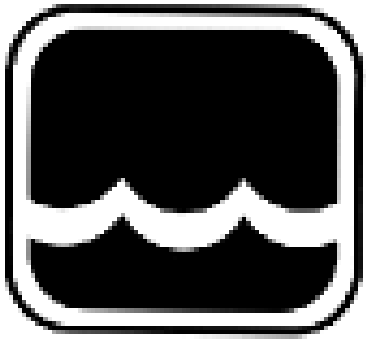

Global Water

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Insertion Flow Meter: IF200

Congratulations on your purchase of the Global Water IF200 Insertion Flow Meter. This instrument has been quality tested and approved for providing accurate and reliable measurements. We are confident that you will find the IF200 to be a valuable asset for your application. Should you require assistance, our technical staff will be happy to help.

Table of Contents

I. IF200 Checklist

a. Insertion Flow Meter

b. IF200 Manual

c. Two 3V (1/2 AA) Lithium batteries (inside computer, inside meter head)

II. Inspection

a. Your IF200 unit was carefully inspected and certified by our Quality Assurance Team before shipping. If any damage has occurred during shipping, please notify Global Water Instrumentation, Inc. and file a claim with the carrier involved.

   Use the checklist to ensure that you have received everything needed to operate the IF200.

III. Description

a. The Global Insertion Flow Meter, IF200, is a rugged, reliable and accurate instrument for monitoring and totalizing flows in full pipes of 2" to 30" diameters. It was designed for flows of less than 80 psi. The debris shedding turbo prop design makes the IF200 ideal for irrigation water, well water, process water, or other non-clean applications.

IV. Installing the Insertion Flow Meter

Precautions

a. **DO NOT** use for municipal gravity distribution systems or with pumped flows of greater than 80 psi.

b. Turn off and lock out all pumps before installing unit.

c. Never attempt to remove the unit with flow on, or with pressure in the pipe.

d. Make sure the threads on the coupling are fully threaded and tight.

e. Don't put your head over the unit when starting the pump.

Installation

f. The pipe to be measured must be provided with a 2" NPT female thread and a 2" diameter hole in the pipe. A T fitting, a Weld-O-Let, or a saddle will accomplish this (using standard plumbing techniques). The fitting should be on the top or sides of the pipe, not on the bottom of the pipe.

g. The Insertion Flow Meter should be installed a minimum of 10 pipe diameters downstream from any turns, and 5 diameters upstream from any turns (or two thirds of the distance down a straight section of pipe 15 diameters long). Longer straight sections will yield slightly better results. Shorter sections can be used, however there may be a decrease in accuracy. If a shorter section of pipe is used, install the unit two thirds of the distance down the straight section.

h. The IF200 must be placed at the correct depth in the pipe. Use a standard tape measure with a hook on the end and follow the instructions below:

    1. Please refer to the **Insertion Flow Meter Diagram**, see Appendix B.
    2. Hook the inside of the pipe wall and measure to the top of the 2" female thread (this is distance A on the **Insertion Flow Meter Diagram**). Note: If you are using a "T" fitting, increase the measured "A" distance by the thickness of the pipe wall.
    3. Screw the IF200 into the pipe by hand, until snug.
    4. Mark a spot on the male thread with a felt tip pen, one thread above the top female threaded piece. (This assumes that the unit will be inserted one turn more when you use the wrench at final installation.)
    5. Unscrew and remove the unit.
    6. Twist unit top to adjust the distance from the bottom of the probe to the ink spot on the thread to equal the measured distance from the pipe inside to the top of the female thread (distance "A"), plus the insertion depth (if any, as calculated above.)

i. The meter must be put inside the pipe so that the turbo-prop is inserted fully into the pipe. The prop support should face into the flow with the prop trailing. The red dot on the meter near the top should face into the flow. For pipe diameters of 2" to 8", mount the IF200 so the bottom of the housing is flush with the inside wall of the pipe. For large diameter pipes, the housing bottom should stick into the pipe at a distance equal to the diameter divided by six, minus one. (Distance=(Diameter/6)-1). For example: A 24" pipe, divide 24 by 6 = 4. Then subtract 1; the bottom of the housing should stick into the pipe 3".

j. Apply Teflon tape to the male thread and install the housing securely into the pipe, using a wrench. Then twist the body until the red spot faces into the flow.

k. If the unit has the optional pulse output cable installed the cable can be attached to the pulse monitor you are using. The pulse output cable is not polarity sensitive.

V. Insertion Flow Meter Calibration Information

a. The flow computer must be calibrated for the pipe diameter and the engineering units of flow and total. This is done by inserting calibration scaling numbers from the **Insertion Flow Meter Calibration Table**, see appendix A. These numbers will only need to be reentered or changed when pipe diameters are changed, or when the batteries need to be changed, see the maintenance section.

b. To change the calibration numbers, remove the computer enclosure cover, by unscrewing the four screws. Note that the screws are retained by the cover and should not be removed.

c. To enter the setup mode, flip the toggle switch to the UP position. There are 7 setup screens numbered 1 through 7 on the left side of the screen. The computer starts in #1. Push the left button to move from setup screen to setup screen.

d. To find the calibration number for Totalizer look at the **Insertion Flow Meter Calibration Table** corresponding to your Diameter and Totalizer units.

e. Follow the steps below to walk though the different setup screens:

    1. Under setup screen #1, insert this number one digit at a time, by pushing the left button until the correct digit is blinking.
    2. Push the right button once to move to a new digit, and repeat until the number displayed is the same as the calibration number. When you have completed entering the number, all digits will stop blinking.
    3. Push the left button once to move to screen #2. This is the decimal point for the Totalizer value, which is factory set to the far right (Off) for no decimal point.

4. For some values you will have to move this decimal place as required. Check the * at the top of the column and the notes at the bottom of the **Insertion Flow Meter Calibration Table**.
5. Push the left button once to enter screen #3. This is the flow rate calibration decimal point.
6. Set the decimal point to the position required by the Calibration Table, under the engineering units and diameter you selected.
7. Push the left button to go to screen #4. Set the calibration number for the flow rate from the table.
8. Screen #5 represents the flow rate display decimal point that should remain OFF except for mgd engineering units, which must have the decimal place, shifted once to the left.
9. Push the left button to go to screen #6. This is the pulse output scalar. **NOTE: This screen is only applicable to those units that have had the extra pulse output hardware installed in them.** The computer retransmits the input pulses by multiplying them by the scalar value, from 0.0001 to 0.9999. If this value is set is set equal to the "Totalizer" scaling number, an output pulse will occur each totalizer unit (ie. Once per gallon, once per m^3, etc.). If this number is set to be $1/10^{th}$ the Totalizer number, an output pulse will occur every tenth Totalizer count. If the number is set to be $1/100^{th}$ the Totalizer number, an output pulse occurs every 100^{th} Totalizer count, etc.
10. Push the left button to go to screen #7. This screen displays the Totalizer reset status. It must remain in the ON position.

f. Put the toggle switch to the DOWN position and the Insertion Flow Meter is ready to go. Push the right button once to reset the Totalizer count to 0.

g. Replace and firmly secure the cover.

h. Press the rubber push button to toggle between Rate and Totalizer displays.

i. The flow computer can be rotated on the flow meter for the best operator viewing. It can be removed from the flow meter for maintenance or security by pulling the computer vertically away from the meter housing until it comes loose. (It is secured by a ¼" jack.)

j. The flow computer can be displaced from the flow meter by using a standard ¼" stereo extension cable. If the unit is used outdoors, seal the joint between the stereo plug and the meter housing with silicon rubber sealant.

VI. Specifications

Resolution:	0.01 inches
Accuracy:	2% of flow
Linearity:	0.5%
Range:	0.1 to 25 feet/sec.
Operating Temperature:	0° to +51°C
Size of unit:	2" diameter; Length: 8.25" (Varies with specified pipe diameter)
Weight:	3 lb. (Varies with specified pipe diameter)
Compression Adapter:	2" male thread (Note: pipe must be provided with a 2" female thread.)

VII. Maintenance

a. There are two batteries inside the computer in the flow meter head. A low battery indicator will appear on the screen two weeks prior to the end of battery life. Replace the batteries with 3V (1/2 AA) camera batteries.

b. Once a year the unit's prop should be inspected for smooth operation.

VIII. Trouble Shooting

Issue: Computer display not reading correctly

a. Check calibration (see calibration set up).
b. Check battery voltage.
c. Visually check jack connections to see if it they are making contact.
d. Remove flow meter from pipe and check prop for smooth rotation and ensure magnets are still attached.

Other issues

e. Call us for tech support: 800-876-1172 or 916-638-3429 (many problems can be solved over the phone). Fax: 916-638-3270 or Email: **globalw@globalw.com.**

   Be prepared to describe the problem you are experiencing including specific details of the application and installation and any additional pertinent information.

f. In the event that the equipment needs to be returned to the factory for any reason, please call to obtain an RMA# (Return Material Authorization). Do not return items without an RMA# Insertion Flow Metered on the outside of the package.

   Include a written statement describing the problems.

   Send the package with shipping prepaid to our factory address. Insure your shipment, as the warranty does not cover damage incurred during transit.

g. When calling for tech support, please have the following information ready;

   1. Model #.
   2. Unit serial number.
   3. P.O.# the equipment was purchased on.
   4. Our sales number or the invoice number.
   5. Repair instructions and/or specific problems relating to the product.

IX. Warranty

a. Global Water Instrumentation, Inc. warrants that its products are free from defects in material and workmanship under normal use and service for a period of one year from date of shipment from factory. Global Water's obligations under this warranty are limited to, at Global Water's option: (I) replacing or (II) repairing; any products determined to be defective. In no case shall Global Water's liability exceed the products original purchase price. This warranty does not apply to any equipment that has been repaired or altered, except by Global Water Instrumentation, Inc., or which has been subject to misuse, negligence or accident. It is expressly agreed that this warranty will be in lieu of all warranties of fitness and in lieu of the warranty of merchantability.

b. The warranty begins on the date of your invoice.

X. Appendix A: Insertion Flow Meter Calibrating Table

Totalizer					Rate			
Pipe Diameter (inches)	gal	m^3 **	Acre feet *		gpm	1/sec	cfs	Mgd ***
2	0.0177	0.0027	.0005		1.060	.073	.0026	.0153
2.5	0.0276	0.0043	.0008		1.656	.115	.0041	.0238
3	0.0340	0.0053	.0010		2.385	.165	.0058	.0343
4	0.0683	0.0106	.0021		4.100	.284	.0100	.0590
6	0.159	0.0247	.0049		9.54	.661	.0233	.1373
8	0.283	0.0439	.0087		16.96	1.175	.0415	.2442
10	0.442	0.0686	.0136		26.5	1.836	.0648	.3816
12	0.636	0.0987	.0195		38.16	2.644	.0933	.5495
14	0.866	0.134	.0266		51.94	3.510	.1270	.7479
16	1.130	0.175	.0347		67.84	4.700	.1659	.977
18	1.431	0.222	.0439		85.86	5.949	.2100	1.236
20	1.766	0.274	.0542		106.0	7.344	.2593	1.526
24	2.543	0.395	.0781		152.6	10.57	.3732	2.197
30	3.975	0.617	.1220		238.5	16.52	.5834	3.434

* Move decimal point 4 places to the left
** Move decimal point 2 places to the left
*** Move decimal point 1 place to the left

XI. Appendix B: Insertion Flow Meter Diagram