SAFETY

SUPPLEMENT

A DOVER COMPANY

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ENGLISH

SAFETY MANUAL

Wilden Pump & Engineering, LLC.

Supplement to Engineering, Operation and Maintenance Manual

IMPORTANT

READ THIS MANUAL BEFORE PRODUCT INSTALLATION, OPERATION, INSPECTION AND MAINTENANCE

This safety manual applies to all Wilden pumps and dampeners and provides instructions for safe installation, operation, inspection, and maintenance. Failure to follow these instructions could result in severe personal injury, including death, and/or substantial product and/or property damage. This document is a supplement to the Engineering, Operation and Maintenance manual. It is important to refer to the Engineering, Operation, and Maintenance manual for additional information about specific products.

GENERAL SAFETY CONSIDERATIONS

- Verify that the model received matches the purchase order and/or specification sheet.
- Ensure all operators are properly trained and employ safe operating and maintenance practices as outlined in this Safety Manual, the Pump User's Guide, and the Engineering, Operation and Maintenance manual for the specific product.
- Wear appropriate safety equipment during installation, operation, inspection and maintenance. Use caution to avoid contact with process fluids, cleaning fluids, and other chemicals. Gloves, coveralls, face shields and other equipment may be required to adequately protect personnel. All personnel must review the Material Safety Data Sheet (MSDS) for all process and cleaning fluids and follow all handling instructions.
- Wear safety glasses and additional safety equipment during operation. If a diaphragm rupture occurs, the material being pumped may be forced out air exhaust.
- Always use proper hearing protection. Pump noise can exceed 75 dBA under certain operating conditions.

PRODUCT INSTALLATION

- Always refer to the detailed installation instructions supplied in the Engineering, Operation, and Maintenance manual.
- Retighten all fasteners to the specifications provided in the Engineering, Operation and Maintenance manual.
- Application pressures and temperatures, product maximum pressures, and an acceptable factor of safety should all be considered when selecting suction and discharge piping and hoses. Extra caution must be taken for all high-pressure H-Series and Rhino pumps due to the high discharge pressure that these pumps produce. Consult the product Engineering, Operation, and Maintenance manual or your local distributor for further information.
- During operation, unwanted movement of the pump could occur. All pumps should be bolted to a secure surface that is both level and flat.
- Flush products thoroughly before installation to reduce the possibility of process fluid contamination or chemical reaction.
- FDA, USDA, and 3A products should be cleaned and/or sanitized prior to usage.
- Ensure proper ventilation of any liquid tanks or vessels. The pump can generate high inlet suction and discharge pressure conditions. Improper ventilation can lead to rupture of the container.
- When using gases other than compressed air to power the product, make sure that the environment has adequate ventilation. Product exhaust or system leak can displace air from the environment creating a risk of suffocation.
- An air shut off valve (user supplied) should be installed to stop the pump in an emergency situation. The air shut off valve should be located far enough from the pump such that it can be reached safely in an emergency situation.
- In the event of a power failure, the shut off valve should be closed, if restarting of the system is not desirable once power is regained.

PRODUCT OPERATION

- Do not exceed the maximum air supply pressure. Refer to the Engineering, Operation, and Maintenance manual for maximum air supply pressure.
- Do not exceed the maximum fluid housing pressure. Refer to the Engineering, Operation, and Maintenance manual or contact factory for details.
- Do not exceed 3.4 bar (50 psig) air supply pressure for UL 79 listed models.
- Do not exceed 0.7 bar (10 psig) pressure to fluid inlet to minimize potential for premature wear and parts failure.

PRODUCT MAINTENANCE

- Follow all maintenance instructions in the Engineering, Operation and Maintenance manual.
- Always wear hand and eye protection to prevent injury during installation and maintenance.
  Example: Removal of a Turbo-Flo® end cap using compressed air could cause the end cap to eject with considerable force.
- Before any maintenance or repair is attempted, the compressed air line to the product should be disconnected and all air pressure allowed to escape. Close system valves to isolate intake and discharge. Carefully drain pressure from intake and discharge piping prior to disconnection. Drain pumps by turning upside down and allowing any fluid to flow into a suitable container. Flush thoroughly prior to performing maintenance.

REGULATORY COMPLIANCE

- Always ensure that product installation, operation, inspection and maintenance conforms with all applicable laws, regulations and codes.
- Not all products are compliant to all regulatory standards. Consult your local distributor for models that meet your regulatory requirements.

FIRE AND EXPLOSION PREVENTION – USE OF PRODUCTS IN EXPLOSION ZONES

- There is a risk of fire and/or explosion if certain conditions exist. These conditions include, but are not limited to, the following:
  - Pumping flammable fluids (in some cases an additional risk may be created by vapors or gases resulting when the process fluid escapes by leaking, component failure, or improper maintenance.)
  - Product used in flammable atmospheres (flammable atmospheres can be caused by the presence of gases, dusts, or vapors)
  - Placement of flammable materials near product
  - Product powered by flammable gases (Example: Natural gas or air/flammable compressor oil mixture)
- Standard Wilden pump models should not be powered by flammable gases. Consult factory for specific models intended to be powered by flammable gases.
- Be aware of the hazards associated with the specific application and the application environment. Conform with all applicable laws, regulations and codes.
- Do not use the product if there is any doubt about the safety of the application.
- Mechanical operation and flowing fluids can generate static electricity. Groundable products are required for all potentially flammable or explosive applications to prevent static spark. The pump, piping, valves, containers and other equipment must be grounded. Periodic inspection of the ground connection should be performed to ensure the equipment is properly grounded.
- The surface temperature of the equipment must be kept below the ignition temperature of any potential explosive atmosphere. The surface temperature is affected by the temperature of the fluid being pumped and the kinetic energy added by the pump and application (e.g., recirculation of process media). The end user must ensure process media and equipment maximum temperature is acceptable for the environment.
- Electrical products have special considerations when used in explosive environments. Ensure electrical products possess the correct rating for the intended application.

ATEX PUMP CONSIDERATIONS

- ATEX products have been assessed for use in potentially explosive atmospheres in accordance with the European Directive 94/9/EC (ATEX 95). Users of ATEX products must be familiar with ATEX requirements and follow all safety guidelines.
- All ATEX product identification tags contain the ATEX rating for the specific model. Verify that the ATEX rating is appropriate for the application.
- It is the responsibility of the end user of ATEX products to ensure that the point of use location has been properly classified in accordance with Directive 1999/92/EC ANNEX I (ATEX 137), and that the equipment placed into service is compatible with that classification.
- Pump must be electrically grounded. The ground connection is marked with a tag having the grounding symbol.
- For ATEX Equipment Group I, Category M2, the equipment must be de-energized in the presence of an explosive atmosphere. This is achieved by disconnecting the air supply.
- When replacing worn or damaged components for products used in ATEX environments, only use parts approved for use in ATEX environments.

U.L. PUMP CONSIDERATIONS

- Do not exceed 3.4 bar (50 psig) air supply pressure or fluid discharge pressure for UL 79 listed models.
- All pipe connections must use U.L. classified gasoline-resistant pipe compound.
- All installations must conform to Flammable and Combustible Liquids Code NFPA 30 or Automotive and Marine Service Station Code NFPA 30A, and all other applicable codes.
- Pump exhaust to be connected to pipe or tubing to be routed outdoors or other location determined to be equivalent.
- Pump should be fitted with a pressure relief valve rated to a maximum of 3.4 bar (50 psig). This valve should be connected to the pump discharge line to vent pressure resulting from thermal expansion. The pressure relief valve should incorporate a return line back to the supply tank.
- Pump must be electrically grounded. The ground connection is marked with a tag having the grounding symbol.

CSA INTERNATIONAL PUMP CONSIDERATIONS

- The pump must be electrically grounded using the grounding conductor provided. Improper grounding can cause improper and dangerous operation.
- The gas outlet of the pump must be vented to a safe location in accordance with local codes or, in the absence of local codes, an industry or nationally recognized code having jurisdiction over the specific installation.

ELECTRICAL PRODUCT CONSIDERATIONS

- Ensure electrical connections are installed according to Engineering, Operation, and Maintenance manual and local laws, regulations and codes.
- Always disconnect power supply before performing installation or maintenance procedures.
- Protect all electrical connections from exposure to the environment and fluids.

SUBMERSIBLE APPLICATIONS

- Not all pumps can be used in submersible applications. Refer to the Engineering, Operation, and Maintenance manual.
- When using a submersible pump, both the liquid path and external components must be compatible with material in which the pump will be submersed.
- Submersed pumps must have a hose attached to air exhaust and the exhaust piped above liquid level.

CHEMICAL AND TEMPERATURE COMPATIBILITY

- Check the chemical compatibility of all wetted components, including elastomers, with all process and cleaning fluids to minimize the risk of dangerous chemical reactions. Example: Pumping halogenated hydrocarbon solvents with an aluminum pump creates the potential for an explosion caused by corrosion of the aluminum components.
- Chemical compatibility can change with process fluid concentration and temperature.
- Check the temperature limits for all components, including the elastomers. Example: Viton® has a maximum limit of 176.7°C (350°F) but polypropylene has a maximum limit of only 79°C (175°F), therefore a polypropylene pump fitted with Viton® elastomers is limited to 79°C (175°F).
- Maximum temperature and pressure limits are based upon mechanical stress only. Certain chemicals will significantly reduce the maximum safe operating temperature and/or pressure.
- Always refer to the Wilden Chemical Resistance Guide or contact your local distributor for information regarding specific products.

TEMPERATURE LIMITS

Pump Housing		
Acetal	-28.9°C to 82.2°C	-20°F to 180°F
Carbon-Filled Acetal	-28.9°C to 65.6°C	-20°F to 150°F
Nylon	-17.8°C to 93.3°C	0°F to 200°F
Polypropylene	0°C to 79°C	32°F to 175°F
PVDF	-12°C to 107°C	10°F to 225°F
Teflon® PFA (UPII)	-28.9°C to 148.9°C	-20°F to 300°F
Teflon® PFA (all other models)	-28.9°C to 107.2°C	-20°F to 225°F
Elastomers		
Buna-N	-12.2°C to 82.2°C	10°F to 180°F
Neoprene	-17.8°C to 93.3°C	0°F to 200°F
Nordel®	-51.1°C to 137.8°C	-60°F to 280°F
Polyurethane	-12.2°C to 65.6°C	10°F to 150°F
Saniflex™	-28.9°C to 104.4°C	-20°F to 220°F
Teflon® PTFE (UPII)	4.4°C to 148.9°C	40°F to 300°F
Teflon® PTFE (all other models)	4.4°C to 104.4°C	40°F to 220°F
Viton®	-40°C to 176.7°C	-40°F to 350°F
Wil-Flex™	-40°C to 107.2°C	-40°F to 225°F
Rhino™-12.2°C to 65.6°C	10°F to 150°F	
Unitec™ Temperature Limits		
Conductive Polyethylene	0.0°C to 70.0°C	32°F to 158°F
Teflon® PTFE -		
UU Series, UA.025, UA.038	0.0°C to 100.0°C	32°F to 212°F
UU High Temperature	0.0°C to 200.0°C	32°F to 392°F
All Others	0.0°C to 120.0°C	32°F to 248°F