



Air diffusion systems

Induction diffuser B 15  
Induction diffuser BW 15

### Application

Strulik induction diffusers B 15 and BW 15 are slot diffusers with very narrow outlet profiles. They are mounted flush into panel, gypsum or wooden ceilings, and are hardly visible.

With these high-quality supply air diffusers it is possible to establish a draught-free air movement within zones having a height of 2.8 to 4.0 m for B 15 and 2.2 to 3.5 m for BW 15.

The requirements of DIN 1946 Part 2 are met at maximum temperature differences of 12 K for cooling and 10 K for heating.

The induction diffusers B 15 and BW 15 are suitable for variable air flows from 100%,  $L_w = 40 \text{ dB(A)}$ , to 25%.

### Function

The **B 15 induction diffuser** discharges through 15 mm wide air outlet elements stable individual air jets that enter into the room at an angle of 40° alternately to the left and to the right.

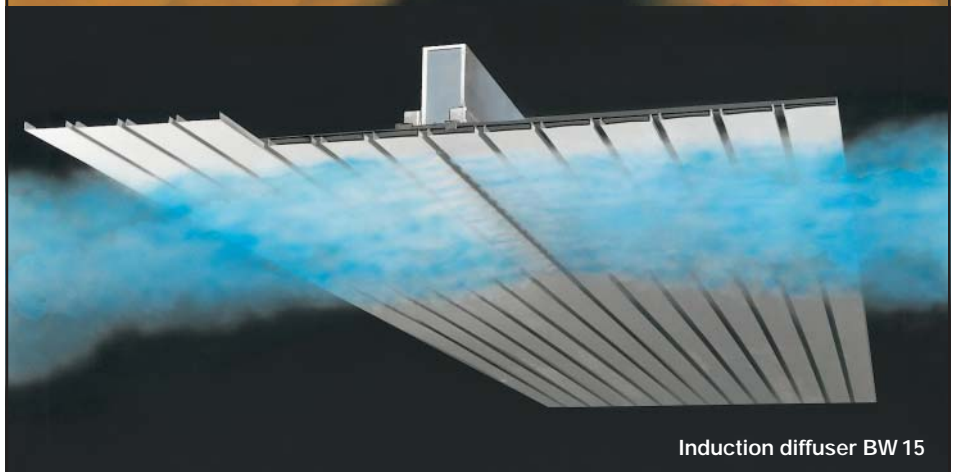
The precise manufacture of the individual jets as well as the ratio of the jet width to jet depth result in a wide range of applications. The unit has a very high induction ratio, i. e. mixing of supply air with room air.

The **BW 15 induction diffuser** discharges two jets parallel to the ceiling. The BW 15 diffuser can thus be used for very low ceiling heights (2.2 m) and temperature difference between the supply and room air of 12 K for cooling.

The relatively high air velocities at both types of diffusers as well as the high temperature difference between supply and room air rapidly decrease on their way into the occupied zone and thus result in draught-free conditions and a very stable room temperature.

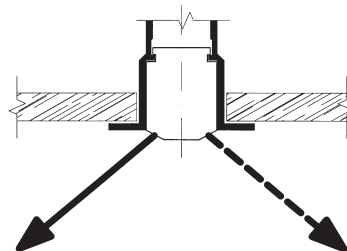


Induction diffuser B 15

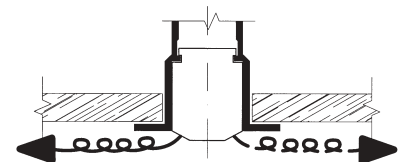


Induction diffuser BW 15

### Types of induction diffusers



Induction diffuser B 15  
with alternately discharged  
individual jets at an angle of 40°



Induction diffuser BW 15  
with alternately discharged swirling jets  
parallel to the ceiling

The company reserves the right of design change without notice.

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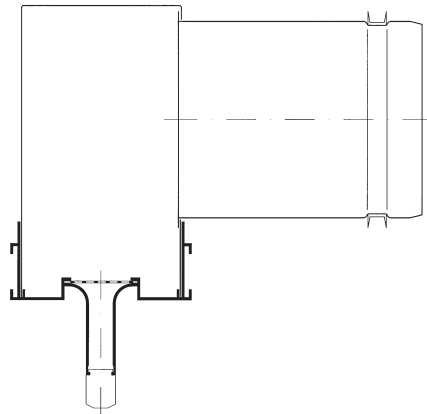
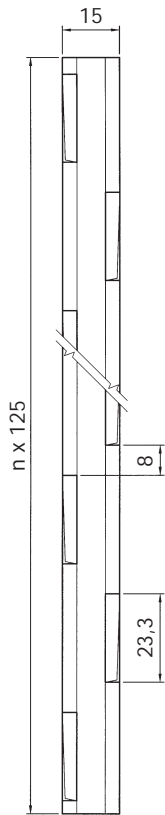
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**Induction diffuser B 15**  
**Induction diffuser BW 15**

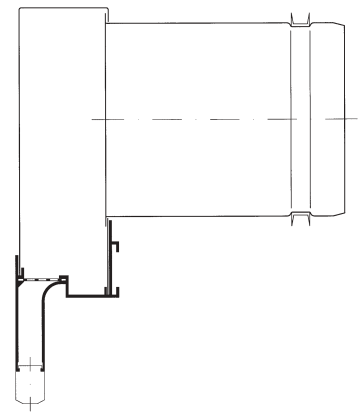
**Types of construction**

**Types of construction**

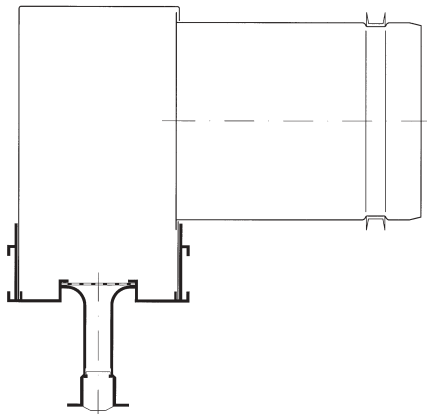
The induction diffusers B 15 and BW 15 in different types of construction are available for slatted or plastered ceilings. A special construction is available for incorporation with ceiling lights.



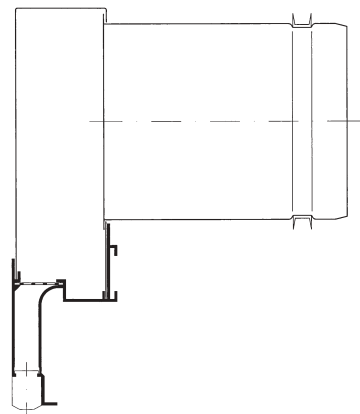
**B 15, BW 15:**  
 For installation onto panel ceilings



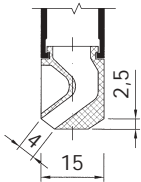
**B 15-LP, BW 15-LP:**  
 For installation with light fittings in a panel ceiling



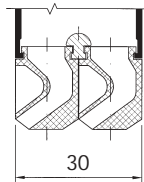
**B 15-D, BW 15-D:**  
 For installation onto plastered ceilings



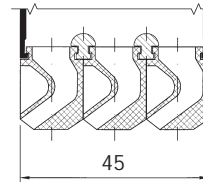
**B 15-LD, BW 15-LD:**  
 For installation with light fittings in a plastered ceiling



**Air discharge port with one slot**



**Air discharge port with two slots**



**Air discharge port with three slots**

**Induction diffuser B 15**  
**Induction diffuser BW 15**

**Construction**  
**Dimensions**

**Construction and dimensions**

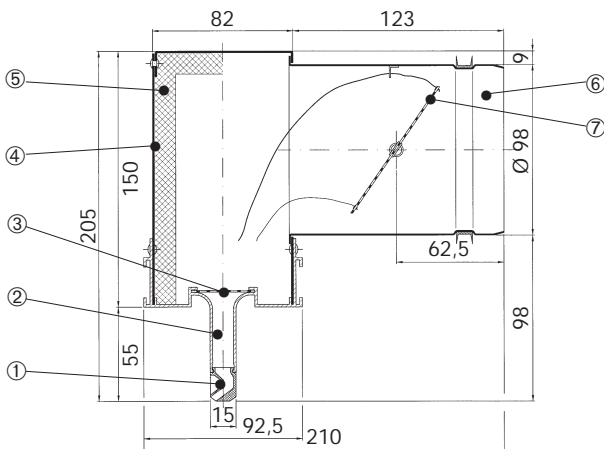
The induction diffusers B 15 and BW 15 consist of the air outlet port (1) with individual elements that are 15 mm wide and 125 mm long.

The nozzle elements are held in the split air discharge port (2) manufactured of extruded aluminium profile. The air discharge port also accommodates the rectifying perforated plate (3) and hat retaining slots for suspension, supporting or connection profiles.

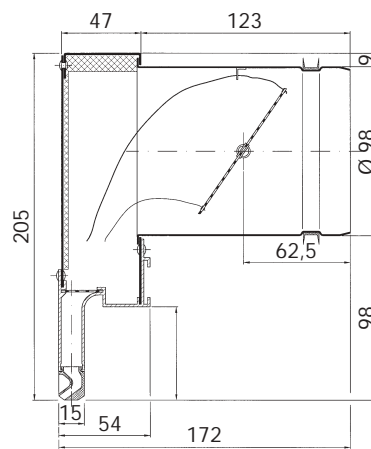
The plenum box (4) is manufactured from zinc-plated steel and optionally lined with an internal acoustic insulation (5) of polyurethane foam. The inlet spigot (6) has a damper (7) for the adjustment of the supply air flow rate.

The standard lengths are 1000 and 1500 mm. Lengths up to 2000 mm are available in graduations of 125 mm.

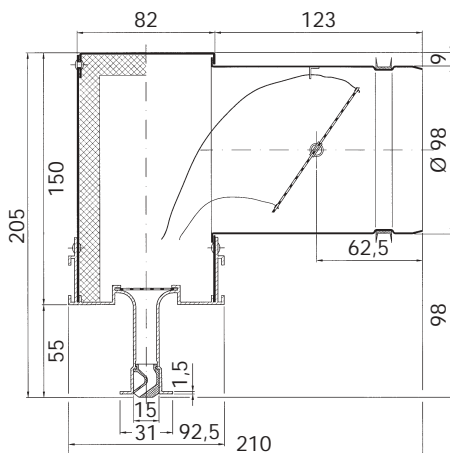
Blank elements are available for all the types of units.



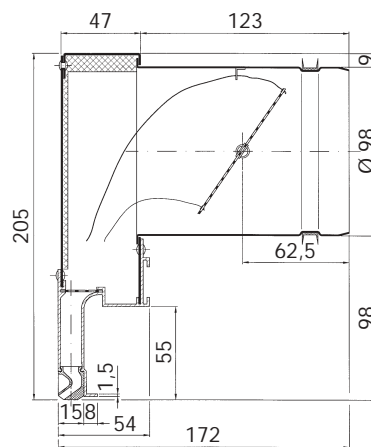
**Construction B 15, BW 15**



**Construction B 15-LP, BW 15-LP**

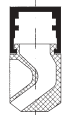


**Construction B 15-D, BW 15-D**

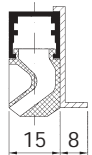


**Construction B 15-LD, BW 15-LD**

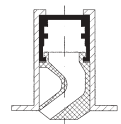
**Blank elements**



**B 15, BW 15**  
**B 15-LP, BW 15-LP**



**B 15-LD, BW 15-LD**



**B 15-D, BW 15-D**

**Induction diffuser B 15**  
**Induction diffuser BW 15**

**Mounting**  
**Design data B 15**

**Mounting**

The induction diffuser is held by suspension angles, which can be moved into the retaining slot at the side and fixed with a screw. It can be fastened to the ceiling with threaded rods or quick-acting suspension devices. The movable suspension profile in the retaining slot and oblong holes enable an exact adjustment of the diffuser in longitudinal and cross direction.

**Design data**

**Induction diffuser B 15**

The induction diffuser B 15 enables a diffused air distribution and a clean room air movement with up to 12 air changes per hour. The temperature differences between supply and room air can be up to 12 K for cooling and 10 K for heating.

Fig. 1 shows the vertical penetration depth  $L_V$  of the velocity isovels 0.15, 0.18 and 0.2 m/s for the isothermal case against the volume flow rate. The increase of the penetration depth against the temperature difference for cooling can be obtained by means of the correction factor F.

This presumes that the below described minimum distances between the diffuser rows are met.

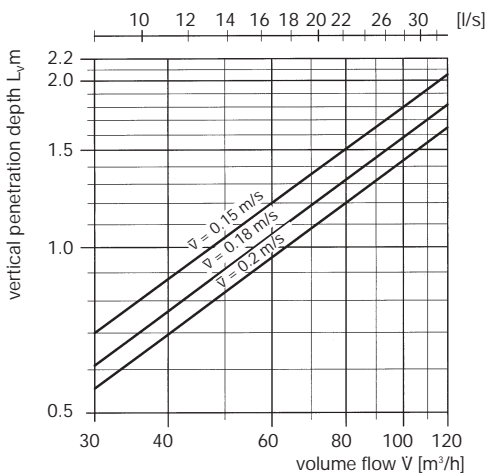
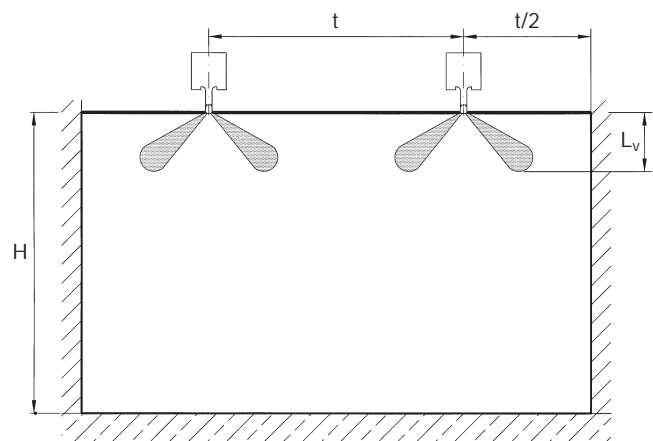
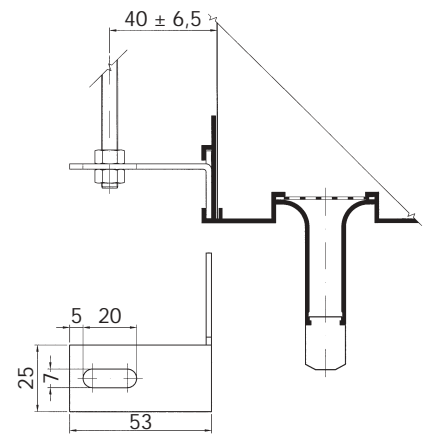


Fig. 1: Vertical penetration depth  $L_V$  against the volume flow rate for the isothermal case for induction diffuser B 15.

$\Delta\theta$	0	2	4	6	8	10	12
Cooling (K)							
Factor F	1	1.03	1.07	1.11	1.14	1.18	1.2

Fig. 2: Correction factor F for the determination the vertical penetration depth  $L_V$  against the temperature difference for cooling for induction diffuser B 15.

**Induction diffuser B 15**  
**Induction diffuser BW 15**

**Design data**

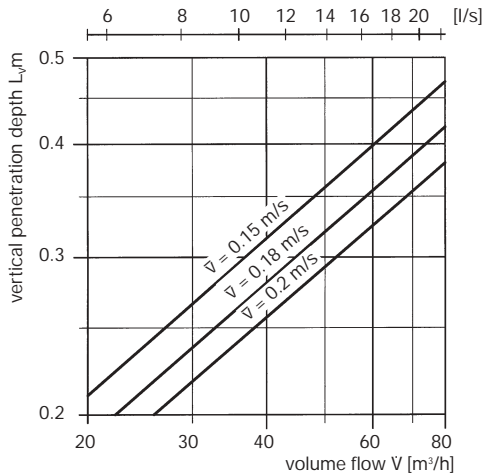
**Vertical penetration depths**  
**Distances between diffusers**

**Induction diffuser BW 15**

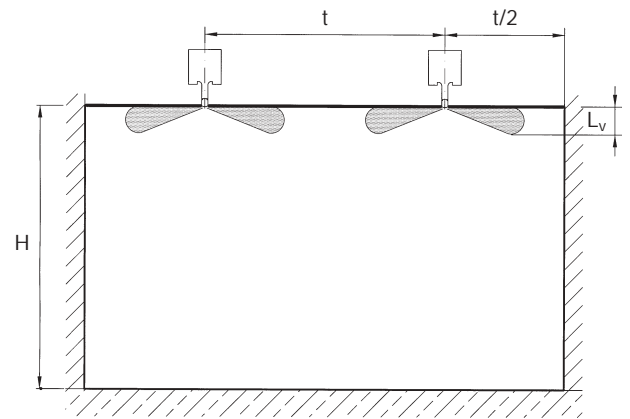
Due to its low vertical penetration depth, the induction diffuser BW 15 is especially suitable for low mounting heights.

Fig. 3 shows the vertical penetration depth of the velocity isovels 0.15, 0.18 and 0.2 m/s. The increase of the penetration depth against the temperature difference for cooling can be obtained by means of the correction factor F.

This presumes that the below described minimum distances between the diffuser rows are met.



**Fig. 3:** Vertical penetration depth  $L_v$  against the volume flow rate for the isothermal case for induction diffuser BW 15.

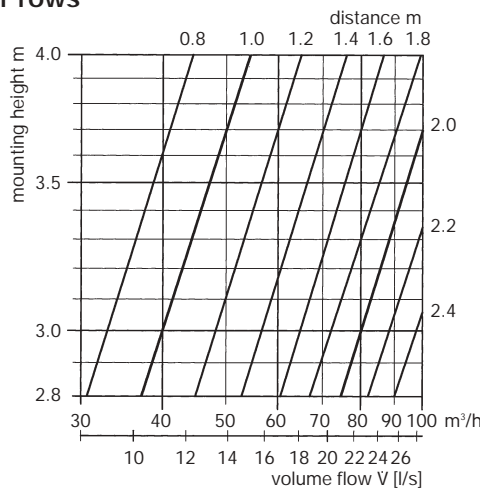


$\Delta\theta$ Cooling (K)	0	2	4	6	8	10	12
Factor F	1	1.02	1.04	1.07	1.08	1.10	1.12

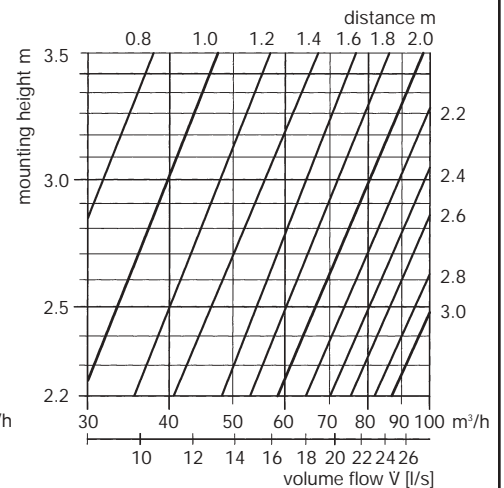
**Fig. 4:** Correction factor F for the determination of the vertical penetration depth  $L_v$  against the temperature difference for cooling for induction diffuser BW 15.

**Minimum distance between diffuser rows**

In order not to exceed the vertical penetration depths shown in fig. 1 to 4, in any case the distances between diffuser rows shown in fig. 5 and 6 must be met.



**Fig. 5:** Minimum distance between the diffuser rows for induction diffuser B 15



**Fig. 6:** Minimum distance between the diffuser rows for induction diffuser BW 15

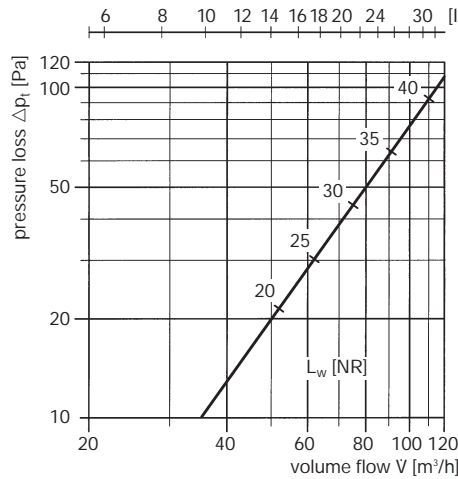
**Induction diffuser B 15**  
**Induction diffuser BW 15**

**Design data**

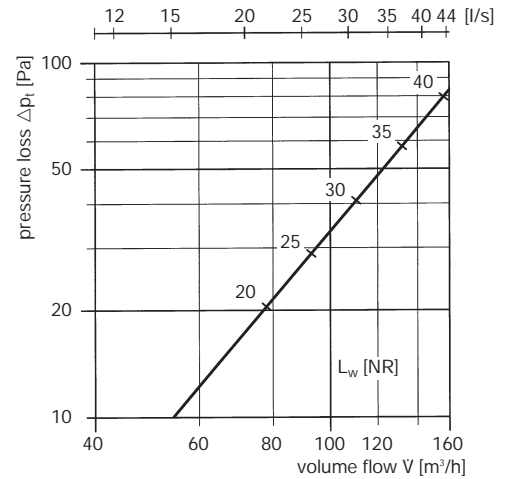
**Pressure loss**  
**Noise level**  
**Noise level per octave**

**Noise level and pressure loss**

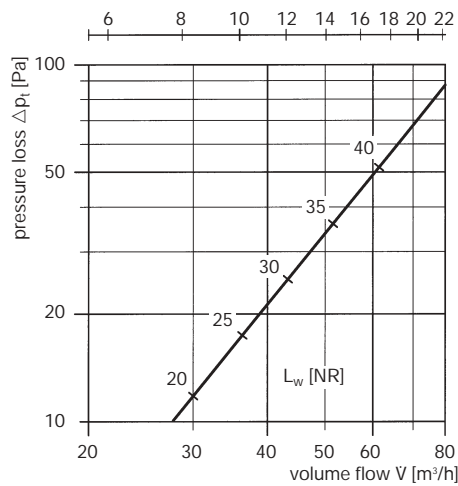
Fig. 7 to 10 show the pressure loss and noise level values for B 15 and BW 15 with one slot. These values are valid for the construction with uninsulated plenum box. The noise level reduces by 2dB(A) with an insulated plenum box. The pressure loss remains nearly the same.



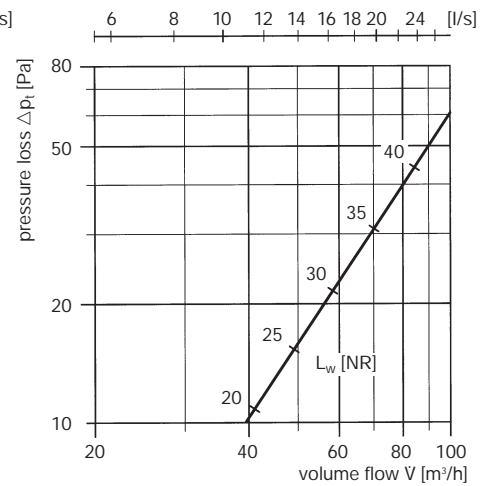
**Fig. 7:** Pressure loss and noise level **B 15**, L=1000 mm, uninsulated, spigot DN 100



**Fig. 8:** Pressure loss and noise level **B 15**, L=1500 mm, uninsulated, 2 spigots DN 100



**Fig. 9:** Pressure loss and noise level **BW 15**, L=1000 mm, uninsulated, spigot DN 100



**Fig. 10:** Pressure loss and noise level **BW 15**, L=1500 mm, uninsulated, spigot DN 100

**Noise level per octave**

The noise level values per octave are calculated from the weighted noise level and an octave correction factor according to the following formula:

$$L_{wo} = L_{wa} + Ko$$

with

- $L_{wo}$ : Noise level per octave dB
- $L_{wa}$ : Weighted noise level dB(A)
- Ko: Octave correction value dB

Correction table for octave evaluation (dB/oct.)

F	63	125	250	500	1000	2000	4000	8000
Ko	- 4	- 1	- 2	- 8	- 14	- 24	- 35	--

Example:  
given:  $L_{wa} = 28$  dB (A)  
unknown:  $L_{wo}$  at 1000 Hz  
 $L_{w1000} = 28 - 14 = 14$  dB

**Induction diffuser B 15**  
**Induction diffuser BW 15**

**Design data**

**Calculation example**

**Calculation example for induction diffuser B 15**

**Given:**

- Room with floor dimensions of 8x5 m
- Room height (mounting height): 3 m
- Supply air flow rate: 800 m<sup>3</sup>/h
- Temperature difference between supply and room air: 6 K for cooling
- Air velocity within the occupied zone:  $\bar{v} = 0.18$  m/s
- Maximum noise level:  $L_w = 36$  dB(A)

**Unknown:**

- Type and number of diffusers
- Air flow rate of the diffusers
- Distance between the diffuser rows
- Noise level at the diffuser
- Pressure loss

**Calculation:**

**1. Determination of the maximum volume flow rate**

For a ceiling height of 3 m the maximum penetration depth up to the occupied zone is  $3 - 1.8 = 1.2$  m. Fig. 2 shows that the penetration depth in case of a temperature difference of 6 K for cooling is 1.11 times as high as in the isothermal case. Thus it is  $1.2 : 1.11 = 1.08$  m. A volume flow rate of **62 m<sup>3</sup>/h.m.** results from  $L_v = 1.08$  m and a room air velocity of 0.18 m according to fig. 1.

**2. Number of air diffusers**

A required **total length of 12.9 m** results from the total volume flow rate of 800 m<sup>3</sup>/h and the maximum specific volume flow rate of 62 m<sup>3</sup>/h.m.

**3. Example of a possible diffuser arrangement**

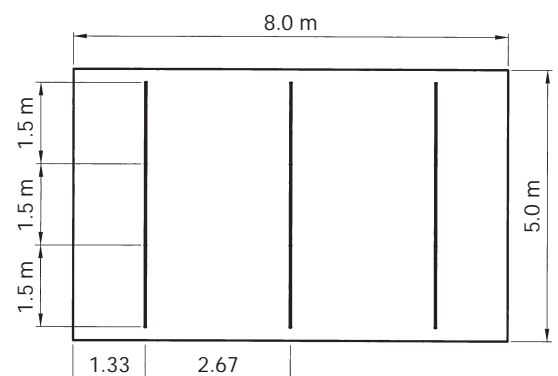
**9 piece** have been chosen. The induction diffusers are **1500 mm long**. Actual air flow:  $800 : 13.5 = 59$  m<sup>3</sup>/h.m.

**4. Distance between diffuser rows**

A **minimum distance of 1.5 m**, contrary to 2.67 m, results from 60 m<sup>3</sup>/h and a mounting height of 3 m.

**5. Pressure loss and noise level**

A maximum **pressure loss of 27 Pa** and a **noise level of 28 db(A)** results from fig. 7 and 8.



# Tender/Order Form

Item	Description	Units Pieces	Unit price	Total
	<p><b>Induction diffuser B 15 or BW 15</b> for the generation of a diffused air diffusion system at a minimum possible temperature gradient. Diffuser consisting of a 15 mm wide slot element of ABS set into an extruded aluminium profile. Aluminium profile with integral rectifying perforated plate and retaining slot for the accommodation of the suspension and connection profile. Air distribution box of zinc-plated steel, inlet spigots with integral damper for the adjustment of the air flow. Diffuser together with suspension brackets.</p> <p><b>Type of diffuser:</b>  <input type="checkbox"/> B 15  <input type="checkbox"/> BW 15</p> <p><b>Type of air discharge port:</b>  <input type="checkbox"/> B 15/BW 15  <input type="checkbox"/> B 15-LP/BW 15-LP  <input type="checkbox"/> B 15-D/BW 15-D  <input type="checkbox"/> B 15-LD/BW 15-LD</p> <p><b>Number of slots:</b>  <input type="checkbox"/> One slot  <input type="checkbox"/> Two slots  <input type="checkbox"/> Three slots</p> <p><b>Length of diffuser:</b>  <input type="checkbox"/> 1000 mm (standard)  <input type="checkbox"/> 1500 mm  <input type="checkbox"/> Special length ..... mm</p> <p><b>Inlet spigot:</b>            ..... pieces, DN .....</p> <p><b>Plenum box:</b>  <input type="checkbox"/> Insulated  <input type="checkbox"/> Uninsulated</p> <p><b>Colour of slot element:</b>  <input type="checkbox"/> Black (standard)  <input type="checkbox"/> White  <input type="checkbox"/> RAL .....</p> <p><b>Colour of air discharge port:</b>  <input type="checkbox"/> Stove enamelled to RAL .....  <input type="checkbox"/> .....</p> <p>Volume flow: ..... m<sup>3</sup>/h.m            Maximum noise level: ..... dB(A)            Maximum pressure loss: ..... Pa</p> <p>Manufacturer: <b>Strulik</b>            Typ: <b>B 15/BW 15</b>            Product: Induction diffuser</p>			