

# FREQUENTLY ASKED QUESTIONS

## SPECIALTY PRODUCTS & ACCESSORIES

### 1. WHAT ARE THE ADVANTAGES OF BLADDER ACCUMULATORS OVER PISTON ACCUMULATORS?

- Rapid response to pressure changes and work cycle
- Complete separation of gas and fluid
- Highly resistant to fluid contamination
- Low maintenance, trouble-free operation
- Readily available, low cost replacement parts
- Eliminates costly down time on expensive systems due to simple repair

### 2. WHAT ARE THE ADVANTAGES OF PISTON ACCUMULATORS OVER BLADDER ACCUMULATORS?

Piston accumulators are highly customizable and can handle much larger volumes, higher pressures and higher temperatures than many bladder accumulators. Additionally, a wider tolerance for initial precharge setting allows for a higher fluid-to-gas ratio for certain applications.

### 3. WHEN SHOULD A DIAPHRAGM ACCUMULATOR BE SELECTED OVER A BLADDER OR PISTON ACCUMULATOR?

Diaphragm accumulators are typically used for pulsation dampening applications where smaller accumulators are sufficient to get the job done. Additionally, diaphragm accumulators are typically less expensive than other types of accumulators, but are often not as customizable.

### 4. HOW DOES A BLADDER ACCUMULATOR WORK?

A bladder accumulator features a seamed molded rubber bladder which is mechanically attached to the gas end of a high-strength metal shell. The flexible bladder provides excellent separation between the gas side of the accumulator and the fluid side or provides a transfer barrier between two fluids. The bladder accumulator is typically charged with dry nitrogen gas to a set precharge pressure determined by the application requirements. As system pressure increases, the rubber bladder flexes to accommodate hydraulic fluid while compressing the nitrogen; as system pressure returns to normal, the nitrogen expands and the bladder returns to its previous position.

### 5. HOW DOES A PISTON ACCUMULATOR WORK?

A piston accumulator consists of a sealed cylindrical body with a polished and honed ID surface and with fluid or gas porting at each end. A lightweight floating piston separates the gas side of the accumulator from the fluid side or provides a transfer barrier between two fluids. The piston accumulator is charged with dry nitrogen gas to a set precharge pressure determined by the application requirements. As system pressure increases, the piston moves along the cylinder tube compressing the nitrogen, or in the opposite direction as system pressure returns to normal and thus discharging fluid from the accumulator.

### 6. HOW DOES A DIAPHRAGM ACCUMULATOR WORK?

A diaphragm accumulator features a one-piece molded rubber diaphragm which is mechanically sealed by a high-strength metal shell. The flexible diaphragm provides excellent separation between the gas side of the accumulator and the fluid side or provides a transfer barrier between two fluids. The diaphragm accumulator is charged with dry nitrogen gas to a set precharge pressure determined by the application requirements. As system pressure increases, the rubber diaphragm flexes to accommodate hydraulic fluid while compressing the nitrogen; as system pressure returns to normal, the nitrogen expands and the diaphragm returns to its previous position.

### 7. ARE ACC INC ACCUMULATORS INTERCHANGEABLE WITH OTHER MANUFACTURERS' ACCUMULATORS?

Accumulators, Inc. bladder accumulators and components are typically interchangeable with those supplied by other manufacturers. In some cases, standard ACC INC bladder accumulator parts are of newer design and may not be fully interchangeable; however, we can often provide parts for older and non-standard designs.

Many of our piston and diaphragm accumulators have the same or similar dimensions to our competitors' units. We can also custom engineer and manufacture an exact fit if needed. The sub-components of our piston and diaphragm accumulators however are typically not interchangeable.

We maintain an extensive cross-reference of our competitors' products at [accumulators.com](http://accumulators.com).

### 8. WHY USE DRY NITROGEN GAS (N<sub>2</sub>)?

Nitrogen is a non-toxic, inert, non-explosive, and non-flammable gas that is readily available at reasonable costs.

**WARNING! NEVER USE SHOP AIR OR OXYGEN!** Shop air has oxygen and when exposed to petroleum-based fluids or grease, can diesel (explode) under pressure. Pure oxygen is even more volatile. Other gases are expensive, corrosive or explosive. **WARNING! THE USE OF HELIUM IS NOT RECOMMENDED.** Helium has several characteristics that can cause system failures. Gas leakage, explosive thermal expansion and a negative Joule-Thomson coefficient are all causes for major concern. ACC INC recommends only dry nitrogen gas be used to precharge accumulators. For more information, please contact us for our full study on the Usage of Helium in Hydropneumatic Accumulators.

Several grades of nitrogen gas are available. For use in our accumulators, we recommend Commercial/Industrial

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grade. This is the most common grade available and the most cost effective. It has been used with accumulators for over 75 years. The average purity is 99.5%. Higher grade gas is acceptable. The N2 MSDS is available from the factory at no cost.

While nitrogen is non-explosive, it is still very dangerous at high pressures. Ensure all personnel working with pressurized vessels receive proper training and follow all safety guidelines.

## 9. WHAT IS THE CORRECT PRECHARGE FOR AN ACCUMULATOR?

Each application has different pre-charge requirements. Our online Sizing Tool at [accumulators.com](http://accumulators.com) can help calculate the optimum accumulator precharge for your application. You can also contact our sales department for further assistance.

## 10. WHAT IS THE PROPER DIRECTION TO MOUNT AN ACCUMULATOR?

The preferred orientation for a bladder accumulator is vertical; however, horizontal mounting is acceptable with a small loss of efficiency when lubricated properly. Piston and diaphragm accumulators can be mounted in any direction. Float accumulators MUST be mounted vertically. ACC INC recommends bolting the accumulator to the skid unit using approved mounting brackets.

## 11. DO ACC INC PRODUCTS MEET ANY THIRD PARTY CODES?

Most ACC INC bladder and piston accumulators are designed to the strict guidelines of the ASME Boiler and Pressure Vessel Code, are witnessed and stamped with the ASME symbol and are registered with the National Board of Boiler and Pressure Vessel Inspectors. Many other design approvals or authority reviews, such as CE, DNV, ABS, CRN, Lloyds, NR-13, AS1210, etc. are available by request at additional cost. We can also modify existing units under the National Board Inspection Code "R" stamp.

Our diaphragm accumulators are designed according to CE guidelines, and are available with third party certifications/design approvals at additional cost.

## 12. DOES ACC INC PERFORM RECERTIFICATION OF ACCUMULATORS?

We can perform a variety of NDA (non-destructive) stress tests on in-service accumulators such as hydraulic pressure testing, magnetic particle testing, visual inspection, and ultrasonic testing along with repair and refurbishment of substandard components. Our engineering department can prepare documentation required to meet a third party accumulator recertification standard.

## 13. WHAT TYPE OF TESTING DO ACC INC ACCUMULATORS RECEIVE?

ACC INC pressure vessels are subject to many rigorous tests such as high-pressure hydraulic testing, magnetic particle testing, chemical analysis, physical analysis, hardness testing, Charpy test analysis, and dimensional inspections. Other tests are available at additional cost.

## 14. DOES ACC INC HAVE A QUALITY CONTROL PROGRAM?

Yes, Accumulators, Inc. is an ISO 9001:2008 certified company with an extensive quality control program periodically reviewed and approved by local, state, national and international agencies. All code designs, code quality control records, quality control manuals and procedures are open to authorized inspectors.

Our main facility in Houston, Texas is approved by ASME to affix the "U" and "R" stamps and is authorized to register vessels with the National Board of Boiler and Pressure Vessel Inspectors. Our facility also has approved Manufacturing Assessments by DNV and ABS.

## 15. ARE CERTIFICATIONS & TRACEABILITY AVAILABLE?

ASME U-1A data reports are available upon request at no charge. Certifications or material certificates appropriate to the respective code are available at additional cost. Most accumulator shells are traceable to the day of manufacture, bladders to the month of manufacture and other components on a case-by-case basis. All vessels are registered with the National Board of Boiler & Pressure Vessel Inspectors.

## 16. ARE ACC INC PRODUCTS COVERED BY ANY WARRANTIES?

Yes, we believe that the ACC INC product warranty is the strongest in the industry. Our full warranty is located at [accumulators.com](http://accumulators.com).

## 17. WHEN SHOULD I USE A SAFETY BLOCK?

Accumulator safety blocks, or isolation valves, can be used in virtually any application. For absolute safety, there is no better method than the use of a safety block to isolate a charged accumulator. Because an accumulator stores a tremendous amount of power in a relatively small volume, safety blocks are always a smart option for the safety of operation personnel and maintenance technicians. Additionally, safety blocks can eliminate costly system downtime by allowing technicians to remove a single accumulator from a rack without having to shut down the entire manifold.

## 18. WHAT FLUID PORT THREADS ARE AVAILABLE?

NPT is standard for bladder accumulators while SAE is standard for piston and diaphragm accumulators. We

offer many other thread types and sizes from stock or as a special order. See catalog pages 5, 29 and 35 for a list of our most common options.

## **19. HOW OFTEN SHOULD THE PRECHARGE BE CHECKED WHILE THE ACCUMULATOR IS IN SERVICE?**

If the accumulator is on a high cycle application it should be checked at least weekly. If the accumulator is used for emergency standby or pressure holding, it should be checked at least monthly. For remote or difficult to access locations, electronic permanent mount pressure monitoring has many advantages. Contact the Accumulators, Inc. sales department for further information.

## **20. HOW DO I PRECHARGE AN ACCUMULATOR?**

Use a genuine Accumulators, Inc. C&G assembly and a regulator to slowly pre-charge the unit to 35 psig. This is the most critical part of the precharge procedure. Next, you may begin to charge your unit to the pressure required to operate appropriately. Consult the instructions listed on the accumulator, shipped with replacement bladder kits or online at [accumulators.com](http://accumulators.com).

## **21. CAN ACC INC MAKE SPECIAL ACCUMULATORS FOR MY APPLICATION?**

Yes. We're experts in special orders design and manufacturing. Among our clientele are Fortune 500 companies, government agencies and the military. Each design is proprietary to the customer.

## **22. DOES ACC INC ACCEPT CREDIT CARDS?**

We accept Visa, MasterCard, American Express and Discover.

## **23. HOW CAN I REQUEST A QUOTE?**

Use our RFQ tool at [accumulators.com](http://accumulators.com) to receive price and availability on any of our products. Of course you can always call us at 713-465-0202, fax us at 713-468-1618 or email us at [info@accumulators.com](mailto:info@accumulators.com).

## **24. IS ACCUMULATORS, INC. ECO-CONSCIOUS?**

Our manufacturing process produces no pollution and uses only minimal electricity. In addition, we recycle cardboard, office paper, junk mail, glass, plastic, packing materials, and aluminum. Employees are encouraged to bring their recyclables from home as well. We pride ourselves on being Earth-friendly.