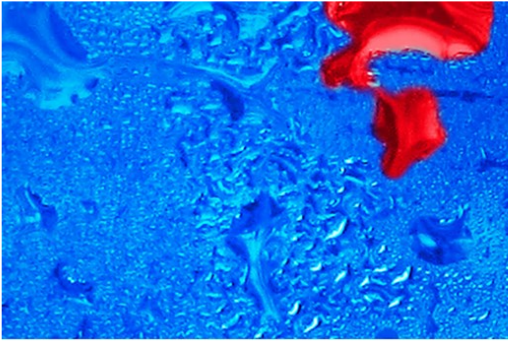


## Cooling resort centers



Inverter compressor technology makes the exclusive SPA even more relaxing

When Tylö AB (a global leader in inspiring environments for saunas, showers and steam rooms) were investing in a new 2000 m<sup>2</sup> SPA centre, including a training centre with separate Training Camp, exhibition and conference rooms in 2010, they had very high requirements. In addition to the usual needs for heating, ventilation, cooling, filtering, etc., they also required **limited space, serviceability, low noise, temperature accuracy, a constant supply air temperature, zoning, individual room control, dehumidification and humidity control, CO<sub>2</sub> control, and last but not least, energy efficiency with low environmental impact.** Tylö headquarter and the Swedish factory plant is located in Halmstad, south of Gothenburg on the west coast of Sweden and have a totally floor space of 25000 m<sup>2</sup>.

### Innovative cooling and ventilation solutions

The perfect solution would come from IV Produkt AB: after four years of active-service test runs, they had decided to add a new compressor technology in the product range, namely Maneurop VTZ with matching frequency converter CD 302. A new air handling unit, EcoCooler with integrated speed controlled DX cooling, was developed and could now be even more successful competing with indirect systems in the form of air or water cooled water chillers in the space requirements, price, temperature accuracy, etc., but above all by a significantly higher COP value (Coefficient Of Performance). The unit deliver this due to the frequency controlled supply and exhaust fans, variable speed of the rotating heat exchanger and an **inverter compressor** running between 30 Hz (1800rpm) and 90 Hz (5400 rpm). There are no power losses in any external heat exchangers, it has no pumps, no three-way valves and no condensers/dry cooler fans, which components are often called "energy parasites".

### The choice of compressor supplier was obvious

"We have very good experiences from both MTZ and VTZ compressors. With the broad product range of Danfoss, we can now offer over 30 standard versions with cooling capacities from 5 kW to 210 kW depending on your wish, with or without cooling recovery", says Jan Magnusson, the refrigeration engineer of the IV Produkt AB. "In units with more than one compressor, we still use a kind of step coupling technology where a VTZ compressor together with one or more MTZ compressors are handling the capacity adjustment, and thanks to inverter technology and electronic expansion valves, we have no problems with handling large variations in air flow, so called VAV systems (Variable Air Volume)," clarifies Jan Magnusson.



### Optimized cooling unit, optimized COP

The conclusion after a series of computer calculations and simulations was that an EcoCooler 360-1V was the appropriate size variation to Tylö's SPA. The unit includes two compressors, one inverter compressor (VTZ-086) and one fixed speed compressor (MTZ-056). It was obvious that this was the optimal solution in all objectives. "This will be an excellent solution," said Kalle Trulsson, service and maintenance manager at Tylö AB. "Practically, first and foremost, one supplier, one responsibility and also a complete, ready-CE Mark air conditioning installation and with these units small footprint we avoid outdoor installations on the roof, as was intended from the beginning. The complete installations will be accommodated in a room we have in connection with the SPA department and it becomes very easy to maintenance as well," pointed Kalle Trulsson.

### Further technical details of the facility:

Airflow from 0.85 to 3.64 m<sup>3</sup> /s. Cooling capacity stepless from 6.8 to 52.3 kW. COP in design operating conditions 5.4 Physical dimensions of the Eco Cooler unit: L= 4590, W= 1580, H= 2175 mm

### COP 7.0 is 350% better than COP 2.0

"Danfoss VTZ compressor is among the best that has happened to us manufacturers based air handling units with integrated speed controlled DX-cooling", says Jan Magnusson, there is in the market a range of good frequency converters, but the great advantage of Danfoss CD 302 is that it is developed to optimal matching the motor in the VTZ compressor and it has a software that speaks the "refrigeration language". In the past, our Star Cooler series with MTZ compressors, step control and a COP of 4.0 to 6.0 competed against traditional water chiller systems with its COP of 2.0 to 4.0. Now, we have gained an additional advantage because Eco Cooler has in the version with cooling recovery, a COP between 4.0 and 7.0. But the biggest difference and advantage is that when using the VTZ compressor, we achieve the indirect liquid cooling systems temperature accuracy, which means we can manage constant supply air temperature in spite of a DX-system. We have also been verified in comparison with traditional liquid cooling systems, our solution can reduce the contractor's installation costs by between 15-40% and the end user can reduce their operating costs by between 15-35%. In this actual case, location Gothenburg, Sweden, there is a energy consumption reduction of approx. 3500 kWh, but in a similar plant in Lyon, France, it would provide a higher reduction, approx. 6000 kWh/year, figures that shows that both we and Danfoss were right on the spot", ends Jan Magnusson, IV Produkt AB. In real money, using a rate of 0.1€/kWh, the electrical bill will be reduced by 350 respectively 600€ per year in Gothenburg and Lyon, and not forget, the comparison is made to a modern, traditional water chiller installation. "We have not run the plant for a year yet so we don't have an operational experience of all four seasons, but we have noticed so far that the unit is incredibly quiet and calm, temperature measurements in the various spaces remain stable and precise and the climate is perceived by all our visitors in the SPA as exceptionally good," declares a very happy and satisfied Kalle Trulsson, Service and Maintenance Manager at Tylö AB.

[VTZ Documentation](#)

[IV Produkt - EcoCooler website](#)

[Online Product Catalogue - Inverter Compressor Solutions](#)