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Global Water

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6" Tipping Bucket: RG200

02/05/10
01-343



Congratulations on your purchase of the Global Water RG200 6" Tipping Bucket. This instrument has been quality tested and approved for providing accurate and reliable measurements. We are confident that you will find the RG200 to be a valuable asset for your application. Should you require assistance, our technical staff will be happy to help.

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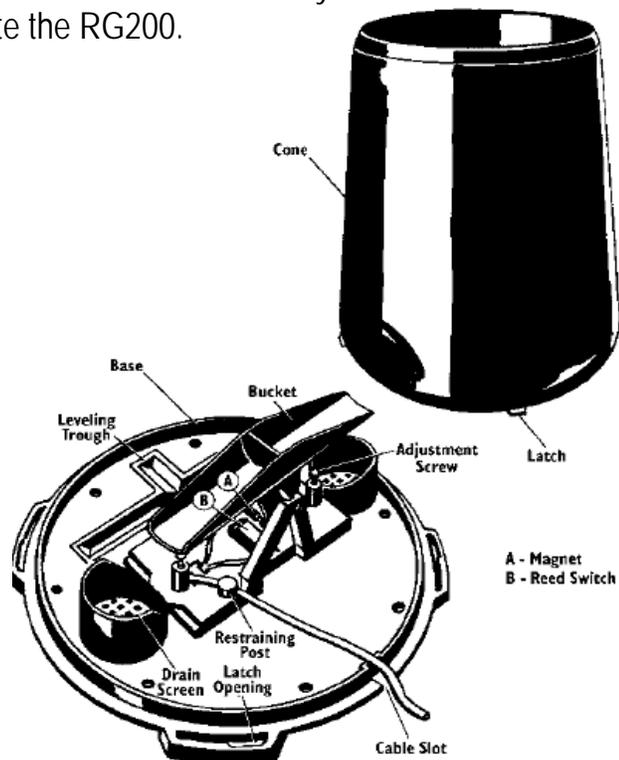
I. RG200 Checklist

- a. 6" Tipping Bucket
- b. RG200 Manual
- c. Mounting Screws, strainer, metric conversion weight

II. Inspection

- a. Your RG200 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 RG200.



Rain Gauge Internal Components



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III. Tipping Bucket Installation

Tools and Materials Needed

You may need some of the following tools and materials to install the RG200 Rain Gauge Tipping Bucket:

1. Drill with 3/32" (2 mm) drill bit
2. Medium Phillips Screwdriver
3. 3/16" (or 5 mm) Wrench
4. Cable Clips or Weather-Resistant Cable Ties with screw holes or other means for mounting
5. Bubble Level

Precautions

- a. The tipping bucket requires a clear and unobstructed mounting location to obtain accurate rainfall readings. It must also be mounted on a level surface that is free of vibration. Once the tipping bucket is mounted remove the housing cover by rotating it counter clockwise. Verify that the tipping bucket is not held in the center position. If held in upright gently press either end down against the stop to ensure proper operation.
- b. To ensure that the surface is level, use a bubble level or pour water into the T-shaped leveling trough in the base and observe the surface of the water.
- c. Be sure there is an unobstructed path for water runoff from the drain screens.
- d. Choose a location that is easily accessible for normal cleaning and is distant from trees or other sources of heavy pollen or debris.



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Installation of Tipping Bucket with the GL500 Data Logger

- e. Pass the Tipping Bucket cable through an unused strain relief. Attach the two wires to the pulse channel of the GL500.

Installation of Tipping Bucket with other Global Water products

- f. The Tipping Bucket comes with an attached RCA jack. Review the literature for the other product to determine where the Tipping Bucket RCA jack should be plugged into.

IV. Tipping Bucket Calibration Information

- a. Accurate calibration can be obtained only with laboratory equipment, but an approximate field check can be easily made. The tipping bucket mechanism is a simple and highly reliable device. Any accumulation of foreign material, dust, etc. will alter the calibration of the unit. The tipping bucket must be calibrated with the rate of flow of water through the tipping bucket mechanism. At least 36 seconds should be allowed to fill one side of the tipping bucket. This represents a maximum flow rate of one inch of rain per hour. If the flow rate is increased, the unit will read low (if properly calibrated). Decreasing the rate of flow will not affect the calibration. Some time is required for the bucket to tip (a few milliseconds). During the first 50% of this tipping time, water continues to flow into the filled bucket; the last 50% of this tipping time, water flows into the empty bucket. The amount of water flowing during the first 50% of time is the error, the faster the flow rate the greater the error. At flow rates of one inch per hour or less, the water actually drips into the bucket rather than flowing. Under these conditions, the bucket tips between drips and there is no error in the readings.

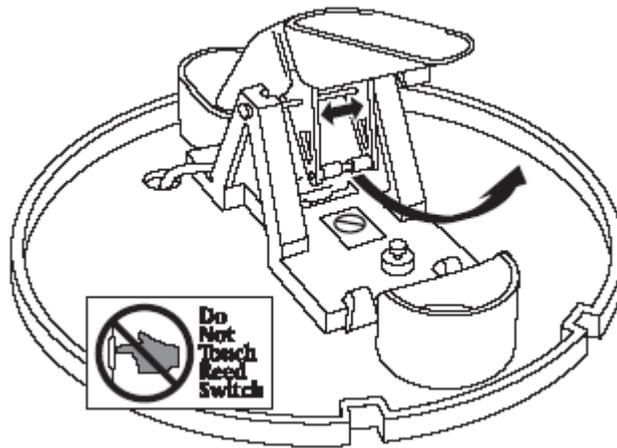


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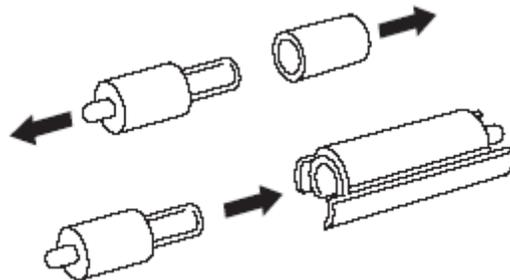
Optional Metric Measurement Adapter

The rain gauge collector tipping bucket mechanism contains a standard measurement weight magnet that takes measurements in .01" for every tip of the bucket. The tipping bucket assembly contains a metric measurement that adjusts the tipping bucket mechanism so that it takes 0.2 mm metric measurements. To change the weight magnet:

1. Find the metric measurement adapter included in the hardware.
2. Locate the standard measurement weight magnet between the arms of the tipping mechanism.
3. Open the arms slightly with one hand while pulling the magnet out with the other hand.



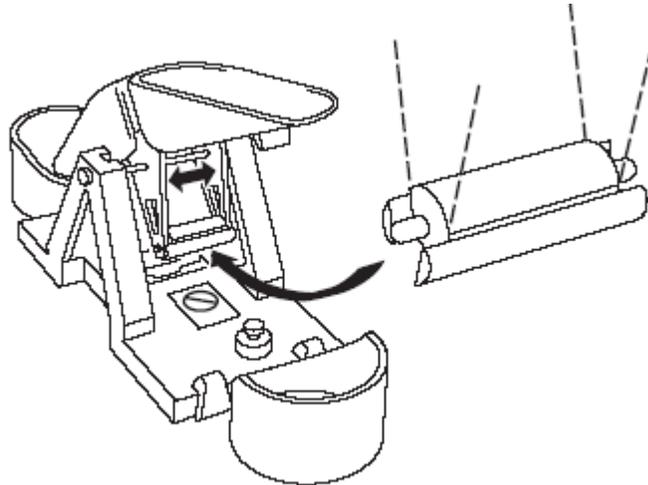
4. Separate an end cap from one side of the magnet.
5. Slide the magnet, with the exposed end of the magnet first, into the open slot of the metric measurement adapter.





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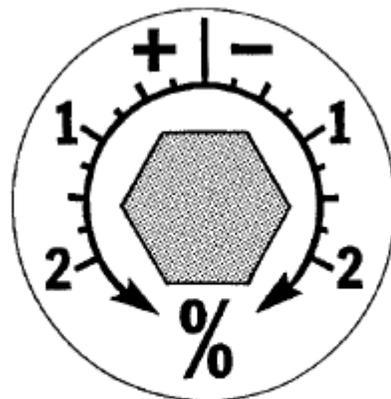
6. Insert the metric measurement adapter between the arms of the tipping bucket, with solid side of the metric measurement facing up.



V. Adjusting the Rain Gauge Tipping Bucket

Our Rain Gauge is calibrated at the factory so the bucket tips (and records rainfall) for each 0.01" (or 0.2 mm if the metric adapter has been fitted) of rain. To adjust the calibration slightly, use a 3/16" (or 5 mm) wrench to rotate the adjustment screws that are located underneath the bucket. The adjustment guide embossed in the platform shows how far you must rotate both screws in turn to effect a 1% and a 2% change.

Moving the screws in the positive (+) direction causes the bucket to tip more times (i.e. give a larger count) for a given amount of water.



Adjustment Guide



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VI. Tipping Bucket Calibration Check

- a. Obtain a plastic or metal container of at least one-quart capacity. Place a very small hole in the bottom of the container.
- b. Place the can in the tipping bucket funnel.
- c. Pour exactly 27.9 ounces of water into the can.
- d. If it takes less than 45 minutes for the water to run out, then the hole in the container is too large.
- e. Rough field calibration of this sort should result in one hundred tips, \pm three.
- f. Adjusting screws are located under the tipping bucket mechanism on the base plate. Adjust both screws equally, i.e. if you turn one a half turn then turn the other a half turn. Turning the screws clockwise will increase the number of tips per 27.9 ounces of water. Turning the screws counter-clockwise decreases number of tips per 27.9 ounces of water. One half turns of both screws normally results in a change of 2-3%.

VII. Tipping Bucket Specifications

Resolution:	0.01 inches
Accuracy:	3% up to 4"/hr
Average Switch Closure Time:	135 ms
Maximum Bounce Settling Time:	0.75 ms
Maximum Switch Rating:	30 VDC @ 0.2 amps
Operating Temperature:	0° to +51°C
Size of Gauge:	6"x15"
Weight:	2.0 lb.



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VIII. Maintenance

The funnel and tipping bucket mechanism should be cleaned periodically. An accumulation of dirt, bugs, etc. on the tipping bucket will adversely affect the readings.

1. Separate the cone from the base.
2. Use warm soapy water and a soft cloth to clean pollen, dirt, and other debris from the cone, cone screens, and bucket.
3. Use a pipe cleaner to clear the funnel hole in the cone and the drain screens in the base.
4. When all parts are clean, rinse with clear water.
5. Reattach the cone and replace the screen.
6. Reconnect the rain collector cable to the junction box.

IX. Trouble Shooting

Issue: 6" Tipping Bucket not reading correctly

- a. Clean Tipping Bucket.
- b. Recalibrate Tipping Bucket.

Other issues

- c. 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.

- d. 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# 6" Tipping Bucketed on the outside of the package.

Include a written statement describing the problems.



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

- e. 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.

X. 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.