INSTRUCTIONS-PARTS LIST 684–029

Rev. A

This manual contains important warnings and information.
READ AND KEEP FOR REFERENCE.

INSTRUCTIONS

GRACO

First choice when quality counts.™

PRECISIONMIX®
Proportioning Controller

FOR PROPORTIONAL MIXING OF PLURAL COMPONENT COATINGS

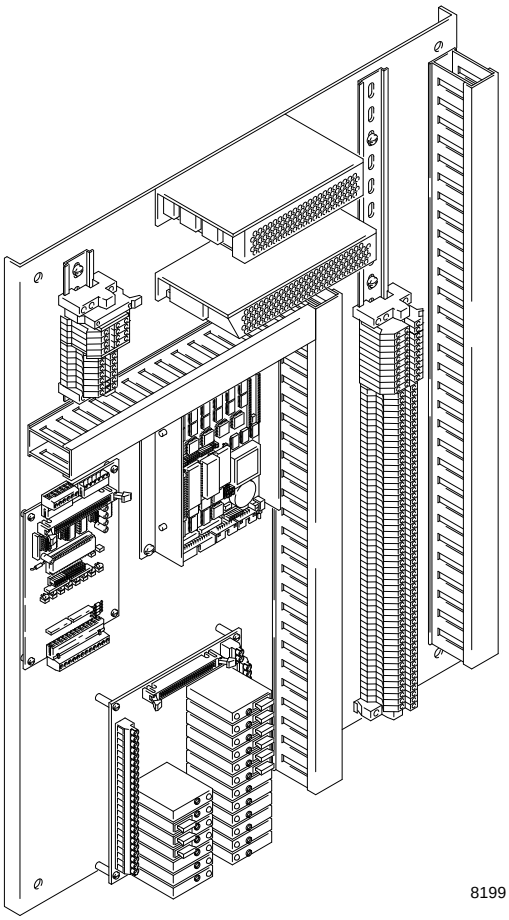
Model 949–724, 24 I/O Controller

+5 Volts, 1.4 Amps; +12 Volts, 0.7 Amps; –12 Volts, 0.002 Amps

The controller is for use only in non-hazardous locations. The maximum applied relay voltage shall not exceed +24 volts. Do not operate it in hazardous locations, as defined in article 500 of the National Electrical Code (USA).

See page 2 for the Table of Contents.

Patent No. 5,368,059



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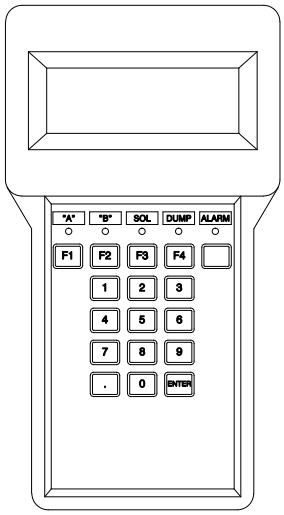
Part No. 112–434 Black Pendant
Part No. 112–435 Red Pendant

The red pendant is the same as the black pendant except the setup options are not accessible.



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Graco Inc. is registered to I.S. EN ISO 9001

Table of Contents

Symbols

Warning Symbol

⚠ WARNING

This symbol alerts you to the possibility of serious injury or death if you do not follow the instructions.

Caution Symbol

⚠ CAUTION

This symbol alerts you to the possibility of damage to or destruction of equipment if you do not follow the instructions.

⚠ WARNING

FIRE, EXPLOSION, AND ELECTRIC SHOCK HAZARD

Improper grounding, poor air ventilation, open flames, or sparks can cause a hazardous condition and result in fire or explosion and serious injury.

- The PrecisionMix Controller must only be installed and serviced by a qualified electrician.
- Ground the equipment and the object being sprayed. See **Ground the System** on page 10.
- Do not install the PrecisionMix equipment in a hazardous area. See Fig. 3, page 8.
- Provide fresh air ventilation to avoid the buildup of flammable vapors from solvent or the fluid being sprayed.
- Extinguish all the open flames or pilot lights in the spray area.
- Keep the spray area free of debris, including solvent, rags, and gasoline.
- Do not turn on or off any light switch in the spray area while operating or if fumes are present.
- Do not smoke in the spray area.
- Do not operate a gasoline engine in the spray area.
- If there is any static sparking while using the equipment, **stop spraying immediately**. Identify and correct the problem.
- Keep liquids away from the electrical components
- Disconnect electrical power at the main switch before servicing the equipment.
- The battery inside the PrecisionMix Controller may explode if mishandled. Do not recharge or disassemble the battery. Do not expose the battery to fire or heat. The battery is intended for use at normal temperatures, where high temperature cycles are not expected to exceed 212° F (100° C)

INJECTION HAZARD

Spray from the gun, hose leaks, or ruptured components can inject fluid into your body and cause extremely serious injury, including the need for amputation. Splashing fluid in the eyes or on the skin can also cause serious injury.

- Fluid injected into the skin might look like just a cut, but it is a serious injury. **Get immediate medical attention.**
- Do not point the spray gun at anyone or at any part of the body.
- Do not put hand or fingers over the spray tip.
- Do not stop or deflect fluid leaks with your hand, body, glove, or rag.
- Follow the **Pressure Relief Procedure** on page 15 whenever you: are instructed to relieve pressure; stop spraying; clean, check, or service the equipment; or install or clean the spray tip.
- Tighten all the fluid connections before operating the equipment.
- Check the hoses, tubes, and couplings daily. Replace worn, damaged, or loose parts immediately. Permanently coupled hoses cannot be repaired; replace the entire hose.

⚠ WARNING

EQUIPMENT MISUSE HAZARD

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

- This equipment is for professional use only.
- Read all instruction manuals, tags, and labels before operating the equipment.
- Use the equipment only for its intended purpose. If you are uncertain about usage, call Graco Technical Assistance at 1–708–678–7200.
- Do not alter or modify this equipment. Use only genuine Graco parts and accessories.
- Check the equipment daily. Repair or replace worn or damaged parts immediately.
- Do not exceed the maximum working pressure of the lowest rated system component. See the instruction manuals of the individual PrecisionMix components for their maximum working pressures.
- Route the hoses away from the traffic areas, sharp edges, moving parts, and hot surfaces. Do not expose Graco hoses to temperatures above 180°F (82°C) or below –40°F (–40°C).
- Do not use the hoses to pull the equipment.
- Do not move pressurized equipment.
- Use fluids or solvents that are compatible with the equipment wetted parts. See the **Technical Data** section of all the equipment manuals. Read the fluid and solvent manufacturer's warnings.
- Comply with all applicable local, state and national fire, electrical and other safety regulations.

TOXIC FLUID HAZARD

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

- Know the specific hazards of the fluid you are using. Read the fluid manufacturer's warnings.
- Store hazardous fluid in an approved container. Dispose of hazardous fluid according to all local, state and national guidelines.
- Wear the appropriate protective clothing, gloves, eyewear, and respirator.

How the PrecisionMix Works

Usage

The standard Graco PrecisionMix can blend most two-component epoxy or polyurethane paints. The PrecisionMix is not for use with “quick-setting” paints (those with a pot life of less than 15 minutes). For information on handling quick-setting paints or abrasive fluids, contact your Graco representative or Graco Technical Assistance (see the back page).

Fluid Supply

The system can be set up to mix components supplied from pressure tanks or feed pumps. The materials can be transferred from their original containers or from a central paint recirculating line.

The standard PrecisionMix is designed to operate an air spray or air-assisted airless system with a capacity of up to 2000 cc/min.

Operating Cycle

To begin operation, the spray gun operator enters the desired ratio and other parameters through the pendant and energizes the electronic controller’s MIX input. From that point on, normal operation of the PrecisionMix is controlled by the operation of the spray gun.

When the gun is triggered, the controller sends signals to the solenoid enclosure to activate the solenoid valves. The solenoid valves activate the manifold’s catalyst and resin valves.

The two components (catalyst and resin) are introduced into the integrator chamber one at a time, through separate fluid lines, check valves, and flow meters. Their entry into the chamber is controlled by a dispense valve for each component. The flow meters monitor the exact fluid volumes being dispensed and send electrical pulses to the controller. The controller monitors these pulses and signals the solenoids to turn the dispense valves on or off accordingly (based on the target volumes calculated by the controller).

The components are pre-mixed in the integrator, then given a homogeneous blending as they pass through a static mixer tube. Output from the mixer tube to the spray gun may be controlled by a fluid pressure regulator.

The two components continue to be alternately fed into the mixing block as long as the gun is triggered. After the trigger is released, if the gun is not triggered again within four minutes, the system will go to an idle mode, which closes off the mix manifold. When the gun is triggered again, the system will continue the process where it left off. Operation can be stopped at any time by energizing the STANDBY input or shutting off the main power switch.

Other inputs and outputs are provided to control the purging process, provide alarm annunciation, and interface with the operator.

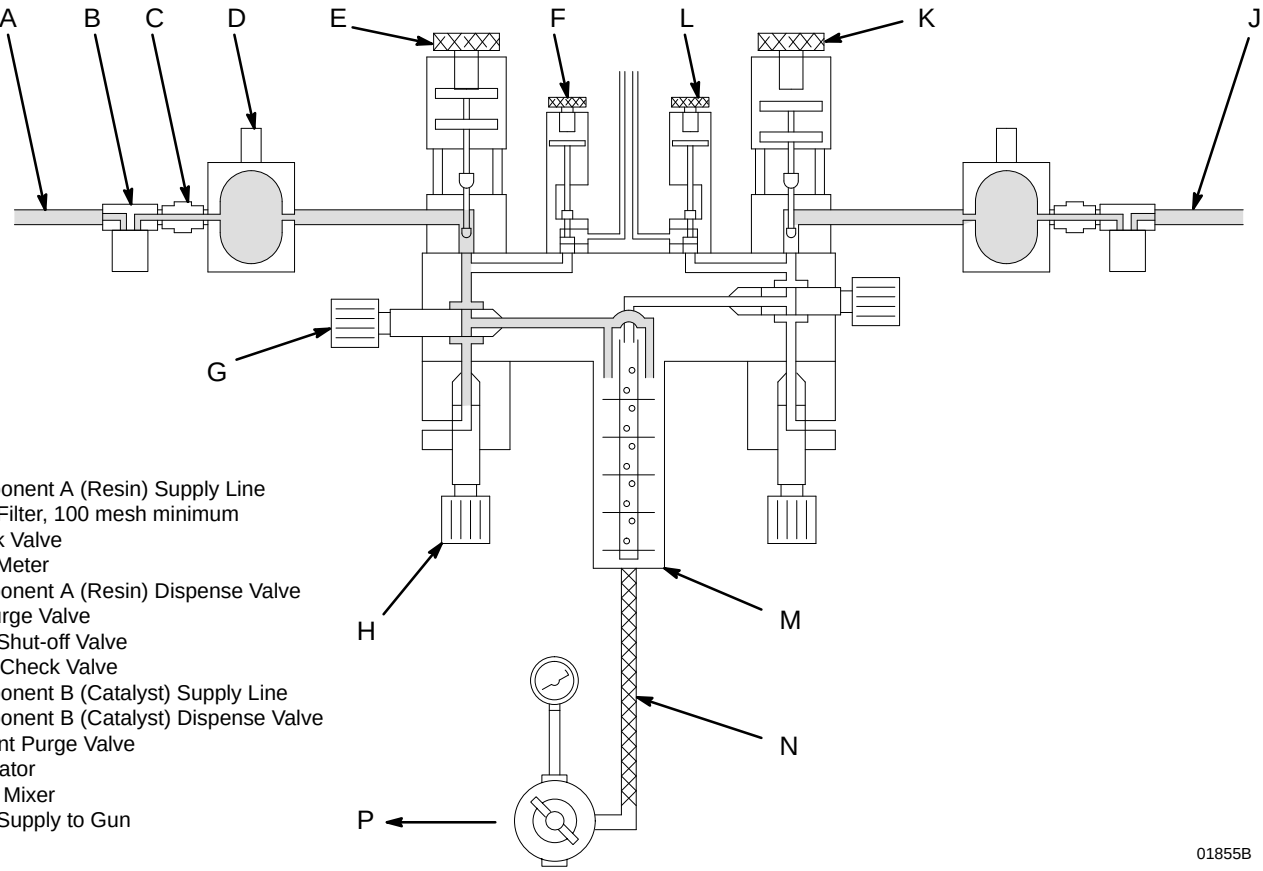
The following is a typical ratio cycle:

- First, the Component A (resin) dispense valve opens, and the fluid begins to flow into the integrator chamber. When the correct quantity has been dispensed (based on the calculated target value), the component A dispense valve closes. See Fig. 1.
- Next, the Component B (catalyst) dispense valve opens. The fluid begins to flow into the integrator chamber and is lined up proportionately with the previously-dispensed Component A sample. The B dispense valve closes when the target volume for Component B has been reached. See Fig. 2.
- The process repeats itself as the spray gun is triggered.
- Four minutes after the operator stops spraying, the PrecisionMix idles.
- The PrecisionMix continues where it left off when the operator resumes spraying.

Adaptive Overrun Correction

The actual volume of fluid dispensed each cycle can vary slightly from the calculated target. However, the controller monitors this variance and continuously makes corrections for it.

Functional Diagram – Component A (Resin) Dispense

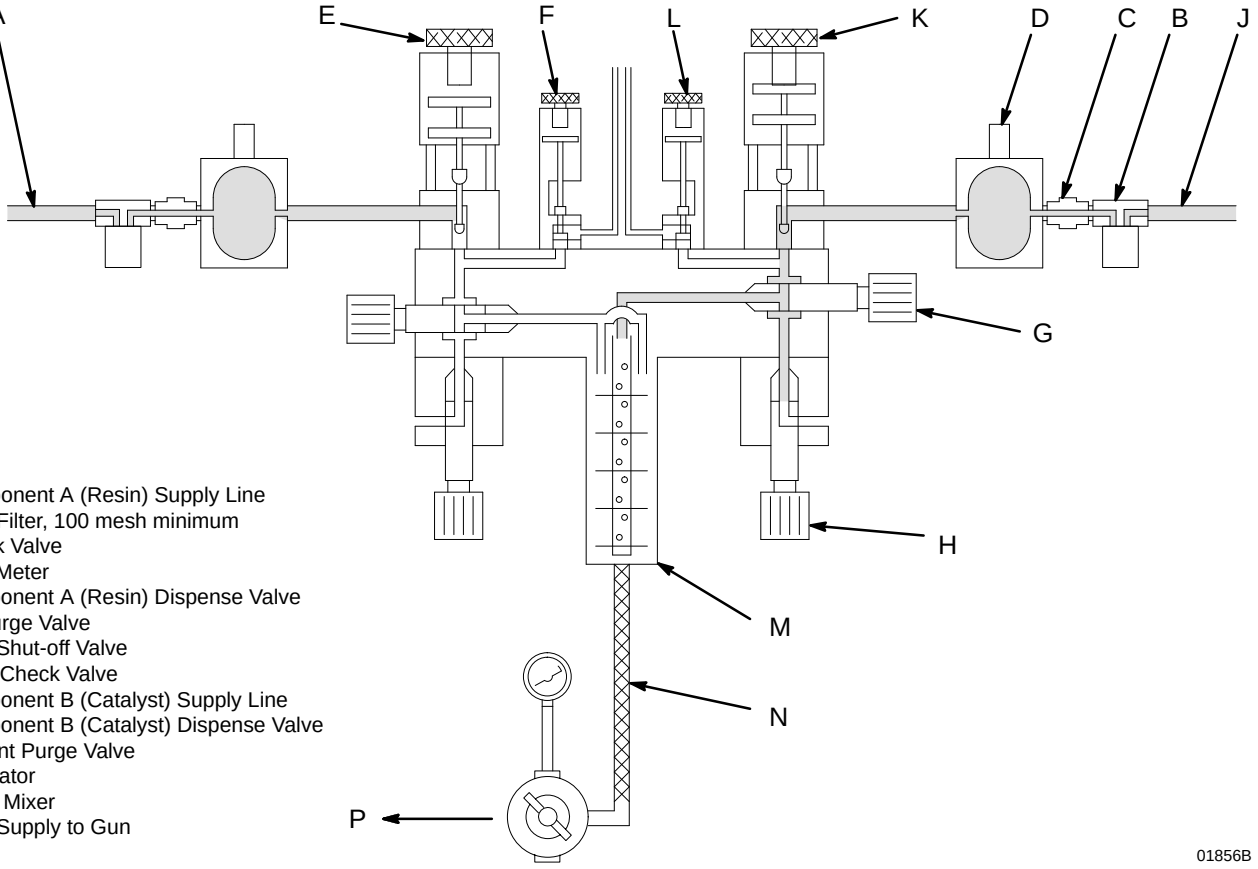


KEY

A Component A (Resin) Supply Line
B Fluid Filter, 100 mesh minimum
C Check Valve
D Flow Meter
E Component A (Resin) Dispense Valve
F Air Purge Valve
G Fluid Shut-off Valve
H Ratio Check Valve
J Component B (Catalyst) Supply Line
K Component B (Catalyst) Dispense Valve
L Solvent Purge Valve
M Integrator
N Static Mixer
P Fluid Supply to Gun

Fig. 1

Functional Diagram – Component B (Catalyst) Dispense

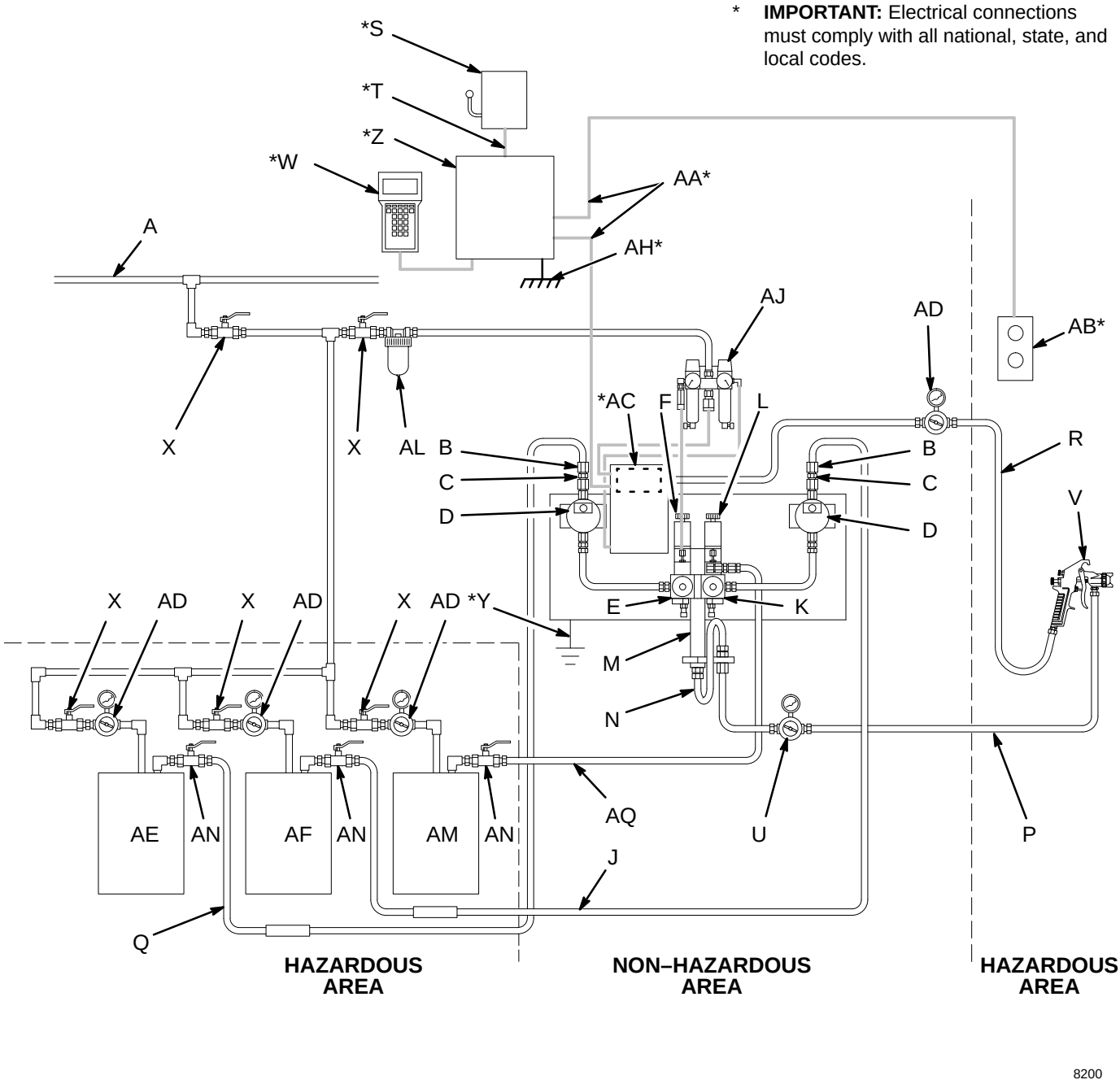


KEY

A Component A (Resin) Supply Line
B Fluid Filter, 100 mesh minimum
C Check Valve
D Flow Meter
E Component A (Resin) Dispense Valve
F Air Purge Valve
G Fluid Shut-off Valve
H Ratio Check Valve
J Component B (Catalyst) Supply Line
K Component B (Catalyst) Dispense Valve
L Solvent Purge Valve
M Integrator
N Static Mixer
P Fluid Supply to Gun

Fig. 2

Typical Installation



KEY

A Air Supply Line
B Fluid Filter (100 mesh minimum) and fluid component inlet to PrecisionMix
C Check Valve
D Flow Meter
E Component A (Resin) Dispense Valve
F Air Purge Valve
J Component B (Catalyst) Supply Line
K Component B (Catalyst) Dispense Valve
L Solvent Purge Valve
M Integrator
N Static Mixer
P Fluid Supply Line to Gun
Q Component A (Resin) Supply Line
R Air Hose
S Main Power Switch
T 115V, 60 Herz Electrical Supply
U Fluid Pressure Regulator & Gauge
V Spray Gun
W Pendant
X Bleed-Type Air Valve (required)
Y Ground Wire & Clamp 222–011 (Required)
Z PrecisionMix Controller (in NEMA enclosure)
AA Prewired Cable
AB Remote Operator Station (Operator Switch & Abort Light)
AC Solenoid Enclosure*
AD Air Regulator & Gauge
AE Component A (Resin) Supply Tank
AF Component B (Catalyst) Supply Tank
AH True Earth Ground
AJ Solenoid Air Supply Station
AL Air Line Filter (10 micron or better)
AM Solvent Supply Tank
AN Fluid Shut-off Valve
AQ Solvent Supply Line

* Mounted on fluid panel. See Standard Precision Mix System 965–739.

Fig. 3

Installation

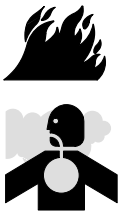
⚠ WARNING

FIRE, EXPLOSION, AND ELECTRIC SHOCK HAZARD

Installing and servicing this equipment requires access to parts which could cause an electric shock or other serious injury if the work is not performed properly.

- Do not install or service this equipment or perform any of the following installation and adjustment procedures unless you are trained and qualified.
- Comply with all applicable local, state, and national fire, electrical, and other safety regulations.

⚠ WARNING



FLAMMABLE OR TOXIC VAPOR HAZARD

Provide fresh air ventilation to avoid the buildup of flammable or toxic vapors. Do not operate the spray gun unless ventilation fans are operating. Follow all national, state, and local codes regarding air exhaust velocity requirements.

NOTE:

- Have the PrecisionMix system binder (a collection of manuals and diagrams in a three-ring binder, supplied by Graco) available during installation.
- Reference numbers and letters in parentheses in this manual's text refer to the numbers and letters in the illustrations.
- Be sure all accessories are adequately sized and pressure-rated to meet the system's requirements.
- Connect the fluid and air supply lines as instructed in the PrecisionMix Manifold manual and the Solenoid Enclosure manual.

The Typical Installation shown in Fig. 3 is only a guideline for selecting and installing system components and accessories, and is not an actual system design. Follow the installation schematic in the system binder provided by Graco or contact your Graco representative or Graco Technical Assistance (see back page) for assistance.

Fluid Supply

The following installation and operation instructions generally presume a standard system, using pressure tanks to supply the paint components and solvent. The **Optional Fluid Supplies** listed below are two possible variations and their effect on the instructions.

Optional Fluid Supplies

NOTE: The fluid supply must be free of pressure spikes, which are commonly caused by a pump stroke changeover. If necessary, install pressure regulators or a surge tank on the fluid inlets to the PrecisionMix, to reduce the fluid supply pressure. Contact Graco for information on fluid pressure regulators.

Supplying Fluid Through Circulating Lines

If there is a central paint recirculating line in your shop, the PrecisionMix can be connected to it instead of to pressure tanks. Other than references to the pressure tanks, operation is the same as described in this manual.

For maintenance and safety, you must install a ball valve between each supply line and the PrecisionMix.

Supplying Fluid Through Pail or Drum Pumps

Instead of pressure tanks, the PrecisionMix can be supplied by pail or drum pumps. Operation is the same, other than references to the pressure tanks.

Location

⚠ WARNING

FIRE AND EXPLOSION HAZARD

The standard PrecisionMix is for use only in non-hazardous locations. Do not operate in hazardous locations, as defined in Article 500 of the National Electrical Code (USA).

NOTE: Special systems are available for use in hazardous locations. Contact your Graco representative.

Installation

Connect the Electrical Supply

Connect the PrecisionMix Controller to a 110 VAC grounded electrical supply.

⚠ CAUTION

If power and grounding connections are not done properly, the equipment will be damaged and the warranty will be voided.

Follow the installation drawings in the system binder provided by Graco.

Ground the System

(See Fig. 5)

⚠ WARNING

FIRE, EXPLOSION, AND ELECTRIC SHOCK HAZARD

To reduce the risk of fire, explosion, or electric shock:

- The PrecisionMix system must be electrically connected to a true earth ground; the ground in the electrical system is not sufficient.
- All wires used for grounding must be 10 gauge minimum.
- A qualified electrician must complete all grounding and wiring connections and check the resistance as instructed on page 12.
- Refer to your local code for the requirements for a “true earth ground” in your area.
- Also read and follow the warnings on page 4.

Ground the PrecisionMix system as instructed here and in the individual component manuals. A ground wire and clamp, part no. 222–011, are available from Graco.

Controller

Connect the controller’s green-yellow ground terminal block to the NEMA enclosure’s grounding lug. Connect a ground wire from the enclosure to a true earth ground. The controller enclosure and the manifold mounting surface must be connected to the same true earth grounding point.

PrecisionMix Manifold

The mounting surface for the PrecisionMix manifold must be electrically connected to the same true earth ground point as the controller enclosure. Different ground points may cause current to flow through the meter cables, causing incorrect signals.

Flow Meters

Meter cables must be connected as shown in Fig. 4. Failure to properly connect the grounded conductor and shield may cause incorrect signals.

Refer to your system drawings for specific wiring requirements.

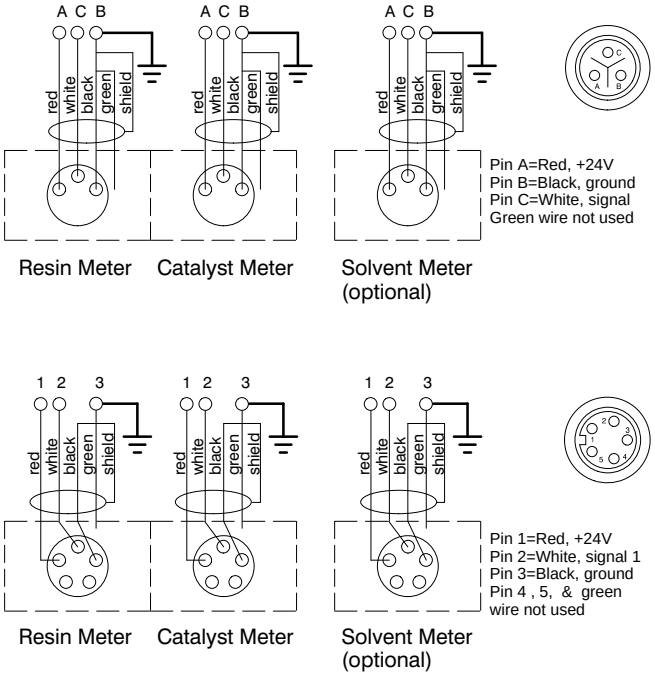


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Fig. 4

Ground the System (continued)

KEY

1. Controller Enclosure, with controller
2. Solenoid Enclosure
3. Flow Meter Cable
4. Ground Wire connection point for the fluid manifold mounting surface grounding wire
5. Manifold Mounting Surface Ground Wire; must be connected to same true earth ground 6 as the controller enclosure is connected to
6. True Earth Ground; check your local code for requirements
7. Controller Enclosure Grounding Wire; must be connected to same true earth ground 6 as the manifold mounting surface is connected to
8. Controller Enclosure's Grounding Lug

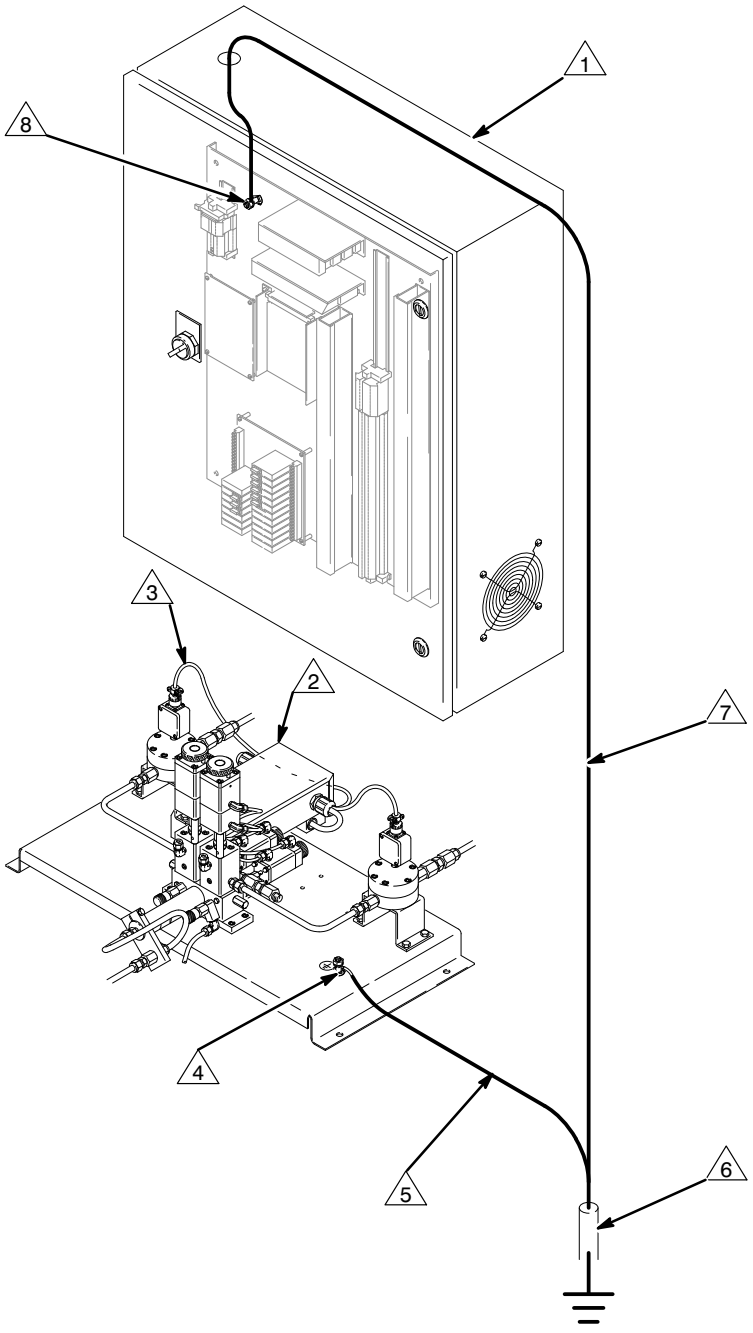


Fig. 5

Continued on the next page.

Installation

Ground the System (continued)

Feed Pumps or Pressure Pots

Use a ground wire and clamp to electrically connect the pumps or pots to a true earth ground. See your separate pump or pressure pot manual.

Air and Fluid Hoses:

Use grounded hoses only.

Spray Gun

Follow the spray gun manufacturers grounding instructions.

Fluid Supply Container

Ground the container according to your local code.

Object Being Sprayed

Ground the object according to your local code.

All Solvent Pails Used When Purging

Ground the solvent pails according to your local code. Use only metal pails, which are conductive, placed on a grounded surface. Do not place the pail on a nonconductive surface, such as paper or cardboard, which interrupts the grounding continuity.

Maintain Grounding Continuity When Purging Or Relieving Pressure

Follow the instructions in your separate gun manual for safely grounding your gun while purging.

Check the Resistance

⚠ WARNING

FIRE, EXPLOSION, AND ELECTRIC SHOCK HAZARD
To reduce the risk of fire, explosion, or electric shock the resistance between the PrecisionMix components and true earth ground must be less than 25 ohms.

Have a qualified electrician check the resistance between each PrecisionMix component and the true earth ground. The resistance must be less than 25 ohms. If the resistance is greater than 25 ohms, a different ground site may be required. Do not operate the system until the problem is corrected.

Connect Other Wiring

Connect the 24 Vdc solenoid enclosure cable and meter cables to terminals inside the controller enclosure as shown on the installation drawings in the system binder provided by Graco.

Connect The Pendant

Connect the pendant cable to the 9-pin controller connector marked PENDANT.

NOTE: The NEMA enclosure bulkhead has a 6-pin connector for the pendant.

Connect the Remote Operator Station

The remote operator station consists of an operator switch and abort light. See Fig. 3, page 8, and Fig. 6, page 13. Connect the operator station in an area where the operator can access the operator switch and see the abort light.

Operator Controls and Indicators

There are no operator controls on the controller itself. Two remote devices provide operator interface; they are the *Remote Operator Station*, located in the spray booth, and the *Pendant*, located on the Controller Enclosure.

Remote Operator Station (See Fig. 6)

The Remote Operator Station consists of an *Operator Switch* and an *Abort Light*.

Operator Switch

There are three operator switch input settings: mix, standby, and purge.

MIX

Setting the operator switch to mix starts the normal operation (mixing and dispensing) of the system.

STANDBY

Setting the operator switch to standby stops the system.

PURGE

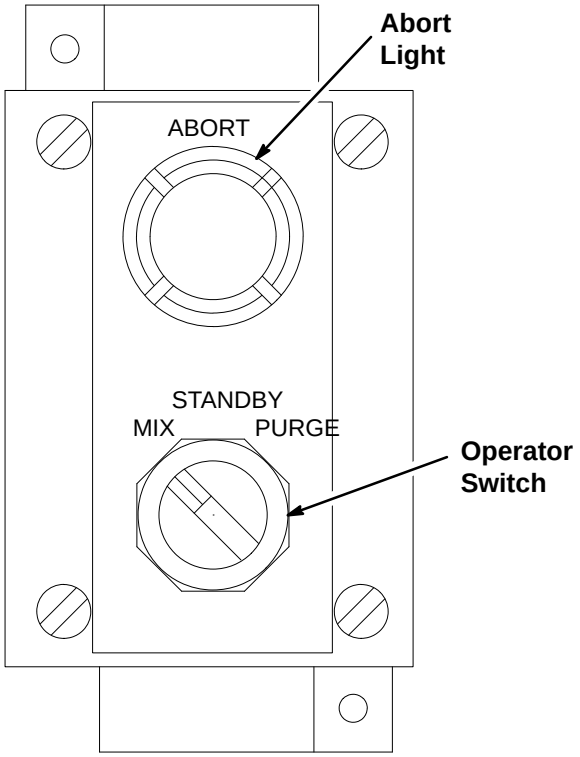
Setting the operator switch to purge causes the system to cycle between the air and solvent purge solenoid outputs to operate the air and solvent purge valves. Purge will not initiate until two seconds after the operator switch has been moved to the purge position. This cycling can be either a function of time or of volume if flow meters are connected to measure volume.

Abort Light

The controller activates the abort light when the PrecisionMix has stopped operating because of an alarm condition. The type of alarm will display on the pendant.

Clearing Alarms

All alarms, except the Pot Life Alarm, can be cleared by slowly moving the operator switch from MIX to STANDBY to PURGE to STANDBY and back to MIX to continue operation.



Typical Remote Operator Station

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Fig. 6

Operator Controls and Indicators

Pendant (See Fig. 7)

Pendant Display

When first powered up, the screen on the pendant displays the calculated target volumes to achieve the desired ratio, and how much fluid has been dispensed in this cycle for each component. See the screen below. As fluid is dispensed, the display will change to reflect the amount remaining before a cycle change.

```
TARGET     ACTUAL (cc)
A  XX.X    XX.X
B  XX.X    XX.X
NXT                RPT
```

On the bottom line of the display screen are the words that correspond to the four soft-keys, F1 through F4. If no word appears over a key, pressing that key will not affect the system.

Example: If you are at the Target/Actual screen, shown above, NXT (next) is the F1 key and RPT (report) is the F4 key.

The fifth key, to the right of the F4 key, is not labeled. It is used to change the display from the series of Run screens to the Main Title screen (shown below), with the black pendant only. The operator can access all of the Setup, Totalizer, and Run screens from the Main Title screen.

```
          GRACO
     PRECISION MIX™
   REV. 1.21 RECIPE 00
RUN  SETUP  BAT GTOT
```

NOTE:

- The black pendant (part no. 112–434) is required to access the setup screens. The setup screens are not accessible with the red pendant (part no. 112–435).
- See pages 24 and 25 for the screen maps. See pages 26 to 39 for detailed information on the pendant display screens.

Pendant Indicators

The pendant is a small display terminal with a 4 x 20 character display, five LED indicators (the small lights), and a keyboard for entering setup parameters. The left four LEDs match the solenoid outputs for Component A (“A”), Component B (“B”), purge (SOL), and the dump valve (DUMP). The fifth LED blinks to indicate an alarm condition.

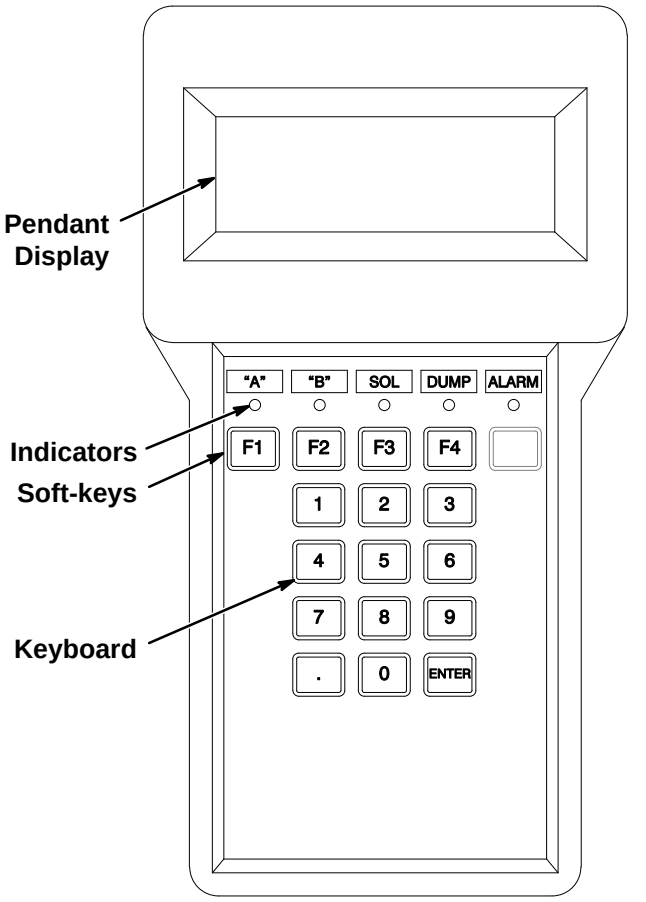

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Fig. 7

Operation

NOTE: The following instructions generally presume a standard system using pressure supply tanks for the paint components and solvent, and air spray guns. See **Optional Fluid Supplies** on page 9 for possible variations and their effect on the instructions.

Pressure Relief Procedure

⚠ WARNING

INJECTION HAZARD
The system pressure must be manually relieved to prevent the system from starting or spraying accidentally. Fluid under high pressure can be injected through the skin and cause serious injury. To reduce the risk of an injury from injection, splashing fluid, or moving parts, follow the **Pressure Relief Procedure** whenever you:

- are instructed to relieve the pressure,
- stop spraying,
- check or service any of the system equipment,
- install or clean the spray tip.

1. Set the operator switch to STANDBY. See Fig. 6.
2. Relieve fluid and air pressure at the component and solvent feed pumps or pressure pots, as explained in their separate instruction manuals.
3. Set the operator switch to MIX.
4. Hold a metal part of the spray gun firmly to the side of a grounded metal pail, and trigger the gun to relieve fluid pressure.
5. Set the operator switch to STANDBY.

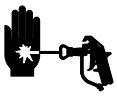
System Pressure

⚠ WARNING

COMPONENT RUPTURE HAZARD
Do not exceed the maximum working pressure of the lowest rated system component. See the instruction manuals of the individual PrecisionMix components for their maximum working pressures.

Initial Startup Sequence

⚠ WARNING



INJECTION HAZARD
To reduce the risk of a serious injury, follow the **Pressure Relief Procedure** at left whenever you are instructed to relieve the pressure.

⚠ CAUTION

It is essential that a ratio check and flow meter calibration are completed before using the system for the first time. Material that is mixed off-ratio and then applied can necessitate extensive rework of the painted parts.

Have the following additional manuals available during startup:

- 308–288, Fluid Manifold
- 308–243, Flow Meter

NOTE: The following instructions assume that the necessary values, such as ratio and meter K-factors, have already been entered for the system. Review all the pendant screens and setup options on pages 26 to 40. If you need assistance in setting parameters, contact Graco EAS Technical Assistance at 612–379–3700.

1. Verify that the flow meters installed on the PrecisionMix manifold are those specified for your installation by checking the part number on each meter identification tag against the part numbers on the system bill-of-materials in the PrecisionMix system binder, supplied by Graco. If the part numbers do not match, call your Graco system engineer or Graco EAS Technical Assistance immediately.

2. The PrecisionMix was tested with lightweight oil. To prevent contamination of your fluids, thoroughly purge the system with solvent as instructed in **Manual Color Change or System Purge**, page 23. Leave the solvent in the system.

Continued on the next page.

Operation

Initial Startup Sequence (continued)

3. Relieve the system pressure.

4. Set the operator switch to STANDBY. See Fig. 6, page 13.

5. Turn on the Precision Mix main power switch. The pendant will display the first Run screen.

```
TARGET      ACTUAL (cc)
A   XX.X    XX.X
B   XX.X    XX.X
NXT                 RPT
```

NOTE: If essential values, such as ratio and meter K-factors, have not been entered for the system, the screen will display “PARAMETERS NOT SET–GO TO SETUP”. See pages 26 to 40 to set parameters.

6. On the black pendent, press the unmarked key in the F5 location (to the far right). See Fig. 7. The pendant will display the Main Title screen.

```
          GRACO
      PRECISION MIX®
    REV. 1.21 RECIPE 00
RUN  SETUP  BAT GTOT
```

7. Press SETUP (F2 key).

```
SETUP RATIO?
RECIPE 00

NO   YES   QUIT   RPT
```

8. Press NO until the pendant displays the Change Installation screen.

```
CHANGE INSTALLATION?
RECIPE 00

NO   YES   QUIT
```

9. Press YES. The pendant will display the Station Number screen. You need to get to the A Flow Meter screen. Press NO until this screen is displayed:

```
A FLOWMETER
VALUE IS .XXX
NEW VALUE? .XXX
NO   TEST  QUIT
```

10. The value displayed represents the K-factor of the meter. The K-factor is the approximate flow volume in cc per one electrical pulse of the meter. The pulses are added by the computer to keep track of the meter flow volume.

11. Using the part number on the meter identification tag, verify that the K-factor is set correctly by comparing the value to the table below. If the value is different, enter the correct K-factor from the table as the new value.

Meter Part No.	Model No.	K-factor
235–587 235–593	3050 3050H	.114
235–588 235–594	3100 3100H	.229
235–592 235–589	3550 3550H	.588

12. Repeat step 11 for the B and Purge flow meter screens.

13. To set the new values into the computer’s permanent Run memory, make sure the operator switch is set to STANDBY, then press QUIT (F3 key) twice to return to the Main Title Screen. Failure to do this will result in the loss of the new data.

14. Complete the **Ratio Check** procedure on page 17 before starting production.

Operation

Ratio Check

NOTE:

- Check the ratio once a month, as part of a regular maintenance routine, and anytime a meter is changed or calibrated.
- Refer to Fig. 1 and Fig. 2, page 7, to understand the fluid paths that occur during this procedure, which involves the manual manipulation of the fluid shut-off valves and ratio check valves.

⚠ WARNING

PRESSURIZED EQUIPMENT HAZARD
To avoid splashing fluid in the eyes when performing a ratio check:

- Wear eye protection.
- Only open the ratio check valves enough to allow fluid to flow at a rate of 100 to 200 cc per minute.

⚠ CAUTION

The fluid shut-off valves and ratio check valves are retained in their housings by mechanical stops that prevent accidental removal of the valve stem while the manifold is pressurized. Do not use a tool to open or close the valve stems. If manual force cannot turn the valve stems, the system pressure must be relieved and the valve properly disassembled and cleaned to remove the resistance.

1. Display the Run screen.

```
TARGET     ACTUAL (cc)
A   XX.X   XX.X
B   XX.X   XX.X
NXT              RPT
```

2. Press NXT. Check if the desired ratio is correct.

```
FLOW 0000 cc/M
DESIRED RATIO X.X
CURRENT RATIO X.XX
NXT              RPT
```

3. Make sure that both ratio check valves (D) are closed. See Fig. 8.
4. Turn off all the spray or dispense devices connected to the PrecisionMix.
5. Close the PrecisionMix fluid passages by turning the fluid shut-off knobs (C) in.
6. Set the operator switch to MIX.
7. Place both ratio check valve dispense tubes into one container. Use a one quart can, 1000 cc beaker, or similar container.

Continued on the next page.

KEY
A Dispense Valve Knobs
B Purge Valve Knobs
C Fluid Shut-off Knobs
D Ratio Check Valve Knobs

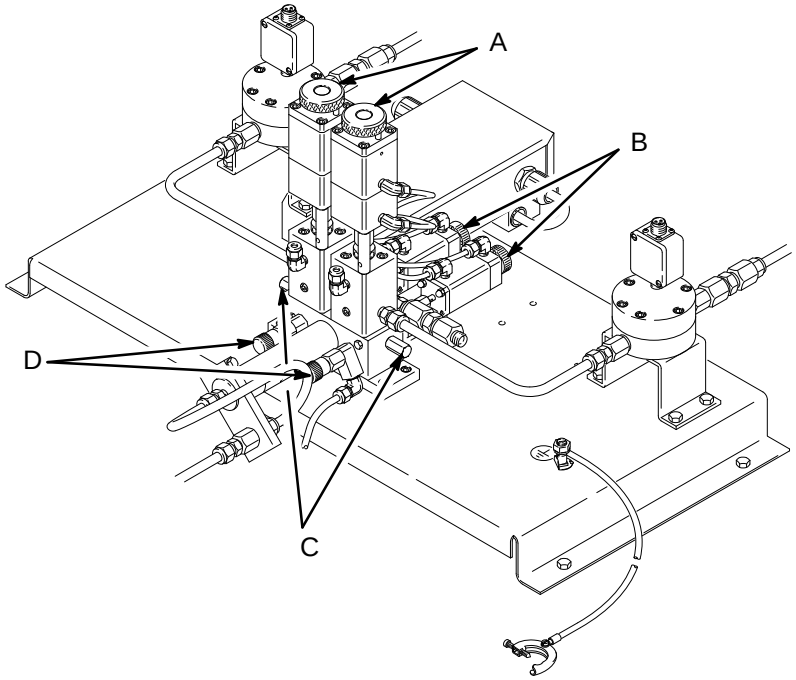


Fig. 8

Operation

Ratio Check (continued)

8. Return to the Run screen on the pendant.

TARGET	ACTUAL (cc)
A XX.X	XX.X
B XX.X	XX.X
NXT	RPT

9. Look at the A and B LED on the pendant. The LED that is lit indicates which valve is currently open. Slowly open the ratio check valve that corresponds to the lit LED. The fluid will dispense into the container until the target value is reached, then the cycle will shift to the other component.

NOTE: The actual value on the pendant for the component being dispensed will count up until its dispense cycle is complete.

10. Slowly open the other ratio check valve. The fluid will dispense into the container until the target value is reached. The dispense cycles of Component A and B will continue until you stop it.

    Allow the system to cycle between the two components for approximately five cycles or until fresh, undiluted fluid flows into the container. Close the Component A ratio check valve while Component B is dispensing to prepare to start the ratio check with a full dose of Component A.

11. Remove the container and replace it with two clean, 1000 cc, graduated beakers. Place one beaker under each ratio check valve dispense tube.

12. Slowly open the Component A and B ratio check valves. Allow the system to cycle between the two components until there is a large enough sample of both materials to measure (500 to 1000 cc of material).

13. Close the Component A ratio check valve while Component B is dispensing to ensure that there are an equal number of dispenses of Component A and B in the beakers.

14. Close the Component B ratio check valve.

15. Compare the volumes of the beakers to the ratio that was programmed into the pendant, and record the measured volumes.

16. Compare the contents of the beakers a second time, 10 to 15 minutes later. Some materials will entrain air bubbles, which will dissipate slowly, causing the volume in the beaker to decrease. Because the meter reads the air bubbles as fluid flow, this condition will cause off-ratio mixing.

    a. If the second comparison of the components in the beakers shows that the material has air bubbles, contact Graco Technical Assistance (see the back page) and your material supplier immediately. The source of the air entrainment must be found and corrected.

    b. If the ratio is close, but not exact, follow the Flow Meter Calibration tests. See pages 37 and 38.

    c. If the ratio is not close, verify the K-factor for the meters as instructed on page 16, step 11, and correct as needed.

    d. If you cannot get an accurate ratio check, call Graco Technical Assistance. See the back page.

17. Make sure that both ratio check valves are closed.

18. Purge the ratio check valves as instructed on page 19 before continuing.

19. Close both ratio check valves and open both fluid shut-off valves before starting production.

Operation

Purging the Ratio Check Valves

⚠ WARNING

PRESSURIZED EQUIPMENT HAZARD
To avoid splashing fluid in the eyes when purging the ratio check valves:

- Wear eye protection.

- Only open the ratio check valves enough to allow fluid to flow at a rate of 100 to 200 cc per minute.

⚠ WARNING

INJECTION HAZARD
To reduce the risk of a serious injury from injection or splashing fluid, follow the **Pressure Relief Procedure** on page 15 whenever you are instructed to relieve the pressure.

⚠ CAUTION

The fluid shut-off valves and ratio check valves are retained in their housings by mechanical stops that prevent accidental removal of the valve stem while the manifold is pressurized. Do not use a tool to open or close the valve stems. If manual force cannot turn the valve stems, the system pressure must be relieved and the valve properly disassembled and cleaned to remove the resistance.

NOTE: Refer to Fig. 1 and Fig. 2, page 7, to understand the fluid paths that occur during this procedure, which involves the manual manipulation of the fluid shut-off valves and ratio check valves.

1. Relieve the system pressure.
2. Close both Component A and B fluid shut-off valves.
3. Place a container under the Component B ratio check valve dispense tube.
4. Turn on the solvent supply.
5. Open the Component B ratio check valve one-half to one full turn.
6. Press the manual override button (H) on the solvent solenoid valve, which is inside the PrecisionMix solenoid enclosure. Refer to Fig. 9.

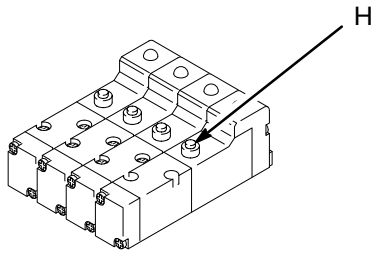


Fig. 9 01906

7. Purge until clean solvent flows from the Component B ratio check valve, then close the valve.
8. Open the Component B fluid shut-off valve.
9. Trigger the spray device while pressing the manual override button (H) on the solvent solenoid valve until clean solvent flows from the gun.
10. Fully open the Component A fluid shut-off valve, and open the Component A ratio check valve one-half to one full turn.
11. Press the manual override button (H) on the solvent solenoid valve.
12. Purge the Component A ratio check valve until clean solvent flows from the check valve, then close the valve.
13. At this point, both Component A and B ratio check valves should be closed and both fluid shut-off valves should be fully open.
14. Purge the system as instructed on page 20 if you are not loading paint into the system to start production. If you are starting production, follow the procedure on page 21.

Operation

Purging the PrecisionMix System

⚠ WARNING

FIRE AND EXPLOSION HAZARD
To reduce the risk of fire, explosion and serious injury when purging the PrecisionMix:

- Be sure the entire system and flushing pails are properly grounded.
- Follow the instructions in your separate gun manual for safely grounding your gun while purging.

⚠ WARNING

INJECTION HAZARD
To reduce the risk of a serious injury from injection or splashing fluid:

- Follow the **Pressure Relief Procedure** on page 15 whenever you are instructed to relieve the pressure.
- If you are using a high pressure gun*, remove the spray tip before purging. Relieve pressure before removing the spray tip.
- Wear protective eyewear.
- Use the lowest possible fluid pressure when purging.

Purge the system during initial startup, at the end of each workday, and before any break longer than the pot life of the fluid.

Solvent purges the right-hand (Component B/catalyst) side of the mixing block and the inner tube of the integrator. Air purges the left-hand (Component A/resin) side of the mixing block and the outer tube of the integrator.

NOTE: Solvent may be used to purge both sides of the mixing block, but this will result in longer purge sequences and high solvent usage. Call Graco EAS Technical Assistance at 612–379–3700 before choosing this option.

1. Relieve the system pressure.
2. If you are using a high pressure gun*, remove the spray tip before purging. Clean the tip separately.
3. Set the fluid pressure regulator at a pressure sufficient to thoroughly flush the system in a reasonable amount of time, but low enough to avoid splashing fluid and an injection injury. In general, a setting of 100 psi (7 bar) is sufficient for flushing.
4. Open the fluid pressure regulator.
5. Set the operator switch to STANDBY. See Fig. 6, page 13.
6. Trigger the spray gun, and set the operator switch to PURGE. The purge sequence will automatically cycle. Hold the gun trigger open until the purge sequence is complete. See page 29 for the setup of the purge sequence.
7. If the system requires further purging, set the operator switch to STANDBY and back to PURGE for another sequence.

NOTE: Adjust the purge sequence so that only one sequence is required. See page 29 for the setup of the purge sequence.

8. De-trigger the gun when the pressure is relieved, and set the operator switch back to STANDBY.
9. Adjust the fluid pressure regulator back to the normal working pressure.

Emergency Purging Procedure

If the electrical power is interrupted, the system can be purged by using the following procedure:

1. Relieve the system pressure.
2. If you are using a high pressure gun*, remove the spray tip before purging. Clean the tip separately.
3. Trigger the spray gun, and press the manual override button (H) on the solvent solenoid valve, which is inside the PrecisionMix solenoid enclosure. Refer to Fig. 9, page 19.
4. Hold the button in until the system is thoroughly purged.
5. Relieve the system pressure.

* A gun is considered *high pressure* when its maximum working pressure is 900 psi [62 bar] or greater. *Airless* spray guns and *air-assisted airless* spray guns are high pressure guns. *Air spray* guns are low pressure guns.

Operation

Starting Production

⚠ WARNING

INJECTION HAZARD
To reduce the risk of a serious injury, follow the **Pressure Relief Procedure** on page 15 whenever you:

- are instructed to relieve the pressure,
- stop spraying,
- check or service any of the system equipment,
- install or clean the spray tip.

NOTE: When you first start up the system after it has been shut down for a period of time, the relays, solenoids, and valves for Components A and B will cycle rapidly until system pressure is built back up. This is normal.

1. Check that the supply tanks for the Component A, Component B, and solvent are filled.
2. Check that all the fluid valves are turned on and the fluid pressure to the PrecisionMix is properly set.
3. Check that the air pressure to the PrecisionMix solenoid enclosure is properly set. Most applications require about 80 psi (5.5 bar) pressure. To operate properly, do not go below 75 psi (5.2 bar) or exceed 95 psi (6.6 bar) pressure.
4. Check that the PrecisionMix fluid shut-off knobs, dispense valve knobs, and purge valve knobs are set as follows:
   - Fluid Shut-off Knobs: fully open
   - Dispense Valve Knobs: three “clicks” open from fully closed setting
   - Purge Valve Knobs: two turns open from fully closed setting
5. Turn on the main power to the PrecisionMix. The pendant will display the first Run screen.

```
TARGET      ACTUAL (cc)
A   XX.X    XX.X
B   XX.X    XX.X
NXT                 RPT
```

6. Push the NXT key on the pendant and check if the desired ratio is correct.

```
FLOW 0000 cc/M
DESIRED RATIO X.X
CURRENT RATIO X.XX
NXT                 RPT
```

7. Go through the other pendant run screens and check that the totalizer and target volumes are satisfactory. See the Screen Maps, pages 24 and 25, for guidance.
8. Remove any air from the fluid lines of the system:
   a. Shut off the air to the gun by closing the air regulator or shut-off valve for the gun atomizing air.
   b. Hold a metal part of the spray gun firmly to the side of a grounded metal pail and trigger the gun.
   c. Set the operator switch to MIX.
   d. If the flow meters overrun because of air in the system, operation will stop. Repeatedly set the operator switch to MIX to STANDBY to PURGE to STANDBY and back to MIX to clear the alarm and continue operation.

Continued on the next page.

Operation

Starting Production (continued)

9. If the fluid output is too low, increase the air pressure on both supply tanks or increase the regulated fluid pressure. If the fluid output is too high, reduce the air pressure, close the dispense valves further, or adjust the fluid pressure regulator.

⚠ CAUTION

Do not use the first 4 to 5 oz. (120 to 150 ml) of material from the system, as it may not be thoroughly mixed due to alarms while loading material into the system.

10. Check the air pressure regulators on the fluid supply tanks. The fluid flow rate at the spray gun should be the same regardless of whether the Component A or B dispense valves are open. The pressure adjustments of each component will vary with each components viscosity. In general, start with the same feed pressures for Component A and B.

11. Check or reset the air regulator in the atomizing air line.

12. Check or reset the (optional) fluid pressure regulator on the static mixer outlet. Use the adjustment key to adjust the regulator.

13. Operation of the PrecisionMix is controlled by the operation of the spray gun. When the gun is triggered, the dispense valves open and allow Components A and B to enter the mix manifold and be mixed and dispensed to the gun.

Monitoring the Fluid Supply

The PrecisionMix controller is equipped with software to monitor the amount of fluid used from a tank or pressure pot and shut down the system and provide an alarm when a limit is reached. See the Tank Volume screen on page 27 to set these limits.

NOTES:

- If required, switch on the supply tank agitators briefly whenever the fluid needs stirring. Over-agitating can cause air entrainment.

- Periodically check the fluid level of Component A, Component B, and solvent in the fluid supply tanks. Refill the tanks as necessary and reset the tank volume settings if that feature is used; see page 27.

⚠ CAUTION

Never allow the fluid supply tanks to empty completely while the PrecisionMix is operating. Fill them periodically, as needed. Failure to fill the tanks when they are low may cause the metering ratios to be incorrect.

Stopping Production

⚠ WARNING

INJECTION HAZARD
To reduce the risk of a serious injury, follow the **Pressure Relief Procedure** on page 15 whenever you:

- are instructed to relieve the pressure,
- stop spraying,
- check or service any of the system equipment,
- install or clean the spray tip.

Stop production at any time by setting the operator switch to STANDBY. If your stop time will not exceed the pot life of Component A or B, no additional action is needed, except to relieve the system pressure. If your stop time will exceed the pot life, you must purge the mixing system. See **Purging the PrecisionMix System**, page 20.

Operation

Manual Color Change or System Purge

⚠ WARNING

INJECTION HAZARD
To reduce the risk of a serious injury, follow the **Pressure Relief Procedure** on page 15 whenever you:

- are instructed to relieve the pressure,
- stop spraying,
- check or service any of the system equipment,
- install or clean the spray tip.

Follow this procedure before using the PrecisionMix system for the first time and before changing the color of the paint.

NOTE: For other color change options, contact your Graco representative.

1. Turn off the PrecisionMix main power switch.
2. Relieve the pressure on both dispense valves.
3. Disconnect the Component A and B fluid supplies, and connect regulated solvent supply lines in their place.
4. Turn on the main power switch, and set the operator switch to MIX.
5. Trigger the spray gun into a grounded waste container until the solvent comes out clear.
6. Turn off the Precision Mix main power switch and set the operator switch to STANDBY.
7. Relieve the pressure.
8. Disconnect the solvent supply from the filter inlets, and connect the new color in its place, then reconnect the catalyst supply line.
9. Using the procedure for **Setting Parameters**, below, change the ratio and other parameters to the new values.
10. Turn on the PrecisionMix main power switch and set the operator switch to MIX.
11. Start production. See page 21.

Setting Parameters

NOTE: See the Screen Maps, pages 24 and 25, for guidance.

To set parameters you must have a black pendant, which allows you to use the unmarked key to the right of F4. Pushing this key displays the revision screen with the choices: RUN, SETUP, BAT and GTOT.

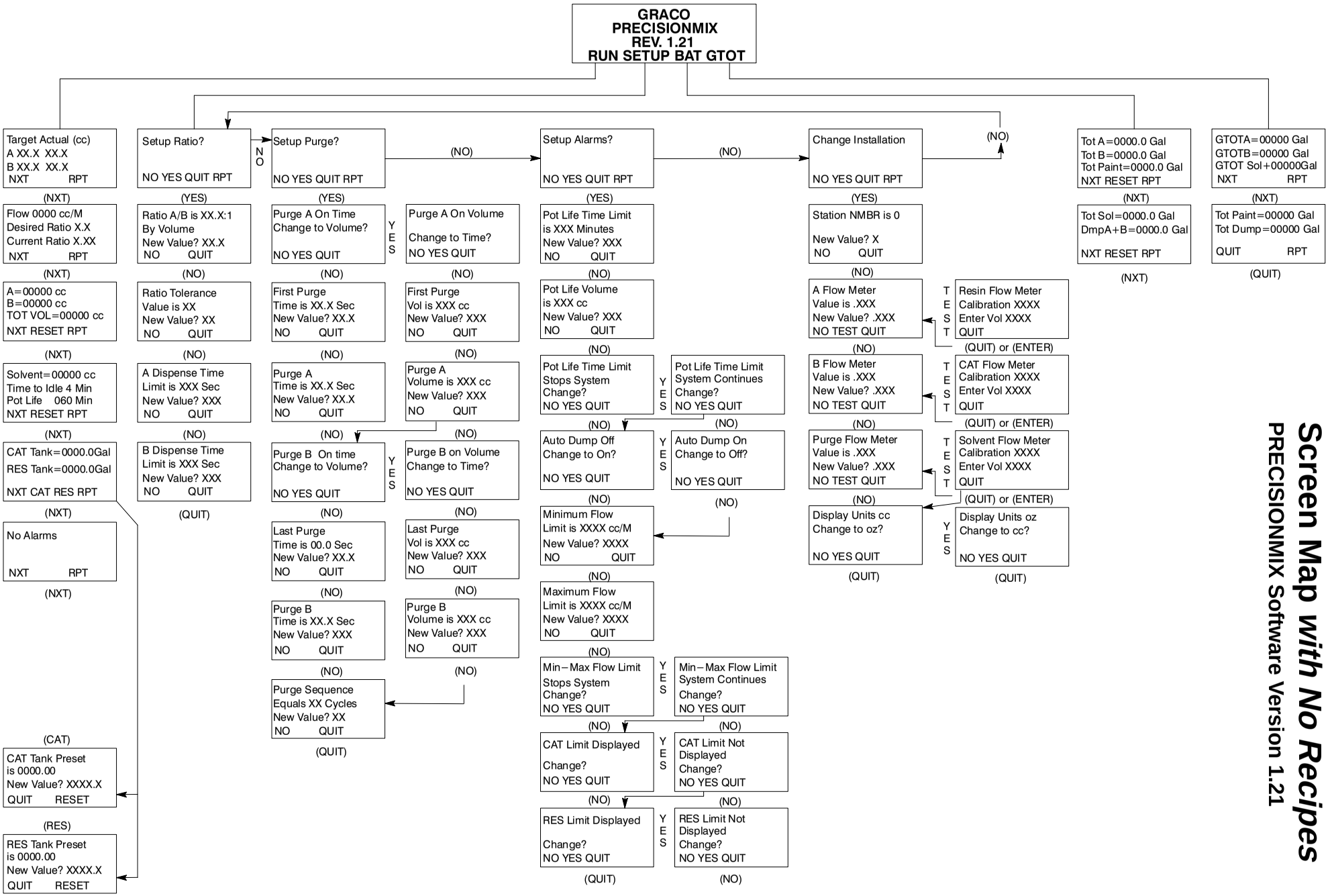
Pushing the SETUP key displays the first of several screens for setting up or changing parameters.

Setup pendant screens are described on pages 26 to 39.

Maintenance

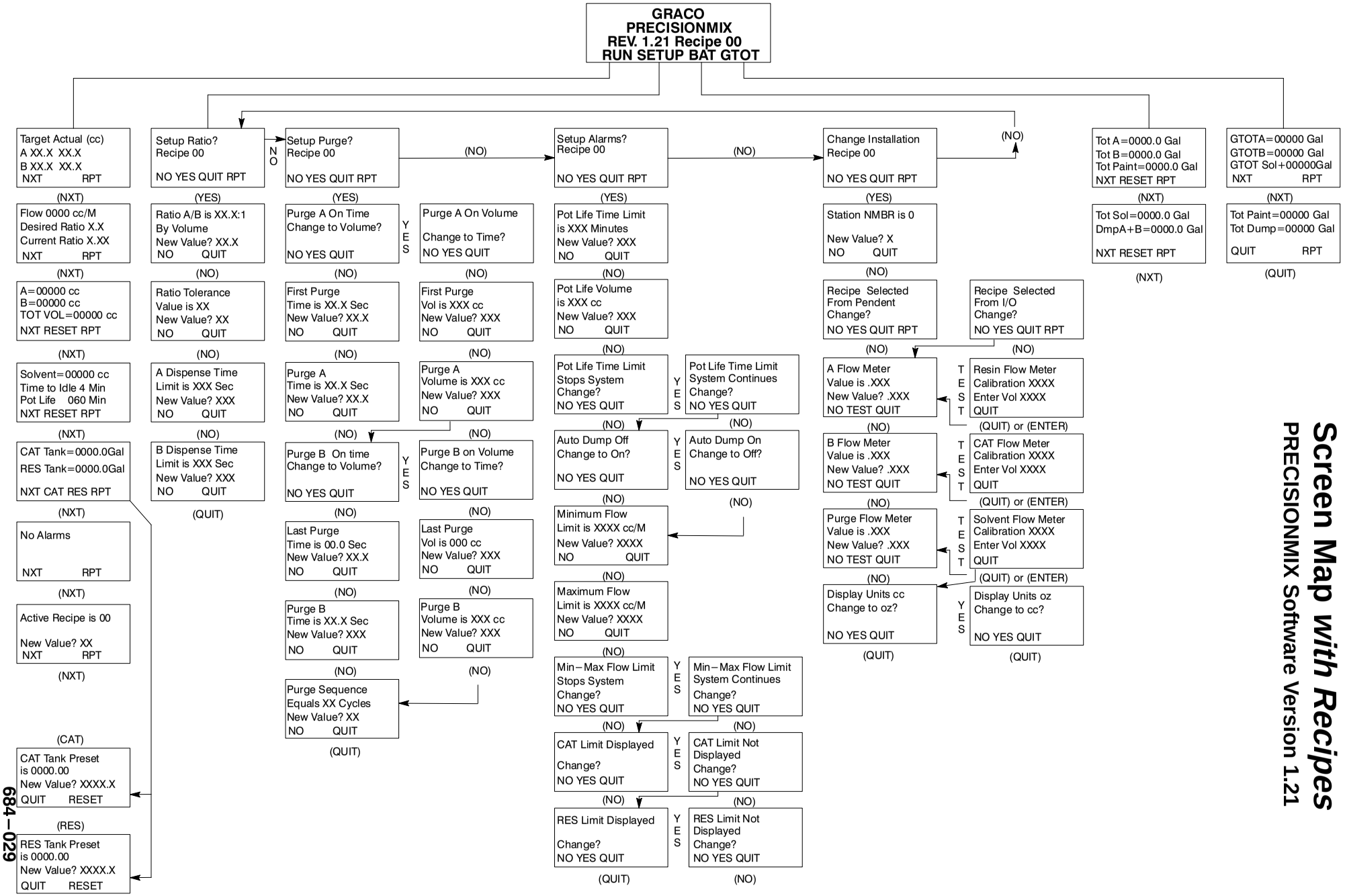
The PrecisionMix Controller requires no regular maintenance. However, it is a good practice to check with Graco periodically to see if hardware or software updates are available.

NOTE: The Controller battery should be changed every 5 to 7 years. Contact your Graco representative for information on ordering and replacing the battery.



Screen Map *with No Recipes*

PRECISIONMIX Software Version 1.21


GRACO
PRECISIONMIX
REV. 1.21 Recipe 00
RUN SETUP BAT GTOT
Target Actual (cc)
A XX.X XX.X
B XX.X XX.X
NXT RPT
(NXT)
Flow 0000 cc/M
Desired Ratio X.X
Current Ratio X.XX
NXT RPT
(NXT)
A=00000 cc
B=00000 cc
TOT VOL=00000 cc
NXT RESET RPT
(NXT)
Solvent=00000 cc
Time to Idle 4 Min
Pot Life 060 Min
NXT RESET RPT
(NXT)
CAT Tank=0000.0Gal
RES Tank=0000.0Gal
NXT CAT RES RPT
(NXT)
No Alarms
NXT RPT
(NXT)
Active Recipe is 00
New Value? XX
NXT RPT
(NXT)
(CAT)
CAT Tank Preset
is 0000.00
New Value? XXXX.X
QUIT RESET
(RES)
RES Tank Preset
is 0000.00
New Value? XXXX.X
QUIT RESET
Setup Ratio?
Recipe 00
NO YES QUIT RPT
NO
(YES)
Ratio A/B is XX.X:1
By Volume
New Value? XX.X
NO QUIT
(NO)
Ratio Tolerance
Value is XX
New Value? XX
NO QUIT
(NO)
A Dispense Time
Limit is XXX Sec
New Value? XXX
NO QUIT
(NO)
B Dispense Time
Limit is XXX Sec
New Value? XXX
NO QUIT
(QUIT)
Setup Purge?
Recipe 00
NO YES QUIT RPT
(YES)
Purge A On Time
Change to Volume?
NO YES QUIT
YES
Purge A On Volume
Change to Time?
NO YES QUIT
(NO)
First Purge
Time is XX.X Sec
New Value? XX.X
NO QUIT
(NO)
First Purge
Vol is XXX cc
New Value? XXX
NO QUIT
(NO)
Purge A
Time is XX.X Sec
New Value? XX.X
NO QUIT
(NO)
Purge A
Volume is XXX cc
New Value? XXX
NO QUIT
(NO)
Purge B On time
Change to Volume?
NO YES QUIT
YES
Purge B on Volume
Change to Time?
NO YES QUIT
(NO)
Last Purge
Time is 00.0 Sec
New Value? XX.X
NO QUIT
(NO)
Last Purge
Vol is 000 cc
New Value? XXX
NO QUIT
(NO)
Purge B
Time is XX.X Sec
New Value? XXX
NO QUIT
(NO)
Purge B
Volume is XXX cc
New Value? XXX
NO QUIT
(NO)
Purge Sequence
Equals XX Cycles
New Value? XX
NO QUIT
(QUIT)
(NO)
Setup Alarms?
Recipe 00
NO YES QUIT RPT
(YES)
Pot Life Time Limit
is XXX Minutes
New Value? XXX
NO QUIT
(NO)
Pot Life Volume
is XXX cc
New Value? XXX
NO QUIT
(NO)
Pot Life Time Limit
Stops System
Change?
NO YES QUIT
YES
Pot Life Time Limit
System Continues
Change?
NO YES QUIT
(NO)
Auto Dump Off
Change to On?
NO YES QUIT
YES
Auto Dump On
Change to Off?
NO YES QUIT
(NO)
Minimum Flow
Limit is XXXX cc/M
New Value? XXXX
NO QUIT
(NO)
Maximum Flow
Limit is XXXX cc/M
New Value? XXXX
NO QUIT
(NO)
Min−Max Flow Limit
Stops System
Change?
NO YES QUIT
YES
Min−Max Flow Limit
System Continues
Change?
NO YES QUIT
(NO)
CAT Limit Displayed
Change?
NO YES QUIT
YES
CAT Limit Not
Displayed
Change?
NO YES QUIT
(NO)
RES Limit Displayed
Change?
NO YES QUIT
YES
RES Limit Not
Displayed
Change?
NO YES QUIT
(QUIT)
(NO)
Change Installation
Recipe 00
NO YES QUIT RPT
(YES)
Station NMBR is 0
New Value? X
NO QUIT
(NO)
Recipe Selected
From Pendent
Change?
NO YES QUIT RPT
(NO)
A Flow Meter
Value is .XXX
New Value? .XXX
NO TEST QUIT
TEST
Resin Flow Meter
Calibration XXXX
Enter Vol XXXX
QUIT
(QUIT) or (ENTER)
(NO)
B Flow Meter
Value is .XXX
New Value? .XXX
NO TEST QUIT
TEST
CAT Flow Meter
Calibration XXXX
Enter Vol XXXX
QUIT
(QUIT) or (ENTER)
(NO)
Purge Flow Meter
Value is .XXX
New Value? .XXX
NO TEST QUIT
TEST
Solvent Flow Meter
Calibration XXXX
Enter Vol XXXX
QUIT
(QUIT) or (ENTER)
(NO)
Display Units cc
Change to oz?
NO YES QUIT
YES
Display Units oz
Change to cc?
NO YES QUIT
(QUIT)
(QUIT)
Recipe Selected
From I/O
Change?
NO YES QUIT RPT
(NO)
Tot A=0000.0 Gal
Tot B=0000.0 Gal
Tot Paint=0000.0 Gal
NXT RESET RPT
(NXT)
Tot Sol=0000.0 Gal
DmpA+B=0000.0 Gal
NXT RESET RPT
(NXT)
GTOTA=00000 Gal
GTOTB=00000 Gal
GTOT Sol+00000Gal
NXT RPT
(NXT)
Tot Paint=00000 Gal
Tot Dump=00000 Gal
QUIT RPT
(QUIT)

Pendant Screens

NOTE: The NXT key will move you to the next screen that is shown in the sequences that follows, unless otherwise indicated.

Run Screens

Target/Actual Display

```
TARGET      ACTUAL (cc)
A   XX.X    XX.X
B   XX.X    XX.X
NXT                RPT
```

Press NXT

TARGET (left hand column) is the desired volumes of Component A and Component B that the controller will maintain.
ACTUAL (right hand column) shows the quantities of Component A and Component B as they are being dispensed.

Flow Rate/Ratio Display

```
FLOW 0000 cc/M
DESIRED RATIO X.X
CURRENT RATIO X.XX
NXT                RPT
```

Press NXT

FLOW is a real time display of how much flow is going through the system. It updates every two seconds and is a weighted average of the previous flow rate displays. The flow rate display can be altered in the setup program to read in ounces. See the **Display Units in cc or oz** screens on page 38.
DESIRED RATIO is the display of what ratio the unit is programmed to run at.
CURRENT RATIO is a display of what ratio the unit actually dispensed on the last cycle.

Component Totalizer

```
A=00000              cc
B=00000              cc
TOT VOL=00000  cc
NXT   RESET        RPT
```

Press NXT

Total volume of Component A (A=), Component B (B=), and Component A + B (TOT VOL=) are displayed. The Totalizers, volume of Component A, Component B, Component A + B, and Solvent are reset by pressing the RESET key or pressing the RPT key. This screen can be altered in the setup program to read in ounces. See the **Display Units in cc or oz** screens on page 38.

Total Solvent, Idle and Pot Life

```
SOLVENT=00000        cc
TIME TO IDLE  4 MIN
POT LIFE XXX MIN
NXT   RESET        RPT
```

After 4 minutes, the following screen will appear:

```
SYSTEM IDLE
POT LIFE REMAINING
XXX MIN
```

Trigger the gun to bring the system out of the idle mode.

To use total SOLVENT, you must have an optional flow meter installed on the PrecisionMix solvent inlet. The Totalizers, volume of Component A, Component B, Component A + B, and Solvent are reset by pressing the RESET key or pressing the RPT key.
TIME TO IDLE is a 4 minute clock that counts down the time that the spray device is not in use. After 4 minutes of not triggering the spray device, the mix manifold closes and the screen changes to the SYSTEM IDLE screen. When the spray device is triggered, the PrecisionMix will start again where it left off.
POT LIFE REMAINING displays how long the mixed fluid has been sitting in the lines. If the unit is turned on and nothing has been mixed, the pot life will not count down.

Pendant Screens

Run Screens (continued)

Tank Volume

```
CAT TANK=0000.0 GAL
RES TANK=0000.0 GAL

NXT   CAT    RES     RPT
```

Press CAT or RES
(Press NXT to go to **Alarm** screen)

This screen can be used to display how much fluid is left in the catalyst feed tank (CAT TANK) and the resin feed tank (RES TANK). By pressing the CAT or RES key you will see a screen that looks like the one of the two following screens.

```
CAT TANK PRESET
IS 0000.0
NEW VALUE? XXXX.X
QUIT          RESET
```

or

```
RES TANK PRESET
IS 0000.0
NEW VALUE? XXXX.X
QUIT          RESET
```

Press QUIT

Enter a value that is less than the amount of fluid that is in the tank and press the ENTER key. The screen should now display the new value on line 2. If you want to use the same value that was previously displayed, press the RESET key. Press the QUIT key to go back to the previous **Tank Volume** screen.

As fluid is used from the tank, the value for the catalyst and resin tank will drop. When one or both of them reaches 0, the unit will stop and the alarm will display.

Alarm

```
NO ALARMS


NXT                   RPT
```

Press NXT

If an alarm is activated on the PrecisionMix, this screen automatically appears, displaying the alarm that occurred. See the alarm descriptions on pages 52 to 56. This screen holds the last three alarms. The most recent alarm will appear on the bottom of the screen.

NOTE: Printing a Run Report (press RPT) will clear the Alarm screen. Refer to page 41.

Current Recipe

```
ACTIVE RECIPE IS 00

NEW VALUE? XX
NXT                   RPT
```

Press unmarked key to get back to the **Main Title** screen. Press SETUP key to access the **Setup** screens.

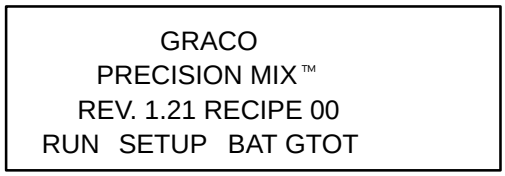
This screen only appears when the recipe portion of the program is turned on. This screen will show you the recipe the unit is currently running. For further information, see **Using the 32 Recipe Option** on page 46.

Pendant Screens

Setup Screens

NOTE: Entries made in the setup screens are buffered. When the QUIT key is pressed, returning you to the main title screen, the changes made in the setup mode are transferred to the battery-backed memory. Since the data used while operating is also buffered, changes made in the setup mode will not affect PrecisionMix operation until the operator switch is moved to the STANDBY position and then back to MIX, transferring the data from the battery-backed memory to the operating buffer.

Main Title Screen



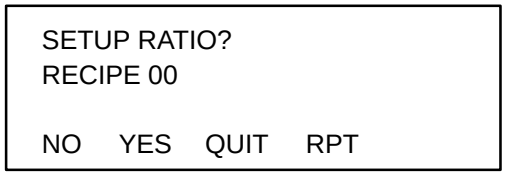
Press SETUP

This screen can only be accessed by pressing the unmarked key in the F5 location (to the far right) on the black pendent. The **Main Title** screen shows the revision (REV) number of the software. It will also show the present Recipe No. the PrecisionMix is operating with if the recipe portion of the program is turned on.

The language of the screens can be changed by pushing the [•] (period) key when you are at the **Main Title** screen. The four languages available are English, French, German, and Spanish.

From this screen, you can go into the Run, Setup, Batch Totalizer, Grand Totalizer and Clock screens.

Setup Ratio Title Screen

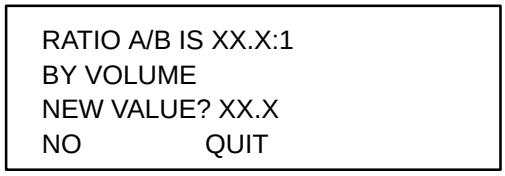


Press YES

If you want to change the program in the ratio category, press the YES key. If you do not want to change the program in the ratio category, press the NO key to move to the **Setup Purge Title** screen (on page 29). Press the QUIT key to return to the **Main Title** screen.

NOTE: RECIPE 00 only appears when the recipe portion of the program is activated.

Program Ratio



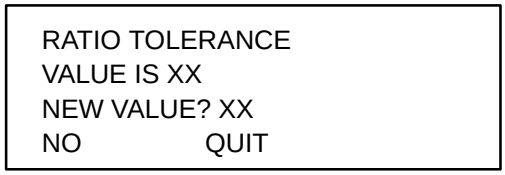
Press NO
(Press QUIT to return to **Setup Ratio Title** screen)

With this screen, you select the volumetric mix ratio at which the PrecisionMix will operate. The volume can be set from 0.0:1 to 99.9:1. The value of Component B is set at 1 and cannot be adjusted. If your B value does not equal one, you must convert the ratio.

Example: If a 3:2 ratio is desired, you would convert the ratio to 1.5:1. 1.5 parts of Component A would then be dispensed to every 1 part of Component B. To enter this value, press the 1, the decimal point, and the 5 on the pendant keyboard. Then press the ENTER key. The new value will display on the top line.

NOTE: 0.0:1 represents a one component dispense. The component A valve will remain open. The Component B valve will not open.

Ratio Tolerance



Press NO

With this screen, you select the tolerance of the ratio entered above. If this tolerance is exceeded, the PrecisionMix will shut down. The value can be set from ± 0 to 25 percent.

Example: If the mix ratio is 2:1 and the tolerance is 5%, when the PrecisionMix checks the ratio on each cycle, if the ratio is within 2.1:1 or 1.9:1, the system will continue to operate. If the ratio is not within those values, the system will shut down. To enter this value, press 0, then 5, and ENTER. The new value will display on line two.

Pendant Screens

Setup Screens (continued)

A Dispense Time

```
A DISPENSE TIME
LIMIT IS XXX SEC
NEW VALUE? XXX
NO          QUIT
```

This is a setable time limit that monitors the amount of time it takes from the beginning of the Component A dispense to the end. The clock counts down when the spray device is triggered and will reset once the dispense is completed. If the time elapses before the dispense is complete, the PrecisionMix will go to an alarm condition.

To enter a new value, type in the number on the key pad and press ENTER. The value can be set from 0 to 999 seconds. The time limit will display on line 2.

NOTE: This setting will not function properly if the air switch in the solenoid enclosure is not set correctly. See manual 308–297.

B Dispense Time

```
B DISPENSE TIME
LIMIT IS XXX SEC
NEW VALUE? XXX
NO          QUIT
```

Press QUIT

The B Dispense Time screen functions the same way as the A Dispense Time screen, except it is measuring the amount of time it takes to dispense Component B.

Setup Purge Title Screen

```
SETUP PURGE?
RECIPE 00

NO   YES   QUIT   RPT
```

Press YES

If you want to change the program in the purge category, press the YES key. See page 31 for the recommended settings. If you do not want to change the program in the purge category, press the NO key to move to the **Setup Alarms Title** screen (on page 32). Press the QUIT key to return to the **Main Title** screen.

NOTE: RECIPE 00 only appears when the recipe portion of the program is activated. Compare the screen maps on pages 24 and 25 to see the differences in the screens when the recipes are activated.

Purge Component A on Time or Volume

```
PURGE A ON TIME
CHANGE TO VOLUME?

NO   YES   QUIT
```

Press NO to keep on TIME
Press YES to change to VOLUME

With this screen, you select how the Component A portion of the purge sequence will count down, by time or by volume. To purge by volume, you must have a flow meter in line with the PrecisionMix Component A purge valve.

NOTE: The Component A purge is usually done with air. If air is used, this function must be set on time as there will not be a meter to measure air volume.

Pendant Screens

Setup Screens (continued)

NOTE: The following screens show what will appear if purge is setup for time, first, and the screen that will appear if setup for volume, second.

First Dispense of the Purge Sequence

```
FIRST PURGE
TIME IS XX.X SEC
NEW VALUE? XX.X
NO          QUIT
```

or

```
FIRST PURGE
VOL IS XXX cc
NEW VALUE? XXX
NO          QUIT
```

Press NO

The first dispense of the purge sequence blows the mixed material line clear with air and is always dispensed on the Component A side. The first dispense is a setable time or volume; refer to the **Purge Component A on Time or Volume** screen.

To enter a new value, key in the number and press ENTER. The value can be set from 0 to 99.9 seconds or 0 to 999 cubic centimeters. It will display on line two.

Purge Component A

```
PURGE A
TIME IS XX.X SEC
NEW VALUE? XX.X
NO          QUIT
```

or

```
PURGE A
VOLUME IS XXX cc
NEW VALUE? XXX
NO          QUIT
```

Press NO

The purge sequence activates two purge valves, one for Component A and one for Component B, alternating on and off. The value you enter for PURGE A determines how long the Component A purge valve is open for its dispense cycle during the purge sequence, with the exception of the first and last purge, which have their own values.

To enter a new value, key in the number and press ENTER. The value can be set from 0 to 99.9 seconds or 0 to 999 cubic centimeters. It will display on line two.

Purge Component B on Time or Volume

```
PURGE B ON TIME
CHANGE TO VOLUME?

NO   YES   QUIT
```

Press NO to keep on TIME
Press YES to change to VOLUME

With this screen, you select how the Component B portion of the purge sequence will count down, by time or by volume. To purge by volume, you must have a flow meter in line with the PrecisionMix Component B purge valve. This screen functions the same as the Purge Component A selection screen.

Pendant Screens

Setup Screens (continued)

Last Dispense of the Purge Sequence

```
LAST PURGE
TIME IS XX.X SEC
NEW VALUE? XX.X
NO          QUIT
```

or

```
LAST PURGE
VOL IS XXX cc
NEW VALUE? XXX
NO          QUIT
```

Press NO

The last dispense of the purge sequence fills the mixed material line with solvent and is always dispensed on the Component B side. The last dispense is a setable time or volume.

To enter a new value, key in the number and press ENTER. The value can be set from 0 to 99.9 seconds or 0 to 999 cubic centimeters. It will display on line two.

Purge Component B

```
PURGE B
TIME IS XX.X SEC
NEW VALUE? XX.X
NO          QUIT
```

or

```
PURGE B
VOLUME IS XXX cc
NEW VALUE? XXX
NO          QUIT
```

Press NO

The value you enter for PURGE B determines how long the Component B purge valve is open for its dispense cycle during the purge sequence.

To enter a new value, key in the number and press ENTER. The new value will display on line two. The value can be set from 0 to 99.9 seconds or 0 to 999 cubic centimeters. It will display on line two.

Number of Purge Cycles

```
PURGE SEQUENCE
EQUALS XX CYCLES
NEW VALUE? XX
NO          QUIT
```

Press NO
(Press QUIT to return to **Setup Ratio Title** screen)

With this screen, you select how many times the purge sequence shifts between Component A purge and Component B purge when the Operator Switch is set to PURGE. The value can be set from 0 to 99 cycles.

NOTE: At the end of the purge cycle, the purge sequence will immediately stop and a message requesting a change to STAND-BY will be displayed on the pendant.

Initial Recommended Purge Sequence

Set the time as follows:

1. FIRST PURGE: Equal to the amount of time it takes to push the air to the tip of the spray gun
2. PURGE A: 2.0 seconds
3. PURGE B: 2.0 seconds
4. LAST PURGE: Equal to the amount of time it takes to dispense a steady stream of clean solvent from the spray gun
5. PURGE SEQUENCE CYCLES (A and B): Start with 10 cycles. Adjust the number up or down until you arrive at the number of cycles it takes to clean the fluid hose.

Pendant Screens

Setup Screens (continued)

Setup Alarms Title Screen

```
SETUP ALARMS?
RECIPE 00

NO    YES    QUIT    RPT
```

Press YES

If you want to change the program in the alarms category, press the YES key. If you do not want to change the program in the alarms category, press the NO key to move to the **Change Installation Title** screen (on page 35). Press the QUIT key to return to the **Main Title** screen.

NOTE: RECIPE 00 only appears when the recipe portion of the program is activated. Compare the screen maps on pages 24 and 25 to see the differences in the screens when the recipes are activated.

Pot Life Time Limit

```
POT LIFE TIME LIMIT
IS XXX MINUTES
NEW VALUE? XXX
NO              QUIT
```

Press NO

With this screen, you set the maximum time allowed for mixed fluid to sit in the system before tripping a pot life alarm. Enter a time value that represents the fluid while it is still at its normal viscosity.

To enter a new value, key in a number and press ENTER. The value can be set from 0 to 999 minutes. It will display on line two.

NOTE: The pot life timer is reset either by a purge, or by the passage of a specified amount of fluid.

Pot Life Reset Volume

```
POT LIFE VOLUME
IS XXX cc
NEW VALUE? XXX
NO              QUIT
```

Press NO

With this screen, you set the volume of fluid the PrecisionMix will mix before the pot life timer resets. Enter a value that represents the volume of mixed fluid that is in the integrator, hoses, and guns.

To enter a new value, key in a number and press ENTER. The value can be set from 0 to 999 cubic centimeters. It will display on line two.

Pot Life Alarm

```
POT LIFE TIME LIMIT
STOPS SYSTEM
CHANGE?
NO    YES    QUIT
```

or

```
POT LIFE TIME LIMIT
SYSTEM CONTINUES
CHANGE?
NO    YES    QUIT
```

Press NO

These screens allow you to select to have the pot life alarm stop the system or allow it to continue operating. In either case, the alarm light on the pendant blinks, the alarm annuciator output goes on, and the relevant alarm message is displayed on the pendant. When the pot life alarm is reset by either a purge or the movement of the specified amount of fluid, the alarm light will go out, the alarm output will go off, and the display will return to the **Target/Actual** screen (on page 26).

Pendant Screens

Setup Screens (continued)

Automatic Dump

```
AUTO DUMP OFF
CHANGE TO ON?

NO    YES    QUIT
```

or

```
AUTO DUMP ON
CHANGE TO OFF?

NO    YES    QUIT
```

Press NO

These screens allow you to turn the automatic dump feature on or off. This would only apply to systems with a dump solenoid in the solenoid enclosure and a pneumatic dump valve installed on the outlet of the PrecisionMix static mixer. A separate output is provided to actuate the dump valve. When turned on, the AUTO DUMP will automatically turn on the dump valve and turn on the purge sequence two minutes after a pot life alarm occurs. This feature would be used to protect the PrecisionMix fluid components, alone, from having mixed fluid in them older than the specified pot life; the fluid hoses and guns are not protected.

Minimum Flow Rate Limit

NOTE: Flow rate calculations are based on time and take several seconds to stabilize. Calculation by the PrecisionMix computer is initiated and terminated by activation or deactivation of the air flow switch in the solenoid enclosure. Constant triggering and de-triggering of the spray device may make this feature difficult to use except in continuous, automatic painting operations.

```
MINIMUM FLOW
LIMIT IS XXXX cc/M
NEW VALUE? XXXX
NO          QUIT
```

Press NO

With this screen, you set the minimum allowable flow rate of the Precision Mix. Minimum flow rate is calculated by measuring the total time of a cycle. If the flow rate drops below the allowable setting, an alarm will activate. If you do not want to use this feature, set the value to 0000 cc/M.

To enter a new value, key in a number and press ENTER. The value can be set from 0 to 9999 cubic centimeters per minute. It will display on line two**.**

NOTE: The MINIMUM FLOW LIMIT setting uses the information from the flow rate display and will not activate the alarm if the spray device is turned off or the flow rate drops below the setting for less than two flow rate checks.

Maximum Flow Rate Limit

```
MAXIMUM FLOW
LIMIT IS XXXX cc/M
NEW VALUE? XXXX
NO          QUIT
```

Press NO

With this screen, you set the maximum allowable flow rate of the Precision Mix. Maximum flow rate is calculated by measuring the total time of a cycle. If the flow rate exceeds the allowable setting, an alarm will activate. If you do not want to use this feature, set the value to 9999 cc/M.

To enter a new value, key in a number and press ENTER. The value can be set from 0 to 9999 cubic centimeters per minute. It will display on line two. (The standard PrecisionMix is rated for 2000 cc/minute maximum fluid flow.)

NOTE: The MAXIMUM FLOW LIMIT setting uses the information from the flow rate display and will not activate the alarm if the spray device is turned off or the flow rate exceeds the setting for less than two flow rate checks.

Pendant Screens

Setup Screens (continued)

Minimum and Maximum Flow Rate Limit

```
MIN–MAX FLOW LIMIT
STOPS SYSTEM
CHANGE?
NO    YES    QUIT
```

or

```
MIN–MAX FLOW LIMIT
SYSTEM CONTINUES
CHANGE?
NO    YES    QUIT
```

Press NO

These screens allow you to select to have the minimum or maximum flow limit alarm stop the system or allow it to continue operating. This alarm occurs when the flow rate exceeds the limits set by the MIN–MAX FLOW LIMIT entries. In either case, the alarm light on the pendant blinks, the alarm annuciator output goes on, and the relevant alarm message is displayed on the pendant. When the MIN–MAX FLOW LIMIT is reset by returning within the limits set, the alarm light will go out, the alarm output will go off, and the display will return to the **Target/Actual** screen (on page 26).

Catalyst Tank Limit Display

```
CAT LIMIT DISPLAYED

CHANGE?
NO    YES    QUIT
```

or

```
CAT LIMIT NOT DISPLAYED

CHANGE?
NO    YES    QUIT
```

Press NO

These two screens allow you to select whether the Catalyst Tank Volume feature in the run screen (refer to page 27) is turned on or off. If it is turned off, the catalyst tank display will not appear in the run screens.

Resin Tank Limit Display

```
RES LIMIT DISPLAYED

CHANGE?
NO    YES    QUIT
```

or

```
RES LIMIT NOT DISPLAYED

CHANGE?
NO    YES    QUIT
```

Press NO

These two screens allow you to select whether the Resin Tank Volume feature in the run screen (refer to page 27) is turned on or off. If it is turned off, the resin tank display will not appear in the run screens.

Pendant Screens

Setup Screens (continued)

Change Installation Title Screen

```
CHANGE INSTALLATION?
RECIPE 00

NO    YES    QUIT
```

Press YES

If you want to change the program in the installation category, press the YES key. If you do not want to change the program in the installation category, press the NO key to return to the **Setup Ratio Title** screen (on page 28). Press the QUIT key to return to the **Main Title** screen.

NOTE: RECIPE 00 only appears when the recipe portion of the program is activated.

PrecisionMix Identification Number

```
STATION NMBR IS 0

NEW VALUE? X
NO              QUIT
```

Press NO

With this screen, you can set a specific ID number for the PrecisionMix. You will need to use this feature when there are multiple PrecisionMix units connected to one printer. The ID number you choose will identify a specific PrecisionMix unit and will print out on the Run Report and the Setup Report; see page 41 and 42. Station #0 is the default. It cannot be used when multiple units are connected to one printer. When station #1 to 8 are used, a (@U10) message will appear on line one of the printed reports; this is normal.

To change the station number, key in the new value and press ENTER. The new number will display on line one.

Recipe Input Select

```
RECIPE SELECTED
FROM PENDENT
CHANGE?
NO    YES    QUIT    RPT
```

or

```
RECIPE SELECTED
FROM I/O
CHANGE?
NO    YES    QUIT    RPT
```

Press NO

These two screens only appear when the recipe portion of the program is turned on. They allow you to select whether different recipes will be set by the pendent or by an outside source (I/O), such as a programmable logic controller or an operator switch. Whatever is selected will globally change for all recipes.

Pendant Screens

Setup Screens (continued)

Component A Flow Meter Calibration Factor

```
A FLOWMETER
VALUE IS .XXX
NEW VALUE? .XXX
NO    TEST  QUIT
```

Press NO to go to **Component B Flow Meter Calibration Factor** screen.
Press TEST to go to next screen.

Since flow meters come in different sizes, it is necessary to tell the Precision Mix Controller the size of the flow meters so it can properly read the electrical pulse the flow meter sends to it. With this screen, you input the size of the Component A flow meter. The flow meter size must be entered in cubic centimeters per electrical pulse. The number you enter must be a 3 digit decimal, but do not enter the decimal point.

Example: If the electrical pulse of the A FLOWMETER equals 0.230 cc, you would press the 2, the 3, and the 0 on the pendant keyboard. Then press ENTER. The new value will display on line two.

See manual 308–243 for the available flow meter sizes. If you do not know the size of the flow meter or do not feel your valves are accurate, go to the **Flow Meter Calibration Test** screen on page 37.

⚠ CAUTION

Before pressing the TEST key, close both the Component A and Component B fluid shut-off valves. The fluids must be shut off as pressing the TEST key will automatically open the dispense valve for the meter being tested.

Pendant Screens

Setup Screens (continued)

Resin Flow Meter Calibration Test

```
RESIN FLOWMETER
CALIBRATION XXXX
ENTER VOL XXXX
QUIT
```

⚠ CAUTION

Both the Component A and Component B fluid shut-off valves must be closed if you choose to use this screen. Pressing the TEST key will automatically open the dispense valve for the meter being tested.

This screen allows you to produce a custom calibration factor for the Component A (resin) flow meter. To find the proper calibration factor, follow the ratio check procedure below.

NOTE: Take a large sample (1000 cc or more) of a fluid that is a known accurate weight per gallon so that any error in measuring the sample is spread out.

Ratio Check

1. Close both the Component A and Component B fluid shut-off valves.
2. Place a container under the resin ratio check valve tube.
3. Open the resin ratio check valve. Make sure there is no air in the ratio check port by pressing the TEST key to dispense about 50 cc. of Component A into the container.
4. Close the ratio check valve.
5. Press the QUIT key.
6. Weight a clean container and record the weight.
7. Place the container under the ratio check valve tube.
8. Press the TEST key.
9. Open the Component A ratio check valve. Allow a large sample of the fluid to flow into the container (see the **NOTE** above).
10. Close the ratio check valve when the sample is dispensed.
11. Weight the sample and calculate how many cubic centimeters of fluid was dispensed.
12. Calculate the theoretical dispensed weight and compare to the actual dispensed weight. If there is a difference between the two values, contact your material supplier for advice and assistance. The coating material may have entrained air due to agitation and/or pressurization. This condition will cause off ratio mixing.
13. Continue to the Component B flow meter calibration test or:
    a. Flush the ratio check valves.
    b. Open the manifold shut-off valves.
    a. Return to the Run Screen to begin production.

On line two of the Flow Meter Test screen there will be a number that represents how much fluid the PrecisionMix determined was dispensed, based on the previously entered calibration factor.

To enter a new calibration factor, key in the amount of fluid actually dispensed (three or four digit number in cc) and press ENTER. This will take you back to the Component A Flow Meter Calibration Factor screen, shown on page 36. The new calibration factor will display on line two.

Pendant Screens

Setup Screens (continued)

Component B Flow Meter Calibration Factor

```
B FLOWMETER
VALUE IS .XXX
NEW VALUE? .XXX
NO   TEST  QUIT
```

Press TEST

```
CAT FLOWMETER
CALIBRATION XXXX
ENTER VOL XXXX
QUIT
```

The **Component B Flow Meter Calibration Factor** screens and the **Solvent Flow Meter Calibration Factor** screens function the same as the **Component A Flow Meter Calibration Factor** screen on page 36. To set the calibration factor, follow the instructions there, substituting Component B (catalyst) for Component A (resin). The solvent flow meter operates in conjunction with the Component B ratio check valve.

⚠ CAUTION

Before pressing the TEST key, close both the Component A and Component B fluid shut-off valves. The fluids must be shut off as pressing the TEST key will automatically open the dispense valve for the meter being tested.

Purge/Solvent Flow Meter Calibration Factor

```
PURGE FLOWMETER
VALUE IS .XXX
NEW VALUE? .XXX
NO   TEST  QUIT
```

Press TEST

```
SOLVENT FLOWMETER
CALIBRATION XXXX
ENTER VOL XXXX
QUIT
```

NOTE: After completing the Flow Meter Tests, flush the ratio check valves and open the fluid shut-off valves before operating the PrecisionMix again.

Display Units in cc or oz

```
DISPLAY UNITS cc
CHANGE TO oz?

NO   YES   QUIT
```

or

```
DISPLAY UNITS oz
CHANGE TO cc?

NO   YES   QUIT
```

These two screens allow you to select whether the Run Screen, Totalizers, Run Screen Flow Rate, Target/Actual, Purge by Volume Inputs, Pot Life Reset Volume Input, Minimum Flow Rate Input and Maximum Flow Rate Input displays in cubic centimeters units or ounces units.

Press QUIT until you are at the **Main Title** screen. Then press BAT to go to **Batch Totalizer** screens.

Pendant Screens

Batch Totalizer Screens

The Batch Totalizers are resettable. They keep a running total in gallons of the fluid dispensed until they are manually set back to zero by pressing the RESET key.

Batch Totalizer Component

```
TOTAL A=0000.0 GAL
TOTAL B=0000.0 GAL
TOT PAINT=0000.0 GAL
NXT   RESET          RPT
```

Press NXT

This screen displays the batch total volume of Component A (TOTAL A), Component B (TOTAL B), and Component A + B (TOT PAINT). Press the RESET key to set the totalizers back to zero.

Batch Total Solvent and Total Component Dump

```
TOTAL SOL=0000.0 GAL
TOT DMP A+B=0000.0 G

NXT   RESET          RPT
```

Press NXT
Press GTOT at **Main Title** screen to go to **Grand Totalizer** screens

The solvent totalizer (TOTAL SOL) will totalize all the fluid that passes through the solvent flow meter in the dump mode. To use the solvent totalizer, you must have a flow meter on the PrecisionMix solvent inlet. The dump totalizer (TOT DMP A+B) will totalize all the fluid that passes through the resin and catalyst flow meters in the dump mode. To use the dump totalizer, input #14 on the I/O board must be turned on. Press the RESET key to set the totalizers back to zero.

Grand Totalizer Screens

The Grand Totalizers are not resettable. They keep a running total in gallons of all the fluid dispensed by the system. Grand totalizers are common for all recipes.

Grand Totalizer Component

```
GTOTAL A=00000 GAL
GTOTAL B=00000 GAL
GTOT SOL=000000 GAL
NXT                  RPT
```

Press NXT

This screen displays the grand total volume of Component A (GTOTAL A), Component B (GTOTAL B), and Solvent (GTOT SOL). To use the solvent grand totalizer (GTOT SOL), you must have a flow meter on the PrecisionMix solvent inlet.

Grand Total Paint and Total Component Dump

```
TOT PAINT=00000 GAL
TOT DUMP=00000 GAL

QUIT                 RPT
```

Press QUIT to go to **Main Title** screen

The paint grand totalizer (TOT PAINT) will totalize all the fluid that passes through the resin and catalyst flow meters in the paint mode. The dump grand totalizer (TOT DUMP) will totalize all the fluid that passes through the resin and catalyst flow meters in the dump mode. To use the paint or dump grand totalizers, input #14 on the I/O board must be turned on.

Setting the Clock

The PrecisionMix Controller has an internal clock which allows the operator to display the year, month, day, hour, and minute of each report and each alarm. Once set, the clock will continue to run whether the PrecisionMix controller is on or off.

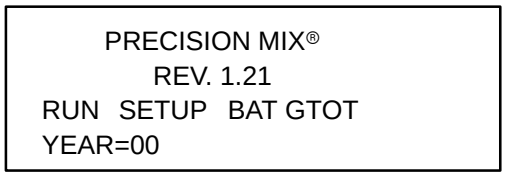
NOTE: The PrecisionMix must be in the STANDBY mode before setting the clock.

To set the clock:

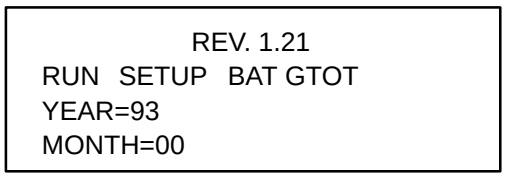
1. Turn the Operator Switch to STANDBY.

2. Press the blank key in the upper right corner of the pendant once, to get to the Main Title screen.

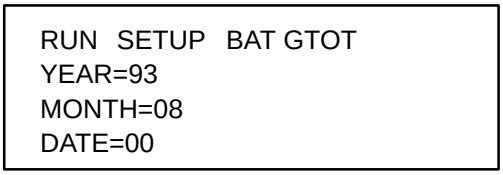
3. Press the blank key once again to get into the clock setup mode.



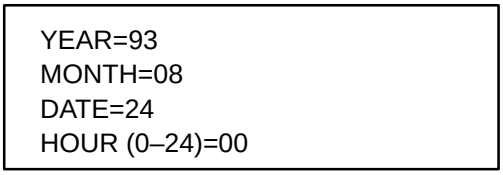
4. Enter a two digit value (year) and the pendant will automatically scroll to the next screen.



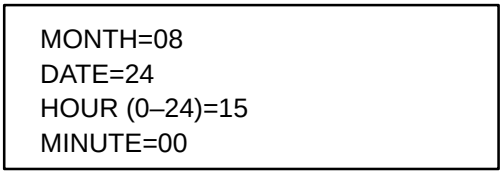
5. Enter a two digit value (month) and the pendant will automatically scroll to the next screen.



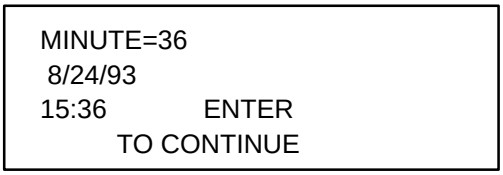
6. Enter a two digit value (date) and the pendant will automatically scroll to the next screen.



7. Enter a two digit value in military time and the pendant will automatically scroll to the next screen.



8. Enter a two digit value (minutes) and the pendant will automatically scroll to the next screen.



9. Press ENTER and the screen will return to the Main Title screen.

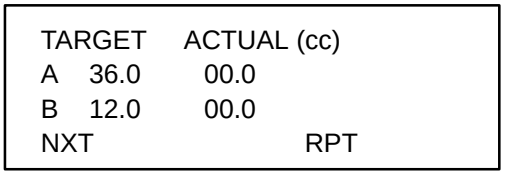
Printer Run Mode Report

The Run Mode Report can be output on a printer that is connected to the PrecisionMix. The report will list the information that can be accessed on the pendant Run screens. The ratio, flow rate, total, and grand total values will show what the PrecisionMix is producing at the time the report was printed.

To print the Run Mode Report, you must be at one of the five run mode screens, where one of the choices on the pendant is RPT. Press the RPT (F4) key to print out the report. The Run Mode Report can also be printed when input module #9 on the I/O board is activated.

NOTE: The PrecisionMix does not have to be in the spray mode to print the report.

Example: Setup Ratio Title Screen



Press RPT (F4)

The printer will print a report that is similar to the report at right, only it will show the values on your system.

NOTE: If you print the Run Mode Report while the unit is mixing fluid at high flow rates and the report shows no time or date (as shown below), this is normal. Due to timing issues, the computer must ignore the clock, assigning a higher priority to maintaining ratio.

```
GRACO PMIX RUN REPORT–STATION 0
00/00/00
00:00

TARGET VOLUME A (cc)=36.0
TARGET VOLUME B (cc)=12.0
DESIRED RATIO 3.0
CURRENT RATIO=3.00
AVERAGE RATIO=3.00
POT LIFE REMAINING 060 MIN
CURRENT FLOW RATE (cc/M)=0000
MAXIMUM FLOW RATE (cc/M)=0000
MINIMUM FLOW RATE (cc/M)=0001
JOB TOTAL A (cc)=00000
JOB TOTAL B (cc)=00000
JOB TOTAL SOL (cc)=00000
JOB TOTAL VOLUME (cc)=00000

JOB TOTALS RESET

BATCH TOTAL A (gal)=0000.0
BATCH TOTAL B (gal)=0000.0
BATCH TOTAL SOL (gal)=0000.0
BATCH TOTAL DUMP A+B (gal)=0000.0
BATCH TOTAL PAINT (gal)=0000.0
YR:MO:DA:HR:MN ALARM MESSAGES
NO ALARMS
```

Printer Setup Mode Report

The Setup Mode Report can be output on a printer that is connected to the PrecisionMix. The report will show you what parameters are currently setup on the PrecisionMix.

To print the Setup Mode Report, you must be at one of the four main setup screens, where one of the choices on the pendant is RPT. Press the RPT (F4) key to print out the report.

Example: Setup Ratio Title Screen

```
SETUP RATIO?
RECIPE 00

NO    YES    QUIT    RPT
```

Press RPT (F4)

The printer will print a report that is similar to the report at right, only it will show the parameters that are setup on your system.

```
GRACO PMIX SETUP REPORT–STATION 0
00/00/00
00:00

DESIRED RATIO 3.0
TOLERANCE=05%

FLOW METER K FACTORS (cc/pulse)
          A=.200
          B=.200
      SOL=.200

A PURGE ON TIME
          A=00.5 SECONDS
          FIRST PURGE=00.5 SECONDS
B PURGE ON TIME
          B=00.5 SECONDS
          LAST PURGE=00.5 SECONDS
# PURGE CYCLES=10

POT LIFE=060 MINUTES
POT LIFE RESET VOLUME=250cc

MINIMUM FLOW RATE=0000cc/M
MAXIMUM FLOW RATE=9999cc/M

DOSE TIME A=010 SECONDS
DOSE TIME B=010 SECONDS

ALARM REACTIONS
          POTLIFE         STOP
          MIN/MAX FLOW
STOP
```

New PrecisionMix Software

⚠ WARNING

ELECTRIC SHOCK HAZARD
To reduce the risk of electric shock, the power to the PrecisionMix Controller must be off before you begin to change the software. The Controller must only be serviced by trained, qualified personnel.

⚠ CAUTION

The service technician and the equipment must be grounded to avoid static electricity discharge, which can damage electronic components.

NOTE: After the software is changed, you must do the following two things for the system to operate properly:

- Initiate the new software. Initiating the software removes the old program and loads the new program.
- Set the proper parameters in the setup program as the parameters will change to the default when the software is changed.

Installing the New Software

1. Turn off the power to the PrecisionMix Controller.
2. Locate the computer card on the PrecisionMix Controller. See page 57.
3. Locate the software chip on the computer card. See Fig 10. Note the direction of the chip and which side of the chip the blank spaces are on.
4. Use an I.C. extraction tool to remove the old software chip. Pull the chip directly up. See Fig 11.

   To remove the software chip without an extraction tool, carefully pry the chip out evenly on both sides. See Fig 12.
5. Install the new software chip with the last row of pins in the last row of holes. Make sure the chip is facing the correct direction and all the pins are in the holes. See Fig 13.
6. Initiate the software as instructed on page 44.
7. Set the proper parameters in the setup program. See the Setup screens, starting on page 28.

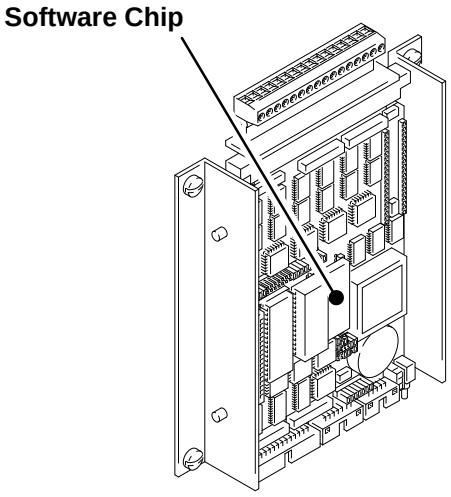


Fig. 10 8203

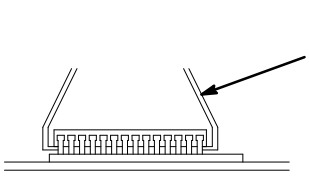


Fig. 11 8205

Fig. 12

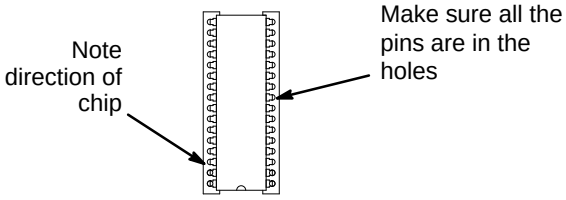


Fig. 13

Initiating the PrecisionMix Software

⚠ WARNING

ELECTRIC SHOCK HAZARD
To reduce the risk of electric shock, the power to the PrecisionMix Controller must be off before you begin to change the software. The Controller must only be serviced by trained, qualified personnel.

⚠ CAUTION

The service technician and the equipment must be grounded to avoid static electricity discharge, which can damage electronic components.

In order for the PrecisionMix Controller to recognize the version of software that is installed, the software must be initiated. The PrecisionMix Core typically comes from the factory with the current software already initiated.

If you have to re-initiate (reboot) the software, there are three modes the PrecisionMix Controller can be initiated into. Follow the instructions in the table below for the mode you choose.

No Recipes, All alarms on output #5, Potlife alarms on output #15	**No Recipes Ratio alarms on output #5 Potlife alarms on output #15 Flow rate alarms on output #16 Tank empty alarms on output #17**	**32 Recipes Ratio alarms on output #5 Potlife alarms on output #15 Flow rate alarms on output #16 Tank empty alarms on output #17**
1. Turn off the power to the PrecisionMix Controller.	1. Turn off the power to the PrecisionMix Controller.	1. Turn off the power to the PrecisionMix Controller.
2. Locate the I/O board on the PrecisionMix Controller. See page 57.	2. Locate the I/O board on the PrecisionMix Controller. See page 57.	2. Locate the I/O board on the PrecisionMix Controller. See page 57.
3. Locate the inputs for the PrecisionMix paint start (input #7) and purge start (input #8). See page 59.	3. Locate the inputs for the PrecisionMix paint start (input #7) and purge start (input #8). See page 59. Locate the input for the most significant bit (input #18).	3. Locate the inputs for the PrecisionMix paint start (input #7) and purge start (input #8). See page 59. Locate the inputs for the ratio selection least significant bit (input #10) and the most significant bit (input #18).
4. On the I/O board, connect a jumper wire from terminal #1 to #15, then to terminal #17. This will turn on the paint and the purge inputs at the same time, when the PrecisionMix is turned on.	4. On the I/O board, connect a jumper wire from terminal #1 to #15, then to terminal #17 and #37. This will turn on the paint, the purge, and the ratio inputs at the same time, when the PrecisionMix is turned on.	4. On the I/O board, connect a jumper wire from terminal #1 to #15, then to terminal #17, to #21, and to #37. This will turn on the paint, the purge, and the ratio inputs at the same time, when the PrecisionMix is turned on.
5. Turn on the power to the PrecisionMix Controller. The #7 and #8 input lights should light up. The display on the pendant should be blank.	5. Turn on the power to the PrecisionMix Controller. The #7, #8, and #18 input lights should light up. The display on the pendant should be blank.	5. Turn on the power to the PrecisionMix Controller. The #7, #8, #10, and #18 input lights should light up. The display on the pendant should be blank.

Continued on the next page.

Initiating the PrecisionMix Software

No Recipes, All alarms on output #5, Potlife alarms on output #15	**No Recipes Ratio alarms on output #5 Potlife alarms on output #15 Flow rate alarms on output #16 Tank empty alarms on output #17**	**32 Recipes Ratio alarms on output #5 Potlife alarms on output #15 Flow rate alarms on output #16 Tank empty alarms on output #17**
6. Turn the power off to the PrecisionMix Controller.	6. Turn the power off to the PrecisionMix Controller.	6. Turn the power off to the PrecisionMix Controller.
7. Remove the jumper wires installed in step 4.	7. Remove the jumper wires installed in step 4.	7. Remove the jumper wires installed in step 4.
8. Turn on the power to the PrecisionMix Controller. Press the blank key in the upper right corner of the pendant.	8. Turn on the power to the PrecisionMix Controller. Press the blank key in the upper right corner of the pendant.	8. Turn on the power to the PrecisionMix Controller. Press the blank key in the upper right corner of the pendant.
9. The Main Title screen will change. It should look like this: GRACO PRECISION MIX® REV. 1.21 RUN SETUP BAT GTOT If the screen does not look like this, repeat steps 1 to 8.	9. The Main Title screen will change. It should look like this: GRACO PRECISION MIX® REV. 1.21 RUN SETUP BAT GTOT If the screen does not look like this, repeat steps 1 to 8.	9. The Main Title screen will change. It should look like this: GRACO PRECISION MIX® REV. 1.21 RECIPE 00 RUN SETUP BAT GTOT The word RECIPE and a two digit number have been added on line three. The recipe is the ratio program selection you are making. You can select from among 32 different recipes (00 to 31). If the screen does not look like this, repeat steps 1 to 8. If you want to revert to having only a single recipe, repeat steps 1 to 8, but do not activate the ratio selection least significant bit (input #10, terminal #21).

Using the 32 Recipe Option

Selecting Pendent or I/O Recipe Control

Go to the SETUP RATIO screen on the pendant. Refer to the Screen Map with Recipes on page 25.

```
SETUP RATIO?
RECIPE 00

NO    YES    QUIT    RPT
```

1. Press the NO key until you reach the Change Installation screen.

```
CHANGE INSTALLATION?
RECIPE 00

NO    YES    QUIT
```

2. Press YES.

```
STATION NMBR IS XX

NEW VALUE? XX
NO              QUIT
```

3. Press NO.

```
RECIPE SELECTED
FROM PENDENT
CHANGE?
NO    YES    QUIT    RPT
```

4. If the screen is set as shown in the previous screen, recipes can only be selected with the pendent. If you want to select recipes with the I/O board, press YES. The screen will change to the following:

```
RECIPE SELECTED
FROM I/O
CHANGE?
NO    YES    QUIT    RPT
```

Programming a Recipe with the Pendent

To change the recipe with the pendant, you must enter the two digit number of the recipe you wish to program.

Example:

```
          GRACO
      PRECISION MIX®
    REV. 1.21 RECIPE 00
RUN  SETUP  BAT GTOT
```

Press 0 and 5 keys.
The screen will change to the following:

```
          GRACO
      PRECISION MIX®
    REV. 1.21 RECIPE 05
RUN  SETUP  BAT GTOT
```

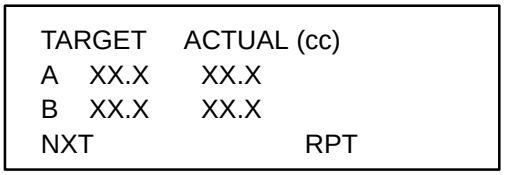
NOTE: You must enter two digits to change the recipe.

Using the 32 Recipe Option

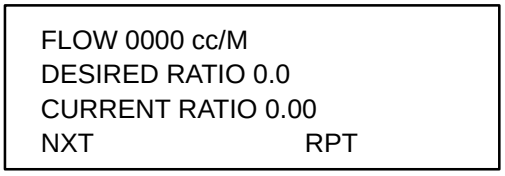
Running a Recipe with the Pendant

There is a Run screen on the pendant that shows the recipe the PrecisionMix is operating with. This screen can be used to display the current recipe whether the recipe is selected from the pendant or the I/O board.

1. To access the Run screen, select RUN on the pendant Main Title screen. If the ratio is not equal to zero, the following screen will appear:

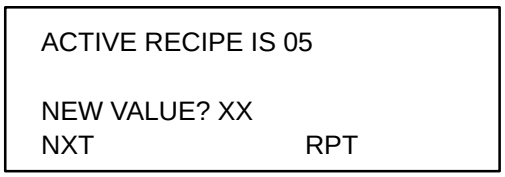


   If the ratio equals zero, the following screen will appear:



NOTE: Ratio 0.0:1 is used for single component (Component A only) dispensing. No catalyst will be dispensed at this ratio.

2. Press NXT until the following screen appears.



3. To change the recipe, enter the two digit number for the new recipe you want.

   If the PrecisionMix is in the STANDBY mode and the recipe data has been entered, when you enter a new two digit number, the PrecisionMix will automatically change to the new recipe.

   If the PrecisionMix is in the MIX mode when you enter a new recipe number, the recipe number will not change and the pendant will beep.

Using the 32 Recipe Option

Selecting a Recipe with the I/O

NOTE: A recipe may not be changed on the I/O board while the Operator Switch is set to MIX. If this happens, the system will stop and an I/O change alarm will occur. The Operator Switch must be used to clear the alarm.

See the chart below for the available I/O board input combinations for recipe selection.

I/O Input Combinations for Recipe Selection

Recipe	Input	Recipe	Input
00	No inputs	**16**	18
01	10	**17**	10, 18
02	11	**18**	11, 18
03	10, 11	**19**	10, 11, 18
04	12	**20**	12, 18
05	10, 12	**21**	10, 12, 18
06	11, 12	**22**	11, 12, 18
07	10, 11, 12	**23**	10, 11, 12, 18
08	13	**24**	13, 18
09	10, 13	**25**	10, 13, 18
10	11, 13	**26**	11, 13, 18
11	10, 11, 13	**27**	10, 11, 13, 18
12	12, 13	**28**	12, 13, 18
13	10, 12, 13	**29**	10, 12, 13, 18
14	11, 12, 13	**30**	11, 12, 13, 18
15	10, 11, 12, 13	**31**	10, 11, 12, 13, 18

To select a recipe with the I/O board, electrically select one of the 32 input combinations and start the PrecisionMix by electrically selecting input #7 (paint start signal).

Example:

1. Display the Recipe screen.

```
ACTIVE RECIPE IS 05

NEW VALUE?
NXT                 RPT
```

2. Turn on input #10 and 11 to select recipe 03. The screen will momentarily change to the following, showing the new recipe value of 03:

```
ACTIVE RECIPE IS 05

NEW VALUE? 03
NXT                 RPT
```

3. The following screen will appear next:

```
ACTIVE RECIPE IS 03

NEW VALUE?
NXT                 RPT
```

4. Set up each of these recipes as you would a normal program. See the Setup screens, starting on page 28. Remember that each recipe has a whole new set of parameters. If you change a parameter from the default parameter on one recipe and would like the same parameter on another recipe, you must set up the new information in that recipe.

   If you select a recipe where the ratio and flow meter calibration factors have not been set up in the program, the pendent will beep and the screen will change to the following:

```
PARAMETERS NOT SET
GO TO SETUP
```

5. Start the PrecisionMix by electrically selecting input #7 (paint start signal).

Electrical Troubleshooting

⚠ WARNING

INJECTION HAZARD
To reduce the risk of a serious injury, follow the **Pressure Relief Procedure** on page 15 before checking or servicing the equipment.

⚠ WARNING

ELECTRIC SHOCK HAZARD
To reduce the risk of electric shock, the equipment must only be serviced by trained, qualified personnel.

Have the following items available before you begin troubleshooting.

- PrecisionMix system binder (collection of manuals and diagrams in a three-ring binder, supplied by Graco)
- Voltmeter that is capable of reading resistance in ac and dc voltage.
- Small standard screwdriver

Controller Component Identification

There are five major controller components:

- Power Supply
- Computer Card
- I/O Board
- Flow Meter Card
- Pendant

Before you troubleshoot the PrecisionMix controller, it is important to understand what the five controller components are and what they do.

Power Supply – See the electrical diagram in the system binder

The power supply consists of several transformers that convert the 110 or 220 Vac power supplied to the system into four different dc voltages (+24,+5, +12, and –12). These dc voltages are required for the system to operate.

Power Requirements

+5 Vdc is required to power the computer operations, the flow meter card, and the pendant.

+12/–12 Vdc power is required for the computer card to communicate with the pendant with RS232 communication.

+24 Vdc is required to power the operator switch, alarm light, solenoids, and air flow switch (to avoid magnetic and radio wave interference from other machinery, such as motors and arc welders).

Computer Card – See page 58

The computer card does all of the math, calculates when to open and close valves, tracks how much fluid has been used, retains the set points in memory, and sounds an alarm if a problem occurs.

The computer card is located in the controller enclosure, as shown on page 57. The computer card holds three integrated circuit (IC) chips: 1.) the PrecisionMix program chip, 2.) clock chip, and 3.) static ram chip. There is also a battery on the computer card to store the memory when the power is turned off.

The computer card can only accept and send out signals that are no greater than +5 Vdc.

I/O Board – See page 59

The input/output (I/O) board is located in the controller enclosure, as shown on page 57. The I/O board enables the computer to communicate with the solvent and purge valves, color changer, operator switch, alarm light, and air flow switch.

The input and output modules are color coded to help identify them. The white module is the +24 Vdc input. The red module is the +24 Vdc output. Each module location on the board is numbered and has a specific function that cannot be changed.

Each module has a green light that is lit when the module is active.

The output modules have a replaceable fuse located on the top of the module, under a black, plastic cap. The input modules have one common fuse located on the I/O board, near the power inlet.

Continued on the next page.

Electrical Troubleshooting

I/O Board (continued)

The Function of the Input and Output Modules

When the computer needs to open a valve, the following things occur:

1. The computer sends a +5 Vdc signal to the appropriate output module.

2. The output module receives the +5 Vdc signal and closes a switch, which sends a +24 Vdc signal to the appropriate solenoid in the solenoid box.

3. The solenoid receives the +24 Vdc signal and opens a small air valve, which sends air to the open side of the fluid valve.

The input modules convert the +24 Vdc signal from the operator switch and the air flow switch into a +5 Vdc signal for the computer so the computer knows when to mix, purge, or standby.

Flow Meter Card – See page 60

The flow meter card is located in the controller enclosure, as shown on page 57. The flow meter card receives the pulse signals from the flow meters, counts them, and communicates the count information to the computer. The card does this by converting the +24 Vdc electrical signals from the flow meter to +5 Vdc signals for the computer card.

The flow meter signals are received very quickly, at 300 herz or greater. The flow meter card was designed to convert incoming signals at those high speeds.

Pendant – See page 14.

The pendant hooks directly to the PrecisionMix computer and communicates with it through RS232 communication.

The function of the pendant is similar to the function of a computer keyboard and monitor. The pendant allows you to see information about the PrecisionMix operation and to make changes to the operation.

At the top of the pendant is a small display screen where all of the dose, flow, and alarm information is displayed. Below this screen are five small lights, called LEDs. The LEDs indicate when the computer opens the resin, catalyst, purge or dump valves. The fifth LED flashes whenever the system is in an alarm mode.

Below the LEDs are five function keys. The first four keys are labeled F1 through F4. These keys correspond to the words on the bottom of the pendant screen. If no word appears over a key, pressing that key will not affect the system. The fifth key is not labeled. It is used to change the display from the series of Run screen to the Main Title screen. The operator can access all of the Setup, Totalizer, and Run screens from the Main Title screen.

Control Panel Power Problems

1. Verify, both visually and with a voltmeter, that the power is turned on at the main circuit breaker. There should be a minimum of 105 Vac and a maximum of 130 Vac for most power supplies to operate properly.

2. Verify that the main power switch on the front of the PrecisionMix enclosure is turned on.

3. Verify that the fuse on the terminal strip inside the controller enclosure is okay. Check for 110 Vac on both sides of the fuse. See your system binder for the wire numbers.

4. Verify that there is power going to the power supply. Check for 110 Vac on the proper terminals. See your system binder for the wire numbers.

5. Verify that the controller enclosure is properly grounded by checking the resistivity between the enclosure and a true earth ground. See **Check the Resistance**, page 12.

Electrical Troubleshooting

Control Panel dc Voltage Problems

NOTE: If any of the voltages are not present while following steps 1 to 8, find the problem and fix it before continuing to troubleshoot.

1. Verify that all dc common terminals are connected together and that they terminate to true earth ground. Check the resistivity between the grounding lug inside the controller enclosure and all dc common connections. The resistance should be less than 25 ohms. See the system drawing for wiring connections.

2. Verify that the main power switch on the front of the PrecisionMix enclosure is on. Check all of the dc voltages on the power supply outputs. There should be +5, +12, –12, and +24 Vdc. See your system binder for the wire numbers.

3. Verify that all dc voltages are on the terminal blocks. There should be +5, +12, –12, and +24 Vdc. See the system drawing for wire numbers.

4. Verify that the correct dc voltages are going to the computer card. There should be +5, +12, and –12 Vdc. See the wiring schematic of 949–724, in the system binder, for the terminal numbers.

5. Verify that the correct dc voltage is going to the flow meter card. It should be +5 Vdc. See the wiring schematic of 949–724, in the system binder, for the terminal numbers.

6. Verify that the correct dc voltage is going to the I/O board. There should be +5 and +24 Vdc. See the wiring schematic of 949–724, in the system binder, for the terminal numbers.

7. Verify that the fuses on the I/O board are okay. Turn the main power switch off and check the resistivity between the main input module fuse and the independent output module fuses. See page 59 for the fuse locations.

8. Verify that the dc voltages are on all other dc terminals inside the control panel. See your system binder for the terminal numbers.

Alarm Troubleshooting

⚠ WARNING

INJECTION HAZARD
To reduce the risk of a serious injury, follow the **Pressure Relief Procedure** on page 15 before checking or servicing the equipment.

⚠ CAUTION

Do not use the fluid in the line that was dispensed off ratio as it may not cure properly.

If the machine stops from an alarm condition, the associated alarm output will be active. The alarm outputs are described below and on the following pages. In addition, the alarm light on the pendant blinks and a relevant message is displayed on the pendant.

To Clear the Alarm and Restart the System

Unless otherwise instructed on these pages, clear the alarm and restart the system by turning the operator switch from MIX to STANDBY to PURGE to STANDBY to MIX.

Ratio Low or Ratio High

Alarm output will be on Output Module #5

Ratio alarms occur when the PrecisionMix has dispensed a cycle where the amount of resin compared to the amount of catalyst does not meet the tolerances that have been programmed for the system.

Ratio Low XX.XX

The PrecisionMix has dispensed a cycle (A + B) at a mix ratio less than the ratio target plus the tolerance.

Ratio High XX.XX

The PrecisionMix has dispensed a cycle (A + B) at a mix ratio higher than the ratio target plus the tolerance.

Common Causes for a Ratio Low or High Alarm

- The flow rate is too high
- Highly unbalanced pressures from the fluid supply system
- Slow actuation of the resin or catalyst valves

Checking the Flow Rate

If the alarm occurs while starting up the system after purging, the flow rate was probably too high.

Restrict the gun needle travel to slow down the initial fluid delivery rate until the fluid hoses are loaded with material.

Checking for Unbalanced Pressures

If the alarm occurred after you have been spraying for some time, the pressures from the fluid supplies could be unbalanced.

1. Check the catalyst and resin pressures.

2. *If the pressures are not about equal,* adjust both fluid supply pressures with the fluid regulators, until the pressures are about the same.

3. *If the pressures are already about equal,* verify that the resin and catalyst valves are operating properly.

Checking the Actuation of the Valves

Manually operate the valves by pressing the brass buttons on the solenoids. The valves should snap open and shut quickly.

If the valves move slowly, it could be caused by:

- air pressure to the valve actuators is too low,
- an interruption in the valve actuating air caused by dirt or water in the air,
- there is something restricting the solenoid or tubing,
- the packings on the dispense valves are too tight, or
- a dispense valve knob is turned out too far. The knob should be turned in until you feel the detents engaging. You may want to put a piece of tape on the knobs after they are properly set to discourage anyone from changing the setting. The recommended setting is three “clicks” open from fully closed.

Alarm Troubleshooting

Dose Time A or Dose Time B

Alarm output will be on Output Module #5.

When the PrecisionMix is in the MIX mode and the air flow switch is closed, which indicates that the gun is being triggered, the PrecisionMix is programmed to expect that the resin or catalyst will dispense within a pre-selected amount of time. The Dose Time alarm will occur if one of the components is not dispensed within the pre-selected amount of time.

Dose Time A

The PrecisionMix has not completed a dose of Component A (resin) in the pre-selected amount of time.

Dose Time B

The PrecisionMix has not completed a dose of Component B (catalyst) in the pre-selected amount of time.

Common Causes for a Dose Time Alarm

- The system is in the MIX mode and the gun is only partially triggered, allowing air but no fluid to pass through the gun
- The fluid flow rate becomes too low
- The meter or cable fails
- The dispense (dose) times are set too low

If a meter or cable fails, resin or catalyst will flow to the gun without the flow being read through the meter pulses. The PrecisionMix could keep the dispense valve open indefinitely because the computer will never see the target value being reached. This condition could cause the operator to spray pure resin or pure catalyst onto a part.

To prevent this from happening, the computer will only allow the Component A or B valve to remain open for the duration of the dose time. The alarm will alert the user if the dose time is exceeded.

Checking for a Meter or Cable Failure

Manually open the catalyst or resin dispense valve and trigger the gun into a grounded waste container. The counts should increase in the first Run screen on the pendant.

NOTE: This test will probably cause an Overdose alarm.

Overdose A or Overdose B

Alarm output will be on Output Module #5.

An Overdose alarm occurs if the fluid continues to dispense on the one side of the manifold after the valves have opened on the other side of the manifold.

Overdose A

The PrecisionMix has continued dispensing fluid on the Component A (resin) side after the valve has shifted to the Component B (catalyst) side. An alarm will occur when the actual dose size reaches 20 cc higher than the target value for Component A.

Overdose B

The PrecisionMix has continued dispensing fluid on the Component B (catalyst) side after the valve has shifted to the Component A (resin) side. An alarm will occur when the actual dose size reaches 10 cc higher than the target value for Component B.

Common causes for an Overdose Alarm are:

- Valve(s) packings or needle/seat are leaking
- Ratio check valve is leaking
- Flow meter fluctuations caused by pressure pulsations,
- Slow actuation of the resin or catalyst valves

Continued on the next page.

Alarm Troubleshooting

Overdose A or Overdose B (continued)

Checking for Pressure Pulsations

1. Close all the manifold valves.
2. Turn off the color changer.
3. Turn on the circulating pumps and all the booth equipment (such as fans and conveyors).
4. Check to see if the PrecisionMix is reading any fluid flow.
5. If the PrecisionMix shows there is fluid flow and there are no leaks from the gun or any other packings or fittings, the meters are probably being affected by pressure pulsations.
6. Close the fluid shut-off valve between the fluid supply system and the meter. The flow indication should stop.
7. If necessary, install pressure regulators or a surge tank on the fluid inlets to the PrecisionMix, to reduce the fluid supply pressure. Contact Graco for information on fluid pressure regulators.

Checking the Actuation of the Valves

See page 52.

I/O Change

Alarm output will be on Output Module #5.

When this alarm displays (with software revision 1.2 or above), the recipe number has been changed while the system is in the MIX mode with recipes selected from I/O.

Flow Too Low or Flow Too High

NOTE: The output will be on output module #16.

Flow Too Low

The PrecisionMix is dispensing a lower fluid flow rate than pre-selected in the setup screens.

Flow Too High

The PrecisionMix is dispensing a higher fluid flow rate than pre-selected in the setup screens.

Common Causes for a Flow Too Low Alarm

- Low fluid pressures from the fluid supply system
- The buildup of cured paint in the fluid components downstream of the PrecisionMix
- The dispense valve knobs are turned too far in

Pot Life Exceeded

Alarm output will be on Output Module #15.

This alarm will occur if the mixed material is in the lines for a longer period of time than the pot life time value that was entered during setup.

For example: If a pot life value of 30 minutes and a volume of 600 cc was entered, the Pot Life Exceeded alarm would occur if over a 30 minute period, 600 cc of fluid was not dispensed.

The alarm becomes inactive if the system has been purged and no new material has been mixed since that purge.

To Remove the Alarm

You have two minutes to move fresh mixed material out to the gun. If this cannot be done, AUTO DUMP will activate if that feature has been selected. Otherwise, a full purge cycle will be required to clear the alarm.

Alarm Troubleshooting

Cat Tank or Res Tank Empty

Alarm output will be on Output Module #17.

This alarm is intended to prevent the system from running out of catalyst or resin.

Cat Tank Empty

The PrecisionMix has dispensed the amount of Component B (catalyst) that was entered into the Catalyst Tank Volume screen.

```
CAT TANK EMPTY


NXT                    RPT
```

To Remove the Alarm

1. Turn the Operator Switch to STANDBY.
2. Press NXT key until you are at the Tank Volume screen.

```
CAT TANK=0000.0 GAL
RES TANK=0000.0 GAL

NXT  CAT   RES    RPT
```

3. Press CAT key.

```
CAT TANK PRESET
IS 0000.0
NEW VALUE? XXXX.X
QUIT          RESET
```

4. Enter a new value or press RESET to reset to the old value.
5. Turn the Operator Switch to MIX.

Res Tank Empty

The PrecisionMix has dispensed the amount of Component A (resin) that was entered into the Resin Tank Volume screen.

```
RES TANK EMPTY


NXT                    RPT
```

To Remove the Alarm

1. Turn the Operator Switch to STANDBY.
2. Press NXT key until you are at the Tank Volume screen.

```
CAT TANK=0000.0 GAL
RES TANK=0000.0 GAL

NXT  CAT   RES    RPT
```

3. Press RES key.

```
RES TANK PRESET
IS 0000.0
NEW VALUE? XXXX.X
QUIT          RESET
```

4. Enter a new value or press RESET to reset to the old value.
5. Turn the Operator Switch to MIX.

Alarm Troubleshooting

Memory Failure Alarm

No output module is associated with this alarm.

NOTE: If the alarm does not clear after following the instructions below, contact Graco Technical Assistance. See the back page.

There are two levels of memory failure:

Revision Change Memory Failure

This alarm will display, if the software was not initiated (rebooted) after the software chip was changed on the Controller:

```
MEMORY FAILURE

REBOOT SYSTEM
```

To Remove the Alarm

Initiate the software. Follow the **Initiating the PrecisionMix Software** instructions on page 44.

Program Corrupted Memory Failure

The Controller has three copies of the program at all times. If something happens to one of the three copies, due to power surge; battery failure; brown out; etc., the equipment will shut down and this alarm will display:

```
MEMORY FAILURE
LOCATION XX
RECYCLE POWER
```

To Remove the Alarm

1. First, write down the location number for future reference.
2. Turn the power to the Controller off, wait 10 seconds, and turn the power back on.
3. If the Target/Actual screen appears (see page 26), the PrecisionMix is set to operate again.

   If the Memory Failure screen appears again, you must Initiate the software and set up the Controller again. Follow the instructions in **Initiating the PrecisionMix Software**, page 44.

Parameters Not Set Alarm

No output module is associated with this alarm.

This alarm indicates that some or all of the parameters, such as set points and mix ratios, have not been entered into the Controller.

```
PARAMETERS NOT SET
GO TO SETUP
```

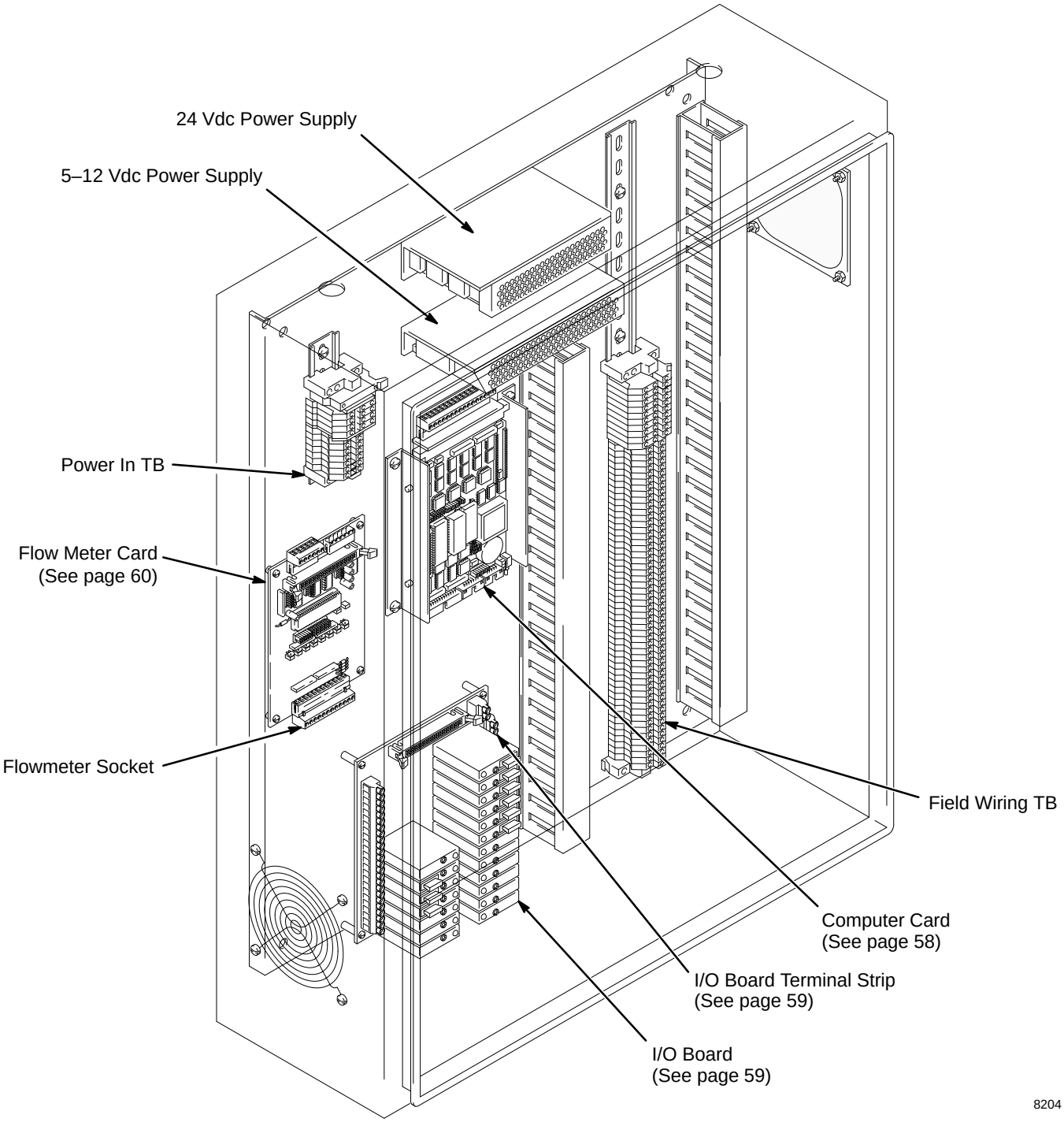
To Remove the Alarm

1. Press the blank key (black pendent only).
2. Go to the Setup screen for the recipe you want to use.
3. Enter the values for ratio and flow meters.
4. You will now be able to use that recipe.

NOTE: If the software was initiated, all of the parameters need to be reset.

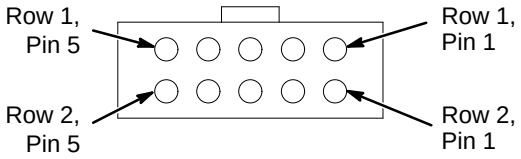
949–724 Controller Component Guide

NOTE: See the system drawings and part no. 949–724 drawing for the electrical schematic.



111–663 Computer Card

Flow Meter Card Plug (Front View)



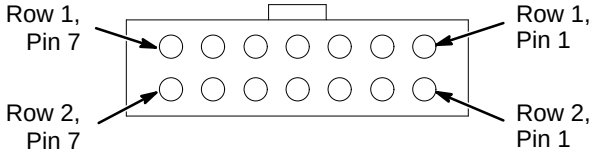
Flow Meter Plug Pin Assignments

Row 2, Pin 1: TB2, Pin 5 (Yellow)

Row 2, Pin 2: TB2, Pin 4 (Orange)

Row 2, Pin 5: TB2, Pin 2 (Gray)

Pendant Plug (Front View)



Pendant Plug Pin Assignments

Row 1, Pin 6: Pend.3 (Purple)

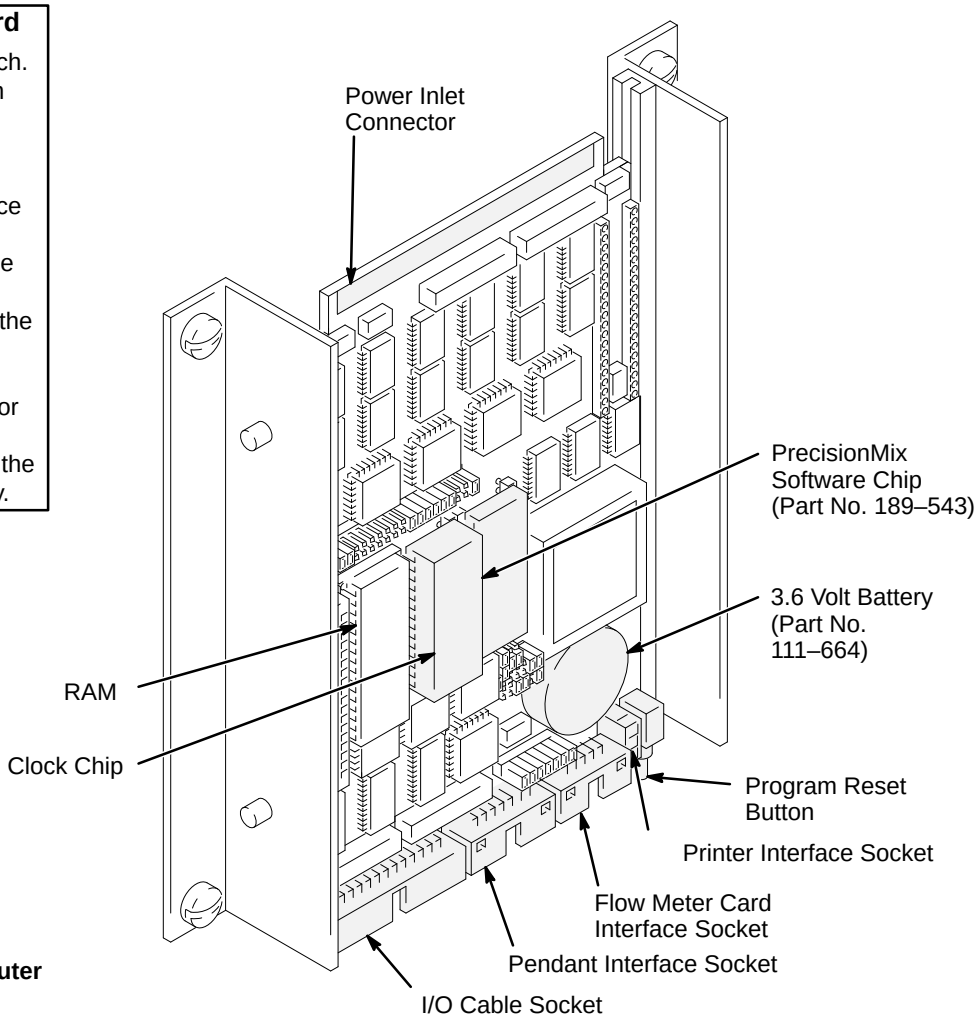
Row 1, Pin 5: Pend.2 (Blue)

Row 1, Pin 2: Pend.6 (Orange)

Row 2, Pin 2: TB2, Pin 4 (White)

Changing the Computer Card

1. Turn off the main power switch.
2. Remove the connectors from the computer card:
   a. I/O Board
   b. Pendant Interface
   c. Flow Meter Card Interface
   d. Printer Interface
3. Loosen the two screws on the small bracket .
4. Slide the bracket away from the computer card.
5. Slide the computer card out from the power inlet connector and other bracket.
6. Install the Computer Card in the reverse order of disassembly.



Complete pre-configured computer cards with battery and chip installed are available:

Part No.	Description
949–372	Single Ratio Card
949–373	Multiple Ratio Card

Power Inlet Connector Pin Assignments

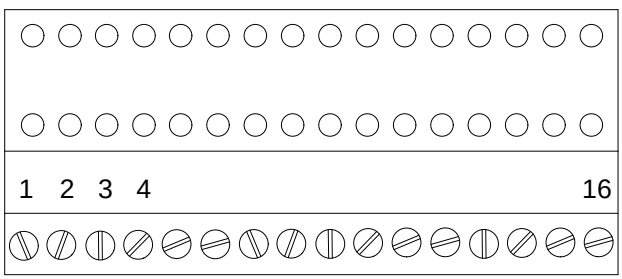
Pin 1: +5 Volts

Pin 2: Common

Pin 3: +12 Volts

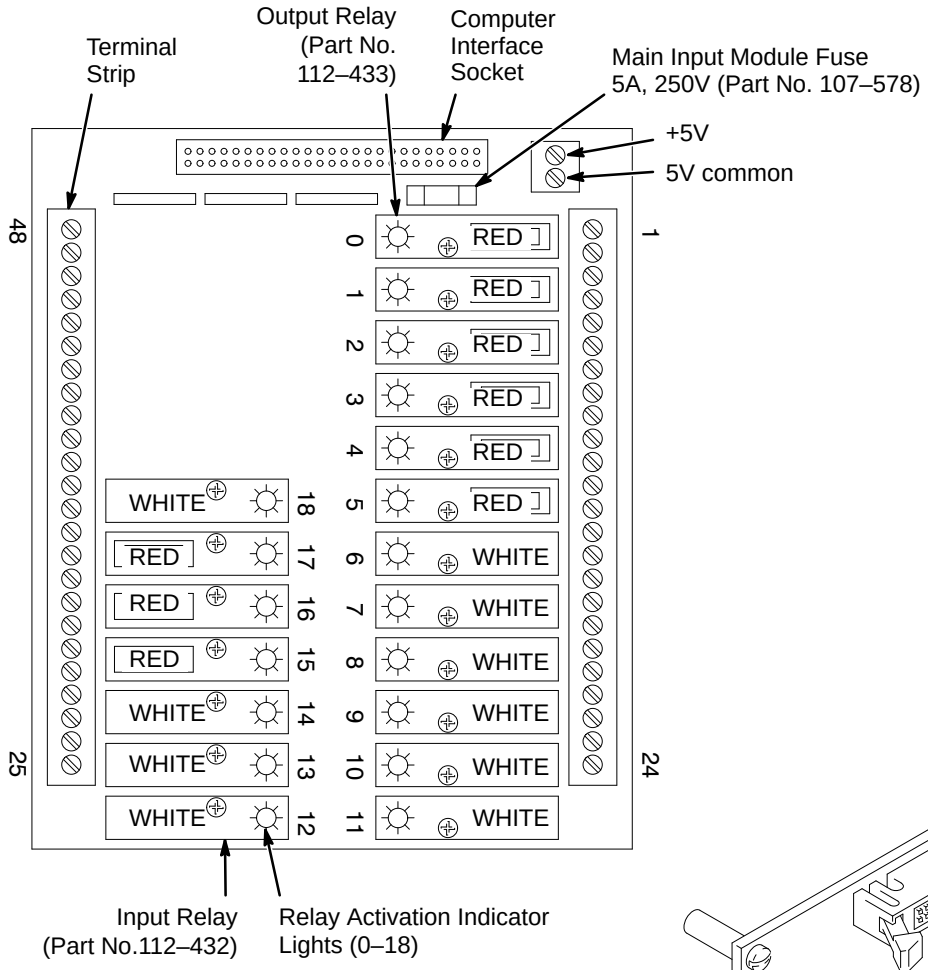
Pin 4: –12 Volts

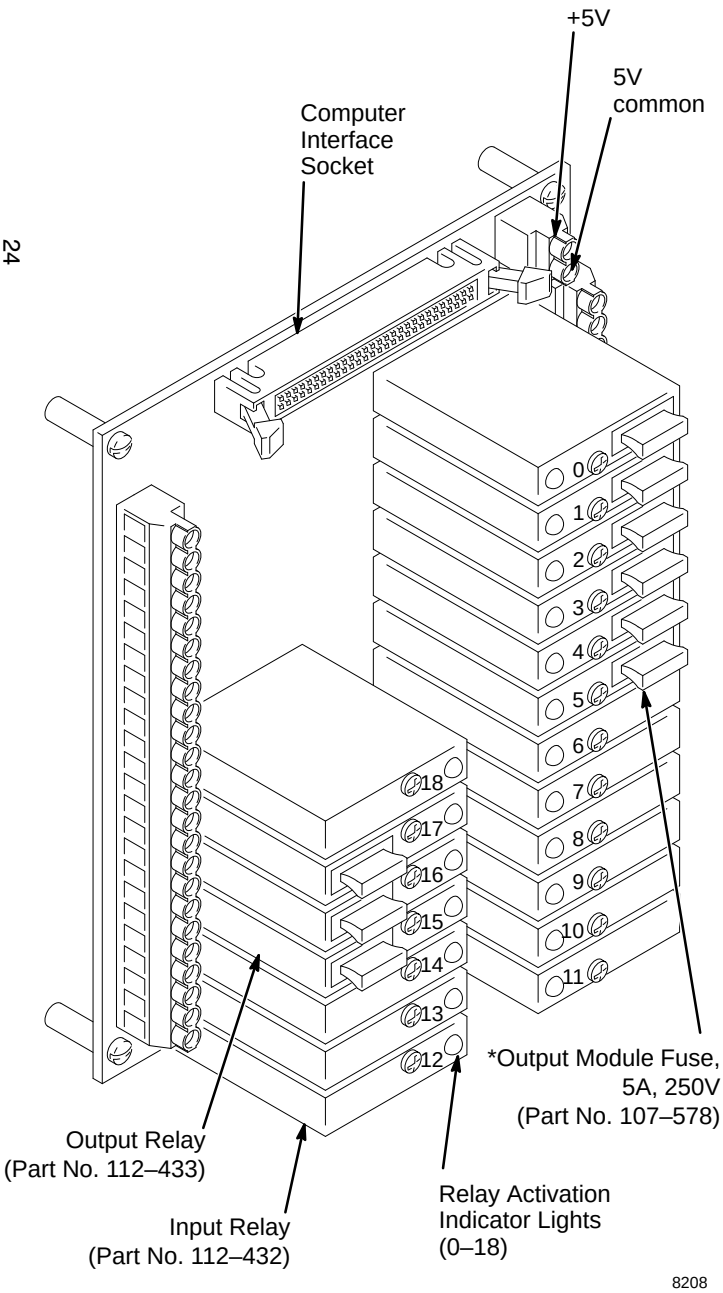
Back View Of Power Inlet Connector



8206, 8207

112–431 I/O Board





8208

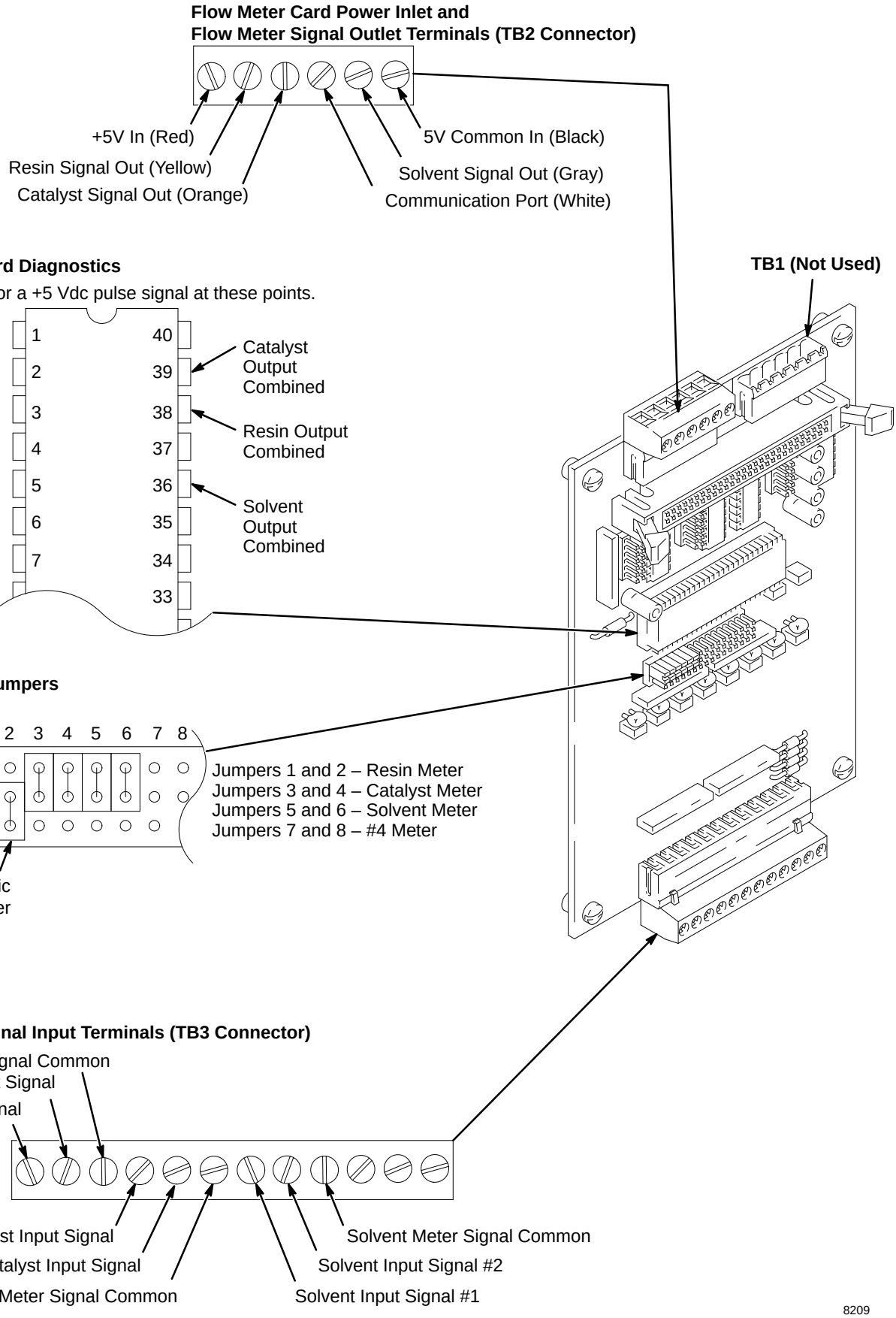
TERMINAL KEY:

0 Catalyst Valve Output
1 Resin Valve Output
2 Solvent Component A Output
3 Solvent Component B Output
4 Dump Valve Output
5 Ratio Alarm Output
6 Air Flow Switch Input
7 Mix Paint Start Input
8 Mix Purge Start Input
9 Remote Printout Input
10 Select Ratio Input LSB 0 (Optional)
11 Select Ratio Input Bit 1 (Optional)
12 Select Ratio Input Bit 2 (Optional)
13 Select Ratio Input Bit 3 (Optional)
14 Color Change cc Input
15 Potlife Alarm Output
16 Flow Too High/Low Alarm Output
17 Tank Empty Alarm Output
18 Select Ratio Input MSB 4 (Optional)

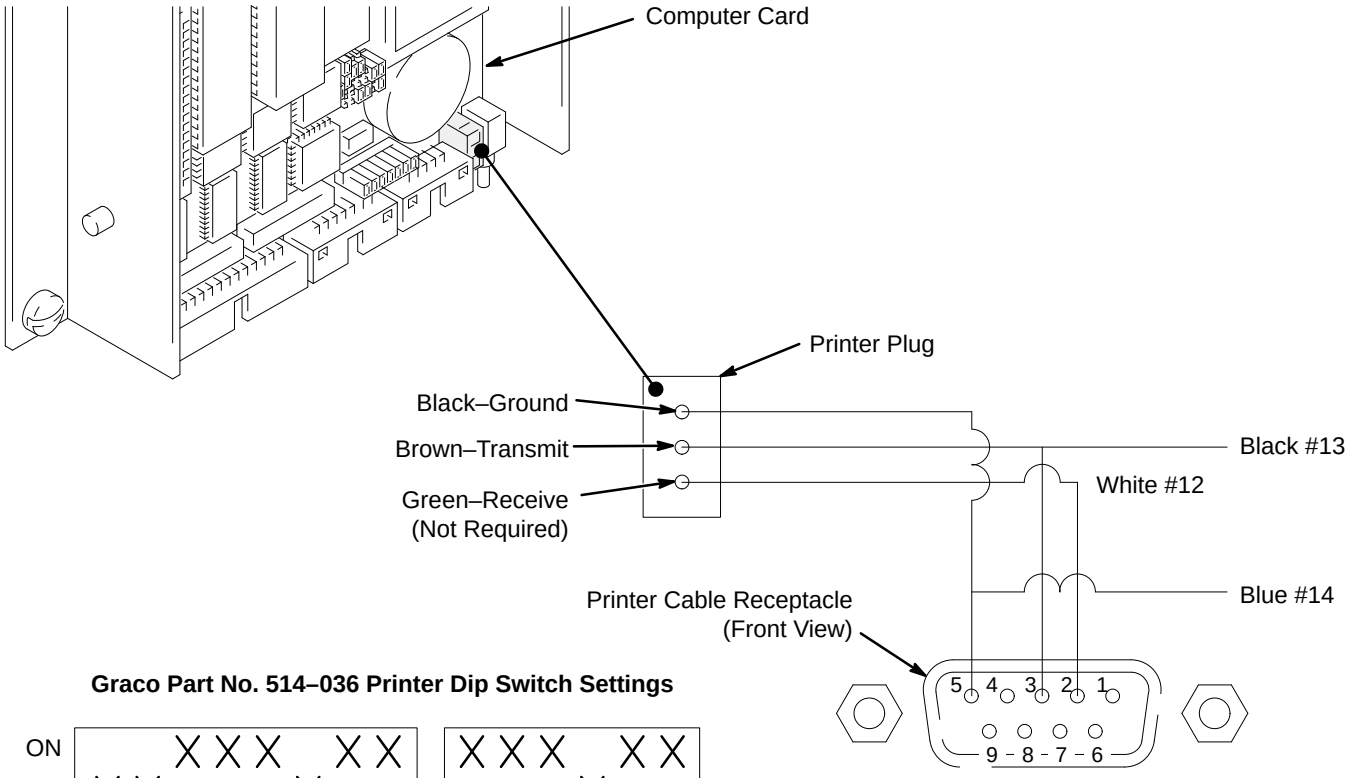
Note: Controller is configured for 32 Recipes

***Each red output module has a fuse on it.**

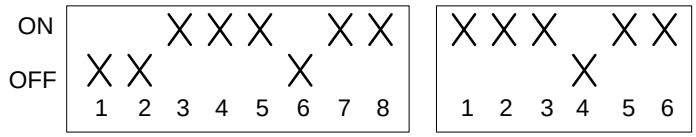
224–944 Flow Meter Card



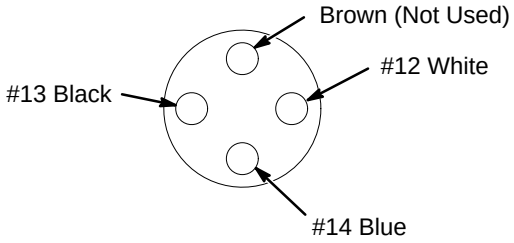
Printer Hookup

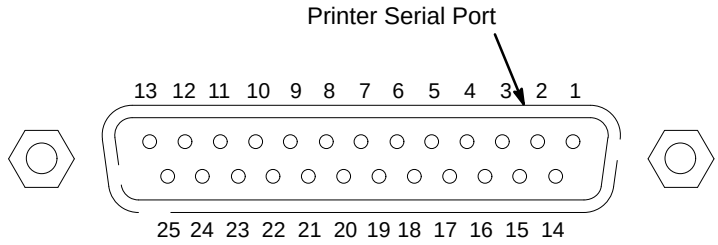


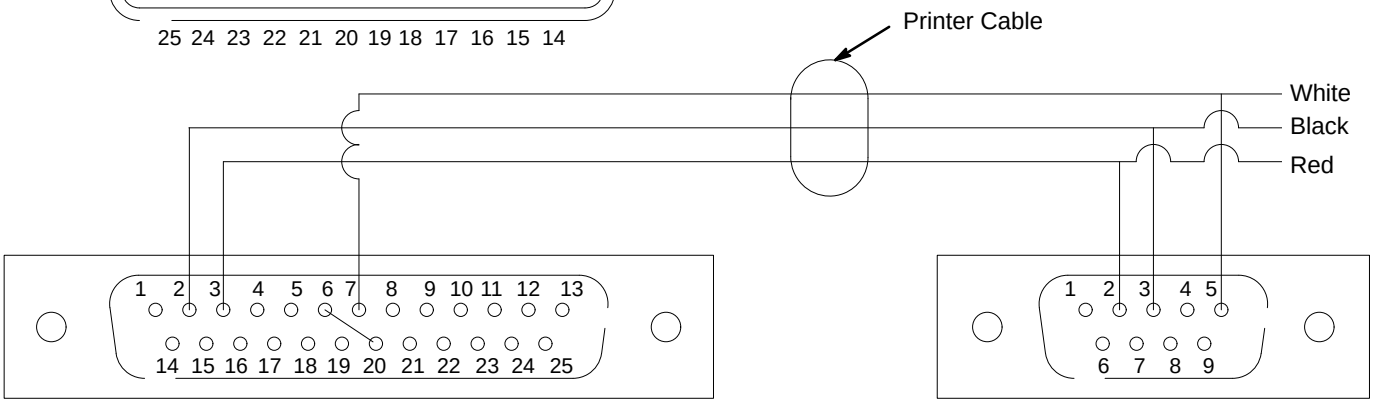
Graco Part No. 514–036 Printer Dip Switch Settings



Printer Cable: Graco Part No. 948–954







25 Pin D–Sub Male Pin Connector (Jumper 6 to 20)

9 Pin D–Sub Male Pin Connector

8210

Technical Data

Category	Data
Electrical supply	+5 Volts, 1.4 Amps; +12 Volts, 0.7 Amps; –12 Volts, 0.002 Amps
Electrical consumption	16 watts
Ambient operating temperature	0–104°F (0–40°C)

Notes

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 by an authorized Graco distributor 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.

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Graco Phone Number

To place a PrecisionMix equipment order or for technical assistance,
contact your Graco distributor or Graco Engineered Application Solutions (EAS).
Phone No. 612–379–3700

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