

## Compact high-speed turbo compressors

### A new approach to electric gas compression

Fan manufacturer ebm-papst shows how the future can be shaped in harmony with the values of our time. The company wants to use its core competencies in aerodynamics, electric motors and electronics to not only support megatrends such as climate neutrality and digitalization, but to actively drive them forward. It is from this perspective that the product range and expertise within the company are being further developed.

ebm-papst is expanding its product portfolio to include turbo compressors for different air and gas mixtures. These turbo compressors are used in heat pumps, self-contained drinking water systems and gas supply systems for fuel cells, for example. All components, from the drive motor to the compressor impeller and the newly developed oil-free high-speed bearings, are coordinated to suit the specific application.

#### High performance in a small installation space

Designed as a platform solution, individual compressors with outputs from 1 to 45 kW can be quickly assembled and different refrigerants, air and other gas mixtures can be compressed without oil. Thanks to their high speeds, the turbo compressors are very compact compared to conventional solutions, operate vibration-free and do not require any lubricating oil. This is of interest wherever gas purity is required. The gas bearing, which is not subject to contact or friction during operation, not only achieves a long service life but also has impressively low noise levels.

#### Tailor-made compressor platform

The new compressor platform enables a wide range of different applications to be operated economically. By combining different impeller sizes and blade geometries, it enables optimum aerodynamic adaptation to the application. This means that, depending on requirements, the impellers can be matched to the required mass flow or pressure ratio and the working gases used, such as air or R290.

#### First prototypes already in use

The P1 (1 kW) and P2 (2.8 kW) platforms are already available as prototypes and are also in use in customer applications. Series production processes were already considered in the concept phase, which will contribute to a competitive cost structure in future series production. With the help of the technical center currently under construction at the main site in Mulfingen, the first small series will start as early as the beginning of 2024. Series production, which is planned from 2026, is aiming for volumes significantly higher than one hundred thousand units per year and platform size.

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Fig. 1: Oil and vibration-free as well as low-wear: the compact high-speed platform P2 compressor



Fig. 2: Student Melanie Bildhoff explains the functional principle of the new high-speed turbo compressors from ebm-papst to German Chancellor Olaf Scholz, his Indonesian counterpart Joko Widodo and his wife Iriana during the tour of the trade fair at Hannover Messe 2023. The trade fair stand was organized entirely by trainees and students.

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### About ebm-papst

The ebm-papst Group, a family-run company headquartered in Mulfingen/Germany, is the world's leading manufacturer of fans and drives. Since the technology company was founded in 1963, it has continuously set the global industry standard with its core competences in motor technology, electronics, digitization and aerodynamics. With over 20,000 products in its portfolio, ebm-papst provides the best energy-efficient, intelligent solution for virtually every ventilation or drive-engineering task.

In fiscal year 2021/22, the "hidden champion" generated revenues of € 2,288 billion. The group employs roughly 15,000 people at 29 production sites (in Germany, China and the USA, to name but a few) and in 51 sales offices worldwide. ebm-papst sets the benchmark with their fan and drive solutions which are used in almost all industries, such as ventilation, air conditioning and refrigeration, heating, information technology, mechanical engineering, household appliances, intralogistics and medical engineering.

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