

# BAE Bladder Accumulators

For working pressures up to 330 bar

aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding



# Bladder Accumulators

#### Series BAE

Bladder Accumulators
Liquids are practically incompressible and therefore cannot be
used directly for storing energy. Hydro-pneumatic accumulators
ased directly for storing energy. Tryaro pricamatic accumulators

used directly for storing energy. Hydro-pneumatic accumulators use the differing compressibility of liquid and gaseous media to enable energy to be stored in liquids under pressure.

Parker's hydro-pneumatic bladder accumulators provide a means of regulating the performance of a hydraulic system. Their simple, compact, design ensures dependable performance, maximum efficiency and long service life.

#### **Technical Data**

Standard volumes 1 – 50 litres

Operating pressure Up to 330 bar, with  $p_2 < 4 \times p_1$ 

where  $p_1$  = minimum working pressure and  $p_2$  = maximum working pressure

Precharge pressure

- energy storage
 - pulsation dampening
 - shock suppression
 90% of minimum working pressure
 60% of maximum working pressure
 60% of maximum pump pressure

Std. temperature range Shell and ports: -40°C to +80°C

Bladder and seals: -15°C to +80°C For use at other temperatures, please

consult factory.

Fluid type Mineral oil (standard compounds)

**Positioning** From vertical (fluid port downwards) to horizontal. A minimum clearance of 200mm must be left above the gas valve for mounting the charging and gauging assembly – see page 5.

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# Why use a Bladder Accumulator?

- · stores energy under pressure
- · damps out pump pulsation and flow fluctuations
- improves system efficiency
- · supplements pump delivery
- · supplies power in emergency
- · absorbs hydraulic shocks
- · compensates for pressure changes in cases of thermal stress
- · very contaminant tolerant
- · suitable for use with low-lubricity fluids
- fast response times
- · Safety cannot disassemble under pressure

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Catalogues describing our standard products are available from your nearest Parker sales office – please see the rear cover of this catalogue for addresses. Where an application demands a non-standard approach, special products can be designed to order – our engineers will be pleased to advise.

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#### Offer of Sale

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#### **Features and Dimensions**

# **Design Features and Benefits**

#### 1 Approvals

All BAE bladder accumulators meet the requirements of the European Pressure Directive (PED) 97/23/EC. Bladder accumulators are marked with the CE logo and supplied with a declaration of conformity. Hydraulic accumulators fulfil the safety requirements for all member states of the European Union, as well as Iceland, Liechtenstein, Norway and Switzerland. Certification to PED + ASME and PED + SELO is also available.

#### 2 Shell

Parker's bladder accumulator shells are made from seamless chrome-molybdenum alloy steel with forged ends, for maximum strength. The standard shell is suitable for use at operating temperatures down to  $-40^{\circ}$ C.

#### 3 Bladder

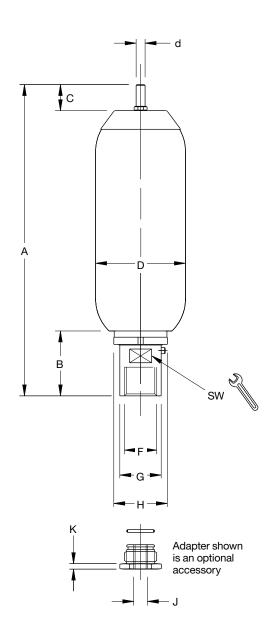
The absence of dynamic sealing surfaces makes bladder accumulators tolerant of contamination and particularly suitable for low-lubricity fluids. Specially formulated for low permeability, Parker's bladders retain their high performance under a wide range of operating conditions including closed loop operation. Optional bladder compounds are available to suit all common fluids and operating temperatures.

#### 4 Gas Valve

Accurate precharging of a bladder accumulator is the key to long and reliable service life. All Parker's bladder accumulators feature a robust gas valve, which is readily accessible for maintenance purposes. A charging and gauging assembly, described on page 5, allows precharging and monitoring to be carried out quickly and easily.

# 5 Fluids and Fluid Ports

Parker's bladder accumulators are supplied as standard for use with hydraulic mineral oil. They are also available for use with other media, such as bio-degradable hydraulic fluids, non-inflammable liquids, emulsions, etc. Fluid ports are made from high-strength alloy steel, for maximum durability. BSPP ports are fitted as standard. Other port styles are available, including stainless steel for sub-sea use.



# **Models, Capacities and Dimensions**

Model	Volume Litres	Mass Kg	Max flow I/min 1
BAE01	1.0	5	240
BAE02	2.4	10	450
BAE04	3.7	13.5	450
BAE06	6.0	17.8	450
BAE10	9.2	29.5	900
BAE20	17.8	46	900
BAE24	22.5	53	900
BAE32	34.6	73	900
BAE50	50	101	900

A max	B max	C max	ØD	Ød	F	ØG	ØН	sw
305	50	55	115	36	G <sup>3</sup> / <sub>4</sub>	35	51	32
535	67	55	115	36	G1 <sup>1</sup> / <sub>4</sub>	53	75	50
417	67	55	170	36	G1 <sup>1</sup> / <sub>4</sub>	53	75	50
540	67	55	170	36	G1 <sup>1</sup> / <sub>4</sub>	53	75	50
559	93	51	223	36	G2	76	101	73
874	93	51	223	36	G2	76	101	73
1009	93	51	223	36	G2	76	101	73
1394	93	51	223	36	G2	76	101	73
1920	93	65	223	55	G2	76	101	73

J	K
G <sup>3</sup> / <sub>8</sub>	8
G <sup>3</sup> / <sub>4</sub>	10
G <sup>3</sup> / <sub>4</sub>	10
G <sup>3</sup> / <sub>4</sub>	10
G1	13

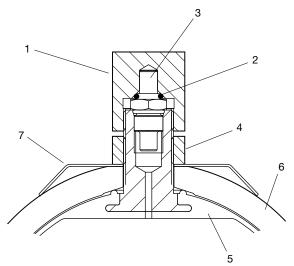
#### Notes

All dimensions are subject to manufacturing tolerances. All dimensions are in millimetres unless otherwise stated.



 $<sup>^{1}</sup>$  A minimum liquid volume (10% of  $V_{\rm o}$ ) must be maintained inside the accumulator. The maximum values listed only apply when installed vertically with the fluid port downwards.

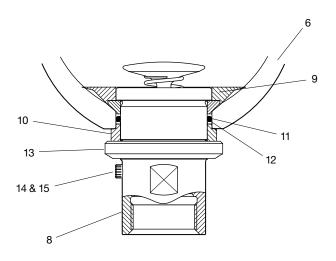
# **Spare Parts and Repair Kits**



**Gas Valve Assembly** 

# Parts List (All Models)

- 1\* Protective cap
- 2\* O-ring protective cap
- 3\* Gas valve
- 4\* Gas valve lock nut
- 5\* Bladder
- 6 Shell
- 7 Identification plate
- 8 Hydraulic port assembly
- 9\* Anti-extrusion ring moulding
- 10 Port spacer
- 11\* O-ring hydraulic port
- 12\* O-ring back-up washer
- 13 Fluid port lock nut
- 14\* Bleed plug
- 15\* Sealing washer for bleed plug



Fluid Port Assembly - All Models

# **Repair Kits**

Repair kits are available for all accumulator models. When ordering repair kits, please supply the complete model number from the identification plate and specify the fluid type and the temperature at which the accumulator is to be used. The repair kit comprises those parts marked with an asterisk in the parts list. For a full description of the compound abbreviations, see 'Bladder Compounds' on page 5.

Model		Compound					
Model	NBR	IIR	FPM	EPDM	ECO		
BAE01	BAE-BK01NBR						
BAE02	BAE-BK02NBR						
BAE04	BAE-BK04NBR						
BAE06	BAE-BK06NBR	1					
BAE10	BAE-BK10NBR	_					
BAE20	BAE-BK20NBR						
BAE24	BAE-BK24NBR						
BAE32	BAE-BK32NBR						
BAE50	BAE-BK50NBR						



<sup>\* -</sup> included in repair kit

#### **Series BAE**

# **Bladder Compounds**

Parker offers bladders moulded from a variety of compounds, to suit a wide range of fluids and operating temperatures. Unless ordered specifically, a Group 1 (nitrile) bladder will be supplied. The table lists the compounds in which bladders are available, their recommended operating temperature ranges,

and the types of fluids with which the different materials are generally compatible. Note that temperature ranges may vary depending on the fluid used in the hydraulic system. If in doubt, contact the factory with details of the application.

Group	Bladder Compound Fluid Medium		Temperature Range
		General purpose, mineral oil-based fluids	-15°C to +80°C
1	Nitrile (NBR)	HFA and HFB fluids <sup>1</sup>	+5°C to + 55°C
		HFC fluids <sup>1</sup>	-15°C to +60°C
2	Low Temperature Nitrile (LT NBR)	Mineral oil-based fluids	-35°C to +75 °C
3	Butyl (IIR)	Most phosphate ester and some synthetic fluids	-15°C to +80°C
5	Fluorocarbon Elastomer (FPM)	High temperature and/or synthetic fluids	-20°C to +100°C <sup>2</sup>
7	Ethylene Propylene Diene (EPDM)	Phosphate ester-based fluids and water	-40°C to +80°C <sup>3</sup>
9	Epichlorohydrine (ECO)	General purpose fluids with enhanced low temperature performance	-32°C to +80°C <sup>3</sup>

- 1 Check with fluid supplier that fluid is compatible with nitrile compounds
- <sup>2</sup> For operating temperatures above 80°C, please consult the factory
- For operating temperatures below -20°C, please consult the factory

#### **Port Sizes**

Standard fluid ports are made from high-strength alloy steel, for maximum durability. BSPP ports are fitted as standard. ISO 6149 and SAE ports are available on request.

Model	BSPP ISO 6149-1		SAE-Thread	SAE Flange (ISO 6162)
BAE01	G <sup>3</sup> / <sub>4</sub>	M27x2	n°12 1¹/₁6"-12	n/a
BAE02 - BAE06	G1¹/₄	M42x2	n°20 15/8"-12	1" 6000 psi Code 62
BAE10 - BAE50	G2	M60x2	n°24 1 <sup>7</sup> / <sub>8</sub> "-12	1 <sup>1</sup> / <sub>2</sub> " 6000 psi Code 62

#### Fluid Port Adapters

A range of adapters is available for use with Parker's bladder accumulators, to reduce the size of the fluid port. Adapters are supplied complete with a nitrile O-ring.

Model	Fluid Port Thread	Adapter Thread	Part No.
BAE01	G <sup>3</sup> / <sub>4</sub>	G <sup>3</sup> / <sub>8</sub>	BPA1
BAE02 - BAE06	G1¹/₄	G <sup>3</sup> / <sub>4</sub>	BPA2
BAE10 - BAE50	G2	G1	BPA3

# **Charging and Gauging Assembly**

The charging and gauging assembly enables the user to charge Parker's bladder accumulators with nitrogen, and to test and alter the precharge pressure. It attaches to the accumulator's gas valve, and can be connected by hose to a standard commercial nitrogen bottle. Each kit contains:

- Test and filling apparatus incorporating gas valve key and bleed valve
- Filling hose, length 2.5m
- Protective case
- Gas valve adapters to fit all standard bladder accumulators
- 25 bar and 250 bar pressure gauges

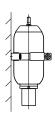
Parker strongly recommends that the nitrogen bottle used should be fitted with a high pressure regulator.

Charging and Gauging Assembly with Adapter - All Models						
Territory	Territory Gas bottle Fitting					
UK	5/8 BSP (male)	UCA 02				
France	W 21.7 x 1/14" (female)	UCA 04				
Germany	W 24.32 x 1/14" (female)	UCA 01				
Italy	W 21.7 x 1/14" (male)	UCA 05				
US	0.960 x 1/14" (male)	UCA 03				

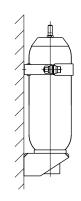


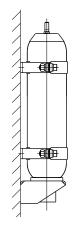
# Mounting **Accessories**

Parker clamp and base brackets provide a simple and secure method of mounting the accumulator. The clamps and brackets are galvanised to resist damage from corrosion. Rubber inserts absorb vibration and resist deformation in high temperature environments.









1 litre

2.5 - 6 litres

10 - 24 litres

32 - 50 litres

# **Clamp Bracket Assembly**

Model	Nominal Volume (I)	Part No.	Quantity	See Figure	
BAE01	1	CB1	1	1	
BAE02	2.5	CBI		ı	
BAE04	4	CB2	2	0	
BAE06	6	CB2		2	
BAE10	10				
BAE20	20		1		
BAE24	24	CB3		3	
BAE32	32		2		
BAE50	50				

Α	В	С	ØD	E	н	K	ØL	М
138	100	159	114	_	73	30	9	14
188	148	181	168	230	92	40	9	14
270	216	241	226	290	123	40	15	21

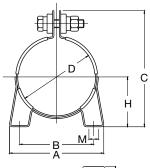
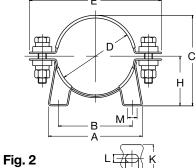


Fig. 1





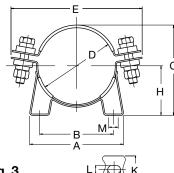
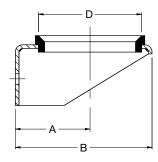


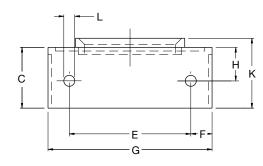
Fig. 3

# **Base Bracket Assembly**

Model	Nominal Volume (I)	Part No.	
BAE10 - BAE50	10 - 50	BB1	

Α	В	С	D	E	F	G	н	к	L
123	235	100	170	200	30	260	25	115	17



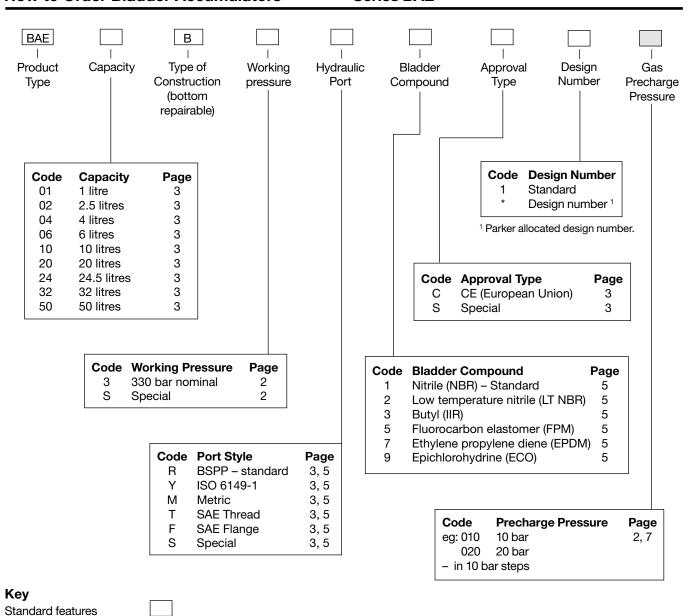


All dimensions are in millimetres unless otherwise stated.



# Bladder Accumulators Series BAE

# **How to Order Bladder Accumulators**



# **Gas Precharge Pressure**

Optional features

BAE bladder accumulators can be delivered precharged with nitrogen. Where this option is chosen, the required precharge pressure should be shown in the last field of the model code, as above. Where this field is left blank, the accumulator will be supplied with a transport filling of approximately 2.5 bar.

#### Certification

BAE bladder accumulators are supplied with a Declaration of Conformity in accordance with European Pressure Equipment Directive 97/23/EC, and with an operating manual and a drawing showing the main dimensions and materials.



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