Battery Powered Electromagnetic Flow Meter

Quick Start Installation Guide

30121-64, Rev. 1.5
November 5, 2018

WARNING!
Incorrect installation or removal of meters can result in serious injury or death. Read the instructions in this guide on the proper procedures carefully.

- 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.

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 Mag 3000. For more detailed information concerning the external connections, external power, pulse output, or data logger, please refer to the meter manual (30120-85 Mc Mag 3000 IOM) or the data logger manual (30121-87 McLogger IOM) downloadable from www.mccrometer.com).
Note Regarding Packaging
When you unpack the Mc Mag3000, you will find a red plastic cap over the front push button. This can be discarded with the rest of the packing materials.

General Installation Considerations
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 is designed at an angle to shed debris in the flow and for other performance enhancements.

Pipe Run Requirements
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.

- Upstream Requirement: Mc Mag3000 meters should be installed a minimum of three diameters away from most obstructions.
- Downstream Requirement: The downstream run should be one diameter of straight pipe length after the meter.

Both upstream and downstream distances are measured from the center of the saddle as shown below.

Flow Meter Installation
The Mc Mag3000 is a saddle type meter. It may be installed directly onto an existing pipe, or may be installed into an optional spool piece to be added to a system.

WARNING!
Insure that the line is depressurized before beginning installation!

New Installations
Saddle type meters offer simplicity of installation. A minimum round hole size of 3” should be cut into the top center of the pipe. The saddle meter is then installed as follows:

1. Loosen and remove the nuts and washers from the straps. Remove the straps from the saddle.
2. Cut or hole-saw the pipe and remove all burrs, slag, and rough edges from the inside and outside of the cutout section.
3. Place the meter assembly on the pipe with the flat gasket on the 4” models, and the “D” shaped ring gasket for larger meters in position on the bottom of the saddle. The saddle must be positioned so that the flat gasket or D-ring maintains contact with the surface of the pipe completely around the cutout opening.
4. Insert the meter probe through the hole and slide the meter forward (downstream) until the probe contacts the front edge of the pipe wall. Then slide the back away from the pipe wall 1/8” to 1/4” leaving the probe in a free state and not in contact with the pipe wall.
5. Install the straps from under the pipe and insert the threaded ends through the holes in the brackets on the side of the saddle.
6. For each strap bolt, replace the washers and nuts.
7. Tighten each of the U-bolt nuts evenly.

**Operation**

The Mc Mag 3000 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.

### Activating The Display

For the purpose of conserving power the display remains blank until activated. To activate the screen, press and hold the activation button for two seconds and then let it go. The screen will automatically deactivate after 60 seconds.

**CAUTION:**

If the lid is broken off, contact the Factory for a lid replacement kit. In the meantime, set the lid on the meter in its proper position and use the boot to hold it in place.

### Converter Boot

The Mc Mag 3000 comes with a boot to help protect the meter.

**NOTE:**

It is HIGHLY recommended that the boot be utilized at all times when the meter is not being read. The boot adds protection to the meter and insures proper closure of the lid, insuring the maximum battery life.

The boot simply slips over the electronics enclosure. When installing the boot insure the corners of the boot fit snugly over the lip of the enclosure.

To remove the boot, grip two corners and pull them away from the lip of the enclosure and then pull upwards.

### Installations Replacing Existing Saddle Meters

The Mc Mag 3000 can be used to replace existing McCrometer saddle meters. The Mc Mag 3000 can be installed with Water Specialties bolt-on saddle meter cutout templates for 6” meters and 8”-20” meters, as well as with McPropeller bolt-on saddle meter cutout templates for 12”-16” OD pipe.

**NOTE:**

The meter CANNOT be installed with Water Specialties bolt-on saddle meter cutout templates for 4” meters.

**WARNING!**

WARNING: Customers are warned that the U-Bolt nuts are to be tightened evenly to approximately 30 foot pounds torque. This is sufficient to seal the saddle to the pipeline. Additional tightening may be required to seal the saddle on rough or irregular pipe (60 FOOT POUNDS MAXIMUM).

### Grounding

The Mc Mag 3000 is fitted with a grounding lug on the saddle for proper grounding. For typical installations the lug can be connected to an earth ground and/or the metal pipe in which it is installed. For electrically noisy installations connect the grounding lug to a dedicated, low impedance earth ground. Low impedance is 10 Ohms or less.

**NOTE:**

Insure that the meter probe is not in contact with the pipe wall when installed!

**IMPORTANT!**

5. Install the straps from under the pipe and insert the threaded ends through the holes in the brackets on the side of the saddle.
6. For each strap bolt, replace the washers and nuts.
7. Tighten each of the U-bolt nuts evenly.
Display Descriptions

Upon activating the display, the Mc Mag3000 automatically cycles through four display screens.

**Screen 1:**
The first screen display shows any active alarms. In the sample below, there is one alarm active for an empty pipe.

**Screen 2:**
The second screen display shows the battery life remaining for both battery packs and the flow totalizer. In the sample below, both battery packs are at 99% and total flow is 500 kilogallons.

**Screen 3:**
The third screen display shows the flow rate and the flow totalizer. In the sample below, flow rate is 15 gallons per minute and total flow is 500 kilogallons.

**Screen 4:**
The fourth screen display shows the flow rate and percent of full scale. In the sample below the flow rate is 15 GPM and the meter is running at 80% of full scale.

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### Alarm Messages

<table>
<thead>
<tr>
<th>ALARM MESSAGE</th>
<th>POTENTIAL CAUSE / CORRECTIVE ACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>B.TEMP.OUT R.</td>
<td>The measured board temperature is out of the allowed range. Ensure that the instrument is operating within the specified temperature conditions: -4° to 140°F (-20° to 60°C).</td>
</tr>
<tr>
<td>B1 LOW</td>
<td>The battery ‘B1’ powering the main board is exhausted. Replace the battery.</td>
</tr>
<tr>
<td>B2 LOW</td>
<td>The battery ‘B2’ powering the main board is exhausted. Replace the battery.</td>
</tr>
<tr>
<td>CALIBRATION ERR.</td>
<td>Contact Factory. This could be a damaged sensor or a noise issue. Check the ground connection.</td>
</tr>
<tr>
<td>CONFIG. ENTERED</td>
<td>The system detects an access to the configuration parameters. Check the data logger events log and take the appropriate action depending on your data protection policy.</td>
</tr>
<tr>
<td>EL.SIG.ERROR</td>
<td>The system detected an error condition on the measuring electrodes. Check the electrode surfaces, the grounding and the process condition.</td>
</tr>
<tr>
<td>EXCIT.ERROR</td>
<td>The system detected an error in the coil’s excitation circuit. Contact Factory.</td>
</tr>
<tr>
<td>F.SENSOR ERROR</td>
<td>The system detected one or more errors in the flow sensor. Contact Factory.</td>
</tr>
<tr>
<td>FLOW&gt;FS</td>
<td>The flow rate is higher than the set full scale value. Check the maximum full scale value and the process conditions.</td>
</tr>
<tr>
<td>MAX Q+</td>
<td>The positive flow rate is higher than the maximum threshold value set.</td>
</tr>
<tr>
<td>MIN Q+</td>
<td>The positive flow rate is lower than the minimum threshold value set.</td>
</tr>
<tr>
<td>NO ALARMS</td>
<td>The system is running with no problems.</td>
</tr>
<tr>
<td>P.EMPTY</td>
<td>The system detected an empty pipe alarm condition. Ensure pipe is full.</td>
</tr>
<tr>
<td>POWER SUPPLY OFF</td>
<td>The power coming from the external power supply went off. Check the power supply source and the relative cables.</td>
</tr>
<tr>
<td>PULS.1&gt;F.MAX</td>
<td>The pulse frequency at Output 1 is too high. Contact Factory.</td>
</tr>
<tr>
<td>PULS.2&gt;F.MAX</td>
<td>The pulse frequency at Output 2 is too high. Contact Factory.</td>
</tr>
<tr>
<td>SYSTEM RESTART</td>
<td>The system was restarted after a reset signal. If this message appears after an AUTO-TEST command, it is not an error indication, otherwise check all the connections, the batteries and the grounding.</td>
</tr>
<tr>
<td>SYSTEM STARTUP</td>
<td>The system was started.</td>
</tr>
</tbody>
</table>