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

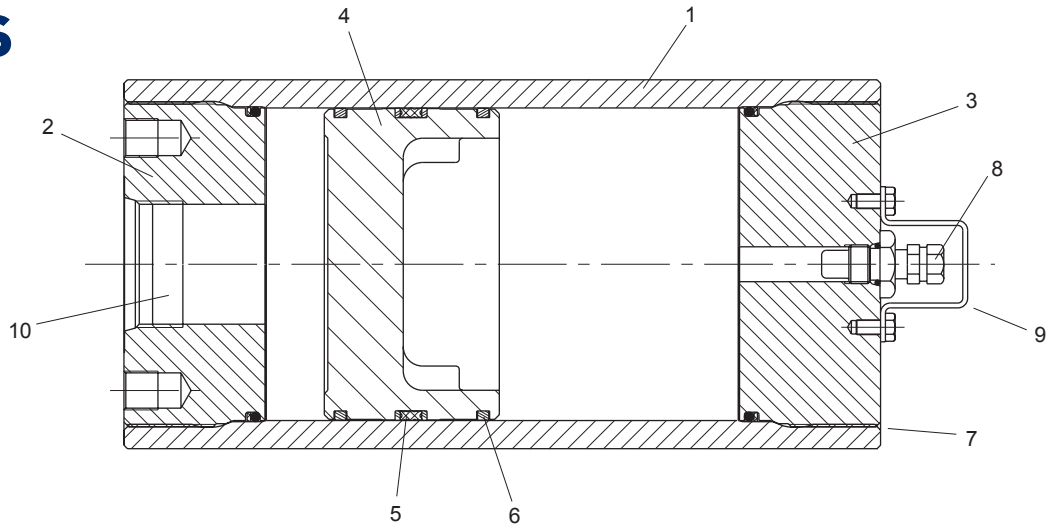
Piston Accumulators

A Series 250 and 350 bar

Parker OLAER®

ENGINEERING YOUR SUCCESS.

Benefits



1, 2 & 3. Shell and Caps

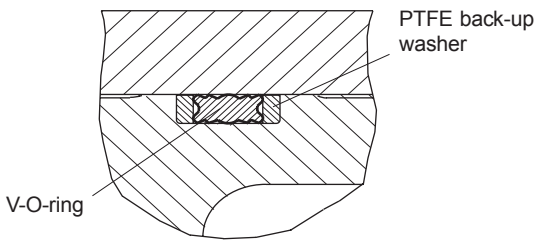
Effective heat dissipation is vital for long seal life. Compact, rugged steel shell and end caps allow heat to dissipate efficiently, while the bore of the accumulator is micro-finished to maximise seal life. Downtime is minimised by the use of threaded caps to simplify maintenance of the accumulator, permitting quick and easy installation of seals.

4. Piston

Rapid response in high cycling applications is assured by Parker's lightweight piston design. The dished profile of the aluminium piston gives extra gas capacity while maintaining stability in the bore, and permits a greater usable volume of fluid. Piston position sensors, available as an optional feature, enable the condition of the accumulator's precharge to be monitored.

5. Piston Sealing

Long service intervals are made possible by total separation of oil and gas, even under the most severe operating conditions. Parker's A Series accumulators feature a wide piston seal assembly comprising a unique five-bladed V-profile O-ring with back-up washers, which eliminates seal roll-over even in high speed applications. The V-O-ring holds full pressure throughout long idle periods between cycles, providing dependable, full pressure storage of hydraulic energy.



6. PTFE Bearing Rings

To reduce wear and extend service life, carbon-filled PTFE bearing rings are fitted, eliminating metal-to-metal contact between the piston and bore.

7. Safety Bleed Grooves

A bleed groove in the gas cap progressively releases unrelieved gas pressure in the accumulator as the gas cap is unscrewed. **Note:** to avoid the risk of damage or injury, an accumulator must always be discharged before disassembly.

8. Gas Valve

To avoid the risk of damage or injury, an accumulator must be discharged before disassembling. For added safety, the gas valves fitted by Parker vent progressively as they are unscrewed. A robust, cored-type gas valve rated at 350 bar is fitted as standard to all A Series piston accumulators. A mechanically opened and closed poppet-type gas valve cartridge, also rated at 350 bar, is available as an option.

9. Gas Valve Protector

To prevent accidental – and potentially hazardous – damage to the gas valve, the steel gas valve protector reduces the risk to the valve from external impact.

10. Ports

To provide the required flow rate and simplify system design, a wide range of port types and sizes is available. BSPP ports are supplied as standard; ISO, metric and SAE threaded and metric flanged ports to ISO 6162 are available to special order.

Applications

- **Industrial Hydraulic Power Units**
- **Machine Tools**
- **Automotive**
- **Marine & Offshore**
- **Oil & Gas**
- **Renewable & Wind Energy**
- **Power Generation**
- **Mining**
- **Transport Rail & Truck**
- **Mobile Construction & Agriculture**

Functions

- Dampen Pulsation and Pressure Spikes
- Supply in Emergency - power loss
- Compensate Thermal Changes
- Supplement Flow Requirement - Energy saving
- Compensate External actuator shock

Main Features

Actual Bore Sizes & Maximum Flow Rates

Model	Pressure	Nominal Bore ø	Actual Bore ø	Max. Recommended Flow Rate*
	bar	mm	mm	l/m
A2	250/350	50	51.4	380
A3	250/350	75	76.2	825
A4	250/350	100	102.4	1500
A5	250	125	127	2200
A6	250/350	150	146.9	3100
A8	250	200	200	5700

*Note: Based on 4m/sec maximum piston speed, port & fitting size will become limiting factors for most applications.

Bore Size, Pressures & Temperature Range

Bore Size (mm)	Max. Working Pressure (bar)	Volume (Litres)		Material Working Temperature Range °C
		Min	Max	
A2	250/350	0.08	2	-40°C to +150°C
A3	250/350	0.25	8	
A4	250/350	0.7	12	
A5	250	2	14	
A6	250/350	3.8	38	
A8	250	9.5	76	

Materials

- Shell – high strength steel
- End caps – steel
- Pistons – lightweight aluminium alloy
- Cast iron low temperature Arctic piston available upon request
- Piston and end cap seals – NBR (standard): other compounds to suit application
- Piston seal backup washers – PTFE
- Piston bearing rings – PTFE
- Gas valve assembly – stainless steel
- Gas valve protector – steel
- Paint finish – black primer (standard – others on request)

Custom Designs

For unique applications and hostile environments, different designs, materials and coatings can be supplied. Please contact our engineering department to discuss custom solutions to individual application requirements.

250 and 350 Bar Pressure Ranges
A Series accumulators are available to suit maximum working pressures of 250 and 350 bar. The same premium quality design and technical features guarantee optimum performance and service life from every model, while differing wall thicknesses to suit 250 or 350 bar working pressures allow the designer to specify precisely the right performance envelope for the application.

Available Options
A wide variety of options are available for A Series accumulators, including:
- Threaded and manifold port styles and sizes
- Seal compounds
- Metric and inch mounting styles
- High flow gas ports for use with remote gas storage bottles
- Water service versions
- Gas valves
- Safety fuses
- Accumulator mounting systems
- Precharge monitors and piston position sensors
- Certifications to suit different market requirements

Water Service
A Series piston accumulators are available for use with water as the fluid medium. Modifications include plating of all working surfaces. Please consult Parker for details.

Operating Temperatures, Seals and Fluids
A Series piston accumulators are fitted as standard with nitrile (NBR) seals. A range of alternative seal materials is available for use at higher or lower temperatures, or with synthetic or high water content fluids, as shown in the table. Other seals are also available for use in exceptional conditions – please consult the factory with details of the application. The shells of Parker's A series accumulators are CE approved for operation at temperatures between -40°C and +150°C.

Filtration
For maximum component life, the system should be protected from contamination by effective filtration. Fluid cleanliness should be in accordance with ISO 4406. The quality of filters should be in accordance with the appropriate ISO standards. The rating of the filter media depends on the system components and the application. The minimum required for hydraulic systems should be class 19/15 to ISO 4406, which equates to 25µ (ß10≥75) to ISO 4572.

Safety
Charging must be carried out by qualified personnel. Before taking any readings or pressurizing with nitrogen, the accumulator must be isolated from the hydraulic system and the fluid side discharged in order to depressurize it. Use only nitrogen (N_2) to pressurize the accumulator.

Danger of Explosion – Never Charge with Oxygen
The types of nitrogen permitted are: type S (99.8% pure); type R (99.99% pure); type U (99.993% pure).

Approvals

Approvals	A2	A3	A4	A5	A6	A8
PED 97/23/EC	•	•	•	•	•	•
CRN	•	•	•	•	•	•

Other approvals available upon request.

Mounting
The optimum mounting orientation is vertical however angled and horizontal mountings are permissible if the hydraulic fluid is kept clean; high levels of contaminants in the fluid can result in uneven or accelerated seal wear.

Seals, Fluids and Temperature Ranges

Code	Seal Type	"Min Temp"	"Max Temp"	"Fluid Classification"	"Fluid Type"	Maximum Velocity (m/s)
K	"NBR (Nitrile)"	-29°C	74°C	"HFB-HFC HM-HV"	"Mineral Oils & Water Glycols"	4 m/s
H	"HNBR (Hydrogenated Nitrile)"	-32°C	150°C	"HFB-HFC HM-HV"	"Mineral Oils & Water Glycols"	4 m/s
E	"FPM (Fluorocarbon elastomer)"	-23°C	121°C	"HFB HM-HV"	"Synthetic Oils"	4 m/s
D	"EPDM (Ethylene Propylene)"	-40°C	121°C	HFD	"Ester Fluids"	4 m/s
Q	"LT-NBR (Low Temperature Nitrile)"	-45°C	71°C	HM-HV	"Mineral Oils"	4 m/s
X	"Low Friction T Seal Consult Parker ACDE"	-43°C	121°C	HM-HV	"Mineral Oils & Water Glycols"	4 m/s
S	"Special Consult Parker ACDE"					4 m/s

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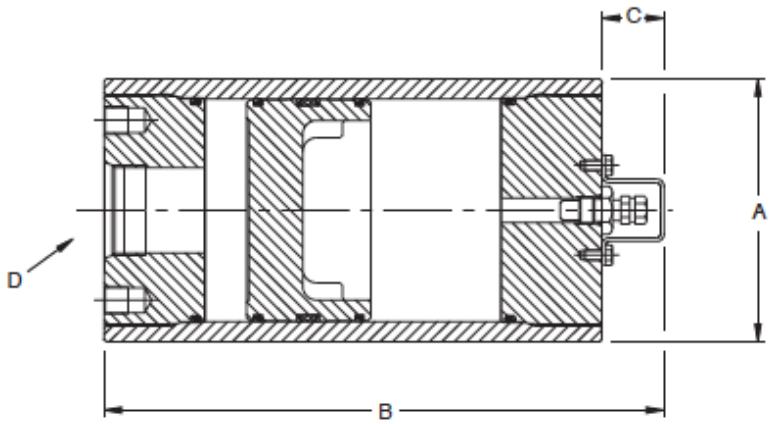
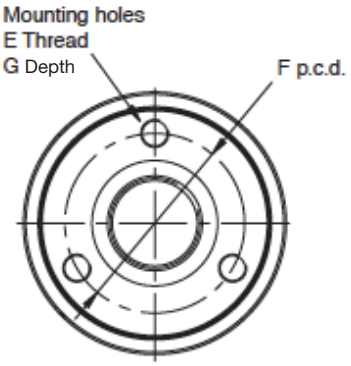
Dimensions





250 and 350 Bar Models, Capacities and Dimensions

Model	Code	Bore ø	Fluid Volume Litres	Gas Volume Litres	250 bar			350 bar			C mm	E[2]	F mm	G mm	250 bar Weight Kg	350 bar Weight Kg
					A mm	B mm	D BSPP	A mm	B mm	D BSPP						
A2	**0005**	51.4	0.1	0.1	61	172	G 3/4	64	172	G 3/4	27 [1]	-	-	-	1.8	2.7
	0010		0.15	0.2		211			211						2	3
	0015		0.25	0.25		250			250						2.5	3.3
	0029		0.5	0.5		360			360						3	4.3
	0058		1	1		590			590						4.4	6.2
A3	**0029**	76.2	0.5	0.55	91	260	G 3/4	96	260	G 3/4	29 [1]	M10	60	15	9	9
	0058		1	1		364			364						11	11
	0090		1.5	1.5		481			481						13	13
	0116		2	2		573			573						14	15
	0183		3	3		814			814						16	20
A4	**0058**	102.4	1	1.1	121	295	G 1	127	306	G 1	29 [1]	M12	82	18	15	18
	0116		2	2		411			422						18	22
	0231		3.8	4		640			651						23	30
	0347		5.7	5.9		872			883						29	38
	0578		9.5	9.6		1330			1341						41	54
A5	**0058**	127	1	1.3	153	272	G 1	-	-	-	29 [1]	M12	100	18	22	-
	0116		2	2.2		346									26	
	0231		3.8	4.1		496									32	
	0347		5.7	6		645									39	
	0578		9.5	9.8		943									52	
A6	**0231**	146.9	3.8	4.3	175	442	G 1 1/2	180	487	G 1	29 [1]	M12	110	18	35	53
	0347		5.7	6.2		554			600						42	60
	0578		9.5	10		778			824						54	74
	0924		15	15.7		1113			1159						73	96
	1155		19	19.4		1337			1383						85	110
	1733		28.5	28.9		1896			1941						112	148
	2310		38	38.4		2454			2500						147	183
A8	**0578**	200	9.5	10.7	230	629	G 2	-	-	-	42	M16	170	24	98	-
	1155		19	20.2		931									122	
	1733		28.5	29.7		1232									146	
	2310		38	39.1		1532									170	
	2772		45	46.2		1774									189	
	2888		47	48.2		1834									194	
	3465		57	58		2136									217	
	4620		76	77.2		2738									266	

[1] Where the optional poppet-type gas valve is fitted (see page 6), dimension C should be increased by 13mm.
[2] A Series piston accumulators are supplied as standard with the metric threaded mounting holes shown in the table. They are also available with inch pattern mounting holes, indicated by the Design Number in the model code – see page 9.

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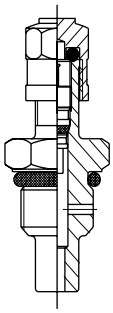
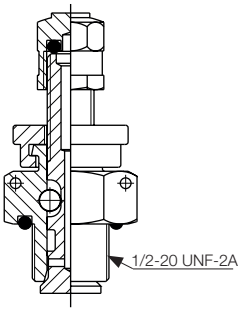
Hellaby, UK

Gas Valves

The standard gas charging valve fitted to A Series 250 and 350 bar piston accumulators is a cored-type gas valve, rated at 350 bar. A mechanically opened and closed poppet-type gas valve cartridge, also rated at 350 bar, is available as an option.



Standard Cored-Type Gas Valve



Optional Poppet-Type Gas Valve

Both types of charging valve may be used with the Charging and Gauging Kit illustrated on page 7.

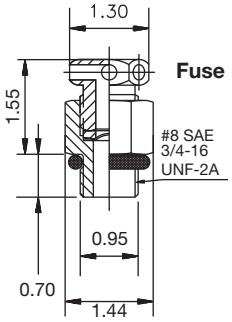
Piston Accumulator Seal Kits

Seal kits are available for all A Series accumulator models however it is recommended to buy a piston assembly with seal already assembled.

When ordering seal 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.

Safety Fuses (Burst Discs)

Safety fuses are available on A Series accumulators to prevent over-pressurization of gas due to external heat or excess hydraulic pressure. They comprise a housing incorporating a disc which is calibrated to rupture at a pre-determined pressure, to be specific by the customer at the time of ordering. Please contact the factory for further information.



Available Options

If your application requires a piston accumulator, gas bottle, or special option that falls outside of Parker's broad offering, consult your local distributor, Parker representative, or the factory with your specific requirements. Parker has the manufacturing and engineering expertise to design and build piston accumulators to your exacting requirements, from simple modifications of standard units to complete designs.

Some example of Parker's past special designs include:

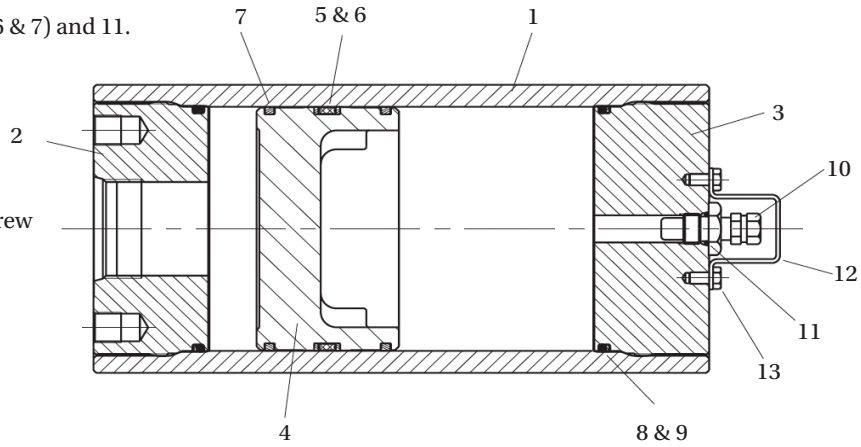
- High Pressures
- Special and Stainless Steel Materials
- Piston Position and Velocity Sensors and Switches
- Water Service
- Non-Standard Capacities
- Extreme Temperatures

Seal Kit Numbers

The seal kits listed contain items 4 (including 5,6 & 7) and 11.

Parts List

1. Shell
2. Hydraulic cap
3. Gas cap
4. Piston
5. V-O-ring
6. V-O-ring back-up washers
7. PTFE bearing ring (piston)
8. O-ring
9. O-ring back-up washer
10. Gas valve
11. Gas valve O-ring
12. Gas valve protector
13. Gas valve protector screw



Seal Kits

Seal Kit Part Numbers with piston seals assembled (remove the P for a Seal Kit without piston seal assembled)

Model	Nitrile NBR	Fluorocarbon Elastomer FPM	Ethylene Propylene EPR	Hydrogenated Nitrile HNBR	Carboxilated Nitrile XNBR	Low Temp. Nitrile NBR
A2	RK0200K000P	RK0200E000P	RK0200D000P	RK0200H000P	RK0200J000P	RK0200Q000P
A3	RK0300K000P	RK0300E000P	RK0300D000P	RK0300H000P	RK0300J000P	RK0300Q000P
A4	RK0400K000P	RK0400E000P	RK0400D000P	RK0400H000P	RK0400J000P	RK0400Q000P
A5	RK0500K000P	RK0500E000P	RK0500D000P	RK0500H000P	RK0500J000P	RK0500Q000P
A6	RK0600K000P	RK0600E000P	RK0600D000P	RK0600H000P	RK0600J000P	RK0600Q000P
A8	RK0800K000P	RK0800E000P	RK0800D000P	RK0800H000P	RK0800J000P	RK0800Q000P

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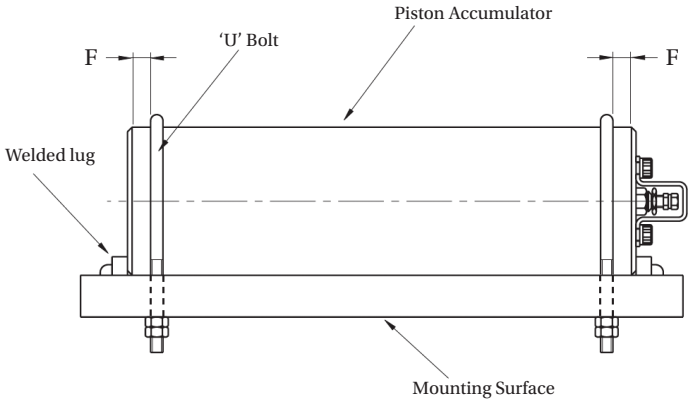
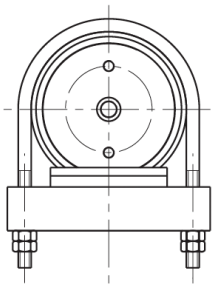
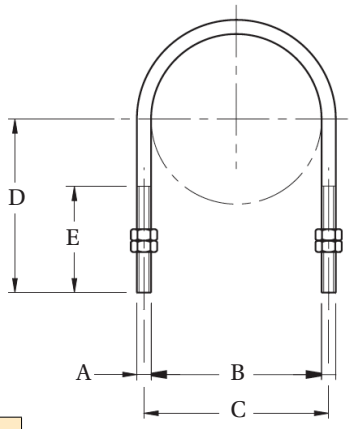
'U' Bolts for Piston Accumulators





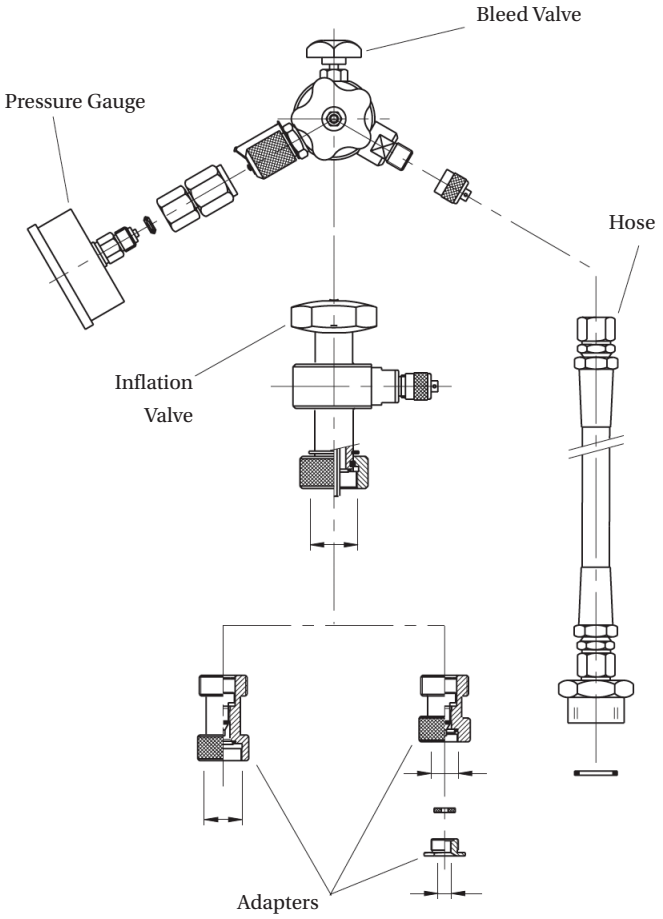


Model	Part No.	A	B	C	D	E	F	
							Min	Max
A2	PE1093-4	M6 x 1	62	68	70	45	10	25
A3	PE1093-1	M8 x 1.25	96	104	92	60	10	25
A4	PE1093-2	M12 x 1.75	128	140	114	76	10	30
A5	PE1093-12	M12 x 1.75	158	170	140	76	15	40
A6	PE1093-3	M16 x 2	180	196	155	95	20	45
A8	PE1093-13	M16 x 2	234	250	200	95	20	50

Note: 'U' bolts should be mounted within the distances shown from the end of the accumulator, to avoid deformation of the shell.

Charging and Gauging

The charging and gauging assemblies listed in the table are suitable for use with both the standard cored-type gas valve and the optional poppet type. Each kit contains a UCA assembly incorporating a gas valve, bleed valve and gas chuck, and a 3m long charging hose with standard nitrogen bottle fittings. The kit includes 25 bar and 250 bar pressure gauges, to permit easy monitoring of the gas precharge.



Territory	Gas Bottle Fitting	Part No.
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
Universal	All available fittings (includes all fittings above)	UCA UNI

All dimensions are in millimetres unless otherwise stated.

Please note:
Resistant parts cannot be supplied as spares (tubes/end caps)

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Hellaby, UK

Fluid Ports - Standard

Port Type	Code	A2		A3		A4		A5	A6		A8
		250 bar	350 bar	250 bar	350 bar	250 bar	350 bar	250 bar	250 bar	350 bar	250 bar
G 3/4 BSPP	**Leave Blank**	•	•	•	•						
G 1 BSPP	**Leave Blank**					•	•	•		•	
G 1 1/2 BSPP	**Leave Blank**								•		
G 2 BSPP	**Leave Blank**										•

Optional Threaded Ports

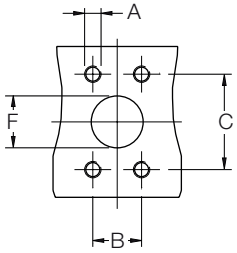
BSPP [1]			Metric to DIN 3852-1			Metric to ISO 6149-1			SAE Thread		
Thread Size	From Model	Code	Thread Size	From Model	Code	Thread Size	From Model	Code	Thread Size	From Model	Code
G 3/4	A2	**RC**	M14	A2	**GA**	M14	A2	**YA**	#5	A2	**TA**
G 1	A3	**RD**	M18	A2	**GB**	M18	A2	**YB**	#6	A2	**TB**
G 1 1/4	A3	**RE**	M22	A2	**GC**	M22	A2	**YC**	#8	A2	**TC**
G 1 1/2	A4	**RF**	M27	A2	**GD**	M27	A2	**YD**	#10	A2	**TI**
G 2	A4	**RG**	M33	A3	**GE**	M33	A3	**YE**	#12	A2	**TD**
-	-	-	M42	A3	**GF**	M42	A3	**YF**	#16	A3	**TE**
-	-	-	-	-	-	-	-	-	#20	A3	**TF**
-	-	-	-	-	-	-	-	-	#24	A3	**TG**

[1] Where the required fluid port is the standard BSPP size for the accumulator bore diameter chosen (see dimension D, page 5), the fluid port field in the order code on page 9 should be left blank.

Optional Flanged Ports

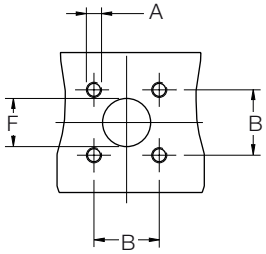
A Series Piston Accumulators are available with metric flange ports to ISO 6162/3000 psi and ISO 6164/6000 psi as shown in the tables. Inch pattern flange ports and flange ports for higher pressure operation are also available, please consult the factory for details.

ISO 6162 Flanged Port Dimensions



Flange Ports to ISO 6162/3000 psi						
Flange Size	From Model	A *	B ± 0.25	C ± 0.25	F	Code
DN13	A3	M8	17.5	38.1	13	**MT**
DN19	A3	M10	22.3	47.6	19	**MU**
DN25	A3	M10	26.2	52.4	25	**MV**
DN32	A3	M10	30.2	58.7	32	**MW**
DN38	A4	M12	35.7	69.9	38	**MJ**
DN51	A4	M12	42.9	77.8	51	**ML**
DN64	A6	M12	50.8	88.9	64	**MM**
DN76	A8	M16	61.9	106.4	76	**MN**

ISO 6164 Flanged Port Dimensions



Flange Ports to ISO 6164/6000 psi					
Flange Size	From Model	A	B ± 0.25	F +0.0 -1.5	Code
DN10	A2	M6 x 1	24.7	10.0	**SD**
DN13	A2	M8 x 1.25	29.7	13.0	**SE**
DN19	A3	M8 x 1.25	35.4	19.0	**SF**
DN25	A3	M10 x 1.5	43.8	25.0	**SG**
DN32	A3	M12 x 1.75	51.6	32.0	**SH**
DN38	A4	M16 x 2	60.1	38.0	**SP**
DN51	A4	M16 x 2	69.3	51.0	**SQ**
DN56	A6	M20 x 2.5	83.4	56.0	**SX**

How to order

Series	Model	Type of Construction	Options	Volume Capacity	Working Pressure	Design Number	Seal Type	Port Size	Gas Port	Pre-Charge
A	**4**	**E**	**S**	**0005**	**L**	**2**	**K**	**RF**	**S**	**/ 010**

A	Series Accumulator
B	Bottle

Code	**Bore Size (nominal)**
2	50 A Series
3	75 A Series
4	100 A Series
5	127 A Series
6	150 A Series
8	200 A Series

Code	**Approval Type**
E	CE approved[1]

Code	**Valve Options**
S	Cored-type gas valve (standard) [2]
W	Cored-type gas valve + water service
F	Cored-type gas valve + safety fuse
G	Cored-type gas valve + water service + safety fuse
M	Poppet-type gas valve
L	Poppet-type gas valve + water service
P	Poppet-type gas valve + safety fuse
R	Poppet-type gas valve + water service + safety fuse

Please see Dimensions table on page 5

Code	**Maximum Working Pressure** [3]	
L	250 bar	(A2, A3, A4, A5, A6 & A8)
H	350 bar	(A2, A3, A4, A6)

Code	**Port**
1	Inch mounting + SAE port
2	Metric mounting + BSPP port (standard)
3	Special ports
###	Specials (Parker assigned number)

Code	**Service/Fluid**
K	Nitrile (NBR)
E	Fluorocarbon Elastomer (FPM)
H	Hydrogenated nitrile (HNBR)
D	Ethylene Propylene (EPR)

Code	**Service/Fluid**
J	Carboxilated nitrile (XNBR)
Q	Low temperature nitrile
S	Special – please specify

Please see Fluid Port tables on page 8 (leave blank if standard)

Gas Port
Specification (where no valve supplied)

[1] Other approvals are available to order – please consult the factory.
[2] Where a gas port is specified, no gas valve will be supplied.
[3] For other pressure ratings, please consult the factory.

Hydraulic and Gas Port Modifications

For accumulators with non-standard ports, specify special gas and/or hydraulic ports and use the appropriate port code from page 8. A typical model number for an accumulator with ISO 6149 hydraulic and gas ports would be: A - 3 - T - M - 0090 - D - 2 - K - YE/YE

Code	**Pre-Charge** (for example)	**Code**	**Pre-Charge** (for example)
010	10 bar	020	20 bar

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Accumulator Sizing Software
Parker Olaer has developed very sophisticated simulation software to optimize accumulator sizing recommendations. The behaviour of accumulators used in applications such as pulsation dampening, surge alleviation, thermal expansion and energy storage can be simulated. Our software can be downloaded from our website www.parker.com/ACDE .

You may also contact your local Parker Olaer office for sizing assistance.

Calculating Accumulator Size
Accurate calculation of accumulator size requires many factors to be considered – the working volume of fluid, ambient and maximum operating temperatures, the working pressure range etc. In addition, correction factors must be applied to allow for temperature compensation between the ambient and gas temperatures, and the consequent effect on precharge pressure in the accumulator. Where the working cycle is sufficiently rapid that no heat transfer takes place, the process is termed *adiabatic*. Conversely, where the process takes place at a constant temperature, it is termed *isothermal*.

Accumulator Sizing Charts
The charts shown opposite are used to estimate the size of piston accumulator required to provide a given volume of fluid discharge from the accumulator.

The curves are based on the following formula:

$$\frac{\Delta V = 0.855\ V0\ [(P_2 / P_1)^{1/n} - 1]}{(P_2 / P_1)^{1/f}}$$

Where:

ΔV = volume of fluid discharged	n = discharge coefficient
V0 = Accumulator size	P_2 = maximum system pressure
f = charge coefficient	P_1 = minimum system pressure

It is assumed that the gas precharge pressure = 0.9 P_1

Isothermal and Adiabatic Operation
In constructing the curves, the following factors have been assumed.

For isothermal operation eg: slow charge and discharge time, f and n = 1

For adiabatic operation, eg: fast charge and discharge time, f and n = 1.8

Note: The charts provide an estimate of the volume of accumulator required to store and release a given volume of fluid under specified conditions. In practice, the true charge and discharge coefficients will depend on the application, and may cause significant variations from the chart results. If in doubt, please contact our engineering department for a more detailed calculation.

Where the ratio P_2/P_1 exceeds 1.9, a fatigue analysis is necessary. Please contact our engineering department for further information.**How to Use the Sizing Chart**
These charts are used to find accumulator size Vo when the required output ΔV is known.
Example
Refer to the red lines in the charts opposite.
ΔV = 6 litres P_2 = 170 bar P_1 = 100 bar

Step 1
As the accumulator outputΔV is known, choose the appropriate pair of charts from the two sets shown opposite. For outputs up to 50 litres use charts A and B, and for outputs above 50 litres use charts C and D. In this case, as the required output is 6 litres, charts A and B should be used.

Step 2
Calculate P_2/P_1 by dividing the maximum system pressure by the minimum pressure required to make the machine function.
In this case, 170/100 = 1.7

Step 3
Using chart A, locate 1.7 on the X-axis and draw a vertical line to the top of the chart.

Step 4
Depending on the cycle time, select the appropriate curve on chart A. For fast cycle times, use the adiabatic curve; for slow cycle times, the isothermal curve should be used. In this case, use the adiabatic curve. (n and f = 1.8)

Step 5
On chart A, identify the point at which the vertical line drawn in step 3 crosses the chosen curve (in this case adiabatic) and draw a horizontal line across to the right hand end of chart B.

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Step 6
Using the lower X-axis on chart B, locate the required accumulator output (ΔV), in this case 6 litres. Draw a vertical line to the top of the chart.

Step 7
Locate the point where the vertical line drawn in step 6 crosses the horizontal line drawn in step 5. Locate the first curve to the right of this intersection.

Step 8
Follow the curve selected in step 7 up to the top X-axis (V0) and read off the required accumulator size, in this case 30 litres. Always round up to the next largest size available; for this example, therefore, a 38 litres accumulator should be selected.

Summary

Pre-charge	90% of 100 bar = 90 bar
Adiabatic / Isothermal	Adiabatic
Accumulator selected	A6ES2310L2K

Accumulator Sizing Chart ΔV = 0.1 to 50 Litres

Chart 1

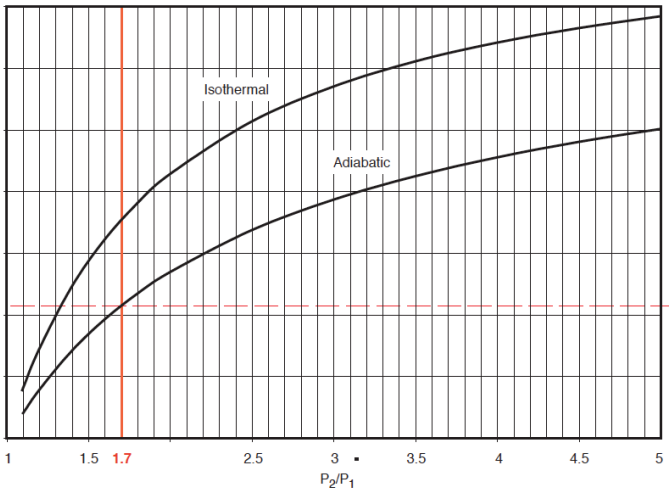


Chart 2

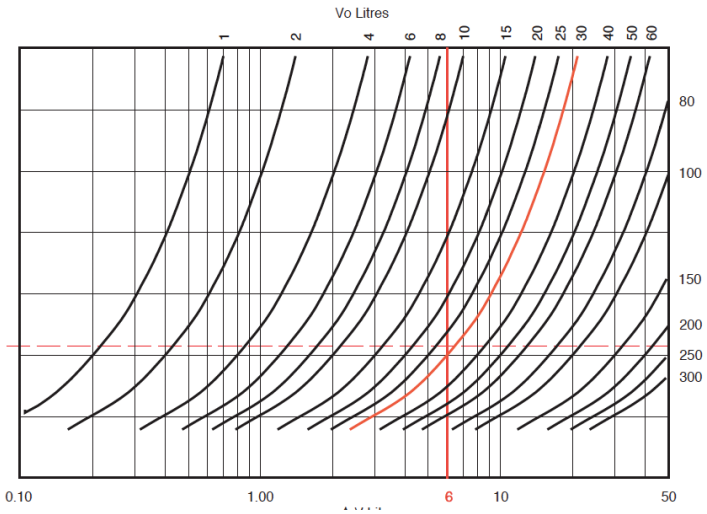


Chart 3

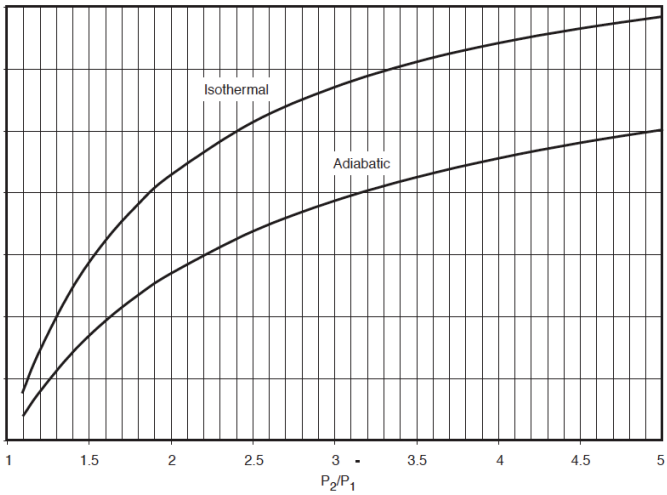
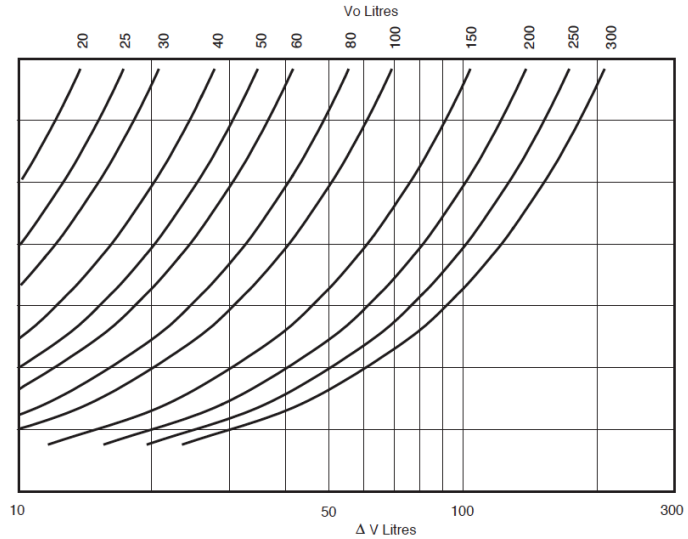


Chart 4



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