

OPERATION INSTALLATION MAINTENANCE MANUAL FOR HALE SMARTATP 125 GPM AND 225 GPM



BY HALE PRODUCTS, INC. A Unit of IDEX Corporation 607 NW 27th Ave, Ocala, FL 34475 (800) 533.3569 (800) 520.3473 (FAX) <u>www.haleproducts.com</u>

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TABLE OF CONTENTS

Section	Title	Page
1. SAFETY		1
1.1. Safety	y Headings	1
1.2. Safety	y Summary	1
2. GENERAL	INSTRUCTIONS	5
2.1. Smar	tATP Specifications And Numbering	5
2.2. Discla	aimer	5
3. TRANSPO	RTATION AND STORAGE	7
3.1. Shipp	ing, Movement, And Installation Preparations	7
3.1.1 SI	hipment Example	7
3.2. Stora	ge	8
4. SMARTATF	OVERVIEW	9
5. INSTALLA	TION	
5.1. OEM	Requirements	
5.1.1 0	EM Supplied Air Solenoid Valves	
5.1.2 Fo	bam Concentrate Tank	14
5.1.3 Fo	pam Concentrate Plumbing	
5.2. Educt	or Installation	
5.3. Meter	ring Valve Installation	
5.4. Check	< Valve Installation	
5.5. Water	r Flow Sensor Installation	
5.5.1 0	ptional Multiple Water Flow Sensors	
5.6. Option	nal Autofill Installation	
5.6.1 Ei	nable Autofill	
5.7. Foam	Flowmeter Assembly Installation	
5.8. Press	ure Transducers Installation	
5.9. Smar	tATP Control Unit (Foam Controller) Installation	
5.10. Smar	tATP (UltraView) Display Installation	
5.10.1 Si	martATP Configuration Setups	
5.10.1.1	125 GPM Or 225 GPM System Setup	
5.10.1.2	Scenario Two (2) Single Tank Without Tank Level Setup	
5.10.1.3	Scenario Three (3) Dual Tanks With Two Level Gauges	



	TABLE OF CONTENTS - CONTINUED	
Section	Title	Page
5.10.1.	4 Scenario Four (4) Dual Tanks With No Level Gauges	27
5.10.1.	5 Scenario Five (5) Draft Mode	
5.11.	Foam Tank Level Sensor Installation	
5.12.	Flushing Water	
5.13.	Foam System Drains	
5.14.	Apparatus Design/Build For Cold Weather (Below Freezing) Duty	
5.15.	Electrical Requirements	
5.15.1	Ground/Primary Power	
5.15.2	RFI/EMI	
5.16.	Typical SmartATP 125 GPM Layout	
5.17.	Typical SmartATP 225 GPM Layout	
5.18.	Optional Akron Brass Valves	
5.18.1	Akron Valve Setup For The SmartATP System	
6. COI	MMISSIONING, STARTUP, OPERATION, AND SHUTDOWN	
6.1.	Commissioning/Startup Checklist	
6.1.1	Electrical	
6.1.2	Mechanical	
6.1.3	Software Setup	
6.1.4	Approved Foam	
6.2.	Operation	
6.2.1	Default Configuration	
6.3.	Display Layout	
6.3.1	Screen Navigation And Icon Definitions	40
6.3.2	Operation Screen	
6.3.2.1	Discharge Flowrate (Indicator)	
6.3.2.2	Foam % (Indicator	
6.3.2.3	Total Water Consumed (Indicator)	
6.3.2.4	Total Foam Consumed (Indicator)	
6.3.2.5	Foam Level (Indicator)	
6.3.2.6	Start/Stop Button (Control)	
6.3.2.7	Foam % Up Button (Control)	
6.3.2.8	Foam % Down Button (Control)	



Section

Title

Page

6.3.2.9	Preset Menu Button (Control)	
6.3.2.10	Prime System Button (Control)	
6.3.2.11	Flush Button (Control)	
6.3.2.12	Instruction Button (Control)	
6.3.2.13	System Options Button (Control)	
6.3.3	OEM Menu Screen	43
6.3.3.1	Move Selection UP Button (Control)	
6.3.3.2	Move Selection DOWN Button (Control)	44
6.3.3.3	Menu Item Selected (Indicator)	44
6.3.3.4	Plus Button (Control)	
6.3.3.5	Minus Button (Control)	
6.3.3.6	Save (Control)	
6.3.3.7	System Options Button (Navigation)	
6.3.4	Instruction Screen	
6.3.4.1	Discharge Flowrate (Indicator)	45
6.3.4.2	Foam Flowrate (Indicator)	45
6.3.4.3	Suction Pressure (Indicator)	45
6.3.4.4	Discharge Pressure (Indicator)	45
6.3.4.5	Pressure Rise (Indicator)	45
6.3.4.6	Start/Stop Button (Control)	45
6.3.4.7	INCR Button (Control)	45
6.3.4.8	DECR Button (Control)	45
6.3.4.9	Home Button (Navigation)	45
6.3.4.10	Flush Button (Control)	45
6.3.4.11	Prime System Button (Control)	45
6.3.4.12	Instruction/Tutorial Button (Navigation)	45
6.3.4.13	System Options Button (Navigation)	45
6.3.5	Preset Menu	
6.3.5.1	Preset Button 1 Thru 6 (Control)	
6.3.5.2	Home Button (Navigation)	
6.3.5.3	System Options Button (Navigation)	



Section

Title

Page

6.3.6	System Options Screen	
6.3.6.1	Zero Total Water (Control)	
6.3.6.2	Zero Total Foam (Control)	
6.3.6.3	Autofill Operation (Navigation)	
6.3.6.4	Flush Operation (Control)	
6.3.6.5	Calibration/Configuration (Navigation)	
6.3.6.6	Maintenance Minder (Navigation)	
6.3.6.7	Back to Previous Screen (Navigation)	
6.3.7	Autofill Operation Screen	
6.3.7.1	Instruction Button (Indication)	
6.3.7.2	Open Valve 100% Button (Control)	
6.3.7.3	Increase Desired Level Button (Control)	
6.3.7.4	Decrease Desired Level Button (Control)	
6.3.7.5	Enable/Disable Button (Control)	
6.3.7.6	Save Button (Control)	
6.3.7.7	Return Button (Navigation)	
6.3.8	Warning Messages	
6.3.9	Typical Operational Procedure	
6.4. Us	ser Calibration	
6.4.1	Entering Passwords	
6.4.2	Unit Of Measure	
6.4.3	Water Flow Calibration For Single Tank	
6.4.3.1	Calibrate the Water Sensor	
6.4.4	Water Flow Calibration For Dual Tank	
6.4.4.1	Selecting the Water Sensor	
6.4.5	Foam Flow Calibration	
6.4.5.1	Calibration Procedure	
6.4.6	Foam Tank Calibration	
6.4.6.1	Calibrate The Tank Level Sensor	
6.4.7	Pressure Sensor Calibration	
6.4.7.1	Calibrate The Pressure Sensors	
6.4.8	Setting Presets	



Sectior	Title	Page
7. PRI	EVENTIVE MAINTENANCE	
7.1.	Preventive Maintenance Plan And Schedule	59
7.2.	Maintenance After Each Use	59
7.2.1	Flush With Clear Fresh Water	59
7.2.2	Check Connections	
7.3.	Bimonthly Maintenance	60
7.3.1	Operate System	60
7.3.2	Flowmeter Check	
7.4.	Annual Maintenance	61
7.4.1	Flow Calibration	61
7.5.	Extreme Conditions Maintenance Guidelines	61
7.5.1	Freeze Protection	61
7.5.2	Unapproved Materials	
7.6.	On Screen Maintenance	
7.6.1	Maintenance Due Indication	63
7.6.2	Resetting Maintenance Interval Due Dates	64
8. TR(DUBLESHOOTING	
APPEN	DIX A. MANUFACTURER'S INFORMATION	A-1
MANUF	ACTURER'S INFORMATION	A-1
WARRA	NTY	A-1



LIST OF FIGURES

Number

Title

Page

Figure 1.	Hale SmartATP Identification Tag	5
Figure 2.	Hale SmartATP System Components Shipped	7
Figure 3.	Hale SmartATP System Packaged For Shipping	8
Figure 4.	Hale SmartATP Single Tank System Diagram	9
Figure 5.	Hale SmartATP Dual Tank System Diagram	10
Figure 6.	Hale SmartATP Single Tank System Shown Physically	11
Figure 7.	Solenoid Relay Example	14
Figure 8.	Check Valve Mounting Orientation	16
Figure 9.	Flow Sensor Tee Position Range	17
Figure 10.	Flow Sensor Placement	18
Figure 11.	Flow Sensor Placement Increase/Reduction	18
Figure 12.	Typical Flow Sensor Placement	19
Figure 13.	Multiple Flow Sensor Placements	20
Figure 14.	Multiple Flow Sensor Wiring	20
Figure 15.	Typical Multiple Flow Sensor Placement For Q-Series Pumps	21
Figure 16.	Autofill Connections	21
Figure 17.	Autofill Harness Connections	22
Figure 18.	Flowmeter Direction-of-Flow Indicator	23
Figure 19.	Foam Tank Level Sensor Mounting	29
Figure 20.	Extra Cable Storage	32
Figure 21.	Typical SmartATP 125 GPM Layout	33
Figure 22.	Typical SmartATP 225 GPM Layout	33
Figure 23.	Akron Valve CAN Bus Setup Screen	34
Figure 24.	Akron Valve Serial Number	35
Figure 25.	Akron Valve Calibration Screen	35
Figure 26.	Operation Screen Layout	41
Figure 27.	OEM Screen Layout (Page 1)	43
Figure 28.	OEM Screen Layout (Page 2)	43
Figure 29.	Instruction Screen Layout	44
Figure 30.	Preset Menu Screen Layout	46



LIST OF FIGURES – CONTINUED

Number

Title

Page

Figure 31.	System Options Screen Layout	
Figure 32.	Autofill Screen Layout	
Figure 33.	Warnings (System Options Screen Layout)	
Figure 34.	Entering A Password Sequence	
Figure 35.	User Menu	
Figure 36.	Water Flow Calibration Screen – Single Tank	
Figure 37.	Water Flow Calibration Screen – Dual Tank	54
Figure 38.	Foam Flow Calibration Screen	
Figure 39.	Foam Flow Calibration	
Figure 40.	Pressure Sensor Menu	57
Figure 41.	Preset Configuration	
Figure 42.	Flowmeter Check – Paddlewheel	61
Figure 43.	Navigate To Maintenance Minder Screen	
Figure 44.	Maintenance Minder Screen	
Figure 45.	Maintenance Minder Warning	64
Figure 46.	Maintenance Reset Icons	64

LIST OF TABLES

Number

Title

Page

Table 1.	Minimum Recommended Straight Pipe Length Per Pipe Size	17
Table 2.	Pipe Size Versus Flow Range	19
Table 3.	Autofill Harness Connections	22
Table 4.	OEM Menu Settings For The Five Typical SmartATP Use Scenarios	24
Table 5.	Hale SmartATP Operating Parameters	39
Table 6.	Hale SmartATP Icon Definitions	40
Table 7.	Password List	51
Table 8.	Water Flow Calibration	54
Table 9.	Foam Flow Calibration Factor	. 56
Table 10.	Recommended Preventive Maintenance	. 59
Table 11.	Hale SmartATP Operator Troubleshooting	. 65

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Revision A	18 October 2019	All – Initial Release		



Abbreviations And Acronyms

The abbreviations used in this manual are limited to standard (commonly used and accepted) scientific units of measure and therefore are NOT defined or listed. The acronyms used in this manual are defined in this listing (in numerical-alphabetical order) and are NOT defined within the text.

AHJ	Authority Having Jurisdiction
ATP	Around The Pump
AWG	American Wire Gauge
DECR	Decrease
EMI	Electromagnetic Interference
FNPT	Female National Pipe Thread
GPM	Gallons Per Minute
INCR	Increase
LPM	Liter Per Minute
NFPA	National Fire Protection Act
NLGI	National Lubrication Grease Institute
NPT	National Pipe Thread
OEM	Original Equipment Manufacturer
P/N	Part Number
RFI	Radio Frequency Interference
SAE	Society of Automotive Engineers
SGX	Starter or Ground Cross-Linked Polyethylene



1. SAFETY

This section provides definitions for DANGERS, WARNINGS, CAUTIONS and NOTES contained herein, precautions to be taken for pump repair as well as an alphabetical summary listing of the WARNINGS and CAUTIONS used in this manual.

1.1. Safety Headings

DANGERS, WARNINGS, CAUTIONS, or NOTICES that immediately precede a step apply directly to that step and all sub steps. DANGERS, WARNINGS, CAUTIONS, or NOTICES that precede an entire procedure apply to the entire procedure. DANGERS, WARNINGS, CAUTIONS, and NOTICES consist of two parts: a heading (that identifies possible result if disregarded) and a statement of the hazard (that provides the mini- mum precautions). NOTES are used to highlight operating or maintenance procedures, practices, conditions or statements that are not essential to protection of personnel or equipment. NOTES may precede or follow the step or procedure, depending upon the information and how it pertains to the procedure/step. The headings used and their definitions are.

ATTENTION 🔺 DANGER

INDICATES A HAZARDOUS SITUATION, WHICH IF NOT AVOIDED WILL RESULT IN SERI-OUS INJURY OR DEATH.

ATTENTION A WARNING

INDICATES A HAZARDOUS SITUATION, WHICH IF NOT AVOIDED COULD RESULT IN SERIOUS INJURY OR DEATH.

ATTENTION A CAUTION

INDICATES A POTENTIALLY HAZARDOUS SITUATION, WHICH IF NOT AVOIDED MAY RESULT IN MINOR OR MODERATE INJURY.

IMPORTANT **A** NOTICE

ADDRESSES PRACTICES NOT RELATED TO PERSONAL INJURY.

NOTE

Highlights an essential aspect of an operating or maintenance procedure, condition, or statement and/or provides pertinent ancillary information.

1.2. Safety Summary

The following warnings and cautions are used throughout the Hale SmartATP manuals (and/or the items they references) and are provided here as a safety summary.

ATTENTION 🛦 DANGER

ALL ELECTRICAL SYSTEMS HAVE THE POTENTIAL TO CAUSE SPARKS DURING SER-VICE. TAKE CARE TO ELIMINATE EXPLOSIVE OR HAZARDOUS ENVIRONMENTS DUR-ING SERVICE AND/OR REPAIR.

ATTENTION A WARNING

A PRESSURE HAZARD MAY EXIST EVEN WHEN THE PUMP IS NOT RUNNING. PRIOR TO REMOVING HOSES OR CAPS FROM PUMP CONNECTIONS, RELIEVE PRESSURE BY OPENING DRAINS. BLEEDER VALVES SHOULD ALSO BE USED WHEN CONNECTING TO AN INTAKE FROM A PRESSURIZED SOURCE.



ATTENTION A WARNING

ALWAYS FOLLOW LOCAL GUIDELINES FROM THE AHJ AND THE APPARATUS MANU-FACTURER.

ATTENTION A WARNING

ALWAYS FOLLOW PROPER OPERATING PROCEDURES. THE PUMP OPERATOR MUST BE FAMILIAR WITH THE PUMP OPERATING INSTRUCTIONS AS WELL AS OTHER OPER-ATING GUIDELINES FOR THE APPARATUS AND ACCESSORIES.

ATTENTION **A** WARNING

DO NOT EXCEED OPERATING PRESSURE LIMITS OF PUMP, INSTALLED PLUMBING, HOSE(S), OR EQUIPMENT IN USE.

ATTENTION **A** WARNING

OPERATORS, INSTALLERS, AND MAINTENANCE PERSONNEL MUST BE TRAINED AND QUALIFIED FOR ALL THE ACTIVITIES THEY PERFORM.

ATTENTION A CAUTION

ALWAYS USE PROPER PPE. FOAM MAY BE TOXIC TO PEOPLE AND/OR THE ENVIRON-MENT. CATCH AND DISPOSE OF FOAM PROPERLY. IMPROPER FOAM HANDLING MAY RESULT IN HEALTH RISKS AND/OR LIABILITY.

ATTENTION A CAUTION

FAILING TO REDUCE SYSTEM PRESSURE BEFORE SYSTEM SHUTDOWN OR FLUSH-ING COULD RESULT IN WATER HAMMERING.

ATTENTION A CAUTION

THE SMARTATP SYSTEMS SHIPPING CONTAINER WEIGHS OVER 50 LBS. LIFT THE SHIPPING CONTAINER USING THE APPROPRIATELY LIFTING METHOD. (TWO PERSON RECOMMENDED)

ATTENTION A CAUTION

TO PREVENT SYSTEM DAMAGE OR ELECTRICAL SHOCK THE MAIN POWER SUPPLY WIRE IS THE LAST CONNECTION MADE TO THE HALE FOAM CONTROLLER. ALWAYS DISCONNECT THE PRIMARY POWER SOURCE BEFORE ATTEMPTING TO SERVICE ANY PART OF THE HALE FOAM SYSTEM.

IMPORTANT A NOTICE

ALWAYS DISCONNECT THE POWER CABLE, GROUND STRAPS, ELECTRICAL WIRES AND CABLES FROM THE CONTROL UNIT OR OTHER HALE SMARTATP EQUIPMENT BE-FORE ELECTRIC ARC WELDING AT ANY POINT ON THE APPARATUS.

IMPORTANT A NOTICE

AN ACCURATE FLOW MEASURING DEVICE MUST BE USED TO MEASURE THE WATER FLOW WHEN CALIBRATING THE FLOW SENSOR. USE A SUITABLE SIZE, SMOOTH BORE NOZZLE AND AN ACCURATE AND CALIBRATED PITOT GAUGE INSTRUMENT OR MASTER FLOW METER. HAND HELD PITOT GAUGES ARE USUALLY NOT VERY ACCU-RATE. MAKE SURE THE SYSTEM IS CALIBRATED WITH AN ACCURATE FLOW MEASUR-ING DEVICE.



IMPORTANT A NOTICE

CONNECT THE PRIMARY POSITIVE LEAD FROM THE HARNESS TO THE MASTER SWITCH TERMINAL OR RELAY TERMINAL USING MINIMUM 12 AWG TYPE SGX (SAE J1127), CHEMICAL RESISTANT, BATTERY CABLE PROTECT BY WIRE LOOM.

IMPORTANT **A** NOTICE

DO NOT CONNECT THE MAIN POWER LEAD TO SMALL LEADS THAT ARE SUPPLYING SOME OTHER DEVICE, SUCH AS A LIGHT BAR OR SIREN.

IMPORTANT **A** NOTICE

DO NOT RUN THE PRIMER FOR MORE THAN 45 SECONDS. IF PRIME IS NOT ACHIEVED IN 30 - 45 SECONDS, STOP AND LOOK FOR AIR LEAKS OR BLOCKED SUCTION HOSE.

IMPORTANT A NOTICE

EXCESSIVE LENGTHS OF PIPE AND/OR USE OF MANY ELBOWS IN THE FOAM AND/OR WATER PLUMBING CAN DEGRADE SYSTEMS PERFORMANCE.

IMPORTANT A NOTICE

FAILING TO REDUCE SYSTEM PRESSURE BEFORE SYSTEM SHUTDOWN OR FLUSH-ING COULD RESULT IN WATER HAMMERING.

IMPORTANT **A** NOTICE

IF THE PUMP LOOSES PRIME AS A RESULT OF PRIMING THE SMARTATP SIMPLY PRIME THE PUMP AGAIN.

IMPORTANT A NOTICE

NEVER MIX CLASS A AND CLASS B FOAM. MIXING THE FOAMS CAUSES THE FOAM TO SOLIDIFY.

IMPORTANT **A** NOTICE

OPENING THE TANK FILL (OR COOLING VALVES) WITH THE FOAM SYSTEM OPERAT-ING CAN PLACE FOAM IN THE WATER TANK.

IMPORTANT A NOTICE

OTHER ELECTRICAL COMPONENTS MUST NOT BE SUPPLIED FROM THIS WIRE. DO NOT CONNECT THE PRIMER AND HALE SMARTATP TO THE SAME POWER WIRE.

IMPORTANT A NOTICE

PRIMING THE SMARTATP DISPLACES THE AIR IN THE FOAM SYSTEM WHICH WHEN PASSED THRU THE PUMP MAY CAUSE THE PUMP TO LOOSE PRIME.

IMPORTANT A NOTICE

SYSTEM SHOULD BE CALIBRATED AFTER INSTALLATION TO VERIFY VALUES WITH THE ACTUAL FOAM CONCENTRATE BEING USED. ONLY CALIBRATE USING ACTUAL FOAM CONCENTRATES. DO NOT USE WATER, TRAINING, OR TEST FOAMS FOR CALI-BRATION VERIFICATION.

IMPORTANT **A** NOTICE

THE CONTROLLER REQUIRES A 51 MM (2 IN) MINIMUM CLEARANCE AT THE REAR OF THE OPERATOR PANEL TO ALLOW PROPER CONNECTION OF CABLES.



IMPORTANT A NOTICE

THE CONTROLLER UNIT DEUTSCH CONNECTORS ARE KEYED TO PREVENT INTER-CHANGE OR REVERSE DIRECTION INSERTION. DO NOT FORCE A CONNECTOR WITH-OUT FIRST VERIFYING THE CONNECTORS ORIENTATION.

IMPORTANT A NOTICE

THE CONTROLLER UNIT MUST BE MOUNTED IN A DRY ENVIRONMENT AND NOT BE SUBJECTED TO EXCESSIVE HEAT.

IMPORTANT A NOTICE

THE FOAM CHEMICAL CAN BE HIGHLY CORROSIVE AND POTENTIALLY DAMAGE THE PUMP IF LEFT INSIDE THE PUMP FOR AN EXTENDED PERIOD.



2. GENERAL INSTRUCTIONS

This manual covers the Hale SmartATP and provides basic information on Hale 125 GPM and 225 GPM versions when local procedures do NOT exist. Basics of operation, installation verification, and preventive maintenance are covered. Refer to the Technical Manual (FSG-MNL-00194) or the Parts Manual (FSG-MNL-00195) for additional information. These manuals and additional information such as SmartATP specifications, ratings, and Hale Bulletin 650, Hale Foam Proportioning System Foam Concentrate Compatibility, can be found on the flash drive provided with the system or on the Hale website (www.haleproducts.com).

2.1. SmartATP Specifications And Numbering

Each SmartATP system has a unique serial number followed by a dash number that define the system as a foam system, along with the sales order information for the purchase. Refer to the Hale Products website (www.haleproducts.com) for detailed SmartATP specifications.

Figure 1 shows the typical identification tag used on the Hale 125 GPM and 225 GPM versions of the SmartATP.

H18509-100 IDEX DINGLEE SO# 731356

Figure 1. Hale SmartATP Identification Tag

2.2. Disclaimer

Our policy is one of continuous development. We therefore reserve the right to amend drawings/products/specifications without notice or obligation.



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3. TRANSPORTATION AND STORAGE

This section covers shipping, movement, installation preparations, and storage for the Hale SmartATP.

3.1. Shipping, Movement, And Installation Preparations

Hale ships the SmartATP using packaging that protects the SmartATP during the transit process and for typical periods of indoor storage.

Upon receipt, perform a full inspection of the packaging and SmartATP, if any damage has occurred, take clear detailed pictures, and immediately file a claim with the carrier. Also, contact Hale Customer Support (800–533–3569) and provide a copy of the claim via email at halecustomerservice@idexcorp.com.

ATTENTION A CAUTION

THE SMARTATP SYSTEMS SHIPPING CONTAINER WEIGHS OVER 50 LBS. LIFT THE SHIPPING CONTAINER USING THE APPROPRIATELY LIFTING METHOD. (TWO PERSON RECOMMENDED)

Use appropriate lift methods and moving equipment (hand apparatus) to move or handle the system.

3.1.1 Shipment Example

Figure 2 shows the components included with a typical SmartATP shipment. Please contact Hale Customer Support (800–533–3569) if you are missing any components.



Figure 2. Hale SmartATP System Components Shipped



Figure 3 shows a typical SmartATP as packaged for shipment. Please contact Hale Customer Support (800–533–3569) if you receive any components damaged during transit.



Figure 3. Hale SmartATP System Packaged For Shipping

3.2. Storage

Hale SmartATP systems should be stored indoors in a protected environment. Packaging is suitable to protect the system for typical storage times associated with vehicle production runs.



4. SMARTATP OVERVIEW

Hale SmartATP systems are a completely engineered, factory matched foam proportioning systems that provides reliable, consistent foam delivery for Class A and Class B around the pump foam operations. Hale currently produces a 125 GPM and a 225 GPM version of the SmartATP.

The SmartATP systems accurately deliver from 0.1% to 10.0% foam concentrate through an eductor directly into the pump suction where it is then fed as a foam solution throughout the entirety of the pump providing an around the pump type foam system. The SmartATP system places foam on the discharge and intake side of the pump (including any relief valves installed) therefore flushing the pump after SmartATP use is recommended. The Hale SmartATP consists of nine major components: a large (or small) eductor, the SmartATP control unit, the display, a metering valve, a water flow sensor, a foam concentrate flow sensor, two pressure sensors, tank(s) level sensor(s), and a check valve. The description of each component is located in the SmartATP Technical Manual (FSG–MNL–00194).

Figure 4 shows the system diagram of the single foam tank system and Figure 5 shows a system diagram for the dual foam tank system. Blue text identified the items supplied by Hale Products; the OEM supplies all other items.



Figure 4. Hale SmartATP Single Tank System Diagram





Note that both layouts are the same for the 125 GPM and 225 GPM versions of the SmartATP. In addition, harnesses supplied include 10 ft. cable extensions to allow for OEM installation flexibility.

When a display input activates the SmartATP system, a signal from the control unit begins foam concentrate injection. The tank shutoff valve opens to allow foam concentrate to the metering valve and the water shutoff valve opens to allow water to flow to the eductor, which provides the appropriate foam solution to the suction side of the pump. The SmartATP monitors pressure and water flow for changes and adjusts the foam solution as required. The SmartATP also monitors the foam concentrate level and warns the operator (or shuts down as programmed) if the level(s) warrant. The autofill option allows foam operations by maintaining low suction pressure when sourcing water from a hydrant by using the hydrant as a source to maintain the onboard water tank level and additionally provides information and/or warnings related to the onboard tank level.

Figure 6 shows the physical layout of the system cabling diagramed above. Note that Figure 6 shows the extra cable coiled to save space for the photo; do NOT coil any extra cabling during an install. (See Figure 20 for correct installation practices.)



Figure 6. Hale SmartATP Single Tank System Shown Physically



5. INSTALLATION

Use the following guidelines to assist the installer with system installation. Carefully review the procedures herein to ensure proper installation of the system. Also provided in this section are lists of Hale tested components for use on the Hale SmartATP to provide the best system performance. Using the recommended materials and specified parts ensures a virtually maintenance free installation.

Differences in apparatus plumbing and foam system configurations make it impractical to show exactly how to install the Hale SmartATP systems on a particular apparatus. The guideline information applies to most situations and provides guidance when designing and installing a Hale SmartATP system. When determining the locations of the SmartATP components for installation purposes, keep in mind pipe runs, cable routing and interference items that could hinder or degrade proper system performance.

Section 4 (see page 4) provides a list of the Hale SmartATP nine major components, and paragraph 5.1 (below) provides a list of the OEM supplied full flow ball valves (with sizes for each function). Install each component (and its associated plumbing and/or wiring) as described, listed, and/or shown in the following component titled subparagraphs.

5.1. OEM Requirements

The OEM shall supply full flow ball valves with the listed minimum sizes (valves may be larger) for the following functions:

•	Flush Valve (minimum)	40 mm (1-1/2 in)
•	125 GPM System Tank Shutoff Valve	50 mm (2 in)
•	225 GPM System Tank Shutoff Valve	80 mm (3 in)
•	Water Shutoff Valve	65 mm (2-1/2 in)

Use air actuated valves with 12/24 VDC electric controlled normally closed solenoids. The Hale harness provides the solenoids with a positive polarity 12/24 volt to actuate the OEM supplied solenoids to open/close the ball valves. Hale offers an optional mounting kit that includes the valves and solenoids.

The OEM is responsible for mounting the Hale SmartATP system inside the apparatus and for supplying the required plumbing. The OEM shall ensure the metering valve manual override handle is accessible (provides a bypass function).

Additionally, due to the many differences in apparatus configurations and design requirements the Hale SmartATP system installer must supply components such as:

- Mounting Brackets Piping
- Hoses Fittings
- Electrical Wiring Foam Tank(s)
- Air Operated Valves
- Solenoid Valves (To Control Air Operated Valves)



5.1.1 OEM Supplied Air Solenoid Valves

Hale supplies 12 VDC power and ground leads to operate air solenoids for the purpose of flush control, water shutoff, and foam tank shutoff valves. The leads provide DELPHI 12010973 connectors and are capable of supplying a maximum of 1/2 amp. If the OEM supplied solenoid requires more than 1/2 amp to operate, an OEM supplied relay is required (source the relays load from a circuit other than the SmartATP system). Figure 6 shows the required relay connections. (The pin numbering shown is NOT required.)

NOTE

Select an appropriately sealed relay to protect against water and dirt ingress.





5.1.2 Foam Concentrate Tank

ATTENTION A CAUTION

ALWAYS USE PROPER PPE. FOAM MAY BE TOXIC TO PEOPLE AND/OR THE ENVIRON-MENT. CATCH AND DISPOSE OF FOAM PROPERLY. IMPROPER FOAM HANDLING MAY RESULT IN HEALTH RISKS AND/OR LIABILITY.

The OEM must supply a foam concentrate tank (or tanks). The tank(s) must be appropriate for the capacity required for the apparatus application. The tank must meet NFPA standards for its design, capacity, etc. (including):

- Filler Size
- Vapor Pressure Venting
- Baffling
- Drain Facilities



Ensure provisions for:

- Installation Of Foam Tank Level Sensor
- Foam Suction Connections
- Tank Drainage
- Proper Fill Openings, Per AHJ Requirements

5.1.3 Foam Concentrate Plumbing

IMPORTANT A NOTICE

EXCESSIVE LENGTHS OF PIPE AND/OR USE OF MANY ELBOWS IN THE FOAM AND/OR WATER PLUMBING CAN DEGRADE SYSTEMS PERFORMANCE.

Flush tank(s) and hoses prior to making SmartATP system connections. Ensure the foam tank and foam concentrate suction hoses are clean before making a connection. Ensure the foam concentrate gravity feeds from the tank to the eductor.

Foam concentrate plumbing consists of:

- Foam Tank
- Foam Concentrate Suction Hose (and fittings as required)
- Foam Tank Shutoff Valve
- Tee (from flush valve) Check Valve
- Piping (between Hale supplied Flowmeter Assembly, Metering Valve, and Eductor)

5.2. Eductor Installation

Locate the eductor in a protected area to prevent road debris and excessive heat buildup. Connect the eductor to the apparatus plumbing with Victaulic groove couplings. Refer to the SmartATP parts manual (FSG–MNL–00195) for overall eductor dimensions and recommended pipe size. The eductor provides an external bolt pattern to mount a support bracket. (The bracket is OEM supplied.)

Figure 4 (see page 9) (or Figure 5– see page 10) shows the eductors position in the system and the required direction of water flow. There is an arrow casted in the body of the eductor that points in the direction of water flow. The recommended eductor mounting height is below the outlet of the foam tank (provides gravity feed). Utilize 65 mm (2-1/2 in) plumbing from the pump discharge through the water shutoff valve all the way to the eductor water inlet (for either version of the SmartATP system). Utilize 80 mm (3 in) plumbing tapered back to the pumps suction-side piping diameter for the eductor outlet.

Poor selection of eductor outlet location/plumbing may cause excessive turbulence. For example, locating the foam solution injection point to close to the eye of the pumps impeller (volute style pumps are mainly affected). Additionally, a drastic increase in pipe size on the outlet of the eductor plumbing could cause turbulence (e.g. injecting the 3–inch eductor outlet into an 8–inch suction pipe). In this situation, Hale recommends gradually increasing the outlet plumbing diameter using multiple diameter adapters. If utilizing a Q-Series pump, to minimize turbulence, use one of the auxiliary suction ports (U, V, W, or X; reference Midship Muscle Pump Manual – P/N 029-0020-63-0) to inject the foam solution and if utilizing a volute style pump, Hale recommends the equivalent of a 6D distance from the impeller eye to the injection point.



5.3. Metering Valve Installation

Locate the metering valve in a protected area to prevent road debris and excessive heat buildup that provides direct access to the override handle. (The handle must be accessible in case of system failure.) Install the metering valve in the foam suction plumbing line using Victaulic groove couplings. Refer to the SmartATP parts manual (FSG–MNL–00195) for overall dimensions of the metering valve and required pipe size. Mount the metering valve below the outlet of the foam tank(s) to ensure gravity feed to the eductor.

5.4. Check Valve Installation

Install the Hale supplied check valve on the apparatus to prevent water contamination of the foam concentrate. Mount the check valve approximately where shown on Figure 4 (see page 9) (or Figure 5– see page 10) to prevent tank backflow if the suction side pressure exceeds the allowed value. ONLY mount the check valve upright (see Figure 8) and in the desired direction of the flow. (The valve has an arrow on the body.) The valve has NPT connections and requires a suitable sealing compound at all joints. Refer to the SmartATP parts manual (FSG-MNL-00195) for check valve overall dimensions and the pipe size(s).



Figure 8. Check Valve Mounting Orientation

5.5. Water Flow Sensor Installation

The Hale SmartATP flow sensor design enables quick and easy sensor inspection and maintenance. The flow sensor measures water velocity in the pipe to calculate the flow rate. The location of the paddlewheel transmitter is important for proper operation and accurate readings.

The OEM is required to mount the flow sensor to ensure measurement of total water flow and NOT a secondary outlet and in a location that is accessible for future maintenance.

NOTE

Reference the Class1 Paddlewheel Flow Sensor Installation (P/N 102714 & 115693) install sheet (P/N 114634) located in the SmartATP parts manual (FSG-MNL-00195) for mounting details.

To install the supplied weld fitting cut/drill a 35 mm (1-3/8 in) hole and weld the fitting into the discharge plumbing in a location that meets all the requirements listed in this section. (See vertical vs. horizontal pipe runs and minimum straight pipe info below.) Refer to the SmartATP parts manual (FSG-MNL-00195) for overall dimensions. Install the flow sensor paddle wheel on a weld fitting. Orientate the flow sensor in such a way that the arrow on the flow sensor points in the direction of the water flow.



In vertical pipe runs, the orientation of the flow sensor is not limited. However, in horizontal piping runs mount the flow sensor within the range shown on Figure 9 (prevents debris from building in the paddlewheel).





Mount the flow sensor in an area that maintains laminar flow. Excessive turbulence in the area of the flow sensor may produce unstable and inaccurate flow readings. Ensure sufficient length of straight pipe prior to the flow sensor to reduce any turbulence in the pipe. Refer to the Table 1 for Hale minimum recommended length of straight pipe before flow sensor placement.

NOTE

Selecting the next smaller pipe permits reducing the length of straight pipe prior to flow sensor placement.

Table 1.	Minimum	Recommended	Straight	Pipe L	ength	Per	Pipe	Size
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Pipe Size Inch (mm)	Minimum Straight Run Length Inch (mm)
2-1/2 (65)	15 (381)
3 (80)	18 (457.2)
4 (100)	24 (609.6)
5 (125)	30 (762)
6 (150)	36 (914.4)

The following guidelines help obtain the best readings to maintain Hale SmartATP system accuracy.

- A. A minimum of six times the pipe diameter of straight run pipe is necessary prior to the flow sensor paddle wheel.
- B. The downstream piping length is not as critical; however, there must be a minimum length of straight pipe (two times the pipe diameter) with no fittings or valves immediately after the flow sensor paddlewheel.



C. Do NOT mount a flow sensor directly after an elbow or valve. Gated valves especially create severe turbulence. See Figure 10.





D. Place the flow sensor after a reduction in pipe size, NEVER after an increase in pipe size. See Figure 11.



Figure 11. Flow Sensor Placement Increase/Reduction

When selecting a flow sensor, it is important to consider the minimum and maximum flow requirements during operation. Refer to Table 2.



NOTE

Mounting the flow sensor in a short section of pipe, one pipe size smaller (e.g., 125 mm (5 in) for 150 mm (6 in) plumbing; 50 mm (2 in) for 65 mm (2-1/2 in) plumbing, etc.) than the plumbing size, provides better accuracy at the lower flows.

Pipe Size inc	h (mm)	Flow (GPM)	Flow (LPM)
2-1/2	(63.5)	30 - 800	114 - 3028
3	(76.2)	50 - 1250	189 - 4731
4	(101.6)	75 - 1800	284 - 6813
5	(127)	120 - 2500	454 - 9463
6	(152.4)	175 - 3000	662 - 11656

Table 2.Pipe Size Versus Flow Range

5.5.1 Optional Multiple Water Flow Sensors

NOTE

The first water flow sensor always connects to the SmartATP control unit.

Hale offers a multiple water flow sensor option for enhanced accuracies on high flowing pumps (required for Q-Series pumps) and for situations where pump house space limits the ability to meet the flow sensor mounting requirements. Mount these flow sensors before every discharge (up to a maximum of 12) and the sum of all of the flows shows on the display. These sensors must still adhere to all rules, but pipe sizes on discharges are typically smaller and thus require less straight run before the sensor. The Figure 12 shows the typical placement of a single water flow sensor installed in a 150 mm (6 in) discharge manifold with three 100 mm (4 in) valves.





Flow sensor placement requires six times pipe diameter (for 150 mm [6 in] pipe = 914.5 mm [36 in]). Achieving this requirement may be difficult if pump house space is limited. Figure 13 shows how multiple flow sensors can reduce the size of the discharge manifold.







Figure 13 shows 100 mm (4 in) plumbing. Smaller plumbing will require less straight run (see Table 1 –page 17) and allows higher accuracies and the ability to read lower flows (see Table 2 – page 19). For every two discharges added, the added flow sensors require an input module (all input modules are factory programmed and ready to be connected to the CAN bus). Refer to the SmartATP parts manual (FSG-MNL-00195) for module dimensions. Figure 14 shows the wiring diagram for Figure 13.



Water Flow Meter (Main Harness)

Figure 14. Multiple Flow Sensor Wiring



Figure 15 shows a typical Q-series pump placement of multiple flow sensors (example of five).



Figure 15. Typical Multiple Flow Sensor Placement For Q-Series Pumps

NOTE

In order to focus on the multiple flow sensor placement, numerous components (brackets, control rods, control and input modules, display, foam tanks, panels, solenoids, wiring harness, etc.) are hidden for clarity. Additionally the eductor, flowmeter assembly, and metering valve are located on far side and are not fully visible.

5.6. Optional Autofill Installation

An optional water tank autofill system can be purchased from Hale Products to use in conjunction with the SmartATP system. See Figure 16. The autofill and typical tank fill require different plumbing.



Figure 16. Autofill Connections



The SmartATP system performs best with low suction pressures; because of this, the desired configuration is to pump from tank with the tank filled via direct tank fill from a hydrant or other pressurized water source. High pressure connection directly to the pump suction would preclude foam operations but autofill maintains the onboard water tank level allowing prolonged foam operations since the Hale autofill monitors and maintains the tank level automatically. Additionally, this configuration reduces water hammer from the waterline.

The autofill plumbing should be plumbed separately from the tank fill allowing tank fill without using the pump discharge. Refer to the SmartATP parts manual (FSG–MNL–00195) for autofill installation plumbing dimensions.

Connect the autofill harness (see Figure 17) to the appropriate components as listed in Table 3 (lists where the autofill connections plug in).



Figure 17. Autofill Harness Connections

Install the harness and verify all connections are tight and secure. See Table 3.

Autofill Connection	Mating Connection
C1	KZCO Autofill Valve
C2	Tee Into SmartATP CAN BUS
C3	Plug Or Terminating Resistor If Necessary
C4	Pressure Switch
C5	PIN 12 On Connector 2B (SmartATP Control Unit)
Open End	Apparatus Power (Individual Wires For Power/Ground)

 Table 3.
 Autofill Harness Connections

5.6.1 Enable Autofill

Only enable Autofill if the apparatus is equipped with the autofill option. Enable the Autofill screen as follows.

- A. Navigate to System Options screen.
- B. Press Calibration/Configuration button.
- C. Enter Autofill password and touch Enter. The autofill operation screen is displayed. (Refer to paragraph 6.4.1, Entering Passwords [page 50], and Table 7, Password List, for details.)
- D. Press Enable/Disable button to enable autofill. (Refer to paragraph 6.3.7, Autofill Operation Screen, [page 47]).



The Autofill password must be entered to access the autofill operation screen unless autofill is currently enabled. (The autofill operation icon is ONLY displayed on the System Options screen while autofill is enabled.)

5.7. Foam Flowmeter Assembly Installation

Install the foam flowmeter assembly in the approximate location shown on Figure 4 (see page 9) (or Figure 5 – see page 10) in accordance with all the water flow sensor installation guidelines (see paragraph 5.5 – see page 16). The assembly provides Victaulic connection at both ends.

Refer to the SmartATP parts manual (FSG–MNL–00195) for overall dimensions and recommended connection size for the 125 GPM system (P/N 178-00585-000) or 225 GPM system (P/N 178-00585-001) foam flowmeter assembly.

Optionally, multiple flowmeters (up to 12 additional flowmeters) may be used when utilizing multiple discharge/suction water ways. Reference Table 12, Multiple Flowmeter Options Listing, in the SmartATP Parts Manual (FSG-MNL-00195) for the items required to support three (3) thru twelve (12) flowmeters.



Figure 18 shows the direction-of-flow indicators for a Hale flowmeter.

Figure 18. Flowmeter Direction-of-Flow Indicator

5.8. Pressure Transducers Installation

The SmartATP supplies two pressure transducers (rated at 21 Bar [Kg/cm], or 300 psi) with 1/4-inch NPT taps. Mount the transducers at the discharge and suction ends of the pump. One transducer measures discharge pressure while the other measures suction pressure. For Hale pumps, refer to your pump manual for discharge and suction tap locations.



5.9. SmartATP Control Unit (Foam Controller) Installation

The foam controller mounts on the operator panel of the apparatus. Secure the controller using four M3.5 x 0.6 (or SAE 6–32) pan head screws and nuts. Refer to the SmartATP parts manual (FSG–MNL–00195) for foam controller installation dimensions.

IMPORTANT A NOTICE

THE CONTROLLER REQUIRES A 51 MM (2 IN) MINIMUM CLEARANCE AT THE REAR OF THE OPERATOR PANEL TO ALLOW PROPER CONNECTION OF CABLES.

THE CONTROLLER UNIT DEUTSCH CONNECTORS ARE KEYED TO PREVENT INTER-CHANGE OR REVERSE DIRECTION INSERTION. DO NOT FORCE A CONNECTOR WITH-OUT FIRST VERIFYING THE CONNECTORS ORIENTATION.

THE CONTROLLER UNIT MUST BE MOUNTED IN A DRY ENVIRONMENT AND NOT BE SUBJECTED TO EXCESSIVE HEAT.

5.10. SmartATP (UltraView) Display Installation

The UltraView display mounts on the face of the operator panel of the apparatus. Secure the display using four M3.5 x 0.6 (or SAE 6–32) pan head screws and nuts. Refer to the SmartATP parts manual (FSG–MNL–00195) for the UltraView display installation dimensions.

NOTE

If CAN Bus Messaging information is required (remote display), contact Hale Products (or local distributor) for the ATP-E System CAN Messaging documentation (P/N 101-00319-000).

5.10.1 SmartATP Configuration Setups

NOTE

If you ordered a Hale SmartATP (125 GPM or 225 GPM) system for a specific (non-default) configuration your system will NOT require programming changes to operate as ordered.

As stated in the Default Configuration paragraph (see page 39) unless ordered for a specific (non default) configuration (or if a replacement display is purchased) the display arrives configured as a 125 GPM system with scenario one (1) parameters programmed into it. Table 4 provides a list of all five operating scenarios and the menu items that require change to utilize each scenario.

The following subparagraphs provide general procedures to switch between a 125 GPM and a 225 GPM system and configure either system for each of the four non default configurations. Each subparagraph is titled for the applicable scenario or other setup requirements.

Scenario/Menu Item		Setting		
One (1)	One (1) Single Tank With Tank Level Installed (Factory Default Setup)			
Num	nber of foam tanks	1		
Foam Default		A or B (Setting depends on tank contents) (B is factory default)		
Tanl	< Level Installed	Yes		

 Table 4.
 OEM Menu Settings For The Five Typical SmartATP Use Scenarios



Table 4.	OEM Menu Settings For The Five Typical SmartATP Use Scenarios – CONTINUED
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Scenario/Menu Item		Setting		
Two (2)	Single Tank Without Tank Level Ir	nstalled	NOTE 1	
Num	Number of foam tanks			
Foar	n Default	A	or B (Setting depends on tank contents)	
Tank	Level Installed	No)	
Three (3) Dual (Two) Tanks With Two Level (Gauges	NOTE 2	
Number of foam tanks		2		
Foam Default		Does NOT matter		
Tank Level Installed		Yes		
Draft Mode		No)	
Four (4)	Dual (Two) Tanks With No Level (Gauges	NOTE 3	
Number of foam tanks		2		
Foam Default		Does NOT matter		
Tank Level Installed		No		
Draft Mode		No		
Five (5) Draft Mode (Used for a single tank with tank level and foam pick up is from off board) NOTE 4				
Number of foam tanks		2		
Foam Default		Do	bes NOT matter	
Tank Level Installed		Ye	s	
Draft Mode		Ye	s	

Note 1: This scenario applies when a customer does NOT want the tank level or when running a trailer that pumps only one (1) type of foam.

- Note 2: This scenario applies when the system uses dual (2) tanks (NOT in draft mode). The system always flushes when switching tanks.
- Note 3: This scenario applies to a dual (2) tank truck and the customer does NOT want tank levels or when running from a trailer that will be flowing two (2) types of foam.
- Note 4: This scenario applies when using draft mode; THE SYSTEM WILL PROMPT THE USER IF THEY WANT TO FLUSH OR NOT. (The reason for the prompt is: we do NOT know what foam was drafted. (When they draft the same type of foam that is in the tank there is NO NEED to flush and when they are switching foam types they NEED to flush.) The prompt allows the user to decide to flush or not.

5.10.1.1 125 GPM Or 225 GPM System Setup

From the Preset (see Figure 30– page 46) or Operation (see Figure 26 – page 41) screen, perform the following to change between the 125 GPM or the 225 GPM configurations.

- A. Press System Options button.
- B. Press Calibration/Configuration button.



- C. Enter OEM Menu password (see Table 7 page 51) and then touch enter (see paragraph 6.4.1, Entering Passwords page 50, and Figure 34 page 50).
- D. Scroll (press Move Selection DOWN Button repeatedly until selection arrow points to desired menu item) to last menu item (Tank Unit Used).
- E. Press + (or –) button until desired configuration is displayed (125 GPM or 225 GPM).
- F. Press Save button.
- G. Restart system (Cycle the power.)

5.10.1.2 Scenario Two (2) Single Tank Without Tank Level Setup

From the Preset (see Figure 30– page 46) or Operation (see Figure 26 – page 41) screen, perform the following to change the system parameters to this configuration.

- A. Press System Options button.
- B. Press Calibration/Configuration button.
- C. Enter OEM Menu password (see Table 7 page 51) and then touch enter (see paragraph 6.4.1, Entering Passwords page 50, and Figure 34 page 50).
- D. Scroll (press Move Selection DOWN Button repeatedly until selection arrow points to desired menu item) to menu item (Number of foam tanks).
- E. Verify parameter is set to one (1), otherwise, press + (or –) button until desired parameter is displayed (1).
- F. If parameter was changed, press Save button.
- G. Scroll (press Move Selection DOWN Button repeatedly until selection arrow points to desired menu item) to menu item (Single tank default foam).
- H. Verify parameter is set to desired foam tank, otherwise, press + (or –) button until desired parameter is displayed (A or B).
- I. If parameter was changed, press Save button.
- J. Scroll (press Move Selection DOWN Button repeatedly until selection arrow points to desired menu item) to menu item (Foam Tank Level Installed).
- K. Press + (or –) button until desired parameter is displayed (No).
- L. Press Save button.
- M. Restart system (Cycle the power.)

5.10.1.3 Scenario Three (3) Dual Tanks With Two Level Gauges

From the Preset (see Figure 30– page 46) or Operation (see Figure 26 – page 41) screen, perform the following to change the system parameters to this configuration.

- A. Press System Options button.
- B. Press Calibration/Configuration button.
- C. Enter OEM Menu password (see Table 7 page 51) and then touch enter (see paragraph 6.4.1, Entering Passwords page 50, and Figure 34 page 50).
- D. Scroll (press Move Selection DOWN Button repeatedly until selection arrow points to desired menu item) to menu item (Number of foam tanks).


- E. Verify parameter is set to two (2), otherwise, press + (or –) button until desired parameter is displayed (2).
- F. If parameter was changed, press Save button.
- G. Scroll (press Move Selection DOWN Button repeatedly until selection arrow points to desired menu item) to menu item (Single tank default foam).
- H. Verify parameter is set to desired foam tank, otherwise, press + (or –) button until desired parameter is displayed (A or B).
- I. If parameter was changed, press Save button.
- J. Scroll (press Move Selection DOWN Button repeatedly until selection arrow points to desired menu item) to menu item (Foam Tank Level Installed).
- K. Press + (or –) button until desired parameter is displayed (Yes).
- L. If parameter was changed, press Save button.

NOTE

The Draft Mode menu item is NOT displayed until Number of foam tanks is set to two (2) and Foam Tank Level Installed is set to Yes.

- M. Scroll (press Move Selection DOWN Button repeatedly until selection arrow points to desired menu item) to menu item (Draft Mode).
- N. Verify parameter is set to desired parameter, otherwise, press + (or –) button until desired parameter is displayed (No).
- 0. If parameter was changed, press Save button.
- P. Restart system (Cycle the power.)

5.10.1.4 Scenario Four (4) Dual Tanks With No Level Gauges

From the Preset (see Figure 30– page 46) or Operation (see Figure 26 – page 41) screen, perform the following to change the system parameters to this configuration.

NOTES

The Draft Mode menu item is NOT displayed until Number of foam tanks is set to two (2) and Foam Tank Level Installed is set to Yes.

This scenario applies to a dual (2) tank truck and the customer does NOT want tank levels or when running from a trailer that will be flowing two (2) types of foam.

- A. Press System Options button.
- B. Press Calibration/Configuration button.
- C. Enter OEM Menu password (see Table 7 page 51) and then touch enter (see paragraph 6.4.1, Entering Passwords page 50, and Figure 34 page 50).
- D. Scroll (press Move Selection DOWN Button repeatedly until selection arrow points to desired menu item) to menu item (Number of foam tanks).
- E. Verify parameter is set to two (2), otherwise, press + (or –) button until desired parameter is displayed (2).
- F. If parameter was changed, press Save button.



- G. Scroll (press Move Selection DOWN Button repeatedly until selection arrow points to desired menu item) to menu item (Single tank default foam).
- H. Verify parameter is set to desired foam tank, otherwise, press + (or –) button until desired parameter is displayed (A or B).
- I. If parameter was changed, press Save button.
- J. Scroll (press Move Selection DOWN Button repeatedly until selection arrow points to desired menu item) to menu item (Foam Tank Level Installed).
- K. Press + (or –) button until desired parameter is displayed (No).
- L. Press Save button.
- M. Restart system (Cycle the power.)

5.10.1.5 Scenario Five (5) Draft Mode

This scenario is used for a single tank with tank level when foam pick up is from off board.

From the Preset (see Figure 30– page 46) or Operation (see Figure 26 – page 41) screen, perform the following to change the system parameters to this configuration.

- A. Press System Options button.
- B. Press Calibration/Configuration button.
- C. Enter OEM Menu password (see Table 7 page 51) and then touch enter (see paragraph 6.4.1, Entering Passwords page 50, and Figure 34 page 50).
- D. Scroll (press Move Selection DOWN Button repeatedly until selection arrow points to desired menu item) to menu item (Number of foam tanks).
- E. Verify parameter is set to two (2), otherwise, press + (or –) button until desired parameter is displayed (2).
- F. If parameter was changed, press Save button.
- G. Scroll (press Move Selection DOWN Button repeatedly until selection arrow points to desired menu item) to menu item (Single tank default foam).
- H. Verify parameter is set to desired foam tank, otherwise, press + (or –) button until desired parameter is displayed (A or B).
- I. If parameter was changed, press Save button.
- J. Scroll (press Move Selection DOWN Button repeatedly until selection arrow points to desired menu item) to menu item (Foam Tank Level Installed).
- K. Press + (or –) button until desired parameter is displayed (Yes).
- L. If parameter was changed, press Save button.

NOTE

The Draft Mode menu item is NOT displayed until Number of foam tanks is set to two (2) and Foam Tank Level Installed is set to Yes.

M. Scroll (press Move Selection DOWN Button repeatedly until selection arrow points to desired menu item) to menu item (Draft Mode).



- N. Verify parameter is set to desired parameter, otherwise, press + (or –) button until desired parameter is displayed (Yes).
- 0. Press Save button.
- P. Restart system (Cycle the power.)

5.11. Foam Tank Level Sensor Installation

Mount the foam tank sensor(s) to the side of the foam tank (or tanks) as shown in Figure 19. The foam tank sensor is compatible with Hale approved Class A and Class B foams.



Figure 19. Foam Tank Level Sensor Mounting

Perform the following generalized procedure to mount the foam tank level sensor.

- A. Coat sensor threads with a suitable sealant.
- B. If tank design and construction allows, thread sensor directly into side of tank (or tank fitting) at proper height (See Step C).

NOTE

Mounting the sensor on the foam tank using a bulkhead fitting with 1/4-inch FNPT threads is acceptable.

C. Locate center of sensor at least 38 to 51 mm (1-1/2 to 2 in) from bottom of foam tank.

After installation, calibrate and verify performance. See paragraph 6.4.6 (page 56), Foam Tank Calibration.

5.12. Flushing Water

Provide flushing water connections for the Hale SmartATP system with a minimum plumbing size of 15 mm (1/2-inch) that can withstand the pressure required to meet hydro test requirements.

5.13. Foam System Drains

The OEM must supply drains with foam capable discharge piping components to prevent freezing in cold weather. When designing the drain system ensure contamination of the water system by foam (concentrate or solution) does NOT occur. Be aware that some multiple drain systems allow individual drain lines to communicate also allowing foam to bypass the installed check valves causing contamination of fire pump and the water or foam concentrate tanks.

Hale optionally offers a manual six (6) port or twelve (12) port drain valve (P/N 104961 or 121368) or an air operated six (6) port drain (P/N 103005). The valves provide individual drains with a single control that is used for applications where a single point for multiple drains is required. If a Hale drain valve is NOT used, Hale recommends individual drain lines and valves for foam capable discharge piping.



5.14. Apparatus Design/Build For Cold Weather (Below Freezing) Duty

If the end-user uses the fire apparatus in severe cold temperatures (below 0° C or 32° F), the fire apparatus builder must keep the air temperature above 0° C (32° F) in the envelope around the SmartATP system. This typically consists of mounting the SmartATP system in a limited ventilation area heated by an appropriately sized pump house auxiliary heater.

5.15. Electrical Requirements

IMPORTANT A NOTICE

THE CONTROLLER UNIT DEUTSCH CONNECTORS ARE KEYED TO PREVENT INTER-CHANGE OR REVERSE DIRECTION INSERTION. DO NOT FORCE A CONNECTOR WITH-OUT FIRST VERIFYING THE CONNECTORS ORIENTATION.

Complete harness electrical diagrams are provided. Refer to the SmartATP parts manual (FSG-MNL-00195) for proper electrical component installation. The system installer must supply primary power wiring to the system as follows:

- To prevent electrical shock the main power supply wire must be the last connection made to the Hale SmartATP motor controller.
- The cables provided with each Hale SmartATP system contain shielded assemblies. NEVER attempt to shorten or lengthen the shielded cables. If necessary, order longer or shorter cables from Hale Products to suit the particular installation.
- The cables are indexed (keyed) so they connect to the correct receptacle one way only. When making cable connections do NOT force mismatched connections (Force may result in damage and can cause improper system operation.)
- Hale factory tested cables are shipped with each SmartATP. Improper handling and forcing connections can damage these cables, which could result in other system damage.
- The system can only perform when the electrical connections are sound. Make sure each electrical connection is correct.
- Hale SmartATP system design is intended for use on direct current, negative (-) ground apparatus electrical systems ONLY.
- Do NOT mount radio transmitter or transmitter cables in direct contact with (or in close proximity of) the Hale SmartATP unit.
- Before connecting the cables, inspect the O-ring seal in the female connector. If the seal washer is missing or damaged, water can enter the connector resulting in possible system failure.
- There are no user serviceable parts inside Hale SmartATP system electrical/electronic components. Opening of these components (display or controller unit) voids the warranty.

5.15.1 Ground/Primary Power

ATTENTION A DANGER

ALL ELECTRICAL SYSTEMS HAVE THE POTENTIAL TO CAUSE SPARKS DURING SER-VICE. TAKE CARE TO ELIMINATE EXPLOSIVE OR HAZARDOUS ENVIRONMENTS DUR-ING SERVICE AND/OR REPAIR.

ATTENTION A CAUTION

TO PREVENT SYSTEM DAMAGE OR ELECTRICAL SHOCK THE MAIN POWER SUPPLY WIRE IS THE LAST CONNECTION MADE TO THE HALE FOAM CONTROLLER. ALWAYS DISCONNECT THE PRIMARY POWER SOURCE BEFORE ATTEMPTING TO SERVICE ANY PART OF THE HALE FOAM SYSTEM.



IMPORTANT A NOTICE

ALWAYS DISCONNECT THE POWER CABLE, GROUND STRAPS, ELECTRICAL WIRES AND CABLES FROM THE CONTROL UNIT OR OTHER HALE SMARTATP EQUIPMENT BE-FORE ELECTRIC ARC WELDING AT ANY POINT ON THE APPARATUS.

OTHER ELECTRICAL COMPONENTS MUST NOT BE SUPPLIED FROM THIS WIRE. DO NOT CONNECT THE PRIMER AND HALE SMARTATP TO THE SAME POWER WIRE.

CONNECT THE PRIMARY POSITIVE LEAD FROM THE HARNESS TO THE MASTER SWITCH TERMINAL OR RELAY TERMINAL USING MINIMUM 12 AWG TYPE SGX (SAE J1127), CHEMICAL RESISTANT, BATTERY CABLE PROTECT BY WIRE LOOM.

DO NOT CONNECT THE MAIN POWER LEAD TO SMALL LEADS THAT ARE SUPPLYING SOME OTHER DEVICE, SUCH AS A LIGHT BAR OR SIREN.

The system installer must provide the primary power wire and ground for the Hale SmartATP system from the apparatus via the SmartATP control unit as follows:

- The Hale SmartATP 125 GPM system requires an operating (sustained) current draw of 10 amps at 12 VDC with a maximum (peak/non sustained) current draw of 15 amps. (5/7.5 amps at 24 VDC)
- The Hale SmartATP 225 GPM system requires an operating (sustained) current draw of 15 amps at 12 VDC with a maximum (peak/non sustained) current draw of 20 amps. (7.5/10 amps at 24 VDC)
- The primary power connection shall supply power to the SmartATP control unit when the apparatus electrical system is energized and the pump is in gear.

NOTE

This supply ensures immediate operation when the operator places the apparatus in PUMP mode, and prevents battery drain when the apparatus is not running

- Use ONLY the recommended wire gauge (or above) for the primary power connection based on the run length.
- Ensure the primary wiring run uses the most direct route (shortest wire run).

NOTE

This limits the RFI/EMI interference encountered from/with radios, computers or other sensitive electronic equipment.

- Ensure the Hale SmartATP system is grounded to the chassis.
- Hale recommends using a braided flat ground strap to connect to the apparatus chassis for the ground connection. (This limits the RFI/EMI interference.)
- Before making ground connections remove all paint, grease, and coatings from the connection area.
- After making connection, seal against corrosion with silicone sealant.
- Use 12 AWG minimum type SGX (SAE J1127) battery cable directly to the battery, battery switch or relay/solenoid for cable runs up to 1.8 m (6 ft.) long.

NOTE

Longer wire runs may require larger battery cable for proper operation.

• Do NOT connect power to the same connection as the pump primer.



5.15.2 RFI/EMI

Proper installation of system components and cables along with proper grounding will limit radio interference caused by the Hale SmartATP system. Additionally, do NOT locate radio cables and hardware in the immediate area where Hale SmartATP equipment is mounted. Do NOT make round coils from the extra lengths of control and flow sensor cables as these can act as an antenna. Do NOT attempt to shorten control and flow sensor cables, however, varying lengths of cable are available to minimize the amount of extra cable in an apparatus. Do NOT route control and flow sensor cables next to antenna wires, radio power lines and radio components. When there is extra cable, double the cable back on itself and secure with plastic wire ties in a flat bundle instead of making a round coil (see Figure 20).



Figure 20. Extra Cable Storage



5.16. Typical SmartATP 125 GPM Layout

Figure 21 shows the recommend SmartATP 125 GPM layout.





5.17. Typical SmartATP 225 GPM Layout

Figure 22 shows the recommend SmartATP 225 GPM layout.



Figure 22. Typical SmartATP 225 GPM Layout



5.18. Optional Akron Brass Valves

If an apparatus (typically a small truck or skid unit) does not have compressed air to operate the valves, Hale recommends using the Akron electric valve option as a potential solution.

The three (or four if using Tank B) Akron Brass valves (shipped loose for the Hale SmartATP system — refer to the SmartATP parts manual [FSG–MNL–00195], Figure 3, Hale SmartATP Connection Diagram) are CAN bus controlled. All of the valves being used must be connected to the appropriate harness (the connectors provide power and CAN communications) and then configured into the SmartATP system as follows.

5.18.1 Akron Valve Setup For The SmartATP System

Prior to turning on the SmartATP system plug the Akron Brass valves into the optional wire harness. The harness connectors supply power, ground, and CAN bus communications (CAN Hi and CAN Lo). Mark each valve (or at least decide the valves function in the system) before performing the valve setup. Ensure each valve is installed at the physical location required to perform the function the valve is setup for.



Figure 23. Akron Valve CAN Bus Setup Screen

- A. Turn on SmartATP system.
- B. Enter password 1717. (Refer to paragraph 6.4.1, Entering Passwords, see page 43.) (The Akron Valve CAN Bus Setup Screen [see Figure 21] appears.)
- C. A list of Akron valve serial numbers appear. (One serial number populates each red box.)

(The serial numbers will appear in place of the \mathbf{M} icons shown on Figure 23.

NOTE

The valves serial number is located on a label as shown on Figure 22. Physically check each valves label to ensure correct assignment of that valves function in the SmartATP system (especially if the valve is already plumbed into the system).



Figure 24. Akron Valve Serial Number

- D. Using Up/Down arrows, select a serial number.
- E. Touch Type icon to assign that valves function.
- F. Repeat Step D and Step E until all valves listed are assigned a Type (function).
- G. Press Save.
- H. Enter password 1818. (The Akron Valve Calibration Screen [see Figure 25] appears.)

Selection		Up Down
Valve Type		Return

Figure 25. Akron Valve Calibration Screen

- Cycle through valve Type(s) using Up/Down keys (arrows). Select valve type for flush. (The Flush Valve is selected when its icon is displayed in the Selection field as shown on Figure 25.)
- J. Press Calibrate button.

NOTE

The flush valve opens fully and then closes fully.



- K. Press Return button.
- L. Using Up/Down keys (arrows), select next valve type.
- M. When that vale types icon is displayed in the Selection field, press Calibrate button.

NOTE

The valve being assigned the function being calibrated opens fully and then closes fully.

N. Repeat Step I thru Step M until calibration for all valve types being used in system is completed. Enter password 5050.

Manually test the opening and closing of all the SmartATP Akron Brass valves to verify that the right valve opens and closes when prompted. If any valve activation is incorrect, repeat the steps above paying particular attention to that function/valve.



6. COMMISSIONING, STARTUP, OPERATION, AND SHUTDOWN

ATTENTION A WARNING

A PRESSURE HAZARD MAY EXIST EVEN WHEN THE PUMP IS NOT RUNNING. PRIOR TO REMOVING HOSES OR CAPS FROM PUMP CONNECTIONS, RELIEVE PRESSURE BY OPENING DRAINS. BLEEDER VALVES SHOULD ALSO BE USED WHEN CONNECTING TO AN INTAKE FROM A PRESSURIZED SOURCE.

ATTENTION A WARNING

ALWAYS FOLLOW LOCAL GUIDELINES FROM THE AHJ AND THE APPARATUS MANU-FACTURER.

ATTENTION A WARNING

ALWAYS FOLLOW PROPER OPERATING PROCEDURES. THE PUMP OPERATOR MUST BE FAMILIAR WITH THE PUMP OPERATING INSTRUCTIONS AS WELL AS OTHER OPER-ATING GUIDELINES FOR THE APPARATUS AND ACCESSORIES.

ATTENTION **A** WARNING

DO NOT EXCEED OPERATING PRESSURE LIMITS OF PUMP, INSTALLED PLUMBING, HOSE(S), OR EQUIPMENT IN USE.

ATTENTION A WARNING

OPERATORS, INSTALLERS, AND MAINTENANCE PERSONNEL MUST BE TRAINED AND QUALIFIED FOR ALL THE ACTIVITIES THEY PERFORM.

ATTENTION A CAUTION

ALWAYS USE PROPER PPE. FOAM MAY BE TOXIC TO PEOPLE AND/OR THE ENVIRON-MENT. CATCH AND DISPOSE OF FOAM PROPERLY. IMPROPER FOAM HANDLING MAY RESULT IN HEALTH RISKS AND/OR LIABILITY.

IMPORTANT A NOTICE

OPENING THE TANK FILL (OR COOLING VALVES) WITH THE FOAM SYSTEM OPERAT-ING CAN PLACE FOAM IN THE WATER TANK.

IMPORTANT 🔺 NOTICE

NEVER MIX CLASS A AND CLASS B FOAM. MIXING THE FOAMS CAUSES THE FOAM TO SOLIDIFY.

IMPORTANT A NOTICE

THE FOAM CHEMICAL CAN BE HIGHLY CORROSIVE AND POTENTIALLY DAMAGE THE PUMP IF LEFT INSIDE THE PUMP FOR AN EXTENDED PERIOD.

6.1. Commissioning/Startup Checklist

Before energizing the apparatus and Hale SmartATP system for the first time, and to verify proper installation for commissioning, ensure the following items are checked:

6.1.1 Electrical

□ Ensure the following electrical items are checked:



- □ Tank level sensor wires connected to motor driver and sealed from moisture.
- □ Tank level sensor functions properly.
- □ Wire harness connection at motor driver correct and tight.
- □ Flow sensor cables properly connected.
- Discharge and intake pressure sensors connected to motor driver and sealed from moisture.
- Discharge and intake pressure sensors function properly.
- □ All cables and wires are secured and protected from damage during operation.
- Control and flow sensor cables properly folded and secured; radio antennas, power lines and equipment away from cables.
- □ Verify SmartATP harness is properly grounded.
- □ Correct voltage provided. Direct current, negative (-) ground.
- Adequate current available. Main power direct to battery, battery switch or fuse panel.
- Primary electrical and ground connections are tight and protected from corrosion with silicone sealant.

6.1.2 Mechanical

Ensure the following mechanical items are checked:

- □ Flow sensor mounted with flow arrow in the correct direction for water flow.
- Check valve mounting direction provides proper foam flow direction.
- □ Eductor mounting provides proper water flow direction.
- □ Piping is proper size and connections are tight.
- □ Check valve is proper size and connections are tight.
- □ Foam concentrate gravity feeds to eductor from foam concentrate tank.
- □ All hoses free of kinks and sharp bends.
- □ No sharp bends that can trap air exist in system.
- □ Flush water connections correct and tight.
- □ No suction or water leaks.
- □ Ensure solenoid air lines connect are to the correct port.
- □ All bolts are tight.
- □ System is properly supported (no sagging or lots of vibration).
- □ All low points in plumbing have a drain.

6.1.3 Software Setup

Ensure the following software items are checked:

- □ Set desired language and desired units in USER MENU
- Setup system for correct operating scenario in OEM MENU (Scenario 1 thru 5 – Scenario 1 is factory default.)



- Calibrate foam tank level
- Calibrate foam flow
- □ Calibrate water flow

6.1.4 Approved Foam

Use ONLY approved foam concentrates in the Hale SmartATP. Refer to Hale Bulletin 650, Hale Foam Proportioning System Foam Concentrate Compatibility. Access the bulletin via searching the Hale website (www.haleproducts.com).

- Class A foam concentrate is approved by Hale and AHJ
- Class B foam concentrate is approved by Hale and AHJ
- □ Specialty foam concentrate is approved by Hale and AHJ
- □ Firefighting water additive is approved by Hale and AHJ

6.2. Operation

ONLY operate the Hale SmartATP system within the input, output, and pressure parameters listed in Table 5.

Parameter		125 GPM System	225 GPM System
Maximum Foam Concentrate Output		125 GPM (473 LPM)	225 GPM (850 LPM)
Minimum Foam Concentrate Output		6 GPM (22.7 LPM)	12 GPM (45.4 LPM)
Recommended Operating Pressure	<u>1</u> /	150 PSI (10.3 BAR)	150 PSI (10.3 BAR)
Maximum System Operating Pressure		300 PSI (20.7 BAR)	300 PSI (20.7 BAR)
Water Flowrate Through Eductor @ 150 PSI		130 GPM (492 LPM)	145 GPM (549 LPM)
Maximum System Suction Pressure		15 PSI (1.03 BAR)	15 PSI (1.03 BAR)
Maximum Lift From Draft	<u>2</u> /	4 FT (1.22 M)	4 FT (1.22 M)

 Table 5.
 Hale SmartATP Operating Parameters

NOTE <u>1</u>/: The system can maintain accurate foam proportioning below this pressure but not rated flow.

NOTE <u>2</u>/: Lift from draft up to 7 FT (2.13 M) possible but NOT guaranteed or supported.

6.2.1 Default Configuration

NOTE

Many OEMs order a large quantity of systems far in advance of delivery, therefore, the specific operating scenario for each is NOT known at the time of purchase. In this situation or when a replacement display is purchased the default factory programming applies.

The Hale SmartATP (125 GPM or 225 GPM) system is factory configured to be a 125 GPM, single tank, with tank B level installed and must be programmed for use in any other configuration or to utilize any of the available options. See paragraph 5.10.1, SmartATP Configuration Setups, for the procedural steps to change the display stored software configuration from the factory default to any of the other four configurations and see paragraph 6.3.3, OEM Menu Screen, for a list of icons the screen displays along with a description of each icons function.



NOTE

If you ordered a Hale SmartATP (125 GPM or 225 GPM) system for a specific (non-default) configuration your system will NOT require programming changes to operate as ordered.

6.3. Display Layout

The Hale SmartATP (UltraView) display is a 115 mm (4.5 in) direct sunlight viewable, color, touch capable display with eight integrated water/weather tight pushbutton switches (hard buttons). In addition to the hard buttons the UltraView also provides soft buttons (soft buttons are displayed on the screen and activated by touching the screen directly).

Upon power up the UltraView displays the boot screen for 3 S, then displays the splash screen for 3 S, then displays the version screen for 2 S, and then displays the default screen (user selectable) typically the preset or operation screen. If a default display does not appear, refer to Section 8 TROUBLESHOOTING (see page 65).

The UltraView display controls the operation of Hale SmartATP system. The border color of the displays Operation Screen indicates the system power state and the currently selected foam concentrate tank.

- Gray Indicates the system is OFF.
- Green Indicates the system is ON with foam tank A selected.

NOTE

The foam B color is selectable in the USER MENU to be either red or yellow.

- Yellow Indicates the system is ON with foam tank B selected.
- Red Indicates the system is ON with foam tank B selected.

6.3.1 Screen Navigation And Icon Definitions

Table 6 provides a list of the icons the UltraView displays.

lcon	Definition	lcon	Definition	lcon	Definition
Ċ	Start/Stop		Home		Zero Total X
4	INCR	i	Instruction Screen		Calibrate X
	DECR	5	Back To Previous Screen	+	Set X
} -\$	Flush		Maintenance Minder		Save
đ	Prime System		System Options		Select X
Ħ	Chart	1	Information/Tutorial	Preset 1 Configuration	Preset X
300	Tank Full	16.1	Battery Voltage		Delete Last
102	Tank Empty	12345 67890	Digits 0 Thru 9	X	Delete All
Φ	Selection Arrow		Simulated Water Flow		Enter/Return

Table 6. Hale SmartATP Icon Definitions



X represents multiple possible entries/items.

6.3.2 Operation Screen

The operation screen (Figure 26) provides the following controls, indicators, and navigation buttons. The following subparagraphs identify each item as a control, indicator, or a navigation button and provide a description of the item.



Figure 26. Operation Screen Layout

6.3.2.1 Discharge Flowrate (Indicator)

The Discharge Flowrate shows the current flow rate of water or foam solution per minute in the Hale flow sensor monitored discharges. The flow sensor (paddlewheel) rate and the water flow calibration factor determine the flow rate.

6.3.2.2 Foam % (Indicator

The Foam % shows the foam concentrate mixture rate setting which ranges from 0.1% to 9.9%.

6.3.2.3 Total Water Consumed (Indicator)

The Total Water Consumed shows the total amount of water (foam solution if pumping foam) pumped through the discharges monitored as monitored by the flow sensor. This value can be reset in the main menu.

6.3.2.4 Total Foam Consumed (Indicator)

The Total Foam Consumed shows the total amount of foam concentrate pumped from the currently selected foam tank. This value can be reset in the main menu.

6.3.2.5 Foam Level (Indicator)

The Foam Level shows the level of foam in the foam tank. The tank level is determined from the tank level transducer and tank level calibration process.

6.3.2.6 Start/Stop Button (Control)

Push to turn on or off the SmartATP system.



NOTE

Turning on the system opens the water shutoff valve, tank valve (foam concentrate), and metering valve. Turning off the system initiates a flush sequence and then all valves close.

6.3.2.7 Foam % Up Button (Control)

Push to increase foam percentage.

6.3.2.8 Foam % Down Button (Control)

Push to close the metering valve, which decreases foam percentage.

6.3.2.9 Preset Menu Button (Control)

Push to change current screen display to the Preset Menu.

6.3.2.10 Prime System Button (Control)

Push to open the metering valve all the way. (Used to evacuate all air in the piping prior to operation.)

6.3.2.11 Flush Button (Control)

Push to run the flush sequence. (The operation runs for a set amount of time.)

Push again to cancel the flush sequence. (Terminates or bypasses the flush sequence.)

6.3.2.12 Instruction Button (Control)

Push to change current screen display to the Instruction Menu.

6.3.2.13 System Options Button (Control)

Push to change current screen display to the System Options screen.



6.3.3 OEM Menu Screen

The OEM menu screen (Figure 27 and Figure 28) provides the following controls, indicators, and navigation buttons. The following subparagraphs identify each item as a control, indicator, or a navigation button and provide a description of the item.

NOTES

Always restart the system (cycle power) after making changes in the OEM Menu.

The Draft Mode menu item is NOT displayed until Number of foam tanks is set to two (2) and Foam Tank Level Installed is set to Yes.

The Draft Mode menu item is displayed directly below the Tank Unit Used menu item.



Figure 27. OEM Screen Layout (Page 1)



Figure 28. OEM Screen Layout (Page 2)



6.3.3.1 Move Selection UP Button (Control)

Push to move selection arrow up to next menu item. Also scrolls the page to display menu items at top of the page.

6.3.3.2 Move Selection DOWN Button (Control)

Push to move selection arrow down to next menu item. Also scrolls the page to display menu items at bottom of the page.

6.3.3.3 Menu Item Selected (Indicator)

Indicates the menu item selected. The item can ONLY be changed while selected.

6.3.3.4 Plus Button (Control)

Push to increase value of selected item.

6.3.3.5 Minus Button (Control)

Push to decrease value of selected item.

6.3.3.6 Save (Control)

Push to save new value of selected item (or items).

6.3.3.7 System Options Button (Navigation)

Push to change current screen display to the System Options screen.

6.3.4 Instruction Screen

ATTENTION **A** WARNING

DO NOT EXCEED OPERATING PRESSURE LIMITS OF PUMP, INSTALLED PLUMBING, HOSE(S), OR EQUIPMENT IN USE.

NOTE

The system can still be controlled while in this screen.

Pushing the Instruction button (from the Operation Screen) displays the Instruction Screen, which provides additional system information.



Figure 29. Instruction Screen Layout



6.3.4.1 Discharge Flowrate (Indicator)

The Discharge Flowrate displays the current flow rate of discharge water (or foam solution) in GPM as monitored by the Hale discharge flowmeter.

6.3.4.2 Foam Flowrate (Indicator)

The Foam Flowrate displays the current flow rate of foam concentrate.

6.3.4.3 Suction Pressure (Indicator)

The Suction Pressure displays the current suction pressure in the pump. The gauge below shows the operational suction pressure range of the system.

6.3.4.4 Discharge Pressure (Indicator)

The Discharge Pressure displays the current discharge pressure in the pump. The gauge below shows the operational discharge pressure range of the system.

6.3.4.5 Pressure Rise (Indicator)

The Pressure Rise displays the difference in pressure between the suction and discharge pressure. The gauge below shows the operational pressure differential for the system.

6.3.4.6 Start/Stop Button (Control)

Push Start/Stop button to turn to Hale SmartATP system on or off.

6.3.4.7 INCR Button (Control)

The INCR button is context dependent (depends on the screen it is being displayed on) and increases the value of the associated parameter.

6.3.4.8 DECR Button (Control)

The DECR button is context dependent (depends on the screen it is being displayed on) and decreases the value of the associated parameter.

6.3.4.9 Home Button (Navigation)

Push the Home button to go to the Operation Screen or the Preset Menu.

6.3.4.10 Flush Button (Control)

Push to run the flush sequence. (The operation runs for a set amount of time.)

Push again to cancel the flush sequence. (Terminates or bypasses the flush sequence.)

6.3.4.11 Prime System Button (Control)

Push to open the metering valve all the way. (Used to evacuate all air in the piping prior to operation.)

6.3.4.12 Instruction/Tutorial Button (Navigation)

Push to display the Instruction Screen (or view an associated tutorial if one exists).

6.3.4.13 System Options Button (Navigation)

Push to display the System Options Screen.



6.3.5 Preset Menu

The display can be set up for up to six different specific hazards with different foam percentages for each hazard.





6.3.5.1 Preset Button 1 Thru 6 (Control)

Select the desired preset and the system will turn on to the desired foam percentage. The system will switch to the Operation Screen and resume normal operation.

6.3.5.2 Home Button (Navigation)

Push the Home button to toggle the display between the Operation Screen and the Preset Menu.

6.3.5.3 System Options Button (Navigation)

Push the System Options button to change the display to the System Options Screen.

6.3.6 System Options Screen



Figure 31. System Options Screen Layout

NOTES

The Date and Time is displayed centered at the bottom of the screen.

The system supply voltage is displayed (3 digit display accurate to one decimal place) next to the battery icon which are located immediately above the Date and Time.



6.3.6.1 Zero Total Water (Control)

Press the zero total water button to zero out the total water consumed display on the home screen.

6.3.6.2 Zero Total Foam (Control)

Press the zero total foam button to zero out the total foam consumed display on the home screen.

6.3.6.3 Autofill Operation (Navigation)

If the Autofill Operation icon is displayed, push the button to change the display to the autofill operation screen. (See paragraph 5.6.1, Enable Autofill - page 22, to enable Autofill operations.)

NOTE

If the Autofill icon is not present (Indicates the Autofill option is not enabled.), pressing this button will have no effect.

6.3.6.4 Flush Operation (Control)

Manually initiates a flush operation.

6.3.6.5 Calibration/Configuration (Navigation)

Opens up the password screen to input passwords to edit system settings/calibrate.

6.3.6.6 Maintenance Minder (Navigation)

The Maintenance Minder button will open up the maintenance recommendation screen.

6.3.6.7 Back to Previous Screen (Navigation)

The back to previous screen button will change the display screen back to the previous screen.

6.3.7 Autofill Operation Screen



Figure 32. Autofill Screen Layout

6.3.7.1 Instruction Button (Indication)

Push to see Valve % (open) and Pressure values.

6.3.7.2 Open Valve 100% Button (Control)

Press to open autofill valve to 100%. (Press again to return to automatic operation.)

6.3.7.3 Increase Desired Level Button (Control)

Press to increase desired tank level by 1/8 tank volume increments. (Available selections are from 3/8 of a tank to full tank.)



6.3.7.4 Decrease Desired Level Button (Control)

Press to decrease desired tank level by 1/8 tank volume increments. (Available selections are from full tank to 3/8 of a tank.)

6.3.7.5 Enable/Disable Button (Control)

Press to toggle between the current Autofill state and the alternant Autofill state. (Enables/Disables Autofill) (Shown disabled.)

6.3.7.6 Save Button (Control)

Press to save the new selected Desired Level.

6.3.7.7 Return Button (Navigation)

Press to return to System Options screen.

6.3.8 Warning Messages

Messages appearing on the display alert the operator to adverse conditions that could cause damage to Hale SmartATP system components, the apparatus, or which could cause personnel injury.

The messages appear on a color warning ribbon (red or blue) at the bottom of the screen.



Warning message location

Figure 33. Warnings (System Options Screen Layout)

This warning ribbon also contains an icon to inform the operator of the severity of the warning.

Informational



The warning ribbon will contain text informing the operator of what has happened, what will happen, or what the operator needs to do.



A warning message may be dismissed by touching the screen anywhere on the warning ribbon. If the warning is still active the warning message will appear again after the inhibit time has expired (configurable in the OEM Menu).

6.3.9 Typical Operational Procedure

ATTENTION A WARNING

ALWAYS FOLLOW PROPER OPERATING PROCEDURES. THE PUMP OPERATOR MUST BE FAMILIAR WITH THE PUMP OPERATING INSTRUCTIONS AS WELL AS OTHER OPER-ATING GUIDELINES FOR THE APPARATUS AND ACCESSORIES.

Always refer to your local AHJ procedure when using the SmartATP system. The Hale SmartATP operation should follow the procedure below during normal conditions:

- A. With truck at Idle, power on the SmartATP system.
- B. Select desired foam percentage.
- C. Increase pump to desired pressure.

IMPORTANT A NOTICE

PRIMING THE SMARTATP DISPLACES THE AIR IN THE FOAM SYSTEM WHICH WHEN PASSED THRU THE PUMP MAY CAUSE THE PUMP TO LOOSE PRIME.

NOTE

The lower the FOAM % setting the longer the system takes to prime.

D. Prime foam system until foam concentrate is coming out of a discharge.

IMPORTANT A NOTICE

IF THE PUMP LOOSES PRIME AS A RESULT OF PRIMING THE SMARTATP SIMPLY PRIME THE PUMP AGAIN.

DO NOT RUN THE PRIMER FOR MORE THAN 45 SECONDS. IF PRIME IS NOT ACHIEVED IN 30 - 45 SECONDS, STOP AND LOOK FOR AIR LEAKS OR BLOCKED SUCTION HOSE.

- E. Monitor SmartATP display, check pump is operating within proper pressure ranges and check foam tank level.
- F. Prior to system shutdown (or flushing operation), bring truck back to idle. Verify no foam is coming out of pump after flush operation.
- G. If foam is still present, initiate manual flush mode (see system settings) and flush system until foam is no longer present.
- H. SmartATP system turns off automatically.

ATTENTION A WARNING

A PRESSURE HAZARD MAY EXIST EVEN WHEN THE PUMP IS NOT RUNNING. PRIOR TO REMOVING HOSES OR CAPS FROM PUMP CONNECTIONS, RELIEVE PRESSURE BY OPENING DRAINS. BLEEDER VALVES SHOULD ALSO BE USED WHEN CONNECTING TO AN INTAKE FROM A PRESSURIZED SOURCE.



6.4. User Calibration

Calibration of the system may be required after major repairs or component changes are made to the Hale SmartATP foam system. Different viscosity foam concentrates may also require calibration.

6.4.1 Entering Passwords

System calibration and configuration is accomplished by accessing screens, which are protected via passwords.

To enter a password:

- A. Push MENU button.
- B. Push Calibration/Configuration button.
- C. Using touch screen keypad, enter desired password. See Table 7.
 - 1. Push Enter touch screen button to submit password.
 - 2. Perform from following as required.
 - a) Push Delete Last Digit touch screen button. (Erases the last digit entered.)
 - b) Push Delete All Digits touch screen button. (Erase all of the digits entered.)

When a valid password is submitted the screen will automatically change to the screen dictated by the password's value. If an invalid password is submitted the display will show an X across the password window for two seconds.



Figure 34. Entering A Password Sequence





Figure 34 Entering A Password Sequence – CONTINUED

Table 7 provides a comprehensive list of OEM passwords. Note that OEM should go into user manual and set language and units prior to calibration.

Password	Menu	Description	
1023	Preset Configuration	Configure presets to be displayed on Preset Menu.	
1515	Multiple Water Calibration	Set calibration factors for water flow	
1560	Foam Calibration	Set the calibration factor for the foam flow	
1717	Akron Electric Setup	Addresses Akron Valve (If Option Selected)	
1818	Akron Calibration	Calibrates Akron Valves (If Option Selected)	
1849	User Menu	Select language and units.	
1919	System Schematic	Shows Parts List	
2020	Autofill	Autofill operation (If Option Selected)	
2314	OEM Menu	Configure System Settings	
3564	Data Logger	Open Data logger to load data onto USB.	
5050	Troubleshoot Menu	Manually control all valves	
5804	Load Defaults	Reset display to factory settings	
6679	Single Water Calibration	Set calibration factors for water flow	
6906	Pressure Menu	Calibrate and adjust pressure settings.	
9292	Foam Tank A Calibration	Calibrate the tank level transducer for the foam tank.	
9494	Foam Tank B Calibration	Calibrate the tank level transducer for the foam tank.	
9999	Maintenance	Reset reminder Dates on maintenance screens.	

Table 7. Password List



6.4.2 Unit Of Measure

The SmartATP controller offers both English and Metric readouts. The Hale SmartATP system is factory calibrated using U.S. measurement (English) units. To change the unit of measure, go to the USER MENU (enter the password 1849 to go to the USER MENU).

Once on the USER MENU screen (Figure 35), there are four items displayed: Language, Unit Of Measure, Foam B Color, and Display Format. Change the Unit Of Measure as follows.





- A. Press Move selection arrow UP button or DOWN button to move selection arrow next to Unit Of Measure box.
- B. Press Select next value or Select previous value button as required to change Unit Of Measure. (Select English or Metric).
- C. Push SAVE (all selections) button.
- D. Push MENU button. (Return to Operation Screen.)
- 6.4.3 Water Flow Calibration For Single Tank

IMPORTANT A NOTICE

AN ACCURATE FLOW MEASURING DEVICE MUST BE USED TO MEASURE THE WATER FLOW WHEN CALIBRATING THE FLOW SENSOR. USE A SUITABLE SIZE, SMOOTH BORE NOZZLE AND AN ACCURATE AND CALIBRATED PITOT GAUGE INSTRUMENT OR MASTER FLOW METER. HAND HELD PITOT GAUGES ARE USUALLY NOT VERY ACCU-RATE. MAKE SURE THE SYSTEM IS CALIBRATED WITH AN ACCURATE FLOW MEASUR-ING DEVICE.

Enter Password 6679.





Figure 36. Water Flow Calibration Screen – Single Tank

6.4.3.1 Calibrate the Water Sensor

A. Use a smooth bore nozzle (of a known size) and a pitot with a pressure gauge or a master flowmeter to verify the accuracy of the discharge flowrate. Perform calibration ONLY if required.

NOTES

Record the pitot pressure and nozzle size or the flowrate value from the master flowmeter.

A high flowrate is 75% or higher of maximum expected water flowrate.

- B. Begin flowing water at a high rate.
- C. Touch chart icon, then input smooth bore size and pressure to determine flowrate if using pitot and pressure gauge. See Figure 36.
- D. Use High Water Flow Increase button or High Water Flow Decrease button to adjust high water flowrate value.
- E. Push Set High Water Flow button. (Locks in the calibration.)

NOTES

Record the pitot pressure and nozzle size or the flowrate value from the master flowmeter.

A low flowrate is 10-20% above the minimum expected flowrate.

- F. Begin flowing water at a low rate.
- G. Push chart icon, then input smooth bore size and pressure to determine flowrate if using pitot and pressure gauge.
- H. Use Low Water Flow Increase button or Low Water Flow Decrease button to adjust low water flowrate value.
- I. Push Set Low Water Flow button. (Locks in the calibration.)
- J. Push Save button. (When it appears.)



Record the calibrated values in Table 8. These values can be entered manually if the controller unit ever needs to be replaced.

	Flow Rate	Flow Pulses
High Rate Cal		
Low Rate Cal		

Table 8. Water Flow Calibration

6.4.4 Water Flow Calibration For Dual Tank

Enter Password 1515.



Figure 37. Water Flow Calibration Screen – Dual Tank

6.4.4.1 Selecting the Water Sensor

- A. Open valve you would like to calibrate and close all others.
- B. Run water through selected valve.
- C. Observe Paddle Frequency on flowmeter you are calibrating. (Reading increases, all others remain at 0.) See Figure 37.
- D. Touch Flowmeter Select soft button for sensor being calibrated. (Next to non zero frequency displayed.)
- E. Perform Water Flow Calibration For Single Tank procedure. (See paragraph 6.4.3 page 52.)
- F. Close calibrated valve.
- G. Open next valve to be calibrated and repeat Step A thru Step F until all valves are calibrated.



6.4.5 Foam Flow Calibration

IMPORTANT A NOTICE

SYSTEM SHOULD BE CALIBRATED AFTER INSTALLATION TO VERIFY VALUES WITH THE ACTUAL FOAM CONCENTRATE BEING USED. ONLY CALIBRATE USING ACTUAL FOAM CONCENTRATES. DO NOT USE WATER, TRAINING, OR TEST FOAMS FOR CALI-BRATION VERIFICATION.

Enter Password 1560.

Tota	lFoam	Foam Factor	
Start/Stop	Total Foam - Tank B		Total Increase
	0.13		Total Decrease Save Value
Information	Foam Calibration		System Options
	Metering Valve % Open	1	

Figure 38. Foam Flow Calibration Screen

6.4.5.1 Calibration Procedure

- A. Place a graduated measure container at suction side of system containing 500 gallons of foam concentrate.
- B. Using home screen, Push Prime System button to evacuate all air in suction side of system. (See paragraph 6.3.2.10, see page 42.)
- C. Refill container with 500 gallons of concentrate.
- D. Operate pump at a minimum of 150 psi. (Supplies the eductor with the motive flow pressure required for calibration.)
- E. Push Start/Stop button. (Starts the system.)
- F. Observe foam level (in graduated measure container).
- G. When graduated container is nearly empty, Push Start/Stop button. (Stops the system so the Total Foam data can be updated to display the correct volume of foam concentrate used.)
- H. Adjust reading in Total Foam display to match actual volume removed from graduated container as follows.
 - 1. To increase Total Foam displayed, Push Total Increase (INCR) button as required.



- 2. To decrease Total Foam displayed, Push Total Decrease (DECR) arrow button.
- 3. Push Save Value button.
- I. Repeat procedure to verify that setting is correct.
- J. Push Information Screen button. (Exits the foam calibration screen.)
- K. Record calibrated value in Table 9.





6.4.6 Foam Tank Calibration

- A. Enter password for foam tank A or foam tank B as follows.
 - 1. Enter Password 9292 for Foam Tank A.
 - 2. Enter Password 9494 for Foam Tank B.





6.4.6.1 Calibrate The Tank Level Sensor

- A. With tank empty, push Foam Tank Empty button. See Figure 39.
- B. Fill tank with approved foam.
- C. With tank full, Push Foam Tank Full button.
- D. Push Save Value button.
- E. Push System Options button and then return to Operation Screen. (Push home button.)



6.4.7 Pressure Sensor Calibration

Enter password 6906.

000000000	0.0	Ö
Minimum Intake Pressure		
Minimum Discharge Pressure 140 Maximum Discharge Pressure 300 Minimum Differential Pressure (%) 30		
Maximum Differential Pressure (%) 100 Intake Pressure Sensor 300 Discharge Pressure Sensor 300		
000000000	0.0	9

ZERO PRESSURE VALUES

Figure 40. Pressure Sensor Menu

6.4.7.1 Calibrate The Pressure Sensors

- A. Verify pressure at suction side of pump is 0 psi (atmospheric pressure).
- B. Verify pressure at discharge side of pump is 0 psi (atmospheric pressure).
- C. Press ZERO PRESSURE VALUES button. See Figure 40.
- D. Run pump and compare pressure values on SmartATP display with pumps master gauges.



6.4.8 Setting Presets

The SmartATP controller allows the department to configure up to six foam presets. Each preset allows for a different foam concentrate rate and foam tank.

Enter the password 1023. The controller will show the preset to configure selection screen (Figure 41).



Figure 41. Preset Configuration

Push the button next to the preset to configure (presets 1 through 6) and the display will show the presets configuration screen.

- Button 1 changes the color of the preset bar (green, red, orange, purple, blue, or DISABLED).
 DISABLED turns the preset OFF and it will not visible on the preset screen.
- Button 2 pops up on the screen keyboard so the preset text can be changed.
- Button 3 toggles the presets foam tank (tank A or B).
- Button 5 increases the presets foam concentrate percentage value.
- Button 6 decreases the presets foam concentrate percentage value. Button 7 toggles the remote activated value (YES or NO).

NOTE

Only one preset is selectable for remote activation.

- The SAVE button saves the presets configuration items to memory.
- The RETURN button moves back to the preset to configure selection screen.



7. PREVENTIVE MAINTENANCE

Regular preventive maintenance assures continued dependable operation.

7.1. Preventive Maintenance Plan And Schedule

Table 10 provides the preventive maintenance and inspections Hale Products requires to be performed as scheduled. The listed preventive maintenance, inspections and checks are required to ensure proper and economical operation and to minimize corrective maintenance.

Interval	Check/Test	Action Required	Item(s) Required			
After Eac	After Each Use					
	Flush	Flush pump thoroughly with clean water (See paragraph 7.2.1, Flush Operation.)	Supply of clean water			
	Connections	Inspect wiring, flow sensors and connections for tightness, corrosion, leaks and/or damage. (See paragraph 7.2.2, Check Connections.)	None			
Bi- Mont	Bi- Monthly (Every 2 Months)					
	Operate System	Operate foam system to move the foam con- centrate and prevent gelling. (See paragraph 7.3.1 Operate System.)	Supply of clean water Acceptable Foam			
	Paddlewheel Check	Inspect and clean paddlewheels to maintain accuracy. (See paragraph 7.3.2 Flowmeter Check.)	Soft bristle detailers brush O-ring lubricant			
Annually (Every 12 Months)						
	Calibrate	Verify foam flow calibration and water flow calibration. (See paragraph 7.4.1 Flow Calibration.)	Supply of clean water Acceptable Foam			

Table 10. Recommended Preventive Maintenance

7.2. Maintenance After Each Use

The following section lists out the preventive maintenance required after each use:

7.2.1 Flush With Clear Fresh Water

IMPORTANT A NOTICE

THE FOAM CHEMICAL CAN BE HIGHLY CORROSIVE AND POTENTIALLY DAMAGE THE PUMP IF LEFT INSIDE THE PUMP FOR AN EXTENDED PERIOD.

The pump and SmartATP system must be thoroughly flushed with clean fresh water after each use. Follow the flushing procedure below.

A. Prior to system shutdown or flushing operation, bring truck to idle.

ATTENTION A CAUTION

FAILING TO REDUCE SYSTEM PRESSURE BEFORE SYSTEM SHUTDOWN OR FLUSH- ING COULD RESULT IN WATER HAMMERING.



NOTE

Always flush the pump and SmartATP system with clear fresh water after pumping contaminated water or foam.

- B. Flush pump and SmartATP system as follows.
 - 1. Navigate to Operation Screen.
 - 2. Initiate flush sequence (Perform ONE of the following.).
 - a) Press Flush button. (Preferred method.)
 - b) Press Start/Stop button.(Stop initiates a flush sequence and then turns the system off.)
 - 3. Verify no foam comes out of pump discharge after flush operation completes.
 - 4. If foam is still present, initiate a manual flush and flush system until it flows clean as follows.
 - a) Navigate to System Options Screen.
 - b) Repeatedly press Flush button until system flows clean water.

NOTE

The standard flush time is 30 seconds. If this flush time is not adequate, navigate to the OEM Menu (Password 2314) and change the flush time.

7.2.2 Check Connections

After each use, inspect wiring, flow sensors and connections for tightness, corrosion, leaks and/or damage. If any electrical connections are unplugged, plug the connector into the appropriate device or harness connector. (Refer to SmartATP Technical Manual, FSG–MNL–00194.)

Check for leaks (air, water, or foam concentrate) or loose mechanical connections.

7.3. Bimonthly Maintenance

The following section lists out the preventive maintenance required bimonthly:

7.3.1 Operate System

Operate foam system to move the foam concentrate and prevent gelling. If the foam is allowed to remain unused for an extended period of time it can start to solidify and any unused or un-flushed foam can clog up the plumbing in the SmartATP system.

7.3.2 Flowmeter Check

Hard water and foam residue can build up overtime resulting in reduced paddlewheel rotation or stopping. Perform the following procedure to check the water and foam flowmeter paddlewheels.

NOTE

ONLY disconnect the flowmeter cable if required because the cable routing/mounting does not allow flowmeter removal.

- A. Match mark or note flowmeter orientation (specifically direction of flow indicator). See Figure 42.
- B. Using a 7/64-inch Allen wrench, remove four (4) flowmeter mounting screws.
- C. Remove flowmeter.





Figure 42. Flowmeter Check – Paddlewheel

- D. Inspect flowmeter paddlewheel as follows.
 - 1. If residue is present on paddlewheel, use a soft bristle detailers brush to remove residue completely.
 - 2. If paddlewheel is broken, corroded, or otherwise damaged, replace the flowmeter. (Refer to SmartATP Technical Manual, FSG–MNL–00194.)
- E. Lubricate O-rings (Use Synthetic Multi Purpose Clear O-ring Lubricant Synthetic NLGI Grade 2 Heavy- Duty, Multi Purpose.)
- F. Install flowmeter according to match marks/notes.
- G. Install four (4) flowmeter mounting screws.
- Using a 7/64-inch hex socket and torque wrench, torque screws to 7.5 in-lbs. (0.85 Nm).

NOTE

If this check continuously finds residue the standard flush time (30 seconds) is not adequate, navigate to the OEM Menu (Password 2314) and increase the flush time.

7.4. Annual Maintenance

The following section lists out the preventive maintenance required annually:

7.4.1 Flow Calibration

Proper calibration is critical to the accuracy of the SmartATP system; therefore, it is recommended that every year the system is to be recalibrated. Both the water and foam flowmeters must be calibrated every year.

- For water flow calibration, perform the procedure in paragraph 6.4.3 (single tank) or 6.4.4 (dual tank).
- For foam flow calibration, perform the procedure in paragraph 6.4.5.

7.5. Extreme Conditions Maintenance Guidelines

Extreme conditions occur when the pump has been operated during freezing weather or when pumping unapproved foam. Extreme conditions indicate a need for increased maintenance.

7.5.1 Freeze Protection

Cold weather transport and cold weather storage of SmartATP systems require the following.



When transporting the completed fire apparatus from the OEM to the dealer, and the dealer to the end-user, or, when the end-user decides to store the finished apparatus in an unheated area subject to below freezing temperatures, a SmartATP winterization process must be used.

Any water and/or foam concentrate that is in the foam concentrate reservoir and associated foam system piping/tubing will freeze and then break system components when the system is subjected to subfreezing temperatures commonly found in over-the-road driving during fire truck delivery and transport. The following precautions must also be taken by OEMs, end-users, re- sellers, fire truck dealers, transport agencies, etc., that will be transporting and/or storing the apparatus in below freezing temperatures:

- A. Drain foam concentrate storage reservoir in accordance with safe foam concentrate handling practices as outlined by foam concentrate manufacturer. If foam reservoir is filled with only water, completely drain storage compartment of water.
- B. When empty, close all drain valves.
- C. Drain fire pump, valves and fire pump system accessories.

The foam system is now winterized and ready for cold weather duty transport and/or cold weather storage. After transport, prior to the placing the unit in service fill the foam reservoir with a Hale approved compatible foam concentrate.

7.5.2 Unapproved Materials

If the SmartATP system is used to move an unapproved liquid (unapproved foam, salt water, etc.) be sure to thoroughly flush the system and pump with fresh water immediately. Inspect unit for any evidence of corrosive damage or leaks.

7.6. On Screen Maintenance

The SmartATP controller keeps track of the maintenance intervals automatically through the on screen Maintenance Minder. View the Maintenance Minder from the System Options Screen and then pushing the Maintenance Minder button. See Figure 43.



Figure 43. Navigate To Maintenance Minder Screen




MAINTENANCE MINDER button

Figure 43. Navigate To Maintenance Minder Screen – CONTINUED

The Maintenance Minder screen contains two intervals: two months and 12 months. (NOTE: The one month interval is now obsolete but may appear on older units until the units software is updated.) The screen shows the due date of each interval and a pie chart for a visual indication of how much time is remaining before the interval maintenance is due. See Figure 44.





7.6.1 Maintenance Due Indication

The SmartATP UltraView displays a full screen message if maintenance is due when the system powers on (see Figure 45). This reminds the operator to check the Maintenance Minder page and complete the required maintenance. Touch anywhere on the screen or any button to dismiss this message (the message disappears until the system energizes again).





Figure 45. Maintenance Minder Warning

When scheduled (preventive) maintenance becomes due, an exclamation mark is superimposed on the maintenance minder icon on the System Options Screen. Press the Maintenance Minder button to navigate to the Maintenance Minder screen to determine what maintenance is due.

The screen indicates what maintenance is due, by changing the due date field to display the word DUE (in red capital letters) and the associated pie chart indicates a fully red circle. See Figure 46. Touch the ① (more information) icon of a maintenance interval to see what maintenance is required.

7.6.2 Resetting Maintenance Interval Due Dates

Reset a maintenance interval by entering the password 9999 in the password entry screen (Calibration/Configuration button on the System Options Screen) and then touch the associated maintenance reset icon shown on the Maintenance Minder screen. Touching the Maintenance Reset icon (Figure 46) next to the maintenance interval desired resets the interval to set/display the new due date.



Figure 46. Maintenance Reset Icons



8. TROUBLESHOOTING

Table 11 shows symptoms, potential causes, and remedies of potential issues with the foam system. If your issue is not on this list, see the SmartATP Technical Manual (FSG-MNL-00194) or contact Hale Customer Support (800–533–3569).

SYMPTOM	CAUSE	REMEDY	
Error Message Displayed At Power On (Foam Tank X is LOW!)	Foam tank X is empty (X can be Tank A or Tank B)	Foam tank X is empty (X can be Tank A or Tank B)	
Error Message Displayed (Metering Valve Increasing to Regain Prime)	Foam tank X is empty (X can be Tank A or Tank B)	Fill foam tank(s)	
	Metering Valve NOT opening	System fault – refer to Technical Man- ual (FSG-MNL-00194)	
Error Message Displayed (Metering Valve Lost Prime)	Foam tank X is empty (X can be Tank A or Tank B)	Fill foam tank(s)	
	Prime lost	Prime foam system until foam comes out of discharge(s)	
	Metering Valve NOT opening	System fault – refer to Technical Man- ual (FSG-MNL-00194)	
Error Message Displayed (Metering Valve Open 100% but desired foam percentage not achieved)	Desired percentage is not ob- tainable at operating water flow rate.	Lower water flow to reach desired foam percentage	
Error Message Displayed (Communication Loss)	Terminating resistor unplugged	System fault – refer to Technical Man- ual (FSG-MNL-00194)	
Error Message Displayed (No Foam Tank X)	Foam tank X is empty (X can be Tank A or Tank B)	Fill foam tank(s)	
	Foam Tank NOT calibrated	Perform foam tank calibration (see paragraph 6.4.6 – page 56)	
Error Message Displayed (No Water flow)	Verify water flow connections	Check pump for: valve positions (suc- tion and discharge sides), water source, loss of prime, etc.	
	Water flow NOT calibrated	Perform water flow calibration(s) (see paragraph 6.4.3 – page 52 or paragraph 6.4.4 – page 54)	
Error Message Displayed (Desired foam flow rate below minimum of system)	Desired Percentage is not ob- tainable at operating water flow rate.	Increase water flow to reach desired foam percentage	
Error Message Displayed (Suction Pressure Too High)	Suction Pressure is too high to run system.	Decrease suction pressure to run sys- tem	
	Pressure sensor values NOT ac- curate	Perform water pressure calibration(s) (see section 6.4.7 – page 57)	

Table 11. Hale SmartATP Operator Troubleshooting



Table 11	Hale SmartATP Operator Troubleshooting - CONTINUED
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SYMPTOM	CAUSE	REMEDY
Error Message Displayed (Discharge Pressure Too High)	Discharge pressure is too high to safely run system	Decrease discharge pressure to run system
	Pressure sensor values NOT ac- curate	Perform water pressure calibration(s) (see section 6.4.7 – page 57)
Error Message Displayed (Discharge Pressure To Low)	Discharge Pressure is too low to operate system.	Increase discharge pressure to run system
	Pressure sensor values NOT ac- curate	Perform water pressure calibration(s) (see section 6.4.7 – page 57)
Error Message Displayed (Autofill Level is below Desired)	Tank Level is significantly below desired level.	Reduce water flow (using water faster than filling the tank)
No Foam Flow	System NOT primed	Prime foam system until foam comes out of discharge(s)
	Check Valve installed incorrectly	System fault – refer to Technical Man- ual (FSG-MNL-00194)
	Eductor installed incorrectly	System fault – refer to Technical Man- ual (FSG-MNL-00194)
	Metering valve stuck closed	If in operation: Open with manual override Otherwise: System fault – refer to Technical Manual (FSG–MNL–00194)
	Water Shutoff/Tank A (or B) Solenoid stuck closed	Verify air supply on and connected
		Verify harness connection are seated
	Water Shutoff/Tank Solenoid closing when system on //opening when system off	Swap associated open and close sole- noid connectors
		Otherwise: System fault – refer to Technical Manual (FSG–MNL–00194)
	No foam in foam tank	Refill foam tank
No Foam Flow Reading (But foam is being distributed)	Foam Sensor improperly in- stalled	Verify harness connection are seated Otherwise: System fault – refer to Technical Manual (FSG–MNL–00194)
Erroneous Water/Foam Flow readings	Turbulence in flow	System fault – refer to Technical Man- ual (FSG-MNL-00194)
	Bad Calibration	Calibrate flow sensors. (See Sec- tion 6.4, page 50.)
	Residue build up on sensor	Perform Flowmeter Check (See para- graph 7.3.2, page 60.)
No Water Flow Reading	Water Flow Sensor	Verify system programming
(But pump is flowing)		Verify harness connections are seated
		Otherwise: System fault – refer to Technical Manual (FSG–MNL–00194)



SYMPTOM	CAUSE	REMEDY
Poor System Max Performance	Suction lift is too high	Reduce lift to < 1.2 m (4 FT) See Table 5 page 39.
	Hydro and/or air leak in eductor plumbing	Locate and seal leak
Erroneous Tank Level Reading	Bad calibration	Calibrate Foam Flow (see Sec- tion 6.4.5, page 55.)
	Dirt in tank	Clean the tank
	Dirt in sensor	Clean opening in sensor
No Tank Level Reading	Tank Level Sensor	Verify harness connection is seated Otherwise: System fault – refer to Technical Manual (FSG–MNL–00194)
Erroneous Pressure Reading	Bad pressure calibration	Calibrate Pressure Sensor (see Sec- tion 6.4.7, page 57.)
	Failed pressure sensor	System fault – refer to Technical Man- ual (FSG-MNL-00194)
No Pressure Reading	Pressure Sensor	Verify harness connections seated
		System fault – refer to Technical Man- ual (FSG-MNL-00194)
Display Does Not Turn On	Source power not on	Verify power supply/system is on
		Verify fuse is not failed
	Display improperly connected	Verify harness connections are seated

Table 11.	Hale SmartATP Operator Troubleshooting – CONTINUED

NOTE: Report ALL abnormal/intermittent conditions to AHJ for maintenance action assignment.



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APPENDIX A. MANUFACTURER'S INFORMATION

This section provides a list that includes the name, address, and telephone number of the manufacturer's points of contact. Each provides the name address and telephone number of the manufacturer's representative and/or service organization that can provide replacements and is most convenient to the project sight.

Additionally, included herein is warranty information.

MANUFACTURER'S INFORMATION

Division	Address	Telephone
Class 1	Mailing: 607 NW 27th Ave, Ocala, FL 34475	(800) 533-3569
	Email: https://www.haleproducts.com	
Hale Products	Mailing: 607 NW 27th Ave, Ocala, FL 34475	(800) 533-3569
	Email: https://www.haleproducts.com	
Godiva LTD (A Unit of IDEX Corp.)	Mailing: Charles Street Warwick, England, CV34, 51 R	Tel: +44 (0) 1926 623600
	Email: godiva@idexcorp.com	FAX: +44 (U) 1926 623666

WARRANTY

See the Hale website (www.haleproducts.com) for product specific warranty and warranty procedures.