nad KLIMA

MADE IN CANADA

LDI

Industrial diffuser

catalog 1.1.6

Table of content

The information contained in this catologue is subject to change.
Refer to the digital version on **www. nadklima.com**

Version 2019

LDI

Presentation and benefits

The LDI diffuser has been specially developed to meet the air requirements in places with high ceilings. The LDI diffuser's design allows it to be installed in free suspension.

The LDI is a high induction helical air jet diffuser with a round or square steel frontal plate. It is equipped with adjustable blades guiding the air flow.

It can be installed as well as in areas where maximum comfort is desired, as in commercial and industrial situations.
The diffuser can be installed in either gypsum, suspended or apparent ceilings.

The ability to manually adjust the air supply feed allows the user to adapt the speed, height of penetration and ratio of induction to meet the needs of the moment.

Benefits

- Adjustable air flow
- Low acoustic power
- Rapid decrease of speeds and temperature variances
- Lower installation costs due to its easy assembly
- Reduces energy air treatment costs
- Distributes a large airflow

Areas of application

- Production workshops
- Commercial spaces
- Assembly workshops
- Printing houses

Configuration and mode of operation

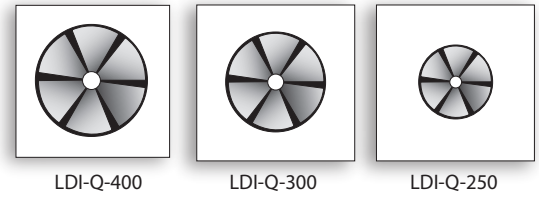
Configuration

The LDI is composed of a square or round front plate, with six adjustable blades mounted on a central hub. The blades can be controlled manually and individually.

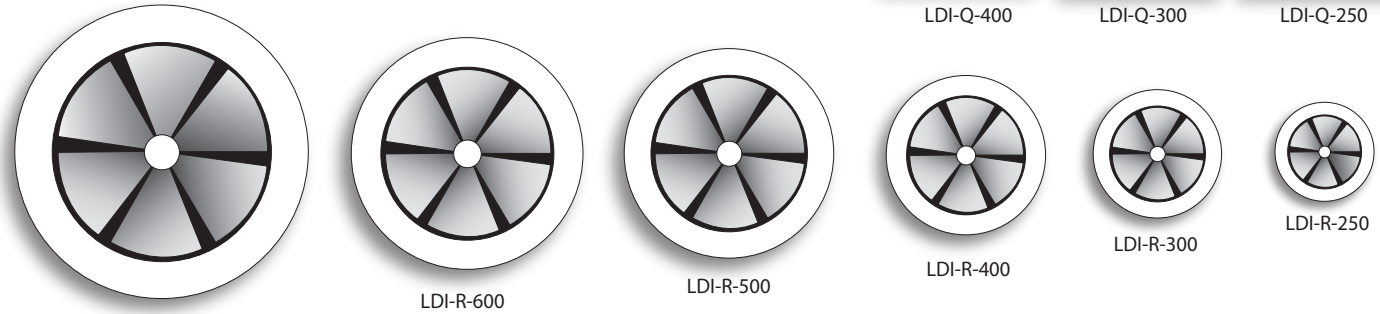
This diffuser is available in 250 / 300 / 400 / 500 / 600 / 800 nominal dimension. It is adapted for heights up to 30 m and flow rates up to 12,000 m^3/h per diffuser.

The diffuser is painted with a TGIC-free polyester powder coat. It provide a smooth easy to clean, chip and fade resistant finish.

The colours are available according to the RAL colour chart.



LDI-Q-400 LDI-Q-300 LDI-Q-250



LDI-R-800 LDI-R-600 LDI-R-500 LDI-R-400 LDI-R-300 LDI-R-250

Mode of operation

Different patterns are created in the air depending on blade angle. It guarantees performance in all cooling, ventilation or heating situations.

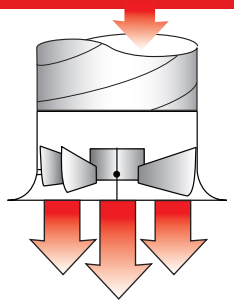
All loads have a defined angular dimension assigned to them. In addition, the asymmetric blades' angle setting ensures that there is no interference for exiting air jets.

At the front plate, a deflection of the air flow (from vertical to horizontal) is produced by the blades.

These adjustable blades allow us to easily switch from heating to cooling mode.

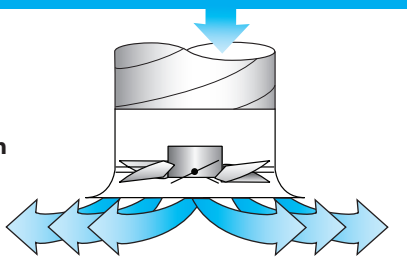
Heating

Blades:
Vertical position
Vertical flow with high penetration



Cooling

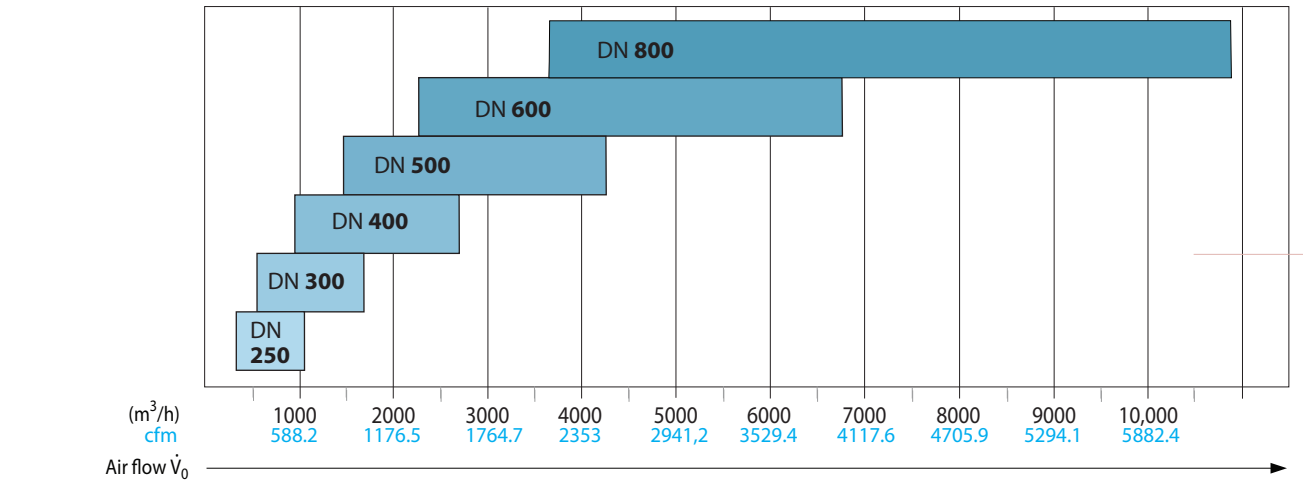
Blades:
Variable oblique position
Helical flow

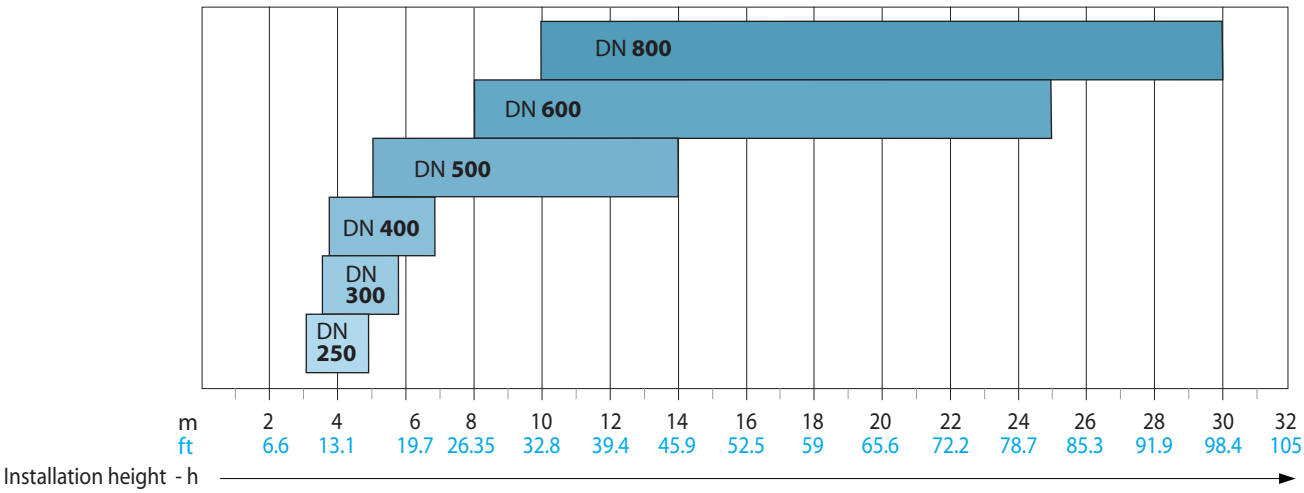


Ranges of application and quick selection

	DN 250			DN 300			DN 400			DN 500			DN 600			DN 800		
L_{WA} (dB(A))	35	45	55	35	45	55	35	45	55	35	45	55	35	45	55	35	45	55
V_0 (m^3/h)	360	550	920	800	1100	1500	1200	1800	2400	1700	2500	3800	2600	3800	5600	3700	5500	8500
Δp (Pa)	30	80	200	48	85	162	47	84	150	32	70	150	25	55	125	25	50	110
Installation height (m)	3.0	3.0	3.0	4.5	4.5	4.5	6.0	6.0	6.0	8.0	8.0	8.0	10.0	10.0	10.0	12.0	12.0	12.0
Min. spacing (m)	1.7	2.6	3.9	2.5	4.0	5.2	2.7	4.5	5.9	3.0	4.5	7.5	3.5	5.0	6.0	4.0	5.5	7.0
y (m)	2.0	3.5	6.2	3.0	4.7	7.0	3.0	5.2	7.2	4.0	5.3	8.5	4.0	5.5	8.6	4.0	5.5	9.0

The minimum spacing in this table applies to the height of systems, which is recommended to be installed at a pre-set angle of 60°.
The vertical penetration height is valid for an angle of 15°, and a temperature difference between ambient air and blown air of 15°C.
The penetration depth and minimal spacing can be manually adjusted.



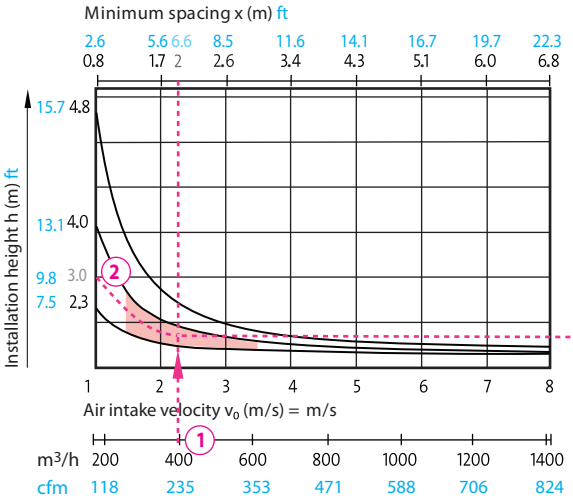


Diagrams

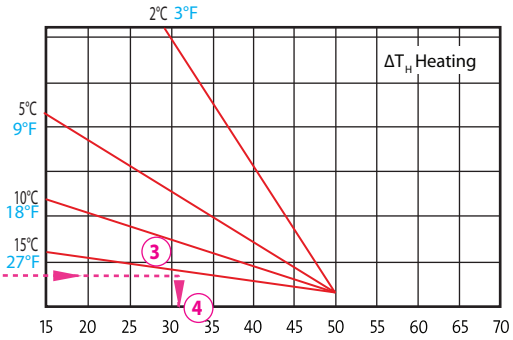
250

Heating mode

suggested planning



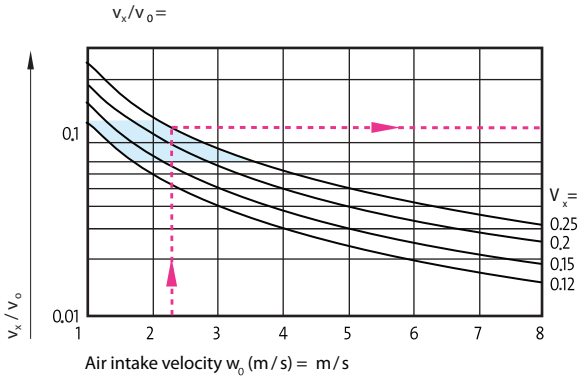
Number of air diffusers = total air flow / air volume per diffuser = parts/diffusers

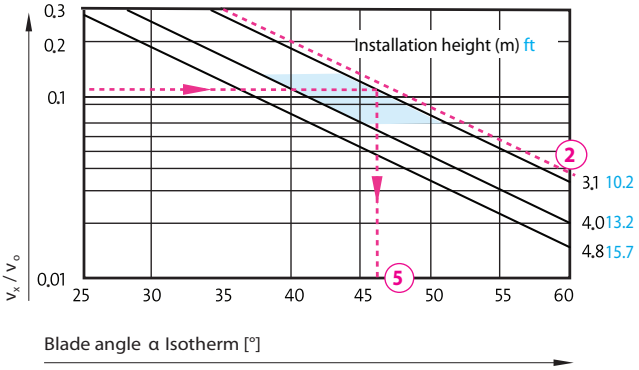


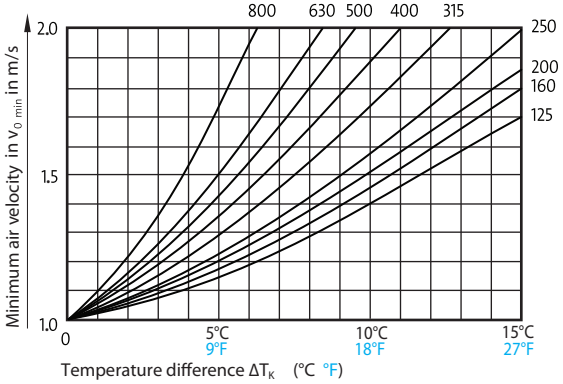
Blade angle α Heating (°) =
v_x = Room air velocity
ΔT = Temperature difference

Cooling mode

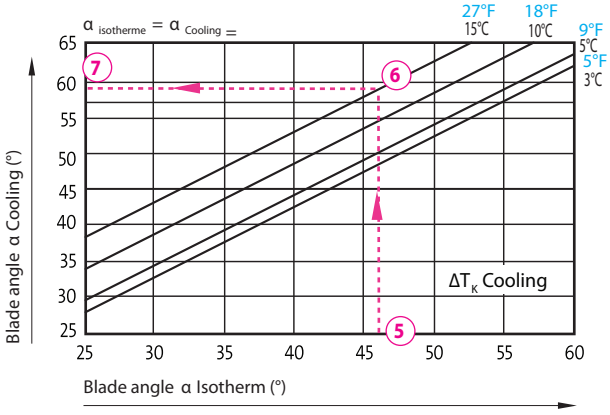
suggested planning







Suggested minimum air velocity for cooling, against temperature difference and minimum blade angle α > 45°

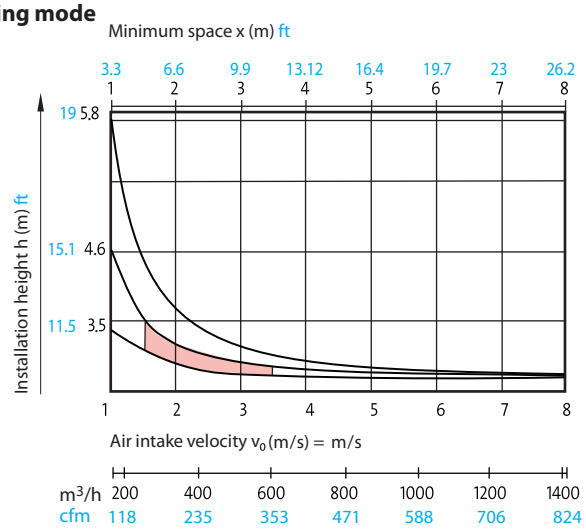


Diagrams

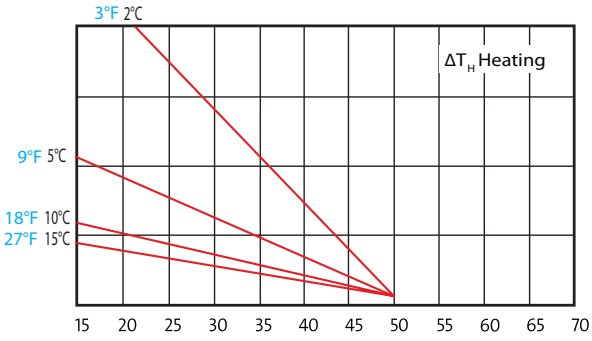
300

Heating mode

Suggested planning



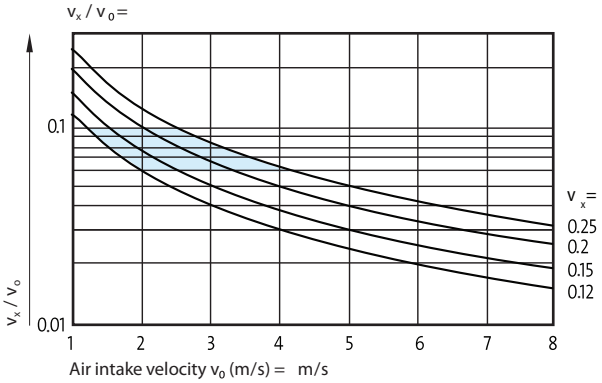
Number of air diffusers = total air flow / air volume per diffuser = parts/diffusers

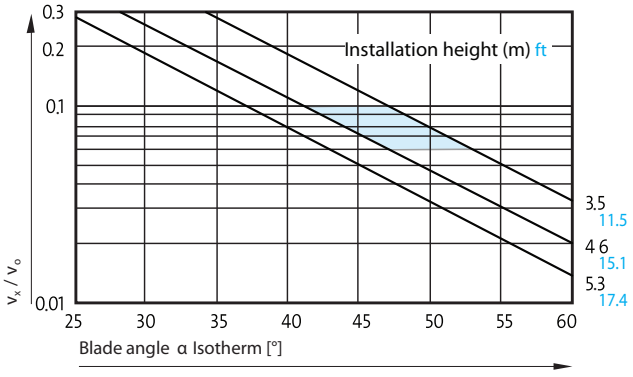


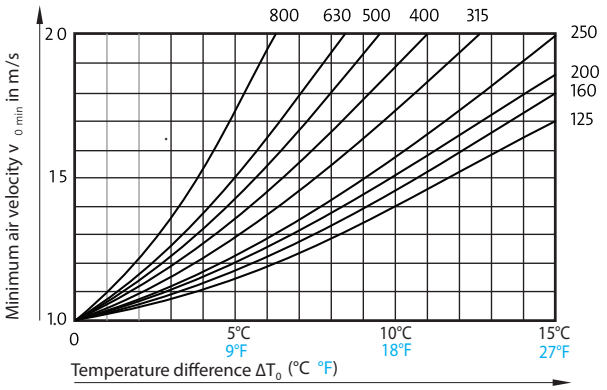
Blade angle α Heating (°) =
v_x = Room air velocity
ΔT = Temperature difference

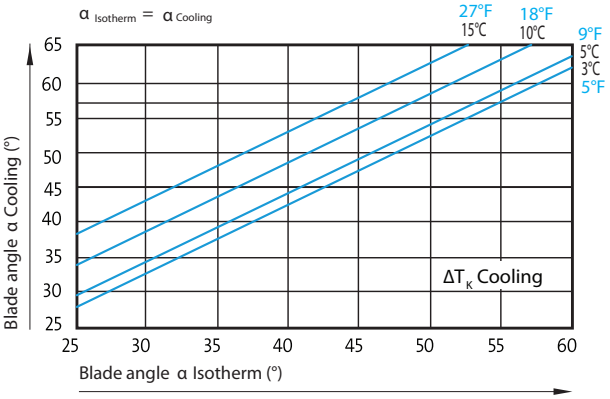
Cooling mode

Suggested planning









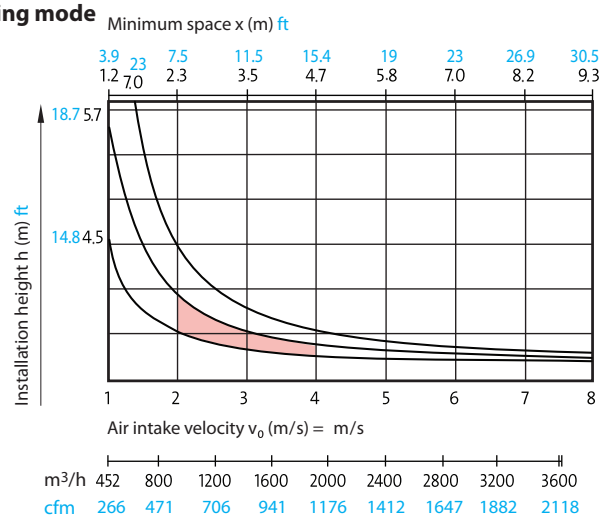
Suggested minimum air velocity for cooling, against temperature difference and minimum blade angle α >45°

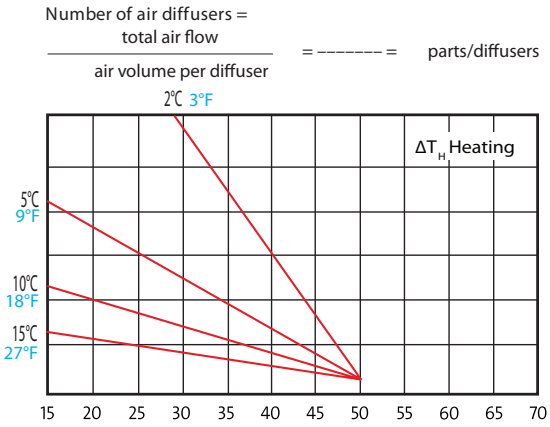
Diagrams

400

Heating mode

Suggested planning



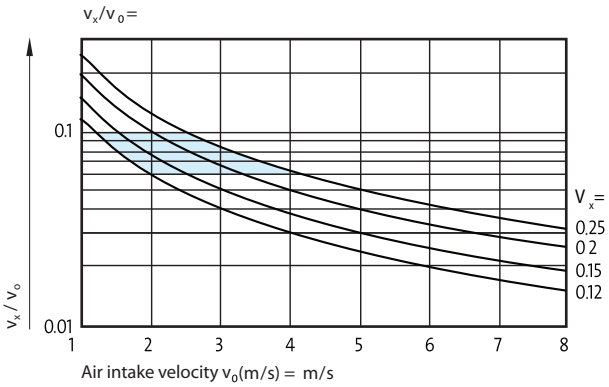


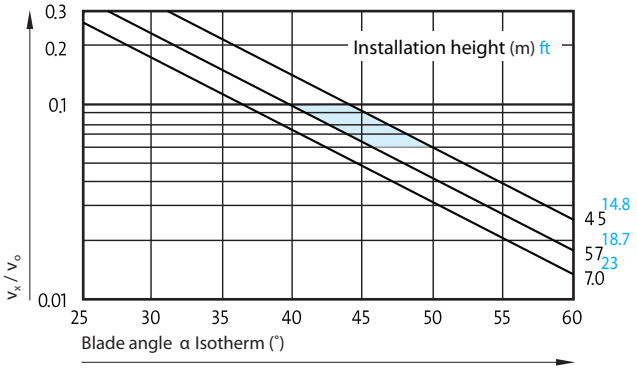
v_x = Room air velocity

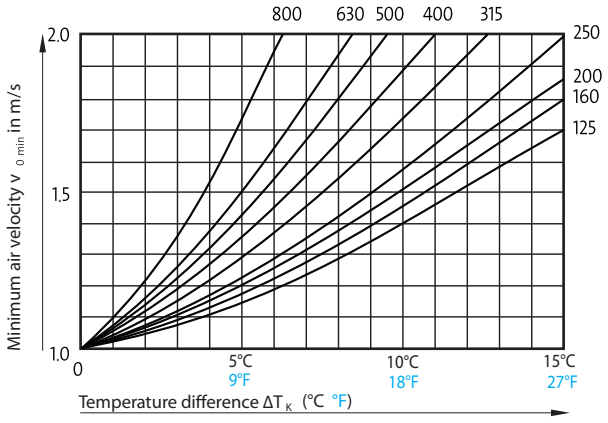
ΔT = Temperature difference

Cooling mode

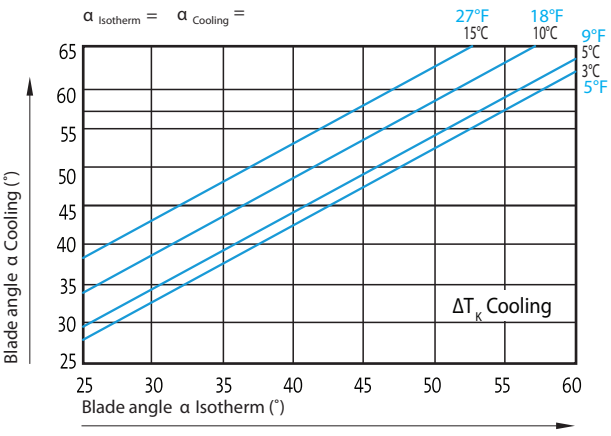
Suggested planning







Suggested minimum air velocity for cooling, against temperature difference and minimum blade angle α >45°

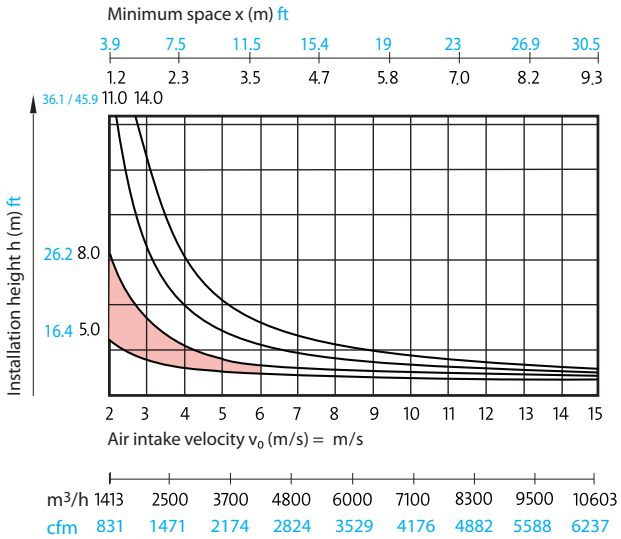


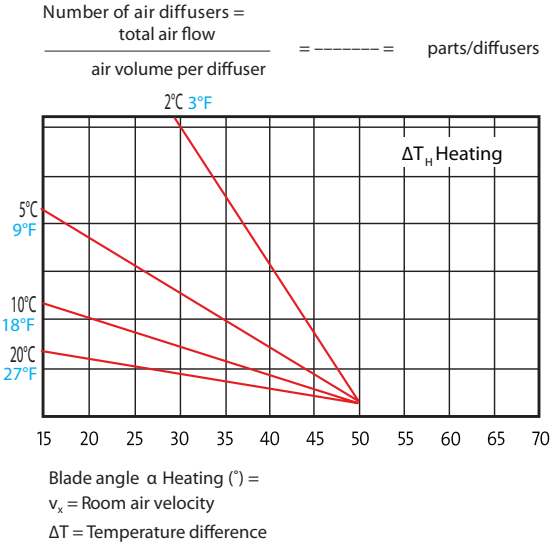
Diagrams

500

Heating mode

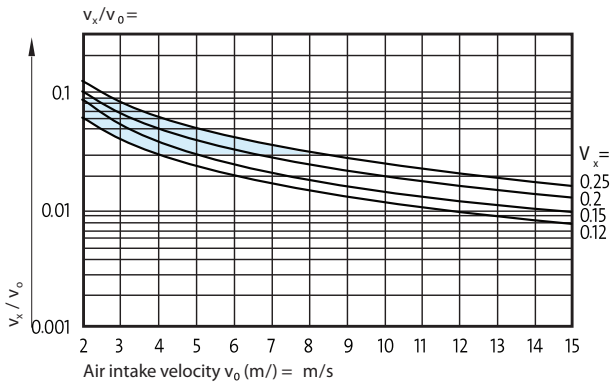
Suggested planning

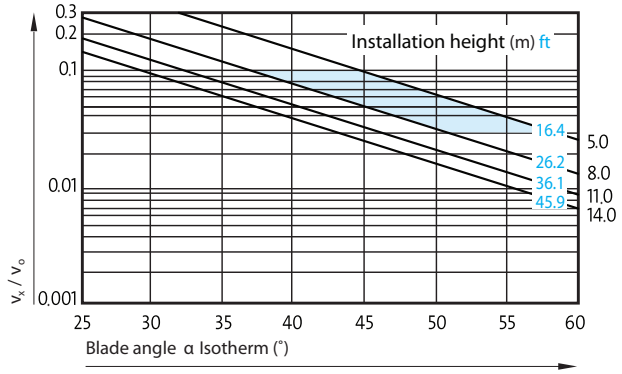


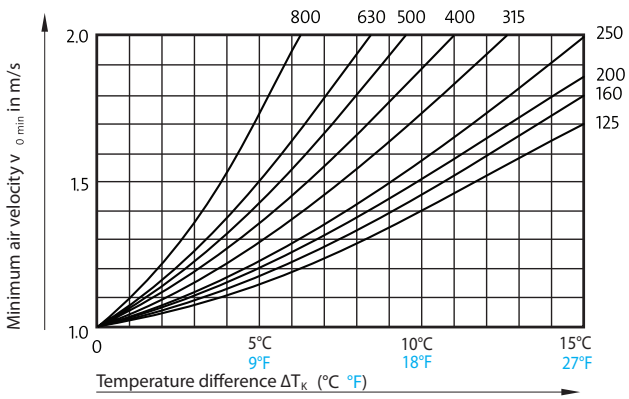


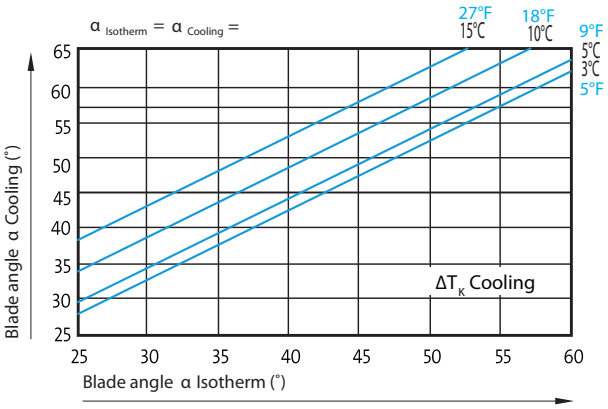
Cooling mode

Suggested planning









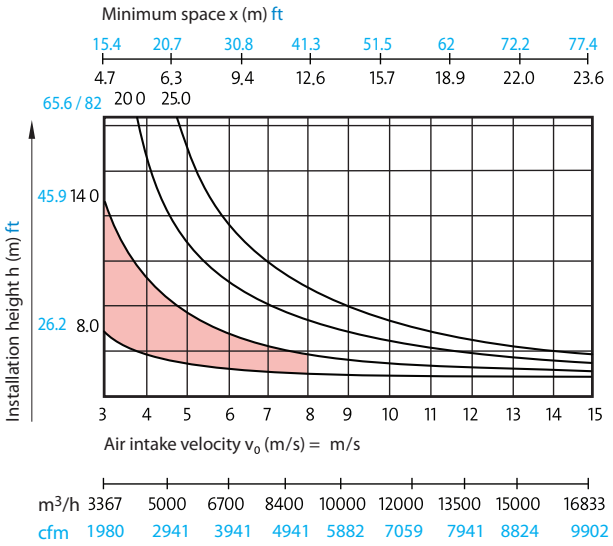
Suggested minimum air velocity for cooling, against temperature difference and minimum blade angle α>45°

Diagrams

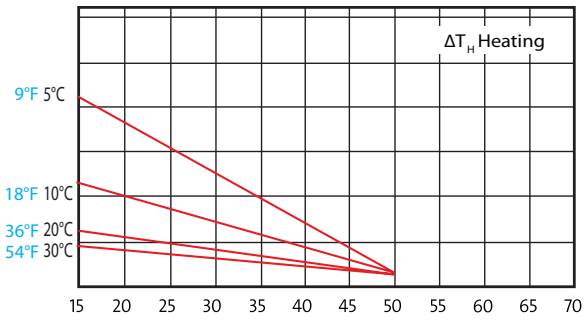
600

Heating mode

Suggested planning



Number of air diffusers = total air flow / air volume per diffuser = parts/diffusers



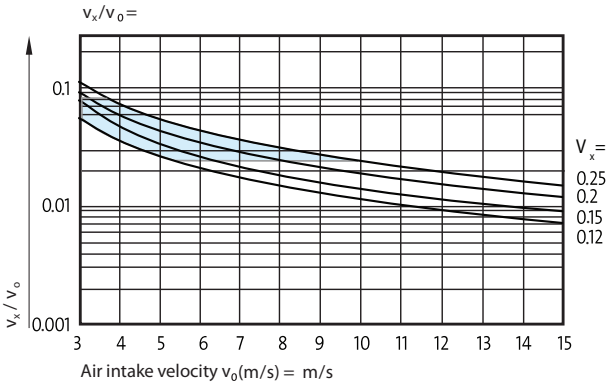
Blade angle α Heating (°) =

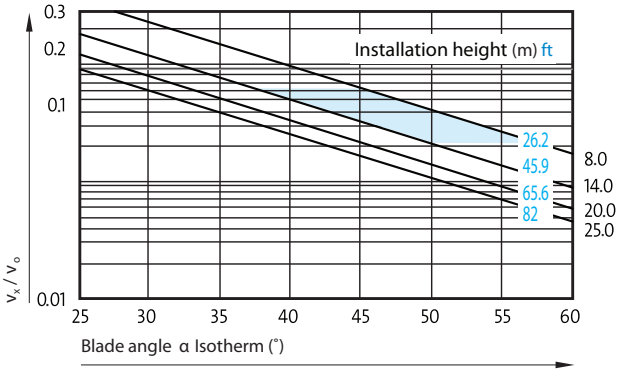
v_x = Room air velocity

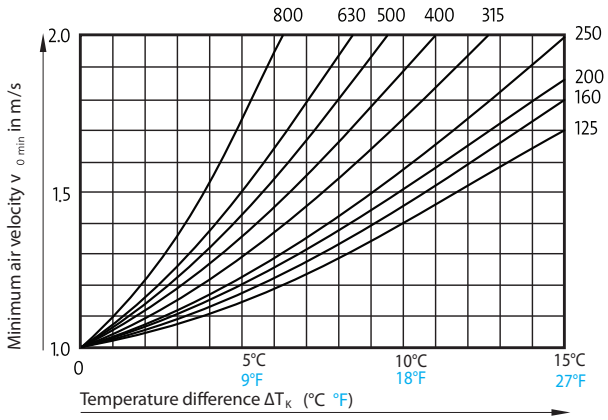
ΔT = Temperature difference

Cooling mode

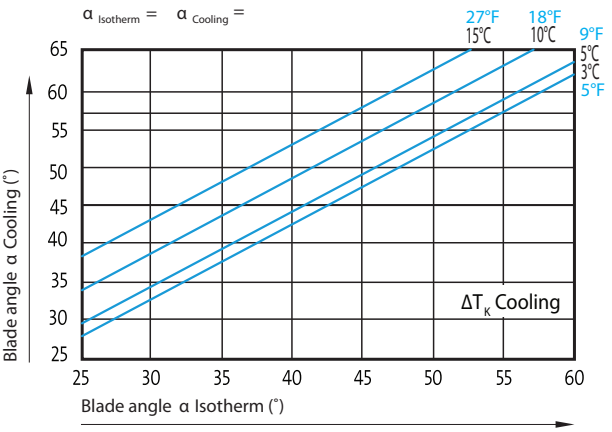
Suggested planning







Suggested minimum air velocity for cooling, against temperature difference and minimum blade angle α > 45°

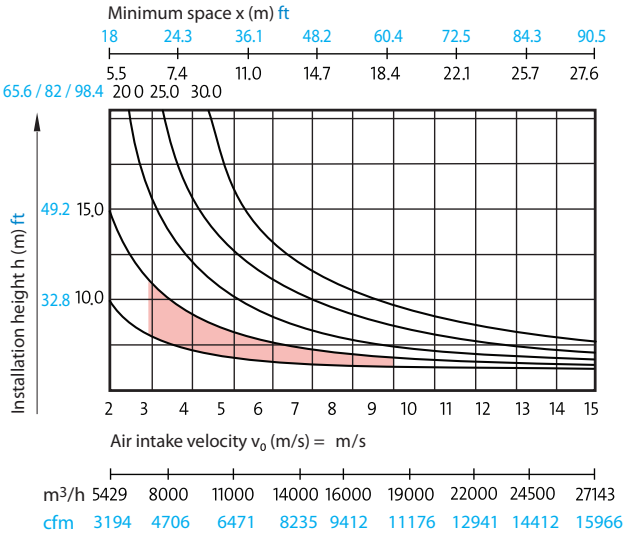


Diagrams

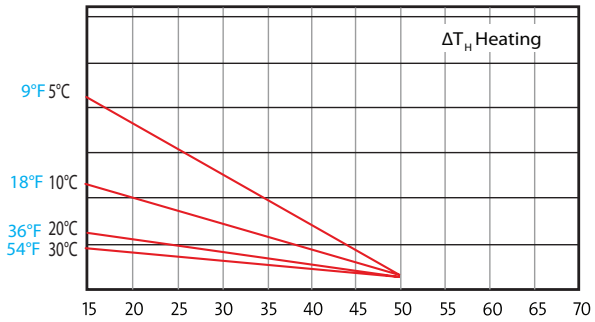
800

Heating mode

Suggested planning



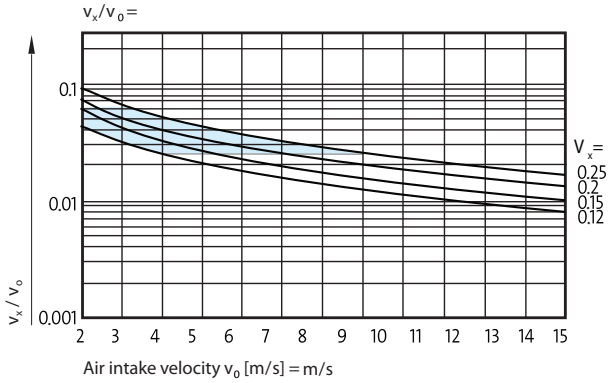
Number of air diffusers = total air flow / air volume per diffuser = parts/diffusers

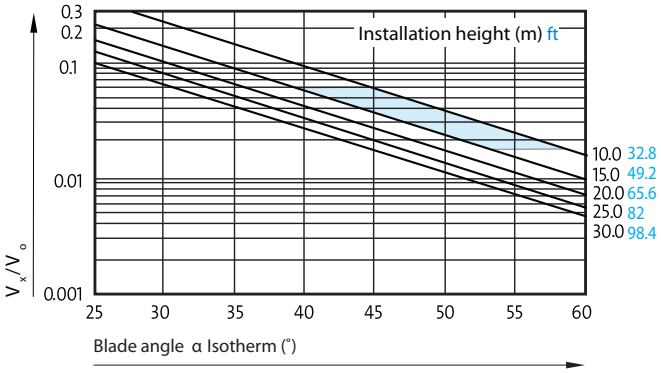


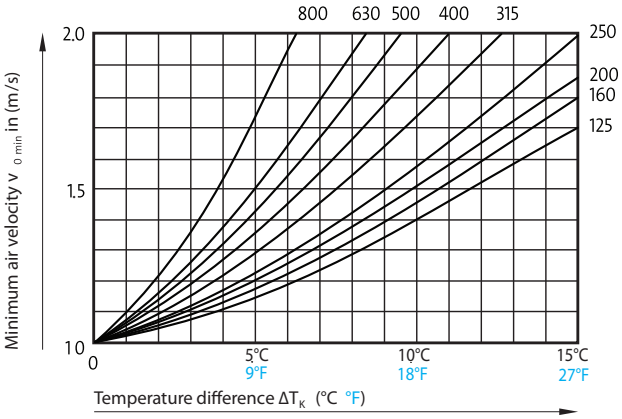
Blade angle α Heating (°) =
v_x = Room air velocity
ΔT = Temperature difference

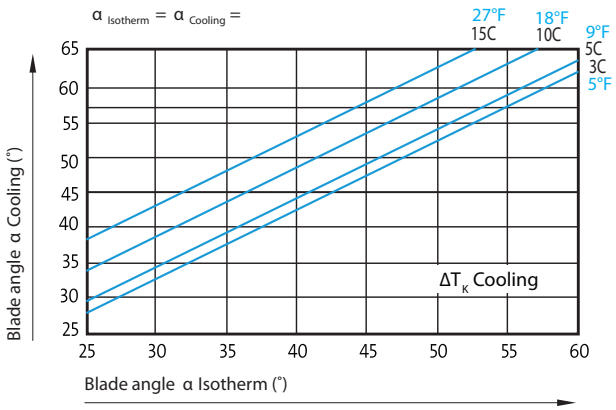
Cooling mode

Suggested planning









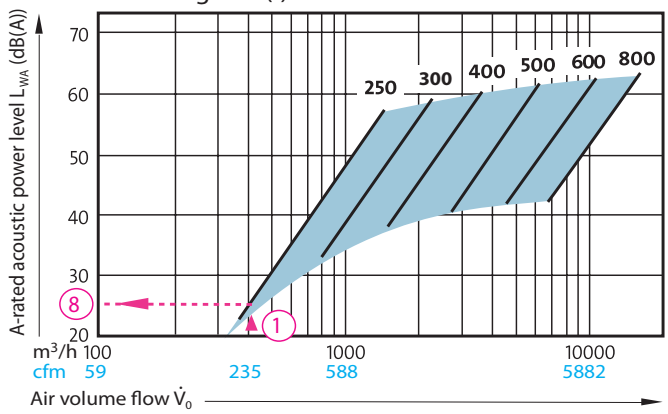
Suggested minimum air velocity for cooling, against temperature difference and minimum blade angle α >45°

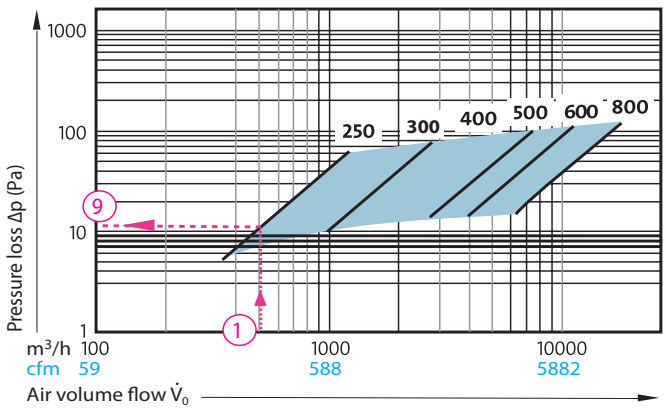
Level of acoustic power and loss of pressure

LDI 250, 300, 400, 500, 600, 800

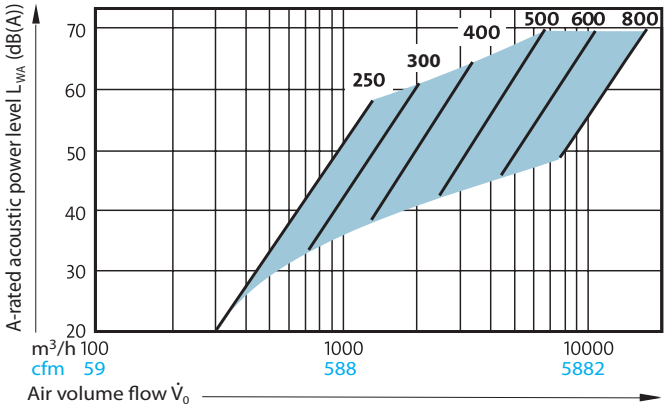
Suggested planning =

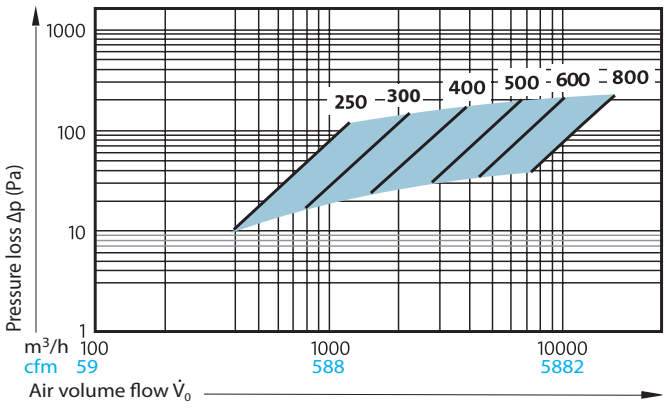
Blade angle α (°) = 30°



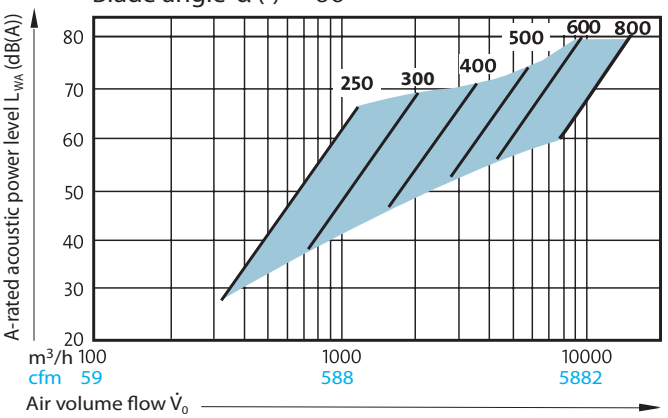


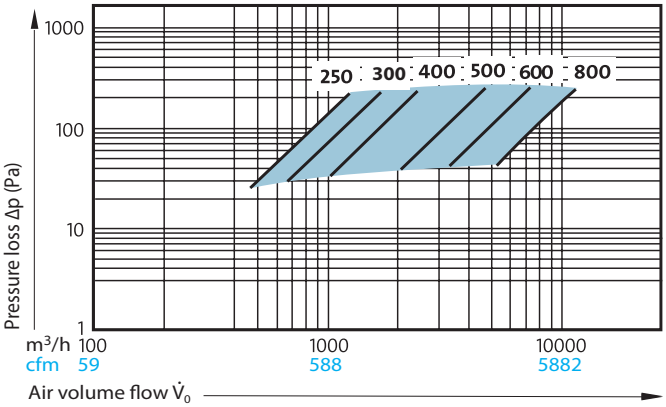
Blade angle α (°) = 45°





Blade angle α (°) = 60°

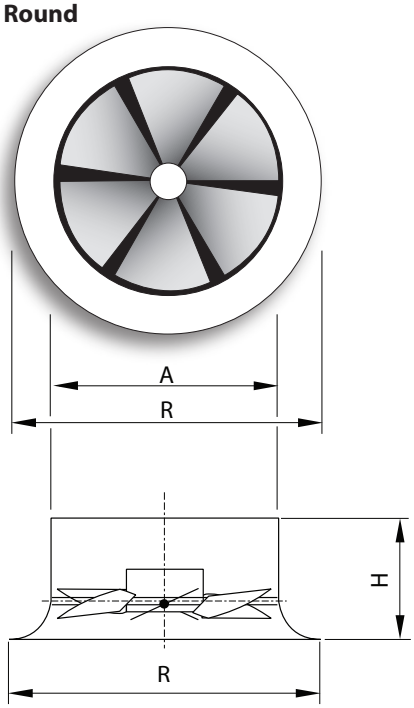




Important
Room acoustic absorption is not accounted for.
For a comparison with north american values, reduce the acoustic power by ten (10) dB.
The values are based on an isothermal flow.

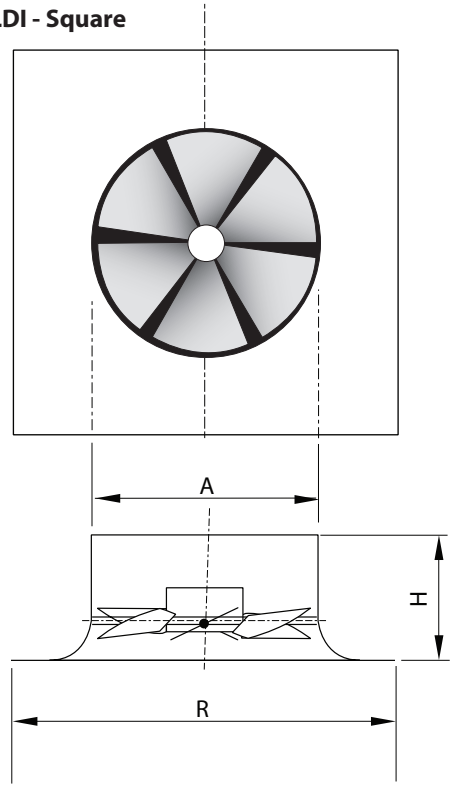
Dimensions and weight

LDI - Round



	250	300	400	500	600	800
Size. ØA (mm)	250	302	400	505	603	804
Size. ØR (mm)	373	415	677	603	830	1100
Size. H (mm)	140	175	215	280	355	425
Weight (kg)	2.4	3.6	6.0	8.5	12.2	24.0

LDI - Square



	250	300	400
Size ØA (mm)	250	302	400
Size. R (mm)	603	603	603
Size. H (mm)	140	175	215
Weight (kg)	2.4	3.6	6.0

Example and plenum

Example

Specifications:
Height of the installation : H = 3.0 m (10 ft) (2)
Airflow / diffuser: V = 400 m³/h (1)
Heating mode: ΔT_H = +15°C (3)
Cooling mode: ΔT_C = -15°C (6)

Required:
1- Nominal diffuser dimension
2- Minimum space between diffusers
3- Blade angles in heating mode, isothermal mode and cooling mode
4- Level of acoustic power L_{WA}
5- Loss of pressure Δp_t

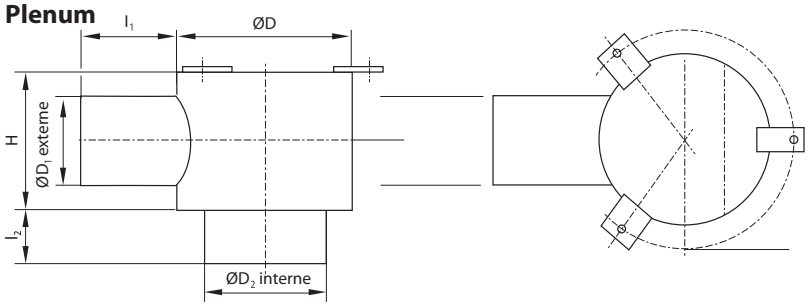
Solution:
1. From the "Range of application" diagram, we read the nominal dimension DN 250.

2. For an airflow of 400 m³/h and an installation height of H = 3.0 m (10 ft), the minimum necessary space between diffusers is ± 2 m.

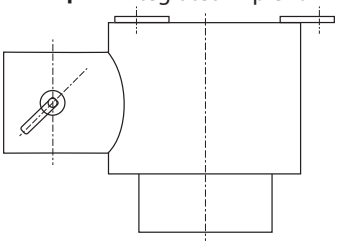
3. From the intersection with the heating line at 15°C, we determine the blade angle: heating mode = 32°C
In isothermal mode, we read: isothermal = 47°C, (5) following an angle in cooling mode at 15°C (6): a cooling mode 59°C. (7)

4 and 5. From the "Level of acoustic power and loss of pressure" diagram, we see:
L_{WA} = 25 dB (8)
ΔP_t = 10 Pa (9)

Plenum

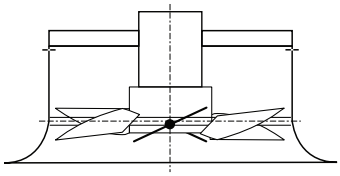


Damper integrated in plenum



Assembly
- Rapid assembly with a collar
- Steel cover for rapid connection
- Secure attachment due to a perforated plate at the air inlet
- Honeycomb flow regulator
- Round plenum
- Flange
- Optional protection piece
- TDR III type elements to control temperature difference

perforated plate inlet



Option (upon request):
- Custom made plenum
- Square frontal plate

	250	315	400	500	600
Size Ø D (mm)	376	376	476	576	676
Size H (mm)	386	381	483	533	610
Size Ø D_1 (mm)	250	300	403	454	556
Size Ø D_2 (mm)	254	305	406	508	609
Size Ø l_1 (mm)	50	50	50	50	50
Size Ø l_2 (mm)	150	150	150	150	150

Specifications

1. Description and physical characteristics

1.1 The LDI helical air jet diffuser shall be manufactured in steel. The square or round diffuser shall be supplied with adjustable blades to guide the air.

1.2 The diffuser shall be designed with a outlet cone favoring a horizontal airflow on 360 degrees, even with a freely suspended diffuser.

1.3 The diffuser shall be powder coated with a polyester TGIC-free paint, providing a smooth, easy-to-clean, chip and fade resistant finish. The architect or client shall choose a standard colour from the RAL colour chart.

2. Performances

Diffusers performance shall be guaranteed with the help of diagrams indicating the loss of pressure, acoustic pressure generated, nominal speed in the occupied zone, airflow trajectory according to the initial temperature differential in heating, isothermal and in cooling modes in the critical areas.

3. Installation

3.1 The diffuser shall be mounted on a circular duct or on a galvanised steel plenum, supplied by the manufacturer.

3.2 Balancing key
When required, the plenum will be provided with a radial balancing key, allowing flow rate adjustment between 0% and 100%.

4. Balancing

The NAD Klima LDI diffusers balancing shall be executed by a certified ventilation system balancing technician, with a recognised professional qualification.

5. Quality required: NAD Klima, LDI model

Codification

LDI	**Product**
Q = Square R = Round	**Configuration**
250, 300, 400 500, 600, 800 (round only)	**Nominal dimension**
330, 415, 535, 603 830, 1100 (round only)	**Outer size**
H = Hand adjustment	**Adjustment**
9003 = White 9010 = Cream 00SB = Solar Black (Standard matte black) 00SM = Silver Matte (Standard metallic grey) ____ = RAL Color (write the RAL color number)	**Diffuser color**
S = With plenum inlet on the side X = Without plenum	**Plenum**
I = With insulation (plenum only) X = Without insulation	**Insulation**
D = With damper X = Without damper	**Balancing damper**
LDI - Q - 250 - 330 - H - 9003 - X - X - X	**Example**

Blue: Standard

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