



Hydraulic Bladder Accumulators High Pressure

1. DESCRIPTION

1.1. FUNCTION

Fluids are practically incompressible and cannot therefore store pressure energy.

The compressibility of a gas (nitrogen) is utilised in hydraulic accumulators for storing fluids.

HYDAC bladder accumulators are based on this principle.

A bladder accumulator consists of a fluid section and a gas section with the bladder acting as the gas-proof screen.

The fluid around the bladder is connected to the hydraulic circuit so that the bladder accumulator draws in fluid when the pressure increases and the gas is compressed. When the pressure drops, the compressed gas expands and forces the stored fluid into the circuit.

HYDAC bladder accumulators can be used in a wide variety of applications and are also available in different pressure ranges, see catalogue sections:

- Hydraulic Bladder Accumulators Standard No. 3.201
- Hydraulic Bladder Accumulators Low Pressure No. 3.202
- Accumulators No. 3.000

1.2. CONSTRUCTION

The high pressure bladder accumulator consists of the pressure vessel, the flexible bladder with gas valve and the hydraulic connection with check valve.

1.2.1 Shell material

The forged pressure vessel is seamless and manufactured from high tensile chrome molybdenum steel.

1.2.2 Bladder material

The following elastomers are available as standard:

- NBR (acrylonitrile butadiene rubber, Perbunan),
- IIR (butyl rubber),
- FKM (fluoro rubber, Viton®),
- ECO (ethylene oxide epichlorohydrin rubber).

The material used depends on the particular operating medium and temperature.

When choosing the elastomer, allowances must be made for the fact that the gas can cool down to below the permitted elastomer temperature if there are adverse discharge conditions (high pressure ratio p_2/p_0 , high discharging velocity). This can cause cold cracking in the elastomer.

The gas temperature can be calculated using the HYDAC Accumulator Simulation Program ASP.

1.2.3 Corrosion protection

For operation with chemically aggressive media, the accumulator shell can be chemically nickel-plated internally or supplied with a special plastic coating, such as Duroplast.

For external corrosion protection the accumulator can be supplied with an epoxy resin finish specially for offshore applications.

1.3. MOUNTING POSITION AND TYPE OF MOUNTING

Information on secure mounting positions and mounting elements can be found in the following catalogue sections:

- Hydraulic Bladder Accumulators Standard No. 3.201
- Supports for Hydraulic Accumulators No. 3.502
- ACCUSET SB No. 3.503

2. TECHNICAL SPECIFICATIONS

2.1. MODEL CODE

(also order example)

SB690 - 32 A 1 / 312 U - 690 D

Series _____

Nominal volume [l] _____

Fluid connection _____
 A = standard connection

Gas side connection _____
 1 = standard model²⁾
 9 = special model (Example: 1/4" - BSP)

Material code¹⁾ _____

Fluid connection _____
 2 = high tensile steel
 3 = stainless steel
 6 = low temperature steel

Accumulator body _____
 0 = plastic coated (internally)
 1 = carbon steel
 2 = chemically nickel-plated (internal coating)
 6 = low temperature steel
 8 = plastic coated (e.g. Duroplast) internally and externally

Accumulator bladder _____
 2 = NBR20
 3 = ECO
 4 = IIR (Butyl)
 5 = NBR21 (low temperature)
 6 = FKM
 7 = other
 9 = NBR22

Certification code _____
 U = PED 97/23/EC

Permitted operating pressure [bar] _____

Connection _____
 A = Thread to ISO228 (1/2" BSP)
 D = Thread to ANSI B1.20.3 (1/2" NPTF)

Required gas pre-charge pressure must be stated separately!

¹⁾ not all combinations are possible
²⁾ gas valve type in SB < 10 l = 7/8 - 14 UNF,
 in SB ≥ 10 l = M50x1.5

2.2. EXPLANATORY NOTES

2.2.1 Operating pressure

690 bar (10000 psi)

Higher pressures on request

2.2.2 Permitted working temperature and elastomer resistance

NBR20	-15 °C ... +80 °C	water water glycol mineral oil
NBR21	-50 °C ... +80 °C	
NBR22	-30 °C ... +80 °C	
ECO	-30 °C ... +120 °C	mineral oil
IIR	-40 °C ... +100 °C	phosphate ester, water
FKM	-10 °C ... +150 °C	chlorinated hydrocarbons, petrol

2.2.3 Gas charging

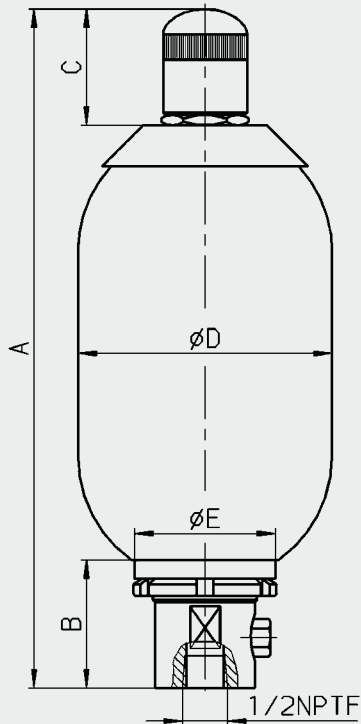
Hydraulic accumulators must only be charged with nitrogen.
 Never use other gases.

Risk of explosion!

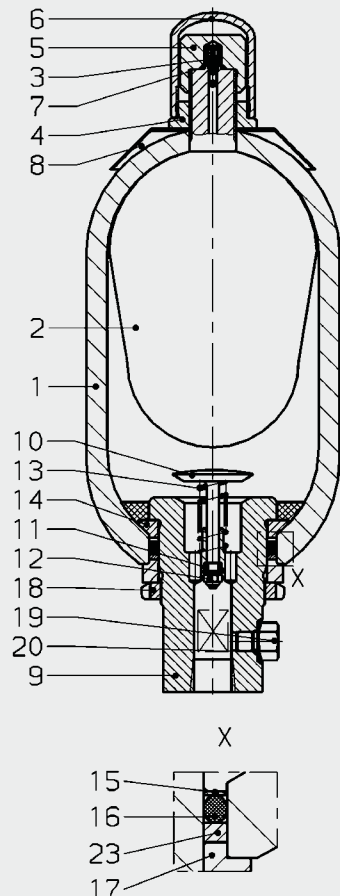
3. DIMENSIONS AND SPARE PARTS

3.1. DRAWINGS

3.1.1 Dimensions



3.1.2 Spare parts



3.2. DIMENSIONS

Nominal volume [l]	Eff. gas volume [l]	Weight [kg]	A max. [mm]	B [mm]	C [mm]	Ø D max. [mm]	Ø E [mm]	SW [mm]
1	1.0	8.5	324	61	58	122	67	45
2.5	2.5	13.5	531					
5	4.9	23	860					
13	12.0	92	700	77	68	250	110	75
20	17.0	114	865					
32	33.5	186	1385					
54	49.7	260	1900					

3.3. SPARE PARTS

3.3.1 Part numbers NBR

Nominal volume [l]	Seal kit P/N	Bladder kit P/N	Repair kit P/N	Anti-extrusion ring P/N
1		03010110	03182617	
2.5	03182615	03211568	03201771	00293262
5		03211569	03201772	
13	03182616	03211570	03211573	03028455
20		03211592	03211574	
32		03211571	03211585	
54		03116598	03211586	

Description	Item
Seal kit	
consisting of:	
O-ring	7
Washer	15
O-ring	16
Vent screw	19
Support ring	23
Bladder kit	
consisting of:	
Bladder	2
Gas valve insert	3
Lock nut	4
Seal cap	5
Valve protection cap	6
O-ring	7
Repair kit	
consisting of:	
Seal kit (see above)	
Bladder kit (see above)	
Anti-extrusion ring	14

Item 1 not available as a spare part.

4. NOTE

The information in this brochure relates to the operating conditions and applications described. For applications and operating conditions not described, please contact the relevant technical department. Subject to technical modifications.

HYDAC Technology GmbH
 Industriegebiet
 D-66280 Sulzbach/Saar
 Tel.: 0 68 97 / 509 - 01
 Fax: 0 68 97 / 509 - 464
 Internet: www.hydac.com
 E-Mail: speichertechnik@hydac.com

