Chilled beams

Polaris I

Use

Lindab's supply air beam Polaris I has a large cooling capacity and can therefore be used to advantage in rooms with substantial cooling requirements.

In terms of appearance, Polaris I looks similar to Professor. Polaris/Professor can therefore be used in alternation in the same room and thus provide an architectonically uniform appearance in the room.

Polaris I is equipped with divergent nozzles, which results in a draft-free indoor climate.

Polaris I can be used for cooling, heating and ventilation. Polaris I can be supplied with the following features, Drypac™ condensation protection, Regula Secura condensation guard, built-in valves and actuators, built-in exhaust air valve, etc. The product offers many possibilities and great flexibility.

Installation

Polaris I is available for integrated installation. Polaris I is installed as an integral part of a suspended ceiling, where the beam is mounted on a standard T-support.

Polaris I can be supplied with horizontal and vertical connections.

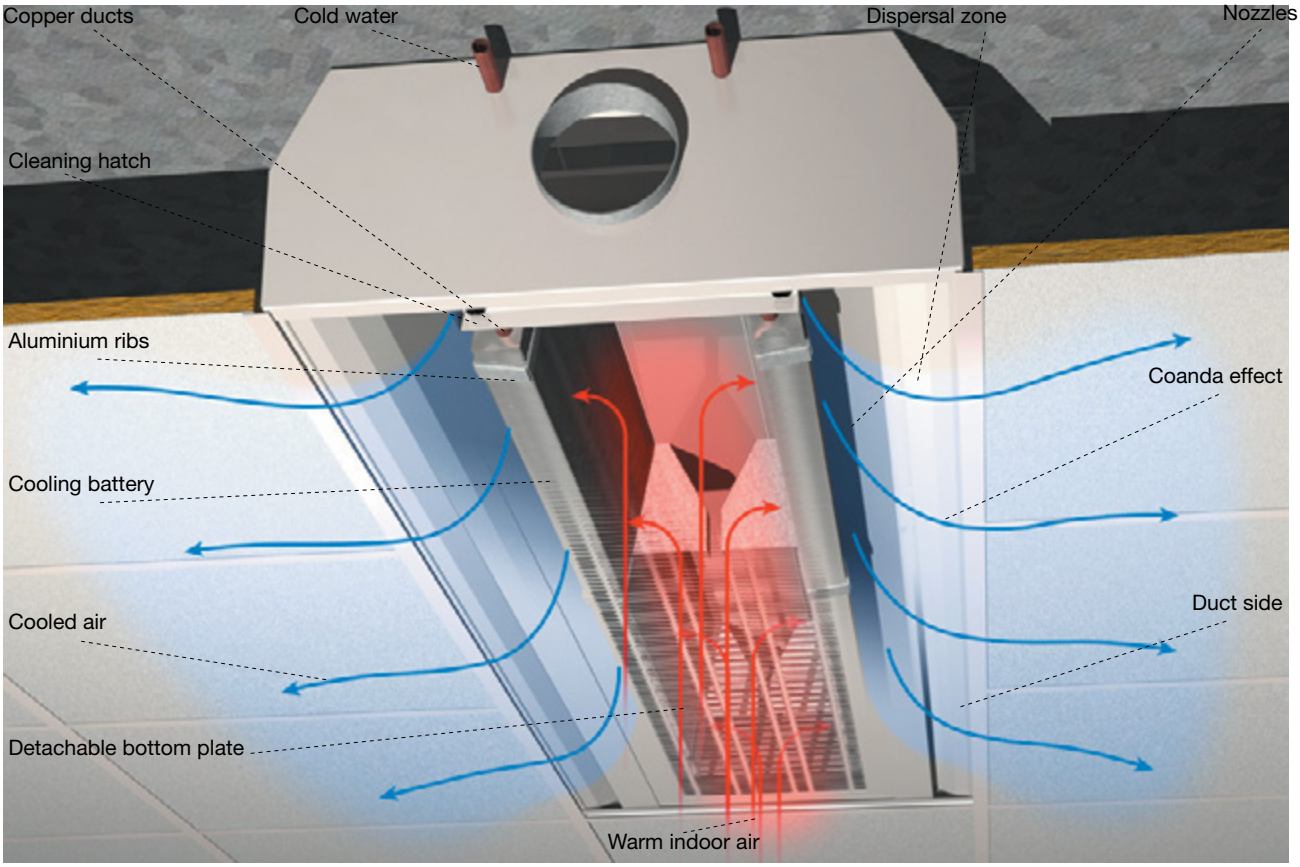
Worth noting

Polaris I is equipped with two large cooling batteries that provide a large cooling capacity. In a room with substantial cooling requirements, 200-270 BTU/ft^2), Polaris I can be used to provide the necessary cooling effect. Lindab's supply air beams are Eurovent-certified and tested according to EN-15116 and EN-14518.

Key figures

Length:	47.2" - 141.7"
Width:	23.3"
Height:	9.1"
Capacity:	Cooling effect of up to 8,350 BTU Air quantity of up 85 cfm (2 x 4" connection)

Chilled beams Polaris I



Picture 1. Polaris I is based on the induction principle.

Function

Powerful function on minimum space

Lindab's supply air beam, Polaris I, is based on the induction principle. Ventilation air with a certain 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 into the ventilation air passing through the battery (see picture 1). The volume of warm indoor air is 4 to 5 times that of the ventilation air. The air is cooled as it passes through the battery, which consists of aluminium ribs with copper pipes filled with cold running water. The heat of the room is absorbed through the aluminium ribs and then transferred through the copper pipe to the water circuit and then on to a central cooling unit. Despite the product's small external dimensions, the construction makes it possible to achieve a high cooling effect.

The nozzles releasing the ventilation air are designed to maintain the Coanda effect, i.e. the adhesive capacity of the air in the duct, in the nozzles. The air then follows the side of the duct towards the ceiling. The side of the beam is shaped so as to transfer the Coanda effect on to the ceiling of the room.

If both heating and cooling are required, there is an extra pipe in the battery, which heats the room.

Chilled beams

Polaris I

Picture 2. Polaris I 5"ø single air connection

Picture 3. Polaris I 0.08" x 14" double air connection

Construction

Maximum accessibility

For best possible accessibility for cleaning, suspension, adjustment or maintenance, the whole underneath of the Polaris I can be removed. Where the beam is equipped with built-in valves and control devices, these are also accessible for adjustment and maintenance from below. The product can be supplied in a version where the volume of air can be varied on both sides. This is achieved by different plugging of the Coanda nozzles. If required, it is also possible to plug one part of the beam completely. We have succeeded in making the product so compact, by using double vertical batteries and double air ducts (see Picture 3). If other pressures and flow patterns are required, Lindab's Coanda nozzles are easily accessible from below for plugging.

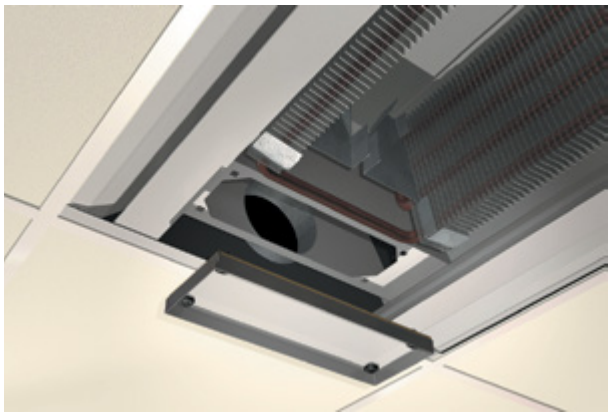
The water pipes are made of copper. Nevertheless, the water should be oxygen-free to prevent corrosion.

Hygiene

Everything is accessible from below

The requirement for all parts of the beam to be easy to clean is met by the removable underside. Polaris I with a single air connection is also supplied with a removable hatch, on the distribution duct, for cleaning and making adjustments (see Picture 4). By loosening the hatch, you can clean both the inlet duct system and the beam's side ducts from the inside. Polaris I with double air connection has a removable cleaning hatch on the end-piece of the product. The vertical batteries are accessible from three sides and thus can be cleaned thoroughly. The same applies to the Coanda nozzles, which can be easily cleaned from below.

All of this allows the product to be cleaned thoroughly. With the Polaris I, with single air connection, this is pos-



Picture 4. Cleaning and making adjustments.

Chilled beams

Polaris I

Climate units

Cooling, heating, ventilation and control

The large capacity of the product allows it to meet the room's need for cooling, ventilation and heating, while occupying a very small area of the ceiling. In a normal-size office, a unit 47.2" long is often sufficient! Since the product is supplied with a factory-preset airflow, at a certain air pressure, installation is quick and easy. By removing the nozzle plugs or plugging more nozzles, respectively, the airflow, if necessary, can be increased or decreased at a later time. The increase, however, is limited by the number of nozzles.

Polaris I can also be supplied with built-in valves and actuators for cooling and heating.

Room environment

The Polaris' ventilation principle is that the cooled or heated air is spread across the ceiling until it reaches the walls where it is driven down into the room (see Picture 6). The heated air is then absorbed from the room and fed to the beam for further cooling or heating. In this way, the room is kept well ventilated. In some cases, conventional supply air beams, which spread the air linearly, can create high air velocities, as the air stream becomes compressed and concentrated towards the centre. To reduce air velocities, the air distribution in Polaris I is angled outwards. The outer nozzles point slightly outwards, which leads to air velocities lower significantly than with conventional supply air beams with a linear outlet.

By using double air ducts, we have made use of all the volume in the beam. The beam can therefore cope with large volumes of air while keeping its noise low, despite its small external dimensions.

Regarding the noise, the nozzles are shaped like an inverted trumpet, i.e. somewhat negatively directed at the outlet, which also leads to very low noise from the nozzle. The structure of the product, with a distribution channel towards the double side ducts, means that the product's sound attenuation is good and that cross-noise in the ventilation system and between rooms is low.

Design

The underside can have different appearances, either transverse slots or round or square perforations.

Chilled beams

Polaris I

Data

Variants

Size: Polaris I is 23.3" wide and 9.4" high (incl. fixings).

Lengths: Polaris I is available in lengths from 47.2" - 141.7" in steps of 4".

Water connection: The cooling water connection is available in o.d. 0.6" or 0.9". Both horizontal and vertical connection are available as part of the standard package. The connection for the heating pipes is o.d. 0.6".

Air connection: The single air connection has a dimension of 5"Ø Both horizontal and vertical connections are available as standard. Polaris I with double air connection uses two 4"Ø, horizontal connectors.

Design: Polaris I is available with different types of bottom plates. The bottom plate is perforated with Slot 0.2" x 0.8" as standard, but other surfaces are also available.

Nozzle angle: The nozzles can be ordered with different angles, 0°, 16° or 30°. The standard is 30°.

Anti-crosstalk hood: It is included in the standard package, to prevent noise spreading to adjoining rooms, but also if there is a requirement for the room air not to come into contact with the space above the suspended ceiling.

Surface treatment: Polaris I is manufactured as standard from enamelled sheet metal, color white, RAL 9010.

Airflow control: The product has a preset pressure drop value, so on-site adjustment is not necessary. A prerequisite is that the duct system in the building has a relatively low-pressure drop compared to that of the product. Where a damper is required, you can order a balancing damper.

Plus features

Factory preinstalled.

Heating: Polaris I can be supplied with a heating feature. An additional coil in the battery heats the room.

Drypac™: Anti-condensation treated cooling batteries that enable water temperatures below the dew point without dripping.

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

Air vent: Air vents are not supplied as part of the standard package but it is possible to order them to be preinstalled.

Adaptation to suspended ceiling: The product can be adapted to most types of suspended ceilings offered on the market.

Exhaust valve: The product can be provided with an exhaust valve.

Cooling effect, Polaris I

Drypac™, condensation protection

All Polaris I models can be ordered with Drypac™ plus, a condensation protection consisting of perlite (volcanic stone) that is applied to the fin surfaces. Drypac™ has properties that enable it to work with a supply temperature that is 39.2° F below the dew point, for continuous operation, and 41 to 46.4° F below the dew point for limited periods. Drypac™ provides both an increased effect output and increased security against condensation drips. At a working temperature above the dew point, the output is reduced by 17% but when the working temperature is below the dew point, there is no reduction in output. This means that the effect is highest when the need is greatest.

Chilled beams

Polaris I

Couplings & connections

Polaris I is supplied in lengths from 47" - 142" in steps of 4". The connection dimension for the water is o.d. 0.60" or 0.87", and 5" (single) and 4" (double) for the air.

Polaris I is available with a large number of coupling options. This is how to find the designation for the coupling option you require for Polaris I.

Note: Connections C and D have a higher noise value than is indicated in the quick selection charts, please check with Lindab.

Step 1.
Indicate the position for the ventilation connection.

Step 2.
Indicate the position for the pipe connection.

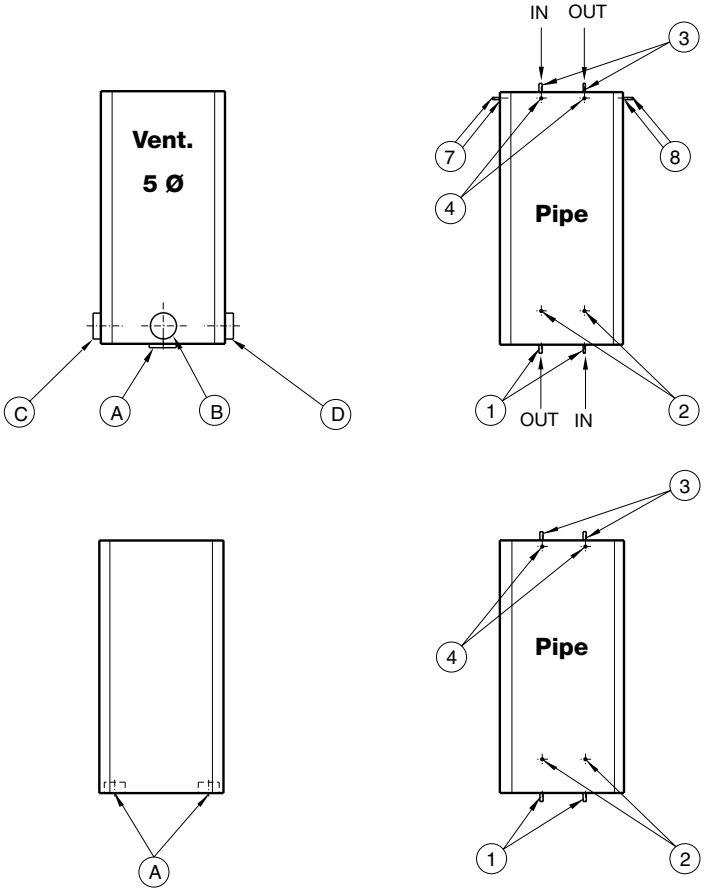


Figure 1. Coupling and connection options.

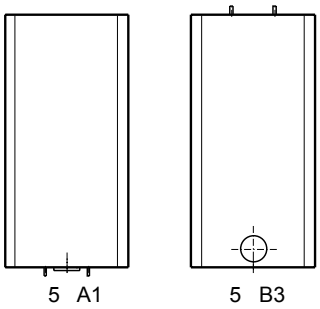


Figure 2. Coupling options A1 and B3, 5"Ø air connection.

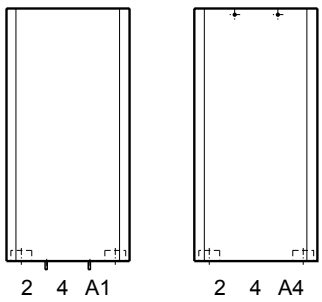
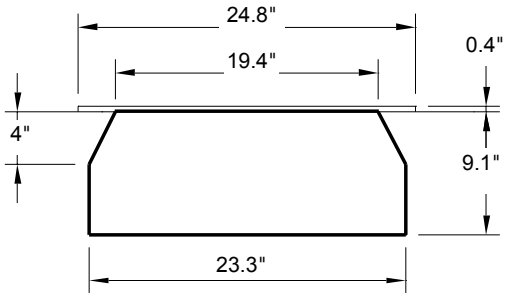


Figure 3. Coupling options A1 and A4. 4"Ø air connection.

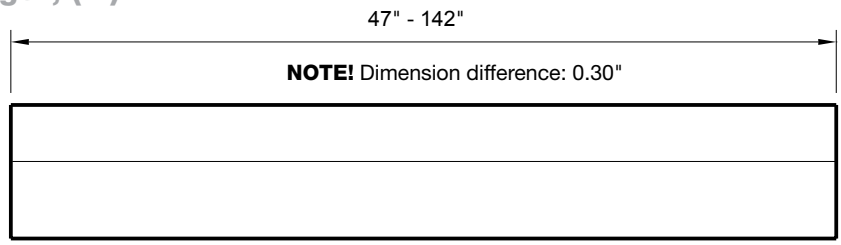
Chilled beams

Polaris I

Width & height, (in)



Length, (in)



Dimensions, (in)

5Ø

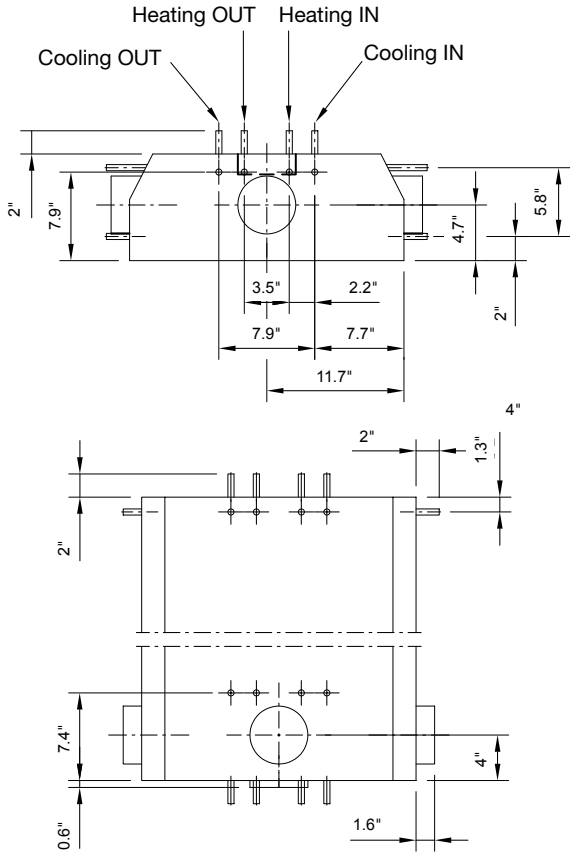


Figure 4. Polaris I 60 2 5"Ø, dimensions.

Vent. 0.08 × 4Ø

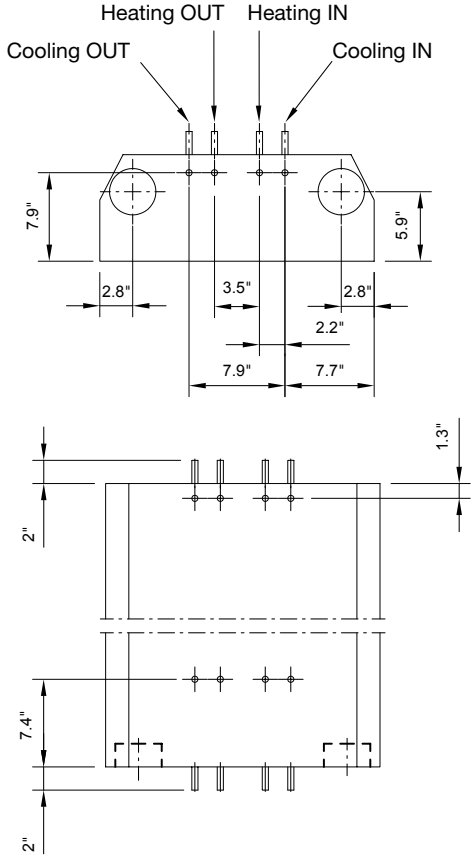


Figure 5. Polaris I 60 2 x 4", dimensions.

Chilled beams

Polaris I

Weight and water volume

	Polaris I 60
Weight, lb/ft	10
Water content, cooling gal/ft	0.11
Water content, cooling gal/ft	0.05
Copper pipes, quality	SS/EN 12449
Pressure class	PN10

Table 16. Polaris I 60, weight and water volume.

Installation examples

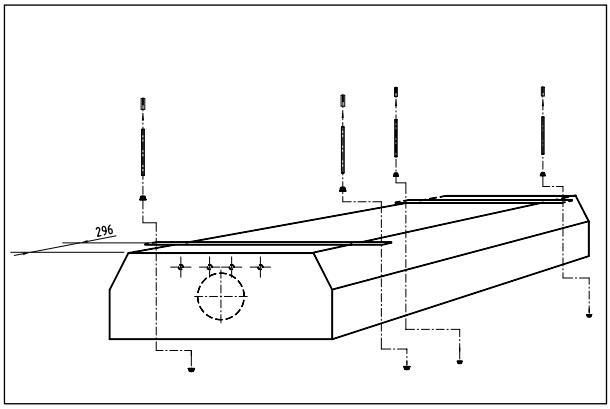


Figure 6. Polaris I 60 installation principle.

Note. Beams longer than 102.4", come with a suspension bracket in the middle.

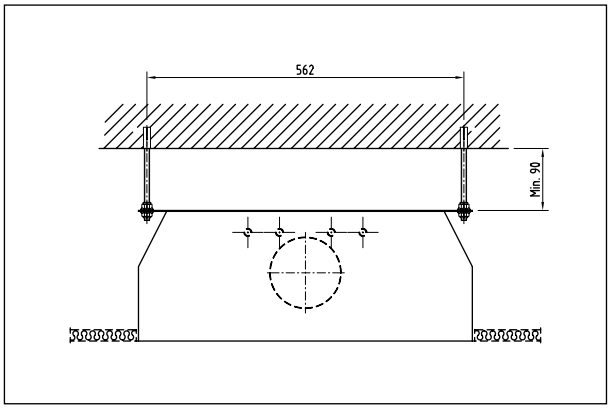


Figure 7. Polaris I 60 recessed in a suspended ceiling.