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Energy-efficient JAEGGI coolers for Germany's biggest data centre

In June 2014, one of the biggest telecommunication groups worldwide inaugurated a huge data centre on an area of 150,000 m² near Magdeburg. 18 units of the tried and tested *hybrid dry coolers HTK* from JAEGGI are in operation for server cooling.

Together with the data centre in Magdeburg, the new centre is to form a core system allowing for extending the supply of cloud services. All the applications and customer data always run in parallel here in order to ensure operational safety. In case servers of a data centre crash, the data and applications partly being company-critical are available at the second centre. For the size of the system, almost 22 MW of cooling capacity are required for the server rooms.

It goes without saying that, right from the beginning, attention was paid to the greatest energy efficiency possible. So the overall energy consumption is reduced by 27 % compared to similar data centres. To meet the requirements of the customer, the coolers' control panels and the master panels had to be equipped with type 2 overvoltage protection modules. Additionally, separate earth rails were used. For structure-borne noise insulation, specific point supports were applied as the coolers are placed on bases in a glycol collection basin.



▲ The wooden model of the new data centre demonstrates the size of the plant.



▲ Bringing-in procedure of the units

Overview

Business line:	AC
Application:	Server room air conditioning
Country/city:	Germany/near Magdeburg
Fluid:	Water/glycol
Product:	JAEGGI HTK

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In order to obtain the maximum energy efficiency of the entire dry cooling plant, free cooling is applied in several stages. During the first one, cooling is performed from 19 °C to 14 °C at a free cooling temperature of 24 °C to 21 °C; this way, refrigerating is not required for almost 8,000 hours per year. In this state, the hybrid dry coolers dissipate more than 12 MW. The refrigerating machine is operated in dry cooling mode for only a few hours; and by opting for a low-temperature cooling water (32 °C to 26°C), the operation during these periods is also particularly energy efficient.

This allows for saving more than 175,000 m³ of water and almost 60,000 m³ of waste water per year compared to a standard cooling tower application. The quick realisation of the project was also challenging. Within a short period of time, a large number of units had to be supplied – 3 x 2 units to the old site and 6 x 2 units to the new site. For this, a large storage space at the plant was necessary for storing the packed coolers prior to further transport.

Technical data

Cooler type	HTK 1.8/10.9-2S-P2-CU-SLNF
Number	18
Total heat capacity for this configuration	2,380 kW for 2 units (21.42 MW in total)

Product side

Fluid	34 % glycol/66 % water
Target fluid temperatures (inlet/outlet)	36 °C/30 °C
Hydraulic connection	Parallel, 2-pass cross counterflow

Air side

Coolers' operating state	Cooler wetted	Cooler dry
Air temperature at inlet	35 °C/35 %	35 °C
Corresponds to wet bulb temperature (inlet)	22.6 °C	22.6 °C
Air temperature at outlet	30.3 °C/87 %	47.2 °C (water temperatures: 51 °C/45 °C)

Total wetting water consumption

For air temperature	35 °C/35 %
Evaporative water volume	37.2 m ³ /h (all the 18 units)