Battery Powered Electromagnetic Flow Meter

Quick Start Installation Guide

30124-79, Rev. 1.2
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About This Quick Start Guide

This Quick Start Guide is a supplement to the Installation, Operation and Maintenance manual supplied with this meter. It is intended to be a quick reference for the basic installation and reading of the Mc Mag2000. For more detailed information concerning the external connections, external power, or pulse output, please refer to the meter manual (30124-77 Mc Mag2000 IOM manual) available at www.mccrometer.com).

• Any person installing, inspecting, or maintaining a McCrometer flowmeter should have a working understanding of piping configurations and systems under pressure.
• Before adjusting or removing any meter, be certain the system has depressurized completely.
• Be careful when lifting meters. Meters can cause serious injury if lifted incorrectly or dropped.
Flow meters are velocity sensing devices and are vulnerable to certain upstream disturbances. Because of this, meters need certain lengths of straight pipe before and after the meter. These distances relate to the diameter of the pipe used. Obstructions can include elbows, valves, pumps, and changes in pipe diameter. The uneven flow created by these obstructions can vary with each system.

Both upstream and downstream distances are measured from the center of the saddle as shown below. In a typical installation to achieve ±2% accuracy the Mc Mag\textsuperscript{2000} flow meter should be installed a minimum of five diameters upstream from most flow disturbers and two diameters downstream of the meter. (Figure 2)

Proper meter installation is the first step to ensure excellent meter performance. Follow these instructions closely. Consult an authorized service representative or the Factory for any circumstances encountered which are not covered in this guide.

All McCrometer products are tested and inspected during manufacture and prior to shipping. An inspection should be performed at the time of unpacking to detect any damage that might have occurred during shipment.

- All magnetic flowmeters are calibrated for a full pipeline only; if less, the flowmeter will over register the flow.
- Although a minimum line pressure is not necessary for an accurate measurement, a full pipe is necessary.
- With the meter installed, check the rate-of-flow indicator. It should be stable to the point that it can be easily read. Some indicator movement is normal due to variations in flow. Erratic movement of the indicator is normally caused by flow variations and the system should be checked. Drastic variations in flow can decrease meter accuracy. If you suspect a problem with the meter, please contact your local McCrometer representative.

### Flow Direction

It is very important to install the flow meter relative to the flow of the water. The sensor must face the flow direction in order for it to make proper measurements. (Figure 1)
Basic Installation Steps

The Mc Mag\textsuperscript{2000} is a saddle type meter. It may be installed directly onto an existing pipe. Follow these steps for a new flow meter installation.

1. Cut or hole-saw a round hole minimum 3” in diameter in the pipe and remove all burrs, slag, and rough edges from the inside and outside of the cutout section.

2. Loosen and remove the nuts and washers from the straps. Remove the straps from the saddle.

3. Apply lubrication to the gasket and inner diameter of U-bolts with MolyKote lubricant or equivalent.

4. Place saddle with gasket in place over the cut out.

5. Place U-bolts underneath the pipe and through the saddle clips.

6. Place the provided washers and nuts on the U-bolts that have been installed through the saddle clips.

7. Start tightening down the nuts evenly in a figure 8 pattern.

7a. Tighten the nuts to \textbf{40 ft. lbs.} evenly using a figure 8 pattern.

7b. Tighten the nuts to \textbf{60 ft. lbs.} evenly using a figure 8 pattern.

7c. Tighten the nuts to \textbf{80 ft. lbs.} evenly using a figure 8 pattern.

8. Go back around and loosen all of the nuts. Do not back the nuts completely off of the U-bolts. The goal is to release force and tension off of the saddle and the gasket.

9. Repeat steps 7a through 7c exactly as described. Any step that is skipped may result in an improper seal.

10. Apply pressure/turn on pump.

11. Verify the saddle is not leaking water. If it is, repeat steps 5 through 7 until the saddle has sealed.

NOTE

The Mc Mag\textsuperscript{2000} can be used to replace existing 4” to 12” Mc Propeller saddle meters. The meter CANNOT be used to replace a Water Specialties bolt on saddle meter.

Installations Replacing Existing Saddle Meters

The Mc Mag\textsuperscript{2000} has been designed for easy replacement in the field for Mc Propeller flow meters. When the existing saddle meter has been removed, follow the basic installation instructions above. The replacement flow meter will be fully assembled and ready to install.

NOTE

The Mc Mag\textsuperscript{2000} should not be connected to any earth ground. Connecting to an earth ground may adversely affect meter performance.
Mc Propeller-to-Mc Mag\textsuperscript{2000} Conversion Kit

Check the parts received against the parts list at right and Figure 3. Contact the factory to report any discrepancies.

### Retrofitting an Existing Mc Propeller Flow Meter

Mc Propeller 4” to 12” saddle flow meters can be retrofit to a Mc Mag\textsuperscript{2000} flow meter. When the existing saddle meter has been removed, follow the instructions below for converting and reinstalling the flow meter.

Refer to Figure 3 (above) and Figure 4 (following page) for the conversion procedure.

1. Remove the flow meter that will be converted to an Mc Mag\textsuperscript{2000}.
2. Remove all parts from the saddle. Keep the saddle and the U bolts. All other parts will not be used.

3. Connect the base plate (#3) to the saddle with the bushing, two o-rings, and gasket (items #5, 6, 7).
4. Place the O-ring (#2) on top of the base plate (#3) and feed the end of the converter cable through the ell.
5. Plug the cable into the sensor (#8).

The Mc Mag\textsuperscript{2000} flow meter reuses the saddle and U bolts from an existing flow meter. The register, canopy, base plate, propeller, and bearing housing are not used. You may wish to keep these components as replacement parts for other propeller flow meters you have.

### Conversion Kit

- **Converter Unit**: G2-CONV
- **O-Ring (243 Buna)**: 1-1551-38
- **Base Plate**: R0138-10
- **Screw 10-32 x 1.25” Long**: 10730
- **Bushing and O-Ring Assembly**
  - Bushing: R0155-00
  - O-Ring (021 Buna): 10273
  - O-Ring (121 Buna): 10274
- **Gasket**: 10023-00
- **O-Ring (024 Buna)**: 10110-10
- **Sensor**: EA540-00

**NOTE:**
During the retrofit procedure, make sure you insert all four screws when attaching the converter unit to the base plate. The converter will not be grounded if the grounding jumper is not connected with both screws. (See exploded view in Figure 3 and Figure 4.)
NOTE
Be careful when starting the threads not to cross-thread.
Hand-tighten only. Do not overtighten the sensor onto the ell! This may damage the sensor and the sealing surface.

6. Twist the sensor counter-clockwise 4-5 times and then screw the sensor onto the ell.
7. Twist any excess length of cable into the cup section of the base plate and secure it with screws (#4), ensuring the O-ring is properly seated in the groove in the bottom of the converter.
8. Install the saddle as described above.

Re-inserting the flow meter
9. Loosen and remove the nuts and washers from the straps. Remove the straps from the saddle.
10. Apply lubrication to the gasket and inner diameter of U-bolts with MolyKote lubricant or equivalent.
11. Place saddle with gasket in place over the cut out.
12. Place U-bolts underneath the pipe and through the saddle clips.
13. Place the provided washers and nuts on the U-bolts that have been installed through the saddle clips.
14. Start tightening down the nuts evenly in a figure 8 pattern.
   14a. Tighten the nuts to 40 ft. lbs. evenly using a figure 8 pattern.
   14b. Tighten the nuts to 60 ft. lbs. evenly using a figure 8 pattern.
   14c. Tighten the nuts to 80 ft. lbs. evenly using a figure 8 pattern.
15. Go back around and loosen all of the nuts. Do not back the nuts completely off of the U-bolts. The goal is to release force and tension off of the saddle and the gasket.
16. Repeat steps 14a through 14c exactly as described. Any step that is skipped may result in an improper seal.
17. Apply pressure/turn on pump.
18. Verify the saddle is not leaking water. If it is, repeat steps 15 through 17 until the saddle has sealed.
Operation

The Mc Mag\textsuperscript{2000} comes pre-configured from the Factory based on the installation parameters provided to McCrometer at the time of order. Other than activating the display, there is nothing required of the user for the basic operation of the flow meter.

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<tr>
<th>NOTE</th>
<th>IMPORTANT</th>
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<tbody>
<tr>
<td>To save battery life, always close the lid after reading the display. If the lid is kept open, the display will remain on, reducing battery life. If the lid is lost, contact the factory immediately for a replacement.</td>
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<th>Activating the Register Display</th>
<th>Display Descriptions and Symbols</th>
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<td>The display is activated when the lid is opened. (Figure 5) The display will remain active for 30 seconds. The screen will automatically deactivate after 60 seconds.</td>
<td>See Figure 6 below.</td>
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![Figure 5. Lift lid to activate the display](image1)

![Figure 6. Interface Screen](image2)