



ELECTRONIC MIX SOLUTIONS

Plural Component Mixing System

Operation Manual



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In this part sheet, the words **WARNING**, **CAUTION** and **NOTE** are used to emphasize important safety information as follows:

⚠ WARNING
 Hazards or unsafe practices which could result in severe personal injury, death or substantial property damage.

⚠ CAUTION
 Hazards or unsafe practices which could result in minor personal injury, product or property damage.

NOTE
 Important installation, operation or maintenance information.

⚠ WARNING

Read the following warnings before using this equipment.



READ THE MANUAL

Before operating finishing equipment, read and understand all safety, operation and maintenance information provided in the operation manual.



WEAR SAFETY GLASSES

Failure to wear safety glasses with side shields could result in serious eye injury or blindness.



DE-ENERGIZE, DEPRESSURIZE, DISCONNECT AND LOCK OUT ALL POWER SOURCES DURING MAINTENANCE

Failure to De-energize, disconnect and lock out all power supplies before performing equipment maintenance could cause serious injury or death.



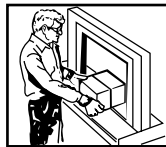
OPERATOR TRAINING

All personnel must be trained before operating finishing equipment.



EQUIPMENT MISUSE HAZARD

Equipment misuse can cause the equipment to rupture, malfunction, or start unexpectedly and result in serious injury.



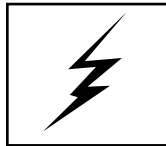
KEEP EQUIPMENT GUARDS IN PLACE

Do not operate the equipment if the safety devices have been removed.



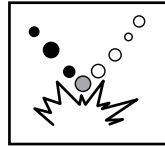
HIGH PRESSURE CONSIDERATION

High pressure can cause serious injury. Relieve all pressure before servicing. Spray from the spray gun, hose leaks, or ruptured components can inject fluid into your body and cause extremely serious injury.



STATIC CHARGE

Fluid may develop a static charge that must be dissipated through proper grounding of the equipment, objects to be sprayed and all other electrically conductive objects in the dispensing area. Improper grounding or sparks can cause a hazardous condition and result in fire, explosion or electric shock and other serious injury.



PLURAL COMPONENT MATERIALS HAZARD

Because of the vast number of chemicals that could be used and their varying chemical reactions, the buyer and user of this equipment must determine all facts relating to the materials used, including any of the potential hazards involved.



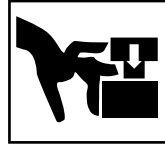
NOISE HAZARD

You may be injured by loud noise. Hearing protection may be required when using this equipment.



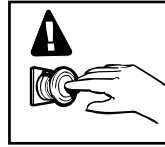
FIRE AND EXPLOSION HAZARD

Improper equipment grounding, poor ventilation, open flame or sparks can cause hazardous conditions and result in fire or explosion and serious injury.



PINCH POINT HAZARD

Moving parts can crush and cut. Pinch points are basically any areas where there are moving parts.

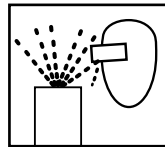


KNOW WHERE AND HOW TO SHUT OFF THE EQUIPMENT IN CASE OF AN EMERGENCY



PRESSURE RELIEF PROCEDURE

Always follow the pressure relief procedure in the equipment instruction manual.



PROJECTILE HAZARD

You may be injured by venting liquids or gases that are released under pressure, or flying debris.



TOXIC FLUID & FUMES

Hazardous fluid or toxic fumes can cause serious injury or death if splashed in the eyes or on the skin, inhaled, injected or swallowed. **LEARN** and **KNOW** the specific hazards or the fluids you are using.



PROP 65 WARNING

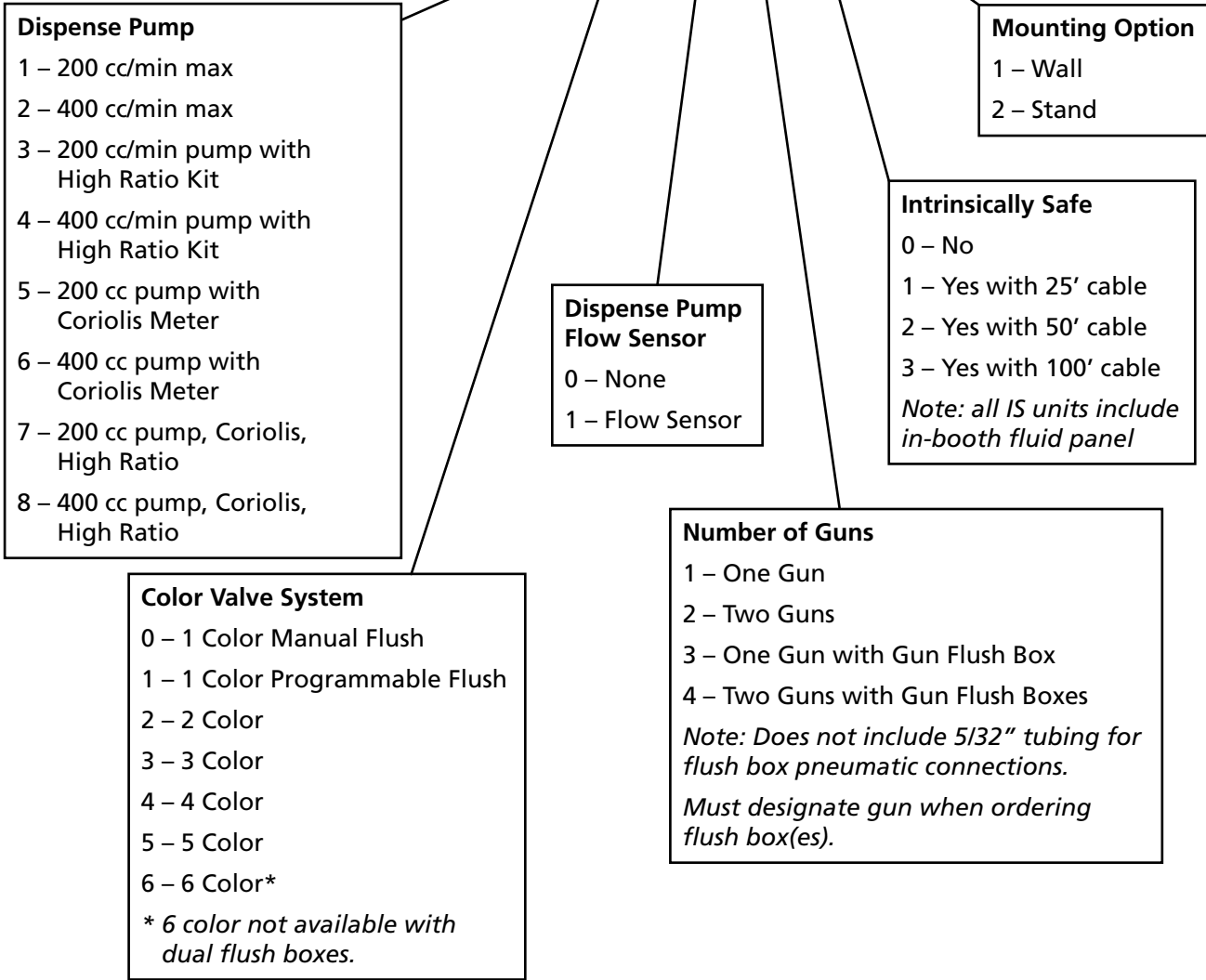
WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

IT IS THE RESPONSIBILITY OF THE EMPLOYER TO PROVIDE THIS INFORMATION TO THE OPERATOR OF THE EQUIPMENT.

FOR FURTHER SAFETY INFORMATION REGARDING BINKS AND DEVILBISS EQUIPMENT, SEE THE GENERAL EQUIPMENT SAFETY BOOKLET (77-5300).

1.1 System Part Numbering

E20-161302



If the example number shown above – E20-161302 – was ordered the customer would receive the following:
 E20 system with 200cc Dispense Pump, 6 colors, with a Dispense Pump flow sensor, one gun with gun flush box, no intrinsic safety, mounted to a stand.

Accessories for Binks EMS (may be added at factory):

- Beacon Light. For 360 degree visibility of in-use / alarm indication
- Pre-wired solenoid stacks for future system expansion
- Solvent Flow Meter. Measure the volume of solvent used for flushing

Part Number	E20-1108	E20-1109	E20-1112	E20-1113	E20-1117	E20-1162
Description	Solenoid Stack A11-A15	Solenoid Stack A16-A19	Gun In Box Pressure Switch 1	Gun In Box Pressure Switch 2	Solvent Meter	Beacon Light

2.1 Technical Specifications

ELECTRONIC MIX SOLUTIONS

The Binks EMS system is designed to accurately mix most two component paints. It will supply any low- pressure manual or automatic spray gun and can easily handle very low flow rates or high ratio materials (greater than 20:1). The system uses real time metering to accurately dispense and mix the resin and hardener on-ratio regardless of varying flow rate as seen in real world paint applications such as feathering or rapid triggering with manual guns.

Binks EMS units are configurable with many popular options such as use with up to 6 colors, programmable flushing, a Dispense Pump flow sensor, in-booth fluid panel capability, and gun flush boxes. The system can provide accurate resin and hardener dispensing from 1:1 to 100:1 ratios. The high flow capability mated with the control hardware and software allows use with two spray guns simultaneously.

The system is easily set up and operated with front panel switches and a 24-key control pendant with a 3.8 inch monochrome screen. Manipulation of system parameters is restricted via password protection.

TECHNICAL SPECIFICATIONS		
Max Working Air Pressure	130 psi	9 bar
Optimal Working Air Pressure	75–100 psi	5.2–6.9 bar
Max Inlet Fluid Pressure	250 psi	17.2 bar
Max Dispense Pump Flow Rate	6.8 or 13.6 oz/min	200 or 400 cc/m
Min Dispense Pump Flow Rate	0.7 or 1 oz/min	2 or 30 cc/min
“A” Side Flowmeter Range	2.4–67.6 oz/min	70–2000 cc/min
Operating Temperature Range	41–122 Fahrenheit	5–50 Celsius
Weight of the Unit	100–150 lbs.	45–68 Kg
Viscosity Range of Fluid	20–3000 cPs	
Mixing Ratio Range	1:1–100:1	
Ratio Tolerance Range	Up to +/- 1%	
Wetted Parts	300 series stainless steel, PTFE, perfluoroelastomer, FEP	
External Power Requirements	95-132 VAC, 50–60Hz. 8 Amp, 14 AWG power supply wire gauge	
Environmental	Indoor use, pollution degree (2)	

2.2 Features

THE BINKS EMS HAS UNIQUE FEATURES THAT YIELD SUPERIOR MIXING PERFORMANCE:

Continuous Flow—The mix manifold is designed to optimize mix quality and minimize internal volume by receiving Resin (Component A) and Hardener (Component B) continuously—not in alternating “doses”.

Accurate Dispensing—Control and positioning of the metering Dispense Pump is precise. An electronically controlled stepper motor with internal worm gear and shaft allow for adjustable dispense speeds while maintaining accuracy.

Ease of Use—The control Pendant is simple to learn, and efficient to use. It allows easy control of the unit, along with real time data feedback and in-depth troubleshooting when alarms occur.

Versatile Configurations— The machine has the ability to accept up to six different resins, and can be configured with manual or programmable flushing. It also allows the use of up to two Gun Flush Boxes.

Intrinsically Safe Option— An intrinsically safe option enables the fluid panel to be mounted in a spray booth. This minimizes the waste produced by color changes.

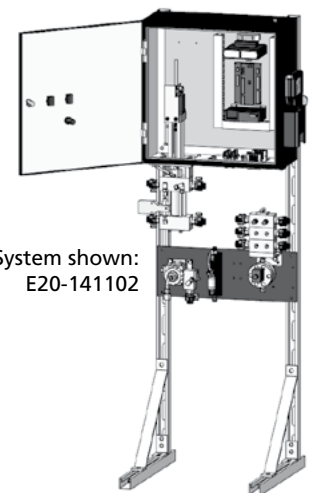
Programmable Flushing— Set unique flushing options specific to material needs.

Mounting Options— The control enclosure can be mounted to a pedestal floor stand for mobility, or it can be ordered with a wall mount to be plumbed into an existing workspace.

Low Flow Capability—The design of the Dispense Pump allows for low hardener flow rates. Very high mix ratios at low flow rates can be achieved. The standard 200cc Dispense Pump can accurately dispense hardener as low as 2cc per minute.

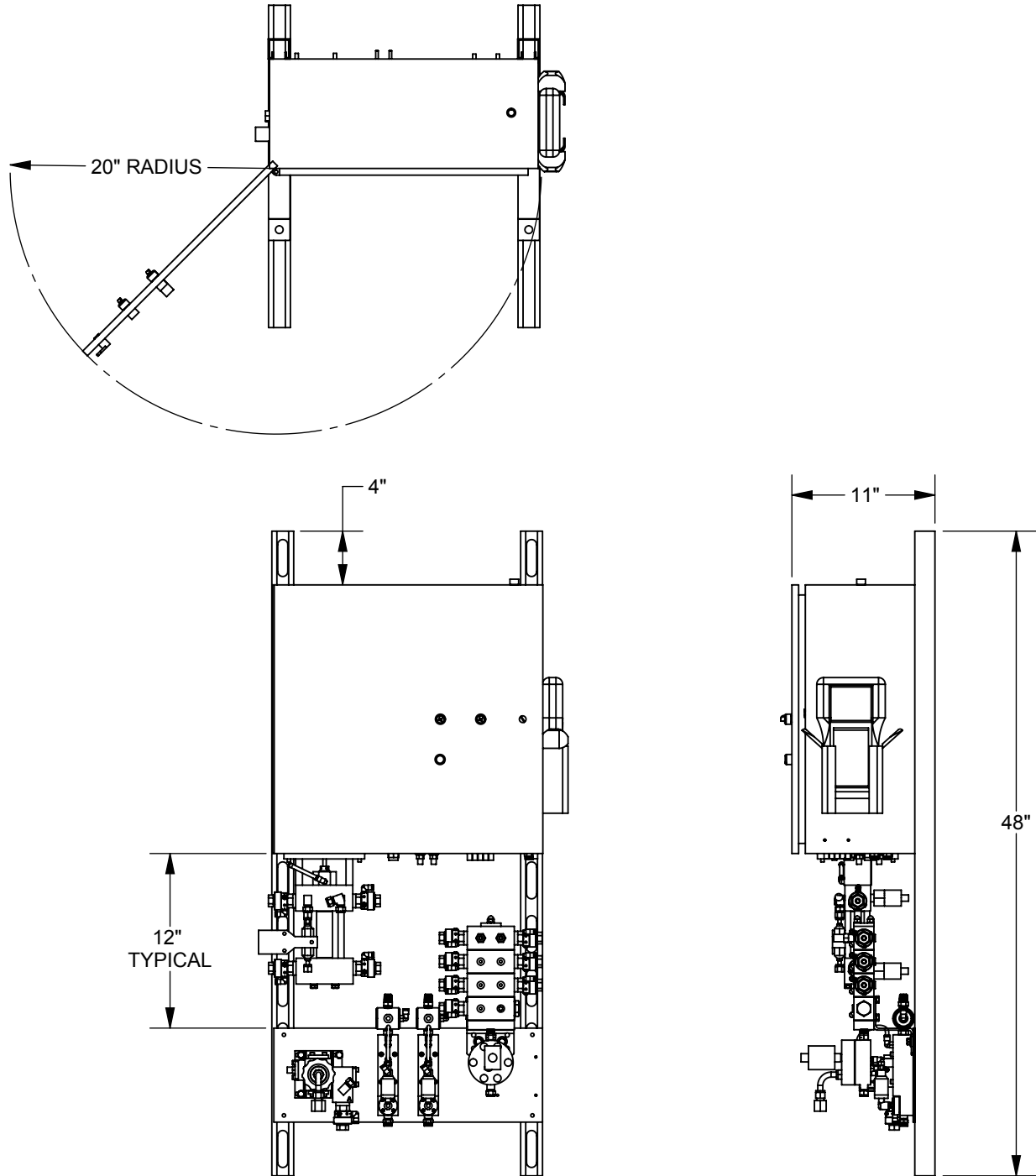
Alarm Warnings—The built in alarm system warns the user of system errors and suggests possible solutions. Help screens provide troubleshooting information to remedy system alarms.

Modular Design—All fluid panel sub-assemblies are easily and quickly removed for maintenance and repair.



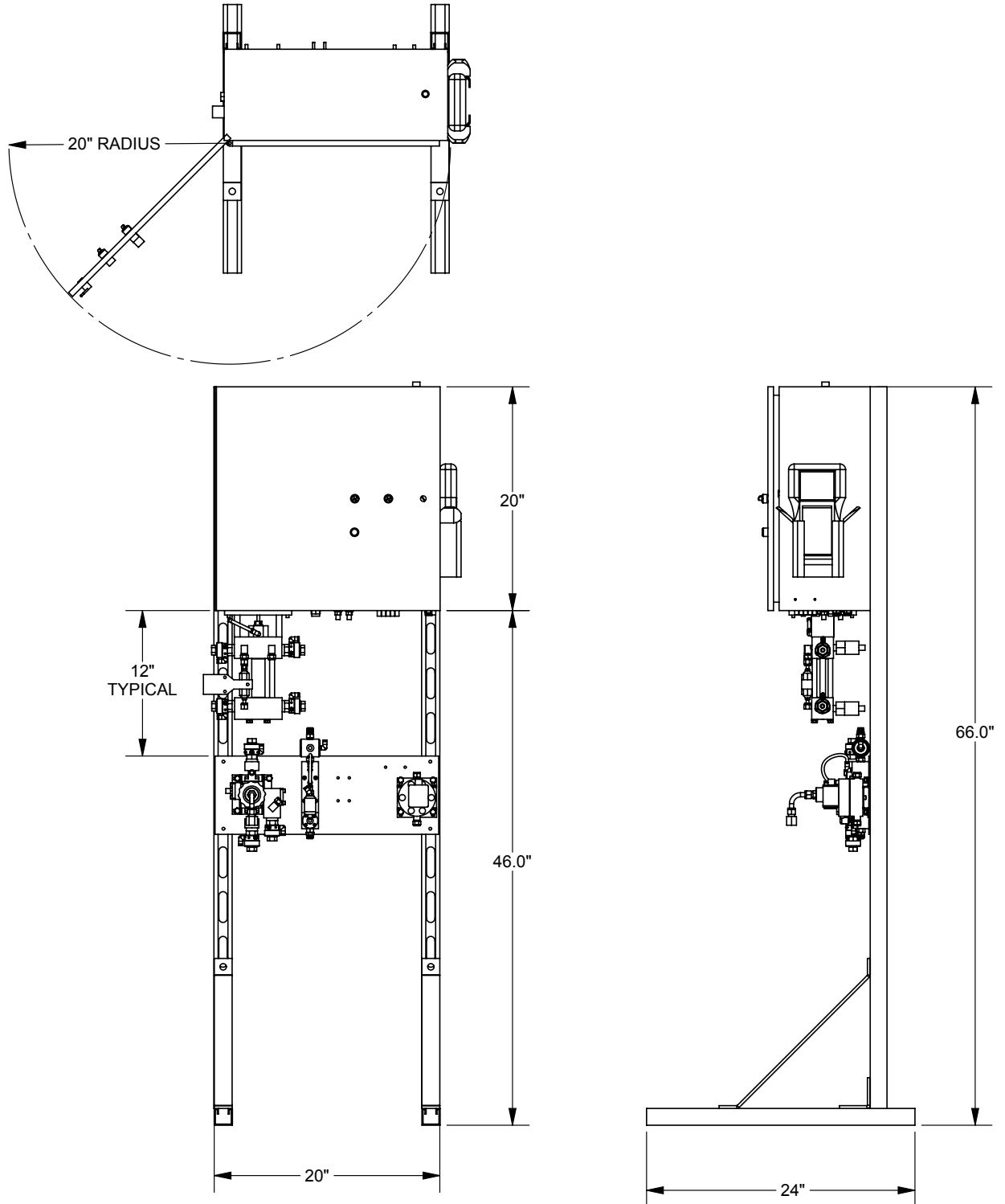
System shown:
E20-141102

3.1 Overall Dimensions—shown with standard wall mount

**Wall mounting requirements:**

- Ensure wall is able to support weight of complete system, including air and fluid hoses and other connected devices. (Minimum 200 lbs. [91 kg])
- Ensure clearance for electrical and fluid connections to unit, and door swing radius.
- Bolt frame sections to wall or panel using minimum 4 each of 3/8" lag screws or cap screws with flat washers.

3.2 Overall Dimensions—shown with optional floor stand



Floor stand requirements:

- Bolting stand to floor or platform is highly recommended. Use minimum 4 each of 3/8" lag screws or anchors with flat washers.

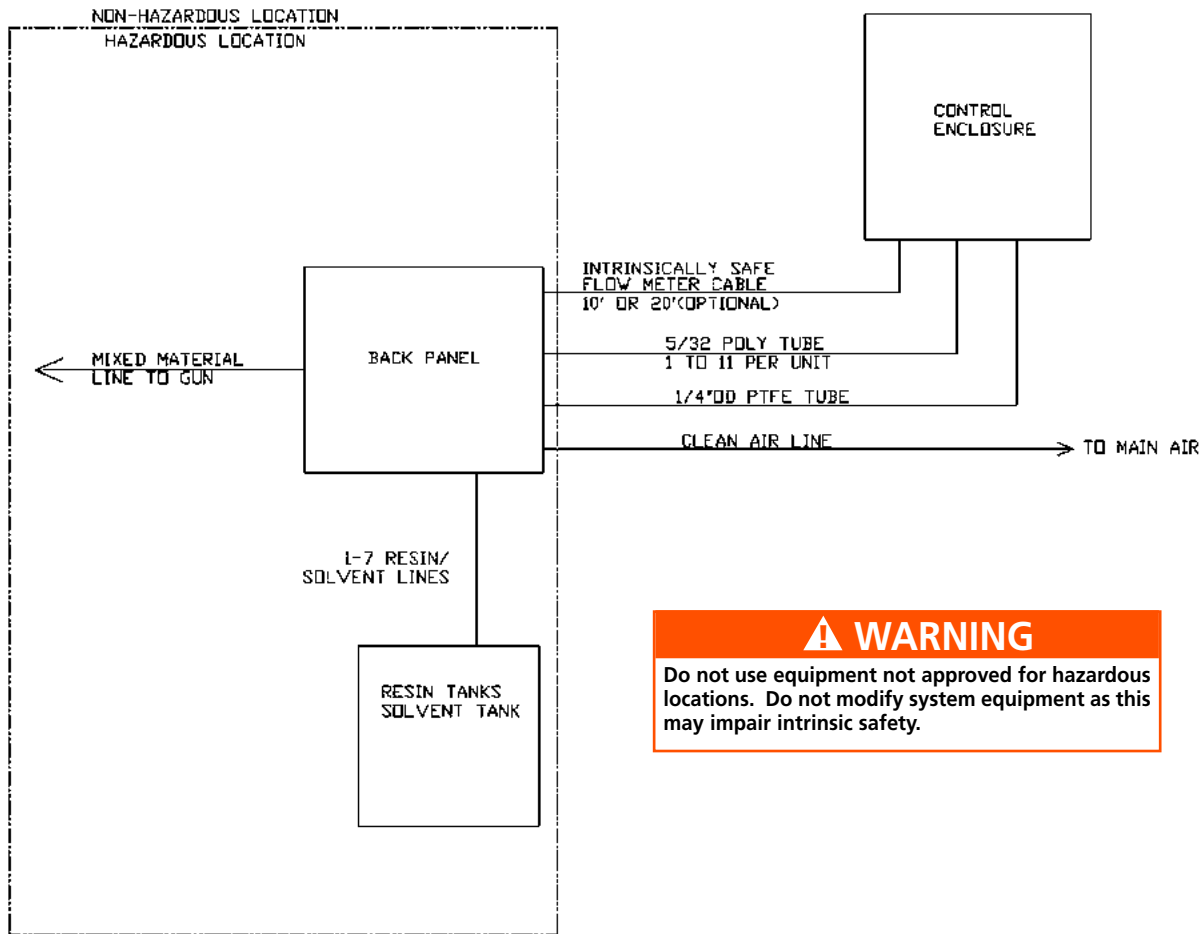
4.1 Installation Diagram for Hazardous Locations

Class 1, Div 1, Group D, T3 (US and Canada)
 Class 1, Zone 1, Group IIA, T3 (ATEX only)

⚠ WARNING

Before performing electrical, air, and fluid connections to the Binks EMS, be sure to understand and verify all requirements for installation, including but not limited to: electrical codes, OSHA requirements, NFPA requirements, and all applicable local codes and ordinances.

Read and understand all operating manuals for connected equipment. Do not supply the Binks EMS with higher fluid or air pressures than recommended in the technical specifications section of this manual.



⚠ WARNING

Do not use equipment not approved for hazardous locations. Do not modify system equipment as this may impair intrinsic safety.

INTRINSICALLY SAFE INSTALLATION REQUIREMENTS

All electrical work must be completed by a qualified electrician and comply with all local and national codes and regulations. Fused power disconnect switch is not included with system but is required for installation.

Control enclosure cannot be placed in a hazardous location.

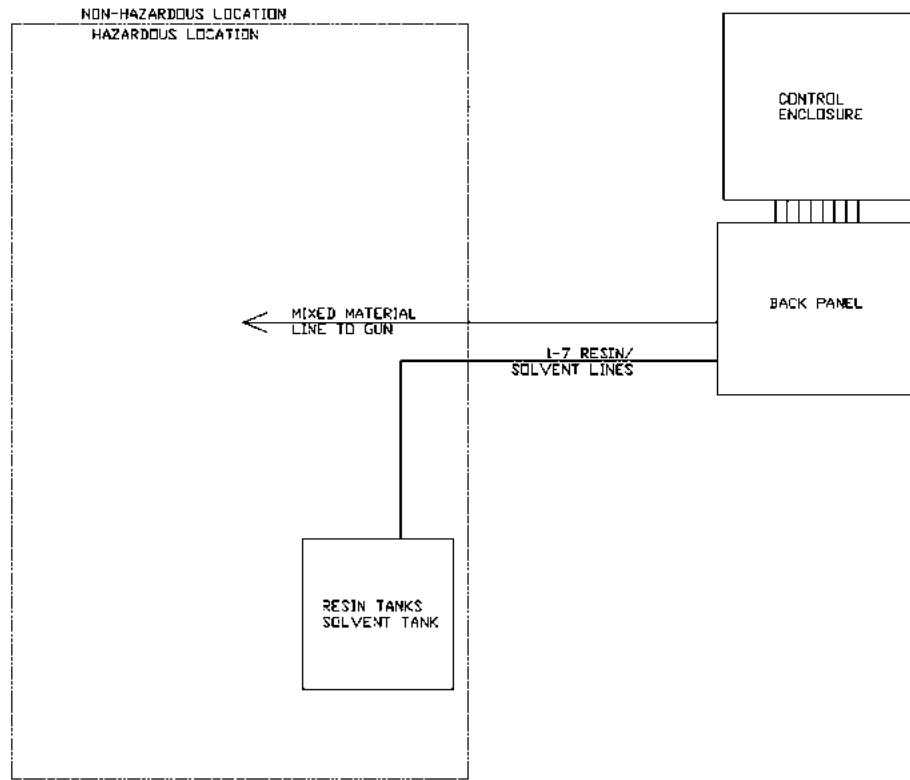
Power requirements for the Binks EMS are 95-132 VAC 50-60Hz 15 Amp 8-14 AWG.

The installation is required to meet the standards of the National Electric Code, NFPA requirements, and all other locally enforced codes.

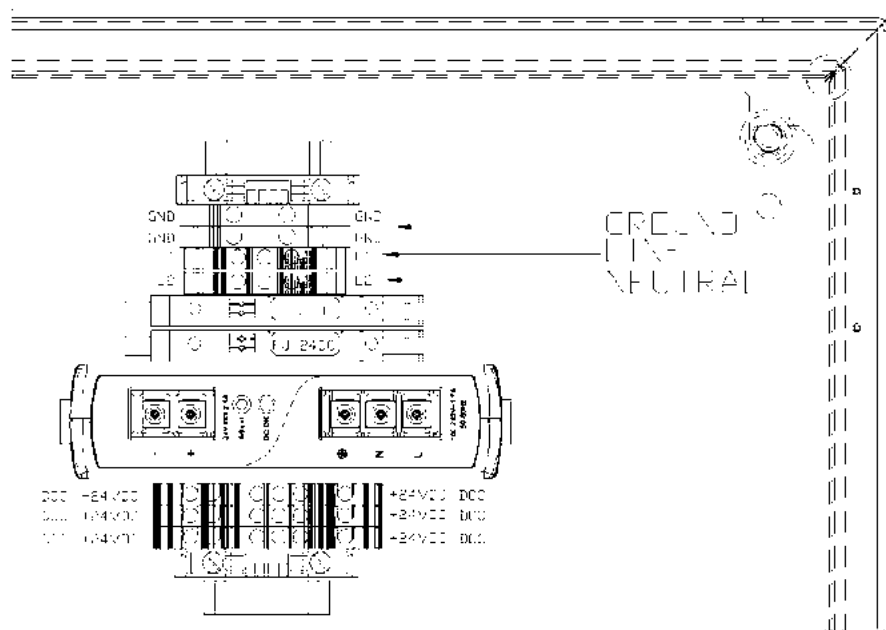
Multiple earthing of components is allowed only if high integrity equipment potential system realized between the points of bonding.

4.2 Installation Diagram for Non-Hazardous Locations

Wall or stand-mounted systems



4.3 Connecting Direct Power

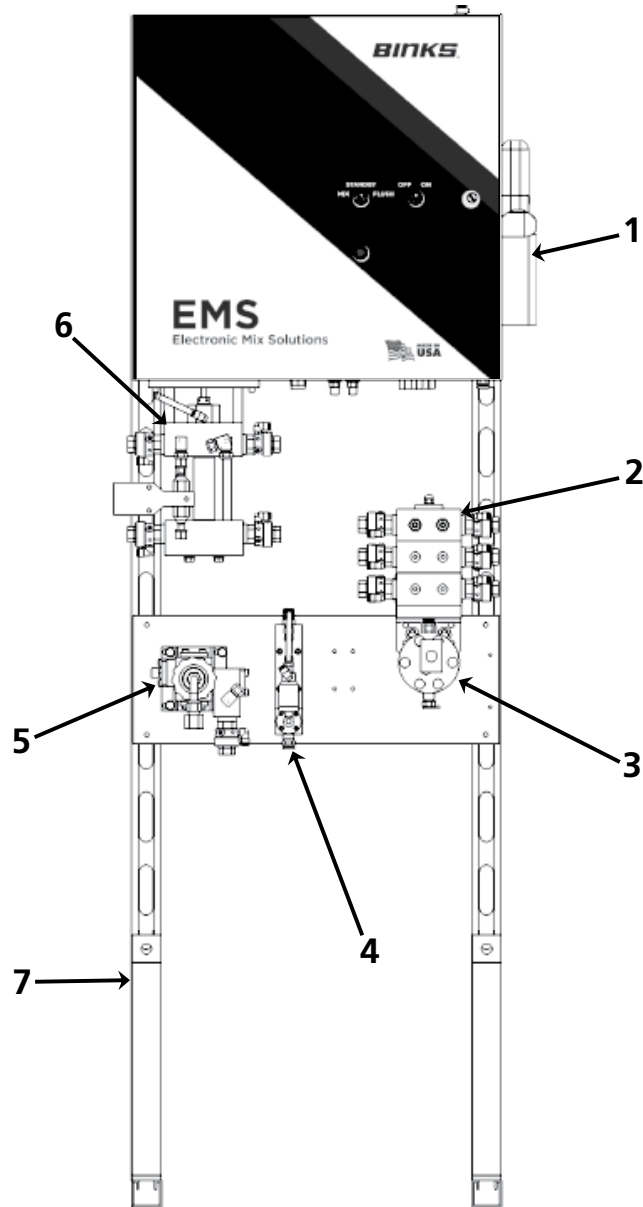


Top right corner view of control enclosure interior

If direct connection to power disconnect is preferred over 3-prong power cord, connect power as follows:

1. Use existing 7/8" diameter hole on top right of control enclosure as the power port.
2. Use a compatible cord grip / strain relief.
3. Connect power cord to the appropriate terminals as shown at left.
4. For the complete electrical schematic please see the electrical diagram section in the Binks EMS Maintenance and Repair Manual 77-2981.

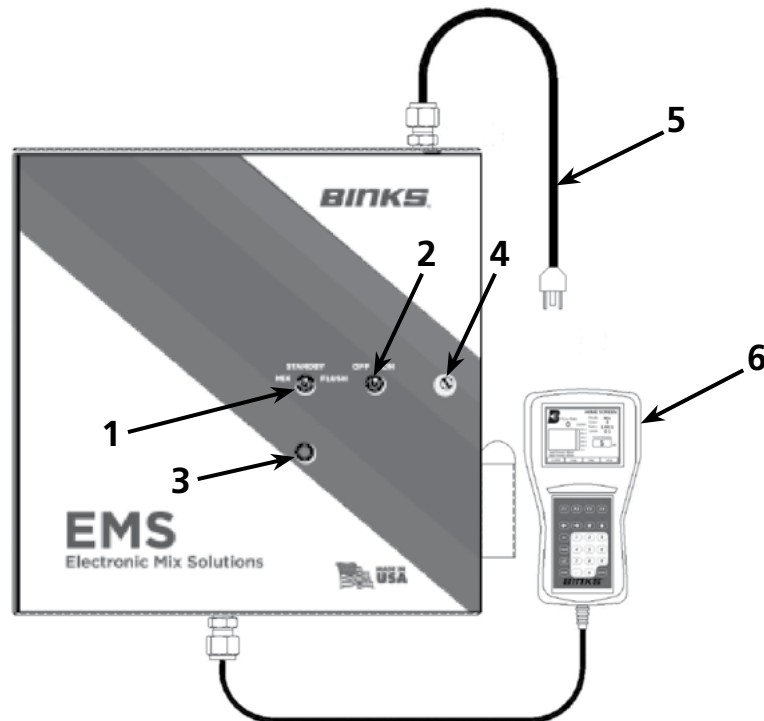
5.1 Component Overview



ITEM	DESCRIPTION
1	Control Pendant with 3.8" monochrome screen and 24 key input.
2	Color Stack. A series of valves and manifold blocks for up to 6 different resin colors, compressed air push and solvent flush valves.
3	Gear flow meter with up to 2000 cc / min output. Coriolis flow meter is optional.
4	Air Flow Switch. Gun atomizing air flow through these switches will tell the controller to look for resin flow. If used with flush boxes, the switches will connect to an upstream valve to shut off atomizing air for flushing.

ITEM	DESCRIPTION
5	Mix Manifold. Three versions available: <ul style="list-style-type: none"> ■ Mix Manifold for Multicolor—used with multi-color valve stack (shown) ■ Programmable Flush for single color systems ■ Manual flush for single color systems
6	Dispense Pump. Driven by the motor in the control enclosure, the Dispense Pump flows the calculated volume of hardener to the mix manifold to provide the correct ratio.
7	Floor Stand (optional) E21-0033

5.2 Control Enclosure Exterior



ITEM	DESCRIPTION
1	<p>Utility Switch: This switch controls the current mode of the unit. This switch must be in a particular mode for proper functionality. See 5.3 Utility Switch Modes for additional information.</p> <ul style="list-style-type: none"> ■ MIX: The primary use of this mode is to spray mixed materials. This mode will also flush and load colors when equipped with programmable flush. To perform a color change, the machine is required to be in mix mode. ■ STANDBY: Neutral position. The primary use of this mode is to load materials into the system, or for short breaks. The system will not supply mixed material simultaneously, but both can be loaded individually. The PRIME function requires the system to be in this mode. ■ FLUSH: The solvent and air valves will start to chop on alternating intervals on systems with Programmable Flush.
2	<p>Power Switch: Turn switch to the off position to power down the system.</p>
3	<p>Alarm: When system is in alarm status, an audible / visual signal is enabled. The Pendant will display Alarm as the current mode until the Alarms have been reset. The mute button on the pendant will disable the audible / visual signal, however the system will remain in alarm status until reset.</p>
4	<p>Enclosure Latch: Open or close the cabinet with a screwdriver or coin.</p>
5	<p>Power Cord: 25 foot power cord with 3-prong plug for connection to 120VAC. May be removed for hard-wire connection.</p>
6	<p>Pendant: 3.8" monochrome display with 24 key membrane key pad. 7 foot cable.</p>

5.3 Utility Switch Modes

The Utility switch on the front of the enclosure controls the current mode of the unit. Each mode is used for separate functions and procedures. The list below identifies all uses for the different modes.

MIX MODE

- When spraying mixed material
- For loading a color
- Resin+Hardener Calibration
- Resin Only Calibration
- View and clear Usage data
- View and reset Alarm History - all alarms are active in this mode
- All other tasks not encompassed by STANDBY mode

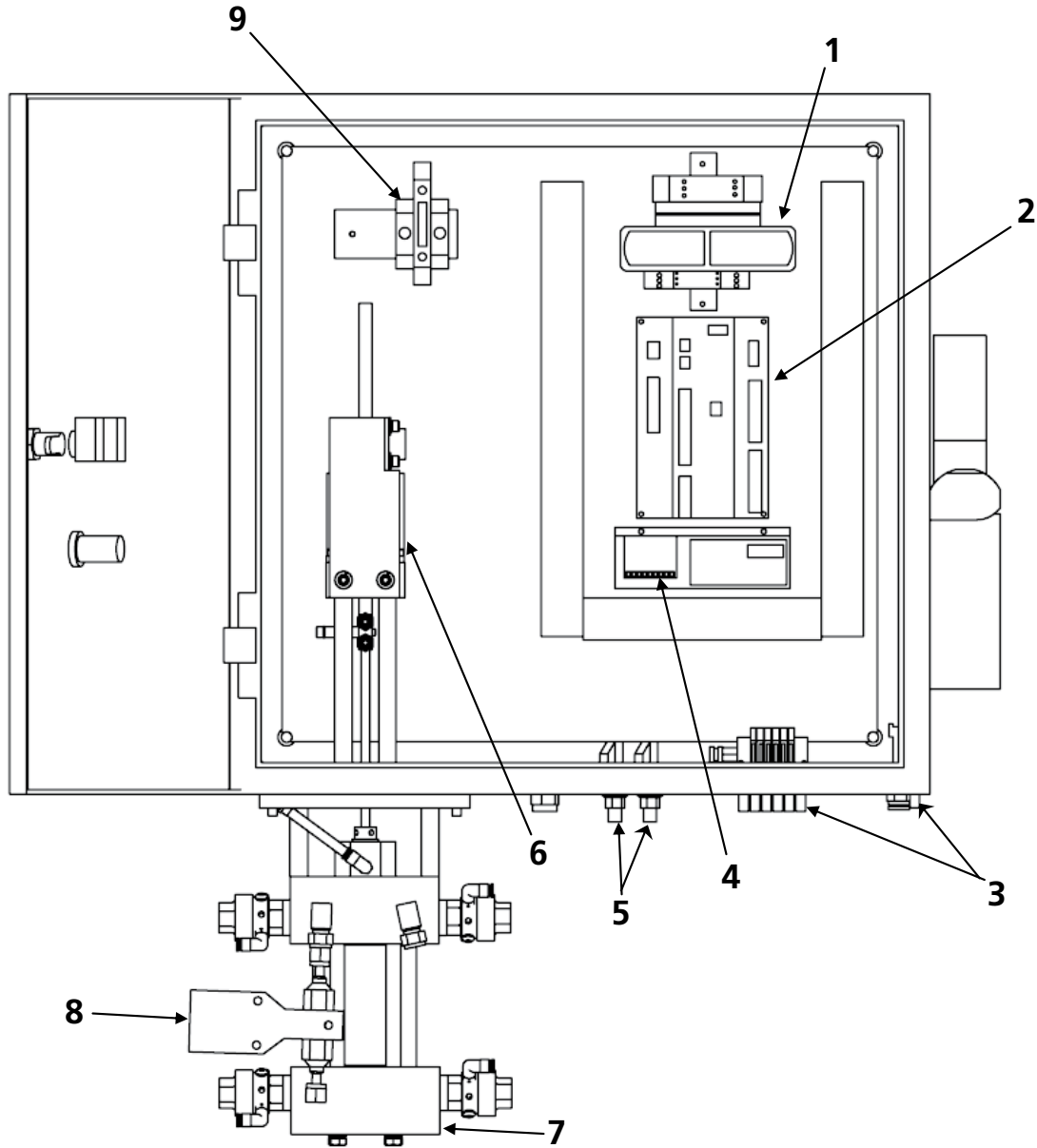
STANDBY MODE

- Prime hardener and resin to the unit
- Pendant Setup and setting changes
- Short breaks and work stoppages
- View and reset Alarm History
- View and clear Usage data

FLUSH MODE

- Flush of fluid lines using an Air/ Solvent chop if the system is equipped with programmable flush
- Accessed manually at any time

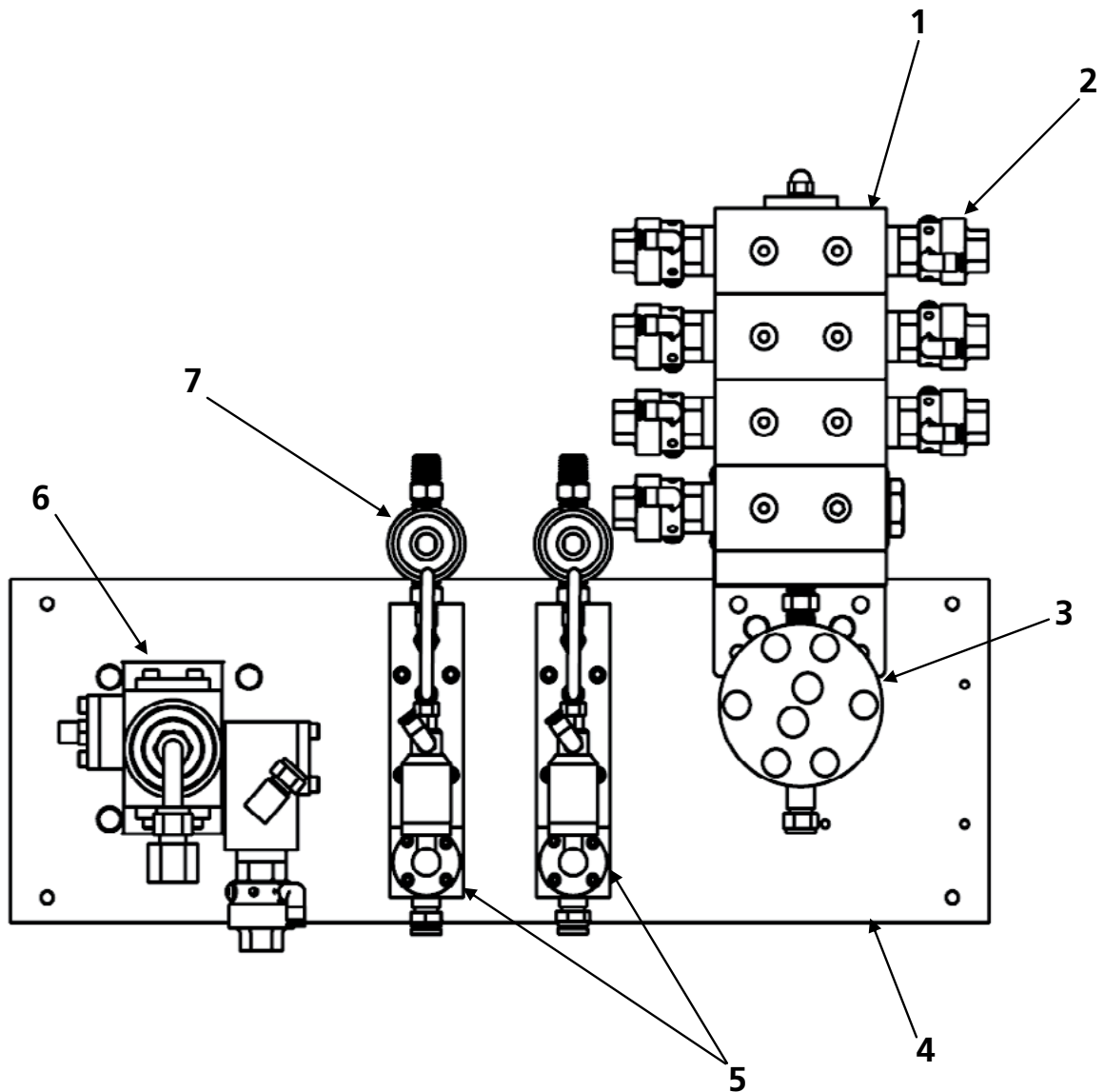
5.4 Control Enclosure Interior and Dispense Pump



ITEM	DESCRIPTION
1	Power Supply. 24vDC
2	PLC Board. Main control board for the Binks EMS.
3	Solenoid Stacks. The electric to pneumatic signal devices used to control the poppet valves.
4	Stepper Motor Drive / Control supplies power to the stepper motor.
5	Pressure Switches convert pneumatic signals from the fluid panel and gun boxes to electric signals for use by the PLC board. Used with Gun Flush Boxes.
6	Stepper Motor drives the Dispense Pump. The motion of the pump is controlled by the PLC Board and the Stepper Motor Drive / Control.

ITEM	DESCRIPTION
7	Dispense Pump. Driven by the motor in the control enclosure, the Dispense Pump flows the correct volume of hardener to the mix manifold to provide the correct ratio.
8	Dispense Pump Flow Sensor. Optional sensor to signal liquid flow / no flow condition.
9	Intrinsically Safe Barrier. Optional equipment to allow the fluid panel to be mounted in a hazardous location (such as a paint booth).

5.5 Fluid Panel



ITEM	DESCRIPTION
1	Color Stack. Included only if ordered with a multicolor system. Flushing air, solvent, and the resin inlet ports for each color are located here. Shown is a 5 color system.
2	Poppet Valve. A pneumatically controlled valve that opens and closes fluid passageways when provided a signal from the corresponding trigger line.
3	Flow Meter. The resin flow measuring device used to calculate and control the rate of movement of the Dispense Pump.
4	Fluid Back Panel. The mounting plate used to secure the components to the wall or stand mount.

ITEM	DESCRIPTION
5	Air Flow Switches. Senses the atomizing air when the spray gun is triggered. One Air Flow Switch is used for each spray gun.
6	Mix Manifold. The location of Resin and Hardener mixing. Combines the two materials and sends the resulting mixture out to the spray gun. Shown is the Programmable Flush Mix Manifold for multicolor systems. Flush valves are located here on single color systems.
7	Air Cut Off Valve. Used on the Air Flow Switch when equipped with a Gun Box. Valve is opened when signal is received from Gun Box.

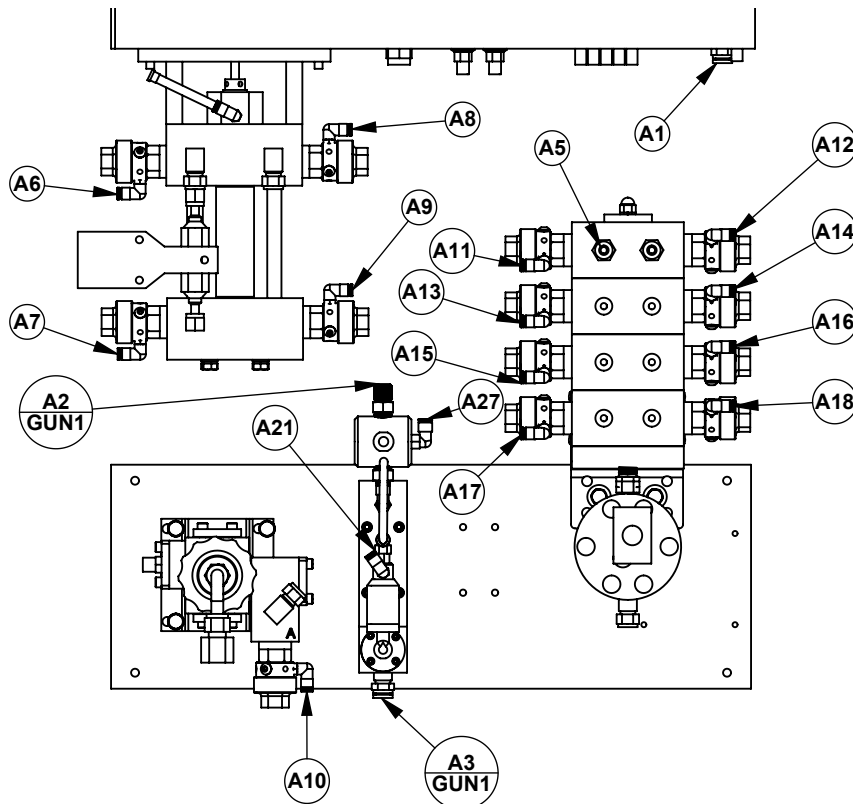
6.1 Air Connections

Clean, dry (-40F dew point), regulated compressed air is recommended for use with all pneumatic components in this system. Air filters, coalescers, regulators, and dryers are not included with the system. Consult your Binks representative for details concerning air control equipment.

Air pressure for the control enclosure should range from 75-100 psi (5 to 7 bar) for proper actuation of the system poppet valves.

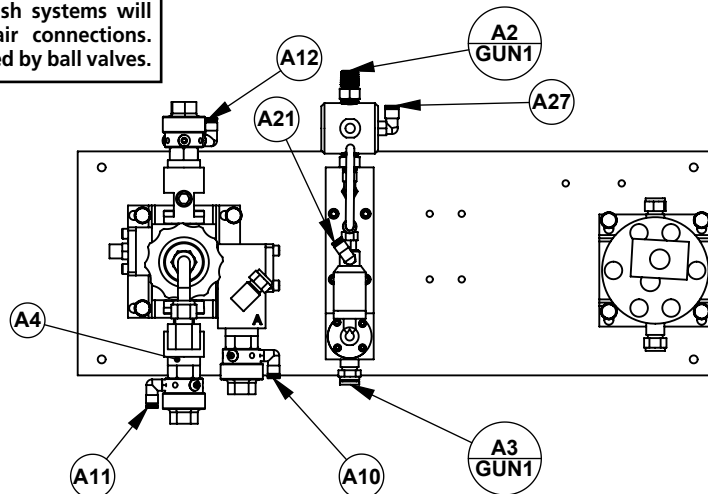
Air pressure for spray gun atomizing air should be greater than 20 psi (1.5 bar) for proper function of the air flow switches.

Multicolor System



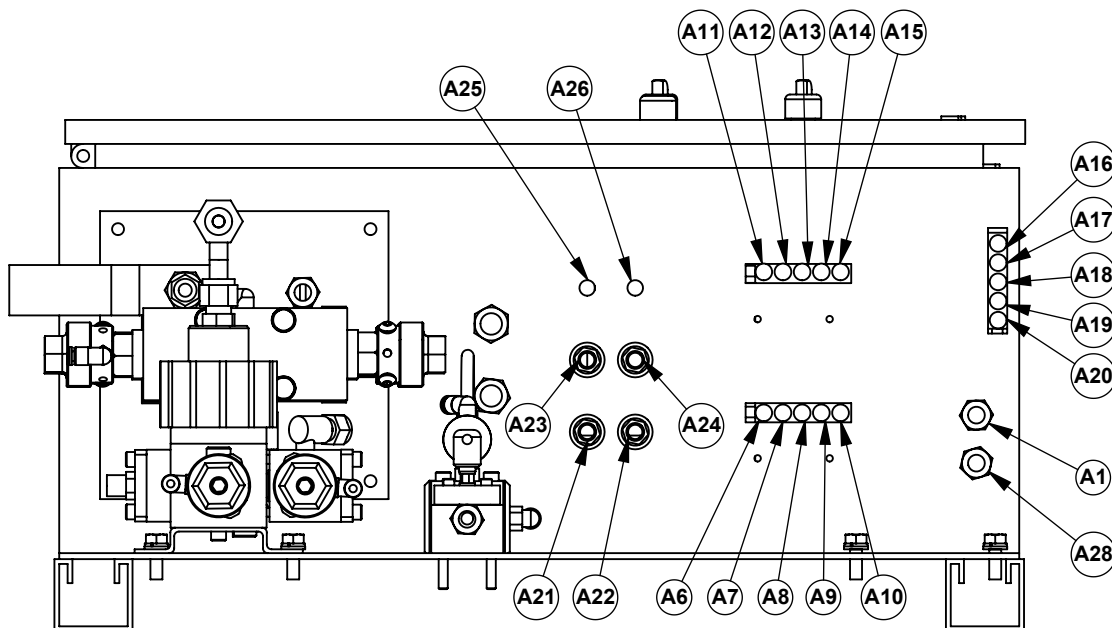
Single Color Fluid Panel

NOTE
Single Color Manual Flush systems will not use A11 or A12 air connections. Poppet valves are replaced by ball valves.



6.1 Air Connections (cont.)

NUMBER	TYPE	DESCRIPTION (HOSE LABEL)	CONNECTING THREAD	HOSE ID / TUBE OD
A1	Hose	Main air inlet	1/4 nps male	5/16"
A2	Hose	Inlet to air flow switch gun 1	1/4 nps male	5/16"
A3	Hose	Outlet from air flow switch gun 1	1/4 nps male	5/16"
A4	Hose	Flushing air to mix manifold	1/4 nps male	5/16"
A5	Hose	Flushing air to color stack	1/4 nps male	5/16"
A6	Poly	Dispense pump top inlet trigger		5/32"
A7	Poly	Dispense pump bottom inlet trigger		5/32"
A8	Poly	Dispense pump top outlet trigger		5/32"
A9	Poly	Dispense pump bottom outlet trigger		5/32"
A10	Poly	Resin Enable trigger		5/32"
A11	Poly	Flush air trigger		5/32"
A12	Poly	Flush solvent trigger		5/32"
A13	Poly	Color 1 trigger		5/32"
A14	Poly	Color 2 trigger		5/32"
A15	Poly	Color 3 trigger		5/32"
A16	Poly	Color 4 trigger		5/32"
A17	Poly	Color 5 trigger		5/32"
A18	Poly	Color 6 trigger connection or Gun Flush Box trigger 2 connection		5/32"
A19	Poly	Gun Flush Box trigger 1 connection		5/32"
A20	Poly	Not in use		5/32"
A21	Poly	Air flow switch 1 signal connection		5/32"
A22	Poly	Air flow switch 2 signal connection		5/32"
A23	Poly	Gun In Box 1 signal connection		5/32"
A24	Poly	Gun In Box 2 signal connection		5/32"
A25	Poly	Not In Use		—
A26	Poly	Not In Use		—
A27	Poly	Optional atomization air shut-off signal		1/4"
A28	N.C.	Solenoid Exhaust Port		1/4"



Bottom view of control enclosure

6.2 Air Connection Descriptions

A1 Main air to the system cabinet; powers all solenoids and flush boxes if equipped. 1/4" NPS male connection. Make sure air supplied to the cabinet is clean and is between working pressures.

A2 GUN 1 Atomizing air inlet to gun 1. 1/4" NPS male connection. Requires clean, regulated air from 20 to 100 psi (1.5 to 7 bar) as appropriate for paint atomization.

A2 GUN 2 Atomizing air inlet to gun 2. 1/4" NPS male connection. Requires clean, regulated air from 20 to 100 psi (1.5 to 7 bar) as appropriate for paint atomization.

A3 GUN 1 Atomizing air outlet (to gun 1). 1/4" NPS male connection. Connect air hose to air inlet of spray gun 1.

A3 GUN 2 Atomizing air outlet (to gun 2). 1/4" NPS male connection. Connect air hose to air inlet of spray gun 2.

A4 Air Flush to mix manifold. Equipped with a check valve at the inlet. Connect air supply to ball valve.

A5 Air Flush to color stack. Equipped with a check valve.

A6 Top inlet poppet valve and solenoid connection.

A7 Bottom inlet poppet valve and solenoid connection.

A8 Top outlet poppet valve and solenoid connection.

A9 Bottom outlet poppet valve and solenoid connection.

A10 Resin Enable poppet valve and solenoid connection.

A11 Air enable poppet valve and solenoid connection. This connection is made on the color stack when multiple colors are ordered or on the mix manifold when auto flush is ordered with one color.

A12 Solvent enable poppet valve and solenoid connection. This connection is made on the color stack when multiple colors are ordered or on the mix manifold when auto flush is ordered with one color.

A13 Color 1 poppet valve and solenoid connection.

A14 Color 2 poppet valve and solenoid connection.

A15 Color 3 poppet valve and solenoid connection.

A16 Color 4 poppet valve and solenoid connection.

A17 Color 5 poppet valve and solenoid connection.

A18 Color 6 poppet valve and solenoid connection or Gun Flush Box trigger 2 signal.

A19 Gun Flush Box 1 trigger signal.

A20 Not In use

A21 Air flow switch gun 1 "flow detected" signal and pneumatic/electric switch.

A22 Air flow switch gun 2 "flow detected" signal and pneumatic/electric switch.

A23 Gun in box gun 1 signal lets the system know that the gun is locked in the box and is ready to flush or load.

A24 Gun in box gun 2 signal lets the unit know that the gun is locked in the box and is ready to flush or load.

A25 Not in use.

A26 Not in use.

A27 Optional atomization air shut-off signal

A28 Air exhaust port to allow air from solenoids to vent. No connection needed.

7.1 Fluid Connections

FLUID SUPPLY

Material resins and hardeners may be supplied to the Binks EMS via pressure tanks, circulating systems, or pumping systems. Fluid must be delivered free from pressure spikes and surges, and entrained air must be avoided. If feeding directly from a pump, a fluid regulator is recommended upstream from the flow meter (or color stack for multi-color units).

Fluid supplied to the Binks EMS must also be free of contaminants and solid particles that may clog or jam the flow meter gears or other downstream components. Typical filtration for paint resins is 100 mesh or smaller. Contact your Binks representative for information regarding fluid supply and conditioning equipment.

NOTE

The inlet fluid pressure of the Dispense Pump should always be maintained 5 to 10% above the outlet pressure. This ensures proper operation of the Dispense Pump.

For compression fittings with ferrules, tighten the ferrule nut 1 to 1.5 turns past finger tight. Do not over tighten, as exceeding 1.5 turns will likely cause the ferrules to cut through the tubing.

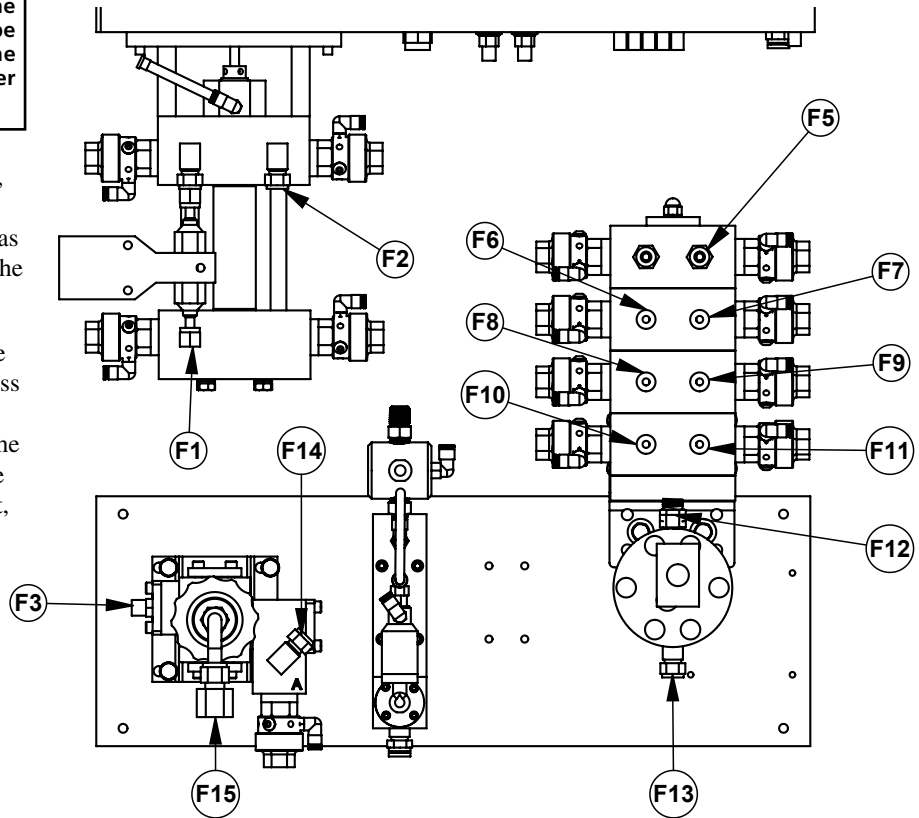
For pipe threads (NPT) use PTFE tape or other pipe thread sealant for stainless steel connections. If using tape, wrap clockwise two to three times around the threads. Ensure tape does not protrude beyond threads. If using liquid sealant, apply sealant bead completely around 2nd male thread.

Multicolor System

NUMBER	DESCRIPTION	CONNECTION TYPE	TUBE OD
F1	Dispense Pump Inlet	3/8" NPS male	—
F2	Dispense Pump Outlet	1/4" Compression	1/4"
F3	Mix manifold inlet from Dispense Pump	1/4" Compression	1/4"
F5	Solvent Inlet (Color Stack)	3/8" NPS male	—
F6	Color 1 Inlet	3/8" NPT female	—
F7	Color 2 Inlet	3/8" NPT female	—
F8	Color 3 Inlet	3/8" NPT female	—
F9	Color 4 Inlet	3/8" NPT female	—
F10	Color 5 Inlet	3/8" NPT female	—
F11	Color 6 Inlet	3/8" NPT female	—
F12	Outlet of color stack (multi-color)	3/8" Comp.	3/8"
F13	Flow meter outlet to Mix Manifold	3/8" Comp.	3/8"
F14	Resin inlet for mix manifold	3/8" Comp.	3/8"
F15	Mix manifold outlet to static mixer	3/8" Compression	—

NOTE

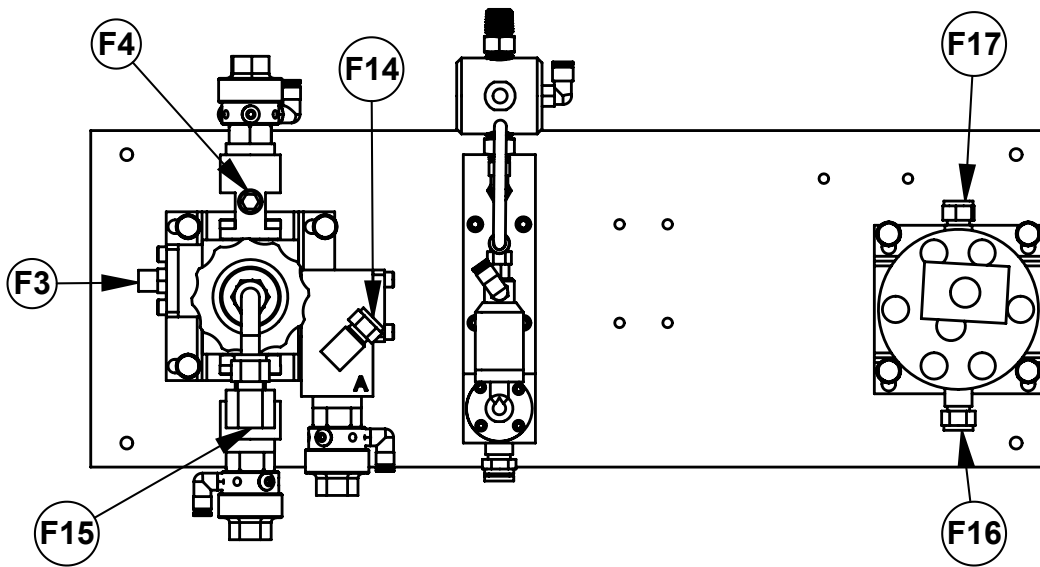
Optional Dispense Pump Flow Sensor Shown



7.1 Fluid Connections (cont.)

Single Color Fluid Panel

NUMBER	DESCRIPTION	CONNECTION TYPE	TUBE OD
F3	Mix manifold inlet from Dispense Pump	1/4" Compression	1/4"
F4	Solvent Inlet (Mix Manifold)	3/8" NPS male	—
F14	Resin inlet for mix manifold	3/8" Comp.	3/8"
F15	Mix manifold outlet to static mixer	3/8" Compression	—
F16	Flow meter inlet (1 color)	3/8" NPS male	—
F17	Flow meter outlet (1 color)	3/8" Compression	—



7.2 Fluid Connection Descriptions

F1 Inlet to Dispense Pump. Fitting is 3/8" NPS male. Thread in upper block is 1/8 NPT female. Connect hardener/catalyst supply directly to inlet of Dispense Pump or Dispense Pump Flow Sensor if equipped. If feeding directly from a pump a fluid regulator between the pump and resin flow meter / color stack is recommended. Contact your Binks representative for more information on fluid regulators and related manuals.

NOTE

Multicolor System illustration (Section 7.1) shows optional Dispense Pump Flow Sensor. This is a recommended option if pressure tanks are used to supply hardener/catalyst to Dispense Pump. Dispense Pump Flow Sensor will alarm Binks EMS when pressure tank runs out of hardener / catalyst or if a supply valve is closed.

F2 Dispense Pump outlet. Outlet thread on Dispense Pump body is 1/8 NPT. 1/4" OD compression fitting is used. 1/4" OD FEP tube travels from here into F3 (mix manifold hardener/catalyst inlet).

F3 Mix Manifold hardener / catalyst inlet. 1/4" OD compression fitting. Connects to Dispense Pump outlet F2.

NOTE

The check valve is required for proper operation. Programmable Flush version with poppet valves includes a 3/8" NPS fitting.

F4 Solvent inlet (single color). Shown with automatic flushing valves. Used only on single-color systems. Manual version is supplied with a ball valve, check valve, and a 3/8" NPS male fitting to connect to solvent supply.

F5 Solvent inlet (color stack). When multiple colors are used the flush solvent inlet is located at the top right side of the color stack. A 1/4" NPT male threaded check valve is supplied in the inlet of the color stack. Attach solvent supply line to the 3/8" NPS male adapter.

F6-F11 represent the optional number of colors (1-6), (1-5 if two gun flush boxes are used). Port threads are 3/8" NPT female. Plugs will be supplied in back.

F12 Outlet of the color stack, inlet for the flow meter. When multicolor unit is purchased the flow meter is mounted directly to color stack to ensure the least amount of material used when flushing or loading. Fittings supplied are 1/4" NPT to 3/8" tube stub.

F13 Flow meter outlet. Thread on flow meter is 1/4" NPT female. 3/8" OD compression fitting is supplied. Fluid flows from here to the resin inlet of the mix manifold (F14).

F14 Resin inlet to Mix Manifold at the Resin Enable Valve. Thread at the block inlet is 1/4" NPT. Equipped with a 1/4" NPT to 3/8" OD compression fitting for connection to F13.

F15 Mix manifold outlet. 3/8" compression. Connected to static mixer assembly (E21-0003 or E21-0003-HR). The end of the static mixer will have a 3/8" NPS male connector. Connect the spray gun's fluid hose to this fitting.

F16 Flow meter inlet. For a 1-color system, the flow meter is mounted directly to the back panel. The fluid inlet to the flow meter is 1/4" NPT thread and is equipped with a 3/8" NPS male connection.

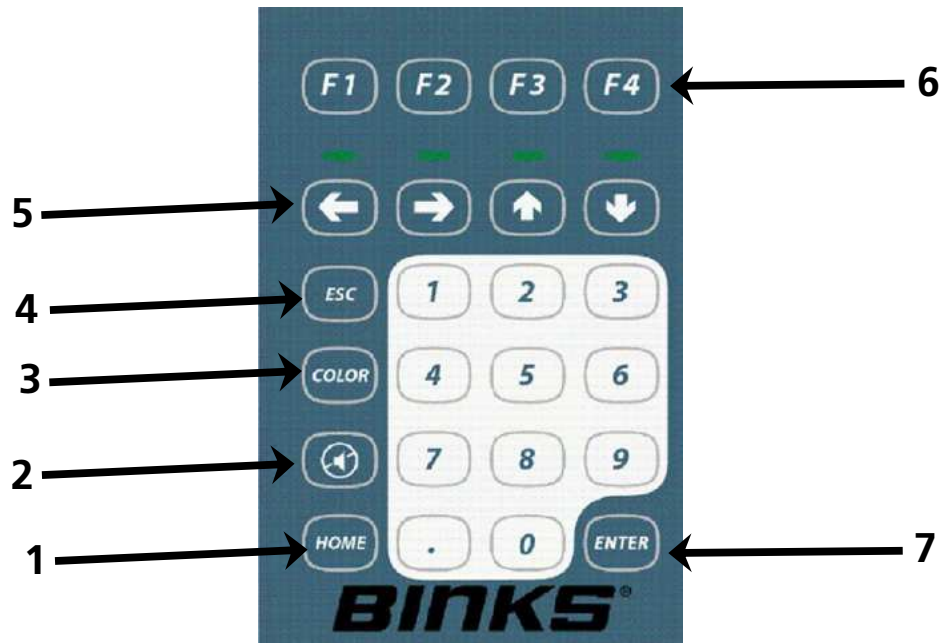
F17 Flow meter outlet. For a 1 color unit, the flow meter is mounted directly to the fluid panel. The fluid outlet from the flow meter is 1/4" NPT thread and is equipped with a 3/8" OD compression fitting.

8.1 Pendant Guide

The Pendant is used to control the Binks EMS. It allows changes in ratio values and system settings for unique functionality. A thorough understanding is required in order to use the full capability of the Binks EMS. The following pages identify the various Pendant buttons and screens, and describe their corresponding functions. Read through this guide to understand how to use the Pendant.

PENDANT KEYPAD

The Keypad is used to enter values into the Pendant and navigate screens. Below is a description of the function of each button on the keypad.

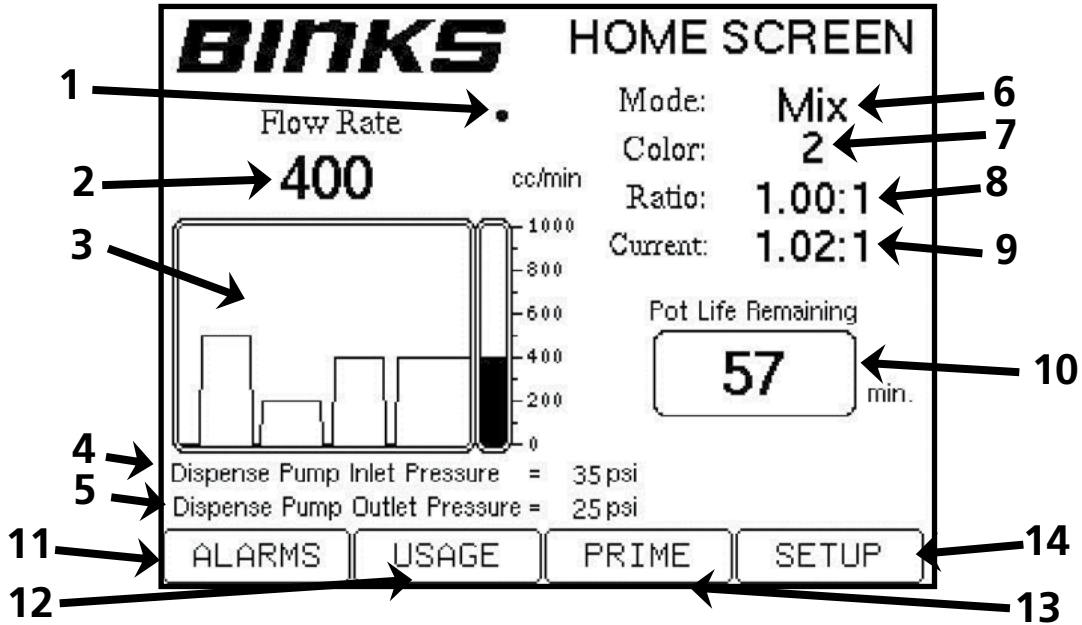


- 1. Home** This button can be pushed at any time to return the display back to the Home Screen.
- 2. Mute** Silence a sounding alarm. This button will NOT reset the alarm, it will only silence the buzzer until the alarm has been reset.
- 3. Color** Used to perform color changes and programmed flush sequences.
- 4. ESC** This is used to cancel an entry in the SETUP menus.

- 5. Arrow keys** These buttons will allow navigation through the SETUP screens.
- 6. F- keys** When an option is listed on the bottom of the screen, it corresponds with the F- keys located directly below the icon.
- 7. Enter** The button used to accept a value after it has been typed into a field.

8.2 Home Screen

The Home Screen is the main monitoring screen of the Binks EMS. It provides real time data to the user and tells the user vital information such as Flow Rate, Pot Life, Current Mix Ratio, and Current Color.

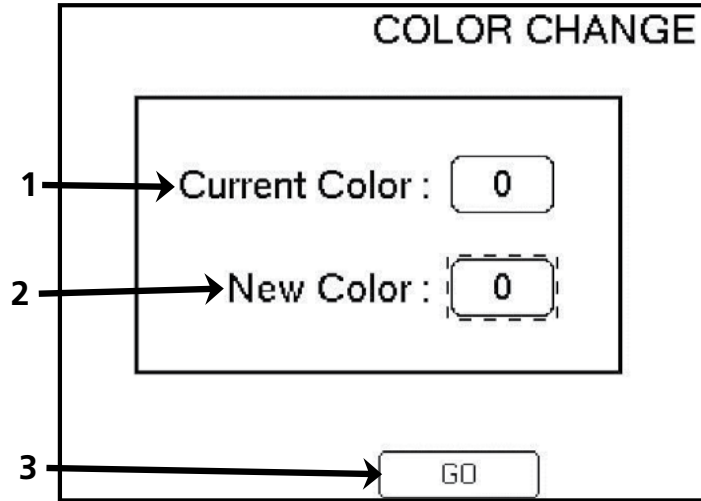


- 1. Resin Flow Indicator** A dot icon indicating resin flow currently detected.
- 2. Current flow rate** Flow rate (cc/minute) also displayed on the graph below.
- 3. Flow rate graph** Adjustable graph that will show the amount of volume (cc) that is or has just been sprayed.
- 4. Dispense Pump Inlet Pressure** Monitors the inbound supply pressure to the Dispense Pump from the hardener supply. The upper and lower pressure transducers are used to measure the pressure depending on the direction of the Dispense Pump piston.
- 5. Dispense Pump Outlet Pressure** Monitors the outbound pressure from the Dispense Pump to the mix manifold. The upper and lower pressure transducers are used to measure the pressure depending on the direction of the Dispense Pump piston.
- 6. Current Mode** Displays whether the system is in mix, standby, flush, or alarm state.
- 7. Current Color** This is the color that is currently loaded. Zero will be displayed if solvent is loaded, or if a failed color change occurred.
- 8. Set Ratio** This is the pre-set ratio defined in the SETUP screen for the current color.
- 9. Current Ratio** This is the current real-time calculated ratio for the color currently in use.
- 10. Pot Life display** This Icon will display the active pot life remaining. A -- in place of a number indicates the unit is flushed and no pot life is in effect.
- 11. ALARMS screen** By pushing F1 (ALARMS), the active alarm screen will be shown. Alarms may be reset from the ALARMS screen.
- 12. USAGE screen** By pushing F2 (USAGE), the accumulated color usage screen will display. This will display the total amount of resin and hardener used for each color.
- 13. PRIME screen** The prime screen will be shown if F3 (PRIME) is pushed. This screen allows manual load of paint components to the system in order to bleed out air pockets without alarming.
- 14. SETUP** Pushing F4 (SETUP) will display the first of the set up screens. Additional screens to change settings are outlined in the following pages.

8.3 Color Change Screen

This is the only screen other than the HOME screen that is accessed directly via a Pendant button. This screen is used for changing colors and / or flushing the system with the flush / load sequences programmed into the system from the accompanying SETUP screens. The Utility switch must be in MIX mode to use the functions on this screen.

1. **Current Color** This is the current color loaded in the system.
2. **New Color** This is the field where the next color number to load is entered.
3. **GO** The button used to start the color load process. The loading will begin with the color selected under New Color.

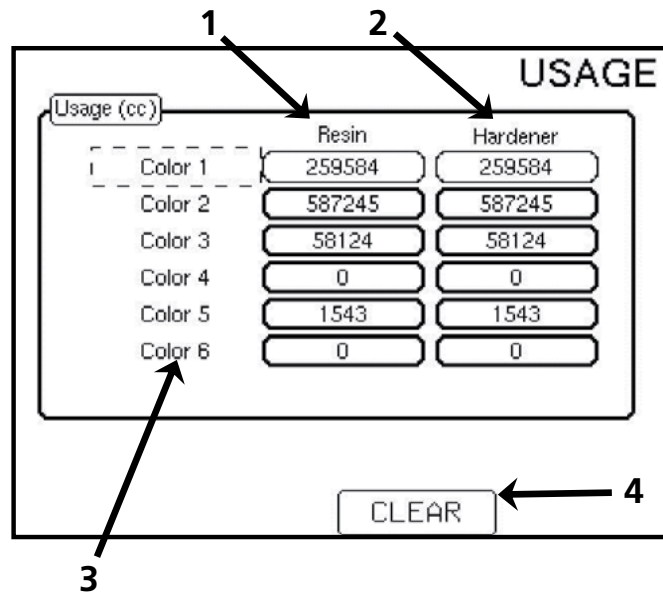


8.4 Usage Screen

Accessed via the Home screen, this screen is used to track the usage of resin and hardener, sorted by color number. It tracks the volume in cc's through the flow meter and the calculated volume of hardener dispensed by the Dispense Pump. Colors and associated counts will only show for the colors that have been set up in the system. If the solvent meter is installed it will be visible at the bottom of this list.

In order for the usage totals to be saved before the system is powered down, this screen must be accessed. Once it is accessed, the values will automatically be saved and the Binks EMS can be powered down.

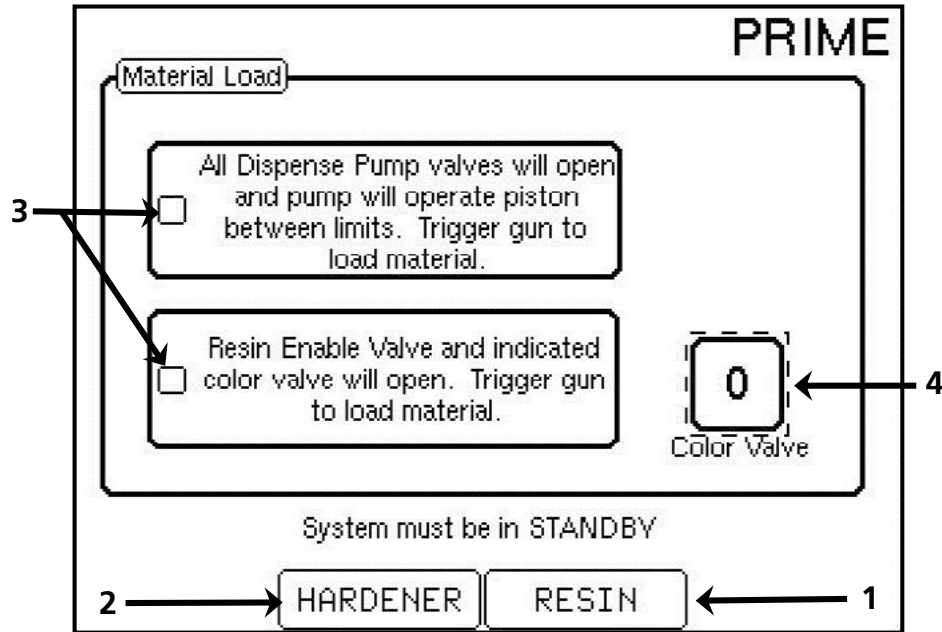
1. **Resin** The total count of resin for the individual color. Measured in cc's.
2. **Hardener** The total count of hardener for the individual color. Measured in cc's.
3. **Description** The description of which color and the corresponding amount of resin and hardener. Colors may be present but will not be used if the system is not equipped. Solvent will be present at the bottom of this list if ordered with the Optional Solvent Meter
4. **CLEAR** The button used to reset the usage totals.



8.5 Prime Screen

This screen is used when priming hardener and resin into the Binks EMS. It allows independent operation of the various Resin color valves, and operates the Dispense Pump

for material loading. This mode requires the Binks EMS to be in STANDBY mode but does not disable alarms. Atomizing air must be off to load materials.



1. RESIN By pressing F3 (RESIN) once, the Resin Enable Valve will open, allowing pressurized fluid to travel through the fluid lines. The gun must be triggered with atomizing air off for successful loading. Press F3 again to stop.

2. HARDENER By pressing F2 (HARDENER) once, the Dispense Pump valves will open, and the Dispense Pump will cycle. The gun must be triggered with atomizing air off for successful loading. Press F2 again to stop.

3. Checkboxes The indicating icon that shows when either the hardener or resin is active.

4. Color Valve The icon displaying which Resin valve is being opened when the resin is enabled.

- **Color 0** is reserved for flushing solvent
- **Colors 1 through 6** are for paint resins
- **Color 7** is reserved for flushing air

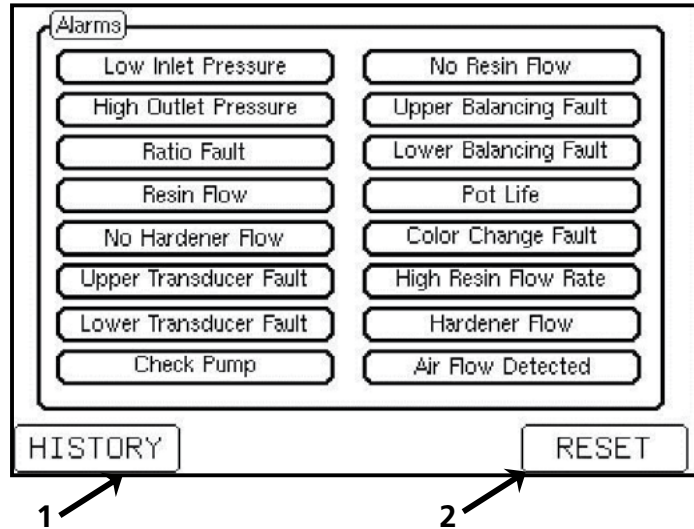
⚠ WARNING

Always follow the PRIME mode with a color 0 (solvent) load to flush out the fluid lines and prevent unmixed material from being sprayed or hardening in the system.

8.6 Alarm Screen

The alarm screen is accessible from the home screen by pressing F1. This screen displays all of the alarms in the system. If an alarm sounds it will be shaded, and the RESET button must be pushed before the unit can spray again. The history of alarms is also saved for easy access. To reset the alarm, simply press F4 (RESET). Additional alarm information and possible causes can be found in the **Binks EMS Maintenance and Repair Manual 77-2981**.

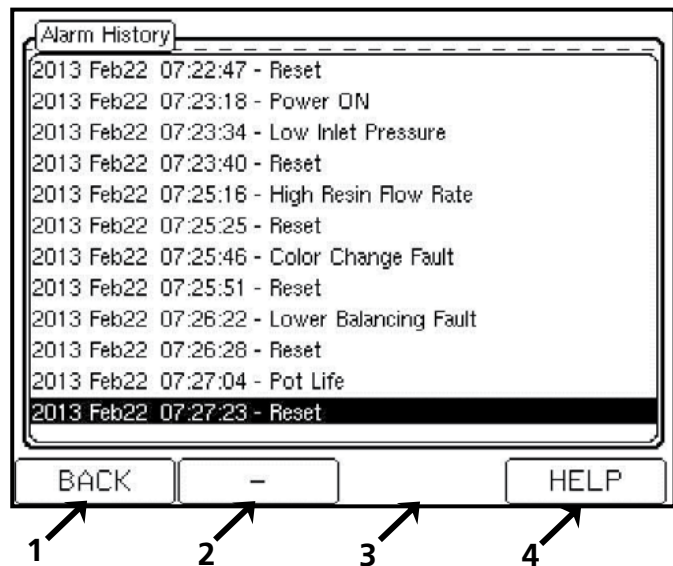
1. **HISTORY** To find out the history of the system, such as what alarms occurred in a given shift, Press F1 (HISTORY) to access a timeline of alarms and events. The last 40 events will be recorded.
2. **RESET** This button will reset all active alarms except for the current pot life. Must be pushed if an Alarm has sounded.



8.7 Alarm History

The previous event history of the unit is shown on the Alarm History page. The previous 40 events are recorded.

1. **BACK** Pressing F1 (BACK) will go back to the alarm screen.
2. **-** Moves the highlighted bar up (back) in time. The last 40 events will be shown in the Alarm History. The entry at the bottom of the screen is the most recent.
3. **+** Moves the highlighted bar down (forward) in time.
4. **HELP** Pushing F4 will bring up a help screen for the given highlighted alarm.



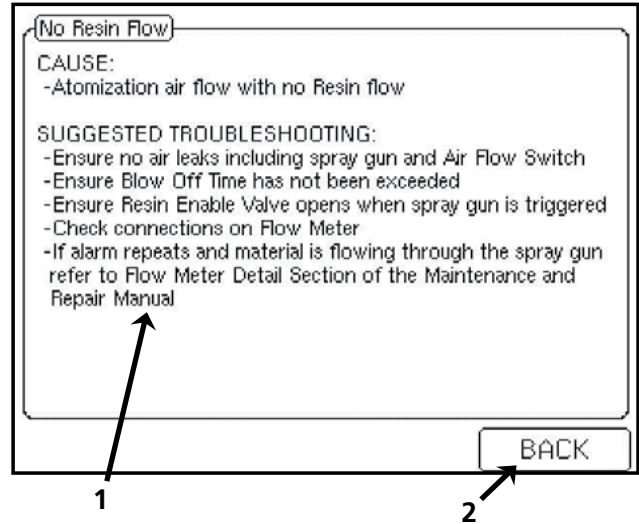
8.8 Alarm Help Screen

The Alarm Help screen is a quick reference guide to suggest possible causes of an alarm. For additional details regarding alarms, see the **Maintenance and Repair Manual 77-2981**. This example shows No Resin Flow.

- 1. Details** A detailed description of the selected alarm. Troubleshooting hints are listed in order of probability.
- 2. BACK** To return to the alarm history page press F4 (BACK).

NOTE

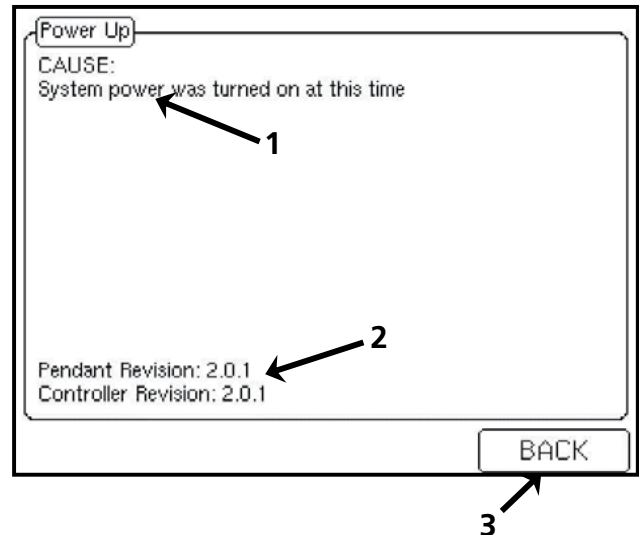
If an alarm has not been reset, 'Alarm' will be shown on the Home Screen after an alarm has been triggered. In this mode, the machine will not spray, and the RESET command must be used.



8.9 Power ON

The Power ON screen is displayed if the help button is pressed while Power ON is highlighted in the Alarm History Screen. This screen indicates the current software revision numbers.

- 1. Details** A description indicating the unit has been powered on.
- 2. Revision Numbers** The current software revision numbers are displayed here.
- 3. BACK** To return to the previous page, press F4 (BACK).



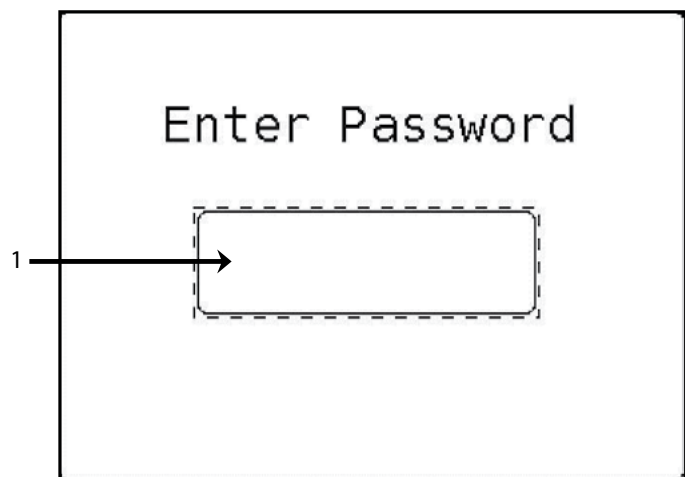
8.10 Password Prompt

By pressing F4 (SETUP) on the home screen, the prompting page will be displayed asking for a password. Enter a password using the number keypad. The default password for the basic settings is 0. After the password is typed, press the enter key to gain access to the set up screens. The default advanced password is 1.

- 1. Password prompt** This is the space where the password is entered. To gain access into the set up screen you must first enter the password and press enter. Acceptable passwords range from 0 to 99999.

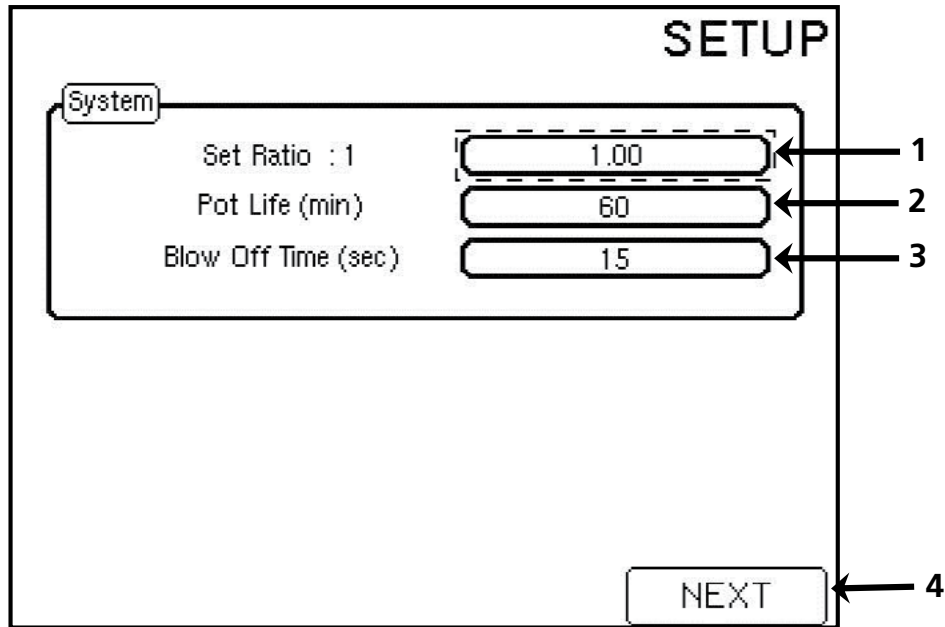
NOTE

Basic and Advanced passwords may be changed after entering the default advanced password. Proceed to the set up password screen and enter the new password.



8.11 System Screen

The system screen is used for setting the ratio in a single color system, changing Pot Life time, and adjusting the Blow Off Time.



- 1. Set Ratio : 1** Putting a new value in the box will override the programmed value and will hold until the system is flushed or another color is loaded. Only available on 1 color systems.
- 2. Pot Life (min)** Adjust this number to correspond with the amount of time it takes mixed material to remain sprayable, represented in minutes. The end of the pot life will result in a pot life alarm . After resetting the alarm the user will be allowed to spray out the material in the line or flush.
- 3. Blow Off Time (sec)** The allotted time for atomizing air to be triggered without spraying material. After the time has expired, an alarm will sound stating No Resin Flow. Useful for blowing contaminants off parts immediately prior to spraying.
- 4. NEXT** By pressing F4 (NEXT), it will advance to the next screen.

NOTE

To adjust values, press the down arrow until the variable in question is highlighted. Use the number pad on the pendant to enter the desired value. After the value is displayed press the enter key to accept the value.

8.12 Set Ratio Screen

This screen sets the resin to hardener ratio for each color loaded into the system. Ratios are programmed as the part of resin relative to one part hardener or catalyst.

For example a 5:2 ratio material could be represented as 2.5:1, and the number 2.5 is then entered in the appropriate field on the screen below.

The screenshot shows a screen titled "SETUP" with a sub-header "Set Ratio :1". Below this, there is a list of six colors, each with a corresponding input field containing the value "1.00". The input fields are arranged in a vertical column. To the right of the list, there is a large arrow labeled "1" pointing to the input fields. At the bottom right of the screen, there is a button labeled "NEXT". To the right of the "NEXT" button, there is a large arrow labeled "2" pointing to it.

1. Colors 1 through 6 Enter the resin ratio for each color relative to one part hardener or catalyst.

2. NEXT Pressing F4 (NEXT) will advance to the next screen.

NOTE

Colors will only be accessible if the system is configured for multicolor.

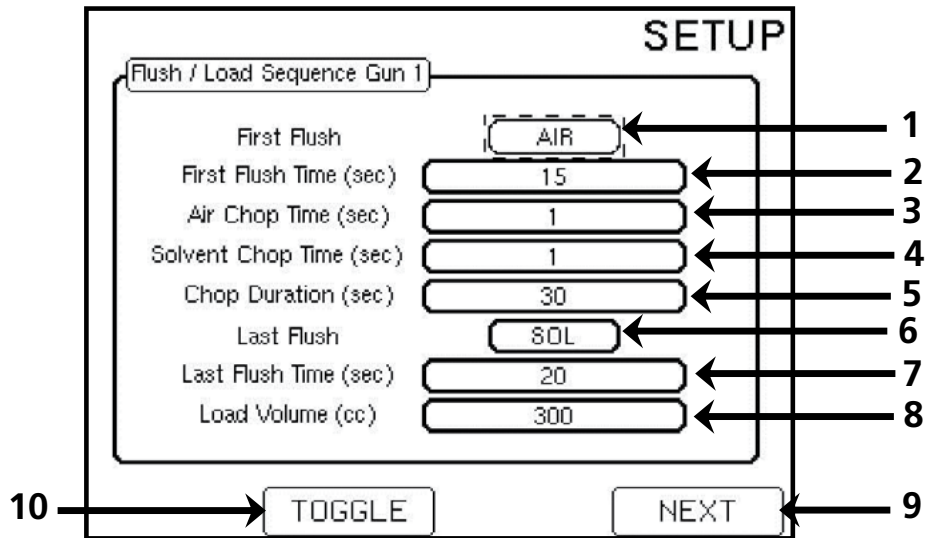
To adjust values, press the up / down arrow until the desired field is highlighted. Use the number pad on the pendant to enter the desired value. After the value is displayed, press the enter key to accept the new value.

When changing paint resins and / or loading a new material into the system always perform a *Flow Meter Calibration - Resin + Hardener*, especially when starting up the unit for the first time.

If changing the ratio of a loaded color, the materials must be reloaded for the changes to take effect.

8.13 Load Sequence

This is the spray gun load sequence setup screen. Unique system load times can be entered here. If the system has 2 spray guns, a second, identical screen will appear after pressing F4 (NEXT). The setup page for gun 2 will be identical. For more information on flush sequences and recommended settings, see **10.6 Flushing Setup**.



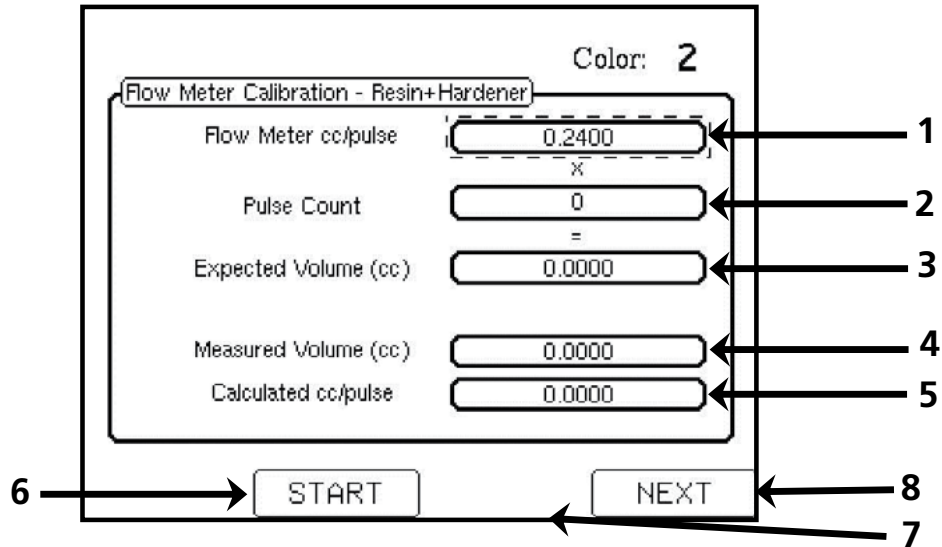
- 1. First Flush** Push F3 (TOGGLE) to switch the First Flush between solvent and air. This is the initial flush of the mix manifold and fluid lines.
- 2. First Flush Time (sec)** This is the duration of the first flush for gun 1.
- 3. Air Chop Time (sec)** After the first flush is completed, the system will go into an alternating solvent and air flush, also known as a chop. This value determines the duration of the air valve open time until the solvent valve is opened.
- 4. Solvent Chop Time (sec)** This value determines the solvent valve open time until the next air chop.
- 5. Chop Duration (sec)** The total duration of the solvent and air chop.
- 6. Last Flush** Press F2 (TOGGLE) to switch the Last Flush between solvent and air.
- 7. Last Flush Time (sec)** The total duration of the Last Flush.
- 8. Load Volume (cc)** At this point all previous material should be flushed out, and this value should be the volume required for new material to properly fill the fluid line for gun 1.
- 9. NEXT** Pressing F4 (NEXT) will advance to the next screen.
- 10. TOGGLE** Pressing F2 (TOGGLE) will switch between solvent and air on first and last flushes.

NOTE

To adjust values, press the up / down arrow until the desired field is highlighted. Use the number pad on the pendant to enter the desired value. After the value is displayed, press the enter key to accept the new value.

8.14 Calibration — Resin+Hardener

This screen is used to check the ratio of the mixed material without interrupting the flow of mixed material through the system. This is the screen used to calibrate the Flow Meter when loading a new color as outlined by the **Binks EMS Maintenance and Repair Manual 77-2981**.



- 1. Flow Meter cc/pulse** This is the cc's per pulse delivered in the system. This number will need to be calibrated for each individual color. Default is .2400
- 2. Pulse Count** Counts the number of Flow Meter pulses received during the calibration test.
- 3. Expected Volume (cc)** This is PLC's calculation of total volume at the current Flow Meter cc/pulse and programmed ratio.
- 4. Measured Volume (cc)** This is a user input. Enter the measured volume after triggering the gun for a specified time. Press F3 (Save) after entering the Measured Volume.
- 5. Calculated cc/pulse** After a new measured volume is inputted, the new cc/pulse will be displayed in this box. This is a preview of the new cc/pulse. **The Save button(F3) must be pressed to accept the new value.**
- 6. START** This button (F2) will reset the expected volume and pulse count to zero. Press this button twice before every calibration.
- 7. SAVE** (not shown) This key is used after a new value is typed into the Measured Volume field and the enter key is pressed. Pressing F3 (SAVE) calculates and saves the new cc/pulse value.
- 8. NEXT** Pressing F4 (NEXT) will advance to the next Calibration screen.

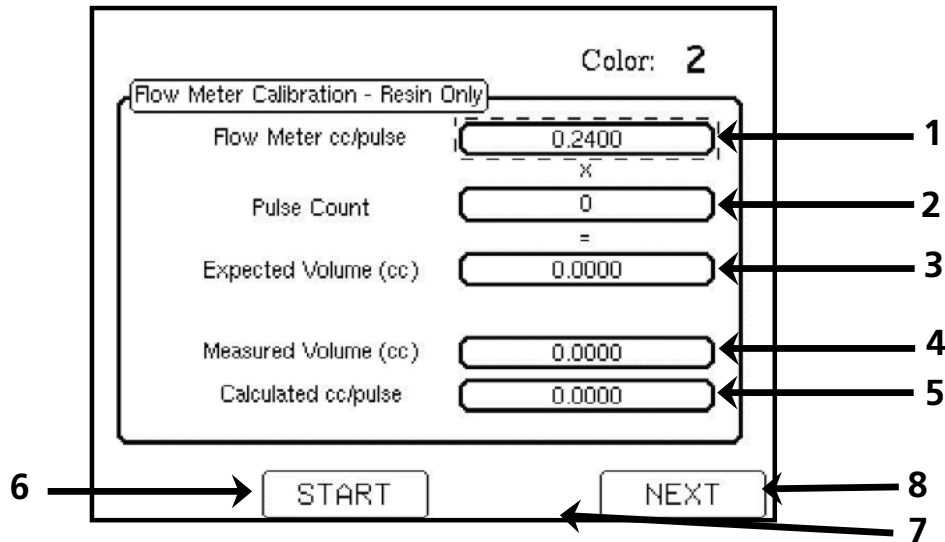
NOTE

The machine must be in MIX mode to perform a calibration.

Always follow any saved calibration with a Color 0 load. Saving only possible with Advanced Password.

8.15 Calibration — Resin Only

This screen is used to check the Flow Meter calibration ONLY. Performing a calibration using this screen will flow paint resin without hardener through the system, and should be followed by a color 0 flush / load. This calibration is used to more accurately calibrate the Flow Meter or troubleshoot the Dispense Pump if necessary.



- 1. Flow Meter cc/pulse** This is the cc's per pulse delivered in the system. This number will need to be calibrated for each individual color. Default is .2400
- 2. Pulse Count** Counts the number of Flow Meter pulses received during the calibration test.
- 3. Expected Volume (cc)** This is PLC's calculation of total volume at the current Flow Meter cc/ pulse and programmed ratio.
- 4. Measured Volume (cc)** This is a user input. Enter the measured volume after triggering the gun for a specified time. Press F3 (Save) after entering the Measured Volume.
- 5. Calculated cc/pulse** After a new measured volume is entered the new cc/pulse will be displayed in this box. This is a preview of the new cc/pulse. **The Save button (F3) must be pressed to accept the new value.**
- 6. START** This button (F2) will reset the expected volume and pulse count to zero. Press this before every calibration.
- 7. SAVE** (not shown) This key will appear when a new value is typed into the Measured Volume box, and the enter key is pressed. Pressing F3 (SAVE) calculates and saves the new cc/pulse value.
- 8. NEXT** Pressing F4 (NEXT) will advance to the Alarm Enables screen.

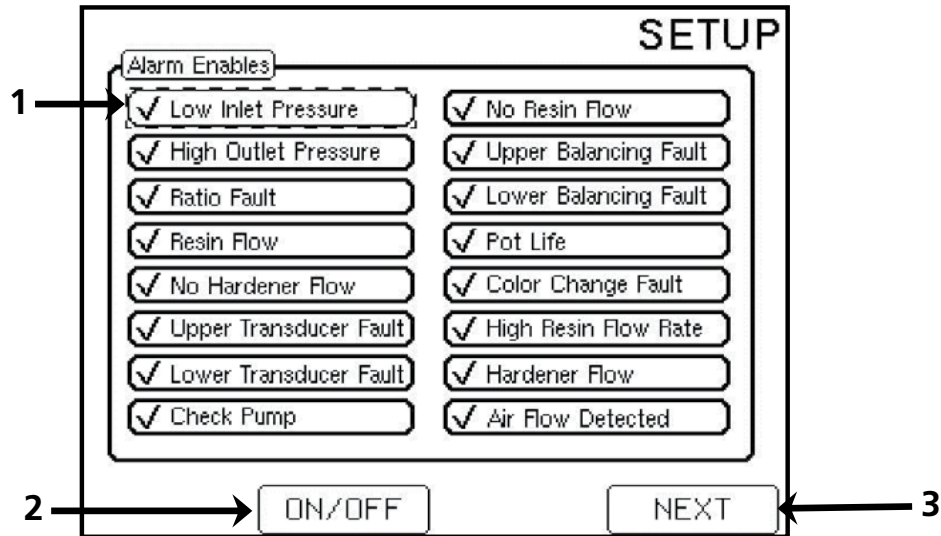
NOTE

Use the Resin + Hardener Calibration first. This calibration procedure will load uncatalyzed material in fluid lines and will require a solvent flush after performing. Only accessible with the Advanced password.

Always follow Resin Only calibrations with a Color 0 flush / load. Saving only possible with Advanced Password.

8.16 Alarm Enables

This screen displays all of the active alarms in the system and allows any listed alarm to be enabled or disabled. For example, if the Dispense Pump flow sensor cable gets damaged and no replacements are in stock, this screen allows the user to disable the No Hardener Flow alarm so spraying may continue until a replacement arrives.



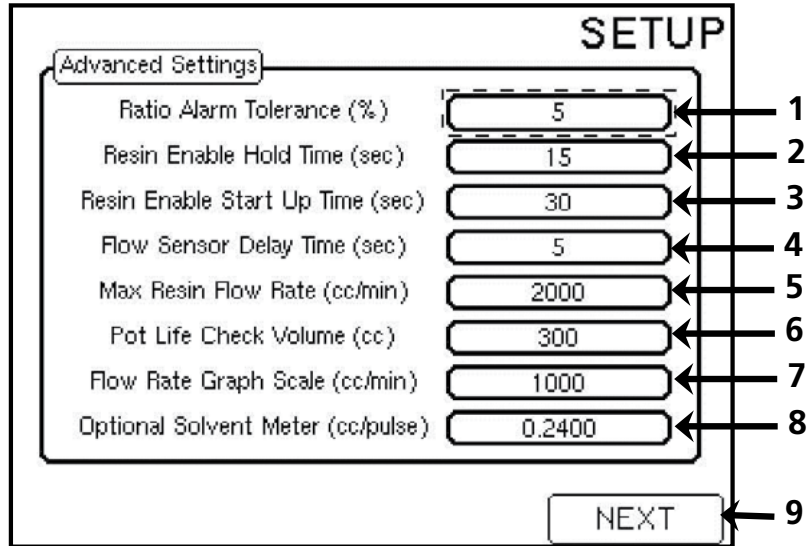
- 1. Highlighted Alarm** Represents the current alarm in question. By pressing the arrows on the pendant, other alarms can be highlighted and then activated or deactivated by pressing F2 (ON/OFF).
- 2. ON/OFF Button** When the alarm is highlighted, pushing F2 (ON/OFF) will turn on or off the given alarm. If the alarm has a check in the box, it is currently active.
- 3. NEXT** Pressing F4 (NEXT) will advance to the next screen.

CAUTION

It is not recommended to turn off any alarm during normal operations.
This page is only accessible with the Advanced password.

8.17 Advanced Settings

This screen is used to set up key parameters related to system settings for alarms and Pot Life. Pot life is monitored over a volume of hose. The system will not reset the pot life value unless the specified hose volume has been dispensed through the spray gun(s). The pot life will not reset if a second gun is connected but not spraying.



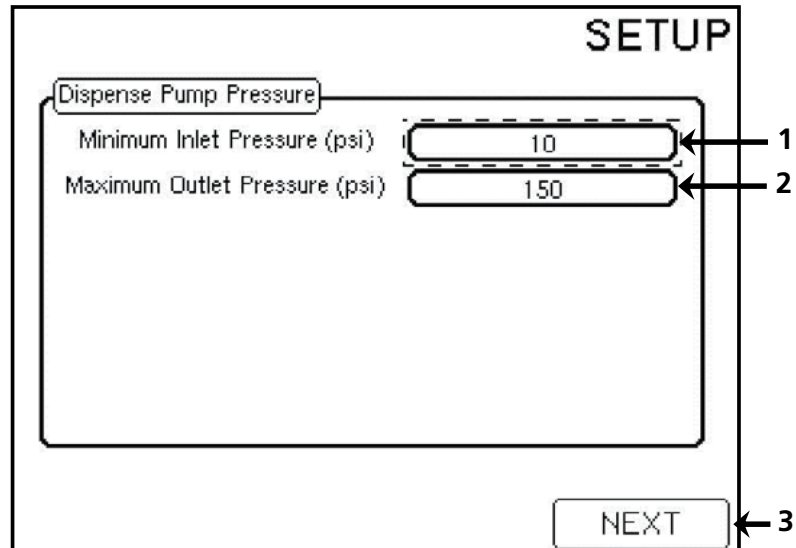
- 1. Ratio Alarm Tolerance %** When the active ratio falls out of this tolerance, the ratio fault will be triggered. The default value is 5%.
- 2. Resin Enable Hold Time (sec)** This is the duration that the resin enable valve will stay open after the air flow switch signal is lost. Default is 15 seconds.
- 3. Resin Enable Start Up Time (sec)** When the unit is switched into MIX mode, the resin enable valve will open for the specified number of seconds. Useful in a single color system to load initial resin. On a multicolor unit, 5 seconds is recommended.
- 4. Flow Sensor Delay Time (sec)** Represents the ramp up time for the Dispense Pump Flow Sensor. During this period of time, the unit will monitor the flow of hardener. For high ratios where flow is very low, a longer time such as 5-10 seconds is recommended.
- 5. Max Resin Flow Rate (cc/min)** The limit of resin flow through the flow meter. Default is 2000 cc/min. This limit can vary depending on the flow meter equipped. The standard gear flow meter limit is 2000 cc/minute.
- 6. Pot Life Check Volume (cc)** Hose Volume in cc's. This is the total volume of fluid lines from the Mix Manifold. If unsure, overestimate. Strictly used for Pot Life determination. Never use a value less than 50 cc's. Approximate hose length volumes are shown in the **9.2 Power Up Procedure**.
- 7. Flow Rate Graph Scale (cc/min)** The scale of the Flow Rate graph on the home screen.
- 8. Optional Solvent Meter (cc/pulse)** Changes the pulse count for the optional solvent meter.
- 9. NEXT** Pressing F4 (NEXT) will advance to the next screen.

NOTE

This screen is only accessible with the Advanced password.

8.18 Dispense Pump Pressure

The Dispense Pump Pressure page allows the pressure limits to be set on the Binks EMS. When the pressures fall out of this range an alarm will sound. These pressure limits should be tuned to the application flow and viscosity requirements for any of the paint colors used. Setting these limits closer to the high and low nominal operating pressures will reduce the probability of a balance fault due to improper pressure settings upstream.



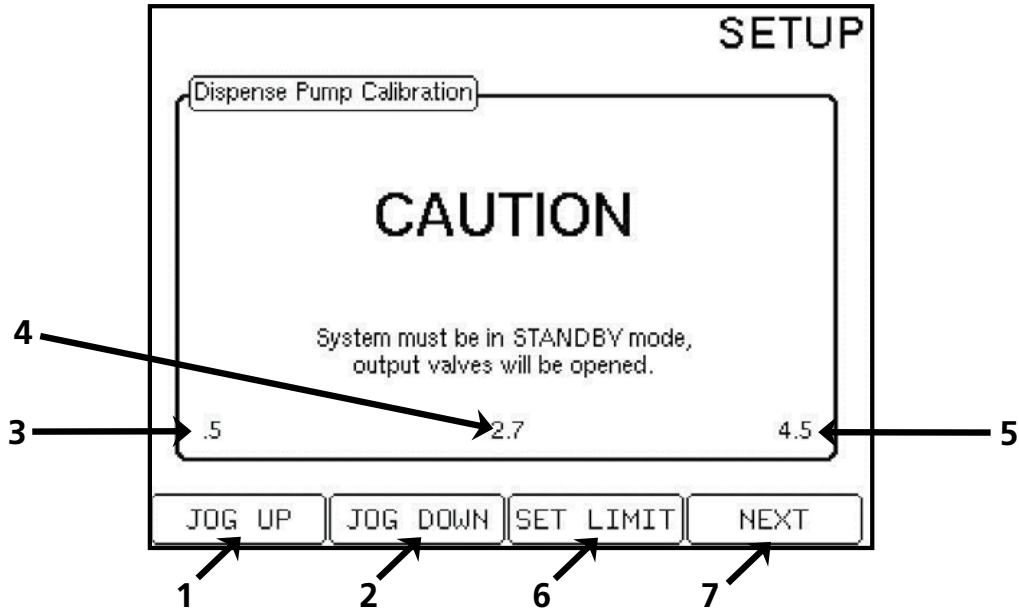
- 1. Minimum Inlet Pressure (psi)** This sets the low limit (in psi) that will trigger a Low Inlet Pressure alarm. Default is 10 psi.
- 2. Maximum Outlet Pressure (psi)** This sets the high limit (in psi) that will trigger a High Outlet Pressure alarm. Default is 150psi.
- 3. NEXT** Pressing F4 (NEXT) will advance to the next screen.

NOTE

This screen is only accessible with the Advanced password.

8.19 Dispense Pump Calibration

This screen is used to calibrate the upper and lower limits of the Dispense Pump. It only needs to be calibrated if the potentiometer gear was disengaged from the ACME threaded rod. For step by step help on calibrating the device, please refer to the **Binks EMS Maintenance and Repair Manual 77-2981**.



1. JOG UP By pressing and holding F1 (JOG UP), the Stepper Motor will move the piston upward. Release to stop motor movement.

2. JOG DOWN By pressing and holding F2 (JOG DOWN), the Stepper Motor will move the piston downward. Release to stop motor movement.

3. UP limit This number is the upper limit. The default value is set between 0.40 and 0.60.

⚠ CAUTION

The JOG buttons must be released to stop motor movement before attached pump components make contact with each other. Have trained personnel adjust these limits to prevent the risk of damage.

4. Current measurement This number displays the current position of the piston. This number ranges between 0 and 5.

5. DOWN limit This number is the lower limit. The default value is set between 4.40 and 4.60.

6. SET LIMIT Pushing F3 (SET LIMIT) will record the position of the piston. Push when the indicating flag has reached the desired location for either the top or bottom limit. The set limit is applied to the last jog that has been pressed.

7. NEXT Pressing F4 (NEXT) will advance to the next screen.

8.20 Passwords

Passwords and current date and time can be entered here. The current date and time is used to time stamp events in the Alarm History screen. The time is displayed in military time (2:34pm=14:34).

The screenshot shows a 'SETUP' screen with two main sections: 'Passwords' and 'Set Time'. The 'Passwords' section has two input fields: 'Basic Password' (containing '0') and 'Advanced Password' (containing '1'). The 'Set Time' section shows the current date and time as '2015 Oct 21 05:34:03' and a list of time components with input fields: Year (2015), Month (10), Date (21), Hour (5), Minute (33), and Second (59). A 'NEXT' button is at the bottom right. Numbered arrows (1-9) point to each of these elements.

- 1. Basic Password** This password will allow access to everything needed for day to day operations. Acceptable password ranges are numbers from 0 to 99999.
- 2. Advanced Password** This password will allow access to all options in the set up menus. Acceptable password ranges are numbers from 0 to 99999.
- 3. Year** Enter the current year.
- 4. Month** Enter the current month.
- 5. Date** Enter the current date.
- 6. Hour** Enter the current hour.
- 7. Minute** Enter the current minute.
- 8. Second** Enter the current seconds.
- 9. NEXT** By pressing F4 (NEXT), it will advance to the next screen.

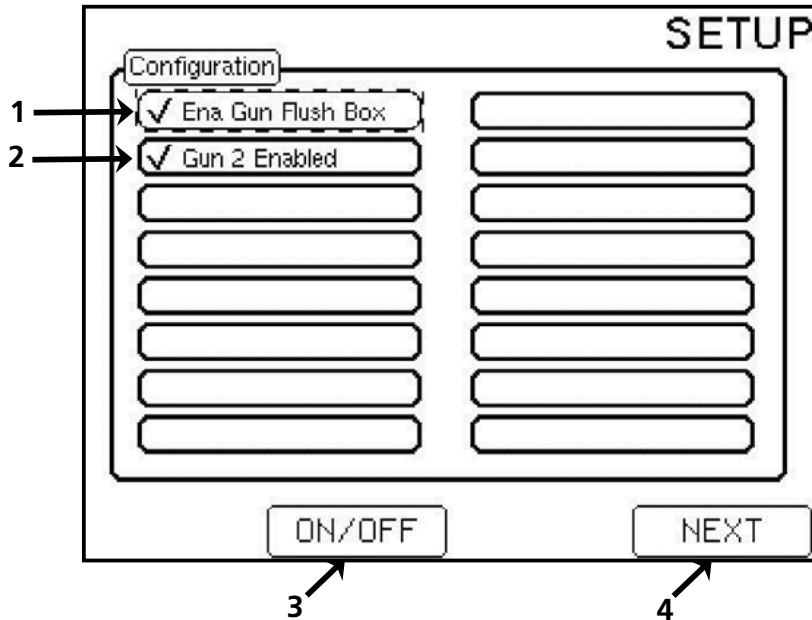
NOTE

This screen is only accessible with the advanced password.

To change values, press the down arrow until the field in question is highlighted. Use the number pad on the pendant to enter the desired value, then press the enter key to accept the value.

8.21 Gun Flush Box Enable

If the Binks EMS is configured with Gun Flush Boxes the Flush Box Enable screen will be accessible. The advanced password must be used to gain access to this page and toggle up to two flush boxes on or off.



- 1. Enable Gun Flush Box** The icon indicating if the gun flush box is enabled. With this checkmark selected, the system is only configured for a single gun.
- 2. Gun 2 Enabled** The icon indicating if gun 2 is enabled for the flush box system. A checkmark will appear when the second gun is enabled.
- 3. ON/OFF** Pressing F2 (ON/OFF) will enable or disable the highlighted gun flush box.
- 4. NEXT** Pressing F4 (NEXT) will advance to the next screen.

NOTE

This screen is only accessible with the advanced password and if the system has been configured with gun flush boxes.

If the system was not configured with flush boxes this page will not be shown.

If configured with gun flush boxes, a flush timeout of 5 minutes will be set when the unit is turned to Flush mode using the Utility Switch. To restart this procedure, turn the switch to Standby mode, then back to Flush mode.

9.1 Binks EMS Startup Guide

Use the following pages as a quick reference to make electrical, air, and fluid connections to the Binks EMS and begin operation. Be familiar with the configuration of the machine and any options or accessories attached. Return to the **8.1 Pendant Guide** portion of this manual for more information on connections and pendant use.

Startup checklist:

1. Verify the frame is secured to the ground or wall and that all components are mounted tight and secure to the enclosure, back panel or framework.
2. Cables for pressure transducers, flow meter, and any other electrical components should be connected.
3. Verify all energy sources are de-energized. Inspect for loose wires anywhere inside the enclosure. Do not attempt to operate with loose wiring. Refer to the **Binks EMS Maintenance and Repair Guide: 77-2981** for wiring diagrams. After wiring verification, it is safe to plug in the system to a proper 3-prong receptacle.
4. Verify all trigger connections are connected as intended (A6-A17). If needed, refer to the **6.1 Air Connections** pages.

Air connections:

Perform the following air connections before use. For more information, go to the **6.1 Air Connections** pages:

1. Regulated air supply to the main air connection (A1). Air pressure should be between 75-100 psi.
2. Regulated air supply to atomizing air inlet on top of the air flow switches (A2). For gun atomizing, typically 20-75 psi.
3. Air flow switch output (A3) directly to the spray gun(s).
4. Air flow switch signal from the individual air switch to pressure switch (A21, A22).
5. Regulated air supply to mix manifold flushing air (A4) or for a multicolor system, the color stack flushing air (A5).
6. If the system is equipped with gun flush boxes:
 - a. Regulated air supply to gun flush box(es) "air" connection (if equipped).
 - b. Gun trigger (TRG) 1 to solenoid (A19) and (TRG) 2 to solenoid (A18).
 - c. Gun in box (GIB) signal lines to pressure switches (A23, A24).
 - d. Air cut off (ACO) trigger lines on gun flush box to air flow switches (A27).

Fluid Connections:

Perform the following fluid connections before use. For more information, go the **7.1 Fluid Connections** pages:

1. Connect hardener supply line to inlet of dispense pump flow sensor/ dispense pump (F1).
2. Connect dispense pump outlet (F2) to mix manifold material hardener inlet (F3).
3. Connect solvent inlet into the mix manifold solvent inlet (F4), or color stack solvent inlet (F5).
4. Connect resin material supply to color stack ports (F6-F11), or flow meter inlet (F17) on single color systems.
5. Connect flow meter outlet (F13 or F16) to mix manifold material inlet (F14).
6. Place mix manifold outlet in position (F15) and screw retaining nut in place. Connect static mix tube to outlet. Connect spray gun fluid line(s) to static mix tube.
7. Energize all fluid lines and check for leaks of any kind. If any are present, be sure to remove pressure and repair the leak before continuing with the **9.2 Power Up Procedure**.

9.2 Power Up Procedure

If the Startup Guide has been followed to this point, the machine should be ready to turn on. Air and fluid should be ready to connect to the system, and may now be opened to pressurize the machine. For Pendant usage directions, refer to the **8.1 Pendant Guide**. Always look for and correct leaks on the Binks EMS.

Startup for systems without gun flush boxes:

1. Turn the utility switch to standby mode. Ensure all compressed air and fluid sources are connected to the EMS and energized.
2. Turn the power switch to on. Select PRIME by pressing F3 on the pendant.
3. With atomizing air off for this step, trigger the spray gun into a grounded metal waste container. Press F2 for Hardener Enable and allow the pump to stroke for at least 2 full cycles (typically about 30 seconds), allowing all air to be removed from the inner chambers.
5. Press F2 again to turn off the Hardener Enable. Release gun trigger.
6. Ensure Color 0 shows in the display box and press F3 to enable the Resin. Trigger the gun until solvent is loaded in the fluid lines.
7. Repeat the Resin load process for all system colors to ensure functionality and to clear air from the fluid lines. After each color has been loaded into the fluid lines, be sure to load with solvent (color 0) so that the inner passageways remain clean and all residual air is removed.
8. Return to the Home screen by pressing the HOME button on the pendant.
9. Press the SETUP button (F4 from the home screen). Proceed through each page and enter the desired values for every screen. Refer to **8.1 Pendant Guide** for more information about each screen.
10. Verify the Pot Life Check Volume (cc) setting is correct for the fluid line setup. Refer to the Hose Size table below.
11. For each color used in the system, an initial calibration must be performed to maintain a proper mixed ratio. Advance to the **9.3 Flow Meter Calibration** page, and perform the test.
12. After settings have been adjusted as needed, turn the Utility Switch to MIX mode.
13. Press the Color button, and load the desired color.
14. After the completion of the color load, energize atomizing air and spray.
15. When spraying is complete, shut off atomizing air and perform a color change or flush as required.

Startup for systems with gun flush boxes:

1. Turn the utility switch to Standby mode. Ensure all compressed air and fluid sources are connected to the EMS and energized.
2. Turn the power switch to on. Select PRIME by pressing F3 on the pendant.
3. Place the spray gun in the gun box and close the lid.
4. Press F2 for hardener enable and allow the pump to cycle for about 30 seconds to prime the pump and hardener line to the mix manifold. Press F2 again when the Pump is primed and no air bubbles are visible in the fluid line leading to the mix manifold.
5. Ensure color 0 shows in the Color Valve box and press F3 to prime solvent. Press F3 again when solvent is visible downstream from the mix manifold.
6. Repeat this process for the remaining paint colors. Follow up this prime process with a color 0 (solvent) prime again to clear resin from the lines and mix manifold.
7. Return to the Home screen by pressing the HOME button on the pendant.
8. Press the SETUP button (F4 from the home screen). Proceed through each page and enter the desired values for every screen. Refer to **8.1 Pendant Guide** for more information about each screen.
9. Verify Pot Life Check Volume using the chart below.
10. Calibrate the flow meter and ratio using the Calibration - Resin + Hardener screen. See **9.3 Flow Meter Calibration** for instructions.
11. Turn the utility switch to MIX mode.
12. Press the color button on the pendant, load the desired color. The system will stop automatically when the mixed material is loaded.
13. Remove the gun from the gun box, close the gun box lid, and spray.
14. When spraying is complete, place the gun in the gun box and close the lid. Perform a color change or flush as required.

Hose Size	15 feet	25 feet	50 feet	75 feet	100 feet
1/4" ID estimated volume	225 cc	325 cc	600 cc	875 cc	1150 cc
3/8" ID estimated volume	400 cc	625 cc	1200 cc	1775 cc	2350 cc

9.3 Flow Meter Calibration

The Binks EMS uses a gear flow meter to measure the flow rate of resin through the system. The PLC uses the resin flow rate to calculate the flow rate of hardener to be dispensed by the Dispense Pump. To maintain ratio accuracy it is very important to ensure the gear flow meter is calibrated for each paint resin used in the system. Follow the steps below to calibrate the flow meter and check proper operation of the dispense pump.

1. Ensure the desired color to be tested has been loaded. Both A and B components must be connected to the system, and ready to spray. The correct ratio values should be entered into the system for all colors to be calibrated.
2. From the Home screen press F4 to show the Password screen and enter the advanced password. Press F4 to advance screens until the Flow Meter Calibration - Resin+Hardener page is visible.
3. Shut off atomizing air so a continuous fluid stream can be captured by a beaker.
4. Place a beaker or graduated cylinder under the fluid tip of the spray gun.
5. Press F2 twice to start the test. This will reset the values to zero. Trigger the gun into the beaker.
7. After triggering for at least 20 seconds, stop the metering at a convenient measurable fluid volume, such as 200 or 300cc. This volume will be the total volume of BOTH components at the specified ratio.
8. Input the measured volume into the Measured Volume field and press Enter. The program will then display the calculated cc/pulse.
9. Input the number shown in the calculated cc/pulse box into the Flow Meter cc/pulse field at the top of the screen.
10. Repeat steps 1-9 to verify the new cc/pulse value. The new Measured Volume should match the Expected Volume. If these values match, the Flow Meter Calibration has been completed successfully.
11. If the values do not match, continue to the next step.
12. If the two volumes are not within 5% tolerance, proceed to the Flow Meter Calibration – Resin Only page to check the Dispense Pump performance. Repeat the above procedure for the Resin only calibration, the difference being that the total volume will be the volume of the Resin component ONLY.

Color: 2

Flow Meter Calibration - Resin+Hardener

Flow Meter cc/pulse	0.2400
	×
Pulse Count	0
	=
Expected Volume (cc)	0.0000
Measured Volume (cc)	0.0000
Calculated cc/pulse	0.0000

START
NEXT

NOTE

The machine must be in MIX Mode for this procedure.

After performing a ratio test, mixed material will be loaded in the fluid lines. If a resin+hardener ratio test results in a changed value, be sure to flush the fluid lines by performing a color 0 load.

Never use water for flow meter calibration or flow testing.

13. If the resulting actual volume is significantly different than the calculated volume after repeated tests, it is possible the Flow Meter may be clogged or sticking and may require disassembly and cleaning.
14. Conversely, if the Resin Only calibration results in accurate measured volumes but the Resin+Hardener calibration does not, there may be a problem with the Dispense Pump. Review the steps in **9.4 Dispense Pump Troubleshooting Checklist** to verify proper operation of the pump.

9.4 Dispense Pump Troubleshooting Checklist

The Dispense Pump has multiple components needed to verify proper operation. Go through this checklist to help identify potential problems with the pump before disassembling. If the problem is still not corrected, it may be necessary to remove the Dispense Pump and clean it thoroughly after flushing it with a solvent. No passageways should be clogged with material.

DISPENSE PUMP TROUBLESHOOTING CHECKLIST	
Description	Pass/Fail
Check for air in all fluid lines. There must be no air bubbles anywhere	_____
Verify there are no leaks anywhere on the pump fluid end.	_____
Examine the Oil Reservoir. Look for overflowing or hints of hardener / catalyst material in the reservoir.	_____
Check that the system is not in an Alarm state. It is possible an Alarm is not allowing the pump to run.	_____
Visually inspect the ACME threaded rod. Look for damage and engagement with the potentiometer gear.	_____
Verify the flag indicator is tightly securing the ACME rod to the pump rod. Inspect the Pump rod for hardened material that may prevent movement.	_____
Change the Binks EMS to Standby mode and go to the PRIME screen. Trigger the gun and Dispense Pump(F2). Ensure Poppet Valve operation. Confirm a constant stream of material is exiting the gun.	_____
Examine the stepper motor. Verify smooth operation when the pump is running. There should not be any 'stuttering' movement of the pump. Unusual movement could be attributed to a flow meter that needs cleaning.	_____

10.1 Daily Operations

Daily use of the Binks EMS involves many procedures. Understanding how the system works and knowing the properties of the paint materials in use is the best way to ensure continuous use with few alarms and repairs. Study the procedures and tips below to better understand the function of the system and read the **Binks EMS Maintenance and Repair Manual 77-2981** to review maintenance and repair schedules and procedures.

10.2 Daily Start Up Procedure

Follow the steps below during startup to ensure proper operation and optimal safety. These daily procedures assume paint solvents, resins, and hardeners have been loaded into the machine and remain loaded between each use of the system.

1. Ensure all fluid and air connections on the system are tight and secure. Ensure fluid supply is adequate for duration of operations.
2. Inspect Oil Reservoir to verify that the Dispense Pump seals are not leaking.
3. Check all poppet valves on the system for leaks.
4. Connect regulated pressurized air to the system and open valve if equipped. Maintain 75psi minimum at all times to the enclosure main air inlet.
5. Energize fluid supplies and open valves supplying the EMS with resin(s), hardener, and solvent.
6. Ensure the switches on the enclosure are set to 'Off' and 'Standby.' Connect power and turn the power switch to the 'On' position.
7. Navigate to the Alarms History page. Verify no alarms have occurred lately. If an alarm has occurred, verify that the problem has been resolved. For Example, if the High Output Pressure alarm shows in the list, verify there are no pinched hoses or clogged static mixers.
8. Turn the Utility switch to MIX mode.
9. Load the desired color. Go to **10.3 Loading a Color** for additional detail.
10. Verify Inlet and Outlet hardener Pressures are correct for the application, and that the Inlet Pressure is 5-10% higher than the Outlet.
11. If using a gun flush box, remove the gun from the box and begin to spray. The gun box cover must be closed without the gun in the box to activate atomization air. If not using a gun box, turn on atomizing air and begin to spray.
12. Fine tune gun settings for the application (flow rate, atomizing air pressure, fan control). **Remember that changing the resin pressure to adjust flow rate at the spray gun should be followed by a matching change to the hardener pressure to maintain the 5 to 10% higher target inlet pressure.**

CAUTION

If using a GUN BOX, ensure gun is in box with the lid closed. If loading a color or flushing without a gun box, ensure atomizing air is turned off, and trigger material into a grounded metal waste container.

10.3 Loading a Color

1. Follow steps 1 through 8 of **10.2 Daily Start Up Procedure**.
2. Go to the Home screen and verify the unit is in MIX mode. Ensure atomizing air is turned off. For systems with gun flush boxes, place the gun in the box and close the lid.
3. Press the Color button on the Pendant to access the Color Change screen.
4. Press the color number desired, and press Go to load the color. When loading a color if the current color is 0, the fluid lines will not be flushed, since it is assumed there is no material in the lines following the **10.5 End of Day Flushing Procedure**.

NOTE
For a color change, the Go button will not display if: <ul style="list-style-type: none">• The spray gun(s) are not in the Gun Box(es).• The Gun Box lids are not closed.• The system is in Standby mode.
5. The color should be loaded and ready to spray. If adjustments need to be made to the flush sequence, go to 10.6 Flushing Setup .

10.4 Color Change Procedure

1. To change colors, the initial color must be loaded by following **10.3 Loading a Color Procedure**.
2. Press the Color button on the Pendant for the color loading screen.
3. Enter the color number desired, and press Go to load the color. The system will proceed to flush the gun(s) in sequence and then load the desired color at the mix ratio for that color.
4. The color selected should be loaded, completing the color change procedure.

10.5 Standby Procedure

When taking a short break, the Binks EMS can be placed into a standby mode. Follow the procedure below. For longer breaks, see **10.8 System Depressurization Procedure**.

1. If Pot Life time is short, clear fluid lines of mixed material. Load Color 0. Refer to **10.3 Loading a Color**.
2. Turn the Utility Switch on the system to Standby mode. For extended shut down procedures, refer to **10.7 End of Day Flushing Procedure** or **10.8 System Depressurization Procedure**.

10.6 Flushing Setup

1. In order to adjust the Flushing Setup, the password must be known. Press SETUP on the Pendant, and enter the password. For help with the pendant, refer to **8.1 Pendant Guide**.
2. Advance to the System screen, and adjust the settings as needed, using the table below as a guide. The recommended settings are a baseline for 25 foot x 1/4" ID fluid hose. Adjust the values accordingly.

NAME	SUGGESTED INITIAL SETTING	DESCRIPTION
First Flush	AIR	Air or Solvent to initially flush fluid lines.
First Flush Time	15 seconds	Duration of first flush. This flush is used to move paint out of the system before attempting to "clean" with the chop process.
Air Chop Time	1 second	Duration of each air burst in the chop process
Solvent Chop Time	1 second	Duration of solvent burst in the chop process
Chop Duration	30 seconds	Total duration of chop process.
Last Flush	SOLVENT	Last flush with Air or Solvent. Final clearing of system—this is also the fluid left in the system if shut down.
Last Flush Time	20 seconds	Duration of last flush - should be timed to minimize solvent waste but still completely load the fluid lines with solvent.
Load Volume	300cc—Use the chart from 9.2 Power Up Procedure	Volume needed to load mixed material into the fluid lines.

The following factors will influence the choices listed above:

Worst case flushing—Always set up the flush parameters using the most viscous/worst case resin material.

Flushing air and solvent pressure—Higher pressures may reduce the time needed to flush the system, but can create significant spitting from the spray gun during the process.

Material viscosity—Viscous materials may move more slowly and require additional time to be purged from the system.

Hose volume/ length—Longer fluid lines encompass a larger volume and may require a longer flush time. Also pressure drop through a longer hose or smaller diameter hose will affect the time required to purge paint and clean the system.

Spray gun tip size—Small tips may restrict flow during a flush.

Try to optimize the system to minimize solvent usage during color changes and flushes by:

- Using air instead of solvent for the first flush
- Let the "chop" process do most of the cleaning
- Don't use more solvent than necessary for the last solvent flush.

10.7 End of Day Flushing Procedure

If the Binks EMS is not to be used for a brief period of time, it can be placed on Standby mode—see **10.5 Standby Procedure**. It is best to shut down the machine following the steps below.

1. Flush the Mixed Material

- A. Color 0 Load: Perform a color 0 load to clear the fluid lines of material and load with solvent. For information on loading, see **10.3 Loading a Color**.
 - i. If the fluid lines are not fully flushed, see **10.6 Flushing Setup**.
 - ii. If **10.6 Flushing Setup** values are adequate, turn the Utility Switch to Flush mode. The machine will go into an air/ solvent chop until the Utility Switch is turned to a different setting. Typically, 30 seconds of flush mode will clear a standard 25 foot hose.
- B. Flush Mode:
 - i. Turn the Utility Switch to Flush mode until the fluid lines have been cleared of mixed material. Perform a color 0 load to fill the fluid lines with solvent. Be sure to trigger the gun.
- C. Manual Flush: Operate air and solvent ball valves until fluid lines are flushed. Be sure to trigger the gun.
 - i. Open Air Flush Valve for 5 seconds while triggering the gun. Close Air Flush Valve.
 - ii. Open Solvent Flush Valve while triggering the gun.
 - iii. Continue until mixed material is flushed out of the system. Close Solvent Flush Valve.

2. Always ensure there are no mixed materials remaining in the fluid lines.

- i. Save your usage data by accessing the USAGE screen.
- ii. Optionally, turn Utility switch to Standby and power off EMS unit using Power Switch.

3. Depressurize fluid supply and close fluid supply valves. Depressurize system air pressure.

NOTE
Always shut down the Binks EMS with flushed fluid lines that are loaded with solvent (color 0).

10.8 System Depressurization Procedure

1. When ready to shut off the machine extended periods, it is recommended the system is flushed of mixed material. This step must be done in MIX mode. Ensure all guns are in gun flush boxes, and that lids are securely closed. If not using flush boxes, shut off atomizing air for the next steps.
2. From the Home Screen on the Pendant, press the color button. Load Color 0 (Solvent) and press Go (F3). If not using a flush box, trigger the spray gun.
3. Wait for the system to flush the fluid lines and load the Solvent. This will remove resin from the color stack and flow meter on multi-color systems, and also remove mixed material from the Mix Manifold. If there is still material visible in the lines, Load color 0 again, or switch the system to Flush mode as long as needed to clear any debris from the fluid lines
4. Shut supply of all pressurized resin, hardener, and solvent to the unit. This step should allow the color stack to no longer be exposed to fluid pressure.
5. The working fluid in both the Color Stack (if equipped), and Dispense Pump are under pressure. To release this pressure, go to the Home Screen and then the Prime screen on the Pendant.
6. If not using GFB, trigger the gun into a grounded metal waste container. Press F2 to engage the Dispense Pump and cycle it to release any built up pressure. Allow it to run for 5 seconds, and then press F2 again.
7. Next, press F3 for resin valves to open and allow the pressure to exit via the Resin side. Input all active colors 1-6 to depressurize all active chambers. Press F3 again after performing on all active colors. Release.
8. Turn the power switch to the OFF position.
9. Next, remove the air pressure input from the system. The air regulator should indicate that there is no longer pressure in the system.
10. Once fluid pressure has been released, the Binks EMS fluid lines can be removed as needed. The unit may be stored in this depressurized state. Store the system in a dry location out of direct sunlight.
11. If disassembling the machine, be sure to verify it is disconnected from all power sources.

NOTE

If Color 7 is loaded on a Multicolor system, compressed air will be sent through the resin lines.

11.1 Glossary of Terms

ACME Lubricant—Lubricant used on the ACME screw threads on the stepper motor rod. The lubricant reduces friction and prevents damage to the threads. Follow callouts where labeled.

Active Ratio—The current resin-to-hardener ratio the system has loaded and ready to spray. Visible on the Home screen of the pendant.

Air Cut Off Valve—A pneumatically (pilot) operated valve that stops the flow of atomizing air to the spray gun during a flush or color change. Only used with gun flush boxes.

Air Flow Switch—A device used to send a pneumatic signal to the EMS control when the spray gun atomizing air is triggered. The switch is located on the EMS fluid back panel. Optionally, it may be located in the spray booth.

Alarm—The red light and buzzer on the front of the EMS Enclosure. Alarms sound when certain monitored values fall out of the operating range, such as the pot life or mixture ratio. Also referred to as a fault.

Atomizing Air—The air supplied to the spray gun that is used to atomize the mixed material. This air is routed through the Air Flow Switch(es), where recommended supply pressure is between 20 and 75 psi.

Air Flush Valve—The ball valve on a single color unit with the manual flush option. It controls the air used to flush the fluid lines. When open, it allows air to travel into the fluid lines. Located on the bottom of the Mix Manifold.

Ball Valve—A hand operated valve that opens or closes a passageway with the turn of a knob or handle.

Blow Back—The term used to describe the backward flow of material through the system. In the Binks EMS system this condition is prevented by the use of check valves to limit the direction that fluid pressure can take. Always ensure proper function of the check valves to prevent Blow Back and the corresponding damage that could occur to the Dispense Pump or other components. Also known as “crossover”.

Blow Off Time—The amount of time allotted for the triggering of atomizing air with no fluid supply. This is a parameter set in the EMS system to allow a painter to use the gun atomizing air for a short time to clean a part immediately prior to spraying.

Calibration—The process of setting a device to measure accurately. The Flow Meter is the only Binks EMS components that requires calibration. See **9.3 Flow Meter Calibration Procedure** to verify the proper performance of the flow meter.

Catalyst—A coating component that initiates a chemical reaction in the coating to accelerate the hardening process. Catalysts are typically identified by high mix ratios such as 10:1 or 50:1. Sometimes the catalyst-to-resin ratio is expressed as a percentage such as 10% or 2%.

Check Valve—Valves used to limit the flow of fluid or air to one direction. The valve is typically held in the closed position by a spring. Check valves should be cleaned or replaced frequently as they are more likely than other components to become clogged with hardened paint particles.

Chop—The term used to describe short bursts of air or solvent in the fluid lines, typically in sequence at varying specified intervals. Lengths of time set in the Setup screens of the Pendant.

Circulation System—A circulation system is fluid plumbing with the ability to circulate paint material in a continuous loop so particles remain in suspension. These systems can be used with the Binks EMS unit and routed through the Color Stack.

Color Stack—The component of the Binks EMS that augments the unit to accept up to 6 colors, allow plumbing for circulation systems, controls flush procedures, and mounts the flow meter for active metering. The component will accommodate 2-6 resin colors.

Component A—The term used to describe the resin material that is sent through the color stack and flow meter.

Component B—The term used to describe the hardener material or catalyst that is metered by the Dispense Pump. Hardeners as used in Urethane or Epoxy paints become part of the final product, whereas catalysts are typically used to initiate a reaction in the paint material.

Depressurized—No residual fluid or air pressure.

Diaphragm—A part of the Air Flow Switch that relays differential pressure to the amplifier and results in a signal to the PLC. If this part is damaged or contaminated it may not function properly and should be replaced.

Dispense Pump—Dispenses hardener to the Mix Manifold at the flow rate requested by the PLC. The dispense pump is available in two different sizes.

Dispense Pump Flow Sensor—The optional low flow sensor placed at the inlet of the Dispenser Pump. It sends a signal to the PLC when it senses fluid flow. Adjustable to accommodate the various flow rate ranges.

EMS—Acronym for the Binks Electronic Mix Solutions system.

11.1 Glossary of Terms (cont.)

Enclosure—The blue box that surrounds the electrical components of the unit and houses the top end of the dispense pump.

Fault—see Alarm.

Floor Stand—The pedestal stand used to mount the unit together with the fluid panel and machine components. Allows the machine to be placed anywhere as long as the surface is flat and level.

Flow Meter—The device used to measure the volume of resin when the machine is running. Material travels through the gears of the (standard) flow meter and sends signal to the PLC which tracks the total volume and compares it to the programmed hose volume to determine pot life. Also available is the Coriolis flow meter.

Fluid Lines—A term used in the manual to describe the fluid hoses throughout the machine and out to the spray guns. These hoses are used to transport the mixed and unmixed fluids.

Fluid Panel—The panel used to mount the mix manifold and fluid components such as the color stack and air flow switches. It is mounted to the frame of the Binks EMS or can be mounted separately.

Flushing—The term used to clean out the fluid lines and other EMS components when changing colors or shutting down for the day. Typically will involve an air and/or solvent chop to remove mixed materials.

Gun Box—The optional equipment that can be ordered to complete a fully automatic fluid line flush procedure. Sends and receives signal to the PLC in order to complete the flushing procedure.

Gun Lubricant—A low viscosity lubricant used to assemble and protect machine components. Follow callouts where labeled.

Hardener—The paint component that chemically reacts with the resin to provide a coating with superior properties to air-drying single component coatings. Also known as the “B” component.

Indicator—The name of the flag guide that shows the location of the piston in the dispenser pump.

Intrinsically Safe Barriers—An electronic safety device which allows relocation of the fluid panel to a hazardous spraying location if used with an intrinsically safe sensor. Also known as a Zener barrier.

Jog Down—The command used to push the piston of the dispense pump downwards and set the limits of operation in the Manufacturing Setup page of the Pendant Setup.

Jog Up—The command used to pull the piston of the dispenser pump upwards and set the limits of operation in the Manufacturing Setup page of the Pendant Setup.

Load Volume—After completing a flushing procedure of the spray guns, the load volume is the volume of material (in cc’s) required to load the mixed material into the fluid lines so that spraying may begin.

Manual Flush—The term used to describe the manual opening and closing of ball valves on the mix manifold when flushing the fluid lines with air and solvent.

Mix Manifold—The combining location of the resin and hardener components. It becomes the location of fluid line flushing when equipped with a single color unit.

Oil Reservoir—The clear plastic tube used to visually identify if the dispense pump seals are leaking and need to be replaced. Mounted on the dispense pump, it should be visible from the front of the Binks EMS.

Pendant—The device used to control the Binks EMS and program flush settings. Used to operate the machine.

Petroleum Gel—A lubricant used to protect parts from galling and damage upon reassembly. Follow callouts where labeled.

Polytetrafluoroethylene (P.T.F.E)—A chemically inert plastic commonly used for o-rings, gaskets, and thread tape. Follow callouts where labeled.

Poppet Valve—The pneumatic valves used to open and close ports throughout the unit.

Potentiometer—A device used to tell the PLC the location of the dispenser pump piston. The potentiometer upper and lower limits must be reset if the potentiometer gear is ever disengaged from the ACME threaded rod.

Pot Life—The period of time during which mixed coating remains sprayable.

Power Switch—The On / Off switch on the front of the enclosure.

Pressure Transducer—The device mounted on the dispenser pump measuring current chamber pressure. Two pressure transducers are used in the dispense pump to provide real time data to the user. Monitored by the PLC.

Programmable Flush—Refers to the process of gun and fluid line flushing of mixed material controlled by the PLC. Programmable flushing is available on single color and standard on multi-color systems.

11.1 Glossary of Terms (cont.)

Programmable Logic Controller (PLC)—A digital computer used for control of devices, such as the operation of the dispense pump, solenoids, and other hardware.

Prime Screen—The term referring to running material through the machine and removing all air bubbles from the fluid lines. Prime the system by running either the Dispense Pump or resin material through the unit.

Pulse Count—The term used when calculating the k factor (cc's per pulse of material) for the volume of material per pulse of the flow meter. This value will have to be set for each color being used in the unit.

Resin—The material that is sent through the color stack and flow meter. The paint resin provides color and flexibility and other properties to plural component coatings. Polyols are resins used for urethane paints, and epoxy resins are used for epoxy paints

Resin Enable Valve—The poppet valve used to enable resin flow through the mix manifold.

Restrictor—The device used to aid in the hardener delivery of high ratio applications. This item will only be present if ordered with the high ratio kit which contains a corresponding manifold outlet.

Seal Assembly—The set of plastic packings and adapters that seal the dispenser pump rod to avoid leakage.

Solenoid—The device used to convert electrical signals to pneumatic trigger signals for poppet valves. Packaged in solenoid stacks for compact location of trigger control. Can be manually triggered if needed.

Solvent—The material used to clean mixed material from the fluid lines.

Solvent Flush Valve—The valve used with the solvent to enable flushing. This valve could be a poppet valve, a ball valve, or may not even be present on a multicolor system.

Static Mixer—A device used in a fluid line to mix two or more fluids together. The static mixer divides, rotates, and re-combines the flow many times to provide efficient mixing with minimal pressure drop.

Stepper Motor—Used to control movement of the dispense pump piston, the stepper motor engages the ACME threaded rod and enables the piston to move up and down. Universal for both sizes of the dispense pump.

Thread Sealant—P.T.F.E tape or liquid pipe thread sealant is required on pipe threads to lubricate and prevent leaks. If using tape, wrap 2-3 times around the male threads. If using liquid, add a bead of sealant around entire 2nd male thread before tightening into female thread. Follow callouts where labeled.

Utility Switch—The control knob used to switch between MIX, STANDBY, and FLUSH modes.

Wall Mount—The frame used to mount the Binks EMS to the wall.

Warning Buzzer—The combination buzzer and light located on the front of the Binks EMS enclosure. It will only sound when an alarm is triggered.

WARRANTY

This product is covered by Binks' 1 Year Limited Warranty.

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