

Precision Mix™ Installation Checklist

This checklist is intended as a general guide to installing standard Precision Mix™ units. Modifications to the installation procedure may be required to accommodate optional features, integration with other system components and/or local conditions and codes.

1. Inspect the containers for damage and check quantities against the shipping documents. ☐
 - A. Instruct the customer to file a claim with the carrier if damage or missing containers are discovered. Do not continue unpacking until the carrier's claims agent has inspected the damage.
2. Carefully uncrate the equipment and compare quantities against the proposal, design drawings, and design bill of materials. ☐
 - A. Contact Graco Engineered Application Solutions Customer Service (612) 379-3700 immediately if quantities do not match.
3. Read and understand the system manual supplied with the equipment and these installation and start up instructions. ☐
 - A. If no manual was received with the equipment, contact Graco Engineered Application Solutions Technical Assistance (612) 379-3622 immediately.
4. Ask the customer to verify the desired location(s) of each of the following components (all components must be located indoors):
 - A. Supply equipment (if applicable). ☐
 - i. Check proximity to available compressed air supply versus available hose length(s). ☐
 - ii. Verify appropriateness of supply equipment's fluid pressure and flow rate if using existing supply, or equipment supplied by others. See page 7 of Instruction Form 308-288. ☐
 - a. If you do not believe the supply equipment is appropriate, consult Graco Engineered Application Solutions Technical Assistance (612) 379-3622.
 - B. Precision Mix™ fluid panel(s). ☐
 - i. **Must be located in a non-hazardous area as defined in Article 500 of the National Electric Code (NEC), (USA), and applicable state and local codes. Exception only if hazardous location option is installed.** ☐
 - ii. Check proximity to supply equipment or circulating lines versus available hose lengths. ☐
 - iii. Check proximity to true earth ground. Use the same true earth ground for all Precision Mix™ components. Do not use an existing ground common to any other devices. A dedicated ground is required for the Precision Mix™. ☐
 - iv. Check proximity to spray area, considering length of mixed line to be purged. (Typically, shorter lines are more desirable as less paint and solvent are wasted during purge). ☐
 - v. Verify that the desired mounting surface is vibration-free. ☐
 - C. Precision Mix™ solenoid panel(s). ☐
 - i. **Must be located in a non-hazardous area as defined in Article 500 of the National Electric Code (NEC), (USA), and applicable state and local codes. Exception only if hazardous location option is installed.** ☐
 - ii. Check proximity to mating fluid panel(s). Interconnecting air line lengths must not exceed 6 feet. ☐
 - iii. Check proximity to available compressed air supply versus available hose length(s). ☐
 - iv. Check proximity to true earth ground. Use the same true earth ground for all Precision Mix™ components. Do not use an existing ground common to any other devices. ☐
 - D. Precision Mix™ control panel(s). ☐
 - i. **Must be located in a non-hazardous area as defined in Article 500 of the National Electric Code (NEC), (USA), and applicable state and local codes.** ☐
 - ii. Check proximity to Precision Mix™ solenoid panel versus the prewired cable length (50' standard). ☐
 - iii. Check proximity to Precision Mix™ fluid panel versus meter cable length (50' standard). ☐
 - iv. Check proximity to 115 VAC, 60 Hz, electrical power supply. Inform customer that power must be

- wired from supply to the control panel(s). ☐
- v. Check proximity to true earth ground. Use the same true earth ground for all Precision Mix™ components. Do not use an existing ground common to any other devices. ☐
- E. Precision Mix™ operator switch(es). ☐
- i. May be located in a hazardous area, provided that installation conforms to Article 500 of the National Electric Code (NEC), (USA), and state and local codes* ☐
- ii. Location of operator switch(es) should be visible to the operator during the application process.* ☐
5. Install supply equipment (if appropriate). ☐
6. Securely mount the Precision Mix™ fluid panel(s) to a vibration-free surface. ☐
- A. Panel(s) may be mounted vertically or horizontally. ☐
- B. 7/16" diameter bolt holes are located in the four corners of the panel(s) for mounting. Reference the system blue prints for mounting dimensions. ☐
- C. The Precision Mix™ fluid panel should be mounted so there is enough space below the outlet to allow for the removal of the integrator housing for cleaning. Access should also be available to perform calibrations and ratio checks. ☐
7. Securely mount the Precision Mix™ solenoid panel(s). ☐
- A. 7/16" diameter mounting holes are located inside the panel in the four corners of the back side. Reference the system blue prints for mounting dimensions. ☐
- B. The Precision Mix™ solenoid panel must be mounted by the fluid panel so the control air tubes do not exceed 6' in length. ☐
8. Securely mount the Precision Mix™ control panel(s). ☐
- A. 7/16" diameter mounting holes are located inside the panel in the four corners of the back side. Reference the system blue prints for mounting dimensions. ☐
9. Have a qualified electrician connect the fluid panel(s), mounting panel(s), and control panel(s) to the same dedicated true earth ground. ☐
- A. Control panel(s) - grounding lug is inside on upper left hand corner of sub-plate. See Instruction Form 308-344, page 8 & 9 for more details. ☐
- B. Solenoid panel(s) - grounding lug is outside on the bottom. See Instruction Form 308-297 page 5 for more details. ☐
- C. Fluid panel(s) - grounding lug is in the lower right hand corner. See Instruction Form 308-288 page 7 for more details. ☐
- D. Have the electrician verify the resistance between each Precision Mix™ component and the ground. Resistance must be less than 25 ohms. Select a new ground site with resistance less than 25 ohms if the current site is greater than 25 ohms. ☐
10. Have the electrician wire the Precision Mix™ operator switch(es) to terminal strip in the mating control panel(s) per the electrical schematic(s) on the system drawing(s) in the system manual(s). ☐
- A. This requires a hole to be cut in the control panel enclosure and a cable strain relief or conduit to be installed. ☐
11. Have the electrician wire any optional or interfacing control devices to the terminal strip in the mating control panel(s) per schematic drawings (if applicable). ☐
- A. This requires a hold to be cut in the control panel enclosure and a cable strain relief or conduit to be installed. ☐
12. Have the electrician wire the cables for the solenoid panel(s) and the flow meters to the terminal strip in the mating control panel(s) per the electrical schematic(s) on the system drawing(s) in the system manual(s). ☐
- A. This requires holes to be cut in the control panel enclosure and cable strain reliefs to be installed. ☐
13. Connect the 14 pin female connector(s) on the solenoid cable(s) to the male connector(s) on top of the mating solenoid panel(s). ☐
14. Connect the female connectors on the flow meter cables to the male connectors on the flow meters on the mating fluid panel(s). Verify that the resin, catalyst, and solvent (if applicable) flow meter cables are wired to the correct terminals in the control panel(s). ☐

15. Connect the male connector on the pendant cable(s) to the female connector on the bottom of the control panel(s). ☐
16. Connect the 9 pin "D" shell connector on the pendant cable(s) to the pendant "D" shell connector and tighten screws. ☐
17. Have the electrician wire fused 110 VAC, 60 HZ, single phase service to the power terminals in the control panel(s) per the electrical schematic(s) on the system drawing(s) in the system manual(s). **Do not energize service to the control panel(s) yet.** ☐
- A. This requires a hole to be cut in the control panel enclosure and a cable strain relief or conduit to be installed.
18. Make the following connections per pages 7 and 8 of Instruction Form 308-297: ☐
- A. Connect (8) 1/8" OD air tubes from the bottom of the solenoid box(es) to the resin, catalyst, solvent, and purge air dispense valves on the mating fluid panel(s). *These air lines must not exceed 6 feet in length.* ☐
- B. Connect a 1/2" OD air tube from the atomizing air outlet (AA OUT) connector on the bottom of the solenoid panel(s) to the atomizing air supply for the mating spray gun(s). Installation of an air pressure regulator between the solenoid panel(s) and the spray gun(s) is recommended. ☐
- C. Connect a 5/32" OD air tube from the dump valve connector on the bottom of the solenoid panel(s) to the pot life dump valve located after the mating fluid panel(s) integrator (if applicable). ☐
- D. Supply regulated compressed air to the atomizing air inlet (AA IN) connector on the bottom of the solenoid panel(s) using a 1/2" OD air tube. A shut-off valve is recommended on this air supply line. *Do not turn on the air supply yet.* ☐
19. Supply air to the air purge dispense valve on the fluid panel. Inlet is a 1/4" OD tube fitting. ☐
20. Connect the spray gun fluid hose(s) to the outlet of the static mixer on the mating fluid panel(s). *Use only grounded fluid hose(s).* ☐
- A. The mixer outlet is 1/4" NPT (F).

Precision Mix™ Start-Up Checklist

This checklist is intended as a general guide to starting up standard Precision Mix™ units. Modifications to the start-up procedure may be required to accommodate optional features, integration with other system components and/or local conditions and codes.

1. Supply solvent (approximately 100 PSI) to the resin, catalyst, and solvent fluid inlets on the Precision Mix fluid panel(s). Inlets are all 3/8" NPT (M). ☐
 - A. Connect the appropriate supply equipment to the fluid inlets on the Precision Mix™ fluid panel(s) as described above. Fill with solvent and energize the supplies.
 - B. If existing circulating lines are to be used to supply the Precision Mix™ unit(s), and flushing them is not feasible, jumper the solvent supply to the resin, catalyst and solvent fluid inlets.
 2. Verify that electrical power to the Precision Mix™ control panel(s) is **not** energized. ☐
 3. Open the air supply to the solenoid panel(s). ☐
 4. Open the front panel on the Precision Mix™ solenoid panel(s). ☐
 5. Verify that the air pressure regulator within the solenoid panel(s) is set for 90 PSI. Damage to the solenoid valves will occur if pressure exceeds 100 PSI. ☐
- SOLVENT FLUSH**
- Solvent Valve**
6. Hold the spray gun(s) firmly against a grounded metal waste container. ☐
 7. Trigger the spray gun(s) open and depress the manual override button on the solvent dispense solenoid valve(s) (solenoid #3 on standard Precision Mix™ solenoid panel(s)). The manual override is the small round brass button. Reference 308-297 Figure 9, Page 9. ☐
 8. Solvent should be dispensed from the spray gun(s) within a few minutes. If it is not, gradually increase the solvent supply pressure until solvent is dispensed. ***Do not exceed the rated working pressure of any system component under any circumstances.*** ☐
 - A. If solvent is not dispensed and increasing the solvent supply pressure will exceed the rated working pressure of a system component, stop and contact Graco Engineered Application Solutions Technical Assistance (612) 379-3622 immediately.
 - B. Continue until clean solvent is being dispensed.
 9. Release the trigger on the spray gun(s). ☐
 10. Release the manual override button on the solenoid valves(s). ☐
 11. Check for, and repair air and/or fluid leaks. ☐
- Catalyst Valve**
12. Trigger the spray gun(s) open and depress the manual override button on the catalyst dispense solenoid valve(s) (solenoid #1 on standard Precision Mix™ solenoid panel(s)). The manual override is the small round brass button. Reference 308-297 Figure 9, Page 9. ☐
 13. Solvent should be dispensed from the spray gun(s). If it is not, gradually increase the solvent supply pressure until solvent is dispensed. ***Do not exceed the rated working pressure of any system component under any circumstances.*** ☐
 - A. If solvent is not dispensed and increasing the solvent supply pressure will exceed the rated working pressure of a system component, stop and contact Graco Engineered Application Solutions Technical Assistance (612) 379-3622 immediately.
 14. Release the trigger on the spray gun(s). ☐
 15. Release the manual override button on the solenoid valve(s). ☐
 16. Check for, and repair air and/or fluid leaks. ☐
- Resin Valve**
17. Trigger the spray gun(s) open and depress the manual override button on the resin dispense solenoid valve(s) (solenoid #2 on standard Precision Mix™ solenoid panel(s)). The manual override is the small round brass button. Reference 308-297 Figure 9, Page 9. ☐

18. Solvent should be dispensed from the spray gun(s). If it is not, gradually increase the solvent supply pressure until solvent is dispensed. **Do not exceed the rated working pressure of any system component under any circumstances.** ☐
 - A. If solvent is not dispensed and increasing the solvent supply pressure will exceed the rated working pressure of a system component, stop and contact Graco Engineered Application Solutions Technical Assistance (612) 379-3622 immediately. ☐
 - B. Continue until clean solvent is being dispensed. ☐
 19. Release the trigger on the spray gun(s). ☐
 20. Release the manual override button on the solenoid valve(s). ☐
 21. Put the spray gun(s) aside, and allow the solvent to sit in the lines for a few minutes. ☐
 - A. Check for, and repair air and/or fluid leaks. ☐
- MATERIAL LOADING**
22. De-energize the supply equipment and relieve fluid pressure from the lines. ☐
 23. Empty remaining solvent from the resin and catalyst supply equipment. ☐
 - A. If jumper hoses were used to connect solvent inlet to resin and catalyst inlets, disconnect them and connect appropriate supply lines to the resin and catalyst inlets on the appropriate Precision Mix™ fluid panel(s). ☐
 24. Fill resin, catalyst, and solvent supply containers with appropriate materials. ☐
 25. Energize the supply equipment, and adjust the fluid supply pressures as desired. Resin and catalyst inlet pressure should be balanced. ☐
- Catalyst**
26. Close the catalyst shut-off valve on the manifold block(s) (see page 5 of Instruction Form 308-288 for location). ☐
 27. Place a waste container under the catalyst ratio check valve outlet(s) (see page 5 of Instruction Form 308-288 for location). ☐
 28. Open the catalyst ratio check valve on the manifold block(s) (see page 11 of Instruction Form 308-288 for location). ☐
 29. Depress the manual override button on the catalyst dispense solenoid valve(s) (solenoid #1 on standard Precision Mix™ solenoid panel(s)). The manual override is the small round brass button. ☐
 30. Catalyst should be dispensed from the ratio check valve(s) within a few minutes. If it is not, gradually increase the catalyst supply pressure until catalyst is dispensed. **Do not exceed the rated working pressure of any system component under any circumstances.** ☐
 - A. If catalyst is not dispensed and increasing the catalyst supply pressure will exceed the rated working pressure of a system component, stop and contact Graco Engineered Application Solutions Technical Assistance (612) 379-3622 immediately. ☐
 31. Release the manual override button on the solenoid valves(s). ☐
 32. Close the catalyst ratio check valve(s). ☐
 33. Open the catalyst shut-off valve(s). ☐
- Resin**
34. Close the resin shut-off valve on the manifold block(s) (see page 5 of Instruction Form 308-288 for location). ☐
 35. Place a waste container under the resin ratio check valve outlet (see page 5 of Instruction Form 308-288 for location). ☐
 36. Open the resin ratio check valve on the manifold block(s) (See page 11 of Instruction Form 308-288 for location). ☐
 37. Depress the manual override button on the resin dispense solenoid valve(s) (solenoid #2 on standard Precision Mix™ solenoid panel(s)). The manual override is the small round brass button. ☐

38. Resin should be dispensed from the ratio check valve(s) within a few minutes. If it is not, gradually increase the resin supply pressure until catalyst is dispensed. ***Do not exceed the rated working pressure of any system component under any circumstances.*** ☐
- A. If resin is not dispensed and increasing the resin supply pressure will exceed the rated working pressure of a system component, stop and contact Graco Engineered Application Solutions Technical Assistance (612) 379-3622 immediately.
39. Release the manual override button on the solenoid valve(s) and close the solenoid panel door. ☐
40. Close the resin ratio check valve(s). ☐
41. Open the resin shut-off valve(s). ☐
- SOFTWARE SET UP**
42. Place the operator switch(es) in the "standby" position. ☐
43. Temporarily install a black pendant on the Precision Mix™ control panel(s) in place of the red pendant(s) if appropriate). Red pendants do not provide access to the set up routine. ☐
44. Energize electrical power supply to the Precision Mix™ control panel(s) and place power switch(es) in "on" position. ☐
45. The "target actual" screen will be displayed on the pendant(s). Press the unmarked key directly under the alarm indicator lamp. ☐
46. The title screen will be displayed. ☐
47. Press the F2 (Set-up) key. ☐
- A. If no change is required, the Title screen will be the same as shown in Instruction Form 308-344, Page 24. ☐
- B. If a color change is installed on the system, the Title screen will be the same as shown in Instruction Form 308-344, page 25. ☐
- C. If multiple recipes are required and there is no recipe selection on the Title screen, contact Graco Engineered Application Solutions Technical Assistance at (612) 379-3622 immediately. ☐
48. Per the instruction starting on page 28 of Instruction Form #308-344, select the desired ratio, purge, and alarm parameters. ☐
49. Per the instruction beginning on page 35 of Instruction Form 308-344, select the desired installation parameters and verify proper factory-set flow-meter values by comparing the part numbers on the meters with the values in the following chart: ☐
- | Flow Meter Part Number | Flow Meter Value (K-Factor) |
|------------------------|-----------------------------|
| 235-587, 235-593 | .114 |
| 235-588, 235-594 | .230 |
| 235-592, 235-589 | .588 |
- It is recommended that all set-up values be recorded on paper and stored in a safe place for future reference.
50. Perform Flow Meter Calibration as outlined in Chart on Page V-7.
51. Perform a ratio check as follows:
- A. Close the resin and catalyst shut-off valves on the manifold block(s). ☐
- B. Verify that all spray gun(s), optional dump valve(s), and any other downstream dispense ports are closed. ☐
- C. Place the operator switch(es) in the "mix" position. ☐
- D. Place a waste container at the outlet of the resin and catalyst ratio-check valve outlet(s). ☐
- E. Open the resin and catalyst ratio-check valves. ☐
- F. After one dispense of each component, place a graduated measuring container at the outlet of the ratio-check valve(s). ☐

- G. Allow the Precision Mix™ to cycle back and forth between resin and catalyst until both measuring containers have collected sufficient fluid to provide an accurate measurement. Make certain that an equal number of resin and catalyst dispenses are collected. ☐
- H. Close the resin and catalyst ratio-check valves. ☐
- I. Compare the volumes collected with the mix-ratio and ratio-tolerance values selected. If ratio(s) were maintained, proceed to step 52. If ratio was inaccurate, perform flow meter calibration test(s) as shown below. After performing calibration test(s), perform another ratio check per the above instructions. If a problem still exists, contact Graco Engineered Application Solutions Technical Assistance at (612) 379-3622. ☐
- 52. Place the operator switch(es) in the "standby" position. ☐
- 53. Open the resin and catalyst ratio-check valves and place a waste pail at their outlets. ☐
- 54. Open the solenoid panel and depress the manual override for the solvent purge valve (solenoid #3). ☐
- 55. When both ratio check valves are purged, release the solenoid manual override, close the resin and catalyst ratio check valves and open the resin and catalyst shut-off valves on the manifold block(s). ☐
- 56. Place the operator switch(es) in the "mix" position. ☐
- 57. Hold the spray gun(s) firmly against a grounded metal waste container and trigger until all solvent is cleared from the line(s). While the solvent is cleared from the lines, Flow Rate High alarms(s) may occur. Clear them by cycling the operator switch(es) to "standby" then "purge" and back to "mix". If the alarms continue after the solvent is cleared from the lines, see the troubleshooting instructions. ☐

Production may now begin.

Flow Meter Calibration

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 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.

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.

On line two of the Flow Meter Test screen there will be a number that represents how much fluid the Precision Mix™ 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.

13. Continue to the Component "B" flow meter calibration test or:
 - a. Flush the ratio check valves.
 - b. Open the manifold shut-off valves.
 - c. Return to the Run Screen to begin production.

14. For solvent meter calibration procedures, contact Graco Engineered Application Solutions Technical Assistance at (612) 379-3622.