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SCOPE OF THIS MANUAL

This manual describes how to install, calibrate and operate an Electronic Preset Meter. Read this manual before attempting any installation of the meter. Keep this manual available for future use.

SAFETY

Warning Symbol Explanation



DANGER Indicates a hazardous situation, which, if not avoided, will result in death or serious personal injury.



WARNING Indicates a hazardous situation, which, if not avoided, could result in death or serious personal injury.



CAUTION Indicates a hazardous situation, which, if not avoided, could result in minor or moderate personal injury or damage to property.

Warnings



IMPROPER GROUNDING, POOR VENTILATION, OPEN FLAMES OR SPARKS CAN CAUSE A HAZARDOUS CONDITION AND RESULT IN AN EXPLOSION OR FIRE AND CAUSE SERIOUS INJURY.

- Make sure the fluid system is properly grounded.
- If there is static sparking or if you feel an electric shock while using the meter, stop dispensing immediately. Identify and correct the problem before continuing.
- Provide fresh air ventilation. This will avoid the buildup of fumes from the fluid being dispensed.
- Do not smoke while dispensing flammable fluids.
- Keep the dispensing area free of debris including solvents, rags and spilled gasoline.



EQUIPMENT MISUSE CAN CAUSE THE METER TO RUPTURE OR MALFUNCTION AND CAUSE SERIOUS INJURY.

- This equipment is for professional use only.
- Read all instructions, tags and labels before operating the equipment.
- Use the equipment only for its intended purpose.
- Do not modify or alter the equipment.
- Do not leave equipment unattended while dispensing.
- Check equipment daily. Repair or replace worn or damaged parts immediately.
- Do not exceed the maximum working pressure level of the lowest rated system component.
- Use only extensions and nozzles that are designed for use with this equipment.
- Use only fluids and solvents that are compatible with the equipment. Read all fluid and solvent manufacturer's warnings.
- Tighten all fluid connections before operating this equipment.
- Do not stop or deflect leaks with hands, body, gloves or rags.
- Do not dispense towards any person or any part of the body.
- Do not place hands or fingers over the end of or into the dispense valve.
- Comply with all local, state, and federal fire, electrical and safety regulations.
- Use of this product in a manner other than specified in this manual may result in impaired operation or damage to equipment.



THIS METER IS DESIGNED SPECIFICALLY TO DISPENSE PETROLEUM PRODUCTS. DO NOT USE FOR ANTIFREEZE (ETHYLENE GLYCOL) SOLUTION, WINDSHIELD WIPER FLUID, BRAKE FLUID OR WATER BASED SOLUTIONS

METER BUTTONS



Figure 1: Meter Buttons

10 1 0.1	Used to enter the batch quantity to be dispensed.
TOTAL	Used to display the accumulated total of fluid dispensed as well as the resettable total during <i>Auto Batch</i> and <i>Manual</i> mode.
AUTO	Used to enter and exit the <i>Manual</i> or <i>Auto Batch</i> mode.
RESET	<ul style="list-style-type: none"> Used in <i>Manual</i> mode to clear the dispensed quantity. Used in <i>Auto Batch</i> mode to clear the dispensed quantity and reset the meter for the next batch. Used to reset the resettable total dispensed while pressing the TOTAL button.
○	Used to activate <i>Emergency Override</i> , which stops the flow.

Table 1: Button locations and descriptions

LCD DISPLAY



Figure 2: LCD Display

1.	Displays <i>Resettable Total</i> , <i>Accumulated Total</i> and <i>Scale Factor</i> .
2.	Displays <i>Unit of Measure</i> .
3.	Not used.
4.	Displays preset batch quantity.
5.	Not used.
6.	Indicates that the unit is in <i>Auto Batch</i> mode.
7.	Indicates that the unit has a low battery.

Table 2: LCD display description

METER INSTALLATION

Relieve System Pressure

⚠ WARNING

THIS EQUIPMENT STAYS PRESSURIZED UNTIL THE PRESSURE IS MANUALLY RELIEVED.

To reduce the risk of injury from fluid spray from the meter, whenever you:

- Are instructed to relieve pressure.
- Stop dispensing.
- Check, clean or service any system equipment.
- Clean or install nozzles.

Follow this procedure:

1. Turn off the power supply to the pump or close the shutoff valve.
2. Dispense any fluid in the system into a waste container by opening the meter.
3. Open all bleed-type master air valves and the fluid meter in the system.
4. Leave the meter open until ready to pressurize the system.

Grounding

⚠ WARNING

THE DISPENSING SYSTEM MUST BE GROUNDED TO PREVENT STATIC SPARKS AND RESULTING EXPLOSIONS.

Movement of fluids through the dispensing system can create static electricity which can cause static sparks. Static sparks can ignite volatile fumes, causing an explosion and fire. Grounding reduces the risk of static sparking. Ground all system components according to local, state and federal codes.

- **Pump:** follow manufacturer's recommendations
- **Air and Fluid Hoses:** use only grounded hoses
- **Air Compressor:** follow manufacturer's recommendations
- **Fluid Supply Container:** follow the local code

Flushing Procedure

⚠ CAUTION

IF THIS INSTALLATION IS NEW OR IF THE FLUID IN THE LINES IS CONTAMINATED, FLUSH THE SYSTEM BEFORE INSTALLING THE METER(S).

NOTE: If the system has multiple dispense positions, begin at the position farthest from the pump and move towards the pump.

1. Close fluid dispense valves at every position. Once the main fluid outlet valve at the pump is closed and the air pressure to the pump motor is properly adjusted, the air valve is opened.
2. Slowly open the main fluid valve.
3. Place the hose end in a waste container. Make sure the hose is secure so no fluid leaks during flushing.
4. Slowly open the dispense valve and allow enough fluid to pass through it to be sure that the system is clean.
5. Close the dispense valve.
6. Repeat this process for all dispense positions.

Attach Meter to Hose

Close the drain valve before starting this procedure.

1. Attach swivel to meter. Apply Loctite® 243 sealant, or equivalent, to the male end of the hose ([Figure 3](#)).

NOTE: The threaded end of the meter always has female threads. The metal end of the hose must have male threads. The inlet and outlet swivel connections are either 1/2 inch NPT or 1/2 inch BSPP, depending on the meter model.



Figure 3: Apply thread sealant

2. Insert the metal end of the hose into the swivel ([Figure 4](#)).



Figure 4: Insert hose into swivel

3. Tighten completely with an open-ended, adjustable wrench (*Figure 5*).



Figure 5: Use wrench to tighten

Attach Nozzle to Meter

1. Apply Loctite 243 sealant, or equivalent, to the end of the nozzle.
2. Thread the nozzle onto the opposite end of the meter where the hose is installed (*Figure 6*).



Figure 6: Thread nozzle onto meter

3. Screw the nozzle in tightly with an open-ended, adjustable wrench (*Figure 7*).
4. Open all dispense position shutoff valves.
5. Start the pump to pressurize the system.
6. Before use, purge all air from the fluid lines and dispense valve(s). Failure to do this can result in inaccurate measurement.



Figure 7: Tighten nozzle with wrench

METER OPERATION

NOTE: The keypad **AUTO** button is used to toggle between *Manual* and *Auto Batch* mode. If liquid has been dispensed, press **RESET** to set the meter back to zero before pressing **AUTO**.

Manual Mode

In *Manual* mode, the meter operates as a free-flow dispensing handle.

1. Pull the trigger and hold to dispense the fluid. How far the trigger is pulled determines the speed of flow. The display shows the amount dispensed.
2. Release the trigger to stop the flow when the desired amount has been dispensed.
3. Press **RESET** once to reset the counter display to zero.

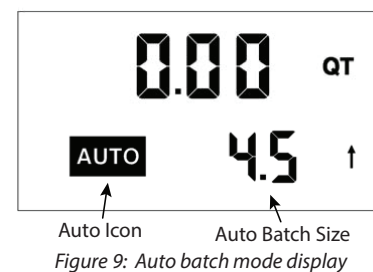


Figure 8: Manual mode screen

Auto Batch Mode

Auto Batch mode allows you to program a batch size, then dispense it with a pull of the trigger. When in *Auto Batch* mode, the *AUTO* icon displays in the lower left of the LCD screen and the batch quantity displays in the lower right.

1. Press **AUTO** to enter *Auto Batch* from *Manual* mode.
2. Change the batch size by pressing **10**, **1**, and **0.1**.
 - ◇ Press **10** to increase the batch amount in increments of 10 units.
 - ◇ Press **1** to increase the batch amount in increments of 1 unit.
 - ◇ Press **0.1** button to increase the batch amount in increments of 0.1 unit.



NOTE: When the numbers reach a value of 9 and the button is pressed again, they roll over to 0, but do not add a number to the column to the left. The maximum batch size is 99.9.

3. Fully pull the trigger and release to begin the flow. There is a click sound that indicates that the solenoid valve in the meter has automatically locked the dispensing valve in the full open position. The flow automatically shuts off after the batch quantity has dispensed, and another click sound can be heard.

NOTE: If a different amount than the batch size is dispensed, see "[Change Scale Factor](#)" on page 9. In case of an emergency or to interrupt a batch, the meter is equipped with an *Emergency Override*. See "[Emergency Override](#)" for instructions.

If the meter loses flow or is disconnected, the valve will automatically close. Once it is reconnected, you can resume flow by pulling the trigger.

4. Press **RESET** when finished. The display resets and the meter is ready for the next batch to be dispensed.

NOTE: After the batch quantity has been dispensed, the meter is a free-flow dispensing handle until the reset button is pressed, and can be operated as if in manual mode. See "[Manual Mode](#)" on page 6 for instructions.

OPERATING MODE FUNCTIONS

These functions operate the same in *Manual* mode and *Auto Batch* mode.

Accumulated Total and Resettable Total

The meter has two flow totalizers, the accumulated total and resettable total. The accumulated total is the total fluid dispensed. The resettable total (*RESETTOTAL*) is the total fluid dispensed since it was last reset.

1. Press and hold **TOTAL** to display the totals. The display switches between both totals every few seconds while the buttons are held.
2. Press **RESET** while viewing *RESETTOTAL* ([Figure 10](#)) to set it back to zero.
3. Release **TOTAL** to return to the operating screen.

NOTE: The accumulated total cannot be reset unless the user changes from English to metric units or from metric to English units. See "[Change Unit of Measure](#)" on page 9 for instructions.



Figure 10: *RESETTOTAL* screen

Emergency Override

In case of an emergency or to interrupt a batch, the meter is equipped with an *Emergency Override* which closes the dispensing valve, immediately stopping fluid flow. Press **0** to activate the *Emergency Override*. You can pull the trigger afterwards to resume flow.

Error Codes

The meter has one error code that may display:

SFO (Scale Factor 0) The Scale Factor setting for the meter is set to 0.000.

The code indicates that there is a communication error between the meter and the keypad. To correct the error, follow the instructions in "[Change Scale Factor](#)" on page 9 to input a valid Scale Factor. All other error codes are for factory purposes only. To clear the meter, press **RESET**.

SERVICE

Low Battery

When the batteries need to be changed, a progression of warnings appears on the meter screen. First, the *Low Battery* icon appears on the display, indicating the batteries are getting low and should be changed. When the icon begins to flash, battery power is too low and meter functions are disabled.



Figure 11: Low battery icon

Changing the Batteries

The battery compartment is located in the lower case on the underside of the trigger guard.

1. Turn the unit face down.
2. Unscrew the two screws and remove the battery door to expose the batteries.
3. Replace the old batteries. The meter takes four AA, alkaline batteries. Battery polarity markings are inside the battery compartment.
4. Dispose of used batteries properly, according to local regulations.

NOTE: Changing the batteries does not affect any of the programmed values or totals.

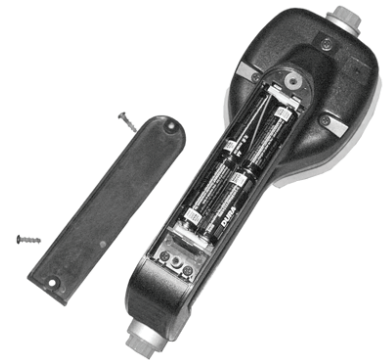


Figure 12: Replacing the batteries

CHANGE FACTORY SETTINGS

Each meter is calibrated at the factory for use with motor oil. See "[Change Scale Factor](#)" on page 9. The *Unit of Measure* is also selected prior to shipment.

Verify Firmware Version

Display the firmware version and code checksum by pressing and holding **TOTAL** and then pressing and holding **1**. The last two digits on the lower right are the firmware version. Meters with version 16 or higher use the procedure outlined in this manual for changing the unit of measure, scale factor and enabling or disabling the EPM functionality.

Enter Programming Mode

1. Press and hold **TOTAL** and **AUTO** simultaneously. After a few seconds, PrG appears on the display.
2. Release the buttons.
3. Press and release these buttons in order: **1**, **AUTO**, **10**, **0.1**, and **TOTAL**.
4. The current unit of measure flashes, indicating that you have entered programming mode.



Figure 13: Entering programming mode

Change Unit of Measure

NOTE: When *Programming* mode is entered, the current unit of measure flashes.

1. Press **TOTAL** to cycle through the four options; PT, QT, GAL, L.
2. When the correct unit of measure is displayed, press **RESET** to select it. The unit of measure stops flashing and the first number of the Scale Factor starts flashing.

NOTE: If L (liters) is selected, the decimal point begins to flash. Press **TOTAL** to toggle between decimal and comma. Press **RESET** to select it and continue to the Scale Factor.

If no scale factor changes are necessary, see "[Save Changes](#)" If they are needed, continue to "[Change Scale Factor](#)"

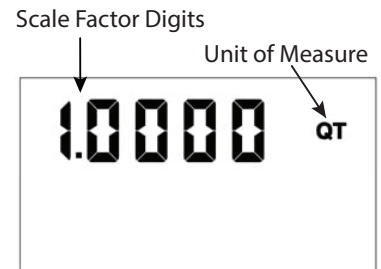


Figure 14: Unit of measure display

⚠ CAUTION

CHANGING THE UNIT OF MEASUREMENT FROM METRIC TO ENGLISH OR FROM ENGLISH TO METRIC CLEARS THE RESETTABLE TOTAL AND ACCUMULATED TOTAL.

Change Scale Factor

⚠ WARNING

CHANGING THE SCALE FACTOR CHANGES THE ACCURACY OF THE METER, POTENTIALLY CAUSING IT TO OVERFILL OR UNDER FILL. THIS HAS THE POTENTIAL TO CAUSE A MECHANICAL BREAKDOWN.

1. Press **TOTAL** to change the selected number.

NOTE: All digits can be scrolled between 0 and 9 except the first. It can only be toggled between 0 and 1.

2. Press **RESET** to advance to the next digit in the scale factor.
3. Repeat for all five digits.



Scale factor digits

Figure 15: Scale factor display

Save Changes

To save changes and exit programming mode:

1. Press and hold **TOTAL** and **AUTO** simultaneously. The display flashes three times and goes blank.
2. Release the buttons, then press **RESET** and the display turns back on.

Verify Changes

1. Verify that the unit of measure is correct.
2. Press and hold **TOTAL** and then **AUTO** to verify that the scale factor is correct.

Calculate Scale Factor

A scale factor is a number used to adjust meter accuracy. The scale factor is set at the factory using motor oil with a viscosity of 10w. The primary use for scale factor recalibration is to batch fluids with different viscosities. If the fluid has a different viscosity, the scale factor must be changed to accurately measure it. The meter multiplies each pulse by the scale factor to correct the accuracy when it converts to the specified units. For an approximate scale factor for fluids of different viscosities, see "[Chart of Approximate Scale Factors](#)" on page 10.

NOTE: The meter's original scale factor was written on the trigger when it was calibrated at the factory. It may have been revised after field installation. Use the scale factor shown on the display, not on the trigger.

To view the current scale factor, press and hold **TOTAL** and then **AUTO**.

Absolute Scale Factor

For absolute scale factor, perform this test:

1. Run a batch through the meter.
2. If the meter measures a different amount than the batch amount, the scale factor needs to be adjusted. For example, if you run a 4.20 quarts batch and the display shows only 4.00 quarts, the scale factor needs adjustment.
3. Divide the amount of liquid in the batch (4.20) by what the display shows (4.00). The result is the error factor (1.05).
4. Find the current scale factor by pressing and holding **TOTAL** and then **AUTO**. For this example the current scale factor is 1.0123.
5. Multiply the current scale factor by the error factor to find the new scale factor ($1.0123 \times 1.05 = 1.0629$).
6. Enter the new scale factor as described in the "[Change Scale Factor](#)" on page 9.

NOTE: Use the current scale factor shown on the display, not on the trigger.

Chart of Approximate Scale Factors

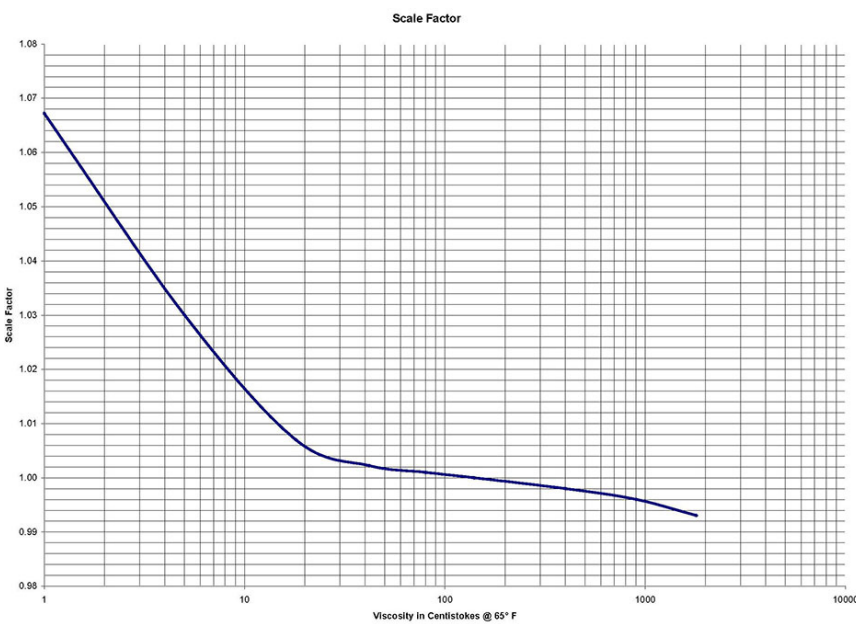


Figure 16: Scale factors for fluids with different viscosities

Fluid	Viscosity	Scale Factor
Automatic Transmission Fluid (ATF)	80	1.002
10W	140	1.000
80W-90	450	0.999
140W	1800	0.993

Table 3: Fluid viscosity and scale factor

DIMENSIONS

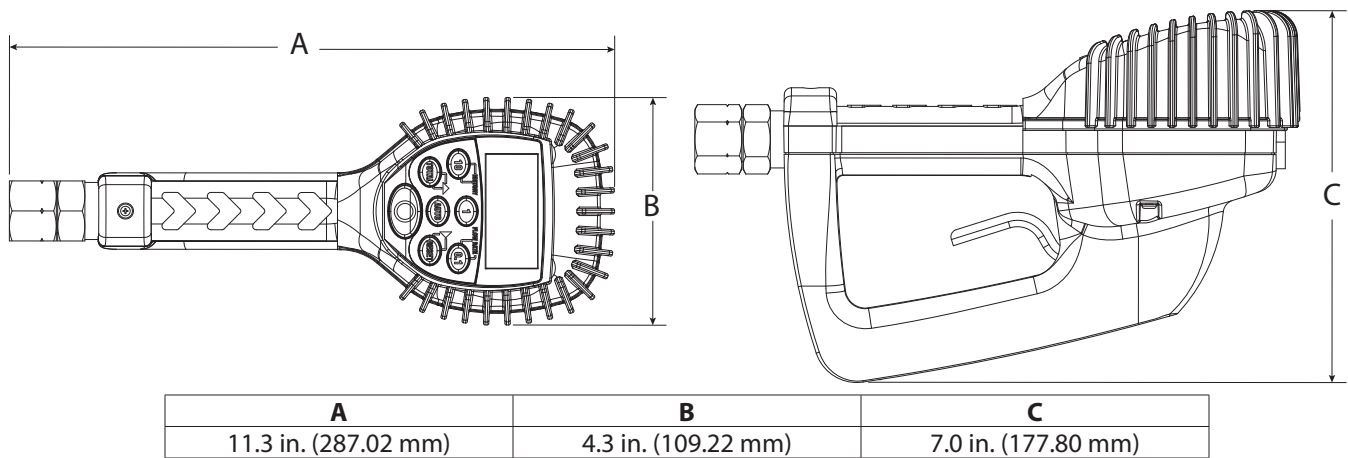


Figure 17: Meter dimensions

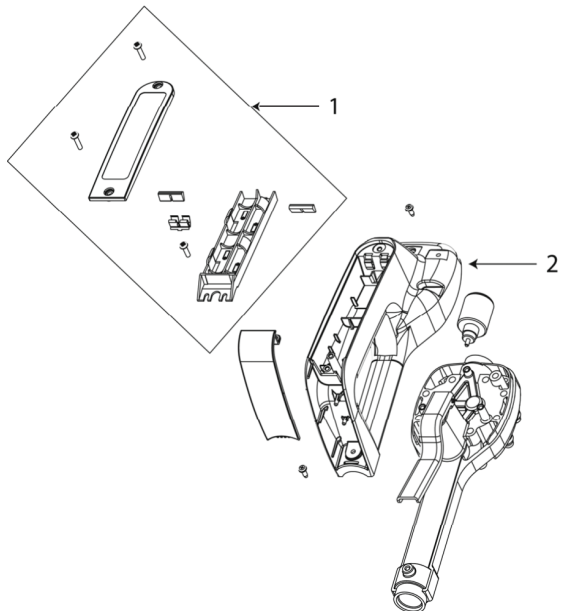
SPECIFICATIONS

Flow Range*	0.25...10 gpm (1...38 lpm)
Operating Pressure Range	5...1000 psi (0.35...69 bar)
Operating Temperature Range	20...120° F (-7...49° C)
Accuracy	± 0.5%
5-digit LCD Display	Quarts, Pints, Gallons, Liters
Inlet and Outlet Connections	1/2 in. NPT (1/2 in. BSPP)

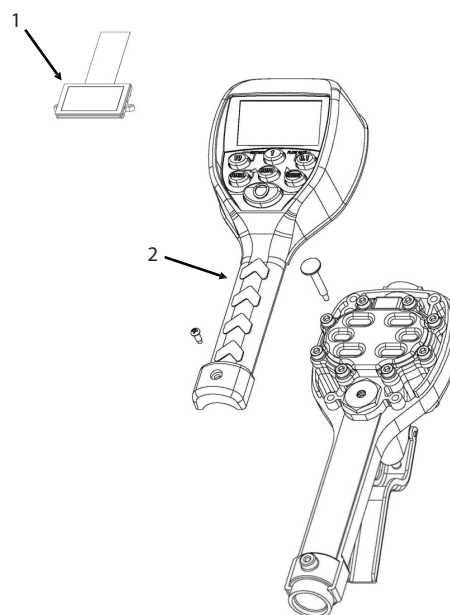
* Minimum and maximum flow range will vary with fluid viscosity

PARTS

Back of Meter



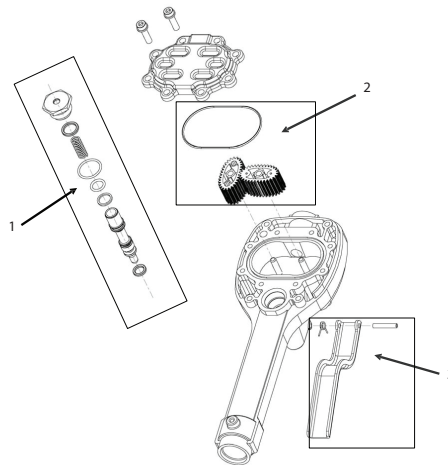
Front of Meter



Item	Description	Part Number
1	Battery holder assembly	64103-026
2	Bottom case with screws	64103-003

Item	Description	Part Number
1	Display assembly	64103-023
2	EPM2 std. register assembly	64103-024
Not shown	Swivel, NPT, special fluids	64082-001
Not shown	Rubber boot	65546-001

Inside Meter



Item	Description	Part Number
1	Valve assembly	64103-010
2	Gear service kit with O-ring	62896-001
3	Trigger assembly	64103-005

TROUBLESHOOTING

⚠ WARNING

RELIEVE THE PRESSURE PRIOR TO CHECKING OR REPAIRING THE METER. MAKE SURE ALL VALVES, CONTROLS AND PUMPS ARE OPERATING CORRECTLY.

Symptom	Possible Cause	Remedy
Battery icon is displayed	1. Batteries are low	1. Replace batteries
Display is blank	1. Meter is asleep 2. Loose battery connection 3. Batteries are dead	1. Press RESET 2. Remove battery pack and check battery connection, then press RESET 3. Replace batteries, then press RESET
Meter does not latch for batching	1. Meter is not in <i>Auto</i> mode 2. Meter was not reset after prior batch 3. Batteries are low	1. Press AUTO and program the batch size 2. Press RESET 3. Check for battery icon, replace batteries, and then press RESET
Slow or no fluid flow	1. Filter is clogged 2. Pump pressure is low 3. Foreign material is jamming meter	1. Clean or replace the filter in the swivel nut 2. Turn up the pump pressure 3. Contact your local distributor for repair
Meter inaccurate	1. Scale Factor not correct for fluid	1. Enter <i>Program</i> mode, check and reset the scale factor

Control. Manage. Optimize.

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