

HPL / HPM

Lift buffer

Operation Manual _EN_ V 1.0.2



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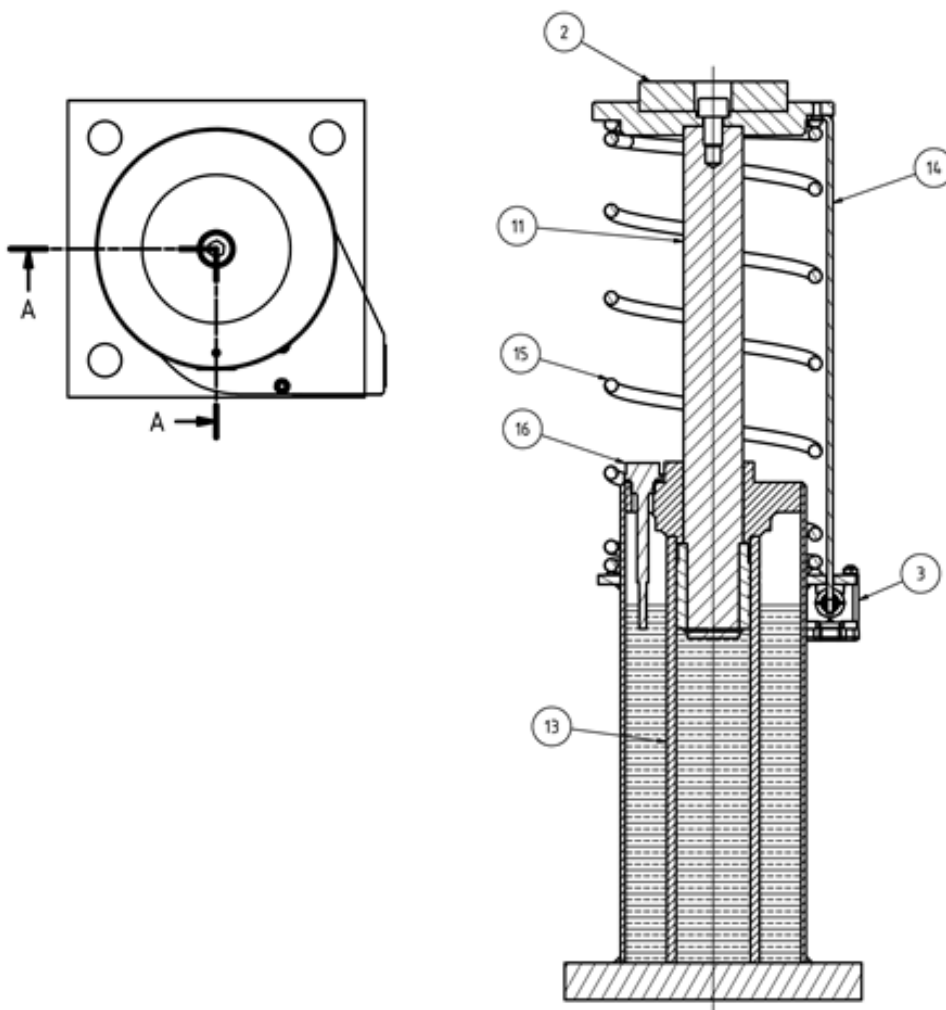
Operating manual for HPL & HPM lift buffers

This operating manual is the original operating manual of Henning GmbH, Schwelm for HPL & HPM type lift buffers.

1 Application

The HPL & HPM type lift buffer is a buffer with **high energy absorption** in accordance with EN 81-20, EN 81-50 5.5, and can therefore be used universally for all applications in lift construction. The type examination permits use in passenger and freight lifts, both under the car and under the counterweight. Installation may only be carried out in vertically moving lifts and with the buffers in an upright position.

2 Function description (Figure 1a)



In the event of an impact, the piston rod **11** is pushed into the metering tube **13**. This displaces the hydraulic fluid in the tube and forces it out through small drilled holes in the wall of the tube and is collected in the outer cylinder. The seal system provides a reliable seal along with the chrome plated piston rod.

After the buffer has impacted and the piston rod is released, the compressed spring **15** returns the piston rod back to the starting position.

The level of hydraulic fluid in the extended piston rod can be measured using the dipstick **16**.


A rubber bumper **2** cushions the impact and reduces the noise of the impact.

The switch **3** monitors the buffer's extended position. When the piston rod is pushed down, the switch is activated by the striker **14**.

3 General notes

An adequately safe environment must be provided for persons working inside the lift shaft.

Please note the general safety instructions issued by the lift manufacturer and the current standards and regulations.

	<p style="text-align: center;">Caution!</p> <p style="text-align: center;">Buffers are technical safety equipment. They must only be installed, inspected and serviced by trained and qualified staff! Please follow the applicable safety rules!</p>
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4 Preparations

4.1 Design data

The buffer label contains information such as the construction size and design criteria

- Piston diameter and stroke
- Minimum impact weight
- Maximum impact weight
- Rated speed

for the buffer. First of all, check that the conditions under which the buffer is operated do not exceed the design criteria.

4.2 Permissible ambient temperature

The permissible ambient temperature for the standard design of the HPL / HPM lift buffer is from -10 °C to +50 °C.

On request the buffer can also be supplied in a special design for low ambient temperatures, which is filled with special

hydraulic oil. This may only be operated between -30 °C and +40 °C and is provided with a special label for this temperature range. Furthermore, an enhanced type examination certificate is also supplied.

4.3 Installation site

The place where the buffer is installed must be clean and dry.

Check the place where the buffer is to be installed and the weight capacity of the equipment used to carry the buffer.

Check the size of the remaining safety space underneath. When the buffer is fully compressed there must be sufficient safety space under the car in accordance with applicable standards.

The piston rod must not be affected by external factors.

In operation of the lift system, the surface of the piston rod must be permanently kept free of frost, snow and ice.

Should the operating conditions not conform to the specifications, please contact Henning GmbH.

5 Installation



Safety note:

Before carrying out any installation and servicing work, make sure that the motor cannot be started up automatically or inadvertently!

1. The buffer is supplied ready for installation and filled with oil.
2. If the buffer is supplied with the piston rod compressed, the transport locks must be removed. Cut through the restraining straps on the side of the buffer. **Caution! The extending piston rod can cause injuries!**
3. Fixing materials must be ordered separately. M 16x160 DIN 529 heavy duty dowels or anchor screws are suitable to be used with 18 DIN 126 nuts and washers.
4. The buffer is fixed directly to the floor or suitable surface. The buffer piston rod must run exactly vertically. This re buffer with a spirit level. The piston rod must be pointing vertically upwards!
5. quires installation on a horizontal fixing surface or using suitable shim plates.
6. Fix the buffer exactly under the centre of gravity of the lift car (centre of the car) or the counterweight. If you are using several buffers, these should be distributed symmetrically around the centre. Check the alignment of the
7. Compress the buffer several times manually. This dispels transport-related air bubbles from the hydraulic fluid. The piston rod must then be fully extended and the oil level must be correct.

For buffers that require service work on a lift

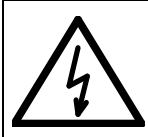


- that can be moved into a service position or
- that can be removed for service work on the lift

the following must be observed:

1. The lift may only be put back into operation if the buffer is back in its operating position and is correctly secured. We recommend fitting a suitable electrical monitoring device.
2. Then compress the buffer at least twice to ensure that there are no air bubbles in the piston chamber.
3. Next, check the extended position of the piston rod and check the oil level.
4. Suitable signs indicating the process sequence must be placed at the installation site.

5.1 Electrical connection



Hazardous voltage!

Prior to any electrical work, make sure that the system is disconnected from the power supply!

Connect the limit switch **3** (Fig. 1a) to the power supply.

When routing the cables, note the operating range of the striker **14** on buffer impact.

6 Putting the buffer into operation



Safety note:

Make sure that all persons have left the lift shaft before carrying out buffer tests!

1. Check that the piston rod is extended and check the oil level.
 2. Carry out an initial buffer test at reduced speed and without additional load.
 3. Check the electrical signal of the limit switch **3**.
 4. Wait approx. 1 to 2 minutes before releasing the buffer again.
 5. Check that the piston rod is extended and check the oil level. Check the buffer and the impact site for possible damage or oil leaks.
 6. If you cannot find any defects, carry out a second test. This should be carried out at the rated speed with maximum load.
 7. Repeat steps 4 and 5 .
- The buffer is ready for operation when everything is found to be OK.

7 Regular tests

The following inspections may be carried out as part of regular lift system checks, or as troubleshooting measures. Please

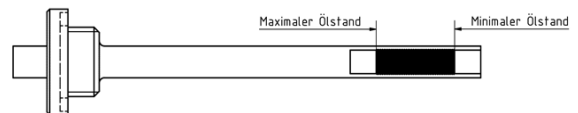
observe the safety notes above when doing this.

7.1 Checking the extended piston rod

- The limit switch **3** is not actuated
- The visible part of the piston rod is as long as the stroke +1 mm (see type plate data).

7.2 Checking the oil level

HPL / HPM series lift buffers are equipped with a dipstick for checking the oil level. Readings should only be taken with the piston rod fully extended (see previous test item).



- The oil level must be within the marked area; a central position at room temperature is ideal.

The buffers are filled up to the central position of the marked area (at room temperatures of approx. 16 – 22 °C) in the factory.

(vertical) buffer as far in as possible several times. If the oil level does not drop despite the piston rod being fully extended, oil must be extracted.

The oil level depends on the temperature. If the ambient temperature is close to freezing, the oil level may drop to a level close to minimum. High ambient temperatures cause the oil level to rise.

If the oil level is too low, oil must be topped up (see section 8.3 'Correcting the oil level'). In this case, check the buffer for leaks.

If an inspection shows that the oil level is too high, this may be caused by air bubbles in the oil. If that is the case, compress the

7.3 Checking the spring

In order to be able to return the piston rod to its initial position after impact, the buffer is equipped with a spring. Carry out a visual inspection of the spring during regular

maintenance work. It must not be warped or broken. If the spring is broken or warped, the buffer must be replaced or repaired.

7.4 General visual inspection

Watch out for traces of oil on the floor or buffer. An oil wetting of the piston rod **11** is normal and no cause for concern. Check the surface of the piston rod for damage and

contamination. Check the condition and operation of the limit switch **3**.

If the buffer is damaged or leaky, replace the buffer or have it repaired by qualified staff.

7.5 Checking the piston rod for ice

If the buffer is operated at ambient temperatures of below freezing, the piston rod must be protected against frost, snow

or ice. Be sure to check that the measures taken to prevent icing are working well.

8 Maintenance

Under normal operating conditions, the HPL / HPM lift buffer does not need to be serviced. But if the inspections referred to

earlier reveal defects, such defects can be repaired as described in the following. Always take safety precautions to ensure the lift cannot be started up inadvertently!

8.1 Correcting the oil level

- Unscrew the dipstick **16** .
- To top up, use the following oil grades:**a) for standard design** (-10 °C to +50 °C): Hydraulic oil DIN 51524-2 HLP or ISO 6743/4 HM Viscosity ISO VG 46
b) for low-temperature design (-30 °C to +40 °C, see type plate):Hydraulic oil MOBIL DTE 10 Excel 22
- Top up the hydraulic oil and check the oil quantity using the dipstick. The dipstick needs to be completely screwed in to do this!
- Unscrew the dipstick again after a short wait, and check the oil level as stated in section 7.2.
- Extract oil when the level is too high (see section 7.2).
- Note the oil level limits shown in section 7.2. The correct oil level is only indicated with the piston rod fully extended. When the oil level is too high the buffer risks being overloaded on impact. When the oil level is too low, the cushioning effect of the buffer can be inadequate.
- Re-insert the dipstick **16** , and make sure that the sealing ring on the dipstick is not damaged.
- If a log book is kept for the lift buffer, note down the oil level checks.

9 Measures taken during operation

9.1 What to do after a full buffer impact

Lift buffers should not get hit while in service. An impacted buffer is therefore always the result of a malfunction. After the buffer is released and the return of the piston rod to its initial position (limit switch **3**) is signalled, the lift is usually ready for operation again.

It is nevertheless recommended to subject the buffer and the system to a visual inspection.

9.2 What to do after oil is found to be leaking

Find out where the oil is leaking. If oil continues to leak and the leak cannot be sealed, the buffer has to be replaced immediately. When only a small amount of oil is leaking, the buffer can continue to be used. First check the buffer's oil level. If the oil level

has dropped under the minimum level, top up oil (see section 8). Afterwards the buffer has to be checked at shorter intervals. When the actual condition of the buffer is not evident, replace the buffer. Remove leaked oil e.g. using oil binders or cleaning rags.

9.3 What to do if the oil level is too low

Check the buffer for leaks. If no leaks are found, top up oil (see section 8).

If oil is leaking, proceed as described in section 9.2.

9.4 What to do if the oil level is too high

A high oil level is only possible when too much oil has been topped up. Note the remarks in section 7.2 'Checking the oil level'. Make sure that the piston rod

is fully extended. When oil has to be extracted, proceed as described in section 8.

9.5 What to do if the piston rod cannot be fully extended

In this case, the buffer must be replaced.

9.6 What to do if the piston rod is damaged

Damaged or bent piston rods affect the operational safety of buffers. These buffers

must be replaced or repaired by qualified staff.

10 Service

Please address spare parts orders to our service department.

The following buffer-specific data must always be supplied (see type plate):

- Type of buffer
- Serial number
- Max. and min. weights
- Rated speed

11 Recycling

At the end of its service life the buffer can be recycled as follows:

- Extract as much of the hydraulic oil as possible and have it disposed of by the waste oil processing industry.
- Dispose of the buffer as scrap iron.

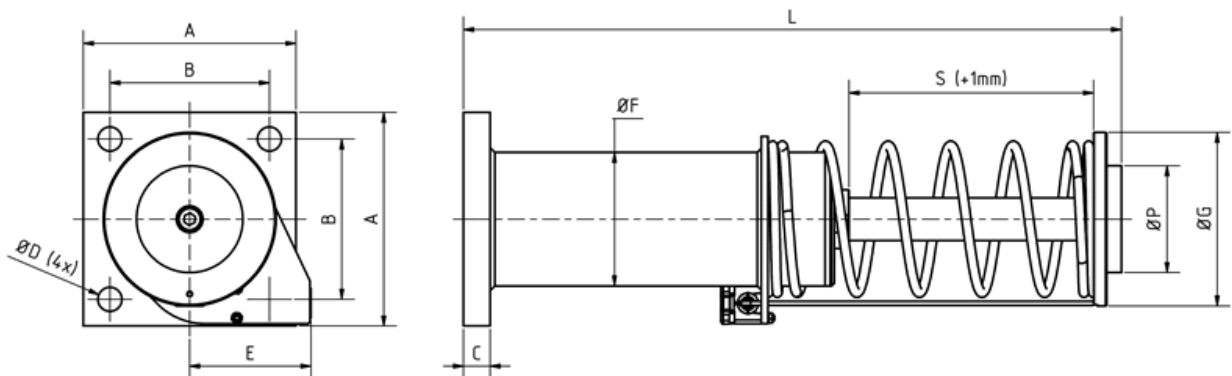
Appendix

Technical data:

Piston size x stroke[mm]	Rated speed[m/s]	Impact weightmin. - max.[kg]	Maximum energy input[kNm]	Maximum buffer force [kN]	Weightwith oil[kg]
HPL 40 x 80	1.0	450 – 3500	5.07	95	12
HPL 40 x 120	1.3	450 – 3500	8.04	95	13
HPL 40 x 175	1.6	450 – 3500	11.94	95	14
HPM 40 x 275	2.0	450 – 3500	18.70	95	17
HPM 40 x 430	2.5	450 – 3500	29.23	95	22

Dimensions of type HPL / HPM:

	S	L	A	B	C	D	E	F	G	P
HPL 40 x 80	80	305	160	120	20	18	91	115	130	80
HPL 40 x 120	120	385								
HPL 40 x 175	175	495								
HPM 40 x 275	275	715								
HPM 40 x 430	430	1122								



All dimensions in mm.

Subject to modifications!

Hydraulic fluids and permissible ambient temperatures in operation:

a) Standard design:

Hydraulic oil DIN 51524-2 HLP or ISO 6743/4 HM

Viscosity ISO VG 46 for temperatures of -10 °C to +50 °C

b) Low-temperature design (on request):

Hydraulic oil MOBIL DTE 10 Excel 22

for temperatures of -30 °C to +40 °C

c) Special designs with biodegradable or highly inflammable hydraulic fluids (on request):

Different special fluids are tested and cleared for use with the HPL/HPM hydraulic buffer.

In individual cases, please note the specific label on the buffer and the additional paperwork for job documentation!

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