



OPERATORS GUIDE

# VIPER VR2000

Armadillo Liners, LLC

11101 Cutten Rd. Ste. 107  
Houston, Texas 77066

Office: (866) 339.6207      Fax: (281) 583.0773

[www.armadilloliners.com](http://www.armadilloliners.com)

# Introduction

## TABLE OF CONTENTS:

System Specifications

Setting Recirculation Valves

Fluid Heater & Over-Pressure Adjustments

Safety

## ABOUT THIS MANUAL. . . .

Before operating, maintaining or servicing any equipment, read and understand all of the technical and safety literature provided with your products. If you do not have the manuals for your machine contact your distributor.

The information in this document is intended only to indicate the components and their normal working relationship during typical use. Each assembly should be directed by a distributor or made from the distributor assembly instructions provided.

This manual provides information for the operation, maintenance and service of this product as used in typical configuration. While it lists standard specifications and procedures some deviations may be found.

Careful study and continued use of this manual will provide a better understanding of the equipment and process, resulting in more efficient operation, longer trouble free service and faster easier trouble shooting.

## CAUTION:

**DO NOT EXCEED 50 PSI ON THE TRANSFER PUMP REGULATORS. . . . OPERATION ABOVE 50 PSI MAY CAUSE PUMP LIP SEAL TO BLOW OUT !**

**SAFETY EYEWEAR FRESH AIR SYSTEM AND GLOVES REQUIRED**

**ALWAYS RELIEVE FLUID & AIRLINE PRESSURE AND CLOSE BALL VALVES BEFORE SERVICING GUN**

**NEVER POINT SPRAY GUN AT ANYONE**

## System Specifications

Material Ratio:	Variable 1:3 to 3:1
Material Viscosity:	200-1500 centipoise (CPS) Check with material Manufacturer for processing Temperature recommendations
Output:	20 LBS. Minute Max
Operating PSI:	1800 - 2200 PSI
Electrical Requirements:	Single Phase 45 AMPS @ 230 VAC, 60HZ
Compressed Air Requirements:	10 CFM @ 100 PSI
Maximum Hose Length:	300 Feet
Dispense Gun:	Air Purge

## Setting recirculation valves

Adjust valves



Set motor speeds to 20.00



Adjust both "A" and "B" component pressure recirculation valves by turning the cap pictured. Turning the cap clockwise raises the setting and counterclockwise lowers the setting. Once the setting is correct, tighten the locknut to the cap.

With pumps running at "spray speed", material should be recirculating freely back into material reservoirs. Recirculation pressure should be set to 2,000-2,200 PSI as viewed on material pressure gauges. (actual line pressures at end of recirc hoses will be low).

Note:  
The machine must be on and with materials at proper temperature prior to final setting.

The motor speed controls must be set to the speed at which spraying will take place. Recommended initial setting is 20.00 on each side. Use the left arrow key to select the digit and the up/down arrow keys to set the speed.

Turning the drive start button to the on (right) position will start the pumps turning.

Pull the trigger on the spray gun to commence spraying. The line pressure should drop to about 1800 PSI and the recirculation valves should completely close. If a recirculation valve does not entirely close it will be necessary to readjust the setting.

For a visual inspection of recirc valve operation it is recommended that the recirc hoses be removed from the drums and placed into 5 gallon buckets while someone else sprays. Once setting is correct, reconnect the recirc lines to drums.

## Fluid heater and over pressure adjustments



Adjust fluid heaters by turning the heater knob clockwise to increase heat and counterclockwise to decrease heat.

The indicator light will light only when the heater is heating and will turn off when the heater has reached its setting.

**CAUTION!** The heater is capable of reaching 250 degrees F. and can cause a severe burn!

Note: The heaters have an internal cut-out switch set for 250F. If the heater over temps the switch will burn out and need replacement.

Over pressure protection pressure switches are factory set for 3,000 PSI and do not require adjustment.

If adjustment is desired unlock the switch by turning the top adjustment ring to unlock position and turn the upper scale setting to the desired pressure. Lock in the new setting with top ring.

**CAUTION!** If the machine reaches an over pressure condition it will momentarily stop and automatically reset. Relieve line pressure and turn off main power before servicing!

Note: Over pressure can occur due to a plugged line or gun.

# End of Day

## End of Day Procedure

1. Turn drive start button to the off (left) position.
2. Bleed off pressure from fluid lines.
3. Turn main power off
4. Close ball valves at the gun.
5. Disconnect air to transfer pumps.
6. Remove gun for cleaning and servicing per manufacturer's recommendations.

## Long Term Storage

If the equipment is not going to be used for extended periods of time material should be cycled through the lines on a weekly basis. Isocyanate will begin to crystallize and harden in the lines causing blockage at the small restrictions.

Long term storage requires flushing of the entire system. Please contact your distributor for product recommendations. You may need to also contact your material supplier to check with chemical compatibility.

## Notes:

# Safety

## Safe Handling & Use Of Urethane Foam Equipment

Any tool, if used improperly, can be dangerous. Safety is ultimately the responsibility of those using the tool. In like manner, safe operation of polyurethane processes is the responsibility of those who use such processes and those who operate the equipment. This manual outlines procedures to be followed in conducting polyurethane operations safely.

All personnel involved in dispensing operations should read and understand this manual. It is most important that equipment operators, maintenance and supervisory personnel understand the requirements for safe operation. This manual cannot answer every circumstance: each user should examine their own operation, develop their own safety program and be assured that their equipment operators follow correct procedures. It is recommended that the precautions in this manual be included in any such program and periodic safety inspections be performed. Urethane foam systems are comprised of several different chemical compounds, some of which may be hazardous if improperly used.

## Required Personnel Safety Equipment

The following personnel safety equipment is strongly recommended for conducting safe operations of the urethane systems.

***EYE PROTECTION***  
***GLOVES***  
***HEARING PROTECTION***  
***BREATHING PROTECTION***

It is recommended that the user consult the state and local regulations established for all safety equipment listed.

## Operating Safety

In operating urethane foam equipment safely, user should make every effort to:

- ✓ Handle chemicals safely
- ✓ Provide adequate ventilation
- ✓ Provide adequate safety equipment (gloves, respirators, safety glasses, protective clothing) etc.
- ✓ Avoid operating equipment that has given any indication of malfunction
- ✓ Become fully acquainted with the equipment and

# Safety

## Operating Safety – cont.

Chemicals used.

- ✓ Particular caution must be taken with respect to the vapors released during the use of urethane foam systems

## Handling Chemicals Safely

Isocyanate compounds are used in urethane foam operations. The medical history of persons who may be exposed to such isocyanates should be examined. It is recommended that individuals with a history of chronic respiratory ailments avoid exposure to all isocyanates.

In addition to the manual, it is recommended that the user consult the regulations established under the Occupational Safety and Health Act, (OSHA) particularly the following sections:

1910.94 pertaining to ventilation.

1910.106 pertaining to flammable liquids.

1910.107 pertaining to spraying finishing operations particularly paragraph (M) Organic Peroxides and dual component coatings.

Local codes and authorities also

Have standards to be followed in the operating of your spraying equipment. Chemical manufacturer's recommendations should be obtained and considered. Your insurance carrier will be helpful in answering questions that arise in your development of safe procedures. Storage of polyisocyanates, diamines and organic solvents should be isolated and restricted to specially constructed storage rooms. Store chemicals in original containers and according to manufacturer's recommendations listed on the container. Maximum ambient temperatures to which such chemicals should be exposed are specified by the manufacturer and **MUST NOT** be exceeded either in the storage area or in the spraying or pouring area.

To avoid moisture contamination, do not open containers until ready for use. After use, the remaining material should be re-sealed in the original container and stored in areas away from moisture. During clean-up of spilled isocyanate component, respirators, gloves and eye protection must be worn. Isocyanates which have spilled can be controlled by covering them with dry saw dust and/or other absorbent inert materials.

# Safety

## Operating Safety – cont.

Care should be taken to avoid skin contact. The absorbent materials and the absorbed isocyanate should be collected promptly, placed in an open-top container, and treated with dilute solutions. While being treated in this manner, the material should be in adequately ventilated area. Clothing on which any material has been spilled should be removed immediately and cleaned before being worn again.

## Clean-up Solvents

Many clean-up solvents are extremely flammable. Please read and follow the manufacturer's warnings and directions. **NO SMOKING** around clean-up solvents and polyurethane equipment. **NO SMOKING** signs must be posted and observed in all areas of operations or where solvents and other flammable materials are used or stored. Clean-up solvents must also be kept away from sources of ignition and used only with adequate ventilation to prevent build-up of vapors. Solvents should be handled in accordance with OSHA Section 1910.106 and 1910.107.

## Toxicity of Chemicals

It is recommended that you contact your chemical supplier(s) for MSDS data sheets available on each product used. Copies of the MSDS sheets on each product should be easily accessible in case of emergency and can assist to determine the best methods of first-aid treatment for each chemical used in your plant. It is also recommended that you consult OSHA Sections 1910.94, 1910.106, 1910.107 and NFPA No. 33, Chapter 14 and NFPA No. 91.

## First-Aid

If chemicals containing isocyanates are splashed on the skin, they can produce ill effects. Steps to counteract such effects should be started immediately.

1. Apply Tincture of Green soap full strength to the contaminated area. If Tincture of Green soap is not available, wash the exposed area repeatedly with soap and water. Soap and water is not as desirable as using Tincture of Green soap because many isocyanate components are not that easily dissolved in water. In addition, soap and

# Safety

## First-Aid – cont.

Water does not form a barrier to the isocyanates.

2. In approximately two to four minutes, wash off the Tincture of Green soap with water. If there is still an indication of isocyanate present, repeat the application. If the isocyanate contamination is on the facial area, care must be taken to avoid getting the Tincture of Green soap in the eyes
3. If person develops breathing difficulties, oxygen should be administered. Quite often the exposed person will experience residual effects such as coughing spells. CONTACT PHYSICIAN IMMEDIATELY.
4. If a person accidentally swallows the chemical, large amounts of water should be swallowed immediately. Vomiting should then be induced by patient sticking his finger down his throat, or by swallowing large quantities of warm salt water or warm soapy water. After vomiting, more water should be taken to dilute isocyanate further.

***CONTACT PHYSICIAN IMMEDIATELY  
IF A PERSON ACCIDENTALLY  
SWALLOWS ISOCYANATE!***

## Ventilation

Hazardous concentrations of some chemical exist before they can be smelled. Chemical component suppliers should be contacted to determine at what concentrations the vapors of the chemicals they supply become dangerous, and the procedures and equipment needed to detect such dangerous concentrations. Such equipment should be obtained. Adequate ventilation must be provided in any area where foam chemicals are sprayed or poured, and wherever the material containers are opened.

In industrial applications, foaming operations should be restricted to specific areas, and proper ventilation should be provided in these areas to prevent chemical vapors from spreading. Spray foaming operations **MUST** be restricted to a spray booth where a minimum exhaust of 100 feet per minute at the face of the booth is provided. Special care should be taken to prevent unsuspecting personnel both inside and outside the plant from being exposed to chemical vapors. The chemical vapors should be exhausted to

# Safety

## Ventilation – cont.

Atmosphere in such a manner and at a sufficiently low concentration that personnel outside the plant are not exposed to dangerous concentrations of chemical vapors. Refer to OSHA Standards, sub-part G, 1910.107 and particularly sub-section (M) for Federal standards. State and local authorities may have applicable statutes or regulations concerning ventilation. In contractor applications (for example, at a construction site, inside building or other enclosed space), the forced ventilation normally provided is likely to be inadequate. Therefore these applications REQUIRE the use of forced fresh air respirators for all persons in the areas where foaming operations are conducted or where the chemical vapors are likely to spread.

## Proper Safety Equipment

All persons spraying or working in areas where forced air ventilation is not adequate to remove isocyanate vapors from the air, MUST use an approved ( U.S. Bureau of Mines) fresh air supplied respirator. Respirators should be regularly inspected, cleaned and disinfected according to good

practices.

Records must be kept of the inspections. The user MUST have a medical clearance indicating that he/she can safely use a respirator. Respirators must fit securely; beards prevent a tight seal around the face. Eye glasses have to be given special attention and contact lenses are prohibited. Safety goggles, gloves and other protective devices are required for operators of foaming equipment. Refer to OSHA Standards, sub-part 1, 1910.132, 1910.133 and 1910.134 for Federal standards.

## **NOTICE**

**All statements, information and data given herein are believed to be accurate and reliable but are presented without guaranty, warranty or responsibility of any kind – expressed or implied. The user should not assume that all safety measures are indicated or that other measures are not required.**