

Instruction Manual

**MATRIX**  
**Electronic Meter**

309497A

6-26-02

**Part No. 246008, Series A**

*1600 psi (11.0 MPa, 110 bar) Maximum Working Pressure*

*5 gpm (18.9 lpm) Maximum Flow Rate*



INSTRUCTIONS

**Read Warnings and Instructions**

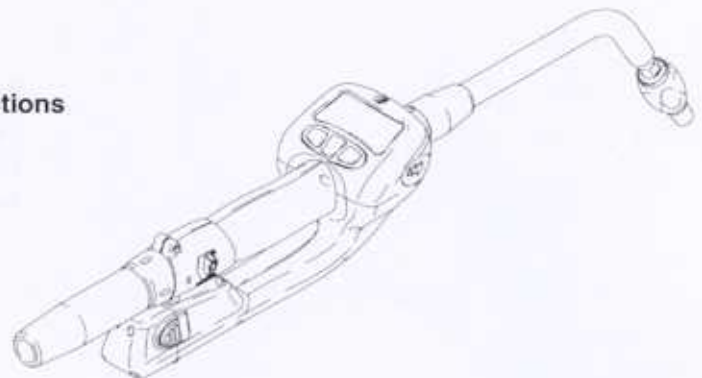
**Factory-Set to Measure in Quarts**

Part 246005, 45° bend rigid extension

Part 246006, 90° rigid extension

Part 246007, flexible extension

U.S. Patents Pending



**! CAUTION**

- This dispense valve is designed to dispense petroleum-based lubricants and antifreeze only. Do not dispense windshield washer solvent with this dispense valve.
- This dispense valve is designed for indoor use only.
- This dispense valve is not designed for in-line installation. Do not install with a shut-off valve on the outlet side of the meter. Such installation could result in damage to the meter housing cover.

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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



### Equipment Misuse Hazard

Equipment misuse can cause 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 distributor for assistance.
- Do not alter or modify this equipment. Use only genuine Graco parts and accessories.
- Do not leave this dispense valve unattended while it is dispensing.
- Check equipment daily. Repair or replace worn or damaged parts immediately.
- Do not exceed the maximum working pressure of the lowest rated system component. See the **Technical Data** on page 17 for the maximum working pressure of this component.
- Use fluids and solvents that are compatible with the equipment wetted parts. See the **Technical Data** section of all equipment manuals. Read the fluid and solvent manufacturer's warnings.
- Route hoses away from traffic areas, sharp edges, moving parts, and hot surfaces. Do not expose Graco hoses to temperatures above 180° F (82° C) or below -40° F (-40° C).
- Comply with all applicable local, state, and national fire, electrical, and safety regulations.
- Do not point the dispense valve at anyone or at any part of the body.
- Do not put your hand or fingers over the end of the dispense valve.
- Do not stop or deflect leaks with your hand, body, glove, or rag.
- Use only extensions and nozzles that are designed for use with this dispense valve.
- Follow the **Pressure Relief Procedure** on page 6 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.

## WARNING

### Fire, Explosion, and Electric Shock Hazard



Improper grounding, poor air ventilation, open flames, or sparks can cause a hazardous condition and result in a fire or explosion.

- Poor ventilation, open flames, or sparks can cause a hazardous condition and result in a fire or explosion and serious injury.
- If there is any static sparking or you feel an electric shock while using this equipment, stop dispensing immediately. Do not use the equipment until you identify and correct the problem.
- Provide fresh air ventilation to avoid the buildup of flammable fumes from solvents or the fluid being dispensed.
- Keep the dispensing area free of debris, including solvent, rags, and spilled gasoline.
- Do not smoke while dispensing flammable fluids.
- You must use the battery type provided with the Matrix Fluid Management System. Use of any other batteries than those specified could affect the safety of this unit.
- Only replace the battery in a non-hazardous location, away from flammable fluids or fumes.
- To reduce the risk of a fire, explosion, electric shock, and serious burns to the body, handle and dispose of a used battery properly.
- 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.

# Programming the Meter

Graco recommends that meters be programmed **prior** to installation or before connecting them to the fluid dispense hose. To program the meters, both the Matrix PC software and transceiver must first be installed on a personal computer (PC).

**NOTE:** electronic meter programming should be completed at the same location as the PC.

**NOTE:** the electronic meter batteries need to be charged prior to use. Follow the charging instructions listed in Manual 309502.

## Meter Programming

1. Insert the battery. See **Removing and Replacing the Battery** on page 12.
2. When the battery is first inserted the display shown in FIG. 1 will appear.

**NOTE:** The Matrix PC software must also be at the meter setup screen for programming. See Instruction Manual 309501 for details.

3. To program the meter with the PC software, hold down both the left up arrow and right down arrow (See FIG. 5) simultaneously until both the ACTIVATE words on the screen become PROGRAM.
4. Push either the left up arrow button or the right arrow down button to program the information into the electronic meter that was previously entered into the Matrix software program.
5. Once this information has been "learned" by the electronic meter, the meter can be connected to the dispensing hose in the corresponding bay. See **Meter Installation** on page 6.

**NOTE:** if the electronic meter is unable to communicate with the PC the message NO SIGNAL LEARN MODE will appear.

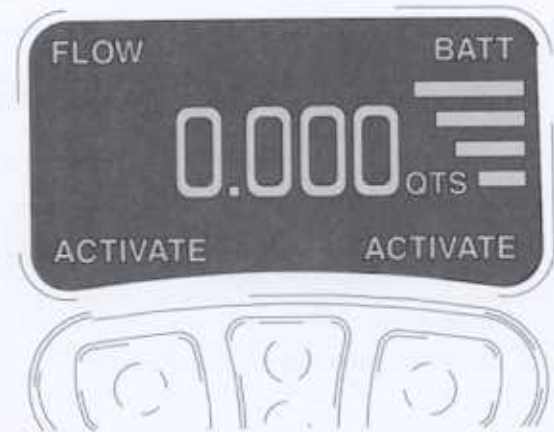


FIG. 1

# Meter Installation

The typical meter installation shown in FIG. 2 is only a guide. The components shown are typical; however, it is not a complete system design. Contact your Graco distributor for assistance in designing a system to suit your particular needs.

KEY	DESCRIPTION
H	Thermal relief kit (required) Part No. 235998 <i>Install downstream from pump.</i>
J	Fluid shut-off valve
K	Hose
L	Hose reel fluid inlet hose
M	Hose reel
N	Electronic metered dispense valve

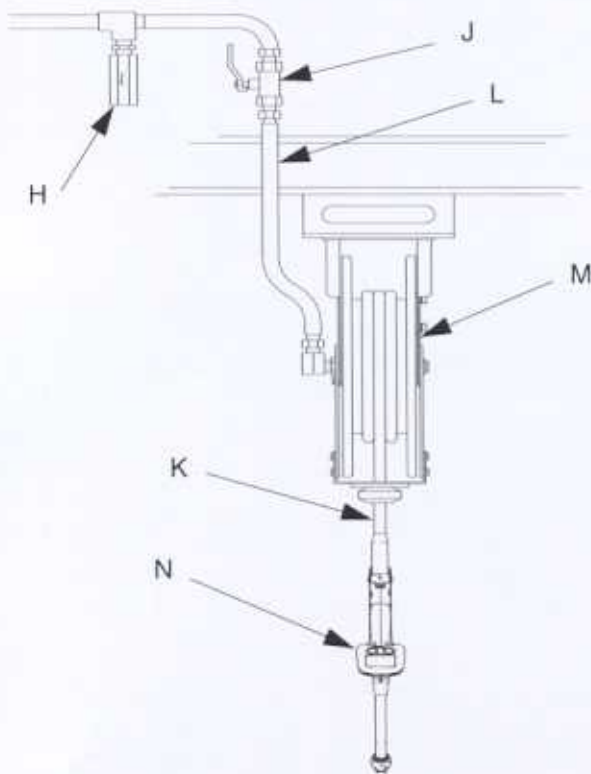


FIG. 2

## ⚠ 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 dispense valve, or splashing fluid, follow the **Pressure Relief Procedure** on page 6 whenever you:

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

### Pressure Relief Procedure

1. Turn off the 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.

## ⚠ WARNING

### Fire and Explosion Hazard

The movement of fluids through the dispensing system generates static electricity. The static electricity can cause volatile fumes to ignite, resulting in explosion and fire. The dispensing system must be grounded. See **Grounding** on page 8 whenever you:

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

## Pre-Installation Procedure

1. Relieve the pressure.

### WARNING

To reduce the risk of serious injury whenever you are instructed to relieve pressure, always follow the **Pressure Relief** Procedure on page 6.

2. Close the shut-off valve (J). See FIG. 2.
3. Ground the hose and reel or console. See **Grounding** on page 8.

## Installation Procedure

### CAUTION

- If this is a new installation or if the fluid in the lines is contaminated, flush the lines before you install the metered valve. Contaminated lines could cause the valve to leak. Follow steps 1 through 6 of the Flushing Procedure below.

If this is an existing installation, go to step 6.

Steps 1 through 6 are the **Flushing Procedure**.

1. Close the fluid shut-off valve (J) at each dispense position. See FIG. 2.
2. Make sure the main fluid outlet valve at the pump is closed, the air pressure to the pump motor is adjusted, and the air valve is open. Slowly open the main fluid valve.
3. Place the hose end (with no dispense valve connected) into a container for waste oil. Secure the hose in the container so it will not come out during flushing. If you have multiple dispense positions, first flush the dispense position farthest from the pump, and work your way toward the pump.
4. Slowly open the shut-off valve (J) at the dispense position. Flush out a sufficient amount of oil to ensure that the entire system is clean, and close the valve.
5. Repeat step 4 at all other dispense positions.

6. Relieve the pressure.

### WARNING

To reduce the risk of serious injury whenever you are instructed to relieve pressure, always follow the **Pressure Relief** Procedure on page 6.

7. Slide the swivel cover (4) of the electronic meter onto the hose, small end first. See FIG. 3.

### WARNING

Leave a minimum two engaged threads bare when using Teflon tape. The bare threads ensure a ground is maintained.

8. Apply thread sealant to the male threads of the hose fitting, thread the hose fitting into the swivel (3) of the meter, and tighten it firmly. See FIG. 3.

**NOTE:** Make sure you let the sealant cure to the manufacturer's recommendations before you let fluid into the system.

9. Thread the sealing nut (2a, 4c, or 5d) onto the extension or adapter (5c), adapter is used only for nozzle kit 246006. Thread the extension or adapter in at least three full turns, position it for proper alignment, and tighten the sealing nut. The Teflon seal on the sealing nut must face the valve housing. See FIG. 4.
10. Thread the new nozzle (2c, 4a, or 5a) onto the extension, and, with an open-end adjustable wrench, tighten it firmly. See FIG. 4.

**NOTE: Only** tighten the nozzle with the wrench on the flats of the nozzle bushing. **Do not disassemble the bushing from the nozzle.** Disassembly will affect the performance of the nozzle.

11. Open all dispense position shut-off valves, and start the pump to pressurize the system. See the **Operation** section for proper operation of meter.
12. To ensure dispensing accuracy, purge all air from the fluid lines and dispense valve before you use it. Set the system flow to the desired flow rate, which is typically 1.5 gpm. Do not exceed a 5-gpm flow rate.

## Grounding

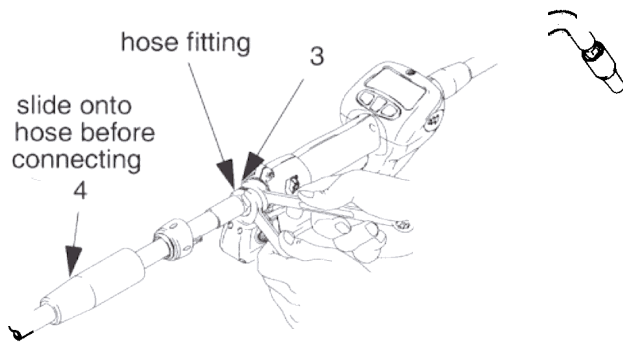


FIG. 3

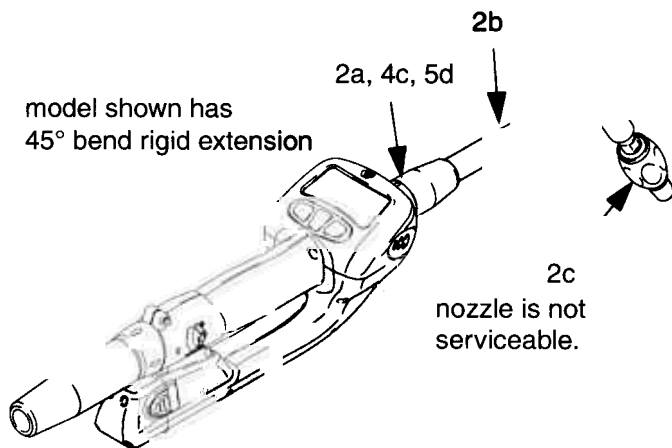


FIG. 4

### **! WARNING**

#### **Fire, Explosion, and Electric Shock Hazard**



When operating the Electronic Meter any ungrounded objects in the spray area (people, containers, tools, etc.) can become electrically charged. Improper grounding can result in static sparking, which can cause a fire, explosion, or electric shock. Follow the grounding instructions below.

Proper grounding is an essential part of maintaining a safe system.

To reduce the risk of static sparking, ground all system components according to local and national electrical codes. Refer to the user manuals for the pump and other system components, and ground the following:

*Pump:* Follow the manufacturer's recommendations.

*Air and Fluid hoses:* Use only grounded hoses.

*Air compressor:* Follow the manufacturer's recommendations.

*Fluid supply container:* Follow the local code.

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

### **! WARNING**

Leave a minimum two engaged threads bare when using Teflon tape. The bare threads ensure a ground is maintained.



# Setup

## Keypad Buttons

The buttons on the keypad are used to select meter functions and enter PIN codes. See FIG. 5:

- left arrow up (A)
- right arrow down (B)
- center arrow up (C)
- center arrow down (D)

**NOTE:** Asleep / Awake - *Asleep* is a battery-saving mode in which the display goes blank after 2 minutes of inactivity during normal operation. The display comes *awake* from sleep mode when any button is pressed, or when the trigger is pulled.

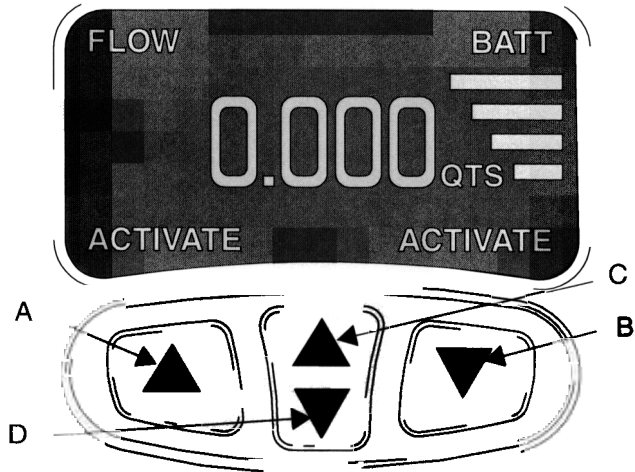


FIG. 5

## Dispense Flow Trigger

The electronic meter dispenses fluids at two different rates. As the trigger is pulled the first stage dispenses at a slow rate and is indicated on the meter display with two bars under FLOW.

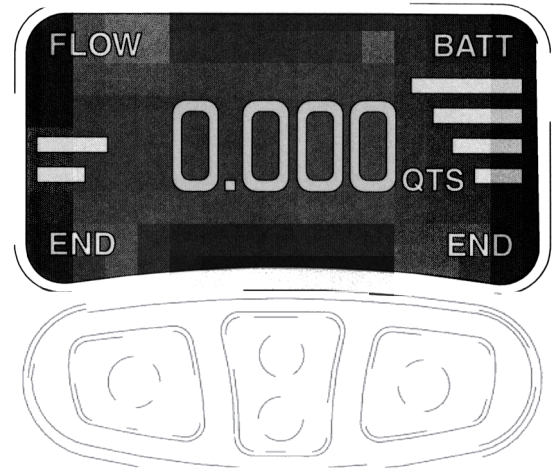


FIG. 6

As the trigger continues to be pulled the meter dispenses at a higher rate which is indicated on the display with four bars under FLOW.

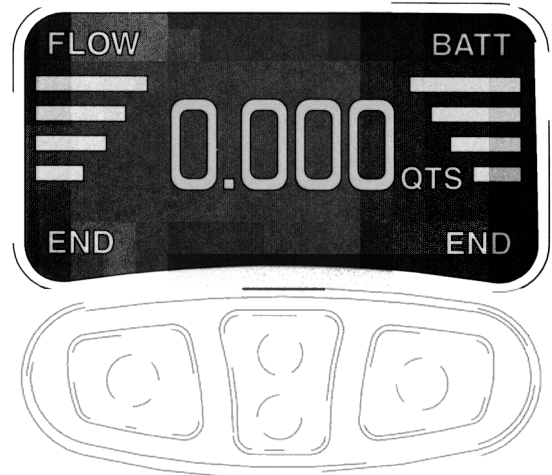


FIG. 7

## Battery Charge Indicator

On the right side of the display is a series of four bars under the word BATT. See FIG. 9. The presence of all four bars indicates a fully charged battery. The bars decline in number as the battery discharges when the meter is used. When one bar is shown the battery needs to be recharged.



FIG. 8

## Security

When the meters were originally programmed one of the following security choices was entered:

- Tracking mode
- PIN Code
- Parts Room Security mode.

Depending on the security mode selected, prior to dispensing it may be necessary to complete one of the following security procedures.

### Tracking Mode

When set for tracking mode no security authorization is required.

## Pin Code Security Dispense Mode

Pin Code Security can be used with either the manual or preset dispense modes. To use a meter with Pin code security:

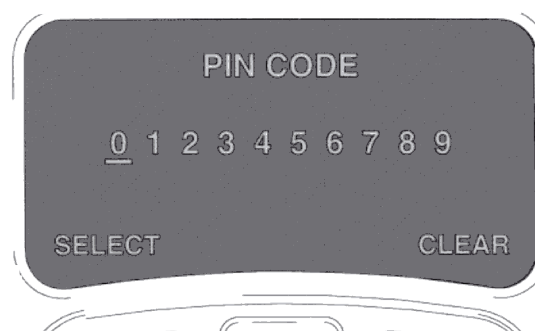


FIG. 9

1. Enter the operator 4-digit pin code using the left arrow and right arrow buttons. The clear button erases the last selection and allows a new selection to be made. The meter displays an asterisk for each digit that is entered. See FIG. 9.
2. When the pin code is complete, press "Enter" to send the signal for authorization to dispense from the PC.
3. The PC authorizes the dispense.

## Parts Room Security Mode

This mode provides high level security and requires a Parts Room administrator to authorize each dispense from the PC.

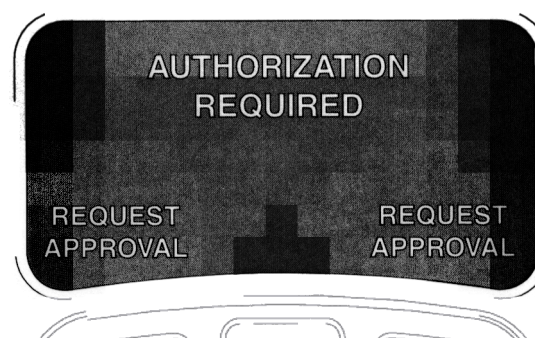


FIG. 10

1. Press Request Approval. This sends the request to Parts Room Administrator's PC for authorization.
2. The administrator grants authorization at PC which then authorizes the meter to dispense.

# Operation

## Pre-programmed Dispense Options

The meter dispense options were programmed using the Matrix software at the time the meter(s) were first set up. The meter is programmed for either:

Manual Dispense Mode

Preset Dispense Mode

**NOTE:** To change the meter from one mode to another it is necessary to reprogram the meter. See **Programming the Meter** on page 5.

## Dispensing Fluid in Manual Mode

This mode provides meter operators with the greatest level of simplicity. To dispense fluids in this mode:

If necessary enter the PIN code or Parts Room Authorization request.

2. Press the left down arrow button under activate the meter to begin communications with the PC. Both ACTIVATE words on the display screen will change to END.
3. Pull the meter trigger to dispense. The meter counts up to desired amount.
4. Release the trigger to complete dispense.
5. Press the right arrow down button to end the job. This logs the dispense to the PC and returns the meter to the cleared "Activate" screen.

**Note:** if "End" is not pressed, the meter will time out and log dispense to the PC.

## Dispensing Fluid in Preset Mode

This mode provides meter operators with the ability to preset the amount to be dispensed. The meter automatically shuts off when the preset amount is dispensed.

1. If necessary enter the PIN code or Parts Room Authorization request. The preset default amount entered into the PC will appear on the meter.

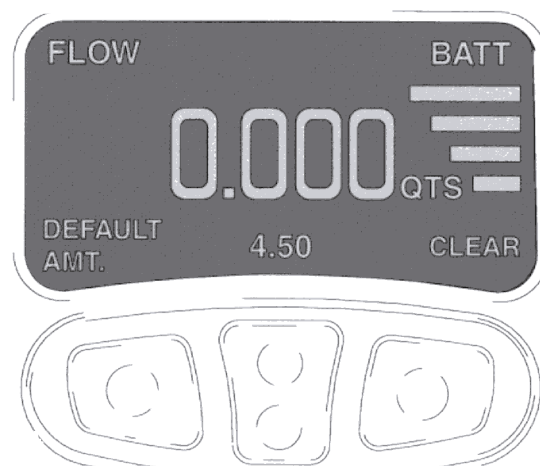


FIG. 11

2. Press the center up arrow button or center down arrow button to change the preset amount.

*OR*

3. Press the right arrow down button under the word CLEAR to zero out the preset amount. The center arrow buttons can then be used to adjust the amount of fluid to be dispensed. See FIG. 11.
4. Pull the meter trigger to start dispense. The meter dispenses the preset amount and shuts off.

**Note:** flow can be stopped at any time during this dispense by pressing any button on the meter.

**Note:** Once the preset amount is dispensed the meter display automatically changes to read "Top Off". This allows the operator to add a small amount of additional fluid if necessary.

5. Press END to complete the job. See FIG. 12. This logs the dispense to the PC and returns the meter to the cleared Operating screen.

**Note:** if “End” is not pressed the meter will time out and log the dispense to the PC.

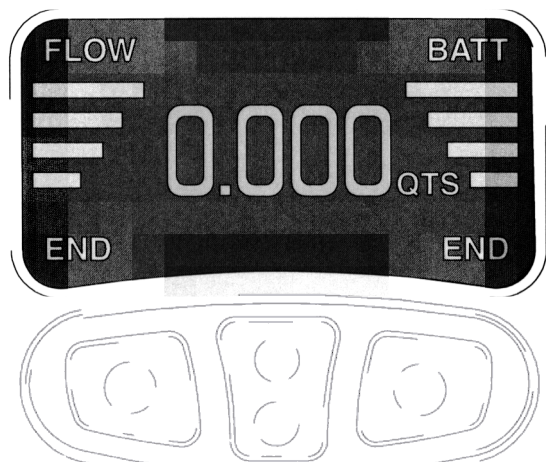


FIG. 12

## Removing and Replacing the Battery

1. Remove the battery by pressing in on both battery lock buttons (E) and pulling the battery (F) out and away from the meter. See FIG. 13.
2. Place the battery in the battery charger following the Recharging Batteries procedure in manual 309502.
3. Replace the battery by pressing in on both battery lock buttons (E) and pushing the battery (F) in to the meter. See FIG. 13.

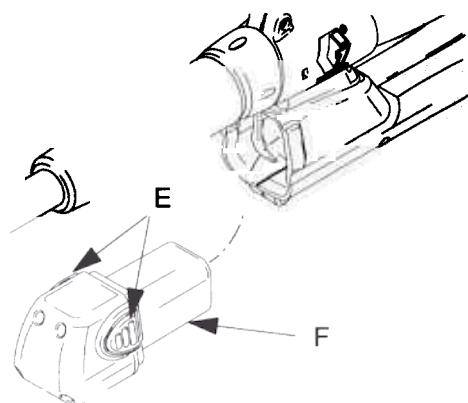


FIG. 13

## Quick-Lock™ Nozzle

1. To close the nozzle to prevent dripping, rotate left (counter clockwise) until tight (approximately 1/4 turn). See FIG. 14.
2. To open the nozzle for dispensing, rotate right (clockwise) until fully open (approximately 1/4 turn).

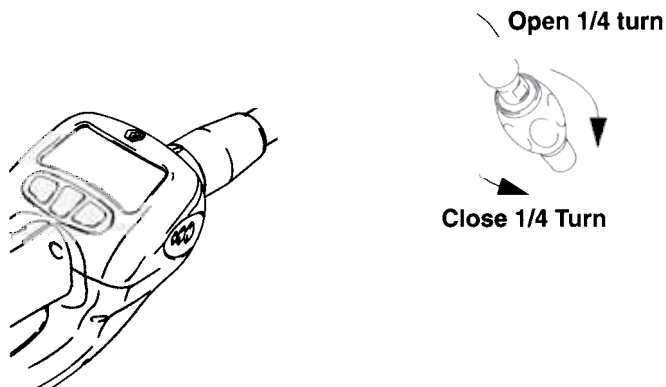


FIG. 14

## Blackout Mode (no signal)

If for any reason the communication link to the computer is lost, the meter will enter a safety back-up mode.

The meter will continue to operate and store data which will be transmitted when the communication link is restored.