Instructions – Parts List

Parts

FOR PROPORTIONAL MIXING OF COATINGS WITH CARBON DIOXIDE

PrecisionMix®II Unicarb® Proportioning System Kit

309023 rev.C

For systems using the Graco PrecisionMix II Controller

Part No. 243213

NOTE: The PrecisionMix II/Unicarb Kit is not CE marked, but the individual components are CE marked. It is up to the integrator to obtain a CE mark for the final system. See the individual component manuals for approval information.

Patent No. 5,368,059

Read warnings and instructions.
See page 2 for **Table of Contents**.

PROVEN QUALITY. LEADING TECHNOLOGY.

GRACO INC. P.O. BOX 1441 MINNEAPOLIS, MN 55440-1441

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 II Controller must only be installed and serviced by a qualified electrician.
- The PrecisionMix II Controller is for use only in non-hazardous locations. The maximum applied relay voltage shall not exceed +24 volts. Do not operate the controller in hazardous locations, as defined in Article 500 of the National Electrical Code (USA).
- Ground the equipment and the object being sprayed. See **Ground the System** on page 22.
- Do not install non-intrinsically safe equipment in a hazardous area.
- 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 II 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).

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.

⚠ WARNING

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 26 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.

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 your Graco distributor or integrator.
- 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 II 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.

The Unicarb Process

Description

The Unicarb process was developed and patented by Union Carbide to help reduce V.O.C (volatile organic compound) emissions and cut production costs. This process is based on the concept that solvents of common paints, coatings and adhesives can be replaced with supercritical carbon dioxide (or CO_2) in many spray applications.

Typical paints, coatings and adhesives are reformulated by the suppliers, with the assistance of Union Carbide, to remove the majority of their common solvents. The resulting fluid is a high viscosity, low V.O.C. coating. This material is then mixed with supercritical CO_2 just prior to application.

The supercritical CO_2 reduces the viscosity of the material and aids in atomization. The fluid is atomized by a combination of the fluid pressure through a preorifice and spray tip and the rapid expansion of the CO_2. Once the mixture of CO_2 and coating leaves the spray nozzle, the CO_2 returns to its gaseous state, which releases energy that breaks the coating into smaller droplets and improves the quality of the finish. The CO_2 flashes away immediately, leaving the solids of the coating behind.

Supercritical CO_2: The CO_2 is in a supercritical state when it is neither completely liquid or gas, but a combination of the two. The CO_2 is kept in a supercritical state through a combination of elevated temperatures and elevated pressures while in the system.

CO_2 Supply: The CO_2 can be supplied in numerous ways. It is available in bulk tanks or cylinders from gas supply venders. CO_2 can also be supplied on site by a CO_2 generator.

Applications

The most common applications for the Unicarb process include the spray application of:

- Paints used in automotive components
- Adhesion promoters in decorative plastics manufacturing
- Conversion coatings and other materials in paper processing

Spray applications are typically performed with fluid pressures ranging from 1200 to 2500 psi (8 MPa, 83 bar to 17 MPa, 172 bar) and at temperatures ranging from ambient to 160° F (71° C). The spray gun is typically airless or air-assisted, without using the air-assist feature.

Benefits

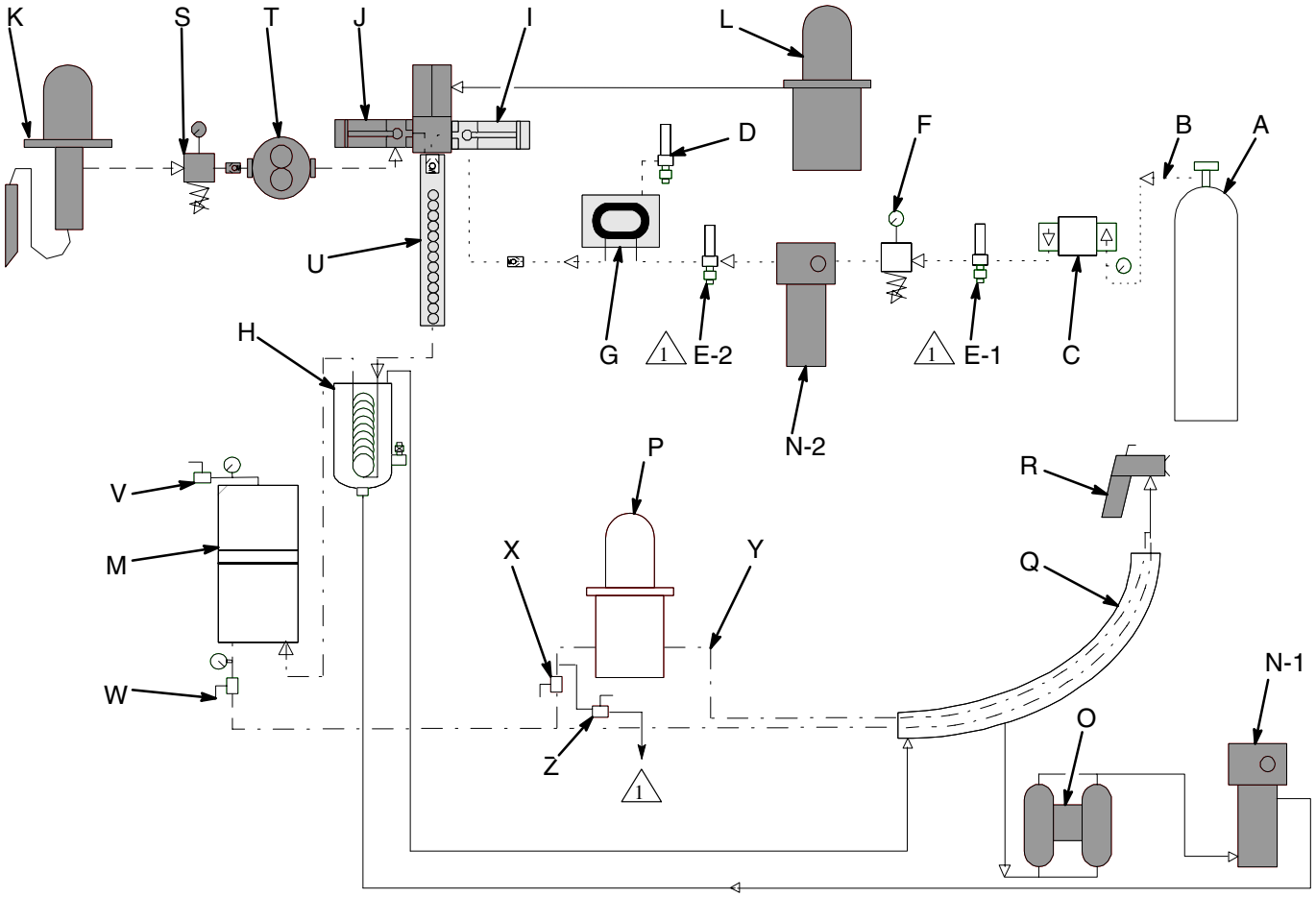
There are two primary benefits of this process.

Reduces V.O.C Emissions: By substituting CO_2 for the majority of organic solvents used in a coating, the V.O.C. emissions are dramatically reduced. This has a positive, measurable, environmental impact and aids in compliance to Environmental Protection Agency regulations.

Cuts Production Costs: The Unicarb process has a higher transfer efficiency than other spray application techniques. More of the coating ends up on the part rather than in the booth filters and hazardous waste disposal drums.

The Unicarb process provides better control of wet film builds, especially for very thin film applications. Better control means applying less coating to achieve the minimum acceptable film build. The savings often justify the cost of the equipment in a short period of time.

PrecisionMix II/Unicarb System



Graco Standard Product
Graco Unicarb Kit (see page 31 for parts)
Supplied by integrator

Fig. 1 **Typical System Installation**

KEY

A CO_2 Supply Tank
B CO_2 Supply Hose
C CO_2 Booster Pump
D Pressure Relief Valve (low pressure)
E Pressure Relief Valve (safety requirement)
F CO_2 Pressure Regulator
G Mass Flow (Coriolis) Meter
H Mixed Material Heat Exchanger (optional)
I CO_2 Dispense Valve
J Resin Dispense Valve
K Resin Supply Pump
L Solvent Flush Pump
M Accumulator (optional)
N Heater (optional)
O Diaphragm Pump (optional)
P Circulation Pump (optional)
Q Heated Hose (optional)
R Spray Gun
S Resin Supply Regulator
T Resin Gear Meter
U Integrator
V Nitrogen Fill Port (optional)
W Accumulator Outlet Valve (optional)
X Circulating Valve (optional)
Y Circulation Hose (optional)
Z Circulating Drain Valve (safety requirement in a circulation loop)

1 Plumb to safe location

Function of Components

The PrecisionMix II/Unicarb proportioning system can be divided into six basic sub-systems:

- **CO_2 Delivery System:** Conditions and delivers CO_2 from the supply container to the PrecisionMix II Mixing System at the correct pressure.

- **Resin Delivery System:** Conditions and delivers resin (coating or adhesive) from the supply container or first stage proportioner to the PrecisionMix II Mixing System, at the correct pressure.

- **PrecisionMix II Mixing System:** Measures, proportions, and mixes the CO_2 and resin fluid streams.

- **Circulation System:** Conditions and transports the CO_2 and resin mixture. It is often used in conjunction with the temperature control system to provide thorough temperature control.

- **Temperature Control System:** Typically a system of components for heating and circulating hot water around the mixed CO_2 and resin delivery equipment to elevate and maintain the temperature of the mixture.

- **Spray Gun:** Atomizes the CO_2 and resin mixture to apply it to the part.

Whether the circulation and temperature control subsystems are used, depends upon the type of resin and the particular application. Each sub-system must operate properly in conjunction with the others for the entire system to operate properly.

Refer to the system diagram on page 6 and to the following sub-system information, the manuals supplied with each of the major system components for further information.

CO_2 Delivery System

The CO_2 delivery system starts with the CO_2 supply (A). This is typically a cylinder or a tank, but it may also be a CO_2 generator, with an ON/OFF valve at the supply outlet.

The CO_2 supply must provide CO_2 liquid and not gas. In the cylinder, this is accomplished by using a dip tube that removes the CO_2 fluid from the bottom of the tank.

CO_2 cylinders typically provide about 800 psi (5.5 MPa, 55 bar) of pressure when full. CO_2 tanks provide about 300 psi (2.1 MPa, 21 bar) of pressure.

The CO_2 travels through a hose (B) to the CO_2 booster pump (C). The CO_2 booster pump is a two-stage, air operated pump that increases the pressure of the CO_2 to acceptable levels. The pump requires an air pressure regulator on the air supply to control the pump pressure.

A pressure relief valve (E-1) is installed at the output of the CO_2 booster pump to relieve excessive CO_2 pressure. The output of the pressure relief valve must be plumbed into a safe location.

The high pressure CO_2 travels to a CO_2 pressure regulator (F). The regulator provides fine, consistent control of the CO_2 pressure and helps to reduce pulsation generated by the CO_2 booster pump. The gauge on the regulator indicates the CO_2 delivery pressure of this sub-system.

Function of Components

Resin Delivery System

The resin delivery system operates in much the same way as the CO_2 delivery system. The resin can be either a conventional, single component coating or adhesive, or it can be a pre-mixed plural component material. The resin is supplied by an air powered pump (K).

The resin pump requires an air pressure regulator (not shown) on the air supply in order to control the pump pressure.

Downstream of the resin delivery system is a resin pressure regulator (S). This provides fine, consistent control of the resin pressure and helps to reduce pulsation generated by the resin pump. The gauge on the regulator indicates the resin delivery pressure.

PrecisionMix II Mixing System

The PrecisionMix II proportioner is described in the separate PrecisionMix II Manual 308916, supplied with the system. Please refer to the section titled “How the PrecisionMix II Works”.

In the PrecisionMix II/Unicarb system, the PrecisionMix II proportioner is used to mix component A or resin with supercritical CO_2 (instead of catalyst as described in the PrecisionMix II manual). The standard PrecisionMix II proportioner has been modified to mix resin with supercritical CO_2 in the following ways.

Flow Meter

The standard positive displacement (gear) flow meter for component B or catalyst has been replaced with a mass flow (Coriolis) meter (G). This type of meter is required for measuring the flow of CO_2 in the system because the CO_2 is neither completely gas or liquid in this stage. The output of the mass flow meter generates electronic pulses, replicating the type of signal sent by a positive displacement meter. A pressure relief valve (E-2) is installed at the meter input to relieve excessive CO_2 pressure.

⚠ WARNING

INJECTION HAZARD

To reduce the risk of serious injury, including injection, install a pressure relief valve (D) to vent the high pressure CO_2 to a safe area as instructed below. Refer to Fig. 1.

The inner tubes of the mass flow meter are rated for high pressure, 5000 psi (34 MPa, 345 bar), however, the secondary enclosure around the meter is only rated for 330 psi (2.1 MPa, 21 bar). A safety problem can occur if the high pressure CO_2 leaks into the secondary chamber. To reduce the risk of serious injury, two purge connections are supplied on the secondary enclosure. A pressure relief valve (D) must be connected to the purge connections to vent any high pressure CO_2 in the secondary chamber to a safe area. The secondary containment area of the meter is filled with dry nitrogen to protect it from corrosion. The meter must be filled with a dry, inert gas after the pressure relief valve is installed.

Mix Manifold

The kit modifies the dispense valve (I) for component B to properly control the flow of CO_2. The kit includes a softer acetal seat to replace the standard stainless steel seat and buna-n seals to help prevent CO_2 leaks. An additional check valve is added to the input of the CO_2 dispense valve to prevent back flow of the CO_2. The standard integrator is replaced with a “ball mixer”, which uses a series of close fitting balls within a tube to help force the CO_2 into the resin material.

Refer to the mix manifold assembly manual 308288, included with your system, for more information about the mix manifold.

Controller

The controller must be setup for airless spraying. See the PrecisionMix II system manual for setup instructions. An in-line flow switch must be installed near the integrator outlet. See page 25 for more information on airless spraying.

Function of Components

Accumulator (Optional)

The PrecisionMix II mixing system may include an accumulator (M) to remove pulsation from the output of the mixing system. The accumulator is a high pressure cylinder containing a piston. The piston contains a seal that prevents fluid from traveling from one side of the piston to the other. The area below the piston is supplied with a mixture of resin and CO_2, fed from the mixing system. The area above the piston is charged with pressurized nitrogen gas.

When the fluid pressure in the output of the mixing system drops quickly, the accumulator supplies the missing pressure. The accumulator can also store brief pressure increases as well.

In systems with a manually activated spray gun, a position sensor can be added to the accumulator. The sensor detects the position of the piston within the cylinder. The sensor provides a signal to the mix and air flow switch inputs. When the piston is too low, the mix and air flow signals are applied, which initiates the supply of mixed material into the system. When the piston is too high, the signal is removed, which stops the supply of mixed material.

Circulation System (Optional)

The circulation system is an option that is used primarily in systems with multiple automatic guns or with resins that resist mixing with the CO_2. The primary component of the circulation system is a circulation pump (P).

The circulation pump is an air-driven, high pressure, piston pump that is designed to precisely balance its input and output. An air pressure regulator (not shown) is installed on the air supply line to control the rate of circulation in the loop.

The circulation pump moves mixed resin and CO_2 in a continuous loop from the pump, through a circulation hose (Y) to the spray gun(s), and back again. In most cases, fluid will also pass through a heat exchanger (H), located in the circulation loop. The loop is fed by the mixing system.

Function of Components

Temperature Control System (Optional)

Because the CO_2 in the system is supercritical, the resin and CO_2 mixture is very sensitive to changes in temperature, which also affects pressure. An increase in temperature will increase the pressure, which will affect atomization and coverage. In some cases, the CO_2 will mix better with the resin if the temperature of one or both fluids is elevated. In other cases, the resin and CO_2 mixture will atomize better if the temperature of the mixture is elevated. The amount and type of temperature control is determined in advance through input and testing by Graco, Union Carbide, the system integrator, and your resin supplier.

Generally, a temperature control system will contain one or more air powered diaphragm pumps (O), electric heaters (N-1, N-2), and heat exchangers (H and Q).

Most systems will use a CO_2 pre-heater (N-2) to elevate the temperature of the CO_2 mixture before entering the mix manifold.

The heat exchangers (H) are used for temperature elevation and control of the mixed material. Two types of heat exchangers are usually used with the system:

- A heat exchanger (H) that circulates the material through the tube side of a shell and tube heat exchanger.
- A heated hose (Q).

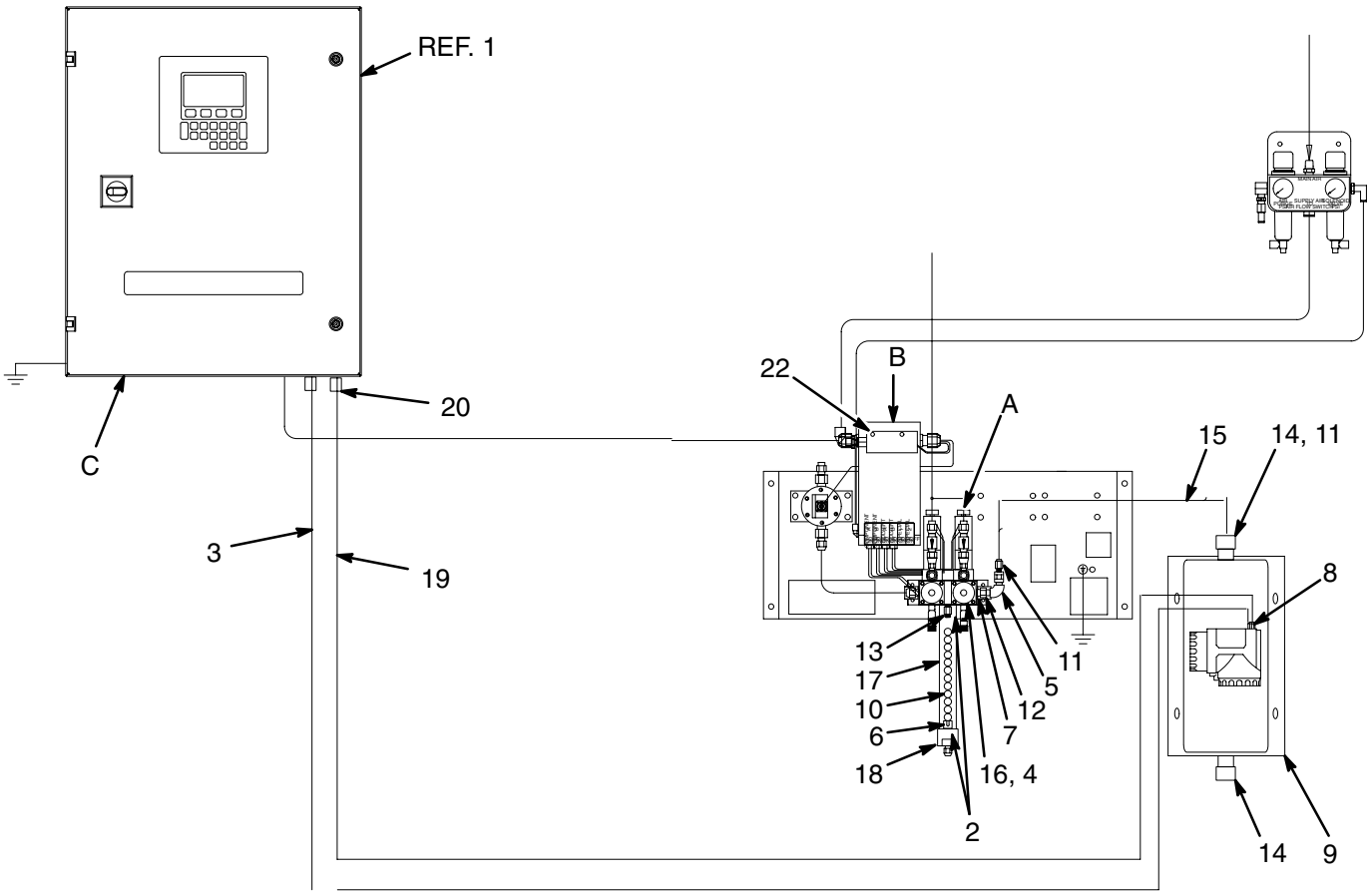
The water for the heat exchangers is supplied by a circulation loop. Electric heater(s) (N-1) heat the water, which is then circulated by an air powered diaphragm pump (O). Install at least one pressure relief valve in each water circulation line to relieve the pressure caused by thermal expansion and accidental rupture of a process line within a heat exchanger.

Spray Gun

The spray gun (R) is typically an automatic or manual airless spray gun or air-assisted spray gun that does not use the air-assist feature. See page 32 for part numbers of guns available from Graco.

The fluid is atomized by a combination of the fluid passing through a pre-orifice and spray tip and the rapid expansion of the CO_2. Once the mixture of CO_2 and coating leaves the spray nozzle, the CO_2 returns to its gaseous state, which releases energy that breaks the coating into smaller droplets and improves the quality of the finish. The CO_2 flashes away immediately, leaving the solids of the coating behind.

Unicarb Kit Installation



NOTE: See page 31 for the kit parts list.

Fig. 2 9488A

⚠ WARNING

Read the **System Installation** warnings and instructions, beginning on page 18, before installing kit parts to properly and safely install the overall system.

NOTE:

- The mix manifold (A) and mass flow meter (9) must be mounted to a vibration-free surface.
- The mix manifold (A), solenoid box (B), and controller (C) must be located in a non-hazardous area.
- Be careful not to kink or damage the tubing (15) during installation.
- The remote operators station (not shown) can be located in a hazardous location but it must be installed in compliance with the National Electric Code and other regulating authorities. Refer to your PrecisionMix II system manual for further information on the remote operators station.
- All low voltage (+24V) lines must be enclosed in shielded cables and be placed in isolated conduit runs to prevent erroneous signals.

Unicarb Kit Installation

⚠ WARNING

INJECTION HAZARD
To reduce the risk of a serious injury from accidental spray from the gun, splashing fluid, or moving parts, follow the **Pressure Relief Procedure** on page 26 before checking or servicing the system and whenever you are instructed to relieve the pressure.

Remove the Component B Gear Meter

1. Disconnect the cable and fluid line from the component B gear flow meter (J). See Fig. 3.

2. Loosen the screws and remove the meter from the fluid panel (K).

Modify the Component B Dispense Valve

1. Disconnect the fluid line (E) and two air lines (F) from the component B dispense valve (D). See Fig. 3 and 4.

2. Loosen the two cap screws (G), and carefully remove the dispense valve. See Fig. 4.

3. Replace the valve seat and seat o-rings with the kit seat (16) and o-ring (4).

4. Remove the component B inlet adapter (H) and replace it with the kit parts in the following order: install the adapter (7), check valve (12), elbow (5), and fitting (11). See Fig. 5. Be sure the check valve arrow points toward the mix manifold.

5. Align the component B dispense valve (D) on the mix manifold and secure it with the two cap screws (G). Reconnect the air lines (F) and fluid line (E). See Fig. 4.

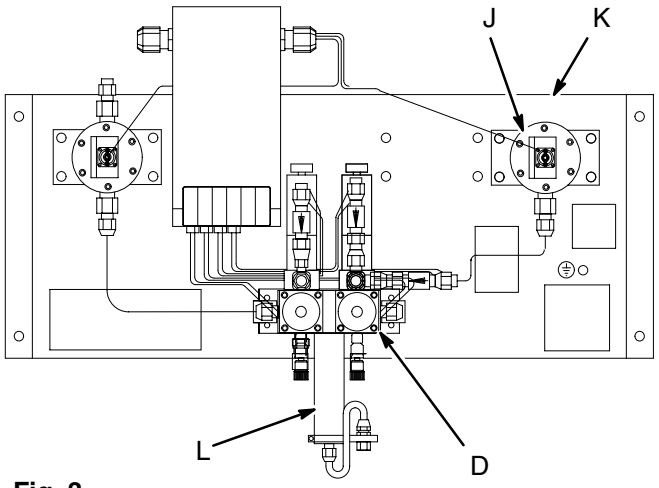


Fig. 3

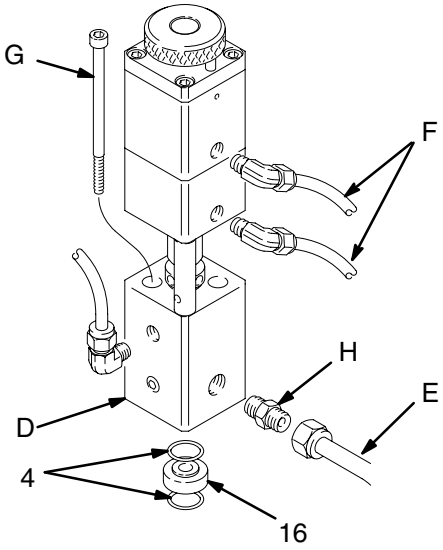


Fig. 4

01912A–new

Unicarb Kit Installation

Replace the Integrator Housing and Tube

1. Remove the mix manifold integrator housing and tube (L). See Fig. 3.

2. Replace the tube with the kit check valve (12). See Fig. 5. Be sure the check valve arrow points away from the mix manifold.

3. Replace the integrator housing with the kit o-rings (2), ball guide (6), ball bearing (10), integrator housing (17), and cap (18).

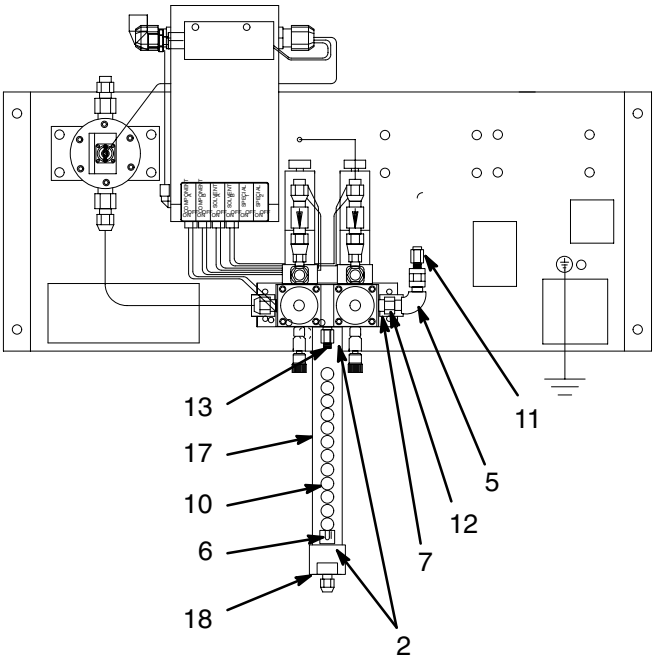


Fig. 5

Unicarb Kit Installation

Install and Configure the 60 Series Mass Flow Meter

1. Mount the mass flow meter (9) on a vibration-free surface.
2. Remove the wire cover (P). See Fig. 8.
3. Connect the power supply input and outputs as shown in Fig. 6 and 7. Re-install the wire cover.
4. Loosen the safety grip screws (M). See Fig. 8.
5. Unscrew the electronics cover (N).
6. Remove the local display (O) if present.
7. Set the DIP switches as shown in Fig. 6.
8. Re-install the display (O) and electronics cover (N).

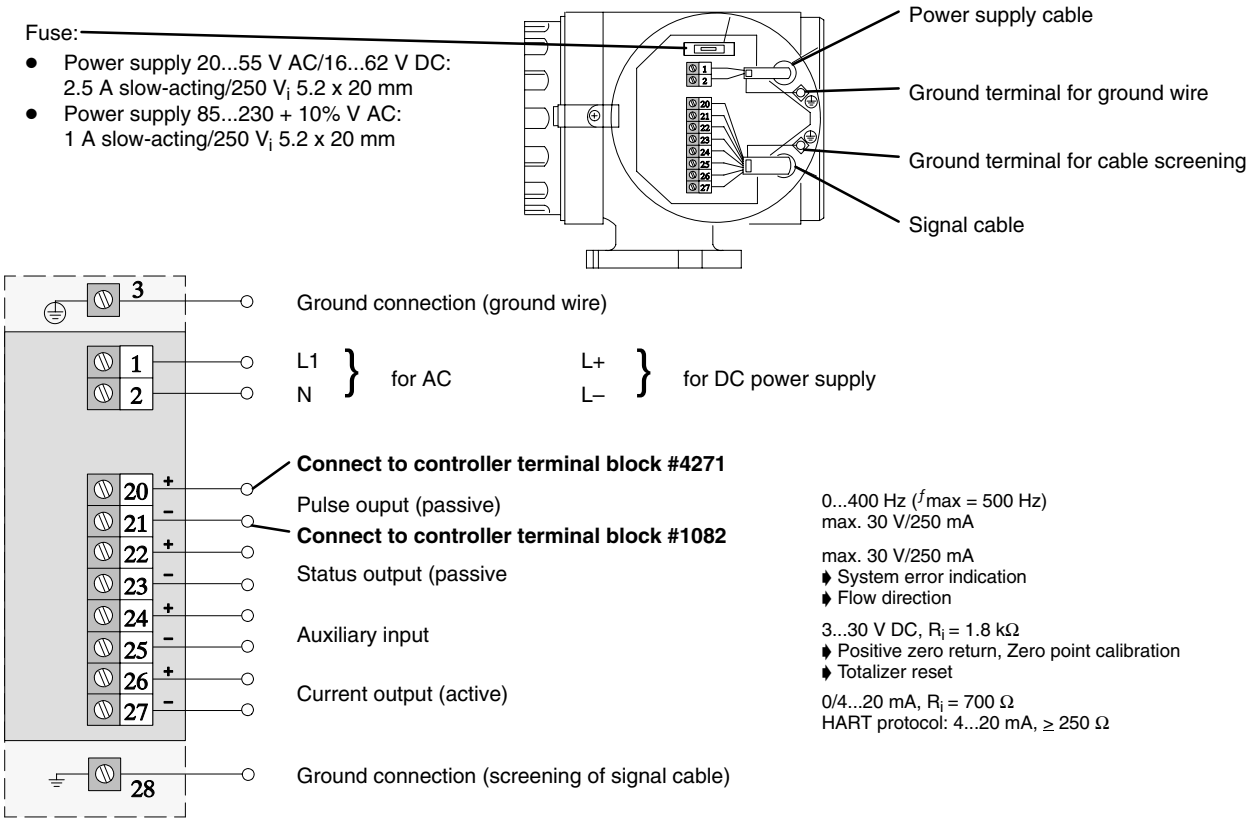


Fig. 6 9486A

NOTE: All signals labeled 1082 are GND.
All signals labeled 2021 are +24V.

1. Connect mass flow meter output #20 to controller input #4271.
2. Connect mass flow meter output #21 to controller input #1082.
3. Connect cable shield to controller input #1082.
4. Install the resistor (1) across controller inputs #4271 and #2021.

NOTE: The flow meter can also be wired directly to the terminal block located inside of the solenoid box (B–Fig. 2). Follow the same procedure above except replace input #4271 with #65, #1082 with #8 or #7, and #2021 with #6.

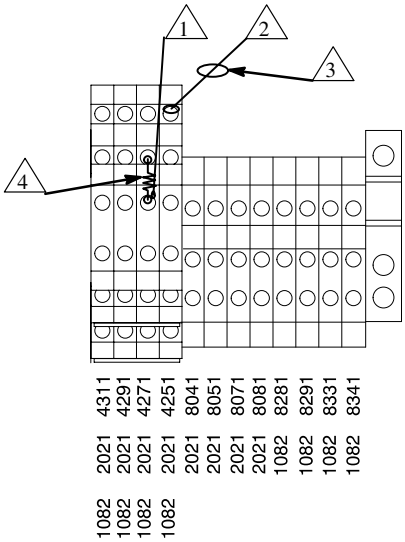
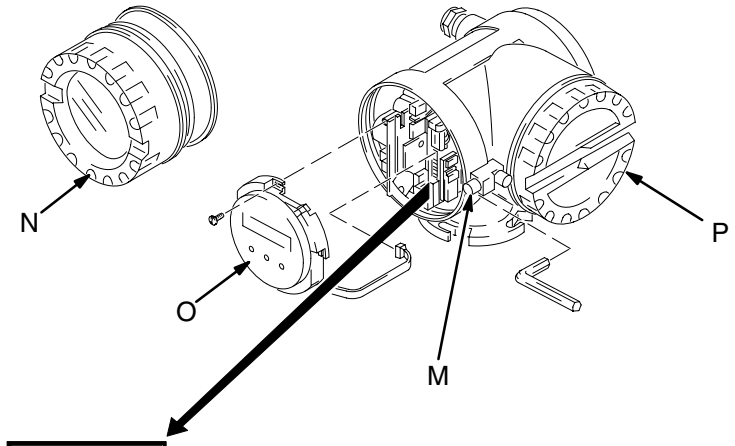


Fig. 7 **Section of Controller Terminal Block**

Unicarb Kit Installation (60 Series Meter)



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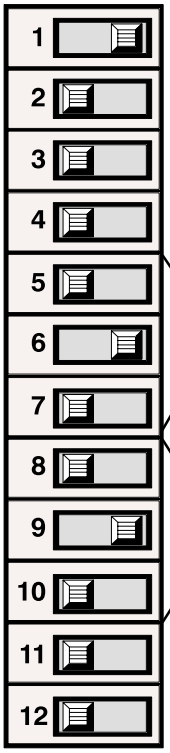


ON Creep suppression activated
OFF Creep suppression deactivated

ON Status output: flow direction
OFF Status output: indication of system errors

ON US engineering units (lb, gal)
OFF SI engineering units (kg, t; l, m^3)

ON 0...20 mA current range
OFF 4...20 mA, current range

Setting pulse value

Scaling the full scale value (= flow at 20 mA)
(Current output)

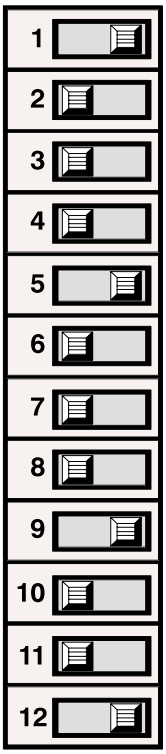
ON Auxilliary input: Positive zero return*
OFF Auxiliary input: Zero point calibration*

ON Short-cycle batching on **
OFF Short-cycle batching off**

* or totalizer reset via local display

** Filling cycle up to <10 sec.

Factory settings
DIP switches No. 1–12



Unicarb system settings
DIP switches No. 1–12

9487A

Fig. 8

Unicarb Kit Installation

Install and Configure the 80 Series Mass Flow Meter

1. Mount the mass flow meter (9) on a vibration-free surface.
2. Remove the wire cover (P). See Fig. 8.
3. Connect the power supply input and outputs as shown in Fig. 6 and 7. Re-install the wire cover.
4. Loosen the safety grip screws (M). See Fig. 8.
5. Unscrew the electronics cover (N).
6. Remove the local display (O) if present.
7. Set the DIP switches as shown in Fig. 6.
8. Re-install the display (O) and electronics cover (N).

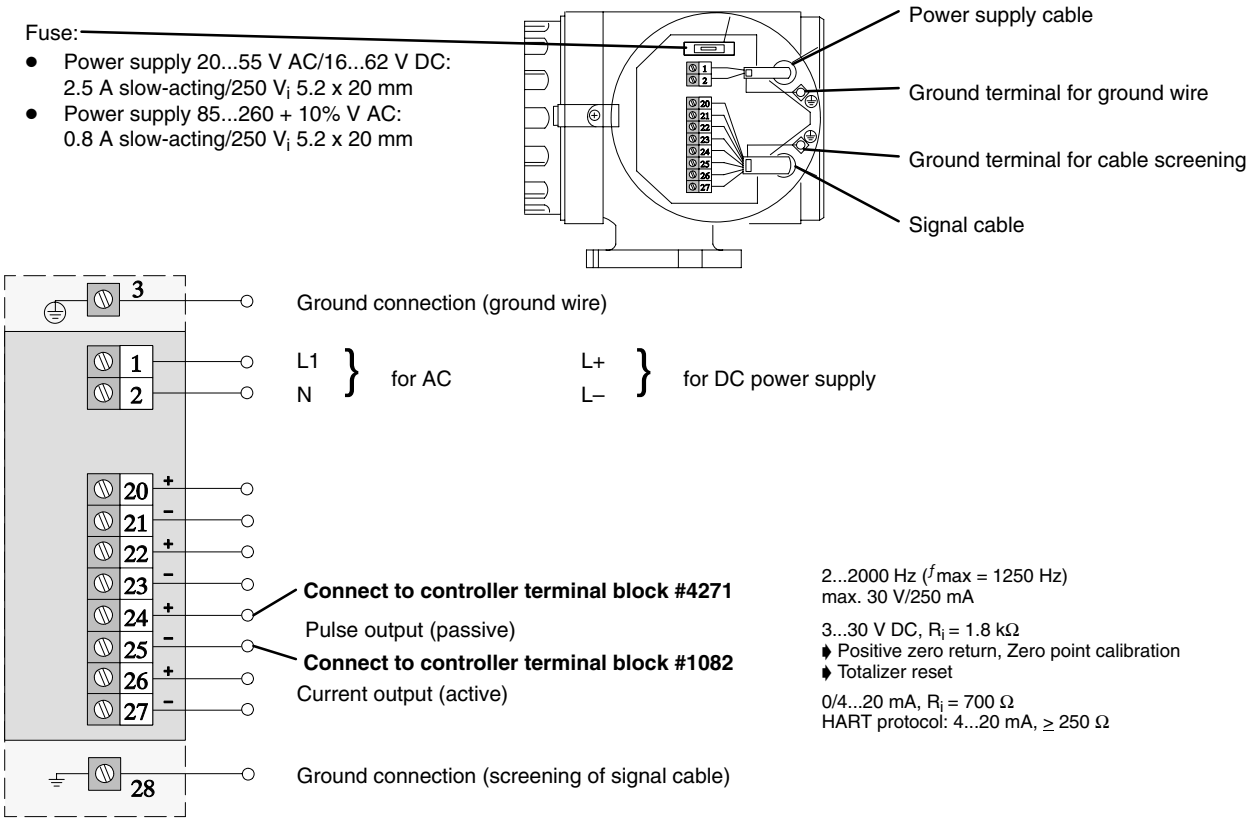


Fig. 9 9486A

NOTE: All signals labeled 1082 are GND.
All signals labeled 2021 are +24V.

1. Connect mass flow meter output #24 to controller input #4271.
2. Connect mass flow meter output #25 to controller input #1082.
3. Connect cable shield to controller input #1082.
4. Install the resistor (1) across controller inputs #4271 and #2021.

NOTE: The flow meter can also be wired directly to the terminal block located inside of the solenoid box (B–Fig. 2). Follow the same procedure above except replace input #4271 with #65, #1082 with #8 or #7, and #2021 with #6.

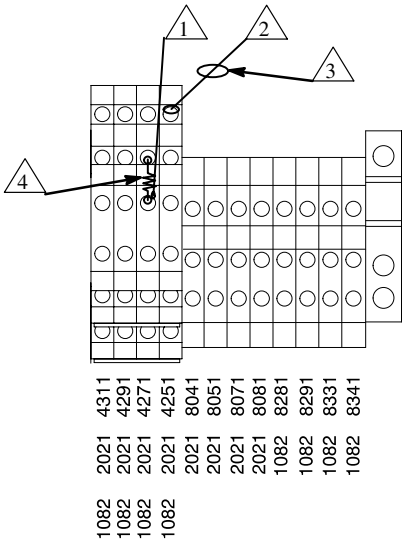


Fig. 10 **Section of Controller Terminal Block**

Unicarb Kit Installation

Using the upgraded electronics for the Promass 80A

If your meter is an 80 series meter, use the following configuration table for initial setup of your meter.

NOTE: To find the series of your meter, check the serial tag of the meter located on the electronics head. In the model number area, you should see the number 60 or 80 . Consult the coriolis flow meter manual included in this kit.

Group	Parameter	Value
Status Output	Off Value	Off
System Units	Mass Flow	kg/h
	Volume Flow	l/h
	Unit Volume	l
	Unit Density	kg/l
	Unit Temperature	Celsius
	Unit Length	Millimeter
	Unit Pressure	Bar G
Current Output (Mass Flow)	Current Span	4–20 mA
Pulse/Freq. Output	Pulse	Pulse
	Assign Pulse	Mass Flow
	Pulse Value	1.0000 kg/P
	Pulse Width	100.00 ms
	Output Signal	Passive/Positive

System 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 and velocity requirements.

NOTE:

- Have the PrecisionMix II/Unicarb system manuals available during installation.
- Reference numbers and letters in parentheses in the text refer to the numbers and letters in the illustrations.
- Be sure all accessories are adequately sized and pressure rated to meet the system requirements.
- Connect the fluid and air supply lines as instructed in the separate PrecisionMix II Manual 308916, supplied with the system.

The typical installation shown in Fig. 11 is only a guideline for selecting and installing system components and accessories and is not an actual system design. Contact your Graco representative for assistance in system design.

Location

⚠ WARNING

FIRE AND EXPLOSION HAZARD
The standard PrecisionMix II/Unicarb system is for use only in non-hazardous locations. Do not operate in hazardous locations, as defined in article 500 of the National Electric Code (USA).

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

CO_2 Delivery System
(Supplied by Integrator)

See Fig. 11, page 20.

⚠ WARNING

EXPLOSION AND INJECTION HAZARD
Failure to follow instructions on the location, mounting, and plumbing of the CO_2 delivery system can result in explosion, fluid injection, or severe freeze burns.

- Read and follow the warnings on pages 3 and 4.
- Follow all national, state and local codes regarding cylinder location and mounting requirements.

NOTE:

- The CO_2 supply (A) should be easily accessible (within 25 ft. (7.62 m) of the mixing system).
- OSHA requires that the CO_2 supply be chained to a wall or rigid structure to prevent it from falling over.
- The ON/OFF valve at the top of the CO_2 supply must be easily accessible.

System Installation

CO_2 Supply

The CO_2 supply must be free of pressure spikes, which are commonly caused by a pump (C) stroke change-over. Install an additional pressure regulator (F) or a surge tank on the CO_2 inlet to the PrecisionMix II/Unicarb proportioner, to reduce fluid supply pressure variations.

The following installation and operation instructions generally presume a standard system, using cylinders (A) to supply the CO_2. The **Optional CO_2 Supplies** listed below are two possible variations and their effect on the instructions.

Optional CO_2 Supplies

Supplying CO_2 from a CO_2 Generator

The mixing system can be connected to a CO_2 generator instead of cylinders. Verify that the output pressure of the CO_2 generator is appropriate for the system. The CO_2 booster pump (C) may or may not be required. Other than references to the cylinders, operation is the same as described in this manual. For maintenance and safety, you must install a pressure relief valve (E-1) between the CO_2 supply line and the mixing system input.

Supplying CO_2 from Cryogenic Tanks

CO_2 can be supplied by cryogenic tanks, which hold more CO_2 than a cylinder. Tanks are typically lower in output pressure than cylinders, around 300 psi (2.1 MPa, 21 bar) compared to 800 psi (5.5 MPa, 55 bar) for cylinders. Other than references to the cylinders, operation is the same as described in this manual. A dip tube is required for cryogenic tanks to ensure that CO_2 liquid is being removed from the bottom of the tank.

Installation of CO_2 Delivery System

1. Connect the adapter fitting to the ON/OFF valve outlet (left-hand thread) of the CO_2 supply.

2. Mount the booster pump (C) in its normal, horizontal position, away from any sources of heat, and close to the mixing system.

3. Connect the supply hose (B) from the CO_2 supply adapter to the CO_2 booster pump inlet (C). The supply hose must be a plastic lined, metal braid hose.

⚠ WARNING

TOXIC FUME HAZARD
To avoid serious injury from CO_2 inhalation, do not use laminated plastic hoses for CO_2 supply. CO_2 will permeate laminated hoses.

The CO_2 supply line must be routed away from any sources of heat to avoid damage to the hose.

4. Connect the booster pump to a filtered, regulated, 1/4 in. (6.4 mm) air supply line that has a bleed-type ball valve installed in the line.

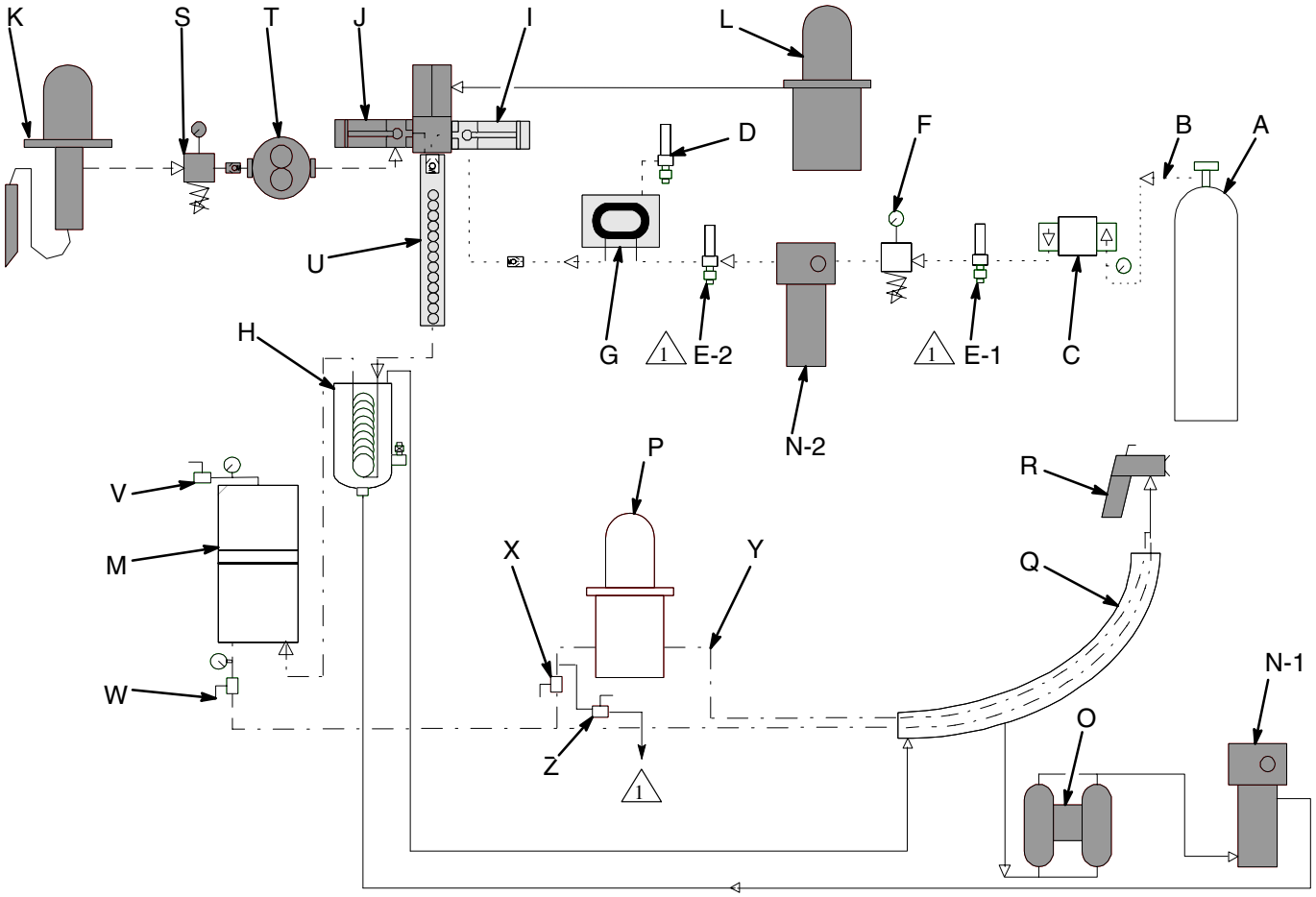
5. The pressure relief valve (E-1) must be plumbed with a (minimum) 3/4 in. (19 mm) tubing vent line, no more than 8 ft. (2.45 m) long. Plumb the tubing to vent the CO_2 to a safe location. The tubing must be rigidly attached to prevent movement if high pressure CO_2 is relieved through the vent line.

6. Use either a plastic lined, metal braid hose or a rigid, high pressure stainless steel tube to connect the pump and pressure relief valve to the pressure regulator (F) inlet. Position the CO_2 regulator for easy adjustment and viewing of the gauge. Make sure that the low pressure gauge port is plugged. The exhaust port of the regulator will occasionally vent CO_2. Plumb the tubing to vent the CO_2 to a safe location.

7. Use small diameter, high pressure, rigid stainless steel tubing to connect the regulator (F), heater (N-2), pressure relief valve (E-2), and mass flow meter (G) . The mass flow meter outlet should be connected to the mix manifold (I) inlet. Verify that the connections are correct and tight.

   NOTE: Keep the tubing volume between the mass flow meter and the mix manifold as small as possible. This will reduce meter response lag time caused by compression of the CO_2.

System Installation



Graco Standard Product
Graco Unicarb Kit (see page 31 for parts)
Supplied by integrator

Fig. 11 **Typical System Installation**

System Installation

Resin Delivery System

See Fig. 11, page 20.

The fluid supply must be free of pressure spikes, which are commonly caused by a pump stroke changeover. Install pressure regulators (S) or a surge tank on the fluid inlets to the mixing system to reduce fluid supply pressure variations.

Resin Supply

Connect the resin pump (E) outlet to the resin fluid pressure regulator (S) with a high pressure hose that is compatible with the resin. Install an air pressure regulator on the pump air supply line to control the pump pressure.

Circulating Lines

If there is a central paint recirculating line in your shop, the resin pump can be connected to it instead of to a supply container. Contact your Graco representative for information on how to do this properly. 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 resin pump.

PrecisionMix II Proportioner

The installation and operation instructions in this manual generally presume a standard system, using air powered piston pumps to supply the paint components and solvent.

Instead of a resin pump, the mixing system can be supplied by a PrecisionMix II proportioner that is premixing a two component material. Make sure that the proportioner is providing the mixture at adequate, but not excessive, pressures. Operation is essentially the same, other than references to the resin pump.

For maintenance and safety, you must install a ball valve between the two component proportioner and the mixing system.

Solvent Flush Pump

See Fig. 11, page 20.

Connect the solvent flush pump (L) output of the pump to both the solvent input and purge air input of the mix manifold. Use a hose that is rated for 3000 psi (21 MPa, 207 bar) and is chemically compatible with the solvent being used.

Electrical Supply

Connect the PrecisionMix II Controller to a 110 or 220 Vac grounded electrical supply. Refer to the separate PrecisionMix II Manual 308916, supplied with the system.

⚠ CAUTION

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

System Installation

Ground the System

⚠ WARNING

FIRE, EXPLOSION, AND ELECTRIC SHOCK HAZARD

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

- The PrecisionMix II 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 wiring and grounding connections and check the resistance as instructed on page 23.
- Refer to your local code for the requirements for a “true earth ground” in your area.
- Also read and follow the warnings, beginning on page 3.

Ground the PrecisionMix II system as instructed here and in the individual component manuals. A ground wire and clamp, part no. 222011, are available from Graco.

Controller

Refer to the installation instructions in the separate PrecisionMix II Manual 308916, supplied with the system.

Mix Manifold

Refer to the installation instructions in manual 308288.

Flow Meters

Meter cables must be connected as shown in the controller manual and system drawings, provided by the system integrator. Failure to properly connect the grounded conductor and shield may cause incorrect signals.

Refer to your system drawings for specific wiring requirements.

Feed Pumps and Circulation Pump

Use a ground wire and clamp to electrically connect the pumps to a true earth ground. See your separate pump 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 Flushing

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 Flushing Or Relieving Pressure

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

System Installation

Check the Resistance

⚠ WARNING

FIRE, EXPLOSION, AND ELECTRIC SHOCK HAZARD

To reduce the risk of fire, explosion or electrical shock the resistance between the system components and true earth ground must be less than 25 ohms.

Have a qualified electrician check the resistance between each PrecisionMix II/Unicarb system 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.

Other Electrical Connections

Connect other wiring, such as the accumulator position sensor (if supplied); the 24 Vdc solenoid enclosure cable and meter cables; and the pendant and the remote operator station, as shown in the system drawings and in the PrecisionMix II Manual 308916.

Circulation System (Supplied by Integrator)

See Fig. 11, page 20.

1. Locate the circulation pump (P) in an area that is close to both the mixing system and the spray gun(s). The size and volume of the circulation line should be minimized.

2. Install an air pressure regulator on the air supply line to the pump to control the rate of circulation.

3. Install a fluid drain valve (X) near the pump outlet.

4. Connect the output of the accumulator (M), or the mixed material heat exchanger (H) if supplied, to the input of the circulation pump (P).

5. Connect the supply and return ports of the circulation pump to their appropriate lines to and from the spray gun(s) (R). If you are not using heated hoses supplied with the system, use only plastic lined, wire braid hoses to make these connections. Route the circulation lines away from any sources of heat.

System Installation

Temperature Control System
(Supplied by Integrator)

See Fig. 11, page 20.

CO_2 Pre-heater

Most systems will use a CO_2 pre-heater (N-2) to elevate the temperature of the CO_2 before entering the mix manifold. Mount the heater and connect power as described in the heater manual supplied with the system. Make sure the thermostat and temperature gauge are accessible and easy to view.

Hot Water Circulation Line

Each heat zone consists of a diaphragm pump (O), heater (N-2), heat exchanger (H), filling canister (not shown), a pressure relief valve (not shown) and interconnecting tubing. The tubing must be 3/8 in. (9.5 mm) minimum diameter plastic tubing. The tubing and fittings must be rated for 100 psi (0.7 MPa, 7 bar), at temperatures as high as 200° F (93° C).

Each item in the hot water circulation line should be designed and installed to enable the water flow to carry any trapped air down stream. This requires that the flow of water enter at the lowest point of a component and exit at the highest point of a component.

1. Connect to each diaphragm pump (O) a separate 1/4 in. (6.4 mm) air line with a bleed-type air shut-off valve and an air pressure regulator for controlling the pump cycle rate.

2. Mount the diaphragm pump in its normal, horizontal position.

3. Mount the heater (N-1) and connect power as described in the heater manual supplied with the system. Make sure rmostat and temperature gauge are accessible and easy to view.

4. Locate the filling canister at the highest elevation of any component in the water circulation line. The canister should be the component closest to the inlet of the diaphragm pump to aid in filling the canister and to help remove unwanted air from the line. Remove the top of the filling canister to fill the line with water.

5. A 100 psi ((0.7 MPa, 7 bar) pressure relief valve is required in each water circulation line. Locate the pressure relief valve at the top of the filling canister. This allows the pressure relief valve to vent air instead of hot water.

Check the Hot Water Circulation Line

1. Turn on the diaphragm pump air valve and slowly open the air regulator until the pump cycles slowly.

2. Fill the system with deionized water from the canister. As the system fills with water, the pump will slow down. Adjust the air regulator until the pump runs at a rate of one cycle every 2 seconds. Fill the system and then the canister about halfway.

3. Operate the pump for about 15 minutes to ensure that all of the air bubbles have been removed.

4. Check the level of the canister again, adding water if necessary. Close the canister.

5. Repeat the process with each remaining heat zone.

System Installation

Spray Gun

See Fig. 11, page 20.

Connect the spray gun(s) (R) to the circulation line of the resin and CO_2 mixture. This is usually done with a heated hose (Q).

Some spray guns are designed with two ports, one for the supply line and one for the circulation return line. Some spray guns have only one port, which requires the use of a tee. Locate the tee as close as possible to the inlet of the gun. Securely tighten all the connections.

Airless Spray

There are various options available to provide a signal to the controller to tell it when an operator is spraying material.

One typical solution is to use an inline flow switch (such as Graco part no. 551835) to sense the flow of mixed material out of the integrator. When this type of flow switch is used with the “Airless Spray” setting on the PrecisionMix II (see Manual 308916), the system will be fully configured for use with airless spray.

Another solution is to use a pressure differential switch or a level indicator on the accumulator. An intrinsically safe barrier must be added if these devices are used in a hazardous area.

The best solution depends on the type of application. Follow the recommendation of your distributor or system integrator.

Set Controller Parameters

Verify that the controller has been wired in accordance with the system diagrams and with the controller manual. Follow the guidelines provided in the PrecisionMix II Manual 308916 to setup the controller parameters, with the following exceptions:

- **Batch Size:** Set to 50 cc initially, unless directed otherwise by Graco or Union Carbide.
- **K-factor of the B Component Meter:** Set to 0.131 cc/pulse.
- **Ratio Accuracy:** Set to no less than 5%.

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.
2. Relieve fluid and air pressure at the resin, solvent, and CO_2 feed supply, as explained in their separate instruction manuals.
3. Set the operator switch to mix.
4. If using an electrostatic gun, make sure the electrostatic power is turned off.
5. Hold a metal part of the spray gun firmly to the side of a grounded metal pail, unlock the trigger safety (manual gun) and trigger the gun until pressure is fully relieved. Lock the trigger safety.
6. Set the operator switch to standby.

Stop production at any time by setting the operator switch to standby. If your stop time will not exceed the pot life of your material, 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.

System Start Up

⚠ WARNING

For your safety:

- Read and follow all warnings described within this manual as well as the other component manuals supplied with the system.
- Make sure that the system is located in a safe (non-hazardous) location, as defined by the NFPA.
- Make sure that the system and fluid supplies are grounded using the ground cables provided. See page 22.

✓	Startup Checklist
	1. Fittings and other hardware can loosen during shipment or operation. Check all of the tubing, hose and fitting connections to make sure that they are tight prior to starting up the system.
	2. *If a circulation system is installed,* verify that the drain ball valve on the recirculating pump is closed.
	3. Verify that a spray gun is connected, pressure has been relieved as instructed on page 26, and that the gun trigger safety is locked (manual gun) or the trigger air to the gun (automatic gun) is turned off.
	4. Verify that the gun is fitted with the proper pre-orifice and spray tip.
	5. Verify that the main air supply is set to 80–100 psi (552–700 kPa, 5.5–7 bar).
	6. Verify that the valve manifold air regulator reads 80–100 psi (552–700 kPa, 5.5–7 bar).
	7. Turn on the air valves to the hot water circulation pumps and ensure that the pumps are cycling at a rate of about 1 stroke per second.
	8. Turn on power to the heaters. Turn up the heater thermostats to the desired setpoint (typically between 5 and 7) and allow the hot water system to rise to the temperature setting (approximately 15 to 30 minutes). Observe the temperature increase on the thermometer located on the heater output.

✓	Startup Checklist
	9. Make sure the operator switch is in the standby position. Turn on power to the PrecisionMix II Controller and turn on the power switch located on the controller panel. Verify that the PrecisionMix II display starts up normally and that the desired ratio has been set. See the PrecisionMix II operating instructions.
	10. Slowly open the CO_2 tank valve. Verify that the tank has an adequate supply by checking the pressure gauge at the inlet of the CO_2 pump. If the inlet pressure is below 650 psi (4.5 MPa, 45 bar), the CO_2 tank should be exchanged. The tank may not be empty, but it does not contain enough liquid CO_2 to operate properly.

✓	Operation Checklist
	While spraying, check the following items. If any of the items are not correct, stop spraying immediately and consult the manuals for corrective action.
	• The system alternates back and forth between the resin and the CO_2.
	• The CO_2 pump comes to a stop prior to the next cycle of resin.
	• The fan pattern is consistent and U shaped as it leaves the nozzle.
	• There are no leaks from hoses or fittings.
	• The system has a sufficient supply of resin and CO_2.
	• The abort light on the operator switch is not lit.

System Start Up

⚠ WARNING

INJECTION HAZARD
To reduce the risk of a serious injury, follow the **Pressure Relief Procedure** on page 26 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: This is a basic procedure for starting up a PrecisionMix II/Unicarb system. Your system may contain optional equipment, which requires different steps. Consult with your distributor or system integrator.

1. Follow the start up checklist on page 27.

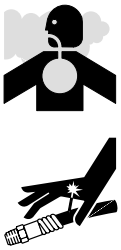
2. Turn on the air valve for the CO_2 supply pump and set the air pressure to provide about 2000 psi (14 MPa, 138 bar) of CO_2 with a full tank.

3. Set the CO_2 regulator at 1800 psi (12 MPa, 124 bar) or the desired setting.

   The CO_2 pump may run for a few seconds to fill the CO_2 lines.

4. Verify that there are no leaks in the CO_2 supply system before proceeding.

⚠ WARNING



If a CO_2 leak is suspected, follow the **Pressure Relief Procedure** on page 26 and repair the leak before continuing. CO_2 inhalation or contact with high pressure CO_2 can result in serious injury, including injection.

5. Load the solvent flush pump with compatible solvent as instructed in the pump manual. Turn on the air to the solvent flush pump and slowly increase the air pressure to 80 psi (552 kPa, 5.5 bar), which will provide about 2000 psi (14 MPa, 138 bar) of solvent pressure.

6. If you are doing an initial startup or changing color, follow steps 7 through 22. If the system is already flushed and ready to load with the spray material, skip to step 16.

7. Follow the **Pressure Relief Procedure** on page 26. With the gun safety locked (manual gun), remove the spray tip from the gun and remove the pre-orifice from the spray tip. Immerse the tip and pre-orifice in a separate container of compatible solvent for cleaning.

8. Place the resin pump siphon tube into a pail of compatible solvent.

9. Turn on the supply air to the resin pump and slowly increase the air pressure to provide about 2000 psi (14 MPa, 138 bar) of fluid pressure with most materials.

10. Set the resin pressure regulator at 1800 psi (12 MPa, 124 bar) or the desired setting.

    The resin supply pump may run for a few seconds to fill the lines.

11. Carefully verify that there are no leaks in the resin supply system before proceeding.

⚠ WARNING

If a fluid leak is suspected, follow the **Pressure Relief Procedure** on page 26 and repair the leak before continuing. High pressure fluid leaks can result in serious injury, including injection.

System Start Up

12. Turn the operator switch to mix. The resin pump and the CO_2 pump may run and alternate for a few seconds each to fill the accumulator (if installed) and the lines, but they should quickly slow and then stop.

    NOTE: During the high speed filling cycle with solvent, the system may occasionally have ratio errors. This is normal. Reset the errors until the system is filled.

13. Carefully verify that there are no leaks in the mixed material system before proceeding.

⚠ WARNING

If a fluid leak is suspected, follow the **Pressure Relief Procedure** on page 26 and repair the leak before continuing. High pressure fluid leaks can result in serious injury, including injection.

14. Unlock the trigger safety (manual gun) and carefully trigger the spray gun into a grounded metal waste container until the system is completely flushed. Lock the trigger safety.

15. Turn the operator switch to standby.

16. Make sure that the resin is fully agitated.

17. Remove the resin pump siphon tube from the solvent pail and place it in the resin pail.

18. Load the resin pump with resin as instructed in its instruction manual. Turn on the supply air to the resin supply pump and slowly increase the air pressure to provide about 2000 psi (14 MPa, 138 bar) of resin pressure. Set the fluid regulator at the desired setting.

19. Move the operator switch to the mix position.

    The resin pump and the CO_2 pump may run and alternate for a few seconds each to fill the accumulator and the lines.

20. Carefully verify that there are no leaks in the mixed material system before proceeding.

⚠ WARNING

If a fluid leak is suspected, follow the **Pressure Relief Procedure** on page 26 and repair the leak before continuing. High pressure fluid leaks can result in serious injury, including injection.

21. Unlock the trigger safety (manual gun) and carefully trigger the spray gun into a grounded metal container until the system is completely flushed. Lock the trigger safety.

22. The system is ready to spray material.

System Shut Down

⚠ WARNING

INJECTION HAZARD
To reduce the risk of a serious injury, follow the **Pressure Relief Procedure** on page 26 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: This is a basic procedure for shutting down a PrecisionMix II/Unicarb system. Your system may contain optional equipment, which requires different steps. Consult with your distributor or system integrator.

1. Turn the operator switch to standby.

2. Follow the **Pressure Relief Procedure** on page 26. With the gun safety locked (manual gun), remove the spray tip from the gun and remove the pre-orifice from the spray tip. Immerse the tip and pre-orifice in a separate container of compatible solvent for cleaning.

3. Turn off the bleed-type ball valves on the resin pump and the solvent flush pump. Place the resin pump siphon tube into a pail of compatible solvent. Turn the bleed-type ball valves back on.

4. Unlock the gun trigger safety (manual gun) and carefully trigger the spray gun into a grounded metal waste container. Trigger the gun until the pressure is relieved, then release the gun trigger and lock the trigger safety.

5. Turn the operator switch to mix. The resin pump and the CO_2 pump may run and alternate for a few seconds each to fill the accumulator (if installed) and the lines.

   NOTE: During the high speed filling cycle with solvent, the system may occasionally have ratio errors. This is normal. Reset the errors until the system is filled.

6. Turn the operator switch to standby.

7. Unlock the gun trigger safety (manual gun) and carefully trigger the spray gun into a grounded metal waste container. Turn the operator switch to purge and carefully trigger the spray gun into a grounded metal waste container. Trigger the gun until the purge cycle is complete, then release the gun trigger and lock the trigger safety.

8. Turn the operator switch to mix. The resin pump and the CO_2 pump may run and alternate for a few seconds each to fill the accumulator and the lines.

   NOTE: During the high speed filling cycle with solvent, the system may occasionally have ratio errors. This is normal. Reset the errors until the system is filled.

9. Turn the operator switch back to standby.

10. Unlock the gun trigger safety (manual gun) and carefully trigger the spray gun into a grounded waste container. Turn the operator switch to purge and carefully trigger the spray gun into a grounded waste container. Trigger the gun until the purge cycle is complete, then release the gun trigger and lock the trigger safety.

11. Set the PrecisionMix II controller mix ratio to 0.0:1. This will force the system to supply solvent only, without CO_2.

12. Turn the operator switch to mix. The resin pump may run for a few seconds to fill the accumulator (if installed) and the lines.

13. Turn the operator switch back to standby.

14. Turn off the heaters (if installed) and the controller.

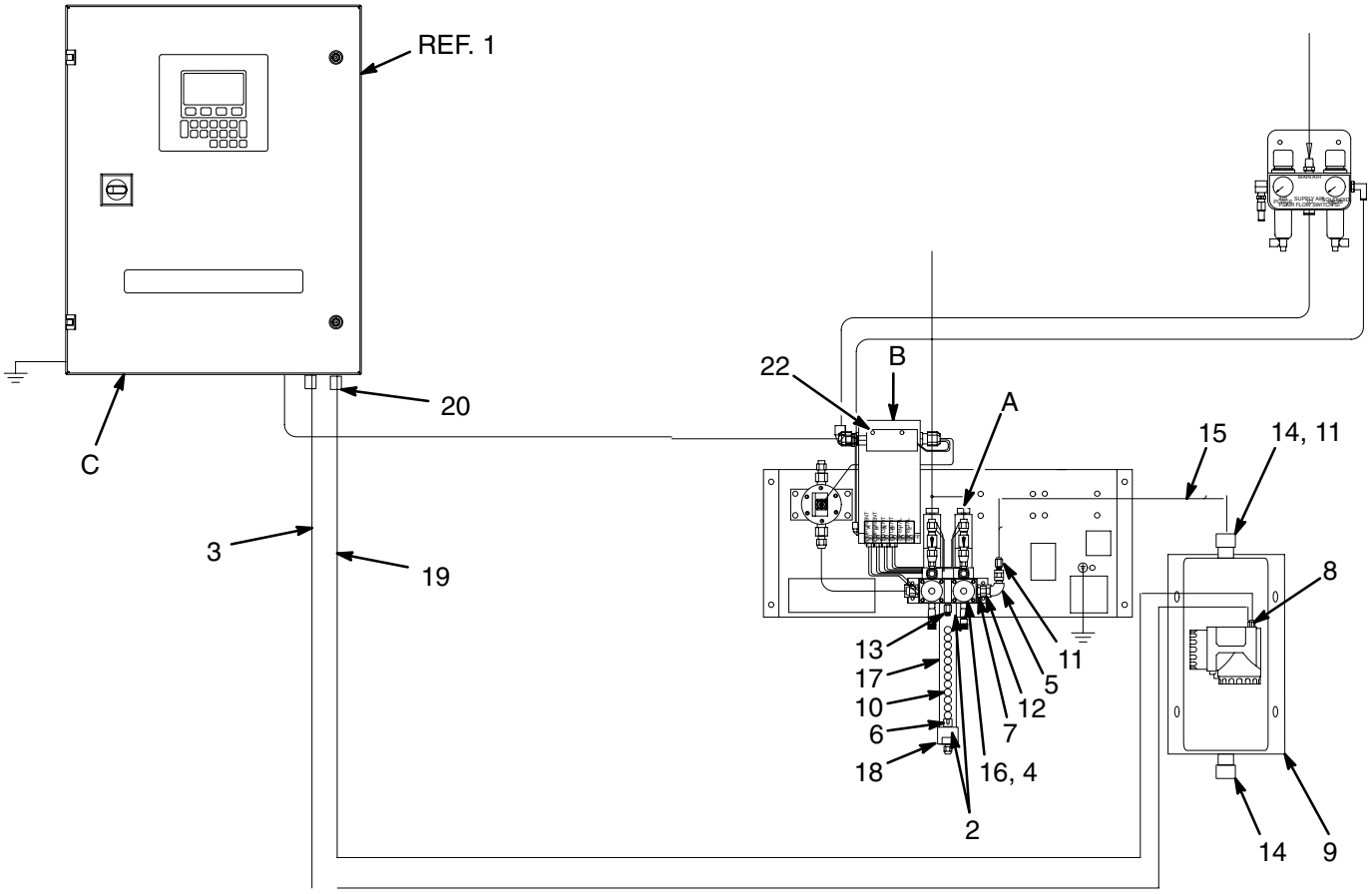
15. *If a temperature control system is installed,* allow the hot water to circulate for about 15 minutes.

16. Turn off all supply air to the system.

17. Clean the front of the spray gun using a soft brush and a compatible solvent.

Parts

Part No. 243213
PrecisionMix II/Unicarb Kit



9488A

Ref. No.	Part No.	Description	Qty.
1	195900	RESISTOR, 200K	1
2	110966	O-RING, Teflon®	2
3	111647	CABLE, 4 conductor	☆
4	108284	O-RING, buna-n	2
5	108417	ELBOW, female, 1/4–18 npt	1
6	186187	GUIDE, ball	1
7	188323	ADAPTER, 1/4 npt x 1/4 bsp	1
8	514030	CONNECTOR, cable	2
9	195899	METER, mass flow	1
10	552255	BALL BEARING, 25 mm dia., steel	12
11	552267	FITTING, adapter, 1/8 tube x 1/4 npt(m)	2
12	195898	VALVE, check, 1/4 npt(m), stainless steel with Teflon seal	1
13	195897	VALVE, check, 1/4 ISO, stainless steel with Teflon seal	1
14	552269	FITTING, adapter, 1/4 npt x 4 face seal, with Teflon o-ring	2
15	552271	TUBE, 1/8 O.D. x 6 ft. (1.8 m) long, stainless steel	1
16	626806	SEAT, valve, fluid	1
17	626811	HOUSING, integrator	1
18	626812	CAP, integrator	1
19	065093	CORD, copper, electrical	☆
20	114421	CONNECTOR, cord	2

☆ *Order length needed.*

Accessories

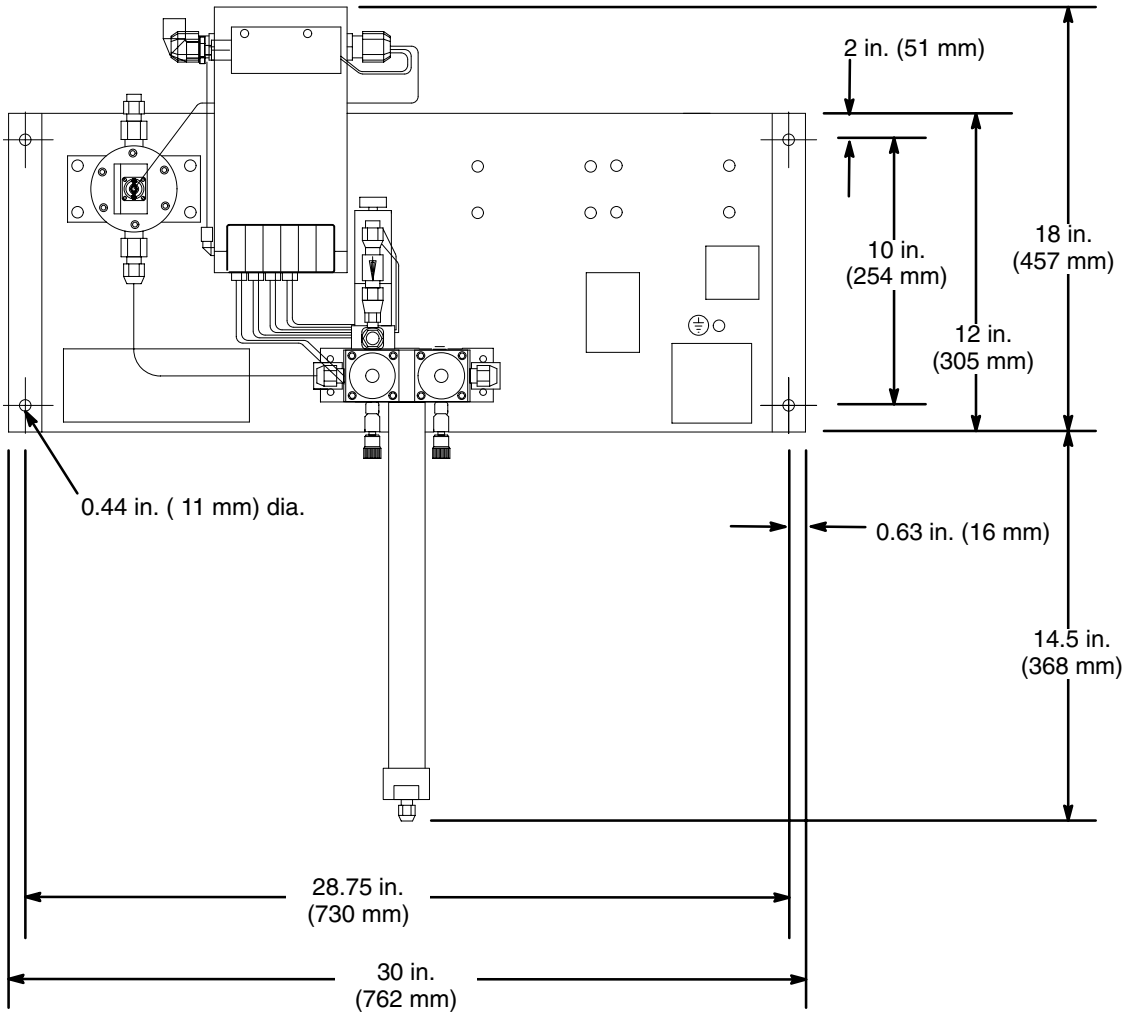
Part No. 965722
PRO AA4500™/UNICARB® Air-Assisted Electrostatic Spray Gun

Electrostatic spray gun with two-finger trigger for spraying components mixed with carbon dioxide.

Part No. 965721
PRO AA5500™/UNICARB® Air-Assisted Automatic Electrostatic Spray Gun

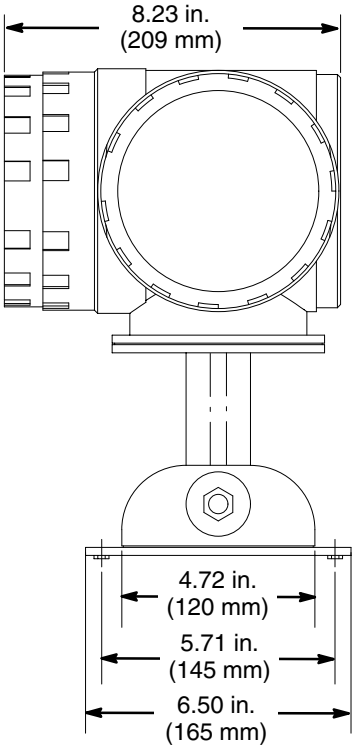
Automatic electrostatic spray gun for spraying components mixed with carbon dioxide.

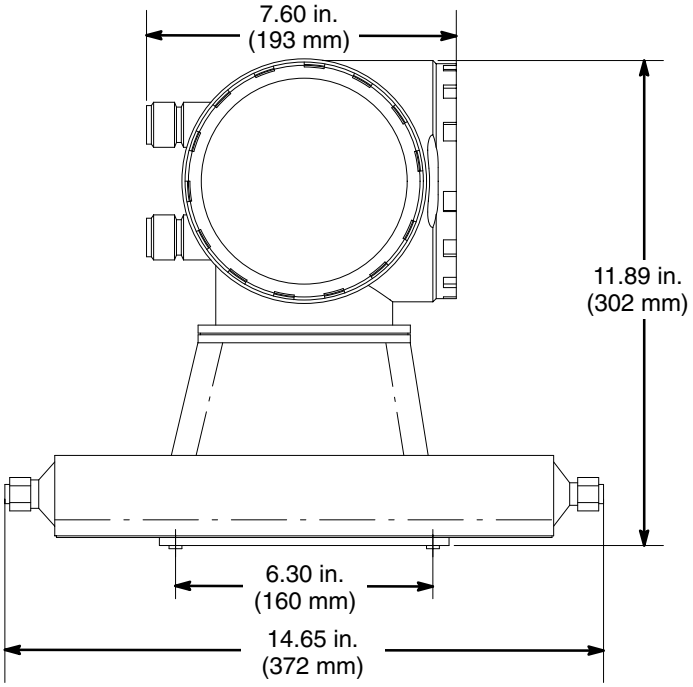
Mix Manifold Dimensions



32.5 in. (826 mm) high x 30 in. (762 mm) wide x 14 in. (356 mm) deep

Mass Flow (Coriolis) Meter Dimensions





Notes

Graco Standard Warranty

Graco warrants all equipment 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.

FOR GRACO CANADA CUSTOMERS

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

Graco Information

TO PLACE AN ORDER, contact your Graco distributor, or call one of the following numbers to identify the distributor closest to you:

1–800–367–4023 Toll Free
612–623–6921
612–378–3505 Fax

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

Sales Offices: Minneapolis, Detroit
International Offices: Belgium, Korea, Hong Kong, Japan

www.graco.com

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