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DGE-ROLLOUT

Heat pump system

WP I Invest - Deliverable I 1.1.2

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Introduction

The Deliverable I 1.1.2, intitled: “Heat pump system” concerns the delivery of the heat pump system to the Bochum site.

Deliveries

The delivery of the components of the heat pump system started on the 30.06.22 and was concluded on the 06.10.22. All the components were delivered at the Fraunhofer IEG location of Bochum (Am Hochschulcampus 1, 44801, Bochum).

The components needed to connect the 2 heat pump units were delivered from the 30.06.22 until 26.07.22. These include: 2 pumps with pump accessories (Fig. 1), 1 flowmeter (Fig. 2), 1 dry cooler (Fig.3), 1 buffer tank (Fig.4).



Figure 1. Pump with accessories



Figure 2. Flowmeter



Figure 3. Dry cooler



Figure 4. Buffer tank

The 2 heat pump units (Fig.5), that constitute the heat pump system, were delivered along with the electrical cabinet (Fig. 6) on the 06.10.22.

The units were placed on the drilling site of the Fraunhofer IEG institutions in Bochum, after the preparation of the safety protocols.



Figure 5. Delivery operations of the heat pump units



Figure 6. Electrical cabinet

The low temperature stage unit is filled with nitrogen whereas the high temperature stage unit is already filled with Butane. Due to the Butane content, the area in which the gas could be blown in case of leakage is defined as ATEX Zone 2, which means “A place in which an explosive atmosphere consisting of a mixture with air of dangerous substances in the form of gas, vapor or mist is not likely to occur in normal operation but, if it does occur, will persist for a short period only”. For this reason, a cubic area of length of 2 m per side was delimited, as shown in Fig. 7 and Fig. 8.

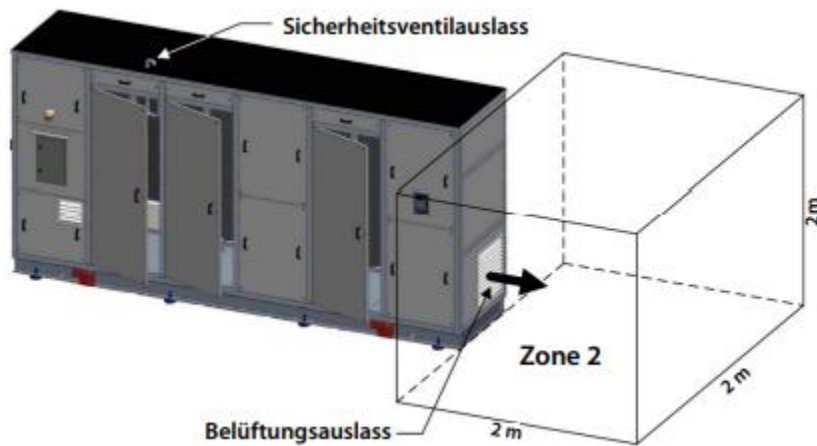


Figure 7. Ex-Zone Butane unit as per manual



Figure 8. Ex-Zone Butane unit at Fraunhofer IEG

The gas alarm was installed for the Butane unit as well as electrical heaters in the containers to ensure a temperature above 5°C on the refrigerant cycle to ensure safety and no pressure changes of the refrigerant.

Next steps

Next steps are the installation and commissioning of the heat pump system as well as delivery of the components needed to connect it to the district heating and the mine.

Conclusions

The components that constitute the heat pump system were delivered to the Fraunhofer IEG location of Bochum from the 30.06.22 and was concluded on the 06.10.22. These include secondary components such as pumps, tank and dry cooler as well as the heat pump units themselves.

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