HYDAC INTERNATIONAL

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 is utilised in hydro-pneumatic accumulators for storing fluids.

HYDAC bladder accumulators are based on this principle, using nitrogen as the compressible medium.

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

The fluid around the bladder is connected with the hydraulic circuit, so that the bladder accumulator draws in fluid when 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 grades (see brochure "Bladder Accumulators Standard" no. E 3.201../.. and the overview brochure "Accumulators" no. DEF 3.000../..).

The available brochure shows the high pressure version of a bladder accumulator 690 bar with its main dimensions, materials, gas and fluid connections as well as available accessories.

E 3.203.0/02.05

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 respective operating medium and temperature.

When choosing the elastomer, allowances must be made for the fact the gas can cool down to below the permissible elastomer temperature if there are adverse discharge conditions (high pressure ratio p_2/p_0, rapid discharge speed). 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**
Depending on the environment and utilised operating fluid the shell of the accumulator can be supplied with corrosion protection, such as duroplastic coating on the in- and/or outside or chemical nickel plating.

For offshore applications a epoxy offshore painting on the outside of the accumulator is available.

1.3. MOUNTING

See brochures below to receive instructions about advised mounting positions and mounting support systems:

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

2. TECHNICAL SPECIFICATIONS

2.1. EXPLANATORY NOTES

2.1.1 **Design Pressure**
690 bar (10,000 psi)

2.1.2 **Working temperature range**

NBR	-10 °C to 80 °C
NBR low temp.	-50 °C to 80 °C
ECO	-30 °C to 120 °C
FKM	-10 °C to 150 °C

2.1.3 **Elastomer resistance**

NBR	water, water glycol, mineral oil
NBR low temp.	
ECO	mineral oil
IIR	phosphate ester
FKM	chlorinated hydrocarbons, petrol

2.2. MODEL CODE
(also order example)

SB690 - 32 A 1 / 312 U - 690 D

Series

Nominal volume in l

Fluid connection
A = standard connection

Gas side
1 = standard model [2]

Material code [1]
Fluid connection
2 = high-strength steel
3 = stainless steel (Niro)
6 = low temperature steel

Accumulator shell
0 = plastic coated (inside)
1 = carbon steel
2 = chemically nickel plated (inside)
6 = low temperature steel
8 = duroplastic coated (inside and outside)

Accumulator bladder
2 = NBR
3 = ECO
4 = IIR (Butyl)
5 = TT-NBR (low temperature)
6 = FPM
7 = others

Certificate code
U = PED 97/23/EC

Permissible operating pressure (bar)

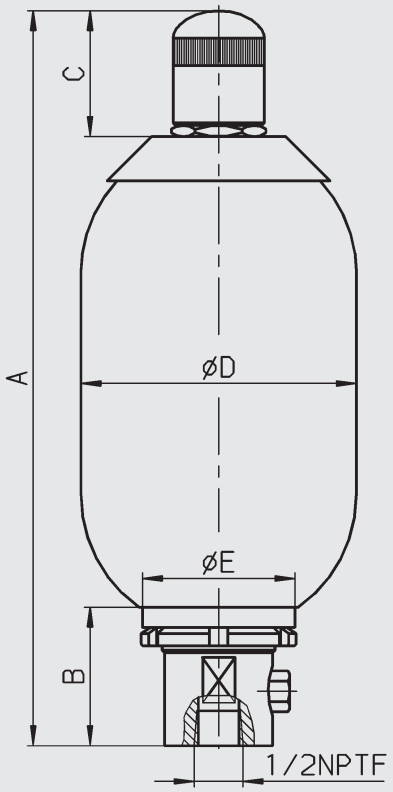
Connection
D = thread according to ANSI B1.20.3 (NPTF)

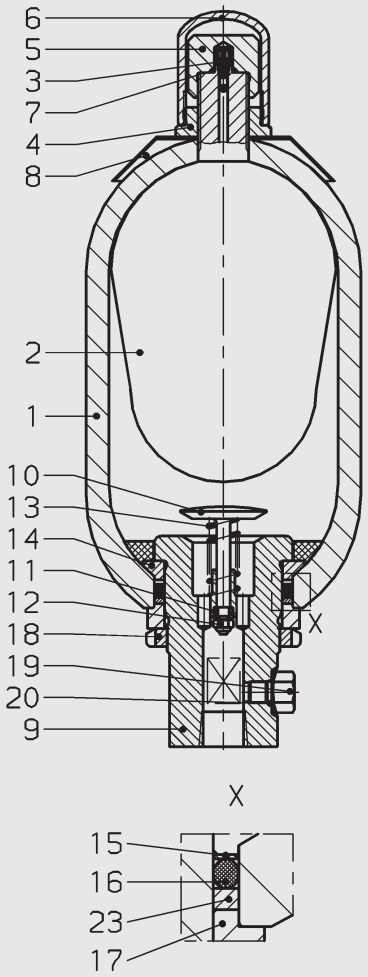
Required gas pre-charge pressure must be stated separately!

1) Not all combinations are possible.
2) Gas valve type in SB ≤ 5 l = 7/8 - 14 UNF,
in SB > 5 l = M50 x 1.5

3. DIMENSIONS AND SPARE PARTS

3.1. DIMENSIONS





Nom. volume	Eff. gas volume	Weight	A max.	B	C	ØD max.	ØE	SW
Litre	Litre	kg	mm	mm	mm	mm	mm	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					

3.2. SPARE PARTS

3.2.1 Part numbers

NBR

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

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

4. NOTE

The information in this brochure relates to the operating conditions and applications described.

For applications or operating conditions not described, please contact the relevant technical department.

Subject to technical modifications.