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CBAL, LEO pharma, Ballerup

## Lindab **Theory Low Impulse**

Displacement diffusers



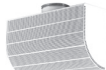





# Displacement diffusers

## Low Impulse

### Low-impulse diffusers

|                     | Product   | Functions  |
|---------------------|---|--|
| <b>Introduction</b> |  | <b>CBAL</b><br> |
|                     |  | <b>CBAV</b><br> |

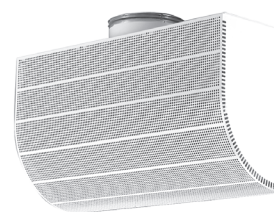
### Low-impulse supplied air

At low-impulse supplied air, cooling temperature air is added at a low velocity from either ceiling- or wall mounted diffusers. That way, the clean air will partially displace the contaminated air. The need for this type of supplied air method usually arises when the environment and health issues demand supplied air as a substitute for the air which is exhausted by fume cubboards, cooking hoods or other types of exhaust diffusers. This often results in air changes up to 50 times per hour.

With an air change that high, it will not usually be possible to use diffusers based on the traditional mixed ventilation without creating draughts. The supply air method with low impulse is different from the traditional supplied air diffusers, and helps to ensure short air throws and limited velocities in the occupied zone. In order to avoid draughts it is however a pre-requisite that air with a limited cooling temperature (-3 to -4 K) is added. Despite the limited cooling temperature, the large air change will normally result in an unproblematic removal of the thermal load.

### Large selection

Lindab offers a large selection of low-impulse diffusers for visible mounting in the ceiling or on the wall. Likewise, the product-programme contains square and circular perforated diffusers for mounting in suspended ceilings with or without plenum boxes type MBA (see chapter on ceiling diffusers). These diffusers have in common, that Lindab in many instances adapts the diffuser for a specific ceiling system or in other ways adapts the diffuser to the constructural or architectural room conditions. In this chapter we will show some of the varieties Lindab has delivered as an inspiration.



CBAV, diffuser

# Displacement diffusers Low Impulse

## Planning guide

The planning guide below is made for rooms with up to 4 metres room height.

## Sound power level and total pressure

Sound power level  $L_{WA}$  and total pressure loss  $\Delta p_t$  can be read in the diagrams, which are shown in connection with product documentation.

## Recommended maximum air flow

Please note the schedule below for the individual products.

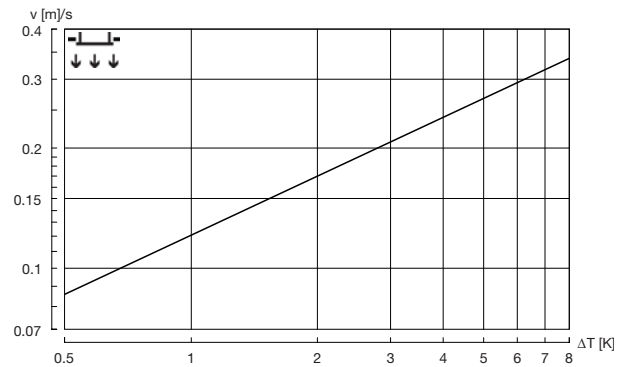
| Produkt       | $q_{max}$<br>recommended<br>$m^3/h$ | $q_{max}$<br>recommended<br>$m^3/h$ |
|---------------|-------------------------------------|-------------------------------------|
| CBAL-1200     | 1000                                | 278                                 |
| CBAL-1800     | 1600                                | 444                                 |
| CBAV-1200     | 800                                 | 222                                 |
| CBAV-1800     | 1200                                | 333                                 |
| PS-1V/H-L-160 | 190                                 | 53                                  |
| PS-1V/H-L-200 | 90                                  | 53                                  |
| PS-1V/H-L-250 | 300                                 | 83                                  |
| PS-1V/H-L-315 | 450                                 | 125                                 |
| PC-6-L-125    | 135                                 | 38                                  |
| PC-6-L-160    | 230                                 | 64                                  |
| PC-6-L-200    | 230                                 | 64                                  |
| PC-6-L-250    | 300                                 | 83                                  |
| PC-6-L-315    | 300                                 | 83                                  |

## Vertical temperature gradient

When air is supplied at a cooling temperature of up to  $-6K$  it will not be possible to register temperatures higher than  $-1K$  lower than the surrounding room temperature, within the diffusers air diffusion area. This is the case no matter the air flow.

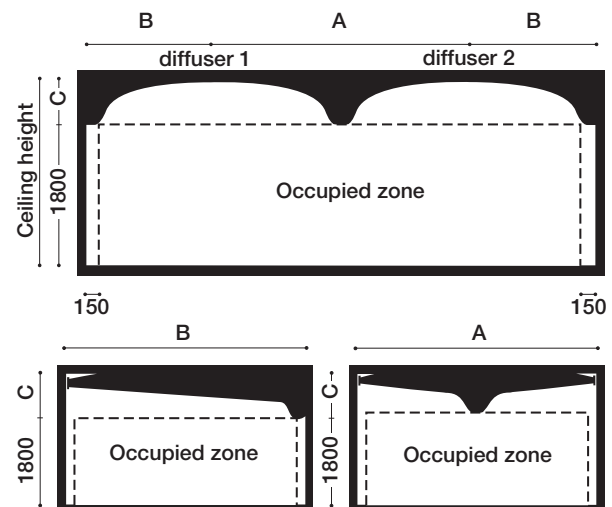
The tolerance level for the temperature is  $\pm 0.5 K$ .

## Velocities in the occupied zone



Please note that for the diffusers PS-1 and PC-6 the diagram is only valid, if the minimum distance between the diffusers is enforced as described in the formula below:

$$L_{0.2} < A/2 + C \text{ (see chapter on theory for more information).}$$

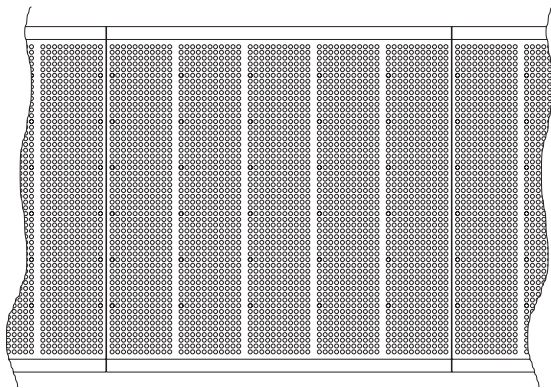


# Displacement diffusers

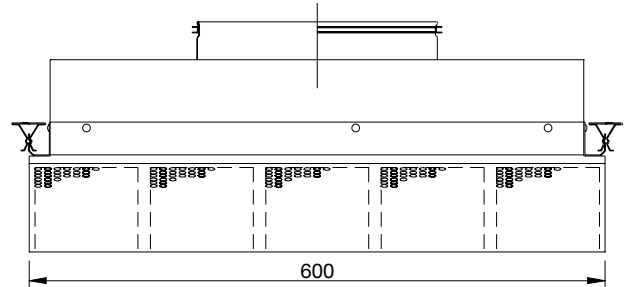
## Low Impulse

### Types of CBAL

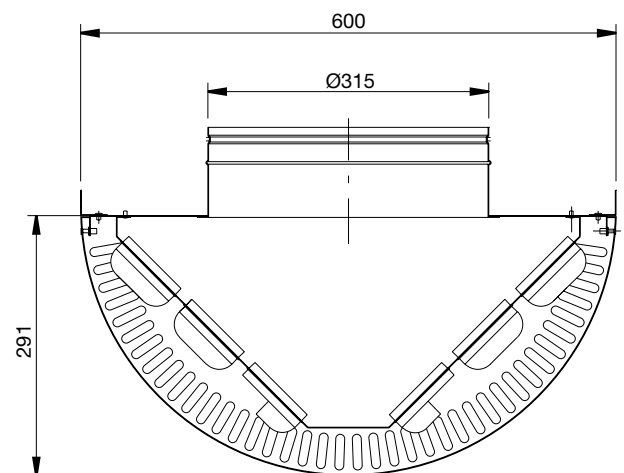
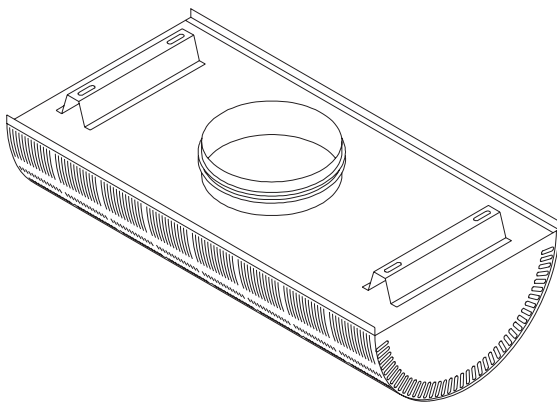
Lindab offers a variety of standard products. On this page we will show a small selection.



*Continuous mounting*



CBAL adapted to 600x600 ceiling systems is used directly in the air duct with moderate velocities, which in principle will function as a pressure chamber. Diffusers are available as 1, 2 or 3 module sections, which can be combined as needed. The diffuser is delivered with built-in resistance, so that adjustment of the individual diffusers is not needed. The individual diffuser can be made inactive by closing. It is possible to “move the air” and obtain a great deal of flexibility when furnishing the room.



CBAL without plenum box is used, when there is a need for a lower building height. The diffuser is usually mounted directly in an air duct placed above the diffuser. The diffuser is available in a length of 1200, 1800 in addition to 2400 mm with 1 and 2 piece Ø315 connections and 2 x Ø400 connections respectively. The diffuser is also adaptable to most ceiling systems.



Most of us spend the majority of our time indoors. Indoor climate is crucial to how we feel, how productive we are and if we stay healthy.

We at Lindab have therefore made it our most important objective to contribute to an indoor climate that improves people's lives. We do this by developing energy-efficient ventilation solutions and durable building products. We also aim to contribute to a better climate for our planet by working in a way that is sustainable for both people and the environment.

[Lindab](#) | For a better climate