

## Lindab Architect

Active chilled beam

## Active chilled beam



Picture 1. Architect Circum, Luna and Prisma.

## Introduction

Architect is a flexible and aesthetical, free hanging active chilled beam, designed to deliver a great flexibility and a perfect indoor climate. With three different designs, the Architect Circum, Luna and Prisma can fit any layout design.

## Worth noting

Architect features the Lindab JetCone, an innovative way of regulating the air volume. The air volume can easily be adjusted without having to worry about pressure and noise issues.

The Angled Nozzles system secures a perfect air spread pattern, available in a number of factory preset angles.

The beam can be easily integrated/used in a Pascal water system to enable VAV/DCV.

Lindabs active chilled beams are Eurovent-certified and tested according to EN-15116.


## Key figures

Length: $\quad 1200-3000[\mathrm{~mm}]$ (in steps of $100[\mathrm{~mm}]$ )
Width: $\quad$ 497-523 [mm] (design specific)
Height: $175[\mathrm{~mm}]$
Capacity: 1384 [W]

## Calculation setup

Room temp: $25\left[^{\circ} \mathrm{C}\right]$, Water temp: $14-17\left[{ }^{\circ} \mathrm{C}\right]$,
Air temp:
Nozzle air pressure:
Air flow:
$18\left[{ }^{\circ} \mathrm{C}\right]$,
80 [Pa],
$15[1 / \mathrm{s} / \mathrm{m}]$

## Active chilled beam

## Highly flexible active chilled beam

The Architect delivers great cooling and ventilation in an architectural, free hanging wrapping.

Equipped with the market leading Lindab JetCone technology, the Architect delivers a precision in air volume handling, only known to Lindab products.

## Many mounting possibilities

With the mounting options, Ceiling, Wall, or Free hanging, the Architect will fit any mounting need.

Designed for visible mounting, the Architect can be fitted on any plane surface, or even freely suspended, with a perfect result.

To hide the air duct and water pipes, the Lindab Architect can be delivered with a Connection Cover (Available in any length up to 3600 mm ), in order to perfect the overall design in the room.

## Lindab Pascal Water Solution VAV/DCV combined with active chilled beams

For an extra energy- and cost saving and environmentally friendly ventilation and cooling system, the Lindab Pascal Water solution should be applied. The Pascal solution will optimize the ventilation, cooling, heating and even lighting for a perfect indoor climate at the lowest running cost by combining the active chilled beam with VAV (Variable Air Volume) or DCV (Demand Controlled Ventilation) technique.

Please refer to: Pascal Water Solutions

## Freedom of design

With three different designs, the Architect Luna, Prisma and Circum can fit any layout design. Project specific adaption based on the actual design of the building is also possible when using the Lindab Architect Luna, Prisma and Circum beam (special).

As the beam consists of an independent body and an interchangeable faceplate, the initial installation of the beam can be carried out, before the design of the faceplate is decided.

## Perforation pattern

The beam is available in two perforation pattern Slot 50\% (standard) and Dotx2 50\% (plus feature).


Picture 2: Perforation pattern


Picture 3. Architect body with battery and JetCone system and front cover Circum.

## Active chilled beam

## JetCones and angled nozzles

The opening size of the nozzles can be adjusted, by operating the adjustment pins in each corner of the beam. The air distribution can also be adjusted, to achieve different amounts of air on either side of the beam, or to achieve an asymmetrical air pattern along the side of the beam. All thanks to our patent pending JetCone system.

Architect Luna, Prisma and Circum are fitted with the JetCone air volume adjustment technology. The JetCone technology provides a market leading flexibility, with the possibility of adjusting the air diffusion pattern and air volume according to air pressure.

Adjustment is made by changing the positions of the four adjustment pins. The adjustment pins can be set in any of the 10 steps, thereby offering a total of 40 different settings. The adjustment is done without any tools, making adjustments a fast and easy process.

The Lindab Angled Nozzles system successfully combines the Jetcone air volume adjustment with a preset air spread pattern. The combination of the Jetcone and the Angled Nozzles systems results in reduced throw lengths and optimized air volume regulation.

The fast adjustment system offers a unique opportunity within planning, as the air flow can be adjusted at any point after ordering.

## Presetting Angled Nozzles

To achieve a desired air spread pattern the beam is delivered with the Angled Nozzles air distribution system. The Angled Nozzles are a simple yet effective way of creating a divergent air spread pattern without the capacity issues normally related to an air deflector system. The Angled Nozzles can be delivered preset in one of the following standard settings:
$30^{\circ}$ (default setting)
$16^{\circ}$
$10^{\circ}$
NB! Please note that the Angled Nozzles are manufactured in a fixed position (default $30^{\circ}$ ) and cannot be retrofitted or changed.

JetCone adjustment pins ( x 4 )


Picture 4. Architect Lindab's JetCone air volume adjustment system.

## Active chilled beam

## Data

## Variants

Architect is an exposed, 2-way active chilled beam installed as an independent part of any ceiling or as a free hanging beam. Wall mounting also possible. Available in 3 different designs: Luna, Circum and Prisma and is standardly prepared for ventilation and cooling (2-Pipe connection).

Lengths: Architect is available in lengths from:
1.2 [m] to 3.0 [m] (in steps of $0.1[m]$ ).

Width: According to type between 497 and 523 [mm] (see table 1).

Height: Is 175 [mm] for all different types.
Water connection: The cooling water connections are 12 [mm].

JetCone: The JetCone is a standard feature. The factory pre-settings will be done according to desired pressure [Pa] and supply air flow $[1 / \mathrm{s}]$ and can be changed easily on site.

Angled Nozzles: The Angled Nozzles are manufactured in a fixed position and cannot be retrofitted or changed (default is $30^{\circ}$ ).

Air connection: The air connection is horizontal or vertical, Ø125 [mm].

Design: Architect is supplied as standard with perforation Slot 50\%, see page 3 .

Surface treatment: Architect is manufactured as standard from enamelled sheet metal.

## Colour

The product is available as standard, in signal white RAL 9003 or in pure white RAL 9010, gloss value 30 . Other RAL colours on request.

## Pascal Water Solution

The beam can be easily integrated/used in a Pascal water system to enable VAV/DCV.

Please refer to: Pascal Water Solution documentation.

## Plus features

Factory preinstalled.

Heating: The product can be equipped with an additional water circuit, with 12 [ mm ] connections, in the battery to provide a heating function.

Integrated Regula Secura: Lindab's Regula Secura condensation protection can be installed in the product.

Integrated Regula Connect: The product can be equipped with the Regula Connect connection card. Please see the Regula chapter for further information.

Integrated valve and actuator: A control valve, with variable Kv value, and an actuator can be pre-installed in the product.

Design: Other perforation Dot2x $50 \%$ is available on request (see page 3).

Wall installation: Architect can also be mounted horizontally or vertically on to a wall. Contact Lindab for more detailed information.

Extended cover: Where it is installed with a horizontal air and water connection, the product's cover can be extended to conceal the connection pipes. The cover can be produced in lengths of up to 3.6 [ m ]. The extended underside also includes wall or ceiling attachments. See next page.

Air connection: The beam is available with aditional 125 [mm] connection on the opposite side.

## Accessories

Delivered separately.
Control: Refer to the chapter Regula.
Hangers: For recommended installation principles (see: "Architect Installation Instruction").

All these different hangers are available at Lindab:
-pendulum hangers (in different sizes)
-threaded rods M8

For additional accessories please refer to the "Accessories" document on www.lindQST.com.

## Active chilled beam

## Architect

## Extended cover / Connection cover

For installation with horizontal air and water connections, the connection pipes can be concealed, using one of three alternative options, depending on the placement and attachment options.

## Options

1. Extended cover with wall attachments (see picture 6). Maximum length: 3600 mm (in steps of 1 mm ).
2. Extended cover with attachment directly against ceiling (see picture 7). Maximum length: 3600 mm (in steps of 1 mm ).
3. Connection cover with attachment directly against ceiling (see picture 8). Maximum length: 3600 mm (in steps of 1 mm ).
 installed on ceiling.


## Active chilled beam

## Dimensioning

## Cooling capacity air $\mathbf{P}_{\mathrm{a}}$

1. Start by calculating the capacity required for the room, to keep a certain temperature. Lindab's TEKNOsim is an excellent tool for this.
2. Calculate which cooling capacity, or read in diagram 1, that is supplied by the ventilation air
3. Remaining cooling capacity needs to be cooled by the water circuit in Architect.

The formula for calculating the capacity of the air:
$\mathrm{P}_{\mathrm{a}}=\mathrm{q}_{\mathrm{ma}} \times \mathrm{c}_{\mathrm{pa}} \times \Delta \mathrm{t}_{\mathrm{ra}}$
Size comparison by $\mathrm{t}_{\mathrm{r}}=25^{\circ} \mathrm{C}$ with:
$\mathrm{q}_{\mathrm{a}}=$ Primary air flow rate
$P_{a}[W]=q_{a}[/ / \mathrm{s}] \times 1.2 \Delta t_{\mathrm{ra}}[K]$ and
$\mathrm{P}_{\mathrm{a}}[\mathrm{W}]=\mathrm{q}_{\mathrm{a}}\left[\mathrm{m}^{3} / \mathrm{h}\right] \times 0.33 \Delta \mathrm{t}_{\mathrm{ra}}[\mathrm{K}]$

## Minimum flow

Please note that flows below the recommended minimum water flow $\mathrm{a}_{\text {wmin }}$, can result in unwanted air in the water pipes. Exceeding the nominal flows is not recommended as the capacity gains will only be minimal.

| Pipe diameter | $\mathbf{q}_{\text {win }}$ | $\mathbf{q}_{\text {wnom }}$ |
| :---: | :---: | :---: |
| $12[\mathrm{~mm}]$ | $0.025[/ / \mathrm{s}]$ | $0.038[/ / \mathrm{s}]$ |

## Definitions:

$\mathrm{P}_{\mathrm{a}} \quad$ = Cooling capacity air [W]
$P_{w}=$ Cooling capacity water [W]
$P_{\text {tot }}=$ Cooling capacity total [W]
$\mathrm{q}_{\text {ma }}=$ Air mass flow rate $[\mathrm{kg} / \mathrm{s}]$
$\mathrm{q}_{\mathrm{a}} \quad=$ Primary air flow rate [1/s]
$\mathrm{q}_{\mathrm{w}}=$ Water flow rate [ $1 / \mathrm{s}$ ]
$\mathrm{q}_{\mathrm{wmin}}=$ Minimal water flow rate [ $1 / \mathrm{s}$ ]
$\mathrm{q}_{\text {wnom }}=$ Nominal water flow rate [l/s]
$\mathrm{c}_{\mathrm{pa}}=$ Specific heat capacity air [1,004 kJ/kg K]
$\mathrm{t}_{\mathrm{r}} \quad=$ Room air temperature [ ${ }^{\circ} \mathrm{C}$ ]
$\mathrm{t}_{\mathrm{wi}}=$ Water inlet temperature [ ${ }^{\circ} \mathrm{C}$ ]
$\mathrm{t}_{\text {wo }}=$ Water outlet temperature $\left[{ }^{\circ} \mathrm{C}\right]$
$\Delta \mathrm{t}_{\mathrm{ra}}=$ Temp. diff., room air and primary air temp. [K]
$\Delta \mathrm{t}_{\mathrm{rw}}=$ Temp. diff., room air and mean water temp. [K]
$\Delta t_{\mathrm{w}}=$ Temp. diff. water circuit $[\mathrm{K}]$
$\varepsilon_{\Delta t w}=$ Capacity correction for temperature
$\varepsilon_{\mathrm{qw}}=$ Capacity correction for water flow
$P_{\mathrm{Lt}}=$ Specific cooling capacity [W/(m K)]


Diagram 1. Cooling capacity air $P_{a}$ as function of the primary air flow rate $q_{a}$. If the air supply flow is $25[1 / s]$ and the temperature difference of the room air and the supply air is $\Delta t_{r a}=6 \mathrm{~K}$, then the Cooling capacity air of the air is $180[\mathrm{~W}]$.

## Active chilled beam

## Dimensioning

## Cooling capacity water $\mathbf{P}_{w}$

Follow the instructions below to read off the effect from the diagram.

1. Calculate $\Delta \mathrm{t}_{\mathrm{rw}}$.
2. Product length $L$ minus 0.4 [m], to obtain the active length $\mathrm{L}_{\text {act }}$.
3. Divide the primary airflow rate $q_{a}$ by the active length $L_{\text {act }}$ Enter the result on the lower axis of diagram 2.
4. Follow the flow line to the right pressure, and then read off the specific cooling capacity $P_{\llcorner t}$ per active metre.
5. Multiply the specific cooling capacity that was read off by $\Delta t_{\text {w }}$ and active length $L_{\text {act }}$.

## Example 1 Cooling:

What is the cooling capacity of a 2.4 [m] Architect with $20[1 / \mathrm{s}]$ and pressure of $60[\mathrm{~Pa}]$ ?

The room's summer temperature is assumed to be $\mathrm{t}_{\mathrm{r}}=24.5^{\circ} \mathrm{C}$ The cooling water temperature in/out of the Architect is $14 / 17\left[{ }^{\circ} \mathrm{C}\right]$.

## Answer:

Temperature difference:
$\Delta \mathrm{t}_{\mathrm{rw}}=\mathrm{t}_{\mathrm{r}}-\left(\mathrm{t}_{\mathrm{wi}}+\mathrm{t}_{\mathrm{wo}}\right) / 2$
$\Delta \mathrm{t}_{\mathrm{mw}}=24.5\left[{ }^{\circ} \mathrm{C}\right]-\left(14\left[{ }^{\circ} \mathrm{C}\right]+17\left[{ }^{\circ} \mathrm{C}\right]\right) / 2=9[\mathrm{~K}]$
Active length:
$\mathrm{L}_{\text {act }}=2.4[\mathrm{~m}]-0.4[\mathrm{~m}]=2[\mathrm{~m}]$
$\mathrm{q}_{\mathrm{a}} / \mathrm{L}_{\text {act }}=20[1 / \mathrm{s}] / 2[\mathrm{~m}]=10[1 /(\mathrm{s} \mathrm{m})]$
Read off, from diagram 2: $\mathrm{P}_{\mathrm{Lt}}=31.3[\mathrm{~W} /(\mathrm{m} \mathrm{K})]$.
Cooling capacity: $\mathrm{P}_{\mathrm{w}}=31.3[\mathrm{~W} /(\mathrm{m} \mathrm{K})] \times 9[\mathrm{~K}] \times 2[\mathrm{~m}]=563[\mathrm{~W}]$
NB! The capacity diagram applies for the nominal water flow of $\mathrm{q}_{\text {wnom }}=0.038[1 / \mathrm{s}]$. To obtain the right cooling capacity $\mathrm{P}_{\mathrm{w}}$ for other flows, read off the capacity correction factor $\varepsilon_{\text {aw }}$ from diagram 3, and then multiply the capacity, which is read off, by this factor as shown in example 2 for heating.


Diagram 2. Specific cooling capacity $P_{L t}$ as a function of primary air flow rate per active metre at nozzle pressures of $40,60,80$ and 100 [Pa].

## Active chilled beam

## Dimensioning

## Capacity correction for water flow $\varepsilon_{\text {qw }}$

## Example 2 Heating:

What is the heating capacity of a $2.4[\mathrm{~m}]$ Architect with $20[1 / \mathrm{s}]$ and pressure of $60[\mathrm{~Pa}]$ ?

The room winter temperature is assumed to be $\mathrm{t}_{\mathrm{r}}=21$ [ $\left.{ }^{\circ} \mathrm{C}\right]$. The hot water temperature in/out of Architect is $55 / 47$ [ ${ }^{\circ} \mathrm{C}$ ].

## Answer:

Temperature difference:
$\Delta \mathrm{t}_{\mathrm{rw}}=\left(\mathrm{t}_{\mathrm{wi}}+\mathrm{t}_{\mathrm{wo}}\right) / 2-\mathrm{t}_{\mathrm{r}}$
$\Delta t_{w w}=\left(55\left[{ }^{\circ} \mathrm{C}\right]+47\left[{ }^{\circ} \mathrm{C}\right]\right) / 2-21\left[{ }^{\circ} \mathrm{C}\right]=30[\mathrm{~K}]$
Active length:
$\mathrm{L}_{\text {act }}=2.4[\mathrm{~m}]-0.4[\mathrm{~m}]=2[\mathrm{~m}]$
$\mathrm{q}_{\mathrm{a}} / \mathrm{L}_{\mathrm{act}}=20[1 / \mathrm{s}] / 2[\mathrm{~m}]=10[1 /(\mathrm{s} \cdot \mathrm{m})]$
Read off, from diagram 2: $\mathrm{P}_{\mathrm{Lt}}=31.3[\mathrm{~W} /(\mathrm{m} \mathrm{K})]$
Water capacity: $\mathrm{P}_{\mathrm{w}}=31.3[\mathrm{~W} /(\mathrm{m} \mathrm{K})] \times 30[\mathrm{~K}] \times 2[\mathrm{~m}]=1878[\mathrm{~W}]$
Use the calculated water capacity and calculate the water flow: $\mathrm{q}_{\mathrm{w}}=\mathrm{P}_{\mathrm{w}} /\left(\mathrm{c}_{\mathrm{pw}} \times \Delta \mathrm{t}_{\mathrm{w}}\right)$
$\mathrm{q}_{\mathrm{w}}=1878 /(4200 \times 8)=0.056[/ / \mathrm{s}]$
The capacity correction $\varepsilon_{\text {qw }}$ will then be 0.743
(see diagram 3) and the new capacity:
$P_{w}=1878[\mathrm{~W}] \times 0.743=1395[\mathrm{~W}]$
Using the new heating capacity, a new water flow is calculated: $\mathrm{q}_{\mathrm{w}}=1395[\mathrm{~W}] /(4200[\mathrm{Ws} /(\mathrm{kg} \mathrm{K})] \times 8[\mathrm{~K}])=0.042[/ / \mathrm{s}]$.

Read off the capacity correction $\varepsilon_{\text {qw }}$ at 0.74 and calculate the capacity: $\mathrm{P}_{\mathrm{w}}=1878[\mathrm{~W}] \times 0.74=1390[\mathrm{~W}]$.

Using the new heating capacity, a new water flow is calculated: $\mathrm{q}_{\mathrm{w}}=1390[\mathrm{~W}] /(4200[\mathrm{Ws} /(\mathrm{kg} \mathrm{K})] \times 8[\mathrm{~K}])=0.041[/ / \mathrm{s}]$.

Seeing that the flow is near stabile at this point in the calculation, the heating capacity is calculated to be 1390 [W].


Diagram 3. Capacity correction $\varepsilon_{q w}$ for water flow for both cooling and heating.

## Active chilled beam

## Pressure drop in water circuit, cooling/heating



Diagram 4. Pressure drop in water circuit, cooling.


Diagram 5. Pressure drop in water circuit, heating.

## Example 3 Cooling:

Architect 2.4 [m], which provides an output of 583 [W].
$\Delta \mathrm{t}_{\mathrm{w}}=3[\mathrm{~K}]$
$\mathrm{q}_{\mathrm{w}}=\mathrm{P}_{\mathrm{w}} /\left(\mathrm{c}_{\mathrm{pw}} \times \Delta \mathrm{t}_{\mathrm{w}}\right)$
$\mathrm{q}_{\mathrm{w}}=583[\mathrm{~W}] /(4200[\mathrm{Ws} /(\mathrm{kg} \mathrm{K})] \times 3[\mathrm{~K}])=0.046[1 / \mathrm{s}]$
The pressure drop in the water circuit in diagram 4 is read off as $\Delta \mathrm{p}_{\mathrm{w}}=2.45[\mathrm{kPa}$.

## Example 4 Heating:

Architect 2.4 m, which provides an output of 1390 [W].
$\Delta \mathrm{t}_{\mathrm{w}}=8[\mathrm{~K}]$
$\mathrm{q}_{\mathrm{w}}=\mathrm{P}_{\mathrm{w}} /\left(\mathrm{c}_{\mathrm{pw}} \times \Delta \mathrm{t}_{\mathrm{w}}\right)$
$\mathrm{q}_{\mathrm{w}}=1390[\mathrm{~W}] /(4200[\mathrm{Ws} /(\mathrm{kg} \mathrm{K}]) \times 8[\mathrm{~K}])=0.041[/ / \mathrm{s}]$
The pressure drop in the water circuit in diagram 5 is read off as $\Delta \mathrm{p}_{\mathrm{w}}=1.09[\mathrm{kPa}]$.

## Definitions:

$\mathrm{q}_{\mathrm{w}}=$ Water flow rate [ $\left.1 / \mathrm{s}\right]$
$\mathrm{P}_{\mathrm{w}}=$ Cooling capacity water [W]
$\mathrm{c}_{\mathrm{pw}}=$ Specific heat capacity water $4200[\mathrm{Ws} /(\mathrm{kg} \mathrm{K})]$
$\Delta \mathrm{t}_{\mathrm{w}}=$ Temperature difference water circuit $[\mathrm{K}]$
$\mathrm{t}_{\text {wio }}=$ Mean water temperature $\left[{ }^{\circ} \mathrm{C}\right]$
$\Delta \mathrm{p}_{\mathrm{w}}=$ Pressure loss water circuit [kPa]

* Diagrams are for a certain mean water temperature $t_{\text {wio }}$. For other temperatures please do your calculations in our waterborne calculator in www.lindQST.com!


## Active chilled beam

## Architect

## Dimensions, weight \& water content



Architect Luna


Architect Circum
Figure 1. Architect's different versions.

| Dimensions | Luna | Prisma | Circum |
| :---: | :---: | :---: | :---: |
| Width, [mm] | 497 | 497 | 523 |
| Height, [mm] | 175 | 175 | 175 |
| Product length <br> undersize, [mm] | $8^{\star}$ | $8^{\star}$ | $8^{\star}$ |
| Dry weight, [kg/m] | 11 | 11 | 11 |
| Water content <br> cooling <br> [l/m] | 0.50 | 0.50 | 0.50 |
| Water content <br> heating <br> [I/m] | 0.25 | 0.25 | 0.25 |

* The face plate extends 4 [mm] beyond the end gables, on each side.

Table 1. Dimensions, weight and water content.

Architect Luna


Figure 2. Architect Luna, Prisma and Circum, suspension / dimensions.

## Active chilled beam

## Architect

## Couplings \& connections

Architect is supplied in lengths from 1.2 [m] to 3.0 [m], in steps of 0.1 [ m$]$. The connection dimension is $12[\mathrm{~mm}]$ for the water and 125 [mm] for the air for Architect Luna, Prisma and Circum.

Architect Luna, Prisma and Circum is available with a large number of coupling options. This is how to find the designation, for the coupling option you require:

## Step 1.

Indicate the position for the ventilation connection.


Figure 3. Coupling and connection options.

## Step 2.

Indicate the position for the pipe connection.


## Examples of designations

Below are examples of common coupling options: Type A1 has a horizontal air connection at the end, and a horizontal pipe connection at the same end of the beam.


Figure 4. Coupling options A1 and B4.

## Active chilled beam

## Architect

## Connection dimensions, cooling

Connection B1 + B3 (A1 + A3)


Figure 5. Architect cooling. Dimensions for the parts.
Total width and length for the respective models vary (see table 1).

## Connection dimensions, heating

Connection A1 + A3 (B1 + B3)


Connection A2, B2, A4, B4


Connection A2, B2, A4, B4


Figure 6. Architect, heating. Dimensions for the parts.
Total width and length for the respective models vary (see table 1).

## Active chilled beam

## Sound effect




Diagram 6a+6b. Sound effect level $L_{\text {wA }}$ at JetCone setting for Architect.

## Active chilled beam

## Architect

## Dimensioning

For dimensioning of chilled beams please refer to our waterborne calculator on www.lindQST.com.

## Pressure drop in air connection

Table 2 shows the pressure drop in the connection. After calculating the necessary pressure for the active chilled beam, add the connection pressure drop to the selected static pressure in the nozzles.

## Example 5:

Architect Luna-12-125-A1 with 20 [l/s] and a static nozzle pressure of $60[\mathrm{~Pa}]$. This provides a necessary total pressure in the duct of $60[\mathrm{~Pa}]+1[\mathrm{~Pa}]=61[\mathrm{~Pa}]$.

| Architect |  |  |  |  |  |  |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: |
| Air flow [1/s] | $\mathbf{2 0}$ | $\mathbf{2 5}$ | $\mathbf{3 0}$ | $\mathbf{4 0}$ | $\mathbf{5 0}$ | $\mathbf{6 5}$ |
| Pressure drop [Pa] | 1 | 2 | 2 | 3 | 5 | 8 |

Table 2. Air pressure drop in the connection to Architect.

## Sound data

| Internal sound dampening $\Delta L$ |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $[\mathrm{~Hz}]$ | Jetcone <br> Position | $\mathbf{6 3}$ | $\mathbf{1 2 5}$ | $\mathbf{2 5 0}$ | $\mathbf{5 0 0}$ | $\mathbf{1 0 0 0}$ | 2000 | 4000 | 8000 |
| $[\mathrm{~dB}]$ | 5 | 17 | 13 | 7 | 5 | 2 | 5 | 8 | 13 |

Table 3. Architect 1.8 m position 5, internal sound dampening.

## Noise level $L_{\text {woct }}$

For calculation of the noise level

| Correction $\mathrm{C}_{\text {oct }}$ [dB] Octave band, average frequency [Hz] L = 1.2-2.0 [m] |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| [Hz] | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 |
| [dB] | 13 | -1 | -4 | -5 | -5 | -7 | -10 | -16 |


| ${\text { Correction } \mathrm{C}_{\text {oct }} \text { [dB] Octave band, average frequency [Hz] } \mathrm{L}=2.1-3.0[\mathrm{~m}]}^{([\mathrm{Hz}]}$ |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\mathbf{6 3}$ | $\mathbf{1 2 5}$ | $\mathbf{2 5 0}$ | 500 | 1000 | $\mathbf{2 0 0 0}$ | 4000 | $\mathbf{8 0 0 0}$ |  |
| $[\mathrm{~dB}]$ | 5 | 0 | -2 | -4 | -5 | -7 | -12 | -18 |

Table $4 a+4 b$. Architect's noise levels $L_{\text {woct }}$ for each octave band in the beam, are calculated by adding the corrections $C_{\text {oct }}$ from the table above to the sound power level $L_{w a}[d B(A)]$. The noise levels are calculated using the following formula:
$L_{\text {woct }}=L_{\text {wa }}+C_{\text {oct }}$

## Active chilled beam

Dimensioning
The specific dimensioning of the product can be easily done with our waterborne calculator in our online quick selection tool LindQST.
Calculate the Architect here


Picture 9. LindQST - Indoor Climate Designer

LindQST® helps you select the right waterborne products, e. g. active chilled beams, passive radiant chilled beams, radiant cooling- and heating panels and facade units and quickly finds the corresponding documentation.

In Waterborne Documentation you can easily find all available product documentation. Always in the latest version.

In Waterborne Calculator you can do a professional calculation based on your specific input data to finetune your choice or calculate different variants of the product. Smart warnings piont out if a set-up will not work.

In Waterborne Selector you can compare the proposed products according to your specific reguirements and select the one which fits best to your needs .

Not enough? With Indoor Climate Designer you can insert your selected waterborne product into your room and simulate the actual air distribution, optimise the placing in the ceiling taking into account the calculated air velocities and sound levels.

You can at anytime display your selection and calculations graphically. In addition, you can print or save all results and related documents for your documentation (incl. data sheets, dxf-files and room books).

With lindQST® you will easily find the most suitable product for your project.

It provides easy and quick access to the latest product information, technical specifications and assembly instructions on the internet, making it the ideal tool for installers, consultants and architects alike.
www.LindQST.com

- Easy access to all current documentation.
- Fast design of waterborne products.
- Indoor Climate Designer: Graphical representation of the spatial situation in 2D / 3D and floor plans from AutoCAD®.
- Calculation of capacities, sound power levels, pressure losses and flow conditions.
- 3D particles or smoke show the air distribution in the room.
- Diagram showing the time course of the $\mathrm{CO}_{2}$ concentration in the room.
- Room book generation and data sheet for individual rooms and outlets or entire projects.
- Project can be saved and exchanged in its own project area.
- Fast product selection waterborne products in accordance to Eurovent (chilled beams and facade units).


## Active chilled beam

## Control

Lindab offers control equipment that is very simple to use. To avoid the heating and cooling being activated at the same time, the system is controlled sequentially (Regula Combi). For the technical data, refer to the chapter Regula.


## Designations

Product/Version:
Architect Luna, Prisma, Circum
Connection diam. water, [mm]:
12
Connection diam. air, [mm]: 125
Coupling options: A1, A2, A3, A4
Length, [m]:
Air quantity, [1/s]:
Nozzle pressure, [Pa]:
$1.2-3.0[\mathrm{~m}]$ in steps of $0.1[\mathrm{~m}]$
5-65 [1]/s
30-120 [Pa]
Distribution profile:
Plus features:
$30^{\circ}$ (default), $16^{\circ}$ or $0^{\circ}$
See page 5

## Order code



## Programme text

Active chilled beam for visible installation. Adjustments to air flow and spread pattern must be possible without tools. Air volume regulation should be as fluent as possible, allowing as many air volume options at any specific air pressure between $30[\mathrm{~Pa}]$ and $120[\mathrm{~Pa}]$. Only linear air flow regulation can be accepted.

## Active chilled beams from Lindab

Qty

## Product:

Architect Luna-12-125-A1-1.8 [m]
Air volume: $\quad 15[/ / \mathrm{s}]$
Nozzle pressure: $60[\mathrm{~Pa}]$
Distribution profile:

## Plus features:

Regula Secura
Cooling control valve
Cooling actuator

## Accessories:

Regula Combi:

## Product:

Architect Circum-12-125-B2-2.4 [m] 20
Air volume: $20[1 / \mathrm{s}]$
Nozzle pressure:
Distribution profile:

## Plus features:

Heating
Regula Secura
Cooling control valve
Cooling actuator
Heating control valve
Heating actuator

## Accessories:

Regula Combi:


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

