

Coriolis Flow Meter

3A5295B

EN

For measuring fluid flow and temperature with PCF™ precision dispense systems in a non-hazardous location only. For professional use only.

Not approved for use in explosive atmospheres or hazardous locations.

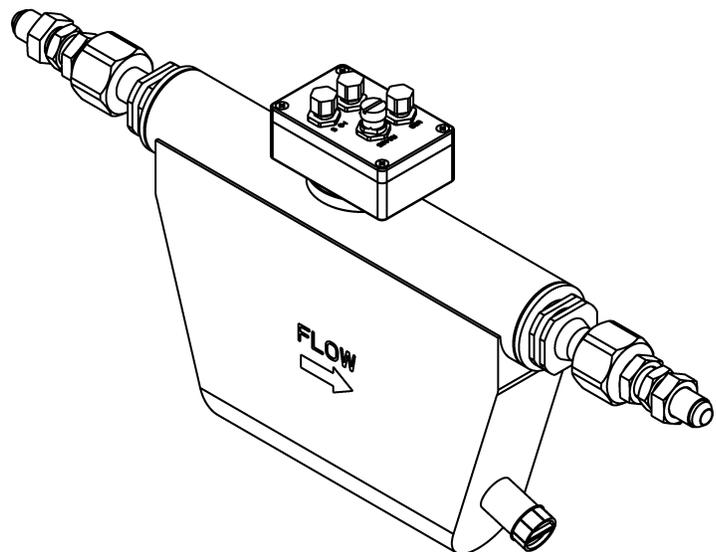
5000 psi (35 MPa, 345 bar) Maximum Fluid Working Pressure

See page 2 for model information, including
maximum working pressure and approvals.



Important Safety Instructions

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



Contents

Related Manuals	2	Operation	8
Warnings	3	Pressure Relief Procedure	8
Installation	5	Recommended Usage	8
Overview	5	Flow Volume Range	8
Installation Requirements	5	Flow Meter Calibration	8
Mounting	6	Maintenance	9
Fluid Line Connection	7	Flushing the Meter	9
Grounding	7	Troubleshooting	10
Sensor Connector Pin-out	7	Parts	11
		Kits and Accessories	12
		Technical Specifications	13
		Graco Standard Warranty	16
		Graco Information	16

Models

Part No.	For Use With	Maximum Working Pressure psi (MPa, bar)	Description
25D026	PCF	5000 psi (35 MPa, 345 bar)	TRICOR® TCM 5500

Related Manuals

Manuals	
Part	Description
3A2098	PCF with PrecisionSwirl™ Instructions-Parts Manual
313377	PCF Instructions-Parts Manual
TCM_E80_M_EN_160520_E006	TRICOR Coriolis Mass Flow Meters Instruction Manual

Warnings

The following warnings are for the setup, use, grounding, maintenance, and repair of this equipment. The exclamation point symbol alerts you to a general warning and the hazard symbols refer to procedure-specific risks. When these symbols appear in the body of this manual or on warning labels, refer back to these Warnings. Product-specific hazard symbols and warnings not covered in this section may appear throughout the body of this manual where applicable.

 <h1 style="margin: 0;">WARNING</h1>	
 	<p>EQUIPMENT MISUSE HAZARD</p> <p>Misuse can cause death or serious injury.</p> <ul style="list-style-type: none"> • Do not operate the unit when fatigued or under the influence of drugs or alcohol. • Do not exceed the maximum working pressure or temperature rating of the lowest rated system component. See Technical Specifications in all equipment manuals. • Use fluids and solvents that are compatible with equipment wetted parts. See Technical Specifications in all equipment manuals. Read fluid and solvent manufacturer's warnings. For complete information about your material, request Safety Data Sheets (SDSs) from distributor or retailer. • Turn off all equipment and follow the Pressure Relief Procedure when equipment is not in use. • Check equipment daily. Repair or replace worn or damaged parts immediately with genuine manufacturer's replacement parts only. • Do not alter or modify equipment. Alterations or modifications may void agency approvals and create safety hazards. • Make sure all equipment is rated and approved for the environment in which you are using it. • Use equipment only for its intended purpose. Call you distributor for information. • Route hoses and cables away from traffic areas, sharp edges, moving parts, and hot surfaces. • Do not kink or over bend hoses or use hoses to pull equipment. • Keep children and animals away from work area. • Comply with all applicable safety regulations.
   	<p>FIRE AND EXPLOSION HAZARD</p> <p>Flammable fumes, such as solvent and paint fumes, in work area can ignite or explode. Paint or solvent flowing through the equipment can cause static sparking. To help prevent fire and explosion:</p> <ul style="list-style-type: none"> • Use equipment only in well-ventilated area. • Eliminate all ignition sources; such as pilot lights, cigarettes, portable electric lamps, and plastic drop cloths (potential static sparking). • Ground all equipment in the work area. See Grounding instructions. • Never spray or flush solvent at high pressure. • Keep work area free of debris, including solvent, rags and gasoline. • Do not plug or unplug power cords, or turn power or light switches on or off when flammable fumes are present. • Use only grounded hoses. • Hold gun firmly to side of grounded pail when triggering into pail. Do not use pail liners unless they are anti-static or conductive. • Stop operation immediately if static sparking occurs or you feel a shock. Do not use equipment until you identify and correct the problem. • Keep a working fire extinguisher in the work area.



WARNING

**SKIN INJECTION HAZARD**

High-pressure fluid from dispensing device, hose leaks, or ruptured components will pierce skin. This may look like just a cut, but it is a serious injury that can result in amputation. Get immediate surgical treatment.



- Engage trigger lock when not dispensing.
- Do not point dispensing device at anyone or at any part of the body.
- Do not put your hand over the fluid outlet.
- Do not stop or deflect leaks with your hand, body, glove, or rag.
- Follow the **Pressure Relief Procedure** when you stop dispensing and before cleaning, checking, or servicing equipment.
- Tighten all fluid connections before operating the equipment.
- Check hoses and couplings daily. Replace worn or damaged parts immediately.

**TOXIC FLUID OR FUMES HAZARD**

Toxic fluids or fumes can cause serious injury or death if splashed in the eyes or on skin, inhaled, or swallowed.

- Read Safety Data Sheets (SDSs) to know the specific hazards of the fluids you are using.
- Store hazardous fluid in approved containers, and dispose of it according to applicable guidelines.

**BURN HAZARD**

Equipment surfaces and fluid that is heated can become very hot during operation. To avoid severe burns:

- Do not touch hot fluid or equipment.

**PERSONAL PROTECTIVE EQUIPMENT**

Wear appropriate protective equipment when in the work area to help prevent serious injury, including eye injury, hearing loss, inhalation of toxic fumes, and burns. Protective equipment includes but is not limited to:

- Protective eyewear, and hearing protection.
- Respirators, protective clothing, and gloves as recommended by the fluid and solvent manufacturer.

Installation

Overview

The TRICOR® TCM 5500 flow meter provides a configurable and highly accurate means of measuring fluid flow. The meter uses the Coriolis principle to measure mass flow and fluid density, and also measures fluid temperature using an integrated temperature sensor.

This manual provides information for using the TRICOR flow meter with the Graco PCF precision dispense systems in non-IS systems. See manual TCM_E80_M_EN_160520_E006 provided by TRICOR for further meter instructions.

Installation Requirements

Fluid Supply

NOTICE

To prevent damaging electrical components, keep liquids away from the meter sensor.

1. Avoid having solids enter the flow meter. Thoroughly flush fluid supply lines before installing the meter.
2. Do not allow sealing tape to overlap inside pipe connections.
3. Use an adequately sized fluid line with a minimal number of restrictions (valves or bends) to avoid turbulence and cavitation.

Location

NOTICE

To prevent the buildup of static electricity, never use the flow meter with an electrostatic gun isolation stand.

The meter measures the flow at the location it is installed, so install the flow meter as close as possible to the fluid regulator.

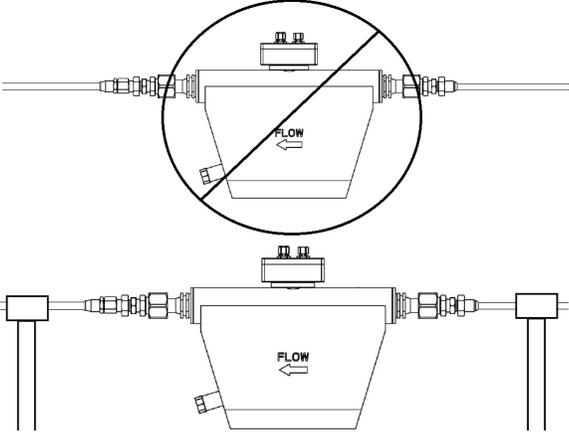
The meter must be located within 20 ft. (6.1 m) of the fluid plate. The Graco-provided meter signal cable assembly (4) must be used. No substitution is allowed.

Mounting

NOTE: A Coriolis flow meter only comes with PFxCxx assemblies.

NOTICE

See **Technical Specifications** on page 13 for the weight of your meter. The meter is heavy and must be properly supported to avoid stress on the fluid connections.



Fluid Flow Upward

Mounting so fluid flow is upward allows solids to settle out and air to rise away from the metering tube. See FIG. 1.

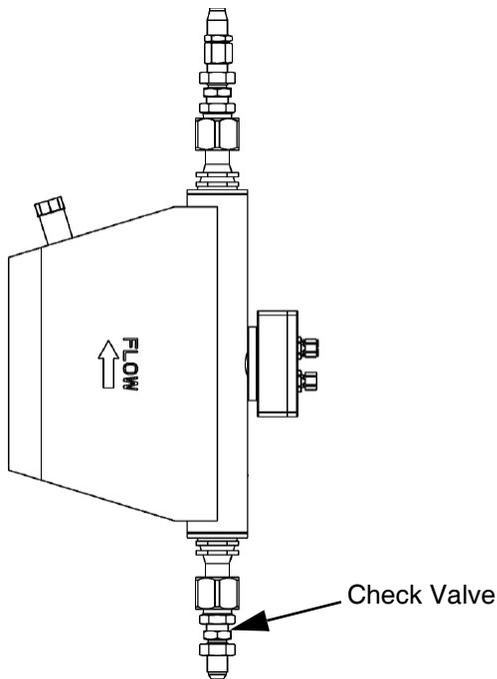


FIG. 1: Fluid Flow Upward

Horizontal Installation

The horizontal installation is the recommended installation.

If the medium might contain solid particles, mount the meter as shown in position A, and in all other cases mount as shown in position B.

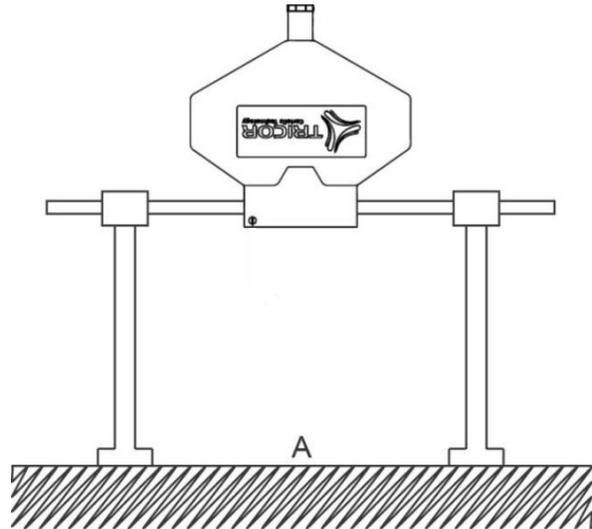


FIG. 2:

Fluid Line Connection

				
<p>Check hoses, tubes, and couplings daily. Tighten connections before operating. Replace worn or damaged parts immediately.</p>				

Connect the fluid supply line to the meter inlet.

Connect the 5 ft (1.52 m) fluid hose from the meter outlet to the appropriate component A or B dispense valve.

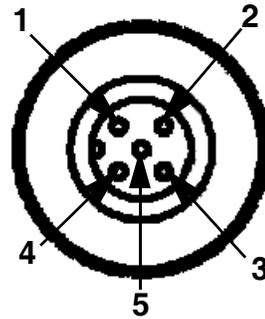
Grounding

				
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Always ground the fluid supply unit using one of the following options:

- a. Mount the meter to a grounded conductive surface.
- b. Connect the conductive fluid hose to the meter inlet and outlet.

Sensor Connector Pin-out



Pin 1: +10-30 Vdc Supply
 Pin 2: Signal Out
 Pin 3: Ground
 Pin 4: No Connection
 Pin 5: No Connection

NOTE: This drawing shows the pin connector used on the meter 25D026.

FIG. 3:

Operation

Pressure Relief Procedure



Follow the Pressure Relief Procedure whenever you see this symbol.



This equipment stays pressurized until pressure is manually relieved. To help prevent serious injury from pressurized fluid, such as skin injection, follow the Pressure Relief Procedure when you stop spraying and before cleaning, checking, or servicing the 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 PCF dispense system.

Recommended Usage

See **Technical Specifications** on page 13 for fluid and ambient temperature limits.

Only use the flow meter with fluids that are compatible with the “Wetted Parts” listed in the **Technical Specifications**.

Flow Volume Range

See **Technical Specifications** on page 13 for flow volume range.

Flow Meter Calibration

The factory calibration factor (k factor) for the flow meter is stated in the **Technical Specifications** section on page 13. 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 (pulses per liter).
4. Measure the mass of the full beaker.
5. Subtract the weight of the empty beaker to determine the fluid mass.
6. Calculate the actual volume dispensed:

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

7. Calculate the new flow meter k factor:

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

8. Repeat steps 1-7 to validate the k factor.

Maintenance

NOTE: Do not service the Coriolis meter or sensor. Return it to your Graco distributor for service.

Flushing the Meter



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

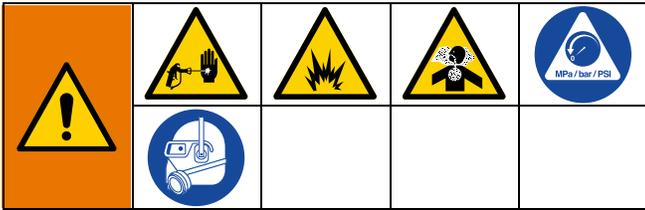
1. Follow the **Pressure Relief Procedure**, on page 8.
2. Connect the fluid line to the solvent supply unit.
3. Flush the meter until it is clean.
4. Follow the **Pressure Relief Procedure**, and then disconnect the fluid line from the solvent supply unit.

To operate the meter after performing the flushing procedure:

1. Reconnect the fluid line to the fluid supply.
2. Turn on the fluid supply.
3. Operate until the meter and fluid line are free of solvent.

NOTE: 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.

Troubleshooting



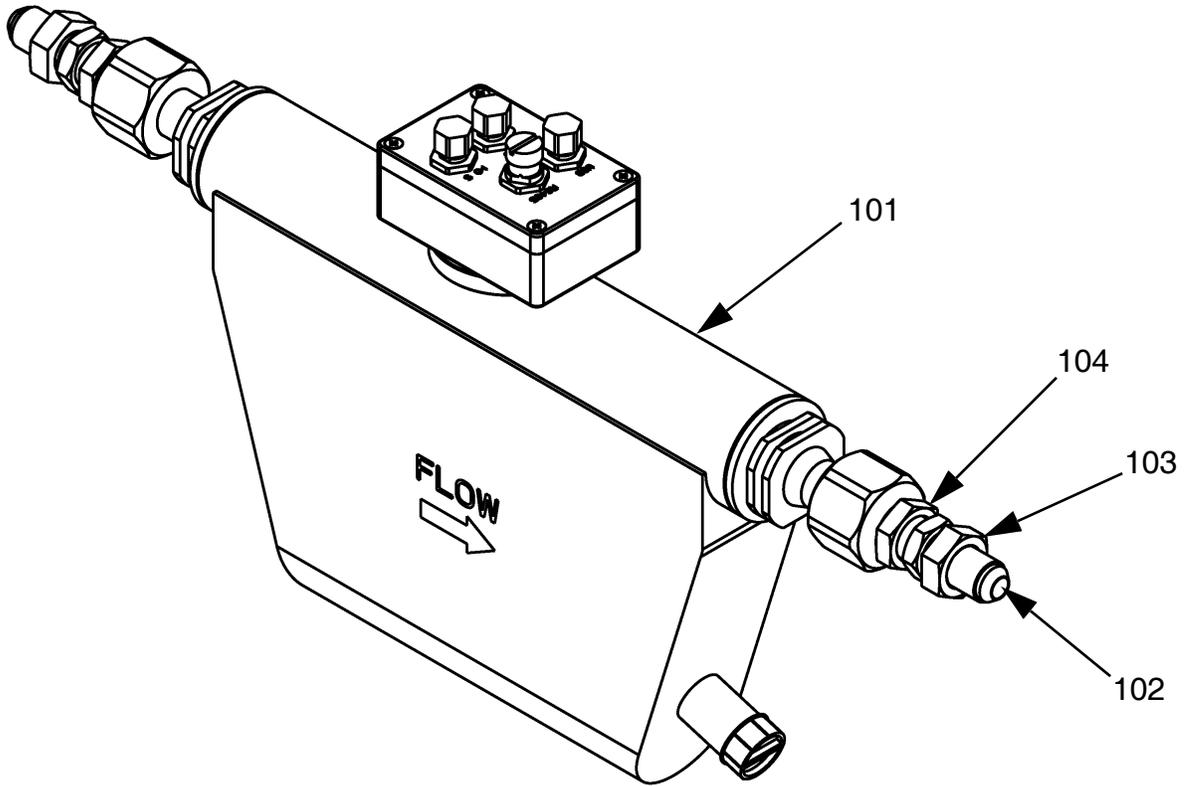
1. Follow **Pressure Relief Procedure**, page 8, before checking or repairing flow meter.
2. Check all possible problems and causes before dis-assembling flow meter.

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 the cable.
	Improper input voltage to sensor	Make sure the input power is 10-30 Vdc.
Fluid is not flowing.	Clogs in fluid line or in meter	Clean the fluid line and/or meter; see Flushing the Meter on page 9.

Parts

25D026 Coriolis Flow Meter Assembly

(Meter approved for use on PCF Platform)



Part No./Description

Ref.	Part	Description	Qty.
101	129548	METER, TCM5500 BULKHEAD: 1/2 npt(m) x 08	1
103	17T273	jic(m)	2
103	100071	NUT, HEX	2
104	502033	BUSHING, PIPE	2

Kits and Accessories

Use Only Genuine Graco Parts and Accessories

25D083 Replacement Electrical Cable

For connecting the sensor to the fluid plate.

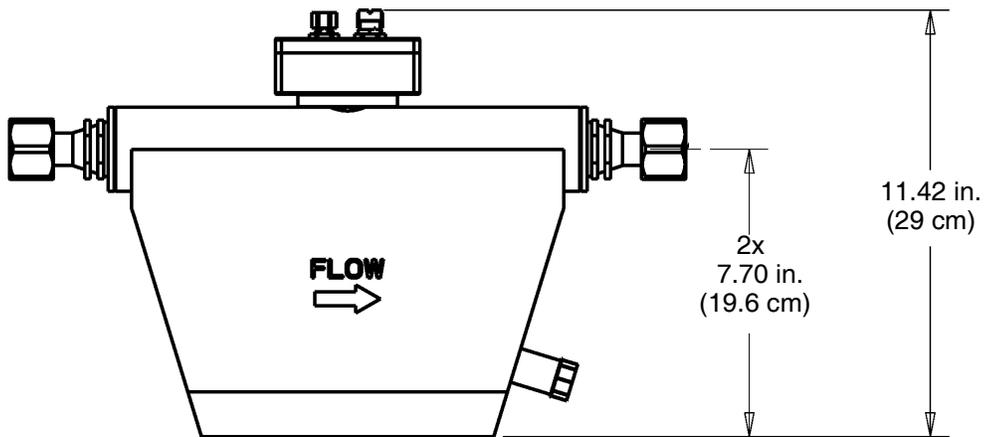
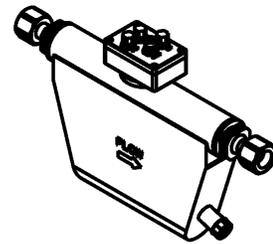
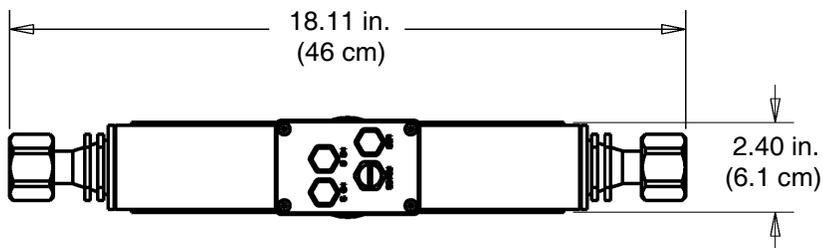
17T319 Fixed Mounting Bracket

For mounting the flow meter.

17T320 Sliding Bracket Option

For mounting the flow meter.

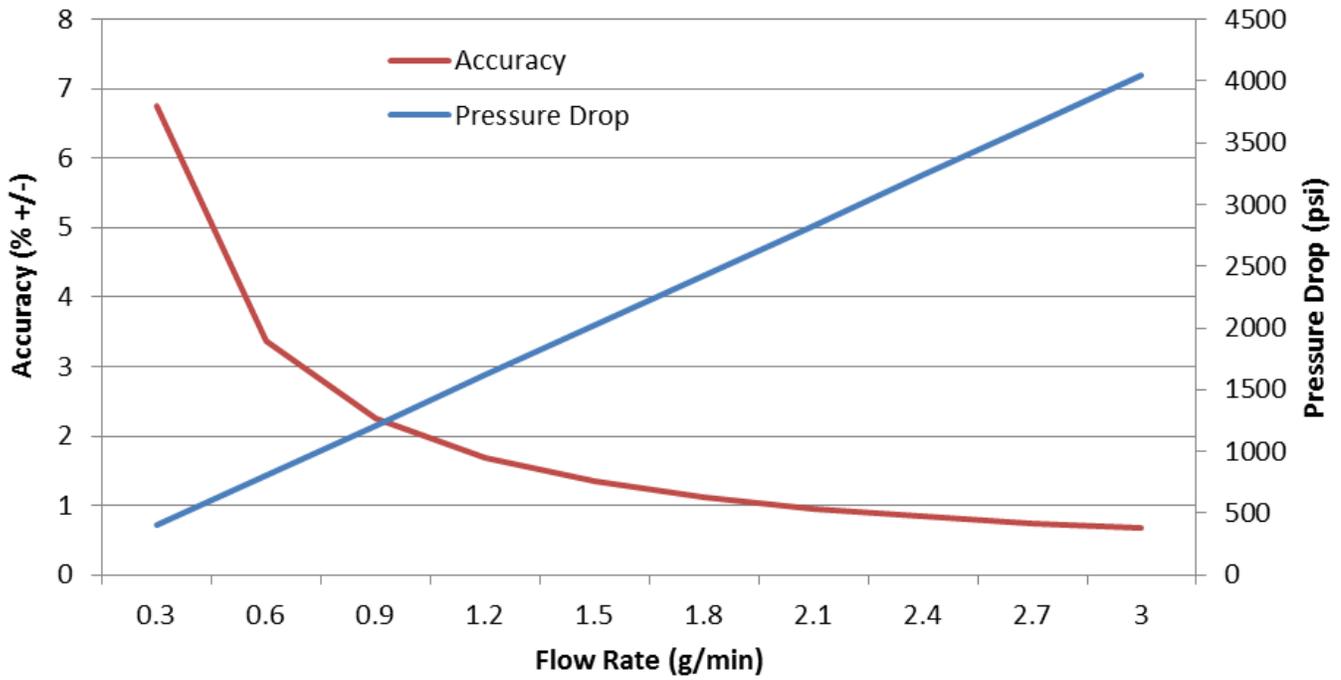
Dimensions



Technical Specifications

Coriolis Flow Meter		
	US	Metric
Maximum fluid working pressure	5000 psi	34.5 MPa, 345 bar
Fluid Viscosity Range	30 - 1,000,000 cps	
Maximum Cable Length	200 ft	60 m
Flow Meter Inlet/Outlet	08 JIC (m)	
Accuracy	+/- 0.25%*	
Repeatability	+/- 0.1%	
Supply Voltage	10 - 30 Vdc	
Typical Current	15mA	
Approvals	CE: 25D026	
Wetted Parts	316 Stainless Steel, 440 SST, PTFE	
Weight	20 lb.	9 kg
Flow Range	0.17 to 17.31 gpm	661 to 65,535 cc/min
Maximum Operating Temperature	120° F	50° C
Maximum Ambient Temperature	140° F	60° C
Calibration Factor (K-Factor)	0.143 cc/pulse	7000 pulses/liter
Notes		
* For most commonly used coatings, the flow meter reading will be accurate to within +/- 0.25%. Accuracy will diminish at low viscosities and low flow rates.		

Pressure Drop vs. Flow Rate in 300000 cP LASD Material



Graco Standard Warranty

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

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

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

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

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

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

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

FOR GRACO CANADA CUSTOMERS

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Graco Information

Sealant and Adhesive Dispensing Equipment

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

For patent information, see www.graco.com/patents.

TO PLACE AN ORDER, contact your Graco distributor, go to www.graco.com and select "Where to Buy" in the top blue bar, or call to find the nearest distributor.

If calling from the US: 800-746-1334

If calling from outside the US: 0-1-330-966-3000

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 3A5295

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Revision B, December 2017