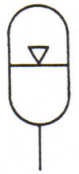


# 5000 psi Piston Accumulators



For Energy Storage, Leakage & Temperature Compensation, Pulsation Dampening



## Features

- 5000 psi maximum working pressure.
- Available sizes from 1.0 to 10.0 cubic inches.
- 0.7 to 6.7 cubic inches of oil available @ 5000 psi.
- Roller burnished tubing & advanced piston sealing technology for leak-free and long cycle life.
- Supplied with nitrogen (N2) pre-charge from factory.
- Maintenance free. Non-rechargeable & non-repairable.
- Attractive black zinc corrosion resistant finish.
- -6 male to -6 male SAE O-ring boss adapter included.

## Options

- Gas valve and custom pre-charge up to 2500 psi.
- OEM private labeling. Consult factory.
- Custom capacities and fluid ports. Consult factory.

Accumulator Gas Capacity (in <sup>3</sup> )	1.0	2.5	5.0	5.0	10.0
N2 Pre-charge (psi)	750			1000	
Oil Reserve @ 5000 psi (in <sup>3</sup> )	0.7	1.8	3.7	3.4	6.7
Diameter (in)	1-3/4			2-3/8	
Length (in)	3.11	3.81	5.20	4.55	6.11
Fluid Port	#6 SAE (9/16-18) female				

\* 2-D & 3-D dimensions and drawings available @ [clampingsolutions.com](http://clampingsolutions.com)

1-3/4 inch OD Models						2-3/8 inch OD Models
AC04-1.0S	\$201			\$298		AC05-05.S
AC04-2.5S		\$213			\$358	AC05-10.S
AC04-5.0S			\$238			AC05-??X ?? = capacity (05, 10) X = gas valve & pre-charge in psi
AC04-?.?X	CF	CF	CF	CF	CF	
?.? = capacity (1.0, 2.5, 5.0)						
X = gas valve & pre-charge in psi	+\$61					

\* CF = Consult factory on custom requests. Minimum quantities may apply.

## Application Notes

Accumulators allow energy to be stored in incompressible fluids by compressing a gas, usually inert nitrogen. A piston is used to keep the gas separate from the hydraulic side. When pressure from the hydraulic side exceeds the pre-charge setting, the gas compresses as the piston travels upwards until a force balance is reached on the hydraulic and gas sides.

When a force imbalance exists in the hydraulic circuit due to leakage, temperature increase, etc., the piston will either extend or retract to try and maintain the force balance. For example, hydraulic fixture leakage would cause the piston to extend and supply pressurized oil to try and maintain circuit pressure. The amount of stored energy available is a function of the volume of nitrogen, pre-charge, maximum hydraulic pressure, and

thermodynamic rate of compression. If you want more or less oil stored at a given pressure, vary any of the parameters.

As stored energy devices, caution must be used in all aspects of system design and operation. System maintenance should only be performed on unloaded (0 psi) accumulator circuits and never remove the gas plug!

Visit [www.clampingsolutions.com](http://www.clampingsolutions.com) for more details on safety, operation, applications and FAQ's.

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## How to Size for Energy Storage or Leakage Compensation

- 1) Determine maximum and minimum acceptable pressures for your hydraulic application. Remember: the smaller the pressure differential, the larger the accumulator must be.
- 2) How much oil reserve do you want above the minimum acceptable pressure? (Rule of Thumb: 1 in<sup>3</sup> oil = 250 drops).
- 3) Look at Output versus Pressure curves below and see how much oil is available between your maximum and minimum acceptable pressures.
- 4) Is it greater than or equal to the desired oil reserve?
- 5) If not, increase the accumulator size or increase your maximum pressure. Another option is to lower either your oil reserve requirement or the minimum pressure.
- 6) Repeat steps until all your requirements are met. If necessary, consult factory for custom sizes, pre-charges, or application consulting.

For example, say you want to store 1.2 in<sup>3</sup> of oil between 1250 and 2750 psi for potential fixture leakage. Looking at the 750 psi pre-charge chart, a 2.5 in<sup>3</sup> accumulator at 2750 psi has about 1.5 in<sup>3</sup> of oil stored. At 1250 psi, the oil stored is about 0.5 in<sup>3</sup>. The difference is 1.5 – 0.5 = 1.0 in<sup>3</sup>. This is not enough oil storage, so you would look at a larger size or a higher maximum pressure.

The 2.5 in<sup>3</sup> accumulator could be used if you went to 5000 psi maximum pressure. 1.7 – 0.5 = 1.2 in<sup>3</sup>. Your other options would be to select a 5 in<sup>3</sup> accumulator of either 750 or 1000 psi pre-charge. With the 750 psi pre-charge, at 2750 psi, 3.0 in<sup>3</sup> of oil is stored. At 1250 psi, about 1.5 in<sup>3</sup>. 3.0 – 1.5 = 1.5 in<sup>3</sup>. 1.5 in<sup>3</sup> > 1.2 in<sup>3</sup>, so the requirement is met with additional safety margin.

