Pure water cooling systems

In some applications, such as cooling of power electronics, ions are not desirable. Ions in the water may lead to short-circuit, or spark over in the electronic equipment. In the present system, a treatment loop maintains the quality of the pure de-ionised water. The heat generated in the cooling circuit is transferred to a raw-water circuit through a SWEP Minex, M10. The designer and manufacturer of the system discussed in this case story, is Swedewater. This Swedish company is a member of the ABB group and supplies customer unique pure-water solutions.

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Power electronics, such as a frequency converter, generate heat during operation. To protect this sensitive equipment, it has to be cooled. The problem is to maintain the cooling-water circuit free from ions and thereby avoid short-circuit of the electronic equipment.

Swedewater has solved the problem by installing a water treatment circuit in connection to the cooling circuit. The treatment circuit contains an ion exchanger, which purifies the cooling water from ions. SWEP offers a M10 to solve the heat transfer task. The Minex is a compact gasketed heat exchanger and due to its smallness, the Minex fits perfectly into the compact system solution. Since the plates are made of stainless steel, no ions are emitted to the pure water. The system is available in different designs. To facilitate transport and installation, the pure water system is mounted in a steel frame.

The main loop consists of a frequency converter (5), i.e the electronics and the SWEP Minex (1). The water in the main loop is cooled with a raw-water circuit inside the Minex. The raw-water circuit contains an air cooler (2), which gives a possibility to cool the space where the system is installed.

The M10 in Swedewater's system.
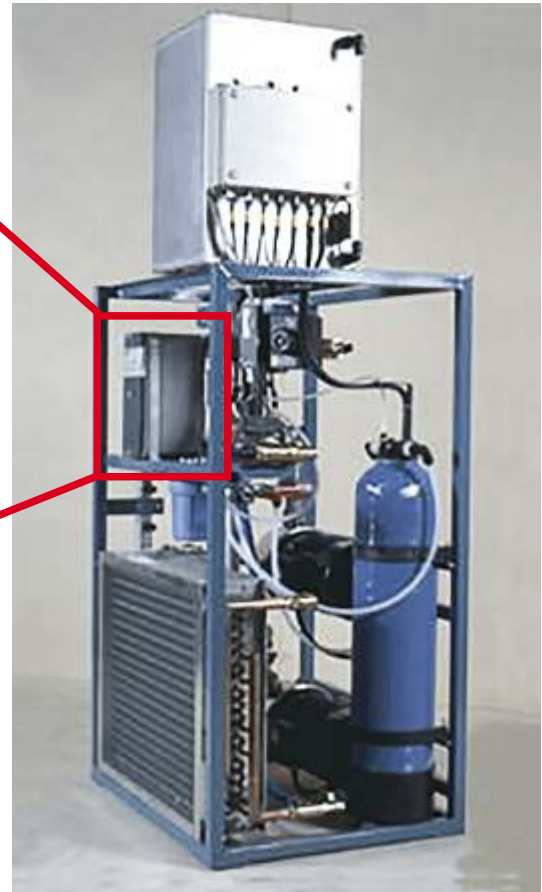
APPLICATION DATA

Heat exchanger unit	M10x40 or M10x60
Cooling capacity	45 or 90 kW
Main flow	120 or 135 l/min
Raw water flow	80 or 150 l/min
Raw-water inlet temperature	min. 4 °C max. 27 °C
Conductivity of pure water at 35 °C	< 0,5 mS/cm
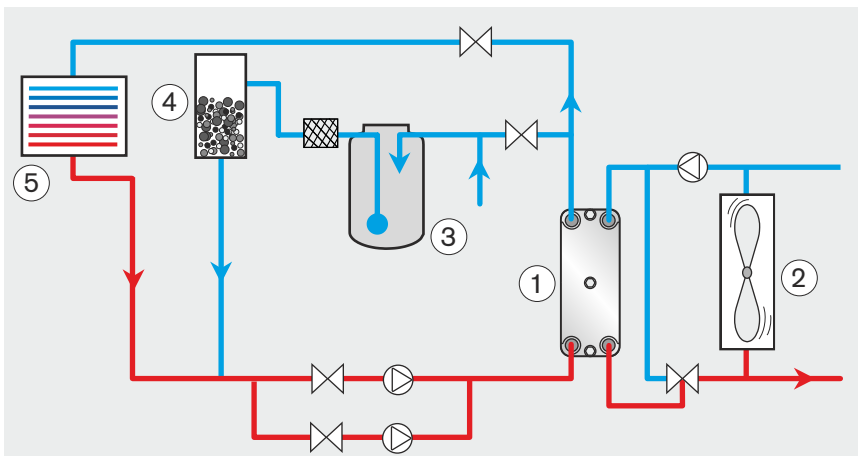
The treatment circuit with an ion exchanger (4), fine mechanical filter, air removal facilities and an expansion tank (3) keep the water deionised.

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