

**1 YEAR**  
WARRANTY

# **Ω OMEGA®** **User's Guide**



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## **FMG80A SERIES** **Low-Flow Magmeter**



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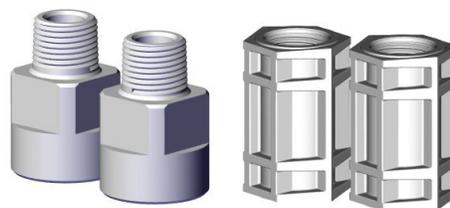
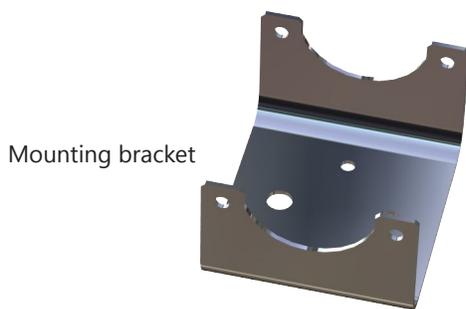
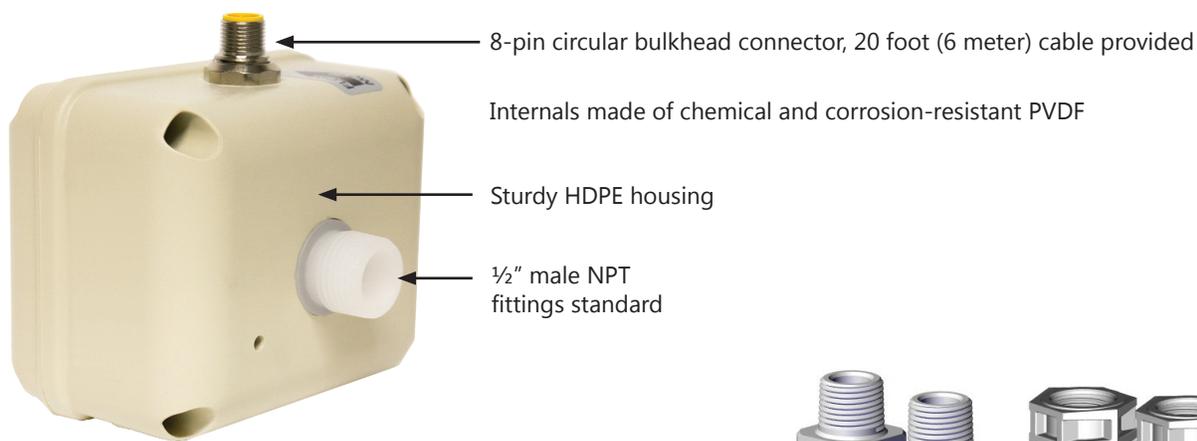
The **FMG80A** magmeter is designed for low-flow chemical injection or difficult-to-meter applications with pulsating metering pumps in 3/4" to 1/4" pipe/tube. The housing is made of sturdy splashproof HDPE plastic.

The FMG80A meter is compact enough to fit most pump/injection systems. With zero straight pipe required after an elbow, it can be easily mounted in tight spaces. The mounting bracket adds stability.

With no moving parts, the FMG80A can handle fluids containing particulate matter without clogging or jamming, keeping maintenance at a minimum. With no metallic parts (100% PVDF body and PVDF carbon fiber-filled electrodes), the meter is corrosion-resistant and compatible with a wide range of chemicals (consult factory for chemicals and concentrations). Accuracy is maintained with conductive fluids (>20 microSiemens) of varying viscosities and densities.

The FMG80A meter has an optoisolated current sinking pulse output that can be connected to many Omega rate/total displays or batch processors, as well as to a 4-20 mA current loop for analog devices. Outputs and power are provided through a cable with 8-pin female circular connector.

FEATURES



Threaded male or female NPT adapters can be purchased separately (available in PVDF and PP) (Female NPT available in 1/2" only)

Specifications\*

<b>Pipe Size</b>		3/4", 1/2", 3/8", 1/4" **
<b>Fittings</b>		1/2" NPT fittings standard in 3/4" or 3/8" flowbody. NPT threaded adapters available for above pipe sizes.
<b>Materials</b>	<b>Body</b>	PVDF
	<b>Electrodes</b>	PVDF carbon fiber filled
	<b>Ground</b>	PVDF carbon fiber filled
	<b>Housing</b>	HDPE with 25% glass
	<b>Adapters (NPT)</b>	Polypropylene or PVDF
<b>Temperature</b>	<b>Ambient</b>	0° to 130° F (-18° to 54° C)
	<b>Fluid</b>	32° to 200° F (0° to 93° C)
<b>Pressure</b>		150 psi
<b>Flow Range</b>	<b>FMG83A, FMG84A</b>	20 GPM max. (0.2 GPM cutoff)
	<b>FMG81A, FMG82A</b>	3 GPM max. (0.03 GPM cutoff)
<b>Accuracy</b>	<b>FMG83A, FMG84A</b>	±1% plus ±0.005 GPM of reading across rated range
	<b>FMG81A, FMG82A</b>	±1% plus ±0.002 GPM of reading across rated range
<b>Output Signal</b>		Optoisolated current sinking or current sourcing pulse output: 30 Vdc, 5 mA max Optoisolated 4-20 mA current loop: 7 Vdc plus load voltage drop min; 50 Vdc max
	<b>FMG83A, FMG84A</b>	500 pulses/liter (1892 pulses/gallon)
	<b>FMG81A, FMG82A</b>	1000 pulses/liter (3785 pulses/gallon)
<b>Power</b>		10-15 Vdc, 150 mA (linear power supply recommended)
<b>Conductivity</b>		>20 microSiemens
<b>Empty Pipe Detection</b>		Hardware/software, conductivity-based
<b>Environmental</b>		NEMA 4X standard; IP66 splashproof standard

\* Specifications subject to change • Please consult our website for current data ([www.omega.com](http://www.omega.com)).

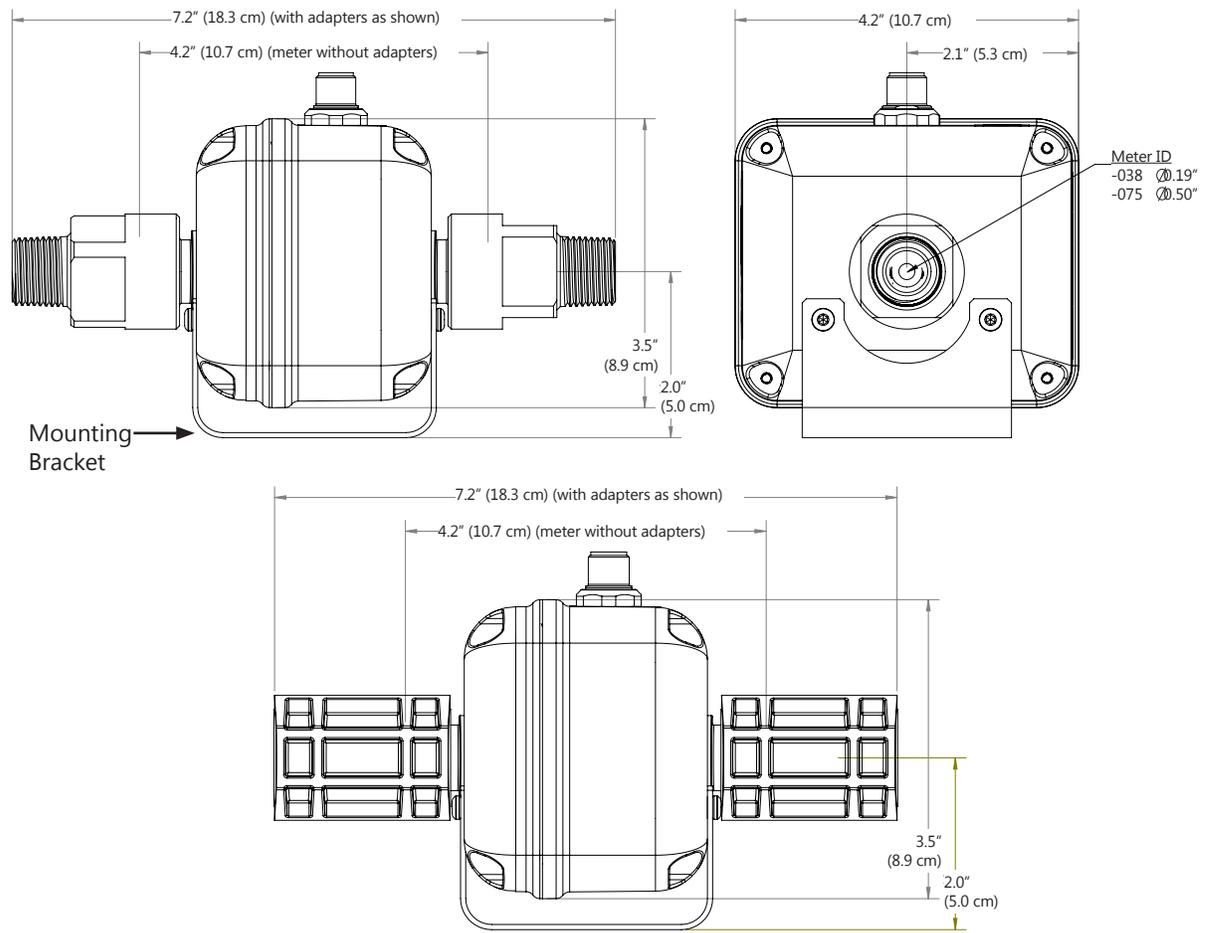
\*\* Requires adaptors

NOTE: Consult factory for applications flowing sodium hypochlorite, sodium chlorite, sodium chlorate.

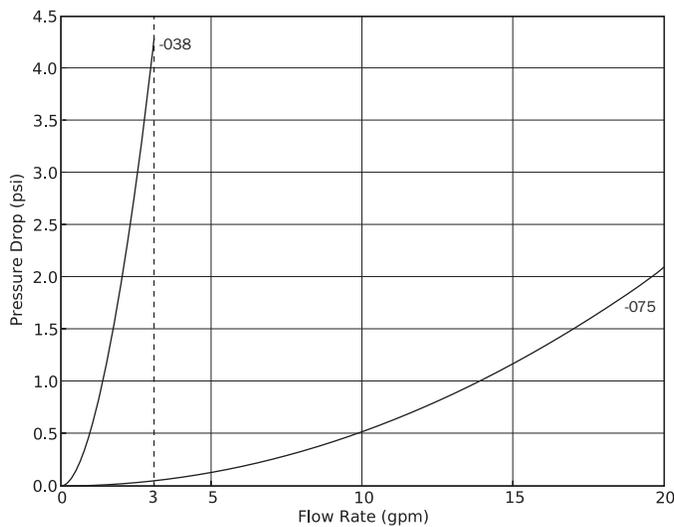
**For applications with the listed chemicals, the following conditions apply:**

- Max concentration 15% / Max temperature 100° F
- Flow is greater than 20% of max for accurate reading

Dimensions



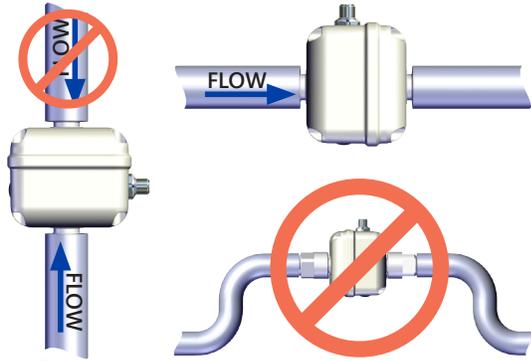
Pressure Drop Curve



**FMG83A/FMG84A with 3/4" adapters.**  
**FMG81A/FMG82A with 3/8" adapters.**  
**Actual curve dependant on pipe size/fittings**

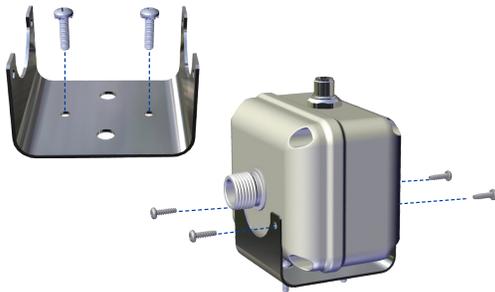
**Positioning**

The FMG80A can be mounted vertically or horizontally. It is important to choose a position that will ensure full pipe. (Under certain conditions of empty or partially-full pipe the meter may give a pulse out when there is no flow.) With a zero straight pipe requirement after an elbow, the FMG80A meter can be installed in tight spaces.

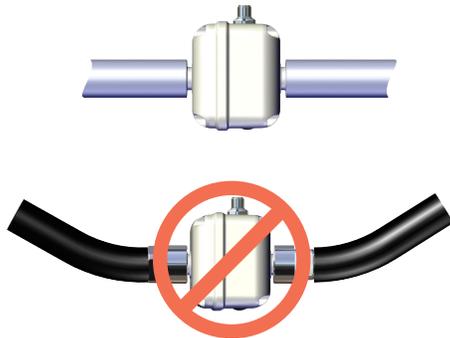


**Mounting**

It is highly recommended to use the mounting bracket provided. The mounting bracket uses two #8 screws on a 1.5" center.



The FMG80A may be supported by its piping connections **IF** the piping is rigid. The meter and pipe must be perfectly aligned with no flexion at the fittings to prevent leakage or damage to the meter.



**Piping**

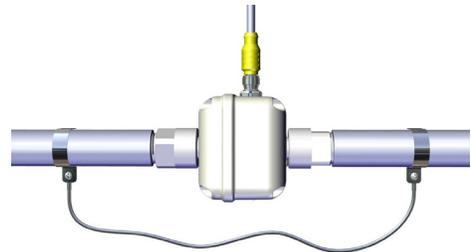
Metal pipe, metal tube, or plastic tubing can be used with the meter. The standard NPT fittings can be used with or without NPT adapters on 3/4" or 3/8" pipe. If used, apply Teflon tape onto the NPT fittings. NPT adapters should be hand tightened onto the fittings. Thoroughly clean the pipe threads and nose and apply Teflon tape to adapter threads. Hold adapters with a wrench while tightening the pipe to prevent damage to the meter.

**Power Supply**

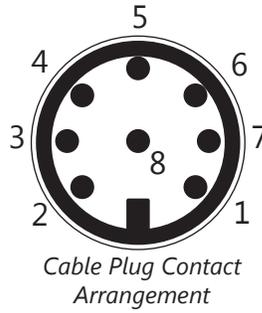
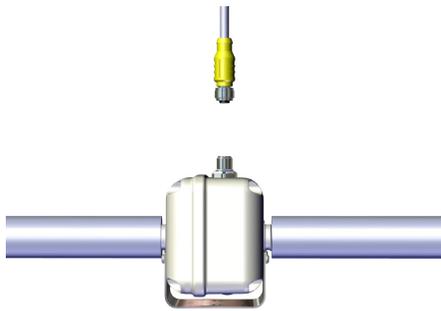
A 12 Vdc linear, regulated power supply with an output current of at least 0.25A is recommended. If a switching power supply must be used, consult Omega for approved manufacturer's model numbers.

**Grounding**

In addition, it is necessary for proper operation to ground the unit to a good quality earth ground. Assure negative power supply is grounded to earth and to the entire electrical/mechanical system. If metal piping is used, jumper inlet and outlet pipes together and connect to ground for best results in metering accuracy. The cable shield drain wire should be left unconnected.

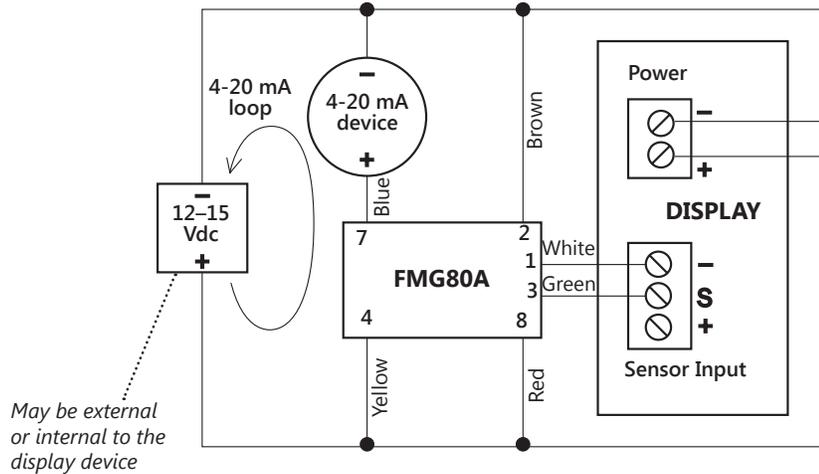


Power and signal connections are provided through the 8-pin male bulkhead connector on the meter housing (20 ft (6 m) cable provided). See the Pin Assignment and Connections diagrams.

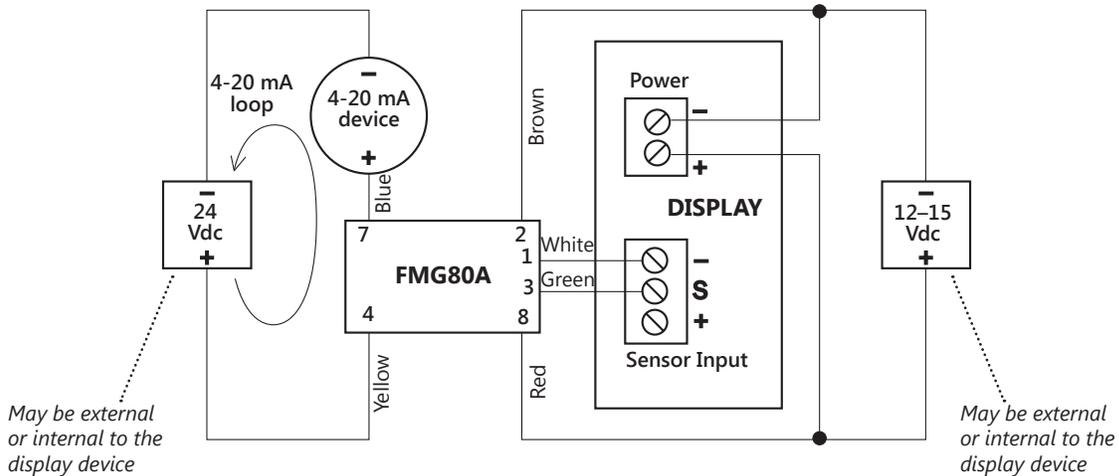


Pin #	Function	Color
1	Pulse (-)	White
2	Ground	Brown
3	Pulse (+)	Green
4	4-20 (+)	Yellow
5	Not used	Grey
6	Not used	Pink
7	4-20 (-)	Blue
8	Power (+)	Red

**4-20 mA Device and FMG80 with Single Power Supply**  
**Important: 4-20mA device input resistance must not exceed 250 Ω**



**Dual Power Supply with Loop Isolation**



**OPERATION**

The meter will output one pulse when powered up. The newly-installed meter takes from a few seconds to a minute for the signal to stabilize at startup, especially if it has been dry. In normal operation, keep the meter filled with fluid and powered on to prevent this delay. When the meter is mounted properly, an empty pipe detection feature will normally detect absence of liquid in the pipe and register zero flow.

The 4-20 mA signal outputs 4 mA at zero flow and 20 mA at 20 gallons/minute flow or 3 gallons per minute, depending on model.

The pulse signal is a 50% duty cycle pulse set at:

FMG83A/FMG84A:  
500 pulses/liter (1892 pulses/gallon)

FMG81A/FMG82A:  
1,000 pulses/liter (3785 pulses/gallon)

**TROUBLESHOOTING**

<b>Problem</b>	<b>Probable Causes</b>	<b>Things to try...</b>
No output	Reversed flow direction Empty pipe Flow rate below minimum Loose or incorrect wiring Fluid conductivity too low Electrical noise	Reverse flow connections Check piping conditions Select a different flow meter Check electrical connections Select a different flow meter Relocate meter or reduce noise
Flow rate incorrect	Fluid conductivity too low Empty pipe Electrical noise	Select a different flow meter Check piping conditions Relocate meter or reduce noise



## WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **13 months** from date of purchase. OMEGA's WARRANTY adds an additional one (1) month grace period to the normal **one (1) year product warranty** to cover handling and shipping time. This ensures that OMEGA's customers receive maximum coverage on each product.

If the unit malfunctions, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective, it will be repaired or replaced at no charge. OMEGA's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of having been damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components in which wear is not warranted, include but are not limited to contact points, fuses, and triacs.

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## RETURN REQUESTS/INQUIRIES

Direct all warranty and repair requests/inquiries to the OMEGA Customer Service Department. BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OMEGA'S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and on any correspondence.

The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR **WARRANTY** RETURNS, please have the following information available BEFORE contacting OMEGA:

1. Purchase Order number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

FOR **NON-WARRANTY** REPAIRS, consult OMEGA for current repair charges. Have the following information available BEFORE contacting OMEGA:

1. Purchase Order number to cover the COST of the repair,
2. Model and serial number of the product, and
3. Repair instructions and/or specific problems relative to the product.

OMEGA's policy is to make running changes, not model changes, whenever an improvement is possible. This affords our customers the latest in technology and engineering.

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