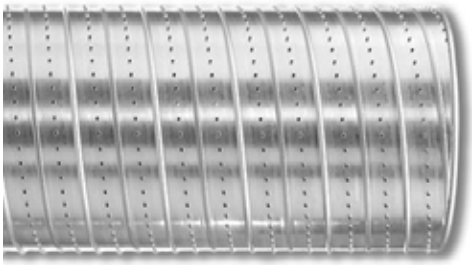
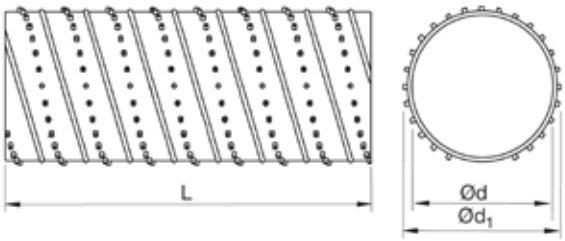
Ventiduct VSR





Description

Ventiduct is an air distribution system consisting of spiral ducts enhanced by a number of small nozzles carefully placed into the duct wall. VSR can be ordered with various nozzle patterns for specific demands.

- Large cooling effect
- Large dynamic range
- Large induction rate
- Short throw
- Discrete diffuser design
- Easy to install
- Supplied in five sizes ranging from 8", 10", 12", 16", 20" Ø
- Available in lengths between 12" to 60"
- Standard G90 construction
    - Optional: epoxy-coated

Dimensions

Ød	$Ød_1$
inch	inch
8	8.4
10	10.4
12	12.4
16	16.4
20	20.4

Nozzle Pattern		Code
300°		300
270°		270
180°		180
90°		090
2 X 90°		290

Order example

VSR 8 270 5 0

- Product
- Diameter
- Nozzle pattern
- Length
- Finish (0=Galvanized, 1=Epoxy coated)

Ventiduct VSR

Dispersal patterns

With Ventiduct nozzle ducts, various flow conditions can be achieved in the room. The downward supply of air always creates the greatest air velocities in the occupied zone and is therefore used mostly in industrial ventilation. The choice between air being supplied horizontally or upwards depends on the required form of flow.

Upward supply air

When cooled air is supplied upwards, the cool air mixes with the warmer room air close to the duct nozzles. The supplied air typically covers a vertical area of 78" to 158" below the ducts. At greater distances between the ducts, the supplied air flows behind in a displacement flow further out in the room.

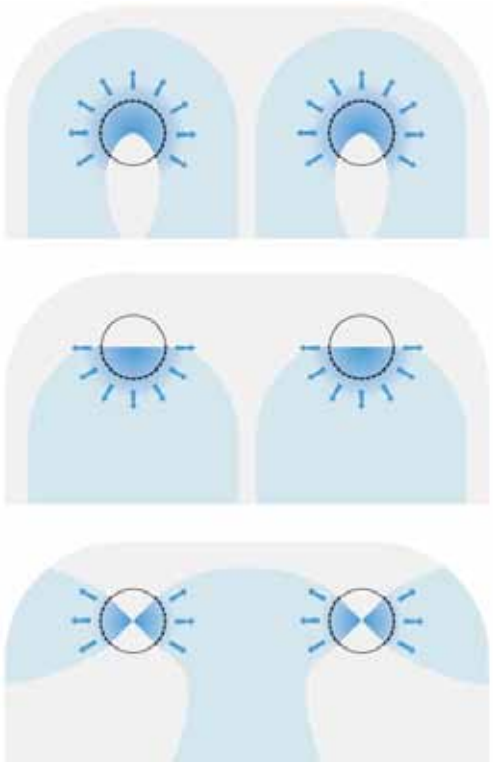
Depending on the required volume flow, a nozzle pattern of between 90° and 300° is used.

Downward supply air

When air is supplied downwards, the air velocities in the occupied zone are increased by the thermal forces (by cooling) and by the dynamic forces (Supplied air velocity). This can result in quite high air velocities in the occupied zone, which is not acceptable for traditional comfort ventilation. However, high air velocities can be recommended if a stable downward flow of air is required, and if increased, air velocities in the occupied zone are acceptable. This could, for example, be desirable for industrial applications. A nozzle pattern between 90° and 300° is used, depending on the volume flow required.

Horizontal supply air

When air is supplied horizontally, air jets are formed, creating a mixed flow in the room. Depending on the various parameters, maximum air velocities occur in the occupied zone due to the thermal load, air jet velocities or a combination of both. When low supply air velocities are being used (low volume flow or large ducts/nozzle patterns) the form of the flow approximates a form of low impulse supply air, as with upwards supply air. Horizontal supply air can be used in locations where there is a deliberate demand for a flow of air throughout the room in accordance with the mixing principle, and therefore where an upward supply is not being used.



Recommended working areas for Ventiduct
The values stated are for guidance only and should be used with care, as incoming volume flow, cooling temperature, duct design and air pattern all have a great deal of influence on the resulting air velocity in the occupied zone.

For more detailed calculations, Lindab will be happy to perform a computer calculation.

Air pattern	Up	Down	Horizontal
Installation height [in] *	98-197	118-315	98-197
Min. distance from ceiling [in] **	8	4-8	4
Δt (t1 - tr) [K]	-1..–10	-1..–6	-1..–8

* Distance from floor to lower edge of duct

** Distance from upper edge of duct to ceiling must be maintained to avoid dirtying the ceiling

Ventiduct VSR

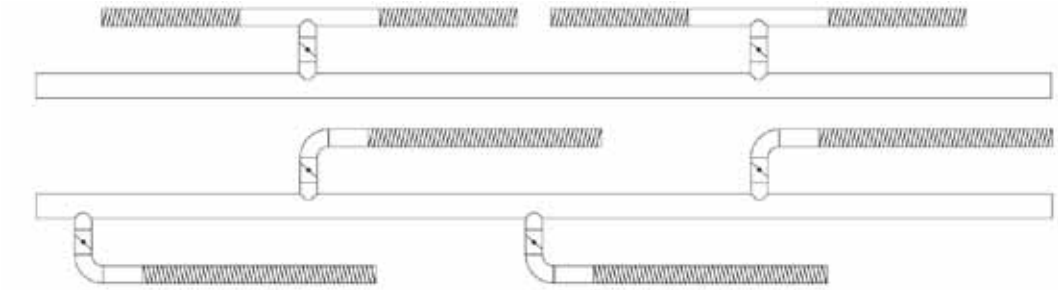
Technical data

Examples of duct design

Ventiduct nozzle ducts can be installed in various ways. In high-ceilinged rooms it is generally an advantage to install Ventiduct nozzle ducts as low down as possible (min. height above floor 96"). This provides the greatest efficiency.

Cactus model

This solution is used for long, narrow rooms.

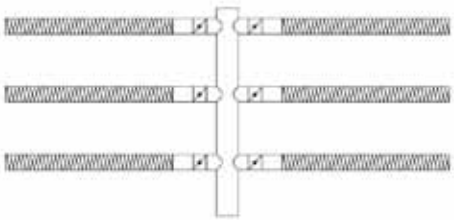


Exchange model

An ideal solution for long, narrow rooms. This model provides an even distribution of supplied air.

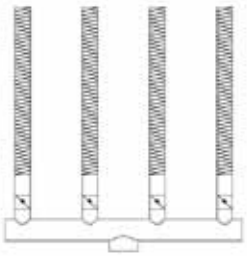
Fishbone model

Ventiduct nozzle ducts stretch out from both sides of the main duct. It is recommended that a volume damper be used for accurate regulation of the air volume.



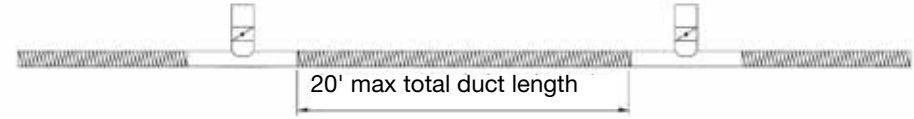
Fork model

Here the Ventiduct nozzle ducts are positioned on one side of a main or branch duct. It is recommended that a volume damper be installed on the duct joins in order to ensure consistent air distribution in the duct system.



Line model

A simple solution that makes duct installation easier and minimizes the number of volume dampers. The distance between the connection ducts is equivalent to twice Ventiduct's maximum length plus the two blind pieces.

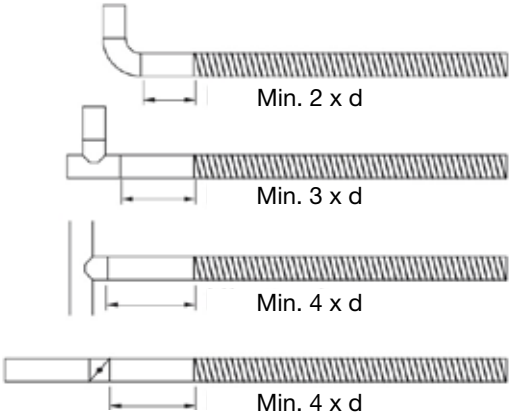


Ventiduct VSR

Technical data

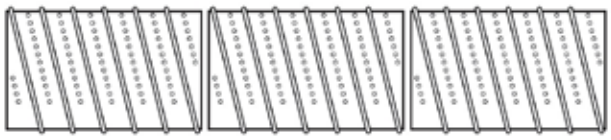
Building-in distance
Ventiducts should not be positioned too close to dampers, elbows, tees or other elements that may create turbulence and hence noise.

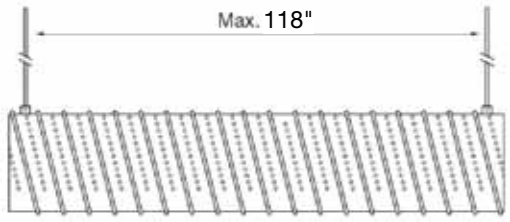
Straight duct sections should be installed between the Ventiducts and potentially disruptive components, as shown in the illustration below. Suitable duct sections are available.



Mounting

Assembly
The Ventiducts are individually packed in cardboard boxes at the factory, to minimize the risk of transport damage. The packaging is numbered to ensure that the ducts are mounted in the correct order, so that the spiral seam is continuous.





Maximum distance between suspension loops is 118"

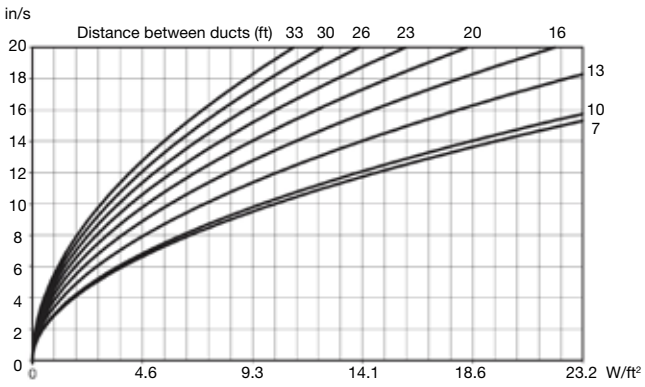
Air velocity in the occupied zone

The air velocity in the occupied zone is a result of air jet velocities and thermal air movements in the room. An exact calculation of the resulting air velocity in the occupied zone can be performed using a computer program. (Contact the Lindab sales department for futher information).

For upward supply, the maximum air velocity in the occupied zone are dependent on the temperature difference ti-tr. The best results are achieved by using maximum supply air per duct foot, according to the table on the left.

Depending on the thermal load (W/ft²) and the duct length, the maximum air velocity in the occupied zone is indicated as a rough estimate in the diagram below.

Diagram only applies to upward dispersal pattern with maximum volume flow per duct foot:
(distance to ceiling > 4 × Ø d).



Please contact Lindab's sales department for further information.