



United Air Specialists, Inc.

a CLARCOR company

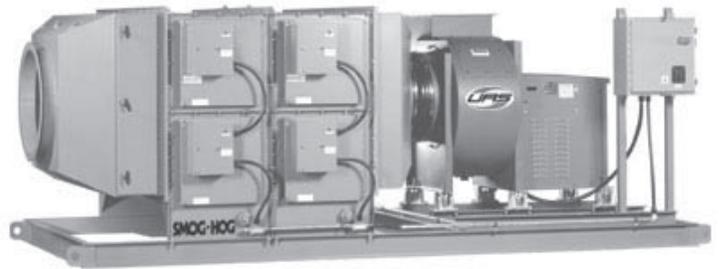
OWNER'S MANUAL



SG-2-A



PSG-12-2 WITH ODOR CONTROL



PSH-22-2

IN-PLACE CLEANING SYSTEM FOR SMOG-HOG® MODELS:

**SG SERIES
PSG SERIES
PSH SERIES**

KNOW YOUR EQUIPMENT

READ THIS MANUAL FIRST.

Your In-Place Cleaning System should provide many years of trouble-free service. This manual will help you understand the operation of your In-Place Cleaning System. It will also help you understand how to maintain it in order to achieve top performance. For quick future reference, fill in the unit information in the spaces below. Should you need assistance, call the United Air Specialists, Inc. customer service number shown below. To expedite your service, have the following information available when contacting UAS.

UAS ORDER #: _____

UNIT MODEL #: _____

UNIT SERIAL #: _____

SYSTEM ACCESSORIES:

INSTALLATION DATE: _____

UNITED AIR SPECIALISTS, INC. CUSTOMER SERVICE

1-800-252-4647

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WARRANTY

SAFETY PRECAUTIONS

We have provided many important safety messages in this manual on your In-Place Cleaning System. Always read and obey all safety messages.



This is the safety alert symbol.

This symbol alerts you to potential hazards that can kill or hurt you and others. All safety messages will follow the safety alert symbol and the word “DANGER” “WARNING” or “CAUTION”. These words mean:



Indicates a hazardous situation which, if not avoided, will result in death or serious injury.



Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.



CAUTION used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in property damage.

IMPORTANT SAFETY INSTRUCTIONS

WARNING

To reduce the risk of fire, electric shock, or injury when using your air cleaner, follow these basic precautions:

- Use two or more people to move and install the cleaning system.
- The air cleaner must be properly grounded.
- Disconnect power before servicing.
- Install all access panels before operating.
- Wear protective clothing and safety glasses when handling collection components or servicing the air cleaner
- Electrical connections should only be made by qualified personnel and be in accordance with local and national codes and regulations.
- Do not use in explosive atmospheres.
- Use nonflammable cleaners.
- Do not collect emissions which are explosive.
- Keep flammable materials and vapors, such as gasoline, away from air cleaner.
- The unit should be inspected frequently and dirt removed to prevent excessive accumulation which may result in flash-over or fire damage.
- The cleaning system should not be used for support of personnel or material.
- Operate only in safe and serviceable condition.

1.0 INTRODUCTION

The In-Place Cleaning System is a preventive maintenance tool designed to remove contaminants from Smog-Hog electrostatic precipitators, extending manual cleaning intervals. The In-Place Cleaning System consists of a series of spray nozzles installed above and in front of the Smog-Hog collection components. Wash water to these spray nozzles is supplied either directly from the end user water supply or from a recirculating reservoir. Since these latter systems tend to be custom designed for the application, dimensions and operational parameters are stated on the UAS system layout drawings and UAS electrical drawings.

This manual describes a cleaning system with the end user supplying the water/piping. In this system the detergent pump assembly directs the detergent to the injector tee assembly installed to the wash water supply pipe which is connected to the Smog-Hog, refer to Figure 1. The In-Place Cleaning System wash cycle is initiated and controlled to completion by the UAS Wash Control Panel.

2.0 SYSTEM DESCRIPTION

2.1 FACE AND OVERHEAD HEADERS

Face and overhead headers are factory installed into each tier, refer to Figure 6. Each tier is identified externally with a power pack enclosure and a module identification nameplate, identified by a letter/number. Face headers direct the wash water in the direction of airflow to the Smog-Hog collection components. The overhead headers direct the wash water from above the collection components. Face and overhead headers are operated by one or two solenoid valves. The number of solenoid valves and sequencing varies with the size of the Smog-Hog, refer to the Sequence of Operation Instructions shipped with the Smog-Hog.

2.2 INJECTOR TEE ASSEMBLY

Figure 1 illustrates the typical configuration of the detergent pump assembly and the point of detergent injection into the wash water supply pipe with the exception of the solenoid valves at the Smog-Hog. The detergent is injected through a metering orifice plate, located within the injectors tee assembly, which provides the proper detergent ratio (20:1) with the wash water. A detergent check valve provides directional flow which eliminates the backflow of wash water into the detergent reservoir.

The detergent pump pressure should be 5 to 10 PSIG higher than the operating water pressure. UAS supplies pressure gauges for the water and the detergent, to monitor these pressures during a cleaning cycle.

The Y-strainer, supplied by UAS, located at the field wash water connection to the injector tee assembly serves to reduce debris to the solenoid valves and the internal spray nozzles within the Smog-Hog cabinet.

State code dictates the use of equipment not supplied by UAS.

- (1) Backflow preventer - eliminates the detergent from contaminating the water supply within the building.
- (2) Water pressure regulator adjusts the operating water pressure which should not exceed 60 PSIG during a wash cycle.
- (3) Ball valves with unions allow for servicing/removal of hardware to the injector tee assembly.

2.3 DETERGENT PUMP ASSEMBLY

The detergent reservoir and diaphragm pump are mounted on a common base including miscellaneous piping and valves, refer to Figures 1 and 2. The detergent reservoir supplies detergent to the pump which directs under pressure to the injector tee assembly and onto the Smog-Hog. The standard detergent pump is incorporated with an adjustable external bypass with a PVC handle located on top for adjusting operating pump pressure. The high pressure detergent pump is used when the injector tee assembly is located remotely from the detergent pump assembly. The pump inlet piping is equipped with a ball valve, directly below detergent reservoir for servicing, and a Y-strainer to eliminate debris.

A detergent pump discharge hose, 1/2 inch transparent PVC braided, is supplied by UAS for observing flow of detergent from the pump. The PVC hose is factory installed to the pump outlet hose barb. Field installation is required for the other end of the PVC hose to the injector tee assembly.

The detergent pump is equipped with a 115VAC power cord/grounded plug, requiring a dedicated, standard duplex receptacle.

2.4 UAS WASH CONTROL PANEL

The UAS Wash Control Panel provides the control for the wash cycle, refer to Figure 1. UAS control functions may vary with application, refer to Sequence of Operation instructions within the UAS Wash Control Panel.

Note: The blower circuit is interlocked with the wash system to prevent initiating a wash cycle when the Smog-Hog is in operation. To initiate a wash cycle, the Smog-Hog should be placed off line. Consequently, the Smog-Hog cannot be placed on line while a wash cycle is in progress. A wash cycle can be interrupted by pressing the "Wash Stop" push button in order to place the Smog-Hog on line. However, the high voltages to the ionizer/collection cell circuits will not be in the normal operating range due to the wetness of the collection components.

A wash cycle can be initiated by the "Wash Start" illuminated push button, identified as the Manual Mode, or by a time clock, refer to the UAS Sequence of Operation instructions to determine if the UAS Wash Control Panel is equipped with a time clock, identified as the Auto Mode. The wash cycle is sequenced through a number of "modes" by a programmable logic controller (PLC). Each mode has a specified time length. All mode time lengths are fixed with the exception of the wash mode.

The description and sequencing of a wash cycle in this

manual is a generalization to familiarize the end user. Refer to the Sequence of Operation instructions for wash sequencing, factory time settings/adjustments, and other options, shipped with the Smog-Hog. The following actions are required by the end user to initiate or stop a wash cycle.

2.5 MANUAL MODE

- (1) Place Smog-Hog off line.
- (2) Press “Wash Start” illuminated push button in which the PLC will initiate and begin the wash cycle sequencing. The “Wash Start” indicator light push button will be illuminated.
- (3) The PLC will complete the wash cycle. End user intervention is not required to end the wash cycle. The wash cycle can be placed off line before completion, by pressing the “Wash Stop”. When the wash cycle is completed or the “Wash Stop” push button is pressed, the “Wash Start” indicator light push button will not be illuminated. Restarting a wash cycle, by pressing the “Wash Start” push button will initiate the wash cycle at the beginning of the program.

2.6 AUTO MODE

In this mode the wash cycle is initiated by the time clock which places the Smog-Hog off line. End user intervention is not required. Wash sequencing is identical to the Manual Mode. The “Wash Stop” push button can be utilized to stop a wash cycle. Restarting a wash cycle by pressing the “Wash Start” illuminated push button will initiate the wash cycle at the beginning of the program.

Note: The programming of the time clock should be performed by the end user or the UAS Field Technician. Refer to time clock instructions within the UAS Wash Control Panel. Step 5 to the time clock instructions should be selected for programming the start time with a five-minute pulse duration.

2.7 WASH SEQUENCING (Manual or Auto Mode)

Step	Mode of Operation	Time (Minutes)
1	Fan Coast	1.0
2	Pre-Rinse	0.5
		per each tier solenoid valve
3	Wash	2.0
		per each tier solenoid valve
4	Rinse	1.5
		per each tier solenoid valve
5	Drain	2
6	Fan Dry-Out	30

Notes: A tier solenoid valve is for a row of components either unicells or separate ionizers and collector cells in which tiers are arranged one above another. A tier is identified by a letter/number (e.g. A2, A1, B2, B1, C2, C1, D2, D1, E2, E1, and F2, F1).

The wash cycle cleans the system from the top tier to the bottom tier.

Models

- PSG, SG - One tier solenoid valve for two unicell components, discharging wash water to the face and overhead header spray nozzles simultaneously.
- PSH - Two ionizers and two collector cell components or four ionizer and four collector cell components utilizing two solenoid valves per tier.
 - One tier solenoid valve discharges wash water to the face header.
 - The other tier solenoid valve discharges wash water to the overhead header.

Description

- Dwell time for system blower to stop.
- Main water solenoid valve open to the injector tee assembly.
- Tier solenoid valve is open. Tier solenoid valves are individually sequenced at the Smog-Hog by the UAS Wash Control Panel.
- Main water solenoid valve is open.
- *Detergent pump is activated.
- Tier solenoid valve is open. Tier solenoid valves are individually sequenced at the Smog-Hog by the UAS Wash Control Panel.
- Main water solenoid valve is open.
- Tier solenoid valve is open. Tier solenoid valves are individually sequenced at the Smog-Hog by the UAS Wash Control Panel.
- Dwell time to drain wash water from the Smog-Hog.
- Main water solenoid valve and tier solenoid valves are closed.
- The system exhaust fan is activated.

*Detergent pump will operate per “Trim Pot” (located on PLC) adjustment, refer to application “Sequence of Operation” (within the UAS Wash Control Panel) section “Checking the Detergent Frequency Selection.”

3.0 INSTALLATION

3.1 WASH WATER SUPPLY PIPE

The wash water supply pipe should be a 1” NPT to the Smog-Hog wash pipe connection. Piping runs may dictate larger diameter piping which should be determined by the installing contractors or plant maintenance. The wash water supply pipe will require heat tracing and insulation if exposed to cold ambient conditions, refer to Figure 1.

The In-Place Cleaning System effectiveness depends on the wash water temperature. Detergents are twice as effective in hot water. The water temperature specification for the In-Place Cleaning System is 140° to 170° F, not to exceed 180° F, refer to Section 3.9.

3.2 INJECTOR TEE ASSEMBLY

The injector tee assembly should be installed in close proximity to the Smog-Hog. As illustrated in Figure 1, the injector tee assembly is installed horizontally to the wash water supply pipe and not exposed to cold ambient conditions. Additional equipment is required which is supplied by others: backflow preventers, water pressure regulators, and two ball valves, refer to Figures 1.

3.3 DETERGENT PUMP ASSEMBLY

The detergent pump assembly should be installed at a level location, not rated for outside/wet conditions. Ten feet of braided 1/2 inch diameter hose is supplied by the factory for connection to the injector tee assembly, refer to Figure 1.

Maximum pipe length from the detergent pump assembly to the injector tee assembly is 80 ft of 1/2 inch diameter pipe which should be limited to five elbows and a 15 ft "head." A high pressure detergent pump will be required if conditions exceed specifications. Contact UAS Customer Service (800-252-4647).

Detergent pump assembly field installation:

1. PVC hose or piping (not to exceed 1/2 inch diameter) from the detergent pump outlet to the bottom hose barb connection at the injector tee assembly.
2. Connecting detergent pump power cord (120 VAC) to the field installed duplex (electrical receptacle). A GFCI receptacle is not recommended. This receptacle is only activated as required by the wash program. A GFCI is subjective to nuisance trips which will increase maintenance.

3.4 UAS WASH CONTROL PANEL

If the UAS Wash Control Panel is not assembled to the Smog-Hog skid, the panel should be installed at an accessible location in the close proximity of the detergent pump assembly. The selected location should conform to code, refer to UAS Electrical Drawings for field wiring.

3.5 DETERGENT FILLING

Before filling the detergent pump assembly with detergent, five gallons of water should be put into the detergent pump assembly to check for external leaks. After a two hour dwell period, check for external leaks underneath the tank and to the detergent pump piping circuit. Repair external leaks if required and proceed filling the tank with detergent into the five gallons of water.

Note: The initial detergent fill into the five gallons of water will not reduce the detergent effectiveness. Successive detergent fills should not be diluted with water.

A transfer pump will be required to transfer detergent from the container to the detergent pump assembly. Shurflo pump; Model 4UN25 or equivalent.

3.6 DRAIN / DRAIN TRAP

Smog-Hog units are supplied with drain connections as identified on the system layout drawing which includes drain pipe diameters and drain trap. Pipe diameter and number of drains on a Smog-Hog will depend on the model. Some models will have a number of drain connections linked to a single drain pipe. The drain pipe should be sloped to assure proper drainage of contaminant and wash water. Drain pipes will require heat tracing and insulation if exposed to cold ambient conditions.

Air passing through the Smog-Hog is under negative static pressure condition. A drain trap will be required to serve as a vacuum break maintaining drainage of fluids (wash water and contaminant residuals) with the system blower on line. Cleanout plugs should be installed in the drain pipe and drain trap to facilitate cleaning, refer to Figure 4 for drain trap illustration.

Note: Drain trap should be primed with water. Drain piping/trap should be sized according to fluid flow requirements (20 GPM), and drain trap sized per total system static pressure. All plumbing should conform with state and local codes.

3.7 DETERMINING WATER USAGE

The following information is required to determine water usage:

1. Unit Model PSG, SG and PSH (refers to nameplate on Smog-Hog or UAS Wash Control Panel)
2. GPM specification; 20 GPM
3. Count the number of solenoid valves to the Smog-Hog cabinet connected to the wash water supply pipe, excluding the solenoid valve to the injector tee assembly.

Models PSG, SG and PSH

20 GPM x 4 minutes = 80 gallons per one solenoid valve

$$\text{Total number of solenoid valves} \times 80 = \text{water usage per gallons wash cycle}$$

Note: "Minutes" documented in each GPM equation to models PSG/SG and models PSH is with the Wash Time Selection in POS 2, refer to Sequence of Operation instructions for "POS" verification.

3.8 DETERMINING DETERGENT CONSUMPTION

The recommended detergent concentration is five percent (20 to 1) per wash cycle. The five percent concentration is achieved by adjusting the detergent pump operating pressure 8 to 10 psi above the operating water pressure, refer to Section 4.1 (5b).

To determine detergent consumption per wash cycle:

$$\text{(detergent concentration)} \times \text{GPM}^1 \times \text{wash mode} = \text{gallon(s) detergent used for one cell(tier) wash solenoid valve}$$

(gallons of water per minute)

$$\text{Gallons of detergent used for one cell(tier) wash solenoid valve} \times \text{numbers of cell(tier) wash solenoid valves}^3 = \text{detergent usage per wash cycle}$$

Notes:

1. Refer to Section 3.9 for GPM specification.
2. Refer to "Sequence of Operation" instructions to determine "POS" from checking Wash Time Selection. "POS" number represents a time length (minutes) by referring to Table, Wash Sequence and Times".
3. Refer to the UAS Electrical Drawing and count the number of cell(tier) wash solenoids, do not count the main water solenoid valve.
4. Refer to "Sequence of Operation" instructions to determine "POS" for checking Detergent Frequency Selection.

Before initiating a wash cycle, mark the level of the detergent next to the scale imprinted on the side of the detergent tank. After completing a wash cycle, determine detergent usage by referring to the scale imprinted on the side of the detergent tank.

3.9 IN-PLACE CLEANING SYSTEM / OPERATIONAL SPECIFICATIONS

Operating water pressure:	40 to 50 psi (not to exceed 60 psi)
Operating detergent pump pressure:	8 to 10 psi above the operating water pressure
Wash water temperature:	140° to 170° F (not to exceed 180° F)
Hot Water Flow Rates:	- Models PSG, SG & PSH 20 GPM per two wide collection components

4.0 OPERATION

4.1 OPERATIONAL CHECKS AND ADJUSTMENTS

Check the following before operating a wash cycle:

- 1). All ball valves or equivalent are open, refer to Figure 1. Shut-off valves can also be located on the backflow preventer.
- 2). Place power on line to the Smog-Hog and the UAS Wash Control Panel.

Note: If the Smog-Hog is operational, place Smog-Hog off line. A wash cycle will not initiate if the Smog-Hog is on line due to the blower circuit interlocked with the wash system.

- 3). Connect the detergent pump assembly power cord into the 115 VAC receptacle.
- 4). Press the "Wash Start" push button to start a wash cycle.

Note: Refer to Sequence of Operations instructions within the UAS Wash Control Panel.

- 5). The following adjustments should be completed during the pre-rinse and wash modes:

- a). During the pre-rinse mode, confirm the operating water pressure. If required, adjust the water pressure regulator to specifications by turning the adjustment screw clockwise to increase pressure, counter clockwise to decrease pressure.

Specifications: 40 to 50 psi

Notes: Consistently low and/or fluctuating operating water pressures (under 40 psi) at the Smog-Hog will result in poor removal of contaminants from the collection components. This can increase maintenance costs. Pressure fluctuations can occur due to "demand" within the facility which will reduce the effectiveness of the wash cycle. A wash cycle should be operated when "demand" is at a minimum. A booster pump may be required if the operating water pressure is below the specifications of 40 psi.

- b). During the wash mode, which is after the pre-rinse mode, adjust the detergent pump operating pressure with black PVC handle located on top of the detergent pump, refer to Figure 1 for detergent pressure gauge. The detergent operating pressure should be 8 to 10 psig higher than the water operating pressure. For example, if the water operating pressure is 50 psig, the detergent operating pressure should be 58 to 60 psig. The injector tee assembly supplied by UAS, includes gauge to observe the operating pressures.

Note: The detergent (diaphragm) pump is self priming and can operate in the dry mode if detergent is depleted in the reservoir. Detergent Ratio: 20 to 1 or five percent concentration at 8 to 10 psi above the operating water pressure.

- c). Press the "Wash Stop" pushbutton before proceeding to statement (d).
- d). To establish correct solenoid valve sequencing, the following procedure should be completed.
 - Tier solenoid valve sequencing should be checked per Sequence of Operation instructions. This can be accomplished by an audible click at each tier solenoid valve or by opening each component access door when each tier solenoid valve is activated. Wash water should be discharging from the spray nozzles at the component access door which is open. Immediately close the component access door to reduce the discharge of wash water from the Smog-Hog cabinet.
 - Initiate a wash cycle to check the tier solenoid valve sequencing.

5.0 MAINTENANCE

5.1 MANUAL CLEANING

The In-Place Cleaning System is an effective measure in prolonging the removal of collection components (unicells or ionizers, collector cells, and filter media) for manual cleaning. Collection components will require manual cleaning periodically as determined by visual inspection, noting the degree of contaminant build-up, high voltage measurements by utilizing a high voltage probe, or a prolong period before the power enclosure(s) indicator light(s) illuminate after a wash cycle. Periodically, before and after a wash cycle, a set of components should be removed from one component access door to determine the effectiveness of the wash cycle. "Clean" components need not be clean to a point that the components appear to be "New" in appearance. There will be tarnish contaminant surface residuals on the components. The Smog-Hog owner's manual provides information on measuring high voltages and manual cleaning collection components.

5.2 WASH SYSTEM COMPONENT INSPECTION

The following wash system components should be inspected monthly:

- Detergent Pump Assembly. Check for piping leaks, detergent pump power cord is connected to the receptacle, and any other visible defects. Correct as necessary.
- Plumbing. Inspect PVC hoses, connections and manifolding to the Smog-Hog for evidence of leaks or deterioration.
- Check Valve. Residual deposits could occur within the detergent check valve requiring periodic cleaning. (Located at the detergent PVC hose connection to the injector tee assembly).
- Solenoid Valves. Normal operation of solenoid valves used in the In-Place Cleaning System can be determined by an audible click at each solenoid valve located at the injector assembly and the Smog-Hog cabinet.

5.3 SOLENOID VALVE DISASSEMBLY

1. Discharge static water pressure within the wash water piping at the Smog-Hog by placing ball valve in the closed position (located before the injector tee assembly) and operate a wash cycle for two minutes. (Press "Wash Start" pushbutton) after two minutes, press the "Wash Stop" pushbutton.
2. Unscrew coil screw from coil and remove coil by lifting up from the plunger assembly.
3. Unscrew bonnet assembly which includes the plunger assembly from the valve body.

Note: Carefully lift off bonnet/plunger assembly to eliminate the spring loaded plunger from discharging from the assembly.

4. The o-ring diaphragm, and strainer can be disassembled from the valve body.

Note: Be careful not to damage the machined surfaces.

5. Clean and inspect parts for debris and damage as identified in statement 4 and also including:
 - a). Valve stem not bent, perpendicular to the valve body/bonnet.
 - b). Plunger spring not deformed.
 - c). Plunger moves freely within valve stem.

6. TROUBLESHOOTING GUIDE

PROBLEM	POSSIBLE CAUSES	RECOMMENDED SOLUTIONS
The wash cycle will not start in the manual and/or auto mode.	1. The Smog-Hog is on line.	1. Place the Smog-Hog off line by pressing the unit "Stop" push button, refer to Section 2.4 for information on the electrical interlock.
	2. Service voltage (120 VAC) has been interrupted to the UAS Wash Control Panel.	2. Confirm that 120 VAC is present at the UAS Wash Control Panel, refer to UAS Electrical Drawings for assistance.
	3. Fuses failed within the UAS Wash Control Panel.	3. Replace fuse(s) and determine if there is an electrical problem, refer to UAS Electrical Drawings.
	4. The programmable logic controller (PLC) is not operational.	4. Confirm 120 VAC is present at the PLC, refer to UAS Electrical Drawings. The LED indicators, "Power" and "Run" should be illuminated to the PLC. If the "Fault" LED indicator is illuminated contact UAS Customer Service at 800-252-4647.
	5. Auto mode is not operating per selected time.	5. Check program time and mode of operation to the time clock, refer to time clock instructions within the UAS Wash Control Panel.
	6. Time is not displayed on time clock.	6. Time clock is in sleep mode due to 120 VAC not present at the UAS Wash Electrical Panel.
	7. Time clock has failed.	7. Replace time clock.
Detergent consumption is low or no consumption.	1. Detergent reservoir is empty.	1. Fill the detergent reservoir.
	2. The detergent pump assembly ball valve is in the closed position.	2. Open ball valve, refer to Figure 2 item (10). The ball valve in Figure 2 is illustrated in the open position.
	3. Detergent pump power cord is not connected to the receptacle.	3. Connect detergent pump power cord (120 VAC) to the receptacle.
	4. The detergent operating pressure is not 5 to 10 psi above the operating water pressure.	4. Adjust the detergent operating pressure pump, refer to Section 4.1 (5b). Check that detergent is visible to the PVC transparent hoses, inlet and outlet to the detergent pump. Remove screen from Y-strainer, checking for debris, refer to Figure 2 item (11).

PROBLEM	POSSIBLE CAUSES	RECOMMENDED SOLUTIONS
<p>Detergent consumption is low or no consumption (continued)</p>		<p>Check for obstructions and kinks to the PVC hoses and rigid piping (supplied by others).</p> <p>Check detergent pump flow, by disconnecting the PVC hose at the injector tee assembly & placing hose in bucket. (Flow rate: 1.2 to 1.5 GPM). Replace detergent pump if not within flow rate specifications.</p>
	<p>5. Trim Pot Adjustment located on PLC for "Detergent Frequency Selection" is adjusted to skip a detergent wash.</p>	<p>5. Refer to "Sequence of Operation" instructions within the UAS Wash Control Panel to determine/adjust "Detergent Frequency Selection."</p>
	<p>6. Trim Pot Adjustment "Wash Time Selection" is in test mode reducing detergent consumption.</p>	<p>6. Refer to "Sequence of Operation" instructions to determine/adjust "Wash Time Selection."</p>
	<p>7. Metering plate is obstructed with debris.</p>	<p>7. Clean metering plate, refer to illustration Figure 3 Item (9).</p>
	<p>8. Auto mode is not operating per selected time or time clock is not programmed.</p>	<p>8. Check program time and mode of operation to the time clock, refer to Time Clock Instructions (Step 6) within the UAS Wash Control Panel.</p>
<p>Operating water pressure is low or at 0 (zero) psi.</p>	<p>1. The water supply valves (supplied by others) are closed.</p>	<p>1. Open the water supply valves.</p>
	<p>2. The Y-strainer screen is obstructed with debris.</p>	<p>2. Clean the screen to the Y-strainer located to the injector tee assembly, refer to Figure 3 Item (1).</p>
	<p>3. Main water solenoid valve and/or cell wash solenoid valves are not operating per Sequence of Operation Instructions.</p>	<p>3. Repair problems by referring to the Sequence of Operation Instructions and the UAS Electrical Drawings located in the UAS Wash Control Panel.</p>
	<p>4. The spray nozzles are plugged at each tier as identified as A1, B1, C1, D1, etc.</p>	<p>4. Operate a wash cycle and open individual module component access doors to determine location of plugged spray nozzle(s).</p>

PROBLEM	POSSIBLE CAUSES	RECOMMENDED SOLUTIONS
<p>Detergent consumption is high.</p>	<p>1. External leaks from the detergent pump assembly and/or piping.</p>	<p>1. Repair external leaks.</p>
	<p>2. The detergent pump operating pressure is not within the specification of 8 to 10 psi above the operating water pressure.</p>	<p>2. Adjust the detergent operating pressure, refer to Section 4.1 (5b).</p>
	<p>3. Trim Pot Adjustment “Wash Time Selection” has been increased in time length.</p>	<p>3. Decrease Trim Pot Adjustment “Wash Time Selection” to the original setting, refer to “Sequence of Operation” instructions located in the UAS Wash Control Panel. (Factory setting: 2).</p>
	<p>4. Metering plate has been removed from the injector tee assembly.</p>	<p>4. Replace metering plate, refer to Figure 3 Item (9).</p>
<p>Wash water is back-flowing into the detergent tank.</p>	<p>1. There is debris within the check valve to the injector tee assembly.</p>	<p>1. Remove check valve and clean, refer to Figure 3 Item (13).</p>

7.0 ORDERING PARTS

7.1 REPLACEMENT PARTS

Replacement parts are illustrated on the following pages. To order UAS parts, call your local UAS representative or contact:

United Air Specialists
 4440 Creek Road
 Cincinnati, OH 45242
 Customer Service: 800-252-4647

For prompt service, please specify:

1. Unit Model Number
2. Unit Serial Number
3. Part Number or Part Description

7.2 RETURNING PARTS

When returning parts directly to UAS, call UAS for a return material authorization number (RMA). Write the RMA prominently on the returned package to assure prompt handling and service.

8. ILLUSTRATIONS

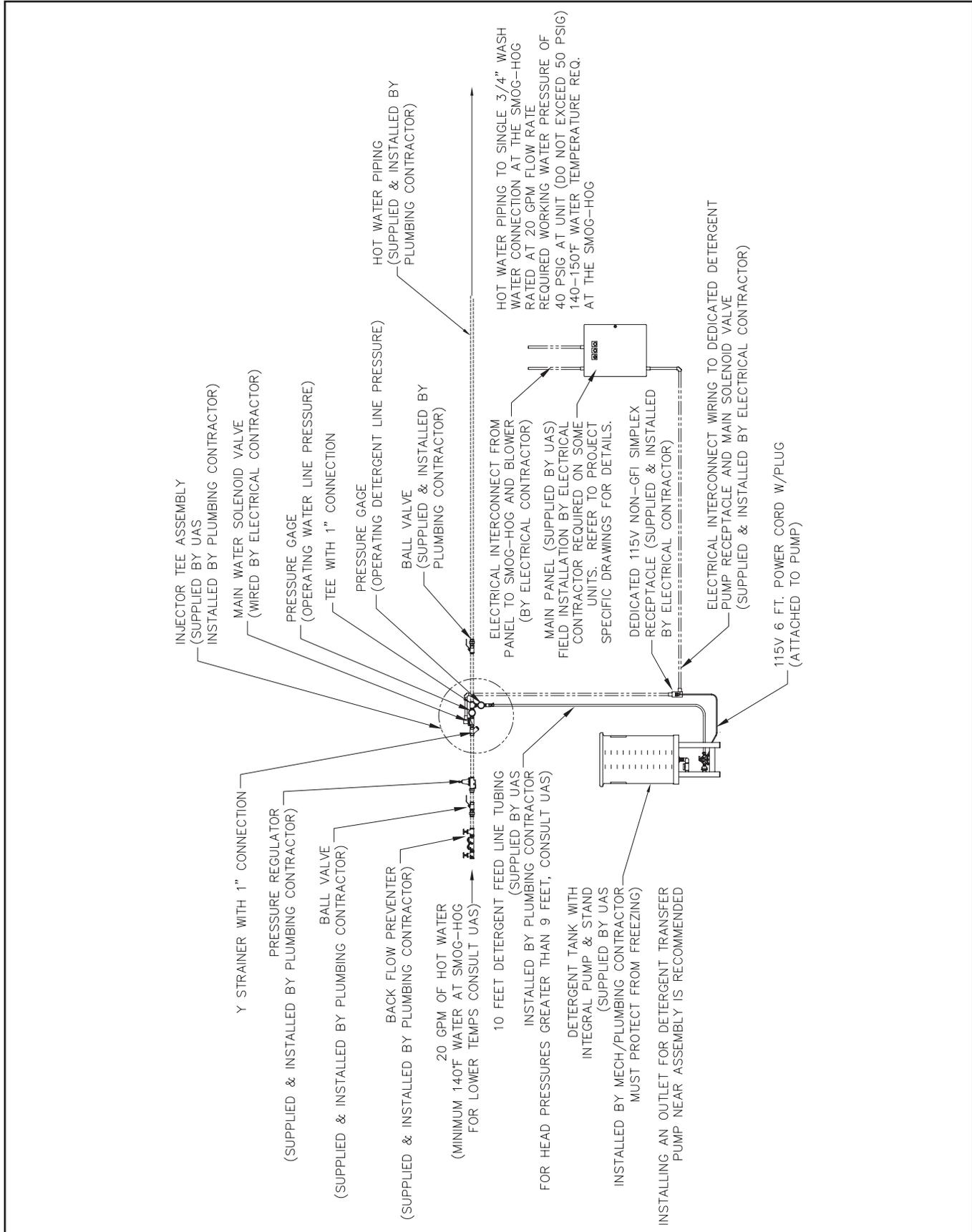


FIGURE 1
In-Place Cleaning System Installation Schematic

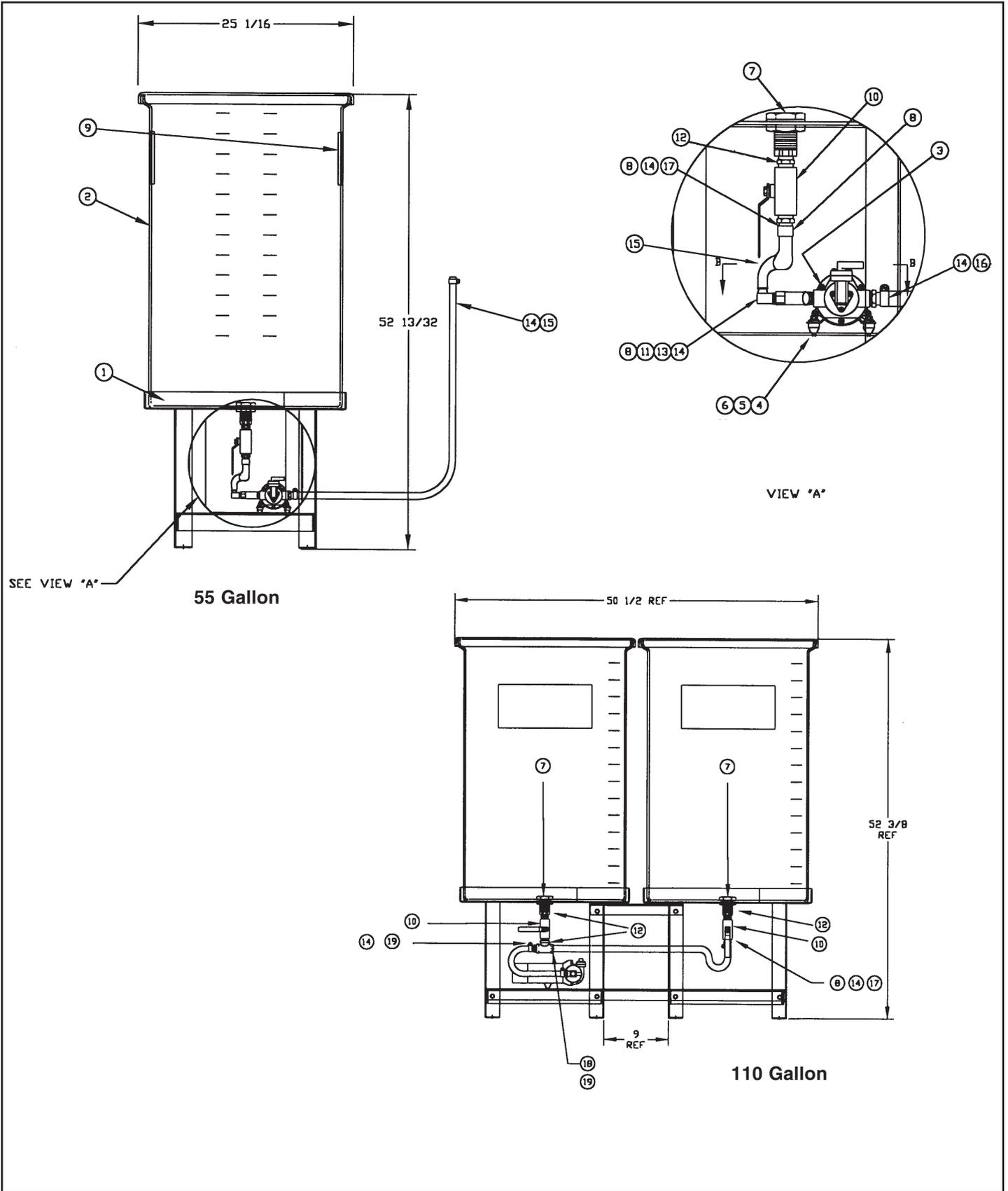


FIGURE 2
Detergent Pump Assembly 55 Gallon and 110 Gallon

DETERGENT PUMP ASSEMBLY

Part # 02-7028 55 Gallon

Part # 02-10562-0001 110 Gallon

Item	Part No.	Description	Quantity
1	18-2539	STAND TANK 55 GALLON	1
	02-10563-0001	STAND, TANK 110 GALLON	1
2	38-1972	TANK WITH COVER, 55 GALLON	1
	38-1972	TANK WITH COVER, 110 GALLON	2
3	07-0080	PUMP WITH BYPASS VALVE	1
4	35-0575	BOLT, HEX HD. 10-32X1"	4
5	30-0043	LOCKWASHER, #10 SPLIT RING	4
6	30-0065	WASHER, #10 FLAT	4
7	38-1811	FITTING, BULKHEAD, 1/2" NPT, 55 GALLON	1
	38-1811	FITTING, BULKHEAD, 1/2" NPT, 110 GALLON	2
8	38-1953	BRB-BS, HOSE 1/2" H X 3/8" MPT	2
9	41-2467	LABEL, SMOG-HOG	1
10	38-0252	BALL VALVE, 1/2" NPT, 55 GALLON	1
	38-0252	BALL VALVE, 1/2" NPT, 110 GALLON	2
11	38-1954	STRNR - W/50 SCRNR, 3/8" NPT BRASS	1
12	38-0705	NIPL-BS, CLOSE 1/2", 55 GALLON	1
	38-0705	NIPL-BS, CLOSE 1/2", 110 GALLON	3
13	38-0732	NIPL-BS, CLOSE 3/8"	1
14	38-0390	CLAMP HOSE 1/2", 55 GALLON	4
	38-0390	CLAMP HOSE 1/2", 110 GALLON	6
15	38-0392	TUBING, PVC HOSE 1/2" ID, 55 GALLON	12 ft.
	38-0392	TUBING, PVC HOSE 1/2" ID, 110 GALLON	15 ft.
16	38-0734	BRB-BS, HOSE 1/2" H X 3/8" MPT	1
17	38-0388	BSHG RDCR, H X 1/2" EXT THRD X 3/8" MPT	1
18	38-0706	TEE-BS 1/2" NPT, 110 GALLON	1
19	38-0718	BRB-BS, HOSE 1/2" H X 1/2" MPT	2

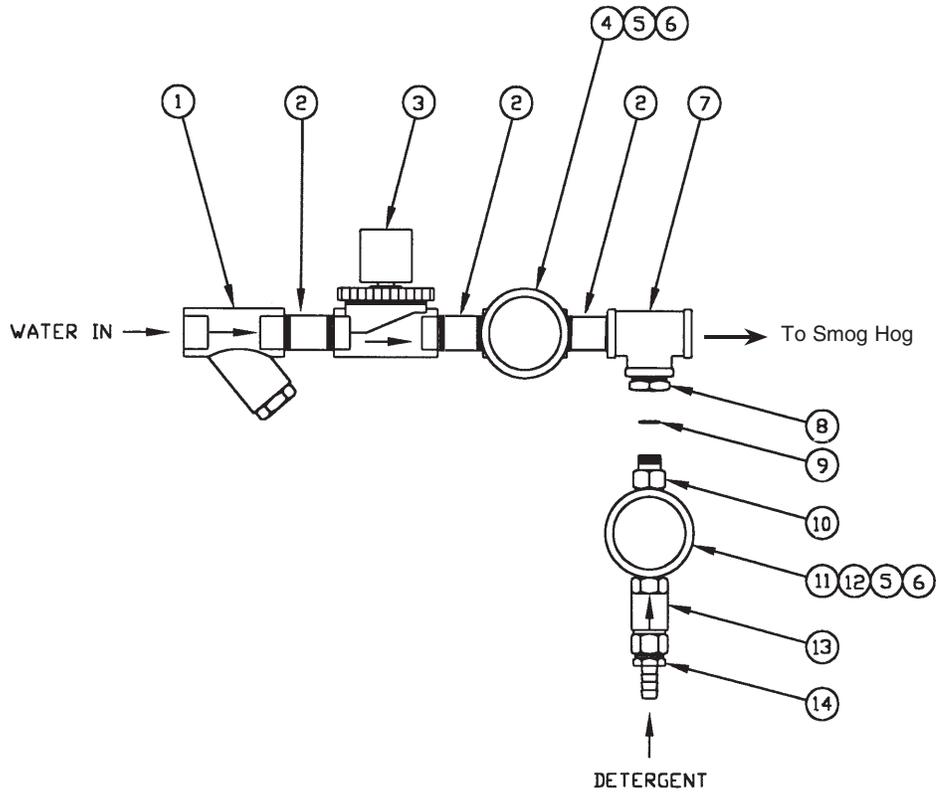
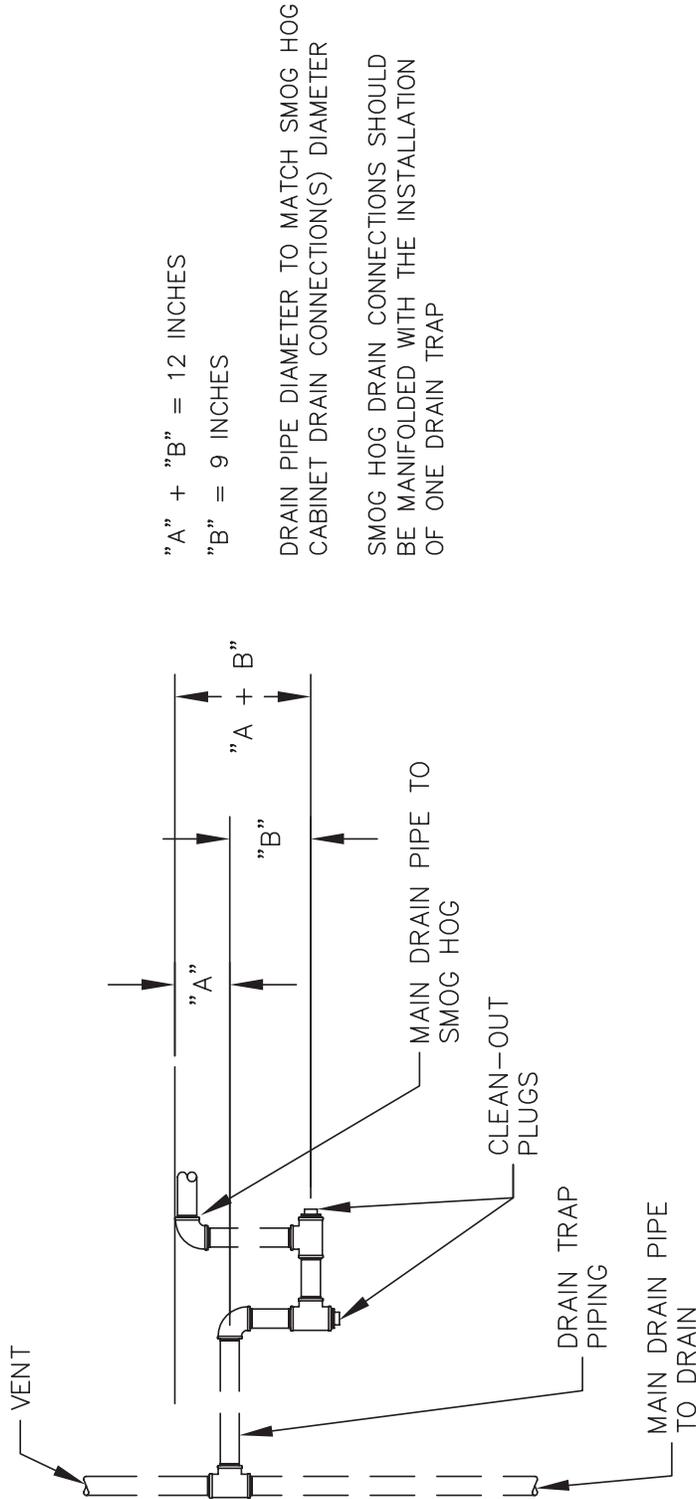


FIGURE 3

INJECTOR TEE ASSEMBLY

PART #02-3158-1

ITEM	PART #	DESCRIPTION	1 GPM
1	38-0199	STRAINER, 40 MESH, 1"	1
2	38-1817	NIPPLE, 1" CLOSE, BRASS	3
3	20-0302	VALVE, SOLENOID, 1"	1
4	38-1821	TEE, 1 X 1 X 1/4, BRASS	1
5	07-0027	SNUBBER, PRESSURE, 1/4", BRASS	2
6	07-0007	GAUGE, PRESSURE	2
7	38-1819	TEE, 1", BRASS	1
8	38-1824	BODY, NOZZLE, BRASS	1
9	38-1825-128	PLATE, METERING, .128" (1 GPM)	1
10	38-1826	ADAPTER, 3/4" NPT BRASS	1
11	38-1827	TEE, 1/2 X 1/2 X 1/4 BRASS	1
12	38-0705	NIPPLE, 1/2" CLOSE, BRASS	1
13	38-0255	VALVE, CHECK 1/2"	1
14	38-0718	HOSE BARB, 1/2"H X 1/2" MPT, BRASS	1
N/A	03-1045	REBUILD KIT FOR 20-0302	1
		SOLENOID VALVE (NOT ILLUSTRATED)	



"A" + "B" = 12 INCHES
"B" = 9 INCHES

DRAIN PIPE DIAMETER TO MATCH SMOG HOG CABINET DRAIN CONNECTION(S) DIAMETER

SMOG HOG DRAIN CONNECTIONS SHOULD BE MANIFOLDED WITH THE INSTALLATION OF ONE DRAIN TRAP

NOTE:

1. MAIN DRAIN LINE SHOULD BE SUFFICIENTLY SLOPED, SIZED AND VENTED TO HANDLE ALL DRAINS MANIFOLDED.
2. DRAIN TRAP PIPING SHOULD BE SIZED ACCORDING TO FLUID FLOW.
3. THIS ILLUSTRATION IS NOT MEANT TO BE A RIGOROUS AND ALL-ENCOMPASSING DESIGN. APPROPRIATE DESIGN CRITERIA (AS PROVIDED BY A PLUMBING/MECHANICAL CONTRACTOR) SHOULD BE UTILIZED TO INSURE PROPER CONTROL OF DRAINAGE EFFLUENT FROM THE SYSTEM. ALL PLUMBING SHOULD CONFORM WITH STATE AND LOCAL CODES.
UAS ACCEPTS NO RESPONSIBILITY FOR PLUMBING DESIGN OR INSTALLATION.
4. "A" DIMENSION EQUAL TO AIR FLOW STATIC PRESSURE (IN INCHES OF WATER) AT WHICH SYSTEM WILL OPERATE.
"B" DIMENSION EQUAL TO AIR FLOW STATIC PRESSURE (IN INCHES OF WATER) AT WHICH SYSTEM WILL OPERATE, PLUS 3" INCHES.

44-0781

FIGURE 4
Drain Trap

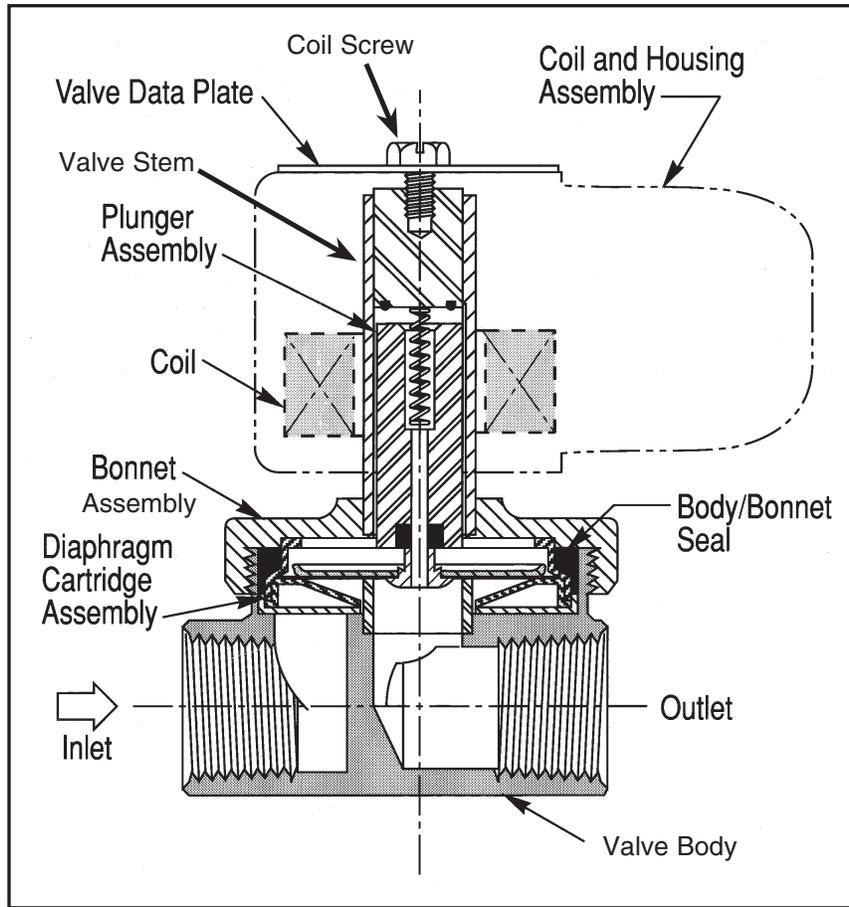


FIGURE 5
Typical Solenoid Valve

PART #	DESCRIPTION
20-0301	SOLENOID VALVE 3/4" TO SMOG-HOG CABINET
03-1044	REBUILT KIT FOR 20-0301 (NOT ILLUSTRATED)

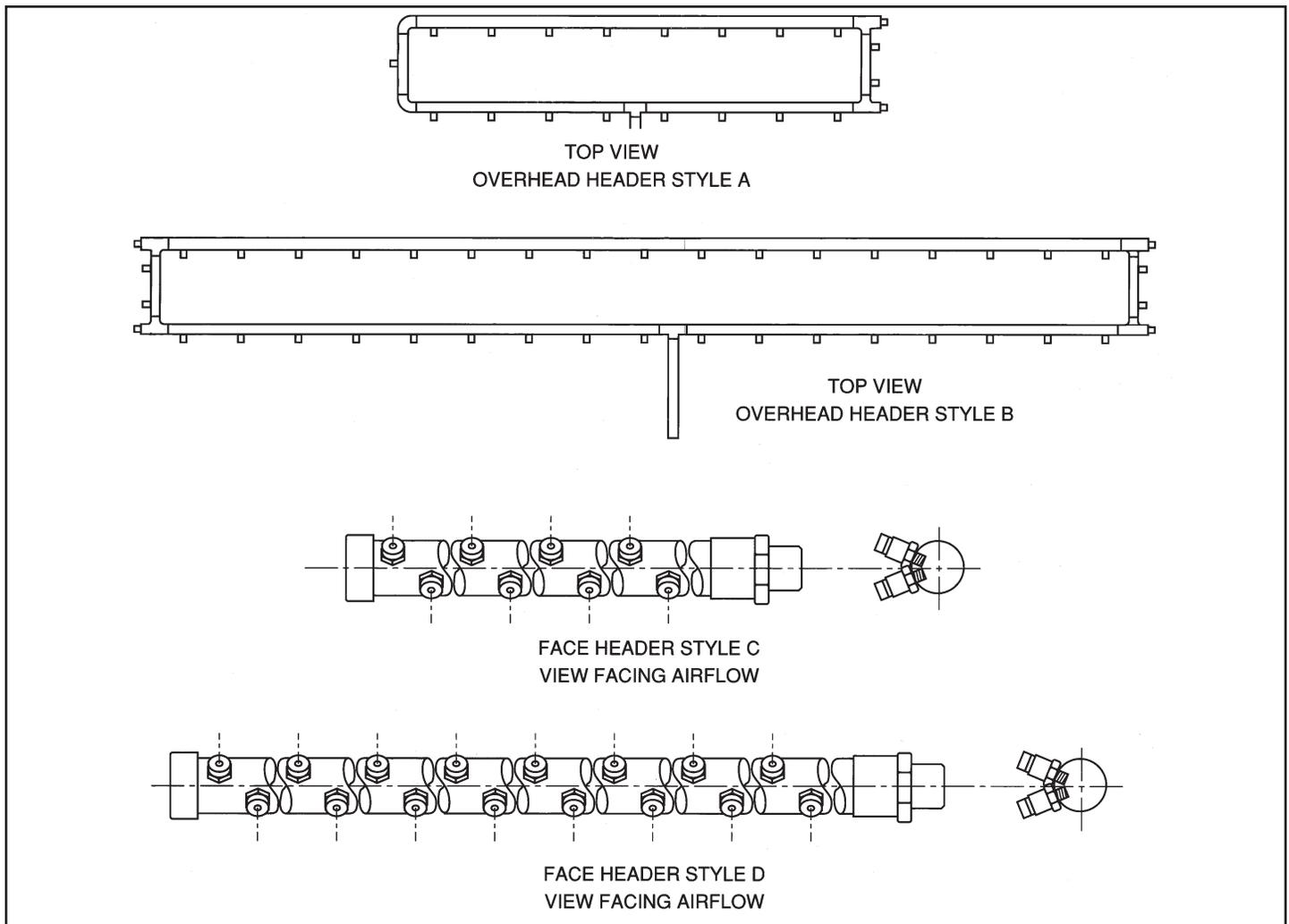


FIGURE 6
Fixed Header Nozzle Configurations

SPRAY NOZZLES		SG, PSG/APC	QUANTITY PER HEADER			
ITEM	PART #	DESCRIPTION	STYLE A	STYLE B	STYLE C	STYLE D
1	38-0659	FLAT SPRAY (FULL JET) 1/8" K 2.5	3	N.A.	—	—
2	38-0420	WHIRLJET 1/8" B2-3W	23	N.A.	—	—
3	38-0026	1/8" GG6SQ	—	—	8	N.A.

SPRAY NOZZLES		PSH	QUANTITY PER HEADER			
ITEM	PART #	DESCRIPTION	STYLE A	STYLE B	STYLE C	STYLE D
1	38-0659	FLAT SPRAY (FULL JET) 1/8" K 2.5	2	4	—	—
2	38-0420	WHIRLJET 1/8" B2-3W	18	38	—	—
3	38-0026	1/8" GG6SQ	—	—	8	16

**UNITED AIR SPECIALISTS, INC.
LIMITED WARRANTY**

UAS warrants to the original purchaser that all equipment will be free from defects in materials and workmanship for one year from the date of shipment from UAS (three years for Smokeeter® and VisionAir™ models other than CC and DC series) and that major structural components on SFC and MCB series will be free from defects in materials and workmanship for ten years from the date of shipment from UAS. This warranty applies only if equipment is properly installed, maintained, and operated under normal conditions and does not apply to damage caused by corrosion, abrasion, abnormal use or misuse, misapplication, or normal wear and tear. This warranty will be void with respect to equipment that is subject to unauthorized repairs or modifications. UAS makes no warranty as to goods manufactured or supplied by others. This warranty is subject to any limitations in UAS' quotation and may not be modified except by a written instrument signed by the President or Vice President of Sales of UAS.

THIS WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, WHETHER WRITTEN, ORAL OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NONINFRINGEMENT.

As Purchaser's exclusive remedy for any defects in the equipment, UAS will exchange or repair any defective parts during the warranty period, provided such parts are returned, prepaid, to UAS' factory. The obligation of UAS is limited to furnishing replacement parts F.O.B. UAS' factory or making repairs at UAS' factory of any parts that are determined, upon inspection by UAS, to be defective. In no event will UAS be responsible for labor or transportation charges for the removal, reshipment or reinstallation of the parts.

IN NO EVENT WILL UAS BE RESPONSIBLE FOR ANY SPECIAL OR CONSEQUENTIAL DAMAGES.



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