Instructions - Parts

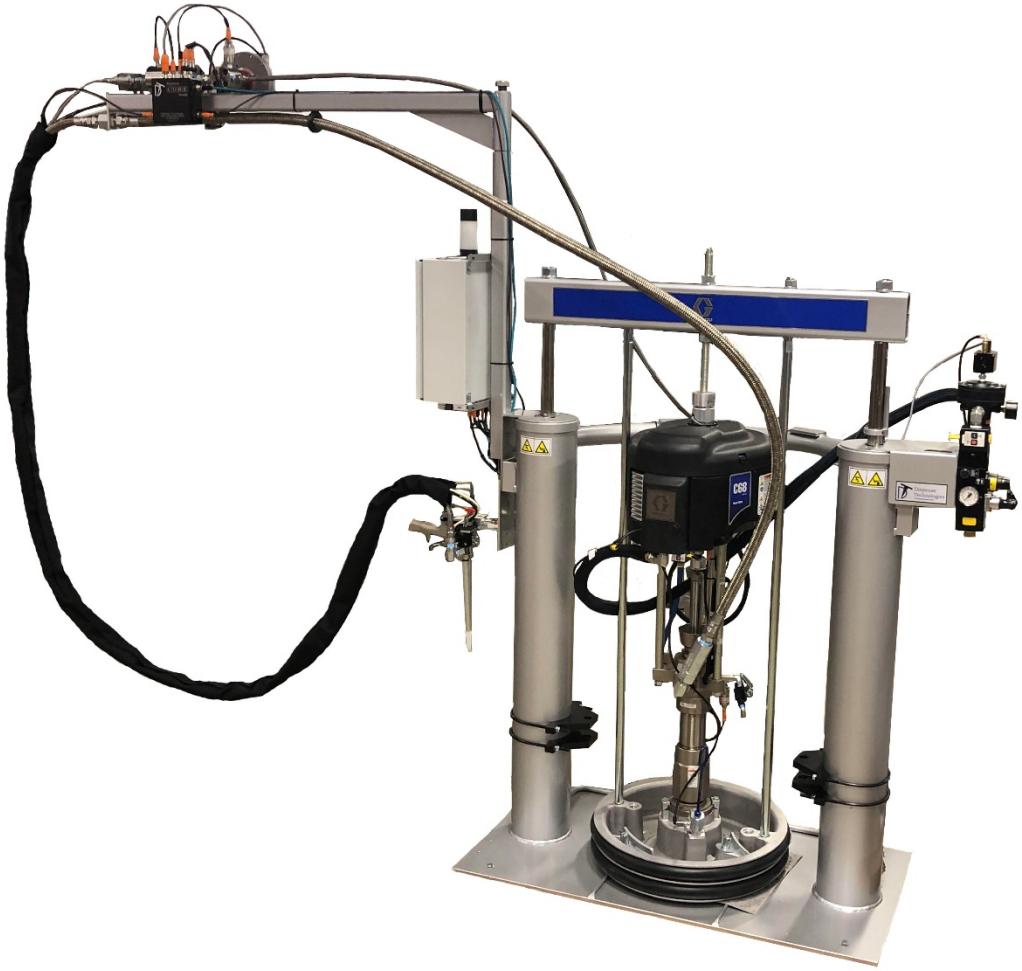
PM105 D

2K Predator®

Used to meter, mix and dispense a variety of 2-component sealants and adhesives.

Not approved for use in explosive atmospheres or hazardous locations

Important Safety Instructions
Read all warnings and instructions in this manual.
Save these instructions.



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Related Graco Manuals

Pump Manuals	
313526	Supply Systems, Operation
313526	Supply Systems, Repair
312376	Check-Mate Pump Packages
312375	Check-Mate Pump Lowers
312889	Repair Parts for Check-Mate 60
312467	Repair Parts for Check-Mate 100
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Fluid Regulator Manuals	
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*The most current related manuals list above are available for viewing and download at www.graco.com

Warnings

The following warnings are for the setup, use, grounding, maintenance, and repair of this equipment. The exclamation point symbol alerts you to a general warning and he hazard symbol refers to procedure-specific risk. Refer back to these warnings as required. Additional, product-specific warnings may be found throughout the body of this manual where applicable.

⚠ WARNING

SKIN INJECTION HAZARD

High-pressure fluid from dispense valve, hose leaks, or ruptured components will pierce skin. This may look like just a cut, but it is a serious injury that can result in amputation. **Get immediate surgical treatment.**

- Do not point dispense valve at anyone or at any part of the body.
- Do not put your hand over the end of the dispense nozzle.
- Do not stop or deflect leaks with your hand, body, glove, or rag.
- Follow **Pressure Relief Procedure** in this manual, when you stop spraying and before cleaning, checking, or servicing equipment.

EQUIPMENT MISUSE HAZARD

Misuse can cause death or serious injury.

- Do not operate the unit when fatigued or under the influence of drugs or alcohol.
- Do not exceed the maximum working pressure or temperature rating of the lowest rated system component. See **Technical Data** in all equipment manuals.
- Use fluids and solvents that are compatible with equipment wetted parts. See **Technical Data** in all equipment manuals. Read fluid and solvent manufacturer's warnings. For complete information about your material, request MSDS forms from distributor or retailer.
- Check equipment daily. Repair or replace worn or damaged parts immediately with genuine manufacturer's replacement parts only.
- Do not alter or modify equipment.
- Use equipment only for its intended purpose. Call your distributor for information.
- Route hoses and cables away from traffic areas, sharp edges, moving parts, and hot surfaces.
- Do not kink or over bend hoses or use hoses to pull equipment.
- Keep children and animals away from work area.
- Comply with all applicable safety regulations.

TOXIC FLUID OR FUMES HAZARD

Toxic fluids or fumes can cause serious injury or death if splashed in the eyes or on skin, inhaled, or swallowed.

- Read MSDS's to know the specific hazards of the fluids you are using.
- Store hazardous fluid in approved containers, and dispose of it according to applicable guidelines.
- Always wear impervious gloves when spraying or cleaning equipment.

PERSONAL PROTECTIVE EQUIPMENT

You must wear appropriate protective equipment when operating, servicing, or when in the operating area of the equipment to help protect you from serious injury, including eye injury, inhalation of toxic fumes, burns, and hearing loss. This equipment includes but is not limited to:

- Protective eyewear
- Clothing and respirator as recommended by the fluid and solvent manufacturer
- Gloves
- Hearing protection

⚠ WARNING

FIRE AND EXPLOSION HAZARD

Flammable fumes, such as solvent and paint fumes, in **work area** can ignite or explode. To help prevent fire and explosion:

- Use equipment only in well ventilated area.
- Eliminate all ignition sources; such as pilot lights, cigarettes, portable electric lamps, and plastic drop cloths (potential static arc).
- Keep work area free of debris, including solvent, rags and gasoline.
- Do not plug or unplug power cords, or turn power or light switches on or off when flammable fumes are present.
- Ground all equipment in the work area. See **Grounding** instructions.
- Use only grounded hoses.
- Hold gun firmly to side of grounded pail when triggering into pail.
- If there is static sparking or you feel a shock, **stop operation immediately.** Do not use equipment until you identify and correct the problem.
- Keep a working fire extinguisher in the work area.

Overview

The Standard 2K Predator® can be configured with either a 5 or 55-Gallon supply system on the major volume material and either a 5 or 55-gallon supply system on the minor volume material. The 55-gallon supply system incorporates a linear transducer to monitor the fluid flow and the 5-gallon supply system uses a fluid flow meter and fluid regulator to monitor and control the fluid flow.

The 2K Predator® RF can be configured with 5-gallon or 55-gallon supply pumps and uses two fluid pressure regulators and two fluid flow meters.

In each configuration, both the major and minor volume materials utilize pressure and volume feedback to monitor and control the ratio of a two-component material. This system can be configured for manual or automatic operation. The electrical control panel precisely monitors and controls the pressure and flow rate of each material in real time to maintain the proper flow and material ratio.

The system controller will verify that the ratio is within the preset limits during the dispense cycle. The controller will adjust either or both of the materials to keep the proper ratio and volume of mixed material. If the ratio is outside of the preset limits, a fault will be indicated.

This system uses a dedicated microprocessor-based controller for diagnostics and supervisory control. The system controller incorporates a touch screen operator interface for setting system variables and displaying system information. This operator interface displays pressure and ratio data, as well as set up values, fault information and module status.

The data logging feature allows data to be collected at a user specified time increment and stored to a USB disk with a time and date stamp. This feature also allows any system faults and warnings to be stored. Included software allows the data to be exported to an Excel spreadsheet for processing. The system controller also offers an optional remote troubleshooting assistance.

Optional remote monitoring is available for troubleshooting.

HMI

The user interface is a color touch screen that allows the system status, warnings, faults, and variables to be viewed.

System Status Screen

- From this screen you can monitor system pressures
- **TEMPERATURE/HUMIDITY**: (Optional) Ambient temperature and humidity can be monitored and stored to the data log
- **DISPENSE:** (Optional) Used for dispensing with an automatic dispense valve.
- Pressing the left or right arrow will take you to additional status screens.
- Pressing any of the available menu soft keys in the left column will direct you to the respective screen.

System Status Screen #2 – System I/O

Inputs

- **NXT A – TOP SWITCH** – Signal from air motor indicating travel in the down position
- **NXT A – BOTTOM SWITCH** – Signal from air motor indicating travel in the up position
- **NXT B – TOP SWITCH** – Signal from air motor indicating travel in the down position
- **NXT B – BOTTOM SWITCH** – Signal from air motor indicating travel in the up position
- **OKAY TO DISPENSE**- Signal from automation that it is okay to dispense or automatically purge
- **DISPENSE** – This signal will be on when the automation gives the dispense signal
- **PUMP A LOW** – (OPTIONAL) Signal indicating the major volume pump is low
- **PUMP A EMPTY** – (OPTIONAL) Signal indicating the major volume pump is empty
- **PUMP B LOW** – (OPTIONAL) Signal indicating that the minor volume pump is low.
- **PUMP B EMPTY** – (OPTIONAL) Signal indicating the minor volume pump is empty

Outputs

- **BEACON** – This signal will be on when the red light is on
- **BUZZER** – This signal will be on whenever the audible alarm is on.
- **GUN ON** – This signal will be on when the system is dispense valve is on.
- **BASE PURGE** – (OPTIONAL) This signal is on when the system is in base purge
- **FAULT** – (OPTIONAL) This signal is on when the system has a fault.
- **IN CYCLE** – (OPTIONAL) This signal is on during a dispense cycle.
- **PURGE WARNING** – This signal is on when the system needs to purge.
- **READY** – This signal is on when it is okay to dispense.

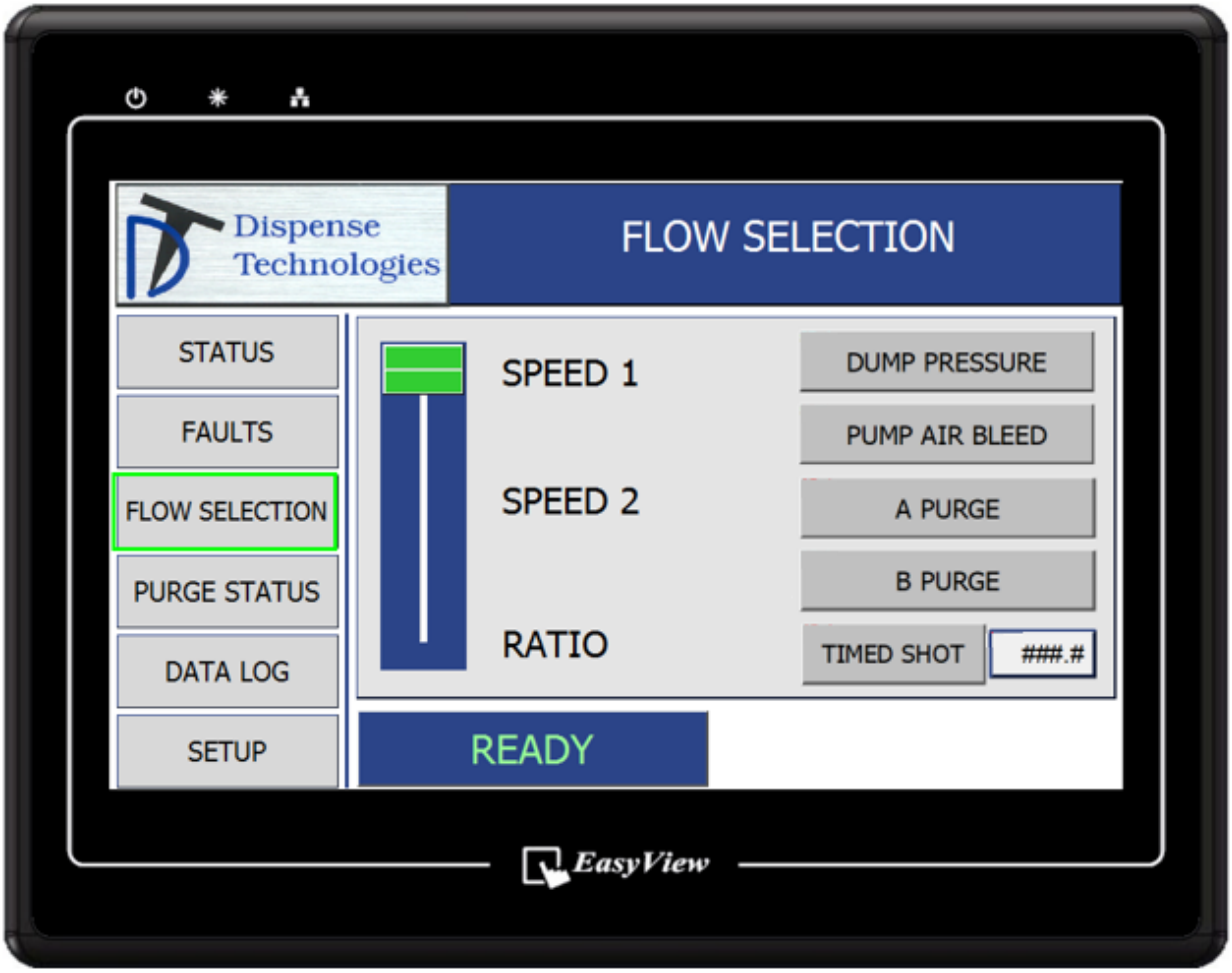
- Pressing the left or right arrow will take you to an additional or the previous status screen.
- Pressing any of the available menu soft keys in the left column will direct you to the respective screen.

Faults and Warnings Screen

The Faults and Warnings screen will indicate and log any faults or warnings with a time stamp while the machine is on. The log is reset when power is turned off.

The Fault log is stored to the USB drive when the optional Fault and Data logging option is purchased

Flow Selection Screen



Do not change the system mode while the system is running.

- **RATIO:** Use this mode to dispense material while the mixer and shroud are **NOT** installed on the dispense valve. Use this mode when taking cup samples without a mixer for ratio verification.
- **SPEED 1:** Use this mode to dispense material at preset speed 1 while the mixer and shroud are installed on the dispense valve.
- **SPEED 2:** Use this mode to dispense material at preset speed 2 while the mixer and shroud are installed on the dispense valve.
- **DUMP PRESSURE:** This mode opens the dispense valve and relieves pressure from the system.
- **PUMP AIR BLEED:** Use this mode to bleed air from the pumps after a barrel change. Lowers the pump pressure on the major volume pump.
- **A PURGE:** Use this mode to run major volume material only through the system. Can be used to base purge the static mixer
- **B PURGE:** Use this mode to run minor volume material only through the system
- **TIMED SHOT:** (OPTIONAL) Use this button to dispense for a preset amount of time with an automatic system.
- Pressing any of the available menu soft keys in the left column will direct you to the respective screen.

Purge Status Screen

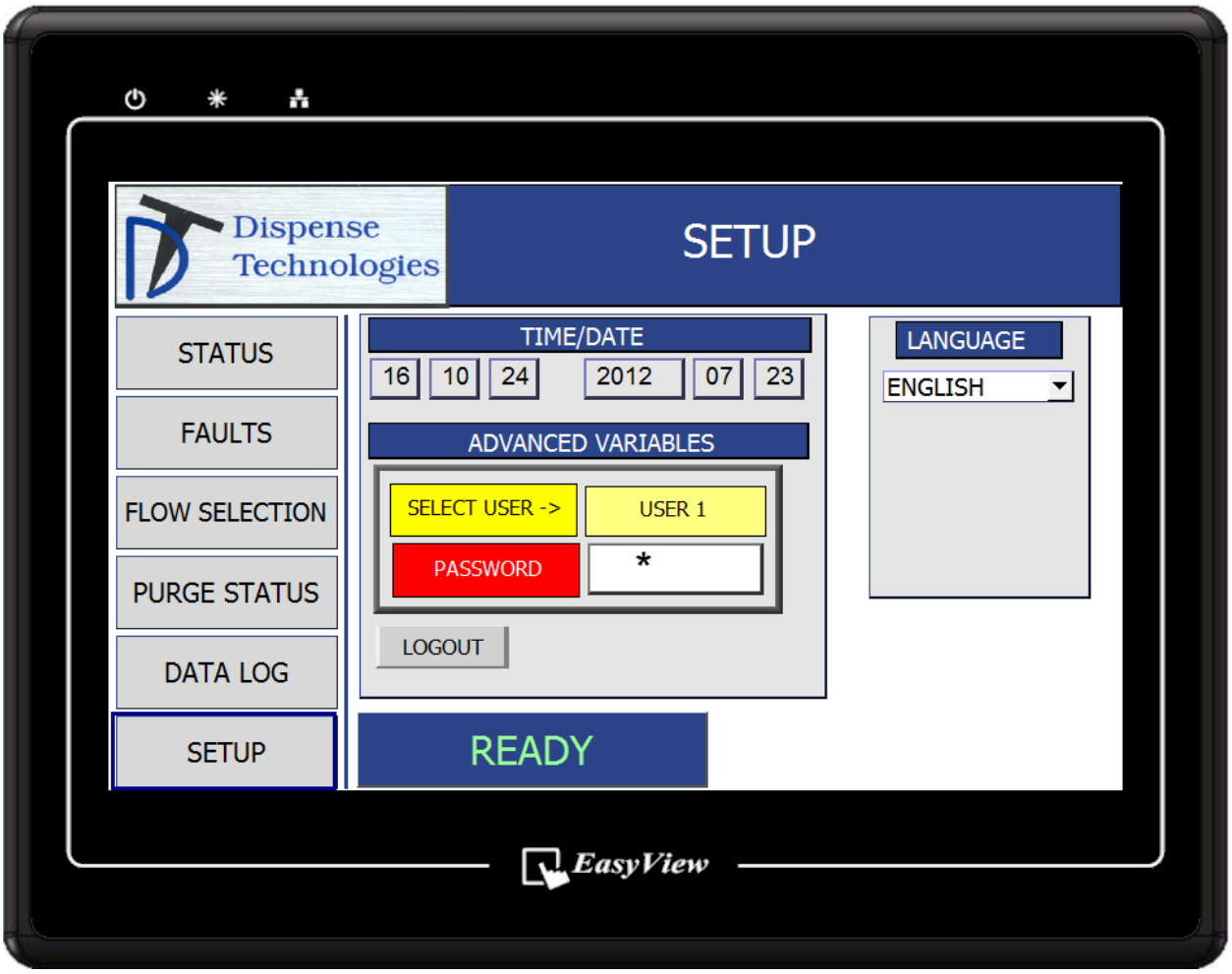
This screen is used to display and change purge values. The system has a built in purge timer to indicate when the system requires purging. The purge timer begins timing after the dispense signal is complete. This value resets every time the dispense signal is turned on. If the “Purge Warning” time is reached, the system will blink the red fault/warning light and pulse an audible alarm once per second until the system is purged. If the “Purge Fault” time is reached, the system fault/warning light will be solid, the audible alarm will turn off and the fault will also be indicated on the control panel screen. At this point, the system will require a new mixer and then the “Reset” button must be pressed on the control screen. If the dispense signal is given while there is a Purge Fault, the audible alarm will sound and the system will not dispense. The purge timer values are set and viewed on the “Purge Values” screen on the control panel.

- **INACTIVE TIME:** The time that the system has not been dispensing.
- **WARNING TIME:** The time at which the system will indicate a warning.
- **FAULT TIME:** The time at which the system will indicate a fault. If the system indicates a purge fault, remove and replace the mixer and press the **RESET** button to clear the fault.
- **AUTO PURGE:** (OPTIONAL) The system will automatically purge if this button is on and the OKAY TO DISPENSE signal is on.
- The **RESET** button will reset a system fault.
- Pressing any of the available menu soft keys in the left column will direct you to the respective screen.

Data Log Screen

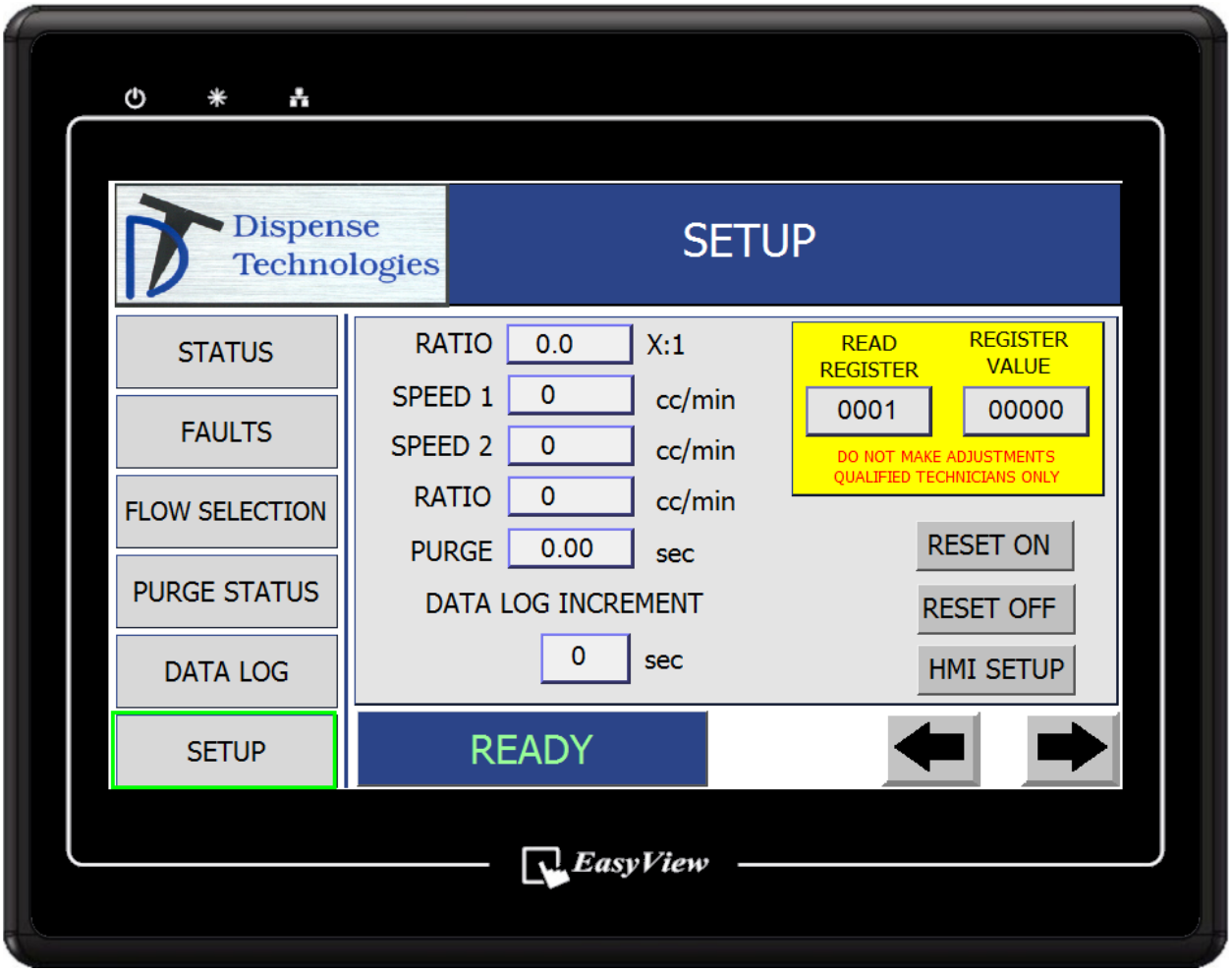
OPTIONAL: The data log screen shows the data logged while the system is running. The **JOB NUMBER** can be entered and used to log data to a specific job number from 0 – 9999

Setup Screen



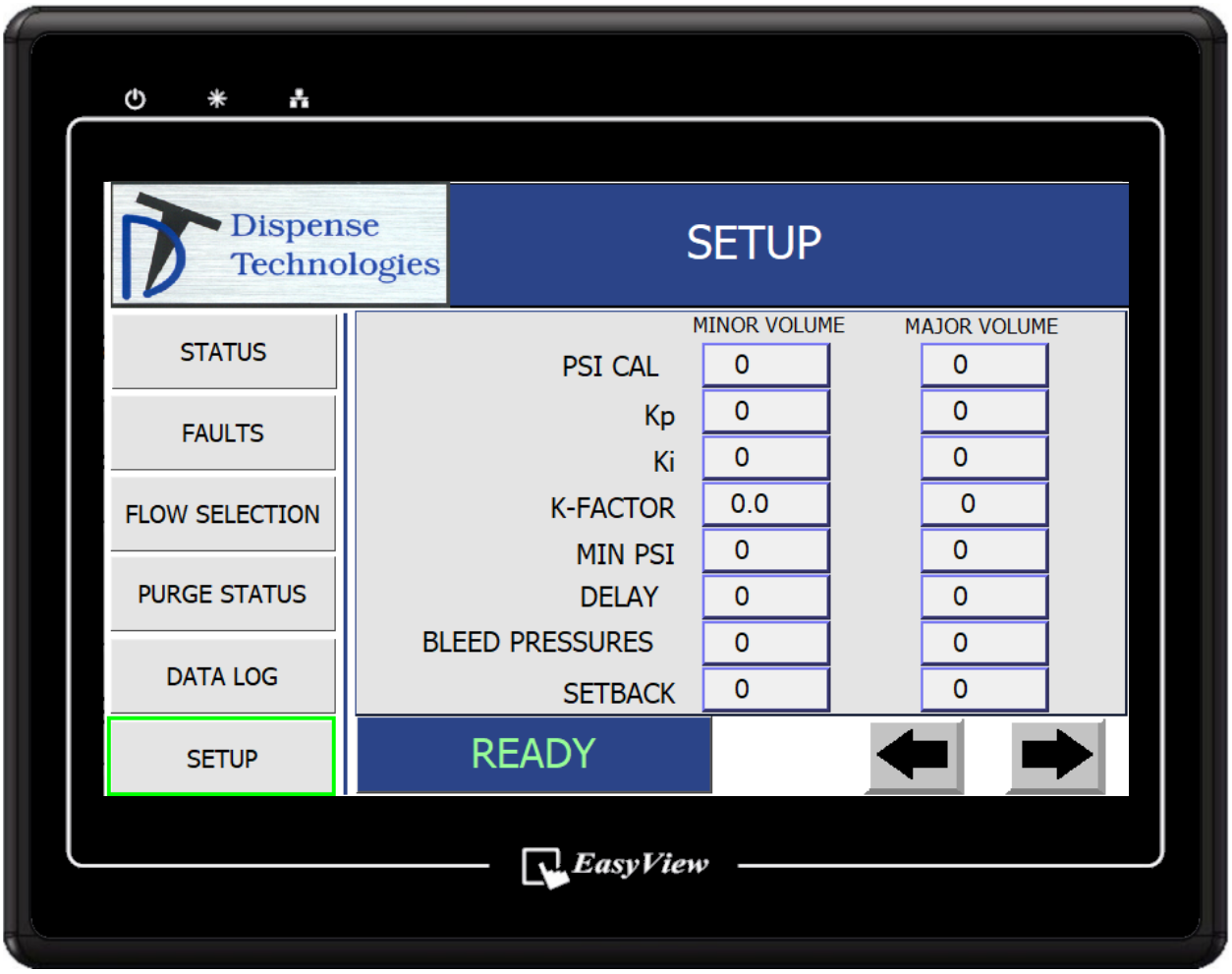
- The Setup screens are used to change preset values in the system.
- From the initial setup screen, enter the user level and password to continue to additional screens. User 1 has the ability to view values only. User 2 has the ability to view and change all values
- Once User 1 or User 2 are logged in, the arrows will appear.
- After making any required changes, press the “LOGOUT” button to prevent any additional changes. The setup screen will automatically logout after 5 minutes
- Language – Press the drop down box to select the desired language
- Time / Date – Press the desired box to change the value. The Time / Date are used in the data logging functions.
- Pressing the left or right arrow keys will take you to additional setup screens
- Pressing any of the available menu soft keys in the left column will direct you to the respective screen.

Setup Screen #2



- **RATIO:** Enter the ratio of Major Volume to Minor Volume
- **+-** – Enter the ratio tolerance before the system will fault
- **SPEED 1:** Enter the desired flow rate in cc/min while in Speed 1
- **SPEED 2:** Enter the desired flow rate in cc/min while in Speed 2
- **RATIO:** Enter the desired flow rate in cc/min while in ratio mode, no mixer
- **PURGE:** (OPTIONAL) The time for an automatic purge or timed shot.
- **DATA LOG INCREMENT** – The time increment that the system will log data while dispensing.
- **READ REGISTER / REGISTER VALUE** – Used for troubleshooting and support
- **RESET ON / RESET OFF** – Used during initial system loading r troubleshooting. All system faults will be ignored while RESET ON is active. RESET ON is disabled by pressing RESET OFF or by cycling power.
- Pressing the left or right arrow keys will take you to additional setup screens
- Pressing any of the available menu soft keys in the left column will direct you to the respective screen.

Setup Screen #3



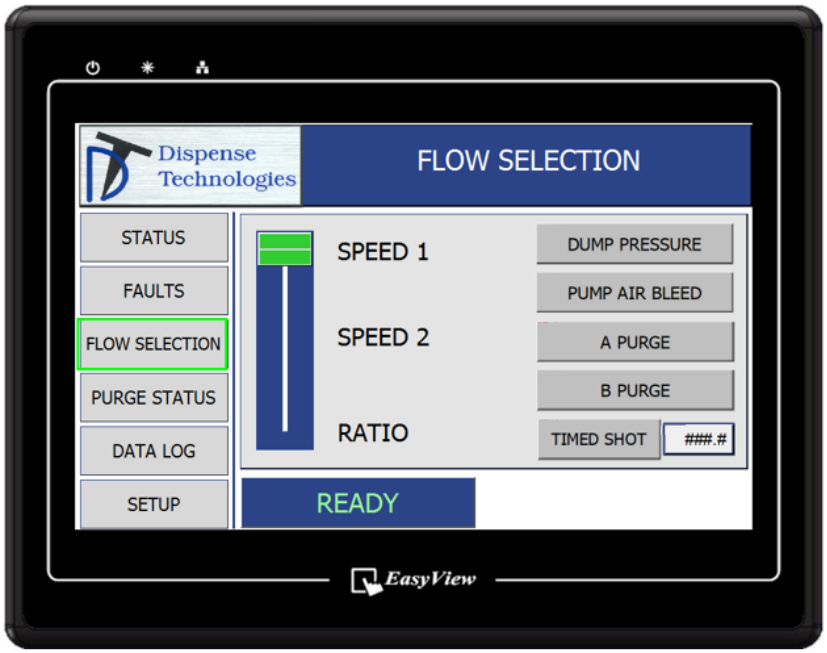
- **PSI CAL:** Value used to calibrate pressure transducer;
- **Kp:** Value used to in PID control
- **Ki:** Value used to in PID control
- **K-Factor:** Value used to calibrate the flow meter and pump displacement
- **MIN PSI:** Minimum pressure before indicating a fault
- **DELAY:** Delay time after the dispense cycle starts until the flow monitoring begins
- **BLEED PRESSURES:** Pressure on the pump during Pump Bleed mode
- **SEBACK:** Pressure setback value while not dispensing
- Pressing the left or right arrow keys will take you to additional setup screens
- Pressing any of the available menu soft keys in the left column will direct you to the respective screen.

Installation

1. Locate the supply pumps and air tank, if equipped.
2. Connect pump air supply hoses to the air tank.
3. Connect shop air supply to the air tank inlet.
    a. Do not use quick disconnect fittings
    b. Use a 3/4" air supply line to the air tank.
4. If the machine is equipped with a swivel boom, install it onto the boom upright post
    a. Connect the fluid supply lines from the supply pumps to the capped connections on the boom.
    b. Attach the 24vdc cable and ethernet communication cable from the electrical control panel to the DispenseCube located on the boom.
    c. Attach the 1/4" air supply hose from the ram to the air manifold on the boom.
5. Verify that all cable connections are secure
6. Verify that all fluid supply hoses are tight to prevent leaking
7. Tighten the packing nut on both supply pumps.
8. Verify that the packing nut reservoir has TSL to lubricate the pump rod and extend packing seal life.
9. Connect electrical power to the system.

Startup Procedures

1. Verify that air is “on” to the system
2. Verify that the air control slider valves air in the on position for both pumps
3. Turn power on to the system.
4. Put the system in “RATIO” mode.
    a. Place the machine in ratio mode by pressing the “Flow Selection button”, and then move the flow slider switch to “Ratio”



5. With a clean rag, remove any night cap / protective cover and grease that was placed on the dispense valve nosepiece.
6. Disengage the trigger lock.
7. Press the trigger to dispense material into a waste container to clear the valve of any cross contamination. Verify that both materials are being dispensed.
8. Release the trigger, engage the trigger lock and wipe any excess material from the dispense valve nosepiece.
9. The machine is now ready for operation.

Operation

1. Install a clean material mixer on to the dispense valve outlet, secure the mixer shroud to the dispense valve nosepiece.
2. Select Speed 1 or Speed 2.
3. Disengage the trigger lock.
4. Press the trigger to dispense material into a waste container until mixed material is exiting the mixer outlet.
5. Reset any faults that were generated during mixer fill.
6. The system is now ready to dispense.

NOTE: ***DO NOT*** run the system with a static mixer in the Ratio mode
NOTE: ***DO NOT*** run the system without a static mixer in Speed 1 or Speed 2 modes

Shutdown Procedures

1. Remove the disposable mixer.
2. Place system in RATIO MODE
3. Press the trigger to dispense material into a waste container to clear any cross contamination from the end of the valve.
4. Engage the trigger lock.
5. Turn air off to both A and B air motors.
6. Position the dispense valve over a material waste container.
7. Put the system in “PRESSURE DUMP” mode.
    a. Place the machine in Pressure Dump mode by pressing the “Flow Selection button”, and then pressing the “PRESSURE DUMP” button. Confirm the mode selection when prompted.
8. After the A and B material have depressurized, wipe any excess material from the dispense valve tip.
9. Put petroleum jelly or another compatible grease in the night cap. Secure the night cap to the gun to prevent material curing.
10. Turn power off to the control panel

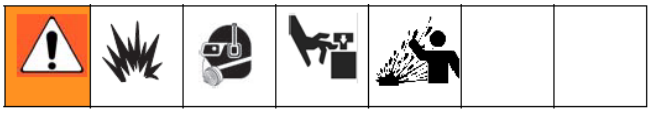
NOTE: Shutting down the machine without clearing cross contamination from the valve can cause material to cure in the front end of the valve and create a blockage

Shutdown Procedures – Optional Base Purge

1. Place the system in “Base Purge” mode from the flow selection screen.
2. Verify that the machine is in Speed 1 or Speed 2
3. Dispense material into a waste container until the disposable mixer is base purged.
4. Remove the mixer.
5. Put the system in “RATIO” mode
6. Dispense material into a waste container to clear the valve of any cross contamination. Verify that both materials are being dispensed.
7. Engage the trigger lock
8. Wipe any excess material from the dispense valve tip.
9. Put petroleum jelly or another compatible grease in the night cap. Secure the night cap to the gun to prevent material curing.
10. Turn power off to the control panel

NOTE: Base purging the mixer or shutting down the machine without clearing cross contamination from the valve can cause material to cure in the front end of the valve and create a blockage.

Drum / Pail Change



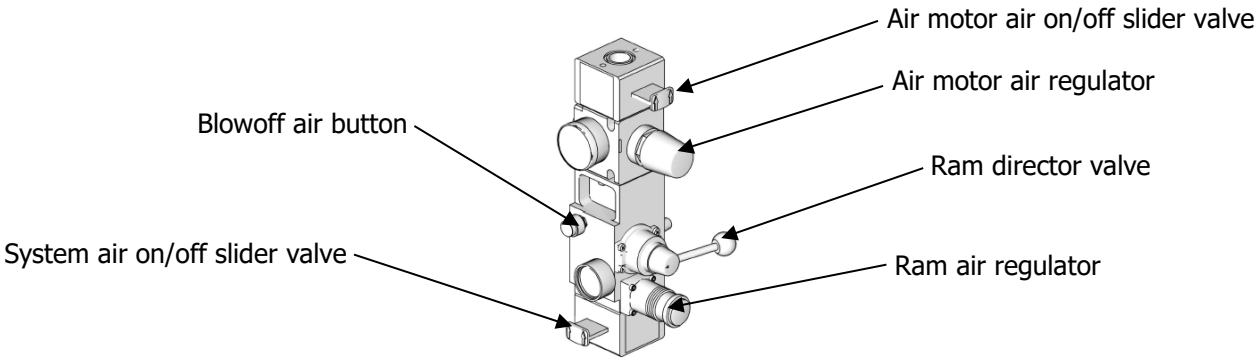
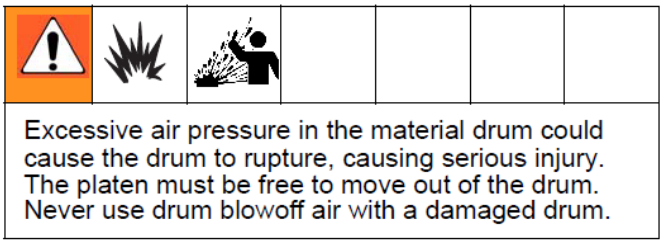


FIGURE 1. Air Controls

Remove Empty Drum / Pail

1. Do not remove the empty container until the new container is located near the pump.
2. Close the air motor slider valve to stop the pump.
3. Set the ram director valve to UP to raise the platen and immediately press and hold the blowoff air button until the platen is completely out of drum. Use minimum amount of air pressure necessary to push the platen out of the drum.



4. Release the blowoff air button and allow the ram to rise to its full height.
5. Remove empty drum.
6. Inspect platen and, if necessary, remove any remaining material or material build–up.

Load New Drum / Pail

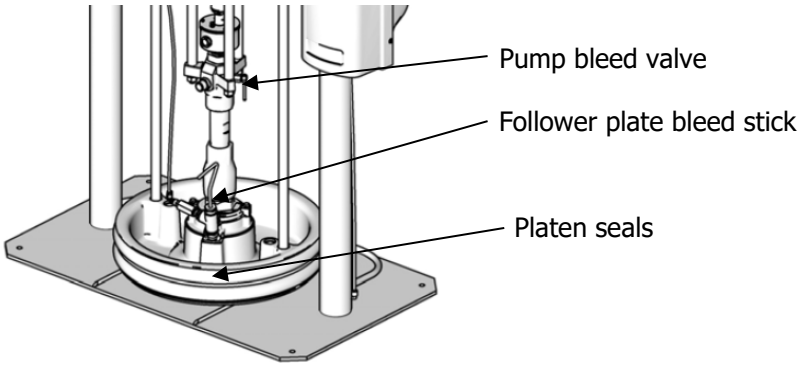
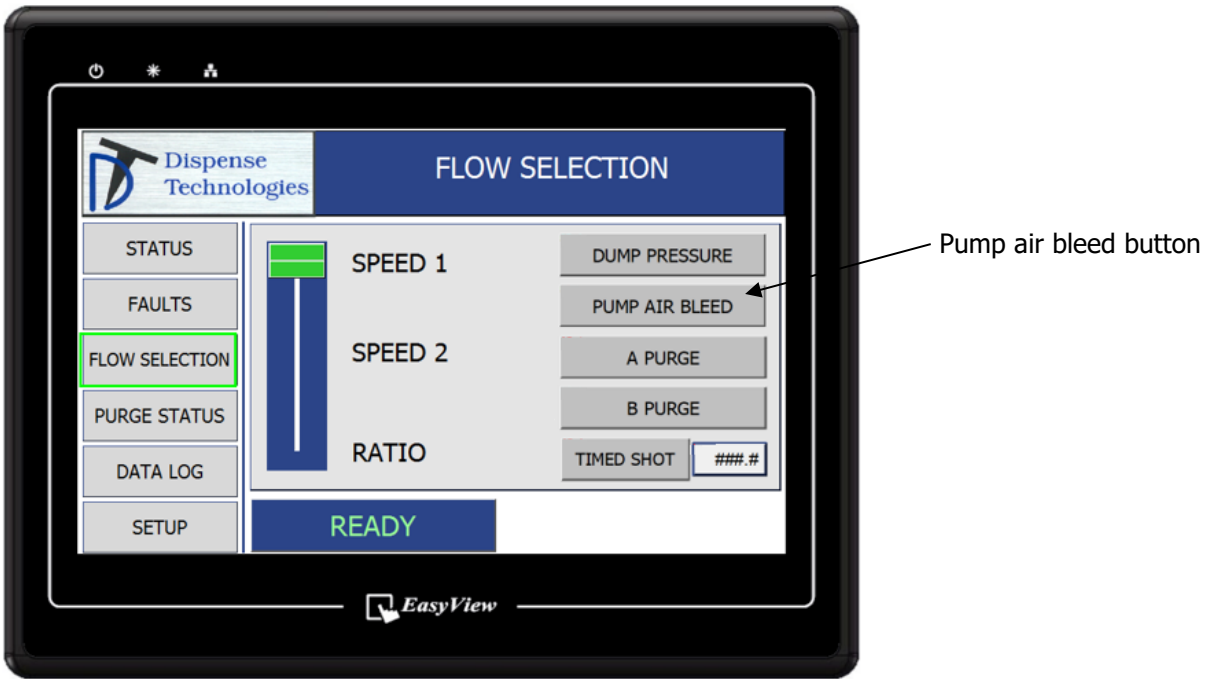


FIGURE 2. Pump components

1. Remove the lid from the new container.
2. Remove any plastic cover packaged in the container and discard appropriately.
3. If the material is packaged in a plastic or foil bag, cut and remove a 6” diameter piece of the bag at center of the container to allow the material to be fed into the pump.
4. Grease the platen seals with petroleum jelly or another grease compatible with the material as recommended by the material supplier.
5. Place the container under the raised ram, make sure that the platen is centered with the container.
6. Loosen the follower plate bleed stick.
7. Set the ram director valve to down to lower the platen into the container. Allow the platen to lower until the platen is resting on the material surface and air has stopped coming out of the platen bleed fitting.
8. Tighten the platen bleed stick.

Bleeding air from the pump

For Pumps *without* a manual air motor air regulator



1. On the control panel, press the “Pump Air Bleed” button.
2. Open the air motor slider valve to start the pump.
3. With a material waste container under the pump bleed valve, open the bleed valve and allow the pump to cycle slowly until all of the air is bled from the pump. Allow one full stroke up and one full stroke down without and air bubbles.
4. Close the pump bleed valve.
5. On the control panel, press the “Pump Air Bleed” button again to exit the bleed mode.
6. Clean the outlet of the pump bleed valve and cover the outlet with petroleum jelly or another compatible grease as recommended by the material supplier.

Pumps *with* a manual air motor air regulator

1. Turn the air motor air regulator to zero
2. Open the air motor slider valve to start the pump.
3. With a material waste container under the pump bleed valve, open the pump bleed valve and adjust the air motor air regulator until the pump begins to cycle slowly. Bleeding a pump under high pressure or a rapid rate will not allow all of the air to escape.
4. Allow the pump to cycle slowly until all of the air is bled from the pump. Allow one full stroke up and one full stroke down without and air bubbles.
5. Close the pump bleed valve.
6. Turn the air motor air regulator back to the run pressure
7. Clean the outlet of the pump bleed valve and cover the outlet with petroleum jelly or another compatible grease as recommended by the material supplier.

Weight ratio Check Procedures

1. Prepare 2 cups/containers for the ratio check. Make sure that they are the appropriate size to hold a 30 second dispense volume.
2. Label one container as “A” and the other container as “B”
3. Tare out a gram’s scale. Weigh container “A” and write the weight value on the container.
4. Weigh container “B” and write the weight value on the container.
5. Remove the disposable mixer, wipe any excess material from the nosepiece.
6. Install the Ratio check nozzle onto the dispense valve.
7. Place the system in Ratio Mode.
8. Dispense material into a waster container for approximately 10 seconds to allow the pressures to stabilize.
9. Place container “A” under the A material output of the ratio check nozzle. Place container “B” under the B material output of the ratio check nozzle.
10. Dispense material into the containers for a minimum of 30 seconds.
11. Weigh container “A” and write the value on the container.
12. Weigh container “B” and write the value on the container.
13. Subtract the empty weight of container “A” from the total weight of container “A”
14. Subtract the empty weight of container “B” from the total weight of container “B”
15. Divide the result of “A” by the result of “B”, this answer is your weight ratio.

Example:

Container “A” empty weight = 2.4 grams

Container “B” empty weight = 2.2 grams

Total weight of container “A” after 30 second ratio check dispense = 99.9 grams

Total weight of container “B” after 30 second ratio check dispense = 9.7 grams

Weight ratio = (99.9 – 2.4) / (9.7 – 2.2) = (97.5) / (7.5) = 13 ratio P.B.W

Preventative Maintenance

NOTE: Before attempting service, remove all power from the system- air, fluid, and electrical.

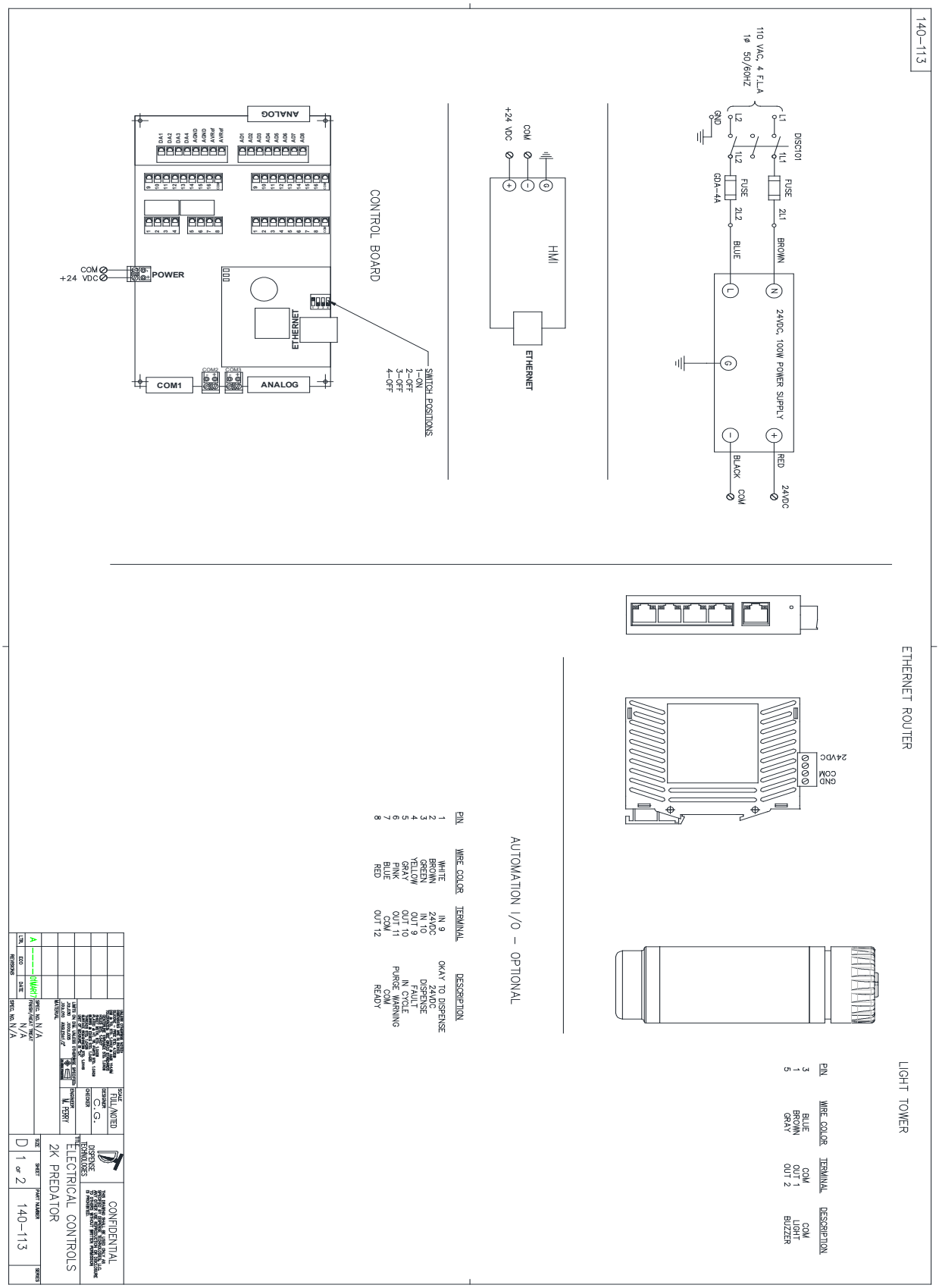
Component	Type of Maintenance	Recommended Frequency
Material Hoses	Inspect for damage Replace	30 Days When damaged
Air Lines	Inspect for damage Replace	30 Days When damaged
Pressure Gauges	Inspect for material pack-out Replace	180 Days When packed-out
Pressure Transducer	Inspect for material pack-out Clean transducer and port	180 Days During inspection
Dispense Valve	Purge and clean discharge ports Clean shroud mounting threads Inspect for material leakage Remove center inject port for cleaning Replace seals and bearings Inspect needles for damage Replace needles	End of production shift End of production shift Daily Weekly As leakage requires During seal change When damaged
Static Mixer	Replace Mixer	As required

Troubleshooting

The system will not dispense if there is a system fault. After eliminating the source of the fault, press the fault reset on the screen to clear the fault in the control panel.

Fault / Warning	Definition	Possible Causes / Solutions
A Supply Fault	The Flowrate of the A material is below the required rate or the pressure is too low.	Check that the air supply is turned on
		Check that the material ball valve is turned on
		Verify that the ram down pressure is sufficient to load the pump.
		Verify that air is turned on to the pump
A Comp Fault	The A side is not able to reach the required flow rate	The gun outlet or mixer has cured material in it. Check and clear any obstruction.
		The viscosity of the material has changed drastically, requiring a higher pressure than is available to reach the required flow. Try lowering the speed setpoint.
A Empty	Pump A is empty	Change the drum/pail
A Low	Pump A is low	Prepare to change the drum/pail
B Supply Fault	The Flowrate of the B material is below the required rate or the pressure is too low.	Check that the air supply is turned on
		Check that the material ball valve is turned on
		Very that the ram down pressure is sufficient to load the pump.
		Verify that air is turned on to the pump
B Comp Fault	The B side is not able to reach the required flow rate	The gun outlet or mixer has cured material in it. Check and clear any obstruction.
		The viscosity of the material has changed drastically, requiring a higher pressure than is available to reach the required flow. Try lowering the speed setpoint.
B Empty	Pump B is empty	Change the drum/pail
B Low	Pump B is low	Prepare to change the drum/pail
Purge Fault	The purge fault time has been reached	Material was not purged during the warning time. Replace the mixer and press the reset button
Ratio Fault	The system is unable to control on ratio.	This could be caused by air in the system.
		This could be caused if a material hose is replaced with a different size.

Electrical Schematics



Remote Troubleshooting Assistance

Optional remote troubleshooting is available. If this option was included, connect an ethernet cable with an internet connection to the RJ45 receptable on the bottom of the control panel. The system will automatically connect to the remote servers and the machine will be available for viewing by Dispense Technologies.

Digital I/O

Optional 24VDC digital I/O is available for remote communications to a robot or cell controller

Pin	Wire Color	Terminal	Description
1	White	IN 9	Okay to Dispense
2	Brown	24VDC	24 VDC
3	Green	IN 10	Dispense
4	Yellow	OUT 9	Fault
5	Gray	OUT 10	In Cycle
6	Pink	OUT 11	Purge Warning
7	Blue	COM	COM
8	Red	OUT 12	Ready

Fieldbus I/O

Optional fieldbus kits are available for remote communications to robot or cell controllers

I/O Map

Output Signals to Automation		
Byte	**Input Bit**	**Description**
0	0	Heartbeat
	1	Ready
	2	In Cycle
	3	No Error
	4	Volume Okay
	5	Reserved
	6	Style bit 0 Selected
	7	Style bit 1 Selected
1	8	Error bit 0
	9	Error bit 1
	10	Error bit 2
	11	Error bit 4
	12	Reserved
	13	Reserved
	14	Reserved
	15	Reserved
2	16	Reserved
	17	Reserved
	18	Reserved
	19	Reserved
	20	Reserved
	21	Reserved
	22	Reserved
	23	Reserved
3	24	Reserved
	25	Reserved
	26	Reserved
	27	Reserved
	28	Reserved
	29	Reserved
	30	Reserved
	31	Reserved

Input Signals from Automation		
Byte	**Output bit**	**Description**
0	0	Heartbeat
	1	Dispense Valve On
	2	Job Complete
	3	Style Strobe
	4	Error Reset / Cancel Job
	5	Reserved
	6	Style bit 0
	7	Style bit 1
1	8	Reserved
	9	Reserved
	10	Reserved
	11	Reserved
	12	Reserved
	13	Reserved
	14	Reserved
	15	Reserved
2	16	Reserved
	17	Reserved
	18	Reserved
	19	Reserved
	20	Reserved
	21	Reserved
	22	Reserved
	23	Reserved
3	24	Reserved
	25	Reserved
	26	Reserved
	27	Reserved
	28	Reserved
	29	Reserved
	30	Reserved
	31	Reserved

Fieldbus I/O Descriptions

Output Signals to Automation	Description
Heartbeat	Signal oscillates on/off every second to verify that communication is established.
Ready	System is ready
In Cycle	System is dispensing
No Error	No system errors are active
Volume Okay	Total job volume within range
Style bit 0 Selected	Style select bit 0 selected
Style bit 1 Selected	Style select bit 1 selected
Error bit 0	Binary code representing active error
Error bit 1	Binary code representing active error
Error bit 2	Binary code representing active error
Error bit 4	Binary code representing active error

Input Signals from Automation	Description
Heartbeat	Return signal from automation to verify that communication is established.
Dispense Valve On	Used to open the Dispense Valve
Job Complete	Signal to indicate the end of a job
Style Strobe	Used to change styles
Error Reset / Cancel Job	Error Reset / Cancel Job
Reserved	
Style bit 0	Select style bit 0
Style bit 1	Select style bit 1

Beacon Descriptions

Signal	Description
Red light off	No active faults or power is off
Red light on	User interaction required - alarm, system is shut down
Red light flashing	User interaction required – system warning

Dispense Technologies Standard Warranty

Dispense Technologies warrants all equipment referenced in this document which is manufactured by Dispense Technologies and bearing its name to be free from defects in material and workmanship on the date of sale to the original purchaser for use. With the exception of any special, extended, or limited warranty published by Dispense Technologies, Dispense Technologies will, for a period of twelve months from the date of sale, repair or replace any part of the equipment determined by Dispense Technologies to be defective. This warranty applies only when the equipment is installed, operated and maintained in accordance with Dispense Technologies' written recommendations.

This warranty does not cover, and Dispense Technologies shall not be liable for general wear and tear, or any malfunction, damage or wear caused by faulty installation, misapplication, abrasion, corrosion, inadequate or improper maintenance, negligence, accident, tampering, or substitution of non-Dispense Technologies component parts. Nor shall Dispense Technologies be liable for malfunction, damage or wear caused by the incompatibility of Dispense Technologies equipment with structures, accessories, equipment or materials not supplied by Dispense Technologies, or the improper design, manufacture, installation, operation or maintenance of structures, accessories, equipment or materials not supplied by Dispense Technologies.

This warranty is conditioned upon the prepaid return of the equipment claimed to be defective to an authorized Dispense Technologies distributor for verification of the claimed defect. If the claimed defect is verified, Dispense Technologies will repair or replace free of charge any defective parts. The equipment will be returned to the original purchaser transportation prepaid. If inspection of the equipment does not disclose any defect in material or workmanship, repairs will be made at a reasonable charge, which charges may include the costs of parts, labor, and transportation.

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Dispense Technologies' sole obligation and buyer's sole remedy for any breach of warranty shall be as set forth above. The buyer agrees that no other remedy (including, but not limited to, incidental or consequential damages for lost profits, lost sales, injury to person or property, or any other incidental or consequential loss) shall be available. Any action for breach of warranty must be brought within two (2) years of the date of sale.

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