

INSTRUCTIONS-PARTS LIST



308968

Rev. C



This manual contains important
warnings and information.
READ AND KEEP FOR REFERENCE.

INSTRUCTIONS

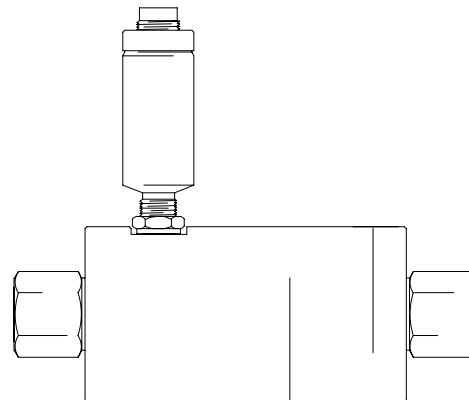
*First choice when
quality counts.™*

Part No. 233021 (.1 to 4.0 GPM)
(.04 to 15.0 L/Min)
Part No. 617418 (.1 to 11.0 GPM)
(.04 to 41.6 L/Min)

Fluid Flow Meter

6000psi (41 MPa, 408 bar) Maximum Fluid Working Pressure

Refer to page 2 for Table of Contents



TI1003



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

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Warnings

Warning Symbol



This symbol alerts you to the possibility of serious injury or death if you do not follow the instructions.

Caution Symbol



This symbol alerts you to the possibility of damage to or destruction of equipment if you do not follow the instructions.

WARNING



INSTRUCTIONS

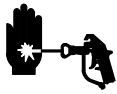


EQUIPMENT MISUSE HAZARD

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, warnings, 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.
- 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 fluid working pressure of the lowest rated system component. This equipment has a 6000 psi (41 MPa, 408 bar) maximum working pressure.
- Be sure that all spray/dispensing equipment and accessories are rated to withstand the maximum working pressure of the pump. Do not exceed the maximum working pressure of any component or accessory used in the system.
- Route hoses and cables away from traffic areas, sharp edges, moving parts, and hot surfaces.
- Do not expose Graco standard hoses to temperatures above 180°F (82°C) or below -40°F (-40°C).
- Use only fluids and solvents that are compatible with the equipment wetted parts. See the **Technical Data** sections of all the equipment manuals. Read the fluid manufacturer's warnings.
- Always wear protective eyewear, gloves, clothing, and respirator as recommended by the fluid and solvent manufacturers.
- Comply with all applicable local, state and national fire, electrical and other safety regulations.

WARNING



INJECTION HAZARD

Spray from the applicator, hose 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 might look like just a cut, but it is a serious injury. **Get immediate medical attention.**
- Do not stop or deflect fluid leaks with your hand, body, glove, or rag.
- Follow the **Pressure Relief Procedure** in your separate equipment manuals whenever you are instructed to: relieve pressure; stop dispensing; clean, check, or service the equipment; or install or clean a nozzle.
- 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.
- Always wear eye protection and protective clothing when installing, operating, or servicing this dispensing equipment.
- Never wipe off build-up around the nozzle or inlet cap until pressure is fully relieved.



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.

- Ground the equipment and the object being dispensed.
- Do not use this equipment with flammable liquids.
- Keep the dispense area free of debris, including solvent, rags, and gasoline.
- If there is any static sparking or you feel an electric shock while using the equipment, **stop dispensing immediately**. Do not use the equipment until you have identified and corrected the problem.
- Be sure all electrical work is performed by a qualified electrician only.
- Have any checks, installation, or service to electrical equipment performed by a qualified electrician only.
- Be sure all electrical equipment is installed and operated in compliance with applicable codes.
- Be sure power is disconnected when servicing and repairing equipment.
- Before operating the equipment, extinguish all open flames or pilot lights in the dispense area.
- Do not smoke in the dispensing area.
- Keep liquids away from the electrical components
- Disconnect electrical power at the main switch before servicing the equipment.

WARNING



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.

- Provide fresh air ventilation to avoid the buildup of vapors from the fluid being dispensed.
- Know the specific hazards of the fluid you are using.
- Store hazardous fluid in an approved container. Dispose of hazardous fluid according to all local, state and national guidelines.
- Always wear protective eyewear, gloves, clothing and respirator as recommended by the fluid and solvent manufacturer.
- Avoid exposure to heated material fumes.

Unpacking and Repacking

Unpacking the Fluid Flow Meter

The fluid flow meter was carefully packaged for shipment by Graco. When the package arrives, perform the following procedure to unpack the unit:

1. Inspect the shipping box carefully for shipping damage. Contact the carrier promptly if damage is discovered.
2. Unseal the box and inspect the contents carefully. There should not be any loose or damaged parts in the bag.
3. Compare the packing slip against all items included in the box. Any shortages or other inspection problems should be reported immediately.
4. Store the box and packing materials in a safe place for future use. Graco recommends that all packing materials be saved in case the unit needs to be shipped again.

Repacking the Product

When the fluid flow meter requires service, it is the purchaser's responsibility to have the unit repaired. As an option, the purchaser can have the unit repaired by an authorized Graco distributor. For additional information, read the following subsections.

On-site Service

The fluid flow meter components are customarily serviced by the purchaser or an authorized Graco technician. When service is required, follow the **Service** procedures in this manual.

Service by an Authorized Graco Distributor

The fluid flow meter can be serviced by an authorized Graco distributor *after* completing a Return Goods Authorization (RGA) form. The purchaser must repackage and ship the fluid flow meter to the Graco distributor. When repacking the Flow Meter, perform the following steps:

1. Retrieve the original box and packing materials for shipment.
2. Place the fluid flow meter and any loose or damaged parts in the same bag and box used in the original shipment. Fill the box with filler material to minimize the possibility of damage.
3. Seal the box tightly to protect its contents and prevent shipping damage.
4. Insure your shipment for the proper replacement value of its contents.
5. Ship the fluid flow meter **freight prepaid** to your authorized Graco distributor for service.

Installation

⚠ WARNING



FIRE, EXPLOSION, AND ELECTRIC SHOCK HAZARD

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

- All electrical equipment must only be installed by a qualified electrician.
- Understand and follow your local code and safety regulations for hazardous location wiring of intrinsically safe circuits.

Dust and Foreign Matter

Avoid having dust or foreign matter enter the flow meter by taking the following precautions:

- Thoroughly flush the fluid supply lines before installing the flow meter.
- When installing fittings, make sure that no sealing tape overlaps into the inside of the pipe.

⚠ CAUTION

The use of Teflon tape or pipe seal on fluid fittings upstream of this meter should be avoided if possible. Contaminants from sealing material may damage the meter.

- Install a 100 mesh fluid filter upstream of the flow meter.

Installing the Flow Meter

- Flow volume can only be measured at the location where the flow meter is installed.
- Do not use more than 200 ft. (61 m) of cable.
- Refer to Fig. NO TAG to locate and install the flow meter, connectors, and fluid shutoff valves. Install a check valve upstream of the meter to prevent backflow. The arrows on the flow meter and check valve show the direction of fluid flow.
- The shutoff valves allow you to isolate the meter for service.
- Refer to the **Technical Data and Dimensional Drawings** for dimension, inlet/outlet size, temperature and other specifications.

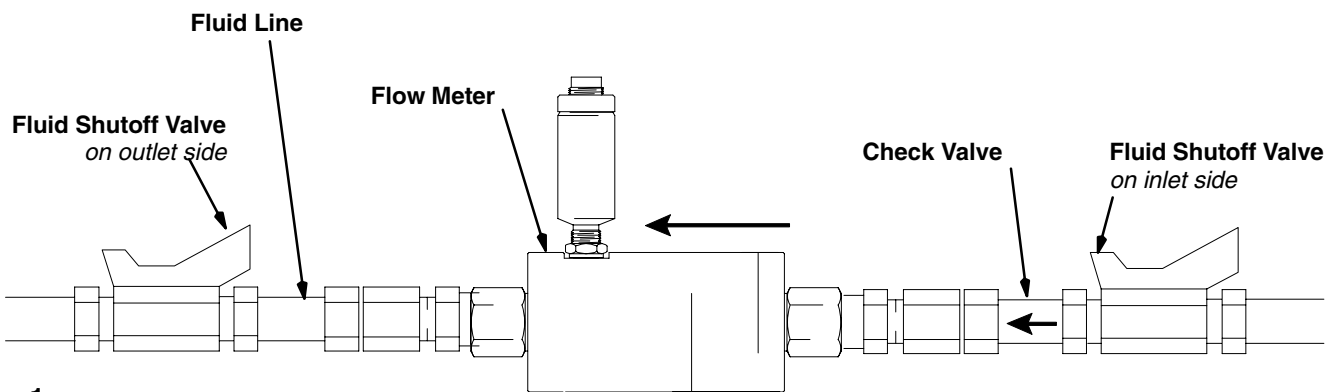



Fig. 1

TI1003

Installation

Grounding



! WARNING

FIRE, EXPLOSION, AND ELECTRIC SHOCK HAZARD

Proper electrical grounding of your system is essential. For your safety, read the warning section, **FIRE, EXPLOSION, OR ELECTRIC SHOCK HAZARD**, on page 3.

1. Ground the flow meter by connecting a grounded cable to the sensor.

Have a qualified electrician check the electrical grounding continuity between the flow meter sensor and a true earth ground; remove the cable connector from the sensor and measure the resistance from the cable connector Pin 3 to true earth ground. Refer to Fig. 2.

If the resistance is greater than 25 ohms, check the cable ground connection. Reconnect the ground sheath or replace the cable. Do not operate the system until the problem is corrected.

2. Always ground the fluid supply unit, using one of the following options:
 - a. Mount the meter to a grounded conductive surface, or
 - b. Connect the conductive fluid hose to the meter inlet and outlet.

Wire Diagram

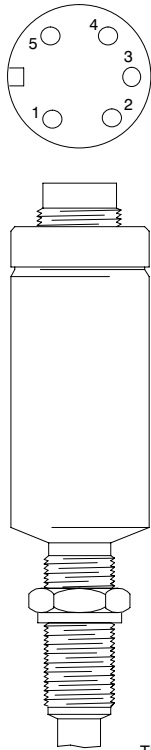


Fig. 2

Terminal Functions

- 1 +7 – 29 VDC Supply
- 2 Signal Out
- 3 Ground (0V)
- 4 Collector
- 5 Emitter

Wire Connections

Wire Color	Flow Meter Terminal
Red	1
White	2
Black	2

Operation

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.

1. Turn off the fluid supply to the meter.
2. Shut off all electrical power to the fluid system.
3. Follow the Pressure Relief Procedure for your fluid system dispensing device.

Flow Meter Function

This is a positive displacement, gear flow meter. The gear flow meter is highly accurate, even with low flow rates. The fluid flowing through the meter rotates the gears. The gear tooth is picked up by a sensor device, which produces an impulse for every gear tooth passing by.

Recommended Usage

WARNING

COMPONENT RUPTURE HAZARD

Do not exceed the maximum working pressure of your meter or any component or accessory in your system.

- See the **Technical Data** for fluid and ambient temperature limits.
- Only use the flow meter with fluids that are compatible with the “Wetted Parts” listed in the **Technical Data**.

Flow Volume Range

See TECHNICAL DATA on page 15 for flow volume range.

CAUTION

The flow meter gears and bearings can be damaged if they rotate at too high a speed. To avoid high speed rotation, open the fluid valve gradually. Do not over-speed the gear with air or solvent. To prolong meter life, Do not use the meter above its maximum flow rate.

Flow Meter Verification

The factory calibration factor (k factor) for the flow meter is stamped on an identification plate located on the flow meter. This calibration factor is the number of flow meter pulses per liter, as determined by a measurement with oil.

Most sealant and adhesive materials are compressible and, since the flow meter is measuring the material under high pressure, the actual volume of material may vary slightly from the measured volume due to this compressibility.

To adjust the flow meter k factor to reflect the uncompressed volume dispensed more accurately, perform the following steps:

1. Obtain a beaker, 500 cc or larger, and measure the mass of the empty beaker.
2. Manually dispense material into the beaker.
3. Record both the volume displayed and the current flow meter k factor.
4. Measure the mass of the full beaker.
5. Calculate the actual volume dispensed:

$$\frac{\text{fluid mass (g)}}{\text{density (g/cc)}} = \text{volume (cc)}$$

6. Calculate the new flow meter k factor:

$$\text{k factor} = \frac{\text{displayed volume (cc)} \times \text{k factor (old)}}{\text{measured volume (cc)}}$$

Troubleshooting

NOTE: The sensor is not a serviceable part. Replace it if it is malfunctioning.

Problem	Cause	Solution
No flow volume displayed at monitoring unit	Flow volume is too low to measure	Increase flow volume.
	Fluid is not flowing	See Problem: Fluid is not flowing, below.
	Damaged cable	Replace cable.
	Improper input voltage to sensor	Make sure input power is 7–29 Vdc.
	Damaged sensor	Replace sensor if it is malfunctioning.
Fluid is not flowing	Clogs in fluid line or in meter	Clean fluid line and/or meter; see Maintenance section.
	Gears worn or damaged	Service meter; see Maintenance section.

Notes

[illegible]

Maintenance

WARNING



FIRE AND EXPLOSION HAZARD

If the meter is not installed in an intrinsically safe installation, make sure the power is off or the electronic sensor is disconnected before wiping the outside of the meter clean with a cloth dampened in a compatible solvent or flushing the meter.

CAUTION

Do not immerse the meter in solvent with the electronic sensor installed. Solvent could damage the electrical components.

Air purge is not recommended for any gear-type flow meter. Air purges do not provide the lubrication the meter gears require.

Residue Build-up on the Meter Gears

Residue build-up may cause the meter gears to bind or stop rotating, which decreases the meter accuracy and makes meter recalibration necessary. As more build-up occurs, recalibration is required more often.

The frequency that your meter requires cleaning depends on the type of fluid being used. Excessive residue build-up usually means that you are using improper cleaning solvents and/or cleaning sequences or processes.

- Check the meter routinely to develop the correct cleaning schedule.
- Use the proper cleaning solvent for the fluid being metered.

Flushing the Meter

WARNING

INJECTION HAZARD

To reduce the risk of an injection injury or other serious injury, follow the **Pressure Relief Procedure** on page 8 whenever you are instructed to relieve pressure.

Flush the fluid supply line and meter fluid reservoir daily with a compatible solvent as instructed below.

1. Follow the **Pressure Relief Procedure**, on page 8.
2. Connect the fluid line to the solvent supply unit.
3. Flush the meter until it is clean.
4. Follow the **Pressure Relief Procedure**, then disconnect the fluid line from the solvent supply unit.
5. Reconnect the fluid line to the fluid supply.
6. Turn on the fluid supply.
7. Operate until the meter and fluid line are free of solvent.

CAUTION

It is not recommended that the meter be operated or flushed with water. Should this occur, residual water should be removed with alcohol and the internal components of the meter should be coated with a light film of oil. If the device is to remain inoperative for an extended period of time, internal components of the meter should be coated with a light film of oil.

Maintenance continued on next page.

Maintenance

Disassembly

WARNING

INJECTION HAZARD

To reduce the risk of an injection injury or other serious injury, follow the **Pressure Relief Procedure** on page 8 whenever you are instructed to relieve pressure.

WARNING



FIRE, EXPLOSION, AND ELECTRIC SHOCK HAZARD

Installing and servicing this equipment requires access to parts that may cause electric shock or other serious injury if the work is not performed properly. Do not install or service this equipment unless you are trained and qualified.

Use only genuine Graco replacement parts. Substitution of components may impair intrinsic safety. This could result in a failure which causes serious injury and/or substantial property damage.

NOTE: Clean and service the meter at a clean workbench. Use only lint-free cloth on parts.

1. Follow the **Pressure Relief Procedure**, on page 8. Then close the fluid shut-off valve on each side of the meter.
2. Remove the sensor (140) by releasing the locknut and removing the sensor from the flow meter housing.
3. Loosen the six bolts (20) at the sensor end (60) of the flow meter.
4. Remove four of the six bolts, keeping two opposite bolts engaged by several threads.

CAUTION

To avoid damaging the shafts (80 and 90), keep the housings parallel to each other when separating them; do not rock the housings from side to side. Do not use chisels or screwdrivers to split and pry apart the housings.

5. Hold the upper housing (60) at the sensor end and gently tap on the two bolts, alternately, to separate the lower housing (70).
6. Remove the last two bolts (20) and carefully separate the two sections completely.

7. Remove and inspect the helical gears (80 and 90), the sleeve bearing (120) and the sleeve (110) by lifting the gears straight out.
8. Check that the ball bearings (100) do not fall out.
9. Unscrew the housing bolts (10) and remove the inlet housing (50).

Inspection

1. Inspect the gears
2. Inspect the housing
3. Check the o-ring (30) condition, replace the o-ring if necessary

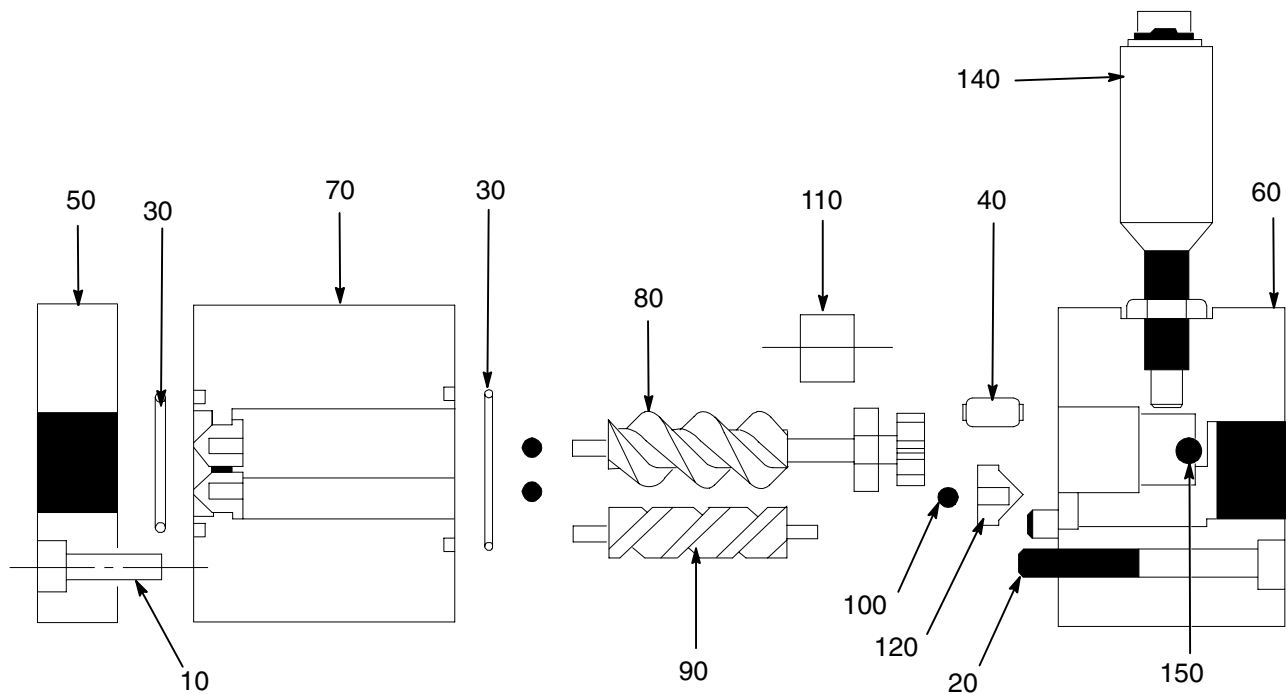
Assembly

1. With the lower housing (70) inlet side pointing up, check that the o-ring is seated snugly and screw the inlet housing (50) on hand tight. Make sure the two index marks on the housing line up.
2. Install the second o-ring (30) in its groove.
3. With the upper housing (60) facing up, insert the large helical gear (80), including the donut bearing into the opening with the tooth gear end going first.
4. Raise the gear until the spacer sleeve (110) can be placed into the same hole above the donut bearing.
5. Press the sleeve down until it sits flush in the housing.
6. Install sleeve bearing (120) into its hole, lifting the gear if necessary.
7. Insert the small helical gear (90) into the sleeve bearing, making sure that the two helical gears mesh with each other.
8. Line up the holes in the lower housing (70) with the gears, and carefully slide the housing over the gears.
9. Insert two opposing bolts (20) and alternately tighten each down until the two housing parts (60 and 70) are together.
10. Insert and tighten the remaining four bolts (20).

Parts

Model 617418, Fluid Flow Meter

Ref No.	Part No.	Description	Qty	Ref No.	Part No.	Description	Qty
10	*	BOLT, inlet housing	6	90	*	GEAR, small helical	1
20	*	BOLT, sensor housing	6	100	*	BEARING, ball	3
30	*	O-RING	2	110	*	SPACER, sleeve	1
40	*	PIN, locating	1	120	*	BEARING, sleeve	1
50	*	HOUSING, inlet	1	130	*	BEARING, sleeve	2
60	*	HOUSING, sensor	1	140	196840	SENSOR	1
70	*	HOUSING, gear	1	150	*	BEARING, ball	1
80	*	GEAR, large helical	1	* Not a replacement part. Order gear meter assembly.			



Accessories

Use Only Genuine Graco Parts and Accessories

Fluid Filter C58997

5000 psi (350 bar) Maximum Working Pressure
With stainless steel bowl and polyethylene support

30 Mesh Filter Screen 515222

Recommended for use with Fluid Filter C58997.

Filter Bank C59547

5000 psi (350 bar) Maximum Working Pressure

C58997 Filter with Mounting Bracket, Shutoff Valves,
and 30 Mesh Filter Screen

Fluid Shutoff Valve

5000 psi (350 bar) Maximum Working Pressure
For shutting off the fluid and isolating the flow meter for
service or replacement. See page NO TAG.

PART NO. DESCRIPTION

521477	1" npt(f)
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Electrical Cables

For connecting to sensor

P-Flo Cable 617707

60 ft (18.3 m) cable with terminal ends for connecting
to Sensor and Precision Flo Control Boxes.

Cable 196842

24 ft (7.3 m) cable with one end terminated for connec-
tion to the sensor and the other end is left bare for
connection to a junction box or special connector.

Sensor Conversion Kit 233026

Kit contains parts to convert Sensor from VTER to
VTER/P.

Sensor 196840

Replacement VTER/P Sensor

Technical Data

Mechanical Specifications

Flow Range

<i>Model I 617418</i>	0.1–11 gal/min (0.4–41.6 L/min)
<i>Model 233021</i>	0.1–4.0 gal/min (0.4–15.0 L/min)

Flow Meter Connector Size

<i>Model I 617418</i>	13,300 per Gallon (3,500 per Liter)
<i>Model 233021</i>	34,700 per Gallon (9,166 per Liter)

Maximum Operating Pressure

<i>Model I 617418</i>	6000 PSI (40.8 MPa, 408 Bar)
<i>Model 233021</i>	6000 PSI (40.8 MPa, 408 Bar)

Port Size

<i>Model I 617418</i>	3/4" NPT(f)
<i>Model 233021</i>	1/2" NPT(f)

Length

<i>Model I 617418</i>	6.1" (155 mm)
<i>Model 233021</i>	4.8" (124 mm)

Diameter

<i>Model I 617418</i>	3.4" (86.2 mm)
<i>Model 233021</i>	3.0" (76.2 mm)

Weight

<i>Model I 617418</i>	14.0 lbs. (6.35 kg)
<i>Model 233021</i>	9.0 lbs. (4.08 kg)

Operating Temperature Range, Fluid and Ambient

<i>Model I 617418</i>	0 to 150° F –20 to 80°C
<i>Model 233021</i>	0 to 150° F –20 to 80°C

Mechanical Specifications

Current Requirements

<i>Model I 617418</i>	<4mA
<i>Model 233021</i>	<4mA

Supply Voltage

<i>Model I 617418</i>	7 to 29 Volts
<i>Model 233021</i>	7 to 29 Volts

Output Signal

<i>Model I 617418</i>	20–2400 Hz
<i>Model 233021</i>	5–2400 Hz

Electrical Data

Voltage level NPN/PNP (three wire connection)
Active Output NPN
High Level: $V_{high} > V_{supply} - (I_{out} \bullet 1.3K\Omega)$
Low Level: $V_{low} > 0.6 V + (1.3K\Omega \bullet I_{out})$

Miscellaneous Specifications

Accuracy above 30cPs

<i>Model I 617418</i>	+/-0.25% of actual reading
<i>Model 233021</i>	+/-0.25% of actual reading

Repeatability

<i>Model I 617418</i>	+/-0.1%
<i>Model 233021</i>	+/-0.1%

Wetted Parts

<i>Model I 617418</i>	Stainless Steel, Teflon®
<i>Model 233021</i>	Stainless Steel, Teflon®

Teflon® is a registered trademark of the DuPont Company.

Related Publications

Product

Form#

Mastic Regulators
Volume Verification and Batch Control Meter
PrecisionFlo Control Module
PrecisionFlo Plus Controller

307517
308967
310531
310558

[illegible]

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 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 procédures concernées.

Graco Phone Number

TO PLACE AN ORDER, contact your Graco distributor, or call this number to identify the distributor closest to you:

1-800-367-4023 Toll Free

612-623-6921

612-378-3505 Fax

All information, illustrations and specifications in this document are based on the latest product information available at the time of publication. The right is reserved to make changes at any time without notice.

Sales Offices: Minneapolis, Detroit

International Offices: Belgium, Korea, Hong Kong, Japan

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www.graco.com

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