



Important Safety Instructions

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

Electronic Lubricant Valve, Metered or Unmetered

Hi-Flow In-Line Dispense Valves

1500 psi (105 bar) Maximum Working Pressure

FOR USE WITH PETROLEUM-BASED LUBRICANTS ONLY

WITHOUT METER

222461 For Oil, includes cap

222561 For Oil, includes Hi-Flow nozzle

WITH ELECTRONIC METER

Measures in gallons/quarts/pints*

222471 For Oil, includes cap †

222441 For Oil, includes Hi-Flow nozzle †

* Meter is factory-set in quarts

Measures in liters

222571 For Oil, includes cap † ‡

222541 For Oil, includes Hi-Flow nozzle † ‡

† These products contain P/N 222560 which is Factory Mutual approved as intrinsically safe for Class I, Division 1, Groups A,B,C,D.

‡ These products contain P/N 222660 which is listed by the Canadian Standards Association as certified as intrinsically safe for Class I, Division 1, Groups A,B,C,D.



MODEL 222461

MODEL 222561

MODEL 222471
or 222571

MODEL 222441
or 222541

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02235
02232
02233

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Graco Phone Number

TO PLACE AN ORDER, contact your Graco distributor, or call this number to identify the distributor closest to you: **1-800-533-9655 Toll Free**

Technical Data

Electronic Meter

Flow range*	0.12 to 12.0 gpm 0.456 to 45.6 lpm
Maximum operating pressure	1500 psi (105 bar)
Weight (bare meter)	1.9 lb (0.95 kg)
Units of measurement	Factory-set in quarts. Display shows quantity in 0.01 increments up to 199.99 gallons, quarts, or pints. Totalizes in gallons or liters up to 19,999 units.
Inlet and outlet	1/2 npt, non-directional flow
Operating temperature range	-4° F to 130° F (-20° C to 55° C)
Storage temperature range	-40° F to 140° F (-40° C to 60° C)
Battery specifications	
Rated discharge current	100 microamps
Rated capacity	1.0 amp hour
Maximum continuous discharge current	1.0 milliamp
Wetted parts	aluminum, nickel, bronze, stainless steel #304, carbon steel, cast ALNICO 8, nitrile rubber

Dispense Valve

Flow capability	12.0 gpm (45 lpm) at 50 psi (3.5 bar) pressure loss using hydraulic fluid
Maximum operating pressure	1500 psi (103 bar)
Weight (without meter)	4 lb (1.8 kg)
Inlet and outlet	1/2 npt
Wetted parts	aluminum, carbon steel, copper, polyurethane, nitrile rubber

* *Tested in No. 10 motor oil. Flow rates vary with fluid pressure and viscosity.*

WARNING



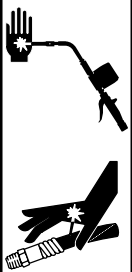
INSTRUCTIONS

EQUIPMENT MISUSE HAZARD

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

- This equipment is for professional use only.
- Read all instruction manuals, tags, and labels before you operate this equipment.
- Use the equipment only for its intended purpose. If you are not sure, call your Graco representative.
- Do not alter or modify this equipment.
- Check equipment daily. Repair or replace worn or damaged parts immediately.
- Do not exceed the maximum working pressure of the lowest-rated system component. Refer to the **Technical Data** on page 2 for the maximum working pressure of this component.
- Use fluids and solvents that are compatible with the equipment wetted parts. Refer to the **Technical Data** section of all equipment manuals. Read the fluid and solvent manufacturer's warnings.
- Do not use 1,1,1-trichloroethane, methylene chloride, other halogenated hydrocarbon solvents or fluids that contain such solvents in pressurized aluminum equipment. Such use could result in a chemical reaction, with the possibility of explosion.
- Do not use hoses to pull equipment.
- Route hoses away from traffic areas, sharp edges, moving parts, and hot surfaces. Do not expose Graco hoses to temperatures above 82° C (180° F) or below -40° C (-40° F).
- Do not lift pressurized equipment.
- Comply with all applicable local, state, and national fire, electrical, and safety regulations.

WARNING



SKIN INJECTION HAZARD

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

- Fluid injected into the skin may look like just a cut, but it is a serious injury. **Get immediate surgical treatment.**
- Do not point the dispensing valve at anyone or at any part of the body.
- Do not put your hand or fingers over the end of the dispensing valve.
- Do not stop or deflect leaks with your hand, body, glove, or rag.
- Use only extensions and no-drip tips that are designed for use with your dispensing valve.
- Do not use a low-pressure flexible nozzle with this equipment.
- Follow the **Pressure Relief Procedure** on page 7 before you clean, check, or service this equipment.
- Tighten all fluid connections before you operate this equipment.
- Check the hoses, tubes, and couplings daily. Replace worn or damaged parts immediately. Do not repair high pressure couplings; you must replace the entire hose.

Operation – Electronic Meter

⚠ CAUTION

Never operate the meter with the black plastic cover removed. The cover protects the meter from damage due to impact. Meters are factory sealed to keep moisture and dirt out. See the **Service** section before you service the meter.

⚠ CAUTION

To prevent line contamination, which can cause equipment malfunction or damage, flush the lines before you install this equipment in the system.

To Activate the Digital Display

Press the **RESET** key pad to clear the meter before you start a new dispense cycle. This is the best way to activate the meter, because it also clears the quantity of the last dispense cycle.

The digital display can also be activated by pressing the **TOTAL** key pad or by running fluid through the meter. See Fig. 1.

NOTE: The digital display of the meter goes blank after approximately two minutes of non-use.

Function of TOTAL

When the digital display is blank, press and release the **TOTAL** key pad to display the quantity of the last dispense cycle. See Fig. 2.

To see the accumulated total of fluid dispensed through the meter, press and hold the **TOTAL** key pad. The accumulated total is shown in gallons for the gallon/quart/pint meter, and in liters for liter meter. The meter can accumulate a running total of up to 19999 gallons (or liters) dispensed before returning to zero. See Fig. 3.

Function of RESET

Press the **RESET** key pad to clear the quantity of the last dispense cycle and return the digital display to all zeros. See Fig. 1.

To Change the Measurement Units

(gallon/quart/pint meter only)

The meter is factory-set to dispense in quarts. To change the measurement units, press and hold the **RESET** key pad until the measurement unit on the right side of the digital display is flashing. Then press the **TOTAL** key pad until the desired measurement unit is shown. Release both key pads. See Fig. 4.

⚠ CAUTION

To be sure the proper amount of fluid is dispensed, always use the same measurement unit for a particular fluid. Units should be changed only by authorized employees.

For Maximum Dispensing Accuracy

(gallon/quart/pint meter only)

Set the meter to dispense in pints or quarts when dispensing 1 gallon or less.

Always press the **RESET** key pad to clear the meter before a new dispense cycle.



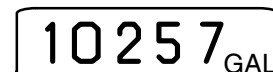
DIGITAL DISPLAY

Fig. 1



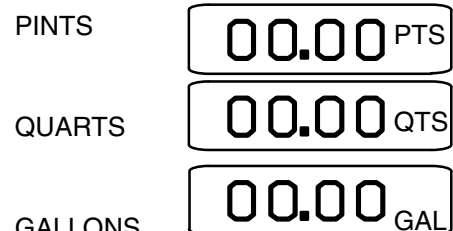
EXAMPLE OF TOTAL FOR
LAST DISPENSE CYCLE

Fig. 2



EXAMPLE OF ACCUMULATED TOTAL

Fig. 3



EXAMPLE OF MEASUREMENT UNITS

Fig. 4

Operation – Metered and Unmetered Dispense Valves

- 1 Unscrew before dispensing fluid
- 2 Rotate knurled sleeve of coupler (b) clockwise to open it for dispensing

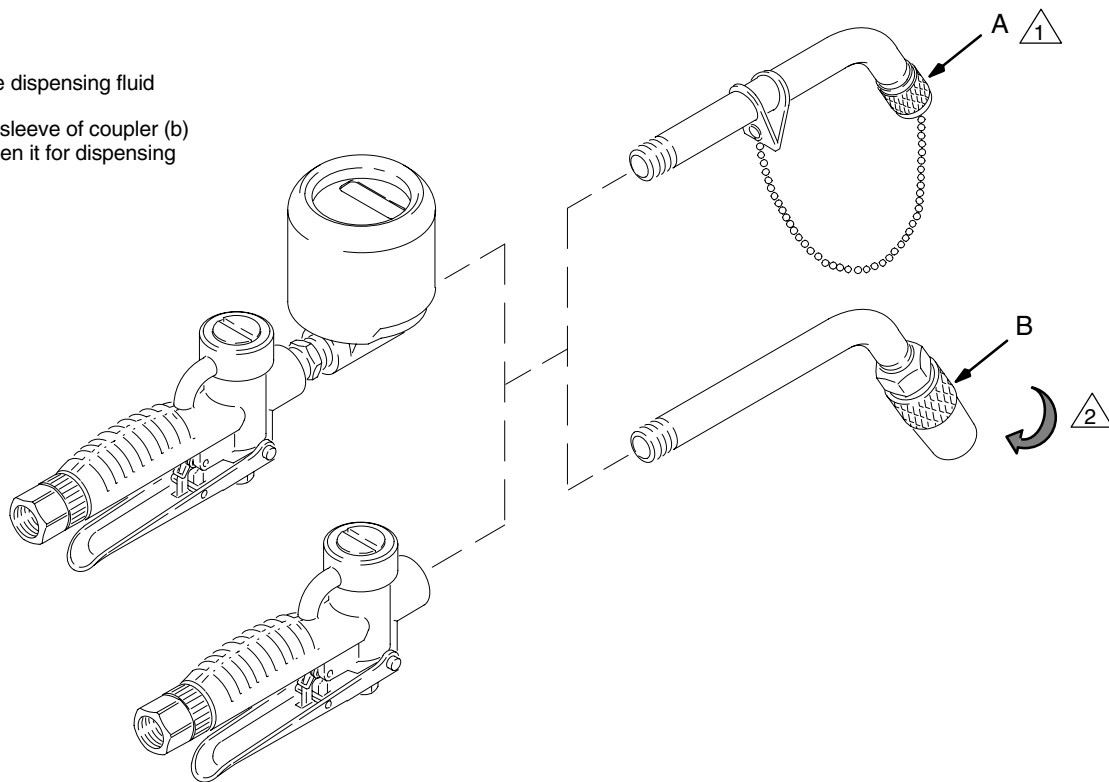


Fig. 5

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⚠ WARNING

To reduce the risk of fluid injection, always grasp the nozzle housing (B) from the threaded end, not from the front, when you adjust the nozzle.

⚠ CAUTION

To prevent line contamination, which can cause equipment malfunction or damage, flush the lines before you install this equipment in the system.

If you are not using a Hi-Flow nozzle, remove the cap (A) from the tube. See Fig. 5.

To dispense from the Hi-Flow nozzle (B), turn the knurled sleeve clockwise until it is open. Trigger the valve. See Fig. 5.

When the dispense cycle is completed, release the trigger, and close the nozzle by screwing the knurled sleeve fully counterclockwise. See Fig. 5.

For electronic metered valves, press the **RESET** key pad on the meter to clear it before the next dispense cycle. See Fig. 1.

Trigger the dispense valve. Lubricant begins to flow with the slightest movement of the trigger and continues to flow until the trigger is released.

When you dispense lightweight fluids, such as automatic transmission fluid, increase the free play of the dispense valve trigger. This reduces the flow and reduces splashing of the fluid. To adjust the trigger free play, loosen the adjusting screw locknut (C). Back the screw (D) out until the desired flow is achieved, then tighten the locknut securely. See Fig. 6.

To lock the control valve in the open position, engage the trigger latching pin in the latch (E). See Fig. 6. To release the latch, squeeze and release the trigger.

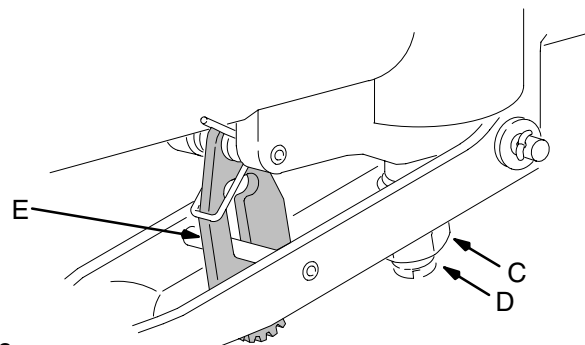



Fig. 6

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Clean the strainer frequently. See page 9 for instructions.

Troubleshooting – Electronic Meter


WARNING

PRESSURIZED EQUIPMENT HAZARD
 The equipment stays pressurized until pressure is manually relieved. To reduce the risk of serious injury from pressurized fluid, accidental spray from the dispenser or splashing fluid, follow the **Pressure Relief Procedure** whenever you:

- Are instructed to relieve pressure
- Stop dispensing
- Check, clean, or service any system equipment
- Install or clean fluid nozzles

Pressure Relief Procedure

1. Turn off the power supply to the pump.
2. Trigger the valve into a waste container to relieve pressure.
3. Open any bleed-type master air valves and fluid drain valves in the system.
4. Leave the drain valve open until you have completed repairs and are ready to pressurize the system.

NOTE: Before you check or repair the meter, be sure all other valves, controls, and the pump are operating properly. Also see **Troubleshooting – Dispense Valve** on page 9.

Problem	Cause	Solution
Digital display does not activate.	Electronic control is malfunctioning.	Replace the electronic control. Order Part No. 235878 for gallons/quarts/pints. Order Part No. 235901 for liters.
There is no fluid flow.	Metering unit is malfunctioning.	Replace the metering unit. Order Part No. 235873 for gallons/quarts/pints. Order Part No. 235904 for liters.
	Dispense valve strainer is clogged.	Remove and clean strainer.
Digital display is dim.	Battery in electronic control is worn.	Replace electronic control within approximately one week of when you notice the dimness. See the part numbers above.

Service – Electronic Meter

⚠ CAUTION

To avoid damaging the electronic components of the control:

- **Always** use the personal grounding strap provided with a replacement metering unit and electronic control when you remove the cover (1), and while you replace the parts. This strap protects the electronic components from damage due to electrostatic discharge.
- Do not lay anything on the control.
- Be sure the open side of the control faces up if you lay it down.
- Do not twist or force parts. Align parts properly as instructed.

⚠ WARNING

To reduce the risk of a fire, explosion, and serious burns to the body, handle and dispose of a used electronic control (103) properly.

The electronic control contains a lithium battery. Do not short circuit, charge, force over discharge, disassemble, crush, penetrate, incinerate, or heat the battery to a temperature exceeding 185° F (85° C). Any misuse or abuse of the battery may cause it to leak or explode.

⚠ WARNING

Use only genuine Graco replacement parts. The use of any other parts may impair the intrinsic safety of this meter. This could result in a failure, which could cause serious bodily injury and/or substantial property damage.

1. Relieve the pressure.

⚠ WARNING

To reduce the risk of serious injury, when you are instructed to relieve pressure, always follow the **Pressure Relief Procedure** on page 7.

2. Attach the disposable grounding wrist strap to your wrist. Connect the adhesive-backed copper foil at the other end to any convenient electrical ground, such as the grounding screw or metal case of a grounded electrical outlet.
3. Lift the bottom edge of the black cover (101) away from the meter (102), and pull the cover off. Remove and discard the screws (106). Lift off the electronic control (103). Remove and discard the large o-ring (104).
4. Install a new metering unit (102) and/or electronic control (103). Install the large o-ring (104) over the lip on top of the metering unit (102). Align the notch on the side of the electronic control (103) with the notch on the side of the metering unit (102). Install the new screws (106), and torque them oppositely and evenly to 4 to 6 in-lb (0.45 to 0.68 N-m).
5. Install the cover so the rolled-in edges are parallel with the inlet fluid passage of the metering unit.

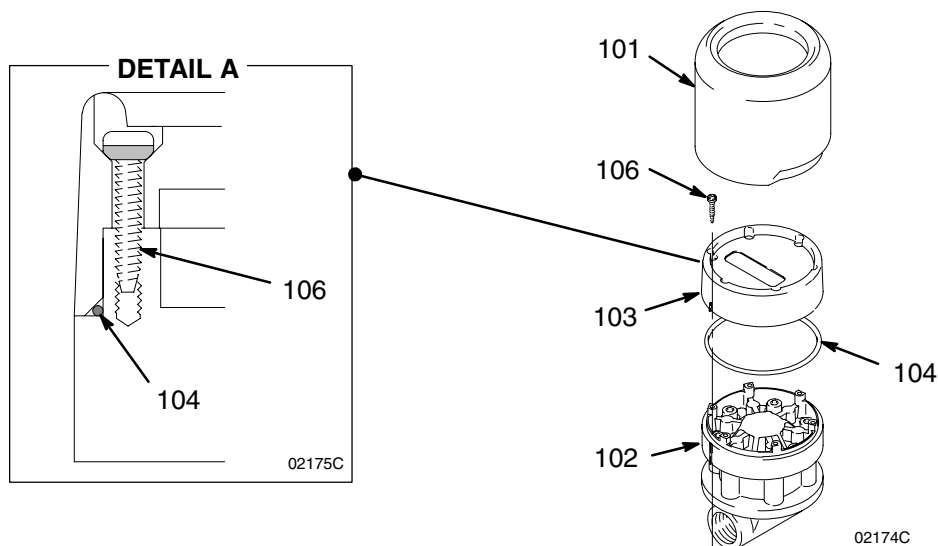


Fig. 7

Troubleshooting – Dispense Valve

Problem	Cause	Solution
Lubricant continues to flow after the trigger is released.	Valve may be out of adjustment.	Adjust the valve.
	Valve spring is weak, o-rings are worn, or valve poppet is unseated.	Check internal valve parts.
Lubricant leaks past the push rod packing (12).	Push rod or packing is worn.	Replace push rod or packing.

Service

NOTES:

- **Relieve the pressure** before you service the control valve.

WARNING

To reduce the risk of serious injury, when you are instructed to relieve pressure, always follow the **Pressure Relief Procedure** on page 7.

- Refer to the **Parts Drawing** on page 10 when you service the control valve.
- Clean and check all parts thoroughly after you disassemble them, and replace worn or damaged parts.
- The reference numbers and letters in parentheses in the text correspond to the numbers and letters in the text, parts drawings, and parts lists.

Clean the Strainer Frequently

Relieve the pressure. Remove the swivel (19), and unscrew the strainer (19a). Clean the filter in mineral spirits. Reassemble, and torque the swivel to 19 to 21 ft-lb (26 to 28 N-m).

Adjust the Valve

Loosen the locknut (8). Turn the adjusting screw (9) in or out as needed. To stop the fluid flow, all of the pressure of the screw (9) against the push rod (20) must be released.

When the valve handle is properly adjusted, there is a small amount of free play. After you adjust the valve, hold the adjusting screw in place, and securely tighten the locknut.

Check Internal Valve Parts

Relieve the pressure. Disconnect the valve from the hose. Remove the valve plug (22). Several other parts will come out with the plug. Clean the valve cavity and seat (18). Inspect the seat for nicks. If the seat is damaged, send the valve to a Graco-authorized service center for repair. If the seat is not damaged, reassemble the valve.

Replace Push Rod or Packing

Relieve the pressure. Disconnect the valve from the hose. Push out the pin (2) of the trigger latch. Swing the trigger out of the way. Remove the guide (10), gasket (4) and push rod (20). Use a dull instrument to remove the packing (12). Install a new gasket, and reassemble the valve.

WARNING

Use only genuine Graco replacement parts. The use of any other parts may impair the intrinsic safety of this meter. This could result in a failure, which could cause serious bodily injury and/or substantial property damage.

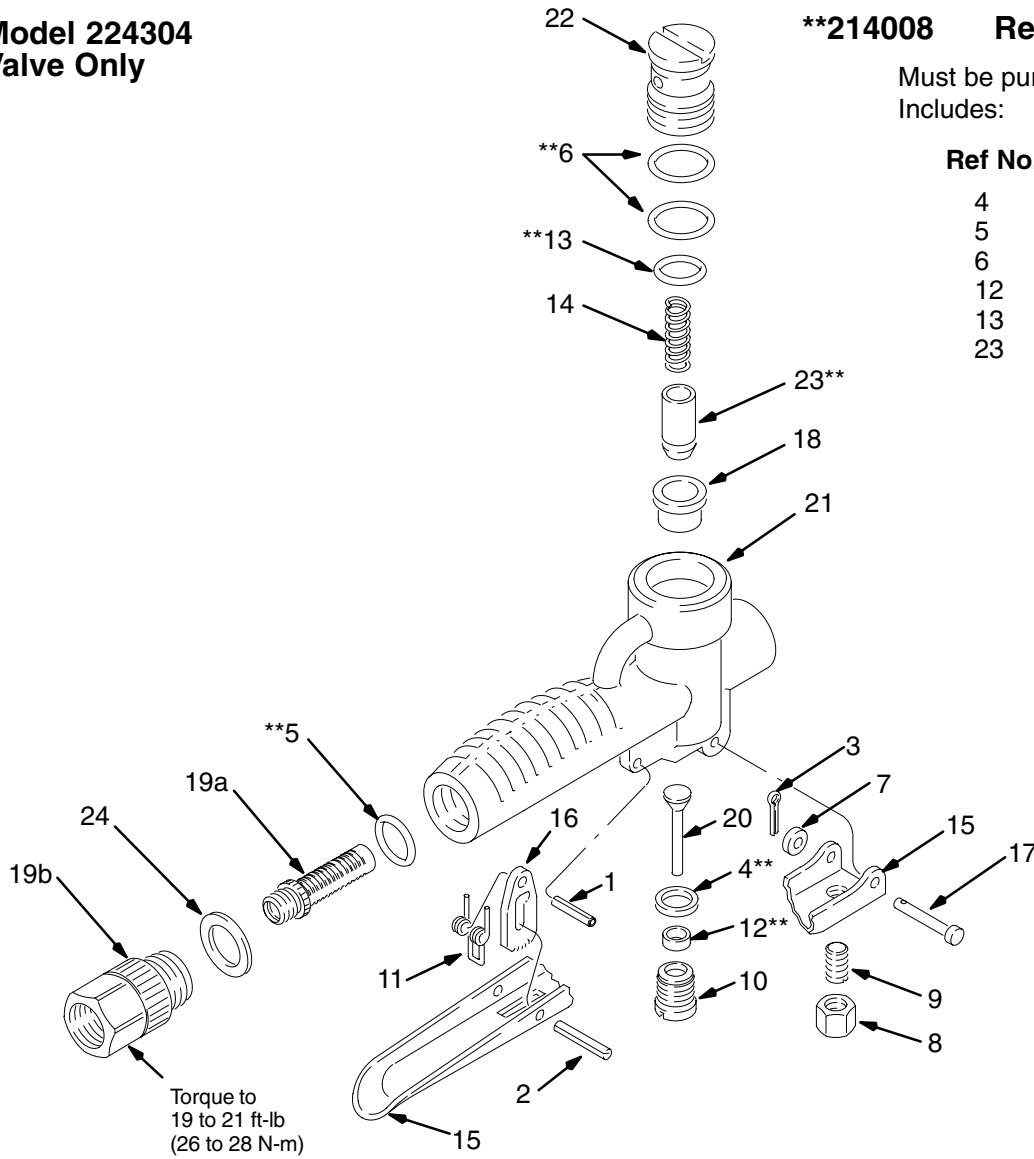
Parts – Valve

Model 224304 Valve Only

**214008 Repair Kit

Must be purchased separately.
Includes:

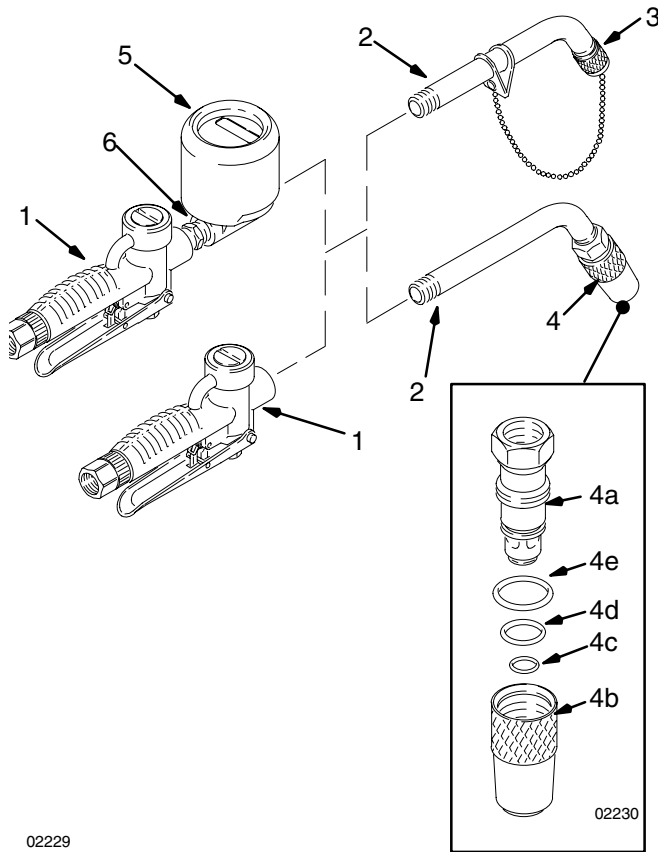
Ref No.	Qty
4	1
5	3
6	2
12	1
13	1
23	1



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Ref No.	Part No.	Description	Qty	Ref No.	Part No.	Description	Qty
1	108445	PIN, spring; 5/32 in. (4.0 mm) dia; 7/8 in. (22.2 mm) long	1	12**	158673	PACKING, v-block; nitrile rubber	1
2	101354	PIN, roll; 3/16 in. (5 mm) dia; 1-1/8 in. (28.6 mm) long	1	13**	158674	O-RING; nitrile rubber	1
3	101421	PIN, cotter; 5/8 in. (16 mm) dia; 3/8 in. (9.5 mm) long	1	14	159080	SPRING, compression	1
4**	150451	GASKET, copper	1	15	159118	TRIGGER	1
5**	155500	O-RING; nitrile rubber	1	16	159168	LATCH, trigger	1
6**	156401	O-RING; nitrile rubber	2	17	159484	PIN, pivot	1
7	157974	WASHER, special	1	18	160708	SEAT, valve	1
8	158213	NUT, lock; 3/8-24	1	19a	159259	STRAINER	1
9	158214	SCREW, slotted headless set; 1/8-24 x 9/16	1	19b	202994	ADAPTER, swivel; 1/2 npt	1
10	158668	GUIDE, push rod	1	20	203977	ROD, push	1
11	158671	SPRING, torsion	1	21	158658	VALVE BODY	1
				22	158662	PLUG, valve	1
				23**	217316	VALVE, piston	1
				24	111853	GASKET	1

Parts – Metered and Unmetered Dispense Valves



With Gallon/Quart/Pint Meter Model 222471, Includes Cap

Ref No.	Part No.	Description	Qty
1	224304*	VALVE	1
2	186660	SPOUT	1
3	224062	CAP & CHAIN	1
5	235880**	METER, gallon/quart/pint	1
6	158491	NIPPLE	1
7	172479†	TAG, WARNING, <i>not shown</i>	1

Model 222441, Includes Hi-Flow Nozzle

Ref No.	Part No.	Description	Qty
1	224304*	VALVE	1
2	186660	SPOUT	1
4	223920	HI-FLOW NOZZLE <i>see parts below</i>	1
5	235880**	METER, gallon/quart/pint	1
6	158491	NIPPLE	1
7	172479†	TAG, WARNING, <i>not shown</i>	1

With Liter Meter

Model 222571, Includes Cap

Ref No.	Part No.	Description	Qty
1	224304*	VALVE	1
2	186660	SPOUT	1
3	224062	CAP & CHAIN	1
5	235900**	METER, liter	1
6	158491	NIPPLE	1
7	172479†	TAG, WARNING, <i>not shown</i>	1

Model 222541, Includes Hi-Flow Nozzle

Ref No.	Part No.	Description	Qty
1	224304*	VALVE	1
2	186660	SPOUT	1
4	223920	HI-FLOW NOZZLE <i>see parts below</i>	1
5	235900**	METER, liter	1
6	158491	NIPPLE	1
7	172479†	TAG, WARNING, <i>not shown</i>	1

Hi-Flow Nozzle

Model 223920

Included with valves 222561, 222441, 222541

Ref No.	Part No.	Description	Qty
4a	186528	STEM, nozzle	1
4b	186-529	SLEEVE, nozzle	1
4c	158032	O-RING	1
4d	155463	O-RING	1
4e	110956	O-RING	1

Without Meter

Model 222461, Includes Cap

Ref No.	Part No.	Description	Qty
1	224304*	VALVE	1
2	186660	SPOUT	1
3	224062	CAP & CHAIN	1
7	172479†	TAG, WARNING, <i>not shown</i>	1

Model 222561, Includes Hi-Flow Nozzle

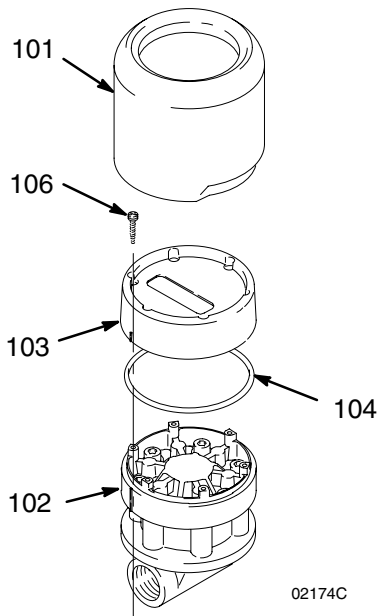
Ref No.	Part No.	Description	Qty
1	224304*	VALVE	1
2	186660	SPOUT	1
4	223920	HI-FLOW NOZZLE <i>see parts to right</i>	1
7	172479†	TAG, WARNING, <i>not shown</i>	1

† Extra Warning tags are available free.

* See parts on page 10.

** See parts on page 12.

Parts – Electronic Meter



Model 235880, Meter – Gallon/Quart/Pint

Includes replaceable items 101 through 106.

Ref No.	Part No.	Description	Qty
101	109118	COVER	1
102	235873*	METERING UNIT – gal/qt/pt	1
103	235878*	ELECTRONIC CONTROL – gal/qt/pt	1
104	109137	O-RING	1
106	112093	SCREW	6

Model 235900, Meter – Liter

Includes replaceable items 101 through 106.

Ref No.	Part No.	Description	Qty
101	109118	COVER	1
102	235904*	METERING UNIT – liter	1
103	235901*	ELECTRONIC CONTROL – liter	1
104	109137	O-RING	1
106	112093	SCREW	6

* Replacement screws and o-rings are included with items 102 and 103.

The Graco Electronic Dispense Valve Warranty and Disclaimers

Graco warrants all equipment manufactured by it and bearing its name to be free from defects in material and workmanship on the date of sale to the original purchaser for use. As purchaser's sole remedy for breach of this warranty, Graco will, for a period of twelve months from the date of sale, repair or replace any part of the equipment proven defective, with the exception of defects in the electronic meter control, including the battery, which will be repaired or replaced for twenty-four months from the date of sale. 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, 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 with Graco equipment of 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 claim. 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.

Disclaimers and Limitations. The terms of this warranty constitute purchaser's sole and exclusive remedy and are in lieu of any other warranties (express or implied), including **warranty of merchantability or warranty of fitness for a particular purpose**, and of any non-contractual liabilities, including product liabilities, based on negligence or strict liability. Every form of liability for direct, special or consequential damages or loss is expressly excluded and denied. In no case shall Graco's liability exceed the amount of the purchase price. Any action for breach of warranty must be brought within two (2) years of the date of sale.

Equipment not covered by Graco Warranty. Graco makes no warranty, and disclaims all implied **warranties of merchantability and fitness for a particular purpose**, with respect to accessories, equipment, materials, or components sold but not manufactured by Graco. These items sold, but not manufactured by Graco (such as electric motor, 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.

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.

MM 308113

Graco Headquarters: Minneapolis

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