



Service Guide

3630
3630-A
3631
3632

Stationary Electronic Meter

Description

Caution

Do not operate these meters with an anti-freeze and water mixture.

The meter models included in the 3630 series are designed to measure quantities of a variety of fluids. These meters dispense motor oils (SAE 5-50), gear oils (SAE 80-240), and automatic-transmission fluid.

The meter is totally electronic except for the metering mechanism. The electronic register module contains a microprocessor board that is powered by a lithium battery.

The meter can be programmed to register in either gallons, quarts, pints, or liters and totalizes in gallons or liters. See **Figure 1**.

A 5-digit liquid-crystal display shows the amount of fluid dispensed. For the current amount, the register unit displays to the second decimal place. The total amount displays the register unit as a whole number (a maximum of 99,999 with no decimal points).

Operation

Fluid enters the inlet port (either end of the meter) and passes through the metering chamber. The force of the fluid causes the internal gear assembly to rotate. Each full rotation of the gear assembly displaces a given volume of fluid.

One gear in the assembly contains two magnets; one at each end of the gear. See

Specifications

Inlet and Outlet Connections	Min. Operating Pressure		Max. Operating Pressure		Min. Operating Temperature		Max. Operating Temperature		Accuracy	Weight	
	psi	Bars	psi	Bars	° F	° C	° F	° C		lbs	kg
1/2 " NPTF (f)	5	0.35	1500	103	-10	-23	110	43	± 0.5 %	2.5	1.14

Table 1 Stationary Electronic Meter - Model 3630 Series Specifications

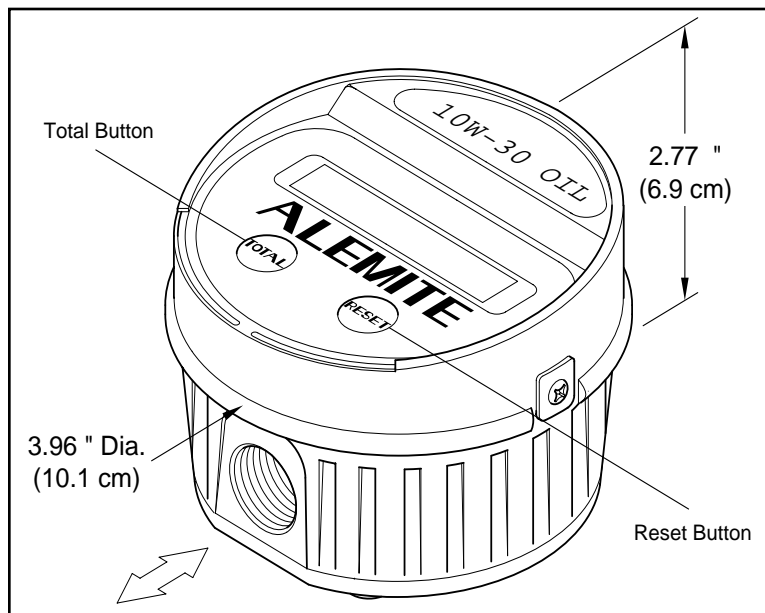


Figure 1 Stationary Electronic Meter - Model 3630 Series

Figure 2. These magnets activate a reed switch in the register module which provide a signal to the microprocessor.

Meter Buttons

Depress the **Reset** button to reset the current display to zero. Check the total amount of fluid dispensed by depressing the **Total** button. Refer to **Figure 1** for register units displayed.

Fluid Type Labels

A set of 12 vinyl labels depicting various fluids is included.

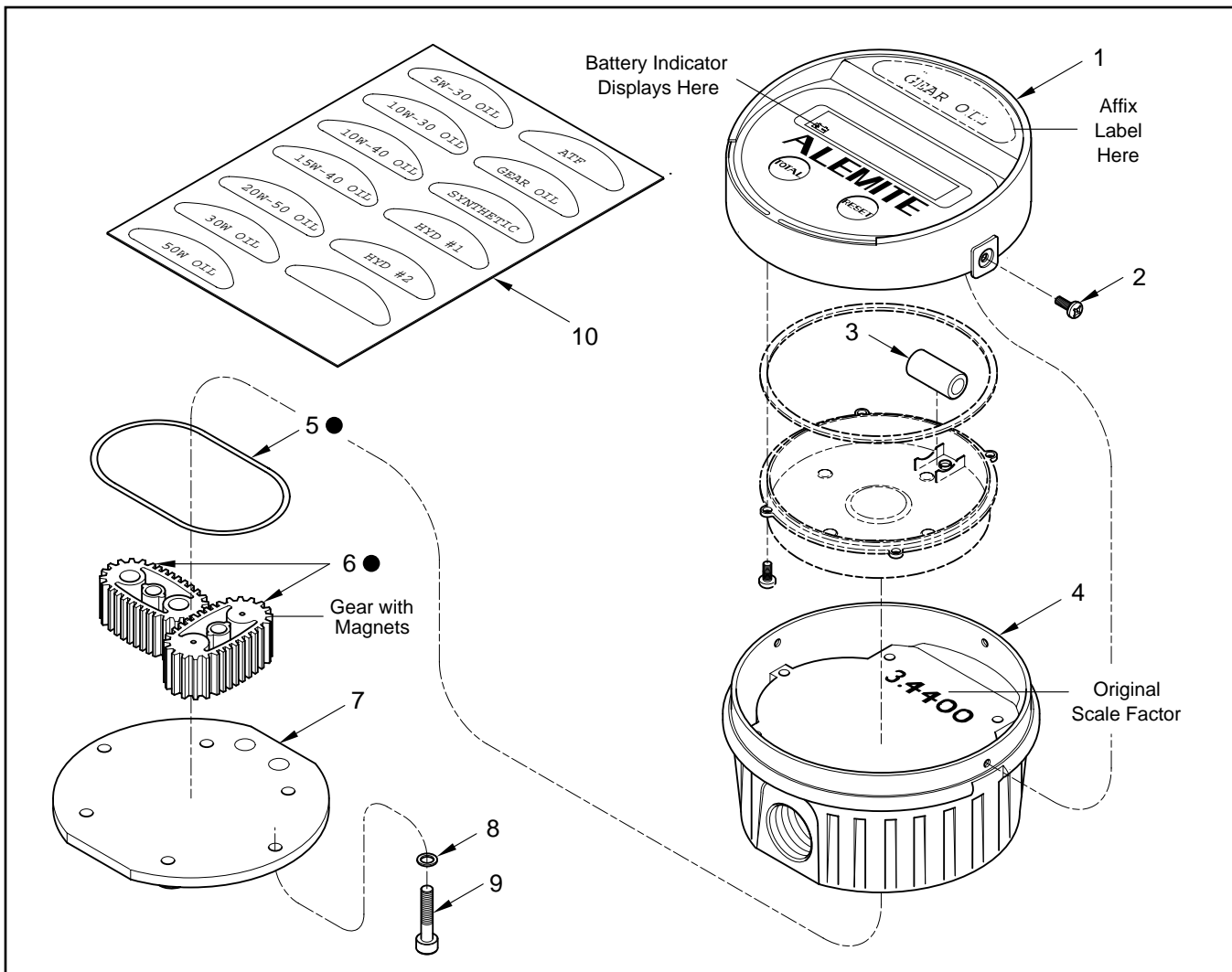
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SER 3630
Revision (2-97)



Item No.	Part No.	Description	Qty	Notes	Numeric Order Part # (Item #)
1	393307-174	Module Assembly, Register (Programmed in Liters)	1		(6)
2	393307-176	Screw	3		339088 (10)
3	393307-177	Battery, Lithium, 1/2 AA, (3 Volt or 3.6 Volt)*	1		393307-174 (1)
4	393307-178	Housing Assembly	1		393307-176 (2)
5	393307-183	O-Ring	1	●	393307-177 (3)
6		Gear Assembly (Includes both gears)	1	●	393307-178 (4)
7	393307-179	Cover, Housing	1		393307-179 (7)
8		Washer, Plain	6		393307-180 (8)
9		Screw	6		393307-181 (9)
10	339088	Label, Fluid Type	1		393307-183 (5)

Legend:
 Part numbers left blank (or in *italics*) are not serviced separately
 ● designates a repair kit item
 * either of the above listed voltage batteries may be used. Radio Shack part number 23-026 is a 3.6 Volt 1/2 AA lithium battery.

Repair Kit

Part No.	Kit Symbol	Description
393307-175	●	Kit, Gear Repair (Includes both Gears and O-Ring)

Figure 2 Electronic Meter - Models 3630 Series- Exploded View

Meter Programming

NOTE: Refer to **Figure 2** for component identification on the following procedures.

Change Unit of Measure

***IMPORTANT:** Changing the unit of measure resets the totalizer to zero.*

1. Remove Screws (2) that secure Register Module (1) to Housing (4).
 - Separate the Register Module from the Housing.
2. Press and hold the area on the back of the Register Module marked **Press Here to Program** for 5 seconds. See **Figure 3**.
 - Once released the display flashes a unit of measure.

NOTE: The number in the display is the scale factor.

3. Press the **Reset** button on the face of the Register Module.

The unit of measure will cycle from Gallons to Liters to Pints to Quarts each time the button is pressed.

Once the required unit displays:

4. Press and hold the area marked **Press Here to Program** on the bottom of the Register Module for 5 seconds once again.

Once released the display flashes several times, locks in the program and then goes blank. The meter will now register in the unit set.

NOTE: After programming, press either the **Reset** or the **Total** button to reactivate the display.

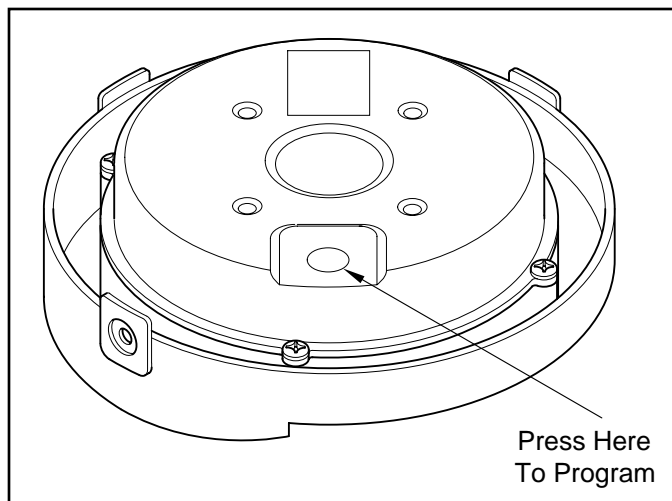


Figure 3 Program Area on Register Module - Bottom View

5. Position the Register Module onto the Housing.
6. Install the Screws that secure the Register Module to the Housing.
 - Do not overtighten.

Recalibration

Variables that cause a meter to require recalibration are:

- fluid viscosity (grade)
- fluid flow rate
- back-pressure

Scale Factor Calculation

To determine the existing scale factor* programmed in the register module:

1. Depress and hold the **Total** button then depress the **Reset** button. Record the value.

NOTE: If the value 1.0000 displays, the battery may have been replaced. This is the default value.

2. Dispense any amount of fluid greater than 1 gallon (3.8 liters) into an appropriate-sized graduated beaker.
 - Dispense the fluid at the normal flow rate.
3. Divide the value of the amount dispensed by the value displayed on the meter. Multiply this product by the existing scale factor. The product is the new scale factor.

EXAMPLE: Exactly 4 quarts were dispensed into the beaker and the meter registered 4.16 quarts. If the existing scale factor is 3.4627, enter a new scale factor of 3.3294.

$$(4 \div 4.16 \times 3.4627 = 3.3294).$$

* The scale factor is a value that the meter uses to calculate the amount of fluid measured.

Change Existing Scale Factor

1. Remove Screws (2) that secure Register Module (1) to Housing (4).
 - Separate the Register Module from the Housing.
2. Press and hold the area on the back of the Register Module marked **Press Here to Program** for 5 seconds. See **Figure 11**.
 - Once released the display flashes a unit of measure.

NOTE: The number in the display is the scale factor.

3. Press the **Total** button on the face of the Register Module.

The digit farthest to the left begins to flash. Pressing the **Total** button again causes the adjacent digit to flash. When the digit to be changed flashes:

4. Press the **Reset** button on the face of the Register Module.

The value of the flashing digit advances each time the **Reset** button is pressed. Once the required value displays:

5. Repeat steps 3 and 4 for any additional digits that require a different value.
6. Press and hold the area marked **Press Here to Program** on the bottom of the Register Module until the display flashes.

After the display flashes several times, it goes blank. The meter will now register using the scale factor set.

NOTE: After programming, press either the **Reset** or the **Total** button to reactivate the display.

Maintenance

Remove and Replace

NOTE: These procedures address the most common repair made to the meter. Refer to **Figure 2** for component identification.

For information on the overhaul of the meter, refer to the section entitled **Overhaul**.

IMPORTANT: Prior to performing any maintenance procedure, the following safety precautions must be observed. Personal injury may occur.



WARNING

Do not use halogenated hydrocarbon solvents such as methylene chloride or 1,1,1-trichloroethane in this meter. An explosion can result within an enclosed device capable of containing pressure when aluminum and/or zinc-plated parts in the meter come in contact with halogenated hydrocarbon solvents.

Release all pressure within the system prior to performing any overhaul procedure.

- **Into an appropriate container, operate the control valve to discharge remaining pressure within the system.**

Never point a control valve at any portion of your body or another person. Accidental discharge of pressure and/or material can result in personal injury.

Read each step of the instructions carefully. Make sure a proper understanding is achieved before proceeding.

Battery

IMPORTANT: Changing the Battery resets the:

- *totalizer to zero*
- *units of measure to liters*
- *scale factor to 1.0000*

*Always record the existing scale factor programmed in the register module before battery removal. To display the existing scale factor, depress and hold the **Total** button then depress the **Reset** button.*

Should the battery indicator appear on the display:

1. Remove Screws (2) that secure Register Module (1) to Housing (4).
 - Separate the Register Module from the Housing.
2. Position the Register Module face downward. See **Figure 3**.
3. Remove the Screws that secure the cover to the Register Module.
 - Remove the cover.

- Remove Battery (3) from the circuit board.



WARNING

Recycle or dispose the used battery properly. Do not burn or puncture the battery. Toxic materials may be emitted which can cause personal injury.

CAUTION

Avoid touching the flat surfaces of the new battery. Skin oils can cause battery deterioration. Clean any suspect battery with alcohol prior to installation.

- Install the new Battery.
 - Make sure the positive terminal on the Battery coincides with the positive indicator mark on the circuit board.

CAUTION

Position the gasket evenly over the entire circumference of the cover. Register Module may leak.

- Install the gasket onto the cover.
- Install the cover assembly on the Register Module.
 - Make sure the area marked **Press Here to Program** covers the switch on the circuit board.
 - Make sure the gasket has not moved.
- Install the Screws that secure the cover to the Register Module.
 - Do not overtighten.
- Reset the scale factor as required.
 - Refer to the section entitled **Change Existing Scale Factor**.
- Change the unit of measure as required.
 - Refer to the section entitled **Change Unit of Measure**.
- Position the Register Module onto the Housing.
- Install the Screws that secure the Register Module to the Housing.
 - Do not overtighten.

Overhaul

NOTE: Refer to **Figure 2** for component identification on all overhaul procedures.

Disassembly

Register Module

- Remove Screws (2) that secure Register Module (1) to Housing (4).
 - Separate the Register Module from the Housing.

NOTE: The Register Module is serviced as an assembly that includes a Battery. No further breakdown of the assembly is necessary.

Metering Gears

- Remove Screws (9) and Washers (8) that secure Housing Cover (7) to Housing (4).
 - Separate the Housing Cover from the Housing.
- Remove O-Ring (5) from the oval groove in the Housing.
- Remove Gears (6) from the Housing.

Clean and Inspect

NOTE: Use a repair kit for replacement parts. Make sure all the components are included in the kit before discarding used parts.

- Clean all metal parts in cleaning solvent. The solvent should be environmentally safe.
- Inspect all parts for wear and/or damage.
 - Replace as necessary.
- Closely inspect the mating surfaces of Cover (7) and Housing (4) for any imperfections. Ensure a smooth and clean contact is obtained when assembled.

Assembly

Metering Gears

CAUTION

Position the Gear with the magnets correctly in the Housing. Meter will not function properly.

1. Install Gear (6) with the magnets into Housing (4).
 - Make sure to locate the Gear properly in the Housing. See **Figure 4**.
2. Install the additional Gear into the Housing.
 - Make sure this Gear engages the magnet Gear perpendicularly.

IMPORTANT: Rotate the Gear assembly by hand. Make sure the gear teeth are properly engaged.
3. Install and seat O-Ring (5) into the oval groove in the Housing.
4. Position Housing Cover (7) onto the Housing.
5. Install Washers (8) and Screws (9) that secure the Housing Cover to the Housing.
 - Tighten the Screws in a crisscross pattern to 90 inch pounds (10.2 Nm).

Register Module

6. Position Register Module (1) onto the Housing.
7. Install Screws (2) that secure the Register Module to the Housing.
 - Do not overtighten.

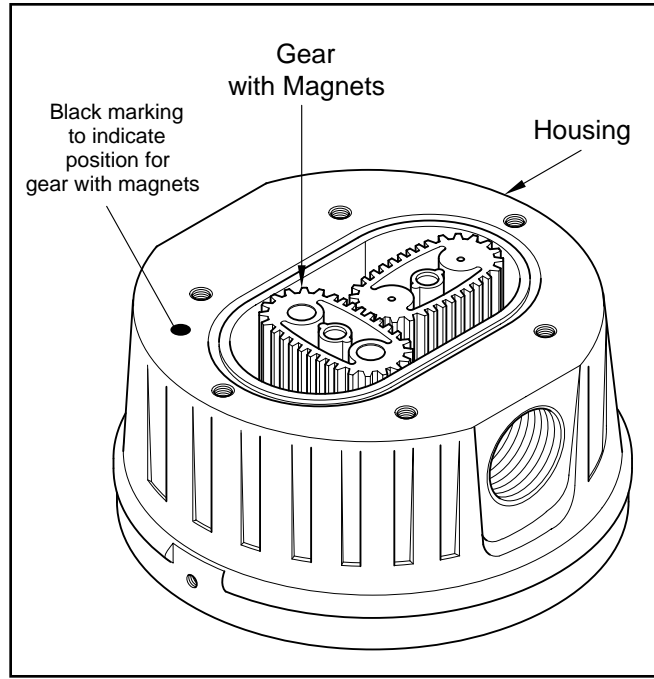


Figure 4 Housing Assembly with Gears- Bottom View

Troubleshooting Chart

Meter Indications	Possible Problems	Solution
Battery indicator appears on display	<ol style="list-style-type: none"> 1. Weak Battery (3) 2. Dirty contacts 	<ol style="list-style-type: none"> 1. Replace Battery (3) 2. Clean Battery (3) and terminals
Display blank	<ol style="list-style-type: none"> 1. Dead Battery (3) 2. Battery (3) installed incorrectly 3. Dirty contacts 	<ol style="list-style-type: none"> 1. Replace Battery (3) 2. Make sure the positive terminal on Battery (3) coincides with the positive indicator mark on the circuit board. 3. Clean Battery (3) and terminals
Meter is not accurate	<ol style="list-style-type: none"> 1. Incorrect scale factor 2. Flow rate above maximum 3. Flow rate below minimum 	<ol style="list-style-type: none"> 1. Change scale factor 2. Decrease flow rate 3. Increase flow rate
Reduced or zero flow	<ol style="list-style-type: none"> 1. Gears (6) clogged 2. Clogged system 	<ol style="list-style-type: none"> 1. Overhaul metering gear cavity 2. Clean system filter
Meter does not count and the flow rate is normal	<ol style="list-style-type: none"> 1. Gears (6) installed incorrectly 2. Register Module (1) defective 	<ol style="list-style-type: none"> 1. Make sure to locate the gears properly in the Housing 2. Replace Register Module (1)

Changes Since Last Printing

Changed Procedure