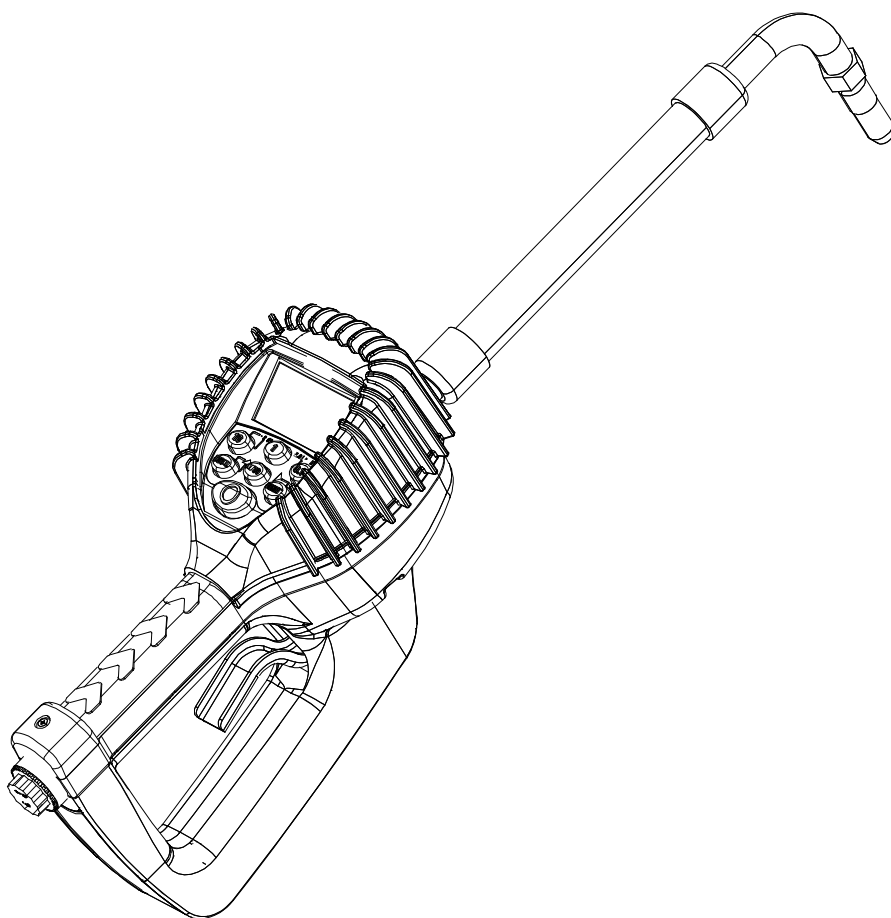


Electronic lube meter

Model 905SF, series “B”



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Section	F22
Page	24F

⚠ DANGER

Read manual prior to installation or use of this product. Keep manual nearby for future reference. Failure to follow instructions and safety precautions may result in death or serious injury.

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Safety

Read and carefully observe these instructions before installing, operating or troubleshooting this equipment.

The equipment must be installed, maintained and repaired exclusively by persons familiar with the instructions.

Install and/or operate the equipment only after safety instructions and this guide have been read and are completely understood.

Adequate personal protection must be used to prevent splashing of material on the skin or in the eyes.

Always disconnect power source (electricity, air or hydraulic) from the equipment when it is not being used.

Any other use not in accordance with instructions will result in loss of claim for warranty or liability.

- Do not misuse, over-pressurize, modify parts, use incompatible chemicals, fluids, or use worn and/or damaged parts.
- Always read and follow the fluid manufacturer's recommendations regarding fluid compatibility, and the use of protective clothing and equipment.
- Failure to comply may result in death or serious injury.

Explanation of signal words for safety



This is the safety alert symbol. It is used to alert you to potential physical injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.



SAFETY INSTRUCTION

Safety instruction signs indicate specific safety-related instructions or procedures.



DANGER

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



WARNING

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



CAUTION

Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.



WARNING

Systems which will be dispensing fluids under pressure may need to be protected by using a thermal relief kit which will safely limit the pressures caused by thermal expansion. Please contact your local Lincoln distributor and refer to Section K5, Page 31 for more details. Failure to include thermal relief protection may cause damage not covered under Lincoln's warranty policy.



WARNING

Explosion and fire hazards

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

- Be sure the fluid system is properly grounded. See your pump instruction manual for details.
- 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.
- Keep the dispensing area free of debris including solvents, rags and spilled gasoline.



DANGER

Do not use unit with methanol based windshield washer fluid or other flammable liquids.

Failure to comply may result in serious injury and/or death.

WARNING

Meter hazards

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.

WARNING

This meter is not designed to dispense petroleum products or methanol based windshield wiper fluid. This meter is designed for windshield wiper fluid, brake fluid, or water-based solutions.

General

The Electronic Preset Meter (EPM) is designed specifically to dispense antifreeze (ethylene glycol) solution, windshield wiper solution, water based solution, and brake fluid. This meter is not designed to dispense petroleum based products or methanol based windshield washer fluid.

Any batch size quarts, liters, pints or gallons can be programmed quickly.

This unit can be programmed by the user to dispense in quarts, liters, pints, and gallons. Any batch size can be programmed quickly.

A 5-digit liquid crystal display, accurate to the second decimal point, shows the exact amount of fluid dispensed.

Typical applications

- Fleet maintenance shops
- Industrial assembly
- Quick lube facilities
- Dealerships
- Construction and mining equipment
- General automotive service centres
- Specialty service and repair shops

Features and specifications

- Oval gear driven meter
- Durable, rugged design
- Rubber boot
- Large, easy-to-read LCD display
- Ease of operation
- CE approved
- Totalization in liters and gallons
- Delivery in liters, quarts, pints, gallons
- Automatic non-drip nozzle with manual shut-off feature
- Maximum totalizer number: 99,999 gallons or liters
- Maximum dispense volume: 99,999 units
- Maximum preset volume: 99.9 Units
- Calibration factor for different fluids

- Changeable units of measure
- One programmable preset
- Total and re-settable total
- Minimum 20,000 cycles on battery life
- Low battery indicator
- Low battery safety lock out feature
- Uses standard AA batteries
- In-line swivel standard with all meters
- Automatic shut-off at preset amount
- Emergency manual shut-off
- Precision control valve operation



Notice

Meter is not for measurement of fluid that is for resale.

Meter overview

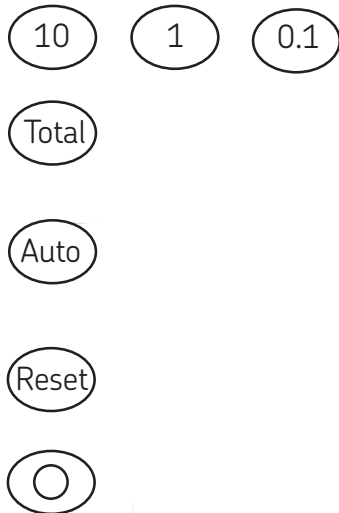
An Electronic Preset Meter (EPM) that is intended to be used for start-up purposes or when a fluid management system is not in use.

The meter automatically shuts off when the dispense batch quantity has been reached.

A "Top Off" feature allows additional fluid to be dispensed and tracked after the batch quantity has been dispensed.

Upon completion of the dispense, the operator presses the RESET button. The display resets and the meter is now ready for the next batch to be dispensed.

Meter buttons



Used to enter the dispense batch quantity when in the EPM mode.

Total is used to display the accumulated total of fluid dispensed, as well as the re-settable total

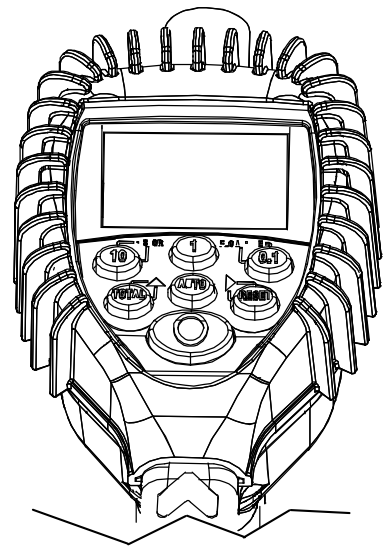
Auto is used to enter and exit the manual or batch mode.

Reset is

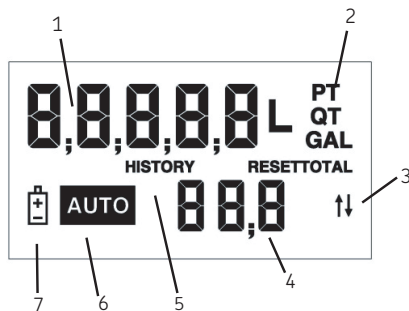
- used in EPM mode to clear the previous batch.
- used to reset the re-settable total dispensed while pressing the TOTAL button.

Shut-off or stop is used to stop the flow through an emergency override.

Meter display



LCD display



- 1 Displays re-settable total, accumulated total and scale factor.
- 2 Displays unit of measure.
- 3 Arrows flash when RF communication is in progress with keypad. Not used on this model.
- 4 Preset batch quantity.
- 5 History icon. Not used on this model.
- 6 AUTO indicates EPM mode.
- 7 Low battery icon.

Meter installation

Relieve system pressure

- 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(s).
- 3 Open all bleed-type master air valves and fluid meter(s) in the system.
- 4 Leave the meter(s) open until ready to pressurize the system.

Grounding

Ground all system components according to local, state and federal codes. Consult the pump user's manual and other system components to ground the following:

Pump: follow manufacturer's recommendations

Air and fluid hoses: use only grounded hoses. Air compressor: follow manufacturers recommendations.

Fluid supply container: follow the local code.

Install meter on hose

Close the drain valve before starting this procedure.

- 1 Apply thread sealant to the external threads of the hose. Recommended sealant is Loctite 243
- 2 Thread a swivel into the meter.

Notice

The threaded end of the meter always has internal threads. The metal end of the hose must have external threads.

The inlet and outlet swivel connections are either 1/2 in. NPT (1/2 in. BSPP), depending on meter model.

WARNING

Pressurized equipment

Do not clean, service or inspect any part of meter while pressurized.

Equipment stays pressurized until pressure is manually relieved. To reduce risk of injury from fluid spray, follow pressure relief procedures when:

- instructed to relieve pressure
- stop dispensing
- check, clean or service any system equipment
- clean or install nozzles.

WARNING

Explosion and Fire

Do not operate this meter without correct grounding.

Movement of fluids through the dispensing system creates static electricity. Static electricity can ignite volatile fumes resulting in an explosion and fire.

Failure to comply may result in serious injury or death.

Install nozzle on meter

- 1 Apply sealant to the end of the nozzle. Recommended sealant is Loctite 243.
- 2 Thread the nozzle onto the meter. Screw it in tightly with an open ended, adjustable, wrench.
- 3 Open all dispense position shut-off valves.
- 4 Start the pump to pressurize the system.

Notice

Before use, to ensure accuracy, purge all air from fluid lines and dispense valve(s).

Flushing procedure

Notice

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

Notice

If installation is new or if fluid in lines is contaminated, flush system before installing meter(s).

- 1 Close fluid dispense valves at every position.
- 2 Adjust air pressure to the pump motor.
- 3 Open air valve.
- 4 Open the main fluid valve.
- 5 Place the hose end in a waste container.
- 6 Open the dispense valve.
- 7 Allow enough fluid to pass through the system to ensure it is clean.
- 8 Close the valve and repeat for all dispense positions.

Meter operation

Manual mode

In the Manual Mode the meter operates as a free flow dispensing handle.



Notice

Keypad AUTO button is used to toggle between manual mode and batch mode.



- 1 Pull the trigger to begin the flow.
- 2 The display shows the amount dispensed.
- 3 When the desired amount has been dispensed, release the trigger
- 4 Press RESET button once to reset the counter display to zero.

Auto batch mode



To enter the batch mode from the manual mode press the meter AUTO button. The screen on the left appears. When in the batch mode, the batch quantity displays in the lower right hand corner of the screen.

The meter is now in Batch Mode.

- 1 Change the batch size by pressing the 10, 1 or 0.1 buttons.
- 2 Press the 10 button to increase the batch amount by increments of 10.
- 3 Press the 1 button to increase the batch amount by increments of 1 unit.
- 4 Press the 0.1 button to increase the batch amount by increments of 0.1 unit.
- 5 Pull the trigger to begin the flow.
- 6 To top off the fluid, pull the trigger to begin the flow and release it when the desired amount has been pumped.
- 7 Press the RESET button when finished.



Notice

Meter solenoid valve automatically locks dispensing valve in full open position.

Trigger falls back to closed position.

After batch quantity is dispensed, flow automatically shuts off.

User has option to top off fluid at end of a batch.



Notice

Display resets and meter is now ready for next batch to be dispensed.



Error Codes

The meter has several error codes that may display.

Error code SFO indicates the meter is set to 0.000 and is invalid. Input a valid setting by following the instructions to change factory settings. All other error codes are for factory purposes only.

To clear the meter, press reset.

Operating mode functions

Re-settable/accumulated totals

The meter has two flow totalizers. One is Re-settable Total the other is Accumulated Total.

- 1 To see the Accumulated Total and the Re-settable Total:
 - 1.1 Press and hold the TOTAL button to see the Accumulated Total.
 - 1.2 Continue holding the TOTAL button.
 - 1.3 After three seconds the screen changes to the Re-settable Total.

- 2 RESET TOTAL displays the total fluid dispensed since the Re-settable Total was last set back to zero.
- 3 Press the RESET button while viewing Reset total to set it back to zero.
- 4 Release the RESET button to return to the operating display.

Notice

Accumulated total cannot be reset unless user changes from English units to metric units or from metric to English units (→ **Change factory settings, Change unit of measure, page 15**).



Resettable total

Emergency override

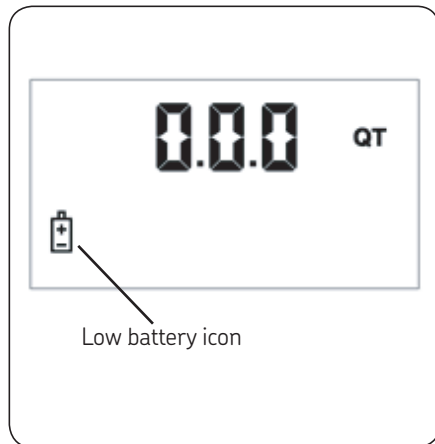
In case of an emergency or to interrupt a batch, the meter is equipped with an emergency override.

- 1 Press the red STOP button to activate the Emergency Override. The override closes the valve, immediately stopping fluid flow.
- 2 Batching can continue after an Emergency Override by pulling up on the trigger.

Service

Low battery

When the batteries need to be changed a progression of warnings appears on the meter screen.



First Warning: the low battery icon appears in the lower left corner of the display.

Change the batteries.

Second warning: battery icon flashes. The battery power is too low and meter functions are disabled.

Changing the Batteries

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

- 1 Turn the unit over.
- 2 Unscrew the two screws. Remove the battery door to expose the batteries.
- 3 Replace the old batteries.



Notice

Battery polarity markings are inside battery compartment.
Meter takes 4 AA, alkaline, batteries.

- 4 Dispose of used batteries properly, according to local regulations.



Notice

Changing batteries does not affect any programmed values or totals.

Change factory settings

Each meter is calibrated at the factory for use with motor oil (see the Change Scale Factor section of this manual). The Unit of Measure is also selected prior to shipment.

Verify firmware version

- 1 The firmware version and code checksum can be displayed by holding the TOTAL and 1 button at the same time.
- 2 The last two digits on the lower right are the firmware version.
- 3 Meters with version 18 or higher use the procedure outlined in this manual for changing the unit of measure, scale factor and enabling or disabling the EPM functionality.

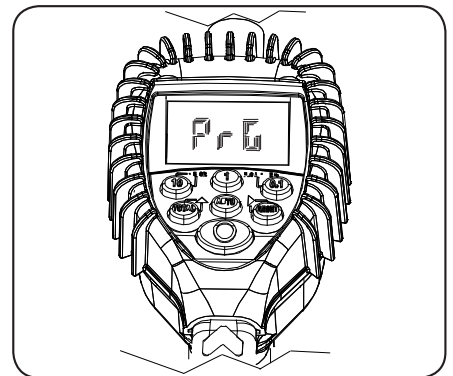
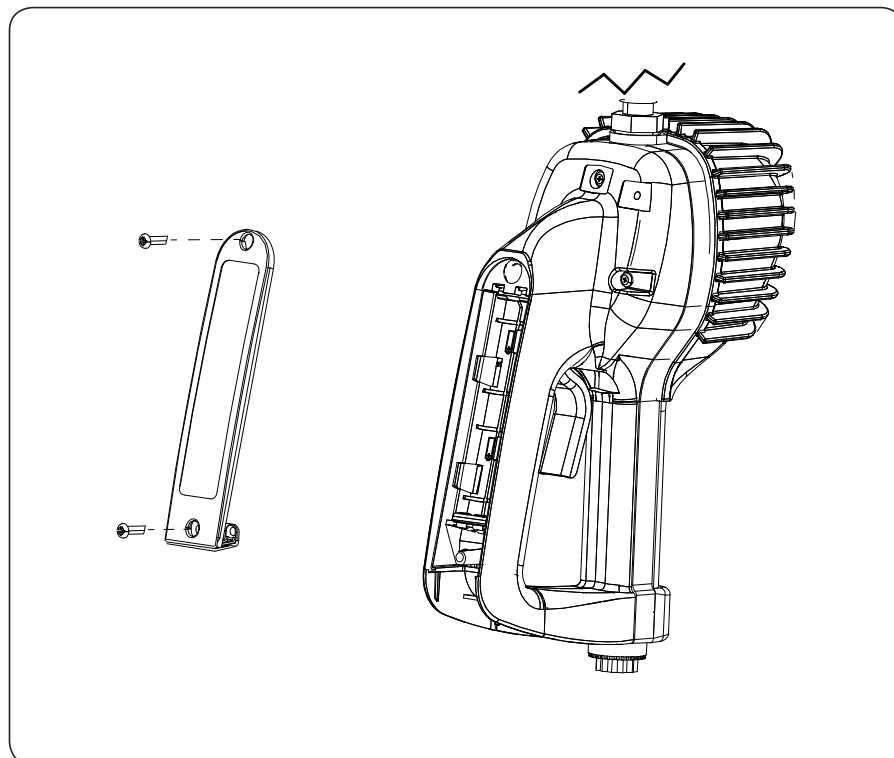
Programming

- 1 Push and hold at the same time the TOTAL and AUTO buttons.
- 2 PrG will appear on the display.
- 3 Release the TOTAL and AUTO buttons.
- 4 Then press and release in order the 1, AUTO, 10, 0.1 and the TOTAL buttons



Notice

Current unit of measure will now be flashing indicating that you have entered programming mode.



Unit of measure

1 Select program mode.

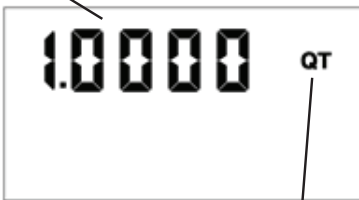


Notice

Actual unit of measure is flashing when programming mode is entered.

Meter has option of four different units of measure from factory.

Scale factor digits



Programming display

Unit of measurement

- 2 Press the TOTAL button to toggle between the four options; pt, qt, gal, l.
- 3 When the desired unit of measure is displayed, press the RESET button.
- 4 If no scale factor changes are necessary, refer to **Save changes**.



Notice

Unit of measure icon stops flashing. If l, (liters), is selected, decimal point begins to flash.

Changing the unit of measurement from metric to English or from English to metric clears the re-settable total and accumulated total.

Scale factor



Notice

Changing scale factor changes accuracy of meter, potentially causing it to overfill or under fill. Potential for a mechanical breakdown may exist.

- 1 Press the RESET button to advance through the scale factor digits.
- 2 Press the TOTAL button to change the selected number.



Notice

All digits can be scrolled between 0 and 9 except first. It can only be scrolled from 0 to 1 or from 1 to 0.

- 3 Press the RESET button to advance to the next number in scale factor.
- 4 Repeat steps 2 and 3 for all five digits in scale factor.

Save changes

- 1 Push and hold at the same time the TOTAL and AUTO buttons.
- 2 The display will flash 3 times and go blank.
- 3 Press the RESET button and the display will turn back on.

Verify changes

- 1 Verify unit of measure is correct.
- 2 Push and hold the TOTAL button and AUTO button together, 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 re calibration is to batch fluids with different viscosities. If the fluid has a lower viscosity, more fluid can slip past the meter gears without being detected. Changing the scale factor adjusts the meter to compensate for the loss.

To view the current scale factor
Press and hold the TOTAL button and the AUTO button at the same time.

For an approximate scale factor for different viscosities, refer to diagram.



Notice

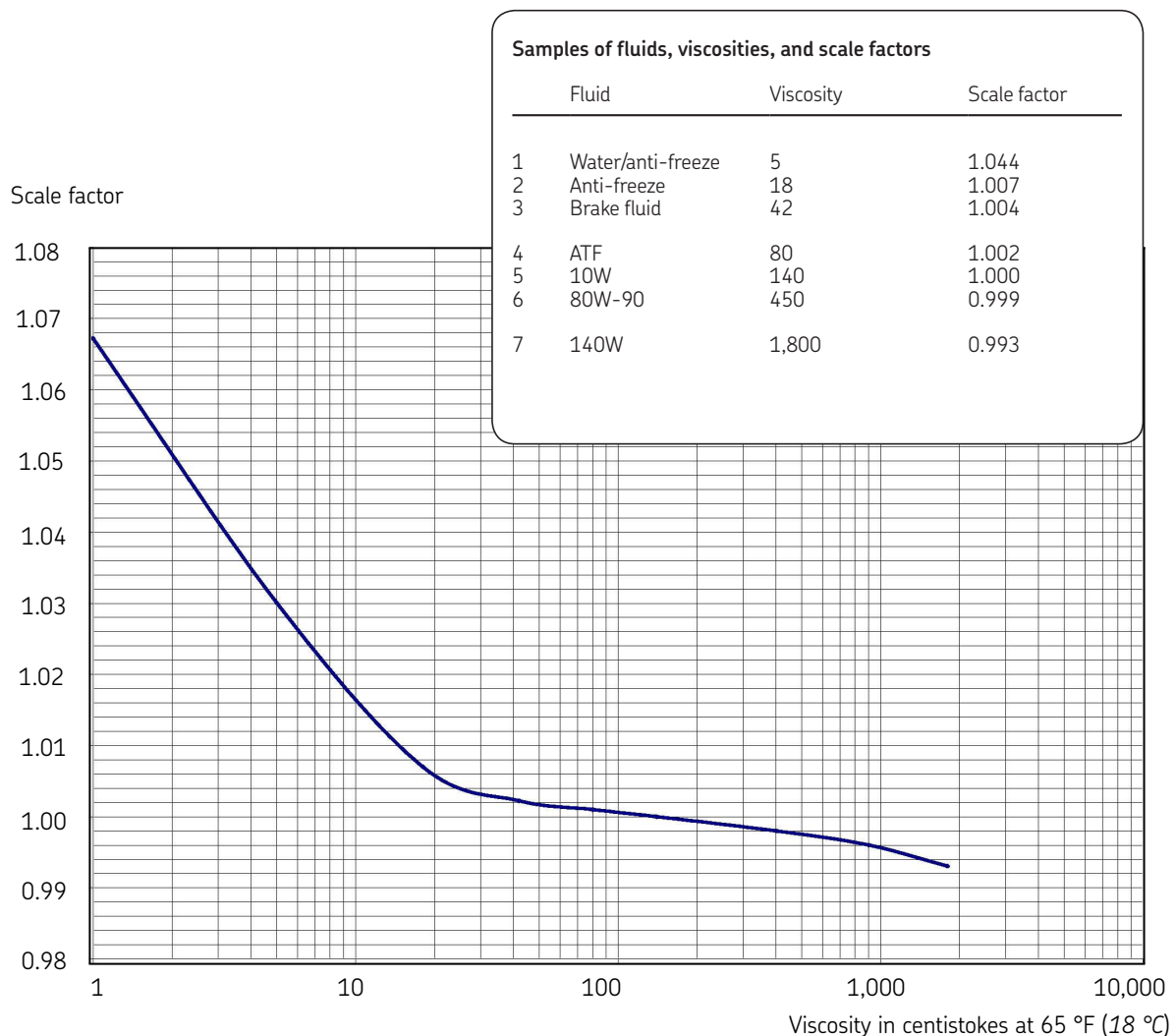
Original scale factor of meter was written on trigger when calibrated at factory and may have been revised after field installation. Use scale factor showing on display, not on trigger. Changing scale factor will change accuracy of meter, potentially causing it to overfill or under fill, causing a potential mechanical breakdown.

Absolute scale factor test

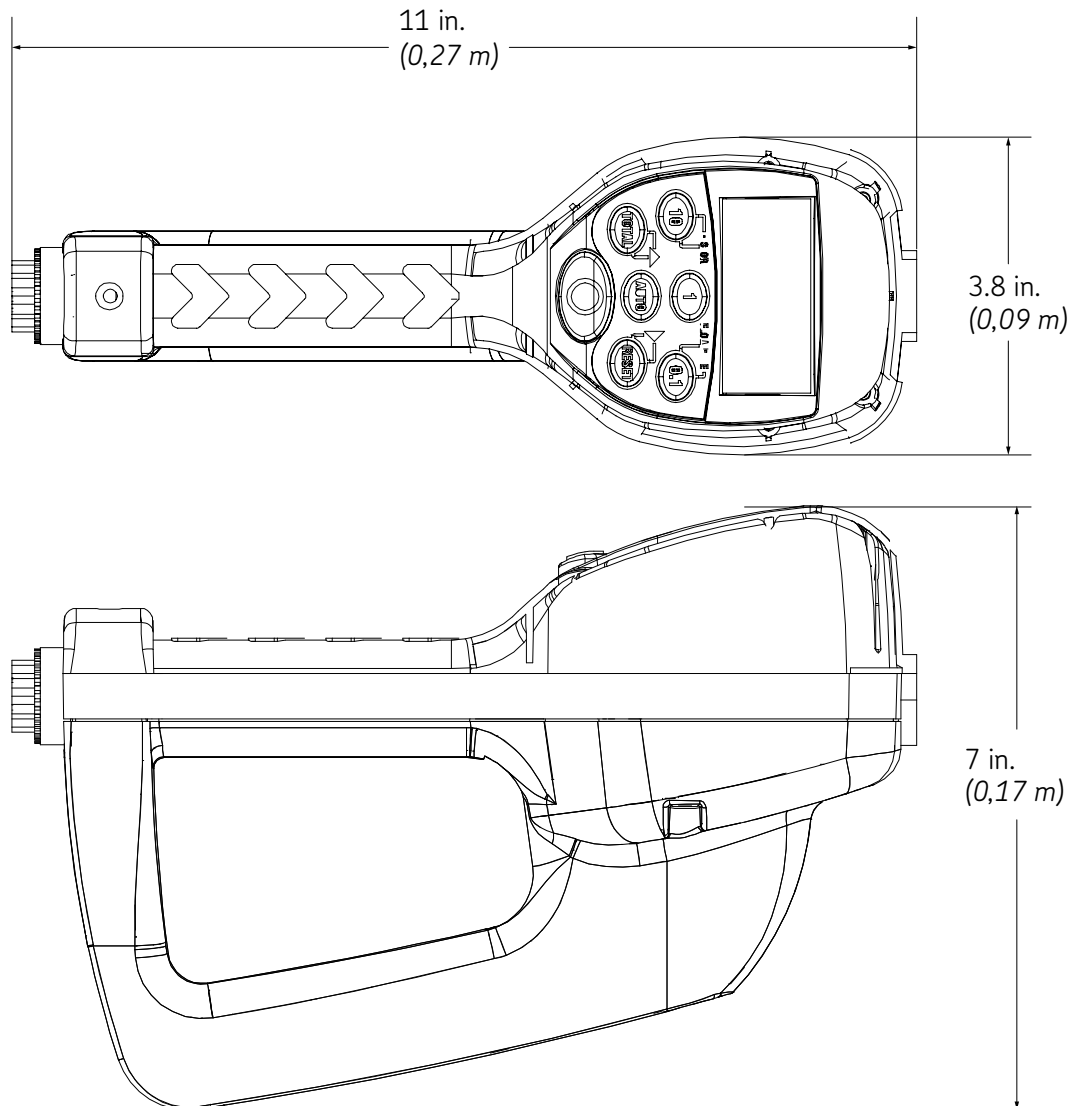
- 1 Run a measured amount of fluid through the meter.
- 2 If the meter delivers 4.20 qt. (3,9 l) and the display shows only 4.00 qt. (3,7 l) then the scale factor needs to be adjusted.
- 3 Divide what the meter delivered 4.20 qt. (3,9 l) by what the display shows 4.00 qt. (3,7 l). You get an error factor of 1.05.
- 4 The existing scale factor is 1.0123, as shown in **diagram 1**. To calculate a new factor: $1.0123 \text{ (existing scale factor)} \times 1.05 \text{ (error factor)} = 1.0629 \text{ (new scale factor)}$.
- 5 Enter that number as described in the change scale factor section of this manual.

Diagram 1

Chart of approximate scale factors for fluids of different viscosity



Dimensions



Specifications

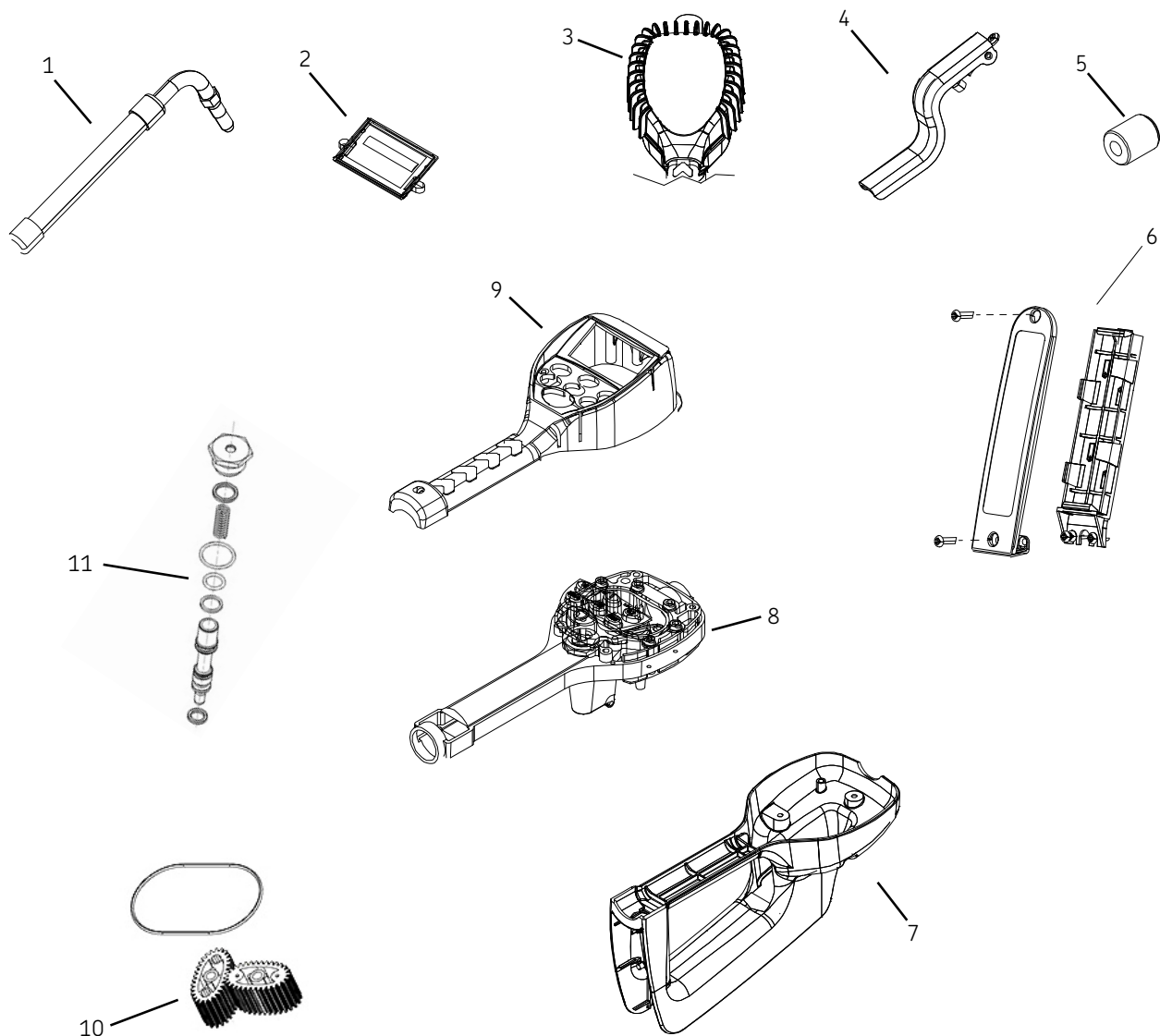
Maximum flow	10 gal./min. (38 l/min.)
Minimum flow	0.25 gal./min. (1 l/min.)
Operating pressure (maximum)	1,000 psi (69 bar)
Operating pressure (minimum)	5 psi (0,35 bar)
Operating temperature (maximum)	120 °F (50 °C)
Operating temperature (minimum)	20 °F (-5 °C)
Accuracy – general	± 0.5%
Accuracy – antifreeze	± 1.5%
5 digit LCD display, 0.39 in. (10 mm) x 0.19 in. (5 mm)	Quarts, pints, gallons, liters
Inlet and outlet connections	1/2 in. NPT (1/2 in. BSPP)
Compatible fluids	Anti-freeze (ethylene glycol, solution, brake fluid, windshield washer solution)

⚠ DANGER

Do not use unit with methanol based windshield washer fluid or other flammable liquids.

Failure to comply may result in serious injury and/or death.

Service parts



Service parts

Item no.	Description	Part number
1	Nozzle	273862
2	Display assembly	274610
3	Rubber boot	274609
4	Trigger	272378
5	Solenoid	276319
6	Battery holder assembly	274632
7	Bottom case	272384
8	Meter body	Not available
9	Register assembly	274631
10	Gear service kit with o-ring	273059
11	Valve assembly	273061
Not shown	Swivel, NPT AFLAS	273411

Troubleshooting

Symptom	Possible cause	Remedy
Battery Icon is displayed, Display blank.	Batteries are low	Replace batteries
	Meter asleep.	Push reset button.
	Loose battery connection.	Remove battery pack and check battery connection and push reset button
Meter does not latch for batching.	Batteries dead.	Replace batteries and push reset button
	Meter not in AUTO mode.	Press AUTO button and program batch size
	Meter not reset after prior batch.	Press RESET button
	Low batteries.	Check for battery icon, replace batteries and push RESET button
Slow or no fluid flow.	Filter is clogged.	Clean or replace the filter in the swivel nut
	Pump pressure is low.	Turn up the pump pressure
	Foreign material is jamming meter.	Contact your local distributor for repair
Meter inaccurate.	Scale factor not correct for fluid.	Enter program mode, check and reset program factor

WARNING

Do not repair or inspect meter while pressurized. Do not operate meter with damaged valves, controls or pumps.

Failure to comply may result in serious injury or death.

Lincoln industrial standard warranty

Standard limited warranty

Lincoln warrants the equipment manufactured and supplied by Lincoln to be free from defects in material and workmanship for a period of one (1) year following the date of purchase, excluding there from any special, extended, or limited warranty published by Lincoln. If equipment is determined to be defective during this warranty period, it will be repaired or replaced, within Lincoln's sole discretion, without charge.

This warranty is conditioned upon the determination of a Lincoln authorized representative that the equipment is defective. To obtain repair or replacement, you must ship the equipment, transportation charges prepaid, with proof of purchase to a Lincoln Authorized Warranty and Service Center within the warranty period.

This warranty is extended to the original retail purchaser only. This warranty does not apply to equipment damaged from accident, overload, abuse, misuse, negligence, faulty installation or abrasive or corrosive material, equipment that has been altered, or equipment repaired by anyone not authorized by Lincoln. This warranty applies only to equipment installed, operated and maintained in strict accordance with the written specifications and recommendations provided by Lincoln or its authorized field personnel.

This warranty is exclusive and is in lieu of any other warranties, express or implied, including, but not limited to, the warranty of merchantability or warranty of fitness for a particular purpose. Warranty on items sold by Lincoln, but not manufactured by Lincoln are subject to the warranty consideration, if any, of their manufacturer (such as hoses, hydraulic and electric motors, electrical controllers, etc.) Assistance in making such warranty claims can be offered as required.

In no event shall Lincoln be liable for incidental or consequential damages. Lincoln's liability for any claim for loss or damages arising out of the sale, resale or use of any Lincoln equipment shall in no event exceed the purchase price. Some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages, therefore the above limitation or exclusion may not apply to you.

This warranty gives you specific legal rights. You may also have other rights that vary by jurisdiction.

Customers not located in the Western Hemisphere or East Asia: Please contact Lincoln GmbH and Co. Kg, Walldorf, Germany, for your warranty rights.

Special limited warranties

Special limited 2 year warranty SL-V series, single injectors – 85772, 85782, and replacement injectors – 85771, 85781

Lincoln warrants the SL-V Injector series to be free from defects in material and workmanship for two (2) years following the date of purchase. If an injector model (single or replacement) is determined to be defective by Lincoln, in its sole discretion, during this warranty period, it will be repaired or replaced, at Lincoln's discretion, without charge.

Special limited 5 year warranty series 20, 25, 40 bare pumps, pmv bare pumps, heavy duty and 94000 series bare reels

Lincoln warrants series 20, 25, 40 bare pumps, PMV bare pumps, heavy duty (82206), mini bench (81133, 81323), and all 94000 LFR series (single arm and dual arm) bare reels to be free from defects in material and workmanship for five (5) years following the date of purchase. If equipment is determined by Lincoln, in its sole discretion, to be defective during the first year of the warranty period, it will be repaired or replaced at Lincoln's discretion, without charge. In years two (2) and three (3), the warranty on this equipment is limited to repair with Lincoln paying parts and labor only. In years four (4) and five (5), the warranty on this equipment is limited to repair with Lincoln paying for parts only.

Special limited 5 year warranty limited oil meters, limited fluid control valves, aod (air-operated diaphragm pumps)

Lincoln warrants the 712 series control valves, 912 series lube meters, electronic lube meters (980, 981, 982 series), our universal inline digital meters (812/813 series), and our AOD pump offering to be free from defects in material and workmanship for five (5) years following the date of purchase. If either is determined to be defective by Lincoln, in its sole discretion, during the warranty period, they will be repaired or replaced, at Lincoln's discretion, without charge.

Special DEF (diesel exhaust fluid) limited warranty

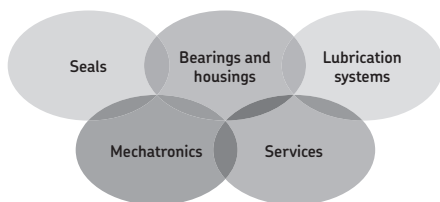
DEF products are warranted to be free from defects in material and workmanship for a period of one (1) year following the date of purchase. The following exceptions to the standard warranty period are in effect:

- **85700-30/85700-50 DEF hose reels (bare reel only),** 277251/277252 AC DEF pumps, and 277256 and 277257 DEF meters are warranted for two (2) years from date of purchase.
- **85623 DEF AOD (air operated diaphragm) pumps** are covered under the standard five (5) year AOD pump warranty.

If either is determined to be defective by Lincoln, in its sole discretion, during the warranty period, they will be repaired or replaced, at Lincoln's discretion, without charge.

Lincoln Industrial contact information

To find Lincoln Industrial's nearest service center call the following number; Customer service 314-679-4200 (international number 01-314-679-4200) or you may also use our website www.lincolnindustrial.com



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Combining products, people, and application-specific knowledge, SKF delivers innovative solutions to equipment manufacturers and production facilities in every major industry worldwide. Having expertise in multiple competence areas supports SKF Life Cycle Management, a proven approach to improving equipment reliability, optimizing operational and energy efficiency and reducing total cost of ownership.

These competence areas include bearings and units, seals, lubrication systems, mechatronics, and a wide range of services, from 3-D computer modelling to cloud-based condition monitoring and asset management services.

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