BIERI
HYDAC INTERNATIONAL

CONDITIONS AND INSTRUCTIONS FOR VALVES

BIERI-Valves are used in hydraulics. The specific valve conditions are depending on the induvidual product and are described on the depending datasheet in detail.

1. PRESSURE
Each valve series is designed for a certain maximum pressure at which it may be operated without risk to the environment and persons. We guarantee this value because we have proven it in tests.

2. FLOW RATE
Exceeding the maximum permitted volume flow can damage the valve or cause a malfunction.

3.FLUID
The type of pressure fluid used is closely related to its viscosity, the compatibility of sealing materials, the resistance of surfaces and the function of the valve. BIERI only uses pressure fluids according to DIN 51524 part 1, 2, 3.

4. AMBIENT TEMPERATURE
The ambient temperature has a direct influence on the materials used in the valve, e.g. on their mechanical strength. The permissible temperature usually depends on the sealing materials:
FKM: -20 °C bis +120 °C
NBR: -30 °C to +80 °C
Solenoid-operated: -20 °C to +50 °C see also Point 8.
There are low-temperature valves where the seals are specially designed for low temperatures. Outside these limits, the strength of the steel is greatly reduced and springs can relax excessively.

5. FLUID TEMPERATURE
The permissible temperatures depend primarily on the sealing materials. BIERI therefore defines:
FKM: from -20 °C to +120 °C
NBR: from -30 °C to +80 °C
Further restrictions:
Solenoid actuated: -20 °C to +80 °C
Manual actuated: up to +80 °C

6. VISCOSITY
BIERI valves must only be operated in defined viscosity. The guaranteed properties can no longer be maintained if the medium is too thin or too viscous. These vary from valve to valve and are usually between 5 - 400 mm²/s.

7. DEGREE OF CONTAMINATION
The correct function and service life of a hydraulic valve correlates closely with the degree of contamination. For example, larger particles cause increased abrasive wear. The fluid cleanliness classes specified in the data sheet represent a minimum requirement for ensuring function. Exceeding them can lead to immediate failure of the valves in the system if they become stuck in critical areas. To extend the life of the valve, it is recommended to use the use of improved filtration with a reduced number of large particles. See also section 11. Tightness.

8. RATED CURRENT, VOLTAGE
Solenoid valves use solenoid coils, which, unless otherwise specified in the data sheet, are fully functional in the voltage range of +/- 10% of the nominal voltage at max. 50 °C ambient temperature. The combination of overvoltage and very hot temperatures can lead to failures. Therefore, always ensure good heat dissipation and the voltage must not exceed the still permissible voltage level.

9. MTTFD Values
In connection with the naming of a MTTFd value, we confirm the use of the of the fundamental and proven safety principles according to ISO 13849-2:2012; Tables C.1 and C.2 for the design of the design of our hydraulic valves. The customer is responsible for the implementation and operation of the valves according to the above standard, as well as the compliance conditions described in the valve data sheet. operating conditions. DIN EN ISO 13849-1:2016 allows the adaptation the MTTFd value to the average number of annual of annual actuations.

10. Tightening torque
When tightening the valve in the housing or on connection blocks, see the tightening torque in the installation or data sheet. Tighten the screw connection between valve and housing with a lubricant before. The lubricant must be compatible with the sealing materials. General: if there is no tolerance range specified, tool type II class A or B according to DIN EN ISO 6789 must be used.

11. TIGHTNESS
For the BIERI seat valves, “poppet-tight“ is specified on the data from the year 2020. Please note that even finest grounded parts can leak.
Points with influence:
Influences of viscosity: the lower the kinematic viscosity is, the more leakage results. As a thumb rule this can be descripted inversely proportionally. For example, a valve with 6 drops per minute at 15 cSt will then have 3 drops per minute at 30 cSt.

Pressure influences: The tightness decreases at pressure-compensated constructions approximately proportional to the pressure. Example: a valve which loses 5 drops per minute at 350 bar, will lose 10 drops per minute at 700 bar. Here is to mention the influence of the valve type: Pressure compensated closing elements ideally have the same contact force over different pressures. But valves with increasing seal-force by pressure can reduce the micro-passages. Because of the elasticity of the material a better tightness results.
For valves with several parallel seats every seat shows its leakage.

Temperature influences: Temperature changes can lead to increasing or decreasing pressure.
This because of thermal expansion. Thus a pressure drop in a system can be falsely attributed to valves. In reality, however it is mainly the medium that cools down. A thumb rule: in a rigid system hydraulic block, 10 bar per °C change in the temperature of the mineral oil can be assumed. Temperature changes of the medium result in considerable viscosity changes (as described above).

Pollution influences: If a valve becomes clogged due to small micro particles, it appears more tight than it would be with a cleaner medium. Larger chips or particles can injure the poppet or seat, have an abrasive effect or jam and thus reduce the tightness and thus also reduce the service life.