



# IM5™ Inline Electronic Meter

308687K

EN

*For use with petroleum-based and synthetic oil, antifreeze, and windshield washer fluid only.*

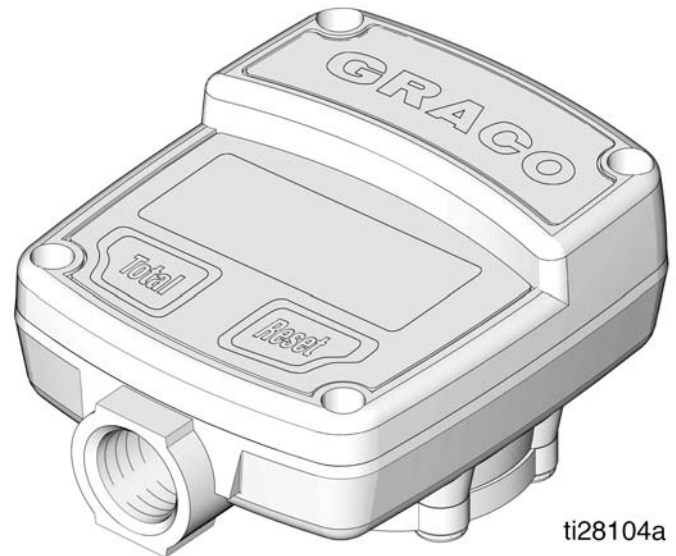
## Model: 239824

500 psi (3.4 MPa, 34 bar) Maximum Working Pressure  
5 gpm (19 lpm) Maximum Flow Rate



### Important Safety Instructions

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



ti28104a

INTRINSICALLY SAFE APPARATUS AND  
ASSOCIATED APPARATUS FOR USE IN CLASS  
1, DIVISION 2, GROUP, C, D, T6










Intertek

3172585

Certified to CAN/CSA C22.2 No. 157

# 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><b>SKIN INJECTION HAZARD</b></p> <p>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. <b>Get immediate surgical treatment.</b></p> <ul style="list-style-type: none"> <li>• Do not point dispensing device at anyone or at any part of the body.</li> <li>• Do not put your hand over the fluid outlet.</li> <li>• Do not stop or deflect leaks with your hand, body, glove, or rag.</li> <li>• Follow the <b>Pressure Relief Procedure</b> when you stop dispensing and before cleaning, checking, or servicing equipment.</li> <li>• Tighten all fluid connections before operating the equipment.</li> <li>• Check hoses and couplings daily. Replace worn or damaged parts immediately.</li> </ul>   |
|     | <p><b>FIRE AND EXPLOSION HAZARD</b></p> <p>When flammable fluids are present in the work area, such as gasoline and windshield wiper fluid, be aware that flammable fumes can ignite or explode. To help prevent fire and explosion:</p> <ul style="list-style-type: none"> <li>• Use equipment only in well ventilated area.</li> <li>• Eliminate all ignition sources, such as cigarettes and portable electric lamps.</li> <li>• Ground all equipment in the work area.</li> <li>• Keep work area free of debris, including rags and spilled or open containers of solvent and gasoline.</li> <li>• Do not plug or unplug power cords or turn lights on or off when flammable fumes are present.</li> <li>• Use only grounded hoses.</li> <li>• <b>Stop operation immediately</b> if static sparking occurs or you feel a shock. Do not use equipment until you identify and correct the problem.</li> <li>• Keep a working fire extinguisher in the work area.</li> </ul> |
|    | <p><b>PRESSURIZED EQUIPMENT HAZARD</b></p> <p>Over-pressurization can result in equipment rupture and serious injury.</p> <ul style="list-style-type: none"> <li>• Do not exceed the maximum air input pressure.</li> <li>• Fill slowly to avoid over pressurizing reservoir.</li> <li>• Use tubing, hoses and other components with pressure ratings equal to or higher than the pump rating.</li> </ul>   |



# WARNING



## EQUIPMENT MISUSE HAZARD

Misuse can cause death or serious injury.

- 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 Data** in all equipment manuals.
- Use fluids and solvents that are compatible with equipment wetted parts. See Technical Data in all equipment manuals. Read fluid and solvent manufacturer's warnings. For complete information about your material, request SDS 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 your 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.





## 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. This 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

The meters must be installed in-line as part of a dispense system as shown in Fig. 1. The typical installation shown is only a guide for selecting and installing an in-line meter; it is not an actual system design. Contact your Graco distributor for assistance in designing a system to suit your needs.

|  |   |  |  |  |
|--|---|--|--|--|
|   |  |  |  |  |
| <p>All electrical wiring must be done by a qualified electrician and comply with all local codes and regulations.</p> <p>Do not use the IM5 In-line Electronic Meter in systems where the operating pressure exceeds the maximum pressure of the meter or any other component in the system.</p> |   |  |  |  |

| NOTICE  |
|---|
| <p>Do not use PTFE tape on threaded connections to the meter. Such use could contribute to over-tightening of the parts and cause the meter housing to crack. Standard pipe thread compound is recommended.</p> |

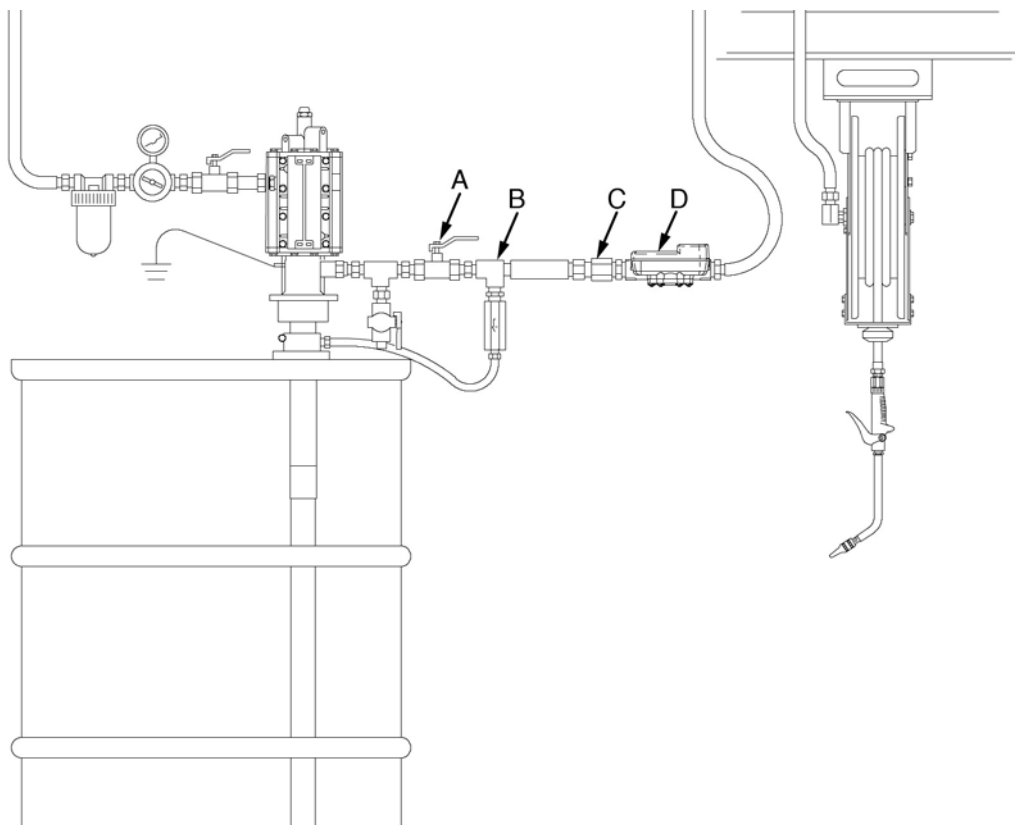


FIG. 1

**Key:**

- A Shut-off valve
- B Thermal relief valve (required; Part No. 235998) Install downstream from the pump
- C In-line filter
- D In-line electronic meter

## Grounding



The equipment must be grounded to reduce the risk of static sparking. Static sparking can cause fumes to ignite or explode. Grounding provides an escape wire for the electric current.

**Pump:** follow the manufacturer's recommendations.

**Air and fluid hoses:** use only grounded hoses.

**Air compressor:** follow manufacturer's recommendations.

**Fluid supply container:** follow local code.

**To maintain grounding continuity when flushing or relieving pressure:** hold metal part of the dispense valve firmly to the side of a grounded metal pail, then trigger the valve.

## Factory Settings

The meter is factory calibrated for 10W-30 oil, and the default unit of measurement is quarts. For other fluids and different units of measurement, see Changing the Measurement Units and Calibration Factor on page 8.

# Operation

## Sleep Mode

The meter automatically shuts down the display after one minute of non-use.

## Activation Mode

There are two ways to activate the display:

- Press any button on the keypad to wake up the digital display. The amount displayed is the value stored when the meter went into sleep mode.
- Dispense fluid through the meter to wake up the digital display. Dispensing fluid through the meter causes the meter to count up from the last displayed value. See Fig. 2.

## Function of TOTAL

Press and hold the **TOTAL** key to see the accumulated total of fluid dispensed through the meter.

The accumulated total is shown in gallons when the unit of measurement is set in gallons, quarts, or pints. The accumulated total is shown in liters when the measurement is set in liters. The meter accumulates a running total of up to 99,999 gallons (or liters) dispensed before returning to zero. See Fig. 3.

## Function of RESET

Press and hold the **RESET** key to clear the digital display after each dispense cycle.

**NOTE:** Always press the **RESET** key to clear the digital display before each new dispense cycle.

## For Maximum Dispensing Accuracy

Set the meter to dispense in pints or quarts when dispensing 1 gallon (3.8 liters) or less.

## Measurement Units

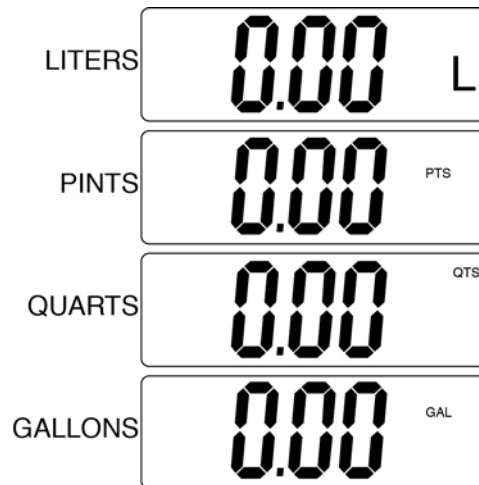
Fig. 4 shows the various measurement units as they appear on the display.



**FIG. 2: Example of Total for Last Dispense Cycle**



**FIG. 3: Example of Accumulated Total**



**FIG. 4: Example of Measurement Units**

## Changing the Measurement Units and Calibration Factor

**NOTE:** A one liter Weights and Measures approved container is required for calibration.

This meter is factory calibrated to dispense 10W-30 motor oil at 70\_ F (21\_ C) at 2.0 gpm (7.6 lpm) and is acceptably accurate for most common fluids over a typical temperature range. If you will use the meter to dispense antifreeze or other approved fluids, you may have to recalibrate it for greater accuracy.

1. Press and hold both the **TOTAL** and **RESET** buttons for four seconds.

The numbers on the display turn off, and the **L** (for liters) and **CAL** (for calibration) icons turn on.

2. Set the units of measurement by repeatedly pressing the **RESET** button until the correct unit of measurement is displayed. See the list below:

GAL = gallons  
 QTS = quarts  
 PTS = pints  
 L = liters

3. Press the **TOTAL** button to go to the CALIBRATION menu.

**NOTE:** If you do not want to change the calibration factor, press the **TOTAL** button again to use the existing calibration factor and to resume normal operation. **To change the calibration factor**, do steps 4 and 5.

4. Dispense exactly one liter of fluid into a calibrated 1-liter container. For proper calibration, you must dispense exactly 1 liter according to the markings on the container.

**NOTE:** If you dispense more than 1 liter, press the **TOTAL** button to exit the CALIBRATION menu. Pressing the **TOTAL** button at this point does not save the new calibration factor. You must complete steps 1 to 5 change the calibration factor.

5. Press the **RESET** button to store the new calibration factor and resume normal operation.




**NOTE:** The number on the display is the calibration factor number. It must be in the range of 311 to 466. The following table lists approximate calibration fac-

tors for different fluids. Your calibration number may vary slightly due to temperature or flow rate.


| Fluid                        | Calibration Number |
|------------------------------|--------------------|
| oil (10W-30)                 | 389                |
| gear lube                    | 389                |
| automatic transmission fluid | 389                |
| antifreeze                   | 367                |
| windshield washer solvent    | 341                |

*Calibration factors at 70°F (21°C) at 2.0 gpm (7.6 lpm)*


# Service

|   |   |   |  |  |
|---|---|---|--|--|
|    |  |  |  |  |
| <p>Only replace the battery in a non-hazardous location, away from flammable fluids or fumes.</p> <p>You must use one of the following battery types:</p> <ul style="list-style-type: none"> <li>• Duracell® MN1604, PC1604</li> <li>• Eveready® EN22, 522</li> </ul> <p>Use of any batteries other than those specified could affect the intrinsic safety of this unit.</p> <p>To reduce the risk of a fire, explosion, and serious burns to the body, handle and dispose of a used battery properly.</p> <p>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.</p> |   |   |  |  |

| NOTICE  |  |  |  |  |
|---|--|--|--|--|
| <p>To avoid damaging the electronic components of the control:</p> <ul style="list-style-type: none"> <li>• Do not remove the black cover over the electronic area when you replace the battery. There are no user-replaceable components under this cover.</li> <li>• Do not lay anything on the electronics.</li> <li>• Do not twist or force parts. Align parts properly as instructed.</li> </ul> |  |  |  |  |

|   |  |  |  |  |
|---|--|--|--|--|
|    |  |  |  |  |
| <p>To avoid malfunction or high-pressure fluid spray, do not remove the meal cover of the metering unit. There are no user-serviceable part inside.</p> |  |  |  |  |

## Pressure Relief Procedure

 Follow the Pressure Relief Procedure whenever you see this symbol.

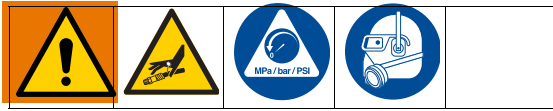
|  |  |   |   |   |
|--|--|---|---|---|
|   |  |  |  |  |
|  |  |   |   |   |
| <p>This equipment stays pressurized until pressure is manually relieved. To help prevent serious injury from pressurized fluid, such as skin injection, splashing fluid and moving parts, follow the Pressure Relief Procedure when you stop dispensing and before cleaning, checking, or servicing the equipment.</p> |  |   |   |   |

1. Turn off power supply to the pump.
2. Trigger the dispense 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 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 correctly.



## Battery Replacement Procedure (FIG. 5)



1. **Relieve Pressure**, (see procedure in previous section).

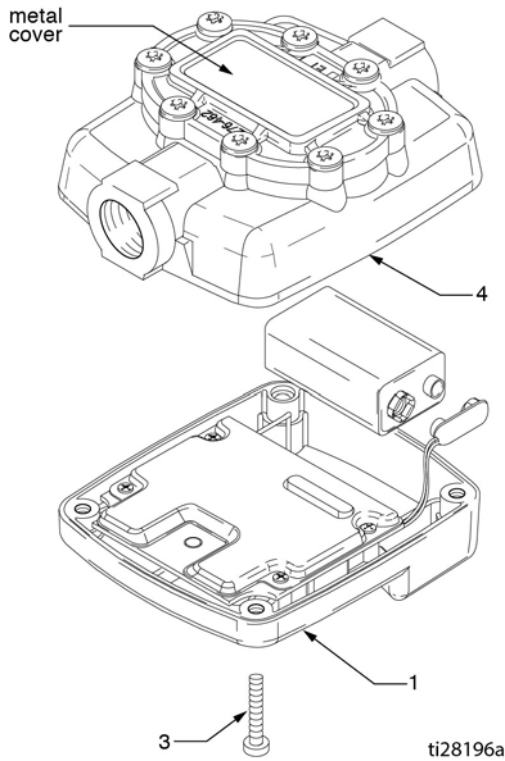


FIG. 5

2. Remove the four screws (3) holding the electronic control (1) and metering unit (4) together.
3. Remove the battery.
4. Install the new battery.

**NOTE:** See Technical Data, page X for recommended batteries.

### NOTICE

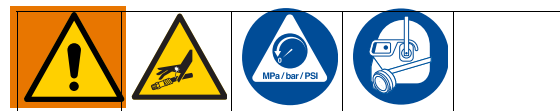
To avoid pinching the battery wires, install the battery as shown in FIG. 5. The battery wire should extend to the far side of the battery compartment.

5. Install the electronic control to the metering unit (4), aligning the longer screws boss on the meter housing with the counter bore in the plastic housing.
6. Install the four screws (3) holding the electronic control (1) to the metering unit (4) together. Torque the screws to 15-20 in-lb (1.7 to 2.3 N•m) or until no gap exists between the electronic control and the metering unit.

### NOTICE

Closing the gap between the electronic control and the metering unit is very important; it ensures that no moisture can enter the electronics.

## Electronic Control Replacement Procedure (FIG. 6)



1. **Relieve Pressure**, (see procedure in previous section).

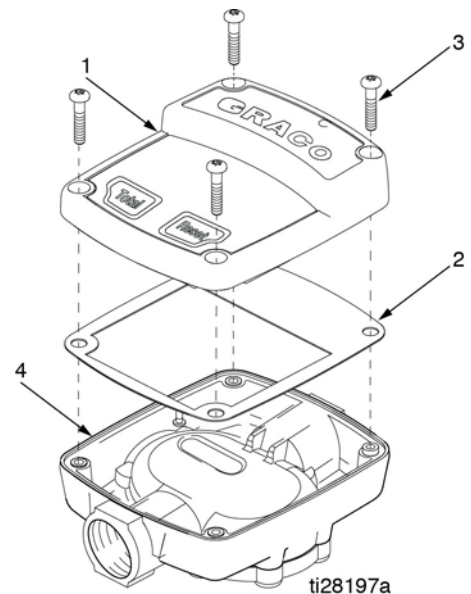


FIG. 6

2. Remove the four screws (3) holding the electronic control (1) and metering unit (4) together.
3. Remove the battery. (See Battery Replacement Procedure in the previous section).

4. Remove all gasket material from the metering unit (4).
5. Assemble adhesive side of new gasket (2) to metering unit (4).
6. Replace battery (see Battery Replacement Procedure, page 9).

**NOTICE**

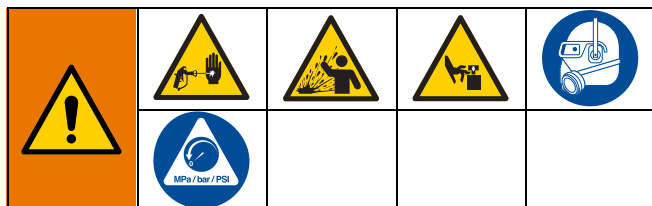
To avoid pinching the battery wires, install the battery as shown in FIG. 5. The battery wire should extend to the far side of the battery compartment.

7. Install the electronic control to the metering unit (4), aligning the longer screws boss on the meter housing with the counter bore in the plastic housing.
8. Install the four screws (3) holding the electronic control (1) to the metering unit (4) together. Torque the screws to 15-20 in-lb (1.7 to 2.3 N•m) or until no gap exists between the electronic control and the metering unit.

**NOTICE**

Closing the gap between the electronic control and the metering unit is very important; it ensures that no moisture can enter the electronics.

# Troubleshooting



| Problem                              | Cause                                | Solution  |
|--------------------------------------|--------------------------------------|---|
| Battery icon is shown on the display | Battery is low                       | Replace the battery. See <b>Battery Replacement Procedure</b> , page 9 and <b>Technical Data</b> , page 13 for recommended battery. |
| Digital display does not activate    | Battery is low                       | Replace the battery. See <b>Battery Replacement Procedure</b> , page 9 and <b>Technical Data</b> , page 13 for recommended battery. |
|                                      | Electronic control is malfunctioning | Replace electronic control. See <b>Electronic Control Replacement Procedure</b> , page 9.   |
| There is no fluid flow               | Metering unit is malfunctioning      | Replace the meter.  |
|                                      | Strainer (if used) is clogged        | Remove and clean or replace strainer using Strainer Kit 239876. See <b>Accessories</b> , page 12.                                   |
|                                      | Pump is not turned on.               | Turn on pump.   |

# Parts

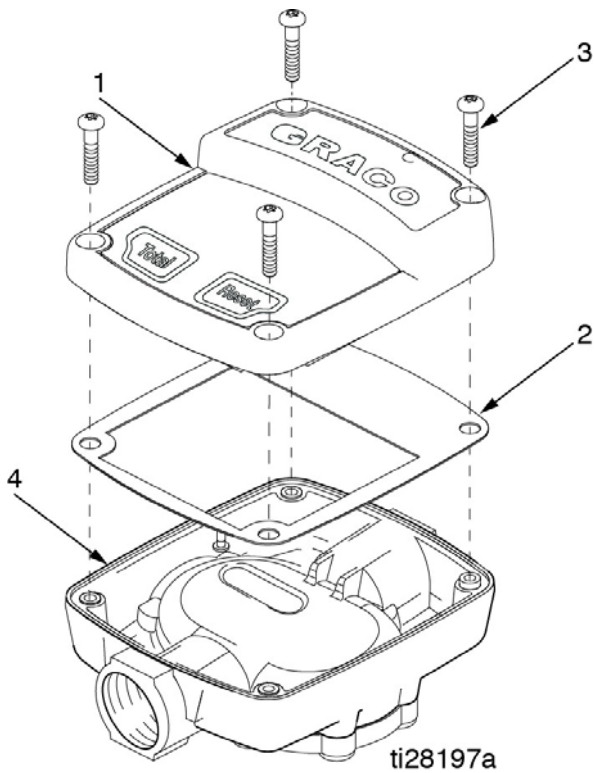


FIG. 7

## Part No./Description

| Ref. | Part    | Description                                | Qty. |
|------|---------|--|------|
| 1    | 245598* | CONTROL, electronic                        | 1    |
| 2    | 113930  | GASKET                                     | 1    |
| 3    | 113941  | SCREW                                      | 4    |
| 4    |         | UNIT, metering (cannot be sold separately) | 1    |

\*Screws (3) and Gasket (2) are included with Control (1)

# Accessories

## Shutoff Valve: 108458

Install upstream from the meter. Shuts off fluid supply from the pump. 1/2-14 npt(f) both ends.

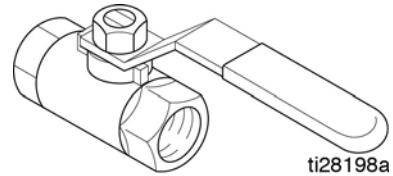


FIG. 8

## Strainer Kit: 239876

Includes strainer and o-ring.

Install the strainer before the meter or before the valve on the meter/valve combination.

Install the o-ring after the strainer to hold the strainer in place. See FIG. 9.

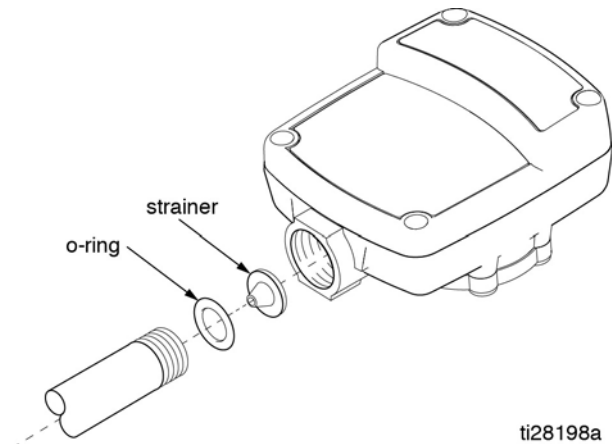


FIG. 9

## Thermal Relief Kit: 235998

1/2 - 14 npt(m) x 1/2-14 npt(f).

Install downstream from the pump.

# Technical Data

| <b>IM5 Inline Electronic Meter</b>                                    |  |                 |
|---|--|-----------------|
|   | <b>US</b>  | <b>Metric</b>   |
| Flow range  | 0.5 to 5 gpm   | 1.9 to 19 lpm   |
| Maximum working pressure  | 500 psi  | 3.4 MPa, 34 bar |
| Minimum working pressure  | 5 psi  | 34 kPa, 0.3 bar |
| <b>Weight</b>   |  |                 |
| Weight  | 1.8 lbs  | 0.82 kg         |
| <b>Units of Measurement</b>   |  |                 |
| Factory-setting   | quarts   |                 |
| Accuracy  | +/- 0.5 percent  |                 |
|   | <i>Measured at 2.5 gpm (9.5 lpm), at 70°F (21°C), with 10-weight oil and 1 gallon dispensed. May require calibration; out-of-box accuracy is +/- 1.25 percent.</i> |                 |
| Repeatability   | +/- 0.15 percent   |                 |
|   | <i>Measured at 2.5 gpm (9.5 lpm), at 70°F (21°C), with 10-weight oil and 1 gallon dispensed.</i>   |                 |
| Inlet / Outlet: Meter can be installed with flow in either direction  | 1/2 npt  |                 |
| <b>Temperature</b>  |  |                 |
| Operating temperature range   | -4°F to 122°F  | -20°C to 50°C   |
| Storage temperature range   | -13°F to 122°F   | -25°C to 50°C   |
| <b>Materials of Construction</b>                                      |  |                 |
| Wetted parts  | nickel, zinc, LCP, nitrile rubber  |                 |
| <b>Battery Information</b>  |  |                 |
| Battery   | standard 9V alkaline: Duracell® MN1604, Duracell PC1604, Eveready® EN22, Eveready 522  |                 |
| Duracell® is a registered trademark of Duracell Inc.                  |  |                 |
| Eveready® is a registered trademark of the Eveready Battery Co., Inc. |  |                 |

# 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.

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For the latest information about Graco products, visit [www.graco.com](http://www.graco.com).

For patent information, see [www.graco.com/patents](http://www.graco.com/patents).

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

**Phone: 612-623-6928 or Toll Free: 1-800-533-9655, Fax: 612-378-3590**

*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. MM308687

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