MACE Doppler Ultrasonic Insert Velocity Sensor

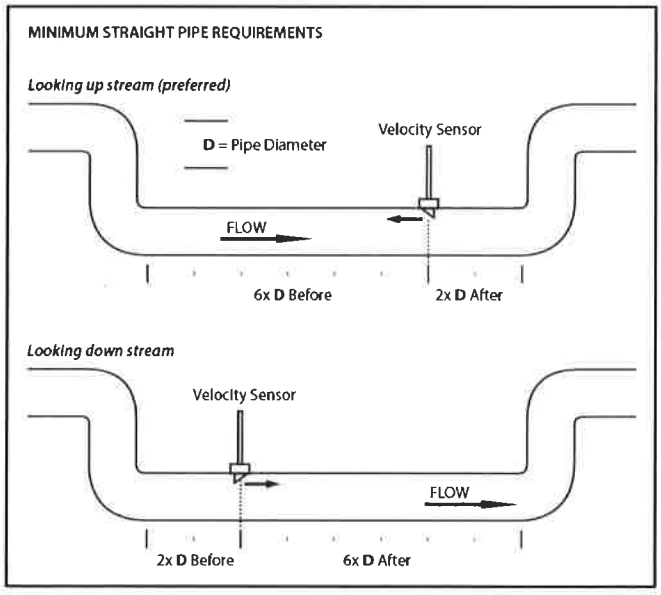
General Information and Installation Instructions:

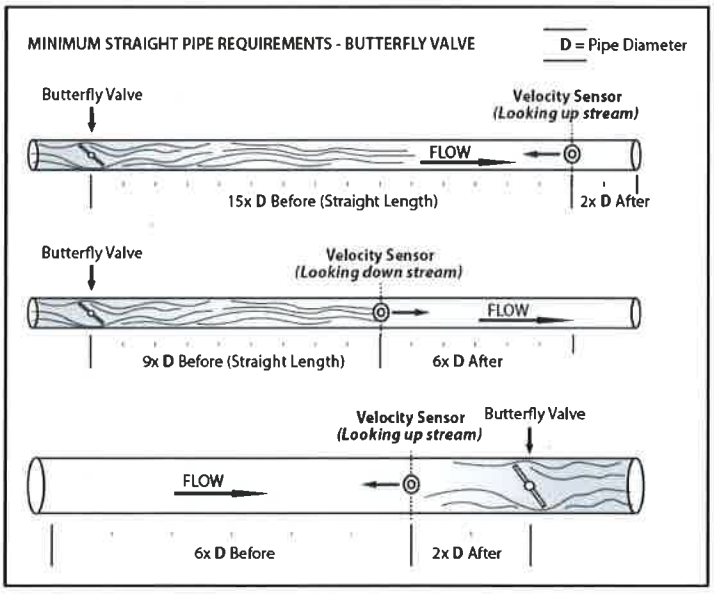
The MACE Doppler Ultrasonic Insert Velocity Sensor can be used on any pipe with a diameter between 4 and 100 inches. This includes corrugated pipe so long as the meter is mounted so that the leading edge of the sensor's angled face bisects the apex of a corrugated "ridge". The meter requires full pipe flow to ensure 1% accuracy unless used in combination with a MACE EchoFlo depth sensor.

The meter must be used with a properly installed MACE datalogging product in order to function. The recommended datalogger is the MACE Agriflo XCi with a MACE Doppler Card to connect the meter to the datalogger.

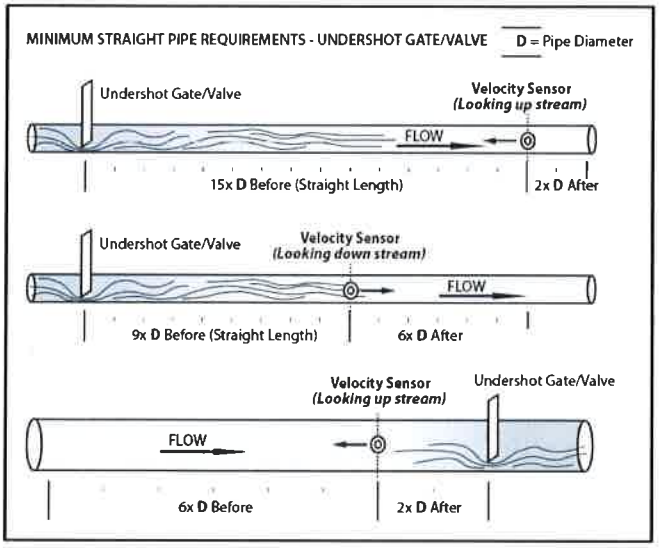
The recommended minimum straight pipe run without flow disturbances are typically given in pipe diameters (dia.), and are measured from the center of the totalizer (flow indicator).

- Minimum Upstream Length: 6 Diameters (i.e., 12" diameter pipe = 72" upstream).
- Minimum Downstream Length: 2 Diameters (i.e., 12" diameter pipe = 24" downstream).
- These are reversed when the meter is "looking" downstream (sensor is pointed downstream)
- Additional clearance needed when pipeline has butterfly valves or undershot gates/valves
- No pumps, elbows, check valves, tees, or changes in pipe diameter are allowed within the minimum lengths identified above.
- Elbow or other discharge feature to ensure full pipe (unless used in conjunction with MACE depth sensor).
- See examples from the MACE website below:





MBK *Engineers*
06/22/2017



Power Options

The MACE Doppler Ultrasonic Insert Velocity Meter relies upon the datalogger for its power supply. The recommended datalogger, MACE Agriflo XCi, is powered by an internal 12 volt, 7.2 Ah battery which can be supplemented with an included solar panel and an AC to DC charger.

Recommended Maintenance

Due to the lack of moving parts, the manufacturer believes there is no necessary calibration. Since this meter operates in a similar fashion to an insertion magnetic meter, MBK recommends to recalibrate the meter every five years to meet the requirements of the measurement regulation.

In-Situ Inc.
General Inquiries: 1-800-446-7488
Fort Collins, CO

Manufacturers and Vendors for Flow Meters

In-Situ Inc.
General Inquiries: 1-800-446-7488
Bill Mann (Sales): 559-458-6034
Fort Collins, CO

Approximate Pricing:

Approximate Pricing of a MACE Doppler Ultrasonic Insert Velocity Sensor

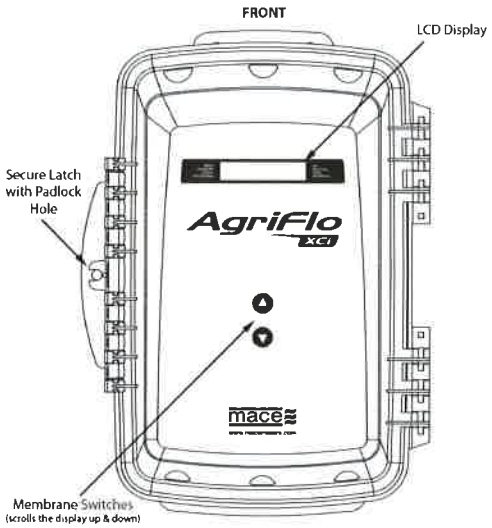
Model	Pipe Size (inches)	Cost of Meter	Cost of Meter with MACE Agriflo XCi and necessary Components
MACE Insert Velocity Sensor	4 through 100	$ 2,100.00	$ 5,050.00

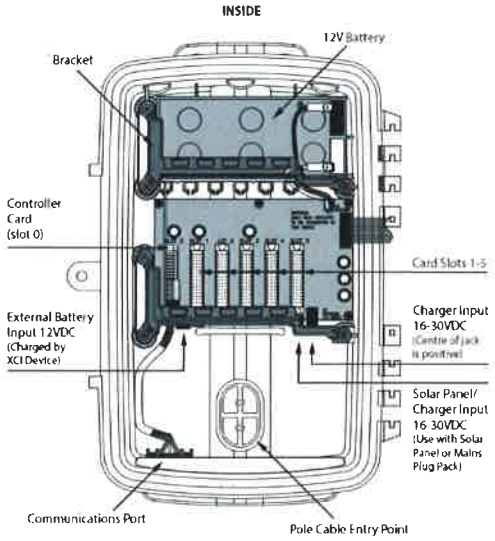
MACE Agriflo XCi

General Information

The MACE Agriflo XCi is a modular datalogger which utilizes any combination of five inserted "cards" to collect data from a variety of sources. All the data collected by the cards is stored on the datalogger's 2 MB internal storage. The current available cards are:

- Doppler card: supports one MACE Doppler ultrasonic meter
- I/O card: supports seven sensor inputs and four control outputs including 4-20 mA, voltage, and digital. This card also supplies 12V to power your add-on sensors
- Pulse I/O card: provides (5 or 12V DC) power to a single pulsing flow sensor and provides a pulse output (used primarily with non-MACE flow sensors)
- SDI-12 Master card: can control and log SDI-12 sensors
- FloSI card: provides an SDI-12 or MODBUS output to interface the Agriflo XCi to SCADA systems
- WebComm card: automatically uploads internal logged data to web-based MACE data server via mobile telephone networks





Power Options

The datalogger comes equipped with an internal 12 volt, 7.2 Ah battery which can be supplemented with included solar and DC chargers. It is also possible to connect the datalogger to existing solar structures.

The datalogger will inform the user, either by the LCD screen or telemetry based alerts, when the battery is running low.

Telemetry

The datalogger is capable of incorporating telemetry at any time, however it requires the use of one of the five available card slots. This means losing the potential to monitor and log additional devices. Telemetry data is sent to the MACE server and the user can request SMS/email alerts for specific information.

Recommended Maintenance

The manufacturer recommends commissioning a local company to install the datalogger and connect to the chosen measurement devices. Questions and problems with the software or readings should be addressed to the manufacturer while general maintenance questions, like a dying battery, can be directed to the local company who installed the device.

In-Situ Inc.
Technical Support: 1-800-446-7488
Fort Collins, CO

HydroScientific West
Ran Nauman: (858) 486-8825
Escondido, CA

Manufacturers and Vendors for Flow Meters

In-Situ Inc.
Technical Support: 1-800-446-7488
Bill Mann (Sales): 559-458-6034
Fort Collins, CO

Approximate Pricing

Approximate Pricing of a MACE Agriflo XCi

Base Datalogger	Cost per Input Card	**Total Base Cost**	Cost for Telemetry Upgrade	SIM Card Charges Per Month	**Total After Five Years**
$1,900.00	$650.00	**$2,550.00**	$900.00	$15.00	**$4,350.00**

Note: Installation and flowmeter cost are not included in above table. Prices obtained 6/22/2017.

Future Developments

The manufacturer has continuously improved the datalogger and launched several generations over the years. It is unknown if any new developments specific to the SB 88 measurement regulation are underway at this time.

For additional questions, please send site photos and measurement information (pipe size, pipe lengths, flow meter brand and model) to **MBK** *Engineers*.

Gary Kienlen Kienlen@mbkengineers.com
Anne Kwedar: Kwedar@mbkengineers.com
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Angela Bezzone: Bezzone@mbkengineers.com
Darren Cordova: Cordova@mbkengineers.com
Kyle Knutson: Knutson@mbkengineers.com
Connor Bovee: Bovee@mbkengineers.com

(916) 456-4400
455 University Avenue, Suite 100
Sacramento, CA 95825

EX100/200-SERIES

INSERTION ELECTROMAGNETIC FLOW SENSOR

APPLICATIONS

3" - 48" pipe (up to 72" optional)

Clean or "dirty" liquids

Conductive liquids

Municipal

Industrial

Irrigation

Features

- No moving parts
- Durable
- Adjustable depth
- Hot-tap available
- Brass or stainless steel
- Immersibility available
- Reverse flow output available

The **EX100/200-Series** are adjustable depth insertion magmeters that fit 3" to 48" pipe (up to 72" optional). The complete lack of moving parts of the EX100/200-Series is the source of its reliability. Brass and stainless steel models withstand a variety of temperature, pressure, and chemical conditions. The EX-Series has no rotor to stop turning in dirty water and there are no bearings to wear out. Like all magmeters, when used in chemical injection applications, these meters should be installed upstream of the chemical line (or far enough downstream to allow complete mixing of fluids before the meter). Adapters mate with standard 1-1/2" (11x/21x) or 2" (15x/25x) FNPT threaded fittings such as saddles and weldolets which may be purchased either locally or from Seametrics.

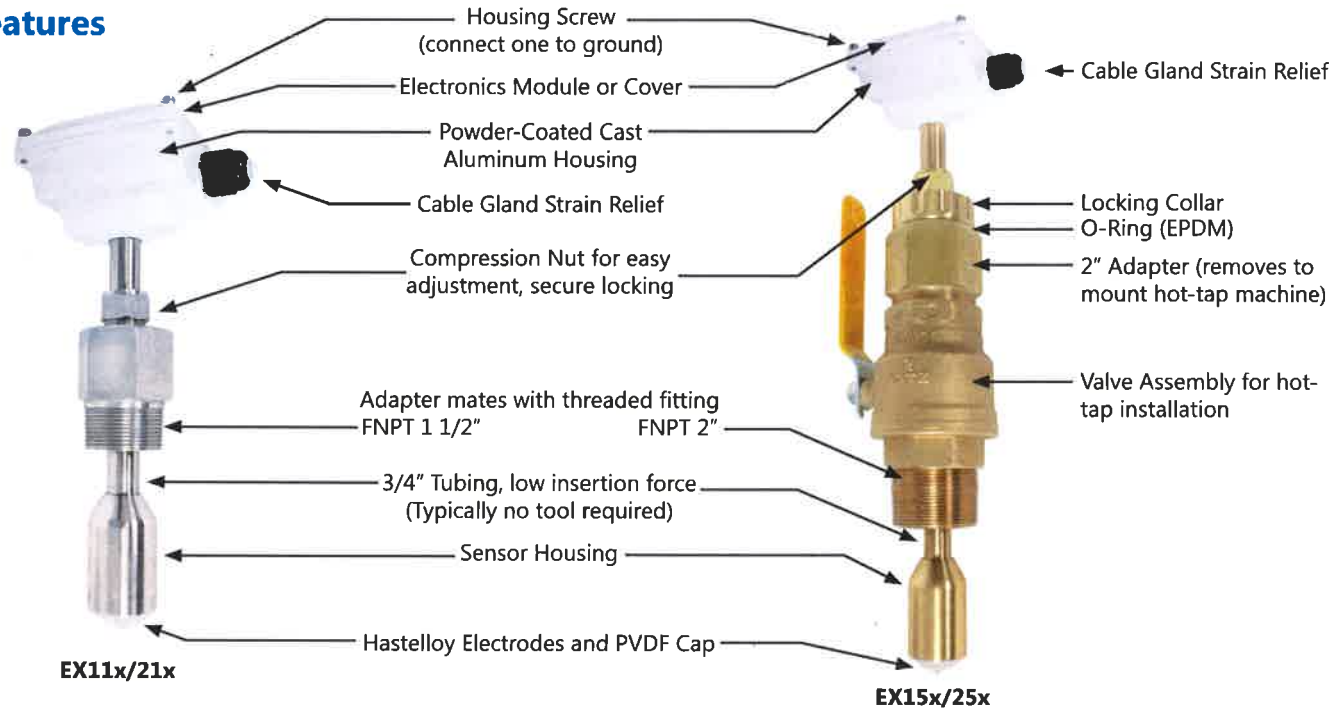
A rapidly reversing magnetic field is produced in the lower housing. As the fluid moves through this field, a voltage is generated that is measured and translated into a frequency signal proportional to flow rate. This square wave signal can be sent directly to a PLC or other control or can be converted using any of the Seametrics family of indicators and converters. A modular system of electronics can be installed directly on the flow sensor or mounted remotely. The FT430 (externally powered with pulse) and the FT440 (loop powered), both provide digital rate and total displays, as well as a programmable pulse; the FT440 also provides a 4-20 mA analog output. The AO55 is a blind analog (4-20 mA) transmitter. Programmable pulse for pump pacing is available with the PD10 (available as wall-mounted unit only).

The "hot-tap" models (EX15x/25x) can be installed or serviced without shutting down the line by means of a 2" full-port isolation valve that comes with a nipple for installation on the pipe fitting; a bronze ball valve is standard, with a 316 stainless steel valve option if needed. In most circumstances, no special tool is required.

Reverse flow output and immersibility are optional.

Contact Your Supplier

Features

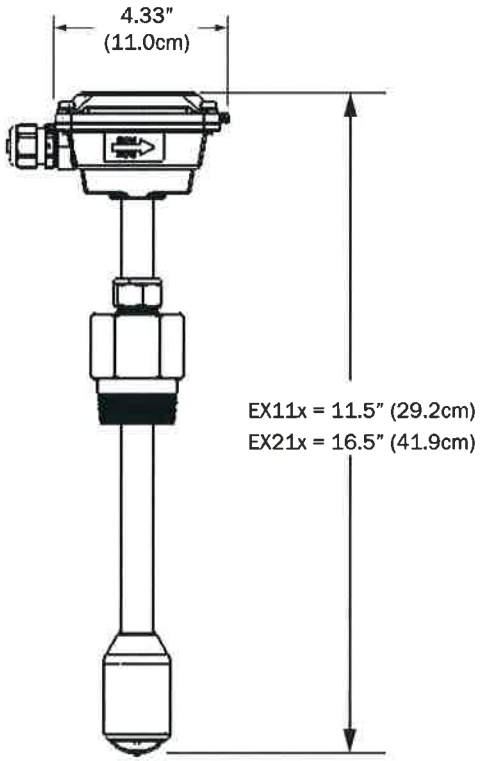


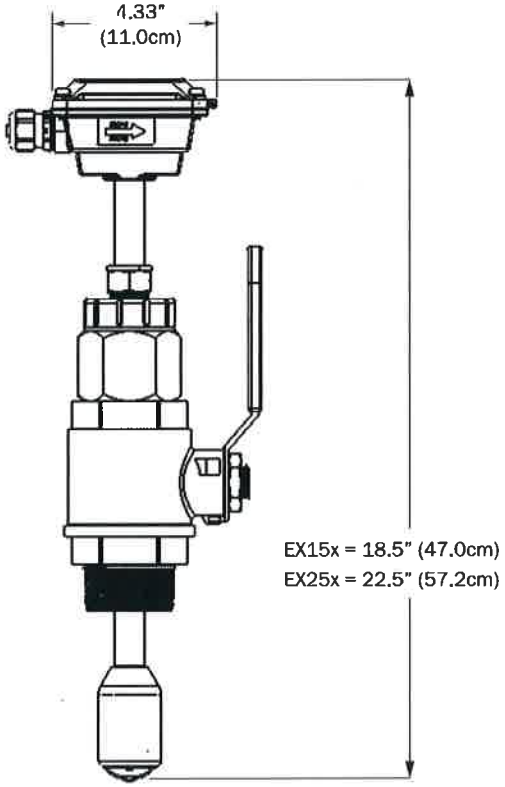
Specifications*

Pipe Size		3" to 48" (up to 72" optional)
Power		**Full Power:** 12 - 24 Vdc, 250mA **Low Power:** 12 - 24 Vdc, 40mA average with 250mA peaks
Materials	**Housing**	Powder-coated cast aluminum
	Tubing/Fitting/Sensor Housing	Brass or 316 Stainless Steel
	Electrodes	Hastelloy
	Electrode Cap	PVDF
	O-Ring *(15x/25x only)*	EPDM
	Valve Assembly *(15x/25x only)*	Bronze (stainless optional) with bronze ball valve
Fitting Size Required		**11x/21x:** 1.5" FNPT **15x/25x:** 2" FNPT
Maximum Pressure		200 psi (14 bar)
Temperature	**Ambient**	0° to 160° F (-17° to 72° C)
	Fluid	32° to 200° F (0° to 93° C)
Minimum Conductivity		20 microSiemens/cm
Flow Velocity		0.28 - 20 ft/sec (0.08 - 6.09 m/sec)
Accuracy		± 1% of full scale
Output		Square wave pulse, opto-isolated, 500 Hz @ 20 ft/sec 6 mA max, 30Vdc forward flow standard; reverse flow optional
Empty Pipe Detection		Software, defaults to zero flow
Cable		Standard 18' (6m), #22 shielded twisted pair, 4-conn. Max. cable run at 24 Vdc = 1000' (300m); at 12 Vdc = 500' (150m). For other circumstances, contact the factory.
Environmental		See meter mounted electronic specification for rating.
Regulatory		CE Mark (full power only)

**Specifications subject to change • Please consult our website for current data (www.seametrics.com).*

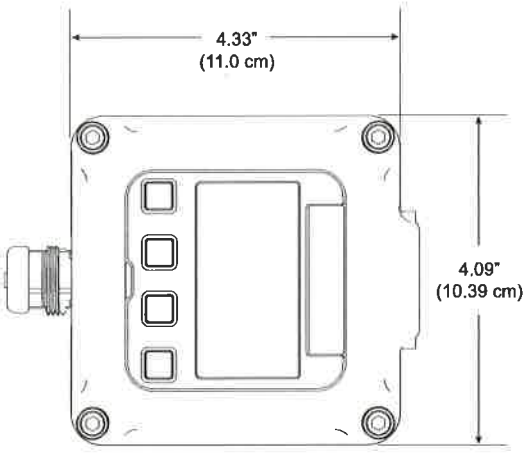
Dimensions





Flow Range

Flow Range (GPM)		
Nominal Pipe Size	**Minimum Flow**	**Maximum Flow**
3	6	440
4	11	783
6	25	1,762
8	44	3,133
10	69	4,895
12	99	7,050
14	134	9,596
16	175	12,533
18	222	15,863
20	274	19,584
24	395	28,200
30	617	44,064
36	888	63,452
48	1,580	112,804



How to Order

	Description	Size	Sensor Material	Options (110/210)	Options (150/250)
Sensor Only	Externally powered (12 - 24Vdc) sensor only.	3" – 10" pipe = EX110 10" – 48" pipe = EX210 Hot Tap 3" – 10" pipe = EX150 10" – 48" pipe = EX250	Brass = B 316 Stainless = S	Brass Adapter Fitting 2" NPT = -02 SS Adapter Fitting 2" NPT = -02 Reverse Flow Output = -15 Brass Adapter 1 ½" BSP = -23 SS Adapter 1 ½" BSP = -24 Old Style Adapter 1 ½" NPT = -35 *Immersible = -40 Low Power = -50 12" Extension (200 Series Only) = -72	316 SS Valve Assembly = -08 No Valve Assembly = -09 316 SS Valve Assembly = -08 Reverse Flow Output = -15 *Immersible = -40 Low Power = -50 12" Extension (200 Series Only) = -72
AO55 Mounted on Sensor	Externally powered (12 - 24Vdc) sensor with AO55 blind 4-20mA analog transmitter mounted on the sensor.	3" – 10" pipe = EX112 10" – 48" pipe = EX212 Hot Tap 3" – 10" pipe = EX152 10" – 48" pipe = EX252	Brass = B 316 Stainless = S	Brass Adapter Fitting 2" NPT = -02 SS Adapter Fitting 2" NPT = -02 Reverse Flow Output = -15 Brass Adapter 1 ½" BSP = -23 SS Adapter 1 ½" BSP = -24 Old Style Adapter 1 ½" NPT = -35 Low Power = -50 12" Extension (200 Series Only) = -72	316 SS Valve Assembly = -08 No Valve Assembly = -09 Reverse Flow Output = -15 Low Power = -50 12" Extension (200 Series Only) = -72
FT430 Mounted on Sensor	Externally powered sensor (12 - 24Vdc) with FT430 rate and total indicator (with pulse outputs) mounted on the sensor.	3" – 10" pipe = EX113 10" – 48" pipe = EX213 Hot Tap 3" – 10" pipe = EX153 10" – 48" pipe = EX253	Brass = B 316 Stainless = S	Brass Adapter Fitting 2" NPT = -02 SS Adapter Fitting 2" NPT = -02 Reverse Flow Output = -15 Brass Adapter 1 ½" BSP = -23 SS Adapter 1 ½" BSP = -24 Tamper Evident Kit = -32 Old Style Adapter 1 ½" NPT = -35 Low Power = -50 Non-resettable Total = -64 12" Extension (200 Series Only) = -72 Hinged Display Cover = -126	316 SS Valve Assembly = -08 No Valve Assembly = -09 Reverse Flow Output = -15 Tamper Evident Kit = -32 Non-resettable Total = -64 12" Extension (200 Series Only) = -72 Hinged Display Cover = -126
DL76 Mounted on Sensor	Externally powered sensor (12 - 24Vdc) with self powered DL76 data logger mounted on the sensor.	3" – 10" pipe = EX116 10" – 48" pipe = EX216 Hot Tap 3" – 10" pipe = EX156 10" – 48" pipe = EX256	Brass = B 316 Stainless = S	Brass Adapter Fitting 2" NPT = -02 SS Adapter Fitting 2" NPT = -02 Reverse Flow Output = -15 Brass Adapter 1 ½" BSP = -23 SS Adapter 1 ½" BSP = -24 Tamper Evident Kit = -32 Old Style Adapter 1 ½" NPT = -35 Low Power = -50 12" Extension (200 Series Only) = -72	316 SS Valve Assembly = -08 No Valve Assembly = -09 Reverse Flow Output = -15 Tamper Evident Kit = -32 Low Power = -50 12" Extension (200 Series Only) = -72
FT440 Mounted on Sensor	Externally powered sensor (12 - 24Vdc) with FT440 rate and total indicator (with pulse and 4-20mA outputs) mounted on the sensor.	3" – 10" pipe = EX119 10" – 48" pipe = EX219 Hot Tap 3" – 10" pipe = EX159 10" – 48" pipe = EX259	Brass = B 316 Stainless = S	Brass Adapter Fitting 2" NPT = -02 SS Adapter Fitting 2" NPT = -02 Reverse Flow Output = -15 Brass Adapter 1 ½" BSP = -23 SS Adapter 1 ½" BSP = -24 Tamper Evident Kit = -32 Old Style Adapter 1 ½" NPT = -35 Low Power = -50 Non-resettable Total = -64 12" Extension (200 Series Only) = -72 Hinged Display Cover = -126	316 SS Valve Assembly = -08 No Valve Assembly = -09 Reverse Flow Output = -15 Tamper Evident Kit = -32 Non-resettable Total = -64 12" Extension (200 Series Only) = -72 Hinged Display Cover = -126

** Immersible to maximum of 3 ft (1m), up to 2 weeks • Roytronic is a registered trademark of Milton Roy Company.*

WildEye Telemetry

General Information

WildEye provides a telemetry based datalogger that is compatible with most flow measurement meters and other measurement devices (pressure transducers, soil moisture monitors, etc.). The datalogger is only the size of a cell phone making it easy to mount in most locations. In addition the datalogger was designed to be capable of being fully submerged and still function.

For an additional $150.00, WildEye provides an expanded datalogger capable of monitoring several measurement devices at the same time. The example MBK discussed with WildEye staff was monitoring pressure transducers on either side of a siphon and a flow measurement device on the siphon.

WildEye provides a 3 year warranty for every device that is included in the price of the monthly telemetry fees.

Wildeye units monitoring a Seametrics AG 2000 (left) and a McCrometer McMag 3000 (right)

Power Options

The datalogger comes equipped with an internal battery that is expected to last five years. In addition, every device contains a monitoring chip that can predict when the battery will run out of power. If the battery dies outside of the warranty, WildEye will replace the device for $200.00, if the monthly fees have been paid.

It is possible to supplement the battery with a solar charger, and in scenarios where a lot of data is being monitored (such as 15 minute interval flow data) this is necessary to meet the 3 year warranty. This battery can also provide power for various 4-20 mA sensors.

Telemetry

The datalogger is built primarily for telemetry. While the device can hold 4 weeks of hourly data if cellular communication is lost, the data will eventually be overwritten. Data is transmitted from the datalogger to the WildEye server based in Sydney on a user-specified interval (typically once a day). Data can viewed on the WildEye website or downloaded to PDF or Microsoft Excel.

Recommended Maintenance

The datalogger was built such that maintenance is not possible by anyone beside WildEye staff. Ideally the datalogger is left alone until the battery dies and the user installs the replacement device. WildEye dose monitor every device and will know when the device will be nearing the end of its battery life. In addition, WildEye can monitor the battery usage to determine if there are any defects or malfunctions.

MBK recommends contacting WildEye directly for any maintenance questions.

WildEye
Jedd Forbes: (559) 290-7915
Fresno, CA

Manufacturers and Vendors for Flow Meters

Seametrics
Tech. Support: (800) 975-8153
Kent, WA

Advanced Water Products
Customer Service: (855) 439-8426
Kerman, CA

TechnoFlo Systems
Eric Huth: (559) 783-1207
Porterville, CA

Eaton Pumps Sales & Service
Customer Service: (530) 661-6737
Woodland, CA

McCrometer/Water Specialties
Customer Service:
Hemet, CA

Davis Machine Shop, Inc.
(951) 652-6811 Sales: (530)696-2576
Meridian, CA

Approximate Pricing

Approximate Pricing of WildEye Units

Model	**Base Cost**	Cost for Solar	Cost for Antenna Upgrade	SIM Card Charges Per Month	**Total After Five Years**
Basic WildEye	**$700.00**	$159.00	$70.00	$15.00	**$1,830.00**
WildEye Expanded	**$856.00**	$159.00	$70.00	$29.00	**$2,825.00**

Note: Installation and flowmeter cost are not included in above table. Prices obtained 6/22/2017.

Future Developments

WildEye is creating a datalogger capable of using satellite signal to push data to their server rather than cellular signal. At this time the device is still a few months away from being ready for release and is roughly estimated to cost twice as much as a standard WildEye datalogger.

For additional questions, please send site photos and measurement information (pipe size, pipe lengths, flow meter brand and model) to **MBK** *Engineers*.

MBK *Engineers*
06/22/2017

Mc Mag 3000™

CONFIGURATION SHEET
BATTERY POWERED
ELECTROMAGNETIC FLOW METER

DESCRIPTION

McCrometer's award-winning Mc Mag3000™ provides growers and irrigators with a new alternative for flow measurement. With a guaranteed 5-year battery life and saddle mount design, the Mc Mag3000 delivers the dependability and ease-of-installation McCrometer has provided to the agricultural market for nearly 60 years. The electromagnetic sensor offers accuracy as low as ±1% while being designed to naturally shed debris.

The meter is available to fit a common range of agricultural line sizes, from 4" to 12" diameter pipe.

The innovative design of the Mc Mag3000 saddle mount meter features a multi-point angled sensor that sheds debris, making it ideal for use in surface water, livestock waste lagoons, and other dirty water applications.

Using electromagnetic technology to measure the water flow, the Mc Mag3000's precision sensor corrects for shifting velocity in the pipe by constantly obtaining the mean velocity from its multiple electrodes. The result is a highly accurate (as low as +/- 1%) flow meter.

The meter combines an innovative saddle, precision sensor, and a battery powered integrated electronic converter package with data logging capability to provide accurate flow measurement for full-pipe flow monitoring applications.

The integrated electronic converter is secured with tamper resistant screws to protect against unauthorized access. The meter offers flow rate and total water used and a guaranteed 5-year battery life. The Mc Mag3000 features three 3.6V lithium-thionyl chloride (Li-$SOCl_2$) D size batteries, with one serving as back-up power. The main power batteries are easily replaced in the field. Pulse and 4-20mA output are available for remote meter reading or SCADA. The Mc Mag3000 is McCrometer CONNECT wireless system compatible, which allows users to access flow data by simply logging on to the Internet. This eliminates costly manual meter reading.

INSTALLATION

The Mc Mag3000 offers hassle-free installation, even in tight spaces. No flanges or costly welding is involved. Users simply cut a 3" diameter hole in the top of their pipe and slide the sensor into the hole, and then cinch the meter onto the pipe using the Factory provided U-straps.

The meter can be mounted in a horizontal or vertical position with a full pipe of water. A minimum of three pipe diameters upstream of a flow disturber and one pipe diameter downstream from the meter are required to ensure optimal accuracy of ±2%. A ±1% accuracy is available with a Factory consultation prior to order.

APPLICATIONS

- **Irrigation**
- **Center Pivot Systems**
- **Well Monitoring**
- **Water Distribution**
- **Chemigation**
- **Livestock Waste Lagoons**
- **Surface Water**
- **Golf Courses and Park Management**

McCROMETER
www.mccrometer.com

3255 WEST STETSON AVENUE • HEMET, CALIFORNIA 92545 USA
TEL: 951-652-6811 • 800-220-2279 • FAX: 951-652-3078 Printed In The U.S.A. Lit. # 30121-41 Rev. 1.6/08-15
Copyright © 2014-2015 McCrometer, Inc. All printed material should not be changed or altered without permission of McCrometer. Any published technical data and instructions are subject to change without notice. Contact your McCrometer representative for current technical data and instructions. U.S. Patent 8,997,580 B2; foreign patents pending.

SPECIFICATIONS	
Pipe Sizes	4", 6", 8", 10", 12"
Body Style	Saddle mount
Pressure	150 psi (10.3 bar) working pressure
Accuracy	± 2% with default calibration ± 1% with custom Factory calibration
Materials	
Sensor Body	Fusion bonded epoxy coated stainless steel (316)
Electrodes	Stainless steel (316)
Saddle Mount	Stainless steel (304)
Saddle Hardware	Stainless steel (304)
Electronic Housing	IP-67 Certified diecast aluminum, powder coated enclosure w/ tamper resistant seal, 6½" x 6½" x 4⅜" tall
O-Ring	SBR rubber D-ring
Boot Cover	EPDM rubber
Display	2-Line LCD display (no backlight), 16 characters per line • Non-volatile memory • Anti-reverse totalizer (standard) • Total (to 9 digits of precision) • Flow Rate and Velocity (to 5 digits of precision) • Two alarms: low battery and empty pipe (optional) To preserve battery life a magnetic switch in the housing lid activates the display
Digits	5 Rate, 9 Total
Units	US gallons, US gallons x1000, US gallons x1,000,000, cubic inches, cubic feet, cubic feet x1000, cubic centimeters, cubic decimeters, milliliters, liters, deciliters, hectoliters, kiloliters, megaliters, cubic meters, cubic meters x1000, acre feet, acre inches, imperial gallons, imperial gallons x1000, imperial gallons x1,000,000, standard barrels, oil barrels, and miner inch days. Rate scales: seconds, minutes, hours, and days.
Power	
Battery	Standard: three 3.6V lithium-thionyl chloride ($Li\text{-}SOCl_2$) D size batteries. Batteries are field replaceable
DC Power	Linear power supply 10-35VDC, 2.4W
Battery Guarantee	Guaranteed 5-year battery life
Outputs	
Pulse Output	Digital pulse (open collector) output for volumetric and/or alarm • Battery power only: 1 pulse output maximum • DC powered version: 2 pulse outputs available
Analog Output	4-20mA (not galvanically separated from the power supply). DC powered option only.
Conductivity	Minimum conductivity of 50µS/cm, for lower conductive fluid consult Factory.
Empty Pipe Detection	Hardware/Software, conductivity-based (optional)
Environmental	
Operating Temperature	-4° to 220°F (-20° to 105°C) sensor (in process fluid), -4° to 140°F (-20° to 60°C) converter (ambient)
Storage Temperature	-40° to 149°F (-40° to 65°C)
Operating Pressure	150 PSI
Electrical connects	Optional shielded cable for 10-32VDC/4-20 mA output Optional shielded cable for pulse out
Pipe Run Requirements	3D Upstream / 1D Downstream
Options and Accessories	• Data logger - minimum of five years of data stored. (Cable sold separately.) • Epoxy coated carbon steel flanged spool piece • DC power w/battery backup: (Pulse & 4 20mA Out) • Annual verification / calibration • Stainless Steel ID tag

McCROMETER
www.mccrometer.com

3255 WEST STETSON AVENUE • HEMET, CALIFORNIA 92545 USA
TEL: 951-652-6811 • 800-220-2279 • FAX: 951-652-3078 Printed In The U.S.A. Lit. # 30121-41 Rev. 1.6/08-15
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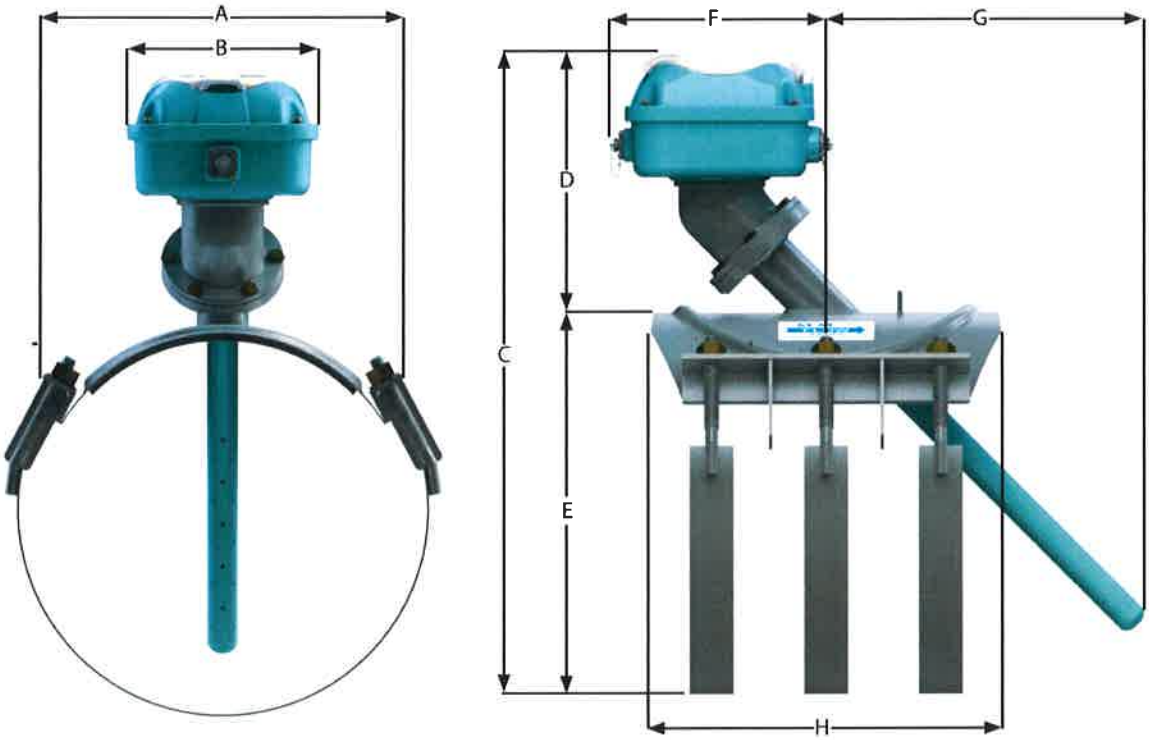
Mc Mag^{3000} DIMENSIONS AND WEIGHTS



	Nominal Pipe Size*				
Max/Min Flow And Weight	**4"**	**6"**	**8"**	**10"**	**12"**
Maximum Flow U.S. GPM	600	1350	2350	3700	5300
Minimum Flow U.S. GPM	40	90	150	240	350
Approximate Shipping Weight lbs.	23	26	29	30	32

	Nominal Pipe Size				
Dimensions (Inches)	**4"**	**6"**	**8"**	**10"**	**12"**
A	7.50	13.00	12.50	13.25	15.25
B	6.44	6.44	6.44	6.44	6.44
C	13.50	15.50	17.50	19.75	21.75
D	8.90	8.90	8.90	8.90	8.90
E	4.50	6.625	8.625	10.75	12.75
F	7.37	7.37	7.37	7.37	7.37
G	3.56	4.93	7.32	8.38	10.77
H	8.00	12.00	12.00	12.00	12.00

All Dimensions based on ANSI B36.10 Nominal Pipe

*** Note:** Meters can be installed in Water Specialties bolt saddle meter cutouts for 6" meters and 8"-12" meters as well as in McCrometer bolt on saddle meter cutouts for 12" OD pipe. **The meter CANNOT be installed in Water Specialties bolt on saddle meter cutouts for 4" meters.** If replacing an existing meter, consult Factory.

McCROMETER
www.mccrometer.com

3255 WEST STETSON AVENUE • HEMET, CALIFORNIA 92545 USA
TEL: 951-652-6811 • 800-220-2279 • FAX: 951-652-3078 Printed In The U.S.A. Lit. # 30121-41 Rev. 1.6/08-15
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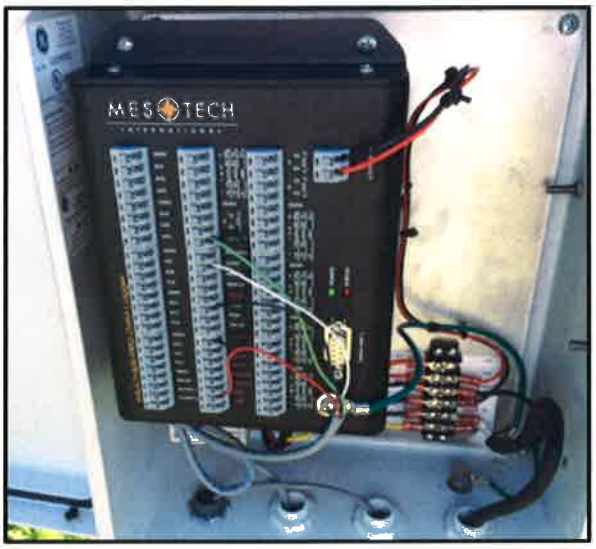
Mesotech WeatherPro Datalogger

General Information

The Mesotech WeatherPro datalogger is compatible with all common sensor outputs for measurement (flow, depth, power use, etc.). The data collected by the sensors is stored on the datalogger's 4 MB internal storage until the user downloads it directly using a flash drive or the data is uploaded using telemetry. Mesotech works with every client to configure and assemble the datalogger and enclosure to meet their specific needs.



Power Options

Mesotech has designed the datalogger to utilize solar, AC, and DC power. The device requires 7 to 40 VDC and can operate at currents less than 55 mA at 12 VDC. Mesotech has built in several protections to prevent a surge from damaging the datalogger. The datalogger can also be equipped with a backup battery that will preserve the data until power can be restored.

Telemetry

The datalogger can be upgraded with telemetry capabilities at any time. Mesotech will work with the client to determine if cellular, line of sight radio, ethernet, or wifi based telemetry will be the most efficient option.

Recommended Maintenance

Mesotech is based in Sacramento, CA and have so far proven their technical support team is readily accessible to clients. Given the customizations the client will have implemented to their datalogger it is recommended to contact Mesotech directly with any maintenance related questions.

Mesotech International Inc.
Chris Swinehart: (916) 368-2020
Sacramento, CA

Manufacturers and Vendors for Flow Meters

Seametrics
Tech. Support: (800) 975-8153
Kent, WA

Advanced Water Products
Customer Service: (855) 439-8426
Kerman, CA

TechnoFlo Systems
Eric Huth: (559) 783-1207
Porterville, CA

Eaton Pumps Sales & Service
Customer Service: (530) 661-6737
Woodland, CA

McCrometer/Water Specialties
Customer Service:
Hemet, CA

Davis Machine Shop, Inc.
(951) 652-6811 Sales: (530)696-2576
Meridian, CA

Approximate Pricing

Approximate Pricing of Mesotech WeatherPro Datalogger

Model	Base Cost	Cost for Solar	Components and Assembly	Total Base Cost	Cost for Telemetry Upgrade	SIM Card Charges Per Month	Total After Five Years
3-Input*	$400.00	$210.00	$70.00	$1,070.00	$600.00	$15.00	$2,570.00
13-Input	$900.00	$210.00	$70.00	$1,570.00	$600.00	$15.00	$3,070.00

*Product is still in testing

Note: Installation and flowmeter cost are not included in above table. Prices obtained 6/22/2017.

Future Developments

Mesotech is still in the process of testing a more economical version of their 13-input datalogger. This version would only have 3 inputs for measurement devices, but otherwise is identical to the datalogger currently available. Mesotech has shared estimated prices for this product as shown in the table above.

In addition, Mesotech is creating an app that would allow the client to view their collected data anytime from a cell phone. This is still in development and no release schedule has been confirmed.

For additional questions, please send site photos and measurement information (pipe size, pipe lengths, flow meter brand and model) to **MBK** *Engineers*.

Gary Kienlen Kienlen@mbkengineers.com
Anne Kwedar: Kwedar@mbkengineers.com
Julian Storelli: Storelli@mbkengineers.com
Angela Bezzone: Bezzone@mbkengineers.com
Darren Cordova: Cordova@mbkengineers.com
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455 University Avenue, Suite 100
Sacramento, CA 95825

McCROMETER

SPI Mag™

Single Profile Insertion Flow Meter

Ideal for Clean or Dirty Water Flow Measurement

Highly Cost-Effective Flow Solution

SPI Mag™

SPI Mag™

Key SPI Mag Specs in Brief *

The SPI Mag Insertion Flow Meter provides a highly cost-effective solution for the accurate measurement of liquid flow in closed conduit, pressurized pipe applications. The SPI measures forward flow only and is suitable for line sizes from 2 to 96 inches. The SPI can be easily re-located to various line sizes.

- **Proven electromagnetic technology based on Faraday's Law**
- **Debris shedding, self-cleaning sensor eliminates costly maintenance**
- **Cost is independent of line size**
- **Easy Hot Tap Installation - no interruption of flow process**

The SPI Mag is suitable for municipal water and wastewater applications including:

- **Wastewater:** Effluent, Waste Activated Sludge (WAS), Return Activated Sludge (RAS), Reclaim / Recycle
- **Clean Water:** Raw Water Intake, Clear Wells

The SPI Mag also reliably measures flow in many types of industrial flow processes involving conductive fluids such as potable water, slurries, sludge, cooling water, and pulp stock.

M-SERIES CONVERTER

The SPI Mag utilizes our pre-programmed M-Series Converter*:

- Curve-fitting algorithm to improve accuracy
- Dual 4-20 mA analog outputs
- RS485 port for easy connection to DCS
- 8 line graphical LCD display
- 3 key touch programming
- Rugged enclosure meets IP67

**See data sheet for complete specs and order information*

The SPI Mag is available with the following specs:

- **Range:** Nominal pipe size availability
- **Accuracy:** ±2% of reading ± 0.03 ft/s (± 0.009 m/s) zero stability from 0.3 to 32 ft/s velocity range (0.09 to 10m/s)
- **Pipe Sizes:** 2 - 96 inches (50 mm - 2,400 mm)
- Reverse flow indication

** See data sheet for complete specs and order information*

McCROMETER

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Phone 800 220-2279 | 951 652-6811 | Fax 951 652-3078

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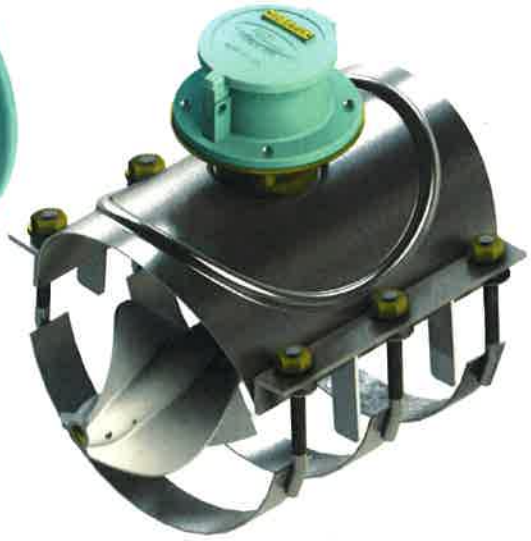
McCROMETER

Water Specialties Propeller Flow Meter™



Built to Last in the Harshest Conditions

WATER SPECIALTIES PROPELLER METER

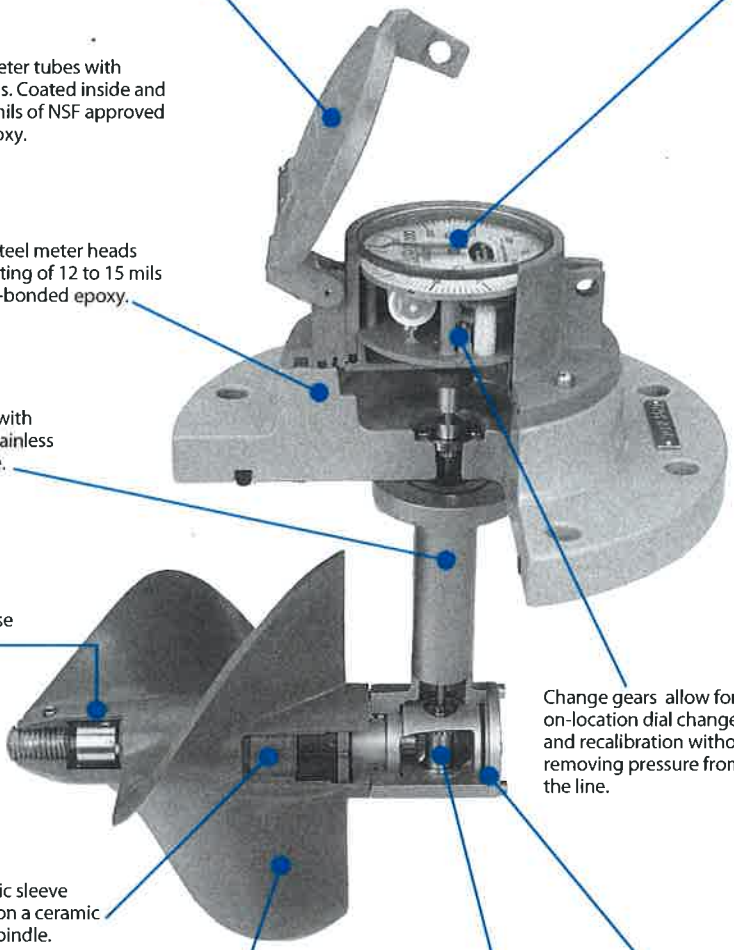
Injection molded thermoplastic bonnets. Hinged lid with padlock hasp to prevent unauthorized entry.

Fabricated steel meter tubes with straightening vanes. Coated inside and out with 12 to 15 mils of NSF approved fusion-bonded epoxy.

Cast iron or fabricated steel meter heads feature a protective coating of 12 to 15 mils of NSF approved fusion-bonded epoxy.

Stainless steel gearbox with removable one-piece stainless steel separator / spindle.

Long life ceramic dual thrust bearings handle both forward and reverse direction flow.



Change gears allow for on-location dial changes and recalibration without removing pressure from the line.

Water-lubricated ceramic sleeve propeller bearing rides on a ceramic sleeved stainless steel spindle.

Injection molded propeller designed to handle temperatures up to 140°F without pitch distortion. Also available for temperatures up to 250°F.

O-ring seals are used at the meter head and all other points where seals are required.

Oil-filled, stainless steel gearbox houses miter gears suspended between stainless steel ball bearings for smooth operation.

Six-Digit Flow Volume Totalizer

Standard: Six-digit flow volume totalizer. 3" diameter display with 100 division center sweep dial. Configurable in gallons, cubic feet, acre feet, or any standard liquid measuring units. Magnetic drive assures moisture tight seal. Available with optional 4-20mA and/or pulse output.

FlowCom Digital Indicator-Totalizer

Optional: FlowCom digital indicator-totalizer has a non-volatile memory. The five-digit indicator shows flow rate in 22 different units, including GPM, CFS, MGD. The eight-digit totalizer provides volumetric flow data and is available in 20 different units, including Gallons, AF, CF. Units of measurement are user-selectable. Battery life is 6-10 years. Housing is NEMA 4X rated. Available with optional 4-20mA and/or pulse output.

Indicator-Totalizer

Optional: Delivers instantaneous flow rate indication and totalization of flow volume. 4-inch diameter display with 250° dial, six-digit totalizer, and test sweep hand. Configurable in GPM, CFS, MGD or any standard liquid measuring units. Choice of standard totalizer measuring units. Available with optional 4-20mA and/or pulse output.

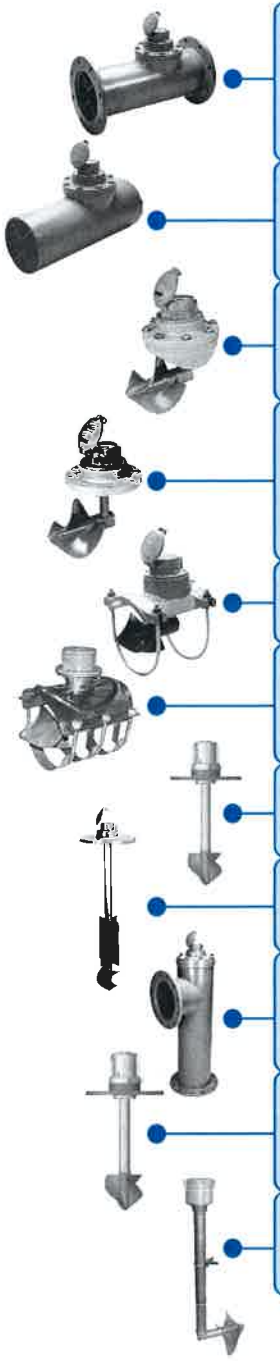
WATER SPECIALTIES
PROPELLER METER

The Water Specialties Propeller Meter is uniquely designed to meet the flow measurement needs of water and wastewater users.

Employed extensively in the water and wastewater industry, it has built a reputation for durability, reliability and high performance.

Our knowledgeable staff can assess your flow measurement application and help you find the best metering technology for your situation.

To find out more about our flow measurement products, or for a free flow evaluation, contact your nearest Water Specialties representative today or visit our website at www.mccrometer.com.



		MODEL NO.	PRESSURE RATING	STANDARD TOTALIZER	INDICATOR/ TOTALIZER	DIGITAL	INSTALLATION NOTES
2" - 48"	STEEL FLANGED-END TUBE METER	ML03	150 PSI	✔			
		ML04	150 PSI		✔		
		ML04D	150 PSI			✔	
		ML08D	300 PSI			✔	
3" - 48"	STEEL PLAIN-END TUBE METER	ML11	150 PSI	✔			●●
		ML12	150 PSI		✔		●●
		ML12D	150 PSI			✔	●●
4" - 72"	STEEL WELDING SADDLE METER	ML19	150 PSI	✔			●●●
		ML20	150 PSI		✔		●●●
		ML20D	150 PSI			✔	●●●
3" - 72"	METER HEAD ASSEMBLY	MLT1	150 PSI	✔			●
		MLI1	150 PSI		✔		●
		MLI1D	150 PSI			✔	●
		MLI2D	300 PSI			✔	●
4"	STRAP-ON SADDLE METER *DUCTILE IRON SADDLE*	LP22D	150 PSI			✔	●●●
6" - 20"	STRAP-ON SADDLE METER *STAINLESS STEEL SADDLE*	LP31	150 PSI	✔			●●●
		LP32	150 PSI		✔		●●●
		LP32D	150 PSI			✔	●●●
4" - 20"	VERTICAL UPFLOW METER	VF28D	150 PSI			✔	○
4" - 20"	VERTICAL DOWNFLOW METER	VF32D	150 PSI			✔	○
4" - 20"	VERTICAL UPFLOW TEE-TUBE METER	VF29	150 PSI	✔			○○
		VF30	150 PSI		✔		○○
		VF30D	150 PSI			✔	○○
10" - 72"	VERTICAL METER HEAD ASSEMBLY	VFT1	150 PSI	✔			
		VFI1	150 PSI		✔		
		VFI1D	150 PSI			✔	
10" - 72"	OPEN FLOW METER	OF12D	150 PSI			✔	○○○

Blue shaded model numbers are standard totalizer options.
Replacement meter heads available for other brands of meters.
Consult factory for special pressure ratings or materials of construction.

Installation notes

- ● Meters bolt into existing Water Specialties saddles or meter tubes.
- ●● Installation is made by using one of many types of pipe couplings available or by welding to adjoining pipe.
- ●●● Installation is made by cutting a hole in the existing pipe and then attaching meter securely to the line.
- ○ Installation is made to an appropriate cast iron or fabricated tee. Replace an elbow in existing systems, such as on the suction side of a centrifugal pump or laterals in irrigation systems.
- ○○ Installation is made to any vertical discharge line with the proper size flange connection, or to vertical discharge concrete turnouts with proper anchor bolts.
- ○○○ Installation is made to any wall or vertical structure which will center the propeller in the measuring area. For use in ditch turnouts, reservoir outlets, closed conduits, or other similar installations that have a controlled flow measuring area and full flow of liquid.

FLOWCOM: YOUR DIGITAL REGISTER SOLUTION

Specially designed LCD display can be read in bright sunlight and will not be damaged by prolonged exposure to sunlight. The indicator-totalizer is encapsulated in a moisture resistant barrier so no moisture can come in contact with the electronic components. This solid state design offers extended life.

Long Life Battery

The battery has a 6 to 10 year lifespan.

Transmitter Optional Outputs

- AMI compatible output
- 4-20mA
- Pulse output
- Contact closure

Memory

The non-volatile memory retains the totalizer quantity and programming.

Easy Installation

The electronic meters can be installed vertically, horizontally, or inclined.

In-field Conversion Kits

Water Specialties mechanical propeller meters can be converted to electronic propeller meters in the field.

McCrometer's Expertise in Flow Physics

A Leader in Flow Metering Solutions

Our application engineers, researchers, and designers apply their expertise in real-world fluid dynamics to continuously improve our innovative flow metering solutions. Instrument, process, facility, and consulting engineers worldwide have confidently chosen McCrometer's flow meters for over 60 years.

Committed to Quality Manufacturing in the USA

McCrometer prides itself on the fact that all Water Specialties flow meters are designed, manufactured, and tested in the USA. Manufacturing takes place in our headquarters in Hemet, California or at our manufacturing and service center in Aurora, Nebraska, and we own and operate one of the world's largest volumetric test facilities in Porterville, California. Our manufacturing facilities and quality control systems are the foundation for being a trusted supplier. Our USA based, high quality manufacturing is another reason our customers around the world have confidently chosen McCrometer flow meters for their most challenging flow applications since 1955.

McCROMETER

www.mccrometer.com

Corporate Headquarters:
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Phone: 800-220-2279 | 951-652-6811 | Fax: 951-652-3078

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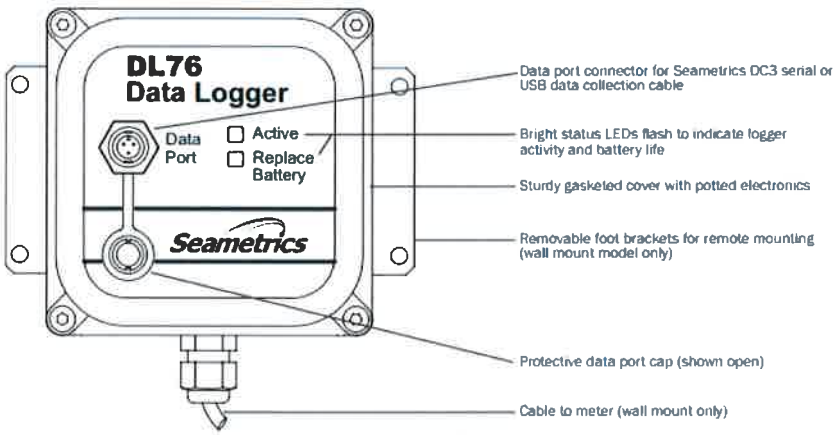
Lit# 30100-02 / Rev 2.6

Seametrics DL76 Datalogger

General Information

The Seametrics DL76 wall mounted datalogger is compatible with any sensor that has a pulse output. It can be mounted directly onto the meter or remotely mounted. The datalogger is capable of storing over 3 years worth of hourly collected data. This data is downloaded from the datalogger by using a laptop and provided FlowInspector™ Version 2 Software. The software can export the data to Microsoft Excel.



Power Options

The datalogger is powered by an internal Size C 3.6 V lithium battery with an estimated life span of 3-5 years. Lights on the surface of the datalogger inform the user if the battery needs to be replaced. These batteries are commercially available and can be easily replaced by the user.

Telemetry

The datalogger has no telemetry capabilities.

Recommended Maintenance

This datalogger can be installed by any company who could install a flow measurement meter. MBK recommends working with the installers for general maintenance issues and with Seametrics on any software or reading issues.

Seametrics
Tech. Support: (800) 975-8153
Kent, WA

Manufacturers and Vendors for Flow Meters

Seametrics
Tech. Support: (800) 975-8153
Kent, WA

Advanced Water Products
Customer Service: (855) 439-8426
Kerman, CA

MBK *Engineers*
06/22/2017

Eaton Pumps Sales & Service
Customer Service: (530) 661-6737
Woodland, CA

Davis Machine Shop, Inc.
Sales: (530)696-2576
Meridian, CA

Golden State Irrigation
Phone: (209) 943-7774
Stockton, CA

Rain for Rent
Phone: (209) 466-5602
Stockton, CA

Approximate Pricing

Approximate Pricing of Seametrics DL 76 Datalogger

Model	Base Cost	Software and Cables	Total Cost
DL 76	$500.00	$180.00	$780.00

Note: Installation and flowmeter cost are not included in above table. Prices obtained 6/22/2017.

Future Developments

Seametrics also makes an internal datalogger on the AG 2000 and AG 3000 flange magnetic flow meters. This internal datalogger is the same in terms of performance, battery, etc. but allows the user to also install a telemetry device. The datalogger on the AG 3000 will require a different cable (IP68 submersible) but still uses the same software as described above. The internal datalogger is not required for either meter to function.

For additional questions, please send site photos and measurement information (pipe size, pipe lengths, flow meter brand and model) to **MBK** *Engineers*.

Gary Kienlen Kienlen@mbkengineers.com
Anne Kwedar: Kwedar@mbkengineers.com
Julian Storelli: Storelli@mbkengineers.com
Angela Bezzone: Bezzone@mbkengineers.com
Darren Cordova: Cordova@mbkengineers.com
Kyle Knutson: Knutson@mbkengineers.com
Connor Bovee: Bovee@mbkengineers.com

(916) 456-4400
455 University Avenue, Suite 100
Sacramento, CA 95825

AG3000 SERIES
FLANGED MAGMETER

AG3000

AG3000-300

AG3000p

AG3000r
(Remote Display)

RIGHT METER FOR
Irrigation
Chemigation
Agricultural automation
Well usage monitoring
Dairy lagoons

Features

- Easy setup
- Minimal straight pipe
- Mounted or remote rate & total
- Tamper-evident seal
- IP68 rated
- Telemetry ready—for wireless meter reading
- No Moving Parts

Contact Your Supplier

The **AG3000** Series is a spool-type electromagnetic flowmeter for use in irrigation applications in 3" to 12" pipe. With no moving parts, these meters provide unobstructed flow and are resistant to wear from debris found in ground or surface water. Little maintenance is required because there are no bearings to wear out or propellers to stop turning. Minimal straight pipe requirements allow AG3000 meters to be used in piping configurations where there is little space between the meter and an elbow.

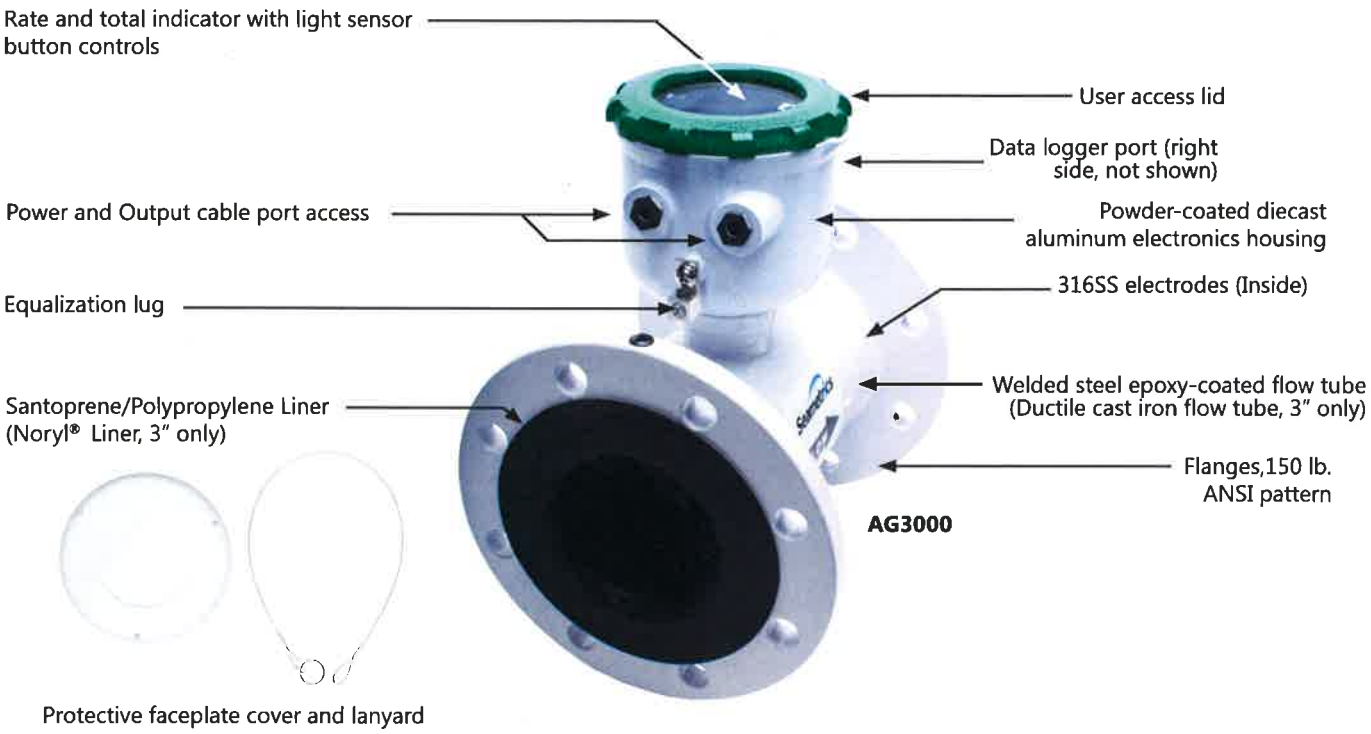
The standard AG3000 is battery powered with an available pulse output. Both rate and total indication are displayed. Bidirectional flow reading is standard with totals available in forward, reverse, net flow, batch forward flow, and batch reverse flow. Batch totals can be reset. Built-in data logging is available as an option for secure flow logging.

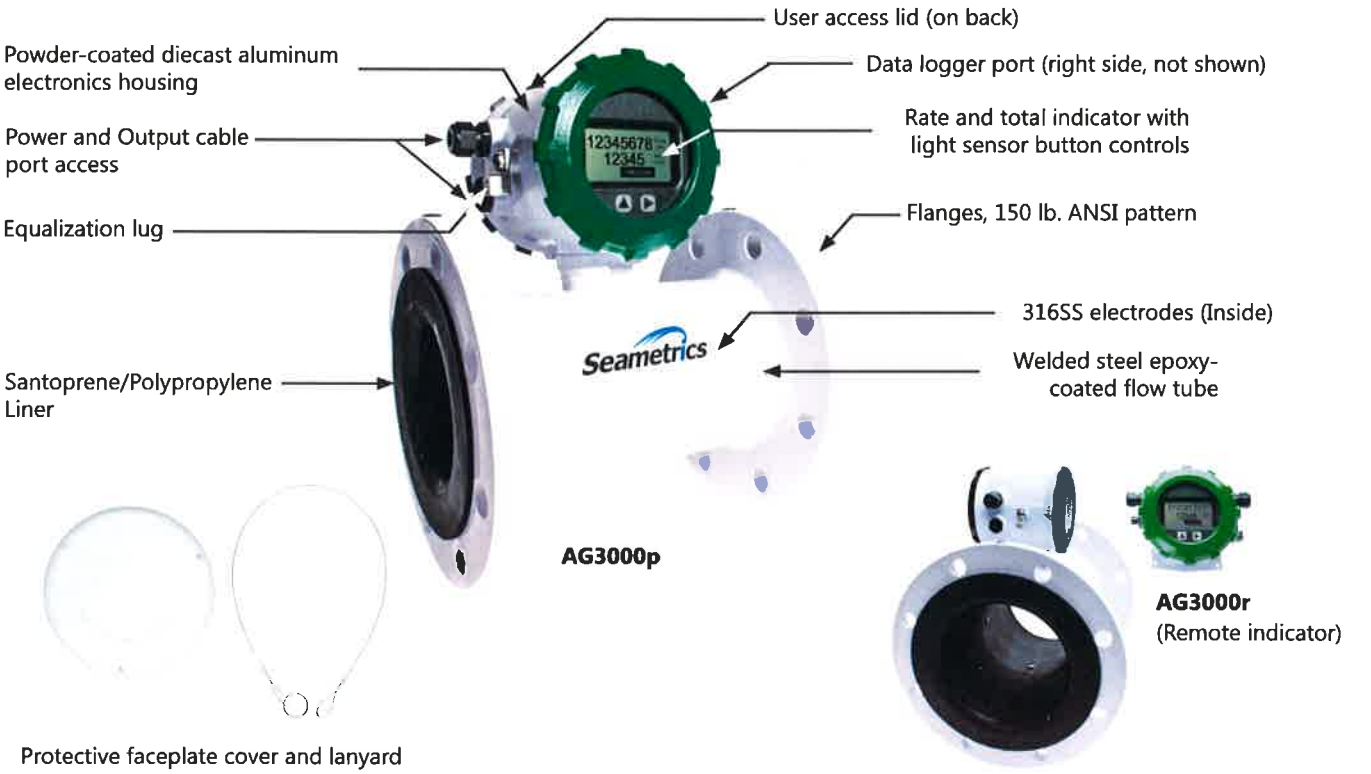
The AG3000 is also available in either AC or DC powered versions, with battery backup. Pulse output is standard on all models and 4-20mA passive current loop is standard on the AG3000p. In addition, 4-20mA loop, HART protocol, high speed digital, and Modbus® protocol outputs are optional on the externally powered units, depending on model. A power/output cable allows outputs for use with a variety of Seametrics and other displays and controls for remote reading and telemetry applications.

Rate and total units, pulse scaling, and various other settings are set via the front panel touch-key pad by the user. The remote display model (AG3000r) provides remote access for controlling the meter and viewing readings.

The AG3000 Series is CE certified (pending) and IP68 for burial, or applications where the meter may be under water for prolonged periods of time. All meters are secured with a seal to protect unauthorized access. The seal can be broken by an authorized agent, to change units of measure, pulse rate, replace the battery pack, or field install a power/output cable. The cable is field installed where external power is available and/or an output is needed.

Features


Rate and total indicator with light sensor button controls
User access lid
Data logger port (right side, not shown)
Power and Output cable port access
Powder-coated diecast aluminum electronics housing
Equalization lug
316SS electrodes (Inside)
Santoprene/Polypropylene Liner (Noryl® Liner, 3" only)
Welded steel epoxy-coated flow tube (Ductile cast iron flow tube, 3" only)
Flanges,150 lb. ANSI pattern
AG3000
Protective faceplate cover and lanyard

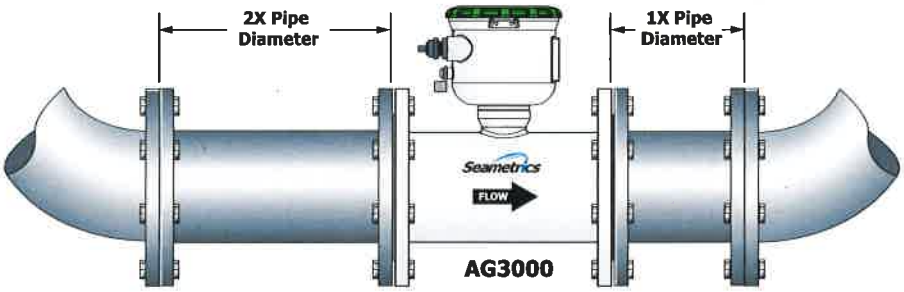

User access lid (on back)
Powder-coated diecast aluminum electronics housing
Data logger port (right side, not shown)
Power and Output cable port access
Rate and total indicator with light sensor button controls
Equalization lug
Flanges, 150 lb. ANSI pattern
316SS electrodes (Inside)
Santoprene/Polypropylene Liner
Welded steel epoxy-coated flow tube
AG3000p
AG3000r
(Remote indicator)
Protective faceplate cover and lanyard

Features

- Built-in Data Logger *(Optional)*
- Bidirectional Flow Reading *(Standard)*
- Pulse Scaled Output *(Standard)*
- 4-20mA Output *(Optional*)*
- HART Protocol Output *(Optional*)*
- Modbus® Protocol Output *(Optional*)*
- High Speed Digital Output *(Optional*)*
- Battery Power *(AG3000 battery model only)*
- External DC Power *(Optional*)*
- Integrated AC Power Supply *(Optional*)*
- Remote Display *(AG3000r)*

Quickly and easily change Total Volume Units, Flow Rate Units, Pulse Output Scaling, and many other settings using the two light sensor button controls on the display panel.

* *Some optional items only available on some configurations. See last page for further details.*



Minimal straight pipe requirements to ease installation in tight quarters.

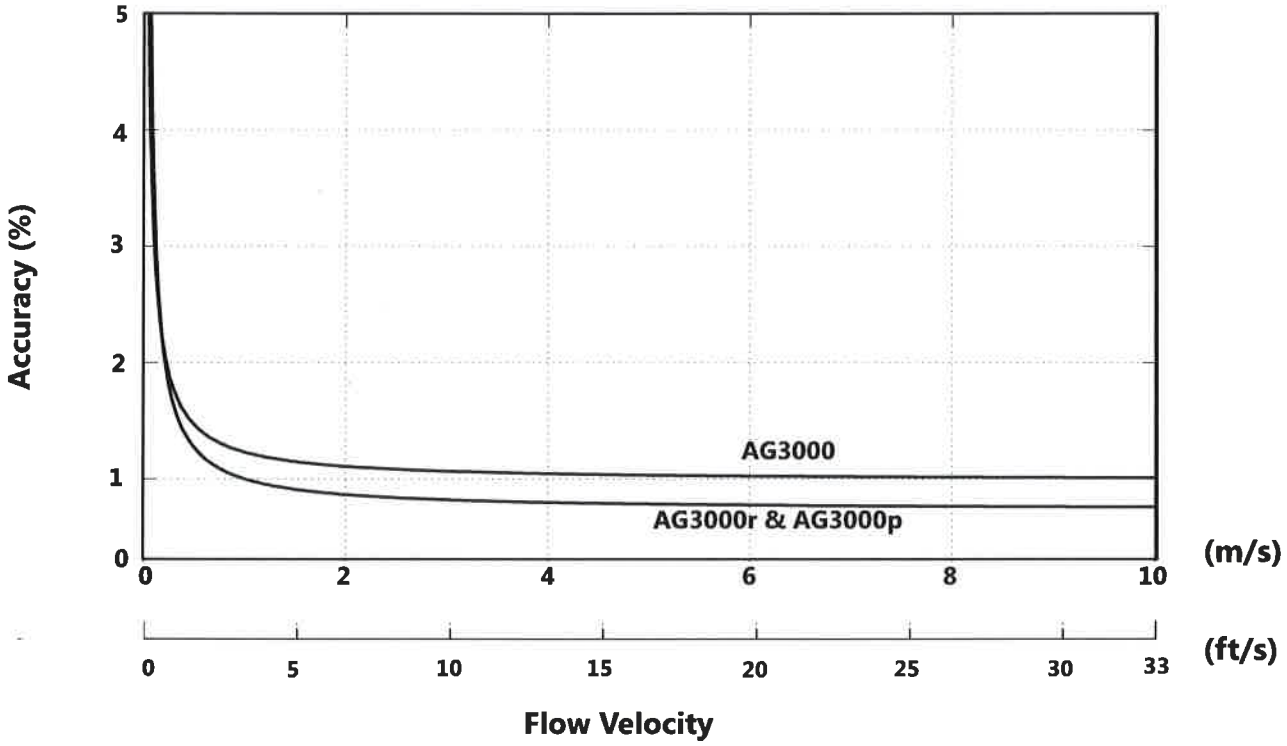
No moving parts to break or foul!

Specifications

Pipe Sizes		3", 4", 6", 8", 10", 12"					
Flanges		150 lb. ANSI Pattern					
Pressure		150 psi (10.3 bar) line pressure					
Temperature	**Operating**	10° to 130° F (-12° to 54° C)					
	Storage	-40° to 158° F (-40° to 70° C)					
Accuracy		±0.75% of reading on AG3000p and AG3000r (±1.0% AG3000), ±0.025% of full-scale flow from low flow cutoff to maximum flow rate of 10 m/sec					
Low Flow Cutoff		0.5% of maximum flow rate					
Material	**Body** *(3" only)*	Ductile cast iron, powder coated					
	Body *(4"-12")*	Welded steel, epoxy-coated					
	Liner *(3" only)*	Noryl®					
	Liner *(4"-12")*	Santoprene flange/Polypropylene liner body					
	Electronics Housing	Powder-coated diecast aluminum					
	Electrodes	316 stainless steel					
	O-ring (3" only)	EPDM					
Display	**Type**	128x64 dot-matrix LCD					
	Digits	5 Digit Rate			8 Digit Total		
	Units	Rate Volume Units		Rate Time Units	Total Volume Units		
	Please Note: All AG3000 meters are factory set for gallons per minute (GPM) rate and acre feet total. If other units are required, they can be set in the field.	Gallons Liters Barrels(42 gal) Cubic Feet Cubic Meters	Million Gallons[2] Mega Liters[2] Imperial Gallons Million Imperial Gallons[2]	Second Minute Hour Day	Gallons Gallons x 10 Gallons x 100 Gallons x 1000 Million Gallons Liters Kilo Liters Mega Liters	Barrels (42 gal) Cubic Meters x 1000 Cubic Feet Cubic Feet x 1000 Second Foot Day Million Cubic Feet	Acre Feet Acre Inches Imperial Gallons Imperial Gallons x 1000 Million Imperial Gallons Fluid Ounces
	Bidirectional[1]	Forward Total, Reverse Total, Net Total, Batch Forward Total, Batch Reverse Total (Batch totals can be reset)					
Power	**DC Power**	9-36 Vdc @ 250 mA max, 30 mA average					
	Battery Backup	DC powered units: Two lithium 3.6V 'D' batteries, replaceable. AC powered units: One 9V alkaline battery, replaceable.					
	AC Power *(AG3000r and AG3000p only)*	85-264Vac, 50/60Hz, 0.12A					
	Battery *(AG3000 only)*	Two lithium 3.6V 'D' batteries, replaceable.					
Scaled Pulse Output	**Signal**	Current sinking pulse, isolated, 36 Vdc at 10 mA max					
	Pulse Rates	User-scalable from 0.1 to 99,999.9 volume units/pulse. Pulse width is one-half of pulse period with minimum pulse width of 2.5 ms, 200 pulses/sec max, 150 pulses/sec max with battery option					
Options	**4-20mA Current Loop**	Isolated, passive, 24Vdc, 650 Ω maximum current loop					
	HART/4-20mA	HART protocol over 4-20mA line					
	High Speed Digital Output *(AG3000 & AG3000p only)*	Isolated, open collector, 24 Vdc					
	Serial Communications	Isolated, asynchronous serial RS485 (Reconfigurable for RS232 or 3.3V CMOS), Modbus® RTU protocol (factory selectable)					
Cable	**Power/Output Cable**	20ft (6m) standard length polyurethane jacketed cable—for power and outputs (lengths up to 200' available).					
	Remote Display Cable *(AG3000r)*	20ft (6m) standard length polyurethane jacketed cable—for connection between meter and remote display (lengths up to 200' available).					
Conductivity		>20 microSiemens/cm					
Empty Pipe Detection		Hardware/software, conductivity-based					
Regulatory		CE (EN 61326), NSF-61					
Environmental		NEMA 6P, IP68 (10ft (3m) depth, continuously)					

Modbus is a registered trademark of Schneider Electric.
**Specifications subject to change. Please consult our website for the most current data (www.seametrics.com).*
[1] If forward and reverse flow data needs to be sent to another device, either the Digital or Modbus output is required.
[2] Rate Time Unit is available in Day only.

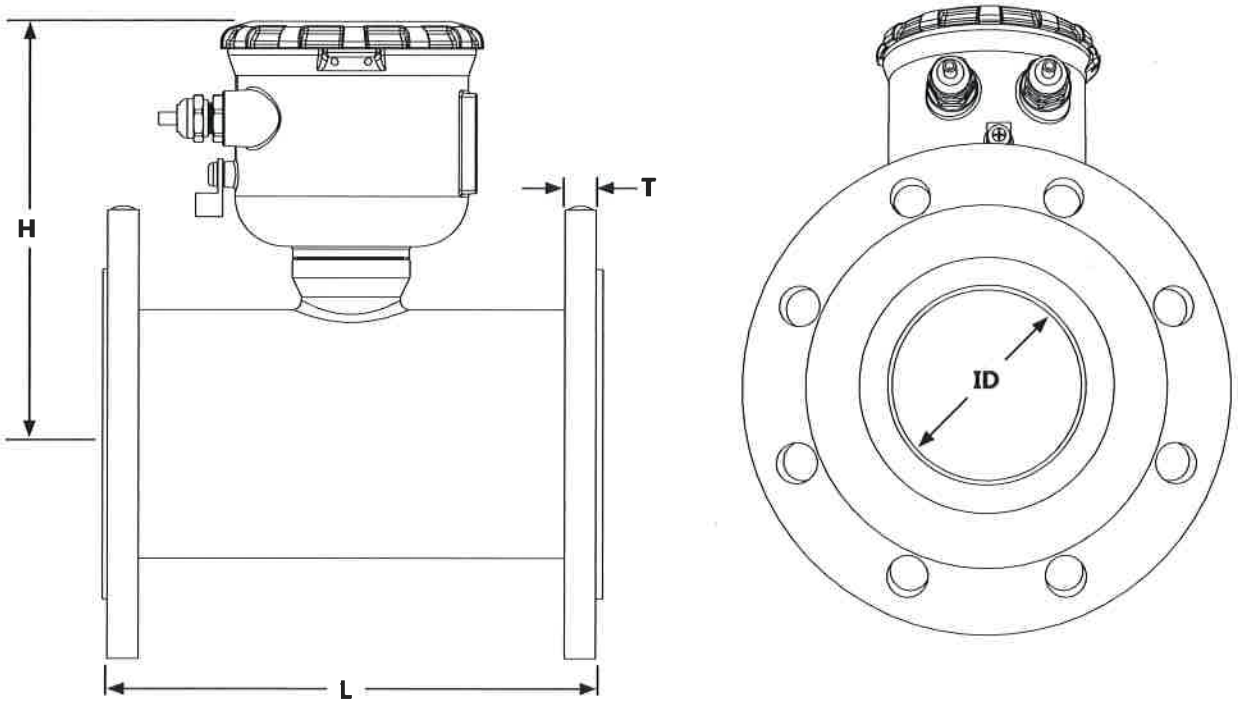
AG3000 Accuracy



Flow Rate (3" - 12")

Pipe Size *(Inches in diameter)*	**3"**	**4"**	**6"**	**8"**	**10"**	**12"**
Max Flow Rate *(Gallons/Minute)*	**723**	1285	2891	5140	8031	11565
Cut-off (min) Flow Rate *(Gallons/Minute)*	**3.62**	6.43	14.46	25.70	40.15	57.82
Max Flow Rate *(Liters/Second)*	**46**	81	182	324	507	730
Cut-off (min) Flow Rate *(Liters/Second)*	**0.23**	0.41	0.91	1.62	2.54	3.65
Max Flow Velocity *(Meters/Second)*	**10**	10	10	10	10	10

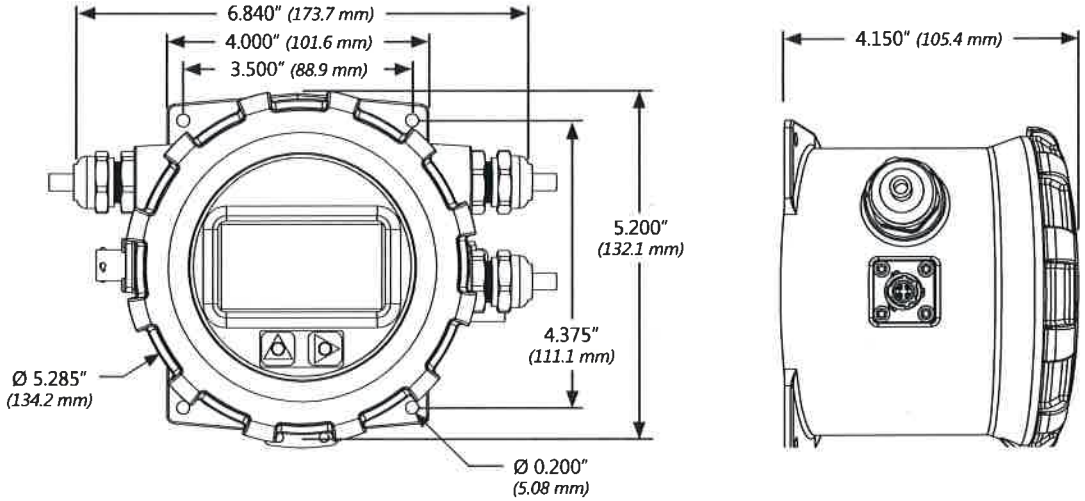
Dimensions - AG3000



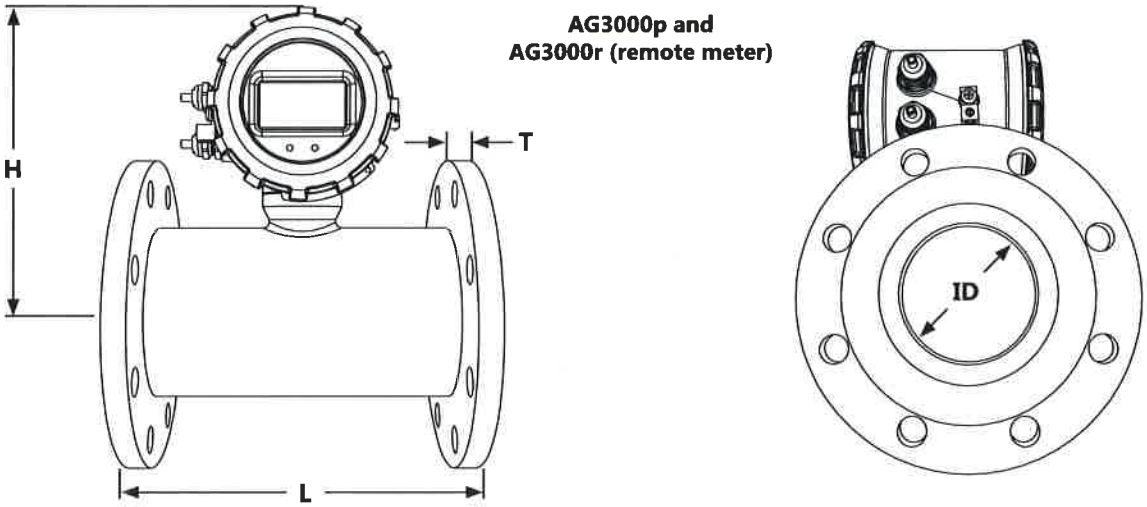
AG3000 Meter Size	L		H		T		ID		Shipping Weight	
	inch	mm	inch	mm	inch	mm	inch	mm	lbs	Kg
3"	12.25	311.15	7.08	179.8	.68	17.25	2.6	66.04	31	14
4"	10.24	260	8.3	211	.62	15.7	3.12	79	27	12
6"	12.27	312	9.1	231	.69	17.5	5.05	128	42	19
8"	14.24	362	10.1	257	.69	17.5	6.44	164	64	29
10"	18.18	462	11.2	284	.69	17.5	8.61	219	123	56
12"	19.68	500	12.2	310	.81	20.6	10.55	268	165	75
Flanges	Standard ANSI 150 lb. drilling								Cable 1 lb.	

Dimensions - AG3000r and AG3000p

AG3000r (remote display)



AG3000p and AG3000r (remote meter)



AG3000 Meter Size	L		H		T		ID		Shipping Weight			
									AG3000p		AG3000r	
	inch	mm	inch	mm	inch	mm	inch	mm	lbs	Kg	lbs	Kg
3"	12.25	311.15	7.95	201.9	.68	17.25	2.6	66.04	31	14	34	15.4
4"	10.24	260	8.6	218	.62	15.7	3.12	79	28	13	31	14
6"	12.27	312	9.4	239	.69	17.5	5.05	128	43	19.5	46	21
8"	14.24	362	10.4	264	.69	17.5	6.44	164	65	29.5	68	31
10"	18.18	462	11.5	292	.69	17.5	8.61	219	124	56.5	127	58
12"	19.68	500	12.5	317	.81	20.6	10.55	268	166	75.5	169	77
Flanges	Standard ANSI 150 lb. drilling								Cable 1 lb.			

AG3000 SERIES
FLANGED MAGMETER

Seametrics

How to Order Worksheet

AG3000
AG3000p
AG3000r

1	2	3	4	5	6	7

2 Style: F1 = 150 lb ANSI Pattern

3 Power: D1 = DC 60Hz, D2 = DC 50Hz
A1 = AC 60Hz, A2 = AC 50Hz
BX = Battery

4 Outputs: X = No optional output
L = 4-20mA S = Modbus®
H = HART/4-20mA G = Digital

AG3000 (Integrated Display)

1 Size	2 Style	3 Power	4 Optional Output (The AG3000 comes standard with one pulse output)	5 Options	6 DC Power/Output Cable - 6 conductor (Must select one)
-0300 3"	-F1	-D1	-X *(requires single cable for DC power & output)*	-XX None	-0000 No Cable *(customer will supply)*
-0400 4"		-D2	-L *(requires single cable for DC power & output)*	-01 Data Logger	Single Dual
-0600 6"			-H *(requires single cable for DC power & output)*		-006S -006D 6 meter (20 ft)
-0800 8"			-S *(requires dual cable for DC power & output)*		-015S -015D 15 meter (50 ft)
-1000 10"			-G *(requires dual cable for DC power & output)*		-030S -030D 30 meter (100 ft)
-1200 12"		-BX	-X *(requires single cable for pulse output)*		-045S -045D 45 meter (150 ft)
					-060S -060D 60 meter (200 ft)

AG3000p (Integrated Display)

1 Size	2 Style	3 Power[1]	4 Optional Output (The AG3000p comes standard with 4-20mA and one pulse output)	5 Options	6 DC Power/Output Cable - 8 conductor (Must select one)
-0300 3"	-F1	-D1	-X *(requires single cable for DC power & output)*	-XX None	-0000 No Cable *(customer will supply)*
-0400 4"		-D2	-H *(requires single cable for DC power & output)*	-01 Data Logger	Single Dual
-0600 6"			-S *(requires dual cable for DC power & output)*		-006S -006D 6 meter (20 ft)
-0800 8"			-G *(requires dual cable for DC power & output)*		-015S -015D 15 meter (50 ft)
-1000 10"		-A1	-X *(requires single cable for output)*		-030S -030D 30 meter (100 ft)
-1200 12"		-A2	-H *(requires single cable for output)*		-045S -045D 45 meter (150 ft)
			-S *(requires single cable for output)*		-060S -060D 60 meter (200 ft)
			-G *(requires single cable for output)*		

AG3000r (Remote Display)

1 Size	2 Style	3 Power[1]	4 Optional Output (The AG3000r comes standard with one pulse output)	5 Options	6 DC Power/Output Cable - 6 conductor (Must select one)	7 Remote Display Cable - 6 conductor (Must select one)
-0300 3"	-F1	-D1	-X *(requires single cable for DC power and output)*	-XX None	-0000 No Cable *(customer will supply)*	-006 6 meter (20 ft)
-0400 4"		-D2	-L *(requires single cable for DC power and output)*	-01 Data Logger	Single Dual	-015 15 meter (50 ft)
-0600 6"			-H *(requires single cable for DC power and output)*		-006S -006D 6 meter (20 ft)	-030 30 meter (100 ft)
-0800 8"			-S *(requires dual cable for DC power and output)*		-015S -015D 15 meter (50 ft)	-045 45 meter (150 ft)
-1000 10"		-A1	-X *(requires single cable for output)*		-030S -030D 30 meter (100 ft)	-060 60 meter (200 ft)
-1200 12"		-A2	-L *(requires single cable for output)*		-045S -045D 45 meter (150 ft)	
			-H *(requires single cable for output)*		-060S -060D 60 meter (200 ft)	
			-S *(requires single cable for output)*			

Modbus is a registered trademark of Schneider Electric. Viton is a registered trademark of DuPont Corporation.

Note: All AG3000 meters are factory set for gallons per minute (GPM) rate and gallons total. If other units are required, they can be programmed in the field.

[1] *AC meters come with a 1.8 meter (6 ft) AC power cable.*

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