

Mix Manifold Kits

310797F

ENG

For mixing 2 component reactive materials. For professional use only.

Part No. 248874, Series A

Mix Manifold

Part No. 248923, Series A (shown)

Remote Mix Manifold Kit, with protective guard and two restrictors

7400 psi (51.0 MPa, 510 bar) Maximum Working Pressure

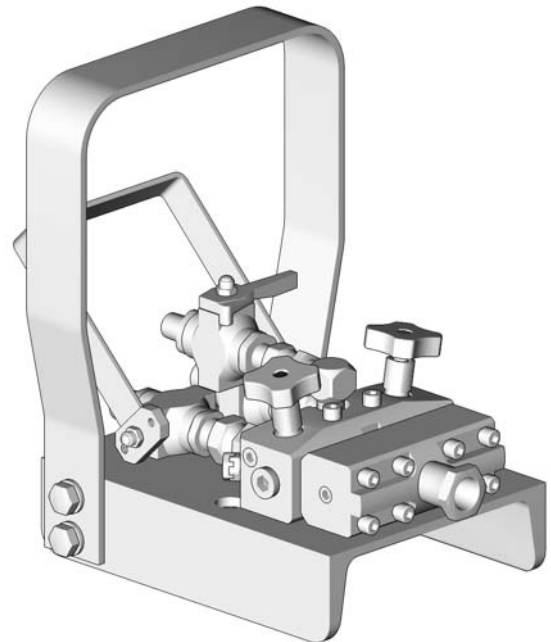
200°F (93°C) Maximum Fluid Temperature



Important Safety Instructions

Read all warnings and instructions in this manual.
Save these instructions.

See page 2 for Table of Contents.





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Manual Conventions






 WARNING
 Hazard Symbol
<p>WARNING: a potentially hazardous situation which, if not avoided, could result in death or serious injury.</p> <p>Warnings in the instructions usually include a symbol indicating the hazard. Read the general Warnings section for additional safety information.</p>

CAUTION
<p>CAUTION: a potentially hazardous situation which, if not avoided, may result in property damage or destruction of equipment.</p>

Note

 Additional helpful information.

Isocyanate Hazard

						
<p>Spraying materials containing isocyanates creates potentially harmful mists, vapors, and atomized particulates.</p> <p>Read material manufacturer's warnings and material MSDS to know specific hazards and precautions related to isocyanates.</p> <p>Prevent inhalation of isocyanate mists, vapors, and atomized particulates by providing sufficient ventilation in the work area. If sufficient ventilation is not available, a supplied-air respirator is required for everyone in the work area.</p> <p>To prevent contact with isocyanates, appropriate personal protective equipment, including chemically impermeable gloves, boots, aprons, and goggles, is also required for everyone in the work area.</p>						

Keep Resin and Hardener Separate

CAUTION
<p>To prevent cross-contamination of the wetted parts, do not interchange resin and hardener parts. Keep parts separate when cleaning the manifold. The manifold is shipped with the resin (high volume) side on the left and the hardener (low volume) side on the right.</p> <p>Never leave hardener (isocyanate) wetted parts exposed to moisture in the air.</p>


Installation

For assistance in setting up a plural component system, contact your Graco distributor, to ensure that you select the proper type and size equipment for your system.

Letters and numbers in parentheses refer to callouts in the figures and parts drawing.

Fluid Inlets

Install fluid temperature sensor (C) between heated hoses (A, B) and mix manifold; feed 18 in. (457 mm) heat sensor (V) back into high volume side of heated hose. See FIG. 1.

 An optional 1/4 npt(m) ball valve inlet stud (38) is supplied for the hardener (low volume) side. See page 17. Using different size inlet fittings can help prevent cross contamination. Part No. 248923 Mix Manifold is supplied with this stud already installed.

248926 “Quick-Set” Style FTS

Part No. 248926 FTS is supplied with swivel adapters (D), 3/8 npsm(f) on the resin side and 1/4 npsm(f) on the hardener side, for connection to Part No. 248923 Mix Manifold.

246079 “Reactor” Style FTS

If using Part No. 246079 FTS, remove JIC fittings from FTS (C), and replace with swivel fittings (D, see following table).

Mix Manifold	Resin Side	Hardener Side
248874	157705, 3/8 npsm(f)	157705, 3/8 npsm(f)
248923	157705, 3/8 npsm(f)	156823, 1/4 npsm(f)

Solvent Inlet

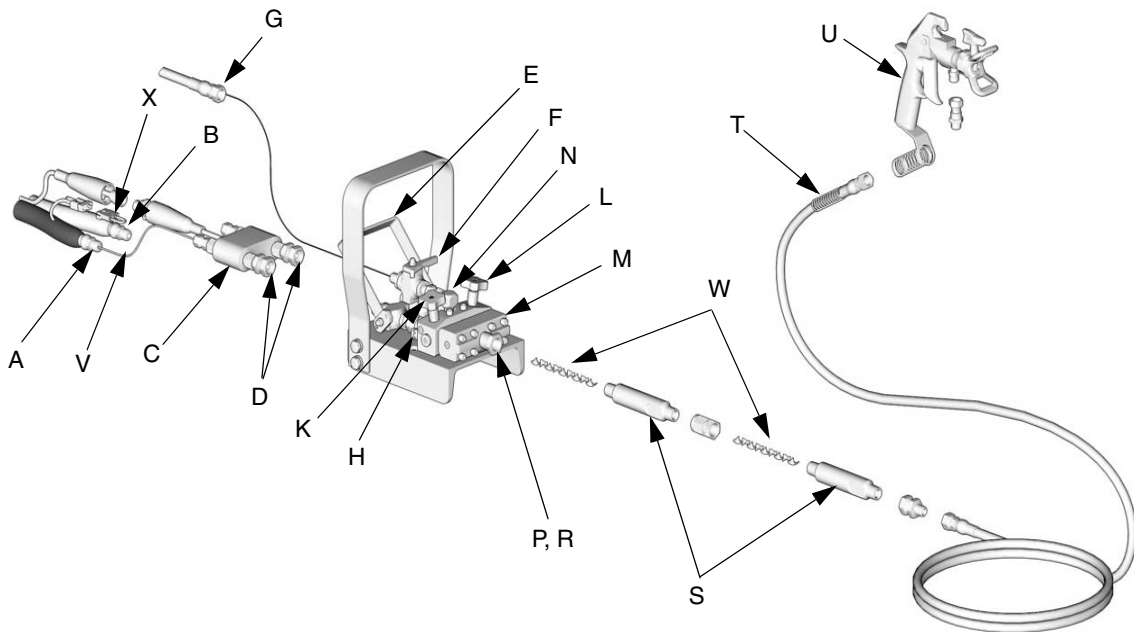
Connect solvent supply line (G) from solvent pump to 1/4 npt(m) solvent inlet valve (F), using Graco approved grounded hose rated to withstand maximum fluid working pressure of solvent pump. Hose core must be chemically compatible with solvent (such as nylon or PTFE).

Fluid Outlet

Connect static mixers (S) and whip hose (T) to 3/8 npt(f) fluid outlet (R). Two static mixers are often used, in series.

Mounting

To mount the bare manifold, drill two 0.27 in. diameter holes in the mounting surface, 1.1 in. (28 mm) apart on center. Secure with two 1/4-20 x 2 in. (6 mm x 50 mm) socket-hd capscrews.




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FIG. 1: Typical Installation

Key:

- A Resin (High Volume) Supply Hose
- B Hardener (Low Volume) Supply Hose
- C Fluid Temperature Sensor (FTS) Module
- D FTS Swivel Adapters (supplied with 248926 FTS)
- E Resin/Hardener Shutoff Handle, 3/8 npt(m) inlets (optional 1/4 npt hardener inlet fitting supplied)
- F Solvent Inlet Valve, 1/4 npt(m)
- G Grounded Solvent Hose
- H Resin Restrictor Port (plugged)
- J Hardener Restrictor Port (plugged; out of view)
- K Resin Flush Valve
- L Hardener Flush Valve
- M Resin and Hardener Check Valve Manifold
- N Solvent Check Valve
- P Hardener Injector (out of view inside outlet R)
- R Mix Manifold Outlet, 3/8 npt(f)
- S Static Mixer Housing
- T Fluid Whip Hose
- U Airless Spray Gun
- V Heat Sensor
- W Static Mixing Element
- X Heated Hose Jumper, Part No. 15C517

Grounding

 **WARNING**

Your system must be grounded. Read warnings in your proportioner manual. Check your local electrical code.

- **Pump:** use a ground wire and clamp as instructed in your proportioner operation manual.
- **Air and fluid hoses:** use only electrically conductive hoses. with a maximum of 500 ft (150 m) combined hose length to ensure grounding continuity. Check electrical resistance of hoses. If total resistance to ground exceeds 29 megohms, replace hose immediately.
- **Mix manifold and solvent flush system:** use only a Graco approved grounded solvent hose. Not all heated hoses are grounded, and the mix manifold primary ground is through the solvent hose. Ensure that the solvent pump is properly grounded, as instructed in your solvent pump manual. Ensure electrical continuity from the spray tip to the grounded solvent hose.
- **Air compressor:** follow manufacturer's recommendations.
- **Spray gun/dispense valve:** ground through connection to a properly grounded fluid hose and pump.
- **Fluid supply container:** follow local code.
- **Object being sprayed:** follow local code.
- **Solvent pails used when flushing:** follow local code. Use only conductive metal pails, placed on a grounded surface. Do not place the pail on a non-conductive surface, such as paper or cardboard, which interrupts grounding continuity.
- **To maintain grounding continuity when flushing or relieving pressure:** hold metal part of the spray gun/dispense valve firmly to the side of a grounded metal pail, then trigger the gun/valve.


Flush Before Using Equipment

The equipment was tested with lightweight oil, which is left in the fluid passages to protect parts. To avoid contaminating your fluid with oil, flush the equipment with a compatible solvent before using the equipment. See **Flushing**, page 9.

Operation


Pressure Relief Procedure

⚠ WARNING



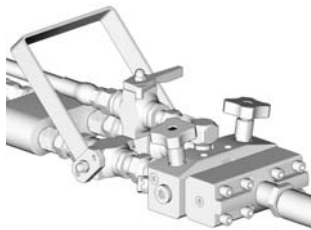
Follow **Pressure Relief Procedure** when you stop spraying and before cleaning, checking, servicing, or transporting equipment. Read warnings in your proportioner manual.

⚠ WARNING




Always wear personal protective equipment. Read warnings in your proportioner manual.

1. Close the mix manifold handle (BACK).



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2. Engage spray gun trigger lock.

 Trigger lock may vary, depending on gun.



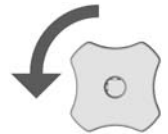
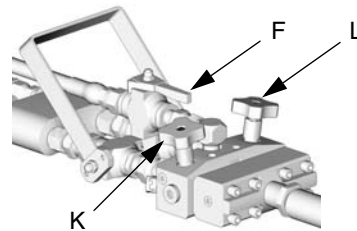
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3. Shut off the proportioner, feed, and solvent pumps.



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4. Open solvent inlet valve (F) and both flush valves (K, L).



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5. Disengage spray gun trigger lock.



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6. Hold a metal part of the spray gun firmly to a grounded metal pail, and trigger the gun to relieve pressure.



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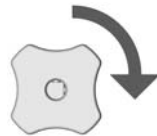
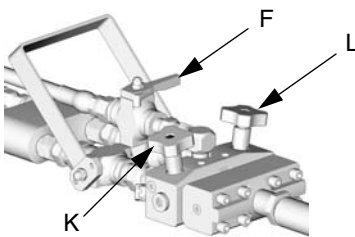
continued on page 8.

7. Engage spray gun trigger lock.



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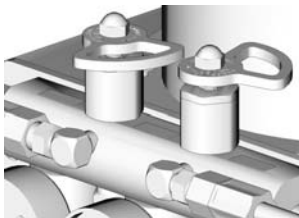
8. Close solvent inlet valve (F) and both flush valves (K, L).



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9. Turn both fluid manifold SPRAY/PRESSURE RELIEF valves (required in your system) to PRESSURE RELIEF, having a container ready to catch the drainage.




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Hydra-Cat Model Shown

10. If you suspect the spray tip or hose is clogged or that pressure has not been fully relieved after following the steps above, **very slowly** loosen tip guard retaining nut or hose end coupling to relieve pressure gradually, then loosen completely. Clear hose or tip obstruction.
11. If the static mixer, whip hose, and gun cannot be flushed because of mixed and cured material, **very slowly** loosen the static mixer tube at the mix manifold outlet to relieve pressure gradually, then loosen completely. Replace or clean the clogged components.

Flushing

WARNING



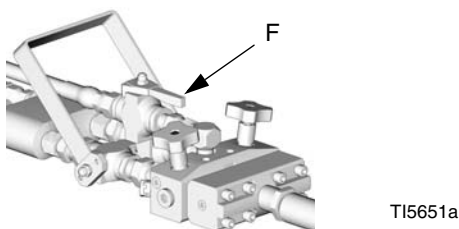
Read warnings and **Grounding** instructions in your proportioner manual. If your system uses heaters, shut off the main power to the heaters and heated hose control before flushing.

- Flush with a fluid that is compatible with the fluid being dispensed and the equipment wetted parts.
- Solvent may channel through viscous fluids and leave a coating of mixed fluid on the inner tube of your hose. Be sure all fluid is thoroughly flushed from the hose after each use. Volume cleans better than pressure.
- Remove spray tip for more thorough cleaning of the whip hose and static mixers.
- Use a solvent that cuts the material you are mixing.
- Always leave equipment filled with fluid to avoid drying and scaling.

1. Relieve pressure, page 7. Remove spray tip and soak in solvent.

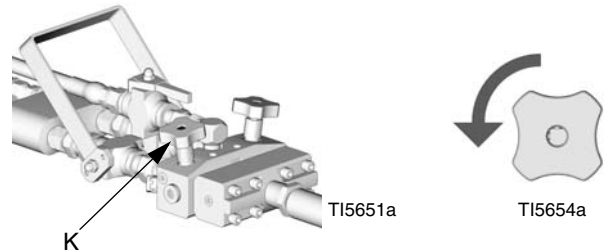


2. Open solvent inlet valve (F).



3. Turn on solvent flush pump.

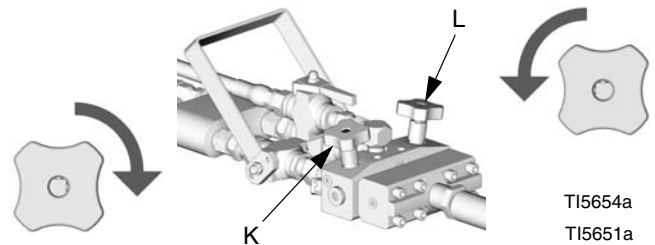
4. Open resin side flush valve (K).



5. Disengage spray gun trigger lock. Hold the gun firmly to the side of a grounded metal pail, shielded from splashing. Trigger the gun and flush for 5-10 seconds.

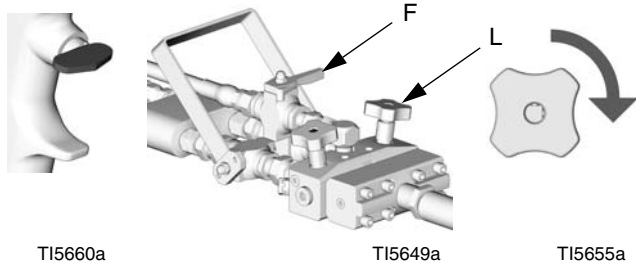


6. Close resin side flush valve (K). Open hardener flush valve (L). Continue flushing until solvent is clear.



continued on page 10.

7. Release the trigger, engage spray gun trigger lock, close the hardener flush valve (L) and close solvent inlet valve (F).



8. Flush any accessory ratio check valves on the manifold (see **Ratio Check**, page 13).
9. Relieve pressure, page 7. Disassemble all other dispensing equipment, as necessary, and clean thoroughly.

CAUTION
To prevent fluid from setting up in the dispensing equipment, flush the system frequently. Be sure there is adequate solvent in the solvent supply before starting to spray.

Cleaning Static Mixers


See FIG. 1, page 5. Typically, two static mixer housings (S, Part No. 15E592) are connected to the mix manifold outlet (R). These housings use plastic mix elements, available in a package of 25 (W, Part No. 248927).

To clean the housing and replace the mix element:

1. Relieve pressure, page 7. Remove mixer housings from mix manifold and from whip hose.
2. Place flats of mixer housing in a grounded vise.
3. Using a 1/2 in. drill bit, drill out old material and the mix element from the inlet end, down to the internal shoulder at the outlet end.
4. Run a brush through the housing to clean any debris.
5. Insert new mix element, broad shouldered end first.

Dispensing

To dispense the resin and hardener, turn on the proportioning pump and open the mix manifold handle (FORWARD). To stop the flow, close the handle (BACK).

-  Always fully open or fully close the valve handle. Spraying with the handle partially open will damage the valve balls and seats.

Volume Balancing the Mix Manifold

When mix manifold is remote mounted, ratio errors can occur between the proportioner and the mix manifold, even if the proportioner output ratio is very accurate.

Restrictors are available to correct imbalances at the mix manifold. See FIG. 2 for available sizes.



248923 Remote Mix Manifold Kit includes two restrictors: .024 size (107) and .032 size (108).

To install restrictors:

1. Relieve pressure, page 7.
2. Remove plug (3) from beveled edge on desired side of mix manifold.
3. Ensure o-ring (110) and filter screen (109) are in place. Install restrictor (107 or 108) in port.

Lead/Lag Imbalance

When resin and hardener volume requirements (ratio) and/or viscosities are different, an imbalance can occur each time the gun is triggered because the fluids rush out of the manifold in a 1:1 ratio before the proportioner starts up.

Install a restrictor on the hardener (low volume) side to balance the flow at the mix manifold, maintain accurate ratio of accumulated fluid in the hoses, ensure smooth check valve operation, and dampen pressure spikes by using the hose as a surge suppressor.



When ratio control is critical and added resin (high volume) pressure drop can be tolerated, install restrictors on both sides to use the hoses as a surge suppressor and meter a smooth flow to the mix manifold.

Check Valve Imbalance

If resin and hardener are at or near 1:1 ratio, when one check valve opens the resulting surge closes the other. This check valve oscillation causes ratio imbalance.

Install restrictors on both sides, to meter a smooth flow to the mix manifold.

Sizing Restrictors

1:1 Mix Ratio

If resin and hardener are at or near 1:1 ratio and viscosities are similar, add a few hundred psi pressure drop to each side, to prevent check valve oscillation. Use the chart in FIG. 2, or use a restrictor on both sides, about twice the size of your spray tip.

Ratios Other Than 1:1

1. Size hose diameters and lengths to correspond with flow and pressure of each fluid.
2. Setup system for spraying with desired tip size (flow), pressure, and temperature. Note readings on pressure gauges when spraying.
3. Size restrictor to cause a slight rise in hardener pressure when spraying (up to 10% above resin pressure). See FIG. 2.
4. Use FIG. 2 to size the restrictor if you know hardener viscosity at hose temperature, and hardener flow rate.

$$\text{Hardener flow rate} = \text{Total flow rate} / (\text{mix ratio} + 1)$$

continued on page 12.

EXAMPLE: Urethane Coating

Mix Ratio by Volume: 3:1

Spray Flow Rate: 1 gpm

3 parts resin = 0.75 gpm

1 part resin = 0.25 gpm

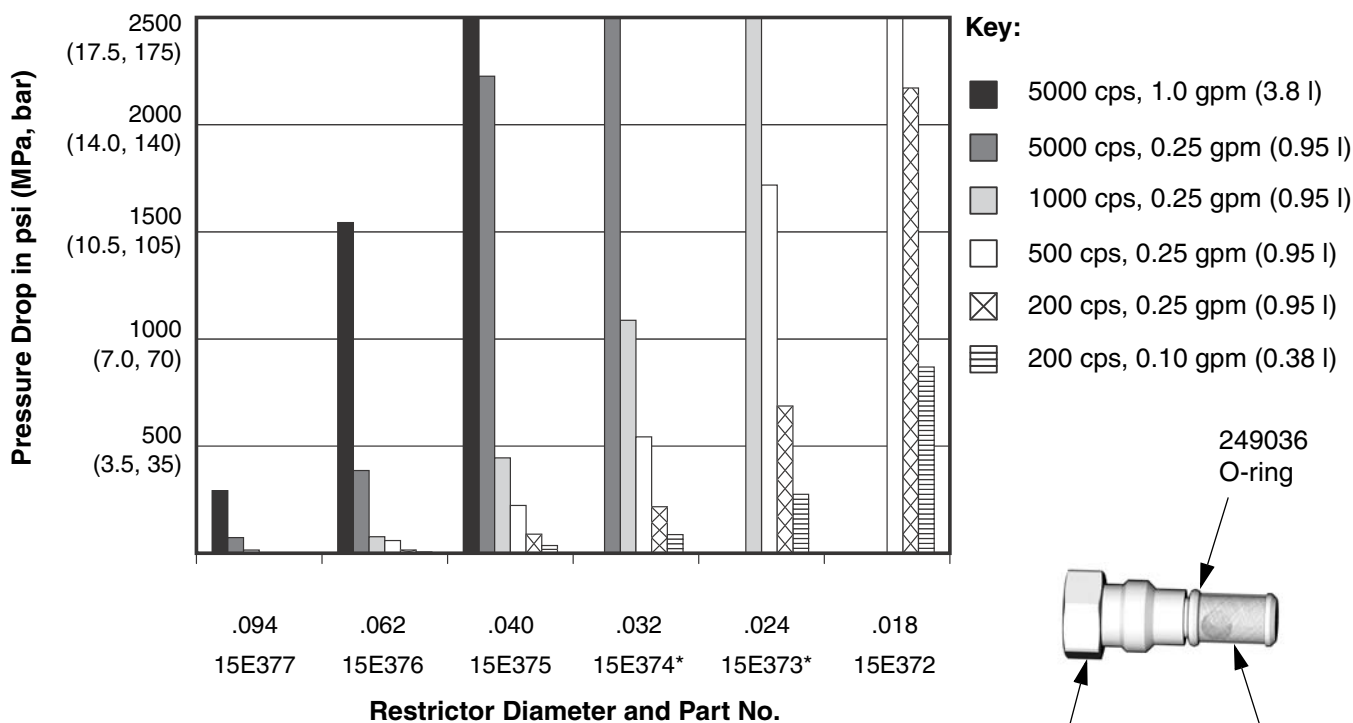
Viscosities

Material	At Ambient 75°F (24°C)	At Spray Temp 100°F (38°C)
Resin	3000 cps	800 cps
Hardener	500 cps	200 cps

FIG. 2 shows that with 200 cps at 0.25 gpm (0.95 l), hardener pressure drop is 700 psi (4.9 MPa, 49 bar). The .024 restrictor will work well. If hardener pressure rises more than 10% over the resin, use the next size .032 restrictor.

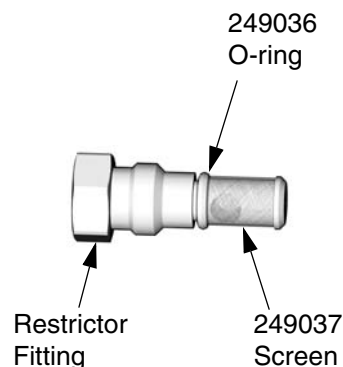
Sizing Restrictors on Xtreme Mix Proportioners

The above method of sizing restrictors applies. However, you can check if the system is balanced by watching the outlet metering valves. The valves should be open (up) most of the time when the gun is triggered. If a valve is only giving short "on" shots, use a smaller restrictor on that side. Fluid should flow most of the time, only making short "off" corrections.



* Included with 248923 Remote Mix Manifold Kit.

Restrictors use 40 mesh screens and o-rings. Order 249037 Screens (package of 10) and 249036 O-rings (package of 6).



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FIG. 2. Typical Restrictor Pressure Drops

Ratio Check

Ratio check valves are available as an accessory. Order the following parts.

Ref. No.	Part No.	Description	Qty.
301	150287	ADAPTER; 1/4 npt(m) x 3/8 npt(f)	2
302	245143	VALVE, ratio check	2
303	116746	FITTING, barbed; 1/8 npt(m) x 1/4 in. (6 mm) ID hose	2

Installation

1. Remove plugs (7) from both sides of manifold.
2. Install adapters (301), valves (302), and barbed fittings (303) as shown in FIG. 3.

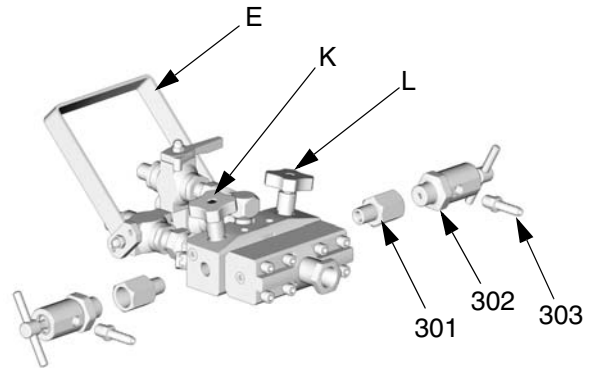
Procedure

1. Fill mix manifold, static mixer, whip hose, and gun with solvent. Close mix manifold, solvent valves, and gun.
2. Place waste containers under barbed fittings (303).
3. Set proportioner to 50% of spray pressure.
4. Open hardener ratio check valve (302).
5. Open shutoff handle (E). Hardener will begin to flow, and hardener pressure will drop.
6. Slowly open resin ratio check valve until hardener pressure comes into balance with resin pressure. Close shutoff handle (E).
7. Remove waste containers and place graduated containers under barbed fittings (303). Open shutoff handle (E) and take ratio sample. Compare amounts in each graduated container; amounts should correspond to desired ratio.



If you know the mix ratio is by weight, weigh the containers for a more accurate measure.

8. After ratio check is completed, flush ratio check valves using flush valves (K, L).



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FIG. 3. Ratio Check Valves (accessory)

Troubleshooting

1. Relieve the pressure before you check or service any system equipment.
2. Check all possible causes and solutions in the Troubleshooting Chart before disassembling the manifold.

Problem	Cause	Solution
Little or no resin output.	Fluid inlet is plugged.	Clean inlet; remove obstruction.
	Fluid container is empty.	Refill.
Little or no hardener output.	Fluid inlet is plugged.	Clean inlet; remove obstruction.
	Fluid container is empty.	Refill.
Mixed fluid will not flush out.	Fluid is hardened in static mixers or whip hose.	Clean with compatible solvent. Replace as necessary.
	Solvent supply container is empty.	Refill.
	Solvent is not compatible with fluid.	Change to compatible solvent.
Hardener pressure higher than normal.	Hardener is cold.	Correct heat problem.
	Restrictor or screen plugging up.	Clean restrictor and screen.
Hardener pressure lower than normal.	Resin is cold. Flow rate is low.	Correct heat problem.
	Worn hardener restrictor.	Replace restrictor.
Spray pattern developing tails.	Static mixer and/or whip hose plugging up.	Replace restrictor. Clean static mixer. Clean spray gun and tip.
	Low pressure from proportioner.	Check air supply pressure. Check outlet gauges.
	Cold material.	Increase heat.
Solvent flush does not shut off with control knob.	Gasket (14) or seat (15) not centered, or damaged.	Check and/or replace.
	Cartridge valve (16) not holding down seat (15).	Open control knob (18) slightly. Tighten valve (16). Close knob (18).
Resin or hardener does not shut off.	Damaged ball or seat in valve (24).	Replace or rebuild valve.
	Lever (25) not seated on square part of valve stem.	Remove nut. Position lever fully on stem. Retighten nut.

Repair

CAUTION

Be sure to label all fluid paths “resin” or “hardener” when disassembling them. Doing so prevents interchanging resin and hardener parts during reassembly, which will contaminate the materials and the fluid path through the equipment.

Color-coded chemically resistant tape may be used to label the parts. Use blue for resin and red for hardener.

WARNING



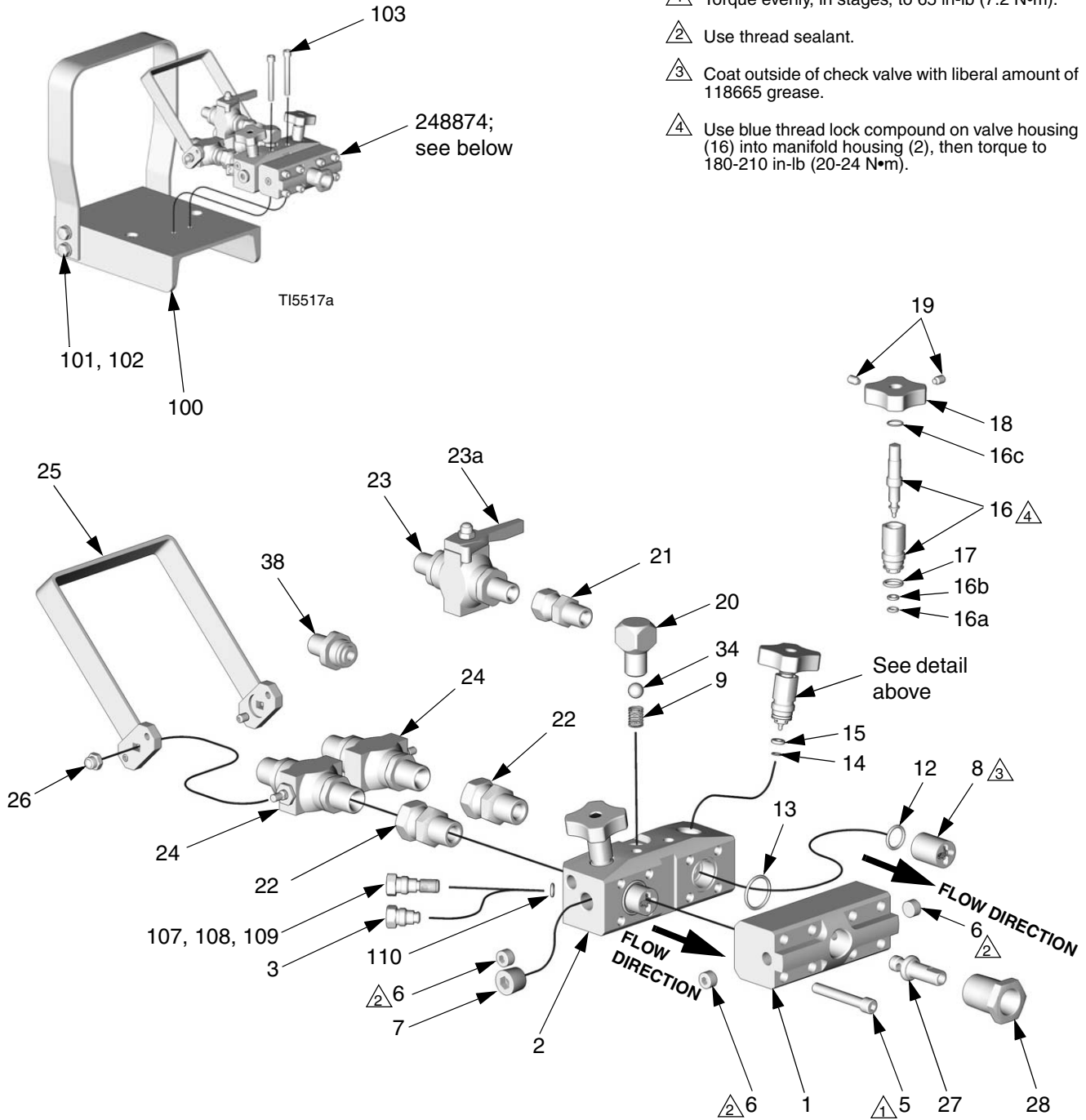
Follow **Pressure Relief Procedure** when you stop spraying and before cleaning, checking, servicing, or transporting equipment. Read warnings in your proportioner manual.

7. Replace all plugs and fittings.
1. Relieve the pressure, page 7.
 2. Remove screws (5) to separate housings (1, 2). Remove all parts from the housings. See the **Parts** drawing, page 16.
 3. Clean all parts thoroughly in a compatible solvent. Use a soft bristle brush to clean the manifold passageways. Keep resin and hardener parts separate.
 4. Coat the two check valve assemblies (8) with Part No. 118665 Grease, then insert in the upper housing (2), ball end first.
 5. Install the flush control valves (16-19).
 - a. Drop small green gasket (14) into housing (2), centering it in small groove.
 - b. Drop hardened seat (15) into housing (2), centering it in its groove.
 - c. Use valve needle to center seat and gasket, then back out. Use blue thread lock compound on valve threads and torque to 180-210 in-lb (20-24 N•m).
 6. Laser-marked side of lower housing (1) must face up (side port on resin side is lower). Install screws (5) through lower housing and into upper housing (2). Tighten screws evenly, in stages, to 65 in-lb (7.2 N•m).

Parts

248874 Mix Manifold, includes items 1-38, 110

248923 Remote Mix Manifold Kit, includes items 1-110



248874 Mix Manifold, includes items 1-38**248923 Remote Mix Manifold Kit, includes items 1-109**

Ref. No.	Part No.	Description	Qty.	Ref. No.	Part No.	Description	Qty.
1	15E364	HOUSING, lower; sst	1	103	100642	SCREW, cap, socket-hd; 1/4-20 x 2 in. (51 mm)	2
2	15E365	HOUSING, upper; sst	1	107	15E373	RESTRICTOR; .024; sst	1
3	15E370	PLUG, restrictor; sst	2	108	15E374	RESTRICTOR; .032; sst	1
5	596936	SCREW, cap, socket-hd; 1/4-20 x 1-1/2 in. (38 mm)	8	109	249037	SCREEN, filter; 40 mesh; package of 10	1
6	110208	PLUG, pipe; 1/8 npt; sst	4	110	249036	O-RING; chemically resistant fluoroelastomer; package of 6	1
7	101970	PLUG, pipe; 1/4 npt; sst	2				
8	249035	CHECK VALVE	2				
9*	117558	SPRING	3				
12*	104319	O-RING; TFE	2				
13*	110135	O-RING; TFE	2				
14	113618	GASKET; nylon	2				
15	15E137	SEAT; sst	2				
16	248641	RETAINER, with needle, solvent purge; includes items 16a-16c	2				
16a	246354	. O-RING; chemically resistant fluoroelastomer; package of 6	1				
16b	118466	. RING, backup; TFE	1				
16c	119372	. RING, retaining	1				
17	248648	O-RING; chemically resistant fluoroelastomer; package of 6	1				
18	15E114	KNOB, valve, solvent purge	2				
19	101366	SETSCREW; socket-hd; half dog point; 10-24 x 0.312 in. (8 mm)	4				
20	15E367	ELBOW, street; 1/4 npt (m x f); lapped	1				
21	156823	UNION, swivel; 1/4 npt (m x f)	1				
22	155665	UNION, adapter, swivel; 3/8 npt(m) x 3/8 npsm(f)	2				
23†	237303	VALVE, ball, solvent; 1/4 npt (mbe); see 306861; also order item 23a	1				
23a	178747	LEVER, solvent valve; replaces standard lever on item 23	1				
24†	237304	VALVE, ball; 3/8 npt (mbe); see 306861; discard supplied lever and replace with item 25	2				
25	217562	HANDLE, shutoff, resin/hardener	1				
26	102310	NUT, hex, with nylon cap; 10-32	2				
27	15E368	TUBE, inner; sst	1				
28	15E369	BUSHING, pipe; 1/2 npt(m) x 3/8 npt(f); sst	1				
34	101947	BEARING, ball; 3/8 in. (10 mm) diameter; sst	1				
38	165274	STUD, optional inlet; 1/4 npt x 11/16-27 uns-2a (standard on Part No. 248923)	1				
100	248778	GUARD, manifold; includes items 101-102	1				
101	100575	. SCREW, cap, hex hd; 3/8-16 x 5/8 in. (16 mm)	4				
102	100133	. WASHER, lock; 3/8	4				

* Parts included in Check Valve Kit 249035.

† Order Repair Kit 237917 for ball valves (23, 24).



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Technical Data

Maximum working pressure	7400 psi (51.0 MPa, 510 bar)
Maximum fluid temperature	200° F (93° C)
Fluid inlet valves	3/8 npt(m); with optional 1/4 npt(m) inlet stud
Fluid outlet size	3/8 npt(f)
Solvent inlet valve	1/4 npt(m)
Wetted parts	<i>Manifold block and internal parts:</i> 302 and 303 stainless steel, hardened stainless steel, chemically resistant fluoroelastomer, nylon, PTFE, tungsten carbide <i>Inlet valves and fittings:</i> 440 stainless steel, plated carbon steel, hardened alloy steel, acetal, PTFE

All other brand names or marks are used for identification purposes and are trademarks of their respective owners.

Graco Standard Warranty

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

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

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

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

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

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

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

FOR GRACO CANADA CUSTOMERS

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

Graco Information

For the latest information about Graco products, visit www.graco.com.

TO PLACE AN ORDER, contact your Graco distributor or call to identify the nearest distributor.

Phone: 612-623-6921 **or Toll Free:** 1-800-328-0211 **Fax:** 612-378-3505

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

Original instructions. This manual contains English. MM 310797

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