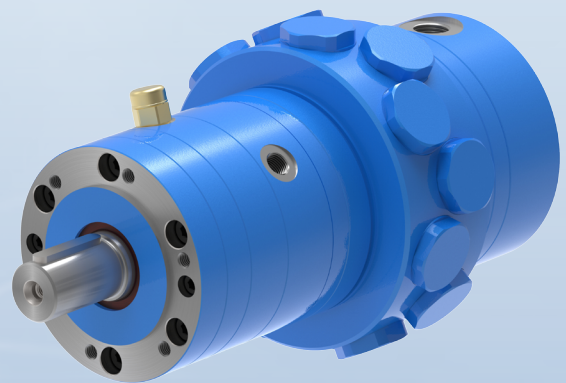




*Multiple disc brakes*



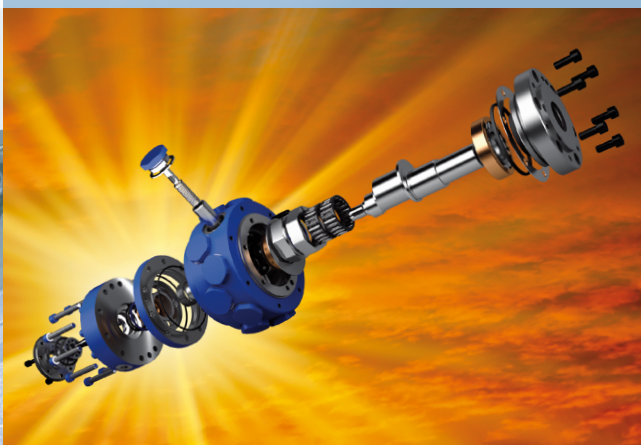
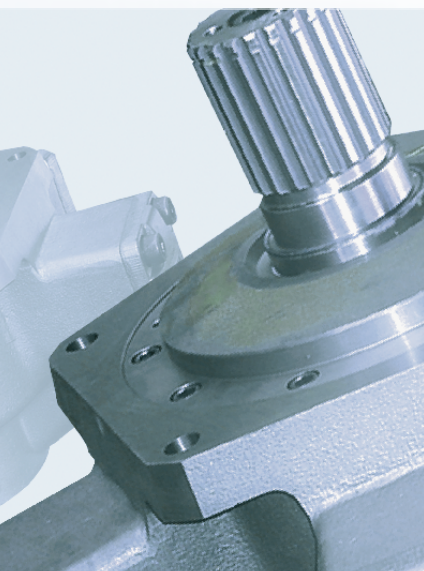
pressure released and spring  
operated multiple disc brakes

series LBD

$T_{\text{brake}} = 50 \text{ Nm} - 6300 \text{ Nm}$

for dry or wet operation as well as for  
fire resistant fluids HFA, HFB, HFC and HFD

Installation- operating instructions



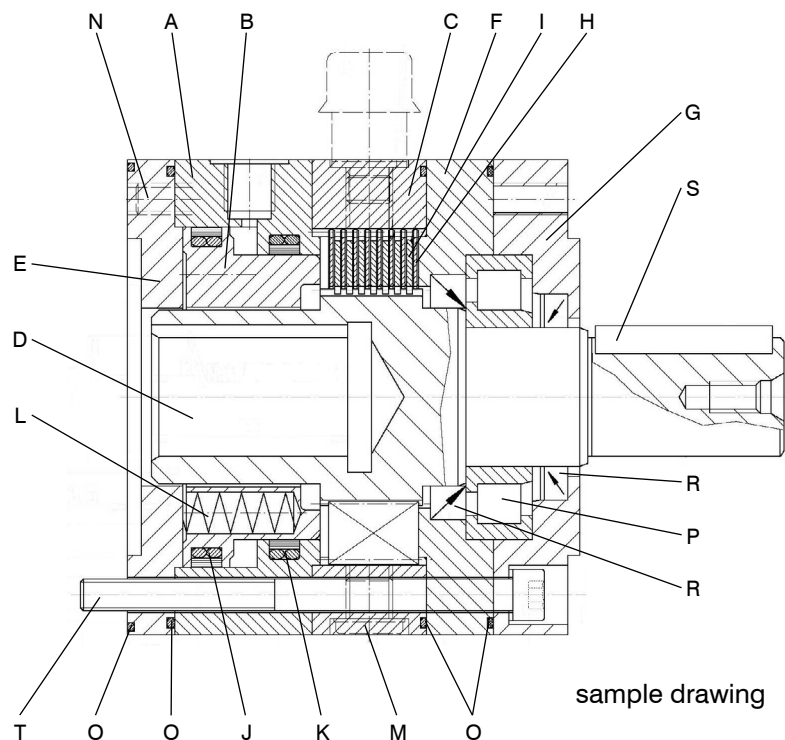
LB2-001 EN Edition 2022/06-02

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## 1. Design and function

A	housing
B	piston
C	external body
D	internal body
E	mounting flange, input
F	sealing cover
G	mounting flange, output
H	outside discs
I	inside discs
J	piston seal
K	rod seal
L	spring
M	screwed plug
N	assembly screw
O	o-ring
P	bearing
R	radial shaft seal ring
S	parallel key
T	fastening screw



LBD brakes are designed as holding brakes for dry or wet operation.  
The brakes are intended for horizontal installation (tolerance  $\pm 15^\circ$ ).  
The brake torque is transmitted by friction discs and the torque transmission is non positive locking.  
The brake force is generated by spring pressure.  
The braking torque is transmitted from the fastening screws through the external body to the internal body by means of a non-positive connection through a system of outside and inside discs with special friction lining (sintered bronze). The discs are soaked in oil in the factory.  
The full braking torque is only reached in a pressureless state.

The brake is released hydraulically (hydraulic connection on the housing).  
By means of the on the piston effecting pressure the pressure springs will be pressed together and the disc released.  
The brakes start to release at a pressure of 15 to 30 bar (218 to 435 psi) and can be operated at up to 320 bar (4640 psi).  
The piston space is protected against corrosion (housing, piston).  
The housing and piston form the actuating unit.  
The piston and the housing are equipped with PTFE (polytetrafluoroethylene) seals (flexible pre-stressing with o-rings).  
At the outer body, a connection for leaks and coolant is present.



**Attention!** Follow instructions:

When released, function-related idle-running torque occurs, which can amount to up to 2 % the rated torque.

The brakes are subject for function-related wear but the braking moment is guaranteed at the maximum permissible wear also. Re-adjustment is not necessary because of the automatic compensation by the piston. Completely worn discs may only be changed as a pack.

**Attention!** Follow instructions:

In the unusual case of leakage the complete actuating unit has to be replaced.

The exact technical characteristic values can be found in the corresponding drawings.

**Attention!** Follow instructions:

Advice's for special design:

-The brake can be adjusted due to the variation of the number of pressure springs which are placed in spring chamber of the piston.

-On requirement the brake can be produced only for dry operation (disc are not soaked in oil). The brake torque increases to 1,4 times of the catalogue value. Please take into account that in case of any contact with oil or another lubricant the brake torque will be decreased!

-In case of using of organic oils, HFD pressure fluids and at higher operating temperatures (> 100°C) seals made of FPM are recommended.

-The fastening screws are designed for the transmission of the maximum brake torque. In case of higher torque's, for example in between of two devices, additional supports are necessary (pins).

**2. Installation and operation****2.1 Installation**

The brake is normally delivered fully assembled on a hydraulic motor or between hydraulic motor and gearbox.

- A. The drive unit is pushed onto the shafts, centred, aligned and screwed with the fastening screws to the connection parts accordingly. A precise centering of the drive unit is to be guaranteed.

It is recommended to install the leakage connection in vertically downwards position. If the brake ordered as a replacement unit for repairs it will be delivered as completely assembled unit with the appropriate shims. The distance between the disk carrier and the motor shaft is 0.1 to 0.3 mm and with the help of shims is adjusted. For this purpose it is necessary to determine the appropriate lengths of brake and drive shaft of the hydraulic motor. Now the necessary shims can be determined and brake and motor are mounted.

**Attention!** Follow instructions:

To make it easier to fit the spring-operated multiple-disc brake and enable the internal body to be turned, it is recommendable to connect to the hydraulics before installing the brake. This will make it possible to apply the necessary air pressure to the brake to release it so that the internal body can be turned freely.

- B. Connect to the hydraulic connection

Connect the hydraulic connection and let out any air out of the system. A test for correct functioning must also be carried out by repeatedly actuating and releasing the brake. The pipes should be as short



as possible and without sharp bends or restrictions of diameter. The backflow system is to be laid out in such a way that no backpressure greater than 3 bar results. Also in the case of dry running, the connection of an overflow pipe is recommendable for safety reasons.

To ventilate the hydraulic oil ISO VG 22 to 68 are recommended.

The maximum pressure fluid temperature may not exceed 100° C.

Hardly combustible fluids like HFA, HFB, HFC and HFD can be used to release the brake.

The maximum pressure fluid temperature may not exceed 60° C.

### C. Lubrication/cooling

If the coupling is used in an oil bath (bath lubrication) is fill with the appropriate lubricant. As a maximum immersion depth of the blades is the friction diameter (1/10 of the disk outside diameter).

The ratings apply it wet run.

In flooded version of the port for the cooling oil to produce.

The cooling oil should be applied to bar only with a maximum pressure of first.

The ratings apply it wet run.

As a lubricant oils hydraulic ISO VG 22 to 68 are recommended.

There are the following demands on the lubricants to be observed:

- high heat and aging resistance
- small oil sump inclination
- neutral behavior towards copper (maximum degree of corrosion according to DIN 2)
- low alloy components

### Lubricant / cooling during operation with fire resistant fluids

The discs are soaked in oil in the factory. Splash lubrication is not necessary.

The characteristic values for dry operation apply.

## 2.2. Operation

A minimum pressure (releasing pressure) must be applied to the brake until fully released. Too low release pressure leads to increased friction (constant braking torque and permanent wear of brake discs). This leads to additional heating of the brake. The maximum braking torque can only be realized without any pressure.

## 3. Maintenance

The brake is for the most part maintenance-free. Maintenance is restricted to visual checks for external damage (e.G. points of impact, leakage) and to checking the braking torque. If the braking effect deteriorates, the brake must be disassembled and the worn components replaced.

### A. Check for leakage after about 5.000 actuations (in dry operation).

When released, slight leakage at the sealing elements is inevitable. It is necessary to check regularly for leakage in order to be able to recognise in good time any damage there may be and function-related signs of wear on the seals. The carry out this check, loosen the leakage screw and drain the leakage.

### B. Check for wear on disc when is a drop in braking torque

The brake discs are subject to function-related wear. Wear on the brake discs is increased if used as a service brake. The check for wear can only be done on the complete disc pack. For this purpose the multiple-disc pack must be taken out and the overall thickness measured. The minimum dimension of the thickness depends on the brake size and is available on request from the producer.





**Attention!** Follow instructions:

As a guideline, checks should be carried out at the following intervals:

approx: 5.000 operating hours or when there is a noticeable drop in braking effect.

**C. Checking the springs when there is a drop in braking torque**

The springs used are designed to be long-lasting. Spring fatigue can only occur after 1 million braking operations. Disassemble the spring and check the length of the unstressed spring. The springs are worn and must be replaced if they are less than 90 % of the original length. The length depends on the brake size. Please ask the manufacturer for the lengths.

**3.1 Disassembly****Attention!** Follow instructions:**The work should only be done in an appropriately qualified workshop!**

The brake must be disassembled in order to replace worn parts with spare parts.  
Separate the spring-operated brake from the hydraulic system and release it from the connecting parts.  
Loosen the assembly screws.

**Danger! Danger of injury to personnel:**

The input mounting flange is spring loaded!  
Continue disassembly according to which components need changing.

**3.2. Assembly**

Before assembly all components must be checked visually, cleaned, and damaged components replaced. Assembly is done in reverse order to disassembly.

**Attention!** Follow instructions:

If the sealing elements are worn, we recommend that the entire actuating unit be replaced.  
Note disc layering! Start with an outside disc and alternatively layer outside disc and inside disc.  
Always finish with an outside disc!

**4. List of spare parts**

The spare parts are described by the art.-no. and its item number and are available from the manufacturer.

**5. Storage and transport**

The brake must be stored in a sealed state in a closed room and protected against atmospheric influences and exposure to, e.g., dirt, dust, moisture, chemical media, excessive heat and mechanical damage.

The relative air humidity should not exceed 70 %.

The brake is provided with temporary corrosion protection for 6 months.

Due to the high hydraulic pressure the sealing surfaces in particular are produced with high precision and accuracy so that jerks, knocks and contact damage in transport cannot impair functioning.



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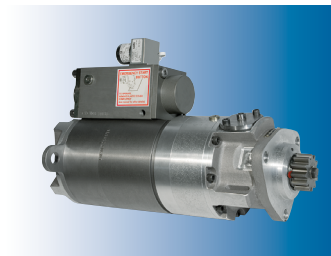
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