

DIAGNOSTIC POINT FOR HYDRAULIC SYSTEMS

HOW LEAKPROOF IS LEAKPROOF ENOUGH?

Minimesse® test points have been indispensable as access and diagnostic points for hydraulic systems for decades. Hydrotechnik, the inventor of these test points, reliably guarantees freedom from leaks safely up to 630 bar, and now up to 1.000 bar! Due to the excellent product characteristics such as, extensive variety, high filling rates and diverse accessories, these products are being used more and more frequently in gas applications. But here the question arises: How leakproof is leakproof enough?

In order to satisfy customer demands for high reliability and easy handling with compatible components, Hydrotechnik has been offering Minimesse® gas charging valves in addition to the test points for liquid media since the mid-1980s. Stainless steels (1.4104 or 1.4571) are primarily used as materials. This ensures that the significantly higher surface quality at the sealing points compared to standard test points cannot be influenced by a surface coating required for free-cutting steels.

The essential measure for the leak proofness of a system is its leakage rate, which describes the amount of substance escaping per unit of time and is typically given in the unit mbar L/s. If one compares the leakage rates and thus the tightness of a standard test point with that of a gas charging valve, it is 1.12×10^{-4} mbar L/s (N₂) to 2.24×10^{-5} mbar L/s (N₂) and the clear difference quickly becomes apparent.

FKM is the main sealing material used. This material is resistant to most gases and covers a wide temperature range. The range includes variants for the temperature ranges -20°C to 200°C, -40°C to 200°C or even -60°C to 200°C.

When selecting the suitable temperature range, not only the operating temperature of the medium or the ambient and storage temperatures must be considered: Rapid expansion of a pressurised gas results in significant cooling at the outlet.

QUALIFICATION AND PRODUCTION-RELATED TESTS

Gas charging valves are subjected to extensive qualification. In addition to the typical burst and pressure change tests, leakage is secured with bubble and helium leakage tests. Particular attention is

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paid to the behaviour at low temperatures, statically, and when actuated, since the sealing materials lose their elasticity at this point.

SOLUTIONS FOR ALL APPLICATIONS

Just as with test points for liquid media, Minimesse® gas charging valves are available for various installation variants and connection geometries. If particularly fast filling is required for large pressure vessels, gas charging valves in DN 4 are also available in addition to the standard series in nominal width DN 2. Gas charging valves with

” GAS CHARGING VALVES ARE ALSO SUITABLE FOR HYDROGEN APPLICATIONS

DVGW approval are also available; this permits the use of gas charging valves in the public energy supply. They are subject to appropriate type testing and production is audited regularly. Minimesse® gas charging valves in versions made of 1.4571 with FKM seals are even suitable for hydrogen. These variants are also suitable for offshore applications due to their high corrosion resistance.

In addition, Hydrotechnik provides control and test fittings that can be safely connected and disconnected up to 500 bar operating pressure without closing the pressure source and without tools. This is particularly helpful when quickly checking and filling several pressure vessels in series. Minimesse® polymer hoses are suitable for temporary applications down to -54°C. For permanent applications, Hydrotechnik recommends stainless steel corrugated hoses or Minimesse® measuring lines.

Photos: Hydrotechnik