



# Dispensit 802-20

3A0228B  
ENG



## Important Safety Instructions

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



# Contents

<b>General Information .....</b>	<b>3</b>
<b>Safety Information.....</b>	<b>3</b>
<b>Illustration References.....</b>	<b>3</b>
<b>General Accessories.....</b>	<b>3</b>
<b>Description Of Operation.....</b>	<b>4</b>
Operation Illustration .....	4
<b>Setup Procedure .....</b>	<b>5</b>
Mounting Dispense Valve.....	5
Air Controller Specifications .....	5
<b>Operating Procedures.....</b>	<b>5</b>
Dry System Checkout.....	5
Material Loading.....	6
Remote Mounted Material Supply.....	6
Valve Mounted Syringe Material Supply.....	6
Wet System Checkout.....	7
<b>Periodic Maintenance.....</b>	<b>7</b>
Dispense Needle Replacement.....	7
Dispense Tube Replacement.....	7
Disassembly.....	8
Model 802-20 General Illustration .....	9
Assembly.....	10
<b>Troubleshooting.....</b>	<b>11</b>
<b>Model 802-20 Recommended Spare Parts.....</b>	<b>12</b>
<b>General Guidelines for O-rings and U-cup Seals.....</b>	<b>13</b>
<b>Warranty.....</b>	<b>14</b>

## GENERAL INFORMATION

The Model 802-20 Dispense Valve is a positive displacement pinch action valve with micrometer adjustment that is designed for applications that require dot-to-dot volumetric consistency. It has material viscosity dispensing capability from very thin material to high viscosity epoxies and metal filled pastes. This valve also has a fail-safe design to prevent material dumping in case of power failure. All wetted parts are disposable for easy maintenance and cleaning. The 802-20 comes complete with the following:

- Model 802-20 Dispense Valve
- Two 3 foot (.9 m) sections of pneumatic air line
- One package of replacement dispense tubes (type as ordered)
- Seal Kit
- Operating & Maintenance Manual
- Syringe (comes with syringe option, size as specified)
- Optional syringe clamp (comes with syringe option)
- Receiver cap with air line (comes with syringe option)

## SAFETY INFORMATION

Only personnel who have been given appropriate training should use this product and safety warnings as set forth in this manual. Read completely before operating.

**Warning:** Do not exceed 100 psi (6.9 bar) pressure on the operating system or 60 psi (4.1 bar) pressure on the syringe reservoir. Higher pressures are not required and may cause a serious hazard.

Toxicity and flammability hazards depend upon the product being dispensed by this unit, and the user should take appropriate safety precautions as indicated on the MSDS of the product.

Always wear safety glasses.

## ILLUSTRATION REFERENCES

Throughout this manual you will find references by illustration item number to the illustrations in the manual. The references are indicated by parentheses around a number such as: (7). Illustrations represent typical valve configurations. The drawings for your exact model are inserted at the back of the manual and include the part numbers for ordering replacement parts.

## GENERAL ACCESSORIES

Graco Ohio Inc. offers a full line of standard and custom accessories for your dispensing needs including:

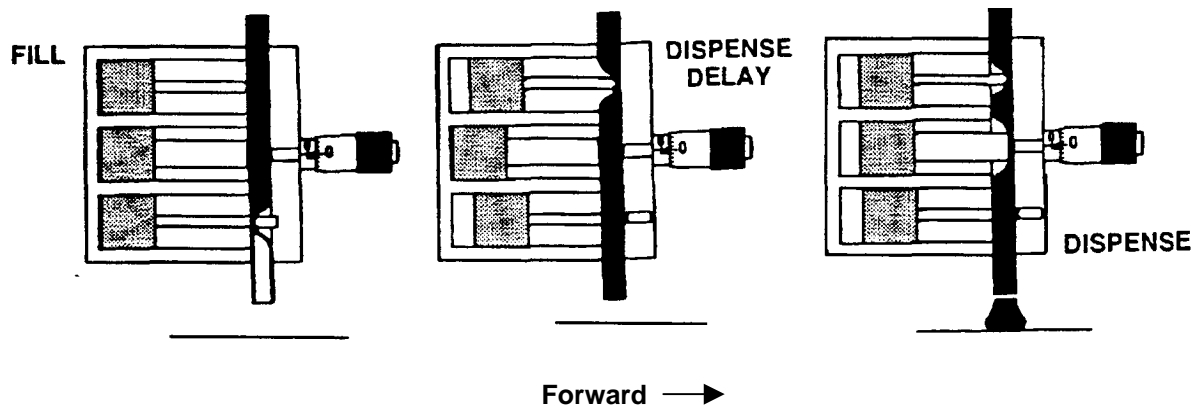
- Valve Controllers
- Syringe Feed Systems
- Cartridge Retainers and Pressure Reservoirs
- Titan 200 High Pressure Cartridge Feed Systems
- Transfer Pump Feed Systems for 1, 5 and 55 gallon containers
- Mounting Bases and Brackets

Consult your Dispensit dealer or the factory for details.

## DESCRIPTION OF OPERATION

1. The normal "ready" state of the system is as follows:
  - The syringe or remote reservoir contains the dispensable material.
  - The system has been purged, filling the dispense tube and needle with material.
  - The bottom pinch-off piston is not pressurized but is held back by the spring closing the dispense tube and holding back the dispensable material. (See "Fill" on drawing below.)
  - The top pinch-off and dispense pistons are back (not pressurized).
2. The dispense cycle begins when the controller is activated.
3. The top pinch-off piston first moves forward to stop material supply and the bottom pinch-off piston moves forward to release the dispense tube. (See "Dispense Delay" on sequential function drawing.)
4. The dispense piston then moves forward until stopped by the micrometer stroke adjust. This squeezes a precise amount of material out of the dispense tube. (See "Dispense" on sequential function drawing.)
5. When the dispense cycle is complete, the spring pushes the bottom pinch-off piston back, sealing the dispense tube to prevent material drip. Immediately after, the dispense piston and top pinch-off piston withdraw allowing the material from the pressurized reservoir to refill the dispense tube. The system is again in the normal "ready" state.

## OPERATION ILLUSTRATION



**Note:** The above illustration is intended to explain the operation of the 802-20 dispense valve. Top and middle pistons in the illustration are incorporated in the top piston of the 802-20 dispense valve.

# SETUP PROCEDURE

## MOUNTING DISPENSE VALVE

For optimum operation, the dispense valve must be mounted on a 1/2 inch (12.7 mm) support rod post or frame. When mounting, firmly affix the valve in place by tightening the socket head cap screw with a 5/32 inch Allen wrench. The valve may be tilted to a maximum of 60° from the vertical depending on the application.

## AIR CONTROLLER SPECIFICATIONS

Operation of the Model 802-20 Dispense Valve requires a controller that can provide the following:

- A minimum of 0.5 SCFM (2.3 cm<sup>3</sup>) of dry unlubricated air at a minimum pressure of 70 psi (4.8 bar) and a maximum of 100 psi (6.9 bar).
- Time delay capability to allow the valve to cycle.
- Independent air pressure regulators for material reservoir and valve operation.
- “Purge capability” which is the ability for the operator to pass or not pass air to the pinch-off piston on the dispense valve.
- For semiautomatic or automatic applications, a foot switch or other control to cycle the valve.
- Connection for .16” ID x .25” OD (6.35 mm) pressure tubing for use between the dispense valve and controller.
- Connection for .16” ID x .25” OD (6.35 mm) pressure tubing for use between the controller and syringe.

**NOTE:** The syringe air supply must be regulated to a maximum of 60 psi (4.1 bar).

## OPERATING PROCEDURES

### DRY SYSTEM CHECKOUT

This is an initial checkout to determine if the setup has been properly completed. The dry checkout is conducted without any material in the system.

1. Attach the color-coded pneumatic pressure lines from the dispense valve to the color-coded cycle air outlets on the air supply controller.
2. Turn on the electric and air supply.
3. Set the air pressure to 70 psi (4.8 bar) on the system pressure gauge.
4. In the normal rest position, the spring holds the bottom pinch-off piston back, sealing the dispense tube. (See “Fill” on Sequential Function drawing.)
5. Momentarily press the dispense valve cycling control switch. The top pinch-off piston is pressurized, sealing the dispense tube while the bottom pinch-off piston is simultaneously pressurized to release the dispense tube. (See “Dispense Delay” on sequential function drawing.) The integral dispense piston moves to the micrometer stop. The dispense valve air solenoid valve should cycle and show a slight fluctuation in the system pressure gauge. (See “Dispense” on sequential function drawing.)  
When this happens, the system is correctly installed.

# OPERATING PROCEDURES

## MATERIAL LOADING

### REMOTE MOUNTED MATERIAL SUPPLY

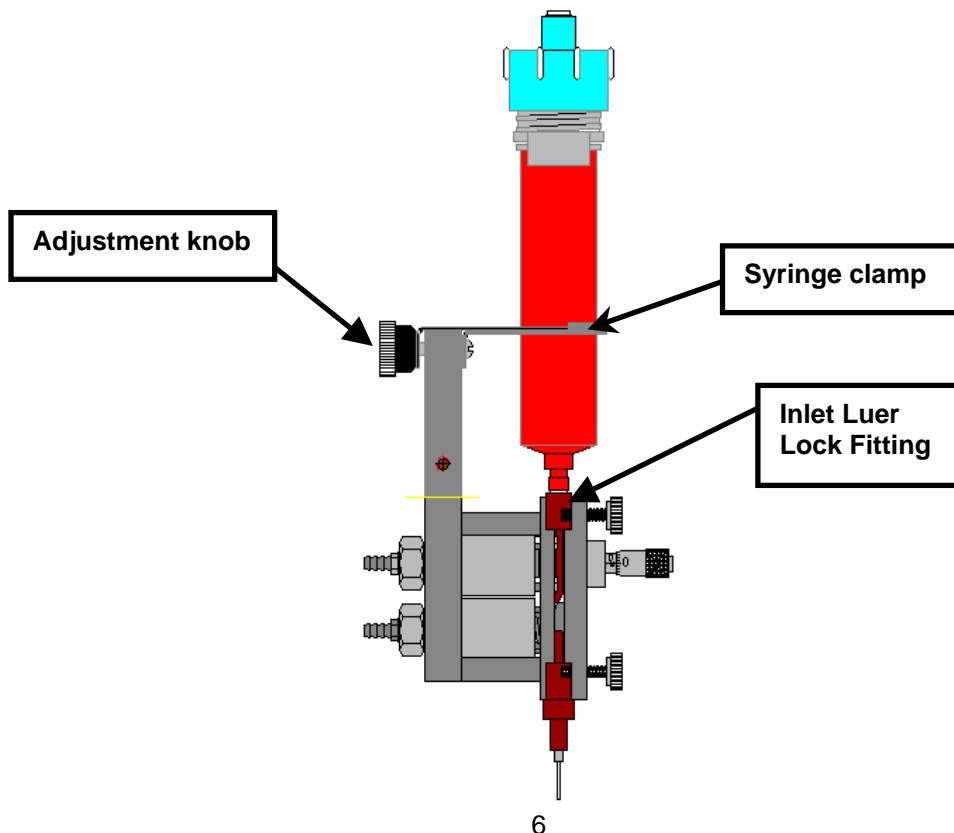
If the material supply is remote mounted then connect material supply tubing to the Dispense Valve material inlet luer lock fitting. When using a remote reservoir, the material supply tubing and fittings must be compatible with the material being dispensed and be capable of withstanding the dispensing pressure.

### VALVE MOUNTED SYRINGE MATERIAL SUPPLY

1. Place the filled syringe of material through the syringe clamp mating the syringe to the male luer lock fitting on the dispense tube, turning until snug (do not over tighten).
2. Hand tighten the syringe clamp using the adjustment knob until snug.
3. Install the receiver cap assembly to the top of the syringe.
4. Attach the air line to the regulator and set the air pressure control to 15 psi (1.0 bar) or to the setting required for the application.

**WARNING:** Do not exceed 100 psi (6.9 bar) pressure on the operating system or 60 psi (4.1 bar) pressure on the syringe reservoir. Higher pressures are not required and may cause a serious hazard.

**WARNING:** Do not apply either operating or reservoir air pressure to the product unless all screws are in place and properly tightened, and the receiver cap and/or reservoir lid is properly in place and tightened. All air connections should be fastened securely.



# OPERATING PROCEDURES

## WET SYSTEM CHECKOUT

Using the purge cycle on the air supply controller, run the material through the dispense line until a smooth material flow comes through the dispensing needle.

After the purge cycle has been completed, set the air supply controller to the manual cycle mode and cycle the dispense valve several times.

## PERIODIC MAINTENANCE

The Model 802-20 Dispense Valve has been engineered for easy cleanup with disposable needle and dispense tube.

**WARNING:** Do not attempt disassembly or cleaning of the unit while it is under pressure.

### DISPENSE NEEDLE REPLACEMENT

Remove the luer-lock type dispensing needle by grasping at the base and twisting one-quarter turn counter-clockwise. Other needles may be held in place with a nut, which must be fully unscrewed. Clean with water or solvent depending on the material dispensed. A fine wire, used cautiously, will help open clogged needles. Replace if damaged or severely clogged. Replacement needles can be ordered for the Model 802-20 Dispense Valve by specifying the proper part number.

### DISPENSE TUBE REPLACEMENT

Tube life is difficult to predict due to its dependence on the cycles, speed, downtime and material dispensed.

A reduction in shot volume is a common sign of a worn dispense tube. Periodic inspection of the dispense tube is recommended. Replace if necessary.

To change the dispense tube, DO NOT disassemble the valve.

**Note:** Pay close attention to the way the old tube is installed and use this information to get the new one in properly.

1. Depressurize the syringe or reservoir, and remove or disconnect it.
2. Pressurize the bottom pinch-off piston --this is the Purge mode. (It may be necessary to push back the top pinch-off piston.)
3. Loosen the upper and lower screw knobs enough to allow the dispense tube to pass out the side of the valve.

**Note:** Different models have different dispense tube configurations. Removal and replacement of the tube assembly will vary.

4. Replacement: Replace tubes only with same or equivalent tubing —tubing with different I.D. or O.D. will change the dispense amount; tubing with different wall thickness will leak, dribble, or have seriously shortened operating life; tubing with inferior mechanical properties will not last. Pay close attention to the way the old tube is installed and use this information to get the new one in properly.

Some tubes may have luer lock fittings or mechanically similar fittings and it may be necessary to disassemble them (removing the needle) to replace the tube.

5. Gently tighten the upper and lower screw knobs after the new tube and needle are replaced.
6. Return air controllers to normal operating modes.
7. Reinstall the syringe or reservoir and purge the valve.

One package of replacement dispense tubes is supplied with the unit. Additional tubes can be ordered for the Model 802-20 Dispense Valve by specifying the proper part number.

## PERIODIC MAINTENANCE

### DISASSEMBLY

Refer to the illustration below and the drawings in the back of this manual for your exact model.

**Caution: Make sure you have your safety glasses on and that the valve is pointed away from you and others. The spring can become a flying object if it escapes your control.**

**Note:** In addition to the items in the seal kit, the parts most likely to require replacement are the dispense tube, needle and needle block.

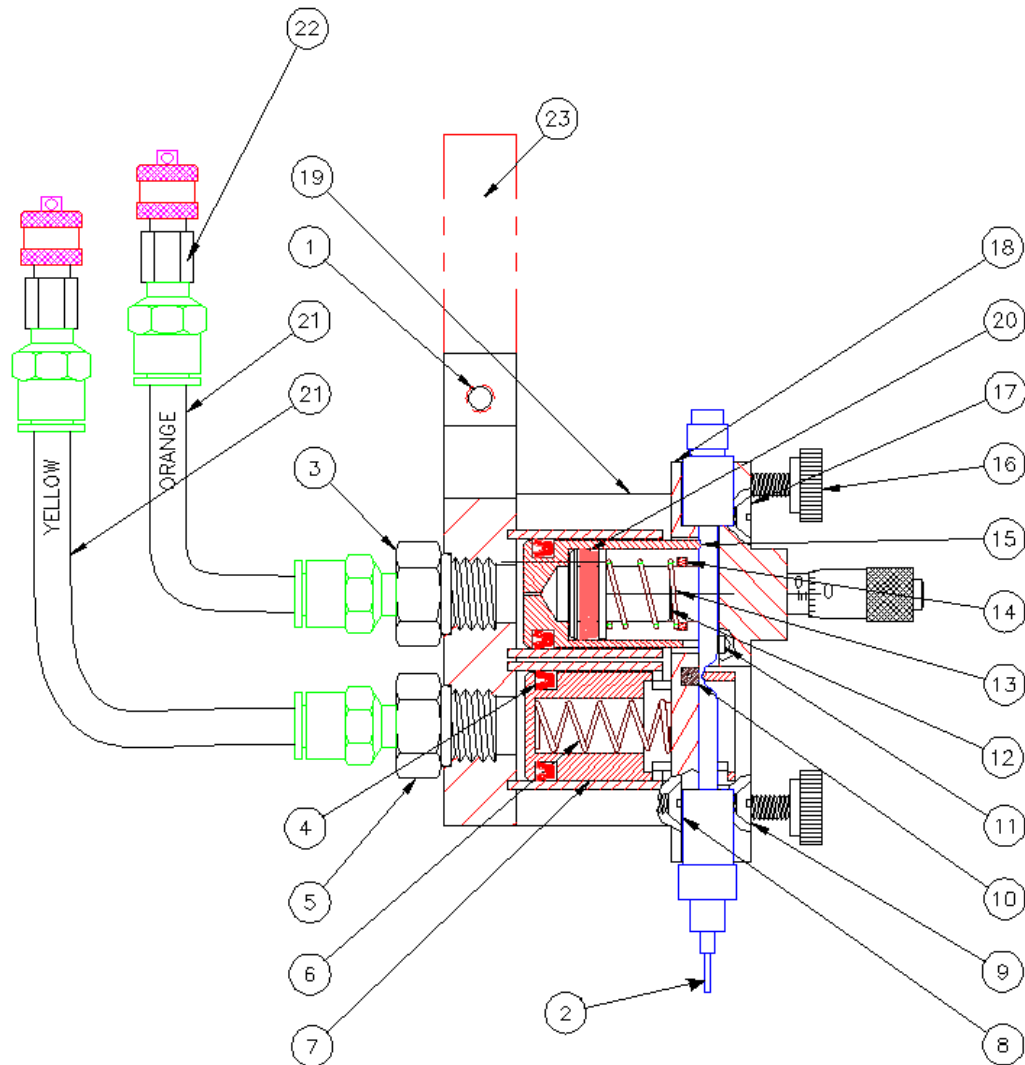
1. Turn off the material inlet pressure to the valve.
2. Turn off the air inlet pressure to the valve.
3. Remove the air pressure line and its end fitting from the valve. Do not remove the mating fitting that is screwed into the valve.
4. Remove the material inlet line if the material supply is remote or remove the syringe if present.
5. Remove the dispense valve from its mounting.
6. Disconnect the needle, needle block and dispense tube fittings.
7. Remove the Faceplate Assembly (17) by loosening and removing two Screws (9).

**NOTE: There is a Spring (6) behind the Backplate (18). In the next step hold the Backplate (18) with your thumb over the Bottom Pinch-off Piston (7) while removing the screws.**

8. Loosen and remove two Screws (8) that holding the Backplate (18) in place. The backplate, the Bottom Pinch-off Piston (7), and its Spring (6) will come loose from the rest of the valve. You may need to push on the Bottom Pinch-off Piston (7) slightly to help with the removal.
9. At this time all four Spacers (19) will be free and may be set aside.
10. Remove the Retainer (14) and Spring (13) from the Top Pinch-off Piston (15).
11. Remove the Top Pinch-off Piston (15) and Dispense Piston (12).
12. Separate the Dispense Piston (12) and the Top Pinch-off Piston (15).
13. Separate the Backplate (18) from the Bottom Pinch-off Piston (7) and Spring (6). Use a tool to hold the Spring (6) in place while you move the backplate.
14. Remove the Bumper (10) from the Backplate (18).
15. Remove the U-cup Seals. Note the direction the old seals face as you remove them since the new seals must face the same direction when you install them.



## MODEL 802-20 GENERAL ILLUSTRATION



1	SCREW,SHC,#10-32 X 3/4	12	DISPENSE PISTON
2	DISPENSE NEEDLE	13	SPRING
3	OUTFLOW CONTROL	14	RETAINER CLIP
4	U-CUP SEAL	15	TOP PINCH-OFF PISTON
5	INFLOW CONTROL	16	KNOB ASSEMBLY
6	SPRING	17	FACEPLATE ASSEMBLY
7	BOTTOM PINCH-OFF PISTON	18	BACKPLATE
8	SCREW,FHM, #6-32 X 1-3/8	19	SPACER
9	SCREW,FHM, #6-32 X 2	20	U-CUP SEAL
10	BUMPER	21	TUBING
11	ROLL PIN	22	TUBE CONNECTOR
		23	CYLINDER BASE ASSEMBLY

# PERIODIC MAINTENANCE

## ASSEMBLY

Refer to the illustration above and the drawings in the back of this manual for your exact model.

**Caution: Make sure you have your safety glasses on and that the valve is pointed away from you and others. The spring can become a flying object if it escapes your control.**

**Note:** Clean all valve parts with an appropriate solvent prior to reassembly. Always install new, lubricated o-rings and seals when assembling the valve. Use Krytox 203GPL(part number 84/0200-K3/11) for lubricating valve parts including seals and o-rings. Lightly lubricate the inside bore of the Cylinder Base Assembly (23) and the outside of the Top Pinch-off Piston (15), Bottom Pinch-off Piston (7) and Dispense Piston (12). Check all three pistons and the Backplate (18) for wear and if worn at the dispense tube contact areas secure replacements before proceeding.

**Note:** Use caution as you install new U-cup seals so that they are not pinched or torn. Do this by making sure they are lubricated, and by tucking the lips of the seal inward before uniformly pushing them into position.

**Note what direction the old seals face as you remove them. Make sure the new seals face in the proper direction when you install them. Consult the drawings for orientation to be sure.**

1. Install the lubricated U-cup Seal (4) on the Bottom Pinch-off Piston (7).
2. Install the lubricated U-cup Seal (4) on the Top Pinch-off Piston (15).
3. Install the lubricated U-cup Seal (20) on the Dispense Piston (12).
4. Insert the Bumper (10) into the Backplate (18).
5. Assemble the Bottom Pinch-off Piston (7) and the Spring (6) with the Backplate (18). Use a tool to push the spring down so that it fits under the backplate. Be sure the spring is centered under the backplate.
6. Assemble the Dispense Piston (12) and the Top Pinch-off Piston (15). This is easiest if you tilt the dispense piston to slide it in place. Use care and a blunt tool to tuck the lips of the U-cup Seal (20) inward before uniformly pushing it down into the valve sleeve.
7. Install the Dispense Piston/Top Pinch-off Piston Assembly (12 & 15) into the top cylinder in the Cylinder Base Assembly (23), tucking the lip of the U-cup Seal (4) inward before uniformly pushing the piston assembly into the cylinder bore. Add lubrication if needed.

**Note:** Position the upper ridge (where the #15 arrow is pointing in the illustration) of the Top Pinch-off Piston (15) towards the top as shown for proper pinch-off action.

8. Install the Bottom Pinch-off Piston/Backplate Assembly (7 & 18) into the bottom cylinder in the Cylinder Base Assembly (23), tucking the lip of the U-Cup Seal (4) inward before uniformly pushing it down into the cylinder bore. Add lubrication if needed. Align the backplate holes and the top pinch-off piston so the parts fit properly.
9. Hold the Backplate (18) in place with your thumb and install the two Screws (8) and two Spacers (19) in the recessed holes in the backplate to hold it in place. Tighten the screws.
10. Install the Faceplate Assembly (17) using the Screws (9), and two Spacers (19). Tighten the screws.
11. Complete the assembly by remounting the valve and installing its dispense tube and needle.
12. Attach the material inlet line to the remote material supply or remount the syringe if so equipped.
13. Attach the air inlet line.

**Perform the Dry System Checkout, Material Loading and Wet System Checkout.  
The valve is ready to be put back in service.**

## TROUBLESHOOTING

If operating difficulties occur review the symptoms below. With each problem there are one or more possible causes that should be investigated to resolve the situation.

**NOTHING HAPPENS** - If absolutely nothing happens when trying to cycle the dispense valve, check the electric/pneumatic power. Check the foot-switch or cycle start switch to be sure it is plugged in.

**VALVE CYCLES, NOTHING DISPENSED** - First, try to purge the unit; this should fix most situations. If it doesn't, check to see that there is enough pressure to the reservoir. Perhaps the reservoir/tube/needle path is clogged; examine and clear or replace as necessary. Consider whether the material could have "set up" in the system.

**IRREGULAR VOLUME DISPENSED** - Irregular dispensing can usually be attributed to faulty material. The material must be a smooth (homogeneous) mixture, without any air trapped in it. A second cause could possibly be that the material is not filling the Dispense Tube fully and in time. Check the reservoir pressure as it may be too low for the type of material being dispensed and/or the cycle time may be too fast. Cycle time is a function of the air supply controller. To adjust, follow the directions found in the controller operating manual.

**REDUCED VOLUMES DISPENSED** - Check to see if dispense tube requires replacement or whether needle is partially clogged (refer to the Periodic Maintenance Section). Wrong pinch tube installed (smaller I.D. will give smaller dispense).

**TUBING LIFE VERY SHORT** - Incorrect dispense tube (tube wall thickness too large).

**VALVE DRIPS** — Dispense tube needs replacing; wrong dispense tube used (wall thickness too small).

**SLOW OR SLUGGISH CYCLE TIME** - This may be due to inadequate lubrication of the piston walls. Remove the top and bottom pinch-off pistons and the dispense piston. Apply a very thin film of Krytox lubricant (part number 84/0200-K3/11) to the outside diameter surfaces of the pistons and the U-cup seals and reassemble. This will restore smooth and consistent operation.

## MODEL 802-20 RECOMMENDED SPARE PARTS

Note: These parts are routine supply items or wear parts not covered by warranty for normal wear.

Quantity	Description	Part Number
1	SEAL KIT,802-20	<i>see assembly drawing for part number</i>
**	KRYTOX 203GPL ASSEMBLY LUBRICANT	84/0200-K3/11
<b>Dispense Tubes</b>		
<b>Custom Dispense Tubes Available - Consult Factory</b>		
	Part Number	Description
		Dispense Tube Sampler Package, 2 each of Dispense tubes marked *
		A1020220-10
**		Dispense Tube,5542-HU.037, Pack of 10*
		A1020157-10
**		Dispense Tube,5542-HU.043, Pack of 10
		A1020211-10
**		Dispense Tube,5542-HU.050, Pack of 10*
		A1020212-10
**		Dispense Tube,5542-HU.060, Pack of 10
		A1020087-10
**		Dispense Tube,5542-HU.066, Pack of 10 *
		A1020152-10
**		Dispense Tube,5542-HU.080, Pack of 10 *
		A1020213-10
**		Dispense Tube,5542-HU.100, Pack of 10*
		A1020090-10
**		Dispense Tube,5542-PP.068, Pack of 10
		A1020153-10
**		Dispense Tube,5542-P.100, Pack of 10
		A1020088-10
**		Dispense Tube,5542-GP.100, Pack of 10
		A1020221-10
<p>Note: Last 3 digits of description indicate tube inside diameter in .001" increments.            Note: Tube material is coded in description as HU = TPE Urethane,            P=Natural Polyethylene, PP = Pink Polyethylene, GP = Green Polyethylene</p>		
<b>Luer Lock Hub Replacement Needles</b>		
<b>Needle length shown is length projecting from LL hub. Other lengths available.</b>		
	Description	Needle Part Number
**	Needle Sampler Package, 10 each of 14, 16, 18, 20 and 22 gauge ½" long needles	E4000025-50
**	Needle,LL,14 ga.x ½", Dark Green,Pack of 50 *	E4000001-50
**	Needle,LL,14 ga.x 1", Dark Green, Pack of 50	E4000014-50
**	Needle,LL,15 ga.x ½", Orange, Pack of 50	E4000004-50
**	Needle,LL,16 ga.x ½", Purple, Pack of 50 *	E4000088-50
**	Needle,LL,16 ga.x 1", Purple, Pack of 50 *	E4000005-50
**	Needle,LL,18 ga.x ½", Pin, Pack of 50 *	E4000006-50
**	Needle,LL,19 ga.x ½", Brown, Pack of 50	E4000008-50
**	Needle,LL,20 ga.x ½", Yellow, Pack of 50 *	E4000009-50
**	Needle,LL,22 ga.x ½", Black, Pack of 50 *	E4000011-50
**	Needle,LL,23 ga.x ½", Light Blue, Pack of 50	E4000024-50

\* Needles are included in Needle Sampler Package.

\*\* The quantity may vary for your application.

## GENERAL GUIDELINES FOR O-RINGS AND U-CUP SEALS

Sizes and materials of construction for O-rings and U-cup seals are selected by Graco Ohio Inc. based on compatibility with the chemicals to which they will be exposed. Solvents that may remove residual chemicals often have negative effects on the mechanical properties of O-rings and seals.

### O-Ring Guidelines

- Always replace an O-ring with the identical one in size, durometer hardness, type and material of construction. Always be alert to the location and size of each O-ring as many look alike and be careful not to mix them. Often similar sizes may be used in various locations on the equipment and if replaced incorrectly, the equipment may not function properly. Refer to the Machine Operation and Service Manual for the correct part number of all O-rings used throughout the equipment and replace them with factory approved parts only.
- Re-use of O-rings is not recommended. Only re-use O-rings as a last resort. If you must re-use them, be sure that they are clean, have no cuts or flat spots and contain NO foreign material. Also, be sure not to soak them in solvent for extended periods as this can cause deterioration of the O-ring. Always replace O-rings that are cut, nicked, or distorted in shape or cross-section.
- Always apply a very thin film of Krytox 203GPL lubricant, item 84/0200-K3/11, to the entire surface of the o-ring before installation. Avoid excessive lubrication. If installing O-rings over threads on a shaft or across sharp edges, roll or push the O-ring carefully into place being careful to avoid cutting or nicking it.
- Avoid stretching the O-ring too much as it may not return to the proper size.
- Do not use any sharp tools or objects to install O-rings

### U-cup Seal Guidelines

- Always replace a U-cup seal with the identical one in size, durometer hardness, type and material of construction. Always be alert to the location and size of each U-cup seal as many look alike and be careful not to mix them. Often similar sizes may be used in various locations on the equipment and if replaced incorrectly, the equipment may not function properly. Refer to the Machine Operation and Service Manual for the correct part number of all U-cups used throughout the equipment and replace them with factory approved parts only.
- Always apply a very thin film of Krytox 203GPL lubricant, item 84/0200-K3/11, to the inner and outer lips of the seal before installation.
- Re-use of U-cup seals is not recommended. Only re-use U-cups as a last resort. If you must re-use them, be sure that they are clean, have no cuts or flat spots and contain NO foreign material. Also, be sure not to soak them in solvent for extended periods as this can cause deterioration of the seal. Always replace U-cups that are cut, have flat spots, are distorted in shape or are damaged in any manner.
- Always be alert to the proper orientation of the sealing lips and re-install them in the same direction as shown on the specific equipment assembly drawing. The U-cup seals are intended to seal in only one direction and if installed incorrectly, chemical leakage through the U-cup can occur.
- Whenever possible, push the back side of the seal over the shaft to protect the inner and outer lips. If this is not possible, carefully tuck the lip in to avoid rolling it back or cutting it.
- If installing over sharp edges, slide the seal carefully into place to avoid cutting it.
- Do not use any sharp tools or objects to install U-cups.

# Graco Ohio 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](http://www.graco.com).

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

**Toll Free: 1-800-746-1334 or Fax: 330-966-3006**

*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 3A0228*

**Graco Headquarters:** Minneapolis

**International Offices:** Belgium, China, Japan, Korea

**GRACO OHIO INC. 8400 PORT JACKSON AVE NW, NORTH CANTON, OH 44720**

Copyright 2009, Graco Ohio Inc. is registered to ISO 9001

[www.graco.com](http://www.graco.com)

Revised 03/2011