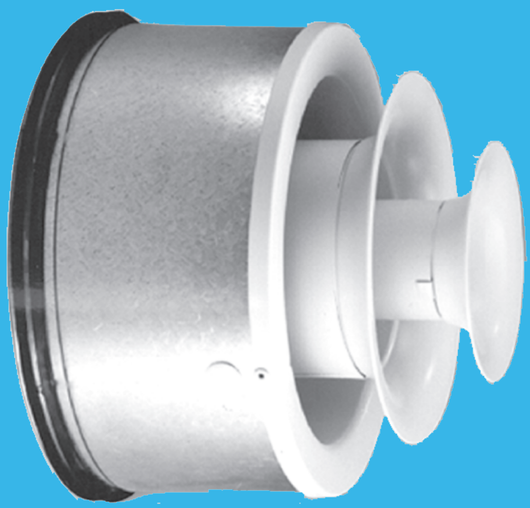
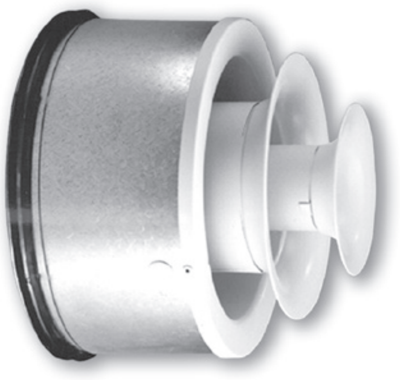


Lindab **GTI**

Nozzle diffuser

Nozzle diffuser

GTI



Description

GTI is a flexible supply air nozzle that is suitable for 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 colour:	RAL 9003 or 9010, gloss 30

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

Order code

Product **GTI** **aaa** **A**

Type
GTI

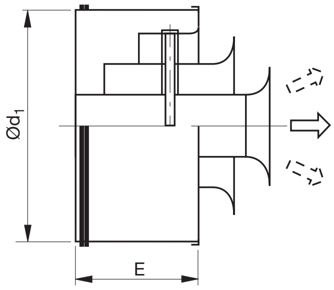
Size
200 - 400

Version
A

Example: GTI - 250 - A

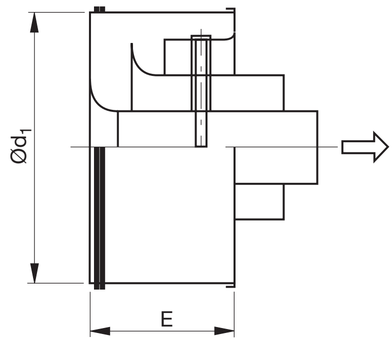
Dimensions

Installation 0



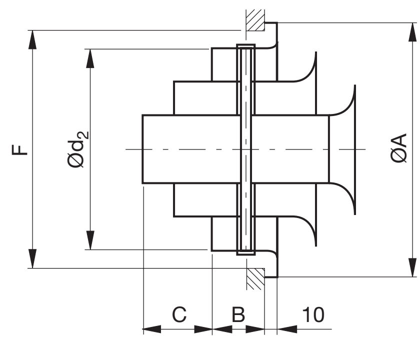
Diffused supply air – for installation in a circular duct or fitting. Supplied adapted to this form of installation as standard.

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	$Ød_1$ mm	E mm	F mm	$Ød_2$ 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

Free area for GTI nozzle – see pages Nozzle calculations.

Nozzle diffuser GTI

Technical data

Capacity

Volume flow q_v [l/s] and [m³/h], total pressure Δp_t [Pa], throw $l_{0.3}$ [m] and sound power level L_{WA} [dB(A)] can be seen in the diagrams.

Throw $l_{0.3}$

Throw $l_{0.3}$ 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.

Frequency-related sound effect level

The sound effect level in the frequency band is defined as L_{WA} + K_{ok} K_{ok} values are given in charts beneath the diagrams on the following pages.

Table 1 - diffused supply air

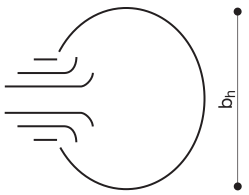
	Centre frequency Hz							
Size	63	125	250	500	1K	2K	4K	8K
200	15	0	-5	-6	-2	-10	-22	-32
250	13	-3	-6	-6	-1	-14	-14	-33
315	16	-1	-6	-2	-3	-15	-26	-35
400	14	-1	-3	0	-5	-16	-27	-32

Table 2 - concentrated supply air

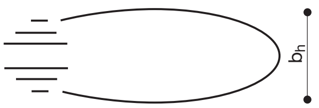
	Centre frequency Hz							
Size	63	125	250	500	1K	2K	4K	8K
200	14	0	-3	-4	-2	-13	-27	-37
250	16	-3	-6	-4	-2	-16	-25	-28
315	18	-1	-5	-2	-3	-16	-29	-40
400	15	-4	-6	-4	-2	-21	-34	-38

Air jet width b_h

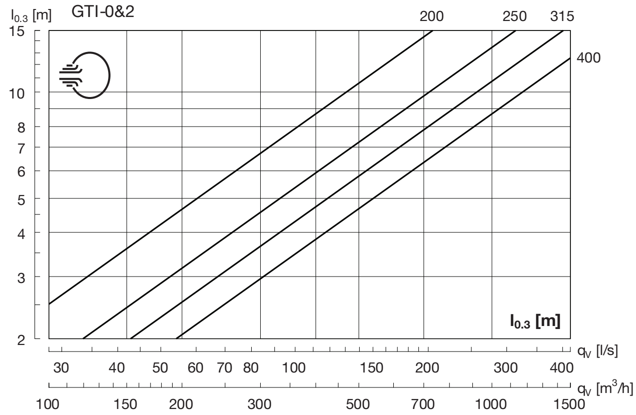
Diffuse

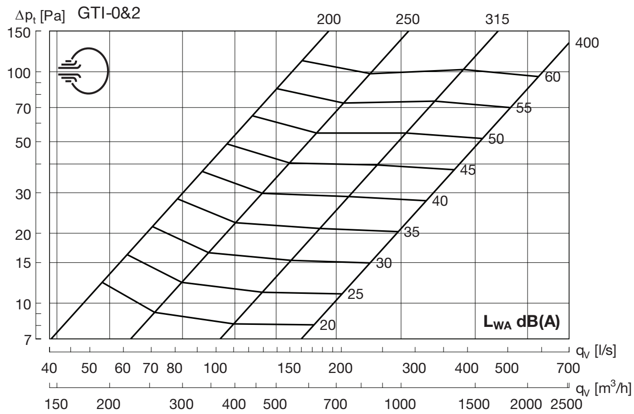


Concentrated

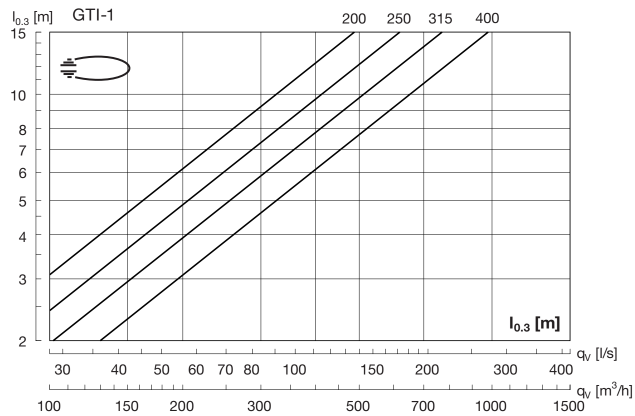


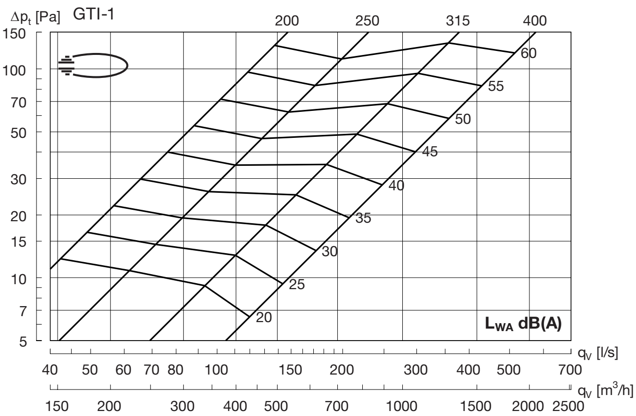
Diffuse supply





Concentrated supply





Supply air nozzle

Calculation

Resulting sound effect level
To calculate the resulting sound effect level from the nozzles, add the sound effect level from the nozzles (L_{WA} nozzle) and the sound effect level from the flow noise in the duct (L_{WA} duct) logarithmically.

Diagram 1, sound effect duct, L_{WA} duct.

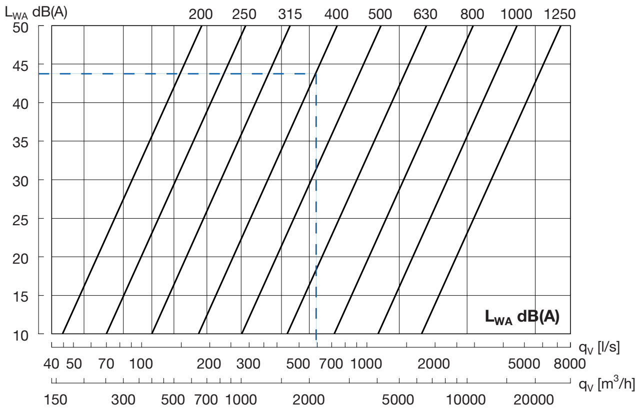
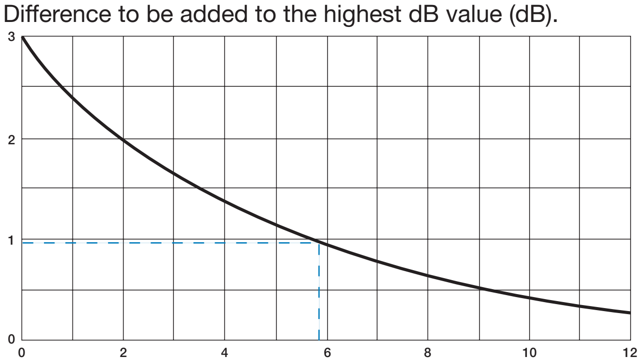
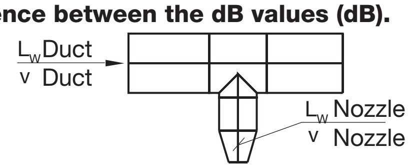


Diagram 2, addition of sound levels.
Difference to be added to the highest dB value (dB).



Difference between the dB values (dB).



Sample calculation:

LAD-200 q = 100 l/s
ΔP_t nozzle 90 Pa

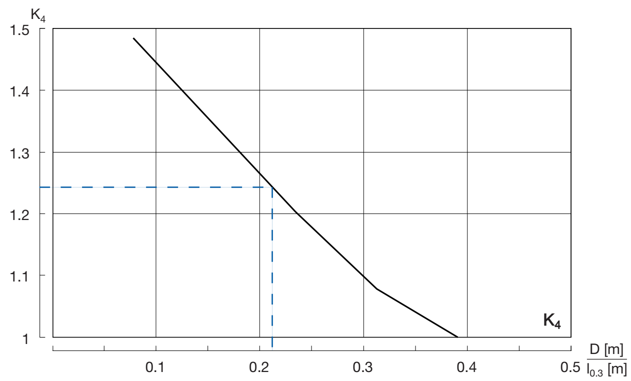
Duct size:
In order to achieve a sensible distribution of the air out to the nozzles without using a damper, it is recommended that the pressure loss in the nozzle be 3 times higher than the dynamic pressure in the duct system.

Selected duct dimension:	Ø 400
Number of nozzles at joint:	6
Volume of air in the duct:	6x100 = 600 l/s
L_{WA} duct (can be seen in diagram 1):	43 dB(A)
L_{WA} 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 K_4 must be multiplied by the throw $l_{0.3}$. 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: $l_{0.3}$ = 7 m
D [m] / $l_{0.3}$[m]: 1.5 / 7 = 0.21

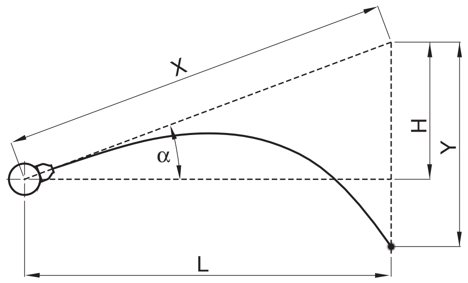
K_4 calculation factor
Can be seen in the diagram: K_4 = 1.25

Resulting throw
$K_4 \times l_{0.3} = 1.25 \times 7 \text{ m} = 8.75 \text{ m}$

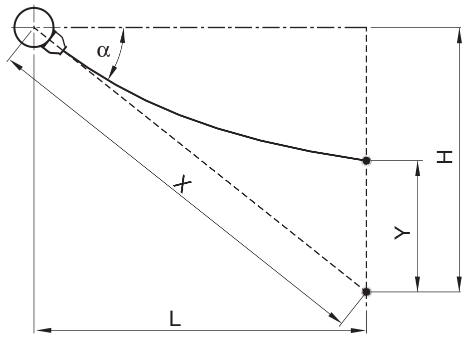
Supply air nozzle

Calculation

Supply air with cooled air



Supply air with heated air



$$X = \frac{L}{\cos\alpha} = \frac{H}{\sin\alpha}$$

$$H = L \times \tan\alpha$$

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: $q = 400\ m^3/h$
$\Delta t = 6K\ \alpha = 30°$
Final velocity $v_x = 0.3\ m/s$

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

$$X = K_1 \times \frac{q}{v_x} = 0.020 \times \frac{400}{0.3} = 27\ m$$

$$Y = K_2 \times \frac{X^3}{q^2} \times \Delta t = 24 \times \frac{27^3}{400^2} \times 6 = 17.7\ m$$

$H = X \times \sin\alpha = 27 \times 0.5 = 13.5\ m$
$L = X \times \cos\alpha = 27 \times 0.87 = 23.4\ m$

Sample calculation: Heated air

LAD-200: $q = 400\ m^3/h$
$\Delta t = 6K\ \alpha = 60°$
Final velocity $v_x = 0.3\ m/s$

$$X = K_1 \times \frac{q}{v_x} = 0.020 \times \frac{400}{0.3} = 27\ m$$

$$Y = K_2 \times \frac{X^3}{q^2} \times \Delta t = 24 \times \frac{27^3}{400^2} \times 6 = 17.7\ m$$

$H = X \times \sin\alpha = 27 \times 0.87 = 23.4\ m$
$L = X \times \cos\alpha = 27 \times 0.5 = 13.5\ m$

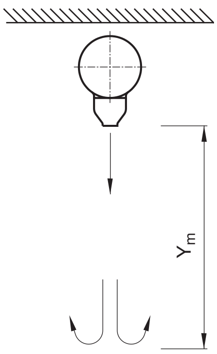
Supply air nozzle

Calculation

Calculation factors:

Size	Free area Am²	K_1 m³/h	K_1 l/s	K_2 m³/h	K_2 l/s	K_3 m³/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



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

Sample calculation:

LAD-160

$q = 200$ m³/h
$\Delta t = 10$ K

The distance to the turning point of the air jet:

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

$$Y_m = 0.122 \times \frac{200}{\sqrt{10}} \text{ (m)}$$

$$Y_m = 7.7 \text{ m}$$

Most of us spend the majority of our time indoors. 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.

Lindab | For a better climate

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For a better climate

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