

AutoJet® SCS Series Fluid Delivery System

OWNER'S MANUAL

AutoJet®
TECHNOLOGIES

From *Spraying Systems Co.*



Spraying Systems Co.®
Experts in Spray Technology

ML00SCSFLUID
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TABLE OF CONTENTS

1. Preface	3
1.1 Using This Manual	3
2. Safety	3
2.1 General Safety Information	3
2.2 Unpacking The System	4
3. SCS Series Introduction	5
3.1 Optional Add-Ons	6
3.2 Spray Control Panel Options	7
4. Air Control Panel (ACP)	8
4.1 Overview	8
4.2 Specifications	8
4.3 ACP Configurations	9
4.4 Air Filter/Regulator	10
4.5 Setup	10
5. Pump Version	11
5.1 Overview	11
5.2 Specifications	11
5.3 Hook-Up	11
5.4 Priming The Pump	12
5.5 Recirculation	12
6. Pumpless Version	14
6.1 Overview	14
6.2 Specifications	14
6.3 Hook-Up	14
7. Pressure Pot	15
7.1 Overview	15
7.2 Specifications	15
7.3 Hook-Up	15
8. Coating Supply Unit– Threaded	16
8.1 Overview	16
8.2 Specifications	16
8.3 Setup	17
8.4 Auto-Refill/Level Sensor	18
8.5 Programming The Level Sensor	19
8.6 Transfer Pump	20
9. Troubleshooting	21
10. Cleaning Procedure	23
11. Suggested Maintenance	24
12. Spare And Replacement Parts	24

SECTION 1

PREFACE

The AutoJet® SCS Series Fluid Delivery System are produced, tested, and checked at the factory. The system can be dangerous if used incorrectly. Read this manual carefully and 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.

1.1 USING 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 voided 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
- Safety glasses or face shield
- Chemical-resistant safety gloves and apron
- Long sleeve shirt and long pants

Users of this product should never place themselves in the path of the 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

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 system components come 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 from the crate, the system is ready for installation and connection.



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



SECTION 3

SCS SERIES INTRODUCTION

The SCS Series includes many components, some are necessary components with other Spraying Systems Co.® systems and some are add-ons that might work with your current system. These systems and devices are included with the complete package for AutoJet® Fluid Delivery System. Refer to the specific package details to understand what you have. For more information contact a Spray Specialist at 1-866-321-2250.

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.



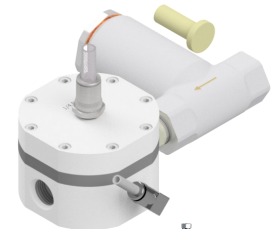
PUMP VERSION

Features a durable air operated diaphragm pump for continuously run spray applications. Fluid pressure is controlled by an external air piloted liquid regulator. This design requires liquid to be drawn from a tote or a tank.



PUMPLESS VERSION

The Pumpless system controls the flow of liquid using an external air piloted liquid pressure regulator controlled by a precision air regulator.



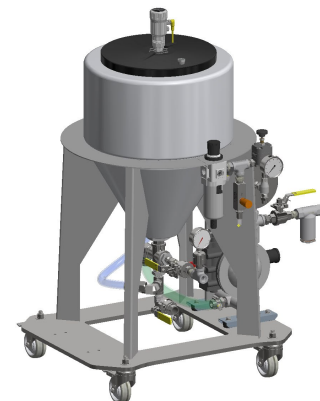
PRESSURE POT

The Pressure Pot version controls the flow of the liquid by using an air regulator to pressurize the pot.



COATING SUPPLY UNIT – THREADED

The Coating Supply Unit is designed for applications that require a higher flow rate directly from the manifold. The fluid will recirculate through a back pressure regulator to create agitation in the tank. The frequency of the agitation can be controlled manual via needle valve.



3.1 OPTIONAL ADD-ONS

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

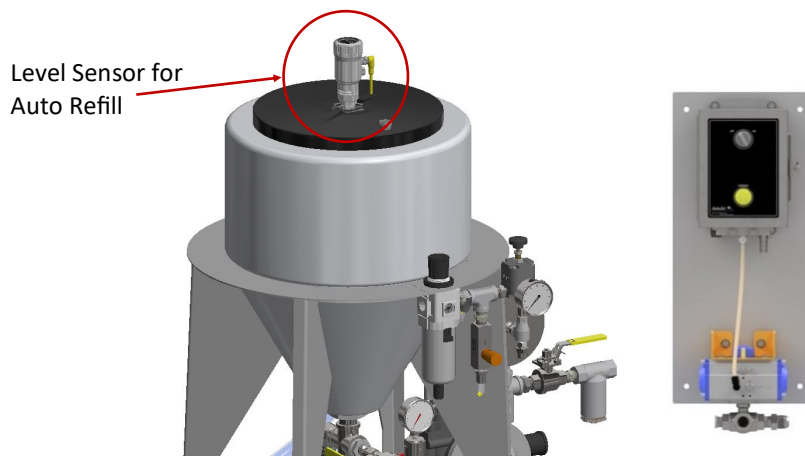
— ACCUCOAT® HD15 IN-LINE HEATER

For applications that require heating the HD15 In-Line Heater is an optional add-on for the 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 to the AccuCoat® HD15 In-Line Heater Owner's Manual.



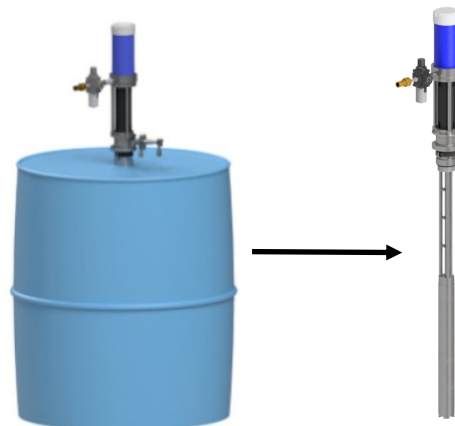
— AUTO-REFILL

Auto-Refill is an optional module that helps refill the supply tank during operation. The auto refill system can be added to the Coating Supply Unit 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. For more information see Auto-Refill/Level Sensor section.



— TRANSFER PUMP

Easily transfer low to medium viscosity liquids out of drums and totes. air driven, 2:1 ratio piston pump, with air regulator.



3.2 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.

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



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., 3A	110/240 VAC, 50/60, 1Ph., 5A/10A (single/dual channel)
Max Number of Nozzles Per Channel	(03) - 8 (10) - 2	(03) - 10 (10) - 3	(03) - 16 (10) - 5
Nozzle Type	Air & Electrically Actuated	Air & Electrically Actuated	Air & Electrically Actuated
High Capacity	×	×	✓
Dual Channel	×*	×	✓
Washdown Enclosure	✓	✓	✓
Stainless Steel Control Panel	✓	✓	✓
Recipes	✓	✓	✓
Trigger Input	✓	✓	✓
Various Power Cord Options	✓	✓	✓
Power On/Off Switch	✓	✓	✓
Level Switch	✓	✓	✓
Level Sensor	×	×	×
Wi-Fi Access	×	×	✓
Remote Access	×	×	×
Precision Spray Control	×	×	✓
Encoder Input	×	×	✓
Flow Monitoring	×	×	✓
Pressure Transmitter Input	×	×	✓
Ethernet IP	×	×	✓

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

AIR CONTROL PANEL (ACP)

4.1 OVERVIEW

The Air Control Panel (ACP) provides and regulates the air supply to any nozzles utilizing atomizing and/or fan air and 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. The ACP can be mounted to the SCS Series frame, or it can be mounted separately in a Two Panel Design configuration that offers direct wall mounting.

The ACP system pairs with the rest of the SCS Series Liquid Delivery package including:

- Pump
- Pumpless
- Pressure Pot
- Coating Supply Unit

4.2 SPECIFICATIONS

COMPRESSED AIR

- Inlet Pressure—100 psi (7 bar) (System designed to work at 100 psi max.)
- Max. Air Flow—100 SCFM [Accumulated total; including pump, atomizing, and fan air lines]
- Required Air quality—Clean, dry air according to DIN ISO 8573-1
- Solids—Class 5
- Water Content—at least class 4 - Cooled down to 59°F below room temperature (location of system)
- Oil Content—at least class 5.

AIR CONNECTION PORTS AND DIMENSIONS

- Cylinder Air - 1/4" ODT
- Atomizing Air - 1/2" ODT
- Fan Air - 1/2" ODT
- Main Air Inlet - 1/2" NPT
- Liquid Pressure Outlet/ Tank Air - 3/8" ODT
- Liquid Pressure Gauge - 1/4" ODT
- Pump Air - 1/2" ODT

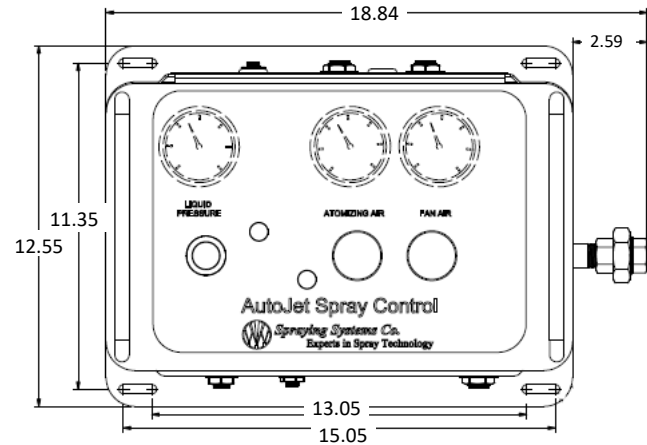
Note: Cylinder air pressure will be equal to the inlet air pressure of the system.

LIQUID AND AIR PRESSURE OFFERINGS

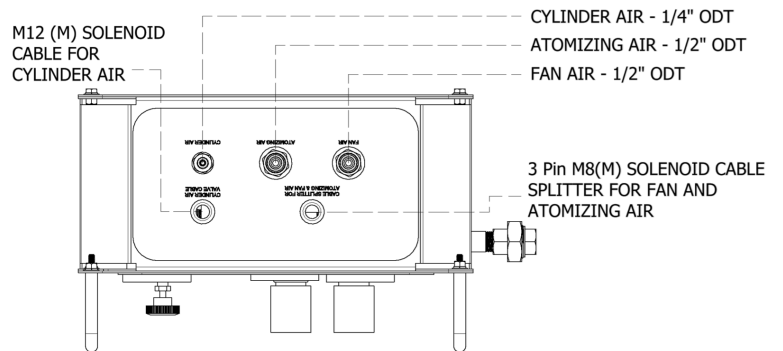
- 0-30 psi (2 bar)
- 0-60 psi (4 bar)
- 0-100 psi (7 bar)

AIR LINE

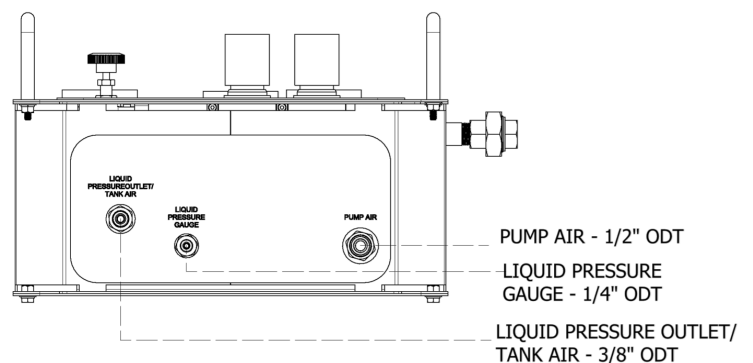
- Max. air flow: 100 SCFM (2831.7 SLPM)
- Brass, aluminum, stainless steel, and nickel plated brass



Mounting and Overall Dimensions



ACP connections, top view



ACP connections, bottom view



4.3 ACP CONFIGURATIONS

The full system versions are equipped with electric valves, manual pressure regulators and gauges to control:

- Pneumatic nozzle actuation.
- Liquid spray pressure and recirculation rate.
- Based on the configuration the system can control atomizing air and fan air.
 - These air controls help control droplet size and spray pattern size depending on the spray nozzle design.

The ACP is available in liquid only; liquid and atomizing air; and liquid, atomizing, and fan air configurations.

LIQUID ONLY

Liquid air control only. Designed for use with hydraulic or pneumatically actuated nozzles.

LIQUID AND ATOMIZING AIR

Liquid air control with atomizing air control. Designed for use with hydraulic or pneumatically actuated nozzles.

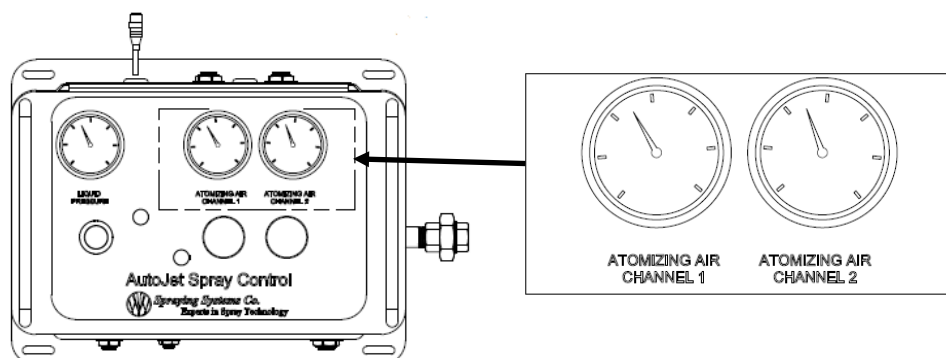
LIQUID, ATOMIZING, AND FAN AIR

Liquid, atomizing, and fan air control. Designed for VX, VAU, and VMAU spray nozzles.

DUAL CHANNEL ACP

Single and dual channel ACPs are available in both single frame design and two panel design (wall mount), depending on your system configuration. Dual channel ACPs are used for dual channel 2150+ spray controls panels, or when your spray solution includes more than one spray control panel. Dual channel has 2 atomizing air gauges with a single liquid pressure gauge.

Dual channel frames do not have fan air. Nozzles utilizing fan air will require a second panel.



4.4 AIR FILTER/REGULATOR

- The system is provided with an air filter/regulator and lock out valve assembly. The unit is provided detached for you to mount directly to the unit or your preferred location.
- Connect a 40-100 psi max air supply line to the input fitting of the lockout valve. Make sure that the lockout valve is in the closed position prior to connecting the unit to the air supply.

4.5 SETUP

SUPPLYING AIR TO THE SYSTEM

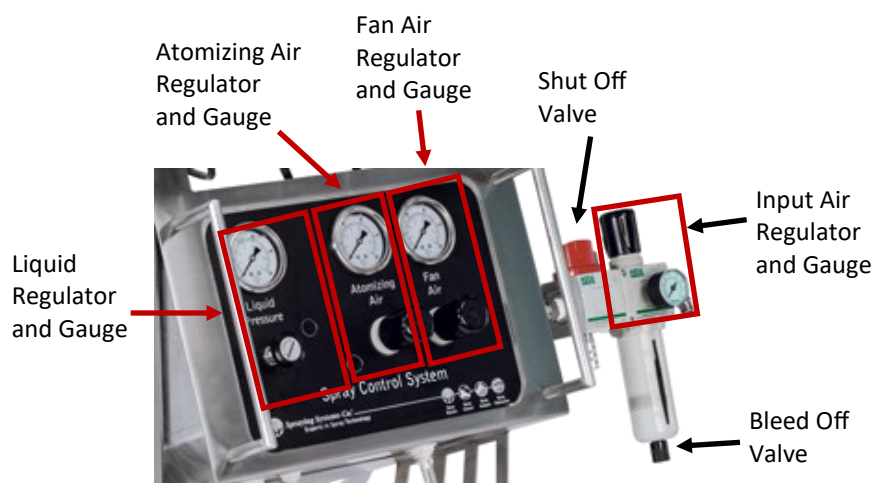
1. Turn the red valve on the air inlet valve/regulator/filter clockwise to the on position. Turn regulator that is on top of the air filter to an air pressure between 40-100 psi (2.8-6.9 bar). Air pressures higher than this will shorten the life of the pump. Air pressure should be 20 psi higher than the pressure intended to spray at.
2. Adjust the regulated pressures (regulators on front panel).
 - If applicable, depending on your spray system you may have anywhere from liquid pressure regulation only to liquid pressure; pump air (preset); atomizing air (drop size); fan air (spray angle/pattern).
3. Adjust the **liquid pressure regulator**: The regulator can be adjusted by first pulling up on the knob and then turning clockwise to increase and counter-clockwise to decrease the pressure. When the proper liquid pressure is reached, press down on the knob to lock it in place.

Note: The pressure is non-relieving and therefore may not relieve the pressure until the spray nozzle is spraying again.

4. Adjusting the atomizing and fan air: Each air control line is equipped with a manual **air pressure regulator**. The regulators can be adjusted by first pulling up on the knob to unlock the regulator and then turning clockwise to increase and counter-clockwise to decrease the pressure.
5. Once the proper air pressure is reached, press down on the knob on the regulator to lock it in place.

Note: Your system is equipped with cylinder air for air actuated spray nozzles. Cylinder air pressure is equal to the inlet air pressure to the system. It is not regulated; therefore, you must provide a minimum of 45 psi (3.1 bar) to the system. It must be above 45 psi (3.1 bar) to actuate air actuated nozzles like Spraying Systems Co.® 1/4JAU series.

6. For systems that control pneumatically actuated nozzles connect 1/4" (6 mm) O.D. tubing from the cylinder air out port of the bulkhead to the spray nozzle cylinder air ports.
 - Tubing may be supplied with optional spray nozzle hook up kit (metric nozzle hook up kits are not available)
7. Connect 1/2" (12 mm) O.D. poly tubing from the atomization air and fan air push-in fittings (if needed) on the side of the enclosure to their corresponding fittings on the spray nozzles.
 - Tubing may be supplied with optional spray nozzle hook up kit (metric nozzle hook up kits are not available)



PUMP VERSION

5.1 OVERVIEW

The pump version features a durable, air operated diaphragm pump that requires liquid to be supplied by a tote or a tank using the system's pump. The pump is not designed to receive pressurized fluid. This version has an option to recirculate liquid from the system back to the supply tank. The pump version is available in food contact and non-food contact configurations.

5.2 SPECIFICATIONS

- System max. air flow: 100 SCFM (2831.7 SLPM)
- Liquid inlet strainer: 100 mesh

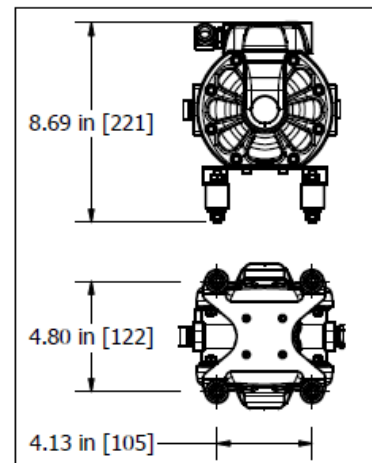
MATERIALS

Standard Version:

- Brass, nickel-plated brass, nylon, acetal, PTFE, polyethylene, polypropylene, Viton®, PVC, EPDM and stainless steel

Food Contact Version:

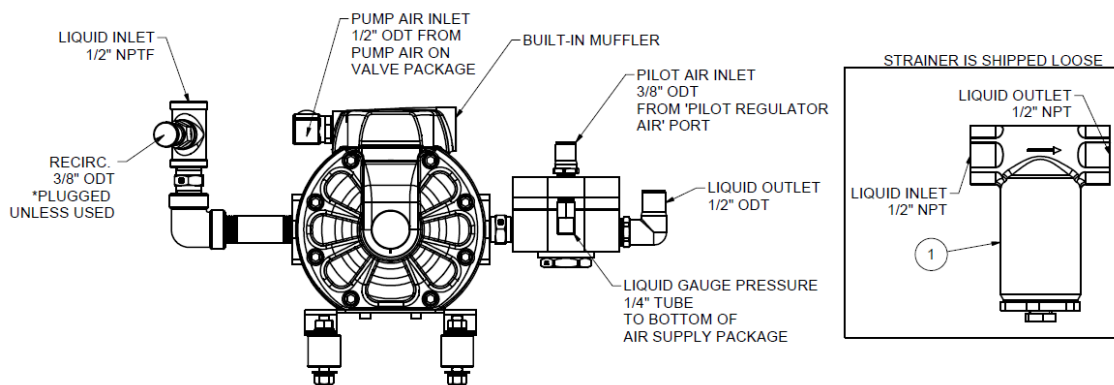
- Food contact acetal, PTFE/CTFE, Viton®, polyethylene, polypropylene, PVC, EPDM, Hastelloy-C, Buna-N and AISI316 stainless steel



Pump Mounting Details

PUMP

- Suitable for water, inks, stains, water-based solvents, lubricants, oils, paints, and non-abrasive slurries.
- Fluid viscosity up to 1000 cP at 68°F (20°C)
- Liquid flows up to 3.5 GPM (13.2 l/min)
- Pump max. air flow: 6 SCFM (169.9 SLPM)



5.3 HOOK-UP

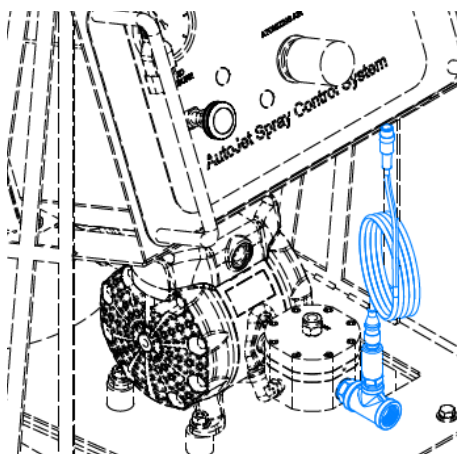
- 1) Connect the provided 3/4" (19 mm) ID hose with foot valve kit to the inlet of the pump.
- 2) This hose section with foot valve is to be placed inside customer's tote/drum for process fluid suction.
- 3) The 3/4" hose allows the pump to prime itself and the foot valve helps to maintain that prime.
- 4) Connect 1/2" OD Tube from pump outlet to corresponding fitting on spray nozzle/manifold. (Tubing may be supplied with optional spray nozzle hook up kit)

Note: This hose kit with foot valve will not be supplied when a 7-Gallon supply tank is provided with the system.



IF YOU HAVE PRESSURE SENSOR:

- 5) Hookup the pressure sensor kit to the 1/2" NPTF liquid outlet on the pump. The signal cable on the pressure sensor should connect to the 2150+ spray control panel M12 bulkhead labeled "PRESSURE".



See your specified Control Panel Manual for all sensor and cable specifications.

5.4 PRIMING THE PUMP

When the pump is not filled with liquid (this would be the case for the first use of the system) the pump and system will need to be primed.

To prime the pump:

1. Turn on the main air to the system (red valve on side). Ensure you have adequate liquid in the supply reservoir.
2. Turn the liquid regulator, on the front panel, at least 1 or 2 turns clockwise.
3. Disconnect the liquid out tubing from the nozzle to allow max. flow for priming.
4. Allow the pump to cycle quickly until the pump is fully primed. (1-4 Hz.), this can take up to 1 minute depending on priming height and fluid viscosity. Ensure all the air is pushed out through the tubing so that all the air bubbles are minimized.
 - It may be necessary to reduce the pump air pressure to the system slightly to prime pump.
 - The pump is self-priming, so it can be above the level of the liquid (max. 5 ft./1.5 m) during the priming process but keep this to a minimum for priming if possible.

5.5 RECIRCULATION

Re-circulating the fluid from the system to the supply tank keeps the fluid in a state of motion, keeps fluid pressure constant, and eliminates pulsing from the pump. This is very useful when spraying fluids that need agitation to keep the particulates in suspension.

Each of these recirculation modes are described below:

- The first method is to re-circulate the fluid out to the spray nozzle and back into the system through the second liquid port and back into a needle valve. (Ex. Nozzles of headers that have this feature include AA250AUH, VAU and VMAU, 98250 product lines)
- The second method is to utilize a "T" splitter on the liquid outlet line with one leg tied into the fluid return line and back into the needle valve. The "T" splitter can be located anywhere from the pump outlet to the back of the nozzle itself.
- Both inlet/outlet are 3/8" ODT push-to-connect fittings



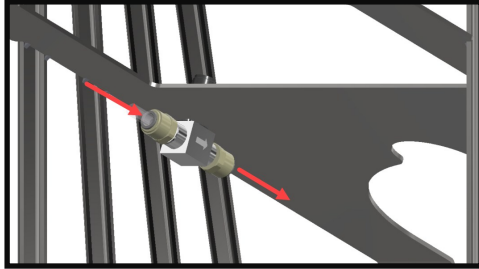
SETTING THE RECIRCULATION FLOW

Counter-clockwise will open the valve and increase recirculation flow. Clockwise will decrease the recirculation flow.

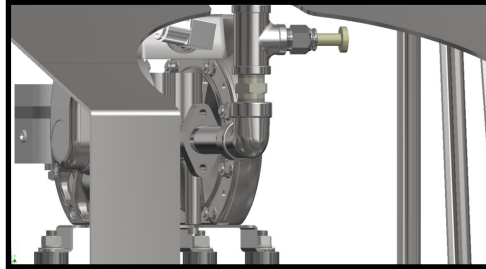
To adjust the amount of fluid that is circulating turn the knob counterclockwise until you have reached the desired amount of recirculation/back pressure.



ATTENTION: If valve is open too much the pump will not keep up with the flow and your pressure can drop.



Standard Recirculation Hook-Up



Pump Recirculation Inlet

PUMPLESS VERSION

6.1 OVERVIEW

The Pumpless Version is the liquid regulator only. It is designed for applications where fluid delivery utilizes a pressurized source typically supplied by the customer. This small assembly ships loose to be mounted directly to the fluid supply. The pumpless system controls the flow of liquid using an internal, air piloted liquid pressure regulator via the Air Control Panel (ACP). The pumpless version is available in food contact and non-food contact configurations.

Pumpless version requires the liquid source to be pressurized from 10 psi min above the maximum application pressure. The maximum required application or discharge pressure must not exceed 100 psi. This version has the option to re-circulate liquid from the system back to the supply tank. Recirculation does require the customer to use a pump and reservoir.

6.2 SPECIFICATIONS

Pumpless version requires the use of the Air Control Panel. For more information go to the Air Control Panel (ACP) section for specifications.

AIR LINE

- Max. air flow: 100 SCFM (2831.7 SLPM)
- Materials: brass, aluminum, stainless steel, and nickel plated brass.

LIQUID LINE

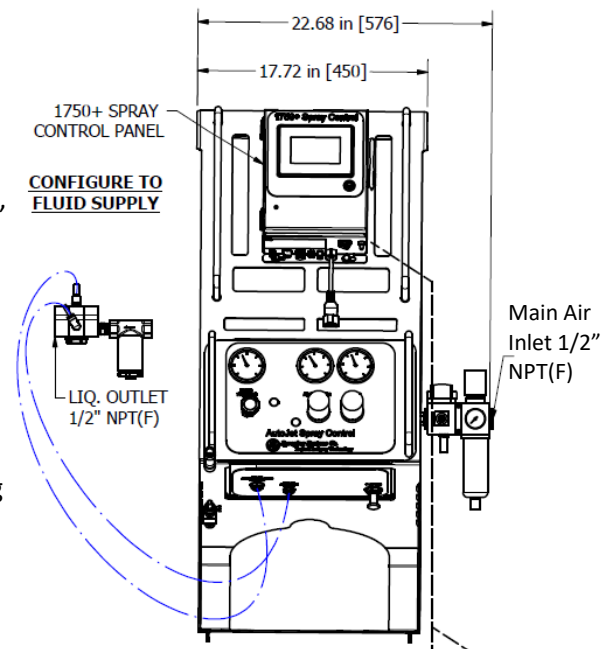
- Liquid inlet strainer: 100 mesh
- Standard Pumpless Version: PVC, stainless steel, Polypropylene, PTFE, nickel plated brass, Viton®, Nitrile and Nylon for liquid lines.
- Food Contact Pumpless Version: Food Contact Acetal, stainless steel, Viton®, FKM and Polyethylene for liquid lines.

6.3 HOOK-UP

- 1) Connect 1/2" OD tube from the liquid inlet fitting to the liquid source (Tubing to be supplied by the customer or purchased).
- 2) Connect 1/2" OD tube from the liquid-out fitting to the corresponding fitting on the spray nozzle.

OPTIONAL RECIRCULATING STYLE SPRAY NOZZLE HOOK-UP KITS:

- 3) Connect 3/8" OD tube from the liquid-in Return fitting to the liquid return line.
- 4) Connect 3/8" OD tube from the Recirculation Liquid Out fitting to the return inlet of the liquid source.



PRESSURE POT

7.1 OVERVIEW

The Pressure Pot Version is designed to pressurize the liquid supply using air over liquid. It only controls the air pressure going to the pressure pot. Adjust the pressure control pressure by the ACP. The Pressure Pot system controls the flow of liquid using an internal manual liquid pressure regulator.

7.2 SPECIFICATIONS

PRESSURE POT CAPACITY OPTIONS

5, 10, or 16 Gallons.

AIR LINE

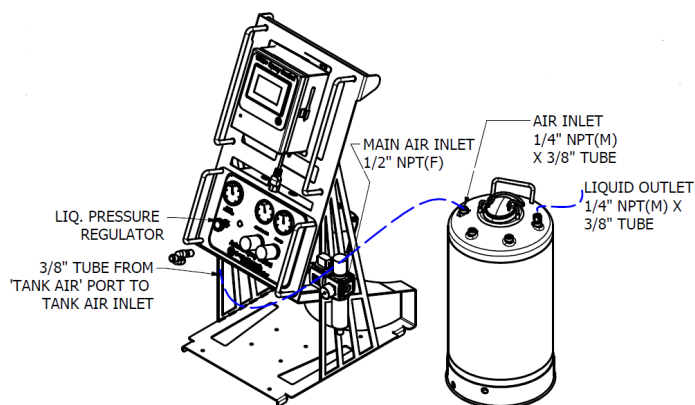
- Nickel plated brass, brass, coated aluminum, PVC, Viton, and Nylon.

WETTED COMPONENTS

- Stainless steel and Viton

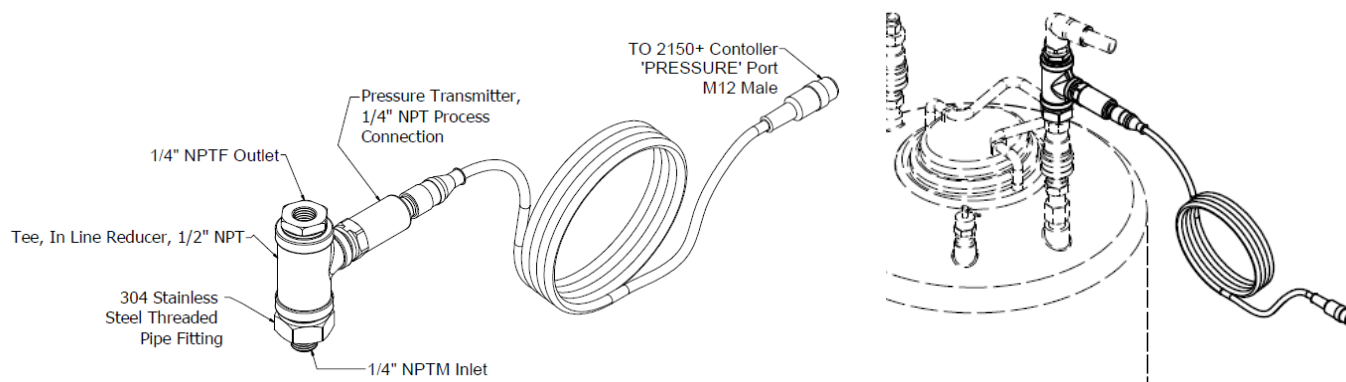
7.3 HOOK-UP

- 1) Connect suitable 3/8" (10 mm) OD Tube from the liquid pressure outlet on the SCS Air Control Panel to the pressure pot air inlet.
- 2) Connect suitable 1/2" (12.7 mm) OD Tube from the liquid out fitting on the pressure pot to the corresponding liquid inlet fitting on the spray nozzles manifold.



IF YOU HAVE PRESSURE SENSOR:

- 3) Attach the pressure sensor cable to the liquid outlet 1/4" NPTM port on the pressure pot and attach to the corresponding 1/4" ODT cylinder air port on the ACP.



COATING SUPPLY UNIT—THREADED

8.1 OVERVIEW

The Coating Supply Unit is designed for applications that require a larger tank size (15 gal/56.8 L) and that may benefit from a higher flow rate system with more automated capabilities with the inclusion of auto-refill. The Coating Supply Unit fluid delivery consists of a diaphragm pump mated to a back-pressure regulator that allows for excess fluid pressure to be re-circulated back to the supply tank. This recirculation agitates the fluid in the tank even if the recirculation loop is not connected. The outlet and recirculation ports of the system have manual 2-way ball valves that allow the user to enable/disable output flow to the nozzles or manifold for recirculation.

Note: The Coating Supply Unit requires the use of an Air Control Panel (ACP) and paired with control panels dedicated to the nozzle on/off control.

8.2 SPECIFICATIONS

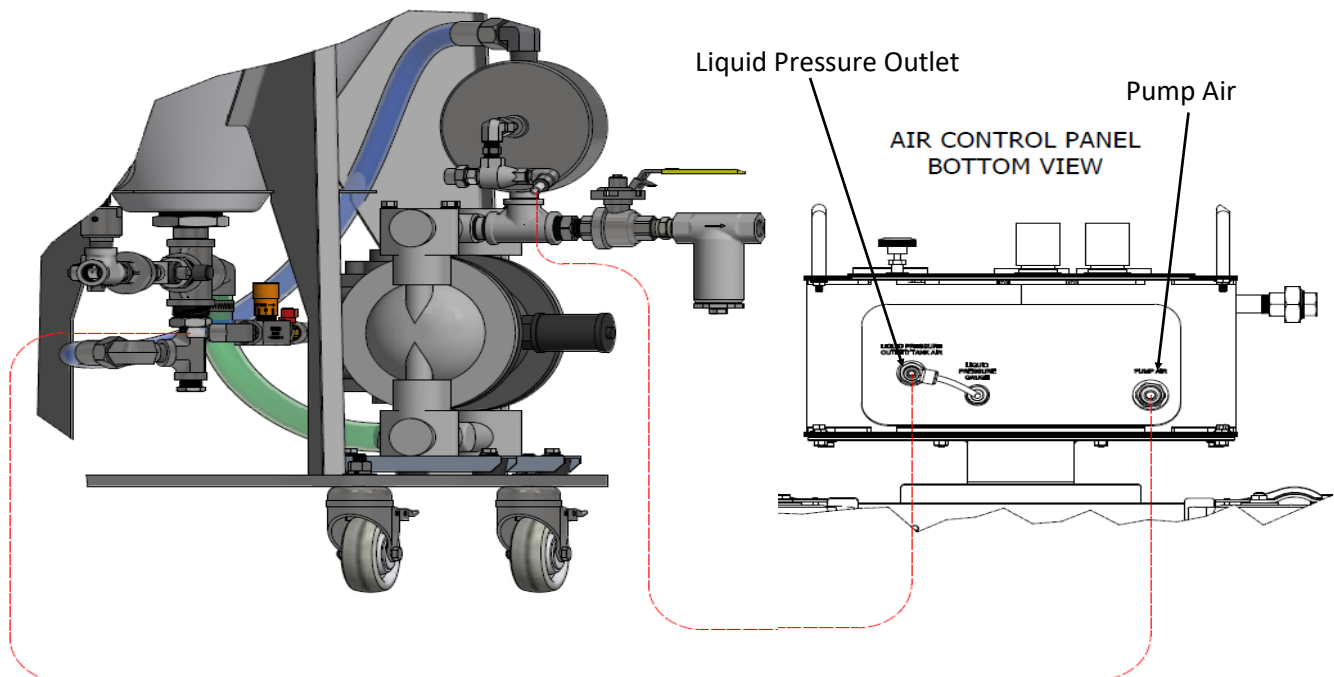
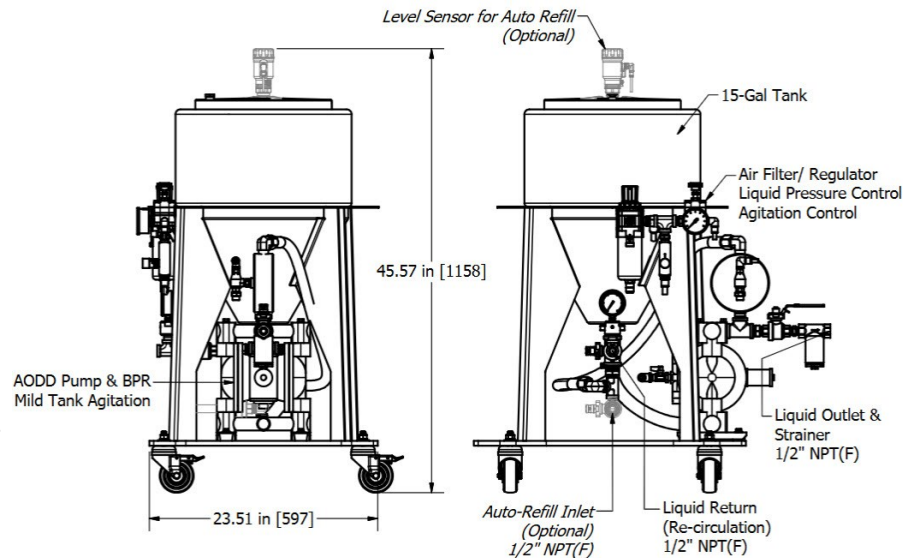
- Air Pressure—20/100 psi
- Air Input—1/2" NPT (F), 10 SCFM (min.) - 100 SCFM (max.)
- Construction—Polyethylene (tank only)
- Dimensions: 42" x 34" x 25"
- Supply Tank Volume—15 gal.

ENVIRONMENTAL

- Operating Temperature Range—32° to 120° F (0° to 42.8°C)
- Humidity Range—5 to 95% (Non-condensing)

LEVEL SENSOR (OPTIONAL)

- Time Domain Reflectometry (TDR)



8.3 SETUP

Connect all process lines to the tanks, pumps and nozzles. See electrical control panel connections for your specific cables and wiring for your system. 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 and water supply.

To operate system, follow all startup procedures above.

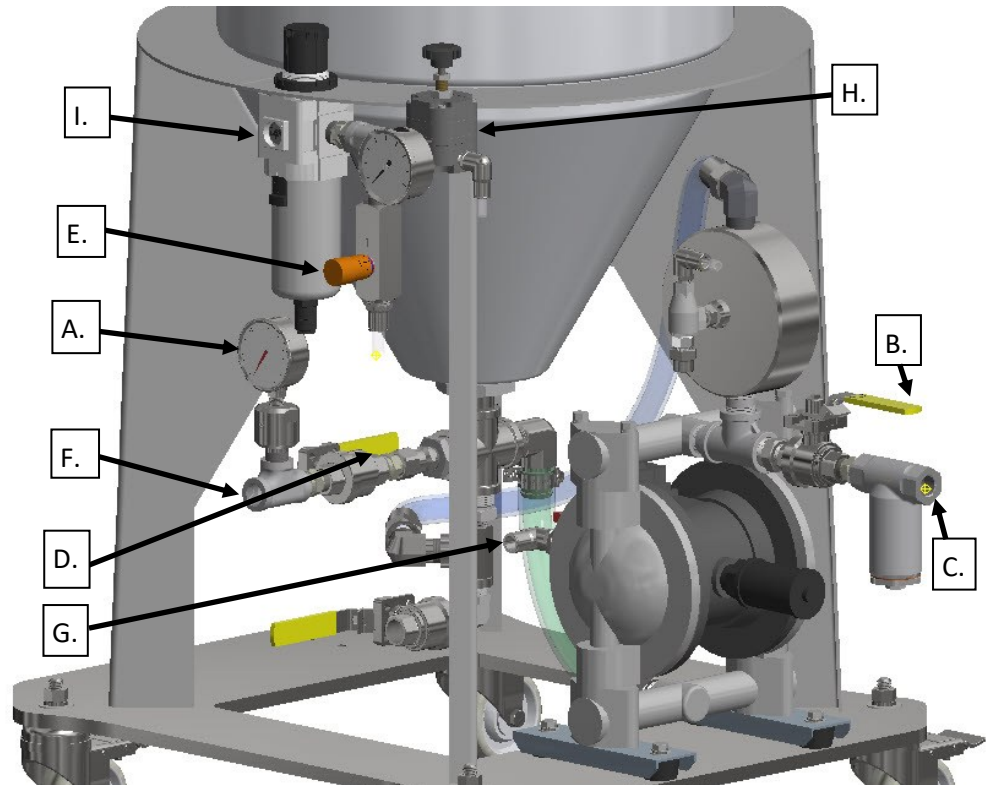
1. To fill the tank manually, open the tank lid and fill to desired level.
2. Turn on the air valve to the pump inlet to allow it to start pumping.
3. Set the desired liquid pressure using the manual pressure regulator. Excess pressure/flow will be released through the backpressure regulator and directly 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 appropriate 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.

- A. Recirculation Gauge – Shows pressure drop through lines
B. Liquid Outlet Valve
C. Liquid Outlet
D. Liquid Return Valve – Closed when not recirculating
E. Needle Valve– Adjusts pump frequency
F. 1/2” ODT liquid recirculation
G. Pump Air Inlet Valve – Must be open during operation
H. Precision Air Liquid Regulator
I. Main Air Regulator/Filter



8.4 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:

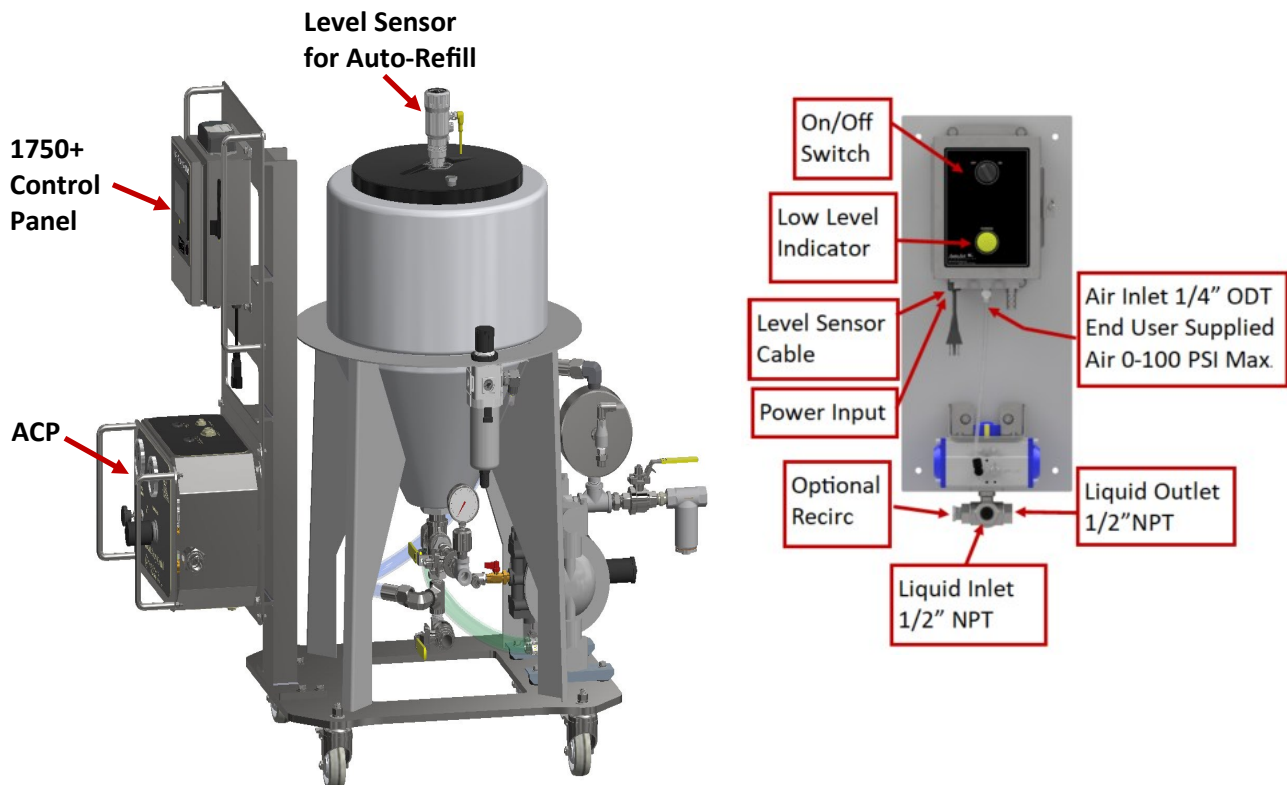
- Air operated valve control panel
- Continuous liquid level sensor – low level indicator

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

1. Connect liquid lines from the pressurized supply 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 and connect the air supply to the auto-refill panel.

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. An NPT thread push tube fitting needs to be added to the air inlet port on the bottom of the controller provided by the customer. Air must be supplied to the air inlet port.
4. The auto-refill controller unit will supply air to the pneumatic 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.
5. Supply air to the inlet on the control box (0-100 PSI max.)



8.5 PROGRAMMING THE LEVEL SENSOR

The auto refill system can be added to the Coating Supply Units 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.

Menu	Parameter	Name	Description	Preset
Expert	Probe	Probe Length	Length of probe for this application	457 mm
Qa	QAHIGH	High Level 20ma	Maximum tank level (QAHIGH>QALOW)	380 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 - AutoRefill stops filling	380
Q1	RP1	Reset Point 1	Low Level - AutoRefill begins filling	76
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

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 410 mm from the bottom of the probe, a 400 mm range.

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.

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 ($100\% * (250 - 10) / 380 = 63\%$), 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.

8.6 TRANSFER PUMP

OVERVIEW

Easily transfer low to medium viscosity liquids out of drums and totes. air driven, 2:1 ratio piston pump, with air regulator.

SPECIFICATIONS

Max. air inlet: 100 PSI (6.89 Bar)

Max. fluid working pressure: 225 PSI (15.51 Bar) Max. Output flow:

2.78 GPM (10.52 lpm)

Air consumption: 8 SCFM

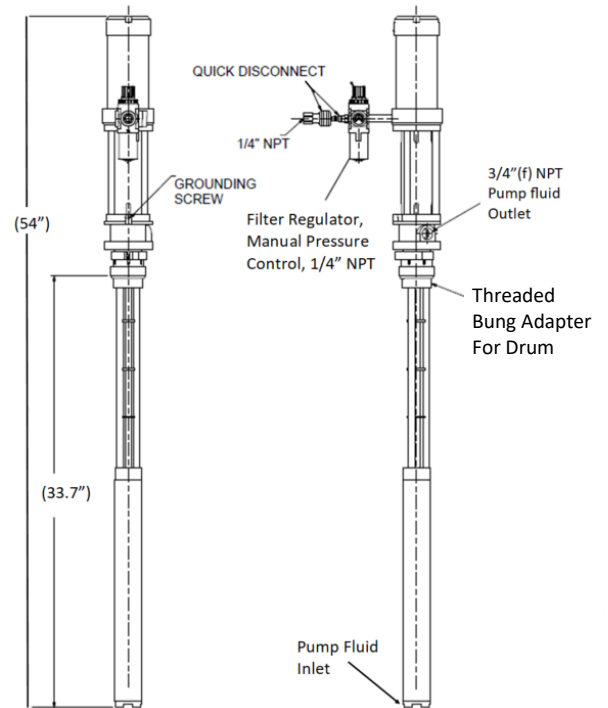
Max. fluid temp: 190°F (88°C)

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 2:1 ratio piston pump, a pressure reading on the filter/regulator of 40 psi will output 80 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.



TROUBLESHOOTING

Some faults set the system into standby mode. In this mode, no further triggers are accepted until the reason for the fault has been corrected. Once the fault has been corrected, complete a power cycle of the spray control panel.

For some faults the SCS Series spray control panels will recover without intervention, but will still indicate the fault on the fault screen. You can access the fault screen by touching the notification box, see reason for the fault if it has been fixed and easily reset any fault message by touching the “Reset” button. All faults have a tolerance time which is the time the error needs to be active for the fault to occur. See your specific control panel manual for more information and contact your Spray Specialist by calling 1-800-95-SPRAY (1-800-957-7729).

⇒ **Spray control panel will not operate spray nozzle**

- Ensure that there is proper fluid pressure supplied to the nozzle.
- Ensure that system is recognizing your trigger input. This is a common problem. If remote trigger/sensor is being used and button on the setup screen is set to “local”, the system cannot be triggered, the system trigger needs to be set to something other than “local”. The inverse is also true, if the system is being triggered from the HMI screen, the trigger option must be set to “local”. Make sure your sensor is NPN design if you are using your own sensor.

- 1) Ensure that the trigger mode is set to Local, DI2 or DI2+ DI4.
- 2) Navigate to the diagnostic screen.
- 3) Activate the main trigger source (object sensor or equivalent): DI2 on diagnostic screen should go from Off to On when the trigger device is activated
 - If this does not occur, then ensure that the trigger device is properly wired
 - If problem still occurs, then consult your controller panel owner’s manual for the trigger device
- 4) If trigger mode is DI2+ DI4, activate the auxiliary trigger: The diagnostic screen on run mode should go from Off to On when trigger device is activated.
 - If this does not occur, then ensure that the trigger device is properly wired.
 - If problem still occurs, then consult the owner’s manual for the trigger device.

⇒ **For electrically actuated spray nozzles:**

- 1) Check that the nozzle cable is properly installed on both ends with no damage to the cable.
- 2) Set duty cycle to 100% from main screen and attempt to trigger again.
 - If the nozzle activates you may have selected a duty cycle too low or max frequency too high for the nozzle you are using.
 - If the problem persists have a qualified electrical technician, ensure that there is 24 VDC on the nozzle cable when the system is triggered.

⇒ **For pneumatically actuated spray nozzles.**

- Ensure that there is a minimum of 45 psi (3.1 bar) of air pressure on the main air input to the system and that the main air valve is in the “on” position.
 - Check air supply.
- 1) Ensure that the valve cable is connected to the main output on the spray control panel.
 - 2) Remove cylinder air tube from the outside port of the system.
 - 3) Trigger the system to see if air comes out of the port.
 - 4) If air comes out they there is an issue with the cylinder on your nozzle. Contact your spray specialist for information on repairing or replacing your nozzle.

PUMP VERSION

⇒ No fluid pressure:

- Check air supply to system. Ensure that there is a minimum of 45 psi (3.1 bar) of air pressure on the main air input to the system and that the main air valve is in the “on” position.
- Check to see if the pump cycling
 - No
 - Check pump air gauge to ensure that proper air supply is being sent to the pump.
 - Check the pump air shutoff valve (white with blue handle next to pump) is turned on.
 - Close pump air valve (white with blue handle next to pump) and press push button on the bottom of the pump air valve (located beneath the pump air inlet) remove hand from the area and turn pump air valve back on.
 - Yes
 - Check to see that all the inlet fittings are tight and not drawing air.
- Check fluid pressure setting
 - Gauge on front panel reads at least 20 psi (1.5 bar) pressure?
- Check fluid filter
 - Is it leaking or clogged?
- Pump stops
 - Make sure there is air pressure going to the pump.
 - The pump may need rebuilding, please contact your Spray Specialist.

COATED SUPPLY UNIT

⇒ 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 PulaJet spray nozzles
- 5) Verify Trigger signal
- 6) Check nozzle for clogging

⇒ Air in liquid line and/or poor pump performance

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



CLEANING PROCEDURE

COATING SUPPLY UNIT- SYSTEM CLEANING PROCEDURE



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

1. If Applicable: Turn the auto-refill switch on the main control panel to the “OFF” position
2. Close the 2-way ball valve on the pump’s incoming air inlet port. This stops the pump from operating.
3. Remove the hose/tube connecting to the recirculation port inlet and use this line to remove majority of the fluid in the tank.
4. When ready, open ball valve for air inlet to the pump again to start draining the tank and fluid lines.
5. 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.
6. At this point, the end user can fill the tank with their suggested cleaning solution. The cleaning solution can be recirculated.
7. Use the control panel to spray the nozzles until all process fluid remaining in the hoses, manifolds and nozzles is discharged.
8. If applicable: Clean the auto-refill system
 - Liquids for cleaning, rinsing, and sanitation can be added to the auto-refill supply tank and fluid delivery line.
 - Turn the auto-refill switch to the “ON” position to begin filling.
 - When complete, turn the auto-refill switch to the “OFF” position to stop pumping.
 - Repeat this process with appropriate fluids till the system is thoroughly flushed.
10. Clean the tank, delivery hose and nozzle assemblies.
 - Liquids for cleaning, rinsing, and sanitation can be added through the open top of the tank or fed through the auto-refill system.
 - Any inside surface on the pressure tank, sensors, or dip tubes can be manually cleaned, scrubbed, or wiped down.
 - 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.

SUGGESTED MAINTENANCE



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

Pneumatic Controls:

Monthly: Check for leaks. Check system main air pressure as specified. Tighten all screw terminal connections to insure proper bonding.

Yearly: Check component calibration and re-calibrate if required. See individual control component manuals for calibration procedures.

Liquid Controls:

Monthly: Check all liquid connections, in-line filters, tubes/hoses for leaks.

Spray Nozzles:

Daily: Check all spray guns for leaks or mechanical malfunctions

Monthly: Clean, lubricate, and adjust all spray guns.

SECTION 12

SPARE AND REPLACEMENT PARTS

Air Control Panel (Liquid Only)- 070TS07000001W0	Part Number
SCS, valve assembly, liquid only, purchased assembly	070TS07000001W0_PA01
Cap, M12(f) Connector, for covering M12 male threads	JC002774398ND
Grommet, for 3/4" Hole Dia.	WA009600K21
cable, mini din ground down to M12 male, cylinder air	WRPCNS000025-00
Air Control Panel (Liquid/Atomizing Air)- 070TS07000002W0	Part Number
SCS, valve package, liquid and atomizing air. purchased assembly.	070TS07000002W0_PA01
Cable, Splitter, wye, M8, 3 pole, male 0.2 meter cable, 2 x female coupling nuts	LE00M8WYE
Cap, cap threads (male) into female pico thread (M8) receptacles, black nylon	WR00PSGMCC
Grommet, for 3/4" Hole Dia	WA009600K21
cable, mini din ground down to M12 male, cylinder air	WRPCNS000025-00
cable, Patch, mini din ground down to M8 3 pole male, 1550, atom/fan air	WRPCNS000026-00
Air Control Panel (Liquid, Atomizing and Fan air)- 070TS07000003W0	Part Number
SCS, valve assembly, liquid, atomizing and fan air, purchased assembly.	070TS07000003W0_PA01
Cable, Splitter, wye, M8, 3 pole, trunk = male 0.2 meter cable, 2 x female coupling nuts	LE00M8WYE
Cap, M12(f) Connector, for covering M12 male threads.	JC002774398ND
Grommet, for 3/4" Hole Dia., 9/16" ID, 1/16" Material Thickness, 1" Flange Dia., SBR Rubber, Blac	WA009600K21
cable, mini din ground down to M12 male, SCS Series air supply packages, cylinder air, 24"	WRPCNS000025-00
cable, Patch, mini din ground down to M8 3 pole male, 1550, atom/fan air	WRPCNS000026-00



Pump - Rebuild Kits	
PU00DF50PP	Part Number—PU00DF50PP
Diaphragm kit - Standard version, 2 PTFE diaphragms and SS backer plates	PU00558309001
Push rod kit—Standard version, PTFE bushing and PTFE seals	PU00558310001
Air valve kit - Standard version replacement assembly	PU00558343
Seat kit - 4 SS seats and PTFE seals	PU00558349001
PU00DF50SS	Part Number—PU00DF0SS
Diaphragm kit - Food contact, 2 PTFE diaphragms and Hast.C backer plates	PU00558347001
Push rod kit - Food contact. PTFE bushing and PTFE seals	PU00558310001R
Air valve kit - Food contact replacement assembly	PU00558300
Check Valve seat kit, food contact version.	PU00558701
Common Rebuild Kits for Both Pumps	Part Number
Air sensor - Hardware and sensor balls	PU00558301
Ball kit - 4 PTFE balls	PU00558319
Pump Assembly Kit - 070TS07000005W0 & 070TS07000004W0	Part Number
PVC PILOT REGULATOR W/VITON	58685-1/2-PVC
100 MESH 1/2TWD STR.SS (VIFDA COMPLIANT)	1/2TWD-FC100
Screen, 100 mesh stainless , for 1/2TWD-SS100 (and 3/8) Strainer & SCS Series liquid strainer	CP5594 -7- 304SS
Pumpless Standard Kit - 070TS07000025W0	Part Number
1/2 TWD-FC100 100 MESH 1/2TWD STR.SS (VIFDA COMPLIANT)	1/2TWD-FC100
CP7717-2-122-VIFDA O-RING, VI-FDA APRVL	CP7717-2-122-VIFDA
Screen replacement - 80 Mesh Size	CP5594-17-304SS
Screen replacement - 200 Mesh Size	CP5594-36-304SS
Screen replacement - 100 Mesh Size	CP5594-7-304SS
PVC PILOT REGULATOR W/VITON	58685-1/2-PVC
SPARE PARTS KIT F/58685-1/2, SSVI	AB58685-1/2-KIT
Pumpless Standard Kit - 070TS07000026W0	Part Number
1/2 TWD-FC100 100 MESH 1/2TWD STR.SS (VIFDA COMPLIANT)	1/2TWD-FC100
CP7717-2-122-VIFDA O-RING, VI-FDA APRVL	CP7717-2-122-VIFDA
Screen replacement - 80 Mesh Size	CP5594-17-304SS
Screen replacement - 200 Mesh Size	CP5594-36-304SS
Screen replacement - 100 Mesh Size	CP5594-7-304SS
ACETAL PILOT REGULATOR W/VITON, FOOD CONTACT	58685-1/2-ACETAL
SPARE KIT F/58685-1/2 PILOT REGULATOR, 316VIF	AB58685-1/2-FC-KIT

Air Booster Kit - 070TS07000048W0	Part Number
Regulator, Air Pressure, Air Piloted, 1/2 NPT(fm) Inlet/Outlet, 1/4 NPT(fm) Gauge and Pilot Ports, 195 scfm, 300 PSI	VC00R2104R00
Main Air Hook-Up kit - 070TS07000008W0	Part Number
1750+ valve kit, inlet valve, filter, pressure gauge, 652 series.	070TS07000008W0_ PA01
Recirculation Standard Kit - 070TS07000022W0	Part Number
Stem, Push to Connect, Straight, 1/2" Stem to 3/8" ODT, Acetal, Food Contact	PLXXPIACADRCID0
Connector, WYE, Push to Connect, 1/2" ODT, Acetal, Food Contact	PLXXPIACGAIDID0
Valve, Flow control, needle type, 3/8" OD tubing, plastic	VC00INP139C
Recirculation Food Contact Kit - 070TS07000023W0	Part Number
Stem, Push to Connect, Straight, 1/2" Stem to 3/8" ODT, Acetal Copolymer, Food Contact	PLXXPIACADRCID0
Connector, WYE, Push to Connect, 1/2" ODT, Acetal, Food Contact	PLXXPIACGAIDID0
Needle valve, PTFE and 316SS, 1/8"(f)npt connections, 200degF max, 1/8" orifice	VC00GH0639382
Pressure Pot Hookup Kit - 070TS07000024W0	Part Number
3/8TWD-FC100 100 MESH 3/8TWD STR.SS (VIFDA COMPLIANT)	3/8TWD-FC100
Tee, Reducing, Push to Connect, 3/8" ODT x 2, 1/4" ODT, Composite	PL0031045660
1/4" Stem OD White Plug for Push-to-Connect Fitting for Food and Beverage	PL009087K96
1/2" Stem OD White Plug for Push-to-Connect Fitting for Food and Beverage	PL009087K98
Screen, 100 mesh stainless , for 1/2TWD-SS100, Strainer & SCS Series liquid strainer	CP5594-7-304SS
Level Switch Kit for 5 & 10 Gallon Pressure Pot - 070TS07000095W0	Part Number
1/4" Level switch for 5 & 10 gallon tanks, NPT, Tube SS, float 316SS	LS0039260SS
Cable, M8 (F), 4-Wire, M12 (F), 4-wire, 5 meters long, PVC	LE00M8FM12F4P5M
Connector, Male, 4-wire M12, male, 18 ga. Max, 4A, Field Wire able, standard key	JC00BS81410
Level Switch Kit for 16 Gallon Pressure Pot - 070TS07000094W0	Part Number
1/4" Level switch for 16 gallon tanks, NPT, Tube SS, float 316SS	LS00392601SS
Cable, M8 (F), 4-Wire, M12 (F), 4-wire, 5 meters long, PVC	LE00M8FM12F4P5M
Connector, Male, 4-wire M12, male, 18 ga. max, 4A, Field Wire able, standard key	JC00BS81410



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