

Instructions



Piston Fluid Flow Meter 309148 Rev.B

3000 psi (21 MPa, 210 bar) Maximum Working Fluid Pressure

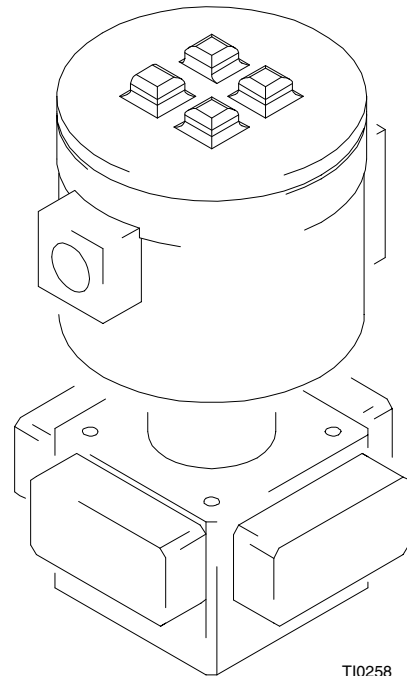
Part No. 116161

.01 to 2.6 gpm (40 to 10,000 cc/min.) Flow Range

**Intrinsically Safe for Hazardous Locations
(Class I; Division 1; Group D) when used
with an approved barrier only.**



Read warnings and instructions.



T10258

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Symbols

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



INJECTION HAZARD

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

- Fluid injected into the skin might look like just a cut, but it is a serious injury. **Get immediate medical attention.**
- Do not stop or deflect fluid leaks with your hand, body, glove, or rag.
- Follow the **Pressure Relief Procedure** on page 5 whenever you: are instructed to relieve pressure; stop operation; or clean, check, or service the equipment.
- Tighten all the fluid connections before operating the equipment.
- Check the hoses, tubes, and couplings daily. Replace worn, damaged, or loose parts immediately.



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 as instructed in **Grounding**, page 4.
- Never use the flow meter with an electrostatic gun isolation stand.
- Keep liquids away from the electronic sensor device.
- Follow the material supplier recommendations when flushing or servicing the meter.
- Do not service the electronic sensor. Return it to your Graco distributor for service.
- If there is any static sparking while using the equipment, **stop spraying immediately**. Identify and correct the problem.



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, 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 working pressure of the lowest rated system component. This equipment has a **3000 psi (21 MPa, 210 bar) maximum working pressure**.
- Use fluids or solvents that are compatible with the equipment wetted parts. See the **Technical Data** section of all the equipment manuals. Read the fluid and solvent manufacturer's warnings.
- Comply with all applicable local, state and national fire, electrical and other safety regulations.

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.
- Install a 200 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.
- The meter is intrinsically safe for Class I; Division 1; Group D hazardous indoor (NEMA 1) locations when installed with an intrinsically safe power device and wiring.

Refer to ANSI standards ISA-RP12.6, NEC Article 504 and the Canadian Electrical Code Appendix F.

- Do not use more than 200 ft. (61 m) of cable.

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, AND ELECTRIC SHOCK HAZARD**, on page 3.

1. Ground the flow meter by connecting a grounded cable to the sensor. Part No. 116005 Cable is available (must be ordered separately).

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 A to true earth ground. Refer to the Wiring Diagram on page 7.

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, or
 - c. Connect a ground wire to the meter's 1/4–20 unc mounting holes.
3. Never use the flow meter with an electrostatic gun isolation stand.

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.

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

The meter flow volume range is 0.01–2.6 gal./min. (40–10,000 cc/min.).

Checking the Meter Accuracy

1. To check the accuracy of the meter, turn your gun fan and atomizing air off, then trigger the fluid into a graduated cylinder; dispense at least 500 cc of fluid.
2. Measure the volume of fluid in the beaker in cubic-centimeters (cc) and read the volume on the flow meter monitor.

If the flow meter scale factor is not between 0.099–0.130 cc/pulse, recalibrate the flow meter.

Maintenance

CAUTION

The only serviceable parts in the meter are the o-rings. Order o-ring replacement kit 116004. Do not disassemble other parts of the meter.

Parts

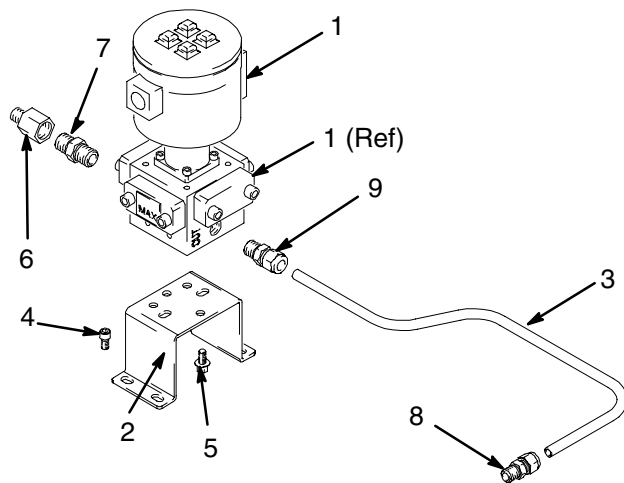
Use Only Genuine Graco Parts and Accessories

Part No. 243513

Piston Meter Kit, for solvent-borne materials (0.8–20 cps)

Ref. No.	Part No.	Description	Qty.
1*	116161	METER, piston; for solvent-borne materials only; includes replaceable items 1a–1d	1
1a*	115981	TRANSMITTER, sensor	1
1b*	116160	METER, piston type	1
1c*	196826	KIT, repair, o-ring; includes 4 PTFE end cap o-rings, 2 PTFE base o-rings, and 1 Viton transmitter o-ring.	1
1d*	116005	CABLE ASSEMBLY (not shown)	1
2	196071	BRACKET, mounting	2
3	196086	TUBE, fluid	1
4	551903	SCREW, cap, socket head	4
5	113161	SCREW	2
6	512351	ADAPTER, pipe increase	1
7*	501684	VALVE, check	1
8	513697	FITTING, adapter, 3/8 tube x 1/4	1
9	513832	FITTING, connector	1

* Keep these spare parts on hand to reduce down time.



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Technical Data

Category	Data
Maximum Working Fluid Pressure	3000 psi (21 MPa, 210 bar)
Flow Range	0.01–2.6 gal/min (40–10,000 cc/min)
Fluid Temperature Range	40–180° F (4–80° C)
Maximum Ambient Temperature	180° F (80° C)
Fluid Viscosity Range	0.3–20 cps
Maximum Cable Length	200 ft (61 m)
Flow Meter Inlet/Outlet	3/8 npt(f)
Resolution	≈ 0.105 cc/pulse
Accuracy	± 0.5 %*

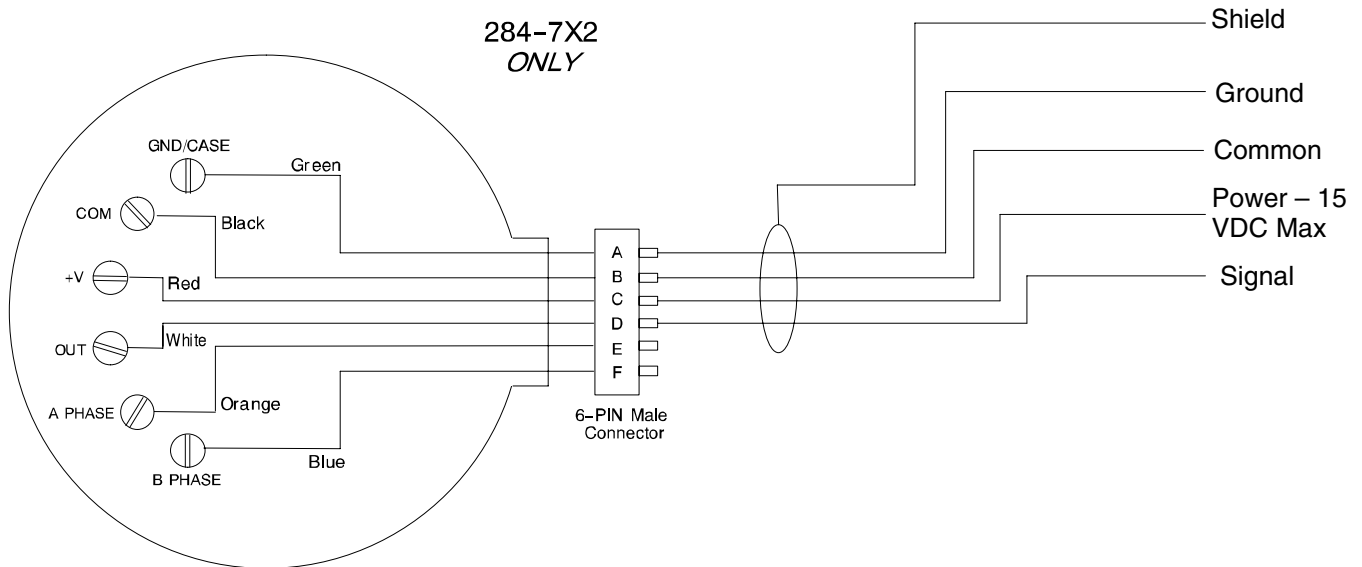
Category	Data
Supply Voltage	4.5–15 Vdc
Intrinsic Safety	Class 1; Div. 1; Group D V max. = 15 V I max. = 15 mA Ci = 0.2 μ f Li = 0mH
Approvals	See front cover
Wetted Parts	303 and 440C Stainless Steel, PTFE

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* For most commonly used coatings, the flow meter reading will be accurate to within $\pm 0.5\%$. Accuracy will diminish at low viscosities and low flow rates.

Wiring Diagram

INTRINSICALLY SAFE



TI0294

Fig. 1

Grace Standard Warranty

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

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

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

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

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

Graco makes no warranty, and disclaims all implied warranties of merchantability and fitness for a particular purpose in connection with accessories, equipment, materials or components sold but not manufactured by Graco. These items sold, but not manufactured by Graco (such as electric motors, switches, hose, etc.), are subject to the warranty, if any, of their manufacturer. Graco will provide purchaser with reasonable assistance in making any claim for breach of these warranties.

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

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Graco Information

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

1-800-367-4023 Toll Free

612-623-6921

612-378-3505 Fax

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

Sales Offices: Minneapolis, Detroit

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PRINTED IN USA 309148 03/2000, Revised 04/2003