



## 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:

- Bladder Accumulators Standard No. 3.201
- Bladder Accumulators Low Pressure No. 3.202
- HYDAC Accumulator Technology No. 3.000

#### 1.2. DESIGN

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 seamless pressure vessel is 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.

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

#### 1.3. INSTALLATION POSITION AND TYPE OF INSTALLATION

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

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

On no account must any welding, soldering or mechanical work be carried out on the accumulator shell. After the hydraulic line has been connected it must be completely vented.

Work on systems with hydraulic accumulators (repairs, connecting pressure gauges etc) must only be carried out once the pressure and the fluid have been released.

**Please read the Operating Manual! No. 3.201.CE**

**When replacing seals and/or bladder, please read the Instructions for assembly and repair (No. 3.301.M).**

##### Note:

Application examples, accumulator sizing and extracts from approvals regulations relating to hydraulic accumulators can be found in the following catalogue section:

- HYDAC Accumulator Technology No. 3.000

## 2. TECHNICAL SPECIFICATIONS

### 2.1. MODEL CODE

Not all combinations are possible.  
Order example. For further information, please contact HYDAC.

**SB690 - 32 A 1 / 312 U - 690 D**

**Series** \_\_\_\_\_

**Nominal volume [l]** \_\_\_\_\_

**Fluid connection** \_\_\_\_\_  
A = standard connection

**Gas side connection** \_\_\_\_\_  
1 = standard model <sup>1)</sup>  
9 = special model (example: 1/4" - BSP)

**Material code** \_\_\_\_\_

**Fluid connection** \_\_\_\_\_  
2 = high tensile steel  
3 = stainless steel  
6 = low temperature steel

**Accumulator shell** \_\_\_\_\_  
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 = Others  
9 = NBR22

**Certificate 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) Gas valve 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	-55 °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!**

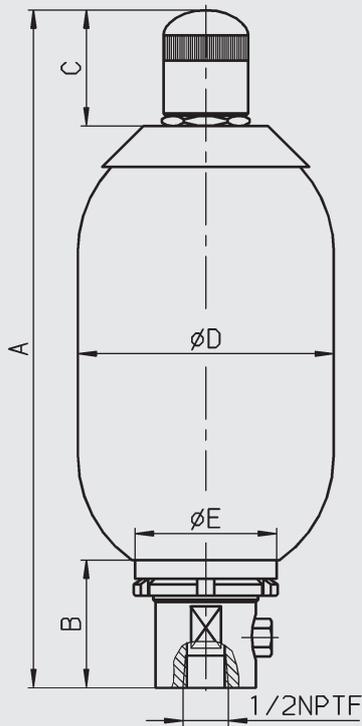
In principle, the accumulator may only be charged with nitrogen class 4.0, filtered to < 3 µm.

If other gases are to be used, please contact HYDAC for advice.

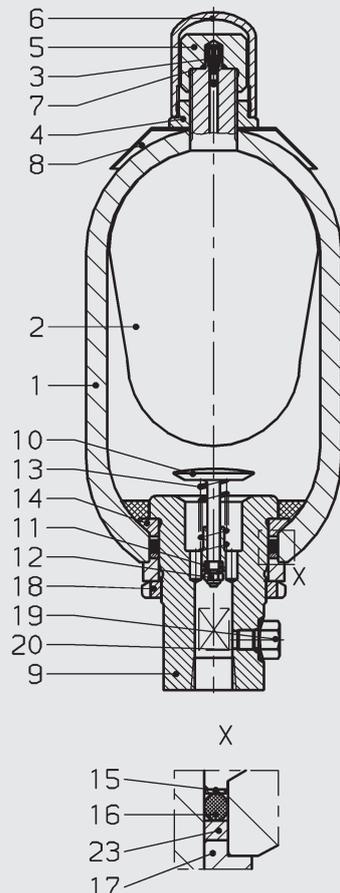
### 3. DIMENSIONS AND SPARE PARTS

#### 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	8.5	324	61	58	122	67	45
2.5	2.5	13.5	531					
5	4.9	23	860					
13	12	92	700	77	68	250	110	75
20	17	114	865					
32	33.5	186	1385					
54	49.7	260	1900					

#### 3.3. SPARE PARTS

##### 3.3.1 Part numbers NBR

Description	Item
<b>Bladder assembly</b>	
consisting of:	
Bladder	2
Gas valve insert	3
Retaining nut	4
Seal cap	5
Valve protection cap	6
O-ring	7
<b>Seal kit</b>	
consisting of:	
O-ring	7
Washer	15
O-ring	16
Bleed screw	19
Support ring	23
<b>Repair kit</b>	
consisting of:	
Seal kit (see above)	
Bladder assembly (see above)	
<b>Anti-extrusion ring</b>	14
<b>Oil valve assembly</b>	
consisting of:	
Valve assembly (items 9-13)	9
Anti-extrusion ring	14
Washer	15
O-ring	16
Spacer	17
Lock nut	18
Bleed screw	19
Support ring	23

Item 1 not available as a spare part.

Nominal volume [l]	Seal kit Part no.	Bladder assembly Part no.	Repair kit Part no.	Anti-extrusion ring Part no.
1	3182615	3010110	3182617	293262
2.5		3211568	3201771	
5		3211569	3201772	
13	3182616	3211570	3211573	3028455
20		3211592	3211574	
32		3211571	3211585	
54		3116598	3211586	

#### 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.

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