

# WMX101

## MUNICIPAL/INDUSTRIAL MAGMETER INSTRUCTIONS



WMX101 MUNICIPAL/INDUSTRIAL MAGMETER INSTRUCTIONS

**ISO** 9001:2000  
CERTIFIED

**SeaMetrics**

The Leader in Flow Meter Value

## TABLE OF CONTENTS

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### General Information

Features, Specifications ..... Page 1

### Installation and Electrical Connection

Positioning the Meter, Piping Conditions, Flanges, Electrical Connections, Electrical Noise Immunity .. Page 2

Straight Pipe Recommendations..... Page 3

Full Pipe Recommendations ..... Page 4

Standard Connection, Connection to SeaMetrics Controllers ..... Page 5

### Operation

Display, Calibration, Empty Pipe Detection ..... Back Page

### Troubleshooting

Problems, Probable Causes, Things to Try ..... Back Page

## TABLES, DIAGRAMS & CHARTS

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Features ..... Page 1

Specifications ..... Page 1

Straight Pipe Recommendations ..... Page 3

Full Pipe Recommendations ..... Page 4

Standard Electrical Connection ..... Page 5

Electrical Connection to SeaMetrics Controllers ..... Page 5

Troubleshooting Problems, Possible Causes, Things to Try ..... Back Page

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## GENERAL INFORMATION

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.

## FEATURES

Cross-drilled screws for tamper-evidence

Rate and total indicator

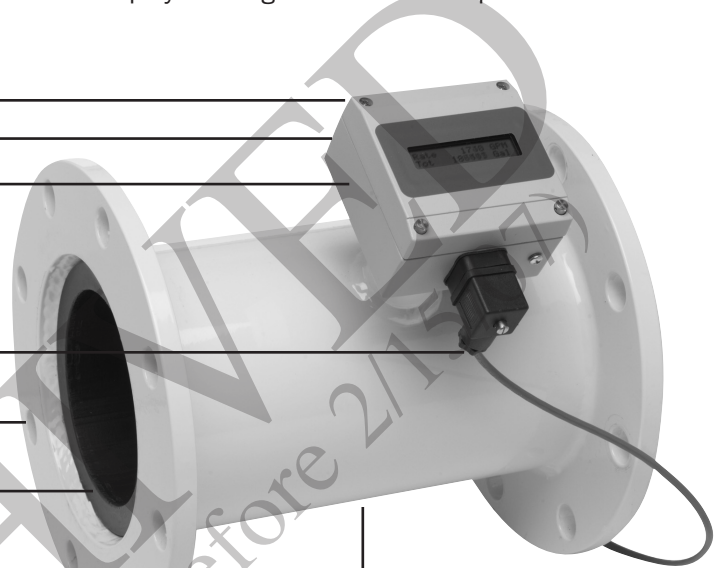
Diecast-aluminum electronics housing

DIN connector

ANSI 150 lb. drilling flanges

HDPE liner  
316SS electrodes

Powder coated steel body



## SPECIFICATIONS

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

# INSTALLATION AND ELECTRICAL CONNECTION

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## INSTALLATION

**Positioning 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.



**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.

## 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.



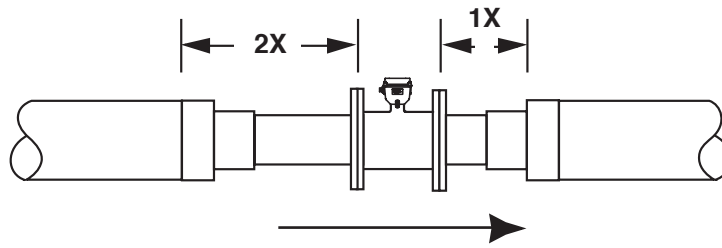
**Caution:** There are no connections inside the display. Breaking the seal wire will **VOID WARRANTY.**

# INSTALLATION

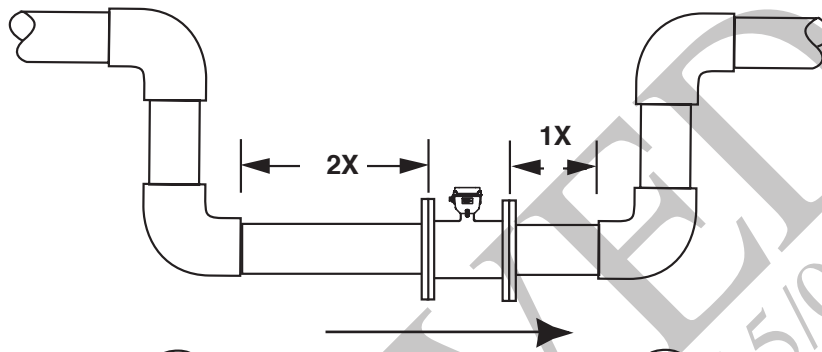
## STRAIGHT PIPE RECOMMENDATIONS

(X = pipe diameter)

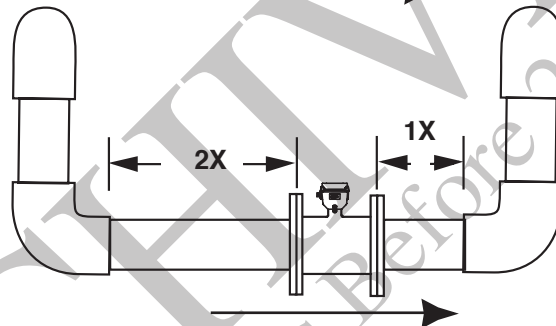
Reduced Pipe



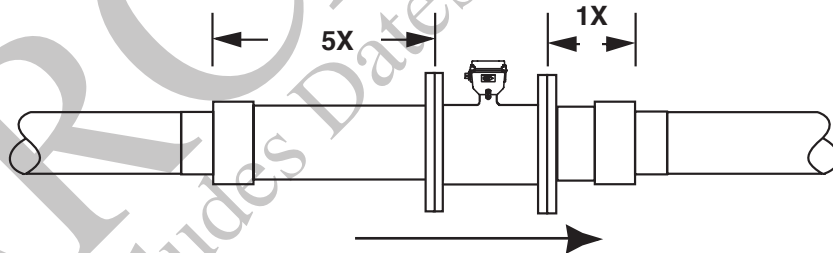
Two Elbows In Plane



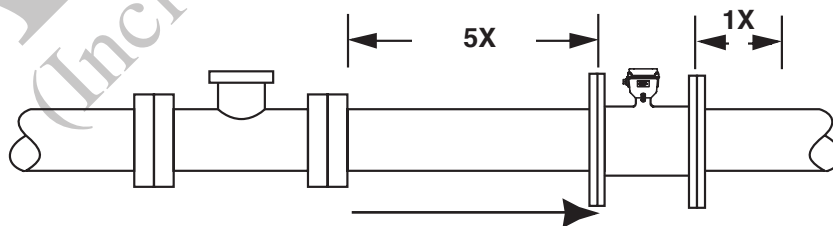
Two Elbows, Out Of Plane



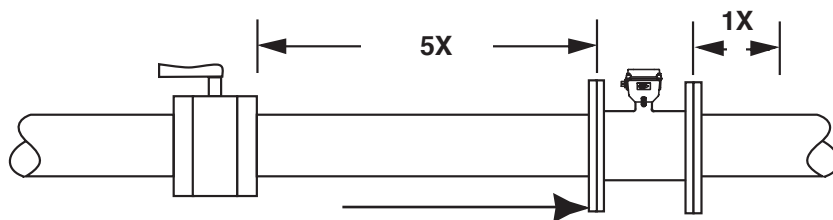
Expanded Pipe



Propeller Meter

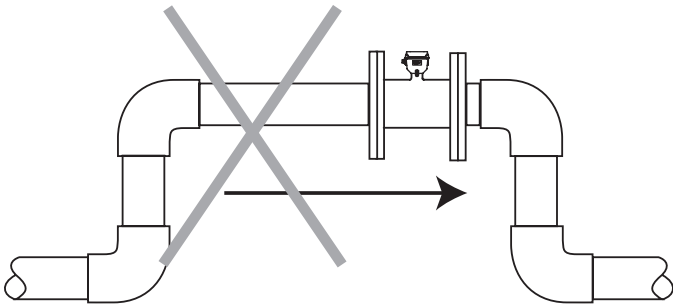


Swirling Flow  
Partially Open  
Butterfly Valve

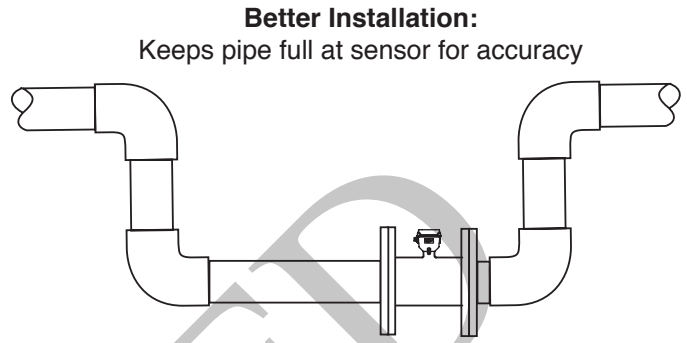


# INSTALLATION

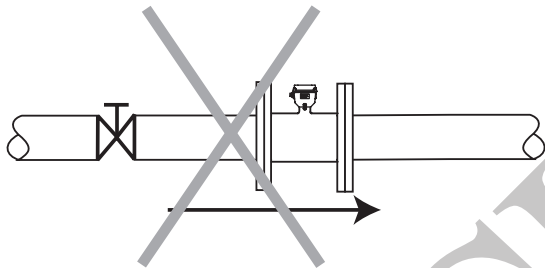
## FULL PIPE RECOMMENDATIONS



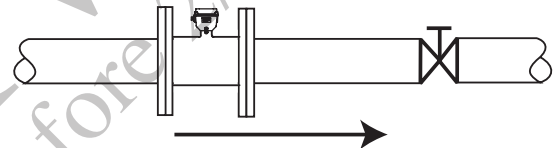
**Possible Problem:**  
Allows air pockets to form at sensor



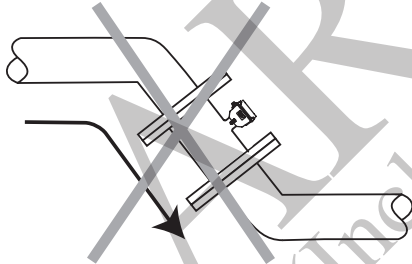
**Better Installation:**  
Keeps pipe full at sensor for accuracy



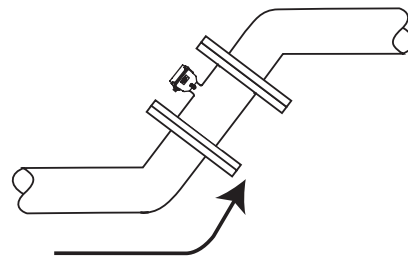
**Possible Problem:**  
Post-valve cavitation can create air pocket



**Better Installation:**  
Keeps pipe full at sensor for accuracy



**Possible Problem:**  
Air can be trapped



**Better Installation:**  
Allows air to bleed off

# ELECTRICAL CONNECTIONS

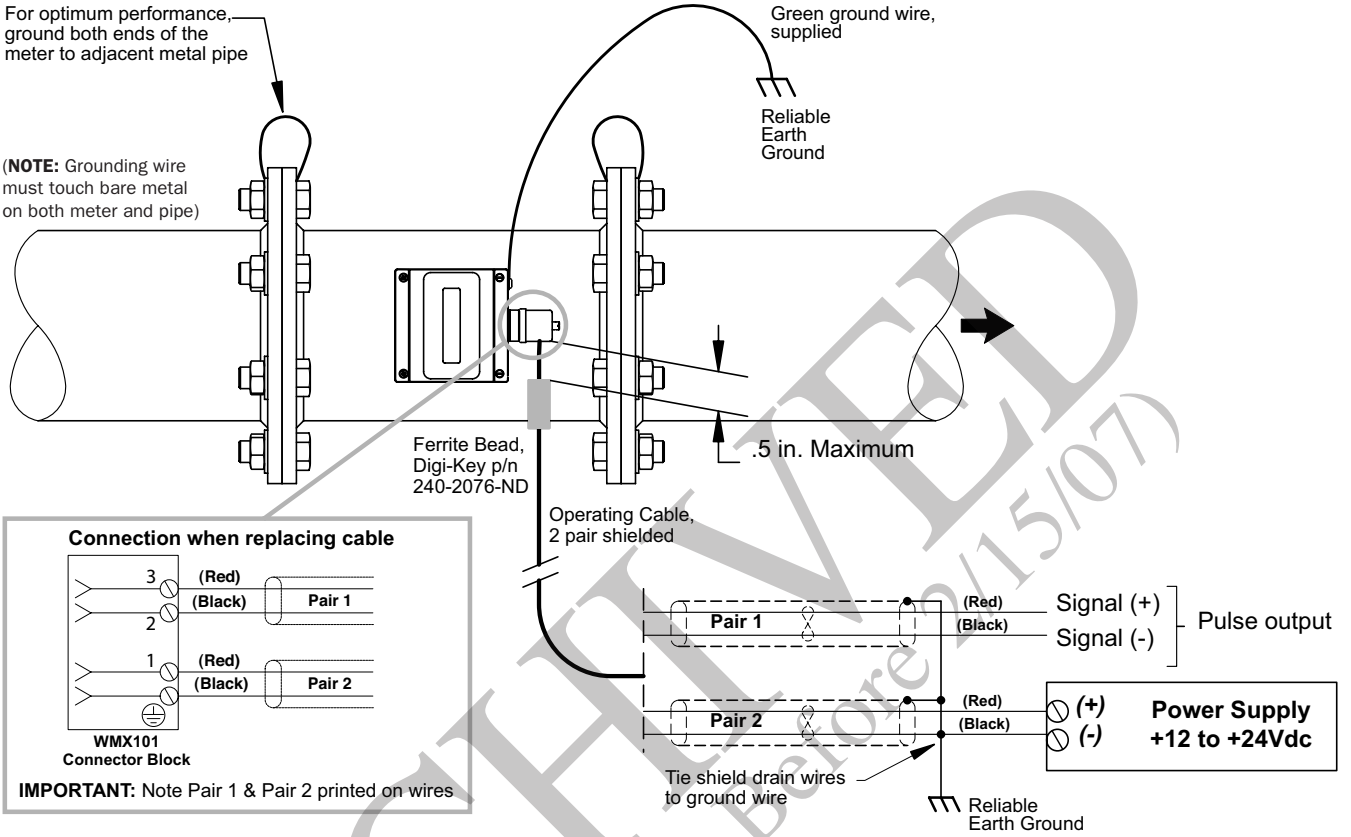
## STANDARD CONNECTION

For optimum performance, ground both ends of the meter to adjacent metal pipe

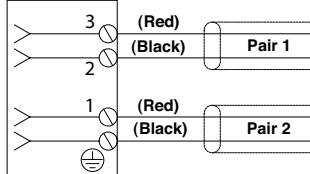
(NOTE: Grounding wire must touch bare metal on both meter and pipe)

Green ground wire, supplied

Reliable Earth Ground



### Connection when replacing cable



WMX101 Connector Block

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

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# 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.

**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.



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

## TROUBLESHOOTING

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

