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The WMX101 is a flanged electromagnetic flowmeter for use in 4", 6", 8", or 10" pipe in municipal or industrial water and wastewater applications where propeller meters have typically been used in the past. Because the WMX101 has no moving parts, and electrodes designed to discourage fouling, this magmeter performs well and requires much less frequent maintenance in applications where debris or sand would impede propeller meters. There is no rotor to stop turning or bearings to wear out. Minimal straight pipe requirements allow WMX101 meters to be used in piping configurations where there is little space between the meter and an elbow.

The WMX101 is externally powered with 12-24 Vdc. Rate and total indication is standard. Standard solid state pulse output allows connection to a telemetry system or a data logger. A pulse-to-analog converter can be added if a 4-20 mA signal is needed. A shielded (power/pulse output) cable with DIN connection is included with the meter. The display housing is fitted with tamper-evident features.

**SPECIFICATIONS**

| Pipe Sizes | 4", 6", 8", 10" |
| Flanges | ANSI 150 lb. drilling flanges |
| Pressure | 150 psi working pressure |
| Temperature Range | 10° F to 130° F |
| Accuracy | +/-1% at 100% to 10% of reading |
| Flow Range | +/-2% at 10% of reading to cut off |
| Min | 12 | 32 | 60 | 95 |
| Max | 500 | 1200 | 2200 | 3500 |
| Materials | Body: Welded steel, epoxy powder coated |
| | Liner: HDPE |
| | Electronics Housing: Diecast aluminum |
| | Electrodes: 316 stainless steel |
| Display | Rate | Total |
| Digits | 6 | 8 |
| Units* | Gallons/Minute, Gallons x 1000 |
| | Million Gallons/Day, Gallons x 1000 |
| | Liters/Second, Cubic Meters |
| | Liters/Second, Megaliters |
| | Cubic Feet/Minute, Cubic Feet |
| Power | 12-24 Vdc, 30 mA |
| Output Signal | Current sinking pulse, opto-isolated, 24 Vdc, 10 mA max |
| Empty Pipe Detection | Hardware/software, conductivity-based |
| Environmental | NEMA 4X |
INSTALLATION

Positoning the Meter. These are all-position meters, meaning that they can be installed horizontally, vertically, and in any radial position. If there is potentially a problem with sludge accumulation, vertical or horizontal with the register up may be preferred. See recommendations on pages 3 and 4.

Piping Conditions. As with most flow meters, the WMX101 requires some straight pipe before and/or after the meter for best accuracy. However, the tendency of electromagnetic meters to average the flow across the entire pipe allows for shorter straight pipe recommendations than most mechanical meters. Follow the guidelines on page 3 for the type of installation that best matches yours.

The WMX101 is designed with an empty pipe detection feature that is activated when one or more of the electrodes is exposed to air. Therefore, an installation in which the pipe is nearly but not completely full will give an erroneous reading of “empty pipe”. To avoid such reading errors, be sure to configure piping to ensure that the pipe is full, without air pockets or bubbles, when there is flow. See diagrams on page 4 for installation recommendations.

Flanges. The flanges on the WMX101 have standard ANSI 150 lb. drilling and will match up with any other ANSI 150 lb. flange.

ELECTRICAL CONNECTION

Electrical Connections. A current source of some kind at 12 to 24 Vdc must be connected to the meter. If needed for remote reading, logging or telemetry, the pulse output can also be connected. See the Connections diagram on page 5 for guidance. It shows the color coding of the pre-installed power/pulse output cable. If it is necessary to replace this cable, for instance to install a longer one, see the drawings for proper installation of the cable into the connector.

Electrical Noise Immunity. For best results, connect grounds and cable shielding as shown in the diagram on page 5, and install the included ferrite beads by snapping them onto the outside of the cable.

Caution: There are no connections inside the display. Breaking the seal wire will VOID WARRANTY.

Caution: These flow sensors are not recommended for installation downstream of a boiler feedwater pump where installation fault may expose the flow sensor to boiler pressure and temperature. Maximum recommended temperature is 130˚ F.
INSTALLATION

STRAIGHT PIPE RECOMMENDATIONS
(X = pipe diameter)

Reduced Pipe

Two Elbows In Plane

Two Elbows, Out Of Plane

Expanded Pipe

Propeller Meter

Swirling Flow
Partially Open
Butterfly Valve

Reduced Pipe

Two Elbows In Plane

Two Elbows, Out Of Plane

Expanded Pipe

Propeller Meter

Swirling Flow
Partially Open
Butterfly Valve
FULL PIPE RECOMMENDATIONS

Possible Problem:
Allows air pockets to form at sensor

Better Installation:
Keeps pipe full at sensor for accuracy

Possible Problem:
Post-valve cavitation can create air pocket

Better Installation:
Keeps pipe full at sensor for accuracy

Possible Problem:
Air can be trapped

Better Installation:
Allows air to bleed off
For optimum performance, ground both ends of the meter to adjacent metal pipe.

NOTE: Grounding wire must touch bare metal on both meter and pipe.

Connection when replacing cable:

- 3 (Red) Pair 1
- 2 (Black) Pair 1
- 1 (Red) (Black) Pair 2

WMX101 Connector Block

IMPORTANT: Note Pair 1 & Pair 2 printed on wires.

Operating Cable, 2 pair shielded

Ferrite Bead, Digi-Key p/n 240-2076-ND

.5 in. Maximum

Green ground wire, supplied

Reliable Earth Ground

Tie shield drain wires to ground wire

Pulse output

Signal (+) (Red) (Black)

Signal (-) (Red) (Black)

Power Supply

+12 to +24Vdc

Reliable Earth Ground

ELECTRICAL CONNECTIONS

STANDARD CONNECTION
**OPERATION and TROUBLESHOOTING**

**OPERATION**

Display. There are two lines to the display, one for flow rate and one for accumulated total. The units used are indicated on the display. **Units are pre-ordered and factory set, and can not be changed in the field.**

If the display indicates letters and digits, the meter has power and should be functioning normally. If there is no display (the display is blank) the meter is not powered.

**Caution:** There are no connections inside the display. Breaking the seal wire will **VOID WARRANTY.**

**Calibration.** The WMX101 is factory calibrated and should not require any form of field calibration.

**Empty Pipe Detection.** All magmeters require a method for determining that the pipe is empty, since in many cases an empty pipe may otherwise cause a false reading. This meter uses a software-based empty pipe detection method. It should immediately go to a zero reading if one or more electrodes is exposed.

**TROUBLESHOOTING**

<table>
<thead>
<tr>
<th>Problem</th>
<th>Probable Cause</th>
<th>Try...</th>
</tr>
</thead>
<tbody>
<tr>
<td>No pulse output</td>
<td>Unit not grounded</td>
<td>Connect to earth ground</td>
</tr>
<tr>
<td></td>
<td>Flow reversed</td>
<td>Note flow direction arrow, reverse direction to meter</td>
</tr>
<tr>
<td></td>
<td>Output connections reversed</td>
<td>Change output connections</td>
</tr>
<tr>
<td></td>
<td>Pipe not full</td>
<td>Check plumbing</td>
</tr>
<tr>
<td></td>
<td>Excessive electrical noise</td>
<td>Check for proper electrical wiring</td>
</tr>
<tr>
<td></td>
<td>No power</td>
<td>Check for power across power input terminals</td>
</tr>
<tr>
<td></td>
<td>Power reversed</td>
<td>Reverse connections</td>
</tr>
<tr>
<td></td>
<td>Fluid conductivity &lt;20 microSiemens/cm</td>
<td>Select another flow meter</td>
</tr>
<tr>
<td>Output pulses incorrect</td>
<td>Missing or incorrect ground wire</td>
<td>Check for proper ground</td>
</tr>
<tr>
<td></td>
<td>Empty pipe</td>
<td>Check for full pipe or install meter in the vertical position</td>
</tr>
<tr>
<td></td>
<td>Excessive electrical noise</td>
<td>Check for proper electrical wiring</td>
</tr>
<tr>
<td></td>
<td>Fluid conductivity &lt;20 microSiemens/cm</td>
<td>Select another flow meter</td>
</tr>
</tbody>
</table>