



# Lindab **Solus**

Simply the natural choice







## Simply the natural choice

Imagine a temperature balancing chilled beam solution where simultaneous cooling and heating is a thing of the past. Lindab Solus secures immediate savings on your investment, installation and running costs, by offering a simple yet highly effective new way of handling ventilation, cooling and heating.

By using the same water inlet temperature for both cooling and heating, the Solus solution will simultaneously cool and heat the individual rooms, according to the actual need. Mixing the return water from the different zones results in a water temperature close to or equal to the needed inlet temperature a part of the year. This allows you to simply recirculate the water, instead of having to cool or heat the water again.

When using renewable energy sources you are able to gain very high energy savings compared to conventional cooling systems.

- **Save up to 45% cooling energy**
- **Installation and investment savings**
- **Maintenance and running costs savings**

# Optimized recycled energy

The Lindab Solus solution is using the same inlet temperature in the water circuit for both heating and cooling. The Solus solution will balance the cold and warm water in the water circuit and thereby allow you to save a large amount of energy by limiting the reheating and recooling need in the water circuit. A needed water inlet temperature between 20-23 °C makes the Solus solution work at completely different temperatures than conventional chilled beam solutions, thereby offering many new opportunities for energy savings.

The main element generating the large energy savings within the Lindab Solus solution is the regaining of thermal energy from the water circuit. Buildings often have a sunny side, typically the south facade, where the water in the coil is used to cool down the room. Traditional systems use a lot of energy to cool and heat the water in the water circuit before returning it back to the rooms once more. A lot of this energy can be saved by using the Lindab Solus solution. The north facade of the building is typically colder and the coil needs to deliver heating to the room instead. Mixing the outlet water from the different zones will result in a water temperature close to the needed inlet temperature. As the outlet temperature will differ from zone to zone within the building, a mixed outlet temperature is closer to the needed inlet temperature and reducing the need for heating and cooling. As a result of this, the heating and cooling units can be fully or partially turned off, while still keeping a perfect indoor climate just by circulating the water. It will not be necessary to run both the heating and cooling unit at the same time ever again!

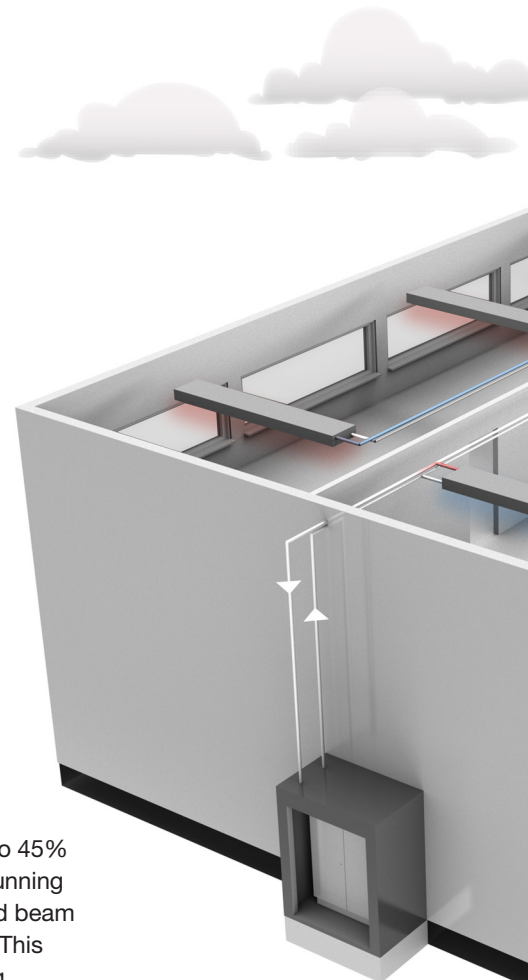
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## Recycled energy and COP

Regaining the thermal energy in the water circuit in a similar fashion as in the recovery section of an AHU's allows you to "recycle" the thermal energy in the water circuit. When using heat pumps together with the Solus solution the COP value will be 20-30% higher compared to conventional chilled beam systems.

## Free cooling

By combining the Lindab Solus solution with a free cooling unit, you are able to save up to 45% cooling energy compared to a traditional chilled beam solution with free cooling. As the running temperature in the water circuit is much higher for Solus compared to conventional chilled beam systems, free cooling will be possible at much higher outdoor temperatures than normal. This means that a much larger proportion of the cooling need can be covered with free cooling.



# Lindab Solus chilled beam

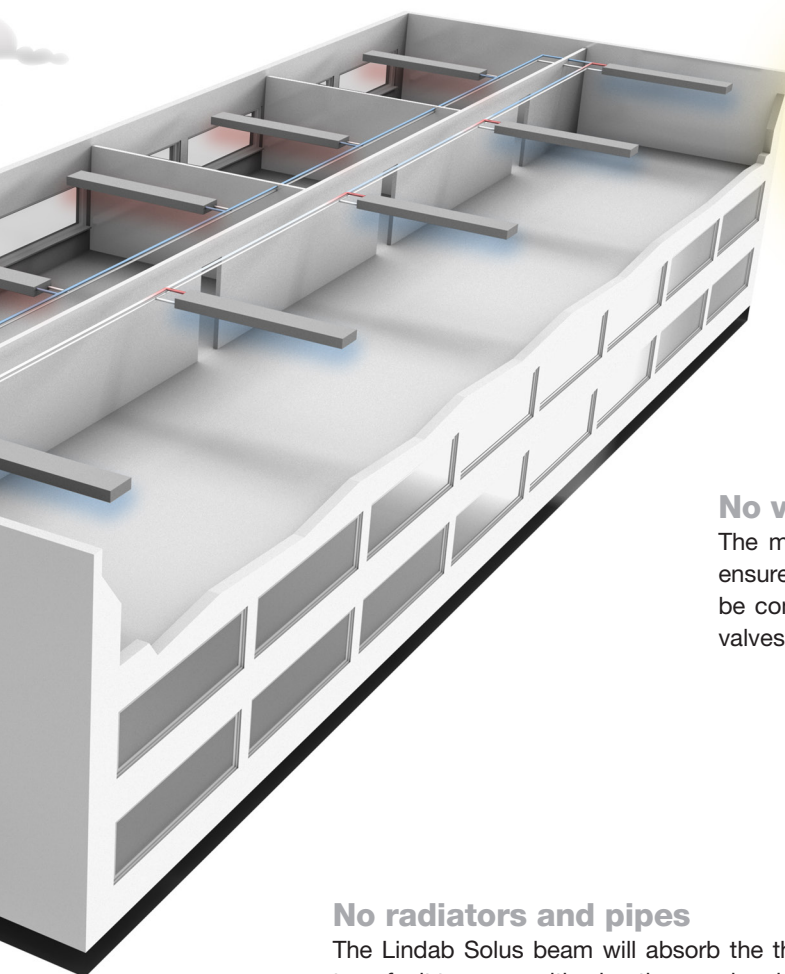
The Lindab Solus solution can be achieved by the most powerful chilled beam on the market, Solus. The optimized chilled beam, Solus, has been through a long development and testing period to be able to realize the performance seen. Solus has been developed by using CFD - simulation software to reach the best possible result. After many laboratory tests we can present a beam with market-leading performance in combination with great esthetics, yet creating an outstanding indoor climate with no draughts.

Lindab Solus Beam is Eurovent certified. Eurovent is an independent certification program verifying the performance data according to EN-15116.



## Save up to 50% on a quick and easy installation

Lindab Solus's simple design with its single water circuit and the regulation equipment free beam leads to direct savings on material purchases. The Solus solution makes it possible to avoid installation of radiators and other expensive heating or cooling sources. This will reduce the investment cost in heating and cooling devices to a minimum. This will save up to 50% of the installation cost and subsequent maintenance costs.



### No valves, actuators or sensors

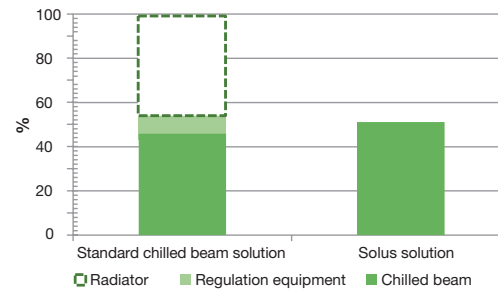
The main feature of the Lindab Solus solution is energy balance. To ensure an optimal balance throughout the building the water flow must be constant, regardless of occupancy. This effectively means that no valves, actuators or any kind of room sensors and regulators are needed.

### No radiators and pipes

The Lindab Solus beam will absorb the thermal energy in zones with high temperatures and then transfer it to zones with a heating need and hereby remove the need for conventional heating systems. A heating unit can still be required to supply the right heating level in cold winter days, but radiators and the associated piping and accessories are a thing of the past with the new Lindab Solus system.

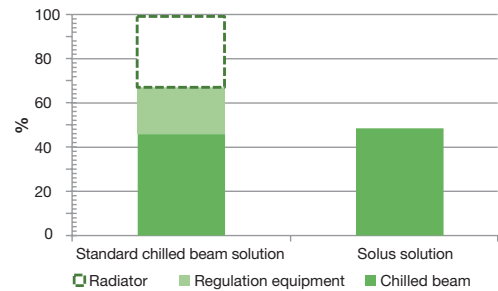
## Great savings with Solus

Choosing the Lindab Solus solution will not only result in large savings on cooling and heating, but will also present large savings on installation costs. As radiators, valves, actuators and other room control equipment is made redundant in the Solus solution, the full costs for these accessories can be listed as savings compared to a conventional chilled beam system.



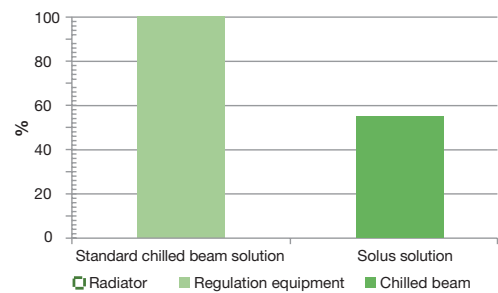
## Installation time

All heating and cooling is handled by the same circuit of water pipes, resulting in a much quicker installation time, as two separate circuit of pipes would normally be necessary. The fact that the Solus solution does not require any control or regulation accessories in each room, only heightens the total savings.



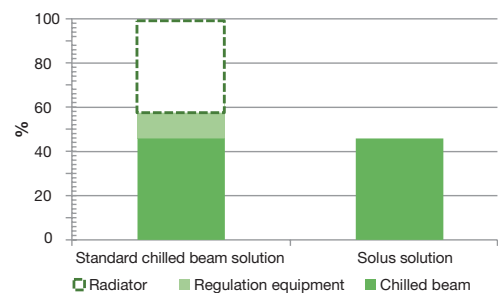
## Cooling energy consumption

Due to the energy balancing effects of the Solus solution, it will be possible to turn the cooling unit partially or fully off according to the season and only circulating the water. The same applies to heating. By applying a free cooling unit to the system, savings of up to 45% can be gained, when compared to a conventional chilled beam solution.



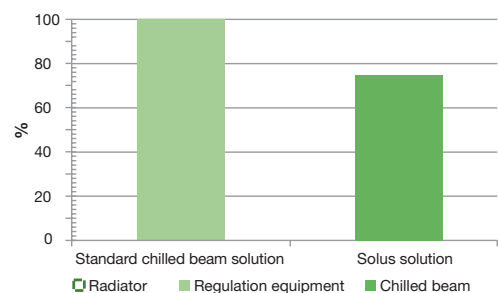
## Maintenance

Less components means less maintenance. As much of the equipment normally used in a chilled beam system is made redundant in the Solus solution, a lower level of maintenance will be required. Furthermore, the Solus beams have no moving parts, unlike e.g. fan-coil systems.



## Chiller performance

As the  $\Delta t$  between the inlet water in the Solus solution and the temperature of the heat pump media is much lower than on a conventional chilled beam solution, heat pumps can be utilized much more efficiently in the Solus solution. For cooling cases, the  $\Delta t$  value will normally be 6°C lower on the Solus solution than for conventional systems. The heat pump COP value can then be expected to be 20-30% higher than in a conventional system, as a lower  $\Delta t$  offers a higher yield. The exact same principle will apply for heating cases as well.



All figures in the diagrams above derives from the master thesis "Innovative Active Chilled Beam Application" by Rouzbeh Gordnorozi at Borås University, Sweden and Lindabs R&D department. Documentation and calculations can be sent on request.





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](#)