

Lindab **Plafond XD**

Exposed active chilled beam



Exposed active chilled beam Plafond XD

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Picture 1. Exposed active chilled beam Plafond XD, with Cover type Badge, installed as 3 individual pieces.

Use

Lindab's new Plafond XD is an exposed design active chilled beam solution for ventilation, cooling and heating, which helps you to create a perfect indoor climate in rooms without suspended ceilings.

The new concept with separate technical Body and Cover, available in many different designs, makes the Plafond XD an ideal choice to fit your architectural aesthetic and building requirements.

If looking for a special design element for your room or you want to change the appearance, the new Plafond XD for exposed installation is the perfect choice. The new Covers are available in different designs to match your room style perfectly.

A modulate concept where the performance of the technical Body is not affected by the different types of Cover means that the design of the Cover can be selected at a later stage even after installation of the Plafond Body. This is architectural freedom at its best.

All technical parts of the Plafond XD Body, connections, cabling, valves, actuators and other plus features or accessories, can easily be hidden behind a Plafond XD Cover. As a special design solution, holes for sprinklers, loudspeaker or (LED-) lighting can be foreseen and pre-cut in the factory on request (depending on Cover design).

Applicable for: offices, hotels, hospitals, schools, banks, or other environments where an exposed installation is preferred or needed.

Installation

Separate, exposed installation of the technical Plafond XD Body part directly on a wall in the upper corner between the wall and the ceiling (to achieve lowest room-and building height), or directly on a wall with a distance to the ceiling (to have optimal indoor climate in the occupied zone of higher room premises).

The benefit of having a technical part that provides the function, and a separate Cover that hides all installed components for the chilled beam system, is that the design of Cover and adjustment to exact conditions on site can be done at a later stage. This makes the installation more flexible and the result looks better.



Picture 2. Plafond XD, with Cover type Badge. Maximum length of a single Cover is 3.6 meters.

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Worth noting

- The primary air volume can be pre-adjusted in the factory and later easily be re-adjusted with Lindab's tool-less, patented JetCone system (default), which creates a great flexibility both when commissioning the system and in case of later changes.
- The Angled Nozzles system for air outlet secures a perfect air spread pattern that reduces draft risk without losing capacity. For different purposes, you can order Plafond with 3 different air patterns as short, medium and long air throws.
- The Plafond Body is available in different lengths, which allows you to choose the active length matching your needs.
- The supply air distribution is horizontally.
- The Plafond XD Cover is available in seven different designs.
- The Plafond XD Covers are prepared for both wall-to-wall mounting and as single beam Covers with design-gables at the ends.
- Especially suitable when it is preferred that the ceiling should be free of services (see picture 1), or when there are no plans for a suspended ceiling (reduction of building height).
- The new Cover concept ensures simple ordering, and easy and fast installation on-site with highest flexibility.
- The beam can be easily integrated/used in a Pascal water system to enable VAV/DCV.
- For a simple but effective system, without need for flexibility in airflow adjustment, the beam can be ordered without Lindab's JetCone system. The Body will then be produced with a number of open nozzles, according to the desired static pressure (Pa) and primary airflow demand (l/s).
- Lindab's active chilled beams are Eurovent-certified and tested according to EN-15116.



Key figures

Cover height	h	208 to 277 mm*
Cover width	w	295 to 532 mm*
Cover length	L_{cov}	1200 to 3600 mm
Cover designs		Badge, Clyp, Alea, Cubo, Gap, Trac, Zune
Body length	L_{nom}	800 to 3200 mm
Water connections		12 mm
Air connection		1x125 mm
Primary air flow rate	q_a	1 to 90 l/s
Static nozzle pressure loss	Δp_{stat}	30 to 120 Pa
Total-cooling capacity (@ 10 K)	P_t	up to 2192 W
Total-heating capacity (@ 28 K)	P_t	up to 5380 W

Table 1. Plafond XD key figures.

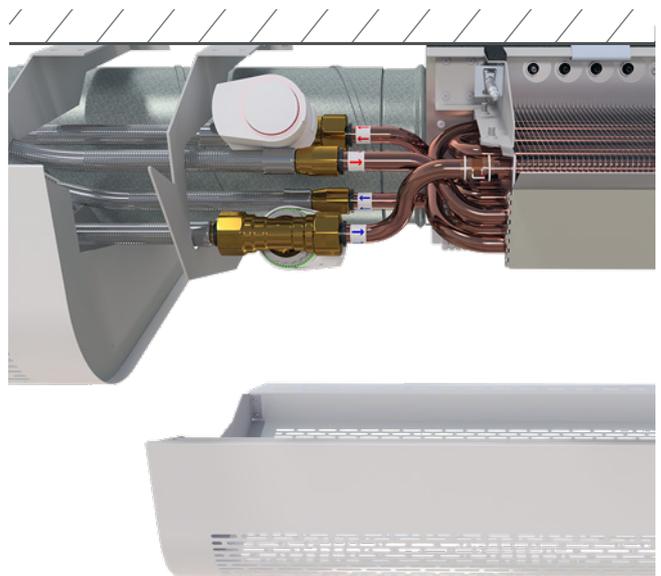
*Cover width and height depending on Cover design.

Construction

Accessibility

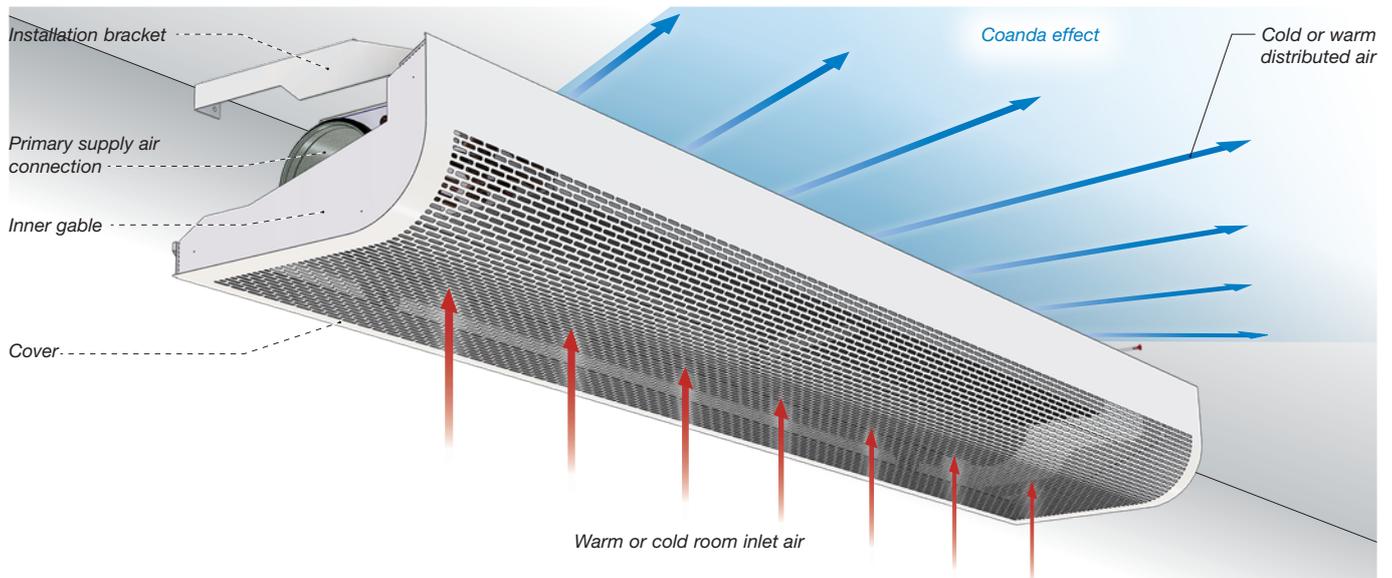
The Body Cover is easily dismantled for maintenance while the connection Cover remains on.

The unique Lindab flexible hoses solve the compact connections with a 4-pipe water connection, LinFlow 2-way valves and Lindab actuators (Plus features).

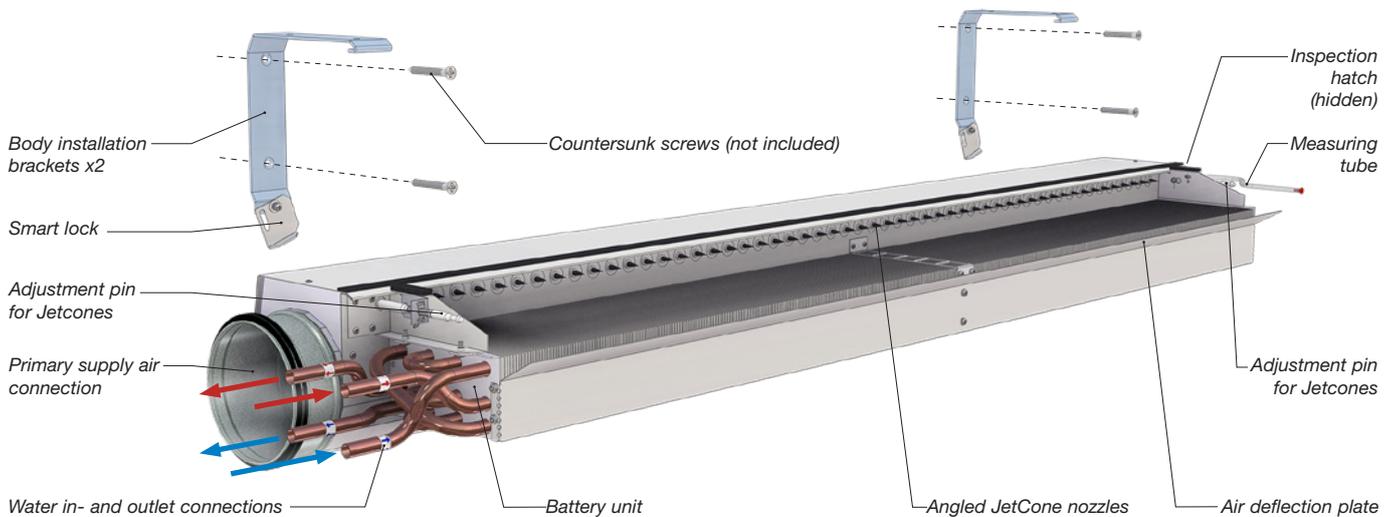


Picture 3. Plafond XD with Cover Clyp in series.

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Picture 4. Plafond XD is based on the induction principle. Illustration shows the Body installed on the wall, sealed to the ceiling, hidden by the Cover Clyp.



Picture 5. Plafond XD Body alone with 4-pipe water connection (cooling and heating).

Optimal functions

Plafond XD's function is based on the induction principle. Ventilation air at a given dynamic pressure is released through specially formed nozzles into a dispersal zone, thereby creating a low static pressure. This low pressure causes warm air from the room to be sucked towards the ventilation air passing through the water battery. The volume of the induced, warm indoor air is 4 to 5 times that of the ventilation air.

The air is cooled (or heated) as it passes through the battery, which consists of aluminium ribs with copper pipes, filled with cold (or warm) running water. While cooling, the heat of the room is absorbed through the aluminium ribs and then transferred through the copper pipe to the water circuit and then goes further to a central cooling unit (see picture 4 and 5).

Despite the small external dimensions of the product, the construction makes it possible to achieve a high cooling or/and heating capacity.

Where both heating and cooling are required, there is a battery with 4-pipe connection available, providing an additional 2-pipe circuit in the battery (for heating).

Exposed active chilled beam Plafond XD

Construction

Maximum accessibility

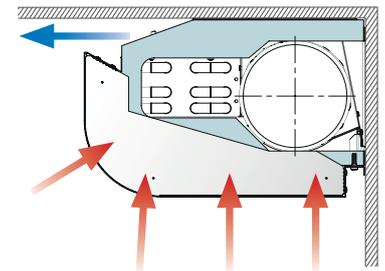
For best possible accessibility for cleaning, suspension, adjustment, or maintenance, of the Plafond XD Body, the whole Plafond XD Cover can be easily dismantled. Where the Body is equipped with e. g. built-in valves or other Regula devices (plus features), these are also accessible for adjustment and/or maintenance from below. The Body must be suspended and adjusted before the front Cover can be installed.

The Plafond XD Cover (different designs) comes with brackets and can easily be installed independently from the Body. This simplifies both the placing of the brackets, the installation and the maintenance.

Installation on the wall, sealed to the ceiling (FC)

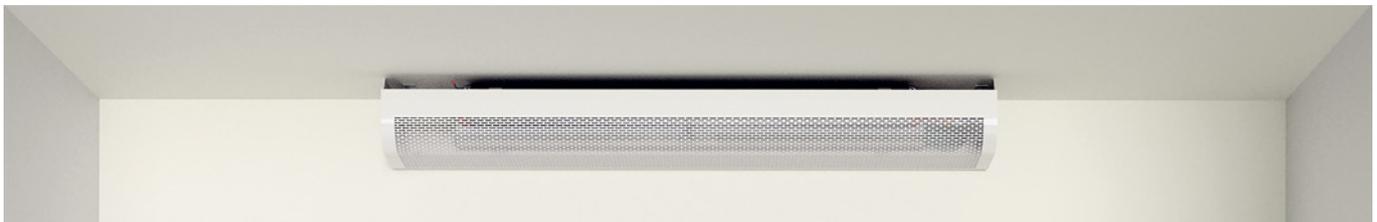
The Plafond-XD-FC Body is installed on the wall, directly sealed to the ceiling without the need of a Top Cover (TC). The air distribution is horizontal along the ceiling (Coanda-effect).

The warm inlet room air enters through the Clip Cover perforation and the cooled air is distributed horizontally along the ceiling (picture 6).



Picture 6. Plafond XD-FC installation on the wall, sealed to the ceiling (FC).

The air distribution is horizontal along the ceiling. Installation principle "Beam" having two exposed inner end-gables. Design end-gables should be ordered separately to hide inner gables, air and water connections (picture 7).

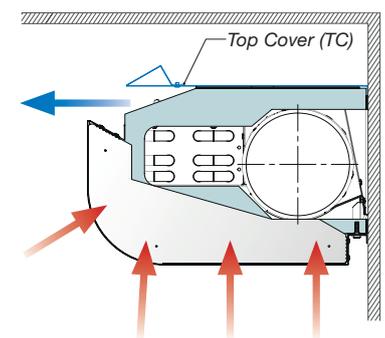


Picture 7. Plafond XD-FC installation on the wall, sealed to the ceiling (FC) without the need of a top Cover (TC).

Installation on the wall, with distance to the ceiling (FW)

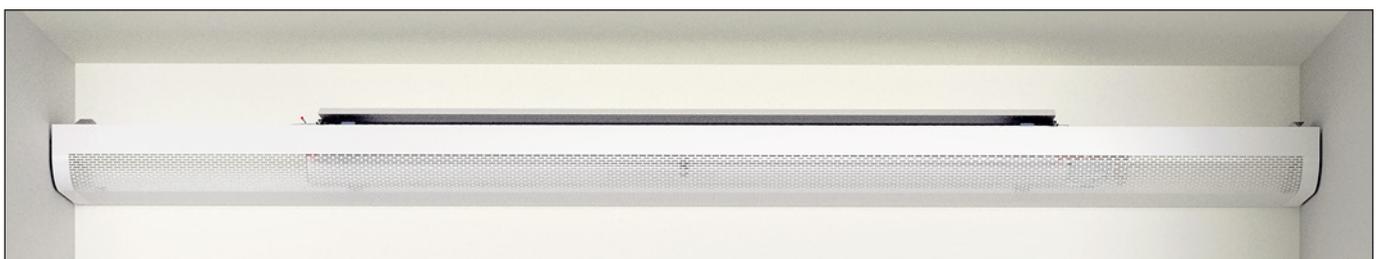
The Plafond-XD-FW Body is installed on the wall, with distance to the ceiling with the need of a Top Cover (TC), which is part of the delivery. The air distribution is horizontal along the ceiling. If a Coanda-effect will be maintained depends on static nozzle pressure loss, primary air flow rate, air temperature and distance to the ceiling.

The FW installation demands a Top Cover to secure the horizontal air distribution (picture 8).



Picture 8. Plafond XD-FW installation on the wall, with distance to the ceiling (FW).

Installation principle "Wall to wall" where no design end-gables are needed. A Top Cover is included for the inner Plafond XD Body, when choosing a FW installation solution (picture 9).



Picture 9. Plafond XD mounted on the wall with distance to the ceiling (FW).

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General Active Chilled Beam Function

The nozzle design, air direction and air volume regulation of the chilled beam play an important role in its operation characteristics.

Nozzle design in general

- Optimal nozzle technical/aerodynamic design give low pressure, high exit speed and an even air jet pattern. This secures high induction, but also ensures low noise generation.
- The most used nozzle design in practice is a round nozzle with an inner diameter of 4-8 mm, which gives excellent aerodynamic properties in pressure drop, even air jet and noise generation. Generally, the smaller the nozzle, the better the properties. In comparison to a round hole design, the aerodynamic nozzle improves pressure drop, speed and jet patterns, resulting in higher induction.

Optimal nozzle design within Lindab's JetCone technology

A round nozzle equipped with JetCone regulation presents optimal results giving high induction as well as high cooling capacity.

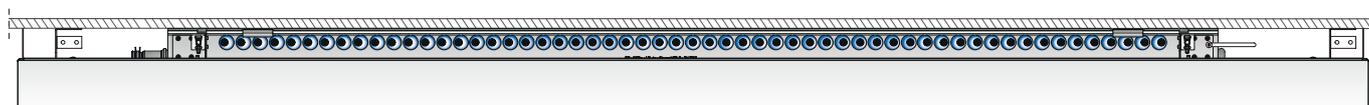
Air direction adjusting

To achieve maximum comfort with low air speeds in the occupied zone, the air from the chilled beam needs to be directed. This is typically associated with draught problems, or with renovations or layout modifications.

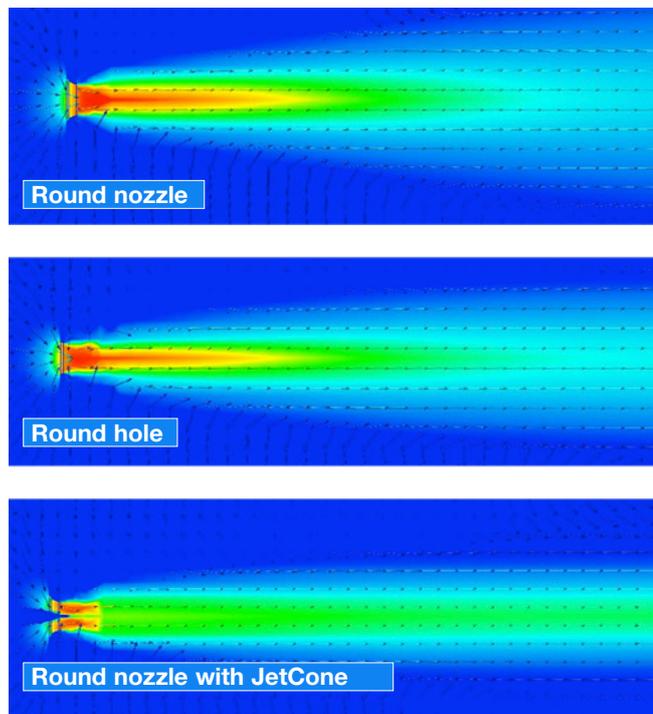
- Rotating guide vanes can be set individually or in groups and allow for air direction angles of up to 30°. This makes it possible to set a fan-shaped air diffusion pattern, however this results in an effect drop of 5-10 % as compared to straight 0° air direction.
- The same results can be achieved with height-adjustable vanes, but also with a 5-10 % capacity drop.
- Fixed eyebrow nozzles can normally be factory set in angles ranging from 0-30°, but not adjusted later, should need arise. This alternative also results in a 5-10 % capacity drop.

Angled Nozzles for optimal air direction within Lindab's JetCone technology

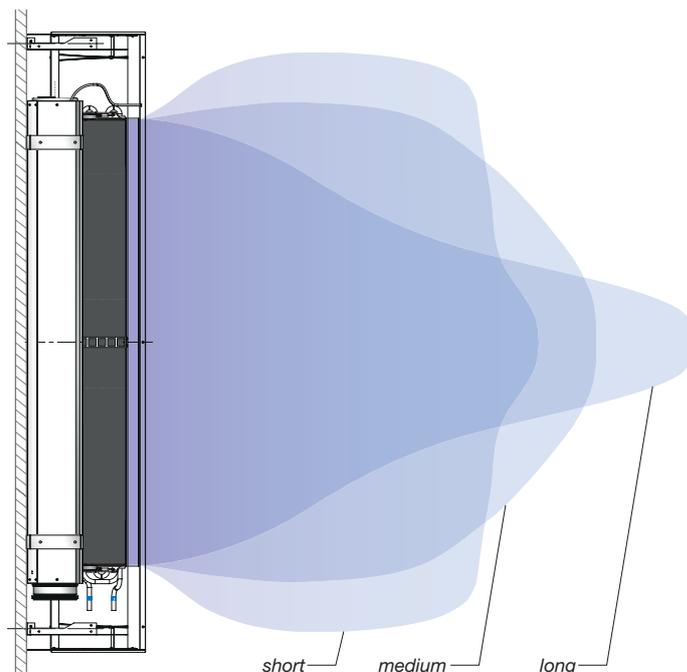
Fixed Angled Nozzles are not adjustable however due to their ideal shape, provide optimal air throw pattern without any loss of capacity.



Picture 10. Front view of Plafond XD showing angled nozzles arrangement.



Picture 11. Graphical illustration showing the patented Lindab JetCone technology, and the resulting optimal high induction and cooling capacity compared with other nozzle configurations.



Picture 12. Top view of Plafond XD showing short, medium and long air distribution patterns.

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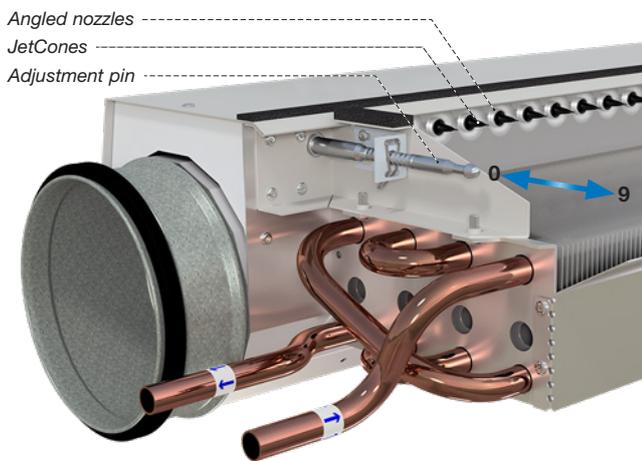
Air volume adjusting

Adjusting the air volume in chilled beams is currently achieved primarily in the following four ways:

- Using oblong slot openings which can give quick and easy air volume adjustments with separate settings for each opening. Due to poor aerodynamics of the slot, the pressure loss is considerable.
- A strip that closes/opens round nozzles is a solution with low pressure losses and low noise generation. The drawback is that only a few air volume positions can be set.
- Using manually plugged nozzles is a common but more time-consuming and cumbersome method.

Optimal air volume adjustment within Lindab's JetCone technology

A more recent method is using JetCone adjustment. This solution uses round nozzles combined with JetCones and has excellent properties in terms of both pressure losses and noise generation. The air volume is regulated quickly and easily and can be varied in a range from 20-100 % of the beams maximum defined air volume. The air volume can also be varied linearly along the length of the beam.

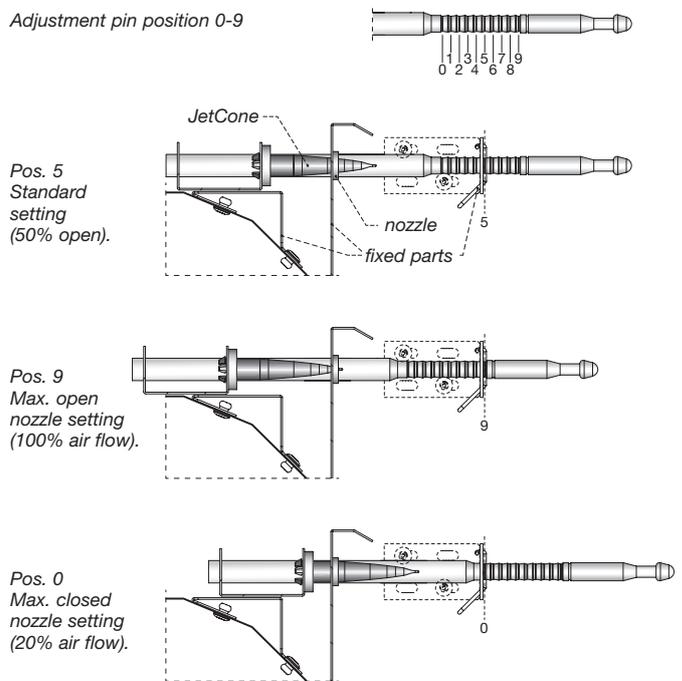


Picture 13. Close up of Plafond XD Body Angled nozzles with JetCones and the placement of the left adjustment pin, here in position 5, (50% open).

Optimal solution within Lindab's active chilled beam JetCone technology

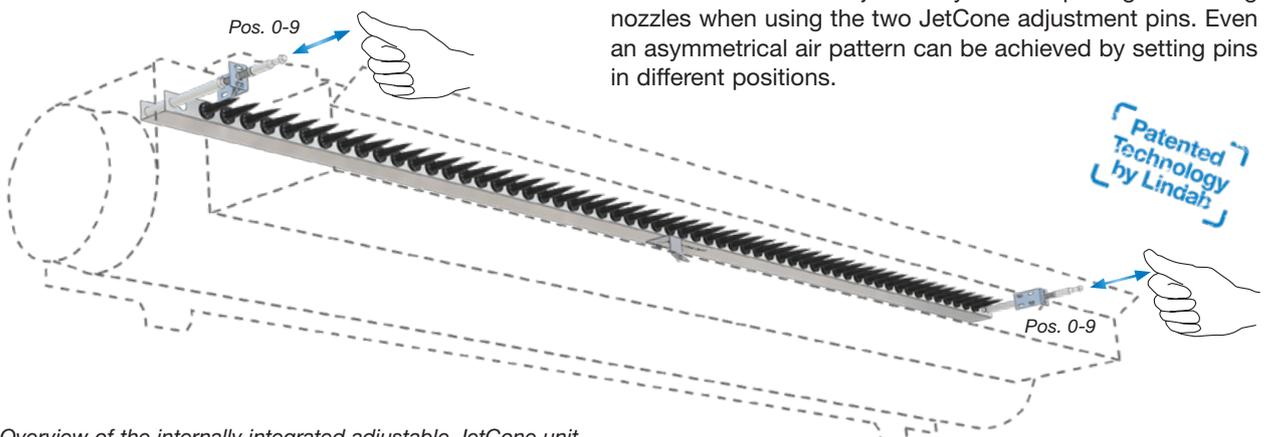
By combining some of the above alternatives in nozzle design, air direction and volume adjustments, an optimal active chilled beam design can be achieved.

Using Angled Nozzles with fully variable JetCone regulation, gives a solution with a high induction level and thus high performance. Short, medium and long air direction settings give optimal air diffusion for open-plan offices. Combined with fully variable air volume regulation, this solution meets today's needs for flexibility and adaptation to new tenant demands. The result is a high level of comfort for any new tenant, at very low renovation costs and with short renovation times.



Picture 14. Adjustment pin positions and settings.

The airflow can be adjusted by either opening or closing nozzles when using the two JetCone adjustment pins. Even an asymmetrical air pattern can be achieved by setting pins in different positions.



Picture 15. Overview of the internally integrated adjustable JetCone unit.

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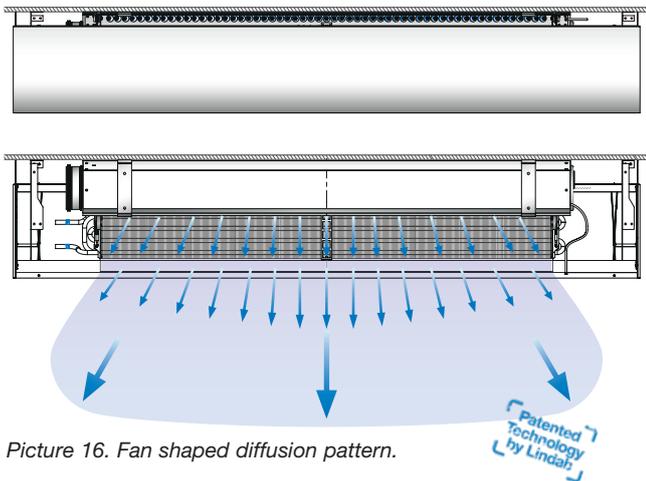
The modern chilled beam with its variable and adaptable air diffusion pattern.

Lindab's active chilled beams are good examples of today's optimal chilled beam solutions. They use JetCone regulation, with air volume easily varied linearly along the length of the beam.

The linear shape of the JetCones makes it possible to maintain the air volume and change the beam's air volume distribution by changing the setting at two spots. In this way, draught problems can easily be addressed, while maintaining the desired air volume.

Optimal variable air diffusion within Lindab's JetCone technology

With this combination you can reach the optimal air diffusion, with full variable air volumes in Lindab's active chilled beams.



Picture 16. Fan shaped diffusion pattern.

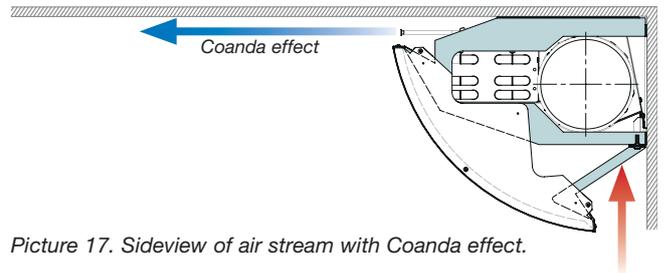
Supply air volume and static pressure adjustment

The opening size of the nozzles can be adjusted, by operating the JetCone adjustment pins in each corner of the beam. Also, the air distribution can be adjusted, to achieve an asymmetrical air pattern along the front side of the beam. All thanks to our patented JetCone system.

Optimal air spread pattern

The Lindab Angled Nozzles system successfully combines the JetCone air volume adjustment with a fixed air direction setting. The combination of the JetCone and the Angled Nozzles systems results in reduced throw lengths and reduced draft risk without losing power performance.

The Angled Nozzles release the ventilation air, the beam outlets are designed to secure the Coanda effect and a fan-shaped air pattern. The adherence of the air to the beam already occurs at the JetCone opening. Then, due to the Coanda effect, the air follows the outlet of the beam towards the ceiling. In this way, the air "adheres" to the room's ceiling.



Picture 17. Sideview of air stream with Coanda effect.

Pre-setting

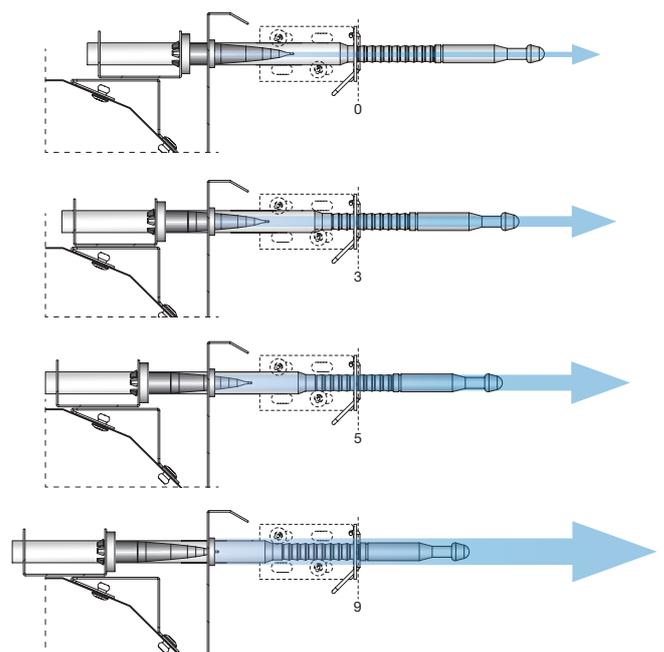
The Plafond XD Body must be ordered with fixed Angled Nozzles (for short, medium or long air direction settings), pre-set primary airflow (1-90 l/s) at a selected static air pressure loss (30-120 Pa).

With the standard JetCone system, the airflow and static pressure settings are pre-set in the factory and, if necessary, can be easily changed later.

The amount of JetCone nozzles will be factory customised according to the primary air demand to enable an average JetCone position "5" (5-5) (default). This leaves space to always have the possibility for both increasing and decreasing the primary airflow rate later on site!

You can see the minimum and maximum possible primary air volume according to your specific set-up in the [waterborne calculator](#) in LindQST.

On demand, it is possible also to choose another JetCone setting as basis f. E. to allow the reduction of primary air only with JetCone position "9" (9-9). Also, a later increase of air can be considered with a JetCone setting "3" (3-3). The [waterborne calculator](#) or [indoor climate designer](#), in LindQST, helps you to find your preferable set-up. Please do not hesitate to ask Lindab for support.



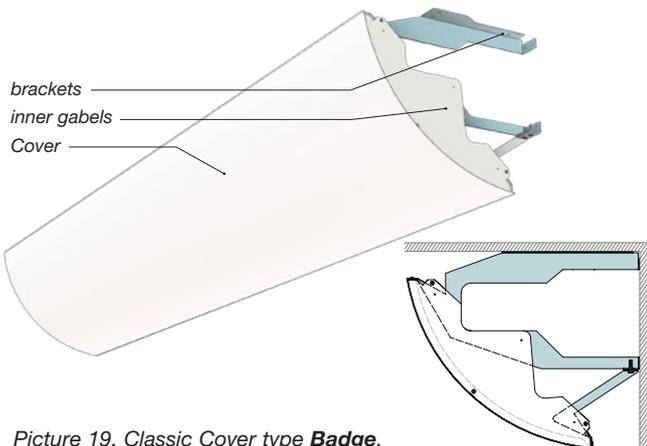
Picture 18. JetCone settings, Position 0, (max. closed, 20% air flow), Position 3, Position 5 and Position 9 (max. open, 100% air flow).

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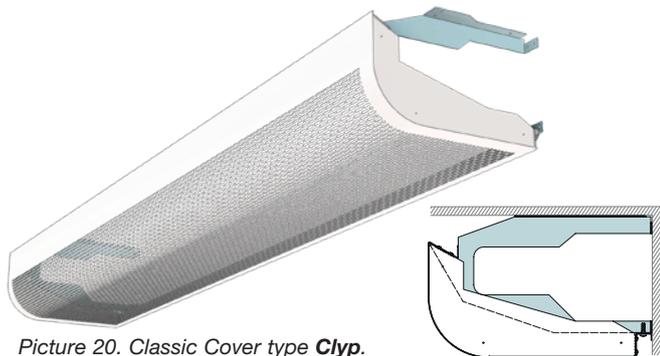
Design

The Plafond XD Cover is available in 7 different standard designs. Two well-known classic designs: Badge (formerly known as "B") and Clyp (formerly known as "C"). The covers can be easily closed on each side with design end-gables (accessories). For details see next page and [installation instructions](#). All different design-shapes are suitable for installation on a finished wall, sealed to the ceiling (FC) or with a certain distance to the ceiling (FW, Top-Cover needed).

All our Plafond XD Cover designs are protected and registered under:
Design registration no.: 008490304-0001-EU



Picture 19. Classic Cover type **Badge**.

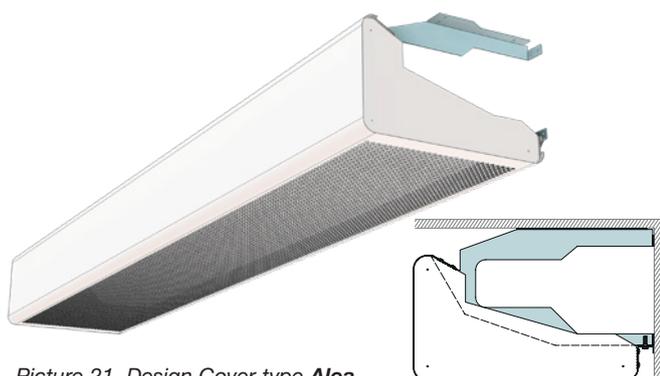


Picture 20. Classic Cover type **Clyp**.

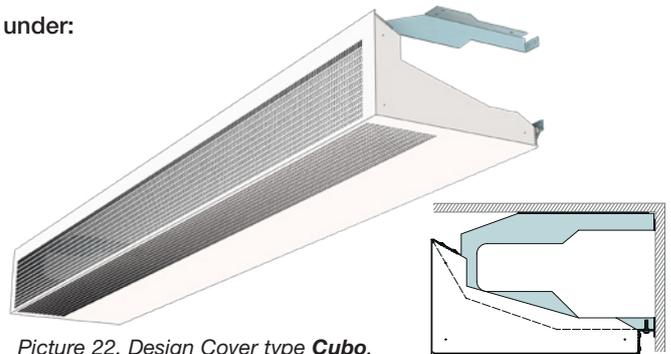
In addition we have developed five new fresh designs:

Alea, Cubo, Gap, Trac and Zune. These designs have been developed by Klaus Nolting, ON3D, Hamburg, Germany.

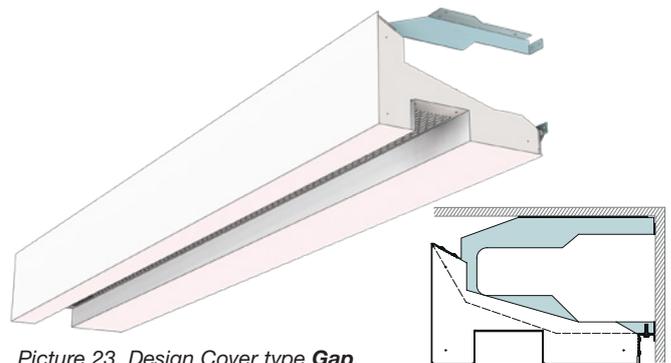
"Individually designed products are more difficult to be integrated in the DNA of an architecture as corresponding architectural elements. Therefore, new markets can be explored by designing the Covers of Plafond XD in such shapes"



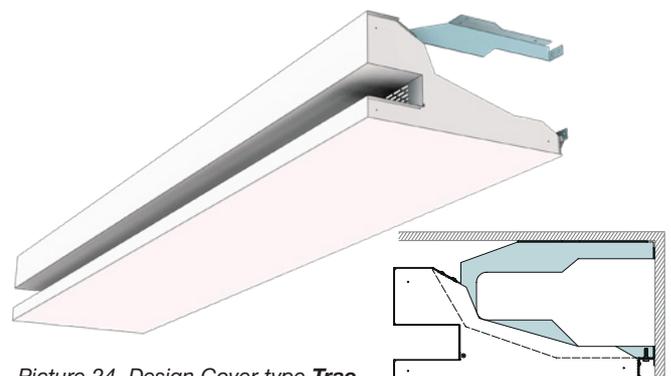
Picture 21. Design Cover type **Alea**.



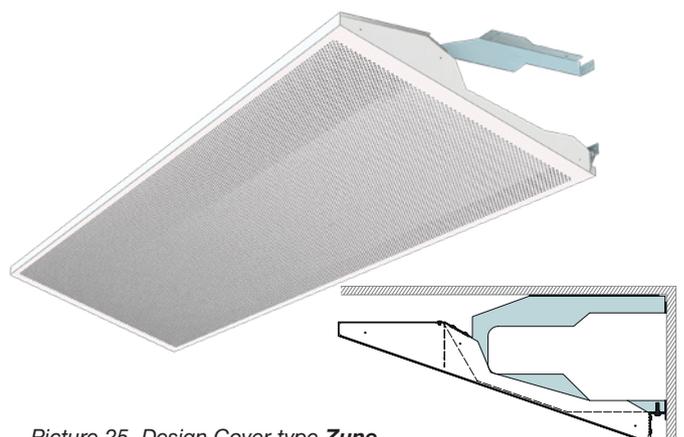
Picture 22. Design Cover type **Cubo**.



Picture 23. Design Cover type **Gap**.



Picture 24. Design Cover type **Trac**.



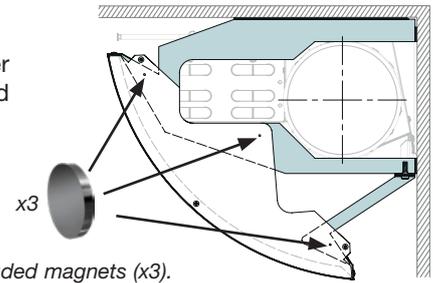
Picture 25. Design Cover type **Zune**.

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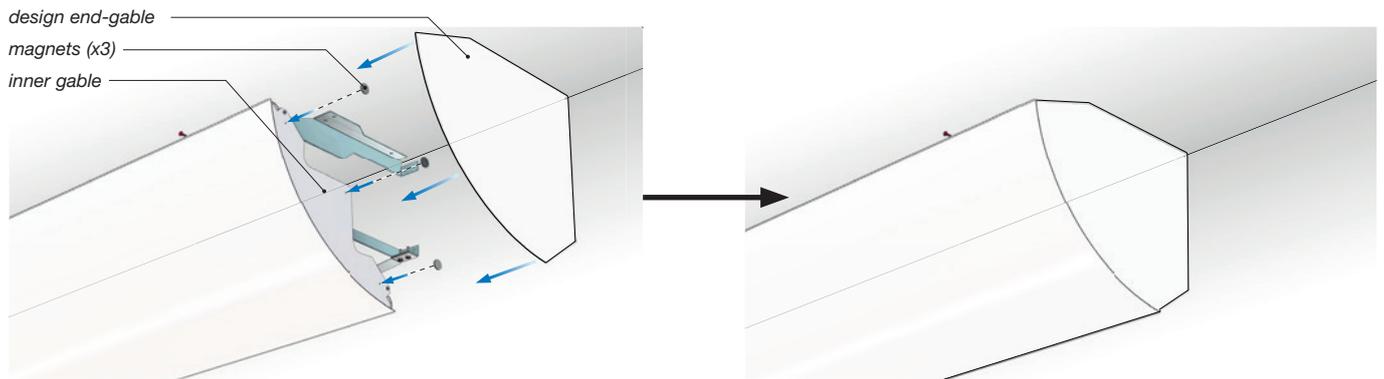
Design end-gables

There are design end-gables available for all Covers to enable a smart finish of the Cover sides when a Cover is mounted "beam", "beam to wall" or "wall to beam". Each ordered design end-gable includes three magnets for tool-less installation.

Design end-gables are not required for "wall to wall" mounted beams.

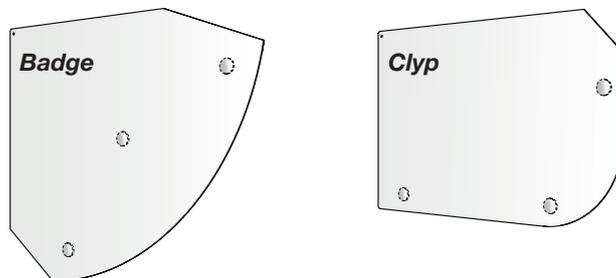


Picture 26. All Cover types have 3 small holes on inner gables which indicate where to place included magnets (x3).

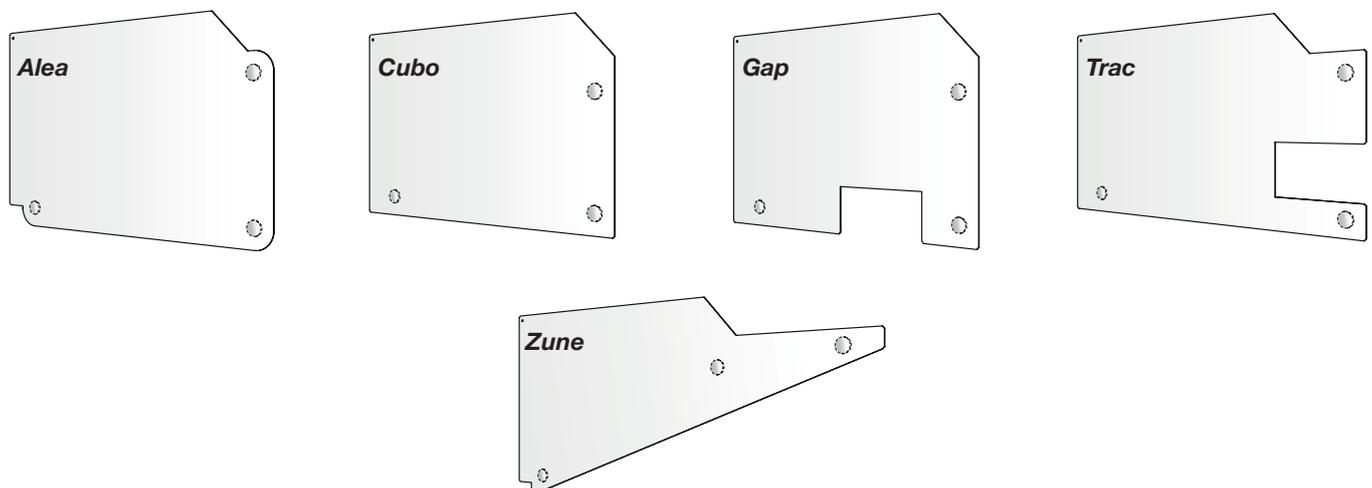


Picture 27. Installing design end-gable on the inner gable of Cover.

Design end-gables for classic Badge and Clyp Covers



Design end-gables for the design Covers



Picture 28. Design end-gables available for all Cover designs.

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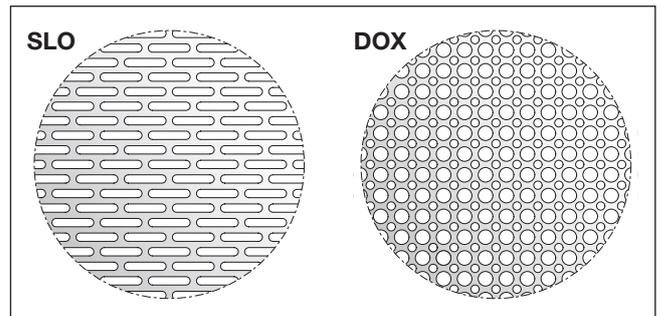
Perforation pattern

The available perforation pattern of the Plafond XD Cover depends on the design chosen. The perforation pattern acts as the air inlet for all Covers except the classic Badge Cover which never has a perforation pattern but instead an open visible slot for the air inlet.

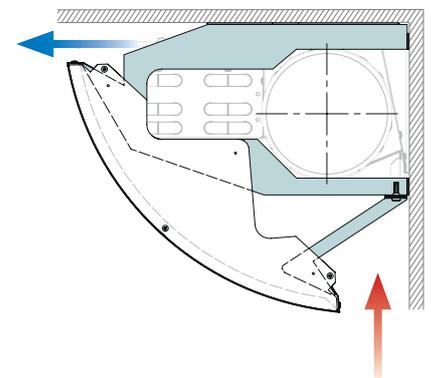
Classic Covers

Classic Covers	Perforation	Air-inlet	Air-outlet
Badge	No	Visible slot	Visible slot
Clyp	Yes	SLO DOX	Visible slot

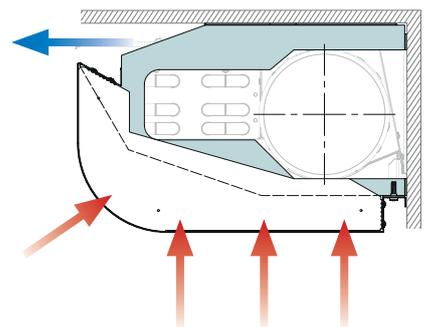
Table 2. Perforation patterns available for the classic Clyp Cover. Type in bold is standard/default. The Classic Badge Cover never has a perforation.



Picture 29. Perforation patterns available for classic Clyp Cover.



Picture 30. Plafond XD, the Badge Cover is the only design that has an open visible slot for room air inlet. The other classic Clyp Cover and all the five new available design Covers on the following pages have room air inlet through the Cover perforations.



Picture 31. Plafond XD, Clyp Cover with perforation SLO and alternative DOX.

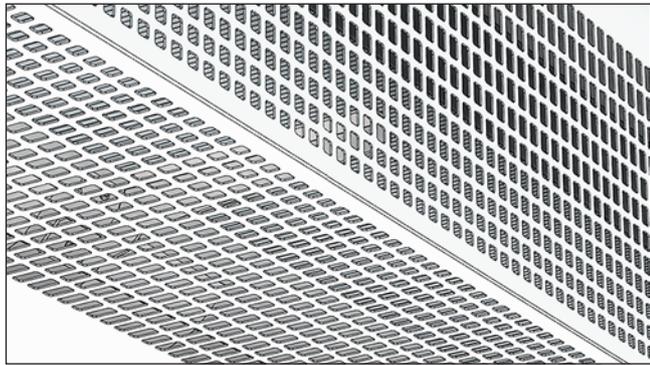
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Design Covers

New unique design Covers and new perforations

With this new concept, Lindab also introduces their new perforation pattern as a unique design form.

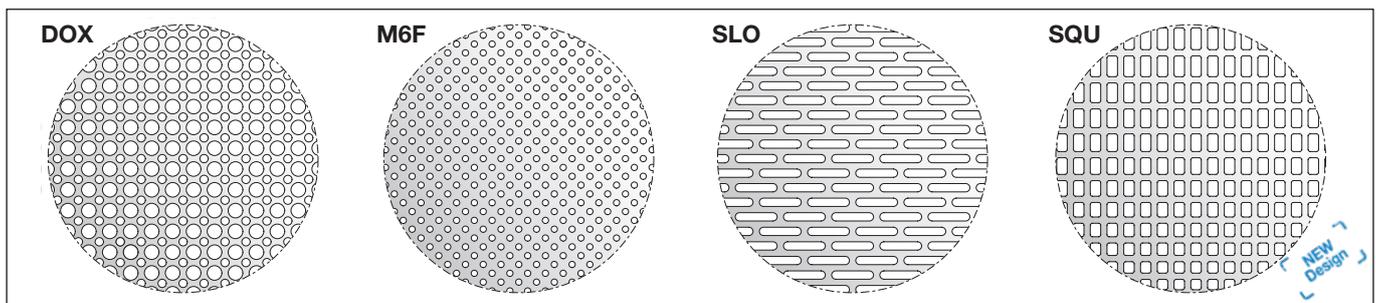
This perforation design has been developed by Klaus Nolting, ON3D, Hamburg, Germany.



Picture 32. New gradiated perforation (SQU).

Design Cover	Perforation	Air inlet	Air outlet
Alea	Yes	DOX SLO	Visible slot
Cubo	Yes	SQU SLO DOX	Visible slot
Gap	Yes	SLO	Visible slot
Trac	Yes	SLO	Visible slot
Zune	Yes	M6F	Visible slot

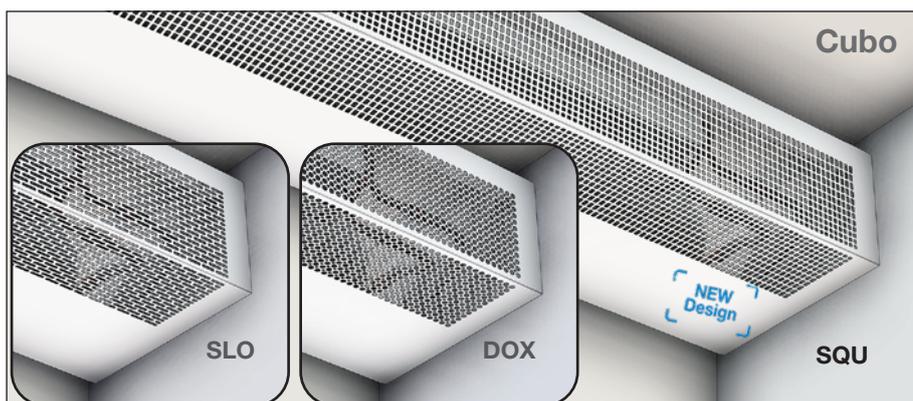
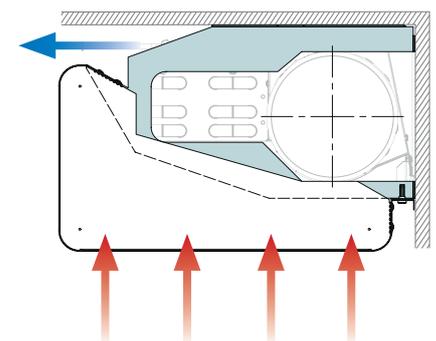
Table 3. Perforation patterns available for the new design Covers. Type in bold is standard/default.



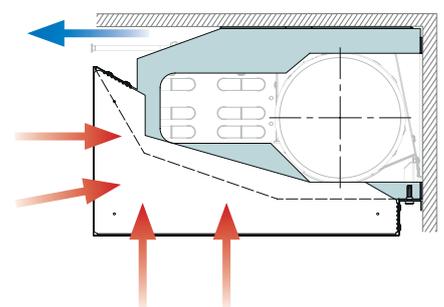
Picture 33. Perforation patterns available for the new design Covers. See table 3 also.



Picture 34. Plafond XD, Alea design Cover with perforation DOX and alternative SLO.

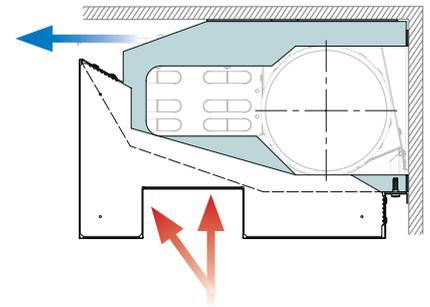
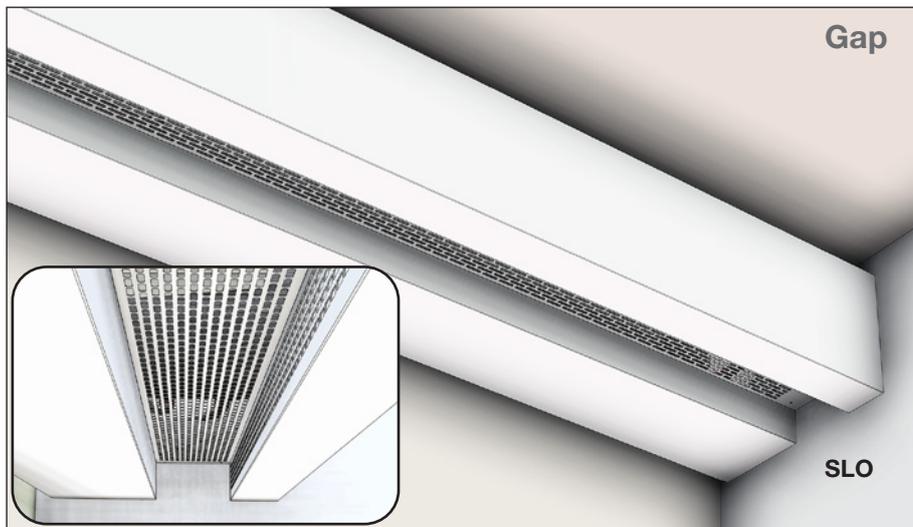


Picture 35. Plafond XD, Cubo design Cover with perforation SQU and alternative SLO and DOX.

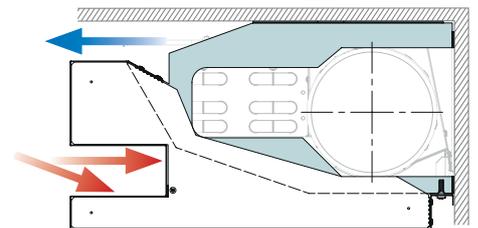
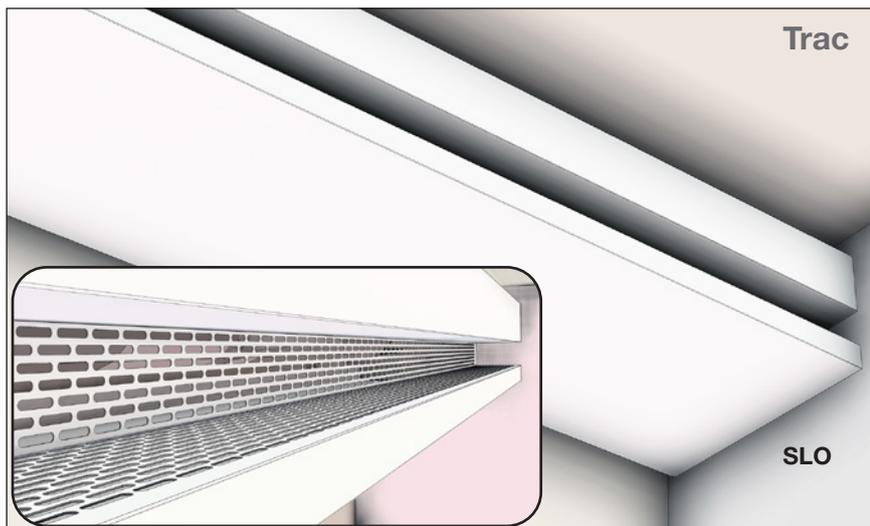


Exposed active chilled beam

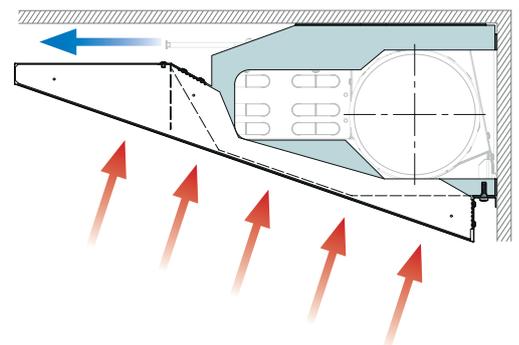
Plafond XD



Picture 36. Plafond XD, Gap design Cover with perforation SLO. Detailed view inserted.



Picture 37. Plafond XD, Trac design Cover with perforation SLO. Detailed view inserted.



Picture 38. Plafond XD, Zune design Cover with perforation M6F. Detailed view inserted.

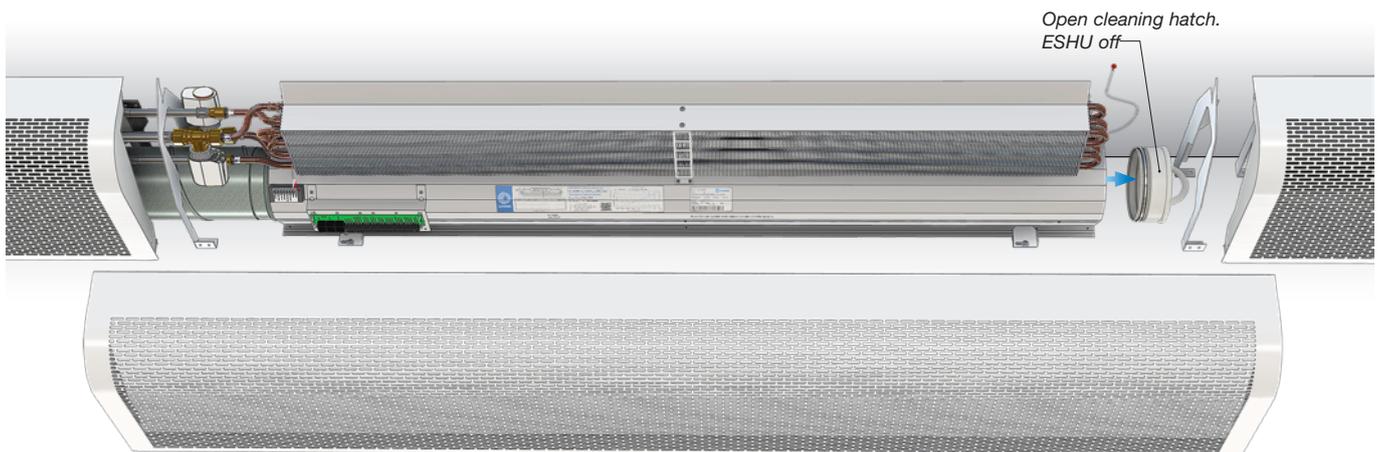
Exposed active chilled beam Plafond XD

Hygiene

Everything is accessible

The requirement for all parts of the beam Body to be easy to clean has been met by the separate, removable Plafond XD front Cover. A cleaning hatch on the beam's air duct provides easy access, so the inner air plenum can be cleaned from the outside.

Maintenance details, see Plafond XD document [Installation Instruction](#), chapter 7.



Picture 39. Easy access to the beam Body. Everything is accessible.

The cooling battery is accessible from three sides and therefore can be cleaned thoroughly. The same applies to the JetCone-/Angled Nozzles, which are accessible from the front. All of this allows thorough cleaning of the product. It is of primary importance to be able to clean the batteries in products installed in premises with high concentrations of dust particles.

Room environment

The ventilation principle in Plafond XD is horizontal air distribution to spread the cooled air across the ceiling. The fixed distribution pattern (short, medium or long) can be selected, with our quick selection tool [lindQST](#), according to the layout of the room. With the JetCone system the air direction can be easily adapted.

The warm room air is then absorbed from the central area of the room and fed to the beam for further cooling (see pictures 40 to 41). The heating works vice versa.

Plafond XD's one-way air distribution is especially suited for premises where the ceiling has beams or is at different levels. The construction is designed to enable the product to be installed with the air direction horizontal. The product's air circulation can be adapted to the conditions of the specific room, resulting in low air velocities.



Picture 40. Plafond XD-FW with Cover type Clyp.



Picture 41. Plafond XD-FC with Cover type Badge. Installation principle "wall/beam".

Exposed active chilled beam Plafond XD

Plafond XD meeting modern demands

Designing for wellbeing demands agile office design with new and alternative solutions for the many requirements of a working environment including lighting, ergonomics, spacial planning as well as ventilation, noise levels, deep cleanability, efficiency, quality and appearance.

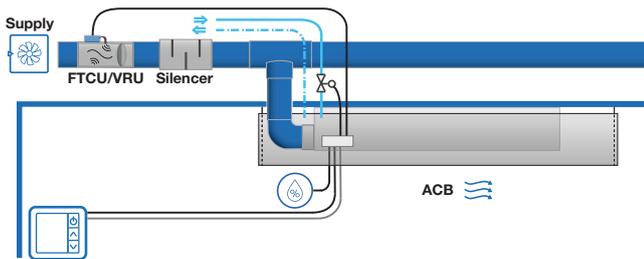
Traditional ventilation methods are being challenged. To meet expectations, ventilation systems are now required to have a very long life cycle but with the ability to adapt to changes in aesthetic or performance requirements.

Plafond XD provides a long service life, low noise, low maintenance, low energy use and can easily satisfy requirements for rapid space reassignment and style updates to meet modern demands.

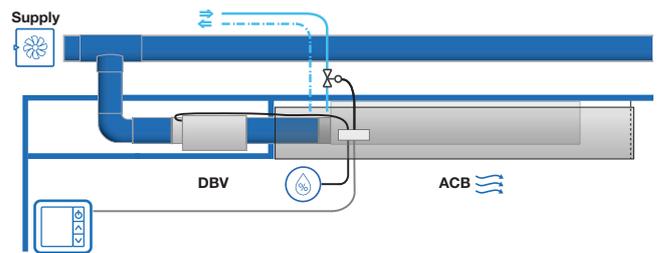
Plafond XD can integrate easily into any design aesthetic, allowing a ceiling clear of services or can be made into a feature with your choice of seven standard Cover styles. We can also consult to help with development of Covers in alternative shapes, materials or finishes for use with our Plafond XD Body to enable a truly unique solution.

Traditional fan coil systems would usually require additional units for any reconfiguration however you can easily future-proof your space by installing Plafond XD Bodies back to back in large rooms. This simplifies any future refit requiring partitioning into independent spaces (as shown on page 18).

Plafond XD can be used in conjunction with Lindab UltraLink, VRU or DBV to form a complete demand controlled ventilation system providing substantial energy saving opportunities and improved indoor air quality.



Picture 42. Plafond XD with FTCU and silencer.



Picture 43. Plafond XD with DBV plenum box.



DBV
Flow regulator for supply air.



VRU
Volume flow regulator - circular.



FTCU
UltraLink® Controller.

Picture 44. DBV, VRU, FTCU can in conjunction with Plafond XD form a complete demand controlled ventilation system..

Though the Plafond XD as standard is installed sealed to the wall, the product has been re-designed to meet any modern demands to e.g. office environments. The brackets for both Bodies and Covers are designed so it is possible to install your Plafond XDs sealed to the ceiling as well.

Changing a single office to an open office, see next page.

Plafond XD is the perfect basis choice to combine esthetics, flexibility with any multi service functions (on demand please contact Lindab for further information or detailed project planning support).

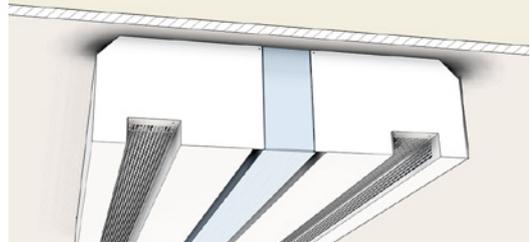
Exposed active chilled beam Plafond XD

Changing a single office environment to an open office

The Plafond XD is the ideal choice for a dynamic office.



Picture 45. Two Plafond XD's placed back to back against removable partition wall.



Picture 46. The partition has been removed and replaced by coverings.



Picture 47. Plafond XD mounted back to back around removable partition wall, sealed to the ceiling.



Picture 48. The partitions have been removed without affecting the Plafond installations.

Exposed active chilled beam Plafond XD

Installation principles of Plafond XD Body in combination with Plafond XD Cover

The Plafond XD-Body can be easily covered by seven different Plafond XD Cover designs. For covering the Plafond XD Body and the connections, the length of the Cover must be 400 mm longer than the nominal length of the Plafond XD Body. The capacity output of the chilled beam is not influenced by the different designs. This gives full architectural freedom. There are design end-gables available in all Plafond XD Cover designs to close the Covers at the sides.

The Plafond XD Body must always be covered by a *single Cover*. Two Covers are not allowed to overlap the Body. If the distance to the wall can not be covered by the max. Cover length an additional *connection Cover* must be ordered.

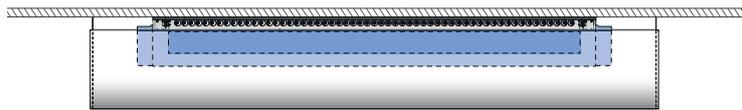
Min. and max. length of Bodies and Covers:

Body: $800 \text{ mm} \leq L_{\text{Body}} \leq 3.200 \text{ mm}$ Cover: $1.200 \text{ mm} \leq L_{\text{cov}} \leq 3.600 \text{ mm}$ Connection Cover: $200 \text{ mm} \leq L_{\text{cov}} \leq 3.600 \text{ mm}$

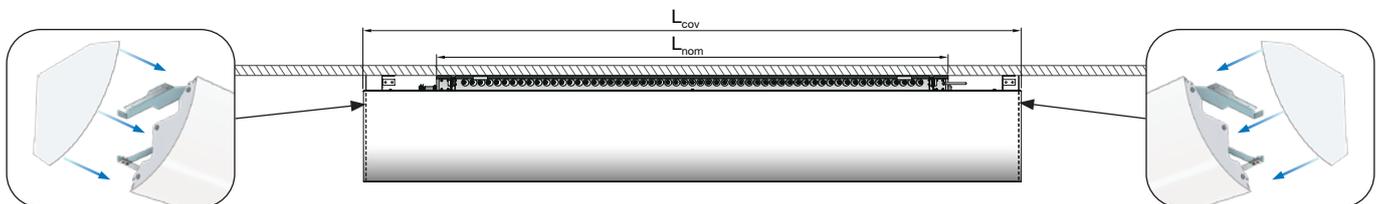
Plafond XD Cover, covering the Plafond XD Body and connection pipes

A wall mounted Plafond XD Body can be covered together with all piping and cabling from beam, on one side (A1) or two sides of the Body (A3,) leading directly into the back wall or ceiling.

Length of a Plafond XD Cover: $L_{\text{cov}} = 1.200 \text{ mm} \leq L_{\text{nom}} + 400 \text{ mm} \leq 3.600 \text{ mm}$.



Picture 49. Installation principle "beam". This type of installation will need two design end-gables like shown in picture 50.



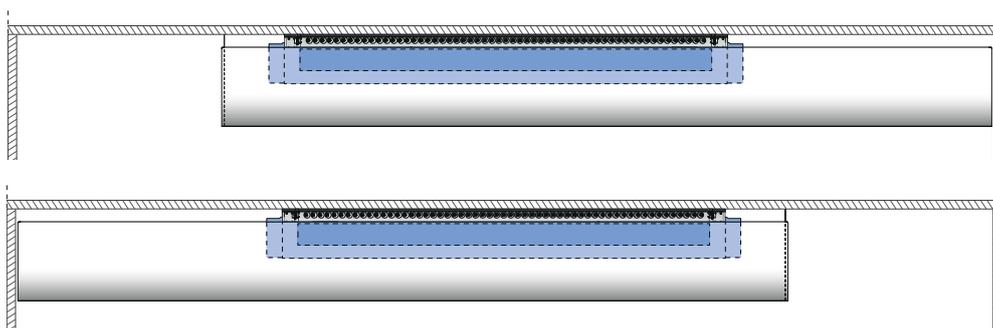
Picture 50. The available design end-gables will conceal the Body and connections, completing the installation. Design end-gables are available for all Cover design types.

Plafond XD Cover, covering the Plafond XD Body from beam to wall

A wall mounted Plafond XD Body can be covered together with all piping and cabling from beam on one side of the Body only from wall to beam or vice versa from beam to wall.

Length of a single Plafond XD Cover: $L_{\text{cov}} = 1.200 \text{ mm} \leq L_{\text{nom}} + 400 \text{ mm} \leq 3.600 \text{ mm}$.

If the distance to the wall cannot be covered by the Cover related to the Body an additional *connection Cover* must be ordered.



Picture 51. Installation principle "beam/wall and "wall/beam". One design end-gable is required for these configurations.

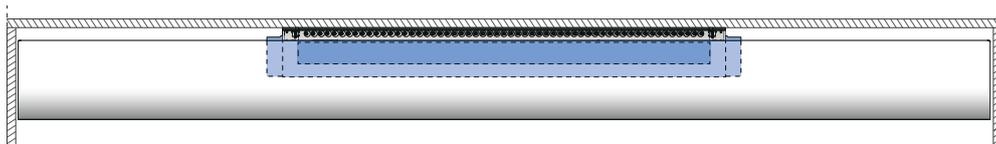
Exposed active chilled beam Plafond XD

Plafond XD Cover, covering the Plafond XD Body from wall to wall

A wall mounted Plafond XD Body can be covered together with all piping and cabling from wall to wall.

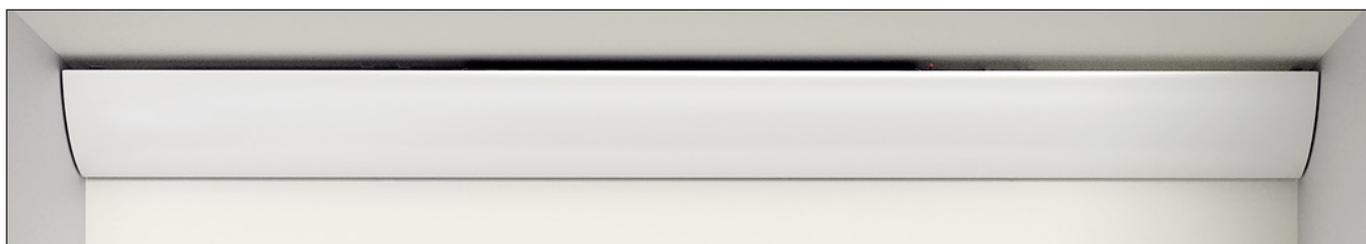
Length of a single Plafond XD Cover: $L_{cov} \geq L_{nom} + 400 \text{ mm} \leq 3.600 \text{ mm}$.

If installation wall is longer than 3.600 mm or if the distance to the walls cannot be covered by the Cover related to the Body one or more additional *connection Covers* must be ordered.

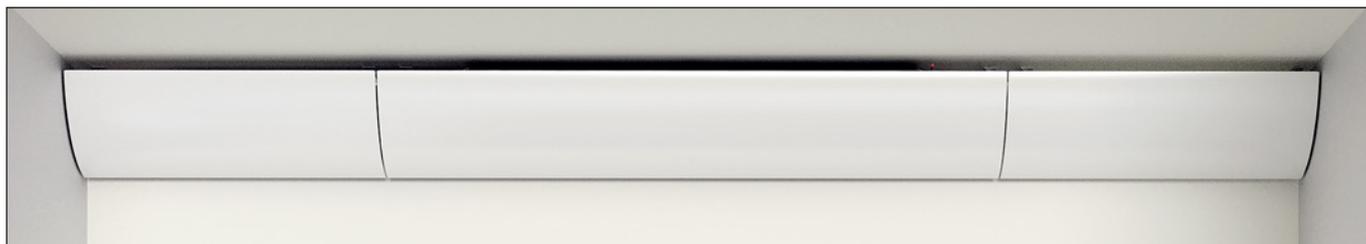


Picture 52. Installation principle "wall/wall".

If a uniform appearance throughout the whole wall is desired, additional Plafond XD Covers can be supplied and installed in series. The Plafond XD Covers can be designed to extend from wall to wall, maximum single Cover-length is 3.600 mm.

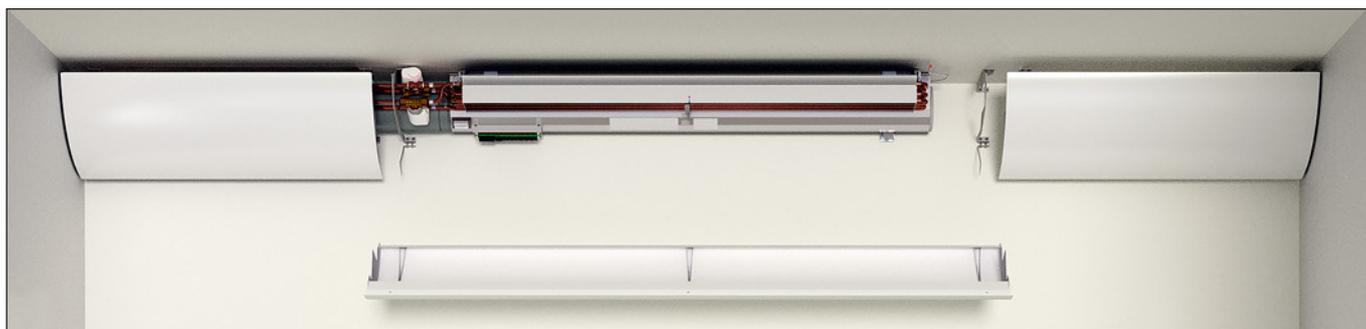


Picture 53. Plafond XD with Cover design Badge as a single Cover extending from wall to wall. Max. length is 3.600 mm.



Picture 54. Plafond XD with Cover design Badge in series (3 pieces) extending from wall to wall. In this installation the XD Body is hidden behind the center Cover.

For the best possible accessibility for cleaning, suspension, adjustment or maintenance of the active Plafond XD Body, the whole Plafond XD Cover can be easily removed. Valves, actuators and controls can be placed behind the Cover, so they are easily accessible for adjustment and maintenance. The active Plafond XD Body will be separately mounted before the Cover is mounted. The Cover will be mounted with additional brackets, independent from the Body.



Picture 55. Only four screws are loosened to remove the main Cover for maintenance.

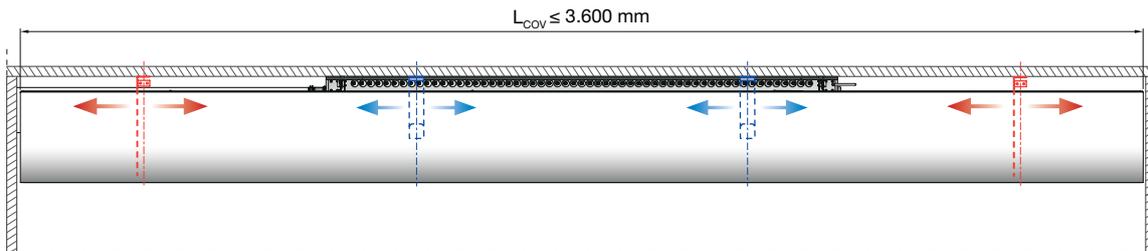
Exposed active chilled beam Plafond XD

Positioning of the Plafond XD Body

The Plafond XD Body can be placed anywhere behind the Plafond XD Cover. Use [LindQST](#) to find best place according to air distribution in the room. (See picture 49-51).

Positioning of the installation brackets

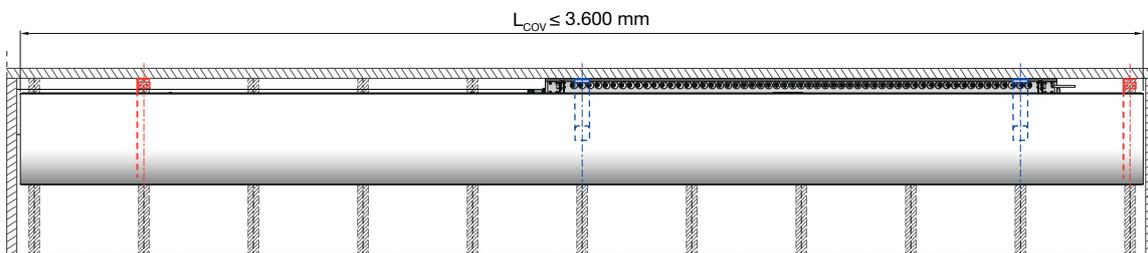
The installation brackets for both the Plafond XD Body and all Covers can be placed freely on the wall, see the Plafond XD [installation instructions](#).



Picture 56. Flexible positioning of both Plafond XD Body and Cover brackets. Body brackets in blue and Cover brackets in red.

Installation on a gypsum wall construction

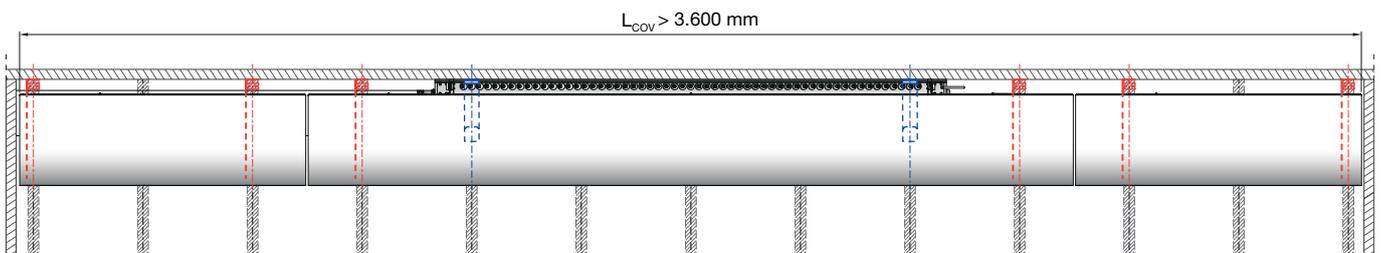
In a gypsum wall construction, it might be helpful to “hit” the inner U-profiles for easier installation. Our flexible hanging system simplifies the installation.



Picture 57. Positioning brackets for Body and Covers strategically on a gypsum wall construction. Body brackets in blue and Cover brackets in red.

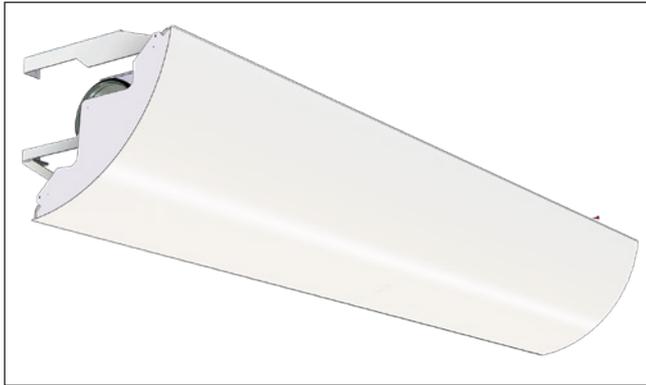
Installation walls exceed more than 3.6 meters

When the installation wall exceeds a length of 3.6 m one Cover is needed to cover the Body which can be placed independent on the wall. At least one additional Cover is needed to cover the part from the beam toward the right wall and maybe another to cover the part from the beam toward the left wall.

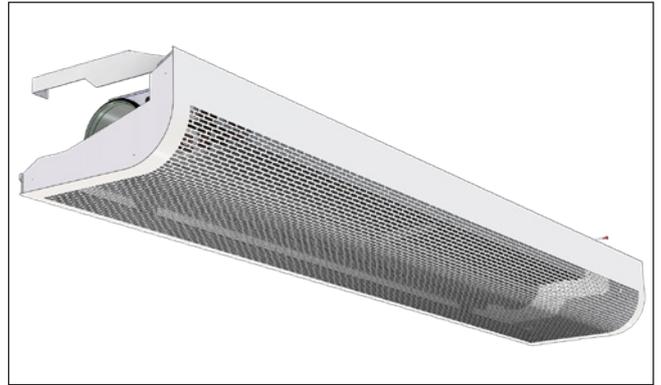


Picture 58. Positioning brackets for Body and Covers strategically on a gypsum wall construction when installation wall exceeds a length of 3.6 m. Body brackets in blue and Cover brackets in red.

Exposed active chilled beam Plafond XD



Picture 59. Plafond XD with design Cover Badge.



Picture 60. Plafond XD with design Cover Clyp.

Data, standard versions

Plafond XD is an exposed, 1-way active chilled beam. Installed on the wall in the corner underneath the ceiling (FC, wall, sealed to ceiling) or directly on the wall with distance to the ceiling (FW).

Plafond XD consists of an active Body part (Plafond XD FC/ FW) and a separate Cover.

The separate Cover is available in seven standard designs: Alea, Badge, Clyp, Cubo, Gap, Trac and Zune.

Plafond XD Body standards

Plafond XD Body types:

There are two different Body types for exposed wall installation available. FC for exposed wall installation sealed to the ceiling (without Top Cover TC) and FW exposed installation on the wall (free hanging) with distance to the ceiling (incl. Top Cover TC). See page 7 for more details.

Lengths:

Plafond XD Body is available in lengths:

$$L_{nom} = 0.8 \text{ m to } 3.2 \text{ m in steps of } 0.1 \text{ m.}$$

Height and width:

Please find the dimensions for both the Body part and all different Cover types in table 1 on page 5 and "Dimensions" on page 31-32.

Water connections:

The cooling- and/or heating in-and outlet connections are male, straight, and horizontal in 12 mm.

NB! The connection must not be soldered (use Lindab's push-on fittings!).

Air connection:

Horizontal air connection, Ø 125 mm male by a Lindab NPU-125.

Battery, 2-pipe connection:

A battery-type for cooling *or* heating, with 2-pipe connection is available.

Battery, 4-pipe connection:

A battery-type for cooling *and* heating, with 4-pipe connection is available.

JetCone:

The JetCone system is a standard feature. The factory settings will be customised to JetCone position 5 (average setting P5) according to the desired static pressure (Pa) and primary airflow (l/s) and can be changed easily on site.

The Body is available without the JetCone system. Here the Body will be pre-adjusted in factory with the right number of open nozzles, according to the desired static pressure (Pa) and primary airflow demand (l/s).

Angled Nozzles:

The Angled Nozzles are manufactured in a fixed position and cannot be retrofitted or changed (default is short). Other settings are available on request.

Inspection hatch:

The opposite side of the Plafond-Body air connection is equipped with a Lindab inspection hatch type ESHU-125.

Material:

Plafond XD Body part is manufactured as standard from enamelled sheet metal. The battery consists of aluminium lamellas and copper pipes. The JetCones are made out of plastic with adjustment pins out of aluminium.

For more details please find Building Product Declaration: [BPD Plafond XD](#).

Colour:

The inner casing (air plenum) of Plafond XD Body is painted black RAL 9003, gloss value 30.

Sample order code:

PLA-FC-12-1x125-A1L-0804-2.4-60-20-P5

Exposed active chilled beam Plafond XD

Data, Plafond XD Cover standards

Plafond XD Cover design:

The separate Plafond XD Cover is available in seven standard designs: Alea, Badge, Clyp, Cubo, Gap, Trac and Zune (see chapter "Design", page 11).

Front Cover lengths:

Plafond XD Cover is available in lengths:

$$L_{cov} = 200 \text{ mm to } 3.600 \text{ mm in steps of } 1 \text{ mm.}$$

If the Plafond XD Cover is combined with a Plafond XD Body, the Cover must go at least 200 mm over the Plafond XD body on both sides and it needs to be minimum 400 mm longer than the Plafond XD Body:

$$L_{cov} \geq L_{nom} + 400 \text{ mm.}$$

As additional connection Covers the Plafond XD Cover is available for all lengths.

Sample order code: PLA-FC-Badge-1800-NON-9003

Colour:

The Plafond XD Cover and the design end-gables are available as standard, in signal white RAL 9003, gloss value 30. Other RAL colours on request.

NB! Extended Cover:

The Plafond XD Cover can be ordered up to length $\leq 3,6$ m.

Sample order code: PLA-FC-**Badge**-2400-NON-9003

Plafond XD-Body Plus features

Factory pre-installed:

Enclosed control valves and actuators:

Lindab 2-way control valves LinFlow, with push-on fittings, variable K_v -value and equipped with 24V on/off (A 40405) or modulating 0-10 V (APR 40405) actuators can be pre-installed to the Body (including adapter VA-64). See [accessories](#) document for details.

Integrated condensation guard:

There is an option to have Lindab's [Regula Secura](#) condensation guard pre-installed in the Body.

Integrated Regula Connect cards:

The Body can be equipped with different [Regula Connect](#) connection cards.

Plafond XD-Cover Plus features

No plus features available.

Accessories

Design end-gables:

The Plafond XD Cover can be closed on both sides by a design end-gable in the same design shape (Alea, Badge, Clyp, Cubo, Gap, Trac and Zune). The design end-gables can be easily put on the Cover bracket by magnets and can be used from both sides, so they do fit on left and right sides.

Sample order code: PLA-DG-Badge-9003

Top-Cover:

A top-Cover (TC) for the Plafond XD Body will be included as standard when installation type FW ("Wall, distance to ceiling") has been chosen. It ensures full capacity output when the Body for architectural reasons is not mounted sealed to the ceiling (FC).

The Plafond XD Top-Cover can be ordered as an separate accessory also and mounted directly to the installed Body.

NB! The Top-Cover always must be installed for "Wall, distance to the ceiling" (Body installation type FW), to ensure function of the beam and is included in Plafond XD Body FW! It is colour independent, because it is not visible from below.

Sample order code: PLA-TC-2.4

Exposed active chilled beam Plafond XD

Accessories

Connection Cover:

The Plafond XD Cover can be ordered as a connection Cover, see previous page "Plafond XD Cover design" and full design range on page 11.

Air connections:

For vertical or backside connection, an additional short bend is available in Lindab's ADS assortment:



Picture 54.
BKU-125-90

Sample order code:
BKU-125-90.

For flexible air connection, a flexible duct is available in Lindab's ADS assortment:

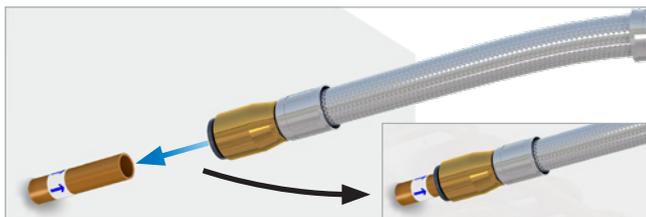


Picture 55.
Lindab's flexible duct assortment.

Sample order code:
DRATMFU-125-500

Water connection:

A vertical or side connection can be easily achieved by a push-on fitting like a bend, an oxygen diffusion inhibitory, flexible hose with push-on couplings or other coupling types. See "[accessories](#)" document.



Picture 56. Example of water connection cooling outlet with push-on flexible hose.



Picture 57. It is easy to make a vertical (ceiling) connection to the in- and outlet water-pipes of an A1L Body (2-pipe connection) using the Lindab flexible hose range.



Tectite angle 12 mm / Order code 884014



Tectite straight 12 mm / Order code 884050

Picture 58. Tectite angle and Tectite straight, both with 12 mm connections suitable for the Plafond XD

Hangers:

Installation brackets for both Body and Covers are always included. See Plafond XD [installation instruction](#) .

Control equipment:

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 [Regula Combi](#) documentation.



Picture 59.
Regula Combi

For additional accessories, please refer to the "[Accessories](#)" document.

Information:

Extract air valve:

An extract air connection can be installed easily behind the Plafond XD Cover independent from the Plafond-Body. Contact Lindab for further information.

Exposed active chilled beam Plafond XD

Dimensioning

The specific dimensioning of the active chilled beam can be easily done with our waterborne calculator in our online quick selection tool LindQST.

[Calculate the Plafond XD here](#)



Picture 60. 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 point out if a set-up will not work.

In [Waterborne Selector](#) you can compare the proposed products according to your specific requirements 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 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 CO₂ 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).



Exposed active chilled beam Plafond XD

Dimensioning air velocities

Air distribution patterns

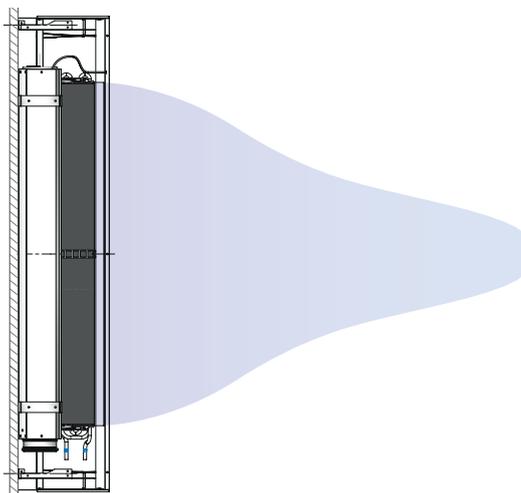
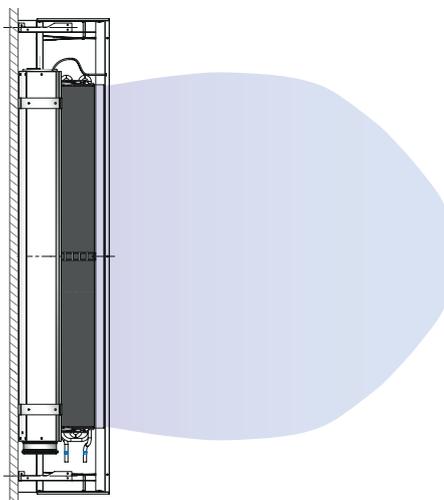
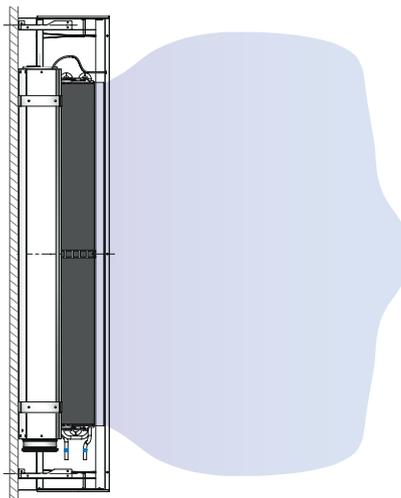
Plafond XD is supplied as default with a short air distribution. It significantly reduces both airtrow lengths and air velocities compared to the conventional linear nozzle technology.

Plafond XD is available also with a medium or a long distribution profile. Below is an example of how the different distribution profiles affect the airtrow length.

NB! This is a principle only for visualising the possible air distribution profile. To calculate the beam with your specific settings, please refer to the [waterborne calculator](#) or the [indoor climate designer](#) in www.lindQST.com.

Short air distribution (default).

Plafond XD is supplied as standard with a short air distribution that is angled outwards (Angled nozzles).



Medium air distribution.

The medium air distribution pattern provides an airtrow in between the long and the short air distribution pattern.

Long air distribution.

The long air distribution pattern is used when a long airtrow is needed; e. g. when the beam is placed centrally with long distances to the walls or several beams are installed in one line to avoid overlapping air distribution pattern, which will result in even longer airtrows.

Picture 61. Air distribution patterns.

Exposed active chilled beam Plafond XD

Connection variants for air and water

Most flexible couplings and connections for air and water

The connection variants options for Plafond XD Body are optimised in order to meet all practical coupling strategies. For further information please refer to Plafond XD [Installation Instructions](#).

Supply air connections

The Plafond XD Body has as a standard horizontal (A) supply air connection (NPU-125) equipped with Lindab SafeClick®. This makes the usage of screws or pop rivets unnecessary, and facilitates fast installation of the units, for secure installation with tightness class D. The ventilation connections are always Ø125 mm.

NB! Other than horizontal in- and outlet directions can be easily achieved using Lindab's [accessories](#) for both air and water connections.

Identify the couplings and connections for air and water.

Standing in front of the air connection side of the Plafond XD Body so you are looking into the air connection and following the air distribution through the nozzles into the room.

A = Horizontal air connection.

1 = Water connection in same side as air connection.

3 = Water connection on opposite side of air connection.

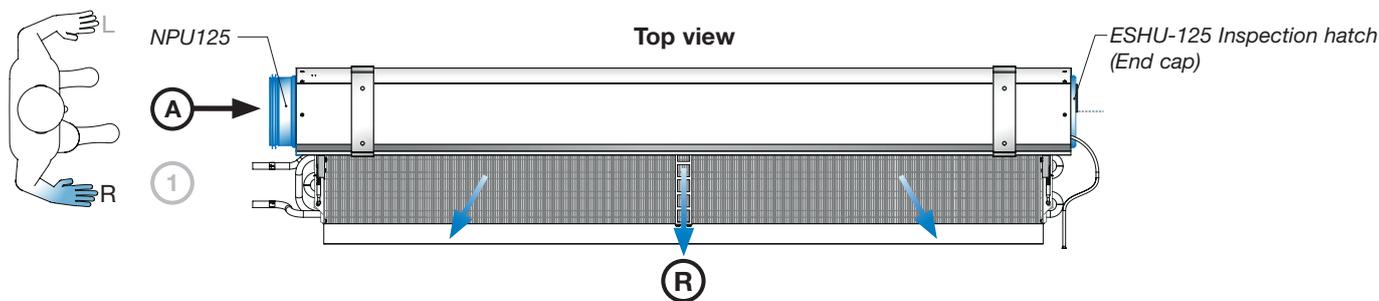
L = Air distribution is to the left.

R = Air distribution is to the right.

Basic connection types:

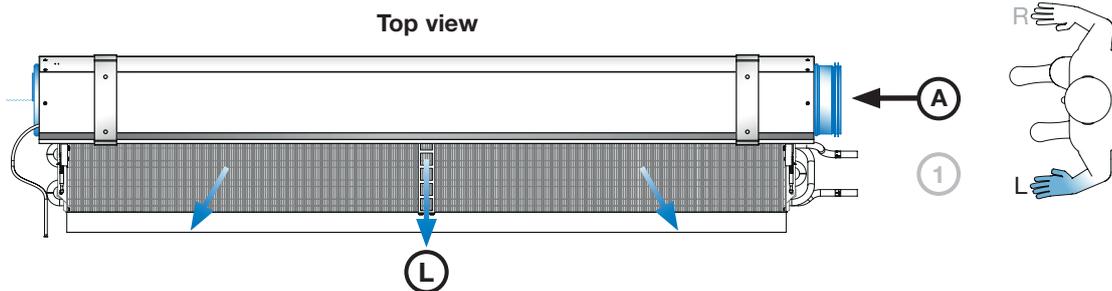
A1L, A1R, A3L, A3R

A1R



Picture 62. Configuration A1R: The supply air is distributed through the nozzles into the room to your right side.

A1L



Picture 63. Configuration A1L: The supply air is distributed through the nozzles into the room to your left side.

Picture 64. The NPU-125 can be replaced by a BKU-125-90 for air supply connection through ceiling (vertical) or wall (side).



Exposed active chilled beam Plafond XD

Water in- and outlet connections

The beam is available with one water circuit (2-pipe system) or two water circuits (4-pipe system). All dimension for the water in- and outlets are 12 mm for both 2-pipe (cooling or heating) and 4-pipe connections (cooling and heating). The connections are as a standard horizontal only,

NB! Alternatives to horizontal in- and outlet directions can be easily achieved using Lindab's [accessories](#) for both air and water connections.

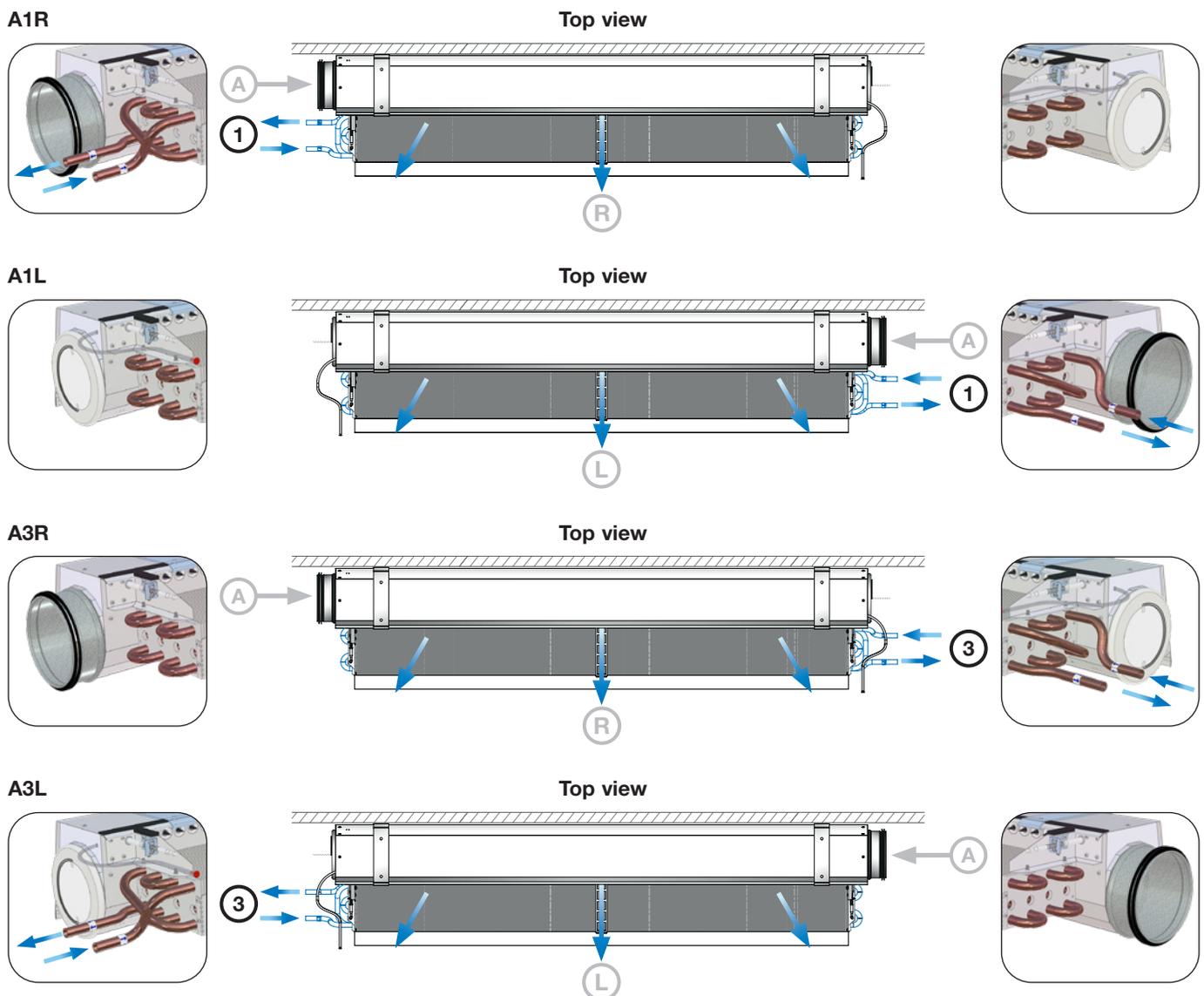
The 2-pipe water connection beam contains one water circuit only. It can be used:

- when the beams are used for cooling only (e. g. in combination with a separate independent radiator heating system).
- in change-over systems for both cooling and heating (e. g. the water circuit is connected to both a chiller and a boiler and can be used for both seasonal heating or cooling in change-over).
- in combination with a 6-way valve (where both a cooling and a heating system are controlled by a 6-way valve using the water coil of the beam for both functions).

Identifying water pipe connections

One water circuit, 2-pipe water connections, cooling or heating.

The water connections on the same side as the air connection is (1) and on the opposite side is (3).



Picture 65. Identifying water connections for the 2-way water circuit of the Plafond XD Body.

Exposed active chilled beam Plafond XD

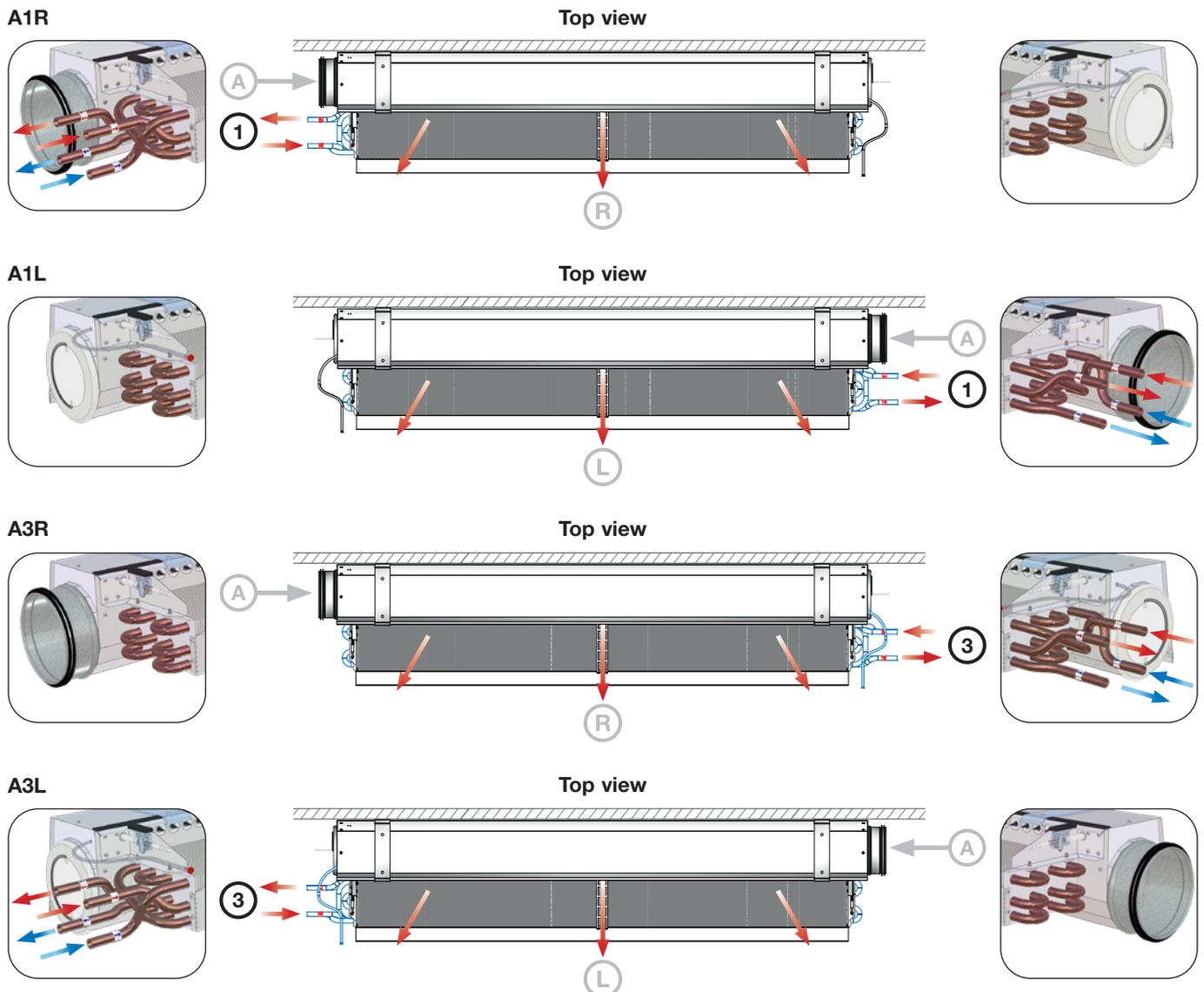
The 4-pipe water connection beam contains two water circuits. One for heating and one for cooling. This is the Lindab recommendation as it provides the most advantages:

- no additional water piping to the outside wall or along the facade (e. g. compared to a radiator heating system).
- free facade for architectural freedom (e. g. full glass facade).
- two separate hydronic systems for easy commissioning, control and lowest energy demands.
- optimised water flows for cooling and heating with easy hydronic balancing.

Identifying water pipe connections

Two water circuit, 4-pipe water connections, cooling and heating

The water connections on the same side as the air connection is (1) and on the opposite side is (3).



Picture 66. Identifying water connections for the 4-way water circuit of the Plafond XD Body.

Exposed active chilled beam Plafond XD

Dimensions

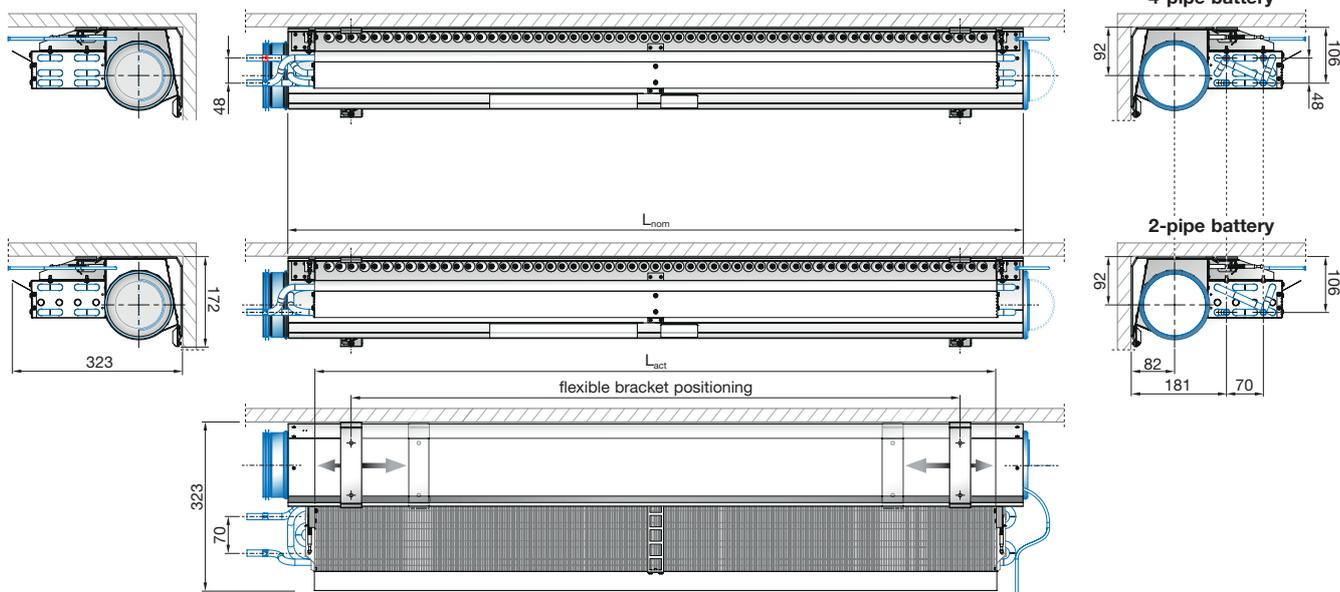
Plafond XD Body dimensions

L_{nom} = nominal length (ordering length) = 800 to 3.200 mm

L_{act} = the active length of the battery

$$L_{act} = L_{nom} - 100 \text{ mm}$$

A1R

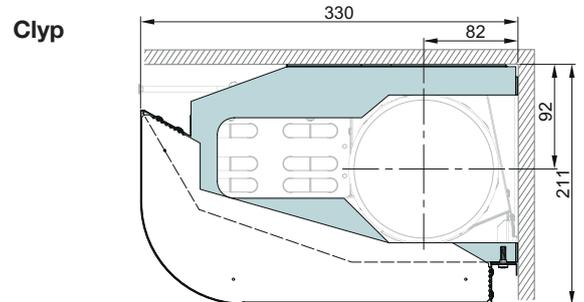
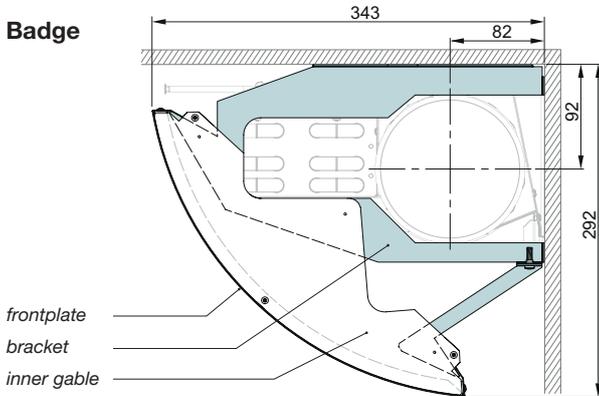


Picture 67. Dimensions valid for all Plafond XD Bodies.

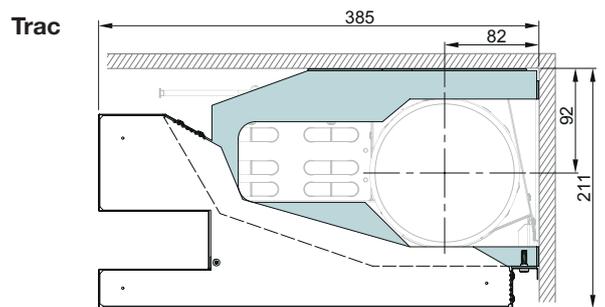
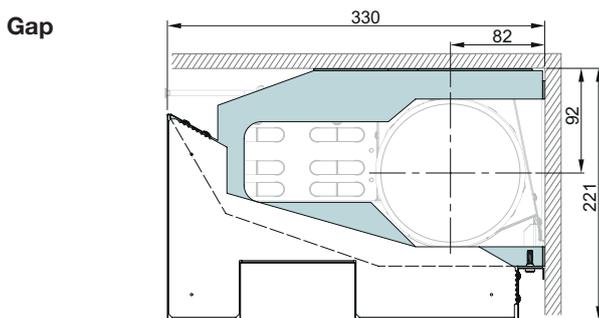
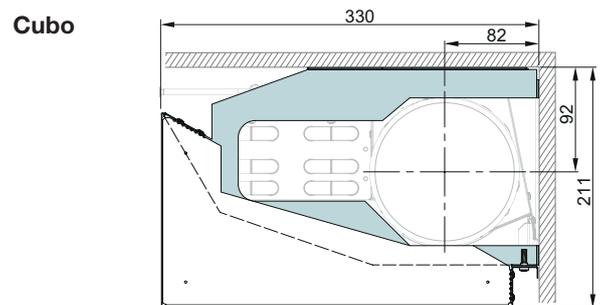
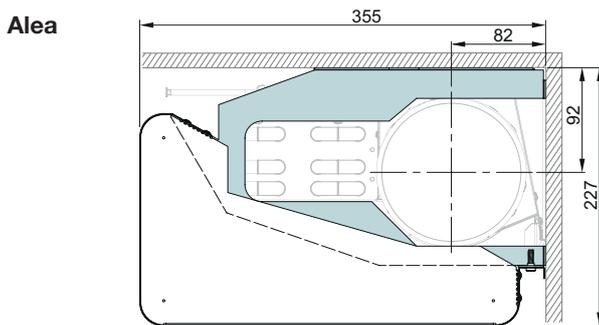
Exposed active chilled beam Plafond XD

Plafond XD Cover dimensions

Classic Covers



Design Covers

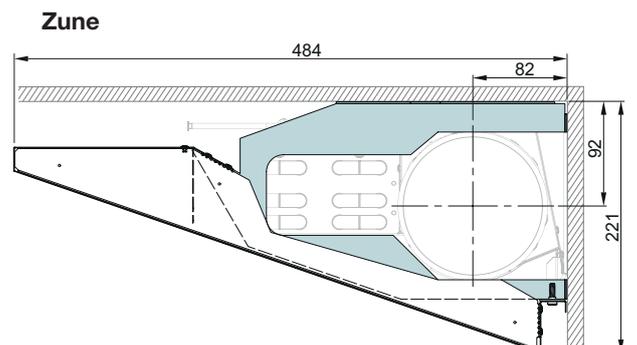


Lengths L_{cov} :

Body Covers: $1.200 \text{ mm} \leq L_{cov} \leq 3.600 \text{ mm}$.

Connection Covers: $200 \leq L_{cov} \leq 3.600 \text{ mm}$
(ordered separately)

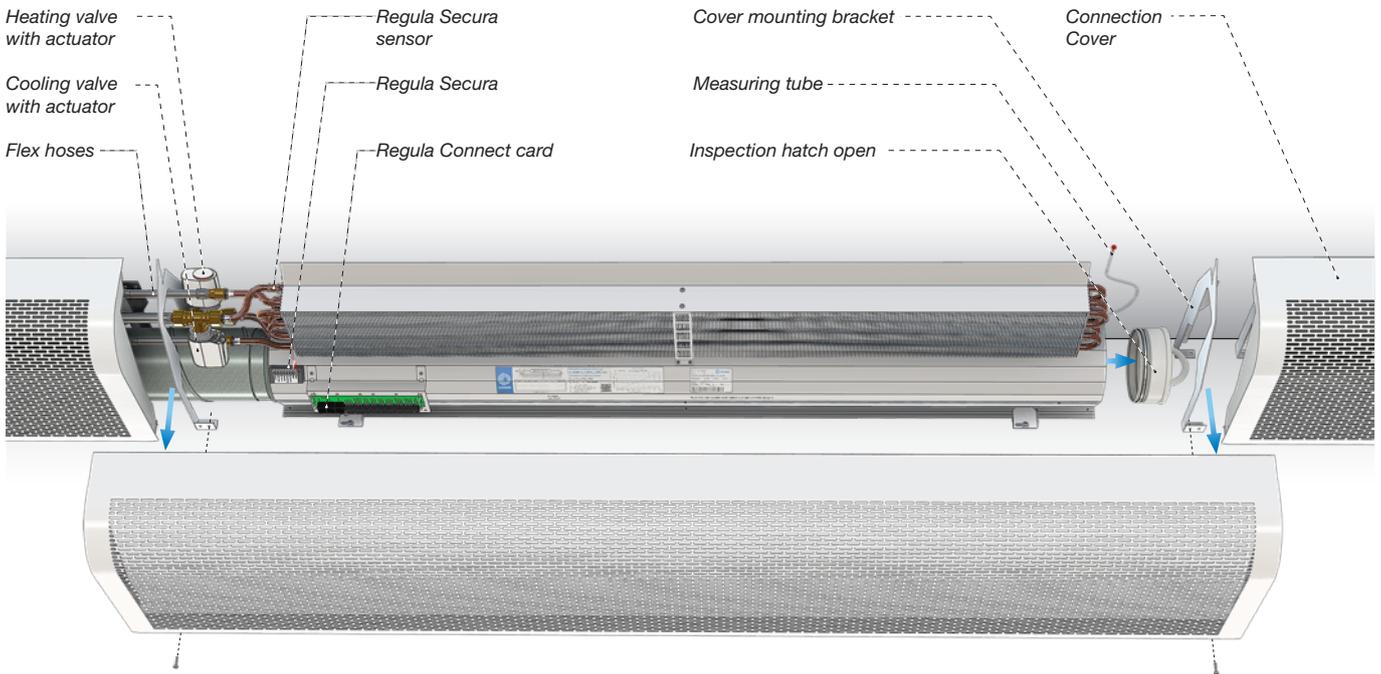
All the Covers come with two included brackets for easy installation independently of the Plafond XD Body. Go to Plafond XD [installation instructions](#) for details.



Picture 68. The chosen Plafond XD Cover design will determine the outer dimensions of your Plafond XD, hiding the Body, connections and accessories.

Exposed active chilled beam Plafond XD

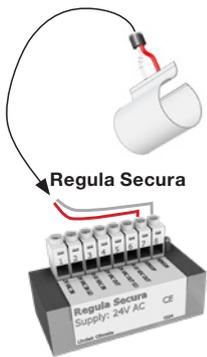
Access to inner parts



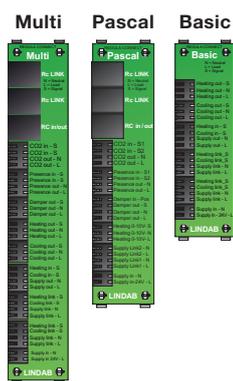
Picture 69. Plafond XD with Design Covers type Ctyp. The Body Cover is easily taken off for maintenance, while the connection Covers remain in place. Here the perforations of the connection Covers are closed by black fleece on the inside of the Covers.

Connection Covers are available with the same perforation as the Body Cover only. The perforation can be closed by a black fleece on the inside of the connection Cover (not part of delivery). Do not cover the perforation of the Body Cover since the perforation of this is for the inlet air!

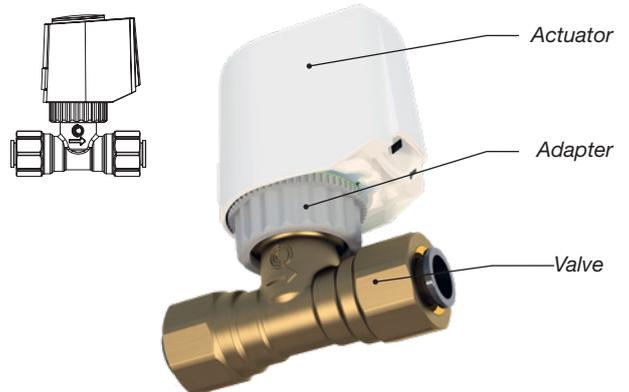
Regula Secura-sensor



Regula Connect card



Valve & actuator



Picture 70. Some of the plus features which are optionally available with the Plafond XD Body.

Exposed active chilled beam Plafond XD

Programme text

Lindab's new Plafond XD is an exposed design active chilled beam solution for ventilation, cooling and heating, which helps you to create a perfect indoor climate in rooms without suspended ceilings.

The new concept with separate technical Body and Cover, available in many different designs, makes the Plafond XD an ideal choice to fit your architectural aesthetic and building requirements.

If looking for a special design element for your room or you want to change the appearance, the new Plafond XD for exposed installation is the perfect choice. The new Covers are available in different designs to match your room style perfectly.

A modulate concept where the performance of the technical Body is not affected by the different types of Cover means that the design of the Cover can be selected at a later stage even after installation of the Plafond Body. This is architectural freedom at its best.

All technical parts of the Plafond XD Body, connections, cabling, valves, actuators and other plus features or accessories, can easily be hidden behind a Plafond XD Cover. As a special design solution, holes for sprinklers, loudspeaker or (LED-) lighting can be foreseen and pre-cut in the factory on request (depending on Cover design).

Applicable for: offices, hotels, hospitals, schools, banks, or other environments where an exposed installation is preferred or needed.

Technical data (Example)* :

Manufacturer:	Lindab
Product:	Plafond XD Body
Type:	PLA-FC-12-1x125-A1L-0800-1.8-80-17-P5
Function:	Cooling 2-pipe
Length:	1.8 [m]
Water connection:	12 [mm]
Supply air connection:	125 [mm]
Connection type:	A1L

Primary airflow rate:	20 [l/s]
Static nozzle pressure:	80 [Pa]

Water temperatures cooling in/out:	14/17 [°C]
Room temperature:	25 [°C]
Water flow rate:	0.05 [l/s]
Pressure loss:	6.2 [kPa]
Cooling capacity/beam:	797 [W]
Induction ratio:	2.9
Sound power level:	21 [dB(A)]

Amount: 2 pieces

Product:	Plafond XD Cover
Cover type:	PLA-FC-Badge-3.600-NON-9003
Length:	2.800 [mm]
Width:	343 [mm]
Height:	292 [mm]
Colour:	RAL 9003, gloss 30

Amount: 2 pieces

* For correct update of your program text find "[Waterborne Calculator](#)" on www.lindQST.com .

Exposed active chilled beam Plafond XD

Specifications

Product: Plafond XD
Body type: FC, FW
Cover Type: Alea, Badge, Cubo, Clyp, Gap, Trac, Zune

Battery type function:

2-Pipe (cooling or heating): 0800
 4-Pipe (cooling and heating): 0804

Connection diam. water, [mm]: 12
Connection diam. air, [mm]: 1x125

Coupling options: A1L, A1R, A3L or A3R

Nominal length Body L_{nom} , [m]: 0.8 to 3.2
 (in steps of 0,1 m)

Nominal length Cover L_{cov} , [mm]: 200 to 3.600
 (in steps of 1 mm)

Static nozzle pressure, [Pa]: 30-120
Primary airflow rate, [l/s]: 1-90

Distribution profile: short (default), medium or long

Plus features: See page 23 and 33

Order codes (for separate order)

Plafond XD Top Cover

Product: **PLA-TC - 2.4**
 PLA-TC
Length [m] *
 0.8 - 3.2 (in steps of 0.1 m)

* Top Cover must match ordered Plafond XD Body length.

Plafond XD design end-gables

Product: **PLA-DG - Badge - 9003**
 PLA-DG
Front Cover design:
 Alea, Badge, Clyp, Cubo, Gap, Trac, Zune *
Colour:
 9003, other colours on request

* Design of end-gable must match ordered front Cover design.

Order codes

Plafond XD Body

Product: **PLA-FC-12-1x125-A1L-0804-2.4-60-20-P5**
 PLA
Installation type:
 FC, FW
Water connection [mm]:
 12
Air connection [mm]:
 1x125
Connection type:
 A1L, A3L, A1R, A3R
Battery type:
 0800, 0804
Nominal product length [m]:
 0.8 - 3.2 (in steps of 0.1 m)
Static nozzle pressure [Pa]:
 30 - 120 Pa
Primary air flow rate [l/s]:
 1-90 l/s *
JetCone position
 P0, P1, P2, P3, P4, **P5**, P6, P7, P8, P9, NR**

* Primary airflow rate is limited by construction (number of nozzles) and depends on length, pressure and JetCone position.

** NR indicates Plafond XD Body without a JetCone system.

Plafond XD Cover

Product: **PLA-FC - Badge - 2800 - NON - 9003**
 PLA-FC
Front Cover design:
 Alea, Badge, Clyp, Cubo, Gap, Trac, Zune
Cover length [mm]:
 200 - 3.600 in steps of 1 mm *
Perforation type:
 NON, SLO, DOX, M6F, SQU **
RAL colour:
 9003, other colours on request

* Cover length must as a minimum be ordered Body length + 400 mm.
 Connection Covers can as a minimum be 200 mm.

** available perforation type according to table 2, page 13 and table 3, page 14.



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](#)