

PRESS-RELEASE

GSR Ventiltechnik, D – Vlotho-Exter

A worldwide first-of-its-kind accuracy

New test bench for leakage tests on high-pressure valves

GSR Ventiltechnik GmbH & Co. KG, the expert in developing and manufacturing high-pressure solenoid valves for demanding fields of application, has installed a new test bench for performing leakage tests on high-pressure valves. The test stand is designed for pressures of up to 360 bar and can detect leakage rates of 10^{-6} mbar l/s. In other words: it detects every one millionth millibar that the pressure of a 1-liter volume increases per second.

Considering that the test bench was a technological innovation, two years of fundamental and intensive research was required for its development and construction.

The test bench consists of two chambers. In one chamber, the internal leakage rates at the valve fitting are detected under vacuum conditions. The valve is pressurised in closed condition and the possible leakage rate is measured at the valve output. Contrary to the conventional test using a measuring probe, this procedure enables determining the actual leakage rate.

The external leakage, i.e. the leak tightness of the entire valve with regard to the environment, is tested in the second chamber of the test stand at pressures of up to 360 bar. In both cases, the utilised test gas is helium, whereof approximately 95% can be re-utilised after the measurement; this represents a considerable cost advantage, considering that helium is a relatively expensive gas.

The results of all measurements are recorded and saved. The documentation of the test results is integrated in the ERP system from GSR Ventiltechnik; in this way, all measured values can be saved together with the product data and the product-related documentation can be retrieved with the complete overview of the measurements at all times. The manufacturer can also establish a connection with the control system of the test bench through a network connection. First, the subsurface purity, which is taken as reference state, is measured. After that, the actual measurement starts on the valve to be checked.

For a medium-sized company such as GSR Ventiltechnik, the new test bench represents a considerable investment, which however makes sense, considering that it documents the quality leadership of the company for technically outstanding products. Even leakage rates, which are generally insignificant in actual practice, are reliably detected.

The extreme accuracy of the leakage rate measurement must also be considered in the light of future valve technologies. In the business, GSR is considered as the reference with regard to the development of valves for hydrogen applications. This field of application has a brilliant future, as hydrogen will undoubtedly play a significant part in the energy mix of the next decades. It however also is a challenging and demanding technology: due to their small size, the hydrogen molecules can penetrate through the smallest leaks. That is why highly accurate tests are an important prerequisite for enabling the production of high-grade valves for the hydrogen technology, which operate reliably and leak-free under pressures of up to 900 bar. The new test bench from GSR Ventiltechnik creates the optimal conditions to meet this requirement. Generally, all valves leaving the production line at GSR's are submitted to a leakage test.

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