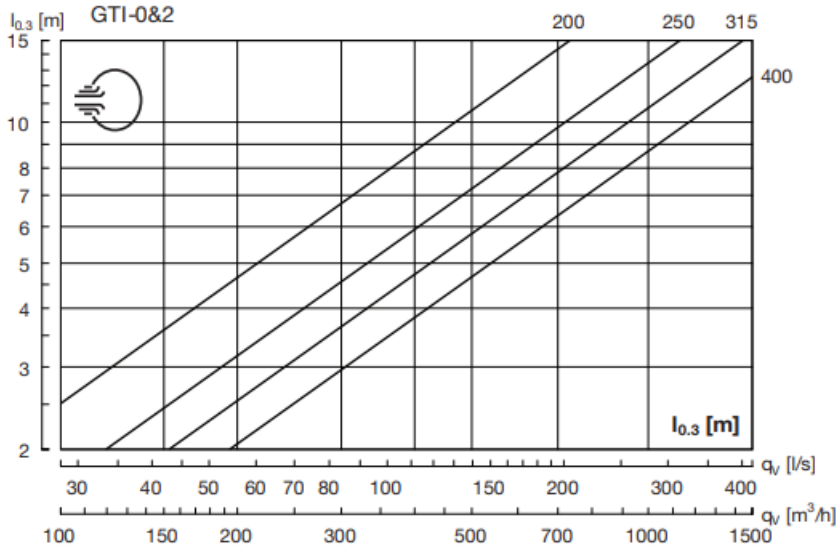
Centre frequency Hz Size 63 125 250 500 1K 2K 4K 8K								
200	14	0	-3	-4	-2	-13	-27	-37
250	16	-3	-6	-4	-2	-16	-25	-28
315	18	-1	-5	-2	-3	-16	-29	-40
400	15	-4	-6	-4	-2	-21	-34	-38

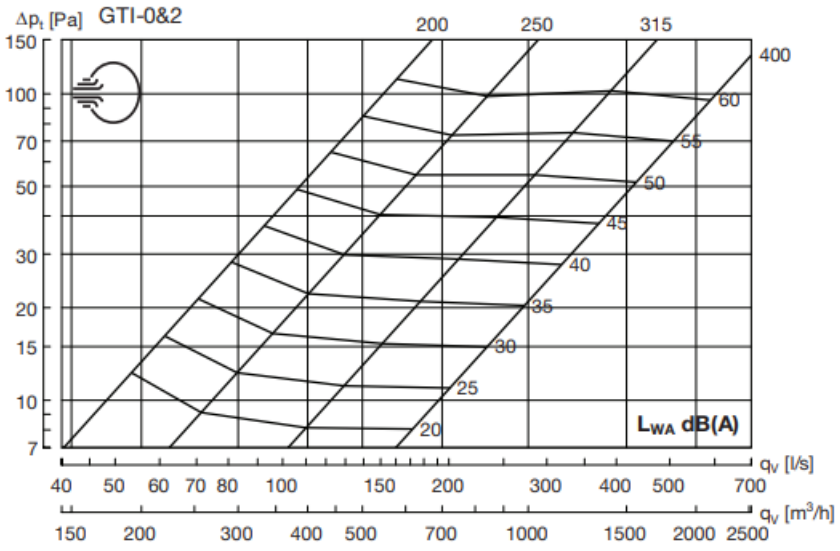
Air jet width bh

- Diffuse
- Concentrated

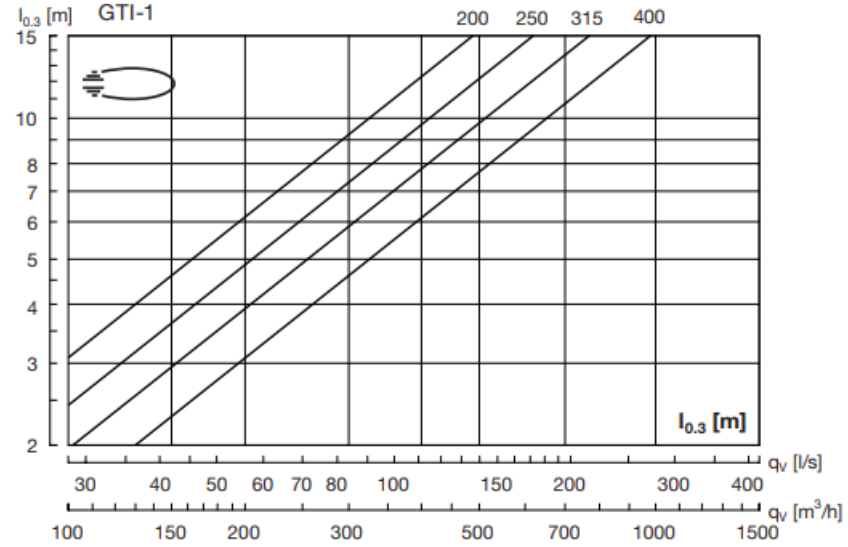


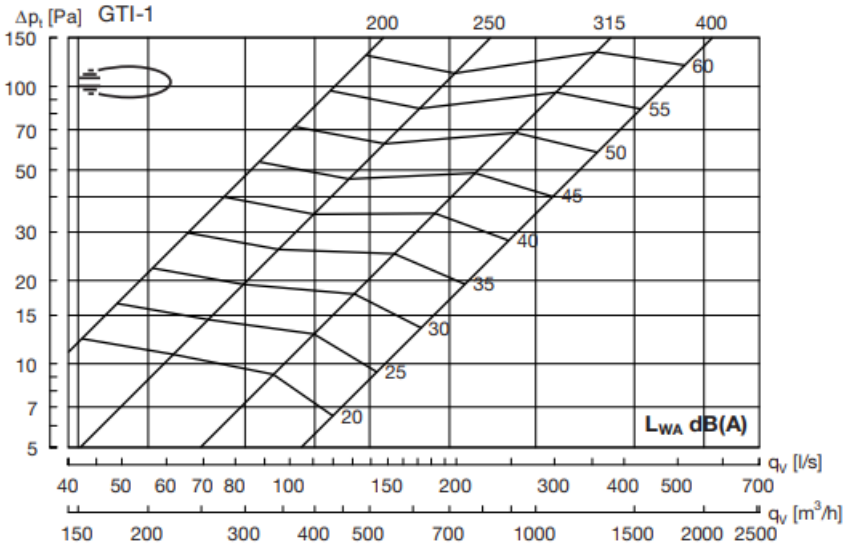
Diffuse supply





Concentrated supply





Resulting sound effect level

To calculate the resulting sound effect level from the nozzles, add the sound effect level from the nozzles (LWA nozzle) and the sound effect level from the flow noise in the duct (LWA duct) logarithmically.

Diagram 1, sound effect duct, LWA duct.

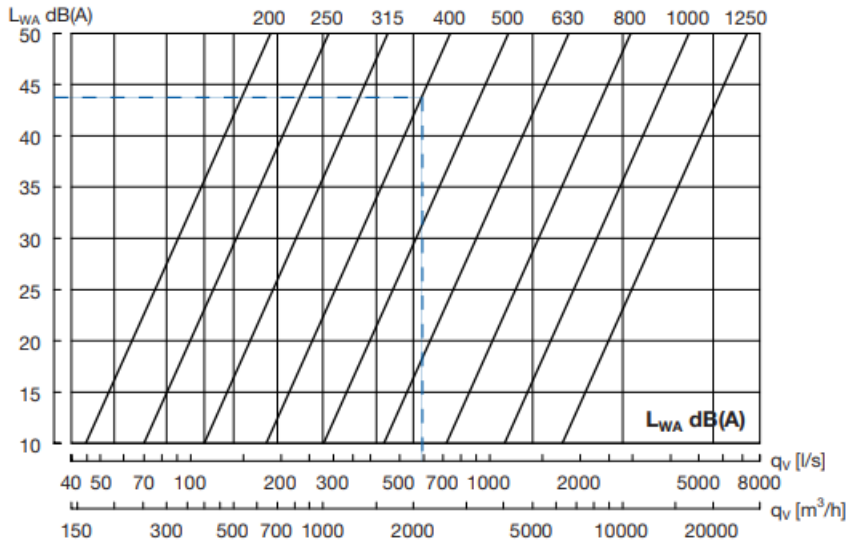
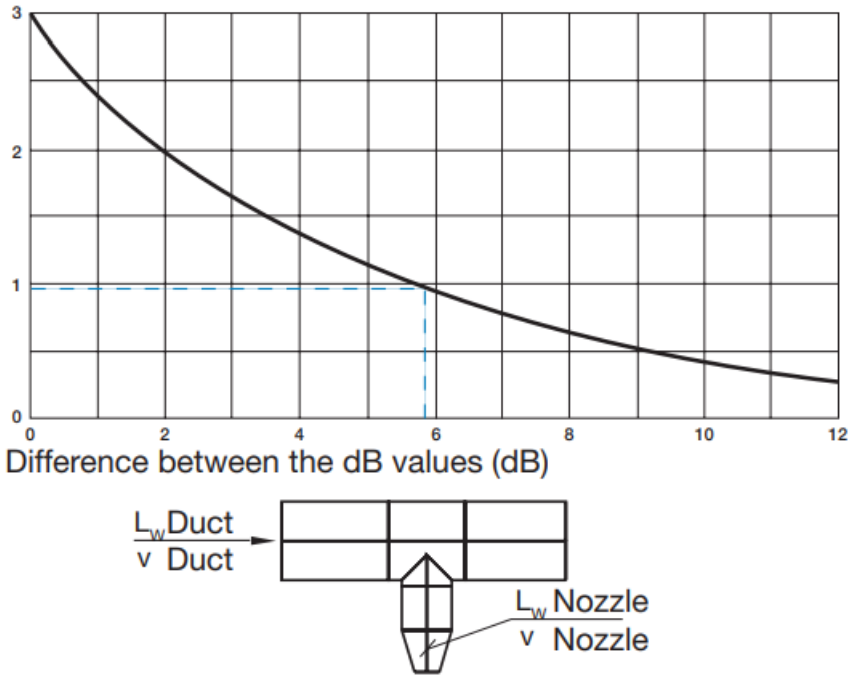


Diagram 2, addition of sound levels.

Difference to be added to the highest dB value (dB).



Sample calculation:

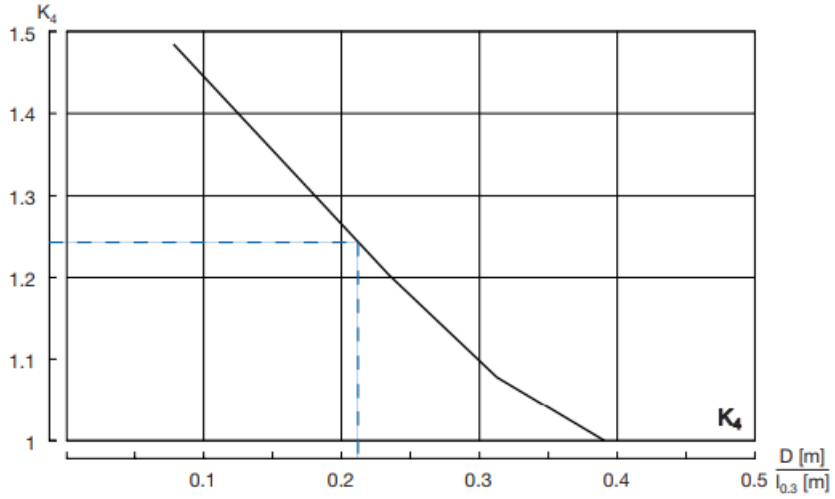
- LAD-200 q = 100 l/s
- ΔPt nozzle 90 Pa

Duct size:
In order to achieve a sensible distribution of the air out to the nozzles without using a damper, it is recommended that the pressure loss in the nozzle be 3 times higher than the dynamic pressure in the duct system.

- **Selected duct dimension:** Ø 400
- **Number of nozzles at joint:** 6
- **Volume of air in the duct:** 6×100 = 600 l/s
- **LWA duct (can be seen in diagram 1):** 43 dB(A)
- **LWA nozzle (can be seen in product diagram):** 37 dB(A)
- **Difference between db values:** 6 dB(A)
- **Value to be added to the highest dB value (diagram 2):** 1 dB(A)

Resulting sound effect level: 43 +1 = 44 dB(A)

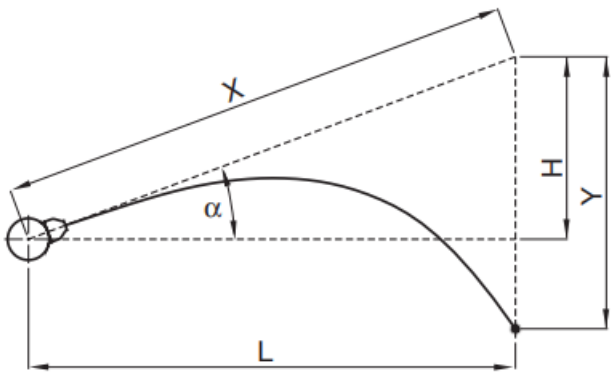
Extension of throw for two nozzles, positioned side by side:
If two nozzles are positioned next to each other, the air jets will be amplified, thereby extending the throw. To calculate this, use the diagram below, in which the distance between the nozzles is designated D. The calculation factor K4 must be multiplied by the throw l0.3. The throw is not extended further with more nozzles.



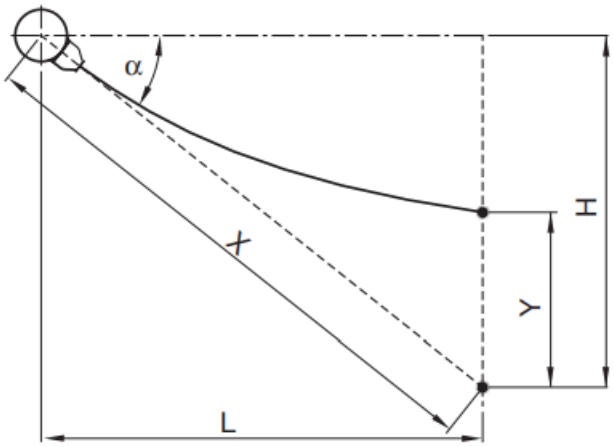
Sample calculation

- **LAD-125. Distance D = 1.5 metres.**
  Volume of air: q = 15 l/s
- **Diagram throw under selected nozzle**
  Specified throw: l0.3 = 7 m
  D [m] / l0.3[m]: 1.5 / 7 = 0.21
- **K4 calculation factor**
  Can be seen in the diagram: K4 = 1.25
- **Resulting throw**
  K4 x l0.3 = 1.25 x 7 m = 8.75 m

Supply air with cooled air



Supply air with heated air



Terminal velocity V_x:

$$v_x = K_1 \times \frac{q}{X}$$

Deflection Y:

$$Y = K_2 \times \frac{X^3}{q^2} \times \Delta t$$

Sample calculation: Cooled air

- LAD-200: q = 400 m3/h
- Δt = 6K α = 30°
- Final velocity vx = 0,3 m/s

$$X = K_1 \times \frac{q}{v_x} = 0{,}020 \times \frac{400}{0{,}3} = 27 \text{ m}$$

$$Y = K_2 \times \frac{X^3}{q^2} \times \Delta t = 24 \times \frac{27^3}{400^2} \times 6 = 17{,}7 \text{ m}$$

$$H = X \times \sin \alpha = 27 \times 0{,}5 = 13{,}5 \text{ m}$$
$$L = X \times \cos \alpha = 27 \times 0{,}87 = 23{,}4 \text{ m}$$

Sample calculation: Heated air

LAD-200: $q = 400\ m^3/h$

$\Delta t = 6K\ \alpha = 60°$

Final velocity $v_x = 0{,}3\ m/s$

$$X = K_1 \times \frac{q}{v_x} = 0{,}020 \times \frac{400}{0{,}3} = 27\ m$$

$$Y = K_2 \times \frac{X^3}{q^2} \times \Delta t = 24 \times \frac{27^3}{400^2} \times 6 = 17{,}7\ m$$

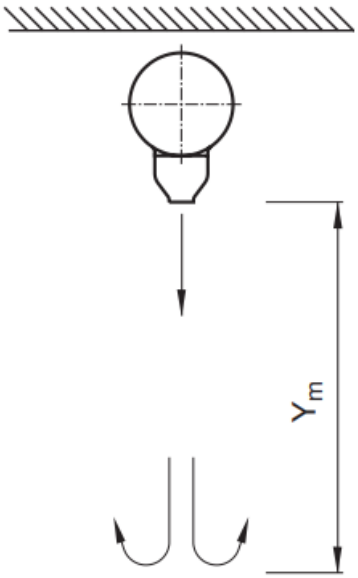
$$H = X \times \sin \alpha = 27 \times 0{,}87 = 23{,}4\ m$$

$$L = X \times \cos \alpha = 27 \times 0{,}5 = 13{,}5\ m$$

Calculation factors

Size	Free area A m^2	K_1 m^3/h	K_1 l/s	K_2 m^3/h	K_2 l/s	K_3 m^3/h	K_3 l/s
LAD							
125	0.0029	0.037	0.133	3.9	0.30	0.24	0.86
160	0.0071	0.023	0.083	15.6	1.20	0.122	0.44
200	0.0095	0.020	0.072	24.0	1.85	0.097	0.35
250	0.0165	0.0153	0.055	54.4	4.2	0.064	0.230
315	0.0254	0.0122	0.044	104	8.0	0.046	0.166
400	0.0398	0.0097	0.035	206	15.9	0.033	0.119
DAD							
160	0.0056	0.026	0.094	10.7	0.83	0.145	0.52
200	0.0095	0.020	0.072	24.0	1.85	0.097	0.35
250	0.0154	0.0157	0.057	49.0	3.78	0.068	0.24
315	0.0240	0.0127	0.046	96.0	7.41	0.048	0.17
GD							
	0.0027	0.038	0.137	3.5	0.27	0.26	0.92
GTI-1							
200	0.0200	0.0090	0.032	114	8.8	0.048	0.173
250	0.0310	0.0073	0.026	219	16.9	0.034	0.122
315	0.0490	0.0058	0.021	435	34	0.024	0.086
400	0.0780	0.0046	0.017	875	68	0.017	0.062

Vertical supply air with heated air



$$Y_m = K_3 \times \frac{q}{\sqrt{\Delta t}} (m)$$

Sample calculation:

LAD-160 $q = 200\ m^3/h$
$\Delta t = 10\ K$

The distance to the turning point of the air jet:

$$Y_m = K_3 \times \frac{q}{\sqrt{\Delta t}} (m)$$

$$Y_m = 0{,}122 \times \frac{200}{\sqrt{10}} (m)$$

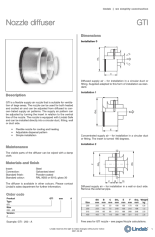
$$Y_m = 7{,}7\ m$$

Lindab reserves the right to make changes without prior notice 2021-02-09

Most of us spend the majority of our time indoors. The indoor climate is crucial to how we feel, how productive we are and if we stay healthy. We at Lindab have therefore made it our most important objective to contribute to an indoor climate that improves people's lives. We do this by developing energy-efficient ventilation solutions and durable building products. We also aim to contribute to a better climate for our planet by working in a way that is sustainable for both people and the environment.

www.lindab.com

Documents / Resources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GTI, Nozzle Diffuser, GTI Nozzle Diffuser, Diffuser