



**Global Water**  
800-876-1172 • [globalw.com](http://globalw.com)



# **Global Water**

**Instrumentation, Inc.**

11257 Coloma Road  
Gold River, CA 95670  
T: 800-876-1172  
Int'l: (916) 638-3429, F: (916) 638-3270

Refrigerated Wastewater Sampler: WS400

5/13/02



**Global Water**  
800-876-1172 • globalw.com

Congratulations on your purchase of the Global Water WS400 Refrigerated Wastewater Sampler. This instrument has been quality tested and approved for providing accurate and reliable measurements. We are confident that you will find the WS400 to be a valuable asset for your application. Should you require assistance, our technical staff will be happy to help.

### **Table of Contents**

I.	Checklist	•	•	•	•	•	•	•	•	Page	3
II.	Inspection	•	•	•	•	•	•	•	•		3
III.	Description	•	•	•	•	•	•	•	•		4
IV.	Installing the Refrigerated Wastewater Sampler							•	•		4
V.	Installing the Pickup Hose	•	•	•	•	•	•	•	•		5
VI.	Using the Refrigerated Wastewater Sampler	•	•	•	•	•	•	•	•		6
VII.	Specifications	•	•	•	•	•	•	•	•		7
VIII.	Maintenance	•	•	•	•	•	•	•	•		8
IX.	Troubleshooting	•	•	•	•	•	•	•	•		9
X.	Warranty	•	•	•	•	•	•	•	•		10
XI.	Appendix A: Automatic Sampler Calibration	•	•	•	•	•	•	•	•		11
XII.	Appendix B: Flow Proportional Sampling	•	•	•	•	•	•	•	•		12
XIII.	Appendix C: Accessories	•	•	•	•	•	•	•	•		13
XIV.	Appendix D: Assembly	•	•	•	•	•	•	•	•		14

\* Copyright © Global Water Instrumentation, Inc. 2002



**Global Water**  
800-876-1172 • globalw.com

## **I. WS400 Checklist**

- a. Refrigerated Wastewater Sampler
- b. 12V Battery (Inside Enclosure)
- c. AC power adapter
- d. WS400 Manual
- e. Refrigerator
- f. Sample bottle (Inside refrigerator)

## **II. Inspection**

- a. Your WS400 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 WS400.



**Global Water**  
800-876-1172 • globalw.com

### **III. Description**

- a. The Global Refrigerated Wastewater Sampler, WS400, is designed specifically to meet the sampling requirements for industrial discharges. The Global Sampler takes a “time weighted” composite sample in a sample container, to meet the wastewater sampling guidelines. The Global Sampler is easily set up near industrial discharges.
- b. The Global Refrigerated Wastewater Sampler consists of a rugged, rainproof refrigeration unit and the control panel enclosure. The enclosure contains a peristaltic sampling pump, a control panel, and a rechargeable battery. An AC power supply and a sample pickup hose are also provided.

### **IV. Installing the Refrigerated Wastewater Sampler Refrigerator**

- a. The refrigerator is designed for freestanding installation only. It should not be recessed or built in. Install the refrigerator on a base strong enough to support it when fully loaded. Allow air to circulate freely around the refrigerator. Provide a 1” clearance around the unit for proper circulation.
- b. In the event of an electrical short circuit, grounding reduces the risk of electric shock by providing an escape wire for the electric current. This appliance is equipped with a cord having a grounding wire with a grounding plug. Do not cut or remove the third (ground) prong from the power cord. Plug the refrigerator cord into a wall outlet to start the cooling cycle. Set the temperature knob to 4.
- c. Never put food or beverages into the refrigerated wastewater sampler, it may become contaminated.

#### **Sampler**

- d. The control panel should be placed upright (it will not work if placed on its back or side).



## Global Water

800-876-1172 • globalw.com

- e. To secure the sample bottle:
  - 1) Screw the bottle caps/float switch onto the sample bottle
  - 2) Place bottle into the sampler enclosure
- f. Insert the long sample pump hose (the end that deposits samples into the bottle) through the hole in the top of the refrigerator and push down the nylon washer into the hole. The washer prevents the cold air from escaping. The pump control panel enclosure can then be fastened down to the refrigerator by peeling off the double-back tape. Press the control panel enclosure firmly down so that it is not easily knocked loose. Insert the depositing end of the pump hose into the hole in the bottle cap.
- g. Plug the float switch lead into the control panel. (Located on the left side of the control panel enclosure).
- h. Use a plastic tie wrap to secure the pick up hose to the refrigerator.
- i. Plug the AC power supply plug into the jack on the side of the control panel and plug power supply into the wall outlet. Unplug the power supply when not in use.
- j. The unit is water resistant, not water proof. The unit must be located well above the water level to continue to provide reliable service.

### **V. Installing the Pickup Hose**

- a. The pickup hose should be installed in a wastewater discharge channel or stream. The pickup strainer should be submerged under water and should be situated to avoid contact with the channel bottom.



**Global Water**

800-876-1172 • globalw.com

## **VI. Using the Refrigerated Wastewater Sampler**

### **Refrigerator**

- a. The temperature control dial has settings from 1 to 7 plus OFF. 1 is the warmest with 7 being the coldest. Initially set the temperature control dial to 4.
- b. After using the refrigerator for 24 hours, adjust the temperature control to the setting that is best suited to your needs. Turning the temperature control dial to OFF stops the cooling cycle but does not shut off power to the refrigerator. If the refrigerator is unplugged or turned off the refrigerator, allow 4 minutes before restarting it or plugging it into a socket.
- c. If the refrigerator will not be used for a period of time, turn the unit off and unplug. Clean the unit and leave the door open.
- d. When transporting the refrigerator, it must be kept in an upright position. If the refrigerator is inadvertently tilted beyond 45 degrees, restore it to the upright position and wait 24 hours before plugging it in.
- e. Do not operate the refrigerator in the presence of explosive fumes.

### **Sampler**

- f. Verify that the control panel enclosure and sampling pickup hose are installed correctly (see previous sections). The Global Water WS400 Refrigerated Wastewater Sampler will function only if the AC power supply is plugged in and the float sensor plug is inserted into its socket.
- g. Set the composite sample Interval and Size knobs to the approximate values desired. To calibrate the control panel for a precise sample size see appendix A.
- h. Turn the sampling unit ON (switch is on the control panel) and verify that the sampler is operating. The unit should go through a sample cycle. If the unit does not start the sample cycle press the pump test button to initiate a sample. If the pickup strainer is under water the bottle will fill to the desired level then the pump will back flush the pickup hose to clear it. The pump test button can also be used to take manual samples. If the pump turns slowly, the internal battery's voltage should be checked and recharged if necessary, see the Maintenance section. If the pump test button does not cause the pump to run, refer to the Trouble Shooting section. The unit must be ON to take automatic samples.



## Global Water

800-876-1172 • globalw.com

- i. The composite sample bottle fills according to the sample specifications set by the user. It will continue to sample as long as the float switch has not been activated. The float switch in the bottle cap will turn the pump off before the sample bottle overflows. After filling the sample bottle, remove it and install a clean empty bottle or transfer the sample to a small bottle for lab or turbidity meter analysis.
- j. The WS400 can be set up to produce flow proportional samples when paced by an external flow monitor, see Appendix B.

### VII. Specifications

Sample Size:	25 ml to 600 ml as set by user (Three gallon composite sample maximum)
Operating Temperature:	0° to +70°C
Size of unit:	14 ¼"L X 4"W X 6 ¼"H Control Panel 20 ¾"H x 19 ¾"W x 19 ¾"D Refrigerator
Weight:	57lb (Shipping Weight 65lb)
Materials:	
Bottles:	2 gallon Polyethylene
Sample Tubing:	15' nylon reinforced ¼" ID polyethylene flexible tubing sections with intake strainers
Sample Pumps:	
Flow Rate:	1000 ml per minute at 4 ft. head
Type:	Peristaltic
Maximum Lift:	22'
Battery:	Rechargeable 5 AH Gel Cell
Battery Life:	~2 hours of continuous pumping under load (Approximately 30 gallons at 4 ft. head)



**Global Water**  
800-876-1172 • globalw.com

## **VIII. Maintenance**

### **Sampler**

- a. The Global Water WS400 Refrigerated Wastewater Sampler requires minimal maintenance. The sampler enclosure is rainproof and rugged. Avoid exposure to extremely rough usage. Routinely wipe the control panel face and the refrigerator, rinse the pickup hose and debris strainer, and wash the sample bottle with mild soap and warm water. Additional plastic and glass sample bottles, noprrene tubing for the sampler pump, bottle caps/float switches, removable debris strainers, and pickup hose can be purchased from Global Water (see Appendix C section).

### **Refrigerator**

- b. Clean the door seal using mild soapy water. Never use harsh cleansers or scouring pads to clean any part. Wash the inside with warm water and baking soda solution (about 2 tablespoons of baking soda to a quart of water). Rinse and dry.
- c. Defrost whenever frost on the wall of the freezer compartment becomes  $\frac{1}{4}$ " thick. Never use a sharp or metallic instrument to remove frost as it may damage the cooling coils. A punctured cooling coil will cause serious problems and void the warranty. Global Water recommends using a plastic scraper.

### **Battery**

- d. If the pump runs slowly, this is an indication that the internal battery requires recharging. We recommend fully recharging batteries approximately once per month. In addition, the battery should be recharged before any extended use. NOTE: The battery life will last longer if recharged before it drains below 10.5 volts.
- e. To recharge the battery, plug the AC power adapter into the control panel and then plug the charger into a wall socket, ensure that the pump does not run during the charging period. Full recharge will take about 12 hours. Additional batteries and AC power adapters are available from Global Water (see Appendix C section).



**Global Water**  
800-876-1172 • [globalw.com](http://globalw.com)

## **IX. Trouble Shooting**

Issue: The pump does not work

- a. Disconnect the float switch. Short the float switch jack on the control panel using a paper clip or wire. Press the red button. If the pump works the float switch is bad.
- b. If the flow proportional option is being used, verify the input is not shorted together.

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](mailto: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# 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.

- 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.



**Global Water**

800-876-1172 • [globalw.com](http://globalw.com)

**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.



**Global Water**  
800-876-1172 • globalw.com

## **XI. Appendix A: Automatic Sampler Calibration**

- a. The composite sample size is approximate. This means that the sample size may vary with distance from the sampler. If precise sample sizes are needed it will be necessary to manually calibrate to the installation.
- b. To manually calibrate, you will need a graduated cylinder that exceeds your intended sample size.
- c. Follow these steps to calibrate:
  1. Install the sampler in its intended location.
  2. Remove the sample bottle.
  3. Adjust the sample size to roughly the size you intend to take.
  4. Place the graduated cylinder under the output of the pump.
  5. Turn on the sampler and press the red pushbutton.
  6. When the sampler is finished pumping, check the amount sampled in the graduated cylinder.
  7. If the sample size is incorrect:  
Empty the cylinder and slightly adjust the sample size clockwise for a larger sample and counter-clockwise for a smaller sample. Then repeat steps 4 through 6.
  8. If the sample size is correct:  
Empty the cylinder and replace the sample bottle. Be sure to re-connect the lead from the bottle cap into its socket, and make sure the output of the pump is going into the bottle.

These steps will need to be repeated for every individual installation.



**Global Water**  
800-876-1172 • globalw.com

## **XII. Appendix B: Flow Proportional Sampling**

- a. To set the WS400 up for flow proportional samples a flow monitor must be attached to the control panel. In this configuration the sampler is designed to take a sample every time a specific amount of flow has passed through the flow monitor.
- b. The flow monitor must provide a momentary switch closure (100ms or longer) whenever a sample is to be taken. The sample will be taken when the pulse ends. The output of the flow monitor must be wired to a 1/4" phone plug (2 wire). The phone plug is then inserted into the Sensor jack on the control panel.
- c. Set the Interval knob to 4 hours and the Size value to the desired sample size. The sample will be taken, flow proportionally, as directed by the flow meter.



**Global Water**  
800-876-1172 • [globalw.com](http://globalw.com)

### **XIII. Appendix C: Accessories**

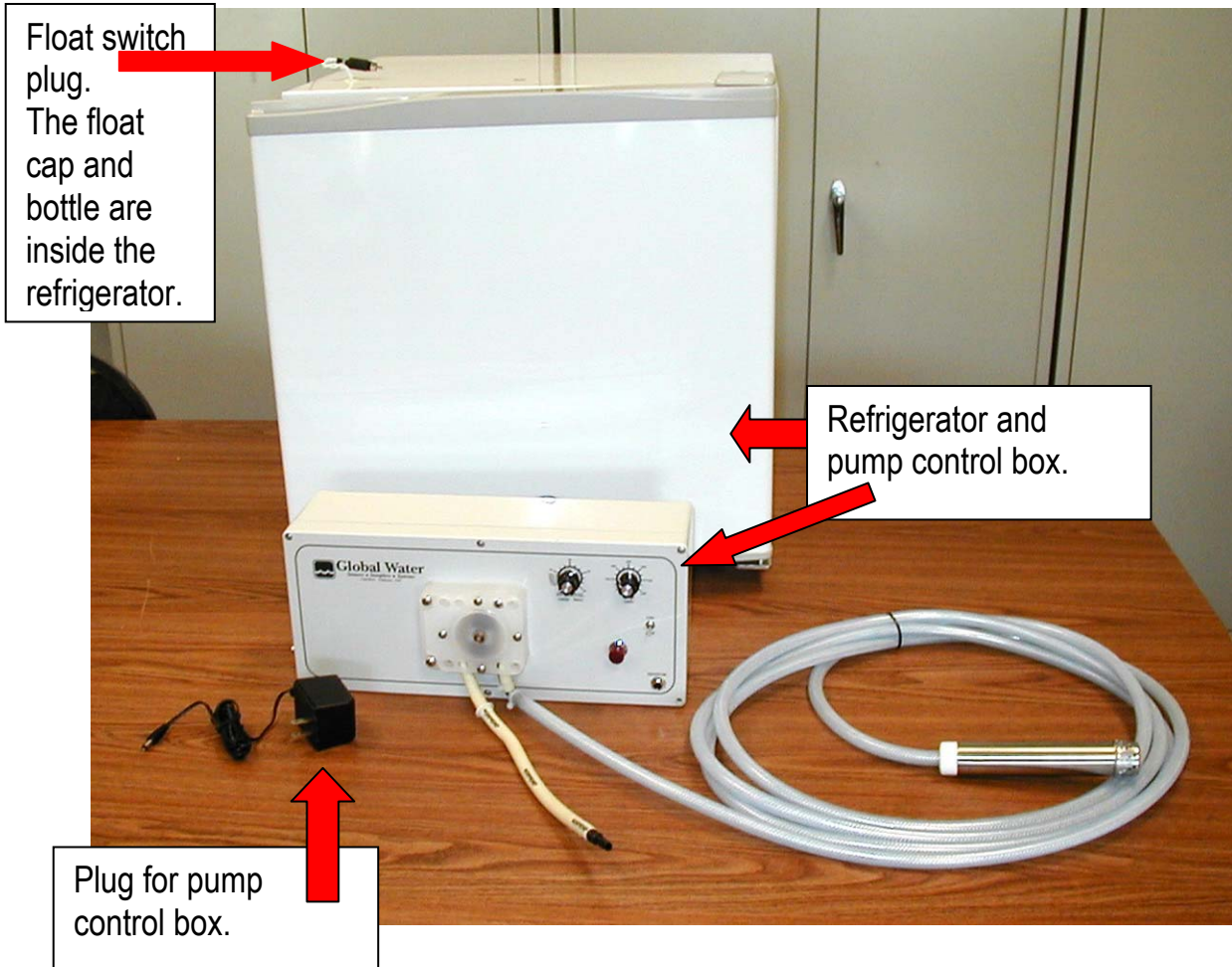
<b><u>Part Description</u></b>	<b><u>Part Number</u></b>	<b><u>Unit</u></b>
12V 5Ah Battery	00-010	Each
AC Power Adapter	00-017	Each
2 Gal Plastic Sample Bottle	00-738	Each
Bottle Cap/Float Switch	CD0300	Each
Pickup Hose	00-546	Feet
Pickup Strainer	CA0300	Each
Pump tubing	00-744	Feet



**Global Water**  
800-876-1172 • globalw.com

#### **XIV. Appendix D: Assembly**

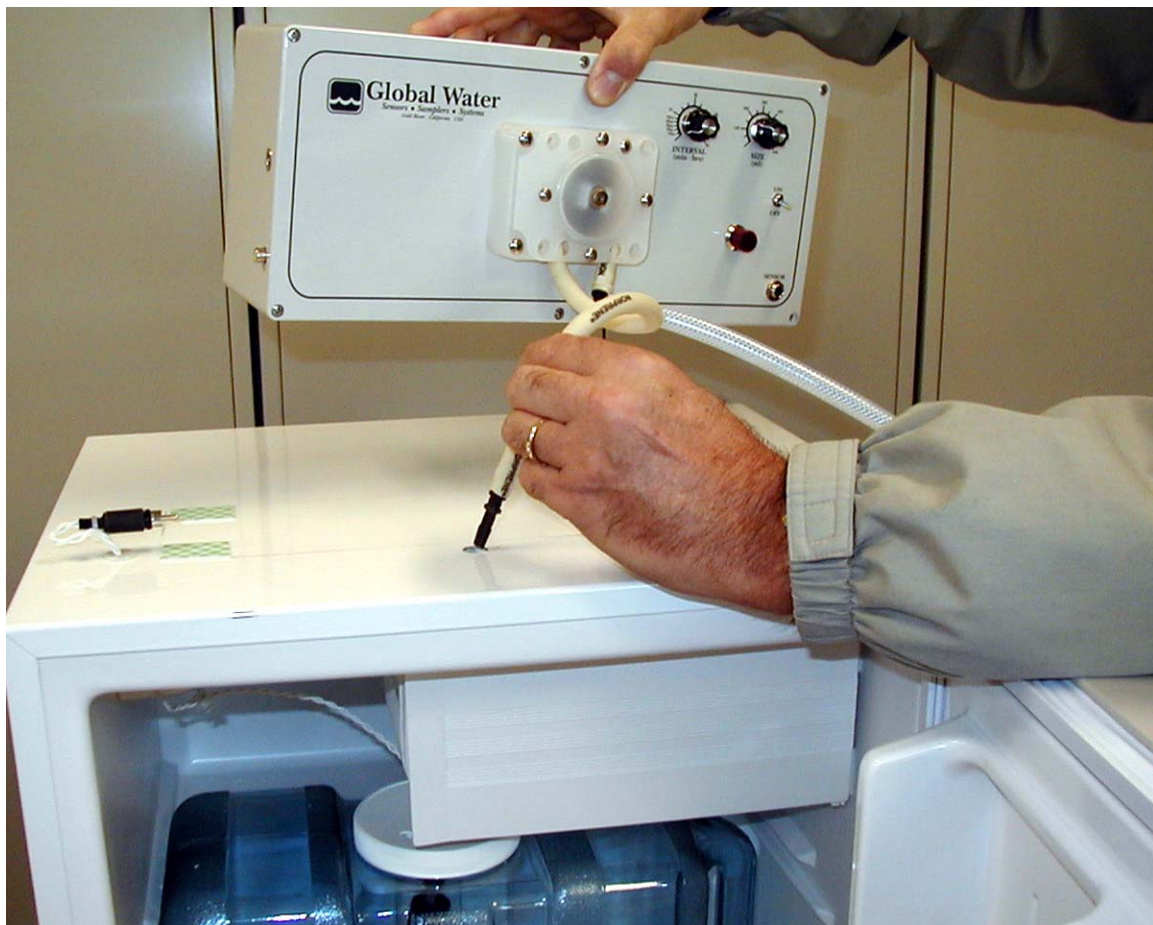
Assembling the WS400 Refrigerated Wastewater Sampler is simple. First, make sure that you have all of the following parts.





**Global Water**  
800-876-1172 • globalw.com

Insert the long sample pump hose (the end that deposits samples into the bottle) through the hole in the top of the refrigerator and push down the nylon washer into the hole. The washer prevents the cold air from escaping. The pump control box can then be fastened down to the refrigerator by peeling off the double-back tape. Press the control box firmly down so that it is not easily knocked loose. Insert the depositing end of the pump hose into the hole in the bottle cap.



Use the plastic tie clip to fasten the sampling hose to the refrigerator.



**Global Water**  
800-876-1172 • globalw.com



Plug for control box.

Plug for float switch.



Just plug the refrigerator and the pump control box into your outlet and turn the refrigerator to "4".