



Peace and quiet for cardiac patients

Bed rest is still the basic prescription for sick people – especially in hospitals. At the Deutsches Herzzentrum Berlin (German Heart Institute Berlin), five fluid coolers made by Güntner, each with a footprint of 18.24 square metres and featuring a heat exchange area of 2,845 square metres, provide quiet and powerful air conditioning for the whole complex.

To protect patients, noise abatement is particularly important in “spa areas, hospitals and special-care homes”. The regulations are documented in the “Technical Instructions on Noise Abatement” (“TA Lärm” in German). The maximum permissible noise level for the time between 6 a.m. and 10 p.m. is 45 decibels and 35 decibels during the night hours. Deviations from the “immission guide values” are permitted only in rare cases and must not exceed an additional 35 decibels during daytime (25 decibels at night).

Quiet V-type coolers for tight spaces

For the engineers of KE & S GbR who were commissioned to plan the central water chilling system for the Heart Institute, the noise abatement requirements were a key component – even more so after the first draft which called for installing eight flat-bed units (Güntner GFH) had been rejected for space reasons.

Uwe Schimo-Lema, General Manager of KE & S, explains: “The specific layout made the difference. The ratio of area to height was not well-suited for flat-bed



Overview

Line of business:	Air conditioning
Application:	Air conditioning, hospital
Country/city:	Germany/Berlin
Fluid:	Water/glykol
Product:	GFD fluid cooler series

Güntner GmbH & Co. KG
Hans-Güntner-Straße 2 – 6
82256 FÜRSTENFELDBRUCK
GERMANY

coolers, because they are relatively large relative to their height. If we had selected GFH flat-bed coolers in the roof area available to us, we would have received significantly less performance. The V-type coolers we installed instead are fairly tall relative to their footprint and deliver much more performance in the space available to us.”

Anwendungsspezifische Auslegung

Based on this decision, Güntner employee Bert Effertz came up with a new design. The second draft replaced the originally planned direct-type condensers on the roof with a dry cooling system employing a water-glycol circuit in the form of six GFD Jumbo fluid coolers, each equipped with 12 fans.

“With this version we need only 300 kilograms of refrigerant per refrigerating machine instead of the usual tons since the tubing and the fluid coolers use a brine circuit,” explains Andreas Rex, Technical Manager for the German Heart Institute Berlin. “Particularly with regard to our special situation, the second design was much more practical and fits our specific needs much more effectively. It also allows us to use the energy-saving free cooling approach already when the external temperature falls below 5 degrees Celsius.”

Heat dissipation ensured – Expansion possible

The system initially employs only five of the six planned GFD fluid coolers because they deliver the currently required maximum performance of 2.5 megawatts consisting of 1,900 kilowatts re-cooling power and 750 kilowatts free cooling. With the current layout, however, a sixth fluid cooler can be installed at any time if this becomes necessary as a result of further expansions and new users.

Andreas Rex: “The overall concept was predominantly based on ensuring the required heat load dissipation of the system. On the other hand, we also had to comply with the legal noise emission regulations.” The flat-bed design would have delivered less performance, but with the advantage of requiring fewer fans. Accordingly, its noise level would have been lower.

Further noise reduction through precise controls

The GFD fluid cooler series, however, also delivers excellent sound power values. Udo Brünjes, Area Sales Manager North-East, explains: “The fans of the GFD fluid coolers are controlled via the Güntner Motor Management system, which makes them precisely adjustable for daytime and nighttime operation. We paid special attention to keeping the sound pressure level as low as possible already during the design stage. Unfortunately, it is not possible to perform accurate calculations in the abstract, because you have to include the existing sound reflection characteristics.

The solution was to compute the noise values on the basis of an emissions report for the site. Once the local conditions were known, the electronic controls of the Güntner fans could be adjusted accordingly.

Since the fluid cooler level on the roof of the Intensive Care Station IPS1 is lower than the surrounding buildings and the facing building held patient rooms, the fan settings required special attention. After all, we wanted to avoid complaints and any costly building modifications that might have become necessary as a result.

Udo Brünjes: “The accurate adjustability of our units provided the customer with significant benefits. With Güntner fluid coolers, the parameters for precise



Five precisely timed trucks delivered the Güntner GFD fluid coolers.



A crane lifts the fluid coolers on to the roof of the ICU IPS1.

operating settings are available for the whole day. The controller also allows you to monitor the fan performance and speed in real time via their power consumption. In addition, this data provides a proper assessment of the power management for the fluid coolers. And the fans can even be run in emergency mode after a hardware defect. This delivers maximum operational reliability.”

The client also appreciated that the precisely timed delivery of the units and their installation with a crane hardly interfered with the hospital's regular operations.

Güntner GFD 080

Fluid cooling performance	380 kW
Free cooling performance	150 kW
Brine temperature – inlet	49,0 °C
Brine temperature – outlet	43 °C