



INSTALLATION, OPERATION & MAINTENANCE MANUAL

NITROGEN POWER RESERVE UNITS



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1 Introduction

1.1 Scope & Purpose of Manual

This manual is intended to assist those who are involved with the installation, operation, and maintenance of the ATI Nitrogen Power Reserve Units. This manual should be reviewed and thoroughly understood PRIOR to installing, operating, or providing maintenance on the device. Refer to separate instruction manuals for details regarding optional accessories and other equipment used with these actuators.

Failure to read and comply with all applicable installation, operation and maintenance instructions may result in bodily injury or equipment damage and will void the Product warranty.

1.2 Company Contact

For any questions or clarifications, contact ATI or your nearest ATI Authorized Representative.

Email: Sales@ATIactuators.com

Web: <http://www.ATIactuators.com/>

ATI Global Headquarters – Customer Support, Design & Manufacturing
Houston, Texas, USA
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US Toll Free: 800-924-8037

2 Definitions

Term/Abbreviation	Definition
MAWP	Maximum Allowable Working Pressure, or Maximum Allowable Operating Pressure (MAOP). The maximum design pressure for the Product.
Product	Nitrogen Power Reserve Units With Hydraulic Override. "Product" in this manual refers to the Applicable Product for this publication as defined in section 1.1.

3 Product Description

3.1 General Description & Typical Applications

ATI nitrogen power reserve units are utilized to operate direct high-pressure gas or gas-over-oil actuators when other power sources, such as pipeline gas pressure, are unavailable. ATI uses D.O.T. compliant high-pressure nitrogen bottles with a manifold that provides a reliable back-up gas supply for any actuator operating condition.

Power units are made-to-order for each customer's actuation requirements. Typical units have 4 or 8 nitrogen bottles, and other combinations are available based upon the reserve volume of gas required to achieve the specified output pressure.

All necessary regulators, gauges, and control valves are provided to ensure nitrogen is supplied at the specified operating conditions. Relief valve protection is provided along with low-pressure sensing and alarm feedback. The units are supplied in sturdy, ventilated all-metal cages with a provision for padlocks.

On customer request, ATI can supply alternative control systems to meet specific application requirements.

3.2 Product Operation

The unit is intended to supply a steady output pressure without the necessity of action by the operator. After initial set-up and adjustment of regulators, the only routine action will be the refilling of nitrogen storage tanks that become depleted.

3.2.1 Monitoring Storage Tank Pressure

The unit is equipped with a pressure switch (Item 4) at the manifold (Appendix A) of the storage tanks. Wiring to this switch is at the nipple and conduit body (Items 21-23). This pressure switch is intended to trigger the operator to refill storage tanks.

The pressure of the storage tanks can be visually monitored by the reference gauge (Item 16).

3.2.2 Refilling Storage Tanks

The unit is equipped with a port for refilling storage tanks. The connection for refill is Item 18. To start filling, open the CGA valve (Item 1). When filling is complete, close the CGA valve before disconnecting the fill line.

IMPORTANT: Every precaution must be taken to ensure that solid or liquid contaminants that may be present in pneumatic fill lines and pipework are removed before connection and pressurization, to avoid possible damages or other loss of performance to the product.

As an alternative to refilling storage tanks, depleted nitrogen tanks can be replaced by filled tanks. To do so, close all tank valves, depressurize the manifold (see 8.1.1. for instructions), and remove connection hoses from the nitrogen tanks that are to be replaced. Remove the bottle clamps (Item 43), replace the tank(s), replace the clamps, and return connections to their original state.

3.3 Product Specifications

3.3.1	Operating Pressure	The working pressure range for the ATI Nitrogen Power Reserve Units is as follows: MAXIMUM (MAWP): 150 PSIG (10.3 bar) Consult ATI for supply pressure outside of these Min. & Max. limits.		
3.3.2	Temperature Limits	Operating Temperature: <table border="1"><tr><td>Operating Temperature</td></tr><tr><td>-20°F to +176°F (-28°C to +80°C)</td></tr></table>	Operating Temperature	-20°F to +176°F (-28°C to +80°C)
Operating Temperature				
-20°F to +176°F (-28°C to +80°C)				
3.3.3	Fluid Type	The Product is designed for standard pneumatic service, with clean, dehydrated compressed air or inert gas other than helium.		
3.3.4	Service Life	The Nitrogen Power Reserve Unit can be operated up to 5 years without maintenance. In harsh environments and safety critical applications, more frequent maintenance intervals should be considered to ensure reliable Product performance. With regularly schedule maintenance using genuine ATI components, the service life of an ATI Nitrogen Power Reserve Units has been extended to 20 years and longer.		

<p>3.3.5 Lifting Point Load Ratings</p>	<p>The Nitrogen Power Reserve Unit is provided with a provision for lifting.</p> <table border="1" data-bbox="646 239 1162 338"> <thead> <tr> <th data-bbox="646 239 971 302">Typical Lifting Provision</th> <th data-bbox="971 239 1162 302">Load Rating LBF (kN)</th> </tr> </thead> <tbody> <tr> <td data-bbox="646 302 971 338">Ø1.5" x 1/2" thick</td> <td data-bbox="971 302 1162 338">2050 (9.2)</td> </tr> </tbody> </table> <p>Review sections 4.2 and 5.1 for safety warnings before lifting the Product. Follow the installation, operation, and safety instructions for the hoist rings, lifting straps or other lifting equipment selected for use with these Lifting Points.</p>	Typical Lifting Provision	Load Rating LBF (kN)	Ø1.5" x 1/2" thick	2050 (9.2)
Typical Lifting Provision	Load Rating LBF (kN)				
Ø1.5" x 1/2" thick	2050 (9.2)				
<p>3.3.6 Pressure Connections</p>	<p>1/2 NPT inlet and outlet connections</p>				
<p>3.3.7 Protective Coating</p>	<p>The ATI standard protective coating includes surface degrease, surface abrasion, and 2 coats of an aliphatic polyurethane paint. The standard protective coating is applied to all environmentally-exposed carbon steel surfaces, with exception of the exposed portion of piston rods and threaded connections. In some assemblies, the standard coating may also cover some stainless-steel materials that are integral to the assembly of carbon-steel components.</p>				
<p>3.3.8 Warranty</p>	<p>Warranty terms and conditions are included in section 10 of this manual.</p> <p>ATI actuators are warranted against defects in material and workmanship for a period of two (2) years after the date of factory shipment. Refer to Product nameplate for serial number to confirm date of shipment.</p> <p>NON-WARRANTY CLAUSE: Contents of this publication are periodically checked for compliance with the associated Products, and corrections are made as necessary for subsequent publications. ATI also modifies the Product in this publication (within limits of Optional Certifications) to meet special requirements for specific customer orders. Therefore, ATI cannot exclude the possibility of discrepancies between this publication and the Product and special documentation that is prepared for a particular shipment, and ATI does not accept liability for discrepancies between information in this publication and the Product.</p>				

4 Safety Warnings

THIS MANUAL COVERS GENERAL INSTRUCTIONS AND DOES NOT CLAIM TO ADDRESS ALL SAFETY FACTORS ASSOCIATED WITH ATI PRODUCTS OR THE ACCESSORIES THAT MAY BE MOUNTED TO ATI PRODUCTS. FOLLOWING THESE INSTRUCTIONS AND GUIDELINES WILL HELP IN PREVENTING PERSONAL INJURY, PROPERTY DAMAGE, AND DAMAGE TO THE PRODUCT.

ACTUATORS AND VALVES COME INTO CONTACT WITH CAUSTIC GASES AND FLUIDS IN MANY APPLICATIONS. AS A RESULT, ALL TOXIC OR FLAMMABLE FUMES MUST BE VENTED AND LIQUIDS MOVED TO A SAFE LOCATION TO ENSURE SAFETY.

4.1 Personnel Requirements

DO NOT INSTALL, OPERATE, OR MAINTAIN AN ATI PRODUCT UNLESS TRAINED AND QUALIFIED IN PRODUCT AND ACCESSORY INSTALLATION, OPERATION AND MAINTENANCE.

PROPER INSTALLATION OF THE PRODUCT IS CRITICAL TO PERFORMANCE AND SAFETY. DUE TO THE MANY VARIATIONS OF ACTUATORS, VALVES, AND RELATED CONTROLS, THE GENERAL INSTRUCTIONS IN THIS MANUAL MAY NOT ADDRESS SPECIFIC ISSUES AT A PARTICULAR INSTALLATION. EACH TECHNICIAN FOLLOWING THESE INSTRUCTIONS MUST BE COMPETENT, TRAINED, AND HAVE A WORKING KNOWLEDGE OF VALVES, VALVE ACTUATORS, ACTUATOR CONTROLS, AND THE SPECIFIC APPLICATION FOR THE INTENDED PRODUCT(S).

IT IS THE RESPONSIBILITY OF THE USER TO ENSURE PROPER SAFETY. ALWAYS TAKE NECESSARY PRECAUTIONS AND UTILIZE PROPER PERSONAL PROTECTIVE EQUIPMENT (PPE) WHEN DEALING WITH COMPRESSED GAS, PRESSURIZED HYDRAULIC FLUID, PINCH POINTS, AND ELECTRICITY. IT IS THE USER'S RESPONSIBILITY TO UTILIZE APPROPRIATE PROTECTION AGAINST HEARING DAMAGE WHEN WORKING NEAR THE ACTUATOR AND CONTROLS.

4.2 Potential Hazards

The Product has been designed in accordance with best practices for operational reliability, but as an industrial machine, it bears the risk of hazards if handled or operated improperly. Only trained, qualified personnel should work on or near the Product.

Some potential risks from installation include rigging & lifting. Risks during maintenance and operations include stored energy hazards, pinch points, overpressure conditions, and ignition hazards.

Rigging & Lifting

The Product includes a provision for lifting, refer to section 3.3.5. This provision does not address all possible assemblies that will include the additional weight of the valve and related controls. The user must ensure that the package weight including this Product does not exceed the rated limit of these lifting points. For cases where this limit is exceeded, the actuator and valve or other equipment must be rigged and lifted separately. Refer to rigging instructions in section 5.1 for lifting recommendations.

Before rigging, ensure the crane/hoist/rigging hardware lifting capacity can safely accommodate the desired load. Dropping the Product and any attached accessories or the attached valve may cause personal injury and/or equipment damage. For all mounting procedures, use adequately rated chain(s) & sling(s) with an adequately rated hoist or crane to lift and maneuver the Product. Use caution during lifting and handling to prevent uncontrolled movement or sudden shock loads.

Stored Energy Hazards & Noise

The Actuator is powered by supply pressure up to the maximum pressure defined in section 3.3.1. It is normal for actuator controls to permit a sudden release of this supply pressure. It is also required that this pressure be released before maintenance activities may begin on the Product. The release of pressure can produce excessive noise caused by sudden discharge at sonic velocity.

Depending on configuration of supply and exhaust lines during installation, this sudden pressure discharge may exhaust at the actuator. Users must be aware of exhaust lines and use appropriate personal protection equipment (PPE) to avoid injury from pressure discharge.

Exhaust port mufflers are optional accessories that may be used to disperse the pressure discharge and reduce noise. In some installations and control schemes, actuators may require exhaust port mufflers to reduce sound pressure levels at the point of exhaust below the limit of applicable codes. The use of a muffler is optional, and it must be properly selected and installed to avoid detrimental back pressure or other emission hazards.

Sharps & Pinch Points

Warning labels and tags located on the Products are made of metal foils that vary in thickness. Because the metal tags have sharp edges, personnel installing, handling, or working around the tags should protect against cuts or injury.

5 Handling and Storage

5.1 Receiving the Product

Proper care and precautions should be taken when unloading and handling the actuator, especially when rigging and lifting. Ensure that the valve is not connected to the actuator.

- ATI recommends that the Nitrogen Power Reserve Unit be lifted using integral lifting ear that is welded to the top of the assembly. Refer to 3.3.5 for load ratings.
- Check that the assembly has not been damaged during transport.
- Check that the model, serial number, and performance data on the Product Tag match those in the order acknowledgement, test certificate and delivery note.
- Check that the fitted accessories comply with those listed in the order acknowledgement and the delivery note.

5.2 Storage and Preservation

ATI Products leave the factory in excellent working condition and with an excellent finish (these conditions are guaranteed by individual inspection certificates). To maintain these characteristics until the Product is installed, it is necessary to take appropriate measures during the storage period.

- Products contain resilient seals and should not be stored in environments that are harmful to resilient seals.
- Plugs must be fitted in all ports for air connections, hydraulic connections, and cable entries. Plastic plugs are typically used to protect against the entry of foreign matter during transport, and these plastic plugs do not have a weatherproof function. If equipment is stored outdoors, the plastic protection plugs must be replaced by metal plugs to ensure weatherproof protection.
- In case of long-term storage, it is advisable to keep the assembly in a dry place or to provide at least some means of weather protection. All plastic protection plugs must be replaced by metal plugs to ensure weatherproof protection. Care should be taken to plug all open ports to keep foreign particles and moisture from entering the Product.

6 Installation Instructions

The unit should be installed on a flat, stable base, preferably concrete, with the nitrogen tanks in an upright position as shown in Appendix B.

6.1 Connection to Actuator or Volume Tank

The output pressure connection for the unit is shown in Appendix B, items 18-19.

7 Preparation for Start-up

7.1 Pneumatic Connections

Pneumatic connection for the output pressure from the unit is shown in Appendix B, items 18 and 19. This connection may feed directly to an actuator, or if required to increase flow volume, this connection may feed an intermediate volume tank that powers the actuator.

IMPORTANT: Every precaution must be taken to ensure that solid or liquid contaminants that may be present in the pneumatic fill lines are removed before connection and refill, to avoid possible damages or other loss of performance to the unit.

The inside of the pipes used for the connections must be cleaned before use. Wash them with suitable substances and blow through them with air or nitrogen. The ends of the tubes must be de-burred and cleaned.

Once the connections are completed, operate the actuator and check that it functions correctly, that the operation times meet the plant requirements and that there are no leakages in the pneumatic connections.

7.1.1 Setting Output Pressure

The output pressure for the unit is regulated by the settings of pressure regulators, refer to Appendix A, item 10. The manifold uses 2 regulators in sequence to stage the pressure reduction from the nitrogen tanks. The regulated output pressure can be visually monitored by the reference gauge, Appendix A, item 17.

7.2 *Electrical Connections*

Connect the signal lines to the pressure switch at the conduit connection shown in Appendix B, items 21-23.

For electrical connections, use components (cable glands, cables, hoses, conduits), that meet the requirements and codes applicable to the site specifications (mechanical protection and/or explosion-proof protection).

Screw the cable glands tightly into the threaded inlets, to guarantee the weatherproof and explosion-proof protection (when applicable).

Insert the connection cables into the electrical enclosures through the cable glands and connect the cable wires to the terminals according to the applicable wiring diagram.

If conduits are used, it is advisable to carry out the connection to the electrical enclosures by inserting flexible conduit so as not to cause anomalous stress on the housing cable entries.

Replace the plastic plugs of the unused enclosure entries with metal ones, to guarantee perfect weatherproof tightness and to comply with the explosion-proof protection codes (where applicable).

After the connections are completed, check that the controls and signals work properly.

7.3 *Start-up*

During the start-up of the unit, proceed as follows:

1. Check that the pressure and quality of the power supply are as prescribed (refer to gauge shown in Appendix A, item 16). Check that the feed voltage values of the electric components (pressure switch, Appendix A, item 4) is as prescribed.
2. Check that the actuator controls supplied by the Nitrogen Power Reserve Unit are working properly (remote control, local control, emergency controls).
3. Check that the required remote signals (valve position, air pressure, etc.) are correct.
4. Check that the setting of the actuator control unit components, (pressure regulator, pressure switches, flow control valves, etc.) meet the site requirements.
5. Check that there are no leaks in the pneumatic (or hydraulic) connections.
6. In accordance with the applicable painting specifications, repair any paint-coat that has been damaged during transport, storage, or assembly.

8 Maintenance

8.1 *Safety Reminder*

IMPORTANT: BEFORE CARRYING OUT ANY MAINTENANCE OPERATION, IT IS NECESSARY TO ISOLATE PNEUMATIC AND FEED LINES AND EXHAUST ALL PRESSURE FROM THE ACTUATOR AND ALL CONTROL MANIFOLDS AND VESSELS, TO ENSURE SAFETY OF MAINTENANCE STAFF. ENSURE THAT ANY ELECTRICAL CONNECTIONS TO NITROGEN POWER RESERVE UNIT CONTROLS ARE DE-ENERGIZED. IF PRODUCT OPERATION IS REQUIRED FOR TROUBLESHOOTING, THE MAINTENANCE PERSONNEL MUST ENSURE THAT ELECTRICAL AND PRESSURE CONNECTIONS ARE IN A CONTROLLED STATE (LOCKOUT/TAGOUT) FOR SAFE OPERATION.

8.1.1 Routine Maintenance

ATI products have been designed to work for long periods in the harsh conditions with minimal maintenance. As with any mechanical equipment, the service interval is determined by environmental conditions and other conditions of use. The customary service interval for routine maintenance is one (1) to five (5) years. More frequent service may be required.

It is advisable to periodically check the actuator as follows:

1. Check that the actuator(s) connected to this Nitrogen Power Reserve Unit will operate within the required operating times. If the actuator operation is infrequent, carry out a few opening and closing operations with all existing controls (remote control, local control, emergency controls, etc.), if plant conditions allow.
2. Check that the signal from the pressure switch is correct. Close all nitrogen storage tanks, then slowly open the CGA valve (Appendix A, Item 1) to depressurize the manifold. Monitor the reference gauge (Appendix A, item 16) and confirm that the switch signal is triggered at an appropriate pressure.
3. Check the paint-coat of the unit. If some areas are damaged, repair the paint-coat according to the applicable specification.
4. Check that there are no leaks in the pneumatic and connections.

8.2 Parts Ordering

In correspondence with ATI or your local ATI Authorized Representative, include the serial number from the ATI actuator Product Tag. If documentation from the original order is available, include the ATI part number from the ATI Order Acknowledgement or ATI Shipping Documents.

Warning: To ensure compliance to certification requirements, use only genuine ATI replacement parts. Rebuilding an ATI Product with components that are not supplied by ATI may void the Product warranty, void the Product Certification, adversely affect Product performance, and/or cause personal injury and property damage.

9 Disposal

At the end of its functional life, users may carry out recycling or disposal of the Product and its accessories using these instructions as a guide.

1. Any disposal or recycling must be performed according to site requirements and local regulatory requirements.
2. It is the user's responsibility to ensure Product is safely depressurized and that cleaning and disposal of any fluids is performed in accordance with local regulations. In some applications, the Product may have been in contact with caustic gases and fluids, which must be cleaned prior to Product disposal.
3. Product may be dismantled for part sorting. Read and follow the appropriate Product and accessory manual(s) before dismantling. Observe all warning instructions marked on the Product(s) and in the manual(s).

4. Sort dismantled parts according to their material. A majority of the material in the Product, more than 98% by weight, can be recycled. Forward sorted parts according to local practice for recycling or disposal.

Materials of construction may be noted in order documentation. If a list of materials is not available, the metal components may be sorted by using a magnet to inspect for ferrous content, as follows:

- Carbon steel may be recycled: Majority of material is carbon steel, ~90% by weight. Carbon steels are ferrous and will hold a magnet.
- Stainless steel may be recycled: Some materials, fittings and many fasteners are stainless steel, typically 300 series, which will not hold a magnet.
- Bronze may be recycled: Bearings are often made of bronze / brass. This material is dark yellow in color with perhaps a green oxide, and it is non-ferrous and will not hold a magnet.
- Aluminum may be recycled: Some special Product constructions many optional accessories contain aluminum components, less dense and lighter in weight than stainless steels, also non-magnetic.
- Plastic may be sorted for recycling or discarded with mixed waste: Optional accessory covers and some position indicators are made of plastic.
- Electronics must be disposed according to local regulations. Optional valve controllers, positioners, transmitters, and some other electronic components are manufactured with solder and capacitors that can be harmful if allowed to leach into the environment. Recycling and disposal of electronics must be done according to applicable regulations.
- Soft parts—elastomeric seals, engineered (PTFE) seals and some bearings throughout the assembly—are not recyclable. Soft goods that have been cleaned of caustic fluids may be discarded with mixed waste.

If local requirements disallow sorting for recycling or other disposal, contact ATI about returning Product to the manufacturer for recycling. ATI will only accept devices that have been cleaned of any caustic fluids, and a fee will be charged for labor and handling of the produce.

10 Terms and Conditions/Warranty

Except as otherwise expressly agreed to in writing by an authorized representative of Automation Technology, LLC. (hereinafter "ATI"), the following terms and conditions (these "Terms and Conditions") shall apply to all offers for the purchase or sale of products manufactured or supplied by ATI under brand names including, but not limited to "ATI", "Gevalco", etc.

A. **CONDITIONAL ACCEPTANCE; REJECTION OF PURCHASER TERMS** – All orders and acknowledgements of Purchaser shall constitute only consent to these Terms and Conditions and a representation that Purchaser is solvent. All quotations and offers of sale by ATI are expressly limited to these Terms and Conditions and are subject to written acceptance by ATI. Any such acceptance by ATI is expressly conditioned upon assent of Purchaser to these Terms and Conditions, and ATI hereby expressly objects to and rejects as material alterations to these Terms and Conditions any terms or conditions of Purchaser, whether contained in Purchaser's order, acknowledgement or otherwise, that are different from or in addition to these Terms and Conditions.

B. **PRICES** - ATI quotations are valid for thirty (30) days from date of issuance, unless otherwise stated by ATI in writing, and are subject to withdrawal or change at any time prior to acceptance by ATI. Prices are ex works, in United States Dollars, and firm for thirty (30) days from date of ATI's written acceptance of Purchaser's order and an unconditional authorization for the immediate manufacture based on customer supplied information. If for any reason authorization does not commence within such thirty (30) days, prices in effect at the time of release for manufacture will apply, unless otherwise stated in writing. All sales, use, excise, value-added, import, export and other taxes, duties, customs and the like (collectively "Taxes") are the responsibility of Purchaser and will be added to the price to the extent that ATI pays on Purchaser's behalf or is required by law to pay in connection with the sale. ATI reserves the right to invoice and be paid for any Tax at the time of shipment or any time thereafter. All orders are subject to laws and regulations that are in effect and that become effective prior to delivery. Typographical or clerical errors in quotations, orders and acknowledgements are subject to correction by ATI. Prices do not include installation or any other service, unless so stated expressly in the quotation or ATI's order acknowledgement. Prices include one (1) copy of any applicable manuals. Any additional manuals or other printed materials requested by Purchaser are subject to additional cost, to be quoted at or near the time that such materials are requested by Purchaser.

C. **PAYMENT** - Payment from Purchaser is due within thirty (30) days from date of first invoice, unless otherwise stated on ATI's quotation or order acknowledgement. For international orders, ATI reserves the right to require, before commencing filling the order, security in the form of a letter of credit or the like, in a form and from a bank or guarantor acceptable to ATI. Subject to any applicable

usury law that would void or render invalid or unenforceable this sentence, in which case the specified rate will be deemed to be reduced to the maximum allowed by law, simple interest at the rate of 1.5 percent per month will apply to balances unpaid within 30 days from date of first invoice. ATI will invoice upon making available for shipment. ATI reserves the right to payment and Purchaser will be responsible for any cost associated with storage of products or delay in making products available for pickup that occurs at the request of Purchaser.

D. FORCE MAJEURE – In no event shall ATI be liable for non-delivery or delay in delivery, or for failure or delay in the performance of any obligation contained herein, that arises directly or indirectly from acts of God, unforeseeable circumstances, acts (including delays or failure to act) of any governmental authority (de jure or de facto), war (declared or undeclared), terrorism, riot, revolution, priorities, fires, floods, weather, strikes, labor disputes, sabotage, epidemics, factory shutdowns or alterations, embargoes, delays or shortages in transportation, delay in obtaining or procuring or inability to obtain or procure labor, materials or manufacturing facilities, delay in obtaining or inability to obtain timely instructions or information from the Purchaser, or any other cause or circumstance of any other kind beyond ATI's reasonable control. The foregoing provision shall apply even though such causes or circumstances may occur after ATI's performance has been delayed for other causes or circumstances.

E. SHIPPING – (a) Products are sold ex works. Risk of loss is the responsibility of and title transfers to Purchaser once products are made available at Seller's facility for pickup by Purchaser or its carrier.

(b) Acknowledged ship dates represent the estimated date of availability for pickup, rather than actual shipment or delivery at destination for which Purchaser is responsible. All indicated shipping dates are estimates, based on prompt receipt of all necessary information from Buyer necessary to process the order. ATI will use its best reasonable efforts to make products available for pickup by such dates, but there is no guarantee to do so. Indicated time periods for pickup availability are estimated from the latest to occur of: 1) ATI's acceptance of Purchaser's order, 2) ATI's receipt of valve dimensional information, if applicable, 3) ATI's receipt of Purchaser supplied components required to manufacture or supply the products, if applicable, or 4) ATI's receipt of drawings approved by Purchaser. Products ordered on an "in stock" basis are subject to prior sale to other customers. Acknowledged ship dates are subject to changes caused by additions to or modification of the original order agreed to by both Purchaser and ATI.

(c) Under no circumstances shall ATI have any liability whatsoever for loss of use or for any indirect or consequential damages as a result of delayed delivery.

(d) Purchaser is responsible for payment of carrier and all other shipping costs and for making all arrangements necessary for pickup, transport, export, import and delivery to Purchaser's destination. Without prejudice to any ex works rights of ATI and obligations of Purchaser, Purchaser consents in advance to ATI shipping collect any products that Purchaser fails to pick up, and Purchaser will remain responsible for all associated pickup, transport, export, import and delivery costs, including any unknown to ATI or Purchaser at the time of shipment.

F. DESIGN - Due to continuous product development, ATI reserves the right to modify designs, materials and specifications without prior notice.

G. CANCELLATION - Orders acknowledged by ATI are not subject to cancellation or suspension except with the advance written consent of ATI and upon terms which will compensate ATI for and indemnify ATI from and against loss or damage occasioned by such cancellation or suspension, including without limitation for all costs and expenses already incurred or commitments made by ATI in connection with the processing, purchasing, handling, and fabrication of equipment for the order and a reasonable profit thereon. ATI's determination of such termination charges shall be conclusive.

H. INSPECTION - Final inspection and acceptance of products must be made at ATI's facility and shall constitute a waiver by Purchaser of any claim for loss or damage, except for latent defects not reasonably discoverable by such inspection. Purchaser's representative may inspect products during normal business hours and must do so in a manner that does not interfere with ATI operations.

I. ATI WARRANTY; EXCLUSIVE PURCHASER REMEDY – All products manufactured by ATI are warranted against defects in material and workmanship for a period of two (2) years after the date that the products were made available for pickup by Purchaser. ATI's warranty excludes any defects resulting from improper or abnormal shipping, operation or maintenance. Purchaser must immediately, and in no event later than thirty (30) days after becoming aware of a suspected defect, notify ATI in writing of any such suspected defect. Within a reasonable time following ATI's receipt of such notice, investigation and confirmation of a defect, ATI will have the right and the obligation, in its sole discretion, to repair at no cost to Purchaser such defect or replace the defective product or component thereof with a non-defective product or component thereof. Repair or component replacement by non-ATI authorized agents WILL VOID all remaining warranty on the product. Products purchased by ATI from a third party for resale to Buyer ("Resale Products") shall carry only the warranty extended by the original manufacturer. ATI's repair or replacement obligations under this Paragraph I do not extend to any labor or other loss or damage occasioned by, incidental to, or in consequence of any such defect. Purchaser's sole and exclusive remedy and ATI's obligation and liability for breach of warranty are expressly limited to such repair or replacement. Goods repaired or replaced during the warranty period shall be in warranty for the remainder of the original warranty or ninety (90) days, whichever is longer. All other remedies of Purchaser are hereby expressly excluded. THE WARRANTY CONTAINED IN THIS PARAGRAPH I IS THE SOLE AND EXCLUSIVE WARRANTY PROVIDED BY ATI WITH RESPECT TO ITS PRODUCTS AND SUPERSEDES AND IS IN LIEU OF ANY AND ALL OTHER WARRANTIES, WHETHER EXPRESS, IMPLIED, STATUTORY OR OTHERWISE, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE, ALL OF WHICH ARE HEREBY EXPRESSLY DISCLAIMED. Purchaser acknowledges and agrees that ATI Manuals, printed materials and any other documentation do not constitute warranties of any kind,

including with respect to quality or performance. Purchaser is expected to determine the suitability of ATI products for ordinary and Purchaser's particular purposes.

J. **EXCLUSION OF CONSEQUENTIAL DAMAGES; LIMITATION OF DIRECT DAMAGES** - ATI shall not be liable for and Purchaser shall have no right to recover from ATI for any indirect, special or consequential damages, even if ATI has actual notice of any special circumstances from which any such damages might arise. Moreover, subject to Paragraph I which would completely bar any such recovery of direct damages if ATI honors its warranty, in no event shall any recovery of direct damages against ATI exceed the amount of the order price attributable to the portion of the product or products that is determined to have caused any alleged loss, damage or injury that is compensable under these Terms and Conditions and not remedied by ATI.

K. **RETURNS** – No product may be returned for credit or adjustment without written permission and tagging instruction from ATI. Upon receipt of approved returns, any handling/restocking charges and/or cost to recondition for resale, will be the responsibility of Purchaser.

L. **GOVERNING LAW; VENUE AND JURISDICTION** - All sales of products by ATI and any disputes arising out of or related to such sales or products or these Terms and Conditions shall be governed by, and these Terms and Conditions shall be construed in accordance with, the laws of the State of Texas, without regard to its conflicts of law principles that would apply the law of another jurisdiction. The United Nations Convention on Contracts for the International Sale of Goods is expressly disclaimed by and excluded from these Terms and Conditions. ATI's offer of sale may only be accepted in Harris County, Texas and any resulting contract is performable in whole or in part in Harris County, Texas. Venue for any litigation arising out of such sale, products or contract shall be proper in the state or federal district courts of Houston, Harris County, Texas, U.S.A., to the exclusive jurisdictions of which Purchaser hereby expressly submits.

M. **NON-WAIVER** – Any waiver by ATI of any breach of any of these Terms and Conditions must be set forth in a writing signed by an authorized representative of ATI and shall not constitute a waiver of or otherwise prejudice ATI's right to demand strict performance of any other term or condition of these Terms and Conditions.

N. **REMEDIES CUMULATIVE** – ATI's remedies pursuant to these Terms and Conditions and applicable law are cumulative in nature and election or pursuit of any such remedy shall not prohibit ATI from electing or pursuing any other such remedy.

O. **SEVERABILITY** – In the event that any provision or portion of any provision of these Terms and Conditions is held void, invalid or unenforceable, such void, invalid or unenforceable provision or portion thereof shall be deemed severed from these Terms and Conditions, and the balance of these Terms and Conditions shall remain in full force and effect.

P. **EXPORT / IMPORT** - Buyer agrees that all applicable import and export control laws, regulations, orders, and requirements, including without limitations those of the United States will apply to the receipt and use of the Goods and Services provided by ATI. In no event shall Buyer use, transfer, release, import, export, re-export Goods in violation of such applicable laws, regulations, orders, or requirements.

Q. **BUYER SUPPLIED DATA** – To the extent that Seller has relied upon any specification, information, representation of operating conditions or other data or information supplied by Buyer to ATI, in the selection, or design of the Goods and the preparation of ATI's quotation, and in the event that actual operating conditions or other data differ from those represented by Buyer and relied on by ATI, any warranties or other provisions contained herein are null and void. To the degree such data errors cause re-design or re-manufacture of the Goods, Buyer shall be responsible for additional costs incurred by ATI.

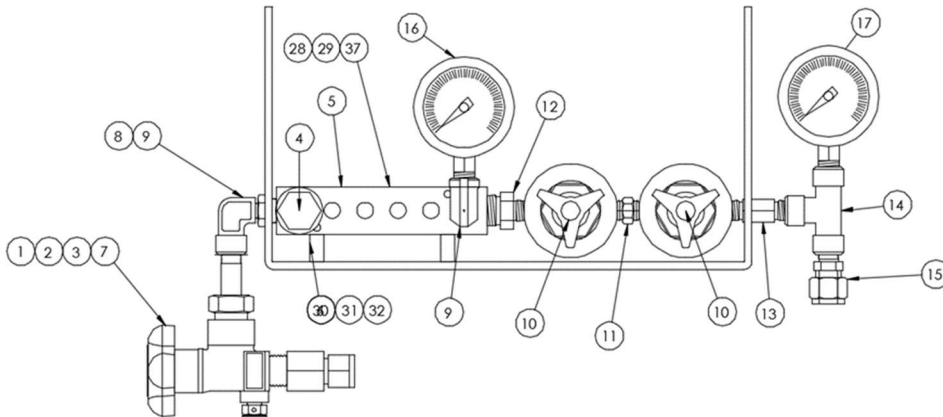
11 Revision Record

Refer to the NON-WARRANTY CLAUSE in section 3.3.8.

Rev #	Issue Date	Description	Reviewed By	Approved By
A	5/29/15	Initial Release	EBW/DAR	DPL
B	7/18/17	Revised address on cover page	KTM	JCP
C	5/12/20	ECN-150828	KTM	RPM

Appendix A

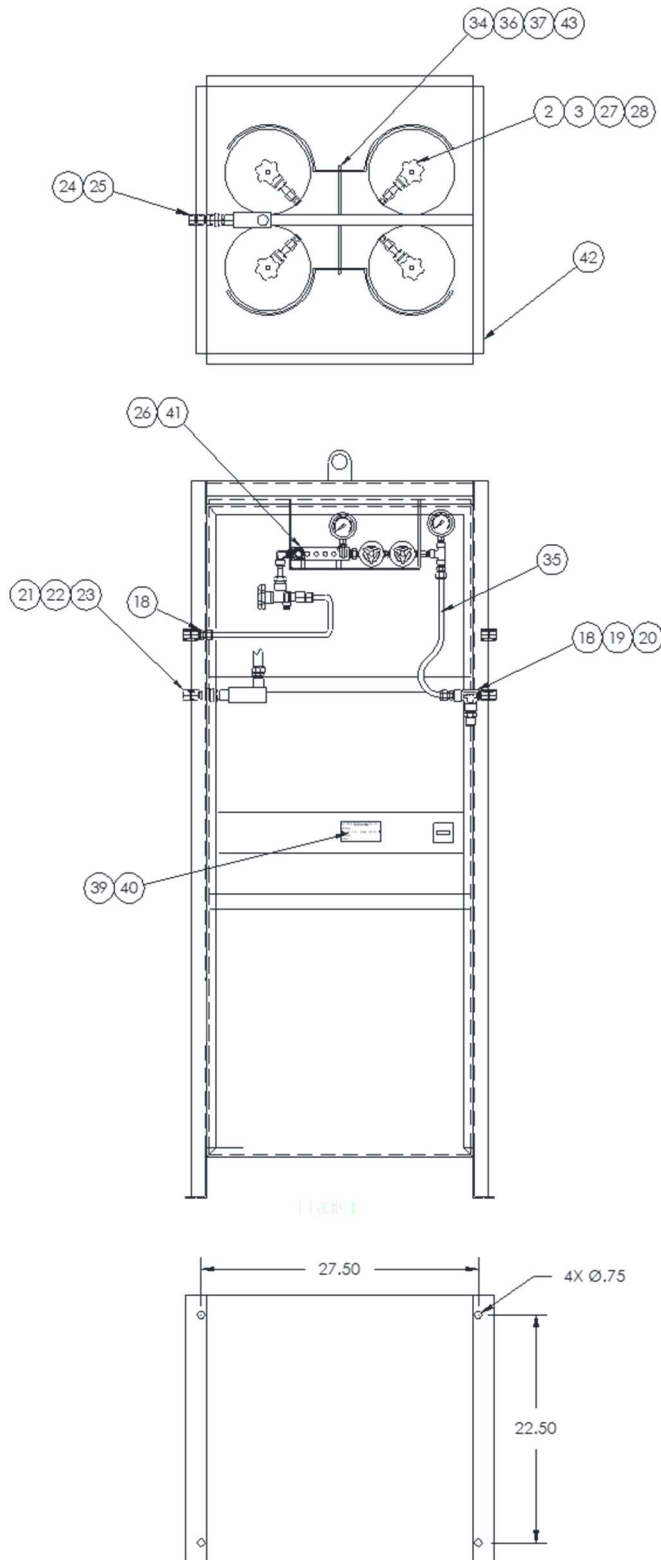
MANIFOLD ASSEMBLY DRAWING AND BOM (FROM 24672 REV D)



BILL OF MATERIALS		
ITEM	QTY	DESCRIPTION
1	1	NITROGEN CGA VALVE
2	1	NITROGEN BOTTLE NUT
3	1	NITROGEN BOTTLE NIPPLE
4	1	PRESSURE SWITCH
5	1	MANIFOLD
6	2	SPACER (MADE FROM 3/8" TUBING)
7	1	1/2" TUBE X 3/4" NPT FEMALE CONNECTOR
8	1	3/4" NPT X 1/2" NPT REDUCING BUSHING
9	2	1/2" NPT STREET ELBOW
10	2	REGULATOR 150 PSIG MAX O/UTLET
11	1	1/2" NPT HEX NIPPLE
12	1	3/4" NPT X 1/2" NPT HEX REDUCING NIPPLE
13	1	1/2" NPT X 2.00" LG. HEX NIPPLE
14	1	1/2" FEMALE TEE
15	1	1/2" TUBE X 1/2" NPT MALE CONNECTOR
16	1	GAUGE 0-3000 PSI 2 1/2" DIAMETER
17	1	GAUGE 0-300 PSI 2 1/2" DIAMETER
29	4	STAINLESS STEEL HOSE
30	4	1/4" TUBE X 1/4" NPT MALE CONNECTOR
31	2	SOCKET HEAD CAP SCREW 10-24 X 2.50" LG.
32	2	HEX NUT 10-24
33	2	LOCKWASHER # 10
38	4	FLUSH PLUG

Appendix B

CAGE ASSEMBLY DRAWING AND BOM (FROM 26323 REV C)



BILL OF MATERIALS		
ITEM	QTY	DESCRIPTION
2	4	NITROGEN BOTTLE NUT
3	4	NITROGEN BOTTLE NIPPLE
18	2	1/2" TUBE X 1/2" NPT MALE CONNECTOR
19	1	1/2" NPT STREET TEE
20	1	1/2" NPT RELIEF VALVE
21	1	1/2" X 2.00" LG NIPPLE
22	1	1/2" MALE/FEMALE CONDUIT UNION
23	1	CONDUIT BODY
24	1	1/2" MALE CONDUIT CONNECTOR
25	-	1/2" LIQUID TITE CONDUIT
26	1	1/2" CONDUIT COUPLING
27	4	1/4" TUBE X 1/4" NPT FEMALE CONNECTOR
28		NITROGEN CYLINDERS
34		UNISTRUT NUT
35		1/2" TUBING
36		ALL THREAD
37		WING NUT
39		TAG
40		POP RIVETS
41	1	90° CONDUIT CONNECTOR
42		4 BOTTLE CABINET
43		BOTTLE CLAMP