Instructions

EVR

Electric Variable Ratio Proportioner

3A8565D

EN

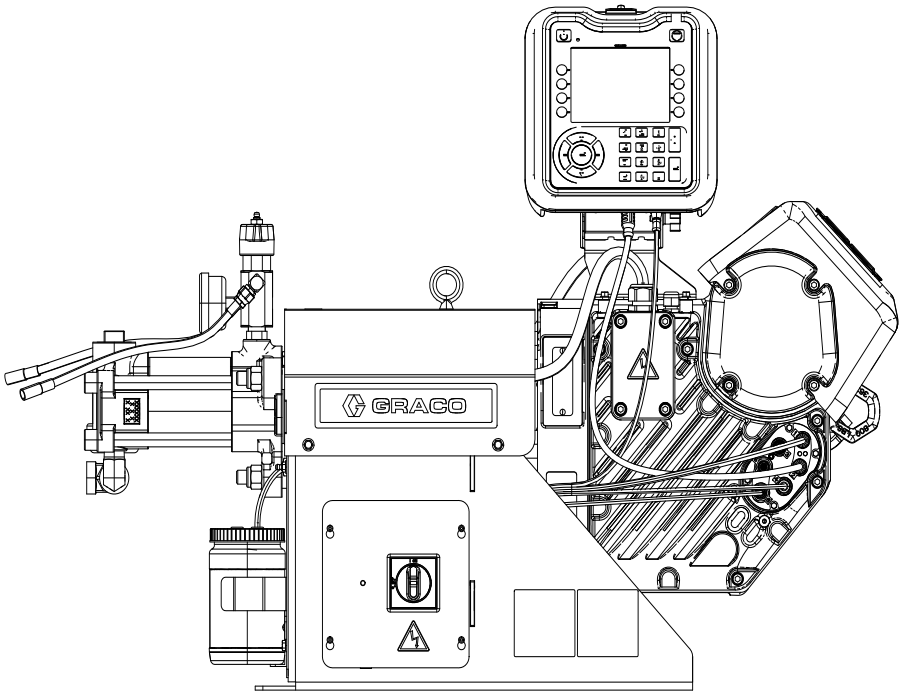
For use with two-component sealant and adhesive materials. For professional use only.

Not approved for use in explosive atmospheres or hazardous (classified) locations.

2000 psi (13.8 MPa, 138 bar) Maximum Fluid Inlet Pressure
3500 psi (24.1 MPa, 241 bar) Maximum Fluid Outlet Pressure

Important Safety Instructions

Read all warnings and instructions in this manual and in related manuals before using the equipment. Save these instructions.



PROVEN QUALITY. LEADING TECHNOLOGY.

Contents

Related Manuals 2
Warnings 3
Keep Components A (Red) and B (Blue) Separate 6
Changing Materials 6
A (Red) and B (Blue) Components 6
Component Identification 7
Interior Components 8
Advanced Display Module (ADM) 9
Installation 11
Grounding 11
Power Requirements 11
Connect Power 11
Install Vented Oil Cap Before Using Equipment 13
Setup 14
Flushing 15
Operation 16
Startup 16
Shutdown 17
Pressure Relief Procedure 17
Adjust Material Inlet Pressure 18
Maintenance 19
Preventative Maintenance Schedule 19
Check Oil Level 19
Change the Oil 20
Bearing Pre-Load 20
Calibrate the Electric Driver 20
ADM - Battery Replacement and Screen Cleaning 21
Grease Cup Maintenance 22
Troubleshooting 23
EVR Error Codes 25
Advanced Display Module (ADM) Operation 31
ADM Screen Overview 32
Home Screen 32
Index Menu 36
Software Update 46
19C237 Software Update Procedure 46
I/O Integration 47
EVR and PLC Connection 48
PLC Inputs 48
PLC Outputs 51
Data Exchange 53
GM General Timing Diagrams 57
Error Codes 67
Recycling and Disposal 68
End of Product Life 68
Schematics 69
Dimensions 74
Technical Specifications 77
California Proposition 65 77
Graco Standard Warranty 78
Graco Information 78

Related Manuals

Manual	Description
3A0019	Z-Series Chemical Pumps Instructions-Parts
3A6482	APD20 Advanced Precision Driver Instructions
312185	MD2 Valve Instructions-Parts
3A6338	Communications Gateway Module Installation Kit Instructions-Parts
3A6394	Z-Series Chemical Pumps High Wear Instructions-Parts
3A6321	ADM Token In-System Programming Instructions
3A0395	Stainless Steel Tank Stands Instructions-Parts

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 the hazard symbols refer to procedure-specific risks. When these symbols appear in the body of this manual or on warning labels, refer back to these Warnings. Product-specific hazard symbols and warnings not covered in this section may appear throughout the body of this manual where applicable.

⚠ WARNING

SKIN INJECTION HAZARD

High-pressure fluid from dispensing device, 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 dispensing device at anyone or at any part of the body.
- Do not put your hand over the fluid outlet.
- Do not stop or deflect leaks with your hand, body, glove, or rag.
- Follow the **Pressure Relief Procedure** when you stop dispensing and before cleaning, checking, or servicing equipment.
- Tighten all fluid connections before operating the equipment.
- Check hoses and couplings daily. Replace worn or damaged parts immediately.

FIRE AND EXPLOSION HAZARD

Flammable fumes, such as solvent and paint fumes, in **work area** can ignite or explode. Paint or solvent flowing through the equipment can cause static sparking. 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 sparking).
- Ground all equipment in the work area. See **Grounding** instructions.
- Never spray or flush solvent at high pressure.
- 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.
- Use only grounded hoses.
- **Stop operation immediately** if static sparking occurs or you feel a shock**.** Do not use equipment until you identify and correct the problem.
- Keep a working fire extinguisher in the work area.

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.

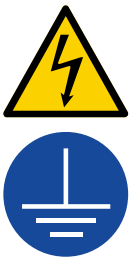
- Read Safety Data Sheets (SDSs) to know the specific hazards of the fluids you are using.
- Store hazardous fluid in approved containers, and dispose of it according to applicable guidelines.

⚠ WARNING

MOVING PARTS HAZARD

Moving parts can pinch, cut or amputate fingers and other body parts.

- Keep clear of moving parts.
- Do not operate equipment with protective guards or covers removed.
- Equipment can start without warning. Before checking, moving, or servicing equipment, follow the **Pressure Relief Procedure** and disconnect all power sources.



ELECTRIC SHOCK HAZARD

This equipment must be grounded. Improper grounding, setup, or usage of the system can cause electric shock.

- Turn off and disconnect power at main switch before disconnecting any cables and before servicing or installing equipment.
- Connect only to grounded power source.
- All electrical wiring must be done by a qualified electrician and comply with all local codes and regulations.

⚠ WARNING

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 Specifications** in all equipment manuals.
- Use fluids and solvents that are compatible with equipment wetted parts. See **Technical Specifications** in all equipment manuals. Read fluid and solvent manufacturer's warnings. For complete information about your material, request Safety Data Sheets (SDSs) from distributor or retailer.
- Turn off all equipment and follow the **Pressure Relief Procedure** when equipment is not in use.
- Check equipment daily. Repair or replace worn or damaged parts immediately with genuine manufacturer's replacement parts only.
- Do not alter or modify equipment. Alterations or modifications may void agency approvals and create safety hazards.
- Make sure all equipment is rated and approved for the environment in which you are using it.
- 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.

PERSONAL PROTECTIVE EQUIPMENT

Wear appropriate protective equipment when in the work area to help prevent serious injury, including eye injury, hearing loss, inhalation of toxic fumes, and burns. Protective equipment includes but is not limited to:

- Protective eyewear, and hearing protection.
- Respirators, protective clothing, and gloves as recommended by the fluid and solvent manufacturer.

Keep Components A (Red) and B (Blue) Separate

Cross-contamination can result in cured material in fluid lines which could cause serious injury or damage equipment. To prevent cross-contamination:

- Never interchange component A (red) and component B (Blue) wetted parts.
- Never use solvent on one side if it has been contaminated from the other side.

Changing Materials

NOTICE

Changing the material types used in your equipment requires special attention to avoid equipment damage and downtime.

- When changing materials, flush the equipment multiple times to ensure it is thoroughly clean.
- Check with your material manufacturer for chemical compatibility.

A (Red) and B (Blue) Components

NOTE: Material suppliers can vary in how they refer to plural component materials.

For all machines:

- The A (Red) side is intended for hardeners and catalysts.
- The B (Blue) side is intended for polyols, resins, and bases. Regardless of the configuration of material used, the high volume material must be in the B (Blue) side.

Component Identification

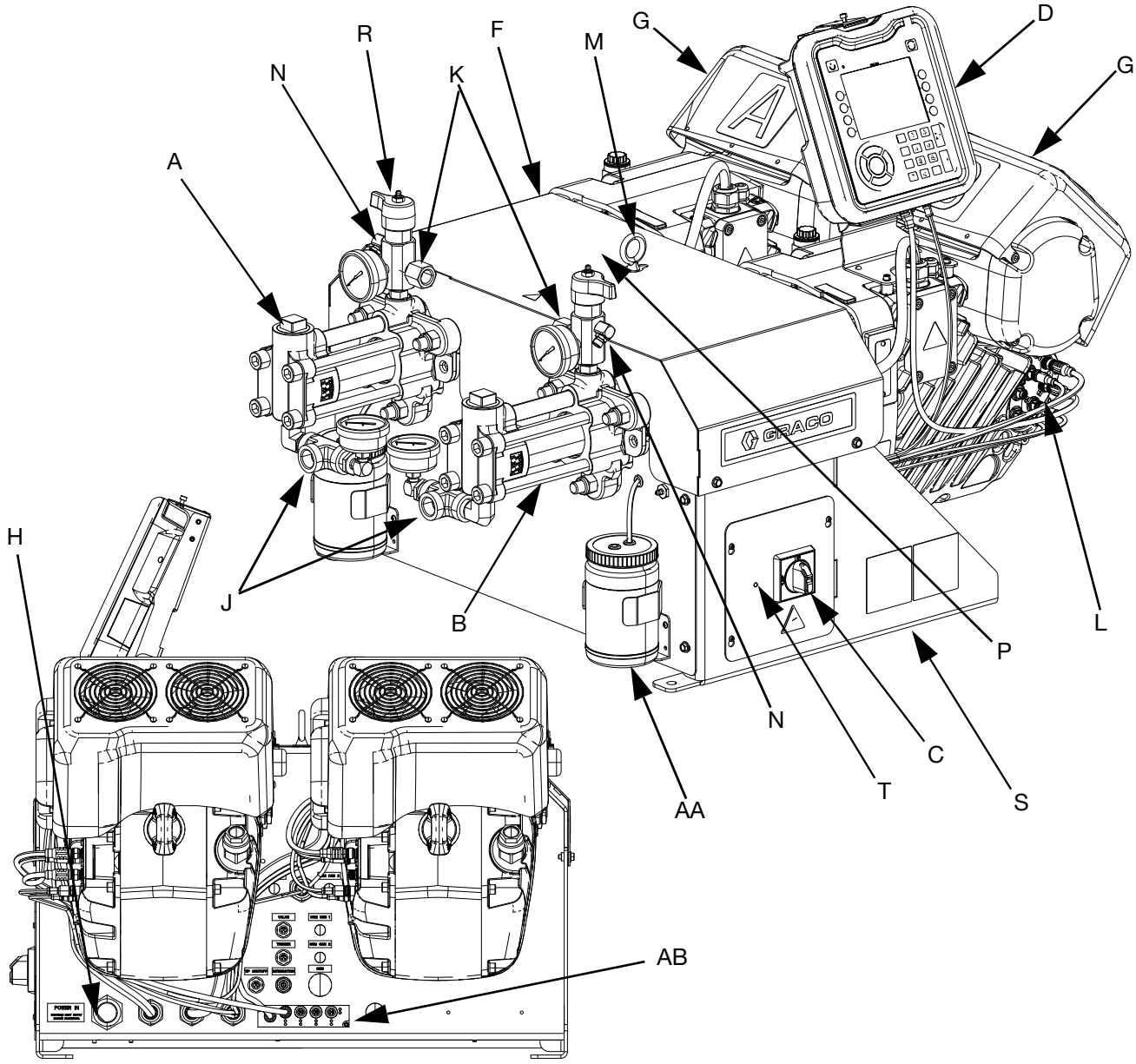


FIG. 1: Component Identification

Key:

A A Pump
B B Pump
C Power Disconnect Switch
D Advanced Display Module (ADM)
F Pump Shroud
G Electric Driver
H Incoming Power Connection
J Pump Inlets
K Pump Outlets
L Driver Communication and I/O Connectors
M Lift Ring
N Pressure Relief Drain Tubes
P B-Side (Blue) Outlet Drain/Relief Valve*
R A-Side (Red) Outlet Drain/Relief Valve*
S EVR Frame
T EVR Frame Cover
AA Grease Receptacle
AB CAN Distribution Block

* *Required components supplied with the system. EVR systems configured without pumps are provided with drain/relief valves, which must be installed after the pumps are assembled, but before placing the system into service.*

Interior Components

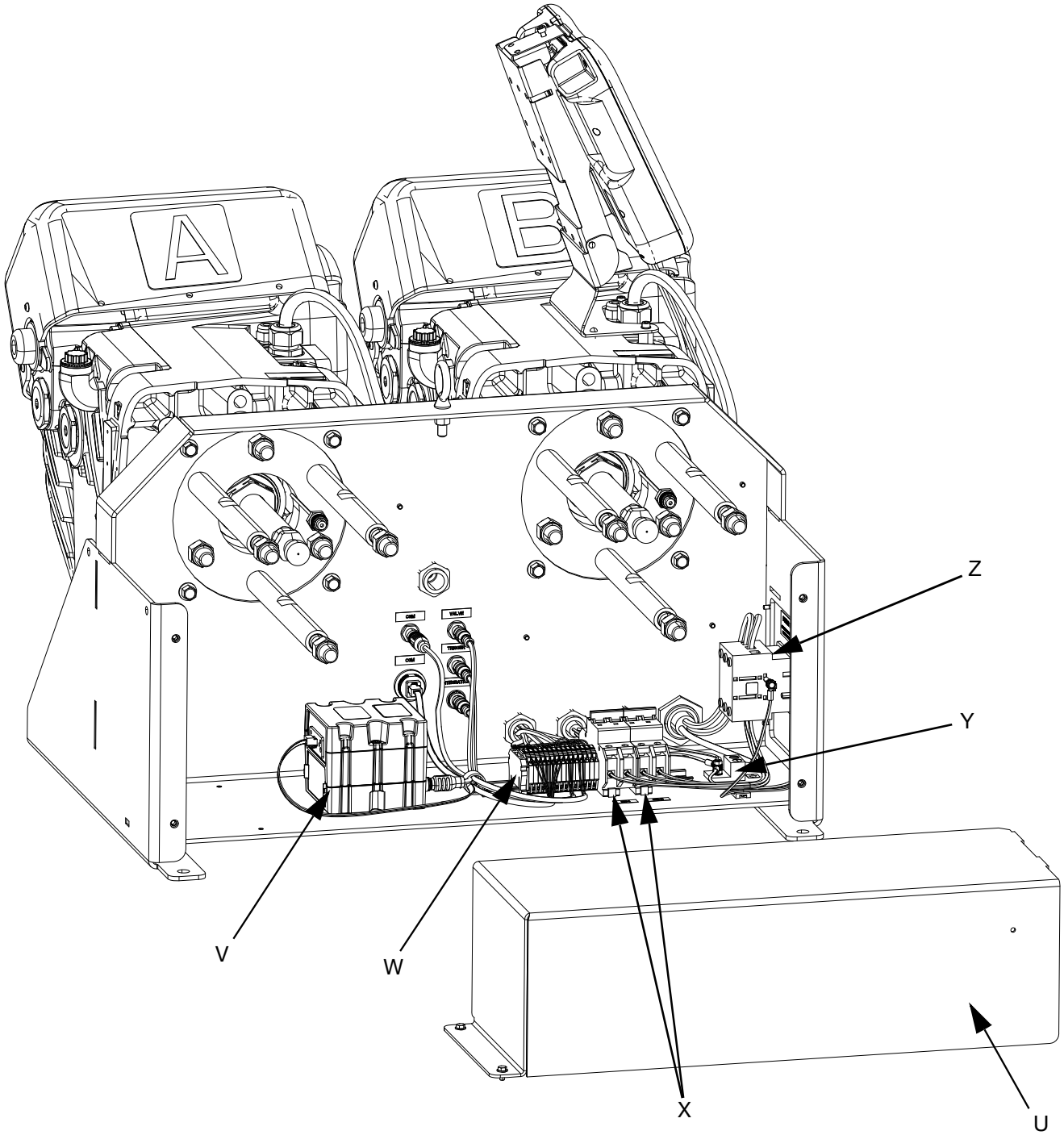


FIG. 2: Interior Components

Key:

U Power Electronics Cover
V Communications Gateway Module (CGM)
W Terminal Block Connections
X Circuit Breakers
CB-1 (Unit B)
CB-2 (Unit A)
Y Ground Lug
Z Disconnect Block

Advanced Display Module (ADM)

User Interface

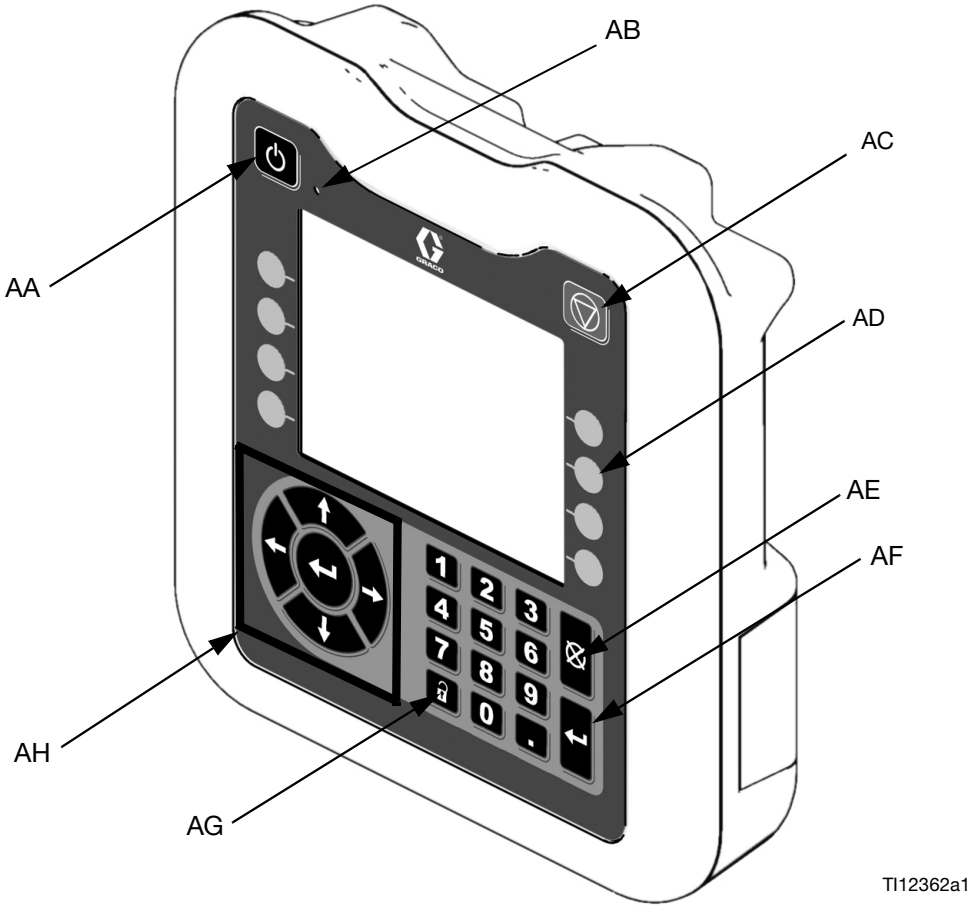


FIG. 3: ADM Component Identification - Front

Buttons

Callout	Button	Function
AA	System enable/ disable	Enables/disables system. When system is disabled, temperature control and dispense operation are disabled.
AB	System Status Indicator Light	Displays system status. See **System Status Indicator (AB) Conditions** on page 10 for details.
AC	Stop	Stop all system processes. Is not a safety or emergency stop.

Callout	Button	Function
AD	Soft Keys	Defined by application using ADM.
AE	Cancel	Cancel a selection or number entry while in the process of entering a number or making a selection.
AF	Enter	Acknowledge changing a value or making a selection.
AG	Lock/Set up	Toggle between run and setup screens. If setup screens are password protected, button toggles between run and password entry screen.
AH	Navigation	Navigate within a screen or to a new screen.

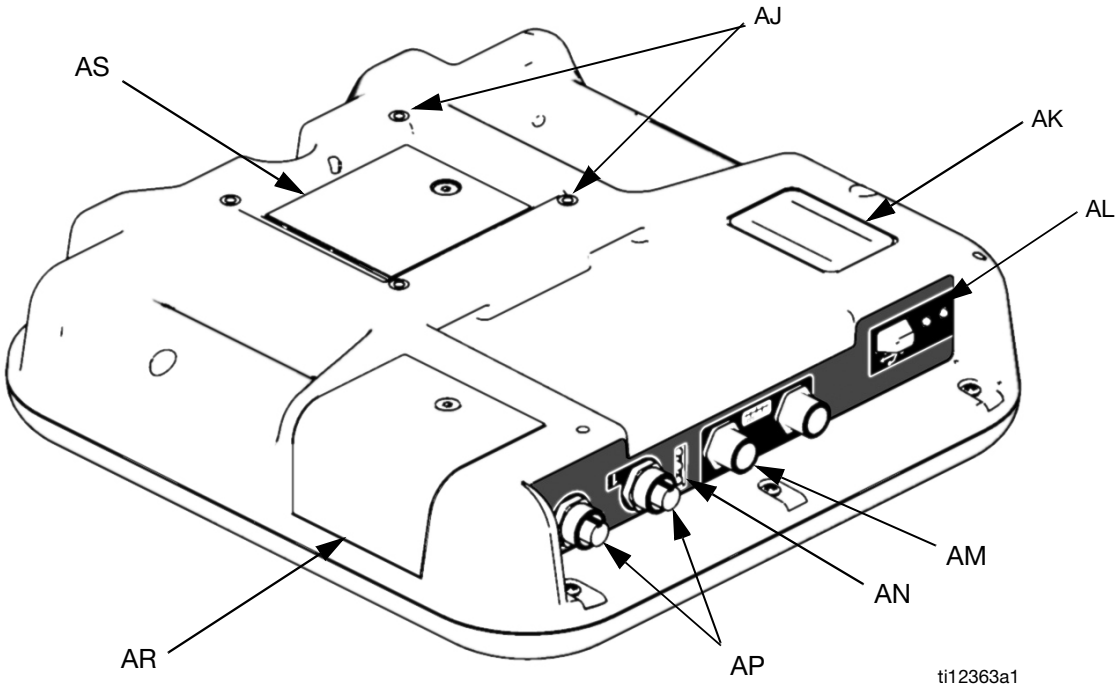


FIG. 4: ADM Component Identification - Rear

Key:
AJ Flat Panel Mount
AK Model Number
AL USB Module Interface
AM CAN Cable Connections
AN Module Status LEDs
AP Accessory Cable Connections
AR Token Access Cover
AS Battery Access Cover

System Status Indicator (AB) Conditions

Green Solid - Run Mode, System On
Green Flashing - Setup Mode, System On
Yellow Solid - Run Mode, System Off
Yellow Flashing - Setup Mode, System Off

ADM Module Status LEDs (AN) Conditions

Module Status LED Signal	Description
Green on	System is powered up.
Yellow on	Communication in progress.
Red solid	ADM hardware failure.
Red flashing	Uploading software.

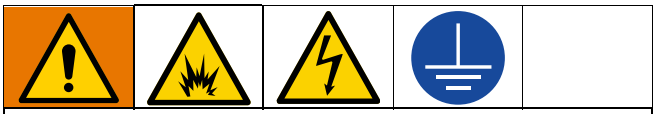
USB Module Status LEDs (AL) Conditions

Module Status LED Signal	Description
Green flashing	System is powered up.
Yellow on	Downloading information to USB
Green/Yellow Flashing	ADM is busy, USB cannot transfer information when in this mode

Installation

All electrical wiring must be done by a qualified electrician and comply with all local codes and regulations.

Grounding



The equipment must be grounded to reduce the risk of static sparking and electric shock. Electric or static sparking can cause fumes to ignite or explode. Improper grounding can cause electric shock. Grounding provides an escape wire for the electric current.

EVR: grounded through the power cord (customer supplied).

Fluid supply containers: follow local code.

Object being dispensed: follow local code.

Solvent pails used when flushing: follow local code. Use only conductive metal pails, placed on a grounded surface. Do not place the pail on a nonconductive surface, such as paper or cardboard, which interrupts grounding continuity.

To maintain grounding continuity when flushing or relieving pressure: hold metal part of the dispense valve firmly to the side of a grounded metal pail, then trigger the dispense valve.

Power Requirements

The system requires a dedicated circuit protected with a circuit breaker.

Voltage	Phase	Hz	Current
200-240 VAC	1	50/60	41 A
480 VAC	3	50/60	18 A

Connect Power

1. Cut power cord wires to the following lengths:
   - Ground wire - 6.5 inches (16.5 cm)
   - Power wires - 3.0 inches (7.6 cm)
   - Add ferrules as necessary. See FIG. 5.

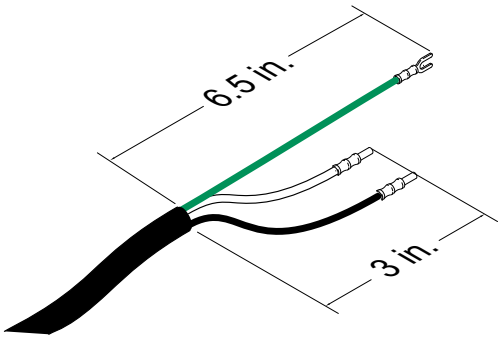


FIG. 5: Power Cord

2. Remove the four screws to separate the EVR Frame Cover (T) and Power Disconnect Switch (C) from the EVR Frame (S) on the electrical driver.

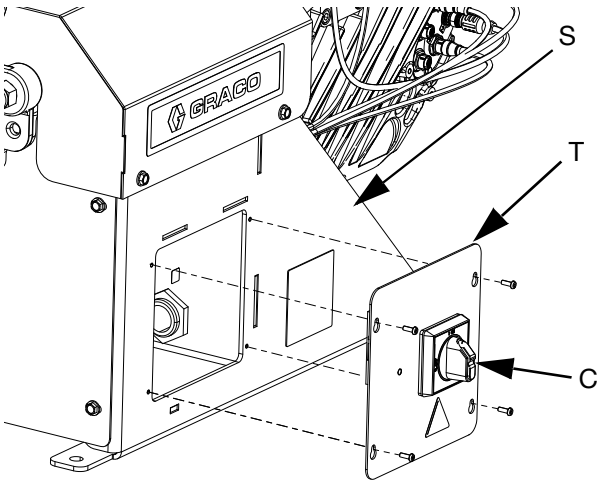


FIG. 6: Remove EVR Frame Cover

NOTE: Inside the EVR Frame (S), power wires are pre-installed to terminals 2T1 and 4T2 on the Disconnect Block (Z). Refer to FIG. 7 for the terminal locations.

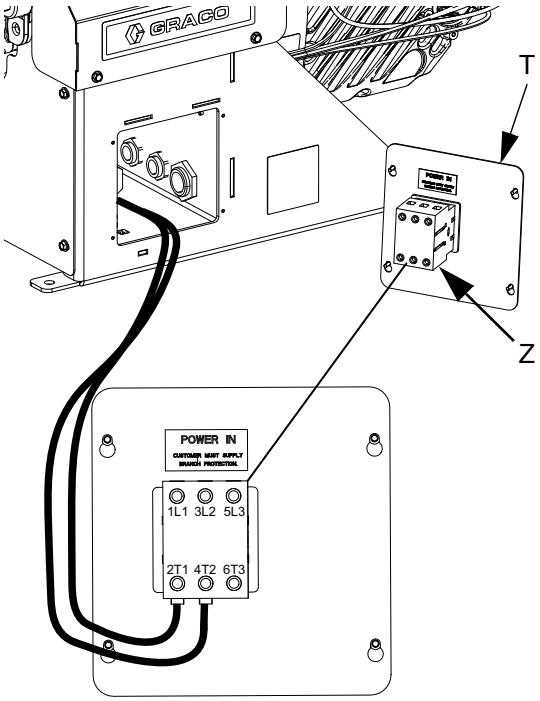


FIG. 7: Terminal Connections

3. Insert the power cord through the cord grip (strain relief) 3/4-14 NPT male, cable range 0.35-0.63 in. (8.9-16 mm), and into the EVR Frame (S).
4. Attach the ground wire to the ground terminal inside the EVR Frame (S) as shown in FIG. 8.

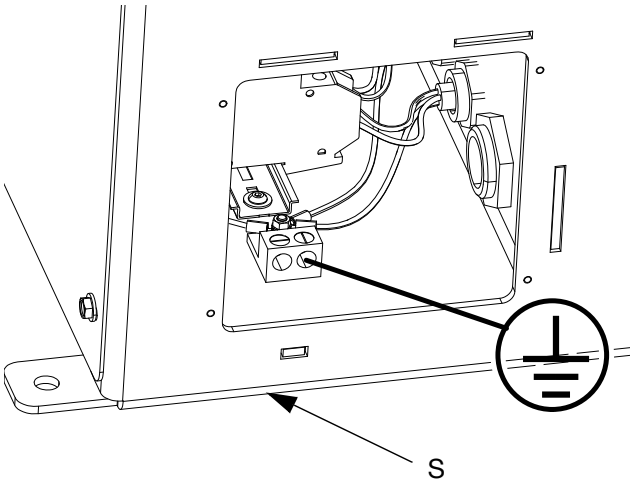


FIG. 8: Attach Ground Wire

5. Refer to FIG. 7 and connect the wires from the power cord into terminals 1L1 and 3L2.

NOTE: Do not attach the ground wire to the grounding lug locknut on the outside of the electric driver. See **Grounding** on page 11.

6. Place the power wires into the open area on either side of the Power Disconnect Switch (C) as space permits.
7. Reinstall the EVR Frame Cover (T) and Power Disconnect Switch (C) using the four screws removed in step 2.
8. Tighten the cord grip to securely hold the power cord in the EVR Frame (S).

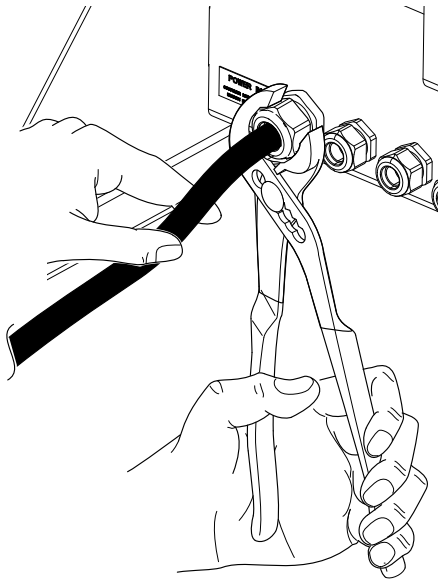


FIG. 9: Tighten Cord Grip

Install Vented Oil Cap Before Using Equipment

The driver gear-box is shipped from the factory pre-filled with oil. The temporary unvented cap (PX) prevents oil leaks during shipment. This temporary cap must be replaced with the vented oil cap (PY), supplied with the equipment, before use.

NOTE: Prior to use, check oil level. Oil level should be half way up the sight glass.

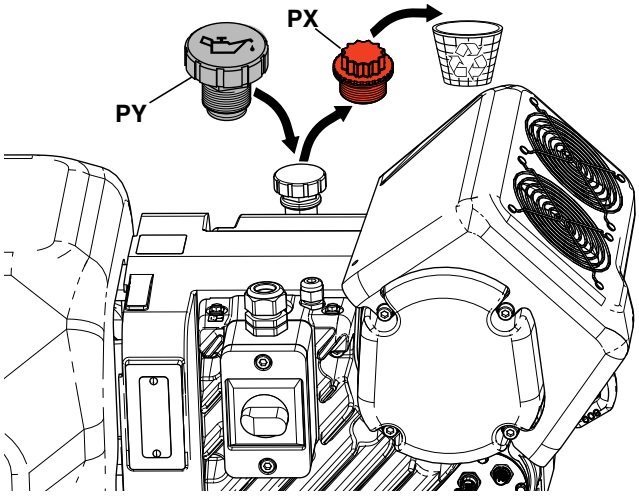


FIG. 10: Unvented and Vented Oil Caps

Setup

After placing the EVR in the desired area of operation:

NOTE: Make sure the EVR is placed on a level surface. See **Dimensions** on page 74 for space requirements.

1. Anchor the EVR to a fixed mounting location. See **Dimensions** on page 74.
2. Follow steps a through c to install pumps ordered separately for EVR systems configured without pumps. If the EVR is already configured with pumps, proceed to step 3.
   a. Install inlet fittings onto the A and B pumps purchased separately.
   b. Install the pumps onto the EVR. Use spring clamps (provided with pumps) to couple the pump to yoke adapters.
   c. Install adapters into the pump outlets, then install outlet manifold assemblies and drain tubes.
   d. Remove the plugs installed on the back of the A and B pumps, and install the pressure transducers as shown in FIG. 11.

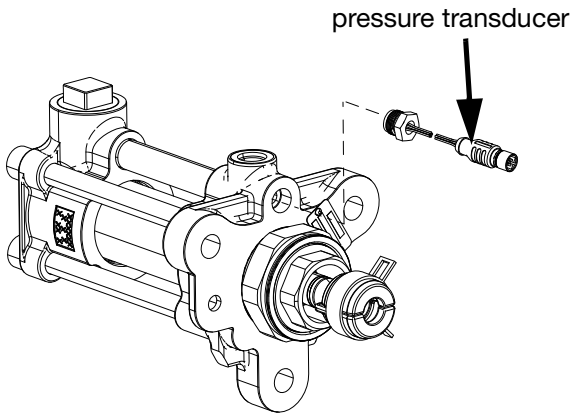


FIG. 11

   e. Install pressure transducers into port #6 on both A and B Electric Drivers (G). The A pressure transducer is marked with red tape, and the B pressure transducer is marked with blue tape.

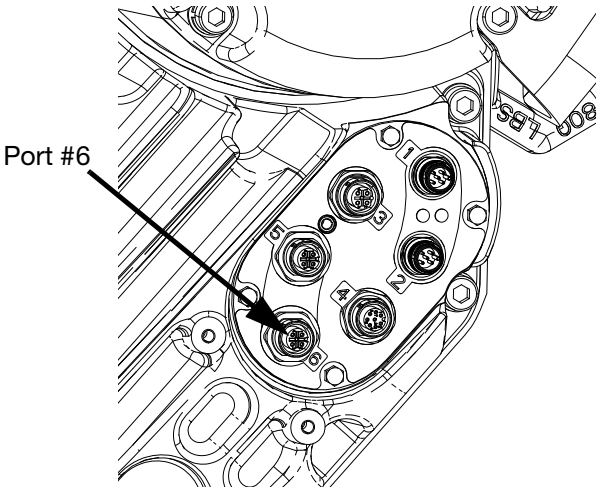


FIG. 12: Electric Driver Port #6

3. Connect the supply systems.
   a. Install feed pumps for component A (Red) and B (Blue) supply drums.

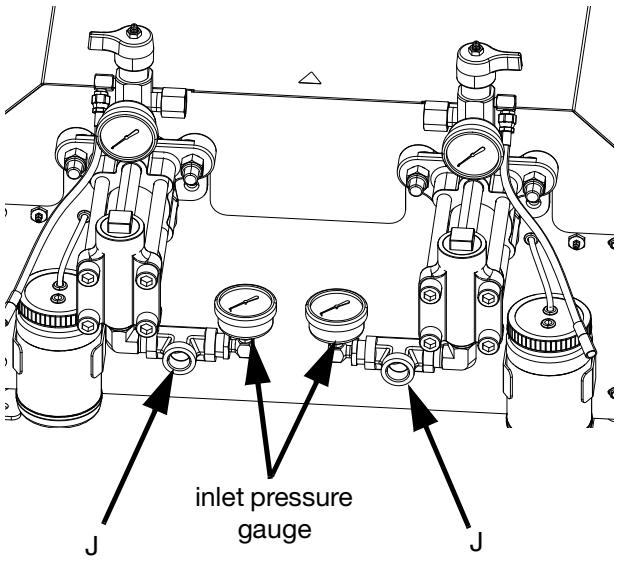


FIG. 13

   b. Ensure the supply systems and, if applicable, the inlet regulators are off or set to zero pressure before connecting.

NOTE: Supply hoses from feed pumps should be 3/4 in. (19 mm) ID minimum.

   c. Assemble, connect and tighten the component B (Blue) inlet hose to the B Pump Inlet (J).

d. Assemble, connect and tighten the component A (Red) inlet hose to the A Pump Inlet (J).

4. Attach the fluid outlet hoses to the Pump Outlets (K).

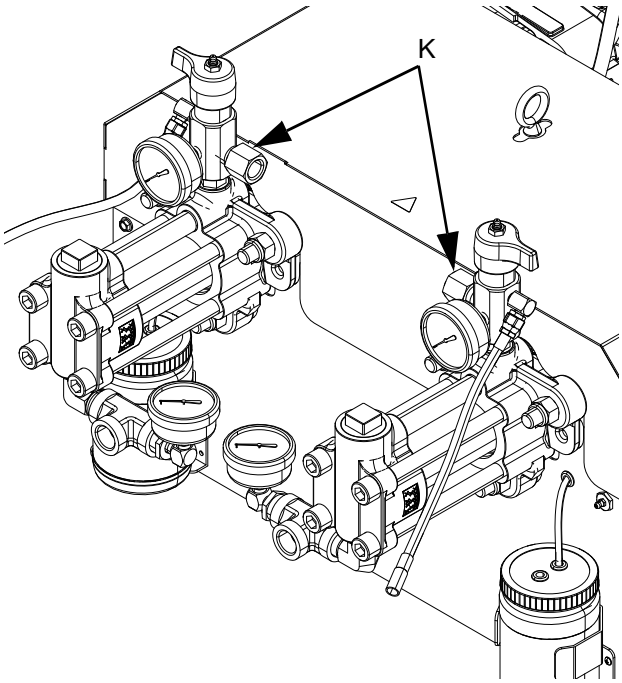


FIG. 14

5. Connect the outlet hoses to the dispense valve. Refer to your dispense valve component manual for complete installation instructions.

6. Pressure check the hoses. If there are no leaks, secure the outlet hoses together to protect them from damage.

Flushing

To avoid fire and explosion, always ground equipment and waste container. To avoid static sparking and injury from splashing, always flush at the lowest possible pressure.

- Flush out old fluid with new fluid, or flush out old fluid with a compatible solvent before introducing new fluid.
- Use the lowest possible pressure when flushing.
- All fluid components are compatible with common solvents.
- To flush the entire system, circulate through the dispense valve and drain valve.

Operation

Startup

1. Use the supply systems to load the fluid.

NOTE: The EVR is tested with oil at the factory. Flush out the oil with a compatible solvent before dispensing.

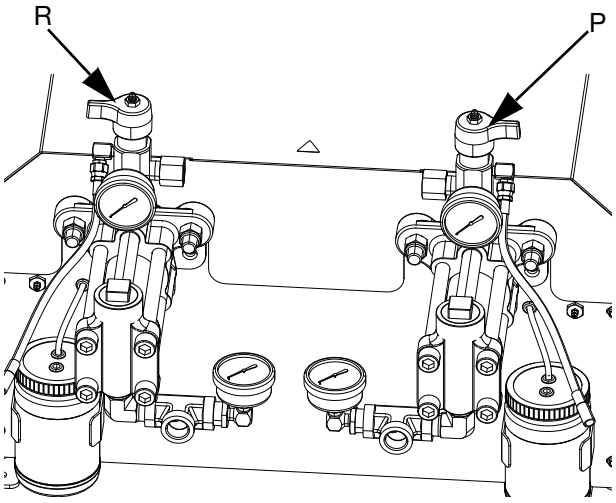
a. Check that all machine connections are tightened. See **Setup** on page 14.

b. Verify both feed supply systems are connected to an air supply.

c. Turn the Power Disconnect Switch (C) to the ON position.

d. Verify the machine is ON and the System Status Indicator (AB) is solid green. See **System Status Indicator (AB) Conditions** on page 10.

e. Turn both Outlet Drain/Relief Valves (P, R) to DISPENSE (pointing toward the outlet pressure gauges).



f. Start the supply systems. See **Adjust Material Inlet Pressure** on page 18.

Keep Components A and B Separate

Cross-contamination can result in cured material in fluid lines which could damage equipment or cause serious injury if injected or splashed on skin or in eyes. To prevent cross-contamination of the equipment's wetted parts, **never** interchange component A and component B parts.

g. Use supply systems to load the system.

h. To prime the pump, cycle the pump a few times or until air-free fluid dispenses. See **Home Screen** on page 32 for instructions on priming the pump through the ADM.

To prevent serious injury from splashing, dispense fluids at a low pressure.

i. Hold the dispense valve nose piece, without a mixer installed, over two grounded waste containers. Leave the mixer off and trigger the dispense valve until both fluids flow freely from the nose piece without any air.

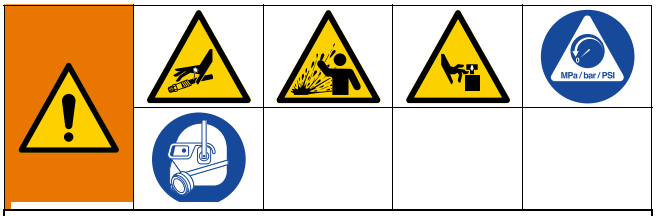
j. With the valve closed, install the required mixer on the dispense valve. Refer to your dispense valve manual.

Shutdown

1. Park the pumps. From the Home screen, press the icon. Material will dispense. The pump will park automatically. Once the pump is parked, the pump will stop moving.
2. Press the enable/disable key on the ADM to disable the EVR.
3. Turn the Power Disconnect Switch (C) to the OFF position.
4. Relieve fluid pressure from the supply system. See your appropriate supply system manual for instructions on relieving fluid pressure.
5. Perform the **Pressure Relief Procedure** on page 17.

Pressure Relief Procedure

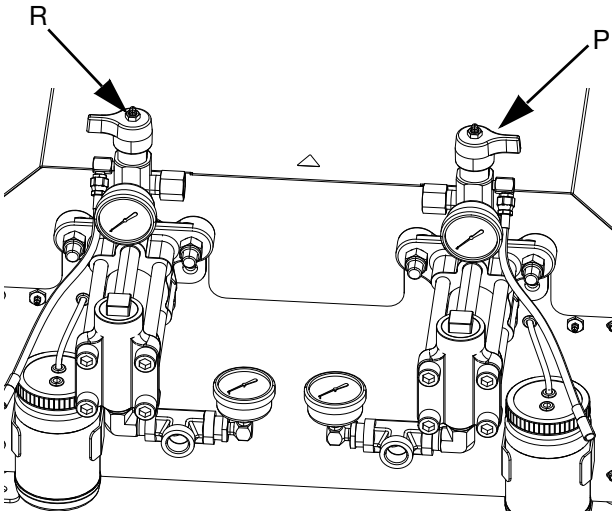
Follow the Pressure Relief Procedure whenever you see this symbol.



This equipment stays pressurized until pressure is manually relieved. To help prevent serious injury from pressurized fluid, such as skin injection, splashing fluid and moving parts, follow the Pressure Relief Procedure when you stop spraying and before cleaning, checking, or servicing the equipment.

NOTE: The fittings on the pressure relief hoses are zinc plated carbon steel. The hoses are cured with sulfur. Check your materials for compatibility with zinc plating and sulfur before reusing any material that passed through them, as it may inhibit curing.

1. Press the enable/disable key on the ADM to disable the EVR, and verify it is inactive.
2. Relieve pressure and shut off the supply systems. See your appropriate supply system manual.
3. Turn the Outlet Drain/Relief Valves (P, R) to PRESSURE RELIEF/CIRCULATION (pointing toward the drain hoses). Route the fluid to grounded waste containers or supply tanks. Ensure gauges read 0.



4. For models with a dispense valve with a safety lock, engage the dispense valve safety lock.

Adjust Material Inlet Pressure

NOTICE

Care must be taken when applying pressure to systems equipped with an inlet pressure regulator on the inlet assembly. Too much pressure could result in a burst hose. Read both operation and service manuals for the pump/ram supply system and the inlet pressure regulator prior to loading material to the EVR system.

Use the following procedure to adjust the fluid pressure to the system inlet. This process assumes that the supply system consisting of a supply pump and outlet hose has already been loaded and primed and is ready to provide material to the pump inlet.

1. Verify that the material supply pump does not provide material pressure in excess of the maximum fluid inlet pressure of 2000 psi (13.8 MPa, 138 bar).
2. Verify that there is no pressure in the material supply pump.
3. If used, verify both fluid inlet regulators are functioning properly. See the regulator component manual for detailed operating instructions.
4. Adjust both inlet regulators (if used) so that there is no air pressure on them and that the regulator pressure gauge reads zero.
5. Place a grounded container at the outlet of the relief lines from the manifold assemblies and secure the lines in place.
6. Turn the pressure relief valves on the manifold to the drain/recirculation position.
7. Gradually increase the air pressure to the supply pump to provide no more than 2000 psi (13.8 MPa, 138 bar).
8. If a fluid inlet regulator is used, slowly increase the air pressure on the inlet regulator to allow material to flow though the pump and out of the drain hose. The required material pressure will vary depending on the material viscosity and flow rate.
9. Once material is flowing from the drain hose, slowly decrease pressure on the inlet regulator until flow stops.
10. Gradually increase pressure to the inlet regulator until material begins to flow again.
11. When material begins to flow out of the drain port, close the pressure relief valves.

NOTE: Record the pump inlet pressure gauge reading. Use this pressure as a starting point for adjusting the material feed pressure to meet application requirements.

NOTE: As a general rule for high viscosity materials, the dispense pressure must exceed the material inlet pressure by 2 to 3 times. Therefore, if the maximum dispense pressure is 2500 psi (17 MPa, 172 bar), the inlet pressure should be no more than 1250 psi (9 MPa, 86 bar). For lower viscosity, flowable materials, the dispense pressure should exceed the inlet pressure by 3-4 times. Use only enough feed pressure to adequately feed the EVR pumps. The minimum feed pressure is 70 psi (0.48 MPa, 4.83 bar).

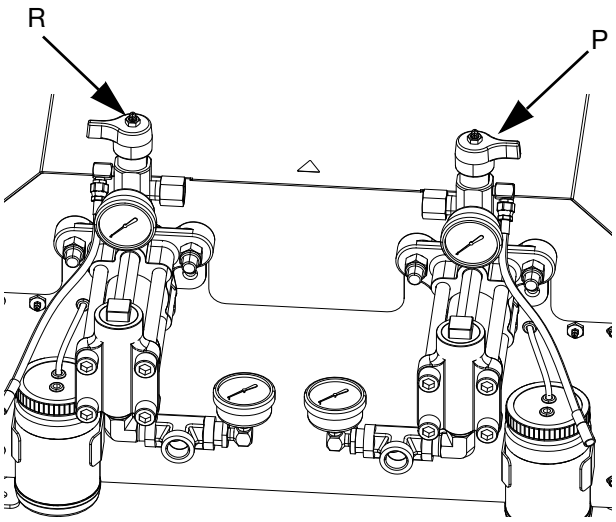
12. The inlet pressure regulator is not self relieving. Reducing the material pressure at the regulator will not effect the pressure reading until the accumulated down stream pressure is relieved. Perform the **Pressure Relief Procedure** on page 17.

Maintenance

NOTE: See the Maintenance section in your component manuals for maintenance instructions for specific system components. See **Related Manuals** on page 2.

Task	Schedule
Change break-in oil in a new unit	After first 200,000 - 300,000 cycles
Inspect fluid lines for leaks	Daily
Grease Outlet Drain/Relief Valves (R,P) with Fusion® grease (117773)	Weekly
Clean dispense valve mix chamber ports regularly, see dispense valve manual	See dispense valve manual
Clean dispense valve check valve screens, see dispense valve manual	See dispense valve manual

Grease Outlet Drain/Relief Valves with Fusion Grease (117773)



Preventative Maintenance Schedule

The operating conditions of your particular system determine how often maintenance is required. Establish a preventative maintenance schedule by recording when and what kind of maintenance is needed, and then determine a regular schedule for checking your system.

Check Oil Level

Check the oil level in sight glass (FC). (See FIG. 15.) The oil level should be near the halfway point of the sight glass when the sprayer is not running. If oil is low, open fill cap (FB) and add Graco Part No. 16W645 ISO 220 silicone-free synthetic EP gear oil. See FIG. 15.

The oil capacity is approximately 2.0 - 2.2 quarts (1.9 - 2.1 liters). **Do not overfill.**

NOTICE

Only use oil with Graco part number 16W645. Any other oil may not lubricate properly and can cause damage to the drive train.

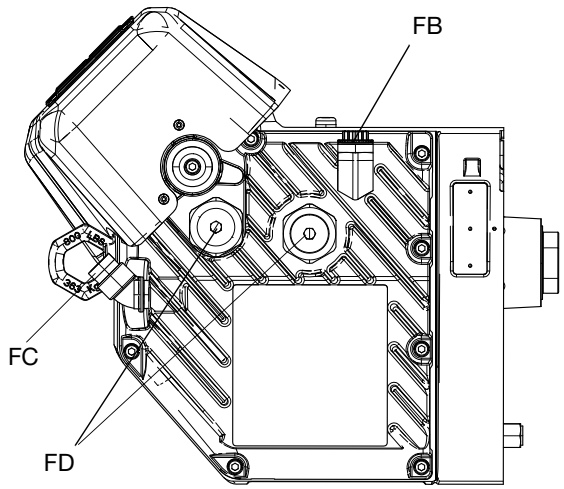
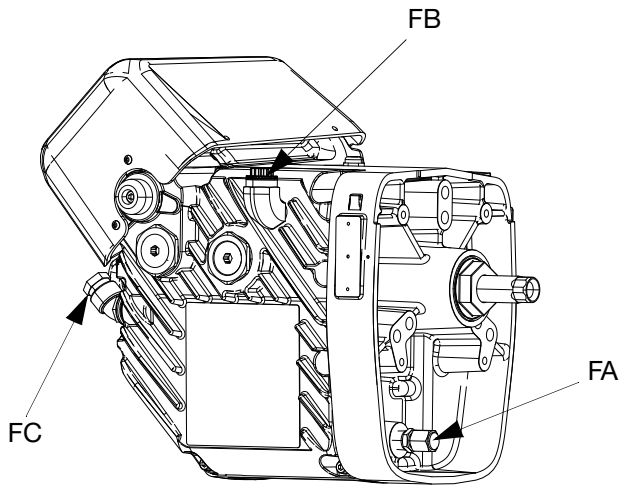


FIG. 15: Sight Glass and Oil Fill Cap

Change the Oil

NOTE: Change the oil after a break-in period of 200,000 to 300,000 cycles. After the break-in period, change the oil once per year.

1. Perform the **Shutdown** procedure on page 17.
2. Place a minimum 2 quart (1.9 liter) container under the oil drain port. Remove the oil drain plug (FA). Allow all oil to drain from the driver.
3. Reinstall the oil drain plug (FA). Torque to 18-23 ft-lb (25-30 N•m).
4. Open the fill cap (FB) and add Graco Part 16W645 ISO 220 silicone-free synthetic EP gear oil. Check the oil level in the sight glass (FC). (See FIG. 15.) Fill until the oil level is near the halfway point of the sight glass. The oil capacity is approximately 2.0 - 2.2 quarts (1.9 - 2.1 liters). **Do not overfill.**
5. Reinstall the fill cap.



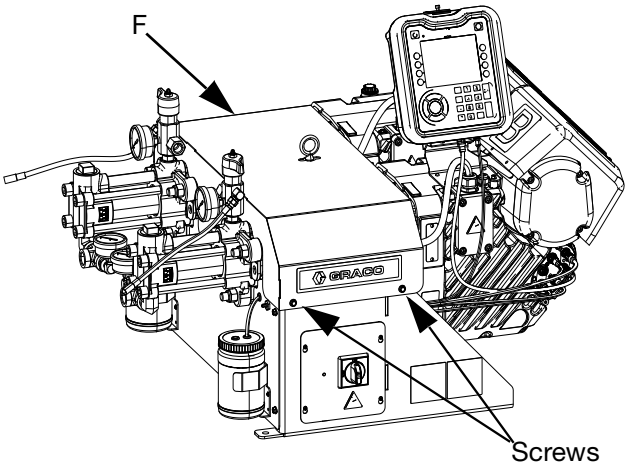
Bearing Pre-Load

See FIG. 15. The bearing pre-loads (FD) are factory set and are not user adjustable. Do not adjust the bearing pre-loads.

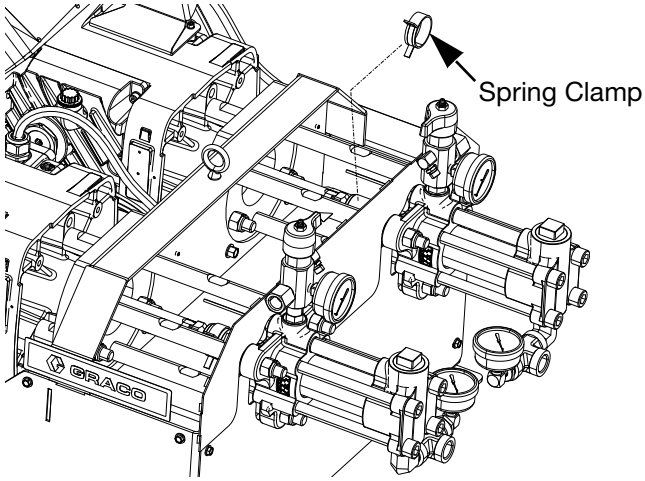
6. Turn the Power Disconnect Switch (C) to the ON position.

Calibrate the Electric Driver

1. Park the pumps. From the Home screen, press the icon. Material will dispense. The pump will park automatically. Once the pump is parked, the pump will stop moving.
2. Turn the Power Disconnect Switch (C) to the OFF position.
3. Perform the **Pressure Relief Procedure** on page 17.
4. Loosen the four screws and remove the Pump Shroud (F).



5. Remove the spring clamps coupling the pump to the yoke adapters. The driver will need to cycle freely during the calibration process.



7. Navigate to Maintenance Screen 1 on the ADM (see page 42). Press to enter Calibration mode.

8. Press the icon to begin calibration. Wait for the calibration process to finish.

   a. The driver output shaft will cycle back and forth slowly over the course of several minutes.

   b. Mid-way through the auto-calibration process, the shaft will pause.

   c. The shaft will cycle five or six times at a faster pace.

9. Verify the calibration process has been completed successfully. Successful calibration is indicated by the green check mark displayed on the screen.

10. Exit the calibration screen.

11. Use the Jog function to move the yoke in position for coupling the pumps (see page 42).

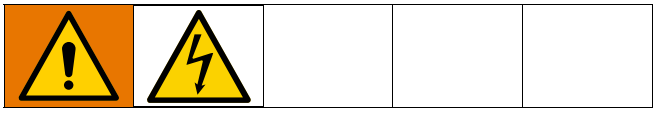
12. Turn the Power Disconnect Switch (C) to the OFF position.

13. Couple the pumps to the yoke adapter using the spring clamps removed previously.

14. Replace the Pump Shroud (F).

15. Turn the Power Disconnect Switch (C) to the ON position and resume operation.

ADM - Battery Replacement and Screen Cleaning



Battery Replacement

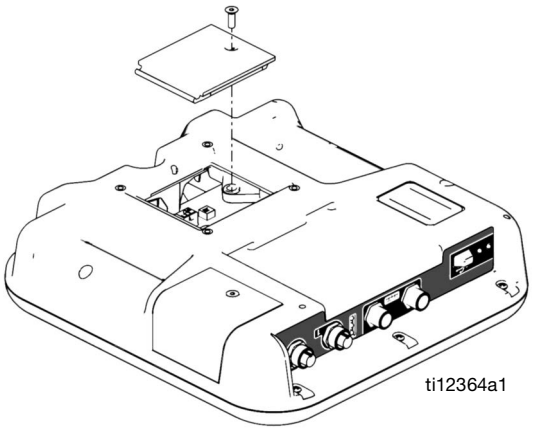
A lithium battery maintains the ADM clock when power is not connected.

To replace the battery:

1. Perform the **Shutdown** procedure on page 17.

2. Disconnect power to the ADM. This can be done by removing the CAN cable from the bottom of the ADM.

3. Remove battery access cover.



4. Remove the old battery and replace with a new CR2032 battery.

5. Properly dispose the old lithium battery according to local codes.

6. Replace battery access cover.

7. Connect the power to the ADM and reset the clock through **Setup Screen 4**. See **Setup Screen 4** on page 38.

Cleaning

Use any alcohol-based household cleaner, such as glass cleaner, to clean the ADM. Spray on the rag then wipe ADM. Do not directly spray the ADM.

Grease Cup Maintenance

Frequency of greasing intervals is dependent on material being pumped. As a basic schedule, lubricate pump with grease after 250 gallons of product (five drums of 55 gallon pails) has been passed through the pump.

If the grease has become hardened, remove the hardened materials or grease. Shorten the intervals between greasing the pump.

If the grease remains clear and free of material, intervals between greasing the pump can be increased.

To Grease the Pump:

1. Locate the grease fitting (A) mounted to the back cover near the pump that is being greased.

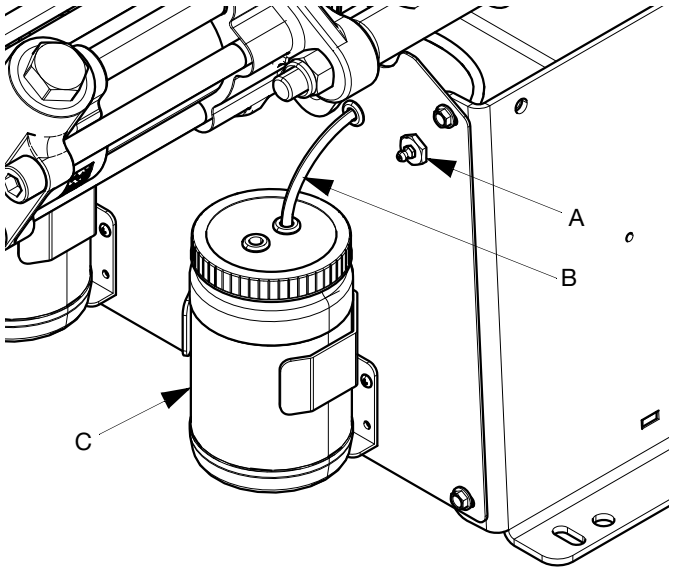
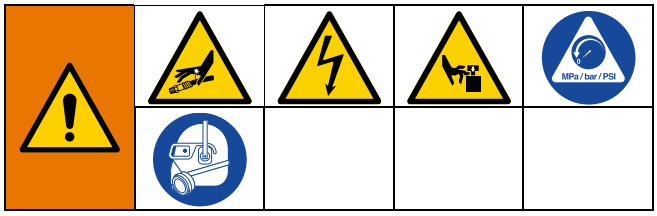


FIG. 16

2. Attach grease gun to the grease fitting (A). Pump new grease into fitting until fresh grease is observed discharging from grease relief tube (B) into the grease reservoir bottle (C).

3. Repeat for the other side.

Troubleshooting



NOTE: For Online help, visit http://help.graco.com for causes and solutions to each error code.

1. Follow **Pressure Relief Procedure**, page 17.
2. Check all possible problems and causes before disassembling.
3. Turn the Power Disconnect Switch (C) OFF.

Try the recommended solutions in the order given for each problem, to avoid unnecessary repairs. Also, determine that all circuit breakers, switches, and controls are properly set and wiring is correct before assuming there is a problem.

Problem	Cause	Solution
General		
Advanced Display Module completely dark	No power	Verify the Power Disconnect Switch (C) is ON
	Loose connection	Tighten 5-pin cable on the Advanced Display Module
	Bad Advanced Display Module	Replace the Advanced Display Module
No or incorrect amount of material dispensed from either side	Ball Valve closed (if Installed)	Open supply ball valve.
	Supply empty	Add fluid
	Air in material	Prime the machine
Significant material leaking from pump seal	Pump shaft worn and/or shaft seal worn	Remove the pump shaft assembly and reinstall read pump rebuild kit
Material dispensed incorrect weight	Specific gravity of one or more of the two materials has changed since setup	Check the specific gravity and re-enter in the setup screens
	Check valve malfunction	Remove the check valve; clean or replace as necessary
	Piston worn or broken	Replace the piston
The wrong pressure is displayed on the ADM/CGM	Incorrect pressure transducer is being used	Verify that the correct pressure transducer is being used. Change if necessary. 25B128: Use 15M669 pressure transducer 25U084: Use 16P289 pressure transducer
	Bad pressure transducer	Replace the pressure transducer

Problem	Cause	Solution
Proportioning System		
Proportioning pump does not hold pressure when stalled	Pump piston or intake valve leaking	1. Observe gauge to determine which pump is losing pressure. 2. Determine in which direction the pump has stalled by observing which directional valve indicator light is on. 3. Repair the valve.
Material imbalance	Inadequate flow from pump;	Increase fluid supply to proportioning pump: • Use minimum 3/4 in. (19 mm) ID supply hose, as short as practical
		Clean inlet strainer screen
		Worn pump inlet valve ball/seat or gasket
Erratic pump movement	Pump cavitation	Feed pump pressure is too low. Adjust pressure to maintain 100 psi (0.7 MPa, 7 bar) minimum.
Pump output low	Obstructed fluid hose or dispense valve; fluid hose ID too small	Open, clear; use hose with larger ID.
	Worn piston valve or intake valve in displacement pump	See pump manual 3A0019.
	Inadequate feed pump pressure	Check feed pump pressure and adjust to 100 psi (0.7 MPa, 7 bar) minimum.

EVR Error Codes

Error Code	Type	Code Description	Cause	Solution
A4N_	Alarm	High Current Motor _	Inlet pressure too high, causing retract stroke to require too much torque	Reduce inlet supply pressure.
			Pump sizes too large for motor to drive at the operating pressure	Reduce pump size.
			Wrong pump sizes are programmed into the system	Verify the pump sizes in the setup screen are correct for the pumps that are installed on system.
				Reduce outlet flow rate or outlet operating pressure.
CAA_	Advisory	Comm. Error Advanced Display _	Motor Control Module (3MCP) is unable to communicate with Advanced Display Module (ADM)	Verify CAN cable is plugged in.
				Remove and reconnect CAN cable, taking care not to cross thread the connector nut.
CAC_	Advisory	Comm. Error Gateway _	Motor Control Module (3MCP) is unable to communicate with Communications Gateway Module (CGM)	Verify CAN cable is plugged in.
				Remove and reconnect CAN cable, taking care not to cross thread the connector nut.
CAM_	Alarm	Comm. Error Motor Control Module _	Advanced Display Module (ADM)is unable to communicate with Motor Control Module (3MCP)	Verify CAN cable is plugged in.
				Remove and reconnect CAN cable, taking care not to cross thread the connector nut.
CAP_	Advisory	Comm. Error Paired Motor _	Motor Control Module (3MCP) is unable to communicate with the Pair Motor Control Module (3MCP)	Verify CAN cable is plugged in.
				Remove and reconnect CAN cable, taking care not to cross thread the connector nut.
CAFX	Advisory	Comm. Inlet pressure & Recirculation Module	System is unable to communicate with the fluid control module	Verify CAN cable is plugged in
				Remove and reconnect CAN cable, taking care not to cross thread the connector nut

Error Code	Type	Code Description	Cause	Solution
CAT_	Advisory	Comm. Error _____ Tank Stand	System unable to communicate with tank stand	Verify CAN cable is plugged in Remove and reconnect CAN cable, taking care not to cross thread the connector nut
CAVX	Advisory	Comm. Error Voltex DMV	System is unable to commu8nicate with Voltex dynamic mix valve (DMV)	Verify CAN cable is plugged in Remove and reconnect CAN cable, taking care not to cross thread the connector nut
CACX	Advisory	Comm. Error Gateway	Motor Control Module (3MCP) lost communication with automation controller	Verify fieldbus cable is properly connected Verify host is communicating
CCCX	Advisory	Comm. Error Gateway _	Motor Control Module (3MCP) lost communication with automation controller	Verify fieldbus cable is properly connected. Verify host is communicating.
ECAA	Record Only	Air Nucleation Disabled for Dispense	The air nucleation dispense button was pressed on the home run screen and a dispense occurred	No action necessary if desired. If not desired, press the button on the run screen again to enable the air nucleation during dispensing
ECMA	Record Only	Motor Spinning Disabled for Dispense	The air nucleation dispense button was pressed on the home run screen and a dispense occurred	No action necessary if desired. If not desired, press the button on the run screen again to enable the motor during dispensing
F3N_	Advisory	Unable to Maintain Flow Rate _	Pump is unable to deliver the desired flow rate	Reduce flow rate. Increase pump sizes. Measure line voltage. Low line voltage may reduce maximum operating flow rate.
F4CX	Alarm	Recirculation Flow Exceeds Max Flow	The flow rate requested by the recirculation exceeded the max flow rate (26 cycle per pump)	Reduce the flow rate so that the recirculation flow rate is below the max flow rate
F4RX	Alarm	Recipe Flow Exceeds Max Flow	The flow rate requested by the recipe exceeded the max flow rate (26 cycle per pump)	Reduce the flow rate so that the recipe flow rate is below the max flow rate
F4PX	Alarm	Purge Flow Exceeds Max Flow	The flow rate requested by the purge exceeded the max flow rate (26 cycle per pump)	Reduce the flow rate so that the purge flow rate is below the max flow rate

Error Code	Type	Code Description	Cause	Solution
F4GX	Alarm	Gel Flow Exceeds Max Flow	The flow rate requested by the gel timer exceeded the max flow rate (26 cycle per pump)	Reduce the flow rate so that the gel timer flow rate is below the max flow rate
L1T_	Deviation	Tank Sensor Failure_	Bad level sensor(s)	Replace level sensor(s)
L2T_	Deviation	Low Material_	Tank low on material	Fill tanks with material
			Loose/broken connection	If the tanks appear to have plenty of material, check to make sure the level sensor(s) is connected to the proper port and that the cord is not damaged
			Bad level sensor(s)	Replace level sensors(s)
L3T_	Deviation	High Material Level_	Defective fill valve	If the tanks appear to have plenty of material, check to make sure the level sensor is connected to the proper port and that the cord is not damaged
				Replace fill valve is leaking
			Defective fill valve	Replace level sensor
L6T_	Deviation	Auto Refill Timeout_	No material is actually being fed	Make sure the feed pumps are operating properly
			Loose level sensor connection	Check for loose or disconnected wires or plugs
			Bad level sensor	Replace level sensor
MA0_	Advisory	Pump Cycles Exceeds Limit _	The number of pump cycles since last reset has exceeded the limit	Performed desired maintenance and reset the pump cycles in the maintenance screen.
MEDX	Advisory	Valve Cycles Exceeds Limit	The number of dispense Valve cycles since last reset has exceeded the limit	Performed desired maintenance and reset the pump cycles in the maintenance screen.
P1D_	Alarm	Low Pressure Outlet _	Pressure exceeds user-defined limit	Inspect for leaks in fluid path.
				Increase operating pressure by increasing flow rate and/or restriction in the hose and valve.
				Decrease user-defined pressure limit.

Error Code	Type	Code Description	Cause	Solution
P1F_	Alarm	Low Pressure Inlet _	Pressure exceeds user-defined limit	Inspect for leaks in fluid path.
				Increase operating pressure by increasing feed pressure and/or restriction in the feed hoses.
				Decrease user-defined pressure limit.
			Out of material	Verify material supply.
P2D_	Deviation	Low Pressure Outlet _	Pressure exceeds user-defined limit	Inspect for leaks in fluid path.
				Increase operating pressure by increasing flow rate and/or restriction in the hose and valve.
				Decrease user-defined pressure limit.
P2F_	Deviation	Low Pressure Inlet _	Pressure exceeds user-defined limit	Inspect for leaks in fluid path.
				Increase operating pressure by increasing feed pressure and/or restriction in the feed hoses.
				Decrease user-defined pressure limit.
			Out of material	Verify material supply.
P3D_	Deviation	High Pressure Outlet _	Pressure exceeds user-defined limit	Inspect for hardened material or obstructions to flow.
				Attempt to purge material at a reduced flow rate.
				Reduce operating pressure by reducing flow rate and/or restriction in the hose and valve.
				Increase user-defined pressure limit.
P3F_	Deviation	High Pressure Inlet _	Pressure exceeds user-defined limit	Inspect for hardened material or obstructions to flow.
				Attempt to purge material at a reduced flow rate.
				Reduce operating pressure by reducing flow rate and/or restriction in the hose and valve.
				Increase user-defined pressure limit.

Error Code	Type	Code Description	Cause	Solution
P4D_	Alarm	High Pressure Outlet _	Pressure exceeds user-defined limit	Inspect for hardened material or obstructions to flow.
				Attempt to purge material at a reduced flow rate.
				Reduce operating pressure by reducing flow rate and/or restriction in the hose and valve.
				Increase user-defined pressure limit.
P4F_	Alarm	High Pressure Inlet _	Pressure exceeds user-defined limit	Inspect for hardened material or obstructions to flow.
				Attempt to purge material at a reduced flow rate.
				Reduce operating pressure by reducing flow rate and/or restriction in the hose and valve.
				Increase user-defined pressure limit.
P6D_	Alarm	Pressure Sensor Error Outlet _	Loose or bad sensor connection to Motor Control Module	Check to make sure that the pressure sensor is properly connected to the Motor Control Module (3MCP).
			Faulty sensor	Replace the Pressure Sensor.
P6F_	Deviation	Pressure Sensor Error Inlet _	Loose or bad sensor connection to Motor Control Module	Check to make sure that the pressure sensor is properly connected to the Motor Control Module (3MCP).
			Faulty sensor	Replace the Pressure Sensor.
P7D_	Alarm	Pressure Imbalance High _	Dispense line is clogged	First try purging fresh material through the system. Then relieve pressure and check for cured material or obstructions in the dispense valve.
			Orifice restrictions sized incorrectly	Adjust orifice restrictions to balance pressure of A and B materials.
			Out of material	Verify material supply.
			Pressure imbalance is defined too low	Increase pressure imbalance amount from the Setup screen of the Advanced Display Module (ADM).

Error Code	Type	Code Description	Cause	Solution
P9D_	Alarm	High Pressure Outlet _	Pressure exceeds system limit	Inspect for hardened material or obstructions to flow.
				Attempt to purge material at a reduced flow rate.
				Reduce operating pressure by reducing flow rate and/or restriction in the hose and valve.
P9F_	Advisory	High Pressure Inlet _	Pump are moving as a result of high inlet pressure	Turn down the inlet pressure on the feed pump.
T4N_	Alarm	High Temperature Motor _	Cooling fans not working properly	Ensure cooling fans are clear of obstructions and operating properly.
V1N_	Alarm	Low Voltage Motor _	AC voltage is too low	Check wire connections and verify line voltage is within specification.
V4N_	Alarm	High Voltage Motor _	AC voltage is too high	Verify line voltage is within specification.
WBN_	Alarm	Encoder Error Motor	Encoder not plugged in	Ensure encoder connector is fully plugged into the circuit board inside the driver.
			Faulty encoder	Replace encoder.
WMN_	Alarm	Controller Fault Motor	Faulty circuit board	Replace motor control circuit board.
W5N_	Deviation	Encoder Calibration Motor	Encoder not calibrated	Calibrate the Encoder from the maintenance screen of the Advanced Display Module (ADM).
WSNX	Alarm	Invalid Recipe	Entry into recipe is not correct or zero	Enter a valid value
WVCX	Deviation	Motor Fault	Over Torque	Cycle power. Increase ramp up time. Cycle power to unit
				Clean mixer. Cycle power to unit
			No power to motor	Make sure that motor has power. Check power supply if cycle power is needed

Advanced Display Module (ADM) Operation

When main power is turned on by turning the Power Disconnect Switch (C) to the ON position, the splash screen will be displayed until communication and initialization is complete.

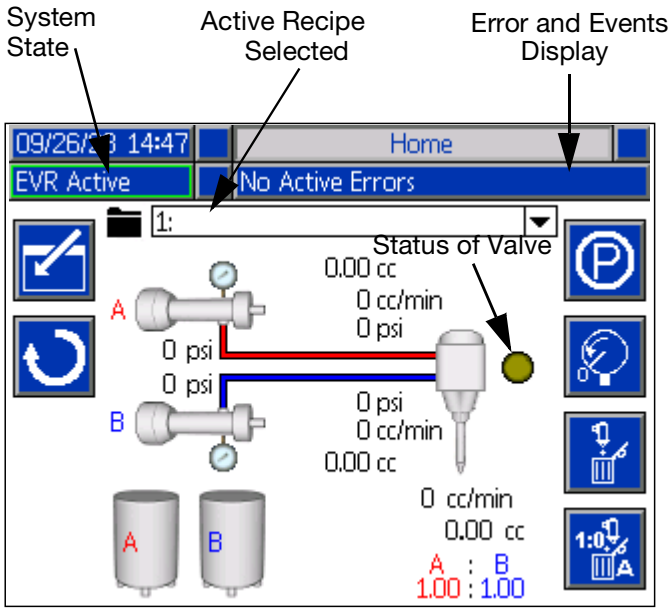
To begin using the ADM, the machine must be on and enabled. To verify the machine is enabled, verify the System Status Indicator Light (AB) is illuminated green, see FIG. 3 on page 9. If the System Status Indicator Light is not green, press the ADM Power On/Off (AA) button . The System Status Indicator Light will illuminate yellow if the machine is disabled.

Perform the following tasks to fully setup your system.

1. Set general system settings. See **Setup Screen 4**, page 38.
2. Set units of measure. See **Setup Screen 1**, page 37.
3. Enable/disable system features. See **Setup Screen 2**, page 37.
4. Define pump information. See **Setup Screen 1**, page 37.
5. Define shots. See **Recipe Definition Screen 1**, page 36.
6. Define recipes. See **Recipe Definition Screen 2**, page 36.
7. If desired, view/reset counters. See **Maintenance Screen 1**, page 42.
8. Enable/disable integration features. See **Integration Screen 1**, page 44.

ADM Screen Overview

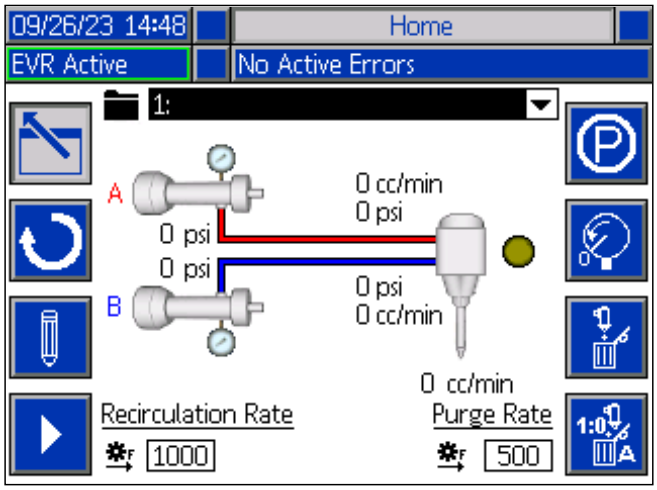
Home Screen



The home screen is the first screen displayed when the ADM is turned on. Here you can monitor the actual flow rate, actual amount dispense, and the current fluid pressure on the A and B fluid outlets of the pump. If installed, the inlet pressure of the pump will be displayed. Note: While the machine is in dispense mode, the system will show actual ratio in the bottom right hand corner instead of the set point.

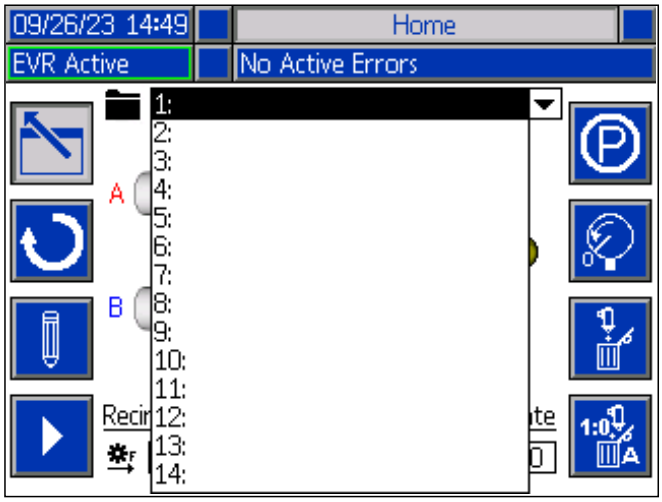
This screen also displays any active errors or events as well as the active recipe selected.

Pressing the icon will enter the home screen and allow you to select the active recipe, recirculation rate, and the purge flow.



To select a recipe, use the navigation keys to highlight the active recipe bar. Then press the Enter button to open a drop down menu where the desired recipe can be selected.

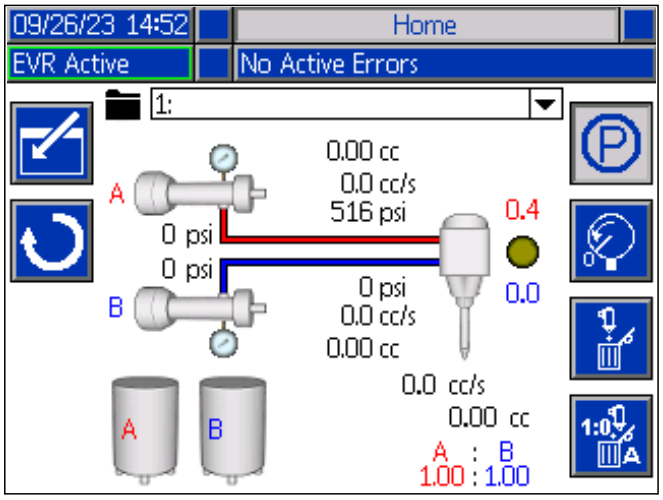
Recipes can also be selected remotely. See **I/O Integration** on page 47.



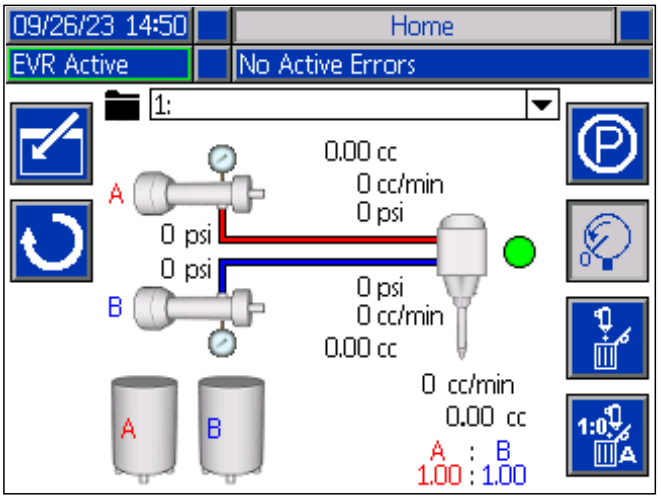
Along the right side of the home screen, there are icons that will allow the user to park, de-pressurize, purge, and base purge.

NOTE: The system must be active to access these icons. The only icon that can be selected when the system is inactive is the de-pressurize icon.

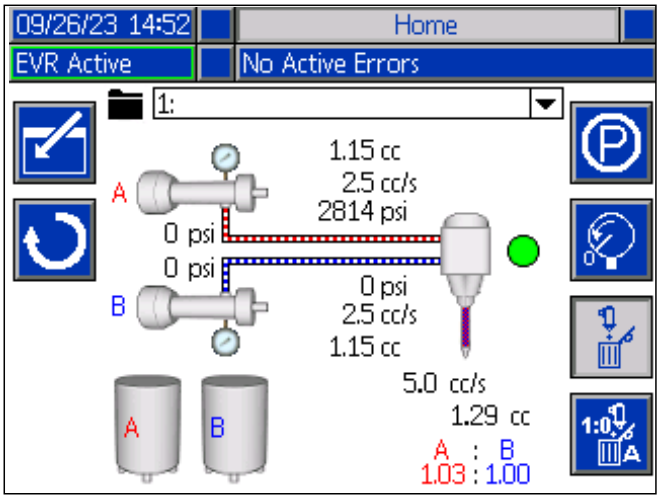
Park: When pressed, the park icon will park the pumps.



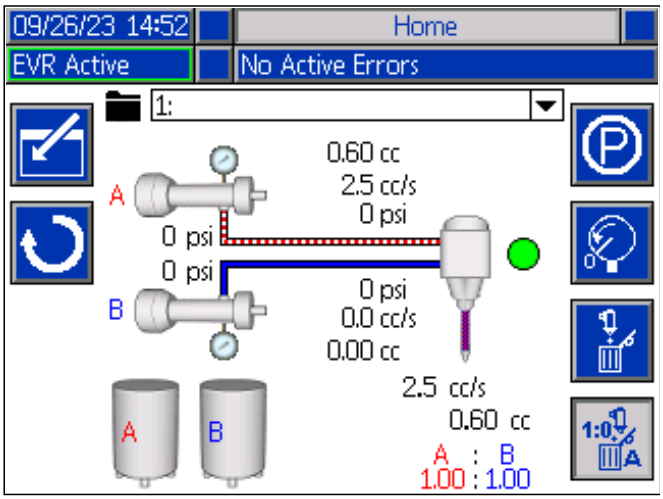
De-Pressurize: When pressed, the de-pressurize icon will open the dispense valve, which will relieve pressure in the pump lines.



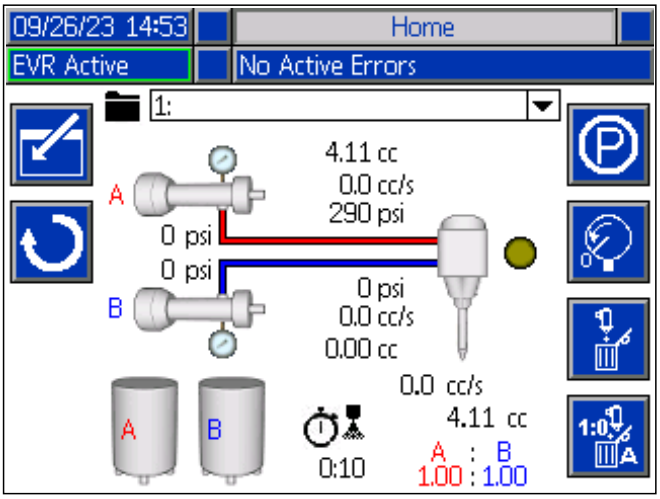
Purge: When pressed, the purge icon will purge material from the pumps. To stop purging material from the pumps, press the purge icon again.



Base Purge: When pressed, the base purge icon will open the dispense valve and purge material from the B pump while the A pump is parking. To stop the base purge, press the base purge icon again.



Gel Timer: If enabled, the gel timer's amount of time remaining before the next gel shot will be displayed under . To start the gel timer, the system must be active and a recipe must have been dispensed. If a feature (Park, Depressurization, Purge, Base Purge, or Recirculation) is triggered or the system is inactive, the gel timer will be stopped and the process will need to be repeated in order to start the gel timer countdown again. If a recipe is dispensed while the gel timer is counting down, then the gel timer will reset and the count down will restart after the recipe is completed.

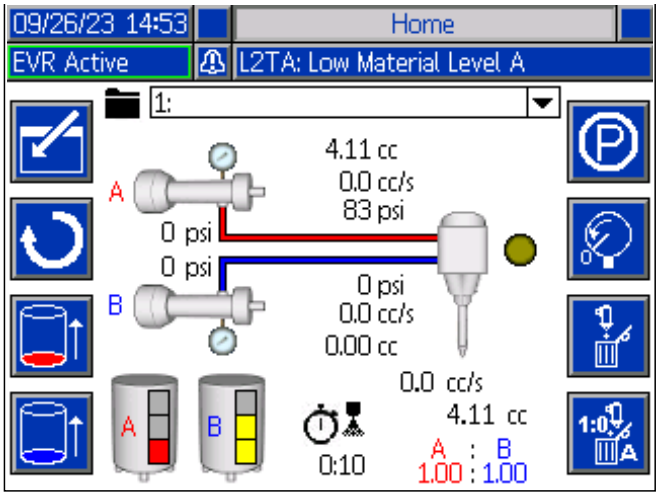


Tank Stand Status Information

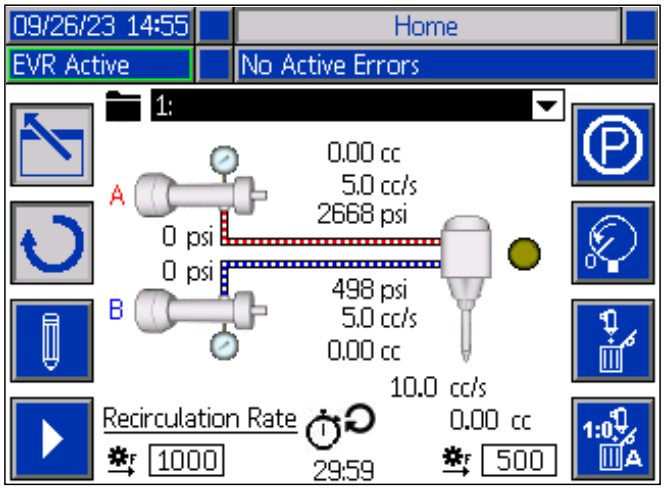
NOTE: The tank stand information and icons will only be shown when the tank stand is connected to the EVR network.

Tank Status Fill Levels: These icons display the fill level of each of the tanks.

Tank Refill: Press or to initiate a tank refill. If a tank is filling, pressing either button will abort the filling operation.

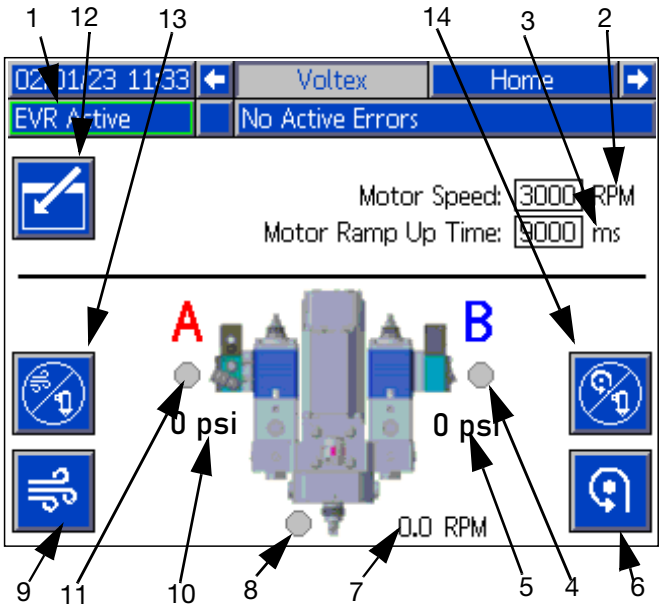


Recirculation: When pressed, the recirculation icon will recirculate the material through the pumps. To stop the material from recirculating through the pumps, press the recirculation icon again.



Votex Dynamic Mix Valve Run Screen

NOTE: This screen will only be displayed if the Voltex Dynamic Mix Valve is connected to the EVR Network.



1. **System State**: Green frame with Active indicated means the system is ready to run. Amber frame with System Off indicated means system is off.

2. **Motor RPM Setpoint:** The RPM's that the motor will run at. The Motor RPM Setpoint can be locked requiring a password.

3. **Motor Ramp Up Time:** This changes the amount of time in milliseconds the motor takes to get to the RPM setpoint. NOTE: 100ms is the fastest acceleration and 9000ms is the slowest acceleration. The goal is to try and prevent breaking mixers with a slower acceleration. Example: 500ms = half a second to get to the RPM setpoint of 4400 RPM.

4. **(B) Valve Status:** Icon turns green when the dispensing system turns on the valve signal. Icon turns gray when dispensing system is off.

5. **(B) Valve Pressure:** If a pressure transducer kit is installed, the text will appear on the screen and display the pressure. There is no error for the transducer being unplugged.

6. **Manual Motor**: This button allows the motor to be turned on by the ADM at the RPM setpoint.

7. **Motor Actual RPM:** Shows what speed the motor is at during the ramp period. It is not direct feedback from the motor.

8. **Air nucleation valve indicator**: Icon turns green if air nucleation is enabled and the valve is open. Icon turns gray when it is off.

9. **Air Purge button**: Will open the air nucleation valve indefinitely to blow out the material in the mixer

10. **(A) Valve Pressure**: If a pressure transducer kit is installed, the text will appear on the screen and display the pressure. There is no error for the transducer being unplugged.

11. **(A) Valve Status**: Turns on when the dispensing system turns on the valve signal.

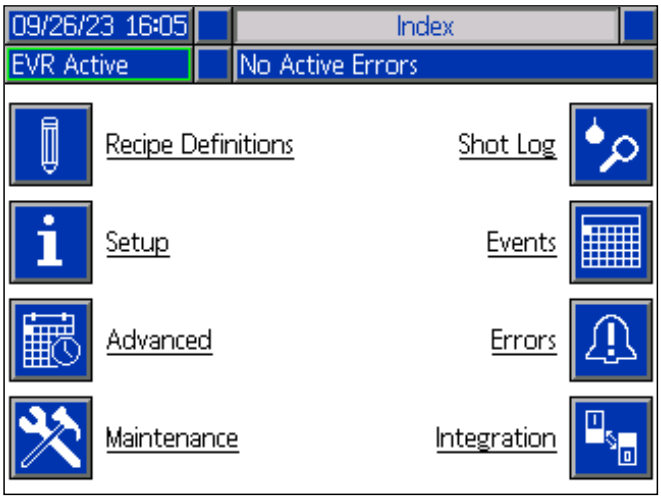
12. **Edit Mode**: Select to enter or exit the editing mode for the screen. Icon is gray when in edit mode and blue when off.

13. **Air Nucleation Disable for Dispensing**: Press this button to stop the air nucleation from running while dispensing. The icon turns grey to signal that the air nucleation has been disabled for dispensing. To re-enable the air nucleation for dispensing, press the button again. Every time a dispense occurs with the air nucleation disabled, an ECAA error will be placed into the events. See **EVR Error Codes** starting on page 25 for more information.

14. **Motor Spinning Disable for Dispensing**: Press this button to stop the motor from spinning while dispensing. The icon turns grey to signal that the motor has been disabled for dispensing. To re-enable the motor for dispensing, press the button again. Every time a dispense occurs with the motor disabled, an ECMA error will be placed into the events. See **EVR Error Codes** starting on page 25 for more information.

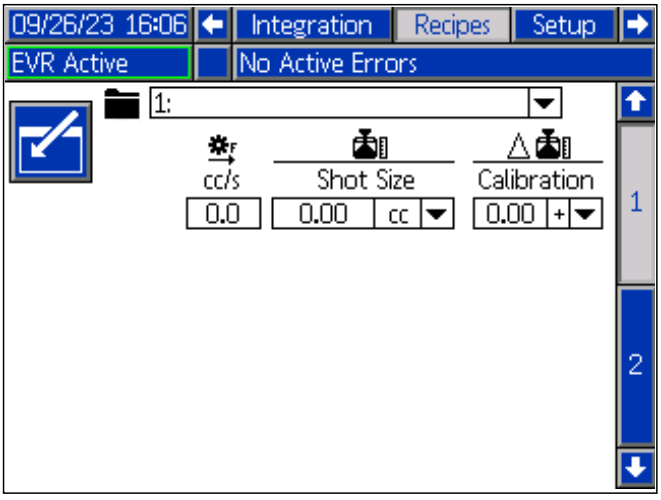
Index Menu

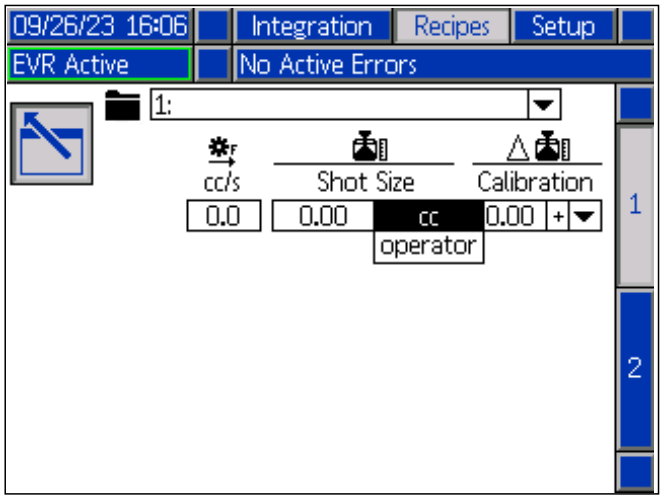
From the home screen, press the button to access the index. This screen provides access to Recipe Definition, Setup, Advanced, Maintenance, Shot Log, Events, Errors, and Integration screens.



Recipe Definition Screen 1

This screen allows users to create and edit recipes. From here, users are able to edit the flow rate, shot size and calibration of individual shot sizes in a selected recipe. There are two options available for the shot size, including operator mode and volume.





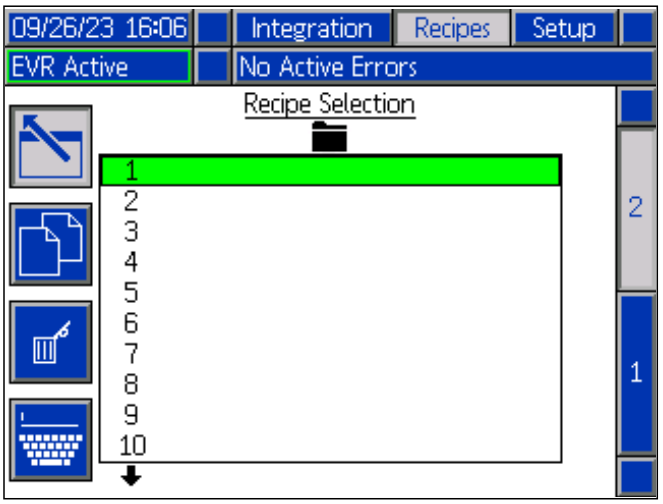
NOTE: If the user selects operator mode for the shot size, the EVR will only dispense at the desired flow rate as long as an external trigger source or foot switch is active for that particular shot of the recipe.

If the user enters the home screen while a recipe including a checked shot size is selected as the active recipe, the user must push the icon at the bottom of the screen or supply an external trigger signal (e.g. a foot switch or other manual switch) to begin dispensing the recipe.

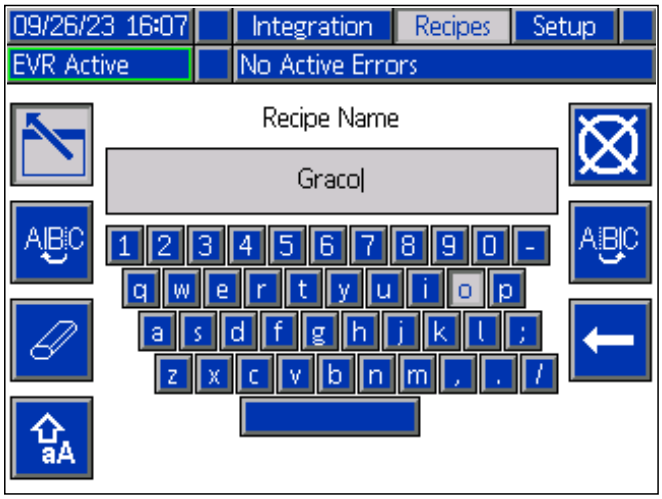
Recipe Definition Screen 2

This screen allows the user to copy, delete, and name selected recipes. Use the arrow keys to select a recipe from the list. The recipe selected will be highlighted in green, as shown below.

NOTE: The recipe selected in this screen will also be shown in the Recipe Definition Screen 1, where it can be edited. See **Recipe Definition Screen 1** on page 36.



To name a recipe, press the icon when the desired recipe is selected. A new screen, shown below, will appear and allow the user to edit the name of the selected recipe. Use the arrow keys to select the desired letter and press to accept the letter.



Setup Screen 1

This screen allows the user to change the dispense mode, rate units, pressure units, pressure imbalance alarm, and the pump line, and size of the A and B pumps.

Valve Type: the valve type can be set to TC or MD2 depending on which valve is installed on the system.

NOTE: If Voltex valve is connected, the system will automatically display Voltex as the only option.

Rate Units: The rate units can be set to minute, second, or hour.

Pressure Units: The pressure units can be set to either psi or bar.

Size: The user can enter the size of the A and B pumps on the unit here.

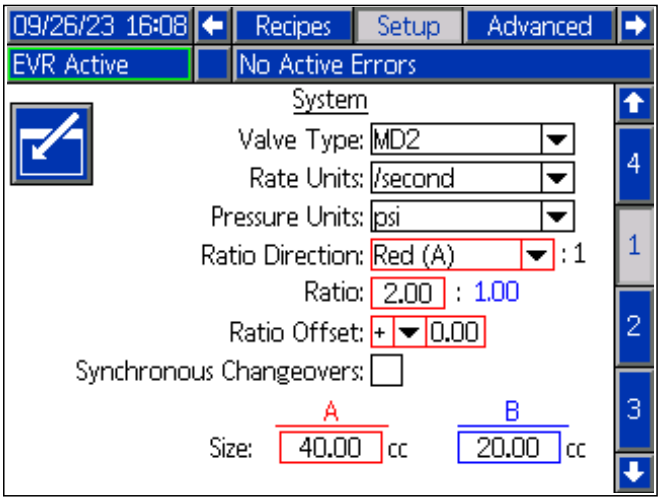
Ratio Direction: The user can define which pump is set to 1.

Ratio: The user can enter a desired ratio that the system will run at. The limits are defined by the software using the pump sizes, and the ratio direction. Note: Any time the user changes the pump sizes on the screen, the software will default back to the fixed ratio of the pumps. After the sizes have been changed, the variable ratio can be adjusted up to five times the fixed ratio. Example: if pump A is 40cc and pump B is 20cc, the variable ratio can vary between 10:1 and 2:1.

Ratio Offset: The user can enter a ratio offset, which is intended to calibrate the system and take into account any offset between materials. The limits are defined by the software using the pump sizes and ratio direction.

Synchronous Changeovers: When checked, the EVR system will try to change over the pumps together while monitoring the stroke lengths of the pumps. If the pump strokes length fall below a specific percentage of the stroke, the system will perform an unsynchronized changeover in order to re-synchronize the changeovers. If unchecked, the EVR system will monitor position of each pump independently and avoid changeover during the dispense when the EVR system is able.

NOTES: Synchronous changeovers will only happen during a recipe dispense. The synchronization will not start working on recipe dispenses until both pumps find their home position. This is defined as a Bottom Changeover. The synchronized changeover should be enabled if there is an issue with the system staying on ratio during a changeover.



Setup Screen 2

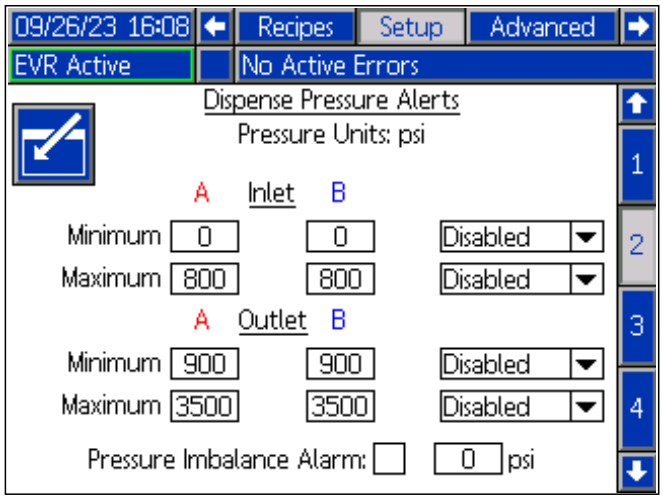
This screen allows the user to monitor inlet and outlet pressures of the EVR during a dispense. The user can specify a minimum and maximum allowable value for A and B for both inlet and outlet pressures. The user can also specify the level of alerts for each individual pressure limit. The alert options include Disabled, Deviation, and Alarm.

Disabled: No pressure monitoring will occur.

Deviation: The user will be notified if the pressure goes below the minimum or above the maximum, but further dispensing will be allowed to occur.

Alarm: If the pressure goes below the minimum or above the maximum, the current dispense will stop and further dispensing will not be allowed until the alarm is acknowledged.

Pressure Imbalance Alarm: When checked, the pressure imbalance alarm will watch the pressure for both A and B pumps. If the pressure difference between pumps is greater then the pressure defined in the alarm box, an alarm will be triggered.



Setup Screen 3

This screen allows the user to configure the internal gel timer and the side to base purge.

Gel Timer: When enabled, the gel timer prevents material from curing in the mixer. The user can set the amount of Idle time the machine can wait between a dispense, along with the amount and flow the material will dispense. If the system does not dispense again before the idle period time runs out, the gel timer will trigger a dispense.

Enable: Turns on/off the gel timer feature.

Idle Period: This the amount of time the unit will remain idle before beginning a dispense.

Alarm: Once the idle period is below the alarm value, the ADM will beep to alert the surrounding area that a gel shot is coming soon. At the same time a “gel shot timer is alarming” bit will be sent across the fieldbus to alert the PLC. If the alarm alert is not desired then set it to 0.

Amount: The amount of material that the system will automatically dispense after the idle period ends.

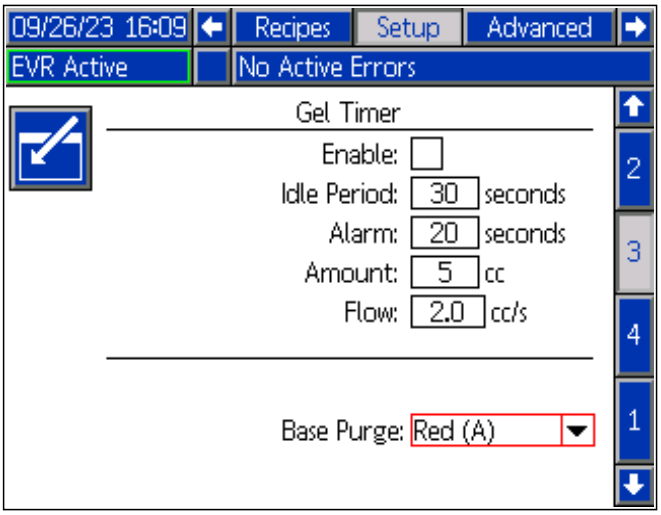
Flow: The flow rate at which the system will automatically dispense after the idle period ends.

Base Purge: This variable is used to define which side the system will base purge when the

icon is pressed.

NOTE: The

icon will have an A or B in the bottom right corner to indicate which side will base the purge.



Setup Screen 4

This screen allows the user to define the recirculation mode that the EVR will operate on.

Recirculation Installed: There are four options:

- None: The EVR will disable all recirculation features.
- Red: (A): The EVR will only recirculate using pump A.
- Blue (B): The EVR will only recirculate using pump B.
- Both: The EVR can recirculate with pump A and/or pump B.

Recirculation Valves: There are two options:
- Manual: The recirculation valves will be controlled from an exterior source.
- Automatic: The recirculation valves will be controlled by the EVR system.

Recirculation Mode: there are three options available for the recirculation mode: Disabled, Manual, and Timer.

- Disabled: The EVR will disable all recirculation features.
- Manual: The EVR will begin recirculating when the recirculation icon is pressed on the run screen. The EVR will continue until the recirculation icon is pressed again.
- Timer: The EVR will recirculate for a specified amount of time after a previously set amount of time has expired.

NOTE: To start the timer feature in recirculation mode, the recirculation icon must be pressed on the home screen. After the icon is pressed, the EVR will begin recirculating the pumps and count down the recirculation on timer. Once the timer has expired, the EVR will count down the recirculation off timer before repeating the process.

NOTE: When a dispense is requested, or another feature is enabled, the recirculation timer will be stopped.

Recirculation Pump Method: This variable is used to define which pump (s) the system will recirculate when the icon is pressed.

There are three options available:

- Both: Will recirculate both pumps.
- Red (A): Will only recirculate the red pump (A).
- Blue (B): Will only recirculate the blue pump (B).

NOTE: When Red (A) or Blue (B) is selected, the icon will have an A or B in the center to indicate which side will be recirculated. if both are selected, the icon will have nothing in the center to indicate that both pumps will be recirculated. If one only side of the pump recirculation is installed, then the **Recirculation Pump Method** will default to that side, and will only run on that side.

Recirculation On: This is the amount of time the system will continue to recirculate if the recirculation made is set to timer.

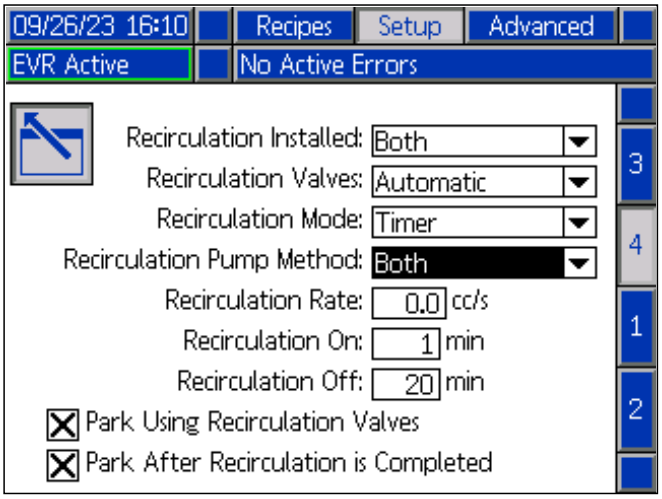
Recirculation Off: This is the amount of time the system will wait before starting the recirculation on timer when the recirculation mode is set to timer.

Park Using Recirculation Valves: If this box is checked, the park feature will park the pumps using the recirculation valves instead of the dispense valves.

Park After Recirculation is Completed: If this box is checked, along with park using recirculation valves, the system will automatically start parking the system after recirculation is completed. This can be canceled at any time while parking the pumps.

NOTES: The recirculation on and recirculation off time can only be set if the recirculation mode is set to timer. Otherwise, recirculation on and recirculation off will be grayed out.

If disabled is selected for the recirculation mode, all other options on the screen will be grayed out.



Setup Screen 5

NOTE: This screen will only be displayed if the Voltex Motor is connected to the EVR network.

Edit Mode: Select this to enter or exit the editing mode for the screen. Icon is gray when in edit mode and blue when off.

Air Nucleation: This will enable the air nucleation solenoid valve. This cycles while dispensing to dose air into the mixed material.

Delay Time: The amount of time before the air nucleation valve toggles between the on time and off time.

On Time: The amount of time the air nucleation valve stays on before toggling off.

Off Time: The amount of time the air nucleation valve stays off before toggling back on.

Motor Speed: The RPM's that the motor will run at.

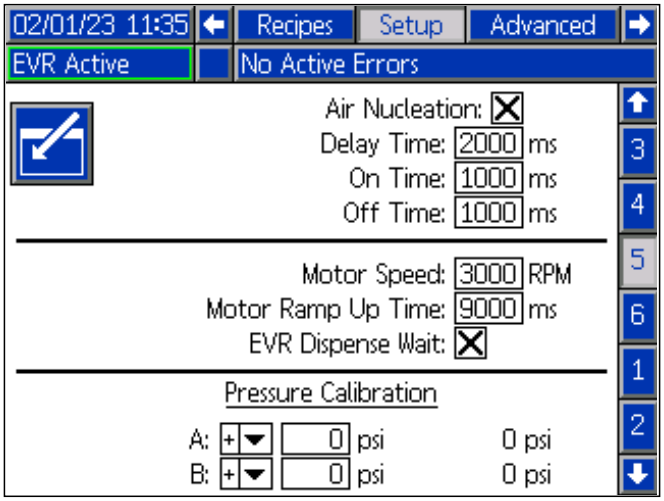
Motor Ramp Up Time: This changes the amount of time in milliseconds the motor takes to get to the RPM setpoint.

NOTE: 100ms is the fastest acceleration and 9000ms is the slowest acceleration. The goal is to try and prevent breaking mixers with a slower acceleration. Example: 500ms = half a second to get to the RPM setpoint of 4400RPM.

EVR Dispense Wait: This will cause the EVR to wait until the Voltex motor is up to speed before dispensing.

Pressure Calibration:

1. Relieve pressure in the system using valve depressurization. See **Pressure Relief Procedure** on page 17.
2. Press the edit mode key.
3. Press the soft key to automatically reset the offsets to zero. The values can also manually be changed and select minus or plus from the drop down menus as appropriate for the calibration.
4. Press the soft key to save changes and exit editing mode



Setup Screen 6

NOTE: This screen will only be displayed if a tank stand is connected to the EVR network.

This screen allows the user to specify the operating parameters for off-board, integrated tanks and indicate which positions have level sensors installed. See Stainless Steel Tank Stands instructions - Parts manual 3A0395 for information about installing level sensors. See **Related Manuals** on page 2. The user may select from the following refill settings: Disabled, Monitor only, manual Fill, and Auto top-Off.

The following describes the system operation when each tank mode is selected

Disabled:

- Disable tank operation.

Monitor:

- The top sensor generates a high level deviation and the bottom sensor generates a low level deviation.
- Refill is not supported, and no button is provided on the run screens to initiate refill.
- Errors will clear when the corresponding condition clears.

Manual:

- The low level sensor will register a low level deviation.
- An icon is shown on the run screens to initiate a manual refill operation at any time.
- Manual refill will continue until either the high level sensor detects material, the user aborts the refill using the refill button on the run screens, or the refill time-out expires.

- The low level alarm will clear when the condition clears.

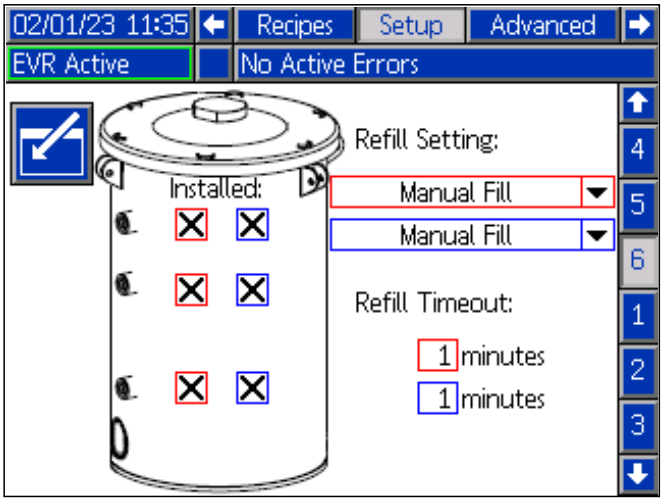
Auto Top-Off:

- The low level sensor will generate a low level deviation.
- When the high level sensor does not detect material, automatic refill will begin and continue until either the high level sensor detects material or until the refill time-out expires.
- The low level deviation will clear when the condition clears.
- An icon is shown on the run screens to initiate an automatic refill operation at any time.
- The icon can also be used to abort a refill operation.

Refill Setting: if a refill setting other than disabled is selected, the user must set at least two level sensor locations as installed by selecting the installed check box on the screen. If all three installed locations are checked the system will default to the Auto Top-off refill setting and operate as follows:

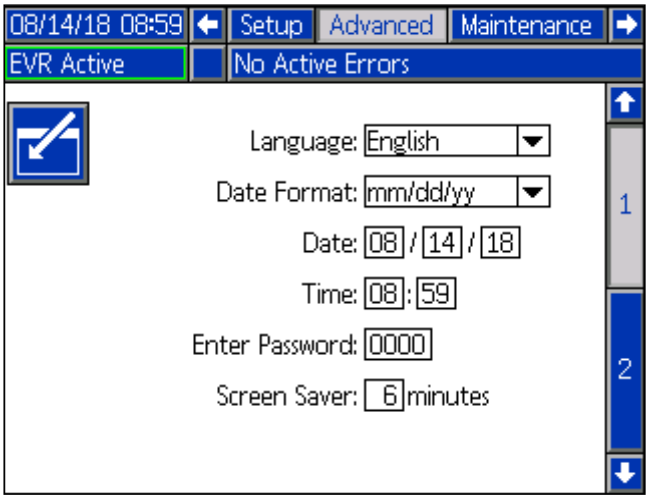
- The low level sensor will generate a low level deviation.
- When the middle sensor does not detect material, automatic refill will begin and will run until either the middle sensor detects material, the high level sensor generates a deviation (if the middle sensor fails), or the refill time -out expires.
- The low level deviation and the high level deviation will clear when the condition clears.
- An icon is shown on the run screens to initiate a manual refill operation at any time. This icon can also be used to abort a refill operation.

Refill Timeout: The refill timeout setting may be set by the user as a means to abort the refill in the case of a high level sensor failure. When an automatic refill begins, the time-out counter will begin to count down. if the timer expires before the high level sensor detects material, the refill will abort.



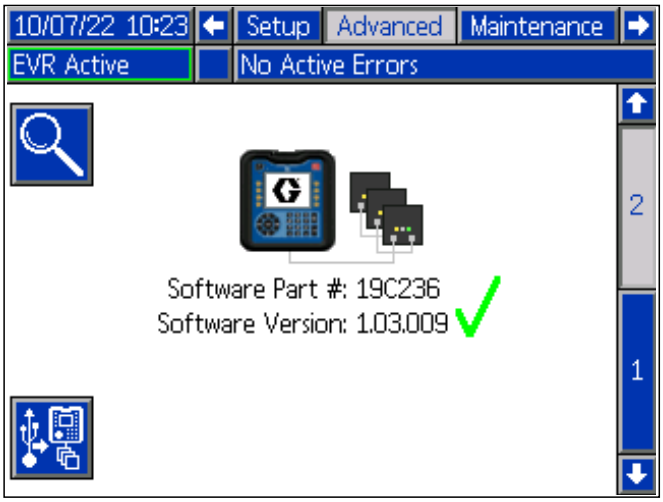
Advanced Screen 1

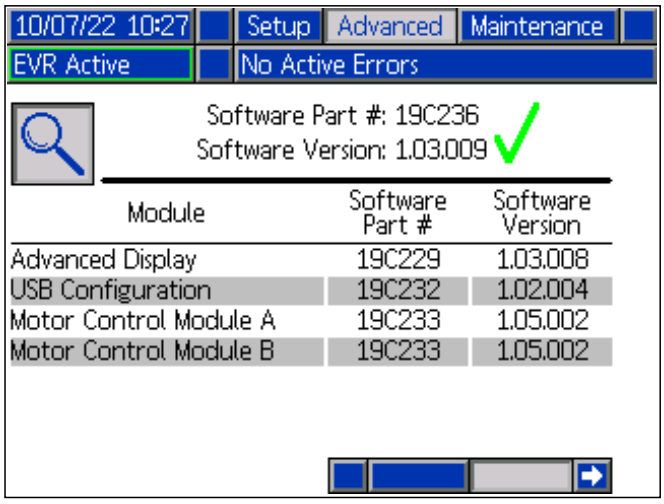
This screen allows the user to change the language, date, and time shown on the ADM. The user can also set up a password and change the screen saver here.



Advanced Screen 2

This screen allows the user to view and upgrade software installed on the system. Clicking the icon will open a new screen that shows what software is currently installed.





Maintenance Screen 1

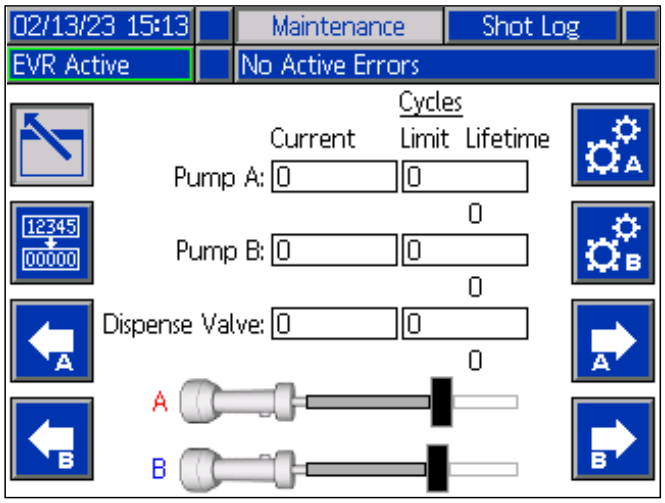
This screen keeps track of the cycles of the A and B pump, both current and lifetime, as well as the number of times the dispense valve has opened and closed. The user can also jog the pumps from the maintenance screen.

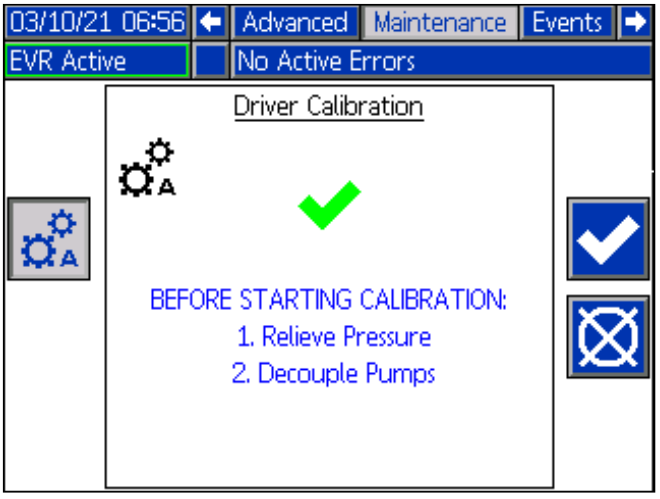
The user can clear the current cycles for the pumps or the dispense valve by highlighting the desired pump (A or B) or dispense valve and pressing the icon.

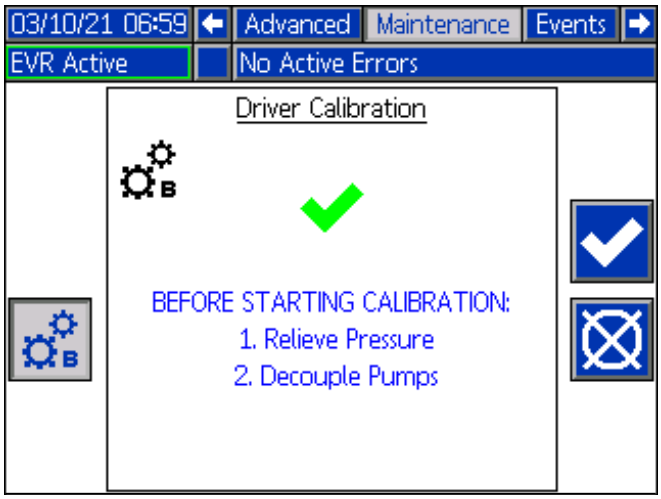
Once in edit mode the user can press the arrows at the bottom of the screen to jog the pumps forward or backward .

The icon is used for the calibration of a new motor control board for Unit A. The icon is used for the calibration of a new motor control board for Unit B. These icons should only be pressed when the appropriate motor board is replaced or when error W5N_ is active.

This screen also allows the user to generate an excessive Pump or Dispense Valve cycles advisory, if the corresponding Pump or Valve cycles exceeds the number entered in the second column limit field. If a non-zero number is entered in that field, and the corresponding pump or valve cycles exceeds that value, the EVR will generate and log an advisory informing the user of the condition. To remove the advisory, either reset the current counter, raise the Limit value, or enter zero for the limit value.







Maintenance Screen 2 and 3

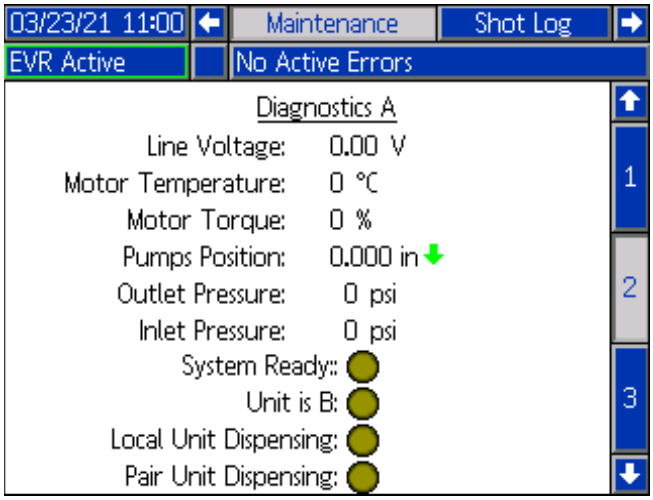
This screen allows users to see the line voltage of the incoming AC power, the motor temperature, the percentage of torque on the motor, and the position of the pumps.

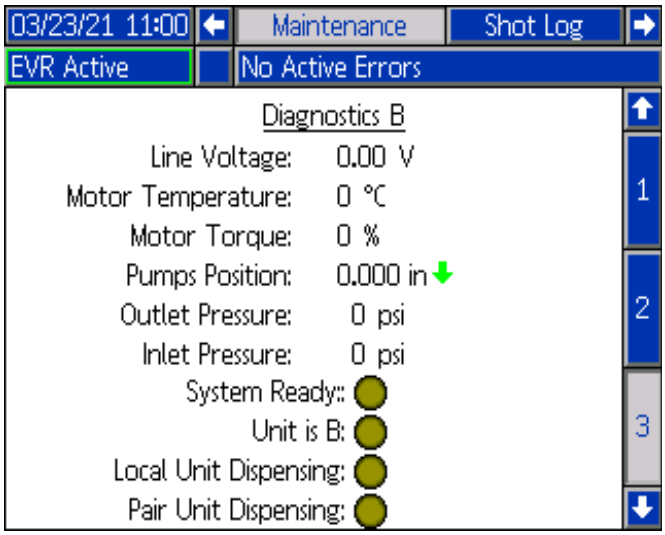
The arrow located to the right of the pumps position indicates the direction the pumps are moving. When the arrow is green, the pumps are moving, and when the arrow is red, the system is going through a changeover.

A green arrow pointing up means the rod is moving towards the driver housing, and a green arrow pointing down means the rod is moving towards the pumps.

A red arrow pointing up signifies a top changeover, and a red arrow pointing down signifies a bottom changeover. The outlet and inlet pressure indicate the active pressures respectively.

The status bits illuminate, indicating when the following are true: system ready, unit is B, Local Unit Dispensing, Pair Unit Dispensing.

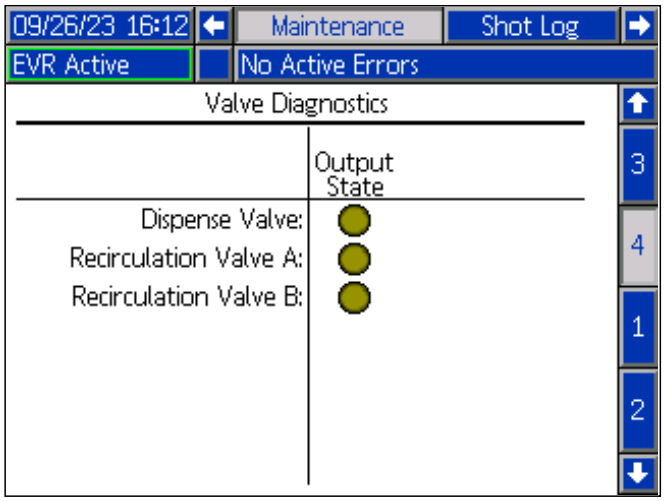




Maintenance Screen 4

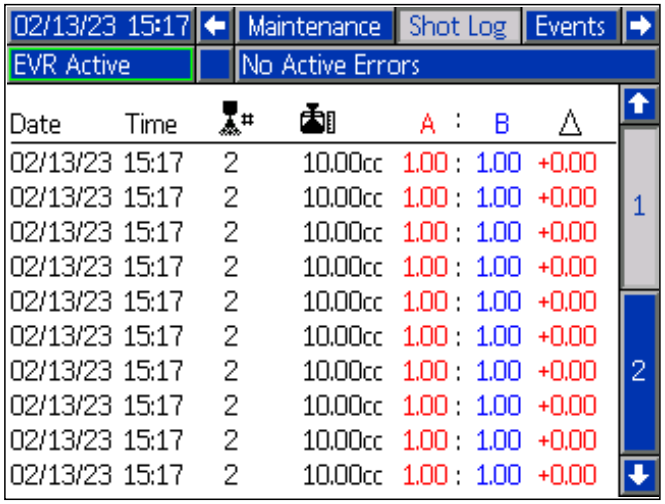
This screen will display the output state of the valves that are installed in the system depending on what modules are connected.

NOTE: Green light means that the output is on.



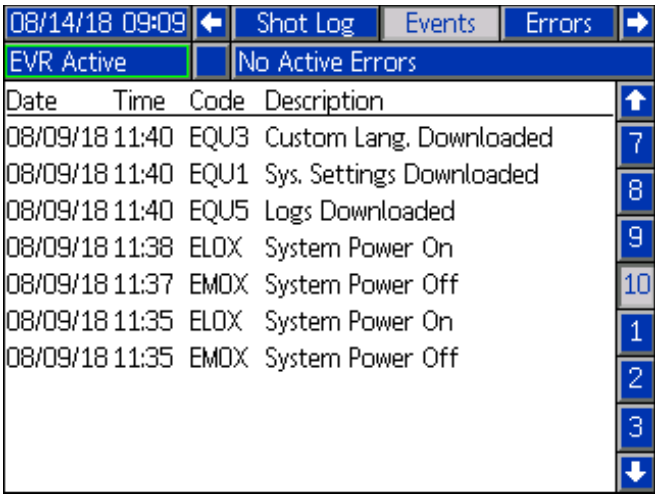
Shot Log

This screen shows users a list of all completed shots. Each shot entry includes a date and time stamp, the recipe selected, the amount dispensed, the ratio of each pump and the calibration.



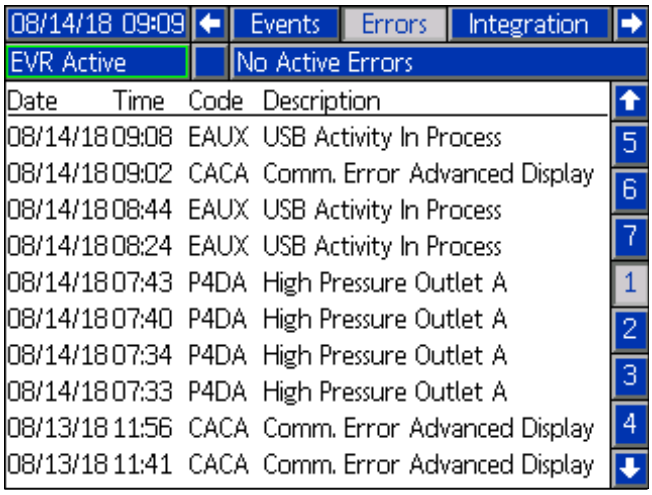
Events Screens

This screen shows users a list of events that have occurred in the system. Each event includes a description and event code along with a date and time stamp. There are 20 pages, each holding 10 events. The 200 most recent events are shown.



Errors Screens

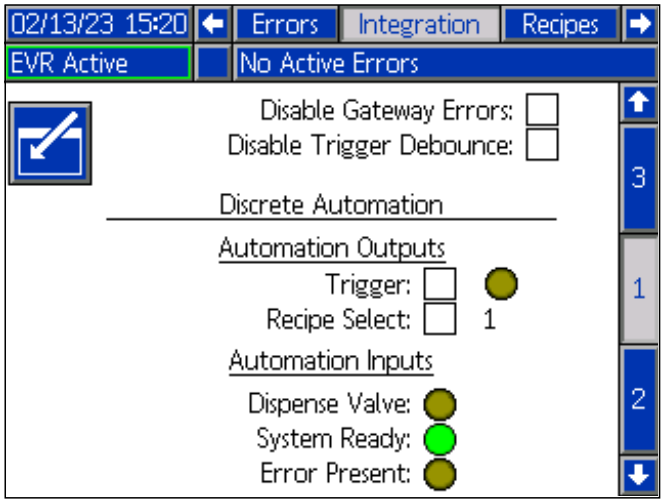
This screen shows users a list of errors that have occurred in the system. Each error entry includes a description and error code along with a date and time stamp. There are 5 pages, each holding 10 errors. The 50 most recent errors are shown.



Integration Screen 1

This screen allows the user to see when the unit is receiving inputs from a PLC, as well as when the unit is sending outputs to a PLC. Integration inputs must be enabled by checking the box for the EVR to use the signal. If the check box is not checked, the EVR will ignore the signal.

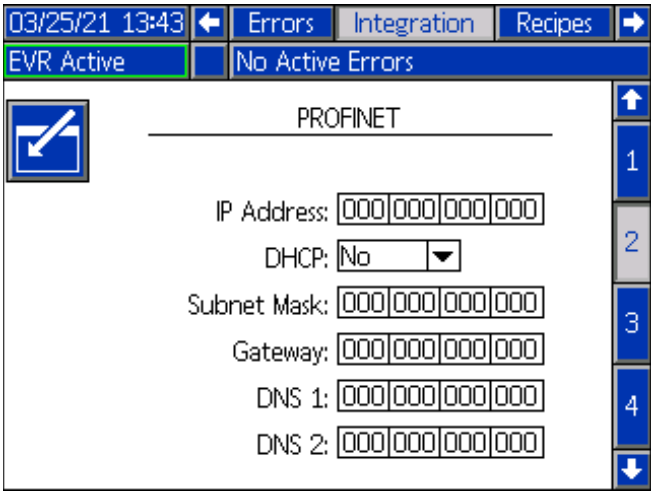
For explanations of each integration pin, see **I/O Integration** on page 47.

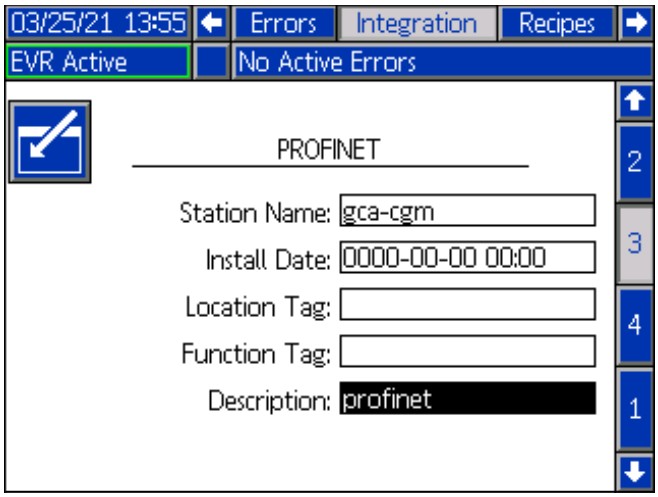


Integration Screens 2 and 3

This screen will appear when a CGM is connected.

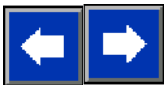
This screen displays the setup screen for a connected CGM.



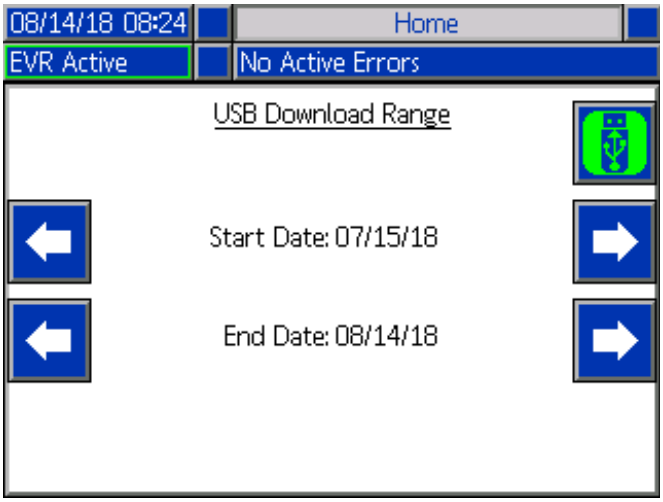


USB Plug-In Screen

This screen will appear when a USB device is plugged into the ADM.

Here the user can select dates to download data from the ADM to the USB device by pressing the left and right arrow icons on either side of the screen  . Once the dates are selected, press the icon, and the download will begin. Information available to download onto a USB device includes shot log data, errors and events.

If the cancel icon is pressed, the USB download will be aborted.



Software Update

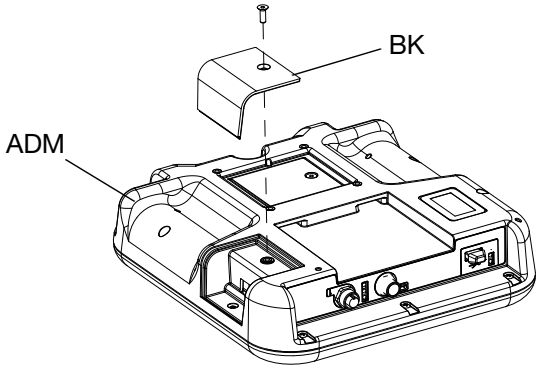
NOTE: If burning your own software token, see the ADM Token Programming manual. See **Related Manuals** on page 2.

19C237 Software Update Procedure

NOTE: A token can be found in the ADM token compartment.

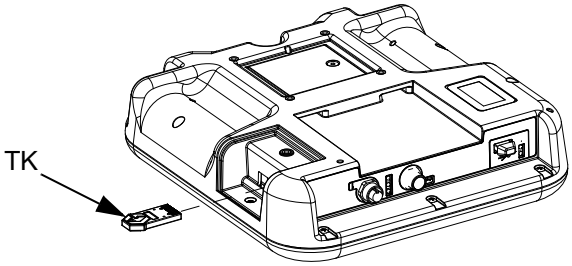
When software is updated on the ADM the software is then automatically updated on all connected modules. A status screen is shown while software is updating to indicate progress.

1. Turn Power Disconnect Switch (C) to the OFF position.
2. Remove ADM from bracket.
3. Remove token access panel (BK).



4. Insert and press EVR software upgrade token (TK, part no. 19C237) firmly into slot.

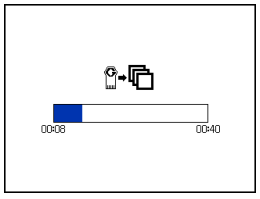
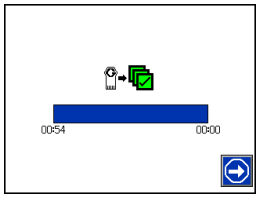
NOTE: There is no preferred orientation of token.



5. Turn the Power Disconnect Switch (C) to the ON position.

NOTICE
A status is shown while software is updating to indicate progress. To prevent corrupting the software load, do not remove token until the status screen disappears.

NOTE: When the ADM display turns on, you may see the following screens:

First: *Software is checking which modules will take the available updates.*	
Second: *Status of the update with approximate time until completion.*	
Third: *Updates are complete. Icon indicates update success/failure. See the following Icon table.*	

Icon	Description
	Update successful.
	Update unsuccessful.
	Update complete, no changes necessary.
	Modules were updated or didn't require an update; however, one or more modules need to be updated manually with a token.

6. Remove token (TK).
7. Replace token access panel (BK).
8. Install ADM into bracket.
9. Press to continue to EVR operation screens.

I/O Integration

Connector	Pin	Input/Output	Description
Valve	1	---	---
	2	24 VDC Digital Output • 24V is ON • 0V is OFF	Valve B
	3	Ground/Return	Ground
	4	24 VDC Digital Output • 24V is ON • 0V is OFF	Valve A
	5	---	---
Trigger	1	24VDC Output	24V for dry contact closure
	2	---	---
	3	Trigger	Trigger a dispense on the EVR
	4	---	---
	5	---	---
Integration	1	Output	System Ready
	2	Output	Alarm Present
	3	Ground/Return	Ground
	4	Input	Recipe Select
	5	Input	Recipe Number Bit 0
	6	Input	Recipe Number Bit 1
	7	Input	Recipe Number Bit 2
	8	Input	Recipe Number Bit 3
Recirculation	1	---	---
	2	24 VDC Digital Output • 24V is ON • 0V is OFF	Recirculation Valve B
	3		Ground
	4	24 VDC Digital Output • 24V is ON • 0V is OFF	Recirculation valve A
	5	---	---
Tip Shutoff	1	---	---
	2	---	---
	3	Ground/Return	Ground
	4	24 VDC Digital Output • 24V is ON • 0V is OFF	Tip Shutoff Valve
	5	---	---

EVR and PLC Connection

Verify the PLC connection parameters are setup correctly.

NOTE: The connection between the EVR and PLC will not be made if the PLC connection parameters are not set up correctly.

Gateway Map: EVR Fieldbus Map	
Comm. Format	**Data-SINT**
Input Assembly Instance	100
Input Instance Size	48
Output Assembly Instance	150
Output Instance Size	24

PLC Inputs

EVR Fieldbus Map 19C930						
Automation Inputs (signal from EVR to PLC)						
Tag ID	**Description**	**Data Type**	**Minimum Value**	**Maximum Value**	**Bit**	**Byte**
1	Heartbeat To PLC	Boolean	0	1	0	0
2	System On	Boolean	0	1	1	
3	PLC Lockout is Active	Boolean	0	1	2	
4	System Ready	Boolean	0	1	3	
5	No Alarms are Present	Boolean	0	1	4	
6	No Deviations are Present	Boolean	0	1	5	
7	No Advisories are Present	Boolean	0	1	6	
8	Recipe is Dispensing	Boolean	0	1	7	
9	Dispense Valve is Opened	Boolean	0	1	0	1
10	System is Purging	Boolean	0	1	1	
11	System is Base Purging	Boolean	0	1	2	
12	System is Depressurizing	Boolean	0	1	3	
13	System is Parking	Boolean	0	1	4	
14	System is Parked	Boolean	0	1	5	
15	Recipe is Valid	Boolean	0	1	6	
16	Gateway Recipe Lockout Active	Boolean	0	1	7	

EVR Fieldbus Map 19C930						
Automation Inputs (signal from EVR to PLC)						
Tag ID	**Description**	**Data Type**	**Minimum Value**	**Maximum Value**	**Bit**	**Byte**
17	Gel Shot is Dispensing	Boolean	0	1	0	2
18	Gel Shot Countdown Timer is Alarming	Boolean	0	1	1	
19	Red Tank is Filling	Boolean	0	1	2	
20	Red Tank Stand Level △ (0-Unknown, 1-Low, 2-Middle, 3-High)	Boolean	0	3	3	
21		Boolean			4	
22	Blue Tank is Filling	Boolean	0	1	5	
23	Blue Tank Stand Level ☆ (0-Unknown, 1-Low, 2-Middle, 3-High)	Boolean	0	3	6	
24		Boolean			7	
25	System is Recirculating	Boolean	0	1	0	3
26	Voltex Motor is Running	Boolean	0	1	1	
27	EVR Dispense is Waiting for Voltex Motor to Reach Speed	Boolean	0	1	2	
28	Voltex Motor is at Target Speed	Boolean	0	1	3	
29	Voltex Air Injection Valve Opened	Boolean	0	1	4	
30	Reserved Bit1	Boolean	-	-	5	
31	Reserved Bit 2	Boolean	-	-	6	
32	Reserved Bit 3	Boolean	-	-	7	
33	Reserved Word 1	uint16	-	-	0-14	4-5
34	Reserved Word 2	uint16	-	-	0-14	6-7
35	Red Pump Outlet Pressure (XXXX.XX bar)	uint16	0.0	275.79	0-14	8-9
36	Blue Pump Outlet Pressure (XXXX.XX bar)	uint16	0.0	275.79	0-14	10-11
37	Red Pump Inlet Pressure (XXXX.XX bar)	uint16	0.0	275.79	0-14	12-13
38	Blue Pump Inlet Pressure (XXXX.XX bar)	uint16	0.0	275.79	0-14	14-15
39	Combined Pump Flowrate Rate (XXXX.XX cc/sec)	uint16	0.00	69.33	0-14	16-17
40	Current Active Recipe	uint16	0	50	0-14	18-19
41	System Ratio (X.XX : 1.00)	uint16	1.00	5.00	0-14	20-21

EVR Fieldbus Map 19C930						
Automation Inputs (signal from EVR to PLC)						
Tag ID	**Description**	**Data Type**	**Minimum Value**	**Maximum Value**	**Bit**	**Byte**
42	System Ratio Offset (-/+ X.XX)	sint16	0.00	0.25	0-14	22-23
43	Active Recipe Flowrate (XXXX.XX cc/sec)	uint16	0	69.33	0-14	24-25
44	Active Recipe Shot Size (XXXX.XX cc)	uint16	0	327.68	0-14	26-27
45	Active Recipe Type (0 = Shot, 1 = operator)	uint16	0	3	0-14	28-29
46	Active Recipe Shot Calibration (-/+ XXXX.XX cc)	sint16	-99.99	99.99	0-14	30-31
47	Recipe Time Remaining (XX.Xsec)	uint16	0.0	3276.0	0-14	32-33
48	Selected Data Exchange Element	uint16	0	32,767	0-14	34-35
49	Selected Data Exchange Element Value	sint32	See the data exchange for Min and Max Values		0-31	36-39
50	Recipe Requested Shot Amount (XXXX.XXcc)	uint32	0.00	9,999.00	0-31	40-43
51	Recipe Actual Amount (XXXX.XXcc)	uint32	0.00	21,474,836 .00	0-31	44-47

NOTES:

The data outlined in red is required to create a recipe.

△ *Red Tank Stand Level Least Significant Bit (LSB) is bit 3 of byte 2 and the Most Significant Bit (MSB) is bit 4 of byte 2.*

☆ *Blue Tank Stand Level Least Significant Bit (LSB) is bit 3 of byte 2 and the Most Significant Bit (MSB) is bit 4 of byte 2.*

PLC Outputs

EVR Fieldbus Map 19C930						
Automation Outputs (signal from PLC to EVR)						
Tag ID	**Description**	**Data Type**	**Minimum Value**	**Maximum Value**	**Bit**	**Byte**
1	System Enable Request	Boolean	0	1	0	0
2	PLC Lockout Request *	Boolean	0	1	1	
3	Operator Dispense/ Shot Request (Use discrete signal for proper timing)	Boolean	0	1	2	
4	Cancel Shot	Boolean	0	1	3	
5	Purge Request	Boolean	0	1	4	
6	Base Purge Request	Boolean	0	1	5	
7	Depressurization Request	Boolean	0	1	6	
8	Park Request	Boolean	0	1	7	
9	Acknowledge All Errors Request	Boolean	0	1	0	1
10	Gateway Recipe Lockout Request	Boolean	0	1	1	
11	Cancel Gel Shot	Boolean	0	1	2	
12	Red Tank Stand Fill Request	Boolean	0	1	3	
13	Blue Tank Stand Fill Request	Boolean	0	1	4	
14	Recirculation Request	Boolean	0	1	5	
15	Voltex Motor On Request	Boolean	0	1	6	
16	Voltex Air Injection Request	Boolean	0	1	7	
17	Reserved Word 1	uint16	-	-	0-14	2-3
18	Reserved Word 2	uint16	-	-	0-14	4-5
21	Desired Recipe	uint16	1	50	0-14	6-7
19	Desired System Ratio (X.XX : 1.00)	uint16	1.00	5.00	0-14	8-9
20	Desired System Ratio Offset (-/+ X.XX)	sint16	0.00	0.25	0-14	10-11
22	Gateway Recipe Flowrate (XXXX.XX cc/sec)	uint16	0	69.33	0-14	12-13

EVR Fieldbus Map 19C930						
Automation Outputs (signal from PLC to EVR)						
Tag ID	**Description**	**Data Type**	**Minimum Value**	**Maximum Value**	**Bit**	**Byte**
23	Gateway Recipe Shot Size (XXXX.XX cc)	uint16	0	327.68	0-14	14-15
24	Gateway Recipe Type (0 = Shot, 1 = operator)	uint16	0	3	0-14	16-17
25	Desired Data Exchange Element	uint16	0	32,767	0-14	18-19
26	Desired Data Exchange Element Value	sint32	See the data exchange for Min and Max Values		0-31	20-24

NOTES:

* *If set, control of the EVR from the ADM will be disabled.*

When in operator mode for recipe, the bit must be held high, if dropped low the operator mode will be completed, dispensing will stop and the dispense will be recorded into the shot log.

When in the shot (cc mode) for recipe, a toggle of the button to start the dispense is needed. The shot can be canceled at any time by using the Stop Recipe Request

The data outlined in red is required to create a recipe.

Data Exchange

NOTE: For EVR Data Exchange timing diagrams, see FIG. 26 page 66.

EVR Fieldbus Map 19C930					
Data Exchange					
Command Value (base 10 decimal)	**Name**	**Format and Units**	**Read/Write**	**Minimum Value**	**Maximum Value**
1	Red MCM Active Alarms bitfield	bitfield	Read Only	0	4,294,967,296
2	Red MCM Active Deviations bit-field	bitfield	Read Only	0	4,294,967,296
3	Red MCM Active Advisories	bitfield	Read Only	0	4,294,967,296
4	Blue MCM Active Alarms bitfield	bitfield	Read Only	0	4,294,967,296
5	Blue MCM Active Deviations bit-field	bitfield	Read Only	0	4,294,967,296
6	Blue MCM Active Advisories	bitfield	Read Only	0	4,294,967,296
7	Pump Size A	XXXX.XX cc	Read/Write	1.00	160.00
8	Pump Size B	XXXX.XX cc	Read/Write	1.00	160.00
9	Purge and Base Purge Flow Rate	XXXX.XX cc/sec	Read/Write	0.00	69.33
10	Pressure Imbalance Alarm Enabled	Boolean	Read/Write	0	1
11	Pressure Imbalance Alarm Level	XXXX.XX bar	Read/Write	0.00	275.79
12	Red Pump Current Cycles❖	XXXX cycles	Read/Write	0	2,147,483,647
13	Blue Pump Current Cycles❖	XXXX cycles	Read/Write	0	2,147,483,647
14	Dispense Valve is Opened Cycles❖	XXXX cycles	Read/Write	0	2,147,483,647
15	Red Pump Life Time Cycles	XXXX cycles	Read Only	0	2,147,483,647
16	Blue Pump Life Time Cycles	XXXX cycles	Read Only	0	2,147,483,647
17	Dispense Valve is Opened Life Time Cycles	XXXX cycles	Read Only	0	2,147,483,647
18	Red Pump Limit Cycles	XXXX cycles	Read/Write	0	2,147,483,647
19	Blue Pump Limit Cycles	XXXX cycles	Read/Write	0	2,147,483,647
20	Dispense Valve is Opened Limit Cycles	XXXX cycles	Read/Write	0	2,147,483,647
21	Recipe Look Up Number	Recipe XX	Read/Write	0	50
22	Recipe Look Up Shot Size	XXXX.XX cc	Read Only	0.00	327.68
23	Recipe Look Up Type	0 - Shot 1 - Operator	Read Only	0	3

EVR Fieldbus Map 19C930					
Data Exchange					
Command Value (base 10 decimal)	**Name**	**Format and Units**	**Read/Write**	**Minimum Value**	**Maximum Value**
24	Recipe Look Up Flowrate	XXXX.XX cc/sec	Read Only	0.00	69.33
25	Recipe Look Up Calibration	X.XX	Read Only	-5.000	5.000
26	Gel Timer Enabled	Boolean	Read/Write	0	1
27	Gel Timer Idle Period	XXXX seconds	Read/Write	0	9999
28	Gel Timer Alarm	XXXX seconds	Read/Write	0	9999
29	Gel Timer Amount	XXXX cc	Read/Write	0	9999
30	Gel Timer Flow Rate	XXXX.XX cc/sec	Read/Write	0	69.33
31	Gel Timer Remaining Time	XXXX seconds	Read Only	0	9999
32	System Ratio Direction	0-Red (A):1 1-Blue (B):1	Read/Write	0	1
33	System Valve Type	0-MD2 1-TC 2-Voltex (Read Only)	Read/Write	0	2
34	System based Purge Side	0-Red (A) 1-Blue (B)	Read/Write	0	1
35	Red Tank Stand Active Alarms Bitfield	Bitfield	Read Only	0	4, 294,967,296
36	Red Tank Stand Active Deviations Bitfield	Bitfield	Read Only	0	4, 294,967,296
37	Red Tank Stand Active Advisories Bitfield	Bitfield	Read Only	0	4, 294,967,296
38	Red Tank Stand Refill Setting	0-Disable 1-Monitor Only	Read/Write	0	3
39	Red Tank Stand Refill Timeout	Minutes	Read/Write	0	99
40	Red Tank Sensor Configuration	1-Low and High Sensor Installed 2-Low and Mid Sensor Installed 3-Mid and High Sensor Installed 4-Low, Mid, and High Sensor Installed	Read/Write	1	4

EVR Fieldbus Map 19C930					
Data Exchange					
Command Value (base 10 decimal)	**Name**	**Format and Units**	**Read/Write**	**Minimum Value**	**Maximum Value**
41	Blue Tank Stand Active Alarms Bitfield	Bitfield	Read Only	0	4, 294,967,296
42	Blue Tank Stand Active Deviations Bitfield	Bitfield	Read Only	0	4, 294,967,296
43	Blue Tank Stand Active Advisories Bitfield	Bitfield	Read Only	0	4, 294,967,296
44	Blue Tank Stand Refill Timeout	0-Disable 1-Monitor Only 2- manual Fill	Read/Write	0	3
45	Blue Tank Stand Refill Timeout	Minutes	Read/Write	0	99
46	Blue Tank Sensor Configuration	1-Low and High Sensor Installed 2-Low and Mid Sensor Installed 3-Mid and High Sensor Installed 4-Low, Mid, and High Sensor Installed	Read/Write	1	4
47	Recirculation Mode	0-Disable 1-Manual 2-Timer	Read/Write	0	2
48	Recirculation Flow rate	XXXX.XX cc/sec	Read/Write	0	69.33
49	Recirculation Timer on Time	Minutes	Read/Write	0	420
50	Recirculation Timer off Time	Minutes	Read/Write	0	420
51	Recirculation Timer Remaining	sec	Read Only	0	25,200
52	Park Using Recirculation valves Enable	0-Disable 1-Enabled	Read/Write	0	1
53	Park After Recirculation is Completed Enable	0-Disable 1-Enabled	Read/Write	0	1
54	Voltex Active Alarms Bitfield	Bitfield	Read Only	0	4, 294,967,296
55	Voltex Active Deviations Bitfield	Bitfield	Read Only	0	4, 294,967,296
56	Voltex Active Advisories Bitfield	Bitfield	Read Only	0	4, 294,967,296
57	Voltex Motor Target Speed	XXXX rpm	Read/Write	0	4400
58	Voltex Motor Ramp Up Time	XXXX ms	Read/Write	0	9000

EVR Fieldbus Map 19C930					
Data Exchange					
Command Value (base 10 decimal)	**Name**	**Format and Units**	**Read/Write**	**Minimum Value**	**Maximum Value**
59	Voltex EVR Dispense Wait Enabled	0-Disable 1-Enabled	Read/Write	0	1
60	Voltex Air Nucleation Enable	0-Disable 1-Enabled	Read/Write	0	1
61	Voltex Air Nucleation Delay Time	XXXX ms	Read/Write	0	2000
62	Voltex Air Nucleation On Time	XXXX ms	Read/Write	0	9000
63	Voltex Actual Motor Speed	XXXX ms	Read/Write	0	9000
64	Voltex Actual Motor Speed	XXXX.XX rpm	Read Only	0	4400.0
65	Voltex Red Valve Pressure	XXXX.XX bar	Read Only	0	300.0
66	Voltex Blue Valve Pressure	XXXX.XX bar	Read Only	0	300.0
67	Voltex Motor Spinning Disable for Dispensing	0-Off 1-On	Read/Write	0	1
68	Voltex Air Nucleation Disable for Dispensing	0-Off 1-On	Read/Write	0	1
69	Recirculation Pump Method Selected	0- Both 1 - Red (A) 2 - Blue (B)	Read/Write	0	2
70	Recirculation Valve Control	0-Automatic 1-Manual	Read/Write	0	1
71	Synchronous Changeovers	0 - Disabled 1 - Enabled	Read/Write	0	1

NOTES:

❖ *Send a “1” to reset the counters to zero.*

Sending a command value of “0” will return the maximum value (0xFFFFFFFF).

GM General Timing Diagrams

NOTE: A 50ms delay is suggested between each CGM signal.

NOTE: When dispensing a bead, it is recommend that the discrete trigger signal be used instead of the fieldbus trigger signal, due to the fact of timing issues and delays.

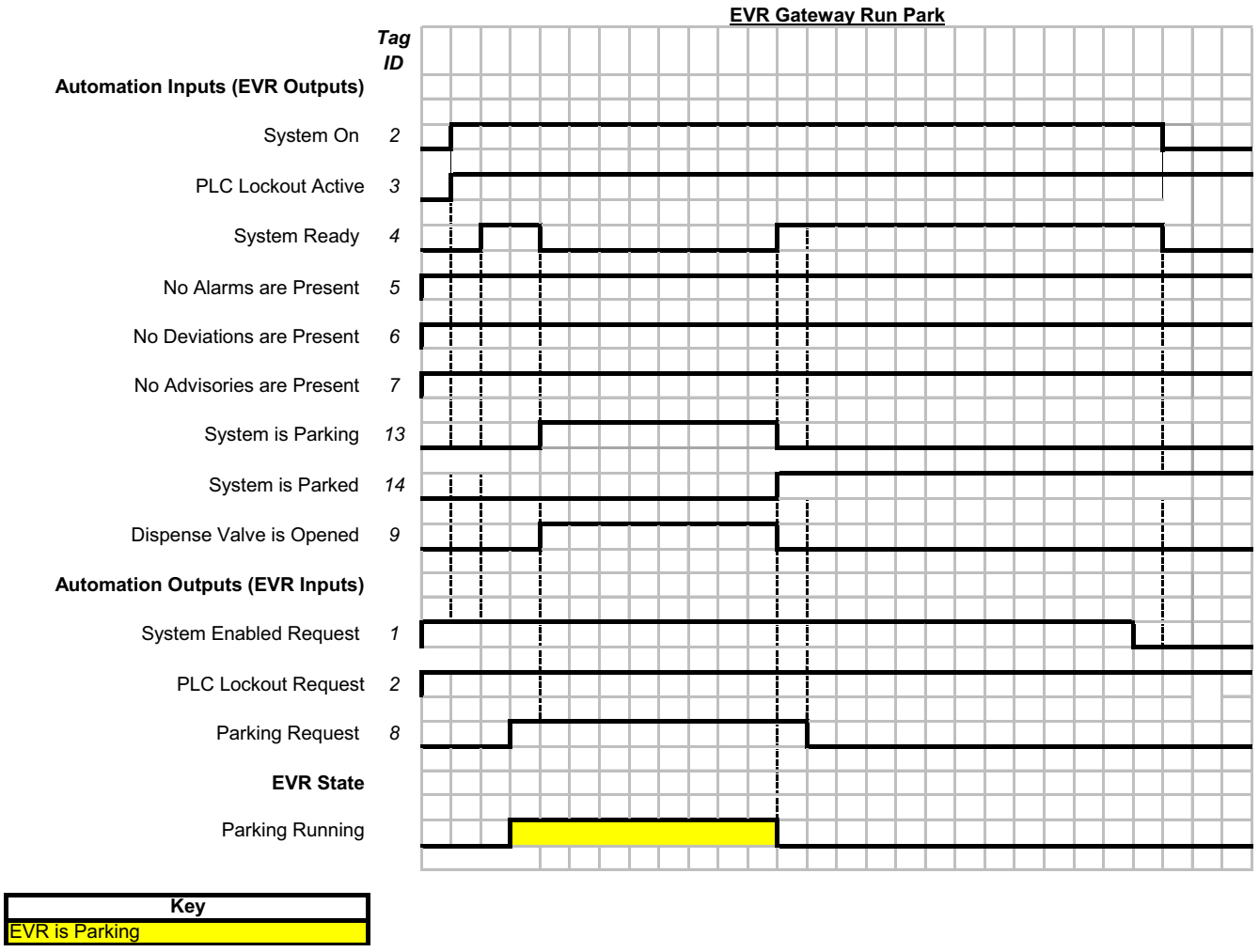


FIG. 17:

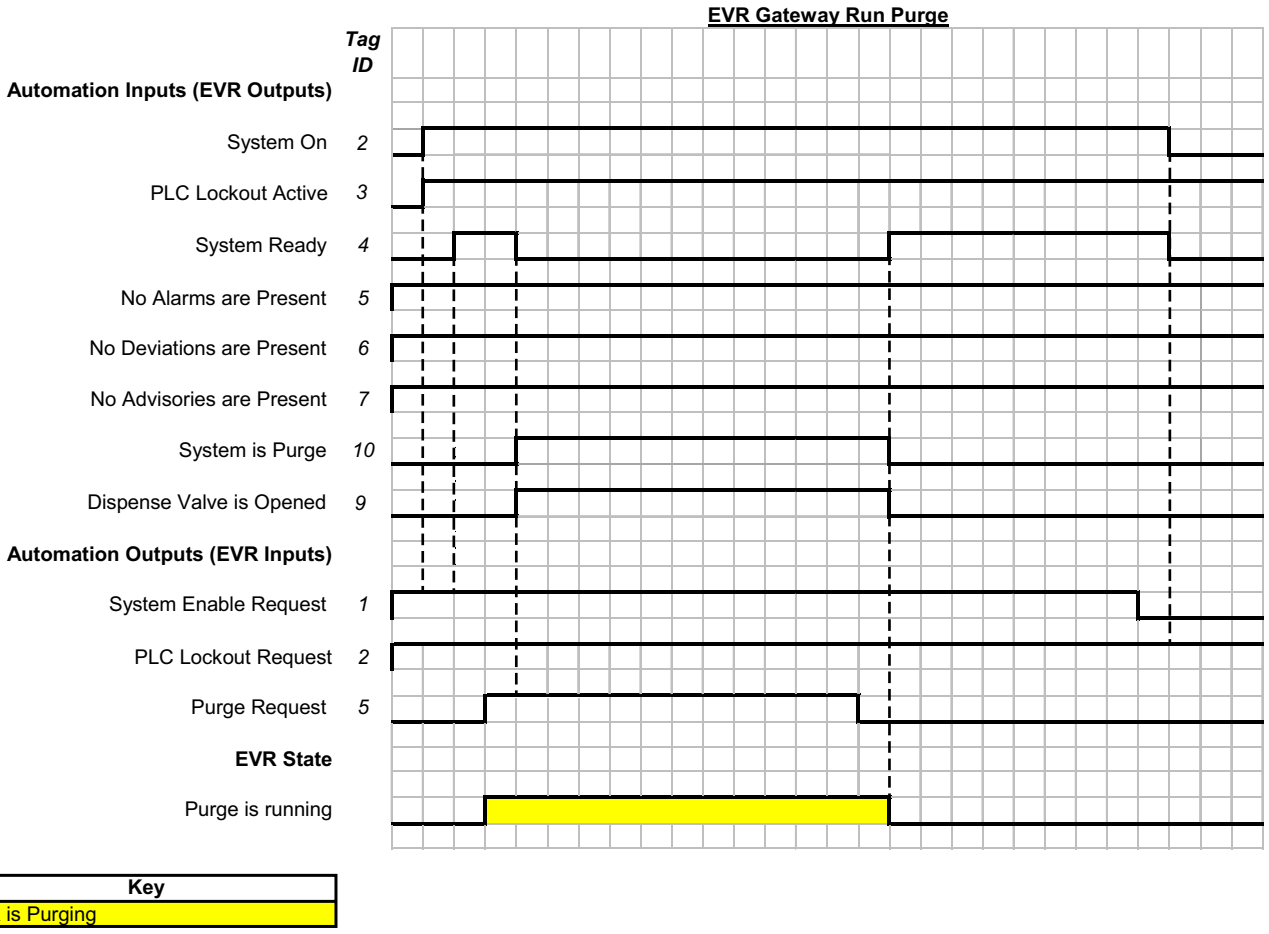

EVR Gateway Run Purge
Tag ID
Automation Inputs (EVR Outputs)
System On 2
PLC Lockout Active 3
System Ready 4
No Alarms are Present 5
No Deviations are Present 6
No Advisories are Present 7
System is Purge 10
Dispense Valve is Opened 9
Automation Outputs (EVR Inputs)
System Enable Request 1
PLC Lockout Request 2
Purge Request 5
EVR State
Purge is running
Key
EVR is Purging

FIG. 18:

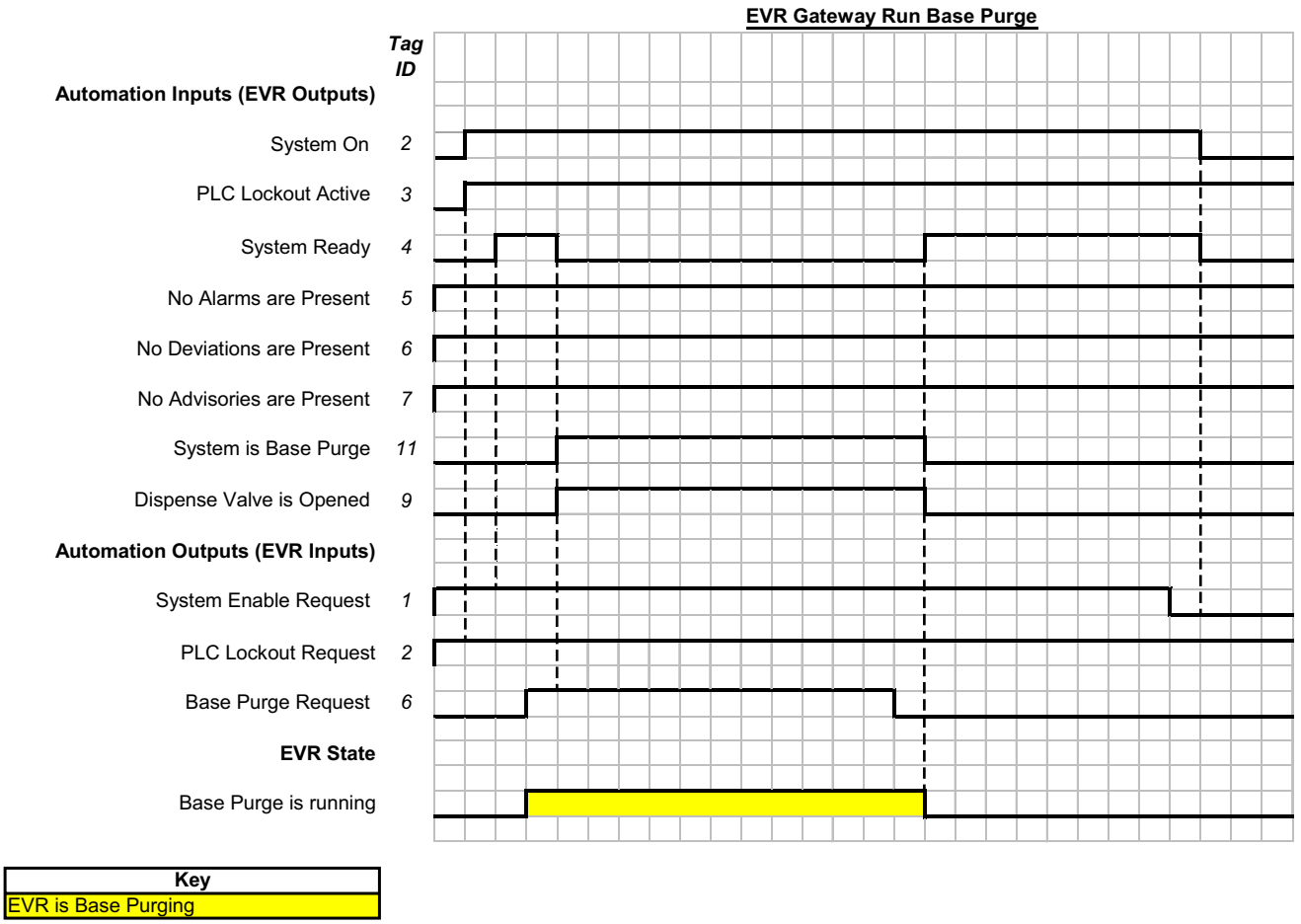

EVR Gateway Run Base Purge
Tag ID
Automation Inputs (EVR Outputs)
System On 2
PLC Lockout Active 3
System Ready 4
No Alarms are Present 5
No Deviations are Present 6
No Advisories are Present 7
System is Base Purge 11
Dispense Valve is Opened 9
Automation Outputs (EVR Inputs)
System Enable Request 1
PLC Lockout Request 2
Base Purge Request 6
EVR State
Base Purge is running
Key
EVR is Base Purging

FIG. 19:

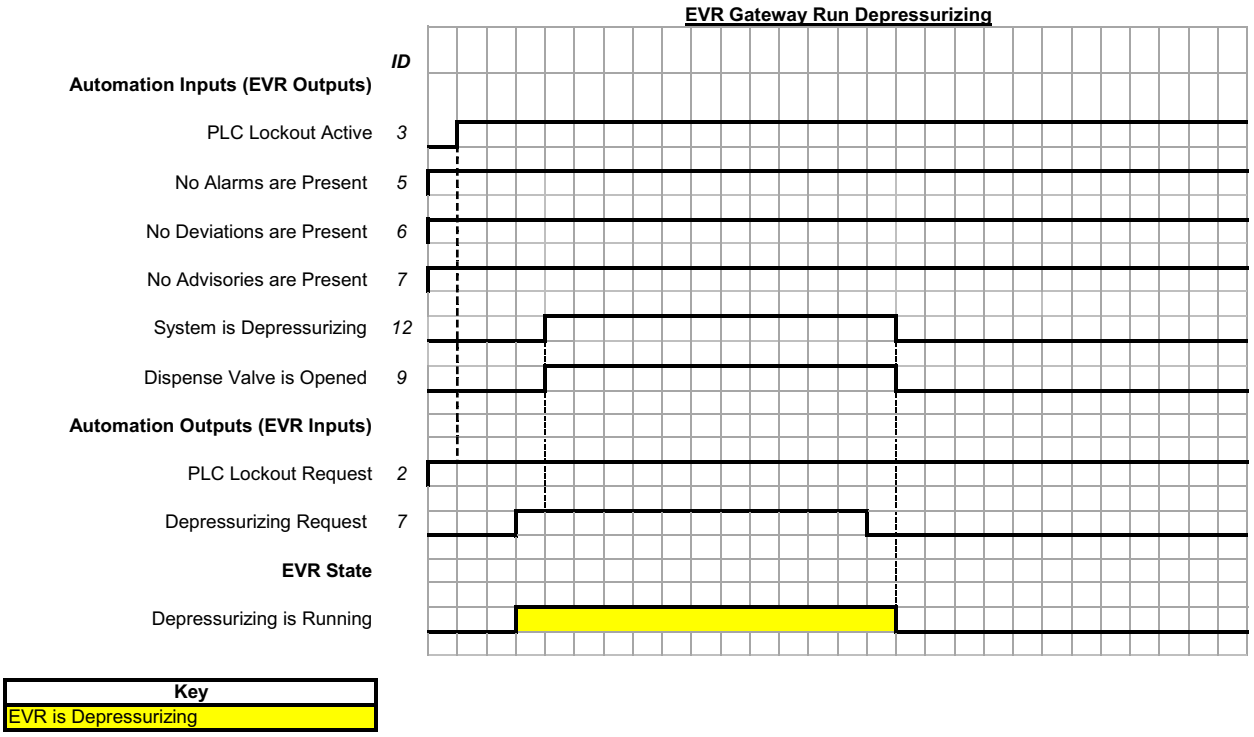

EVR Gateway Run Depressurizing
ID
Automation Inputs (EVR Outputs)
PLC Lockout Active 3
No Alarms are Present 5
No Deviations are Present 6
No Advisories are Present 7
System is Depressurizing 12
Dispense Valve is Opened 9
Automation Outputs (EVR Inputs)
PLC Lockout Request 2
Depressurizing Request 7
EVR State
Depressurizing is Running
Key
EVR is Depressurizing

FIG. 20:

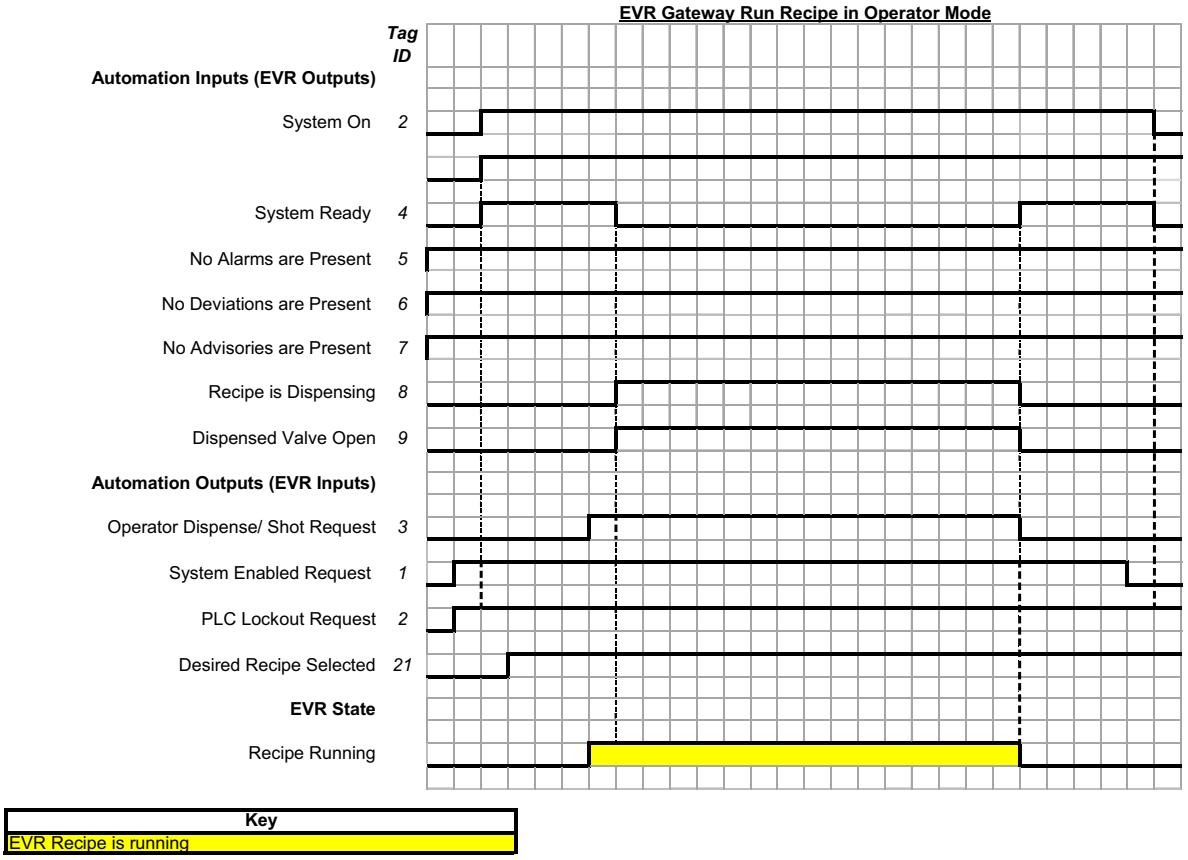

EVR Gateway Run Recipe in Operator Mode
Tag ID
Automation Inputs (EVR Outputs)
System On 2
System Ready 4
No Alarms are Present 5
No Deviations are Present 6
No Advisories are Present 7
Recipe is Dispensing 8
Dispensed Valve Open 9
Automation Outputs (EVR Inputs)
Operator Dispense/ Shot Request 3
System Enabled Request 1
PLC Lockout Request 2
Desired Recipe Selected 21
EVR State
Recipe Running
Key
EVR Recipe is running

FIG. 21:

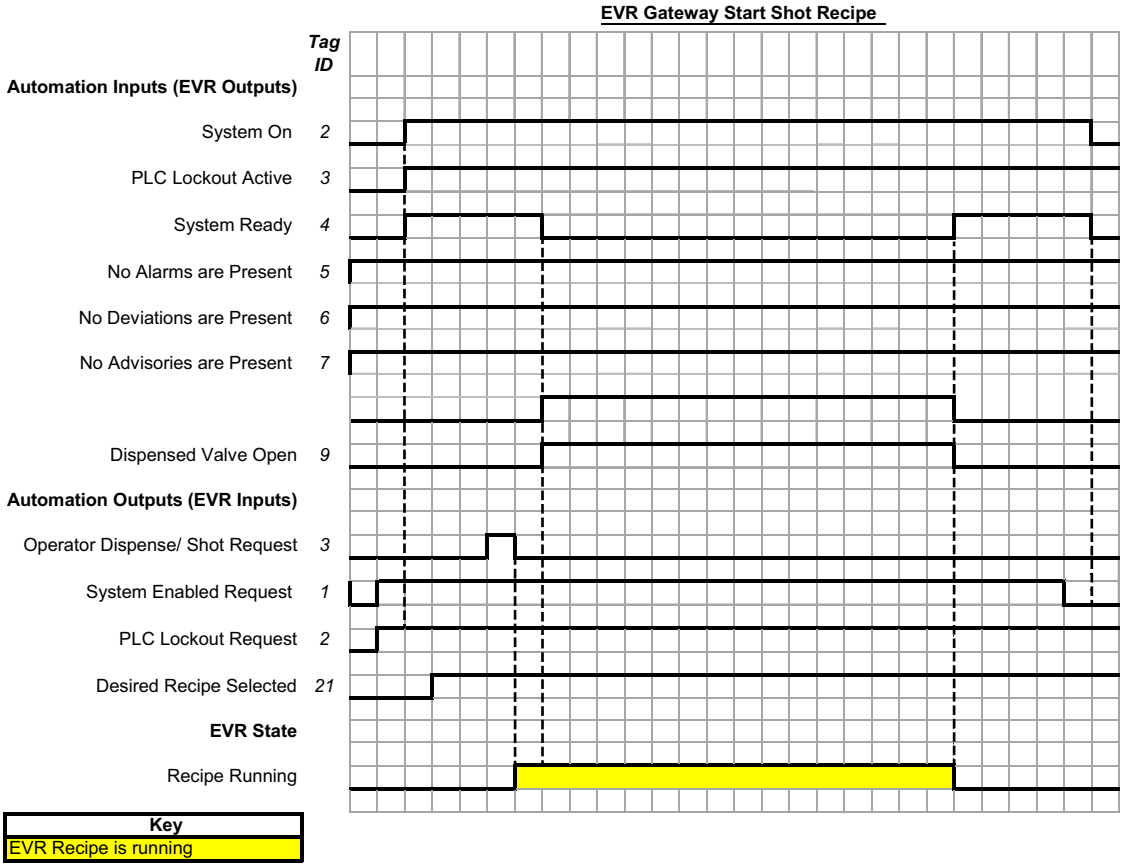

EVR Gateway Start Shot Recipe
Tag ID
Automation Inputs (EVR Outputs)
System On 2
PLC Lockout Active 3
System Ready 4
No Alarms are Present 5
No Deviations are Present 6
No Advisories are Present 7
Dispensed Valve Open 9
Automation Outputs (EVR Inputs)
Operator Dispense/ Shot Request 3
System Enabled Request 1
PLC Lockout Request 2
Desired Recipe Selected 21
EVR State
Recipe Running
Key
EVR Recipe is running

FIG. 22:

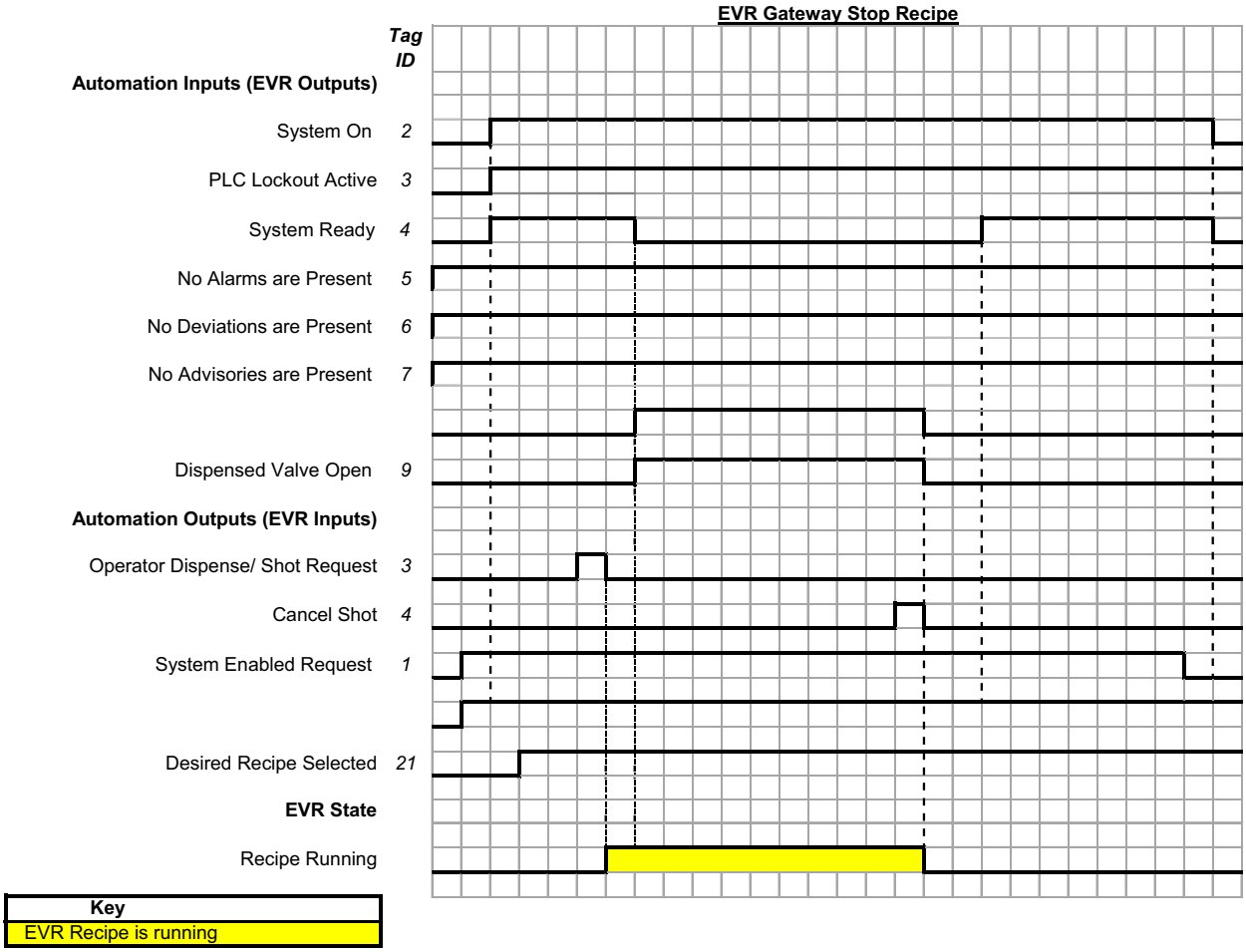

EVR Gateway Stop Recipe
Tag ID
Automation Inputs (EVR Outputs)
System On 2
PLC Lockout Active 3
System Ready 4
No Alarms are Present 5
No Deviations are Present 6
No Advisories are Present 7
Dispensed Valve Open 9
Automation Outputs (EVR Inputs)
Operator Dispense/ Shot Request 3
Cancel Shot 4
System Enabled Request 1
Desired Recipe Selected 21
EVR State
Recipe Running
Key
EVR Recipe is running

FIG. 23:

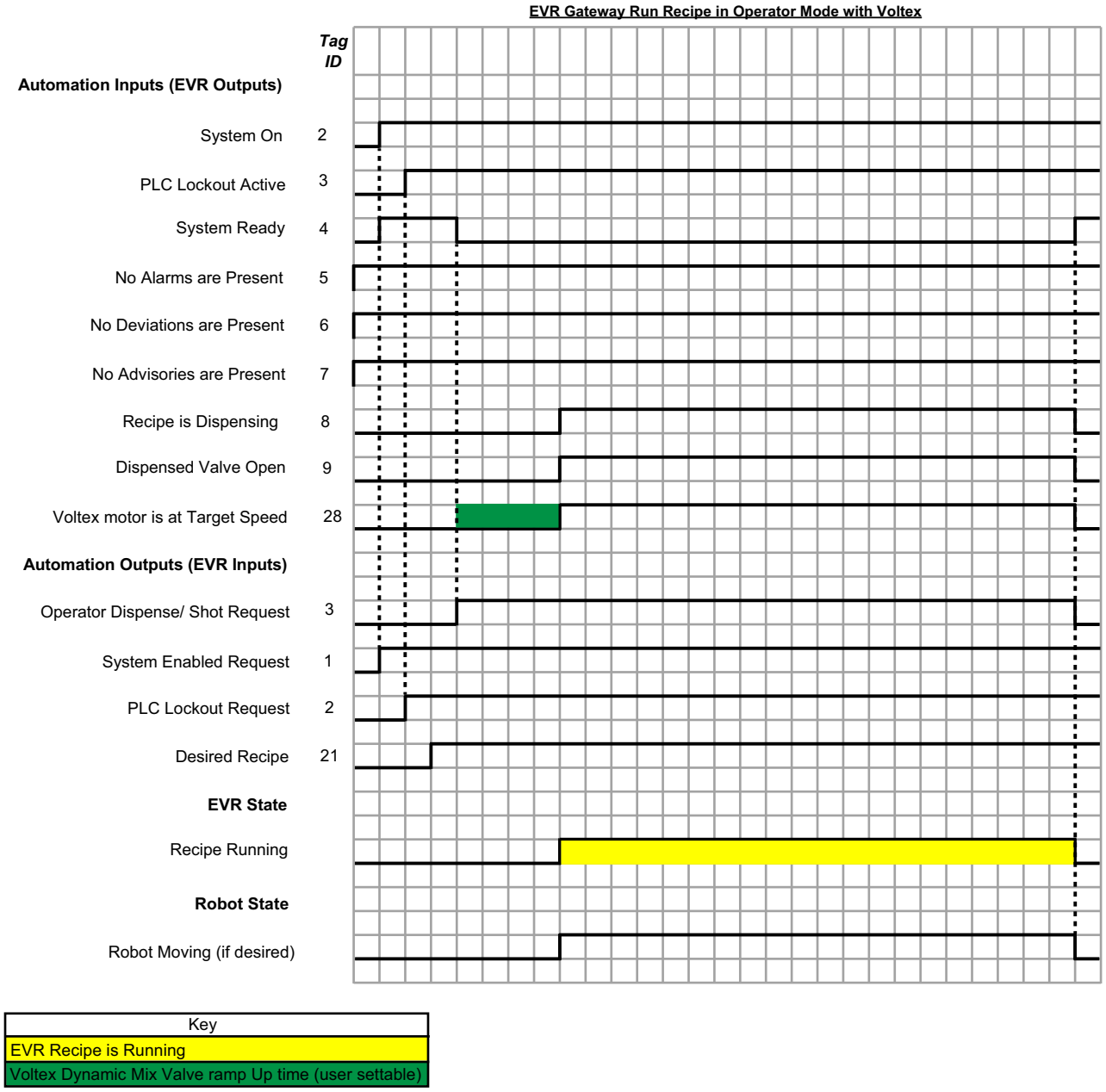

EVR Gateway Run Recipe in Operator Mode with Voltex
Tag ID
Automation Inputs (EVR Outputs)
System On 2
PLC Lockout Active 3
System Ready 4
No Alarms are Present 5
No Deviations are Present 6
No Advisories are Present 7
Recipe is Dispensing 8
Dispensed Valve Open 9
Voltex motor is at Target Speed 28
Automation Outputs (EVR Inputs)
Operator Dispense/ Shot Request 3
System Enabled Request 1
PLC Lockout Request 2
Desired Recipe 21
EVR State
Recipe Running
Robot State
Robot Moving (if desired)
Key
EVR Recipe is Running
Voltex Dynamic Mix Valve ramp Up time (user settable)

FIG. 24:

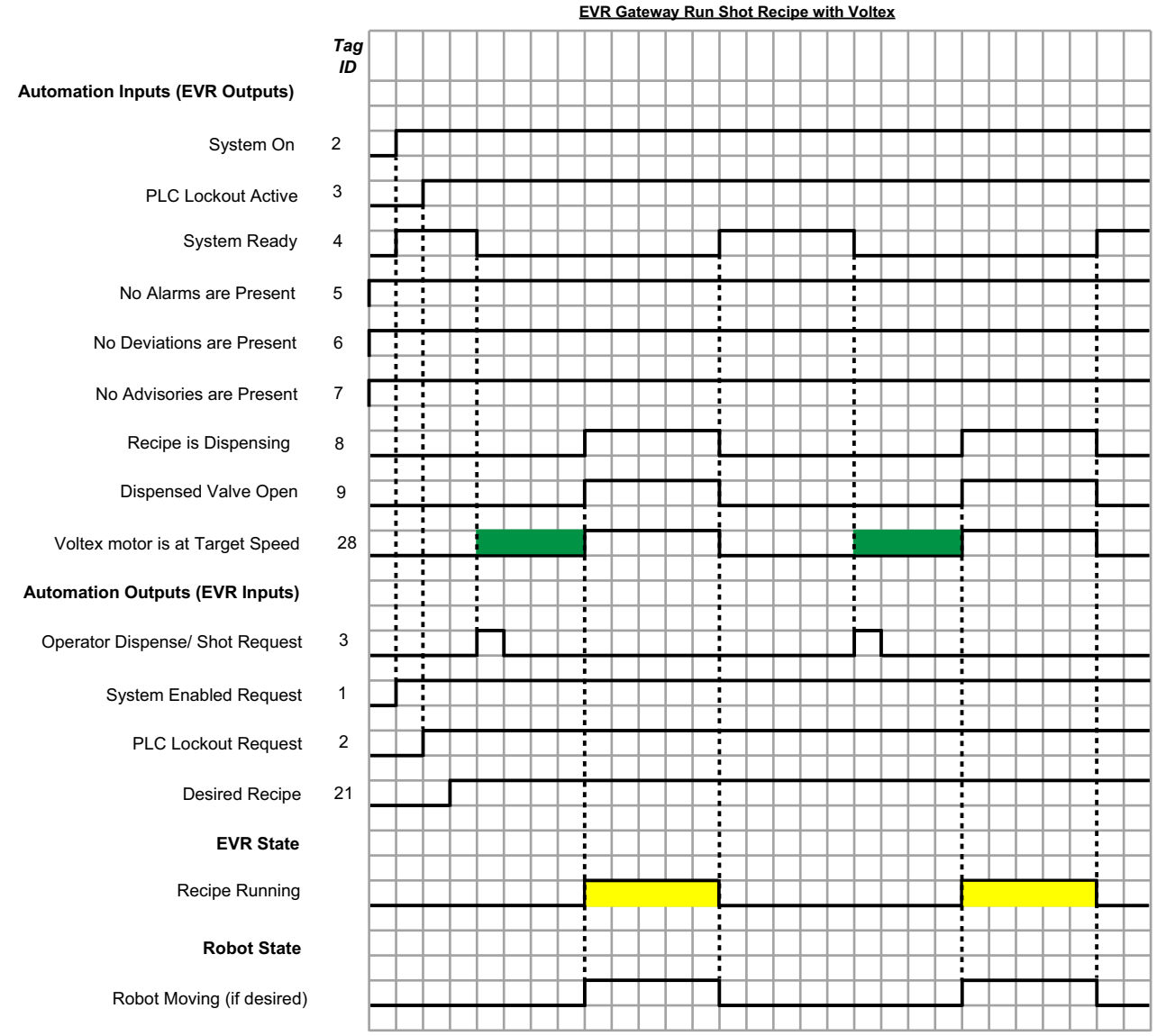
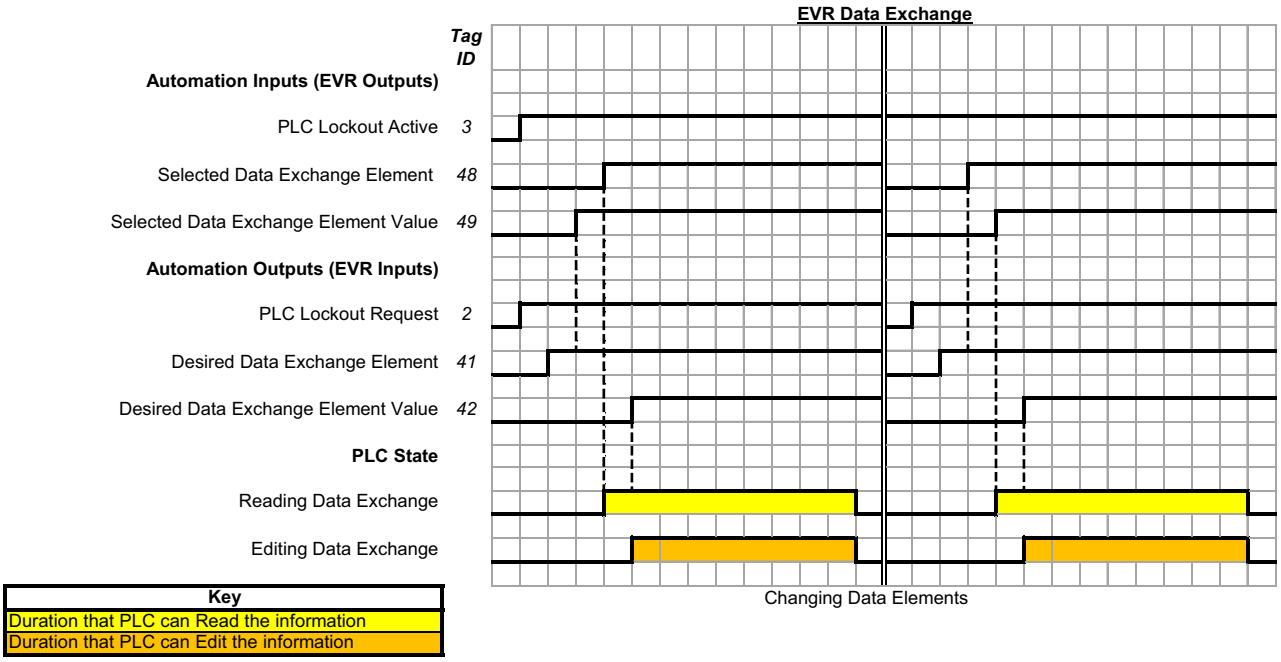

EVR Gateway Run Shot Recipe with Voltex
Tag ID
Automation Inputs (EVR Outputs)
System On 2
PLC Lockout Active 3
System Ready 4
No Alarms are Present 5
No Deviations are Present 6
No Advisories are Present 7
Recipe is Dispensing 8
Dispensed Valve Open 9
Voltex motor is at Target Speed 28
Automation Outputs (EVR Inputs)
Operator Dispense/ Shot Request 3
System Enabled Request 1
PLC Lockout Request 2
Desired Recipe 21
EVR State
Recipe Running
Robot State
Robot Moving (if desired)
Key
EVR Recipe is Running
Voltex Dynamic Mix Valve ramp Up time (user settable)

FIG. 25:



NOTE: PLC lockout has to be enabled to write a data exchange element value. To request a data exchange element, the PLC lockout does not have to be enabled.

FIG. 26:

Error Codes

3mcp Error Codes

Alarms Bitfield		
Bit Number	**Alarm Code**	**Alarm Name**
0	P9D_	High Pressure Outlet _
1	P6D_	Pressure Sensor Error Outlet _
2	P7D_	Pressure Imbalance High _
3	V1N_	Low Voltage Motor _
4	V4N_	High Voltage Motor _
5	T4N_	High Temperature Motor _
6	T4N_	High Temperature Motor _
7	WBN_	Encoder Error Motor
8	WMN_	Controller Fault Motor
9	WMN_	Controller Fault Motor
10	WMN_	Controller Fault Motor
11	A4N_	High Current Motor _
12	P4D_	High Pressure Outlet _
13	P1D_	Low Pressure Outlet _
14	P4F_	High Pressure Inlet _
15	P1F_	Low Pressure Inlet _
16	WSNX	Invalided Recipe
17	F4RX	Recipe Flow Exceeds Max Flow
18	F4PX	Purge Flow Exceeds Max Flow
19	F4GX	Gel Flow Exceeds Max Flow
20	F4CX	Recirculation Flow Exceeds Max Flow
na	CAM_	Comm. Error with Motor Controller

Deviation Bitfield		
Bit Number	**Deviation Code**	**Deviation Name**
0	P6F_	Pressure Sensor Error Inlet _
1	W5N_	Encoder Calibration Motor
2	P3D_	High Pressure Outlet _
3	P2D_	Low Pressure Outlet _
4	P3F_	High Pressure Inlet _
5	P2F_	Low Pressure Inlet _

Advisory Bitfield		
Bit Number	**Advisory Code**	**Advisory Name**
0	CAA_	Comm. Error Advanced Display _
1	CAP_	Comm. Error Paired Motor _
2	CAC_	Comm. Error Gateway _
3	CCC_	Comm. Error Gateway _
4	F3N_	Unable to Maintain Flow Rate _
5	MA0_	Pump Cycles Exceeds Limit _
6	MEDX	Valve Cycles Exceeds Limit
7	P9F_	High Pressure Inlet _
8	CATA	Comm. Error Red Tank
9	CATB	Comm. Error Blue Tank
10	CAFX	Comm. Error Fluid Control Module
11	CAVX	Comm. Error Voltex DMV

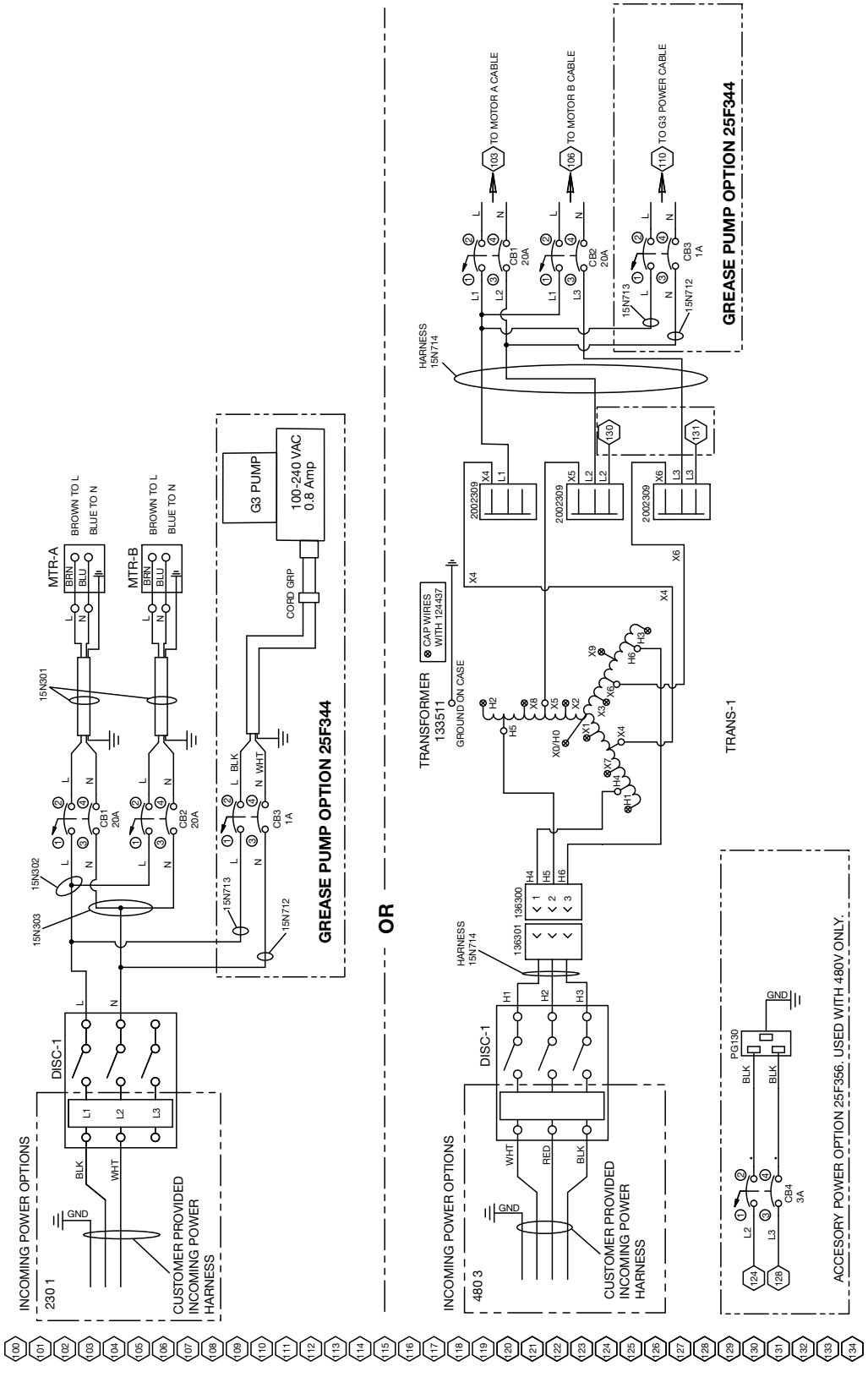
Tanks Error Codes

Deviation Bitfield		
Bit Number	**Deviation Code**	**Deviation Name**
0	L3T_	High Material Level_
1	L2T_	Low Material Level_
2	L6T_	Auto Refill Timeout_
3	L1T_	Fill Sensor Fault_

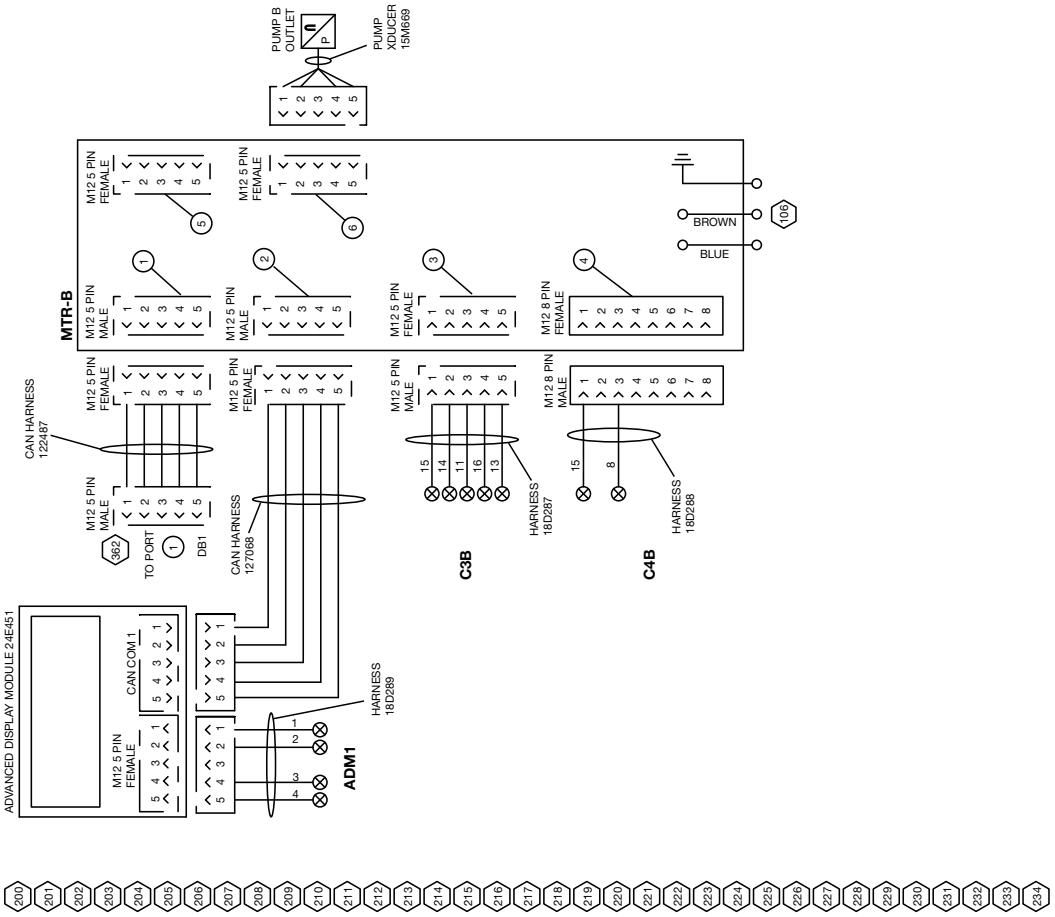
Voltex DMV Error codes

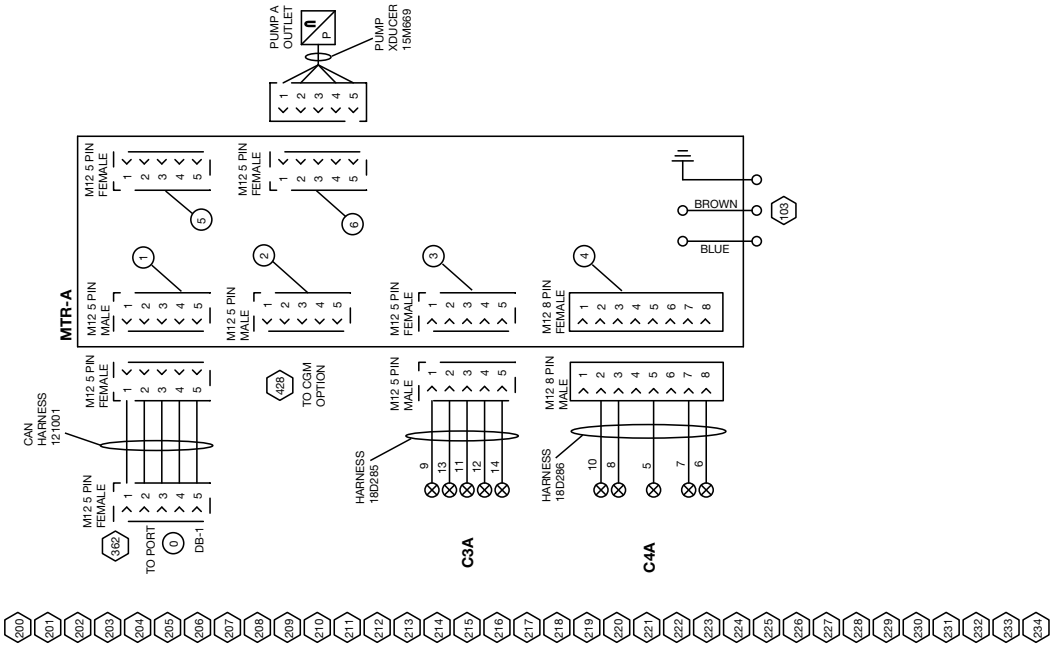
Deviation Bitfield		
Bit Number	**Deviation Code**	**Deviation Name**
0	WVCX	Motor Fault

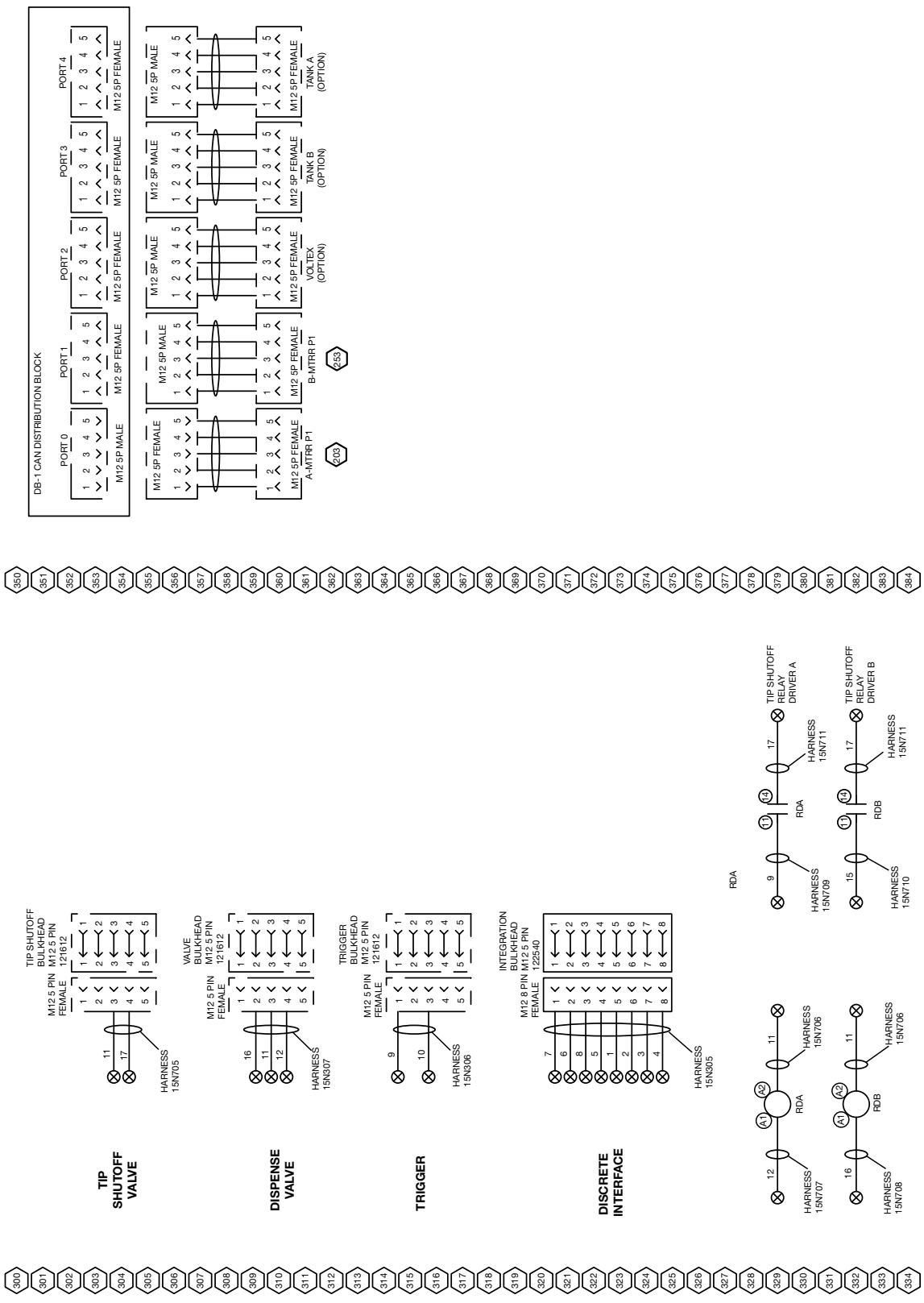
Recycling and Disposal

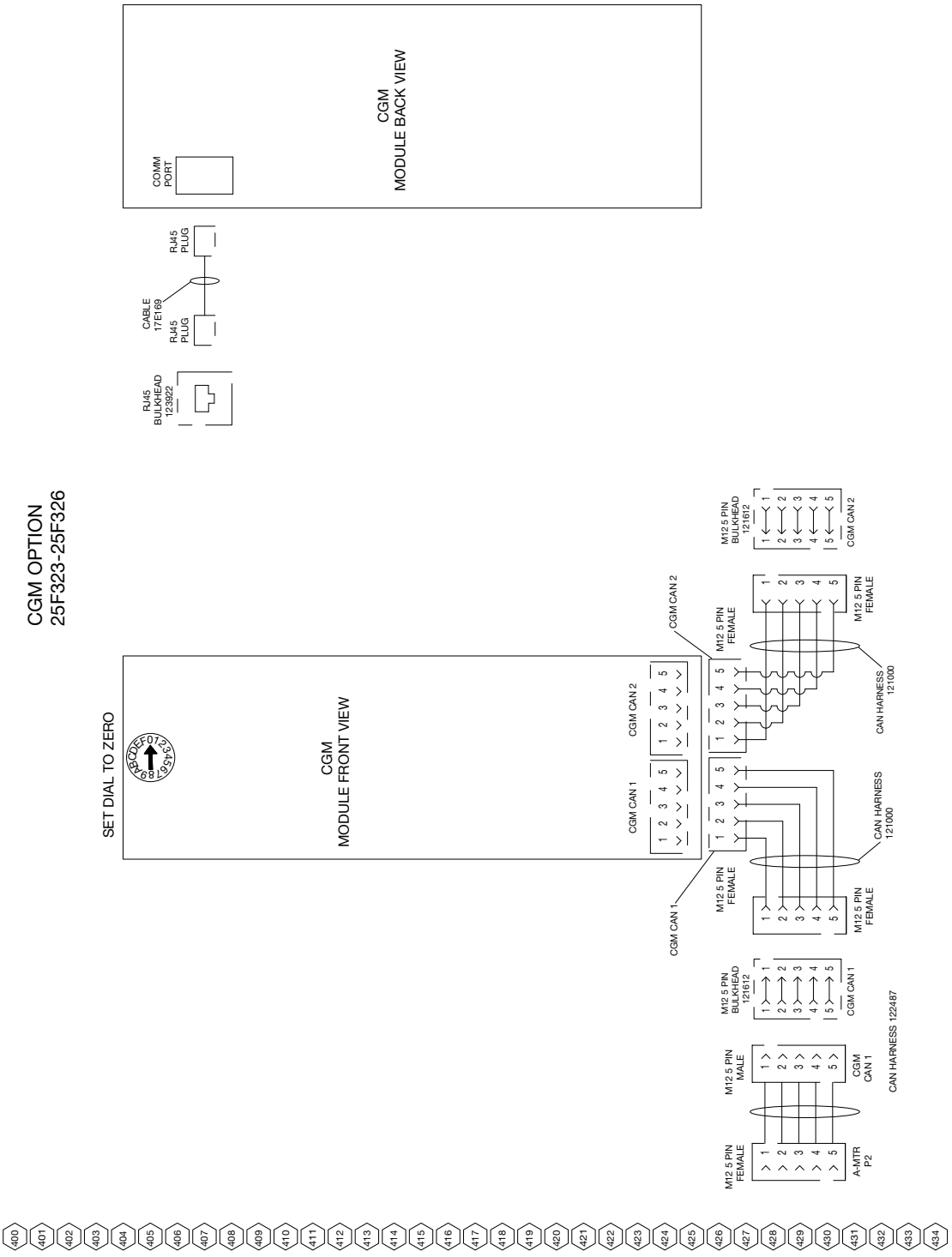


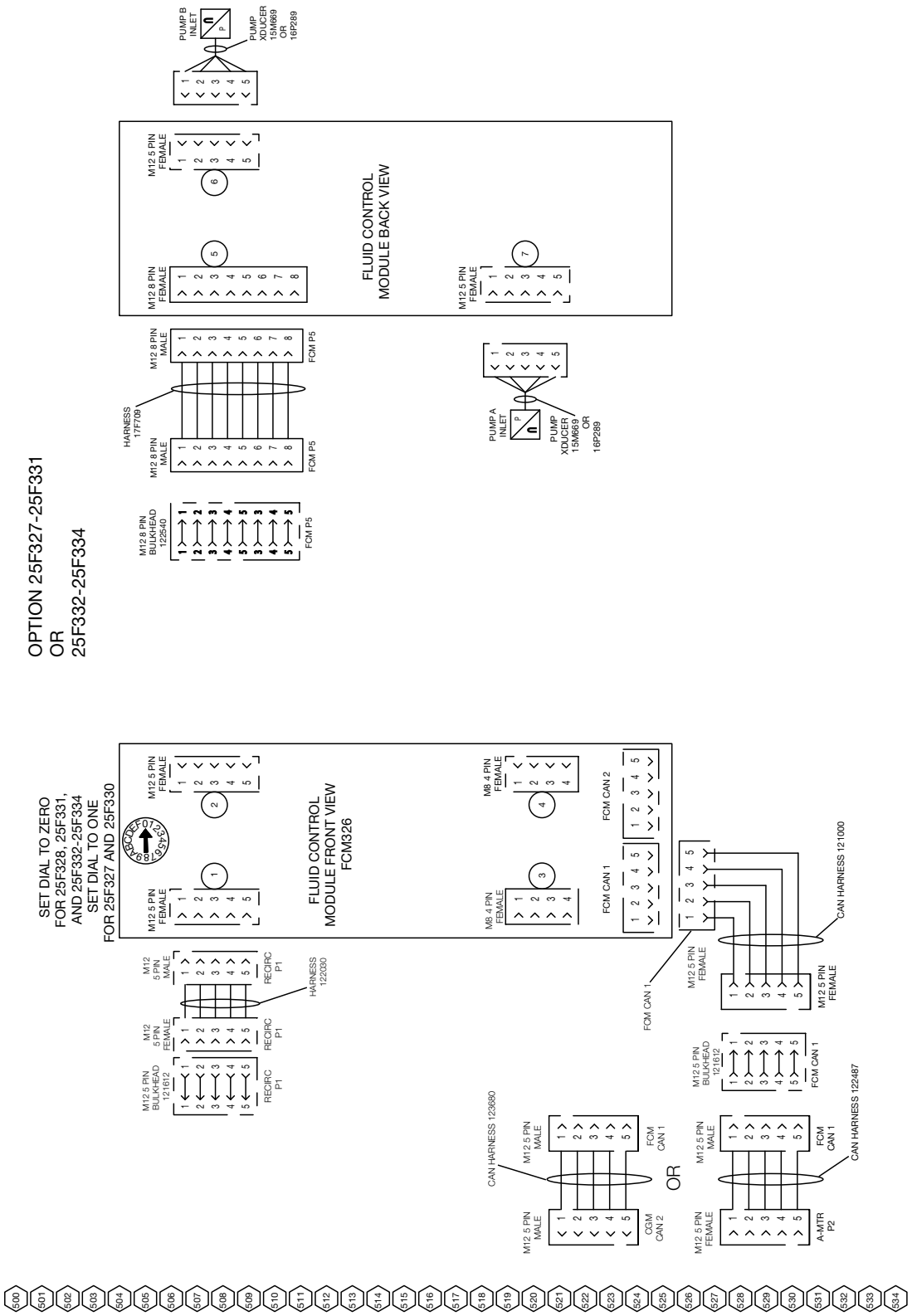
Schematics

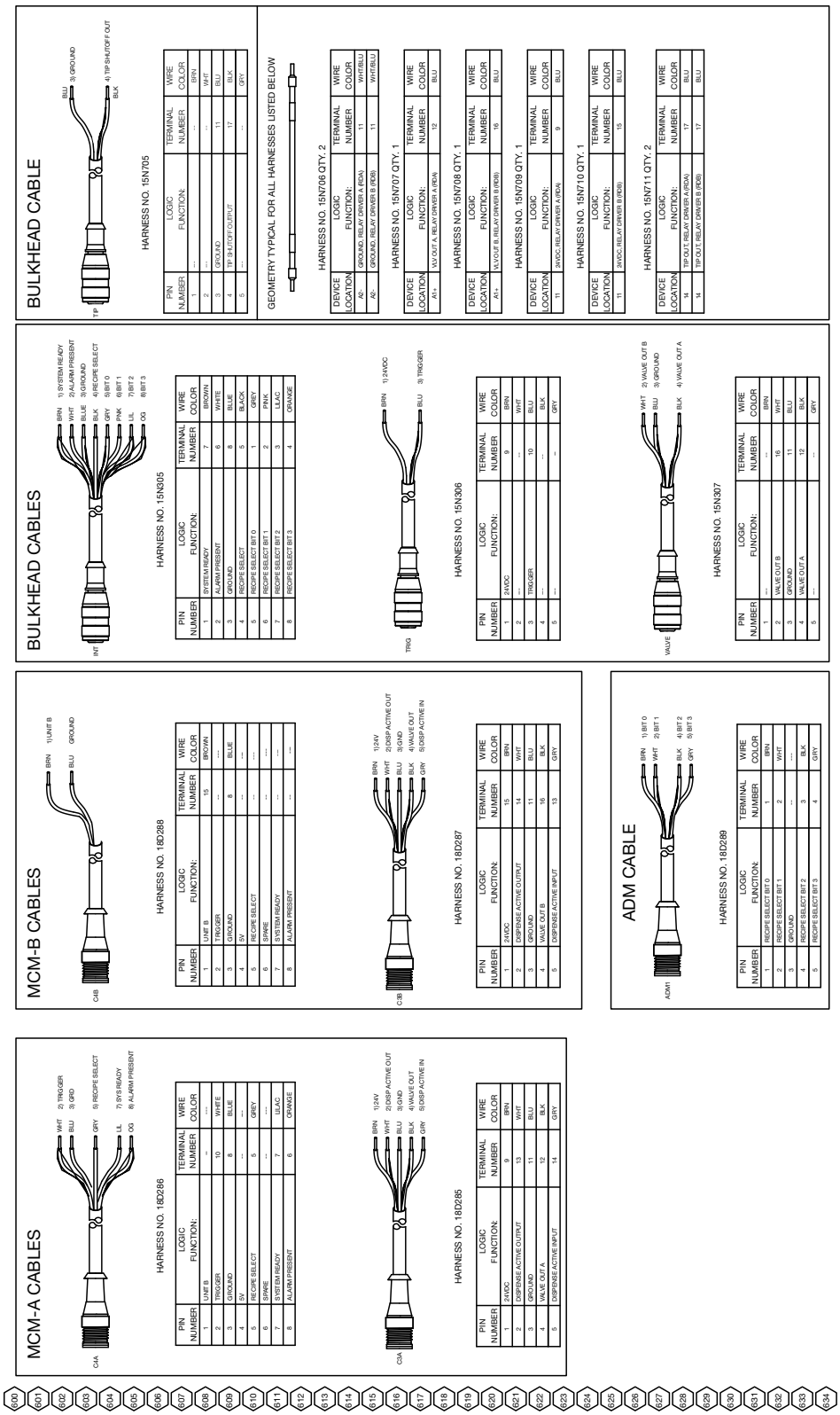

PUMP B OUTLET
PUMP XDUCER 15M669
MTR-B
M12 5 PIN FEMALE
M12 5 PIN MALE
M12 8 PIN FEMALE
BROWN
BLUE
106
CAN HARNESS 122487
362
TO PORT
DB1
CAN HARNESS 127068
ADVANCED DISPLAY MODULE 24E451
CAN COM 1
HARNESS 18D289
ADM1
C3B
C4B
HARNESS 18D287
HARNESS 18D288
200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234


PUMP A OUTLET
PUMP XDUCER 15M669
MTR-A
M12 5 PIN FEMALE
M12 5 PIN MALE
M12 8 PIN FEMALE
BROWN
BLUE
103
CAN HARNESS 121001
362
TO PORT
DB-1
428
TO CGM OPTION
HARNESS 18D285
HARNESS 18D286
C3A
C4A
200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234

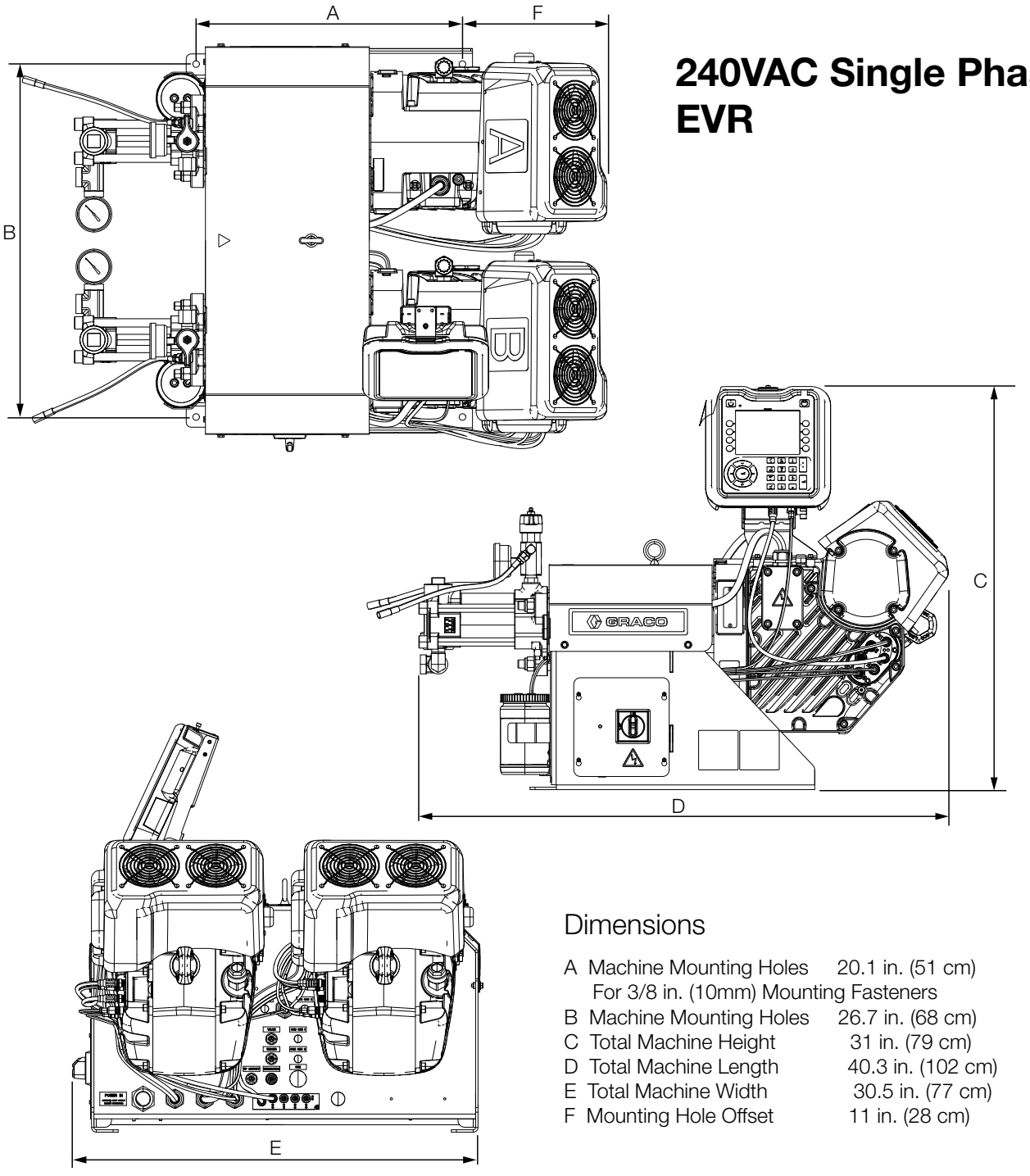

DB-1 CAN DISTRIBUTION BLOCK
PORT 0
PORT 1
PORT 2
PORT 3
PORT 4
M12 5P MALE
M12 5P FEMALE
A-MTRR P1
B-MTRR P1
VOLTEX (OPTION)
TANK B (OPTION)
TANK A (OPTION)
203
253
TIP SHUTOFF VALVE
DISPENSE VALVE
TRIGGER
DISCRETE INTERFACE
HARNESS 15N705
HARNESS 15N307
HARNESS 15N306
HARNESS 15N305
HARNESS 15N707
HARNESS 15N708
HARNESS 15N706
HARNESS 15N709
HARNESS 15N710
HARNESS 15N711
RDA
RDB
TIP SHUTOFF RELAY DRIVER A
TIP SHUTOFF RELAY DRIVER B


CGM OPTION
25F323-25F326
SET DIAL TO ZERO
CGM
MODULE FRONT VIEW
CGM
MODULE BACK VIEW
COMM
PORT
RJ45
BULKHEAD
123922
CABLE
17E169
RJ45
PLUG
RJ45
PLUG
CGM CAN 1
CGM CAN 2
M12 5 PIN
FEMALE
M12 5 PIN
BULKHEAD
121612
M12 5 PIN
MALE
CAN HARNESS
121000
CAN HARNESS 122487
A-MTR
P2
CGM
CAN 1


OPTION 25F327-25F331
OR
25F332-25F334
SET DIAL TO ZERO
FOR 25F328, 25F331,
AND 25F332-25F334
SET DIAL TO ONE
FOR 25F327 AND 25F330
FLUID CONTROL
MODULE FRONT VIEW
FCM326
FLUID CONTROL
MODULE BACK VIEW
M12 5 PIN FEMALE
M12 8 PIN FEMALE
M8 4 PIN FEMALE
M12 8 PIN MALE
M12 8 PIN BULKHEAD 122540
M12 5 PIN BULKHEAD 121612
M12 5 PIN MALE
HARNESS 177709
HARNESS 122030
FCM P5
REC/RC P1
FCM CAN 1
FCM CAN 2
PUMP A INLET
PUMP B INLET
PUMP XDUCER 15M669 OR 16P289
CAN HARNESS 123880
CAN HARNESS 121000
CAN HARNESS 122487
CCM CAN 2
A-M/TR P2
OR


MCM-A CABLES
C4A
1) 24VDC
2) TRIGGER
3) GND
5) RECIPE SELECT
7) SYS READY
8) ALARM PRESENT
HARNESS NO. 18D286
HARNESS NO. 18D285
C3A
1) 24V
2) DISP ACTIVE OUT
3) GND
4) VALVE OUT
5) DISP ACTIVE IN
MCM-B CABLES
C4B
1) UNIT B
3) GROUND
HARNESS NO. 18D288
HARNESS NO. 18D287
C3B
BULKHEAD CABLES
INT
1) SYSTEM READY
2) ALARM PRESENT
3) GROUND
4) RECIPE SELECT
5) BIT 0
6) BIT 1
7) BIT 2
8) BIT 3
HARNESS NO. 15N305
TRIG
1) 24VDC
3) TRIGGER
HARNESS NO. 15N306
VALVE
2) VALVE OUT B
3) GROUND
4) VALVE OUT A
HARNESS NO. 15N307
ADM CABLE
ADM1
1) BIT 0
2) BIT 1
3) BIT 2
4) BIT 3
HARNESS NO. 18D289
BULKHEAD CABLE
TIP
3) GROUND
4) TIP SHUTOFF OUT
HARNESS NO. 15N705
GEOMETRY TYPICAL FOR ALL HARNESSES LISTED BELOW
HARNESS NO. 15N706 QTY. 2
HARNESS NO. 15N707 QTY. 1
HARNESS NO. 15N708 QTY. 1
HARNESS NO. 15N709 QTY. 1
HARNESS NO. 15N710 QTY. 1
HARNESS NO. 15N711 QTY. 2

Dimensions

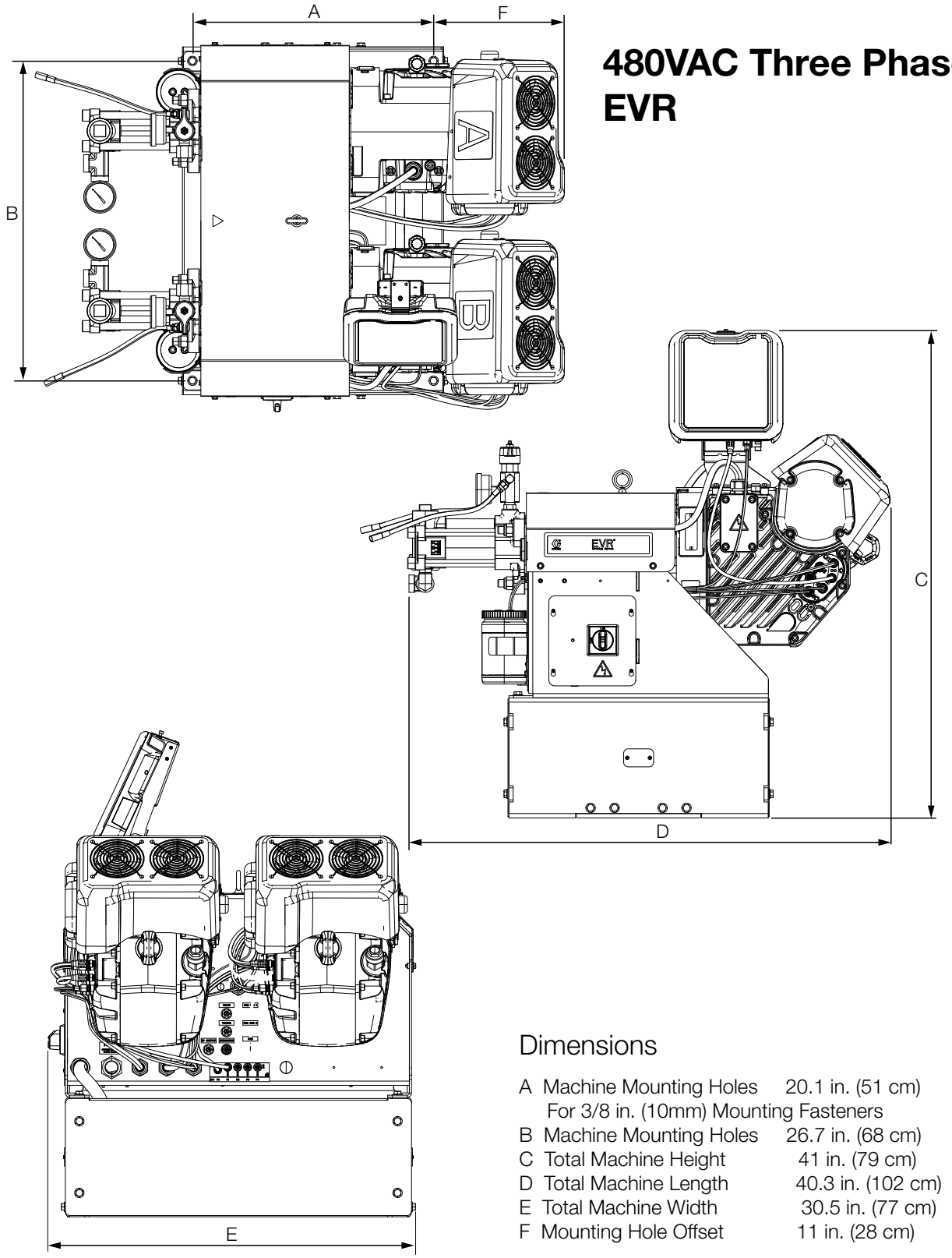


240VAC Single Phase EVR

Dimensions

A	Machine Mounting Holes For 3/8 in. (10mm) Mounting Fasteners	20.1 in. (51 cm)
B	Machine Mounting Holes	26.7 in. (68 cm)
C	Total Machine Height	31 in. (79 cm)
D	Total Machine Length	40.3 in. (102 cm)
E	Total Machine Width	30.5 in. (77 cm)
F	Mounting Hole Offset	11 in. (28 cm)

480VAC Three Phase EVR



Dimensions

A	Machine Mounting Holes For 3/8 in. (10mm) Mounting Fasteners	20.1 in. (51 cm)
B	Machine Mounting Holes	26.7 in. (68 cm)
C	Total Machine Height	41 in. (79 cm)
D	Total Machine Length	40.3 in. (102 cm)
E	Total Machine Width	30.5 in. (77 cm)
F	Mounting Hole Offset	11 in. (28 cm)

Technical Specifications

EVR		
	US	**Metric**
Maximum fluid working pressure ‡	3500 psi	24 MPa, 241 bar
Maximum fluid temperature	120°F	50°C
Fluid circulation ports	1/4 NPS(m)	
Line voltage rating	200-240V, 1ph, 41A, 50/60 Hz	
	480V, 3ph, 18A, 50/60Hz	
Wetted parts	Stainless steel, zinc-plated carbon steel, brass, tungsten carbide, chrome, fluoroelastomer, PTFE, ultra-high molecular weight polyethylene, silicon nitride	
Weight at 240V	425 lbs	193 kg
Weight at 480V	680lbs	308kg
Fluid inlet pressure at inlet fitting		
Pump Inlet	70 - 2000 psi	0.48 - 13.8 MPa, 4.8 - 138 bar
Fluid Inlets		
Component A	3/4 npt(f)	
Component B	3/4 npt(f)	
Fluid Outlets on Manifolds		
Component A	1/2 npt(f)	
Component B	1/2 npt(f)	
NOTES		
‡ *The maximum fluid working pressure for the base machine without hoses is 3500 psi (24.1 MPa, 241 bar). If hoses, valves or accessories rated at less than 3500 psi are installed, the system maximum fluid working pressure becomes the rating of the hoses. The minimum pressure rating for hoses is 2000 psi. Do not install hoses with a pressure rating lower than 2000 psi.*		
All other brand names or marks are used for identification purposes and are trademarks of their respective owners.		

California Proposition 65

CALIFORNIA RESIDENTS

⚠ **WARNING:** Cancer and reproductive harm – www.P65warnings.ca.gov.

Graco Standard Warranty

Graco warrants all equipment referenced in this document which is manufactured by Graco 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 Graco, Graco will, for a period of twelve months from the date of sale, repair or replace any part of the equipment determined by Graco to be defective. This warranty applies only when the equipment is installed, operated and maintained in accordance with Graco's written recommendations.

This warranty does not cover, and Graco 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-Graco component parts. Nor shall Graco be liable for malfunction, damage or wear caused by the incompatibility of Graco equipment with structures, accessories, equipment or materials not supplied by Graco, or the improper design, manufacture, installation, operation or maintenance of structures, accessories, equipment or materials not supplied by Graco.

This warranty is conditioned upon the prepaid return of the equipment claimed to be defective to an authorized Graco distributor for verification of the claimed defect. If the claimed defect is verified, Graco 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.

THIS WARRANTY IS EXCLUSIVE, AND IS IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO WARRANTY OF MERCHANTABILITY OR WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE.

Graco's 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.

GRACO MAKES NO WARRANTY, AND DISCLAIMS ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, IN CONNECTION WITH ACCESSORIES, EQUIPMENT, MATERIALS OR COMPONENTS SOLD BUT NOT MANUFACTURED BY GRACO. These items sold, but not manufactured by Graco (such as electric motors, switches, hose, etc.), are subject to the warranty, if any, of their manufacturer. Graco will provide purchaser with reasonable assistance in making any claim for breach of these warranties.

In no event will Graco be liable for indirect, incidental, special or consequential damages resulting from Graco supplying equipment hereunder, or the furnishing, performance, or use of any products or other goods sold hereto, whether due to a breach of contract, breach of warranty, the negligence of Graco, or otherwise.

FOR GRACO CANADA CUSTOMERS
The Parties acknowledge that they have required that the present document, as well as all documents, notices and legal proceedings entered into, given or instituted pursuant hereto or relating directly or indirectly hereto, be drawn up in English. Les parties reconnaissent avoir convenu que la rédaction du présente document sera en Anglais, ainsi que tous documents, avis et procédures judiciaires exécutés, donnés ou intentés, à la suite de ou en rapport, directement ou indirectement, avec les procédures concernées.

Graco Information

Sealant and Adhesive Dispensing Equipment

For the latest information about Graco products, visit www.graco.com.
For patent information, see www.graco.com/patents.
TO PLACE AN ORDER, contact your Graco distributor, go to www.graco.com, or call to identify the nearest distributor.

If calling from the USA: 1-800-746-1334

If calling from outside the USA: 0-1-330-966-3000

All written and visual data contained in this document reflects the latest product information available at the time of publication.
Graco reserves the right to make changes at any time without notice.

Original instructions. This manual contains English. MM 3A8565
Graco Headquarters: Minneapolis
International Offices: Belgium, China, Japan, Korea

GRACO INC. AND SUBSIDIARIES • P.O. BOX 1441 • MINNEAPOLIS MN 55440-1441 • USA
Copyright 2021, Graco Inc. All Graco manufacturing locations are registered to ISO 9001.

www.graco.com
Revision D, October 2023