

1. Supporting documents

Note:
The documents mentioned below are available for download on our website www.zimmer-group.de. Only the documents currently available on the website are valid.

- Catalogs, drawings, performance data
- Detailed installation and operating instructions
- General Terms and Conditions of Business with specifications for warranty entitlement

2. Safety

This installation and operating instructions are intended for installation and maintenance technicians as well as design engineers requiring the clamping and braking element for an application. Please read through all of the installation and operating instructions carefully before start-up and pay special attention to the following hazard warnings and notes.

3. Safety notes

Caution:
Non-compliance may result in severe injuries.
Injuries/malfunctions can occur especially with:

- Pinching during installation due to an unsecured mounting piece
- Improperly assembled pneumatic connections
- Pneumatic supply faults, e.g. due to pressure fluctuations
- Damaged or loose pneumatic lines
- Missing or loose mounting screws
- Removal of the safety cover
- Do not switch off the working medium during assembly or repair work on the clamping and braking element
- Human error
- Failure to observe the safety and warning instructions during installation and start-up

3.1 Proper use

Note:
The clamping and braking element should only be used in its original state with its original accessories, without any unauthorized changes and within the scope of its defined parameters for use. Zimmer GmbH accepts no liability for any damage caused by improper use.

The LBHS clamping and braking element is designed for operation with hydraulic fluid only. The clamping and braking element is not suited for operation with any other media. According to EN ISO 13849, the clamping and braking element is a tried-and-tested component and can be used without additional control engineering measures in control systems of Category 1. For questions regarding use of the LBHS clamping and braking element, please contact Zimmer GmbH.

The clamping and braking element must not...

- ...be mounted on a linear guide rail other than what the manufacturer has specified.
- ...be installed in facilities that are used for transporting people (e.g. elevators).
- ...be used in vehicles.
- ...be used underwater or in other fluids.
- ...be used in a corrosive environment (for example, in connection with acids).
- ...come in contact with abrasive media (such as grinding dust).
- ...be used in a vacuum.
- ...come in direct contact with food.
- ...be used in areas with a potentially explosive atmosphere.

3.2 Personnel qualification

The installation, start-up, maintenance and repairs may be undertaken only in accordance with these installation and operating instructions and only by qualified personnel who have the professional expertise and know the conditions, as well as the dangers, of the machine into which the clamping element is being installed.

Danger:
Never open the housing. Intervention is not permitted and can lead to serious injuries.
Warranty and disclaimer.

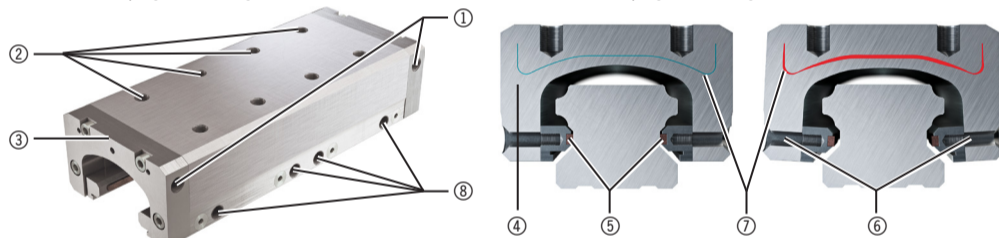
4. Product description

The hydraulically operated LBHS series is a safety component. It is designed for clamping and braking on linear guide rails. The function is based on the internal stress of the material for depressurized clamping and braking. The eroding contour inside of the housing makes a low and narrow design that simultaneously features high holding forces possible. The internal stress of the material makes it possible to close the element without pressure by.

Any damage to the contact surface of the linear guide rail is ruled out by the pairing of rail and contact profile materials as well as by the contact profile geometry. The elements are configured to the respective rail measurement at the factory.

Fig. 1: LBHS clamping and braking element

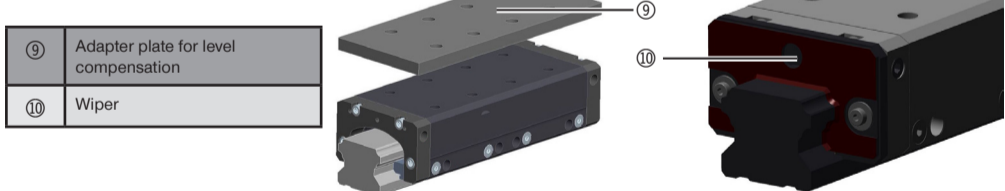
Fig. 2: LBHS clamping and braking element cross section



| | |
|---|---------------------------------|
| ① | Hydraulic connections |
| ② | Tapped holes for assembly bolts |
| ③ | Cover |
| ④ | Housing |

| | |
|---|---|
| ⑤ | Clamping jaws and brake pads |
| ⑥ | Assembly bolts for clamping jaws and brake pads |
| ⑦ | Eroding contour |
| ⑧ | Tapped holes for disassembly |

Fig. 3: LBHS accessories



5. Connections

The LBHS series clamping and braking element has four hydraulic connections ①, which are opposite each other in pairs. The hydraulic connections are provided with plug screws at the factory. All 4 connections can be used.

Note:
Only one connection ① has to be occupied for the LBHS clamping and braking element to function reliably. All unused connections must be closed off.

6. Installation

- ▶ Check the clamping and braking element for any damage before assembly.
 - The clamping and braking element is allowed to be used only in conjunction with linear guide carriages.
- ▶ The mounting face of the clamping and braking element has to be completely covered with the mounting piece.
 - Make sure the mounting piece is sufficiently rigid.
 - Mount the element using at 8 bolts.
 - Arrange the bolts symmetrically
 - If necessary, use an adapter plate (accessory) to make a level surface
 - Use bolts with a minimum strength class of 8.8 (note the tightening torques).
- ▶ To ensure a short response time, choose the shortest possible hydraulic hose length.

6.1 Installation procedure

- ▶ Remove the desired plug screw
- ▶ Attach the M5 or G1/8 hydraulic connection to one of the connections ①. Connections that are not required ① must be closed off with a plug screw.
- ▶ Filling the hydraulic piping
 - ▶ Loosen blanking plug on the opposite side of the hydraulic connection
 - ▶ Loosen hydraulic connection at the clamping and braking element
 - ▶ Fill hydraulic continue until oil comes out at both connections
 - ▶ Closing blanking plug and tighten the hydraulic connection

Caution:
Unreleased air inside of improperly filled hydraulic lines may cause the destruction of the clamping and braking element. The pressurizing with hydraulic pressure must take place after the installation and on the linear guide, exclusively.

- ▶ Connect the hydraulic connection, open the clamping and braking element by pressurizing ① the connection with a min. of 120 bar and max. of 130 bar.
- ▶ Make sure the mounting face is clean and flat.
- ▶ Push the clamping and braking element onto the guide rail from the end. Depending on the rail manufacturer and thus the shape of the contact profile, it may also be possible to put the element on from above.

- ▶ If necessary, insert the adapter plate ⑨ between the element and the mounting piece
- ▶ Manually screw the assembly bolts into the threaded holes. Note the minimum screw-in depth of 0.9 x Ø.
- ▶ The element centers itself as a result of multiple cycles (a min. of 10 opening and closing cycles).
- ▶ Switch the element into a depressurized state and clamp. Tighten the assembly bolts using the specified tightening torque. (See "Technical data" table)

| | |
|---|---|
| Installation and operating instructions | Im Salmenkopf 5 D-77866 Rheinau, Germany ☎: +49 7844 9138 0 ☎: +49 7844 9138 80 |
| LBHS | |
| DDOC000219 Index 0 | www.zimmer-group.de |

Caution:
If the mounting screws are tightened when the clamping and braking element is not clamped, the clamping and braking element can shift and therefore be unable to achieve the optimum clamping force! Furthermore, the guide rail could become damaged.

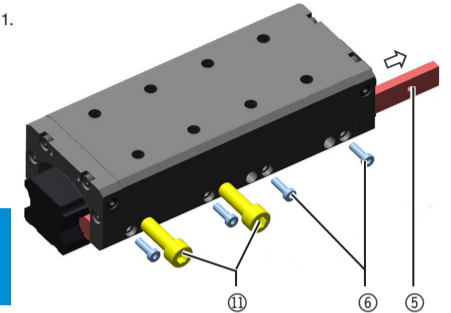
6.2 Disassembly

Disassembly is carried out in the reverse order of that described in Chapter 6.1.

Use the following process for disassembly in the event of faults:

- ▶ Remove all mounting screws ⑤
- ▶ Screw 2 M10 cylinder screws ⑪ into the disassembly holes ⑧.
- ▶ Carefully clamp the LBHS until the clamping jaws and brake pads can be removed from the other end of the LBHS.
- ▶ Repeat this process for all four clamping jaws and brake pads.

Note:
If the disassembly bolts are screwed in on the side where the jaws/pads have already been removed, a suitable pad it to be pushed in to protect the profile rail.



6.3 Checking operational readiness

After the clamping and braking element has been properly installed, verify that it is ready to be operated according to the following characteristics:

- Check the hydraulic connections for leaks by looking/listening.
- Check the specified tightening torque of all assembly bolts (see Technical Data table).
- Check the pressurized clamping and braking element for leaks by looking/listening.
- Check for ease of movement on the linear guide rail when the clamping and braking element is open.
- Check the clamping process by manually moving the mounting piece

7. Maintenance

The clamping and braking element is maintenance-free up to the number of cycles listed in point 8 under the following conditions:

- HLP 46 hydraulic fluid
- The guide rail must be clean and free from greasy films.

▶ Even though the element is, as mentioned, maintenance-free, perform a regular visual inspection for possible corrosion, damage and contamination on the clamping and braking element.

▶ Clean the clamping and braking element as needed using a commercially available machine cleaning agent and then apply an anti-corrosion agent to the housing.

8. Technical data

| LBPS size type ... | 20 | 25 | 30 | 35 | 45 | 55 | 65 |
|--|---|--------|------|------|------|------|-------|
| Operating medium | HLP 46 hydraulic fluid in accordance with DIN 51524-2 | | | | | | |
| Minimum operating pressure [in bar] | 120 | | | | | | |
| Maximum operating pressure [in bar] | 130 | | | | | | |
| Hydraulic connection | M5x0.5 | M5x0.5 | G1/8 | G1/8 | G1/8 | G1/8 | G1/8 |
| Displacement per cycle at 120 bar [in cm³] | 1.0 | 1.1 | 1.4 | 1.8 | 2.1 | 2.9 | 3.5 |
| Assembly bolts with a min. strength class of 8.8 | M8 | M8 | M8 | M9 | M10 | M10 | M10 |
| Tightening torque [in Nm] | 25.0 | 25.0 | 25.0 | 25.0 | 49.0 | 49.0 | 49.0 |
| Weight [in kg] | 0.80 | 1.00 | 2.00 | 3.00 | 4.80 | 8.00 | 14.00 |
| Holding force [N] | | | | | | | |
| Opening width on each side [mm] | 0.025 to 0.05 | | | | | | |
| Operating temperature | -10 °C to +70 °C | | | | | | |
| Static clamping cycles [B ₁₀ d value] | up to 500,000 | | | | | | |
| Dynamic brake cycles | up to 2000 | | | | | | |

9. Troubleshooting

The following table displays a list of possible faults. The described measures for corrective actions must be carried out by an expert maintenance/service technician. If the described measures for corrective actions are unsuccessful, contact the customer service department at Zimmer GmbH.

| Fault | Reason | Possible cause | Remedies |
|-------------------------------|-------------------------------|---|---|
| LBHS does not open | Operating pressure is too low | Operating pressure at the pressure source is set too low | Set the operating pressure in the range from 120 to 130 bar |
| | | Leaks / blockage / crushing of lines | Check the hydraulic connections and lines |
| Response times are too long | Too little oil is being fed | Valve is too small ⇒ LBHS opens after a delay | Choose a larger valve |
| | | Line from the valve to the LBHS is too long ⇒ LBHS opens after a delay | Make line as short as possible / select larger line diameter |
| | | Line from the LBHS to the valve is too long ⇒ LBHS closes after a delay | Make the lines as big and long as possible |
| Oil loss | Leaky housing parts | | Open and close the LBHS multiple times, otherwise: ☎ Service Zimmer GmbH. |
| | Leaky connections | | Check line |
| Holding force is insufficient | Rail/LBHS is unsuitable | LBHS and rail have different tolerances | ☎ Service Zimmer GmbH |
| | LBHS can be bent | Mounting piece is not rigid enough / assembly bolts are loose | The mounting surface should be completely covered and be sufficiently rigid |

10. Transport and storage

The clamping and braking element is to be transported and stored only in the packaging supplied by Zimmer GmbH. If the clamping element is stored differently, it must be provided with corrosion protection to prevent any corrosion.

11. EC Declaration of Conformity in terms of the EU Machinery Directive 2006/42/EC (Annex II 1 A)

Name and address of the manufacturer:
ZIMMER GmbH • Im Salmenkopf 5 • D-77866 Rheinau, • Phone: +49 7844 9138 0 • Fax: +49 7844 9138 80 • www.zimmer-group.de
We hereby declare that the following, identically constructed safety components
Product designation: hydraulic clamping and braking element

Type designation: LBHS

conform to the requirements of the 2006/42/EC directive in their design and the version we put on the market.

The following harmonized standards have been used: (The manufacturer has a full list of the applied standards.)
DIN EN ISO 12100:2011-03 Safety of machinery - General principles - Risk assessment and risk reduction
DIN EN ISO 4413 Hydraulic fluid power - General rules - Safety requirements for hydraulic systems

Authorized representative for compiling the relevant documents:

| | | |
|---|------------------------------|----------------------------|
| Michael Hemler (see manufacturer's address) | Rheinau, Germany, 2014-11-27 | Martin Zimmer |
| First name, last name | Address | Place and date of issuance |
| | | Legally binding signature |