



Instruction- and Maintenance Manual

Pressure Bottle HDF

GB

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1. General Notes

These instructions apply primarily to pressure accumulators marked by CE, but are also binding for hydraulic accumulators with other approvals.

The HENNLICH - HDF pressure accumulator has been designed, manufactured and tested in accordance with the European specification for pressure equipment in accordance with the DGRL 214/68/EU directive.

Strict compliance with the instructions and recommendations given in this document and in all other relevant documents is mandatory for the operation of the pressure equipment. The supplier assumes no responsibility for direct or indirect damage to property or any personal injury, as well as for consequential damage, such as operational failures, resulting from non-observance of the following instructions.

Before commissioning and during operation, it is necessary to follow all instructions for using the accumulator. Compliance with the current instructions is the responsibility of the operator, who must ensure that the documents supplied with the equipment are kept in a safe and accessible place. They can also be useful for audits and inspections.

2. Function and Intended Use

The HENNLICH pressure accumulator HDF is used for the following hydraulic applications:

- A pressure vessel is used to store liquids or gases under high pressure.
- To store the energy transferred by a liquid and release it again as required (energy storing).
- Maintaining a necessary pressure over a certain period of time.
- Hydraulic balancing.
- To absorb excess energy, e. g. in the form of a pressure surge.

These pressure accumulators are designed to be installed as components in a machine or system or to be combined with other components to form a machine or system.

For commissioning and operation within the EU, the regulations of the Pressure Equipment Directive DGRL 214/68/EU and the Machinery Directive 2006/42 EG or other country-specific regulations within and outside the EU must be observed.

The fluid group information (1 or 2) on the nameplate refers to the system medium to be used (hazard or no hazard fluid).

The accumulator may only be put into operation if it has been installed in the system for which it is intended and it has been ensured that the system meets the specifications of the Machinery Directive, the Pressure Equipment Directive and/or others statutory and local regulations.

If repairs are carried out personally without informing the manufacturer, the guarantee claim expires.

Intended use also means that the operator has read and understood this manual completely.

The standard HDF pressure accumulator configured for medium fluid group 1 (= hazardous fluids) implies operation with hazardous media such as e.g. E.g.: highly flammable, explosive, highly flammable, flammable, very toxic, toxic and oxidizing fluids.

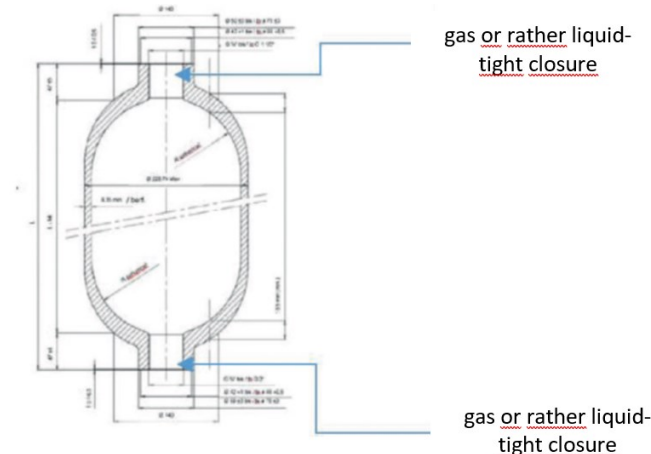
The standard HDF pressure accumulator configured for medium fluid group 2 (= non-hazardous fluids) is designed for operation with non-hazardous media. This fluid group includes all fluids that do not fall into group 1. The standard HDF pressure accumulator without a corresponding surface coating is intended exclusively for operation with non-corrosive system media and may also only be operated in a non-corrosive atmosphere with the standard painting supplied by the factory.



The outside of the standard storage body is primed in RAL 5015 (blue) and can be painted by the operator to protect against corrosion. For operation in a corrosive atmosphere, HENNLICH - HCT offers special tanks with internal and external coatings.

3. Functionality

The HENNLICH - pressure accumulator enables the storage of liquids and gases



3.1 Storage Connections

- Use of intended adapters and connecting parts

The operator must ensure that the threaded connections (a) and (b) on the pressure vessel are sealed or piped as intended with gas or liquid-tight connections corresponding to the respective application (Figure 1).

3.2 accumulator connection thread

- Depending on the type of accumulator, the pressure accumulator can be equipped with various accumulator connection threads from G3/4" to G2".

4. Configuration

The standard HENNLICH pressure accumulators are configured as forged carbon steel pressure vessels. (special version on request)

The pressure accumulators can be supplied with specially corrosion-resistant coatings based on specific orders. External coatings are possible for all types - Interior coatings on request.

If necessary, the type of coating can be configured according to the system medium.

5. Safety Instructions

The current commissioning ordinances and regulations for the safe operation of hydraulic accumulators require the compliance with all safety-related measures, as e.g.:

- Attaching suitable safety devices to prevent excess pressure
- Safety regulations when handling the operating medium
- Use of proper and calibrated pressure gauges
- correct connection of pressure gauges
- if necessary, use of suitable shut-off devices, etc.

The operator must ensure that all relevant legal regulations are observed. HENNLICH - accessories, e.g. safety and shut off blocks contain the legal requirements (e.g. according to TRB 403).



It is strictly forbidden:

- to weld, solder, drill or carry out other works on the pressure accumulator that could change the mechanical properties of the pressure device
- modifying of the accumulator or its components

6. Transportation - Storage

6.1 Transportation

Handle with care!

For transport, use only tested lifting gear and equipment which enable a safely handling in accordance to the size and weight of the accumulator.

6.2 Storage

Hydraulic accumulators should be stored in cool, dry places. They must not be exposed to heat or flames. It is recommended to store accumulators in a horizontal position.

7. Labeling of the hydraulic accumulator

Data, markings and other markings must not be changed.

The following information are displayed on the hydraulic accumulator:

- HENNLICH - HCT - Logo
- Accumulator type
- If necessary, article number of the hydraulic accumulator

Permissible operating data:

- Temperature range TS (in °C)
- maximum permissible pressure PS (in bar)
- fluid group to be used (1 or 2)
- Date of manufacture MM / YY
- Nominal volume of the hydraulic accumulator (in liters)
- Test pressure PT (in bar)
- Date of test YY / MM

and for volumes > than 1 liter:

- CE logo and identification number of the notified body

Warnings on the nameplate and on the accumulator vessel:

- Warnings and precautions regarding disassembly

Damaged or lost nameplates must be replaced!



8. Commissioning

The operation of accumulators and equipment may only be carried out by qualified personnel. Hydraulic accumulators are systems that require monitoring and are subject to explicit commissioning regulations. Pressure equipment that is put into operation in the EU must comply with the European Pressure Equipment Directive DGRL 214/68/EU.

According to the provisions applicable in Germany, (§14 (1), §15_ BetrSichV (1)), a system subject to monitoring may only be put into operation for the first time and after a significant change, if the proper condition and the intended mode of operation with regard to assembly, installation, installation conditions and safe function, have been checked by a notified body.

Pressure equipment classified in Article 4.3 and Category I can, if necessary, be put into operation by a qualified person from the operator. Pressure equipment configured in Categories II, III, IV must be put into service by a notified body.

In addition, systems subject to monitoring are subject to a repeat inspection obligation in accordance with Section 16_ BetrSichV. (If you have any questions – contact HENNLICH - HCT!)

Before commissioning, the pressure device must be visually inspected for any external damage.

Before work is carried out on the hydraulic system, it must be ensured that the system is depressurized. Incorrect installation could cause serious accidents and damage.

8.1 Work prior to commissioning

Check whether the pressure device corresponds to the existing operating conditions. (Fluid medium / fluid group / operating parameters such as permissible operating pressure, permissible operating temperature, etc.).

8.2 Permissible operating pressure (PS)

The maximum permissible operating pressure (PS) for the pressure accumulator is specified on the type plate or stamped on the accumulator body. Check that the maximum allowable working pressure of the accumulator corresponds to the application-specific hydraulic system. If the system pressure is higher, the accumulator must not be used.

8.2.1 Permissible temperature range (TS)

The temperature range (TS) for the hydro bladder accumulator is explicitly shown on the type plate. The temperature displayed on the accumulator body implies the maximum allowable temperature of the storage body (design temperature of the body). Check whether the specified permissible temperature range covers the application-specific operating temperature.

8.2.2 Suitable hydraulic fluids

Check that the operating medium is compatible with the equipment supplied.

It is strictly forbidden to use the pressure accumulator with an operating medium for which it is not intended or suitable.

Group 1 fluids must not be used in an accumulator intended only for Group 2 fluids. The type plate (sticker) or the accumulator itself, as well as the declaration of conformity, shows the fluid group for which the hydraulic accumulator is approved.



Group 1 (hazardous fluids) includes explosive, extremely flammable, highly flammable, ($T_{max} > \text{flash point}$), very toxic, toxic, oxidizing liquids (as defined in Chapter 2 of Article 2 of the European Directive 67/548/EEC of June 27, 1967 defined - the classification of the fluids is based on the Directive 2014/68 EU, Art.13).

Group 2 (non-hazardous liquids) includes all other liquids.

When using Group 1 hazardous liquid, all possible safety instructions must be strictly observed in accordance with current laws and regulations in force.

If other media are used that differ from hydraulic fluids (e.g. HLP 46), these must be marked by the operator on the accumulator!

8.2.3 Installation

Consider the prevailing climatic conditions and, if necessary, protect the accumulator from sources of heat, electrical and magnetic fields, lightning, moisture and other adverse environmental conditions. For best performance, place the accumulator as close to the consumer as possible.

The preferred installation position is vertical.

In order to avoid corrosive deposits inside the storage tank, a condensate drain must be attached to the lower accumulator connection.

8.2.4 Assembly

- Make sure that the connected pipe system is laid stress-free.
 - Make sure the storage is properly fixed and cannot move uncontrollably.
- HENNLICH clamps and brackets are suitable for this and can be supplied as accessories.
- The pressure accumulator must be mounted in such a way that no external forces can act on it.

8.2.5 Final check before commissioning

The final check before commissioning must be carried out in accordance with the current operational safety regulations and national laws.

(e.g. use of appropriate safety devices or acceptance test by a recognized test center, etc.)

8.2.6 Starting up the pressure accumulator

Secure the hydraulic accumulator. When filling, position yourself in such a way that you cannot be damaged in the event of a leak in the device. The comments in 8.1.4 must also be observed.

Danger:

When using gas as the operating medium:

The gas pressure varies according to the operating and room temperatures.

The maximum system pressure must not exceed the maximum permissible operating pressure of the pressure accumulator.

8.2.7 Hydraulic pressure systems

Check the hydraulic pressure system for leaks.

Ensure that the system-side hydrostatic pressure cannot exceed the maximum allowable pressure PS indicated on the hydraulic accumulator.

Caution! Never open a bleed screw or other parts when the hydraulic system is under pressure.



9. Maintenance / Repair

Before the hydraulic accumulator is removed from the system, it must be ensured that the hydraulic accumulator is completely depressurized.

Before dismantling the hydraulic accumulator, make sure that the accumulator and its direct connections and connection lines are completely relieved and the accumulator is completely separated from the system on the system side (pay attention to outgassing from the liquid)!

To keep the equipment in good operating condition and to ensure a long service life, the following maintenance is recommended:

9.1 General maintenance work

depending on the test intervals and the operating conditions:

- Review of safety instructions
- Checking of fastenings and connections

- Visually inspect of the accumulator for possible signs of wear such as corrosion or deformation.

- If an abrasive or corrosive liquid is used, regular checks must carry out, depending on the aggressiveness internal wear.
- regular condensate drainage
- The hydraulic accumulator must be checked regularly, both internally and externally, in accordance with statutory regulations.

- If an abrasive or corrosive liquid is used, regular checks must carry out, depending on the aggressiveness internal wear.



10. Listing of alleged faults

Incident/type of disruption	Assumed cause	Effect / hazard	Measure to remedy the fault / preventive measures
leackage	Defective connection parts, seals	Loss of oil / gas Area: Storage / connections	Periodic checking of connections, under Observing the tightening torque
	Insufficiently fastened connection parts	loosening the connecting parts	
	Cracks in storage body	danger of bursting	Immediate shutdown of the plant. The accumulator must be sorted out
Cracks / deformations into the accu vessel	overloading of the accumulator operating of the device outside predetermined application limits	danger of bursting	Compliance and control of the permitted operating parameters (see rating plate, declaration of conformity, operating instructions). Securing the hydraulic accumulator against overpressure using appropriate safety valves
Reduction of the wall thickness of the accumulator vessel	Abrasion due to increased frictional forces / by Use of unsuitable fluids / contamination of the fluid	danger of bursting	Immediate shutdown of the plant. The device needs to be sorted out./ Use of suitable fluids. Avoidance of contamination into the Operating system.
Corrosion of the inside of the accumulator	by using of unsuitable fluids (e.g. corrosive fluids)	Corrosion / danger of bursting	Immediate shutdown of the plant. The device needs to be sorted out./ Use of suitable fluids. Storage and tranport: Closing of the holes by protection capes
Corrosion of the outside of the accumulator	As a result of insufficient surface coating (e.g. operation of the memory outside)	Corrosion / danger of bursting	Immediate shutdown of the plant. The device needs to be sorted out./ Use of suitable accu vessels. (coated or stainless steel accu vesels)
Assembly problems	damaged or contaminated connection thread	None / or insufficient mounting options	Use of suitable fastening equipment (e.g. clamps, consoles, rear walls).
	improper fastening equipment	effect of external forces and tensions	
parts that come loose	deficient attachment	functional problems, people and property damage	ensure sufficient fixations, in particular Fixations of pressurized parts check regularly. (e.g. gas valve, (Bleeder screw, connecting parts)
commissioning problems	Exceeding the storage time of systems subject to monitoring	Commissioning refusal by the notified body if the storage time is exceeded (>2 years)	Additional internal inspection according to § 14 BetrSichV by the notified body.



11. Fatigue Life

The product-specific load cycles are documented regarding the underlying ranges of compressive stress into the accordant EU declarations of conformity.

12. Additional hazard and safety information

1. Transport, moving the hydraulic accumulator

Danger of property damage and personal injury!

Uncontrolled movements or the hydraulic accumulator falling to the ground can lead to property damages and personal injuries.

Recommendation: Use liftings and transport devices to lift and transport the accumulator. (e.g. HENNLICH accessories)

2. Assembly, maintenance and repair

Danger of property damage and personal injury!

The maintenance and repair of the accumulator requires basic mechanical and hydraulic knowledge.

The maintenance and repair of the hydraulic accumulator may only be carried out by qualified personnel (qualified person).

Disassembly, assembly and repair of the hydraulic accumulator may only be carried out by authorized persons. No guarantee is given for repairs carried out by the customer! For transport, close all openings with suitable protective caps so that no dirt or moisture can get into the bladder accumulator.