

Combined heating and power station in mixed residential and commercial area



Line of Business:	EPC
Application:	Energy and Process Cooling, Machine Cooling
Country / City:	Germany / Rosenheim
Fluid:	Glycol
Product:	Drycooler GFH

An unusual project started by a utilities company, the Stadtwerke Rosenheim in the south of Germany placed high demands on performance and sound insulation. The project was the installation of a new gas motor plant to generate electrical power combined with a refuse incinerator in the centre of the town in the buildings of the previous plant. The location is a mixed residential and commercial area with residential and office buildings as near as just 25 metres. Drycooling designed exactly for these requirements resulted from cooperation with Güntner.

The refuse heating plant belonging to the Stadtwerke Rosenheim supplies around 600,000 m² of residential and commercial buildings with district heating and about 30,000 households with electricity. As parts of the previous power station had reached the end of their service life, it was decided in August 2003 to install a new gas motor plant. This was supposed to replace some of the old equipment and to optimise it with regard to both costs and profits. Mr Reinhold Egeler, the manager of the Rosenheim refuse heating plant, explained: "By generating electricity ourselves instead of buying it, we see an excellent opportunity of minimising our supply risks and simultaneously optimising processes economically and technically." Components made by Güntner in Fürstfeldbruck were chosen for the cooling equipment of the new plant in Rosenheim. "Güntner is a well-known name and has also been recommended to us", said Reinhold Egeler. "From the moment when direct communication with Güntner in Fürstfeldbruck had been established, everything got going very quickly. As we had to keep to very tight deadlines, Güntner's flexibility was very advantageous for us, e.g. to arrange very sudden personal meetings on site."

Drycooling for continuous operation

The air and fuel mixture used in the power station for the gas motors is cooled in two stages, with the waste heat that is produced in the second stage not being of any use so that it must be dissipated into the surroundings. The necessary mixture coolers work with a glycol and water mixture that is cooled back down from 45.5 °C to 40.0 °C by means of drycoolers installed in the open. To make independent and variable operation possible, a separate Güntner axial drycooler was installed for every gas motor, the choice of drycooler being made from among 400 different standard drycoolers in the GFH series. With its heat exchange area of 2,047 m², the model GFH 102C/2x5-E proved to be the best drycooler. With a cooling capacity of 300 kW, each of the drycoolers manages an air volume flow of 104,800 m³/h.



Quiet during operation, these drycoolers are specially designed for outdoor installation. In addition, they are made using Güntner's durable and reliable floating coil design – an important criteria for the decision as the gas motors are mainly used at full load so that the drycooling systems installed on the roof of the former gas turbine building have to run during the entire operation time of 5,000 to 6,000 hours a year. In order to allow independent switching each of the drycoolers is fitted directly with a switch cabinet made by Güntner Controls that ensures automatic switchover between day and night operation and regulates the temperature of the coolant.

Emergency cooling with deionised water

It must also be possible to use the gas motors to generate electricity in summer when all the waste heat is not tapped off in the district heating system. In the summer and autumn months the Stadtwerke Rosenheim therefore use an additional emergency cooling system, which is completely emptied in periods when it is not in use. The emergency coolers are five S-GFH axial drycoolers, Model 102B/2x9, each having a Güntner switch cabinet for eight-stage control. They cool the coolant down from 110 °C to 70 °C. As the emergency cooling system uses deionised water, no materials containing copper can be used in the entire system so the drycoolers necessary in this section are made of galvanised steel outside. To make it easier to empty these drycoolers when they are not in



use, the heat exchangers are inclined horizontally. There is one venting and one emptying outlet each on the narrow end of the drycoolers.

Economy transformer from Güntner Controls

The component that is responsible for the extremely quiet operation of the drycoolers is an economy transformer that is only available from Güntner Controls. It has been incorporated as an additional element in the switch cabinets. This control unit, which is also often used in hospitals, optimises the sinus current and thus reduces noise emission to mere air and bearing noise. "Güntner has excelled in implementing the strict requirements issued by the noise experts," said power plant manager Reinhold Egeler with satisfaction. "Since the new plant was put into operation in September 2004 we have made a major contribution to the cost-effectiveness of the location and to job security in the power station."

noise. Fortunately, we soon realised that Güntner is very competent in this field, too," said engineer Reinhold Egeler. Based on the high requirements concerning noise in the expert report issued by ACCON GmbH, Güntner designed the circuitry of the selected drycoolers to exactly suit the local conditions. The specifications for noise during the day were max. 76 db(A) for the entire drycooling of the mixture coolers and max. 89 db(A) during the day for the emergency coolers. Noise during the night was not to exceed 62 db(A) for the entire equipment for mixture cooling and 76 db(A) for emergency cooling.



The challenge of noise protection

The greatest challenges: The power station belonging to the Stadtwerke Rosenheim is located in the centre of the town so that residential areas border it to the south at a distance of just 20 to 25 m. To the north the distance is also just 80 to 100 m. As the permissible noise emission values in the existing power station had already been pushed to their limits, it was not possible for the new plant to cause any significant increase in noise emission. "Therefore, it was important for us to have a partner who can do something about the problems of