Parker Hannifin Corporation
Veriflo Division
250 Canal Boulevard
Richmond, CA 94804-0034
phone 510 235 9590
fax 510 232 7396
www.parker.com/veriflo

Parker Hannifin Corporation
Veriflo Division
Partek Operations
7075 East Southpoint Road
Tucson, AZ 85706
phone 520 574 2600
fax 520 574 2700
www.parker.com/partek

Safety Guide
PN: 25000194
Revision: –
Date: 09.01.07

Safety Guide For Selecting and Using Veriflo Division Products and Related Accessories

⚠ WARNING: FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF VERIFLO DIVISION VALVES, PRESSURE REGULATORS, FLOW CONTROLLERS, AND RELATED ACCESSORIES ("PRODUCTS") CAN CAUSE DEATH, PERSONAL INJURY, AND PROPERTY DAMAGE. POSSIBLE CONSEQUENCES OF FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THESE PRODUCTS INCLUDE BUT ARE NOT LIMITED TO:

- **Release of toxic, or otherwise injurious, liquids, gases, and chemicals ("fluids").**
- **Injection, inhalation, or exposure to fluids.**
- **Contact with, or injection by, high-pressure fluid discharge.**
- **Rupture of the product or other system components.**
- **Products, components, parts, or other items thrown at high speeds.**
- **Explosion or fire.**
- **Improper and unsafe function of the devices or systems using the product.**

Before selecting or using any of these Products, it is important that you read and follow the instructions below.

1. GENERAL INSTRUCTIONS

1.1. Scope: This safety guide is designed to cover general guidelines on the installation, use, and maintenance of Veriflo Division valve, pressure regulator, and flow control products and related accessories ("products").

1.2. Fail-Safe: Veriflo products can and do fail without warning for many reasons. Design all systems and equipment in a fail-safe mode, so that failure of Veriflo products will not endanger persons or property.

1.3. Relevant International Standards: For a good guide to the application of a broad spectrum of pneumatic fluid power devices see: ISO 4414:1998, Pneumatic Fluid Power – General Rules relating to systems. See www.iso.org for ordering information.

1.4. Distribution: Provide a copy of this safety guide to each person that is responsible for selection, installation, or use of Veriflo products. Do not select or use Veriflo products without thoroughly reading and understanding this safety guide as well as the specific Veriflo publications for the products considered or selected.

1.5. User Responsibility: Due to the wide variety of operating conditions and applications for Veriflo products, Parker and its distributors do not represent or warrant that any particular Veriflo product is suitable for any specific end use system. This safety guide does not analyze all technical parameters that must be considered in selecting a Veriflo product. The user, through its own analysis and testing, is solely responsible for:

- Making the final selection of the appropriate Veriflo product;
- Assuring that all user's performance, endurance, maintenance, safety, and warning requirements are met and that the application presents no health or safety hazards;
- Complying with all existing warning labels and / or providing all appropriate health and safety warnings on the equipment on which the Veriflo products are used; and
- Assuring compliance with all applicable government and industry standards.

1.6. Safety Devices: Safety devices should not be removed, or defeated.

1.7. Warning Labels: Warning labels should not be removed, painted over or otherwise obscured.

1.8. Additional Questions: Call the appropriate Parker technical service department if you have any questions or require any additional information. See the Parker publication for the product being considered or used, or call 1-800-CPARKER, or go to www.parker.com, for telephone numbers of the appropriate technical service department and Veriflo catalogs and publications.

2. PRODUCT SELECTION INSTRUCTIONS

2.1. Operating Pressure: The user must assure that the pressures applied to the product will never exceed the maximum operating pressure of the product, the maximum operating pressure of any options and accessories connected to the product, and the maximum operating pressure of any other system component. Consult product labeling and Veriflo Division catalogs for maximum operating pressures. Additional operating pressure considerations:

- Pressure regulators have an outlet operating pressure range that is less than the maximum operating inlet pressure. Never exceed the maximum operating inlet pressure. Never exceed the maximum operating outlet pressure.
- Pressure gauges should be selected such that the pressure to be measured is no more than 75% of the full scale range of the gauge. For additional information refer to ASME standard B40.1, Pressure Gauges and Gauge Attachments. See www.asme.org for ordering information.
- Products may be fitted with special connections and adaptors to connect the product to a pressure cylinder. The maximum operating pressure of the product, its options, and accessories must equal or exceed the maximum pressure of the cylinder. For more information regarding the selection and safe use of pressure cylinders and cylinder connections, contact the Compressed Gas Association (CGA), 4221 Walney Road, Chantilly, VA, 20151, Phone: 703-788-2700, Fax: 703-961-1831, or visit the CGA web page at www.cganet.com.

2.2. Temperature Rating: Never exceed the temperature ratings of a product. Excessive heat or cold can shorten the life expectancy of a product, cause improper function, and product rupture. Consult Veriflo Division catalogs for maximum and minimum temperature ratings.

2.3. Leakage: Most products experience small amounts of leakage. Product leakage must be suitable for the application, environment, and the process fluid. Good system design and product selection require consideration of both internal and external leakage. Leakage can create hazardous situations due to exposure to the process fluid, unintended chemical reactions, loss of system pressure, or unexpected transfer of fluids and pressures within the system. Consult Veriflo Division catalogs for product leakage rates.

2.4. Severe Leakage: The user must address in their system design and product selection any hazards that may result from severe leakage due to product or system failure. Good system design requires consideration of the possibility of severe internal and external leakage and may require safety pressure relief devices and secondary fluid containment. Severe leakage can create hazardous situations due to exposure to the process fluid, unintended chemical reactions, loss of system pressure, or unexpected transfer of fluids and pressures within the system.

2.5. Flow Rate: The flow rate requirements of a system are an important consideration when selecting a product. Products need to be able to provide adequate flow and pressure for the desired application.

2.6. Environment: Many environmental conditions can affect the integrity and suitability of a product for a given application. Veriflo Division products are designed for use in general purpose industrial applications. If these products are to be used in unusual circumstances such as direct exposure to sunlight, weather, and/or corrosive or caustic environments, such use can shorten the useful life and lead to premature failure of a product.

2.7. Fluid Compatibility: Veriflo products are constructed from a variety of materials. The user is solely responsible for selecting and assuring that the product and materials of construction are compatible with the process fluid. The user must take extreme caution when selecting products and materials for use with corrosive and hazardous fluids. The user should contact their fluid supplier for additional safety and product selection guidance.

2.8. Oxygen Service: Extreme caution must be taken when using oxygen. A serious risk of ignition, fire, and explosion exists. The user is solely responsible for selecting the product and specifying materials to be used in oxygen service.

- Do not use a product or operate a system if there is evidence of contamination (e.g. debris, particles, oils, lubricants, grease, etc.);
- Do not interchange products, components, or accessories with those that have been used in other types of gas service;
- Do not operate a pressure regulator without a proper filter;
- Always apply pressure to the regulator slowly to avoid heating from adiabatic compression. Fast opening valves should not be used.

3. PRODUCT INSTALLATION AND OPERATING INSTRUCTIONS

3.1. Product Inspection: Prior to assembly or installation a careful examination of the product must be performed. All products must be checked for correct style, size, and model number. DO NOT use any product that displays any signs of nonconformance.

3.2. Installation and Operating Instructions: Parker published Installation and Operating Instructions must be followed. These instructions are available by calling 1-800-CPARKER, or at www.parker.com. Important installation and operating considerations:

- Installation, operation, removal and servicing of these products must be performed by knowledgeable personnel who understand how the products are to be applied and have been trained and equipped for the handling, use and servicing of pressurized fluids and systems.
- The user must identify the product inlet and outlet ports by the markings on the product to ensure proper connection to the system. DO NOT use any product with unclear or missing inlet and outlet port markings.
- After installation and servicing the product must be tested for proper function and leakage. Leak test methods should be appropriate for the system leak integrity requirements.
- Do not use a product or operate a system if there is evidence of contamination (e.g. debris, particles, oils, lubricants, grease, etc.).
- Do not interchange products, components, and accessories with those that have been used in other types of gas service.
- Process gases must be clean and free of moisture.
- Do not operate a pressure regulator without a proper inlet filter.
- Prior to installation, follow lockout and tagout procedures for the system and equipment. Follow all government, state and local safety and servicing practices including, but not limited, to all OSHA Lockout Tagout procedures (OSHA Standard – 29 CFR, Part 1910.147, Appendix A, The Control of Hazardous Energy – Lockout / Tagout).
- Always wear appropriate personal protection equipment such as approved safety glasses, face shield, apron, gloves, etc.

4. MAINTENANCE, REMOVAL, AND SERVICING INSTRUCTIONS

4.1. Maintenance: Even with proper selection and installation, product service life may be significantly reduced without a continuing maintenance program. A maintenance program must be established and followed by the user and, at minimum, must include instructions 4.2 through 4.6. Maintenance, inspection, service, and replacement intervals need to be established so that products are replaced before any failure occurs. Important considerations when establishing the frequency of maintenance, inspection, service, and replacement of Veriflo Division products:

- Previous performance experiences including known failures in the application or similar applications.
- Government and/or industrial standards.
- When failures could result in unacceptable down time, equipment damage or personal injury risk.

4.2. Inspection: Any of the following conditions requires immediate system shut down and replacement of worn or damaged components. Never approach a product or system exhibiting these or other abnormal conditions until the system has been shut down and depressurized.

- Escaping fluid and abnormal pressure readings: Escaping fluid and abnormal pressure readings may indicate severe leakage or product or system failure.
- Damaged or degraded components: Look to see if there are any visible signs of wear or component degradation.
- Kinked, crushed, or damaged hoses and plumbing: Kinked plumbing can result in restricted fluid flow and lead to unpredictable system behavior.
- Any observed improper system or component function: Immediately shut down the system and correct the malfunction.
- Excessive dirt build-up: Dirt and clutter can mask potentially hazardous situations.

4.3. Routine Maintenance Issues:

- Remove excessive dirt, grime and clutter from work areas.
- Make sure all required guards and shields are in place.
- Warnings and specifications on the product should not be covered or painted over. If masking is not possible, contact your local representative for replacement labels.

4.4. Removal: Before attempting to remove a product from service, review the product operating instructions. These instructions are available by calling 1-800-CPARKER, or by accessing the Parker WEB site at www.parker.com. Other important product removal considerations:

- Installation, operation, removal and servicing of these products must be performed by knowledgeable personnel who understand how the products are to be applied and have been trained and equipped for the handling, use and servicing of pressurized fluids and systems.
- Follow lockout and tagout procedures for the system and equipment as stated in section 3.2 above.
- Isolate the product from all pressure sources upstream and downstream of the product by closing and locking out the appropriate valves.
- Safely depressurize the product and system.
- Properly purge hazardous fluids from the product and system.
- Always wear appropriate personal protection equipment such as approved safety glasses, face shield, apron, gloves, etc.

4.5. Servicing (conversion or replacing of any worn or damaged parts): Remove the product from the equipment or system prior to servicing. Follow guidelines above for removal instructions. Parker published Service Instructions must be followed. These instructions are available by calling 1-800-CPARKER, or at www.parker.com. To avoid unpredictable system behavior that can cause death, personal injury and property damage:

- Installation, operation, removal and servicing of these products must be performed by knowledgeable personnel who understand how the products are to be applied and have be trained and equipped for the handling, use and servicing of pressurized fluids and systems.
- After installation and servicing the product must be tested for proper function and leakage. Leak test methods should be appropriate for the system leak integrity requirements.
- Warnings and specifications on the product should not be covered or painted over. If masking is not possible, contact your local representative for replacement labels.

4.6. Putting Serviced Product Back into Operation: Follow the guidelines above for product installation and operating instructions, section 3 above.