



CAHS

compressed-air-and-heat system



EUROPÄISCHE UNION
Europäischer Sozialfonds



One step ahead - altAIRnative generation of compressed air

COMPRESSED AIR – ESSENTIAL AND EXPENSIVE

The generation of compressed air is one of the least efficient energy transformation processes in the industry. Nearly 100% of the supplied electrical power is transformed into heat, mostly on a temperature level, which is too low for industrial applications. Our aim was the development of a CHP solution that combines energy and cost efficiency, low CO₂ emissions as well as flexibility in application. We achieved our aim by creating the compressed-air-and-heat system "made by altAIRnative".

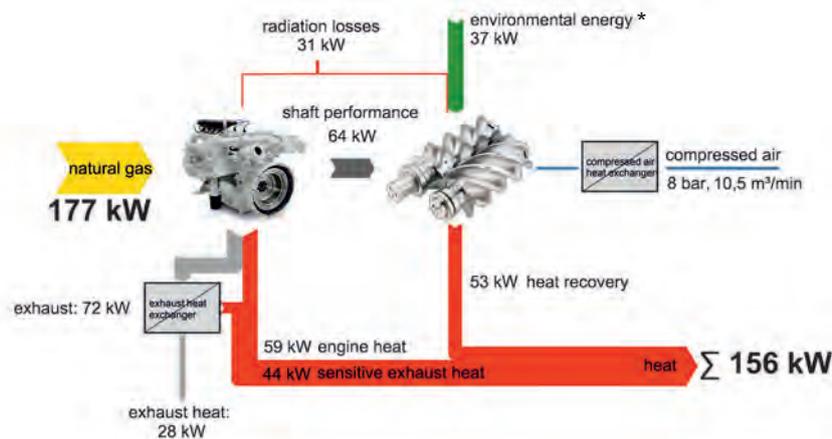
COMPRESSED-AIR-AND-HEAT SYSTEM (CAHS) – IDEA AND SOLUTION

In comparison to a classic CHP a CAHS does not generate electricity but compressed air. In order to do that, a natural gas engine is connected to a directly driven compressor. During the compression process of the air the total mechanical power of the gas engine is converted into heat. This thermal energy is the first step of using the heat. Furthermore, the heat of the engine cooling and the exhaust gas is used. Compared to the separated generation of compressed air and heat, the CO₂ emissions are reduced by approximately 42%. The CAHS has economic advantages, too. Based on the average industry prices for electricity and natural gas the amortization amounts to less than 2.5 years – this means the usually very cost intensive compressed air is supplied at zero cost.

SOLUTION PORTFOLIO

The self-developed and in own production manufactured CAHS are available in six sizes, from the little "Föhn 26 kW" to the big "Tornado 300 kW". The two sizes "Taifun 170 kW" and "Tornado 300 kW" are available optionally with oil-free two-staged compressors. These two plants are especially interesting for the food industry and for applications with adsorption refrigerators, as flow temperatures up to 108°C are possible. Through this, the customer is able to lower the company's steam demand or to increase the efficiency of the absorber.

The compact construction is perfect for the integration into the existing system. Our compressed air and heat systems meet the customer's requirements due to various optional equipment. For the improvement of the total efficiency, we offer a container installation (optionally with or without silencing hood) or different heat exchanger configurations. In order to reduce the energy consumption, we integrated in our CAHS high-efficient pumps and especially optimized heat exchangers.



energy flow chart: CAHS D-ORKAN

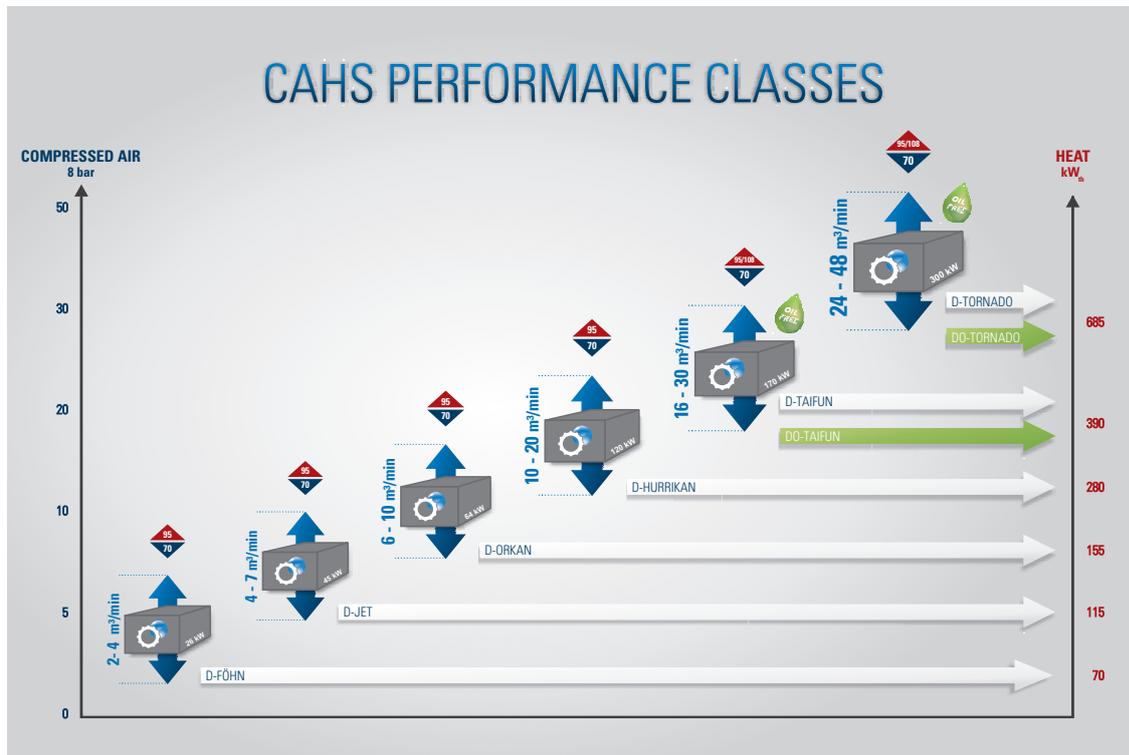
*Joule-Thomson-Effect (source: https://en.wikipedia.org/wiki/Joule%E2%80%93Thomson_effect)

efficient. inovative. flexible

YOUR ADVANTAGES AT A GLANCE

- use of a highly efficient natural gas engine
- regulation of compressed air quantity from 50-100% without efficiency loss
- module-based construction and delivery in different sizes and pressure stages (4 bar / 8.5 bar / 10 bar / 13 bar) = utmost flexibility
- flow temperature of 95°C or up to 108°C for oil-free plants
- use of high-efficient pumps with variable speed control in hot water systems
- integration of a calorific value heat exchanger and a compressed air cooling into the heat circle in order to use the condensate heat of the water and the compressed air
- focus on the compactness of the CAHS for the integration in existing systems
- elimination of diverse conversion efficiency losses, e.g. frequency

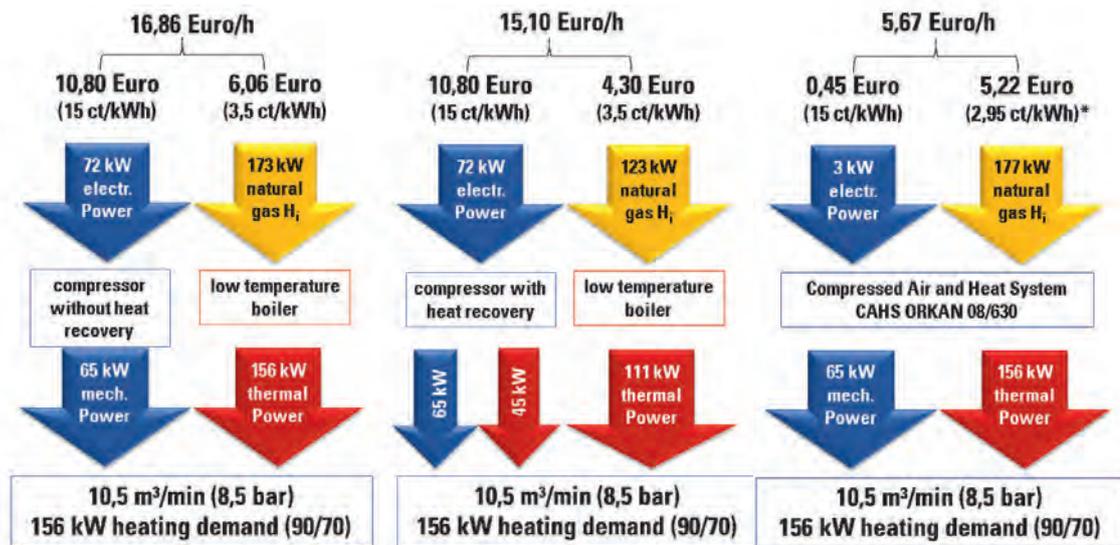
- converter at electrical driven compressors or
- elimination of feed-in and feed-out losses of generated electricity in comparison to a CHP
- effective, efficient and variable concentration of the total waste heat compared to the separate generation of heat, electricity and compressed air
- optionally: generation of adsorption cold through suitable cold modules
- independence from political framework, e.g. KWKG and EEG



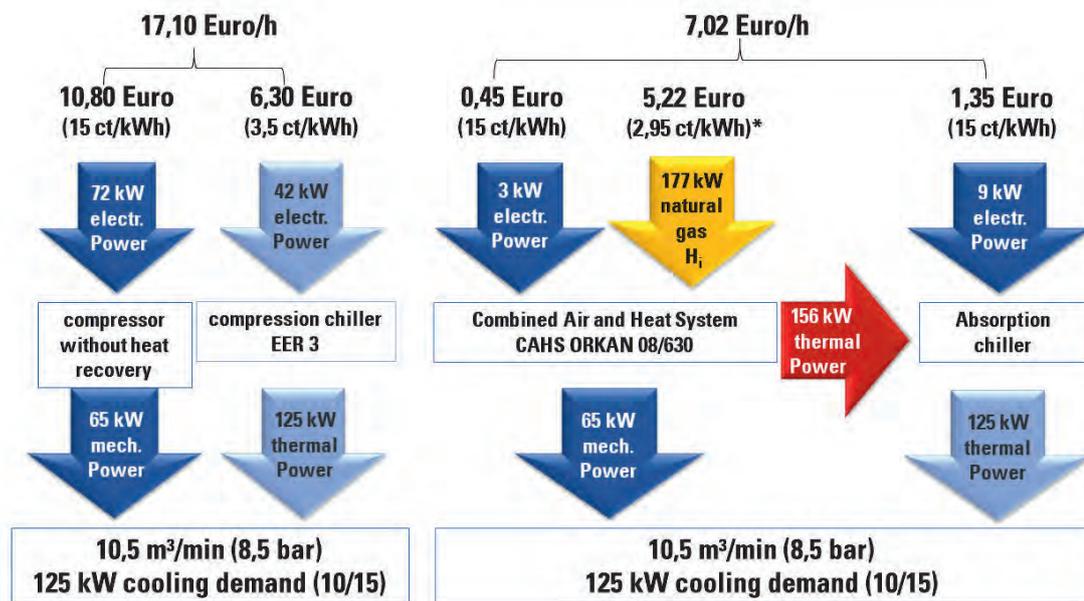
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COMPARISON OF ENERGY COSTS FOR THE GENERATION OF THERMAL ENERGY AND COMPRESSED AIR

- for heat demand



- for cooling demand



*reduced by the energy tax

