AutoJet® Sanitary Food Coating Spray System

OWNER'S MANUAL

AutoJet® TECHNOLOGIES

Spraying Systems Co.®
Experts in Spray Technology

ML00COATINGSYS
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TABLE OF CONTENTS

SECTION 1

PREFACE

1.1 IMPORTANT

The AutoJet® Sanitary Food Coating Spray System and all components are produced, tested and checked at the factory. The system can be dangerous if used incorrectly. Read this manual carefully and read any safety instructions.

Operators must always follow the general safety instructions in the working area and aim to prevent accidents.

The manufacturer reserves the right to make changes in standard construction without prior notification.

Images and diagrams in this manual may not be exact representations of your system configuration.

1.2 HOW TO USE THIS MANUAL

This manual is intended to be a source of information for the operators and technicians who may be installing, interacting with, or servicing/maintaining Spraying Systems Co.® systems and components.

This manual contains important safety warnings, installation instructions, operating instructions, troubleshooting, and maintenance information.

ICONS

WARNING: The user can be seriously injured, damage their health, and/or damage the system.

CAUTION: Product, process, or environment can be damaged or be in danger if the instructions are not followed correctly.

ATTENTION: Supplementary information for the user that draws attention to possible problems.

SECTION 2

SAFETY

2.1 GENERAL SAFETY INFORMATION

READ AND FOLLOW INSTRUCTIONS

All safety-related and operating instructions should be read before the system is operated. Follow all operating instructions.

SERVICING

Do not attempt to service this system unless you have been trained or authorized to conduct repairs. Only authorized and qualified service personnel should attempt to service this system. Service by unauthorized personnel may void any and all warranties.

WARNING: Before performing any maintenance, make sure electrical power is off and any air/liquid pressure is bled from the system.

UNINTENDED USE

Use of Spraying Systems Co.® equipment in ways other than those described in the documentation supplied with the equipment may result in injury to persons or damage to property. Examples of unintended use of equipment would be:

- Using incompatible materials/damaged parts
- Making unauthorized modifications/using unapproved auxiliary equipment

- Removing or bypassing safety guards or interlocks
- Operating equipment in excess of maximum ratings

REGULATIONS AND APPROVALS

Make sure all equipment is rated and approved for the environment in which it is used. Any approvals obtained for Spraying Systems Co. equipment will be void if instructions for installation, operation, and service are not followed. All phases of equipment installation must comply with federal, state, and local codes.

PERSONAL PROTECTIVE EQUIPMENT

Spraying Systems Co. strongly recommends the use of appropriate safety equipment when working in potentially hazardous environments and chemicals. This safety equipment includes, but is not limited to, the following:

- Protective hat, long sleeve shirt, and pants
- Safety glasses or face shield
- Chemical-resistant or safety gloves and apron

Users of this product should never place themselves in the path of the resulting spray. Users should consult and follow the recommendations of the Safety Data Sheet (SDS) of any chemical or fluid sprayed using this system.

PRESSURIZED SYSTEMS

It is important to recognize proper safety precautions when using a pressurized spray system. When dealing with pressure applications, the system pressure should never exceed the lowest rated component. Always know your system, all component capabilities, maximum pressures, and flow rates.

WARNING: Fluids under pressure can penetrate skin and cause severe injury.

ATTENTION: Always remember to carefully read the chemical manufacturer's labels, follow SDS, and all directions.

WARNING OF SHOCK HAZARD

To reduce the risk of electric shock, do not open the cover on electrical control panel. For service contact Spraying Systems Co.® at 1-866-321-2250.

WARNING: Plug panels into a GFCI outlet.

WARNING: To prevent injury, avoid contact with potentially hot parts. Components can cause severe burns. Do not aim the spray at any person or part of the body. Do not place any part of your body into the spray pattern.

USE OF CHEMICAL COMPONENTS

The use of any chemicals requires careful control of all worker safety.

Spraying Systems Co.® does not manufacture or supply any of the chemical components used in this equipment and is not responsible for their effects. Because of the large number of chemicals that could be used and their different chemical reactions, the buyer and user of this equipment should determine compatibility of the materials used and any of the potential hazards involved.

2.2 UNPACKING THE SYSTEM

The Sanitary Food Coating Spray System is mounted on a skid with wheels; caution must be taken when moving the system. The system components come carefully packaged to protect them from damage. Use caution when opening the crate. The crate will contain all parts needed to install the unit. Parts of the unit may be wrapped in bubble wrap. Remove all of the packaging material wrapping the system. Once unpacked and removed the from the crate, the system is ready for installation and connection.

CAUTION: The packaging may contain exposed cables, hoses, or other components. Always exercise caution when opening boxes to avoid accidental damage or slicing of various components.

SYSTEM OVERVIEW

3.1 INTRODUCTION

The AutoJet® Sanitary Food Coating Spray System is a system that can be used in a variety of applications to properly manage fluid supply of low to mid viscosity fluids. This system consists of a 20-gallon, 316 steel supply tank and sanitary AOD pump to efficiently deliver processed fluid to the spray nozzles. It offers versatility through a variety of equipment options such as, auto-refill for keeping the tank full without disturbing production and in-line liquid heating for viscous spray applications. Sanitary materials and clamp-style connections allow for easy cleaning and low maintenance costs.

3.2 SPECIFICATIONS

AIR INPUT REQUIREMENTS

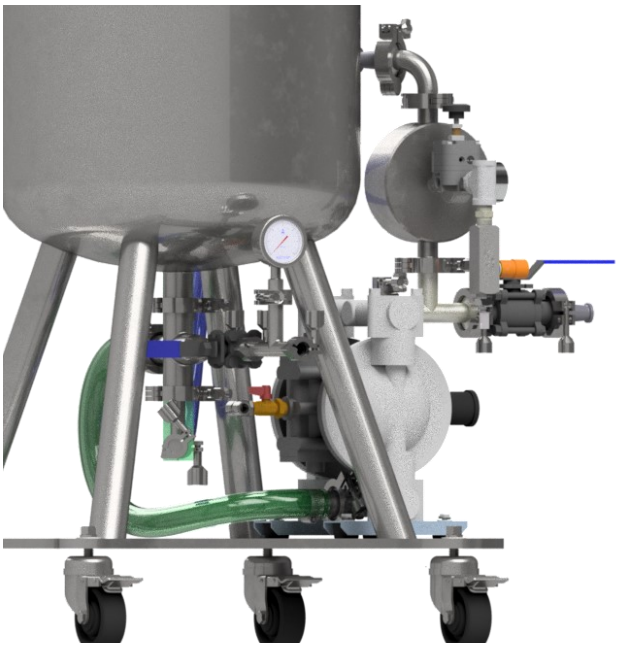
- Pressure: 80 psi (min), 100 psi (max)
- Inlet Port: 1/2” NPT(f)
- Consumption: 10 SCFM Normal/40 SCFM Max Operation

ENVIRONMENTAL

- Operating temperature range: 32° to 120°F (0° to 42.8°C)
- Humidity Range: 5 to 95% (non-condensing)

SUPPLY TANK

- 20 gallon (76-liters) tank with removable lid
  - — Stainless steel bar leg supports welded to base plate
- Stainless steel frame mount assembly
  - — 48 inches long x 36 inches wide x 60 inches high



3.3 SPRAY CONTROL PANEL OPTIONS

Spray control modules pair with the optional variable spray mount and provides the means to set operating parameters and control the functioning of the automatic spray nozzles. AutoJet® offers three updated panel models to choose from. The controllers are designed to run electric actuated spray nozzles.

Features	AutoJet 1000+	AutoJet 1750+	AutoJet 2150+
HMI Touch Screen	4.3”	4.3”	7”
Power Input	110-240 VAC, 50/60, 1Ph., 3A	110-240 VAC, 50/60 1 ph., 5A	120 VAC, 50/60, 1Ph., 8A
Washdown Closure	✓	✓	✓
Recipes	✓	✓	✓
Trigger Input	✓	✓	✓
Global Compatibility, multi-voltage power cords available	✓	✓	✓
Stainless Steel Control Panel	✓	✓	✓
Power On/Off Switch	✓	✓	✓
Level Switch	✓	✓	✓
Pulse Width Modulation (PWM)	×	✓	✓
System Outputs	×	✓	✓
Dual Channel*	✓	×	✓
HMI Wi-Fi Access	×	✓	✓
2300 Series Controls	×	✓	✓
Precision Spray Control	×	✓	✓
Encoder Input	×	×	✓
Flow Monitoring	×	×	✓
Pressure Input Sensor	×	×	✓
Ethernet IP	×	×	✓
High Capacity	×	×	✓

Controllers not included with this system package. These controllers are suggested.

*Dual Channel 1000+ is only capable with electric actuated spray nozzles and air nozzles can only work with a single channel.

3.4 OPTIONAL ADD-ONS

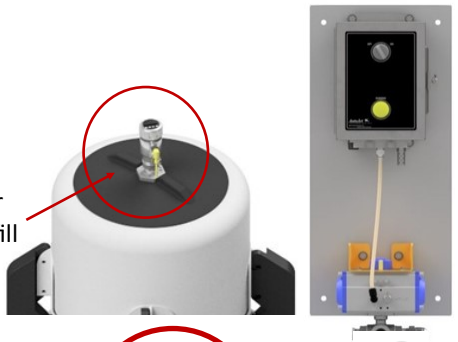
These add-on systems are for any liquid delivery supply units.

HD15 IN-LINE HEATER

For applications that require heating the HD15 In-Line Heater is an optional add-on for the Food Coating Supply Unit. The In-Line construction allow heating to be achieved only on-demand for optimal response and energy efficiency. For more information refer the HD-15 In-Line Heater Owner's Manual

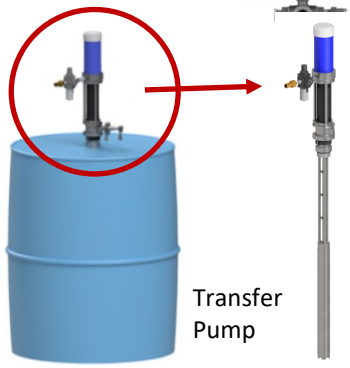
AIR CONTROL PANEL (ACP)

Provides and regulates the air supply to any nozzles utilizing atomizing and/or fan air. This unit also features a precision liquid regulator that allows for smooth and quick pressure adjustments. Easy access push-to-connect tube fitting ports are located on the top and bottom of the ACP. For more information refer the SCS Series Fluid Delivery System Owner's Manual.



AUTO-REFILL

Auto-Refill is an optional module that helps refill the supply tank during operation and recirculation. The auto refill system can be added to the Food Coating System and requires a level sensor connection to attach to the control panel. The level sensor displays the current tank level as a percent to full. The refill setpoint can be adjusted for user preference.



TRANSFER PUMP

Easily transfer low to medium viscosity liquids out of drums and totes. Air driven sanitary design, piston pump, with air filter/ regulator.

Dual Channel Flow Meter

FLOW METER

Designed for the 2150+ Spray Control Panel measures the flow of the nozzle

PRESSURE SENSOR

Designed for the 2150+ Spray Control Panel to provide liquid pressure monitoring and application adjustment.

SECTION 4

SYSTEM START-UP

Fluid delivery is accomplished via a diaphragm pump mated to a back-pressure regulator allowing for excess fluid pressure to be recirculated back to the supply tank. A manual 2-way valve allows for the option of recirculation of fluid from nozzles back to supply tank. The main air is configured to supply the diaphragm pump with a single connection.

4.1 SETUP

Connect all process lines to the tanks, pumps and nozzles. Main air is configured to supply the diaphragm pump with a single connection. Before starting the system for the first time, be sure to follow all instructions on the drawings and in the "System Hook-Up and System Operation" section of this manual.

CAUTION: Always check all electrical, hydraulic, and pneumatic connections before powering on the system or turning on air/water supply.

To operate system, follow all startup procedures.

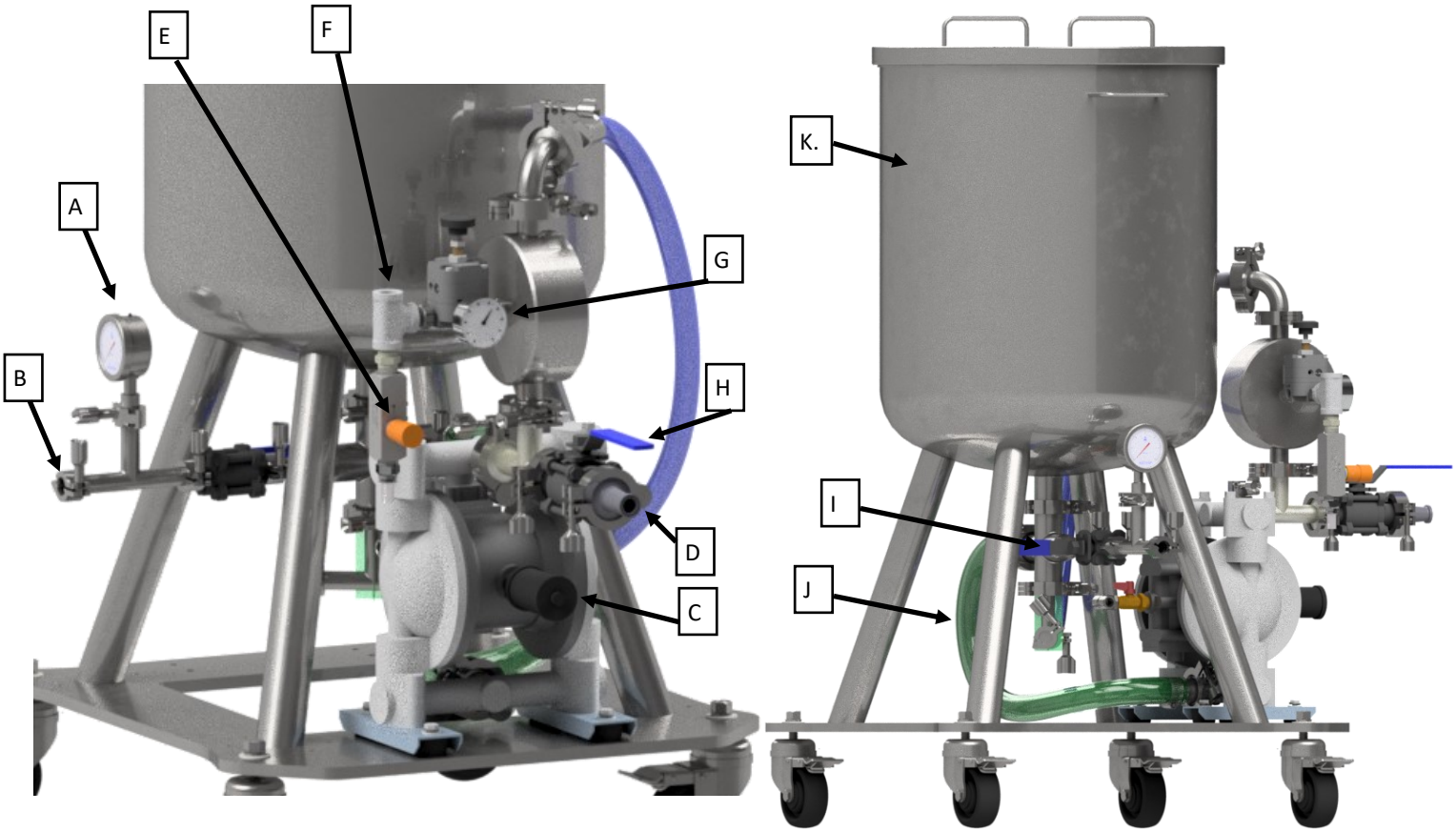
1. To fill the tank manually, open the tank lid and fill to desired level.
2. Turn on the air valve to the pump inlet to allow it to start pumping.
3. Set the desired liquid pressure using the manual pressure regulator. Excess pressure/flow will be released through the backpressure regulator and directly back to the tank.
4. Adjust the knob on the needle valve to adjust this rate of recirculation allowing for mild agitation of the contents of the tank. Never throttle the valve more than what the nozzles require for operation. This can be checked by running the nozzles and turning down the flow of air to the pump. If you start to see large drops in the air pressure control gauge, the pump speed is too low to keep up. Adjust the needle valve while spraying and circulating to increase pump speed.
5. If external circulation to the nozzles and back is desired, an orifice plate is provided at the return.
6. Make sure 2-way ball valve on liquid outlet is open and if desired, 2-way ball valve on liquid inlet is open for recirculation.

FLUSH AND DRAIN TANK

1. If using auto-refill, complete the steps as needed in the Auto-Refill section of this manual and turn the refill control switch to "ON" (Auto-Refill section in "Optional Add-Ons" section of this manual).
2. To empty the tank, either direct the outlet fluid line to a drain or use the spray controller to flush the tank contents through the spray nozzles or header. Fill with any desired cleaning fluid which can be controlled with the approapriate controller.

WARNING: The air supplied to the machine must be clean, free of moisture and lubricating fluids; failure to do this will void all warranties.

SYSTEM DIAGRAM



A. Recirculation Gauge*– Shows pressure drop through lines
B. Liquid Recirculation 3/4”
C. Pump
D. Liquid Outlet
E. Needle Valve– Adjusts pump frequency to maintain pressure
F. Air Inlet 1/2” NPT (Customer supplied)
G. Liquid Pressure Gauge– Adjusts to set liquid pressure
H. Liquid Outlet Valve
I. Pump Air Inlet Valve– Must be open during operation
J. Auto-Refill Inlet
K. 20-Gallon Tank

* To loosen the pressure on the recirculation gauge you need to increase the frequency so you have the correct pressure to nozzle ratio.

4.2 AUTO-REFILL/LEVEL SENSOR

The automatic refill module allows the refill of the liquid pressure tank without having to shut down the spray process. Auto-refill (optional) comes with a level sensor, pneumatic ball valve, and optional drum pump. The auto refill module accepts a signal from the level sensor that when the liquid is low it triggers the refill tank.

Auto-Refill module consists of:

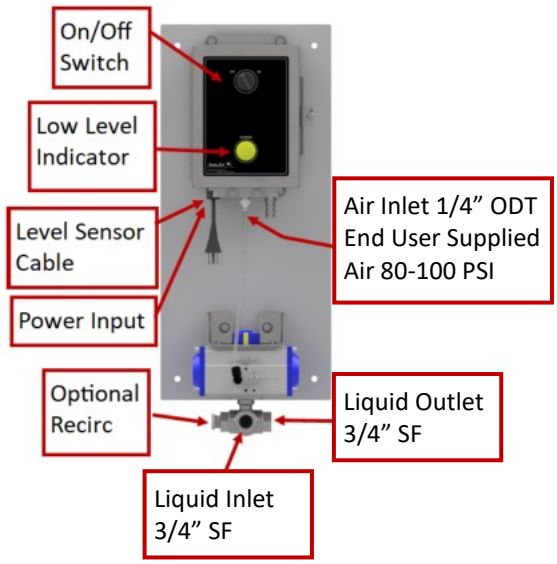
- Air-operated valve control panel
- Continuous liquid level sensor – low level indicator

AUTO-REFILL AND LEVEL SENSOR TO THE PUMP SET-UP:

1. Connect liquid lines from the pump to the refill port. Note, the rest position of the refill valve will have a circular indicator to the adjoined ports with no air actuating the valve.
2. The re-circulation port, in the rest position, is for recirculating the fluid from the source. This is useful for fluids that fall out of suspension, or if your pump is positive displacement it is required to use this fitting. If you do not wish to re-circulate, please plug this port.
3. Next, connect fluid line from the refill valve port to the fill port at the bottom of the tank. Supply air to the inlet on the control box (80 -100 PSI required to actuate the valve).

AUTO-REFILL CONTROL PANEL SET-UP

1. Connect power to the controller.
2. Plug the level sensor cable into the sensor mounted to the main tank unit.
3. The auto-refill controller unit will supply air to the numatic valve when the main tank level is low. In that case, the yellow light on the controller will illuminate indicating the automatic refill has been triggered and is currently filling.
4. The indicator light will shut off once the fluid reaches the high-limit setpoint via level sensor.



PROGRAMMING THE LEVEL SENSOR

The tank level sensor comes pre-programmed. However, the set points (Q1 – SP1 and Q1 – RP1) can be adjusted to configure the system specifically for the application.

The level sensor displays the tank level as a percent (%) full. However, all parameters are measured in millimeters (mm) from the bottom of the probe. The usable range of the level sensor is between 10 mm and 390 mm from the bottom of the probe.

There are two switching outputs that can be adjusted: Q1 and Q2. Output Q1 is used for the Auto-Refill feature and output Q2 is used for the Low Tank Level indicator.

Menu	Parameter	Name	Description	Preset
Expert	Probe	Probe Length	Length of probe for this application	558 mm
Qa	QAHIGH	High Level 20ma	Maximum tank level (QAHIGH>QALOW)	390 mm
AutCal				
Qa	QALOW	Low Level 4ma	Minimum tank level	10 mm
Qa	QAPOL	Configure	Analog output signal as configured	QA-Nrm
Qa	QATYP	Configure	Setting the output signal	Auto V
DspVal	Length	Configure	Display shows fill level in %	%
Q1	SP1	Switching Point 1	High Level - Auto-Refill stops filling	390
Q1	RP1	Reset Point 1	Low Level - Auto-Refill begins filling	250
Q1	OU1	Switching Function	Output Type - Normally Open/Closed	Qx-Hnc
Q2	SP2	Switching Point 2	Not Low Level - Indicator will turn off at or below this value	50
Q2	RP2	Reset Point 2	Low Level - Indicator will turn on at or below this value	10
Q2	OU2	Switching Function	Output Type - Normally Open/Closed	Qx-Hno

To access the above parameters from the main display (% full), press and hold the “Set” button. Use the up and down arrows to navigate to “Q1MENU” or “Q2MENU” and press the “Set” button. Use the up and down arrows to navigate to “SP1” or “RP1” (or “SP2” and “RP2”) and press the “Set” button. Use the up and down arrows and the “Set” button to change the numeric values assigned to the given parameter. Instructions for setting other parameters can be found on pages 32-35 of the provided component manual.

Assuming the tank has been initially filled and given the values in the above table, as the system is being used the level in the tank will decrease. Once the fluid reaches 250 mm from the bottom of the probe, 63% full (100% * (250-10)/390=64%), Auto-Refill will turn on. As the fluid level rises and reaches 390 mm from the bottom of the probe, 100% full, Auto-Refill will be turned off.

If Auto-Refill is switched off or the supply is interrupted, and the fluid level reaches 10 mm from the bottom of the probe, 0% full, the Low Tank Level indicator will turn on. This is intended as a warning that the system is not automatically refilling. The Low Tank Level indicator will turn off once the fluid level rises above 50 mm from the bottom of the probe, 10% full.

4.3 TRANSFER PUMP

Easily transfer low to medium viscosity liquids out of drums and totes. air driven, piston pump, with air regulator.

SPECIFICATIONS *(SUBJECT TO CHANGE BASED ON PROVIDED PUMP)*

- Max. Air Inlet: 100 PSI (6.89 Bar)
- Max. Fluid Working Pressure: 250 PSI (17.24 Bar)
- Max. Output Flow: 10 GPM
- Air Consumption: 16 SCFM

SYSTEM START-UP

1. Check the regulator reads “0” psi.
2. Make sure all air and liquid supply fittings/lines are connected and secured fully before starting.
3. Start transfer pump process by turning the knob on the filter/regulator clockwise.
4. Slowly raise air pressure until the transfer pump begins cycling.
5. Use the regulator to control the pump speed and liquid pressure.
6. Since this is a 3:1 ratio piston pump, a pressure reading on the filter/regulator of 40 psi will output 120 psi.

PRESSURE RELIEF PROCEDURE

1. Using the filter/regulator, turn knob counterclockwise to relieve pressure.
2. Once gauge reads “0” psi, the liquid supply can be removed.
3. If nozzle/hose is clogged/pressure has not been fully relieved after following the steps above, very slowly loosen the hose end coupling to relieve pressure gradually, then loosen completely. Clear hose or nozzle blockage.

CAUTION: Trapped air can cause the pump to cycle unexpectedly, which could result in serious injury from splashing or moving parts.

WARNING: Never let the pump run dry of the fluid being pumped. A dry pump can accelerate and cause personal injury and/or damage to the pump.

FLUSHING

Flush at the lowest possible pressure and flush with a fluid that is compatible with the fluid being dispensed and the equipment wetted parts.

1. After Pressure Relief Procedures above, place suction tube in drum containing flushing fluid.
2. Set pump to lowest fluid pressure, and start pump.
3. Cycle pump until desired flushing is complete.
4. Completely relieve air pressure to pump before removing pump from drum.

SECTION 5

CLEANING/MAINTENANCE

ATTENTION: Cleaning procedure is only a suggestion. Customer is ultimately responsible for a sanitation procedure that meets their requirements and standards.

5.1 CLEANING PROCEDURE

1. Turn the auto-refill switch on the main control panel to the “OFF” position (if applicable).
2. Close the 2-way ball valve on the pump’s incoming air inlet port. This stops the pump from operating.
3. Close the recirculation port 2-way ball valve.
4. Remove the hose/ tube connecting to the recirculation port inlet and use this line to remove majority of the fluid in the tank.
5. When ready, open ball valve for air inlet to the pump again to start draining the tank and fluid lines.
6. Once the tank is empty, then majority of the fluid is drained. Reconnect the open hose/tube to the recirculation port and open the recirculation ball valve.
7. At this point, the end user can fill the tank with their recommended cleaning solution. The cleaning solution can be recirculated.
8. Use the control panel to spray the nozzles until all process fluid remaining in the hoses, manifolds and nozzles is discharged.
9. Clean the auto-refill system (as applicable).
    a. Liquids for cleaning, rinsing, and sanitation can be added to the auto-refill supply tank and fluid delivery line.
    b. Turn the auto-refill switch to the “ON” position to begin filling.
    c. When complete, turn the auto-refill switch to the “OFF” position to stop pumping.
    d. Repeat this process with appropriate fluids till the system is thoroughly flushed.
10. Clean the tank, delivery hose and nozzle assemblies.
    a. Liquids for cleaning, rinsing, and sanitation can be added through the open top of the tank or fed through the auto-refill system.
    b. Any inside surface on the pressure tank, sensors, or dip tubes can be manually cleaned, scrubbed, or wiped down.
    c. Use the control panel to spray and move cleaning and sanitizing fluids through the hoses, manifolds and nozzles.
11. The fluids, time to flush, repetitions, etc.… are to be determined by the end user to meet your required level of cleaning and sanitation.
12. After cleaning and sanitation, return all valves and port covers to their production ready state.

5.2 MAINTENANCE

ATTENTION: Any long term shut-down requires that all liquid lines, liquid components, pumps, spray guns be flushed and cleaned thoroughly.

	Daily	Monthly	Every 6 Months	Every 12 Months
Pneumatic Controls	N/A	• Check for leaks • Check system main air pressure as specified	• Tighten all screw terminal connections to insure proper bonding.	• Check component calibration and re-calibrate if required. See individual control component manuals for calibration procedures.
Liquid Controls	N/A	• Check all liquid connections, in-line filters, tubes/hoses for leaks.	N/A	N/A
Spray Nozzles	• Check all spray guns for leaks or mechanical malfunctions	• Clean, lubricate, and adjust all spray guns.	N/A	N/A

Check individual control manuals for specific controls or call a spray specialist at 1-866-321-2250.

SECTION 6

TROUBLESHOOTING

Please refer to troubleshooting below or contact Spraying Systems Co. for further assistance.

-System does not spray or has a bad pattern.

1. Check air supply pressure on pump
2. Check ball valve at the fluid outlet and inlet if recirculating
3. Power to the Control Panel
4. Check wiring between the Control Panel and the PulsaJet gun(s)
5. Verify Trigger signal
6. Check nozzle for clogging.

-Air in liquid line/Poor pump performance.

1. Check pump air supply and regulator
2. Check for leaks in air inlets
3. Check for leaks in liquid inlets
4. Disassemble pump and check for damaged diaphragm or seals

-No pressure at the nozzle.

1. Ensure the inlet air pressure should be 20psi over desired liquid pressure up to 100psi.

SECTION 7

SPARE AND REPLACEMENT PARTS

20-Gallon Pump System

Description	Part Number
Pump, Diaphragm, 1" Sanitary, 316 SS Body, PTFE Diaphragm.	PU00NDP20BSTFDA
Kit, Rebuild, air motor side, for Yamada NDP-20BPT-PP pump and PU00NDP20BSTFDA sanitary pump	PU00NDP20BPT_SP01
K20-MT-1 Liquid Kit - for PU00NDP20BST - spare parts kit	PU00NDP20BST_SP00
Piston Pump, 3:1 ratio, Stainless Steel	PU00333120
Regulator, Back Pressure Regulator, 1" Tri-Clamp Fluid Inlet/Outlet	VC00FD08T100J15
Rebuild Kit - for VC00FD08T100J15 - Passive Pulsation Dampener	VC00FD08T100J15_SP01

Warranty is one (1) year on non-wear parts from ship date. Wear items are covered for manufacturing defect only for a period of one (1) year. Wear items include, but may not be limited to, Liquid pump and Liquid regulator. Seller warrants that its products will conform to and perform in accordance with the products' specifications.

Seller warrants that the products do not infringe upon any copyright, patent, or trademark.

THE FOREGOING WARRANTIES ARE IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THOSE CONCERNING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

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