DIAPHRAGM ACCUMULATOR INSTALLATION, OPERATION & CARE

Accumulators, Inc.®

www.accumulators.com

The user is the sole responsible party to ensure proper selection, installation, operation and maintenance of these products and to follow all safety procedures. Please see accumulators.com for detailed instructions and warranty information, as well as our terms and conditions of sale. Contact the Acc Inc sales department with any questions.

18435 Morton Road Houston, TX 77084 USA
P: 713-465-0202 F: 713-468-1618 E: info@accumulators.com

For more detailed instructions, please visit our website at: www.accumulators.com

R2: NOVEMBER 2017

⚠ WARNING ⚠

⚠ READ ALL WARNINGS BEFORE PROCEEDING WITH INSTRUCTIONS!
FAILURE TO FOLLOW INSTRUCTIONS WILL VOID YOUR WARRANTY!

⚠ For 2,000 thru 10,000-psi Bladder Accumulators. For charging other pressure vessels, contact us.

⚠ High Pressure Gas in Dangerous!

⚠ Only a qualified service technician should perform a precharge.

⚠ Never use oxygen or shop air!

⚠ Precharge with industrial grade dry nitrogen (N_2) gas or better only!

⚠ Do not operate an accumulator without a proper nitrogen gas precharge.

⚠ Release all system hydraulic and pneumatic pressure before attempting any maintenance or service.

⚠ Use only genuine ACC INC approved charging and gauging equipment for precharging and pressure check.

⚠ Wear proper eye protection, steel-toed shoes, and take proper safety precautions before attempting any maintenance or service.

⚠ Slowly increase initial precharge pressure to approximately 35 psig until the bladder is fully inflated. Precharge to a minimum of 30% of maximum available working pressure. Only introduce high pressure to the desired psig after the bladder has fully inflated and the poppet has closed.

⚠ WARNING ⚠

Diapragm accumulators manufactured by Accumulators, Inc. have proven to be extremely reliable when used properly. Please note that the following instructions are general guidelines only and are not intended to be a complete list of all possible variables. More detailed information is available at www.accumulators.com.

APPLICATION AND SIZING

It is highly recommended that a qualified fluid power specialist review the accumulator and system application for correct sizing, temperature, elastomer, pressure, cycling, connections, placement and efficiency. At a minimum, the following variables should be considered in the accumulator's selection (see our website at www.accumulators.com for more details):

1. PRESSURE: The accumulator's Maximum Allowable Working Pressure (MAWP) should meet or exceed the system MAWP. System spikes must be identified and accounted for. Never use the accumulator's proof or design burst pressure in your assessment. Installation of an accumulator with an MAWP exceeding the system MAWP, while safe and acceptable, may be an unnecessary additional cost.
2. It is important to determine the type of application (stand-by power, shock absorption, etc). Sizing and precharge are determined by the application type.
3. SIZING: The selection of the proper size accumulator is important for efficient operation. If too small, there may be insufficient capacity to complete the job. Our exclusive sizing tool is available on our website.
4. FLUID COMPATIBILITY: It is important that the system fluid be compatible with the accumulator elastomer compound. Several compounds are available and can be found using our comprehensive rubber compatibility tool located on our website.
5. TEMPERATURE: Each type of elastomer compound has a range of Min & Max temperatures. You must ensure that the system does not exceed this range.
6. PRECHARGE: The proper nitrogen gas precharge is critical to the operation of any accumulator. It is generally a percentage of the Min or Max working pressure of the system, determined by the type of application. The calculation is part of all sizing formulae.
7. CONNECTIONS, PLACEMENT AND ORIENTATION: As with all fluid power components, the connection, placement and orientation of the accumulator can affect the efficiency. Every system is different and it is up to the user to determine the best arrangement.

NEW COMMISSIONING

Prior to operating a new AccuMight® diaphragm accumulator on any system, a few steps should be taken to ensure safety and proper accumulator function:

1. Only a qualified fluid power technician should install an accumulator.
2. Carefully remove the accumulator from the factory packaging, read and understand all factory labels, stickers, tags and nameplates attached to the accumulator and packaging.
3. Read and understand any written factory instructions accompanying the accumulator.
4. If the accumulator is part of a third party OEM system, read and understand all of their labeling and instructions.
5. All the steps listed in Accumulator Precharging Instructions below, should be followed.
6. The proper training of your accumulator maintenance personnel is recommended.

DIAPHRAGM REMOVAL

1. Turn off your system and release all hydraulic or fluid pressure.
2. Remove gas protective cap and valve cap from the accumulator.
3. Install a genuine ACC INC approved charging and gauging assembly on gas valve stem. Attach the air chuck to the accumulator gas valve by hand tightening its swivel hex connection.
4. For 3000 psi accumulators. Turn the air chuck "T" handle clockwise until it stops. This opens the valve core. For 4000 psi and higher accumulators. Open the valve by turning its top hex nut, counter-clockwise.
5. Release all nitrogen gas by opening up the bleed valve completely. (For 4000 psi or higher accumulators, the gas valve must also be opened).
6. Remove the gauging device from gas valve stem and remove the valve extension if used.
7. Release any remaining gas pressure from the accumulator. For 3000 psi accumulators, remove the valve core from the gas stem using core tool (AI-506). For 4000 psi or higher accumulators, open the gas valve fully, then remove the gas valve.
8. Remove the accumulator from the system.
9. Unscrew the upper portion of the accumulator using a band wrench and a vise. (AM60TR series has a removable screw plug. Use AM60TR series plug removal tool (AM-505) to remove screw plug. Hold body in a vise.)
10. Remove the bladder carefully making sure o-rings (if any) and back-up rings (if any) are removed. Please note the configuration of the components. (Different models have different configurations).
11. Thoroughly clean the interior of the shell sections paying particular attention to the seat area.

BLADDER INSTALLATION

1. Install new gas valve, new o-ring and new valve core.
2. Lubricate the accumulator bladder and shell with system fluid.
3. Apply a small amount of compatible grease on the new o-ring, new bladder "lip" and shell seat area. (On AM60TR series also apply

below threads on screw plug).
4. Carefully insert a new bladder making sure the “seat” is properly aligned.
5. Attach the two shell sections. (On AM60TR series insert screw plug.)
6. Hand-tighten the sections, making sure the bladder and o-ring are correctly seated and are not “pinched”.
7. Tighten fully using a band wrench and vise. (On AM60TR series use plug removal tool (AM-505) to screw in plug. Hold body in vise).
8. Precharge the accumulator (See Instructions below).
9. Reinstall the unit on the system.

BEFORE PRECHARGING

NOTE: Most accumulators are shipped with just minimal gas pressure. The user is responsible for determining the proper precharge level and ensuring that correct pressure is maintained at all times. Precharge should equal 30% to 80% of the maximum system pressure, depending on function of the accumulator.

It is recommended that a genuine Accumulators, Inc. Charging and Gauging Assembly be used:

- 3000 psi: AI-CG3-3KT-SS
- 5000 psi and 6000 psi: AI-CG6-6KT-SS
- 10000 psi: AI-CG10-10KT-SS

Follow all instructions below:

PRECHARGING INSTRUCTIONS

If the accumulator is already installed on a system:

A. Pump a small amount of system fluid (10% of accumulator capacity) into the accumulator, at low pressure.
B. Turn off all power to the system and make sure all fluid pressure is released prior to precharge.

OR

If accumulator is not yet installed:

NOTE: Accumulators should be installed as soon as possible after reciept. If the accumulator will be kept in storage longer than 30 days, contact us for instructions.

A. The accumulator will normally be fully lubricated at the factory and charged with a minimal precharge to close the poppet.

If the poppet is open (indicated by a fluid leak at the fluid end, if the accumulator has been exposed to heat, or stored longer than 90 days), manually install fluid to 10% of the accumulator volume. See commissioning instructions shipped with the accumulator for more information.

1. Remove the protective cap and valve cap. DO NOT REMOVE THE GAS VALVE.
2. Attach the gland and nut portion of the charging assembly (AI-CG3-3KT-SS for 3000 psi accumulators, AI-CG6-6KT-SS for 4000 psi and higher) to a dry nitrogen gas bottle and tighten securely, *see photo 4*. NOTE: If the gland and nut do not fit, the wrong gas or wrong pressure is being used.

3a. For 3000 psi accumulators: Rotate “T” handle counter clockwise so it is all the way out before attaching air chuck, opening the valve core. Attach the air chuck to the bladder accumulator gas valve by hand, tightening its swivel hex connection, *see photo 1*. Tighten with a hand wrench if loose. For top-repairable models, use a TR Valve Extension (AI-TR-015). Connect the swivel connector to the tank valve located on the charging head assembly and tighten.

3b. For 4000 psi and higher accumulators: Open the valve by turning its top hex nut counter-clockwise, making sure not to twist the bladder, *see photo 3*.

4a. If using a nitrogen gas regulator, temporarily set it to 35 psig and open the nitrogen gas valve, then set the regulator to the desired psig level.

4b. If you are not using a nitrogen gas regulator, care should be taken to slowly “crack” the valve open. The use of a nitrogen gas regulator is strongly reccommended since the valve can be opened fully using a regulator set to 35 psig.

5. Begin precharge slowly (35 psig) using dry nitrogen gas, until the bladder is fully inflated. (Full inflation is indicated by the sound of the poppet closing). Continue precharging to desired pressure by increasing gas flow slowly.
6. Gas will adjust to ambient temperature following precharge. Recheck pressure after 15 minutes.

7a. For 3000 psi accumulators: Turn the air chuck “T“ handle counter-clockwise until it stops. This closes the valve core.

7b. For 4000 psi and higher: close the valve by turning its top hex nut clockwise. Remove the charging assembly from the accumulator. Check for
8. gas leakage. (The use of gas leak detection fluid or soapy water is recommended). Put the valve cap on if pressure stays constant after 30 minutes. If not, repeat steps 1-11. When pressure is constant, install protective cap. Tighten hex jam nut firmly.
9. Install the protective cap and Accumulators, Inc. nameplate and hand tighten.
10. If not previously installed, install the accumulator on the system. Check for fluid leakage.
11. Pressurize system and operate. Precharge to minimum of 30% of operating pressure.

OPERATION

Accumulators are generally worry free when installed, commissioned and maintained properly. It is the user’s responsibility to monitor system working conditions, which can change over time. Attention should be given to the system fluid: As components wear, fluid may become contaminated or break down, operating temperatures can change and leakage can take place. System operations may change, which can affect the pressure, flow rate, cycle time and temperature of the accumulator. Any change in any system variable may affect the accumulator.

MAINTENANCE

Precharge is the most critical accumulator maintenance issue. An improper precharge level will cause a decline in accumulator efficiency. An extremely low precharge will cause bladder damage. Make sure system operating parameters have not changed since installation. Maintenance personnel should have the proper tools and training.

PRECHARGE MAINTENANCE

- For cycling applications, check the precharge weekly.
- For non-cycling applications, check monthly.
- Some gas will be lost over time due to premeance.
- A more rapid loss may indicate a gas valve or bladder problem.

1. Release system fluid pressure, not the gas precharge.
2. Remove gas protective cap and valve cap. DO NOT REMOVE THE GAS VALVE.
3. Install Accumulators, Inc. approved gauging device on the gas valve stem.
4. For 3000 psi accumulators: Screw down air chuck “T” handle and check pressure.
5. For 4000 psi and higher: Open gas valve top hex fitting keeping bottom hex tight, *see photo 2*. Check gas pressure.
6. Add additional dry nitrogen gas if necessary using the above procedures, steps 5-12, 14.
7. To release excess nitrogen gas (if any), open the bleed valve located at the bottom of the gauging device until desired pressure is achieved. Recheck the gas precharge.

ACCUMULATORS, INC. DISTRIBUTOR NETWORK

Genuine Accumulators, Inc. products are sold worldwide through a large network of authorized fluid power service providers. Most of these locations maintain an inventory of complete accumulators, bladders, parts and accessories. These fluid power experts can provide exstensive applications and service expertise. Call the factory or visit our website to find a professional in your area.

REPAIR & SERVICE CENTER

Accumulators, Inc. offers a complete Repair & Services Center for its users and customers. We can inspect, test, repair and recondition any Accumulators, Inc. product as well as products of many other bladder accumulator manfacturers.

Service can be obtained by bringing or shipping the unit to the factory OR to any Accumulators, Inc. authorized service provider. Complete details are available on our website.

- ACCUMULATORS ARE HEAVY DEVICES THAT CAN EASILY ROLL. TAKE CAUTION TO SECURE ACCUMULATOR WHILE SERVICING. WEAR PROTECTIVE FOOTWEAR AND KEEP FINGERS CLEAR WHEN HANDLING.

SPECIAL ORDERS

Accumulators, Inc. manufactures a wide range of special accumulators and bladders that can be adapted to most customer applications. Units can be made with many different types of gas valves and with a wide range of materials and at many pressure ranges. Many elastomers are available.

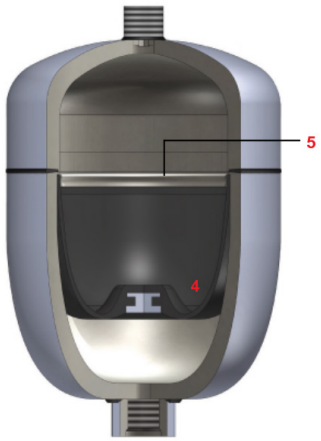
RECOMMENDED ACCESSORIES

ITEM DESCRIPTION	ACC INC PART NUMBER	PRESSURE
Basic 3kpsi Maintenance Kit	AI-TKIT-B	3000 psi
Standard 3kpsi Maintenance Kit	AI-TKIT	3000 psi
Deluxe 3kpsi & 6kpsi Maintenance Kit	AI-TKIT-1	3000-6600 psi
High-Pressure 6kpsi Maintenance Kit	AI-KIT-6	6600 psi
Charging & Gauging 3kpsi Kit 3000 psig gauge	AI-CG3-3KT-SS	3000 psi
Charging & Gauging 3kspi Kit 6600 psig gauge	AI-CG3-6KT-SS	3000 psi
Charging & Gauging 6kpsi Kit 6600 psig gauge	AI-CG6-6KT-SS	3000-6600 psi
TR6 Gas Valve Wrench (Top Repairable)	AI-515 (2 pc set)	6600 psi
AM TR 60, TR 45 Repair Tool	AM-505	3000-6600 psi
Valve Core Tool	AI-506	3000 psi
Charging valve extension	AI-TR-015	3000-6600 psi

REPAIRABLE DIAPHRAGM ACCUMULATOR

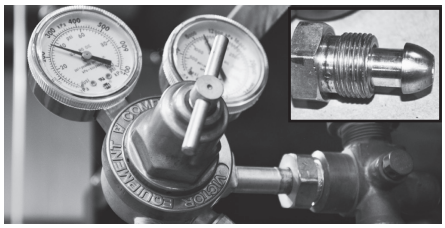
AME Series

WELDED DIAPHRAGM ACCUMULATOR

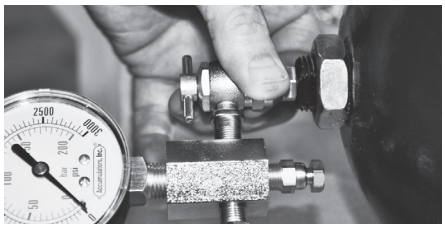


AMW Series

ACCESSORIES AND STEPS



Attaching Air Chuck

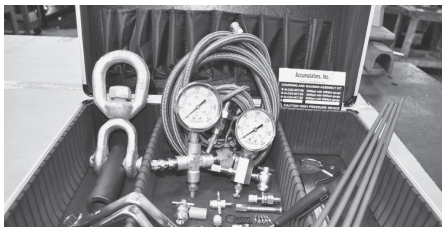


Nitrogen source regulator attached with gland and nut

AI-CG3-3KT-SS
(3000 psi Charging Assembly)

AI-CG6-6KT-SS
(6000 psi Charging Assembly)

TOP: AM-505 (AM TR 50, TR 45 Repair Tool)
BOTTOM: AI-506 (Valve Core Tool 4-Way)



AI-TKIT-1
Deluxe 3kpsi & 6kpsi Maintenance Kit