

# BlueWater Flowmeter FM676

## Obstructionless Electromagnetic Flowmeter



### DESCRIPTION

The Model 676 BlueWater electromagnetic flowmeter is designed to measure the flow of water (and other liquids) with full pipes conditions. This model of flow meter is ideally suited for irrigation as it is battery operated, rugged, and easy to install and configure.

The BlueWater stores all calibration and flow information in a flash memory eliminating the need for a backup battery to store information and eliminating the need to reprogram the meter if the module is replaced or exchanged.

### CERTIFIED ACCURACY

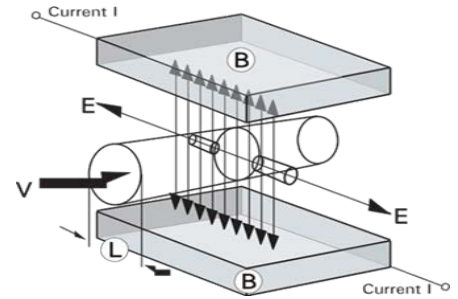
Each BlueWater is 'wet-flow' calibrated in Sparling's Primary Flow Lab traceable to the National Institute of Standards and Technology (NIST).

### FEATURES

- Easily field programmable, without a factory service call
- Long life battery - up to 5 years.
- Battery replacement requires no tools.
- 8 – 36 VDC. When DC connected, battery is backup.
- Transmitter easily replaced in the field without requiring removal of the flow tube.
- Stores total and calibration information in a non-volatile Flash memory – no backup battery required.
- Pulse output standard
- Forward, Reverse, and Net totalization
- Rotatable modular display
- Empty Pipe Detection
- Standard Accuracy 1%
- Sizes: 3" to 14"
- Optional datalogger – using standard USB cable.

## PRINCIPAL OF OPERATION

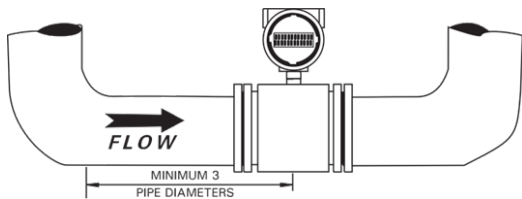
The Model 676 magnetic flowmeter is based on Faraday's Law which states that the voltage induced in a conductor moving through a magnetic field is proportional to the velocity of that conductor. The magnetic flowmeter will measure liquids with conductivities greater than 5 micro-siemens.



## INSTALLATION

The meter may be oriented in any position from vertical to horizontal. Flow may be in either direction through the meter. If not installed horizontally, however, ensure the pipe will be full by ensuring up flow of the fluid.

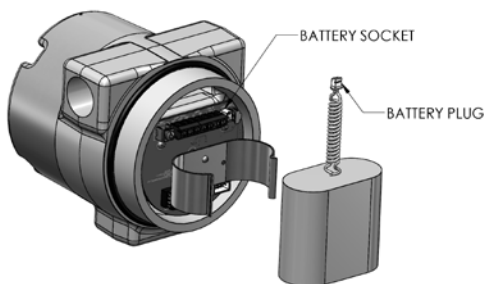
Provide at least three pipe diameters of straight piping approach between an upstream elbow and the midpoint of the meter.



More straight approach should be provided after valves or multiple elbows. Provide at least 10 diameters after expanders or laterals which are of smaller diameter than the line size.

## BATTERY

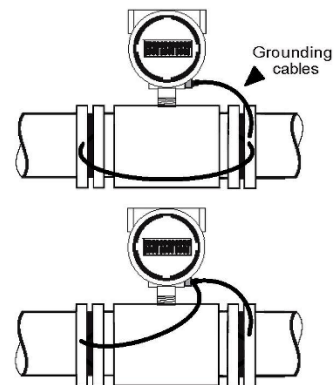
BlueWater has a long-life battery, up to five years. Changing the battery is a straightforward operation, requiring no tools.



## GROUNDING

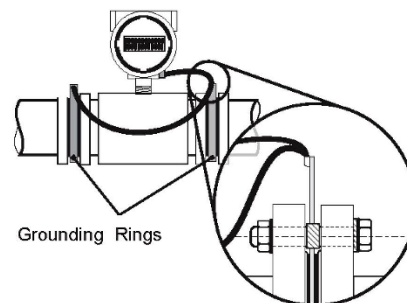
If the meter is installed in metal pipe, grounding rings are not required:

### Mounting in Unlined Metal Pipelines



When installing in plastic or coated pipes, ground rings are required:

### Mounting in Plastic or Lined Pipeline, or where Conductivity < 20 micromhos/cm



## EASY TO READ ROATABLE DISPLAY

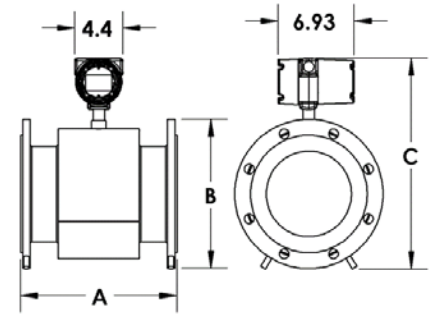
The display is rotatable 360 degrees in 90-degree increments ensuring easy reading in any orientation

## Dimensions

The following are the key dimensions, shipping weight and the minimum and maximum flow rates of each size of meter

### BlueWater Dimensions, Weight and Flow Rate

Size	Dimensions (Inches)			Weight lbs.	Flow Rates (GPM)		
	Length (A)	Flange (B)	Height (C)		1 fps	3 fps	33 fps
3	6.00	7.50	13.00	48	20	60	664
4	10.24	9.00	14.38	55	35	107	1,182
6	12.27	11.00	17.00	75	85	254	2,800
8	14.24	13.50	19.40	105	145	436	4,800
10	18.18	16.00	22.56	155	236	709	7,800
12	19.68	19.00	25.00	235	333	1,000	11,000
14	21.38	21.00	26.67	365	409	1,227	13,500



## How to specify a BlueWater Meter

Table 1 - Base Model Number FM676 - BlueWater					
FM676	Table 2				
	Nominal Size				
	Code	Inches	mm		
	03	3	80		
	04	4	100		
	06	6	150		
	08	8	200		
	10	10	250		
12	12	300			
14	14	350			
	Table 3 - Transmitter and Mounting				
	0 Integral NEMA-4X enclosure				
	Table 4 - Power Supply				
	1 Battery and DC Power				
	Table 5 - Outputs				
	0 Pulse Output				
	Table 6 - Datalogger				
	0 No Datalogger				
	1 Datalogger				
FM676 - Size (XX) Trans - Power Outputs Datalogger Eg: FM676-040-100 is 4" BlueWater™, Battery / DC power, pulse output & no datalogger					

## Specifications

Power Requirements	7.2 V 19Ah Battery and / or 8 – 36 VDC. When connected to DC power, battery acts as a back up to supplied power.
Wire Size	Power: 14 – 16 AWG Pulse output: 18 AWG
Accuracy	1% of flow rate (1 – 33 fps)
Power	3 mW at lowest sample frequency
Minimum Conductivity	5 $\mu$ siemens
Velocity Range	0 – 33 fps
Ambient Temp Limits	-40° to 140°F (-40° to 60 °C)
Process Temp	-40° to 180°F (-40° to 80 °C)
Storage Temp Limits	-40° to 140°F (-40° to 60 °C)
Max Working Pressure	150 psi
End Connections	150 psi flanges, ANSI pattern
Construction	Metering Tube: 304 SS with welded ANSI compliant carbon steel flanges Liner: Polyurethane Electrodes: 316 SS Transmitter Housing: Cast Aluminum, NEMA4X Electrical Rating: General Purpose
Output Signal	Vdc pulse with 12.5/25/50/100 ms on-time



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