



# Groundbreaking concept for highest energy efficiency

The West Cambridge data centre, one of the most ambitious IT projects in the higher education sector, makes its server capacities available to the renowned Cambridge Research Community. The data centre is cooled by only three hybrid dry coolers from JAEGGI and thus without compressor. In 2016, the data centre received the prestigious Public Service Digital Delivery Award for the innovative engineering concept.

The plant offers an overall re-cooling capacity of 1815 kW in free cooling mode and is operated according to ASHRAE 2008 standards for higher allowable data hall temperatures, thus eliminating the need for refrigeration compressors and, with power usage effectiveness of 1.2, leading to the construction of one of the most capable, secure and energy-efficient data centres in the higher education sector in the UK.

Taking into account the fact that 30 – 40 % of any data centre's power is needed to store digital data and the amount of digital data generated is soaring, it was decided to invest in a completely new datacentre with the highest possible reduction in energy consumption.

## Novel approach, less power consumption

To achieve this goal, the university accepted a forward-thinking approach: The 'chilled water' solution, true to the ASHRAE A2 temperature range, supplies air



### Overview

Line of Business:	IT Cooling
Application:	Data Centre Cooling
Country/City:	Great Britain/Cambridge
Fluid:	Ethylen glycol 27%
Product:	JAEGGI HTK

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at a higher temperature (up to 35°C) than conventional approaches, and without the use of chillers. This enables the system to work very efficiently in 'free cooling' mode for 100 % of the time, effectively leading to 10 % reduction in power consumption compared to 2013.

### Backup power and capacity reserve

To safeguard the continuous operation of the centre, all the equipment has dual power feeds; backup power is guaranteed by three generator sets that can maintain operation for three days. Of the four N+1 Hybrid Dry Coolers, only three are necessary to keep up the everyday running of the plant. The whole is controlled by an intelligent system with the highest possible power efficiency and flexibility.

The new facility comprises four data halls with one hall kept deliberately free for future demand – considering the speed with which the amount of data increases, a clear-sighted decision. Therefore, an additional Hybrid Dry Cooler has been incorporated into the system in order to be prepared for the next step.

### Main details

Type of cooler	3 x HTK1.8/5.45-2S-P6-CU-SLNF 1 x HTK1.8/5.2-2S-P6-CU-SLNF
Number	3+1
Heat output for total layout design	4 x 605 kW capacity = 2420 kW installed capacity

### Cooling water side

Coolant	27 % Glycol
Medium-temperatures (incoming/outgoing) design max	35 °C / 28 °C
Medium-mass flow of cooler overall	287.8 t/h (= 276.2 m <sup>3</sup> /h, density 1041.8 kg/m <sup>3</sup> )
Hydraulic circuit	Parallel, 6-pass crossover counter-current

### Air side

Operating status of cooler	Hybrid mode	Dry mode
Ventilator speed	76 %	100 %
Air status at input	35 °C / 41 % RH	19 °C
Corresponds to wet-bulb temperature (input)	24 °C	
Air status at output	29 °C / 96 %	30.6 °C

### Total moistening water consumption

With air status	35 °C dry bulb/41 % RH/24 °C wet bulb
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Evaporation water quantity	3.5 m <sup>3</sup> /h for 3 coolers
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### Alignment of cooler / coolers

Base area of cooler	7393 mm x 1770 mm
Overall height of cooler	2455 mm
Operating weight of cooler	4828 kg

### The whole facility contains the following coolers

Cooler type	3 x HTK1.8/5.45 and 1 x HTK1.8/5.2
Control	HybriMatic
<b>Overall re-cooling performance</b>	1815 kW with max 39 kW fan power