

District Heating Network Dresden-Nord



Many consumers in the Klotzsche neighborhood of Dresden, Germany, had until 2014 been supplied with district heating by a so-called "island net", CHP Klotzsche. The area has grown substantially in the last years and the system had almost reached its capacity limits. If this system had broken down, a great number of households could have ended up without heat in a part of the world where winters can get very cold. Built in 2003, the CHP will now only be used for extra power during peak times. Instead, a new and more reliable pipeline, supported by brazed plated heat exchangers (BPHEs) will supply power to this part of the city.

The power supplier DREWAG (Stadtwerke Dresden GmbH) wanted to take a further step towards the modernization of its district heating network. By the end of 2014, more than 3000 households and the industry area of the Klotzsche neighborhood will have been connected to the municipal district heating network through a seven-kilometer-long district heating pipeline, making the heat production more cost-efficient and environmentally friendly.

DREWAG is a company that supplies all of the German city of Dresden with energy and water, as well as natural gas and district heating/cooling. The goal of the project Fernwärmetrasse Dresden-Nord (District Heating Pipeline Dresden-Nord) is to connect the neighborhood of Klotzsche to the central heating network. The project will significantly contribute to CO₂ reduction, while ensuring efficient district heating in this part of the city.

"In the long run the project helps secure the cost-effectiveness of district heating in Dresden. With the expansion of a modern CHP in Dresden, the city comes much closer to its climate protection target." (DREWAG press release)

DREWAG chose GESA for the construction of the pipeline, which started in August 2012. Founded in 1993, GESA is an engineering company for the area of Dresden, Colonia and Hamburg. GESA, in turn, chose SWEP for the BPHE installations, knowing that the project demanded heat exchangers out of the ordinary. The solution was the new SWEP XXL series B649. It was absolutely crucial to have a system with as high operational dependability as possible and a low life cycle cost. The absence of gaskets in BPHEs and their proven durability and dependability made the choice of technology easy.

The pipeline was constructed in a landscape with some height differences, so the transfer stations had to be able to compensate for the higher pressure. The SWEP engineers calculated 6 XXL BPHEs for the whole heat capacity 49 MW, redundancy considered. During the calculation of the right size of BPHE different operation cases, i.e. different



temperature profiles and loads, were considered to insure stable operation at all times. After some adjustments of the parameters – primary temperatures of up to 140°C and secondary temperatures of up to 128°C, with a pressure of up to 22 bar – they had the solution: five units of the brazed plate heat exchanger B649 x 360 with 9 MW each and one unit of B649 x 144 with 4 MW, with 25 bar working pressure.

"The main advantage of BPHEs is the compact design", says Hans-Joachim Ettrich at the DREWAG Department of Power Plant Engineering. "SWEP heat exchangers are therefore used in a lot of house heat transfer stations as well, according to the Dresden Department of District Heating."

In the new system waste heat from the electricity production is used directly for heating purposes. This approach is not only effective, but also environmentally friendly. With the new pipeline it is possible to generate about 90 percent of the power plant's capacity, compared to only about 30 percent today. According to DREWAG, the emission of more than five million tons of CO₂ has been avoided since the company began converting its power plants twelve years ago. The new pipeline will reduce it by a further 8,600 tons of CO₂ per year.

The entire structural implementation, including all connections to the network Klotzsche, took place in several phases and will be finished in 2014. And



Klotzsche is just one part of a huge shift in Dresden. During the past decade SWEP has delivered several hundred units to the city of Dresden alone. The compact, brazed BPHE B649 has a connection size DN150 and complements the existing product portfolio of SWEP for high performance in district energy and cooling.

In total there are over 7,000 DHS stations and about 100 header stations (BPHE) in Dresden, and a great number of them are already equipped with SWEP units.

The investment in BPHE technology will strengthen the ability to meet increasing demands for high capacity, high efficiency and compact brazed plate heat exchangers. SWEP will take leadership in driving the conversion from other technologies, such as gasket PHEs and S&T.

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