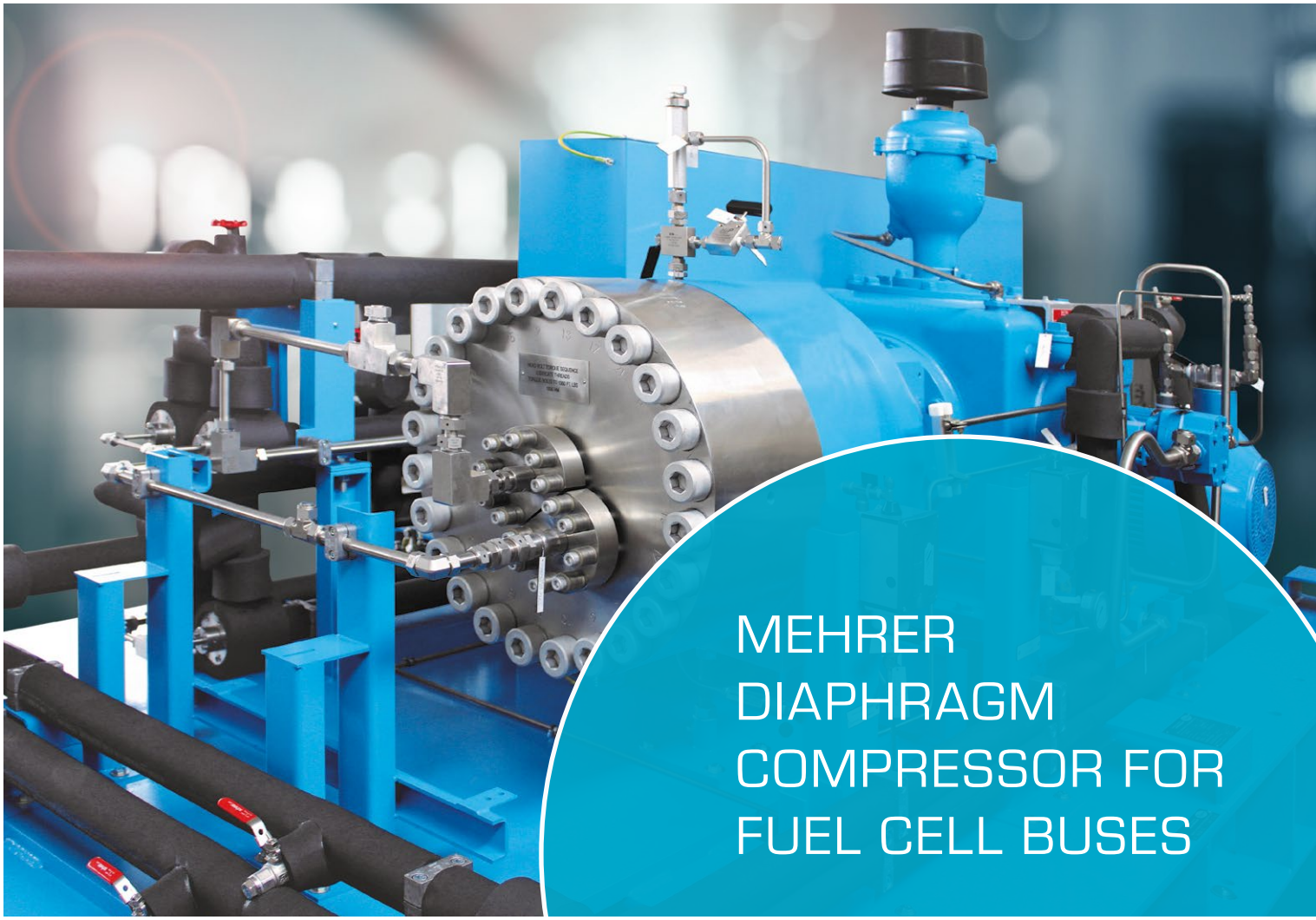
CASE **STUDY**

MEHRER COMPRESSORS IN USE



MEHRER DIAPHRAGM COMPRESSOR FOR FUEL CELL BUSES

Mehrer diaphragm compressors form the core component between the supplied hydrogen and a refuelling system for fuel cell buses.

The buses are refuelled by overflowing the hydrogen due to the pressure difference between the storage banks of the filling station and the bus tank. To achieve high refuelling speeds, the interaction between the various storage tanks and the compressor is therefore crucial.

The Project

In order to make local transport environmentally friendly and low-emission, many cities are increasingly turning to fuel cell technology. The hydrogen required for the operation of the bus fleet is delivered by tubetrailer. Trailer refuelling can be necessary for various reasons: if a pilot test is carried out, if local hydrogen production is not yet available, or if the hydrogen is produced in large-scale plants and for cost reasons it makes sense to supply the consumer/filling station. Incoming vehicles have a tank pressure of 350 bar. The Mehrer diaphragm compressor draws flexibly from an inlet pressure range of 50–300 bar from the tube trailer and compresses the hydrogen to 480 bar. The compressor solution was delivered in a turnkey container and represents the core component between the delivered hydrogen and the refuelling storage.

Diaphragm compressor for reliable refuelling of the bus fleet

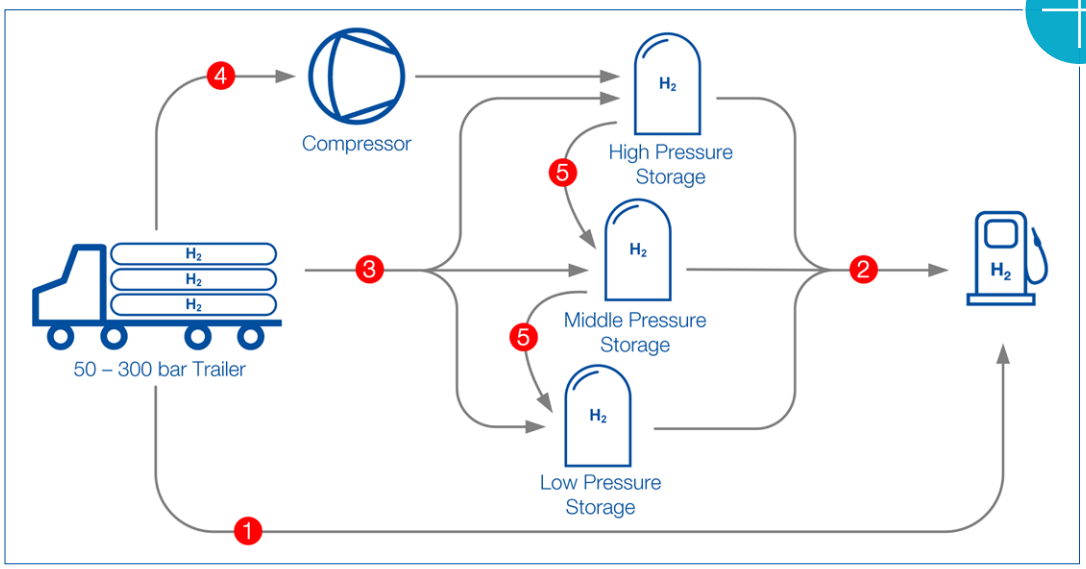
Operating Mode

The refueling of a fuel cell bus always takes place cascading in the pressure drop of the trailer (see point 1 in the schematic illustration) or from the storage banks (see 2). From the connected trailer, the gaseous hydrogen is fed to the internal storage banks (see 3). In case of a possible pressure drop, this can initially happen through overflow. A direct refueling of the vehicles by the compressor is not intended, the compressor is only used for refilling the plant storage tanks (see 4), even during the refueling process.

The refilling of the storage tanks starts automatically when the minimum pressure in the low pressure storage bank is reached. Therefore the high pressure storage is filled first, from which the medium pressure and low pressure storage bank is filled by overflow (see 5). The process is stopped automatically as soon as the storage tanks are filled.
At the project start four buses will be refuelled at the customer's plant. In the long-term, up to ten fuel cell buses are to be supplied with hydrogen. The respective filling pressure of the tank is 40 kg. Refuelling will be carried out with several starts per day and relatively short running times.

» What impressed us about Mehrer Compression was that the trial operation and commissioning went off without a problem. Our employees were very well instructed by the excellently prepared Mehrer Service Team with regard to the new compressor system in a very short time. «

CTO of the customer



Schematic representation of the operating mode