The Innovation Company

**LTG Aktiengesellschaft**

# *Air Diffuser Combination Type LDK-B for Wall Installation*


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*LDK-B-E-TP-01 (11/09) 419-156*

# Air Diffuser Combination Type LDK-B for Wall Installation

LTG Linear diffusers, integrated in the ceiling, are characterized by the following features:

- indoor air flow with high thermal comfort
- very low-noise generation
- high flexibility in adapting the individual air jets to suit various room geometries
- high flexbility when integrating diffusers in varying ceiling designs
- large air flow area with uniform appearance
- high-quality design and finish

These qualities equally apply to linear diffusers integrated in walls, but with specific details for:

- indoor air flow, air diffuser settings
- supply and return air guidance
- installation in dry-walls
- sound insulation of the walls, cross-talk sound attenuation

## Indoor air flow with air guidance from the corridor walls

Due to the highly inductive mixture of supply air jets with room air, speeds and temperature differences in the wall area are rapidly reduced.

The “mixing air” zone creates a zone of displacement flow, travelling close to the floor toward the facade and ascending from there, in both summer and winter, together with the heated air, then flowing back along the ceiling to the return air in the corridor wall.

It is a prerequisite, however, that the supply air flow is introduced to the room at an “under-temperature“ all year round.
Due to high induction chracteristics, any short-circuit between supply and return air is insignificant. The size of the mixed air zone depends on the type of diffuser element used, the supply air flow rate , and the supply air temperature.

The diffuser combination is factory-set to provide thermal comfort also for workplaces underneath the diffuser for the specified field of application.

## Supply and return air guidance

Linear diffusers for supply and return air may be used independent of one another, in terms of a diffuser combination or as supply and return air diffuser with a shared diffuser element. The diffusers are located horizontally, at the same height.

Combination diffusers are installed in a centered position to the window axis into the corridor wall and are indifferent to any supply and return air field of axis. Separate arrangement may require diffuser modifications if room walls are moved.

The return air may also be extracted in from a central point in the ceiling or from the corridor area. This would require the use of sound insulated return air diffusers without duct connection or transfer air diffusers with two-sided diffuser elements.

Best position is the wall area above the door.

## Installation in dry-walls

The most common metal stud wall grid dimension is 62.5 cm. Therefore, grid dimensions of corridor walls and facades usually differ from one another. Using a cross bar substructure and CW sections, air diffusers may be arranged in a centered position to the windows. For easy installation and flexibility, the plenum boxes should not be fixed to the stud wall structure.

LTG air distribution plenums are fitted through an easily produced slot in the wall and fixed.
The diffusers are clipped in place as “final-fix” items after all painting work has been completed.
If partitioning of the room has not been determined at the time of the HVAC installation, we recommend to completely install all air ducts and diffusers in a dry construction ceiling element and to connect the walls to this ceiling element, as necessary.

Factory-prefabricated assemblies of dry construction elements and air ducts may provide savings in installation time and cost of materials.

## Sound insulation of walls, cross-talk sound attenuation

The shielding of sound between rooms requires varying sound reduction indices of partition walls. The HVAC system reduces the sound insulation of walls since the sound-reflecting air connections carry the sound from room to room (cross-talk). Are provisions of the wall insufficient to meet the required $R_w$ value, cross-talk sound absorbers will have to be integrated into the air ducts.

As an alternative to packaged cross-talk sound absorbers, sound absorber elements may be integrated in the LTG air connection boxes to save space.

An LTG computer program may calculate the resulting approximate sound reduction index in case of known wall acoustics.

You will find the actual ***tender documentations*** at the end of this document.
They are available in word format at your local dealership or at www.LTG-AG.de.

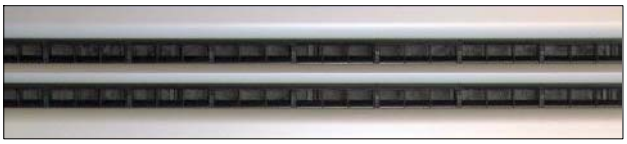
# Air Diffuser Combination Type LDK-B for Wall Installation

## Range of Products

### LDK-B 12/8/2 LTG System clean®

Standard length: 1000 mm, 1200 mm
Standard width: 79 mm (with border profile 8)
98 mm (with border profile 1)

### LDK-B 20/8/2

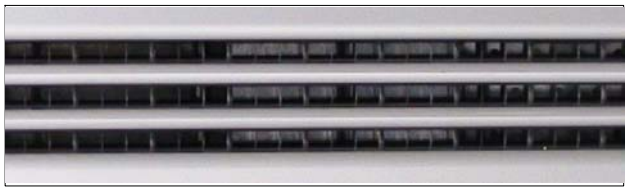


Standard length: 1000 mm, 1200 mm
Standard width: 79 mm (with border profile 8)
98 mm (with border profile 1)

### LDK-B 12/8/3 LTG System clean®

Standard length: 1000 mm, 1200 mm
Standard width: 110 mm (with border profile 8)
129 mm (with border profile 1)

### LDK-B 20/8/3



Standard length: 1000 mm, 1200 mm
Standard width: 110 mm (with border profile 8)
129 mm (with border profile 1)

### LDK-B 12/8/4 LTG System clean®

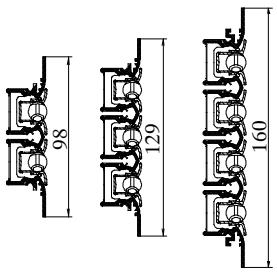
Standard length: 1000 mm, 1200 mm
Standard width: 141 mm (with border profile 8)
160 mm (with border profile 1)

### LDK-B 20/8/4

Standard length: 1000 mm, 1200 mm
Standard width: 141 mm (with border profile 8)
160 mm (with border profile 1)

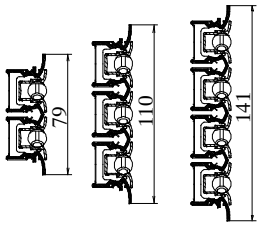
### Border profile 12/8/.

*Border profile No. 1*




*12/8/2* *12/8/3* *12/8/4*

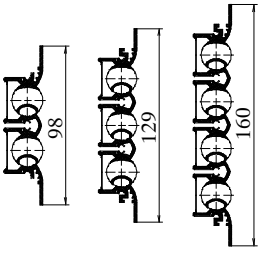
*Border profile No. 8*




*12/8/2* *12/8/3* *12/8/4*

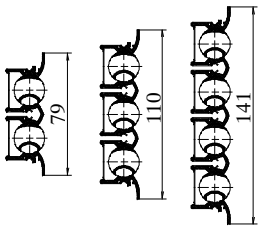
### Border profile 20/8/.

*Border profile No. 1*




*20/8/2* *20/8/3* *20/8/4*

*Border profile No. 8*




*20/8/2* *20/8/3* *20/8/4*

# Air Diffuser Combination Type LDK-B for Wall Installation

## Versions

The diffuser combination type LDK-B consists of cylindrical slot nozzles contained by aluminum profiles.

Section **surfaces** include aluminum coloured anodized, painted similar to RAL, or chromium-plated. Painted sections are suitable for normal use. For use in wet environments, such as swimming pool areas, anodized profiles have proven effective.

**Slot nozzle**s are available white, black, or coloured similar to RAL.

Individual wall fitting is realized using a variety of **edge profiles**.

## LTG System clean®

A part of the supply air is diffused directly along the wall through a slot in the diffuser border profile. This ”air curtain” prevents deposition of dust, smoke and textile particles on the ceiling surface around the diffuser and may reduce the requirement for cleaning, renovation or redecoration.

## Accessories

Diffuser combinations are available with or without **sound absorber**. The sound absorber is installed inside the air distribution box in order to save space.

**Regulating dampers** for supply and return air are integrated in each diffuser plenum combination.

## Tolerances

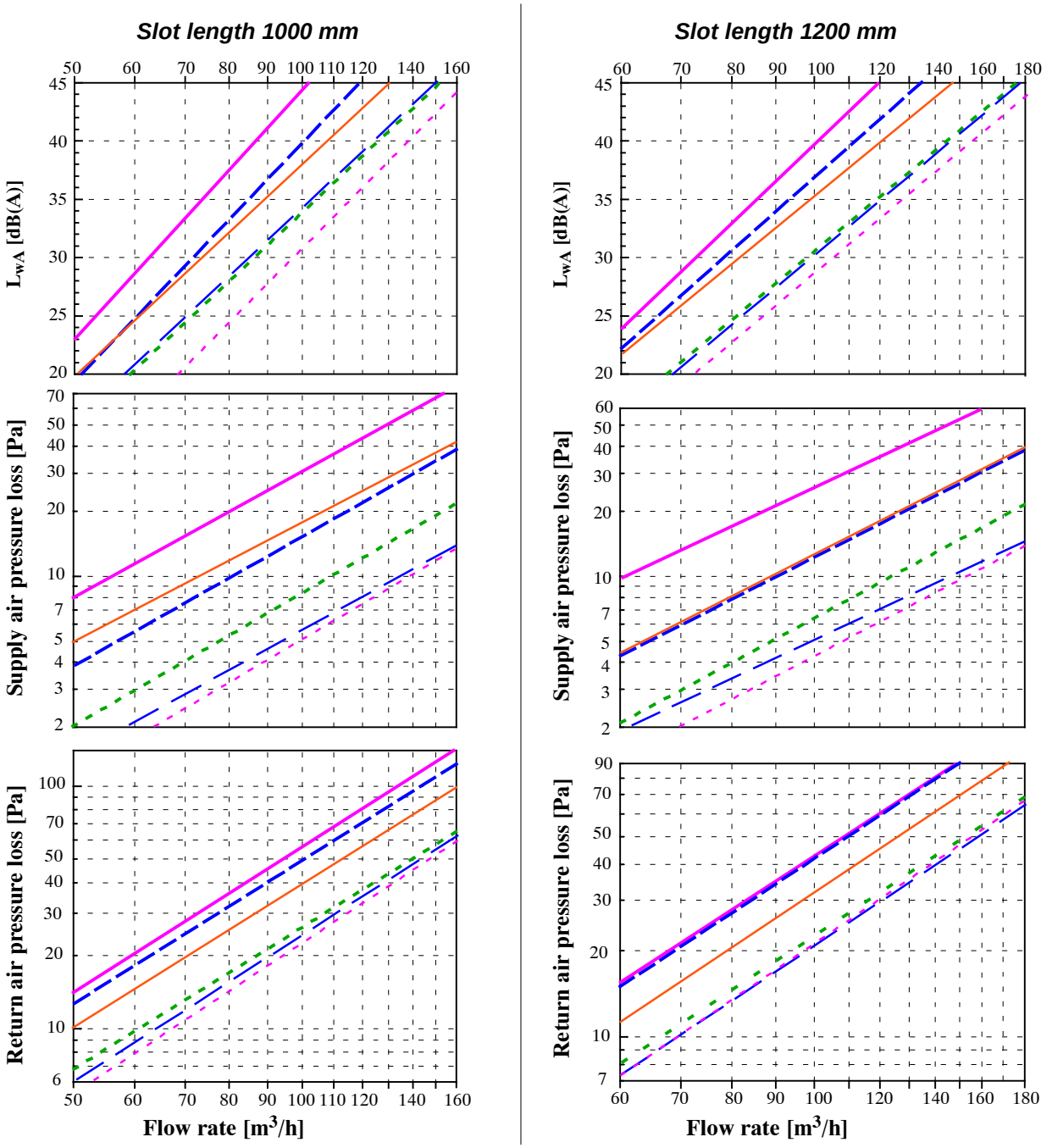
- Concerning the values given in these technical specifications, the following general tolerances acc. to DIN ISO 2768-vL apply:
- Length tolerance : $\leq 1.5$ m $\pm$ 1.5 mm
  $\geq 1.5$ m $\pm$ 2.0 mm
- Straightness and torsion tolerances acc. to DIN EN 12020-2.

## Surface Finishes

- The surface finishes of LDK-B meet standard indoor use requirements, i.e. room climate requirements acc. to DIN EN ISO 7730.
- Other finishes meeting special use requirements are available on request.

# Air Diffuser Combination Type LDK-B for Wall Installation

## Pre-selection




**LDK-B 12/8/2 LTG System clean®** (from page 8)
**LDK-B 12/8/3 LTG System clean®** (from page 16)
**LDK-B 12/8/4 LTG System clean®** (from page 24)
**LDK-B 20/8/2** (from page 32)
**LDK-B 20/8/3** (from page 40)
**LDK-B 20/8/4** (from page 48)

Sound power level selection diagram applies to straight connection.

Acoustics data ± 3 dB,
Supply air flow = return air flow
Acoustic data + pressure loss for connection:
LDK-B 12/8/2, ... 12/8/3 and ... 20/8/2: NW 100
LDK-B 12/8/4, ... 20/8/3 and ... 20/8/4: NW 125

Without integrated sound absorber
Damper open
Detailed data with specific profile

Selection program available from
LTG Aktiengesellschaft

# Air Diffuser Combination Type LDK-B for Wall Installation

## Selection

The damper installed in the connection cross section serves to fine tune and set varying flow rates with identical duct pressure.

More significant pressure variations along the air ducts may only be compensated to a limited extent.

Duct connections should be smooth and efficiently flowed into the LTG plenums to avoid regenerated noise. Highly corrugated flexible ducts are unsuitable from an acoustics point of view.

To investigate cross-talk sound absorption, use the following calculation, analogous to VDI 2081:

- specified frequency-related $R_w$ value of the wall (reference curve if octave spectrum unavailable)
- convert to sound pressure level differences source/receiving room
- start with the sound power level in the air connection of the diffuser in the source room
- calculate the frequency-independent branch attenuation, starting from the air connection of the diffuser in the source room to the air connection in the receiving room
- substitute the frequency-dependent insertion attenuation of diffuser and cross-talk damper (substitute twice!)
- convert to sound pressure of the receiving room after deducting the room absorption (frequency-dependent if available)
- calculate the resulting sound insulation of the wall with the ventilation sound flanking path
- determine the $R_w$ value and compare with required $R_w$.

Sound flanking paths via ceiling element walls and transmission to the adjacent corridor with return air open from the corridor plenum should be investigated.

The LTG selection program supports professional planners and building acoustics experts by allowing selection of a cost-effective corridor wall HVAC system.

The result will depend on the air duct cross sections and on the number of diffusers in adjacent rooms.

For example, three supply and return air diffusers each in adjacent rooms will make 3 x 3 = 9 sound paths. The acoustically most unfavourable points are located at the end of the distribution duct since branch attenuation is the least significant there.

# Air Diffuser Combination Type LDK-B 12/8/2 LTG System clean® for Wall Installation

*Air Diffuser Combination*
*LDK-B 12/8/2/11 LTG System clean®*

## Function

Adjustable supply air diffuser producing a tangential air flow along the ceiling, followed by a mixed diplacement air flow in the occupied zone.

Adjustable direction of diffused air; factory-set; subsequently adjustable when installed; high induction ratio, i.e. rapid reduction of air discharge speed and temperature differences; formation of an additional air curtain close to the ceiling to reduce pollution in the diffuser area caused by airborne dust particles.

Return air diffuser matching supply air diffuser, (roller/cylinder setting may vary).

## Advantages

- Supply and return air diffuser in the same building axis
  - arranged next to each other
  - shared diffuser
  - easy retrofitting of diffuser using clips
  - connections to the plenum
- Connection plenum box with integrated, technically optimized separation of supply and return air flow
- Diffuser with varying dimensions
  - standard length 1000 mm, 1200 mm
- Design
  - surface finish anodized, painted or chromium-plated, air guiding elements black, white (RAL 9010), aluminum grey (RAL 9007) or chromium-plated
- High ventilation efficiency due to
  - displacement air flow with excellent flushing of the occupied zone
- Complete floor area available for working space
- Low diffuser flow noise due to technically optimized HVAC elements
- Excellent cross-talk attenuation between adjacent rooms due to optional box-integrated sound absorbing elements
- Adjustable throttling device integrated in the connecting box
- No suspended ceiling required

# Air Diffuser Combination Type LDK-B 12/8/2 LTG System clean® for Wall Installation

## Indoor Air flow

visualization by smoke tracer

**Example:** 3 axes,
3 diffusers 70 $m^3$/h supply and return air each
$\Delta t$ = -8 K (cooling mode),
Installation height 2.5 m
Ceiling clearance 0.25 m (diffuser centre)
3 diffuser combinations, 1000 mm each

## Version

Ready-to-install unit, consisting of:

- high-quality design diffuser element made of aluminum extrusion profiles with cylindrical plastic slot nozzles, with rectifier blades, flow-smooth inside contour, optimized for a low-turbulence, low-noise air guidance
- wall connecting profiles type 1 and 8 from the LDB 12/8 LTG System clean® program
- aluminum rails, aluminum coloured anodized, painted or chromium-plated, air cylinders optional black, white, aluminium grey or chromium-plated
- easy installation/removal of diffuser elements by clip fixing without the need of further tools (clip-on/off, e.g. when painting the wall)
- continuous air connection box with technically optimized separation of supply and return air to avoid internal short-circuits.

## Range of products

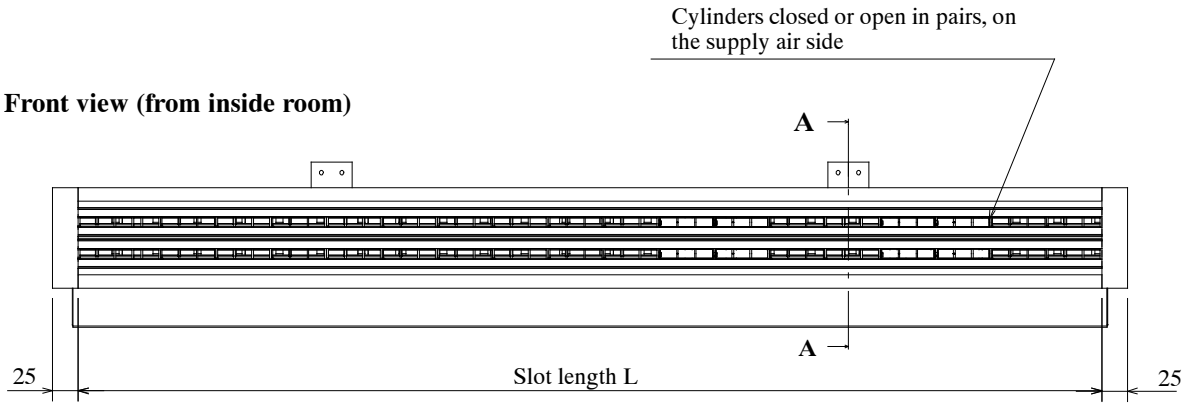
- two-slot version
  LDK-B 12/8/2 LTG System clean®
- standard lengths 1000 mm, 1200 mm
- one integrated damper each, in the supply and return air section, subsequently adjustable
- spigot diameter supply and return air optional DN 80 and DN 100
- sound absorber (optional)

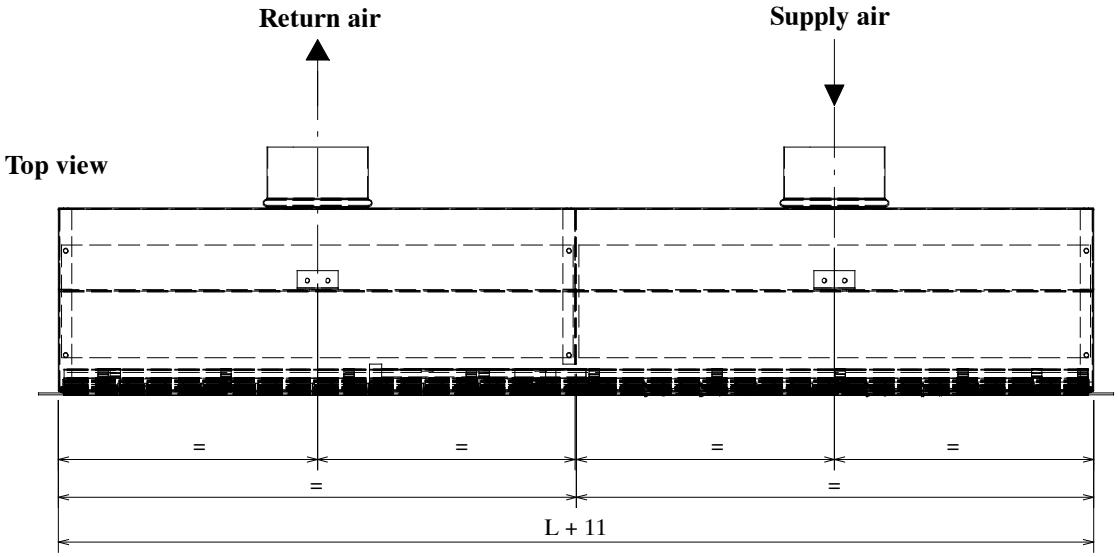
## Installation

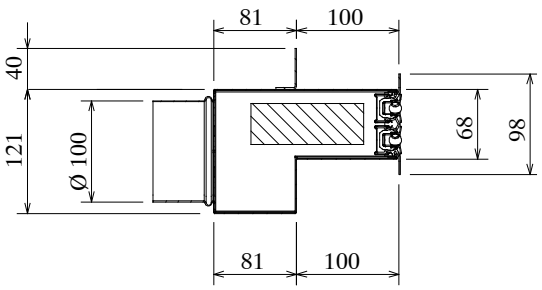
- LDK-B 12/8/2 LTG System clean® air diffuser combination pushed through from the corridor towards the room. Fixed using two angles on the corridor wall.
- Diffuser elements are simply clipped in from the room side.

# *Air Diffuser Combination Type LDK-B 12/8/2 LTG System clean® for Wall Installation*

## *Dimensions including sound absorber*



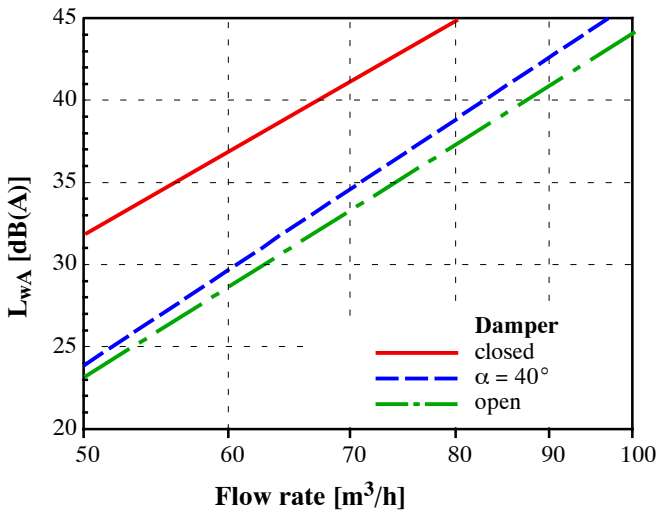




**Section A-A**

# *Air Diffuser Combination Type LDK-B 12/8/2 LTG System clean® for Wall Installation without sound absorber*

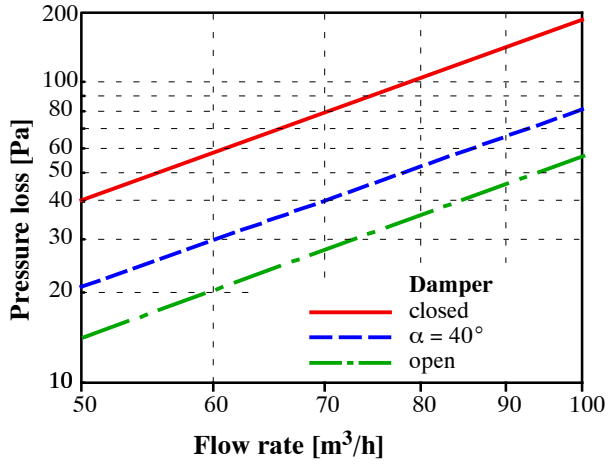
***with adjustable damper inside box, slot length 1000 mm***

### *Sound power level $L_{wA}$ selection diagram*

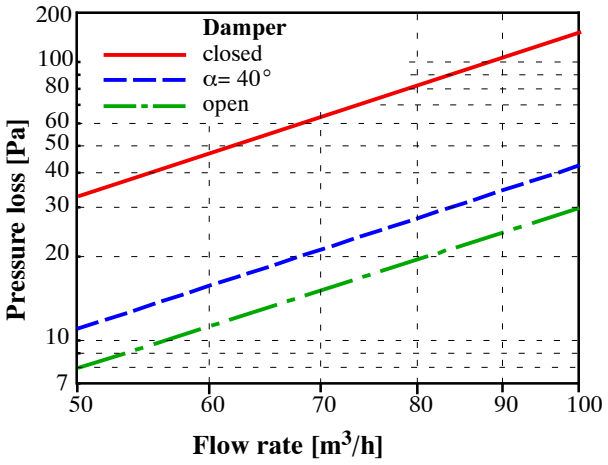



### *Pressure loss Δp selection diagram*

#### *Return air pressure loss*




#### *Supply air pressure loss*




Sound power level and pressure loss selection diagrams for connection types straight (A) or 90° elbow or smooth alu flex hose with R/D > 1 (B), respectively.

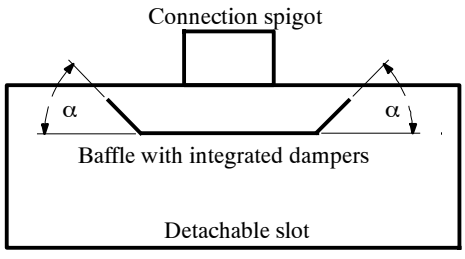
Connection type B:
Supply air pressure loss ± 10% (damper open only)

Acoustic data ± 3 dB,
Supply air flow rate = return air flow rate
Acoustics and pressure loss for NW 100 connection

High thermal comfort up to 170 m³/hm supply air flow rate and –8 K supply air temperature difference.

***Selection diagrams available from LTG AG***

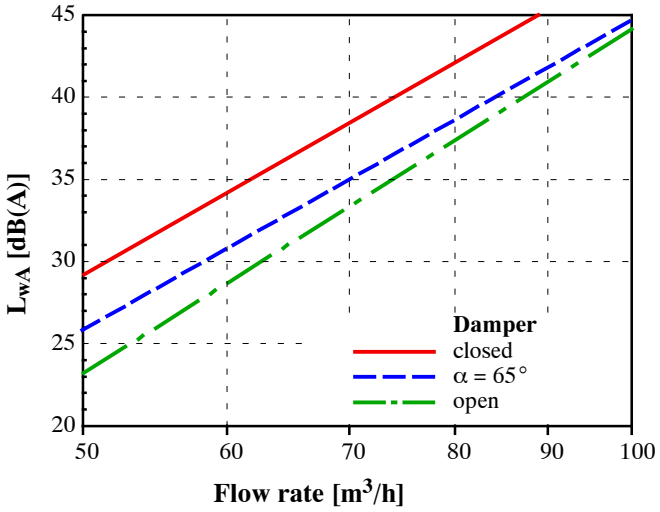
### *Damper setting*



# *Air Diffuser Combination Type LDK-B 12/8/2 LTG System clean® for Wall Installation with sound absorber*

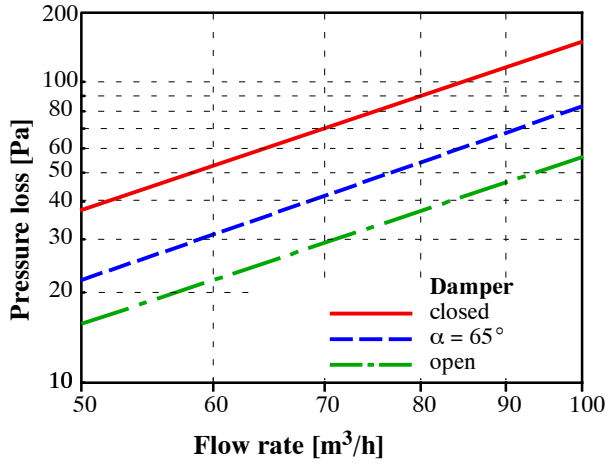
***with adjustable damper inside box, slot length 1000 mm***

### *Sound power level $L_{wA}$ selection diagram*

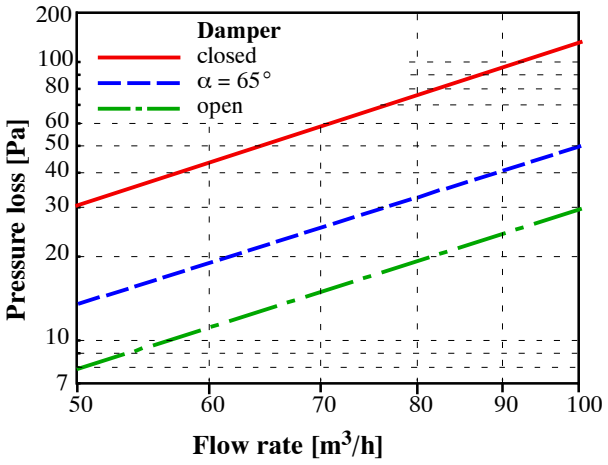



### *Pressure loss Δp selection diagram*

#### *Return air pressure loss*




#### *Supply air pressure loss*




Sound power level and pressure loss selection diagrams for connection types straight (A) or 90° elbow or smooth alu flex hose with R/D > 1 (B), respectively.

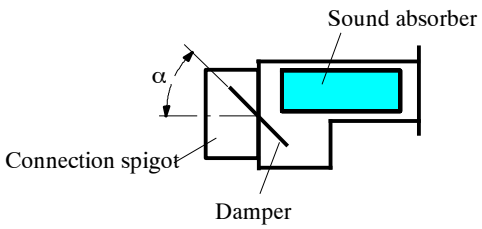
Connection type B:
Supply air pressure loss ± 15% (damper open only)

Acoustic data ± 3 dB,
Supply air flow rate = return air flow rate
Acoustics and pressure loss for NW 100 connection

High thermal comfort up to 170 m³/hm supply air flow rate and –8 K supply air temperature difference.

***Selection diagrams available from LTG AG***

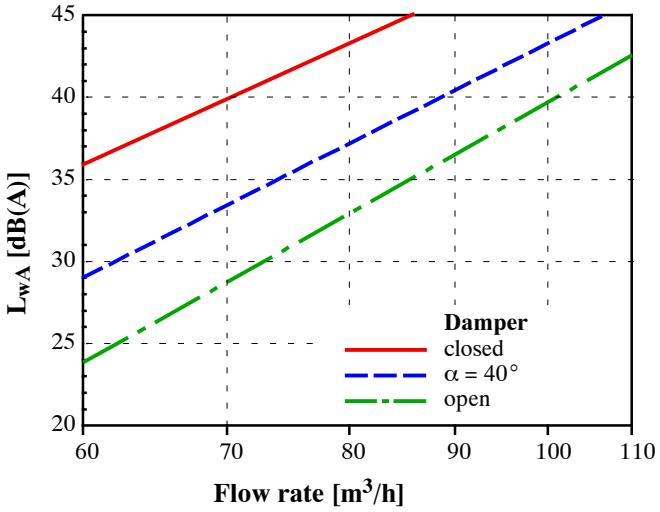
### *Damper setting*



# *Air Diffuser Combination Type LDK-B 12/8/2 LTG System clean® for Wall Installation without sound absorber*

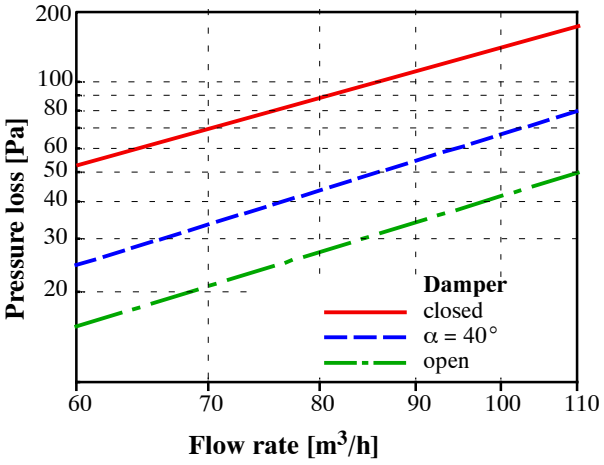
***with adjustable damper inside box, slot length 1200 mm***

### *Sound power level $L_{wA}$ selection diagram*

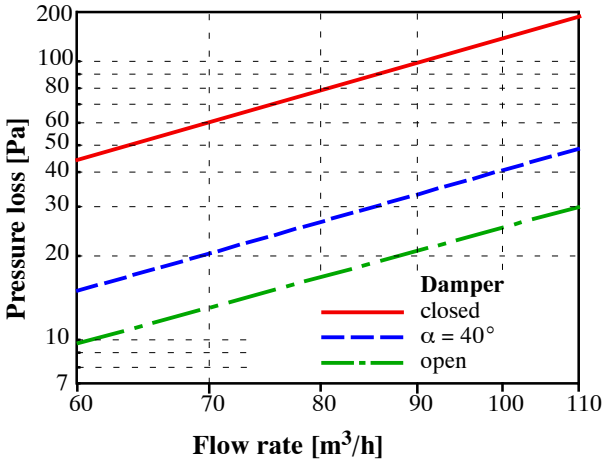



### *Pressure loss Δp selection diagram*

#### *Return air pressure loss*




#### *Supply air pressure loss*




Sound power level and pressure loss selection diagrams for connection types straight (A) or 90° elbow or smooth alu flex hose with R/D > 1 (B), respectively.

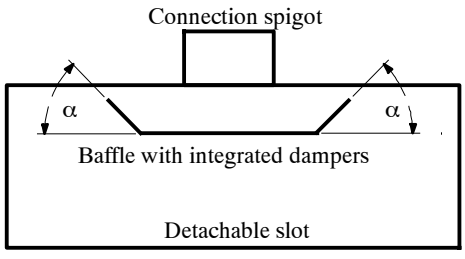
Connection type B:
Supply air pressure loss ± 10% (damper open only)

Acoustic data ± 3 dB,
Supply air flow rate = return air flow rate
Acoustics and pressure loss for NW 100 connection

High thermal comfort up to 170 m³/hm supply air flow rate and –8 K supply air temperature difference.

***Selection diagrams available from LTG AG***

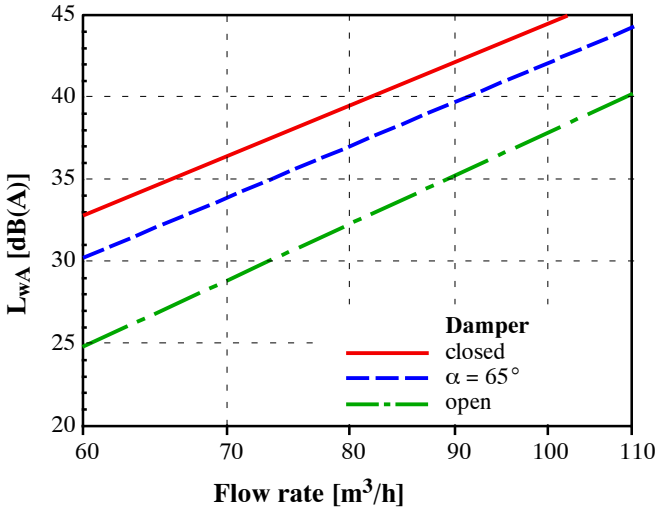
### *Damper setting*



# *Air Diffuser Combination Type LDK-B 12/8/2 LTG System clean® for Wall Installation with sound absorber*

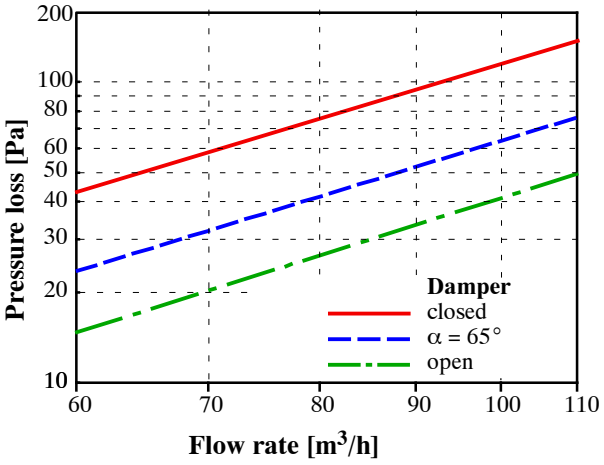
***with adjustable damper inside box, slot length 1200 mm***

### *Sound power level $L_{wA}$ selection diagram*

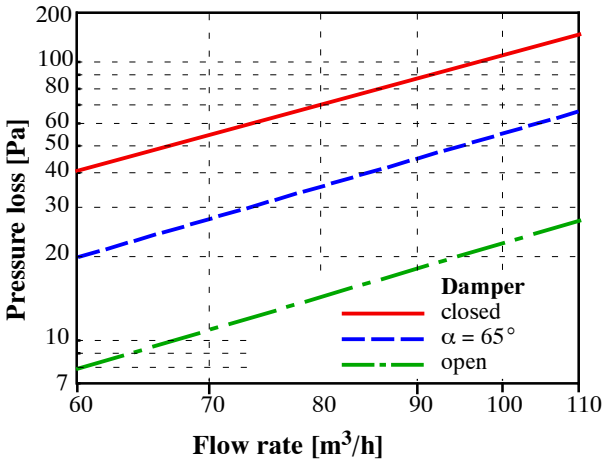



### *Pressure loss Δp selection diagram*

#### *Return air pressure loss*




#### *Supply air pressure loss*




Sound power level and pressure loss selection diagrams for connection types straight (A) or 90° elbow or smooth alu flex hose with R/D > 1 (B), respectively.

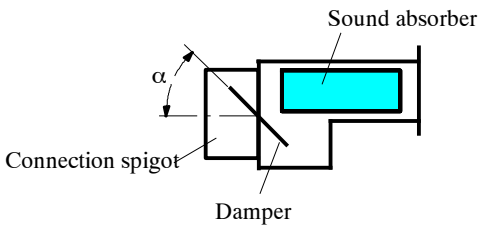
Connection type B:
Supply air pressure loss ± 15% (damper open only)

Acoustic data ± 3 dB,
Supply air flow rate = return air flow rate
Acoustics and pressure loss for NW 100 connection

High thermal comfort up to 170 m³/hm supply air flow rate and –8 K supply air temperature difference.

***Selection diagrams available from LTG AG***

### *Damper setting*



# Air Diffuser Combination Type LDK-B 12/8/2 LTG System clean® for Wall Installation

## Insertion Loss % End Reflection Factor

The cross-talk sound transmission via air ducts between adjacent rooms is a sound flanking path which might reduce the sound insulation of partition walls. DIN 4109 or customer agreements set minimum sound insulation requirements for partition walls in terms of a weighted sound reduction index $R_w$. Sound insulation indices may be calculated in terms of a sound pressure level difference with known wall surface S and the equivalent absorption surface A of the receiving room:

$\Delta L = R - 10 \lg (S/A)$

When assessing the sound pressure level difference in the air duct between the source and receiving room, calculation must be in the frequency bands (compare VDI 2081, Pages 1, 2, and LTG selection program). Therefore, for cross-talk sound absorbers manufacturers' frequency-dependent insertion loss indices will have to be used. For air diffusers, the insertion loss/end reflection of the air diffusers according to DIN EN ISO 7235 is decisive.

The following decision must be made:

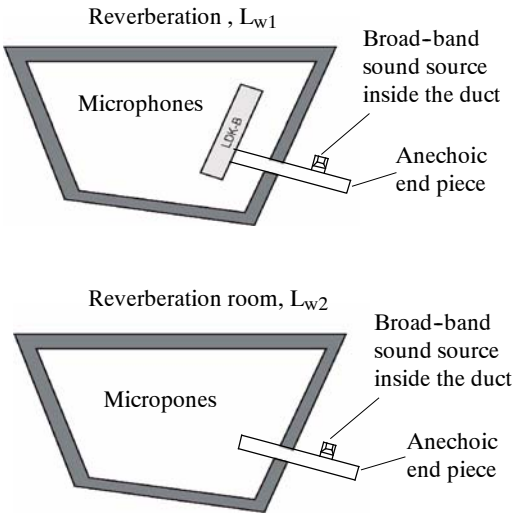
1. no cross-talk sound absorber required
2. sound absorber integrated in the air diffuser required
3. additional packaged attenuator of length x required

Through loss data of the air diffusers are determined as follows:

$D_t = D_i + D_{td}$

*$D_i$ air diffuser insertion loss index*

*$D_{td}$ theoretical end reflection at the open end of a straight, solid duct (duct end reflection) from equation B3 in DIN EN ISO 7235*




*Calculation of $D_i$*

**1. No additional sound absorber**

Insertion loss/end reflection of LDK-B 12/8/2 LTG System clean® without internal fittings

| Octave | $D_t$ in dB |
|---|---|
| 63 Hz | 25 |
| 125 Hz | 19 |
| 250 Hz | 13 |
| 500 Hz | 13 |
| 1000 Hz | 7 |
| 2000 Hz | 5 |
| 4000 Hz | 6 |
| 8000 Hz | 5 |

The above data apply to an NW 100 mm spigot connection, standard lengths 1000 mm and 1200 mm

**2. Sound absorber integrated in the diffuser combination**

Insertion loss/end reflection of LDK-B 12/8/2 LTG System clean® with centered sliding block absorber (melamine resin foam)

| Octave | $D_t$ in dB |
|---|---|
| 63 Hz | 25 |
| 125 Hz | 19 |
| 250 Hz | 15 |
| 500 Hz | 16 |
| 1000 Hz | 12 |
| 2000 Hz | 15 |
| 4000 Hz | 17 |
| 8000 Hz | 14 |

The above data apply to an NW 100 mm spigot connection, standard lengths 1000 mm and 1200 mm

**3. Off-the-shelf cross-talk sound absorber**

Ask the manufacturer for insertion loss indices.

# Air Diffuser Combination Type LDK-B 12/8/3 LTG System clean® for Wall Installation

*Air Diffuser Combination*
*LDK-B 12/8/3/11 LTG System clean®*

## Function

Adjustable supply air diffuser to produce a local mixed air flow close to the wall followed by a displacement air flow towards the occupied zone.

Adjustable direction of diffused air; factory-set; subsequently adjustable when installed; high induction ratio, i.e. rapid reduction of air discharge speed and temperature differences; formation of an additional air curtain close to the ceiling to reduce pollution in the diffuser area caused by airborne dust particles.

Return air diffuser matching supply air diffuser

## Advantages

- Supply and return air diffuser in the same building axis
  - arranged next to each other
  - shared diffuser
  - easy retrofitting of diffuser using clips
  - connections to the plenum
- Connection plenum box with integrated, technically optimized separation of supply and return air flow
- Diffuser with varying dimensions
  - standard length 1000 mm, 1200 mm
- Design
  - surface finish anodized, painted or chromium-plated, air guiding elements black, white (RAL 9010), aluminum grey (RAL 9007) or chromium-plated
- High ventilation efficiency due to
  - displacement air flow with excellent flushing of the occupied zone
- Complete floor area available for working space
- Low diffuser flow noise due to technically optimized HVAC elements
- Excellent cross-talk attenuation between adjacent rooms due to optional box-integrated sound absorbing elements
- Adjustable throttling device integrated in the connecting box
- No suspended ceiling required

# Air Diffuser Combination Type LDK-B 12/8/3 LTG System clean® for Wall Installation

## Indoor Air flow

visualization by smoke tracer

**Example:** 3 axes, 1.3 m each,
3 diffusers 80 $m^3$/h supply and return air each
$\Delta t$ = -8 K (cooling mode)
Installation height 2,4 m

## Version

Ready-to-install unit, consisting of:

- high-quality design diffuser element made of aluminum extrusion profiles with cylindrical plastic slot nozzles, with rectifier blades, flow-smooth inside contour, optimized for a low-turbulence, low-noise air guidance
- wall connecting profiles type 1 and 8 from the LDB 12/8 LTG System clean® program
- aluminum rails, aluminum coloured anodized, painted or chromium-plated, air cylinders optional black, white, aluminium grey or chromium-plated
- easy installation/removal of diffuser elements by clip fixing without the need of further tools (clip-on/off, e.g. when painting the wall)
- continuous air connection box with technically optimized separation of supply and return air to avoid internal short-circuits.

## Range of products

- three-slot version
  LDK-B 12/8/3 LTG System clean®
- standard lengths 1000 mm, 1200 mm
- one integrated damper each, in the supply and return air section, subsequently adjustable
- spigot diameter supply and return air optional DN 80 and DN 100
- sound absorber (optional)

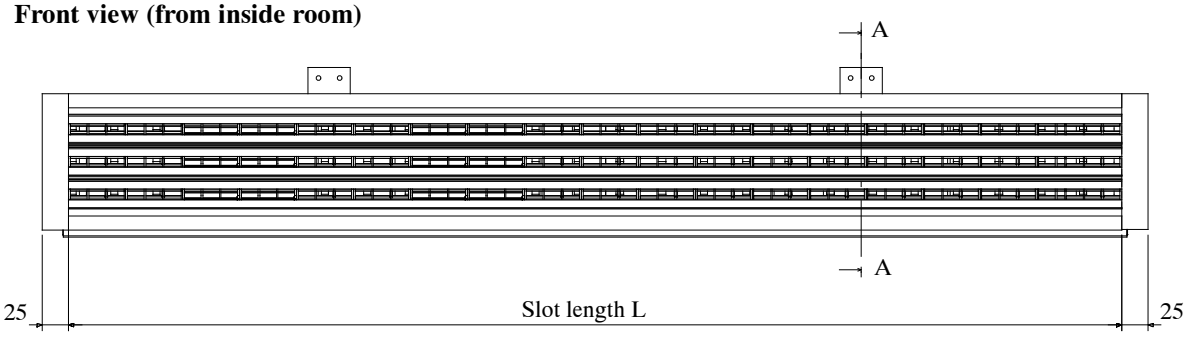
## Installation

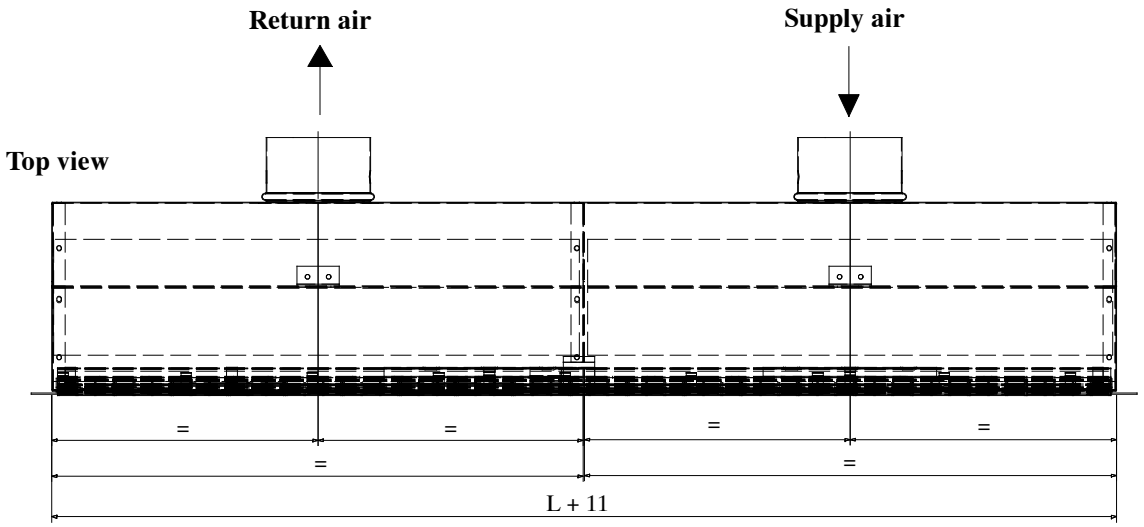
- LDK-B 12/8/3 LTG System clean® air diffuser combination pushed through from the corridor towards the room. Fixed using two angles on the corridor wall.
- Diffuser elements are simply clipped in from the room side.

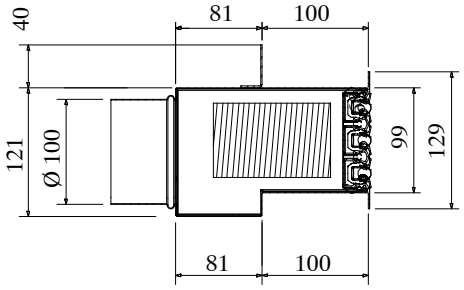
# *Air Diffuser Combination Type LDK-B 12/8/3 LTG System clean® for Wall Installation*

## *Dimensions including sound absorber*

**Front view (from inside room)**



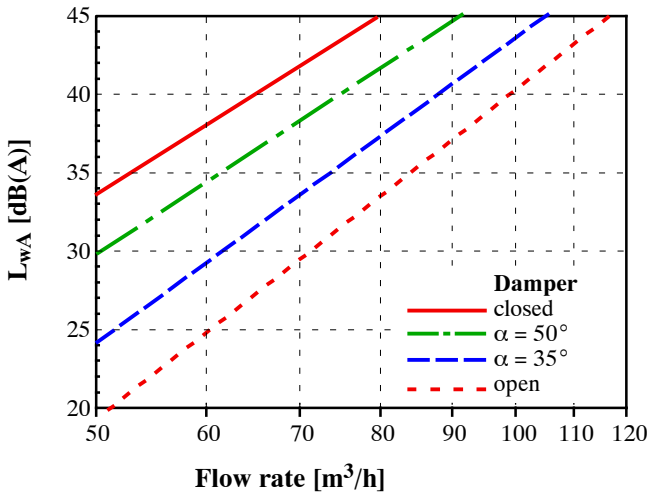




**Section A-A**

# *Air Diffuser Combination Type LDK-B 12/8/3 LTG System clean® for Wall Installation without sound absorber*

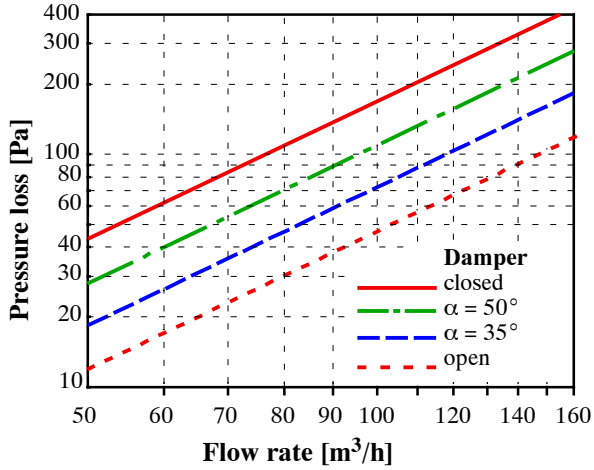
***with adjustable damper inside box, slot length 1000 mm***

### *Sound power level $L_{wA}$ selection diagram*

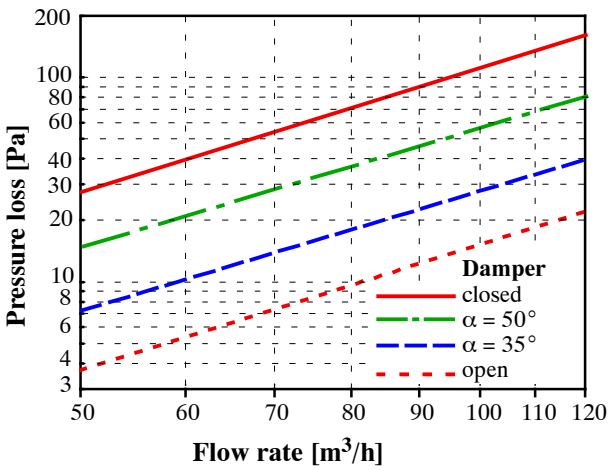



### *Pressure loss Δp selection diagram*

#### *Return air pressure loss*




#### *Supply air pressure loss*




Sound power level and pressure loss selection diagrams for connection types straight (A) or 90° elbow or smooth alu flex hose with R/D > 1 (B), respectively.

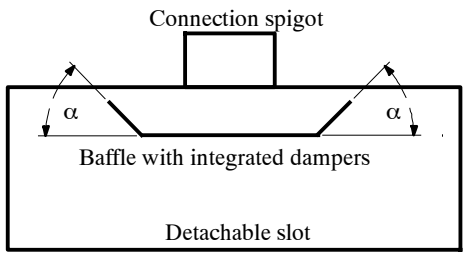
Connection type B:
Supply air pressure loss ± 20% (damper open only)

Acoustic data ± 3 dB,
Supply air flow rate = return air flow rate
Acoustics and pressure loss for NW 100 connection

High thermal comfort up to 165 m³/hm supply air flow rate and –8 K supply air temperature difference.

***Selection diagrams available from LTG AG***

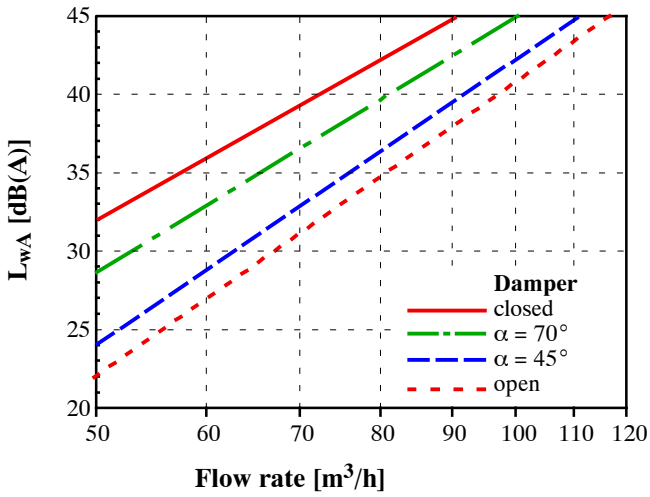
### *Damper setting*



# *Air Diffuser Combination Type LDK-B 12/8/3 LTG System clean® for Wall Installation with sound absorber*

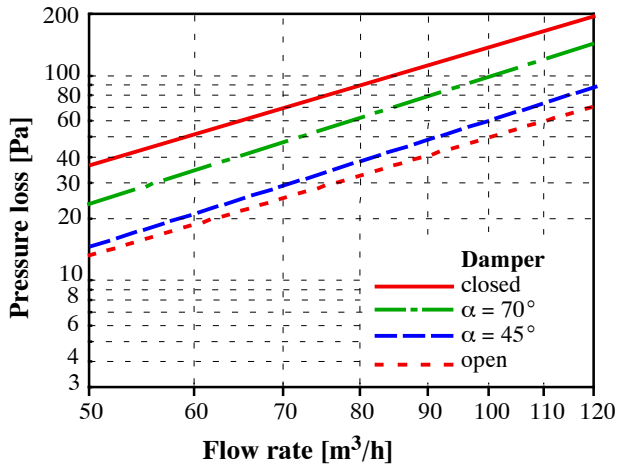
***with adjustable damper inside box, slot length 1000 mm***

### *Sound power level $L_{wA}$ selection diagram*

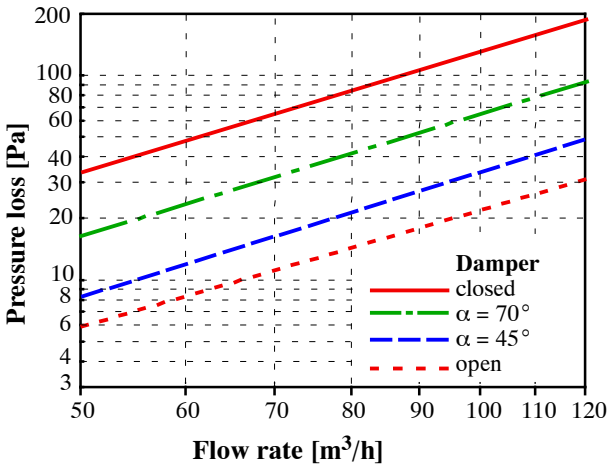



### *Pressure loss Δp selection diagram*

#### *Return air pressure loss*




#### *Supply air pressure loss*




Sound power level and pressure loss selection diagrams for connection types straight (A) or 90° elbow or smooth alu flex hose with R/D > 1 (B), respectively.

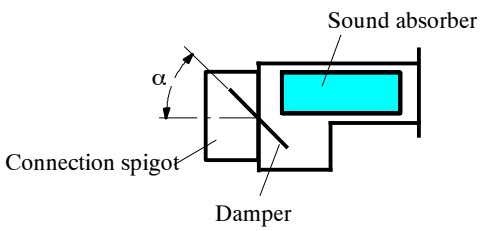
Connection type B:
Supply air pressure loss ± 30% (damper open only)

Acoustic data ± 3 dB,
Supply air flow rate = return air flow rate
Acoustics and pressure loss for NW 100 connection

High thermal comfort up to 165 m³/hm supply air flow rate and –8 K supply air temperature difference.

***Selection diagrams available from LTG AG***

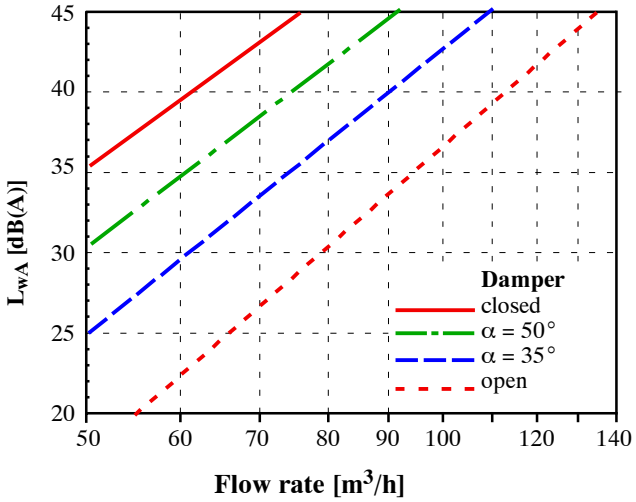
### *Damper setting*



# *Air Diffuser Combination Type LDK-B 12/8/3 LTG System clean® for Wall Installation without sound absorber*

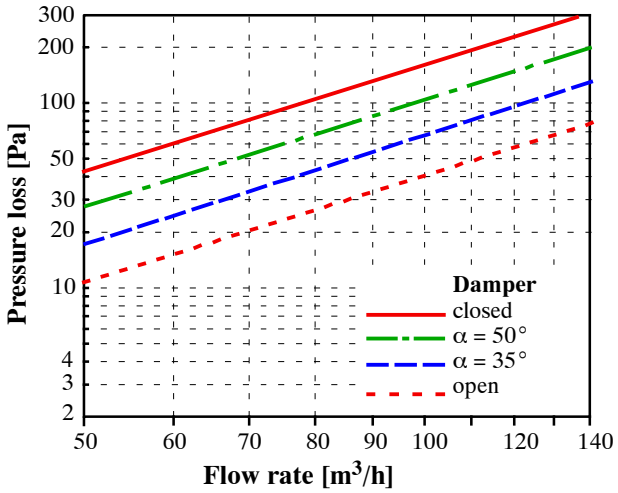
***with adjustable damper inside box, slot length 1200 mm***

### *Sound power level $L_{wA}$ selection diagram*

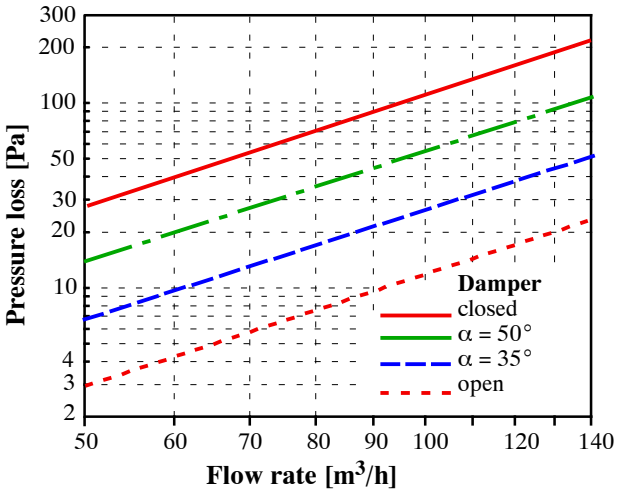



### *Pressure loss Δp selection diagram*

#### *Return air pressure loss*




#### *Supply air pressure loss*




Sound power level and pressure loss selection diagrams for connection types straight (A) or 90° elbow or smooth alu flex hose with R/D > 1 (B), respectively.

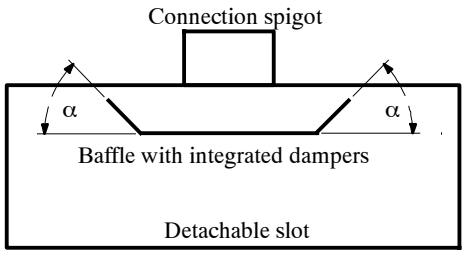
Connection type B:
Supply air pressure loss ± 20% (damper open only)

Acoustic data ± 3 dB,
Supply air flow rate = return air flow rate
Acoustics and pressure loss for NW 100 connection

High thermal comfort up to 165 m³/hm supply air flow rate and –8 K supply air temperature difference.

***Selection diagrams available from LTG AG***

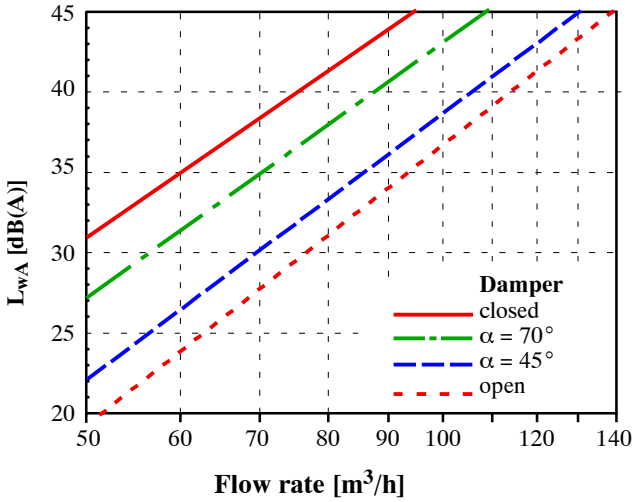
### *Damper setting*



# *Air Diffuser Combination Type LDK-B 12/8/3 LTG System clean® for Wall Installation with sound absorber*

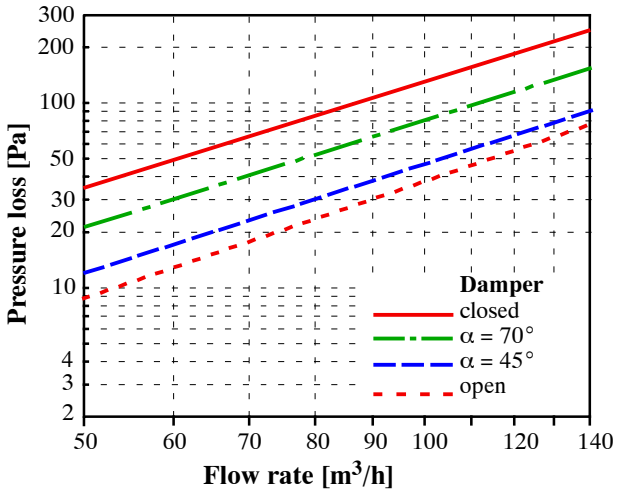
***with adjustable damper inside box, slot length 1200 mm***

### *Sound power level $L_{wA}$ selection diagram*

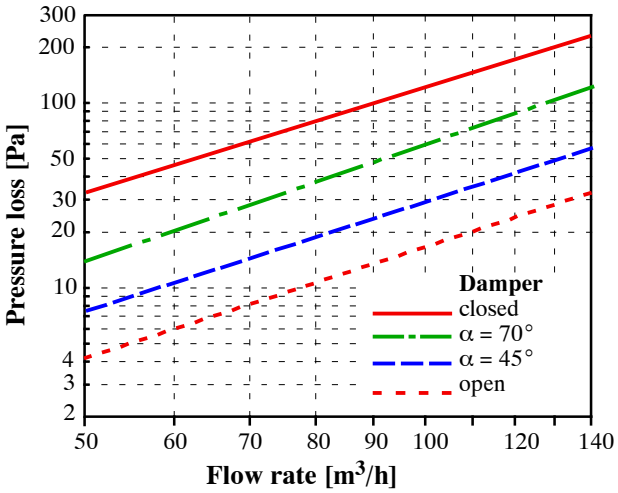



### *Pressure loss Δp selection diagram*

#### *Return air pressure loss*




#### *Supply air pressure loss*




Sound power level and pressure loss selection diagrams for connection types straight (A) or 90° elbow or smooth alu flex hose with R/D > 1 (B), respectively.

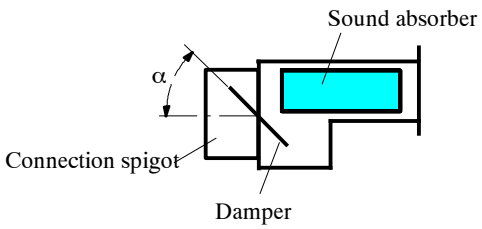
Connection type B:
Supply air pressure loss ± 30% (damper open only)

Acoustic data ± 3 dB,
Supply air flow rate = return air flow rate
Acoustics and pressure loss for NW 100 connection

High thermal comfort up to 165 m³/hm supply air flow rate and –8 K supply air temperature difference.

***Selection diagrams available from LTG AG***

### *Damper setting*



# Air Diffuser Combination Type LDK-B 12/8/3 LTG System clean® for Wall Installation

## Insertion Loss % End Reflection Factor

The cross-talk sound transmission via air ducts between adjacent rooms is a sound flanking path which might reduce the sound insulation of partition walls. DIN 4109 or customer agreements set minimum sound insulation requirements for partition walls in terms of a weighted sound reduction index $R_w$. Sound insulation indices may be calculated in terms of a sound pressure level difference with known wall surface S and the equivalent absorption surface A of the receiving room:

$\Delta L = R - 10 \lg (S/A)$

When assessing the sound pressure level difference in the air duct between the source and receiving room, calculation must be in the frequency bands (compare VDI 2081, Pages 1, 2, and LTG selection program). Therefore, for cross-talk sound absorbers manufacturers' frequency-dependent insertion loss indices will have to be used. For air diffusers, the insertion loss/end reflection of the air diffusers according to DIN EN ISO 7235 is decisive.

The following decision must be made:

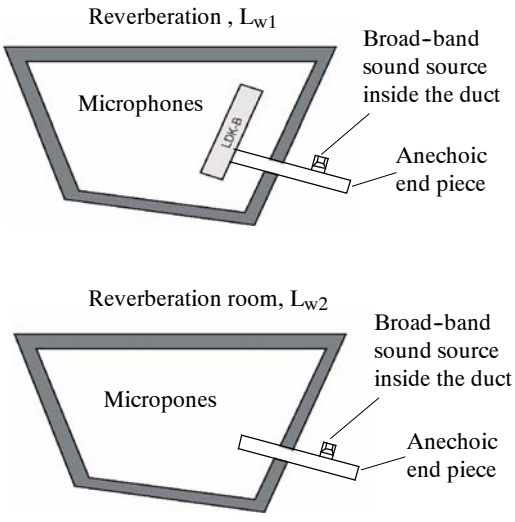
1. no cross-talk sound absorber required
2. sound absorber integrated in the air diffuser required
3. additional packaged attenuator of length x required

Through loss data of the air diffusers are determined as follows:

$D_t = D_i + D_{td}$

*$D_i$ air diffuser insertion loss index*

*$D_{td}$ theoretical end reflection at the open end of a straight, solid duct (duct end reflection) from equation B3 in DIN EN ISO 7235*




*Calculation of $D_i$*

**1. No additional sound absorber**

Insertion loss/end reflection of LDK-B 12/8/3 LTG System clean® without internal fittings

| Octave | $D_t$ in dB |
|---|---|
| 63 Hz | 25 |
| 125 Hz | 19 |
| 250 Hz | 13 |
| 500 Hz | 11 |
| 1000 Hz | 5 |
| 2000 Hz | 5 |
| 4000 Hz | 5 |
| 8000 Hz | 5 |

The above data apply to an NW 100 mm spigot connection, standard lengths 1000 mm and 1200 mm

**2. Sound absorber integrated in the diffuser combination**

Insertion loss/end reflection of LDK-B 12/8/3 LTG System clean® with centered sliding block absorber (melamine resin foam)

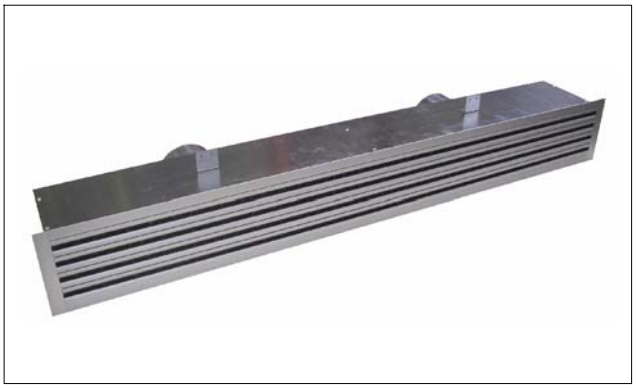
| Octave | $D_t$ in dB |
|---|---|
| 63 Hz | 25 |
| 125 Hz | 19 |
| 250 Hz | 14 |
| 500 Hz | 15 |
| 1000 Hz | 15 |
| 2000 Hz | 17 |
| 4000 Hz | 18 |
| 8000 Hz | 16 |

The above data apply to an NW 100 mm spigot connection, standard lengths 1000 mm and 1200 mm

**3. Off-the-shelf cross-talk sound absorber**

Ask the manufacturer for insertion loss indices.

# Air Diffuser Combination Type LDK-B 12/8/4 LTG System clean® for Wall Installation



*Air Diffuser Combination*
*LDK-B 12/8/4/11 LTG System clean®*

## Function

Adjustable supply air diffuser to produce a local mixed air flow close to the wall followed by a displacement air flow towards the occupied zone.

Adjustable direction of diffused air; factory-set; subsequently adjustable when installed; high induction ratio, i.e. rapid reduction of air discharge speed and temperature differences; formation of an additional air curtain close to the ceiling to reduce pollution in the diffuser area caused by airborne dust particles.

Return air diffuser matching supply air diffuser

## Advantages

- Supply and return air diffuser in the same building axis
  - arranged next to each other
  - shared diffuser
  - easy retrofitting of diffuser using clips
  - connections to the plenum
- Connection plenum box with integrated, technically optimized separation of supply and return air flow
- Diffuser with varying dimensions
  - standard length 1000 mm, 1200 mm
- Design
  - surface finish anodized, painted or chromium-plated, air guiding elements black, white (RAL 9010), aluminum grey (RAL 9007) or chromium-plated
- High ventilation efficiency due to
  - displacement air flow with excellent flushing of the occupied zone
- Complete floor area available for working space
- Low diffuser flow noise due to technically optimized HVAC elements
- Excellent cross-talk attenuation between adjacent rooms due to optional box-integrated sound absorbing elements
- Adjustable throttling device integrated in the connecting box
- No suspended ceiling required

# Air Diffuser Combination Type LDK-B 12/8/4 LTG System clean® for Wall Installation

## Indoor Air flow

visualization by smoke tracer

**Example:** 3 axes, 1.3 m each,
3 diffusers 80 $m^3$/h supply and return air each
$\Delta t$ = -8 K (cooling mode)
Installation height 2,4 m

## Version

Ready-to-install unit, consisting of:

- high-quality design diffuser element made of aluminum extrusion profiles with cylindrical plastic slot nozzles, with rectifier blades, flow-smooth inside contour, optimized for a low-turbulence, low-noise air guidance
- wall connecting profiles type 1 and 8 from the LDB 12/8 LTG System clean® program
- aluminum rails, aluminum coloured anodized, painted or chromium-plated, air cylinders optional black, white, aluminium grey or chromium-plated
- easy installation/removal of diffuser elements by clip fixing without the need of further tools (clip-on/off, e.g. when painting the wall)
- continuous air connection box with technically optimized separation of supply and return air to avoid internal short-circuits.

## Range of products

- four-slot version
  LDK-B 12/8/4 LTG System clean®
- standard lengths 1000 mm, 1200 mm
- one integrated damper each, in the supply and return air section, subsequently adjustable
- spigot diameter supply and return air DN 125
- sound absorber (optional)

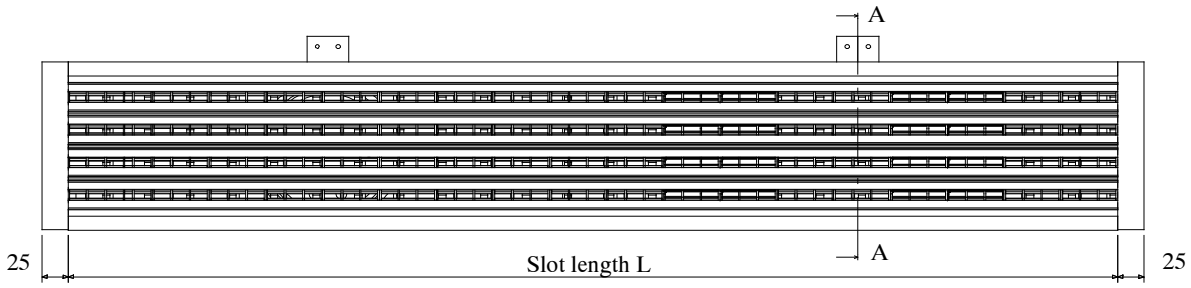
## Installation

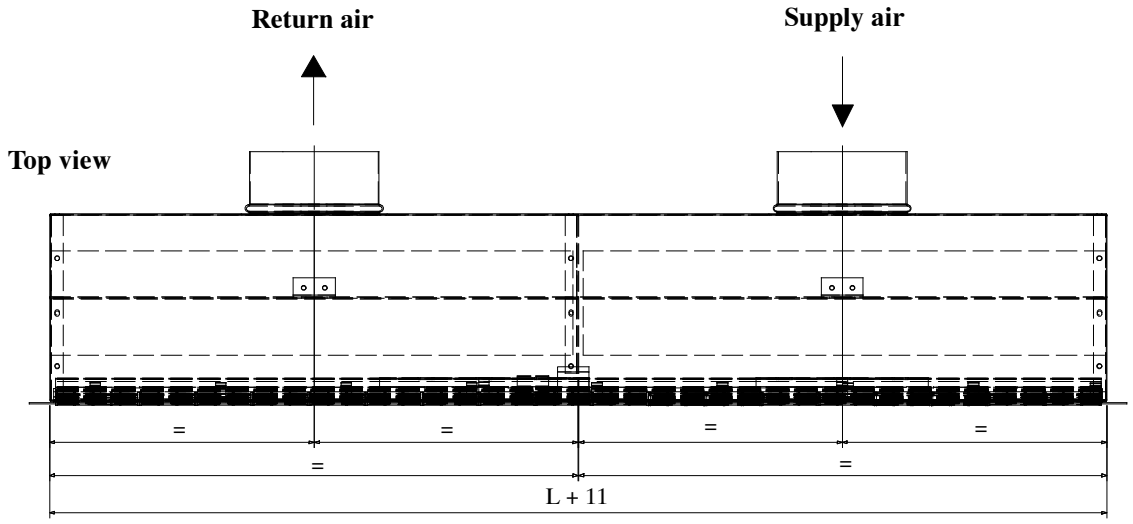
- LDK-B 12/8/4 LTG System clean® air diffuser combination pushed through from the corridor towards the room. Fixed using two angles on the corridor wall.
- Diffuser elements are simply clipped in from the room side.

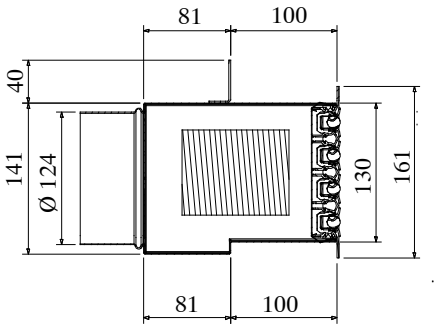
# *Air Diffuser Combination Type LDK-B 12/8/4 LTG System clean® for Wall Installation*

## *Dimensions including sound absorber*

**Front view (from inside room)**



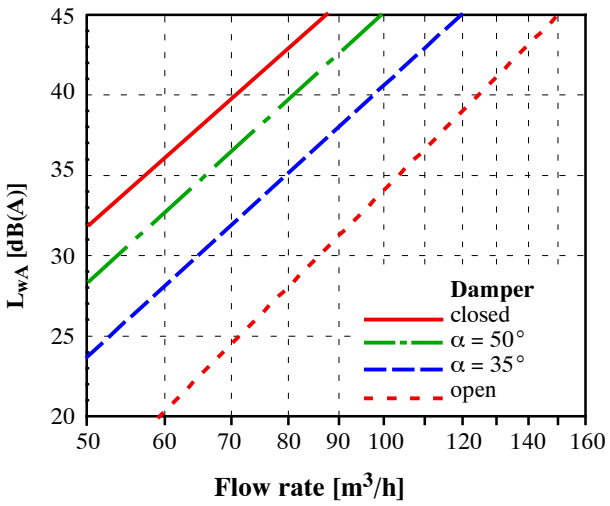




**Section A-A**

# *Air Diffuser Combination Type LDK-B 12/8/4 LTG System clean® for Wall Installation without sound absorber*

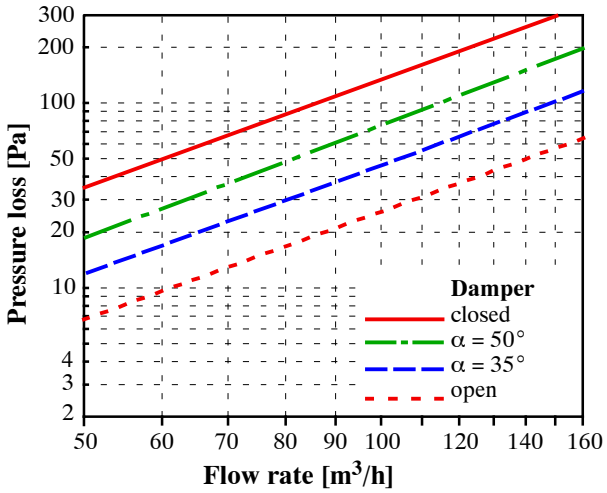
***with adjustable damper inside box, slot length 1000 mm***

### *Sound power level $L_{wA}$ selection diagram*

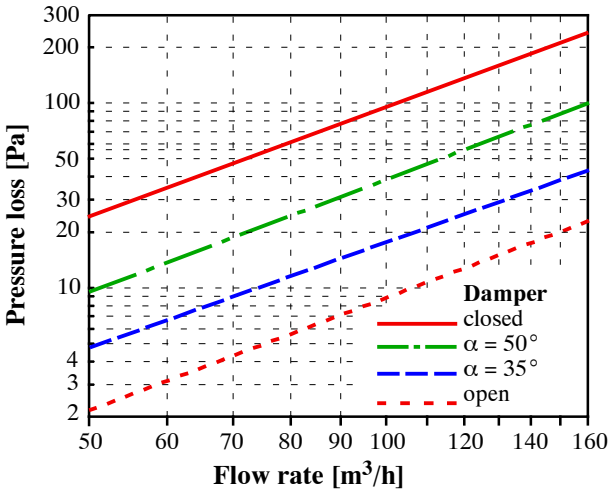



### *Pressure loss Δp selection diagram*

#### *Return air pressure loss*




#### *Supply air pressure loss*




Sound power level and pressure loss selection diagrams for connection types straight (A) or 90° elbow or smooth alu flex hose with R/D > 1 (B), respectively.

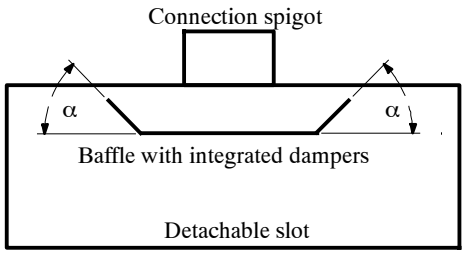
Connection type B:
Supply air pressure loss ± 20% (damper open only)

Acoustic data ± 3 dB,
Supply air flow rate = return air flow rate
Acoustics and pressure loss for NW 125 connection

High thermal comfort up to 220 m³/hm supply air flow rate and –8 K supply air temperature difference.

***Selection diagrams available from LTG AG***

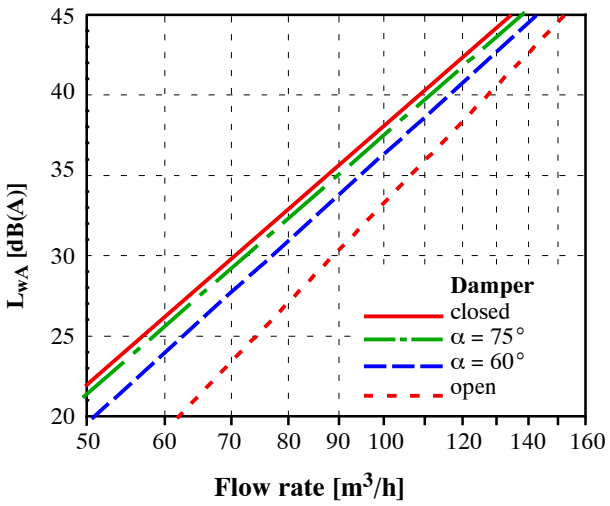
### *Damper setting*



# *Air Diffuser Combination Type LDK-B 12/8/4 LTG System clean® for Wall Installation with sound absorber*

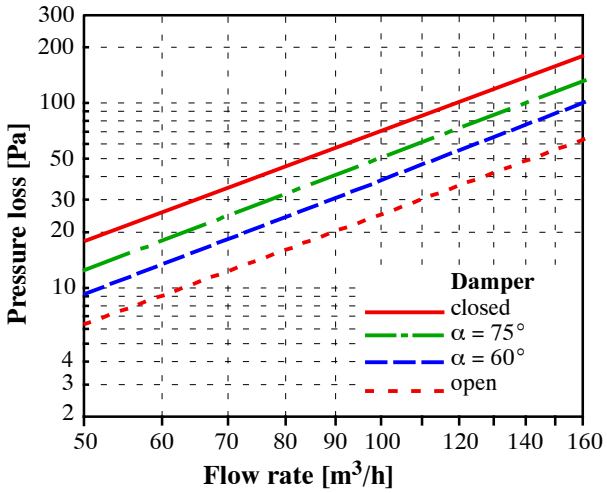
***with adjustable damper inside box, slot length 1000 mm***

### *Sound power level $L_{wA}$ selection diagram*

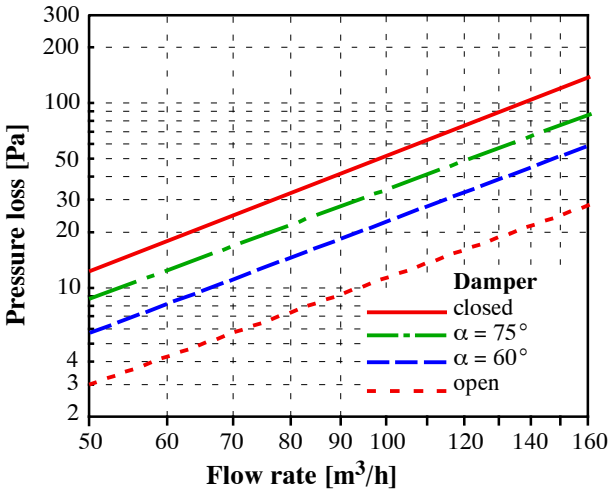



### *Pressure loss Δp selection diagram*

#### *Return air pressure loss*




#### *Supply air pressure loss*




Sound power level and pressure loss selection diagrams for connection types straight (A) or 90° elbow or smooth alu flex hose with R/D > 1 (B), respectively.

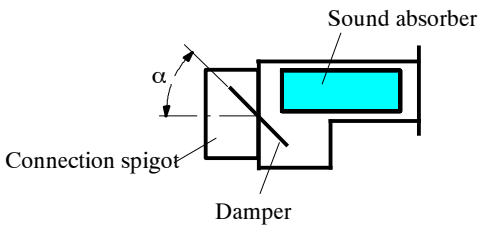
Connection type B:
Supply air pressure loss ± 20% (damper open only)

Acoustic data ± 3 dB,
Supply air flow rate = return air flow rate
Acoustics and pressure loss for NW 125 connection

High thermal comfort up to 220 m³/hm supply air flow rate and –8 K supply air temperature difference.

***Selection diagrams available from LTG AG***

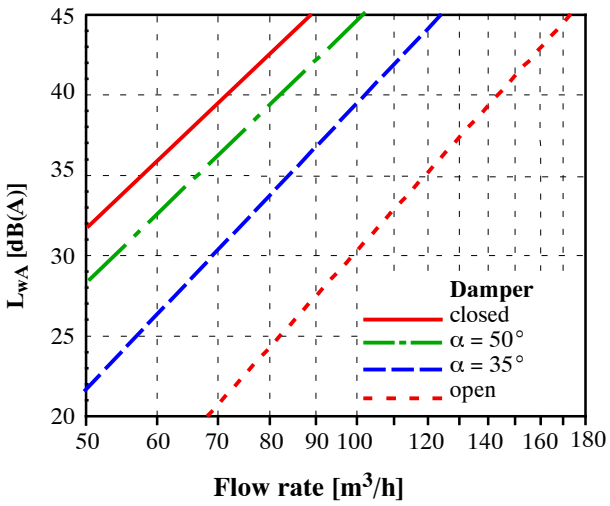
### *Damper setting*



# *Air Diffuser Combination Type LDK-B 12/8/4 LTG System clean® for Wall Installation without sound absorber*

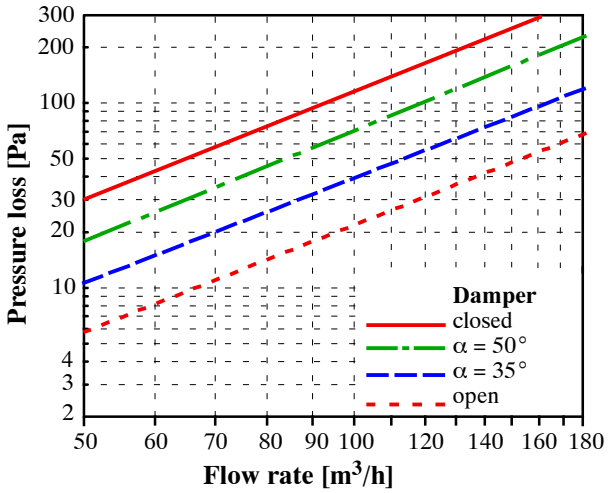
***with adjustable damper inside box, slot length 1200 mm***

### *Sound power level $L_{wA}$ selection diagram*

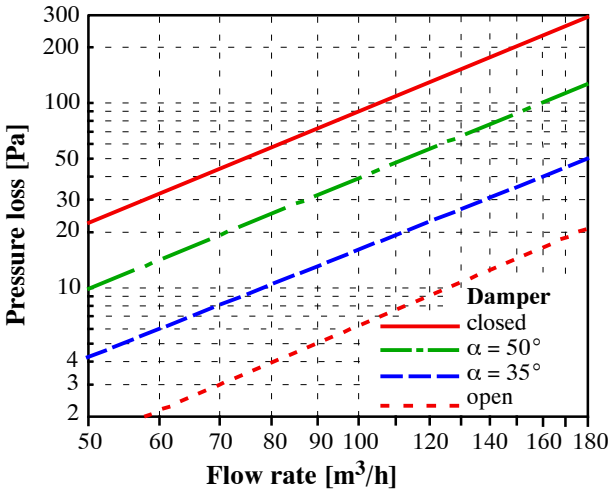



### *Pressure loss Δp selection diagram*

#### *Return air pressure loss*




#### *Supply air pressure loss*




Sound power level and pressure loss selection diagrams for connection types straight (A) or 90° elbow or smooth alu flex hose with R/D > 1 (B), respectively.

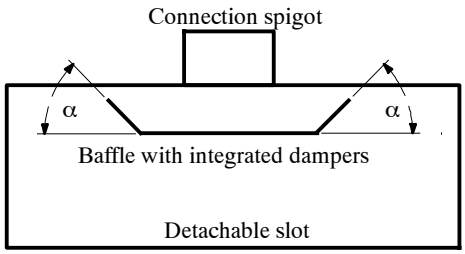
Connection type B:
Supply air pressure loss ± 20% (damper open only)

Acoustic data ± 3 dB,
Supply air flow rate = return air flow rate
Acoustics and pressure loss for NW 125 connection

High thermal comfort up to 220 m³/hm supply air flow rate and –8 K supply air temperature difference.

***Selection diagrams available from LTG AG***

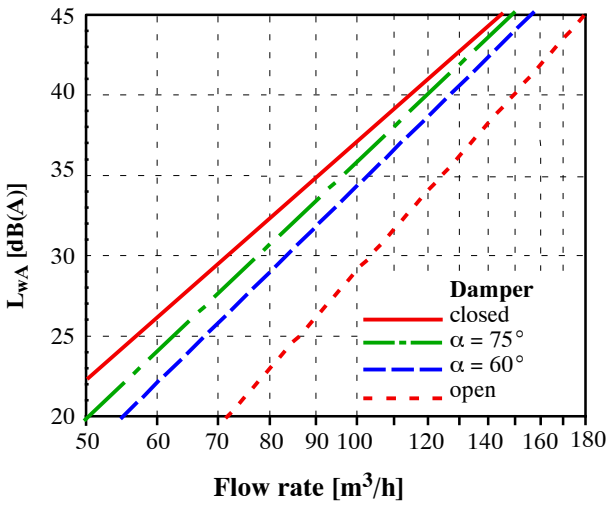
### *Damper setting*



# *Air Diffuser Combination Type LDK-B 12/8/4 LTG System clean® for Wall Installation with sound absorber*

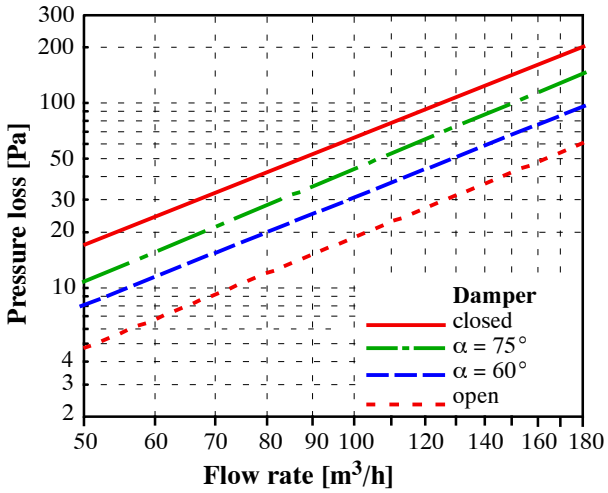
***with adjustable damper inside box, slot length 1200 mm***

### *Sound power level $L_{wA}$ selection diagram*

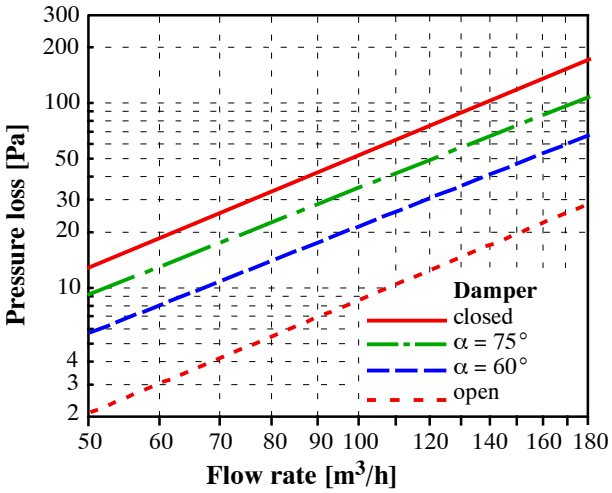



### *Pressure loss Δp selection diagram*

#### *Return air pressure loss*




#### *Supply air pressure loss*




Sound power level and pressure loss selection diagrams for connection types straight (A) or 90° elbow or smooth alu flex hose with R/D > 1 (B), respectively.

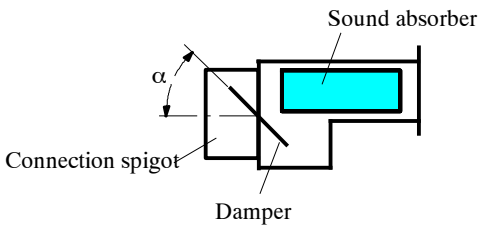
Connection type B:
Supply air pressure loss ± 20% (damper open only)

Acoustic data ± 3 dB,
Supply air flow rate = return air flow rate
Acoustics and pressure loss for NW 125 connection

High thermal comfort up to 220 m³/hm supply air flow rate and –8 K supply air temperature difference.

***Selection diagrams available from LTG AG***

### *Damper setting*



# Air Diffuser Combination Type LDK-B 12/8/4 LTG System clean® for Wall Installation

## Insertion Loss % End Reflection Factor

The cross-talk sound transmission via air ducts between adjacent rooms is a sound flanking path which might reduce the sound insulation of partition walls. DIN 4109 or customer agreements set minimum sound insulation requirements for partition walls in terms of a weighted sound reduction index $R_w$. Sound insulation indices may be calculated in terms of a sound pressure level difference with known wall surface S and the equivalent absorption surface A of the receiving room:

$\Delta L = R - 10 \lg (S/A)$

When assessing the sound pressure level difference in the air duct between the source and receiving room, calculation must be in the frequency bands (compare VDI 2081, Pages 1, 2, and LTG selection program). Therefore, for cross-talk sound absorbers manufacturers' frequency-dependent insertion loss indices will have to be used. For air diffusers, the insertion loss/end reflection of the air diffusers according to DIN EN ISO 7235 is decisive.

The following decision must be made:

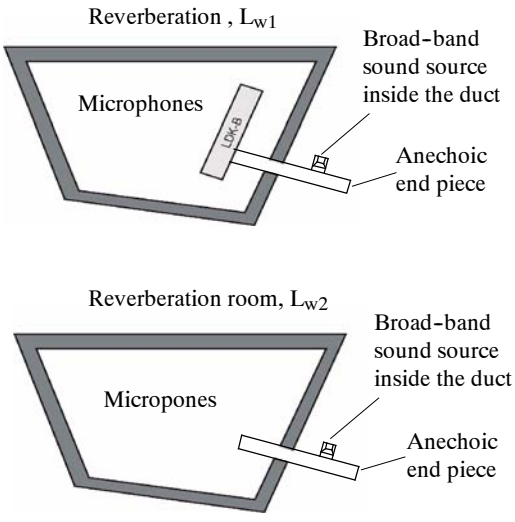
1. no cross-talk sound absorber required
2. sound absorber integrated in the air diffuser required
3. additional packaged attenuator of length x required

Through loss data of the air diffusers are determined as follows:

$D_t = D_i + D_{td}$

*$D_i$ air diffuser insertion loss index*

*$D_{td}$ theoretical end reflection at the open end of a straight, solid duct (duct end reflection) from equation B3 in DIN EN ISO 7235*




*Calculation of $D_i$*

**1. No additional sound absorber**

Insertion loss/end reflection of LDK-B 12/8/4 LTG System clean® without internal fittings

| Octave | $D_t$ in dB |
|---|---|
| 63 Hz | 23 |
| 125 Hz | 17 |
| 250 Hz | 11 |
| 500 Hz | 10 |
| 1000 Hz | 3 |
| 2000 Hz | 4 |
| 4000 Hz | 4 |
| 8000 Hz | 5 |

The above data apply to an NW 125 mm spigot connection, standard lengths 1000 mm and 1200 mm

**2. Sound absorber integrated in the diffuser combination**

Insertion loss/end reflection of LDK-B 12/8/4 LTG System clean® with centered sliding block absorber (melamine resin foam)

| Octave | $D_t$ in dB |
|---|---|
| 63 Hz | 23 |
| 125 Hz | 17 |
| 250 Hz | 11 |
| 500 Hz | 12 |
| 1000 Hz | 12 |
| 2000 Hz | 15 |
| 4000 Hz | 15 |
| 8000 Hz | 13 |

The above data apply to an NW 125 mm spigot connection, standard lengths 1000 mm and 1200 mm

**3. Off-the-shelf cross-talk sound absorber**

Ask the manufacturer for insertion loss indices.

# Air Diffuser Combination Type LDK-B 20/8/2 for Wall Installation

*Air Diffuser Combination LDK-B 20/8/2/11*

## Function

Adjustable supply air diffuser producing a tangential air flow along the ceiling, followed by a mixed diplacement air flow in the occupied zone.

Adjustable direction of diffused air; factory-set; subsequently adjustable when installed; high induction ratio, i.e. rapid reduction of air discharge speed and temperature differences.

Return air diffuser matching supply air diffuser

## Advantages

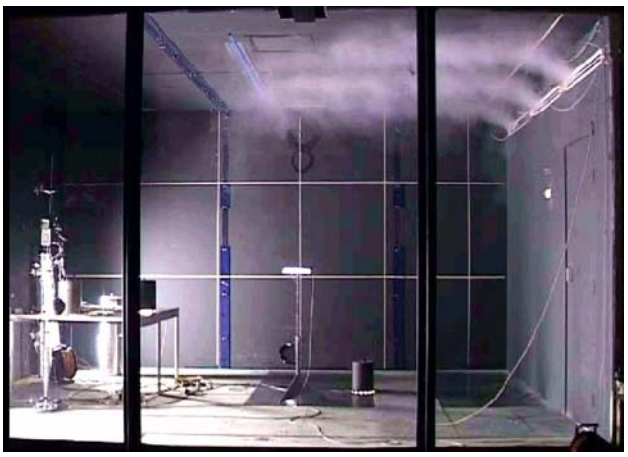
- Supply and return air diffuser in the same building axis
  - arranged next to each other
  - shared diffuser
  - easy retrofitting of diffuser using clips
  - connections to the plenum
- Connection plenum box with integrated, technically optimized separation of supply and return air flow
- Diffuser with varying dimensions
  - standard length 1000 mm, 1200 mm
- Design
  - surface finish anodized, painted or chromium-plated, air guiding elements black, white (RAL 9010), aluminum grey (RAL 9007) or chromium-plated
- High ventilation efficiency due to
  - displacement air flow with excellent flushing of the occupied zone
- Complete floor area available for working space
- Low diffuser flow noise due to technically optimized HVAC elements
- Excellent cross-talk attenuation between adjacent rooms due to optional box-integrated sound absorbing elements
- Adjustable throttling device integrated in the connecting box
- No suspended ceiling required

# Air Diffuser Combination Type LDK-B 20/8/2 for Wall Installation

## Indoor Air flow

visualization by smoke tracer

**Example:** 3 axes,
3 diffusers 100 $m^3$/h supply and return air each
$\Delta t$ = -8 K (cooling mode),
Installation height 2.5 m
Ceiling clearance 0.25 m (diffuser centre)
3 diffuser combinations, 1000 mm each



## Version

Ready-to-install unit, consisting of:

- high-quality design diffuser element made of aluminum extrusion profiles with cylindrical plastic slot nozzles, with rectifier blades, flow-smooth inside contour, optimized for a low-turbulence, low-noise air guidance
- wall connecting profiles type 1 and 8 from the LDB 20/8 program
- aluminum rails, aluminum coloured anodized, painted or chromium-plated, air cylinders optional black, white, aluminium grey or chromium-plated
- easy installation/removal of diffuser elements by clip fixing without the need of further tools
- continuous air connection box with technically optimized separation of supply and return air to avoid internal short-circuits.

## Range of products

- two-slot version LDK-B 20/8/2
- standard length 1000 mm, 1200 mm
- one integrated damper each, in the supply and return air section, subsequently adjustable
- spigot diameter supply and return air optional DN 80 and DN 100
- sound absorber (optional)

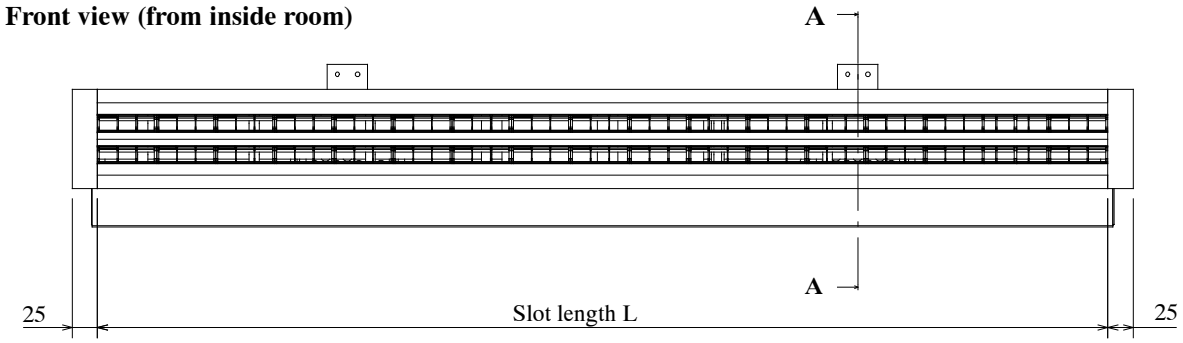
## Installation

- LDK-B 20/8/2 air diffuser combination pushed through from the corridor towards the room. Fixed using two angles on the corridor wall.
- Diffuser elements are simply clipped in from the room side.

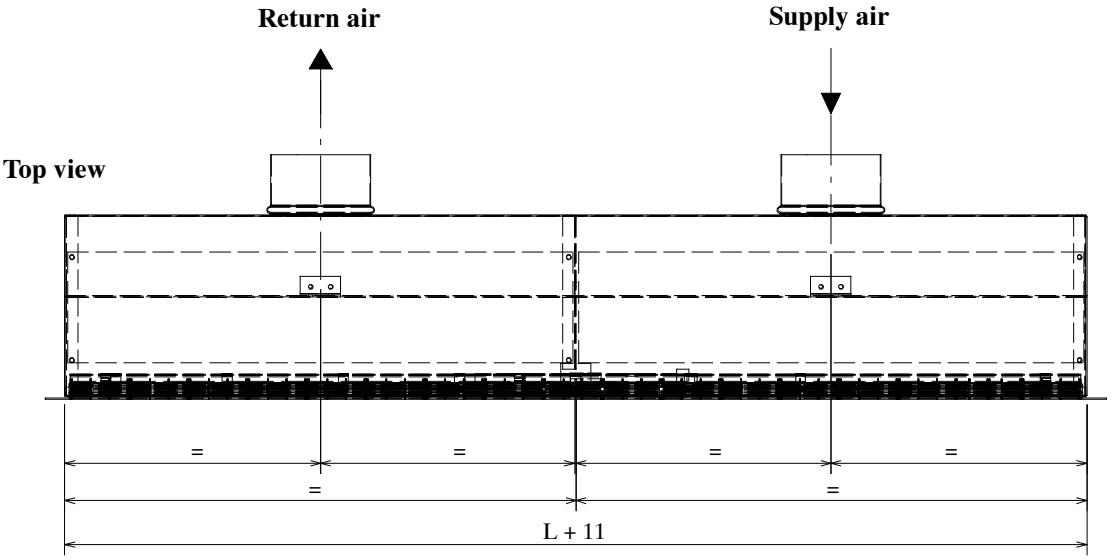
# Air Diffuser Combination Type LDK-B 20/8/2 for Wall Installation

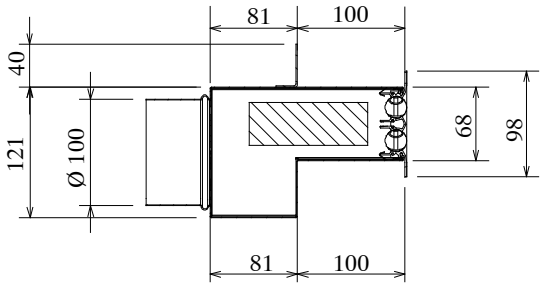
## Dimensions including sound absorber

**Front view (from inside room)**




**Top view**



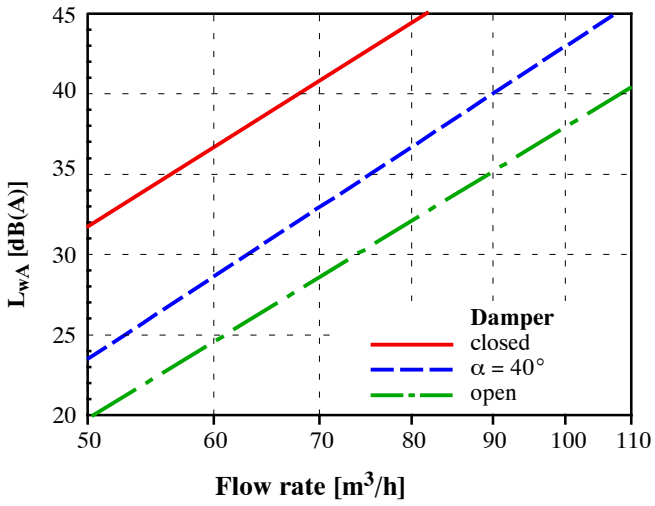




**Section A-A**

# Air Diffuser Combination Type LDK-B 20/8/2 for Wall Installation

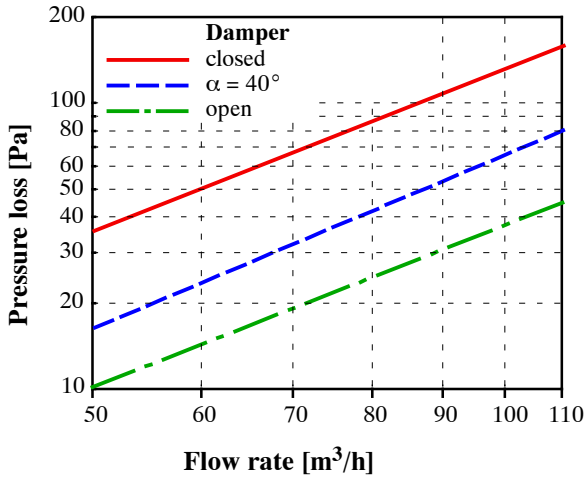
## without sound absorber, with adjustable damper inside box, slot length 1000 mm

### Sound power level $L_{wA}$ selection diagram

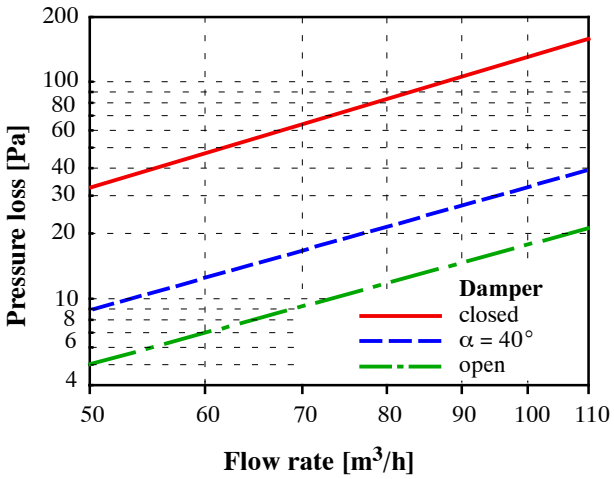



### Pressure loss Δp selection diagram

#### Return air pressure loss




#### Supply air pressure loss




Sound power level and pressure loss selection diagrams for connection types straight (A) or 90° elbow or smooth alu flex hose with R/D > 1 (B), respectively.

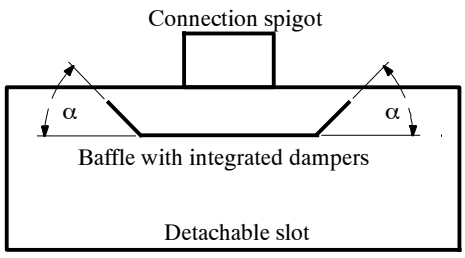
Connection type B:
Supply air pressure loss ± 20% (damper open only)

Acoustic data ± 3 dB,
Supply air flow rate = return air flow rate
Acoustics and pressure loss for NW 100 connection

High thermal comfort up to 190 $m^3$/hm supply air flow rate and –8 K supply air temperature difference.

*Selection diagrams available from LTG AG*

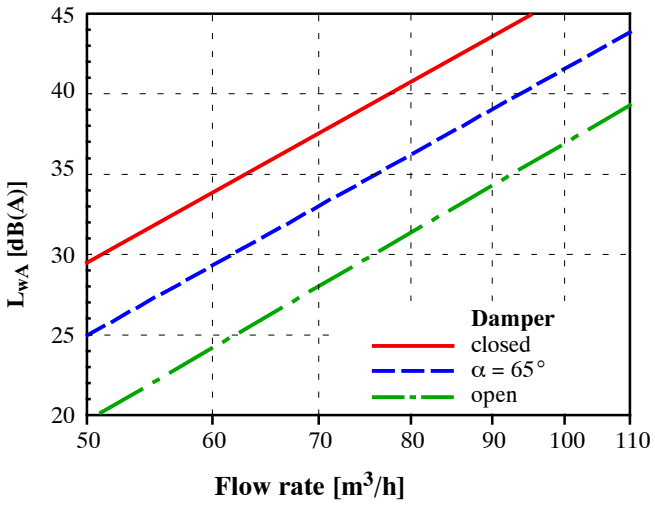
### Damper setting



# Air Diffuser Combination Type LDK-B 20/8/2 for Wall Installation

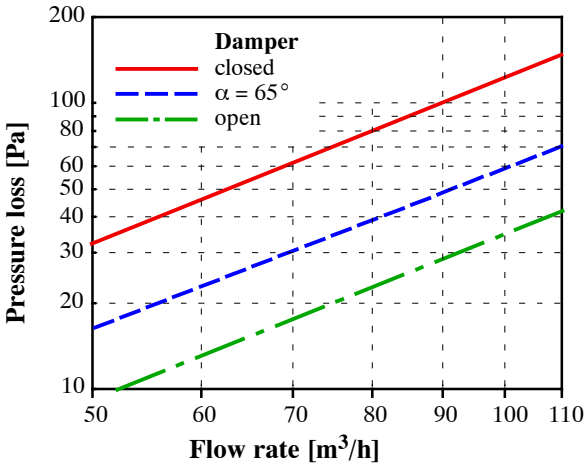
## with sound absorber, with adjustable damper inside box, slot length 1000 mm

### Sound power level $L_{wA}$ selection diagram

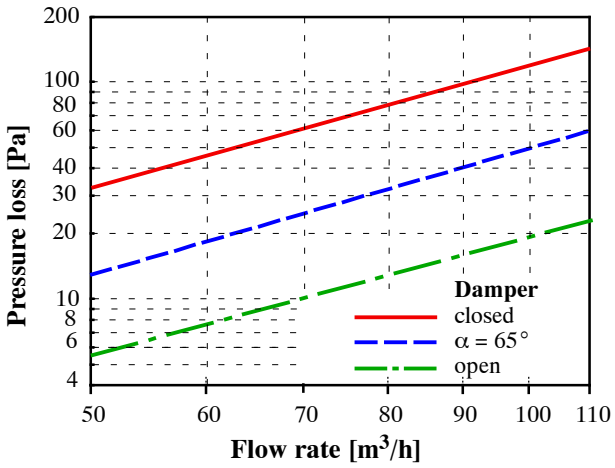



### Pressure loss Δp selection diagram

#### Return air pressure loss




#### Supply air pressure loss




Sound power level and pressure loss selection diagrams for connection types straight (A) or 90° elbow or smooth alu flex hose with R/D > 1 (B), respectively.

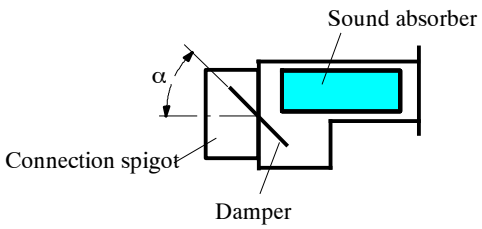
Connection type B:
Supply air pressure loss ± 15% (damper open only)

Acoustic data ± 3 dB,
Supply air flow rate = return air flow rate
Acoustics and pressure loss for NW 100 connection

High thermal comfort up to 190 $m^3$/hm supply air flow rate and –8 K supply air temperature difference.

***Selection diagrams available from LTG AG***

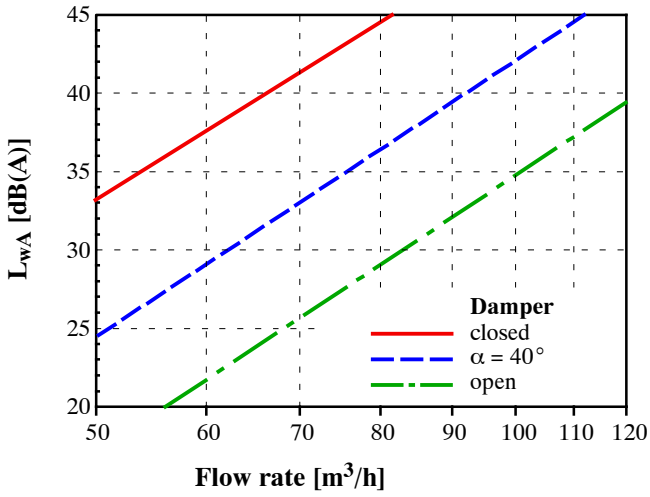
### Damper setting



# *Air Diffuser Combination Type LDK-B 20/8/2 for Wall Installation*

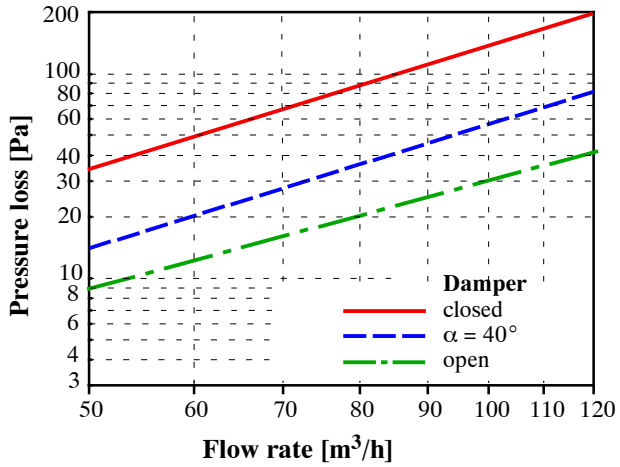
## *without sound absorber, with adjustable damper inside box, slot length 1200 mm*

### *Sound power level $L_{wA}$ selection diagram*

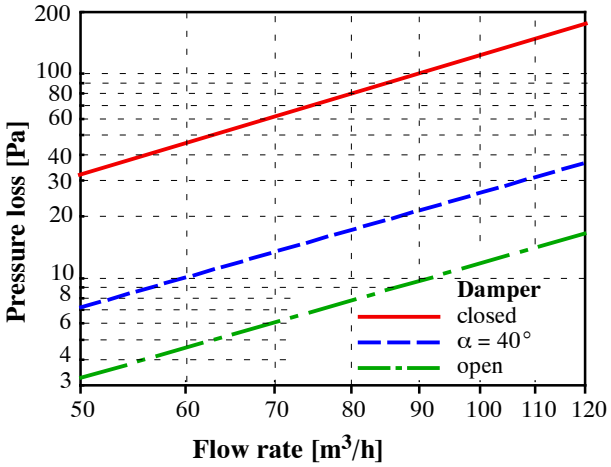



### *Pressure loss Δp selection diagram*

#### *Return air pressure loss*




#### *Supply air pressure loss*




Sound power level and pressure loss selection diagrams for connection types straight (A) or 90° elbow or smooth alu flex hose with R/D > 1 (B), respectively.

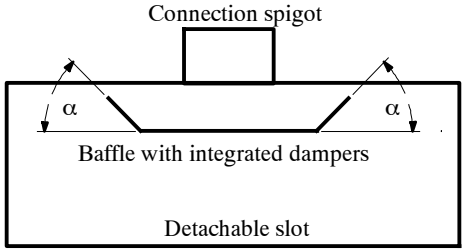
Connection type B:
Supply air pressure loss ± 25% (damper open only)

Acoustic data ± 3 dB,
Supply air flow rate = return air flow rate
Acoustics and pressure loss for NW 100 connection

High thermal comfort up to 190 m³/hm supply air flow rate and –8 K supply air temperature difference.

*Selection diagrams available from LTG AG*

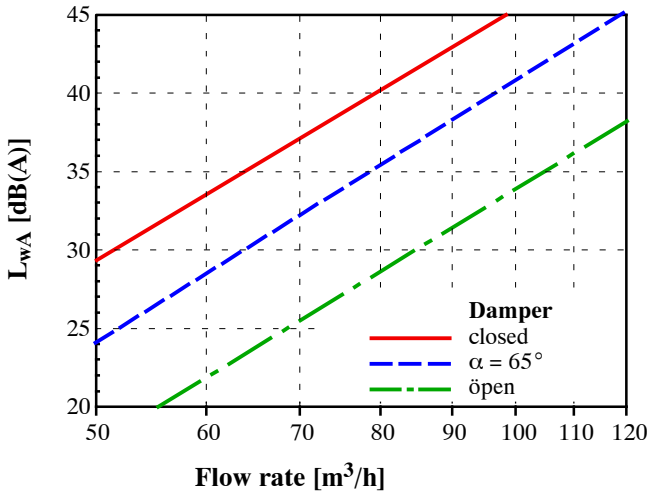
### *Damper setting*



# *Air Diffuser Combination Type LDK-B 20/8/2 for Wall Installation*

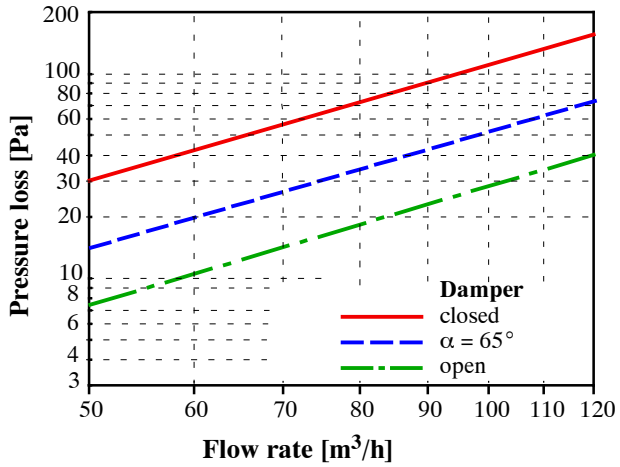
## *with sound absorber, with adjustable damper inside box, slot length 1200 mm*

### *Sound power level $L_{wA}$ selection diagram*

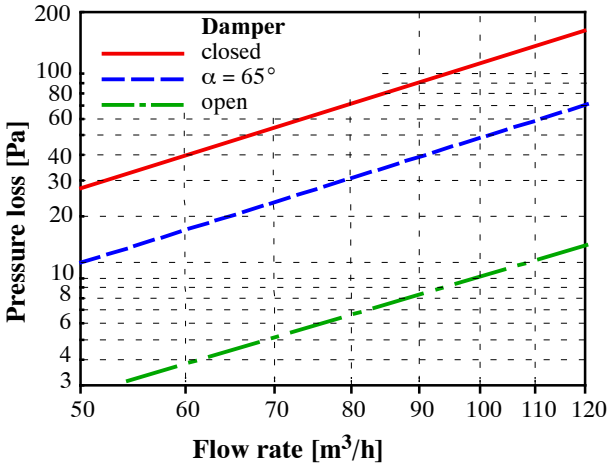



### *Pressure loss Δp selection diagram*

#### *Return air pressure loss*




#### *Supply air pressure loss*




Sound power level and pressure loss selection diagrams for connection types straight (A) or 90° elbow or smooth alu flex hose with R/D > 1 (B), respectively.

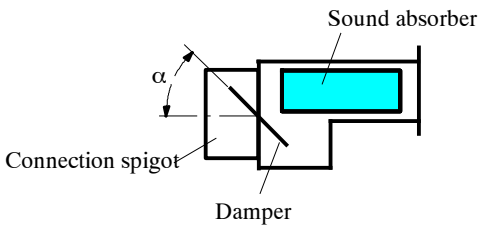
Connection type B:
Supply air pressure loss ± 30% (damper open only)

Acoustic data ± 3 dB,
Supply air flow rate = return air flow rate
Acoustics and pressure loss for NW 100 connection

High thermal comfort up to 190 m³/hm supply air flow rate and –8 K supply air temperature difference.

***Selection diagrams available from LTG AG***

### *Damper setting*



# Air Diffuser Combination Type LDK-B 20/8/2 for Wall Installation

## Insertion Loss % End Reflection Factor

The cross-talk sound transmission via air ducts between adjacent rooms is a sound flanking path which might reduce the sound insulation of partition walls. DIN 4109 or customer agreements set minimum sound insulation requirements for partition walls in terms of a weighted sound reduction index $R_w$. Sound insulation indices may be calculated in terms of a sound pressure level difference with known wall surface S and the equivalent absorption surface A of the receiving room:

$\Delta L = R - 10 \lg (S/A)$

When assessing the sound pressure level difference in the air duct between the source and receiving room, calculation must be in the frequency bands (compare VDI 2081, Pages 1, 2, and LTG selection program). Therefore, for cross-talk sound absorbers manufacturers' frequency-dependent insertion loss indices will have to be used. For air diffusers, the insertion loss/end reflection of the air diffusers according to DIN EN ISO 7235 is decisive.

The following decision must be made:

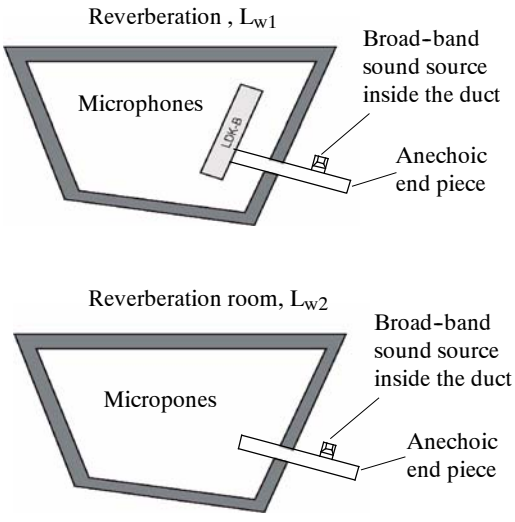
1. no cross-talk sound absorber required
2. sound absorber integrated in the air diffuser required
3. additional packaged attenuator of length x required

Through loss data of the air diffusers are determined as follows:

$D_t = D_i + D_{td}$

*$D_i$ air diffuser insertion loss index*

*$D_{td}$ theoretical end reflection at the open end of a straight, solid duct (duct end reflection) from equation B3 in DIN EN ISO 7235*




*Calculation of $D_i$*

**1. No additional sound absorber**

Insertion loss/end reflection of
LDK-B 20/8/2, without internal fittings

| Octave | $D_t$ in dB |
|---|---|
| 63 Hz | 25 |
| 125 Hz | 19 |
| 250 Hz | 13 |
| 500 Hz | 13 |
| 1000 Hz | 5 |
| 2000 Hz | 6 |
| 4000 Hz | 7 |
| 8000 Hz | 6 |

The above data apply to an NW 100 mm spigot connection, standard lengths 1000 mm and 1200 mm

**2. Sound absorber integrated in the diffuser combination**

Insertion loss/end reflection of
LDK-B 20/8/2 with centered sliding block absorber (melamine resin foam)

| Octave | $D_t$ in dB |
|---|---|
| 63 Hz | 25 |
| 125 Hz | 19 |
| 250 Hz | 15 |
| 500 Hz | 16 |
| 1000 Hz | 13 |
| 2000 Hz | 15 |
| 4000 Hz | 18 |
| 8000 Hz | 15 |

The above data apply to an NW 100 mm spigot connection, standard lengths 1000 mm and 1200 mm

**3. Off-the-shelf cross-talk sound absorber**

Ask the manufacturer for insertion loss indices.

# Air Diffuser Combination Type LDK-B 20/8/3 for Wall Installation

*Air Diffuser Combination LDK-B 20/8/3/11*

## Function

Adjustable supply air diffuser producing a tangential air flow along the ceiling, followed by a mixed diplacement air flow in the occupied zone.

Adjustable direction of diffused air; factory-set; subsequently adjustable when installed; high induction ratio, i.e. rapid reduction of air discharge speed and temperature differences.

Return air diffuser matching supply air diffuser

## Advantages

- Supply and return air diffuser in the same building axis
  - arranged next to each other
  - shared diffuser
  - easy retrofitting of diffuser using clips
  - connections to the plenum
- Connection plenum box with integrated, technically optimized separation of supply and return air flow
- Diffuser with varying dimensions
  - standard length 1000 mm, 1200 mm
- Design
  - surface finish anodized, painted or chromium-plated, air guiding elements black, white (RAL 9010), aluminum grey (RAL 9007) or chromium-plated
- High ventilation efficiency due to
  - displacement air flow with excellent flushing of the occupied zone
- Complete floor area available for working space
- Low diffuser flow noise due to technically optimized HVAC elements
- Excellent cross-talk attenuation between adjacent rooms due to optional box-integrated sound absorbing elements
- Adjustable throttling device integrated in the connecting box
- No suspended ceiling required

# Air Diffuser Combination Type LDK-B 20/8/3 for Wall Installation

## Indoor Air flow

visualization by smoke tracer

**Example:** 3 axes,
3 diffusers 100 $m^3$/h supply and return air each
$\Delta t$ = -8 K (cooling mode),
Installation height 2.5 m
Ceiling clearance 0.25 m (diffuser centre)
3 diffuser combinations, 1200 mm each

## Version

Ready-to-install unit, consisting of:

- high-quality design diffuser element made of aluminum extrusion profiles with cylindrical plastic slot nozzles, with rectifier blades, flow-smooth inside contour, optimized for a low-turbulence, low-noise air guidance
- wall connecting profiles type 1 and 8 from the LDB 20/8 program
- aluminum rails, aluminum coloured anodized, painted or chromium-plated, air cylinders optional black, white, aluminium grey or chromium-plated
- easy installation/removal of diffuser elements by clip fixing without the need of further tools
- continuous air connection box with technically optimized separation of supply and return air to avoid internal short-circuits.

## Range of products

- three-slot version LDK-B 20/8/3
- standard length 1000 mm, 1200 mm
- one integrated damper each, in the supply and return air section, subsequently adjustable
- spigot diameter supply and return air optional DN 100 and DN 125
- sound absorber (optional)

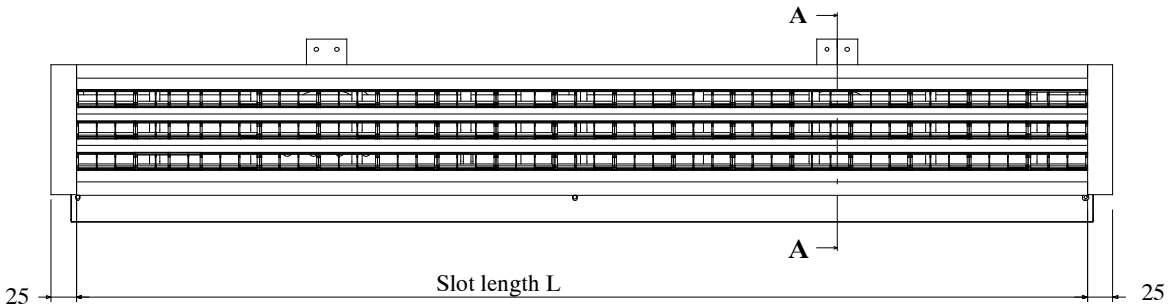
## Installation

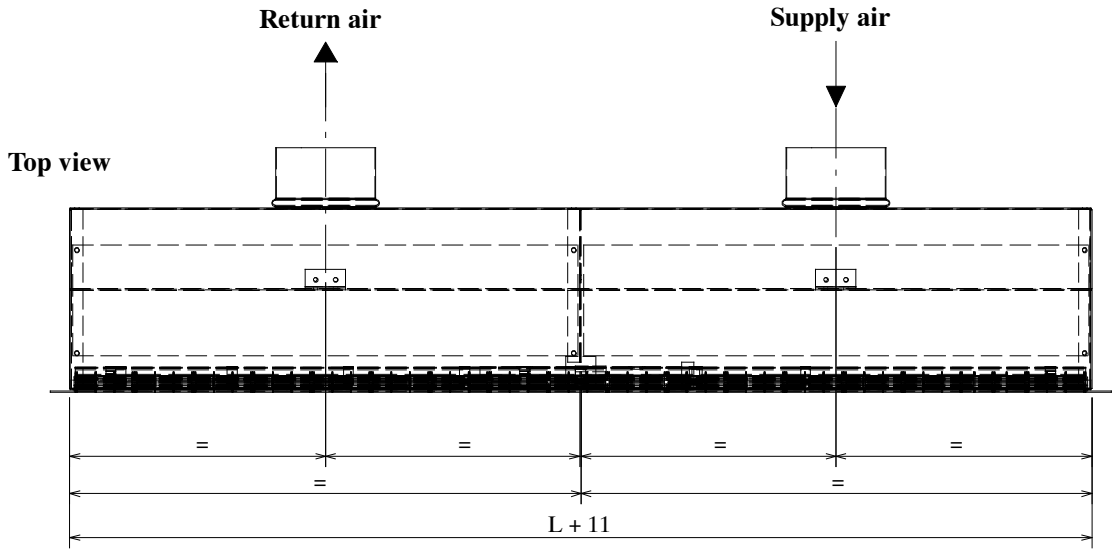
- LDK-B 20/8/3 air diffuser combination pushed through from the corridor towards the room. Fixed using two angles on the corridor wall.
- Diffuser elements are simply clipped in from the room side.

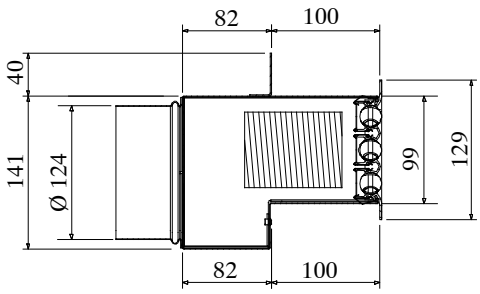
# Air Diffuser Combination Type LDK-B 20/8/3 for Wall Installation

## Dimensions including sound absorber

**Front view (from inside room)**



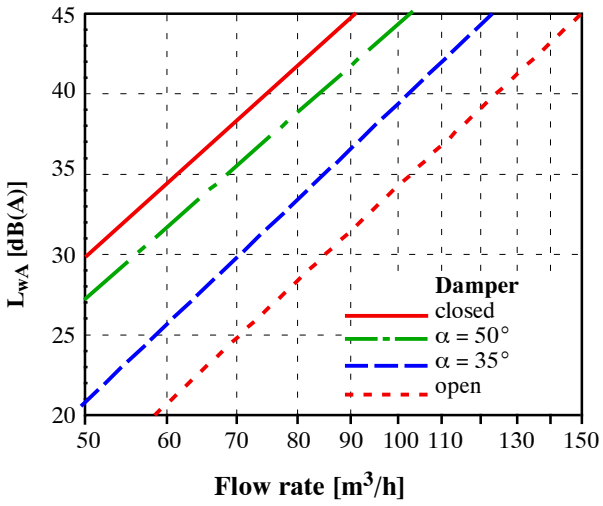




**Section A-A**

# Air Diffuser Combination Type LDK-B 20/8/3 for Wall Installation

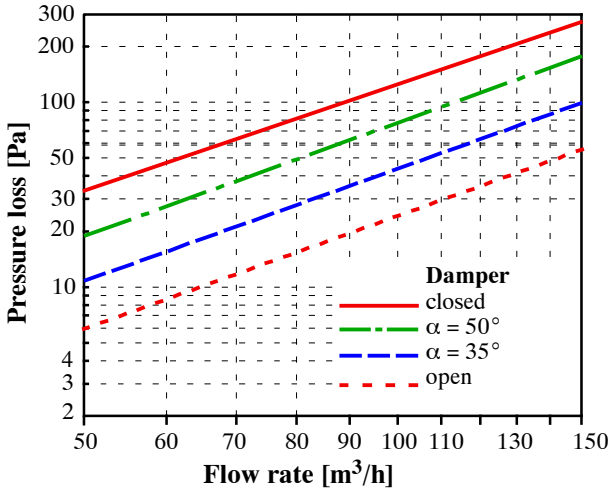
## without sound absorber, with adjustable damper inside box, slot length 1000 mm

### Sound power level $L_{wA}$ selection diagram

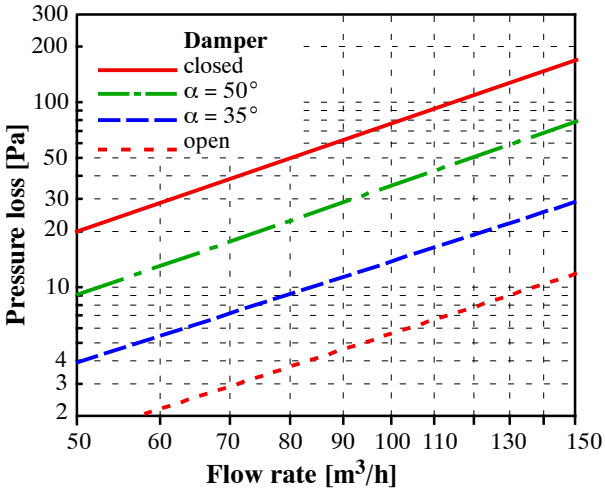



### Pressure loss Δp selection diagram

#### Return air pressure loss




#### Supply air pressure loss




Sound power level and pressure loss selection diagrams for connection types straight (A) or 90° elbow or smooth alu flex hose with R/D > 1 (B), respectively.

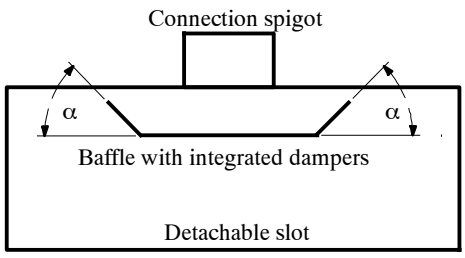
Connection type B:
Supply air pressure loss ± 20% (damper open only)

Acoustic data ± 3 dB,
Supply air flow rate = return air flow rate
Acoustics and pressure loss for NW 125 connection

High thermal comfort up to 190 m³/hm supply air flow rate and –8 K supply air temperature difference.

*Selection diagrams available from LTG AG*

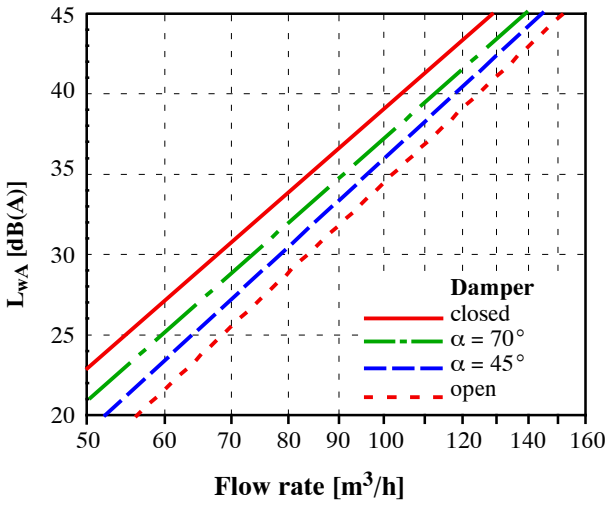
### Damper setting



# Air Diffuser Combination Type LDK-B 20/8/3 for Wall Installation

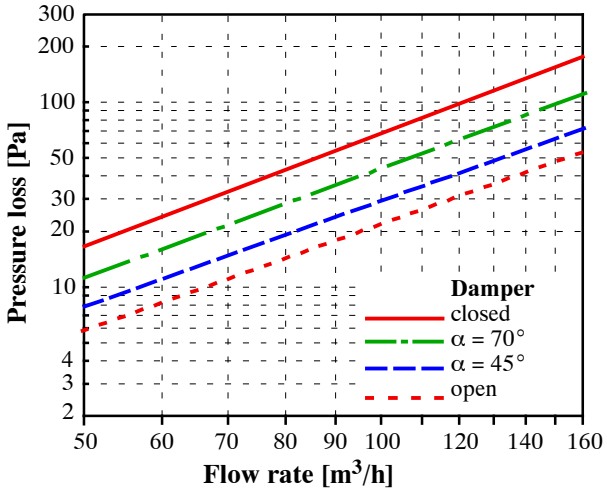
## with sound absorber, with adjustable damper inside box, slot length 1000 mm

### Sound power level $L_{wA}$ selection diagram

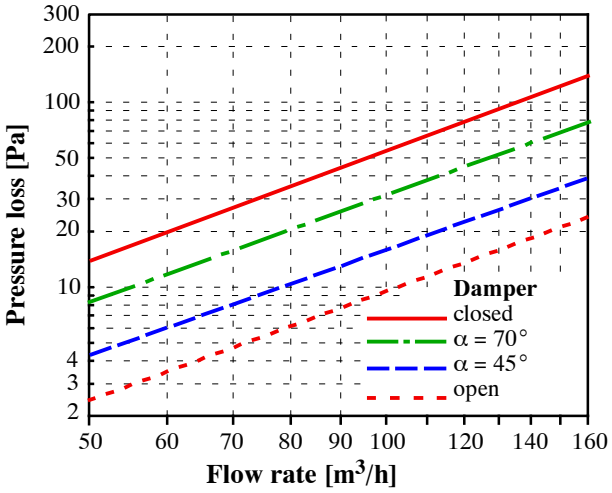



### Pressure loss Δp selection diagram

#### Return air pressure loss




#### Supply air pressure loss




Sound power level and pressure loss selection diagrams for connection types straight (A) or 90° elbow or smooth alu flex hose with R/D > 1 (B), respectively.

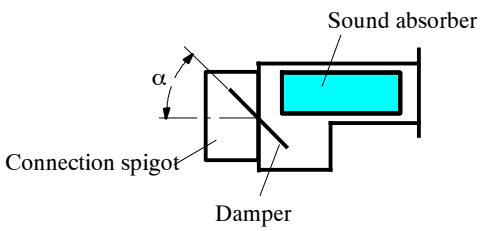
Connection type B:
Supply air pressure loss ± 20% (damper open only)

Acoustic data ± 3 dB,
Supply air flow rate = return air flow rate
Acoustics and pressure loss for NW 125 connection

High thermal comfort up to 190 m³/hm supply air flow rate and –8 K supply air temperature difference.

*Selection diagrams available from LTG AG*

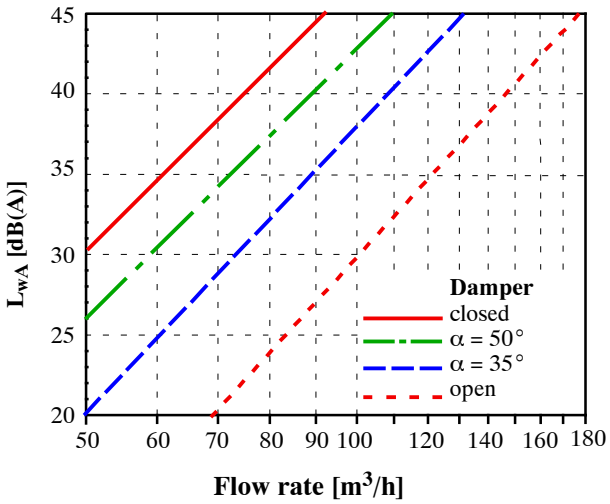
### Damper setting



# Air Diffuser Combination Type LDK-B 20/8/3 for Wall Installation

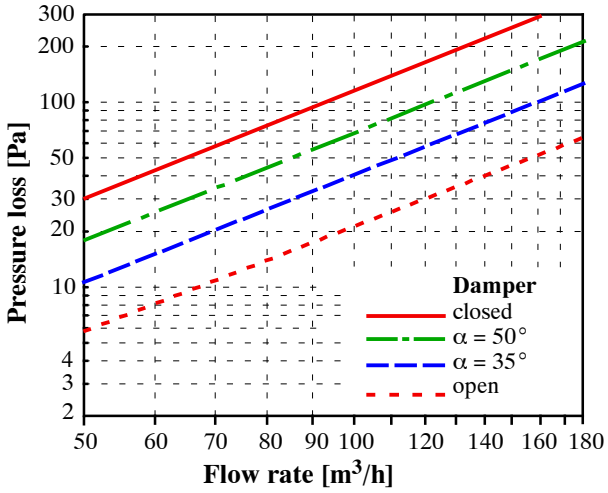
## without sound absorber, with adjustable damper inside box, slot length 1200 mm

### Sound power level $L_{wA}$ selection diagram

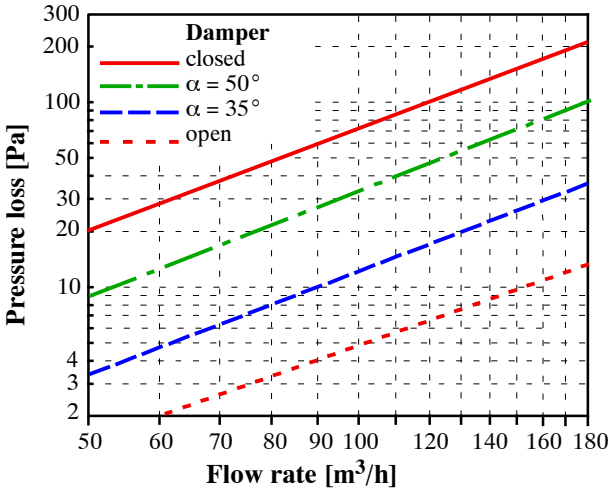



### Pressure loss Δp selection diagram

#### Return air pressure loss




#### Supply air pressure loss




Sound power level and pressure loss selection diagrams for connection types straight (A) or 90° elbow or smooth alu flex hose with R/D > 1 (B), respectively.

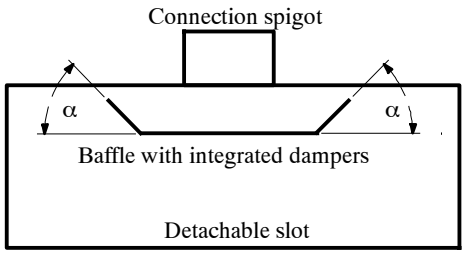
Connection type B:
Supply air pressure loss ± 15% (damper open only)

Acoustic data ± 3 dB,
Supply air flow rate = return air flow rate
Acoustics and pressure loss for NW 125 connection

High thermal comfort up to 190 m³/hm supply air flow rate and –8 K supply air temperature difference.

*Selection diagrams available from LTG AG*

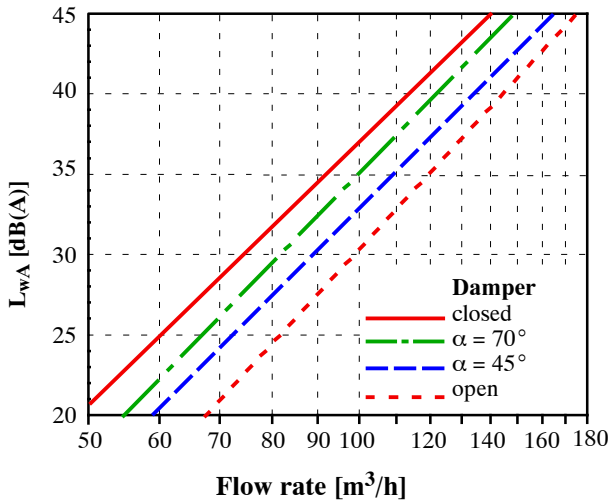
### Damper setting



# Air Diffuser Combination Type LDK-B 20/8/3 for Wall Installation

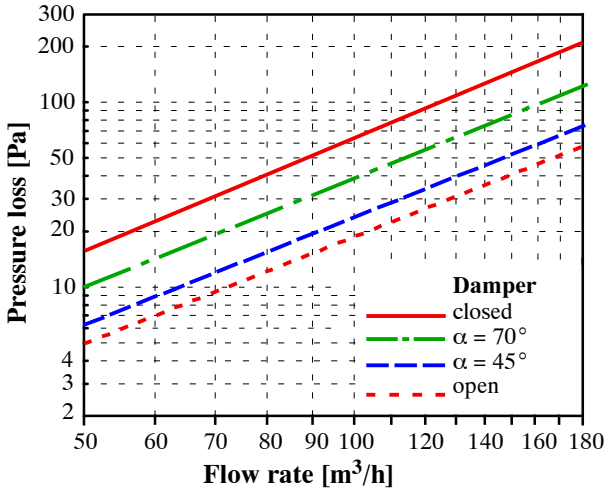
## with sound absorber, with adjustable damper inside box, slot length 1200 mm

### Sound power level $L_{wA}$ selection diagram

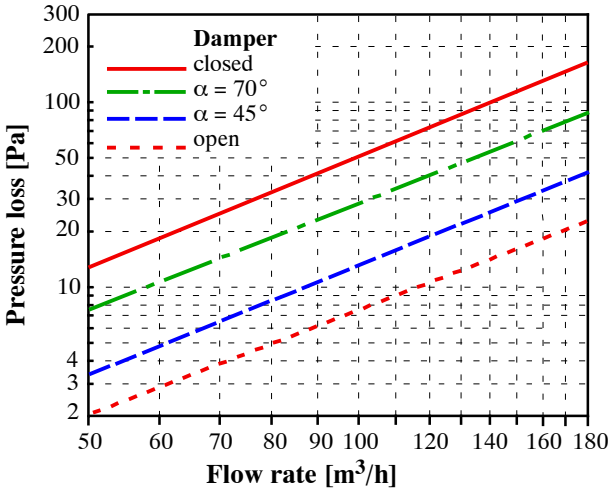



### Pressure loss Δp selection diagram

#### Return air pressure loss




#### Supply air pressure loss




Sound power level and pressure loss selection diagrams for connection types straight (A) or 90° elbow or smooth alu flex hose with R/D > 1 (B), respectively.

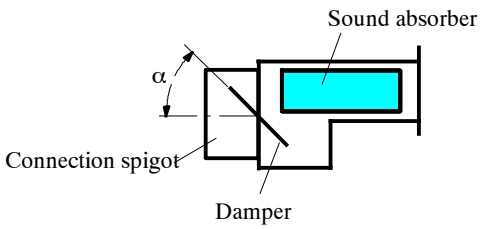
Connection type B:
Supply air pressure loss ± 20% (damper open only)

Acoustic data ± 3 dB,
Supply air flow rate = return air flow rate
Acoustics and pressure loss for NW 125 connection

High thermal comfort up to 190 m³/hm supply air flow rate and –8 K supply air temperature difference.

***Selection diagrams available from LTG AG***

### Damper setting



# Air Diffuser Combination Type LDK-B 20/8/3 for Wall Installation

## Insertion Loss % End Reflection Factor

The cross-talk sound transmission via air ducts between adjacent rooms is a sound flanking path which might reduce the sound insulation of partition walls. DIN 4109 or customer agreements set minimum sound insulation requirements for partition walls in terms of a weighted sound reduction index $R_w$. Sound insulation indices may be calculated in terms of a sound pressure level difference with known wall surface S and the equivalent absorption surface A of the receiving room:

$\Delta L = R - 10 \lg (S/A)$

When assessing the sound pressure level difference in the air duct between the source and receiving room, calculation must be in the frequency bands (compare VDI 2081, Pages 1, 2, and LTG selection program). Therefore, for cross-talk sound absorbers manufacturers' frequency-dependent insertion loss indices will have to be used. For air diffusers, the insertion loss/end reflection of the air diffusers according to DIN EN ISO 7235 is decisive.

The following decision must be made:

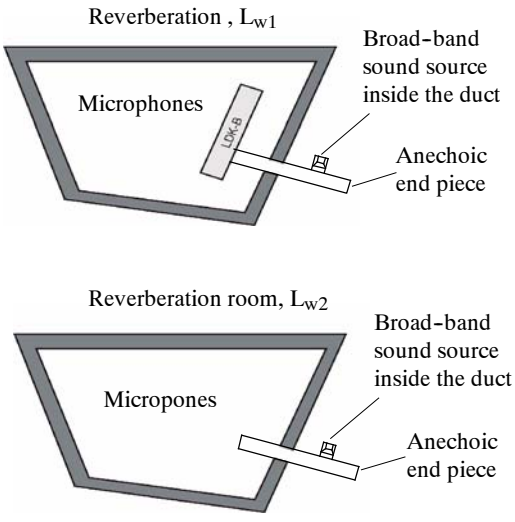
1. no cross-talk sound absorber required
2. sound absorber integrated in the air diffuser required
3. additional packaged attenuator of length x required

Through loss data of the air diffusers are determined as follows:

$D_t = D_i + D_{td}$

*$D_i$ air diffuser insertion loss index*

*$D_{td}$ theoretical end reflection at the open end of a straight, solid duct (duct end reflection) from equation B3 in DIN EN ISO 7235*




*Calculation of $D_i$*

**1. No additional sound absorber**

Insertion loss/end reflection of
LDK-B 20/8/3, without internal fittings

| Octave | $D_t$ in dB |
|---|---|
| 63 Hz | 23 |
| 125 Hz | 17 |
| 250 Hz | 11 |
| 500 Hz | 8 |
| 1000 Hz | 4 |
| 2000 Hz | 6 |
| 4000 Hz | 5 |
| 8000 Hz | 5 |

The above data apply to an NW 125 mm spigot connection, standard lengths 1000 mm and 1200 mm

**2. Sound absorber integrated in the diffuser combination**

Insertion loss/end reflection of
LDK-B 20/8/3 with centered sliding block absorber (melamine resin foam)

| Octave | $D_t$ in dB |
|---|---|
| 63 Hz | 23 |
| 125 Hz | 17 |
| 250 Hz | 11 |
| 500 Hz | 11 |
| 1000 Hz | 12 |
| 2000 Hz | 15 |
| 4000 Hz | 15 |
| 8000 Hz | 13 |

The above data apply to an NW 125 mm spigot connection, standard lengths 1000 mm and 1200 mm

**3. Off-the-shelf cross-talk sound absorber**

Ask the manufacturer for insertion loss indices.

# Air Diffuser Combination Type LDK-B 20/8/4 for Wall Installation

*Air Diffuser Combination LDK-B 20/8/4/11*

## Function

Adjustable supply air diffuser producing a tangential air flow along the ceiling, followed by a mixed diplacement air flow in the occupied zone.

Adjustable direction of diffused air; factory-set; subsequently adjustable when installed; high induction ratio, i.e. rapid reduction of air discharge speed and temperature differences.

Return air diffuser matching supply air diffuser

## Advantages

- Supply and return air diffuser in the same building axis
  - arranged next to each other
  - shared diffuser
  - easy retrofitting of diffuser using clips
  - connections to the plenum
- Connection plenum box with integrated, technically optimized separation of supply and return air flow
- Diffuser with varying dimensions
  - standard length 1000 mm, 1200 mm
- Design
  - surface finish anodized, painted or chromium-plated, air guiding elements black, white (RAL 9010), aluminum grey (RAL 9007) or chromium-plated
- High ventilation efficiency due to
  - displacement air flow with excellent flushing of the occupied zone
- Complete floor area available for working space
- Low diffuser flow noise due to technically optimized HVAC elements
- Excellent cross-talk attenuation between adjacent rooms due to optional box-integrated sound absorbing elements
- Adjustable throttling device integrated in the connecting box
- No suspended ceiling required

# Air Diffuser Combination Type LDK-B 20/8/4 for Wall Installation

## Indoor Air flow

visualization by smoke tracer

**Example:** 3 axes,
3 diffusers 120 $m^3$/h supply and return air each
$\Delta t$ = -8 K (cooling mode),
Installation height 2.5 m
Ceiling clearance 0.25 m (diffuser centre)
3 diffuser combinations, 1200 mm each

## Version

Ready-to-install unit, consisting of:

- high-quality design diffuser element made of aluminum extrusion profiles with cylindrical plastic slot nozzles, with rectifier blades, flow-smooth inside contour, optimized for a low-turbulence, low-noise air guidance
- wall connecting profiles type 1 and 8 from the LDB 20/8 program
- aluminum rails, aluminum coloured anodized, painted or chromium-plated, air cylinders optional black, white, aluminium grey or chromium-plated
- easy installation/removal of diffuser elements by clip fixing without the need of further tools
- continuous air connection box with technically optimized separation of supply and return air to avoid internal short-circuits.

## Range of products

- four-slot version LDK-B 20/8/4
- standard length 1000 mm, 1200 mm
- one integrated damper each, in the supply and return air section, subsequently adjustable
- spigot diameter supply and return air optional DN 125
- sound absorber (optional)

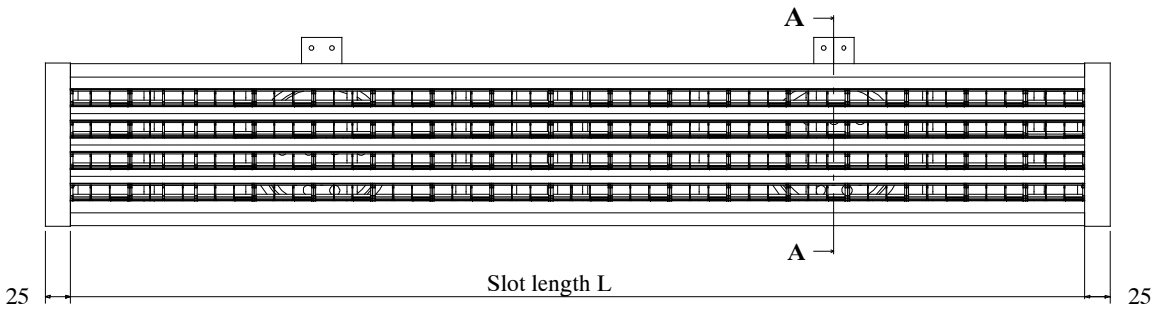
## Installation

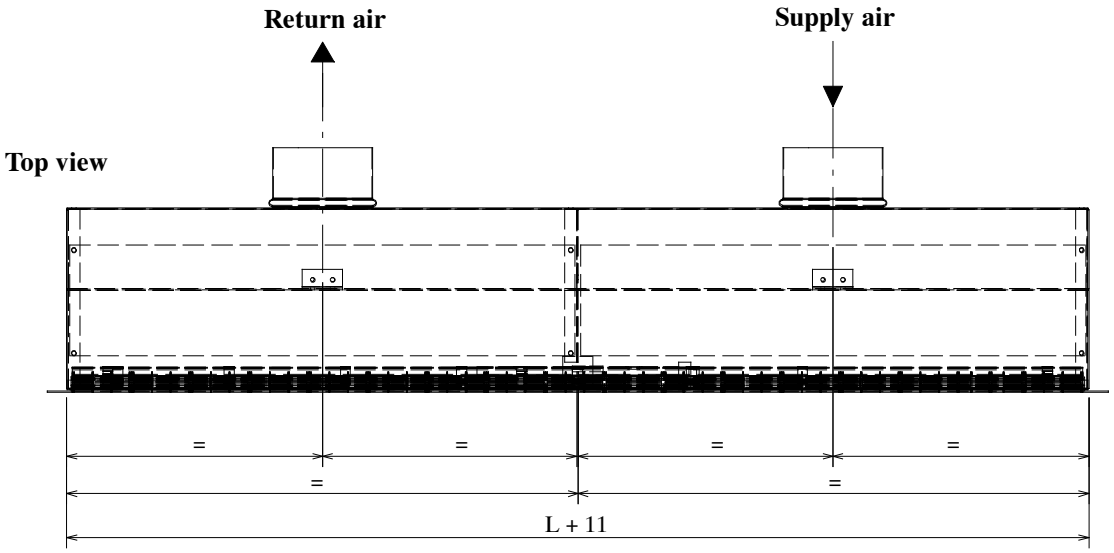
- LDK-B 20/8/4 air diffuser combination pushed through from the corridor towards the room. Fixed using two angles on the corridor wall.
- Diffuser elements are simply clipped in from the room side.

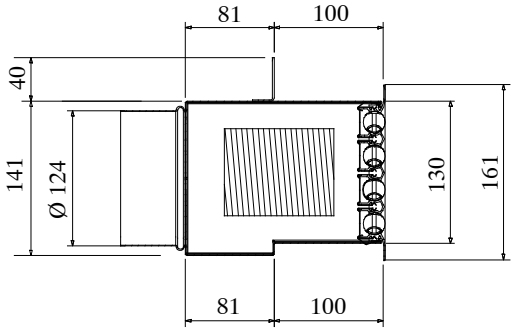
# Air Diffuser Combination Type LDK-B 20/8/4 for Wall Installation

## Dimensions including sound absorber

**Front view (from inside room)**



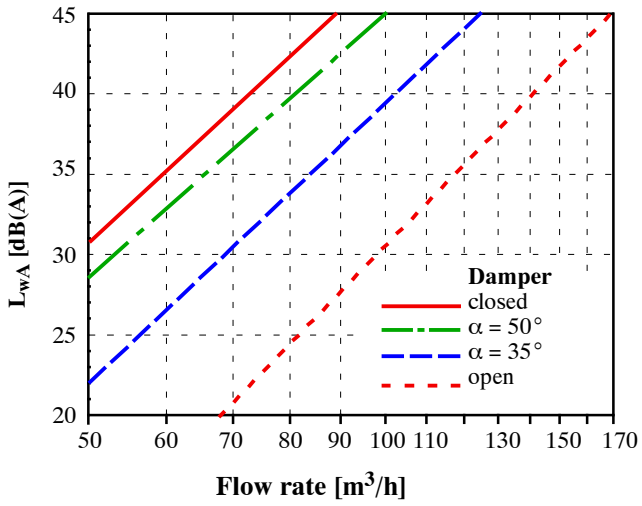




**Section A-A**

# Air Diffuser Combination Type LDK-B 20/8/4 for Wall Installation

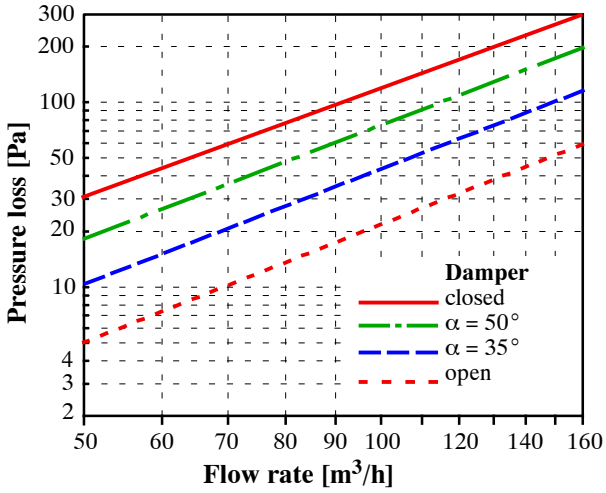
## without sound absorber, with adjustable damper inside box, slot length 1000 mm

### Sound power level $L_{wA}$ selection diagram

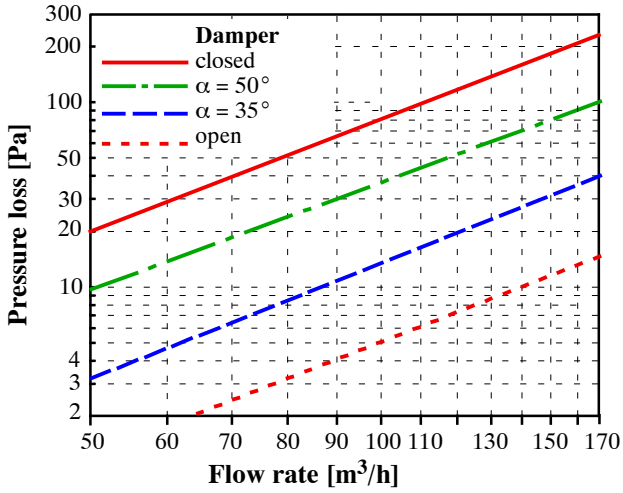



### Pressure loss Δp selection diagram

#### Return air pressure loss




#### Supply air pressure loss




Sound power level and pressure loss selection diagrams for connection types straight (A) or 90° elbow or smooth alu flex hose with R/D > 1 (B), respectively.

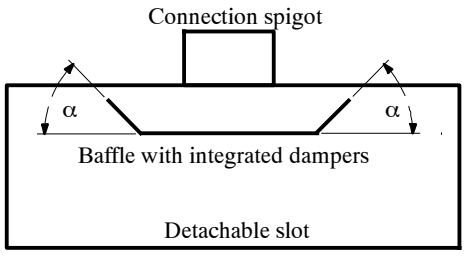
Connection type B:
Supply air pressure loss ± 30% (damper open only)

Acoustic data ± 3 dB,
Supply air flow rate = return air flow rate
Acoustics and pressure loss for NW 125 connection

High thermal comfort up to 200 m³/hm supply air flow rate and –8 K supply air temperature difference.

*Selection diagrams available from LTG AG*

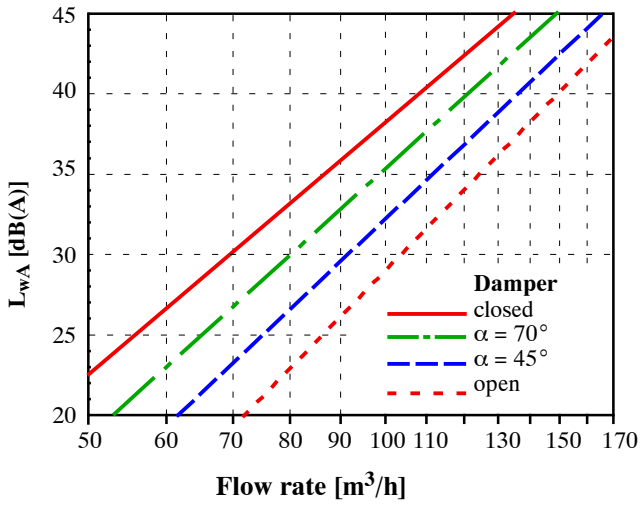
### Damper setting



# *Air Diffuser Combination Type LDK-B 20/8/4 for Wall Installation*

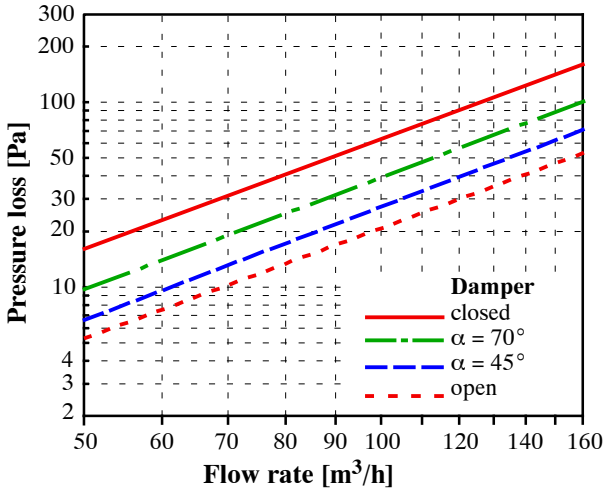
## *with sound absorber, with adjustable damper inside box, slot length 1000 mm*

### *Sound power level $L_{wA}$ selection diagram*

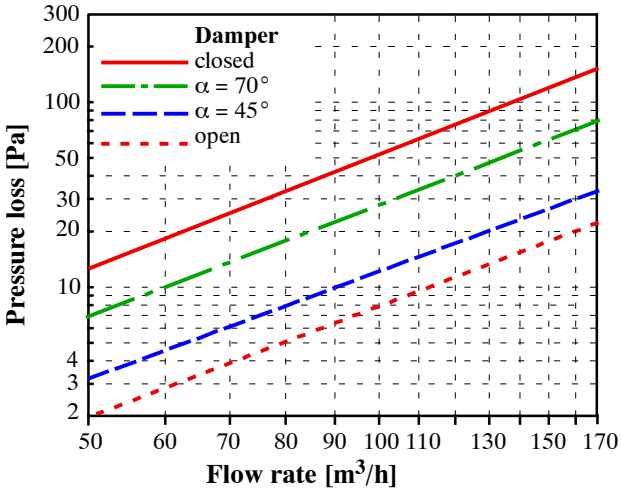



### *Pressure loss Δp selection diagram*

*Return air pressure loss*




*Supply air pressure loss*




Sound power level and pressure loss selection diagrams for connection types straight (A) or 90° elbow or smooth alu flex hose with R/D > 1 (B), respectively.

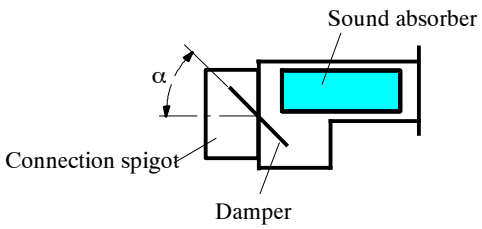
Connection type B:
Supply air pressure loss ± 20% (damper open only)

Acoustic data ± 3 dB,
Supply air flow rate = return air flow rate
Acoustics and pressure loss for NW 125 connection

High thermal comfort up to 200 m³/hm supply air flow rate and –8 K supply air temperature difference.

***Selection diagrams available from LTG AG***

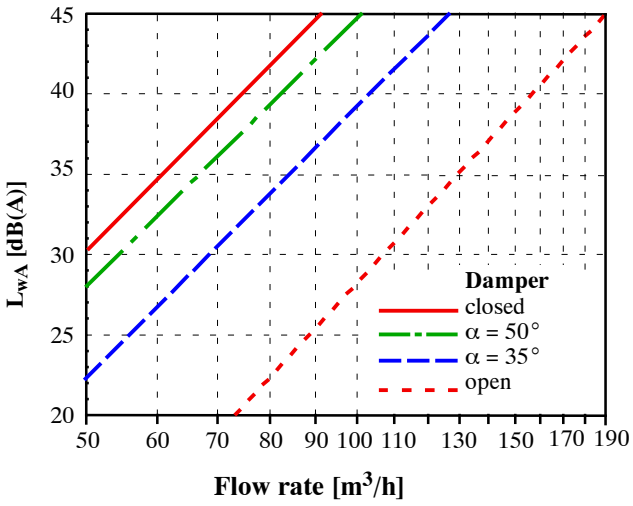
### *Damper setting*



# Air Diffuser Combination Type LDK-B 20/8/4 for Wall Installation

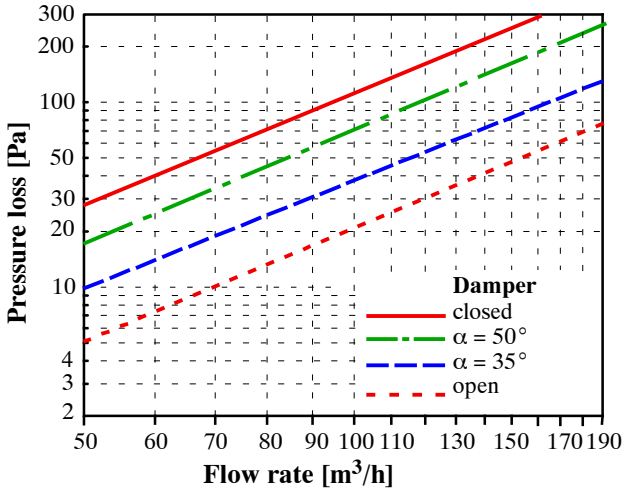
## without sound absorber, with adjustable damper inside box, slot length 1200 mm

### Sound power level $L_{wA}$ selection diagram

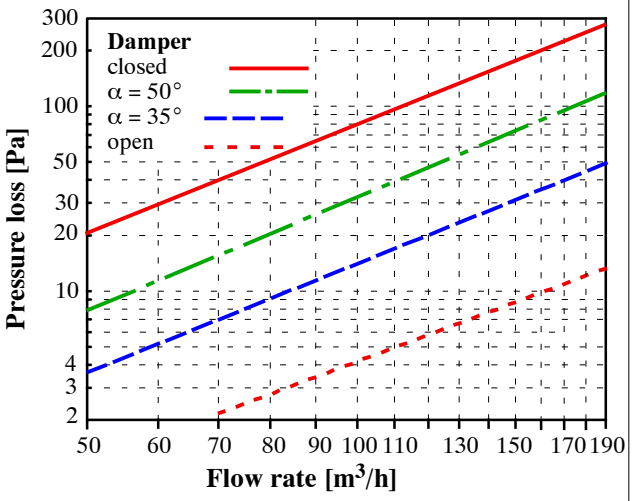



### Pressure loss Δp selection diagram

#### Return air pressure loss




#### Supply air pressure loss




Sound power level and pressure loss selection diagrams for connection types straight (A) or 90° elbow or smooth alu flex hose with R/D > 1 (B), respectively.

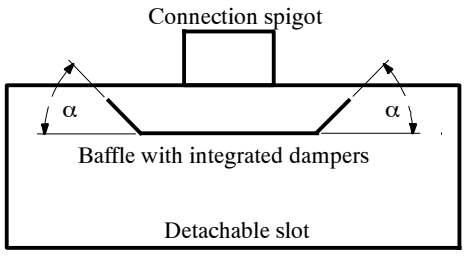
Connection type B:
Supply air pressure loss ± 35% (damper open only)

Acoustic data ± 3 dB,
Supply air flow rate = return air flow rate
Acoustics and pressure loss for NW 125 connection

High thermal comfort up to 200 m³/hm supply air flow rate and –8 K supply air temperature difference.

*Selection diagrams available from LTG AG*

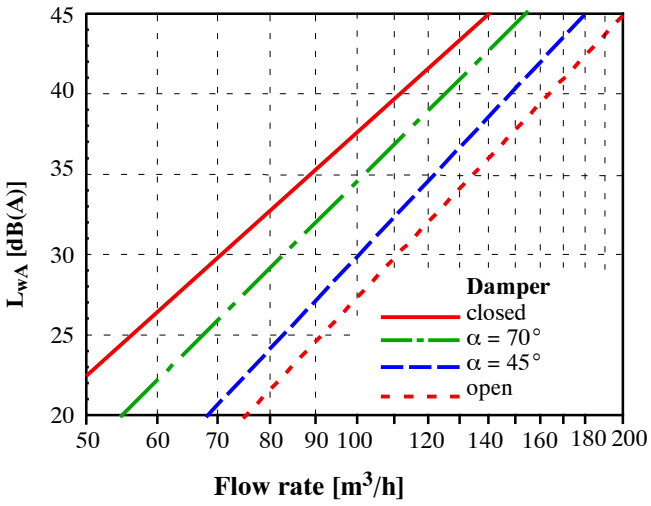
### Damper setting



# *Air Diffuser Combination Type LDK-B 20/8/4 for Wall Installation*

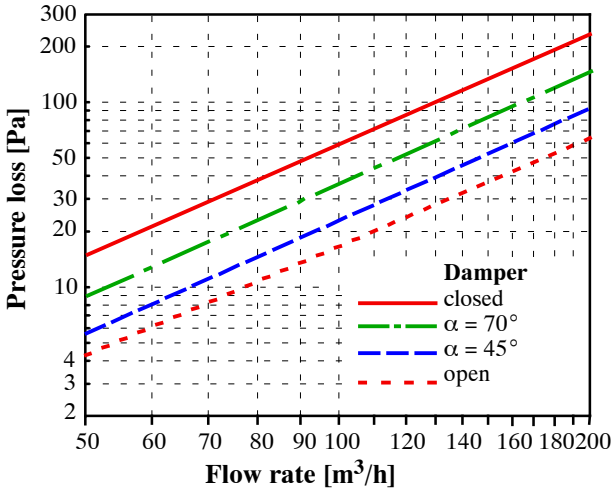
## *with sound absorber, with adjustable damper inside box, slot length 1200 mm*

### *Sound power level $L_{wA}$ selection diagram*

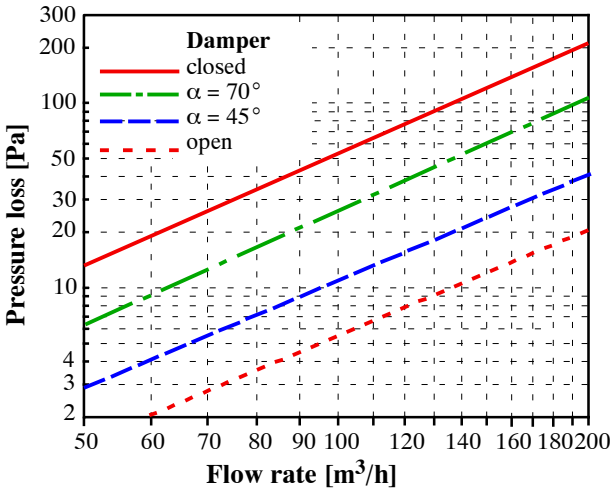



### *Pressure loss Δp selection diagram*

*Return air pressure loss*




*Supply air pressure loss*




Sound power level and pressure loss selection diagrams for connection types straight (A) or 90° elbow or smooth alu flex hose with R/D > 1 (B), respectively.

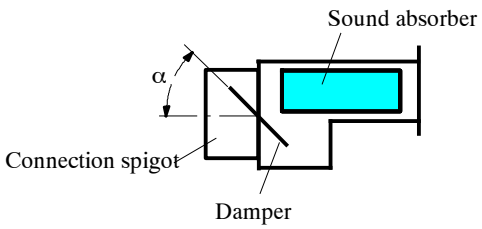
Connection type B:
Supply air pressure loss ± 35% (damper open only)

Acoustic data ± 3 dB,
Supply air flow rate = return air flow rate
Acoustics and pressure loss for NW 125 connection

High thermal comfort up to 200 m³/hm supply air flow rate and –8 K supply air temperature difference.

***Selection diagrams available from LTG AG***

### *Damper setting*



# Air Diffuser Combination Type LDK-B 20/8/4 for Wall Installation

## Insertion Loss % End Reflection Factor

The cross-talk sound transmission via air ducts between adjacent rooms is a sound flanking path which might reduce the sound insulation of partition walls. DIN 4109 or customer agreements set minimum sound insulation requirements for partition walls in terms of a weighted sound reduction index $R_w$. Sound insulation indices may be calculated in terms of a sound pressure level difference with known wall surface S and the equivalent absorption surface A of the receiving room:

$\Delta L = R - 10 \lg (S/A)$

When assessing the sound pressure level difference in the air duct between the source and receiving room, calculation must be in the frequency bands (compare VDI 2081, Pages 1, 2, and LTG selection program). Therefore, for cross-talk sound absorbers manufacturers' frequency-dependent insertion loss indices will have to be used. For air diffusers, the insertion loss/end reflection of the air diffusers according to DIN EN ISO 7235 is decisive.

The following decision must be made:

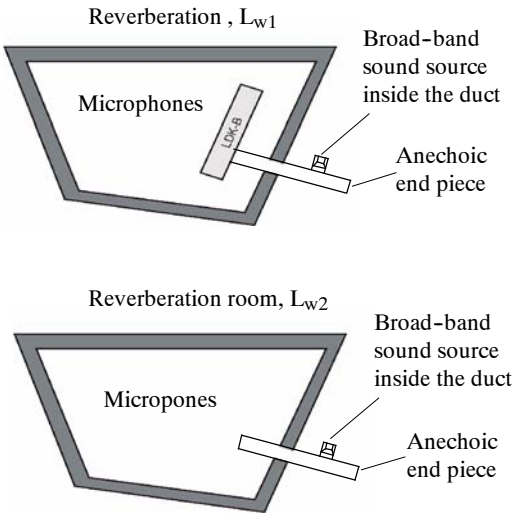
1. no cross-talk sound absorber required
2. sound absorber integrated in the air diffuser required
3. additional packaged attenuator of length x required

Through loss data of the air diffusers are determined as follows:

$D_t = D_i + D_{td}$

*$D_i$ air diffuser insertion loss index*

*$D_{td}$ theoretical end reflection at the open end of a straight, solid duct (duct end reflection) from equation B3 in DIN EN ISO 7235*




*Calculation of $D_i$*

**1. No additional sound absorber**

Insertion loss/end reflection of
LDK-B 20/8/4, without internal fittings

| Octave | $D_t$ in dB |
|---|---|
| 63 Hz | 23 |
| 125 Hz | 17 |
| 250 Hz | 11 |
| 500 Hz | 6 |
| 1000 Hz | 3 |
| 2000 Hz | 4 |
| 4000 Hz | 5 |
| 8000 Hz | 3 |

The above data apply to an NW 125 mm spigot connection, standard lengths 1000 mm and 1200 mm

**2. Sound absorber integrated in the diffuser combination**

Insertion loss/end reflection of
LDK-B 20/8/4 with centered sliding block absorber (melamine resin foam)

| Octave | $D_t$ in dB |
|---|---|
| 63 Hz | 23 |
| 125 Hz | 17 |
| 250 Hz | 11 |
| 500 Hz | 10 |
| 1000 Hz | 11 |
| 2000 Hz | 14 |
| 4000 Hz | 15 |
| 8000 Hz | 13 |

The above data apply to an NW 125 mm spigot connection, standard lengths 1000 mm and 1200 mm

**3. Off-the-shelf cross-talk sound absorber**

Ask the manufacturer for insertion loss indices.

# *Specification and Schedule of Prices*

## *Air Diffuser Combination LDK-B 12/8/2 LTG System clean®*



| Qty. | Description | Unit Price in € | Total price in € |
|---|---|---|---|
| | Adjustable linear diffuser for constant or variable flow rates with shared supply and return air box, with integrated thermal insulation and separation of supply and return air unit to ensure minimum short-circuit.<br>Slot edge profiles designed for installation in walls above head height (door height).<br>High induction ratio of short cylinders produces a tangential flow along the ceiling, followed by a mixed air/displacement air flow from the corridor side into the room.<br>Furthermore, an air curtain close to the wall is created to reduce pollution in proximity of the diffuser caused by airborne dust particles.<br>Quick reduction of air discharge speeds and temperature differences up to -8 K with a supply and return air flow rate of up to about 100 $m^3/h$ (L = 1200 mm) meeting EN 13779 requirements in the occupied zone.<br>Supply and return air connection with one spigot DN 80 or DN 100 each.<br>Also available as single diffuser for supply air or return air.<br><br><u>Diffuser consisting of:</u><br>- aluminum extrusion profile<br>- cylindrical plastic slot nozzles with rectifier blades. Technically optimized, smooth inside contour without seams for a low-turbulence, low-noise air deflection.<br>- air distribution box of galvanized sheet steel with integrated, subsequently adjustable damper in the supply and return air section<br>- connection box with 2 mounted brackets for quick installation from the corridor side<br>- diffuser may be clip fixed subsequently from the room side<br><br><u>Design:</u><br>Aluminium profiles on request:<br>o border profile - Nr.: 11 oder 88, incl.<br>o painted according to RAL, incl.<br>o natural anodized<br><br>Slot nozzles / diffuser cylinders on request:<br>o black, incl.<br>o white, incl..<br>o aluminum grey (RAL 9007), incl.<br><br>o End bracket on the face side incl.:<br>o 15 mm mounted for border profile - Nr.: 88<br>o 25 mm mounted for border profile - Nr.: 11<br><br>**Diffuser length (standard, other lengths on request)**<br>**o 1000 mm**<br>for wall thickness o 100 mm o 125 mm<br>**o 1200 mm**<br>for wall thickness o 100 mm o 125 mm<br><br>**Manufacturer: LTG Aktiengesellschaft**<br>**Series: LDK-B 12/8/2 LTG System clean®** | | |

# *Specification and Schedule of Prices*

## *Air Diffuser Combination LDK-B 12/8/2 LTG System clean®*



| Qty. | Description | Unit Price in € | Total price in € |
|---|---|---|---|
| | **Special Version / Accessories:**<br><br>Aluminium profile:<br>o high-gloss chromium-plated<br><br>Slot nozzles / diffuser cylinders:<br>o chromium-plated<br><br>o Connecting pins for continuous assembly, incl.<br><br>o Air connection box with integrated sound absorber element for improved cross-talk attenuation<br><br>o Air connection box in special length<br><br>o Air connection box for supply air or return air only<br><br>**Special version on request** | | |

# *Specification and Schedule of Prices*

## *Air Diffuser Combination LDK-B 12/8/3 LTG System clean®*



| Qty. | Description | Unit Price in € | Total price in € |
|---|---|---|---|
| | Adjustable linear diffuser for constant or variable flow rates with shared supply and return air box, with integrated thermal insulation and separation of supply and return air unit to ensure minimum short-circuit.<br>Slot edge profiles designed for installation in walls above head height (door height).<br>High induction ratio of short cylinders produces a tangential flow along the ceiling, followed by a mixed air/displacement air flow from the corridor side into the room.<br>Furthermore, an air curtain close to the wall is created to reduce pollution in proximity of the diffuser caused by airborne dust particles.<br>Quick reduction of air discharge speeds and temperature differences up to -8 K with a supply and return air flow rate of up to about 100 $m^3/h$ (L = 1200 mm) meeting EN 13779 requirements in the occupied zone.<br>Supply and return air connection with one spigot DN 100 each.<br>Also available as single diffuser for supply air or return air.<br><br><u>Diffuser consisting of:</u><br>- aluminum extrusion profile<br>- cylindrical plastic slot nozzles with rectifier blades. Technically optimized, smooth inside contour without seams for a low-turbulence, low-noise air deflection.<br>- air distribution box of galvanized sheet steel with integrated, subsequently adjustable damper in the supply and return air section<br>- connection box with 2 mounted brackets for quick installation from the corridor side<br>- diffuser may be clip fixed subsequently from the room side<br><br><u>Design:</u><br>Aluminium profiles on request:<br>o border profile - Nr.: 11 oder 88, incl.<br>o painted according to RAL, incl.<br>o natural anodized<br><br>Slot nozzles / diffuser cylinders on request:<br>o black, incl.<br>o white, incl..<br>o aluminum grey (RAL 9007), incl.<br><br>o End bracket on the face side incl.:<br>o 15 mm mounted for border profile - Nr.: 88<br>o 25 mm mounted for border profile - Nr.: 11<br><br>**Diffuser length (standard, other lengths on request)**<br>**o 1000 mm**<br>for wall thickness o 100 mm o 125 mm<br>**o 1200 mm**<br>for wall thickness o 100 mm o 125 mm<br><br>**Manufacturer: LTG Aktiengesellschaft**<br>**Series: LDK-B 12/8/3 LTG System clean®** | | |

# *Specification and Schedule of Prices*

## *Air Diffuser Combination LDK-B 12/8/3 LTG System clean®*



| Qty. | Description | Unit Price in € | Total price in € |
|---|---|---|---|
| | **Special Version / Accessories:**<br><br>Aluminium profile:<br>o high-gloss chromium-plated<br><br>Slot nozzles / diffuser cylinders:<br>o chromium-plated<br><br>o Connecting pins for continuous assembly, incl.<br><br>o Air connection box with integrated sound absorber element for improved cross-talk attenuation<br><br>o Air connection box in special length<br><br>o Air connection box for supply air or return air only<br><br>**Special version on request** | | |

# *Specification and Schedule of Prices*

## *Air Diffuser Combination LDK-B 12/8/4 LTG System clean®*



| Qty. | Description | Unit Price in € | Total price in € |
|---|---|---|---|
| | Adjustable linear diffuser for constant or variable flow rates with shared supply and return air box, with integrated thermal insulation and separation of supply and return air unit to ensure minimum short-circuit.<br>Slot edge profiles designed for installation in walls above head height (door height).<br>High induction ratio of short cylinders produces a tangential flow along the ceiling, followed by a mixed air/displacement air flow from the corridor side into the room.<br>Furthermore, an air curtain close to the wall is created to reduce pollution in proximity of the diffuser caused by airborne dust particles.<br>Quick reduction of air discharge speeds and temperature differences up to -8 K with a supply and return air flow rate of up to about 130 $m^3/h$ (L = 1200 mm) meeting EN 13779 requirements in the occupied zone.<br>Supply and return air connection with one spigot DN 100 or DN 125 each.<br>Also available as single diffuser for supply air or return air.<br><br><u>Diffuser consisting of:</u><br>- aluminum extrusion profile<br>- cylindrical plastic slot nozzles with rectifier blades. Technically optimized, smooth inside contour without seams for a low-turbulence, low-noise air deflection.<br>- air distribution box of galvanized sheet steel with integrated, subsequently adjustable damper in the supply and return air section<br>- connection box with 2 mounted brackets for quick installation from the corridor side<br>- diffuser may be clip fixed subsequently from the room side<br><br><u>Design:</u><br>Aluminium profiles on request:<br>o border profile - Nr.: 11 oder 88, incl.<br>o painted according to RAL, incl.<br>o natural anodized<br><br>Slot nozzles / diffuser cylinders on request:<br>o black, incl.<br>o white, incl..<br>o aluminum grey (RAL 9007), incl.<br><br>o End bracket on the face side incl.:<br>o 15 mm mounted for border profile - Nr.: 88<br>o 25 mm mounted for border profile - Nr.: 11<br><br>**Diffuser length (standard, other lengths on request)**<br>**o 1000 mm**<br>for wall thickness o 100 mm o 125 mm<br>**o 1200 mm**<br>for wall thickness o 100 mm o 125 mm<br><br>**Manufacturer: LTG Aktiengesellschaft**<br>**Series: LDK-B 12/8/4 LTG System clean®** | | |

# *Specification and Schedule of Prices*

## *Air Diffuser Combination LDK-B 12/8/4 LTG System clean®*



| Qty. | Description | Unit Price in € | Total price in € |
|---|---|---|---|
| | **Special Version / Accessories:**<br><br>Aluminium profile:<br>o high-gloss chromium-plated<br><br>Slot nozzles / diffuser cylinders:<br>o chromium-plated<br><br>o Connecting pins for continuous assembly, incl.<br><br>o Air connection box with integrated sound absorber element for improved cross-talk attenuation<br><br>o Air connection box in special length<br><br>o Air connection box for supply air or return air only<br><br>**Special version on request** | | |

# *Specification and Schedule of Prices*

## *Air Diffuser Combination LDK-B 20/8/2*



| Qty. | Description | Unit Price in € | Total price in € |
|---|---|---|---|
| | Adjustable linear diffuser for constant or variable flow rates with shared supply and return air box, with integrated thermal insulation and separation of supply and return air unit to ensure minimum short-circuit.<br>Slot edge profiles designed for installation in walls above head height (door height).<br>High induction ratio of short cylinders produces a tangential flow along the ceiling, followed by a mixed air/displacement air flow from the corridor side into the room.<br>Quick reduction of air discharge speeds and temperature differences up to -8 K with a supply and return air flow rate of up to about 115 $m^3$/h (L = 1200 mm) meeting EN 13779 requirements in the occupied zone.<br>Supply and return air connection with one spigot DN 100.<br>Also available as single diffuser for supply air or return air.<br><br><u>Diffuser consisting of:</u><br>- aluminum extrusion profile<br>- cylindrical plastic slot nozzles with rectifier blades. Technically optimized, smooth inside contour without seams for a low-turbulence, low-noise air deflection.<br>- air distribution box of galvanized sheet steel with integrated, subsequently adjustable damper in the supply and return air section<br>- connection box with 2 mounted brackets for quick installation from the corridor side<br>- diffuser may be clip fixed subsequently from the room side<br><br><u>Design:</u><br>Aluminium profiles on request:<br>o border profile - Nr.: 11 oder 88, incl.<br>o painted according to RAL, incl.<br>o natural anodized<br><br>Slot nozzles / diffuser cylinders on request:<br>o black, incl.<br>o white, incl..<br>o aluminum grey (RAL 9007), incl.<br><br>o End bracket on the face side incl.:<br>o 15 mm mounted for border profile - Nr.: 88<br>o 25 mm mounted for border profile - Nr.: 11<br><br>**Diffuser length (standard, other lengths on request)**<br>**o 1000 mm**<br>for wall thickness o 100 mm o 125 mm<br>**o 1200 mm**<br>for wall thickness o 100 mm o 125 mm<br><br>**Manufacturer: LTG Aktiengesellschaft**<br>**Series: LDK-B 20/8/2** | | |

# *Specification and Schedule of Prices*

## *Air Diffuser Combination LDK-B 20/8/2*



| Qty. | Description | Unit Price in € | Total price in € |
|---|---|---|---|
| | **<u>Special Version / Accessories:</u>**<br><br>Aluminium profile:<br>o high-gloss chromium-plated<br><br>Slot nozzles / diffuser cylinders:<br>o chromium-plated<br><br>o Connecting pins for continuous assembly, incl.<br><br>o Air connection box with integrated sound absorber element for improved cross-talk attenuation<br><br>o Air connection box in special length<br><br>o Air connection box for supply air or return air only<br><br>**Special version on request** | | |

# *Specification and Schedule of Prices*

## *Air Diffuser Combination LDK-B 20/8/3*

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| Qty. | Description | Unit Price in € | Total price in € |
|---|---|---|---|
| | Adjustable linear diffuser for constant or variable flow rates with shared supply and return air box, with integrated thermal insulation and separation of supply and return air unit to ensure minimum short-circuit.<br>Slot edge profiles designed for installation in walls above head height (door height).<br>High induction ratio of short cylinders produces a tangential flow along the ceiling, followed by a mixed air/displacement air flow from the corridor side into the room.<br>Quick reduction of air discharge speeds and temperature differences up to -8 K with a supply and return air flow rate of up to about 115 $m^3$/h (L = 1200 mm) meeting EN 13779 requirements in the occupied zone.<br>Supply and return air connection with one spigot DN 125.<br>Also available as single diffuser for supply air or return air.<br><br><u>Diffuser consisting of:</u><br>- aluminum extrusion profile<br>- cylindrical plastic slot nozzles with rectifier blades. Technically optimized, smooth inside contour without seams for a low-turbulence, low-noise air deflection.<br>- air distribution box of galvanized sheet steel with integrated, subsequently adjustable damper in the supply and return air section<br>- connection box with 2 mounted brackets for quick installation from the corridor side<br>- diffuser may be clip fixed subsequently from the room side<br><br><u>Design:</u><br>Aluminium profiles on request:<br>o border profile - Nr.: 11 oder 88, incl.<br>o painted according to RAL, incl.<br>o natural anodized<br><br>Slot nozzles / diffuser cylinders on request:<br>o black, incl.<br>o white, incl..<br>o aluminum grey (RAL 9007), incl.<br><br>o End bracket on the face side incl.:<br>o 15 mm mounted for border profile - Nr.: 88<br>o 25 mm mounted for border profile - Nr.: 11<br><br>**Diffuser length (standard, other lengths on request)**<br>**o 1000 mm**<br>for wall thickness o 100 mm o 125 mm<br>**o 1200 mm**<br>for wall thickness o 100 mm o 125 mm<br><br>**Manufacturer: LTG Aktiengesellschaft**<br>**Series: LDK-B 20/8/3** | | |

# *Specification and Schedule of Prices*

## *Air Diffuser Combination LDK-B 20/8/3*



| Qty. | Description | Unit Price in € | Total price in € |
|---|---|---|---|
| | **<u>Special Version / Accessories:</u>**<br><br>Aluminium profile:<br>o high-gloss chromium-plated<br><br>Slot nozzles / diffuser cylinders:<br>o chromium-plated<br><br>o Connecting pins for continuous assembly, incl.<br><br>o Air connection box with integrated sound absorber element for improved cross-talk attenuation<br><br>o Air connection box in special length<br><br>o Air connection box for supply air or return air only<br><br>**Special version on request** | | |

# *Specification and Schedule of Prices*

## *Air Diffuser Combination LDK-B 20/8/4*



| Qty. | Description | Unit Price in € | Total price in € |
|---|---|---|---|
| | Adjustable linear diffuser for constant or variable flow rates with shared supply and return air box, with integrated thermal insulation and separation of supply and return air unit to ensure minimum short-circuit.<br>Slot edge profiles designed for installation in walls above head height (door height).<br>High induction ratio of short cylinders produces a tangential flow along the ceiling, followed by a mixed air/displacement air flow from the corridor side into the room.<br>Quick reduction of air discharge speeds and temperature differences up to -8 K with a supply and return air flow rate of up to about 120 $m^3$/h (L = 1200 mm) meeting EN 13779 requirements in the occupied zone.<br>Supply and return air connection with one spigot DN 125.<br>Also available as single diffuser for supply air or return air.<br><br><u>Diffuser consisting of:</u><br>- aluminum extrusion profile<br>- cylindrical plastic slot nozzles with rectifier blades. Technically optimized, smooth inside contour without seams for a low-turbulence, low-noise air deflection.<br>- air distribution box of galvanized sheet steel with integrated, subsequently adjustable damper in the supply and return air section<br>- connection box with 2 mounted brackets for quick installation from the corridor side<br>- diffuser may be clip fixed subsequently from the room side<br><br><u>Design:</u><br>Aluminium profiles on request:<br>o border profile - Nr.: 11 oder 88, incl.<br>o painted according to RAL, incl.<br>o natural anodized<br><br>Slot nozzles / diffuser cylinders on request:<br>o black, incl.<br>o white, incl..<br>o aluminum grey (RAL 9007), incl.<br><br>o End bracket on the face side incl.:<br>o 15 mm mounted for border profile - Nr.: 88<br>o 25 mm mounted for border profile - Nr.: 11<br><br>**Diffuser length (standard, other lengths on request)**<br>**o 1000 mm**<br>for wall thickness o 100 mm o 125 mm<br>**o 1200 mm**<br>for wall thickness o 100 mm o 125 mm<br><br>**Manufacturer: LTG Aktiengesellschaft**<br>**Series: LDK-B 20/8/4** | | |

# *Specification and Schedule of Prices*

## *Air Diffuser Combination LDK-B 20/8/4*



| Qty. | Description | Unit Price in € | Total price in € |
|---|---|---|---|
| | **<u>Special Version / Accessories:</u>**<br><br>Aluminium profile:<br>o high-gloss chromium-plated<br><br>Slot nozzles / diffuser cylinders:<br>o chromium-plated<br><br>o Connecting pins for continuous assembly, incl.<br><br>o Air connection box with integrated sound absorber element for improved cross-talk attenuation<br><br>o Air connection box in special length<br><br>o Air connection box for supply air or return air only<br><br>**Special version on request** | | |