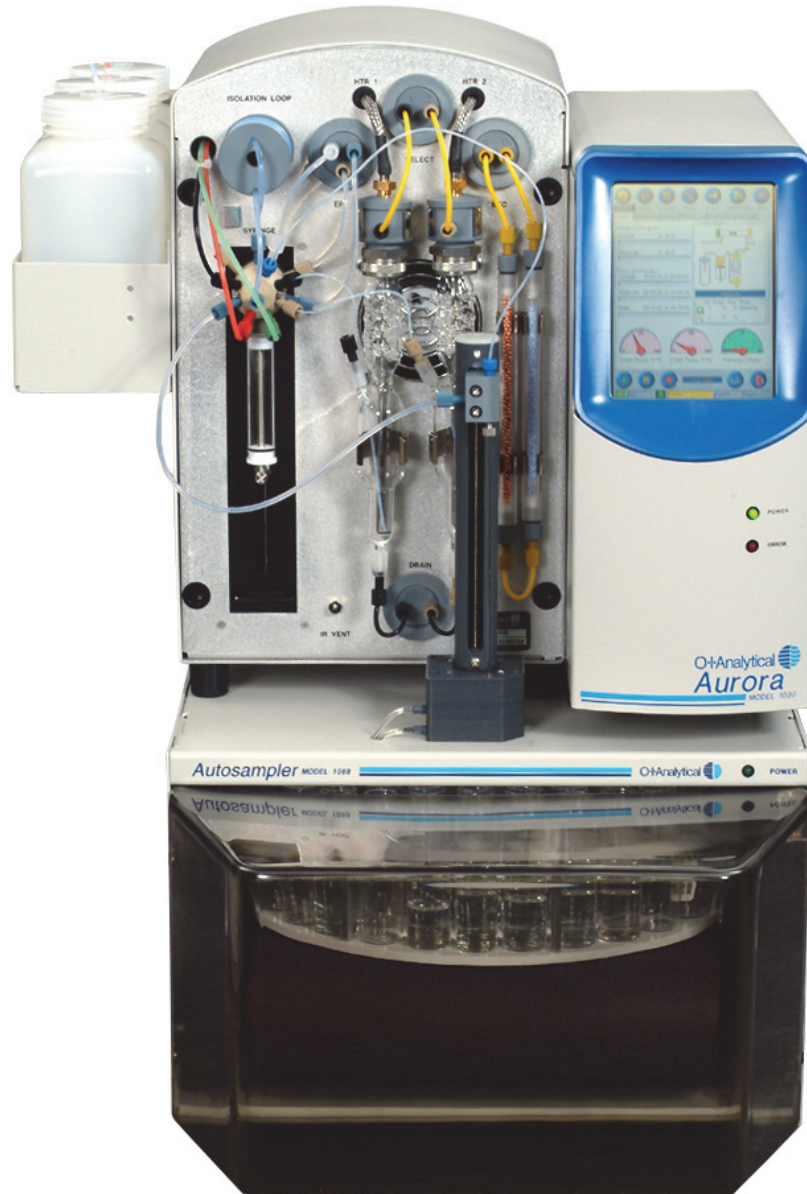




# 1088 Rotary Autosampler Operator's Manual



151 Graham Road · P.O. Box 9010 · College Station, Texas 77842-9010  
Telephone (979) 690-1711 · FAX (979) 690-0440 · [www.oico.com](http://www.oico.com) · [oicemail@oico.com](mailto:oicemail@oico.com)

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# Chapter 1 Introduction

The 1088 Rotary Autosampler (1088) is a liquid-sample transfer instrument that transfers sample from a vial to the Aurora 1030 Total Organic Carbon Analyzer (Aurora). It provides automated sample introduction that enables the operator to perform other tasks while the autosampler runs.

The 1088 is designed to be sturdy, reliable, and easy to use. When combined with the Aurora, the 1088 fully automates the analysis of 88 samples. It can sample from open vials or via septum piercing using vials capped with septa. The Aurora combined with the 1088 allows sequential or random sampling, providing user flexibility. The 1088 uses minimal benchspace because it easily docks with the Aurora.

The Aurora combined with the 1088 can preacidify open vials and prepurge samples while they are in the autosampler. This feature allows TIC removal prior to sampling, shortening analysis time by eliminating TIC analysis time.

The *1088 Rotary Autosampler Operator's Manual* explains the procedures for installing, using, and maintaining the 1088. It also provides information about troubleshooting problems and describes the design of the 1088.

## Operating Principle

The 1088 uses a unique carousel containing 88 sample positions. The 1088 is a liquid-sample transfer autosampler that removes the sample from a vial and transfers the sample to the Aurora. Samples automatically move into position under the motorized needle assembly. The needle lowers, the sample transfers via syringe to the Aurora, and the analysis process begins. The 1088 can perform a programmable number of rinses of the needle and sample pathway. The 1088 also provides sampling via open vials or septum piercing.

## Features

- Automatically samples 88 USEPA-approved, 40-mL VOA vials.
- The Aurora docks directly on the 1088 chassis to minimize benchspace requirements.
- Programmable rinses through the Aurora provide maximum flexibility.
- Water or lightly particulated water samples transfer with no system clogging.
- Removable, lightweight sample carousel makes sample loading and unloading easy.
- Easily configure the 1088 through the Aurora touchscreen.
- The motorized needle drive assembly facilitates automatic sample transfer from an open or closed vial.
- Programmable variable speed magnetic stirring ensures homogeneous insoluble and particulated samples for sampling.
- Sample pretreatment configuration allows pre-acidification and presparging of samples to reduce analysis time.

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## Specifications

### General Specifications

#### **System Dimensions (1088 with the Aurora)**

- 26" D x 18.5" W x 26" H
- 66 cm D x 47 cm W x 66 cm H
- Footprint: 494 in<sup>2</sup>

#### **Dimensions**

- 18.75" D x 15.5" W x 20.0" H
- 47.62 cm D x 39.37 cm W x 50.8 cm H
- Footprint: 494 in<sup>2</sup>

#### **Weight**

- 20 kg (44 lbs)

#### **Environmental Considerations**

- Indoor use only
- Relative humidity; (80% max up to 31 °C, 50% max 32-40 °C)
- Operating Temperature; (10-40 °C)
- Altitude: (<2000m)

#### **Vial Specifications**

- Capacity: 88 vials (with standard wash and waste stations)
- Size: 40-mL VOA vials, 95.25 mm x 27 mm

#### **Sample Transfer Pathway**

- 8.3" stainless steel needle with 7" sleeve
- Q/i" O.D. x Q/qy" I.D. x 17" Teflon<sup>®</sup> tubing

### Performance Specifications

#### **Sample Transfer Accuracy**

- Greater than  $\pm 0.3\%$

#### **Programmable Parameters**

- Sample and wash needle depth (0–100%)
- Stirring speed
- Number of needle rinses between samples



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## Requirements

### **Power Requirements**

- 115–230 VAC (autoselecting); 50/60 Hz
- Fuse rating: 4A 250VAC GDC
- Power: 150VA Max

## **Safety Information**

The 1088 Autosampler meets the European Union directives for emissions and safety as noted in the Declaration of Conformity for this instrument as tested and documented by a certified independent laboratory.

## **Operator Precautions**

For operator safety, pay attention to **WARNING** and **CAUTION** statements throughout the manual.

- A **WARNING** indicates a condition or possible situation that could result in physical injury to the operator.
- A **CAUTION** indicates a condition or possible situation that could damage or destroy the product or the operator's work.

Warnings and precautions in this manual or on the instrument must be followed during operation, service, and repair of the instrument. Failure to follow these warnings and precautions violates the safety design standards and intended use of the instrument. OI Analytical is not be liable for the operator's failure to comply with these warnings and precautions.

Connect the 1088 to a dedicated AC power supply through a three-conductor power cord with the third wire firmly connected to an electrical ground at the power outlet. **Any interruption of the grounding conductor or disconnection of the protective earth terminal could cause a shock that could result in personal injury.**

Any power cord used shall have the same or greater power rating as the cord supplied with the instrument. Position the PFPD controller so there is easy access to the power switch.

## General Precautions

- Disconnect the AC power cord before removing covers.
- Replace or repair faulty or frayed insulation on power cords.
- Perform periodic leak checks on supply lines, fittings, and pneumatic plumbing.
- Turn off the main power switch and disconnect the main power cord before using a liquid solution to locate leaks.
- Wear safety glasses to prevent possible eye injury.
- Do not perform unauthorized modifications or substitute parts to the instrument that are not OI Analytical original parts. Any unauthorized modifications or substitutions void the warranty.
- Maintain a static-safe area when handling all electronic parts and assemblies. Use a static-control wrist strap that is connected through a one megaohm resistor to an appropriate earth ground. Store all electrical parts and equipment in static-protective containers.

## Safety Symbols

The following symbols may be located on the instrument:



Warning/Caution, see accompanying instruction for more information.



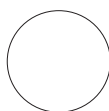
Indicates a hot surface.



Indicates hazardous voltages.



Indicates earth (ground) terminal.



Indicates the OFF position on the power switch.



Indicates the ON position on the power switch.



## Chapter 2 Instrument Components

### Exterior Components

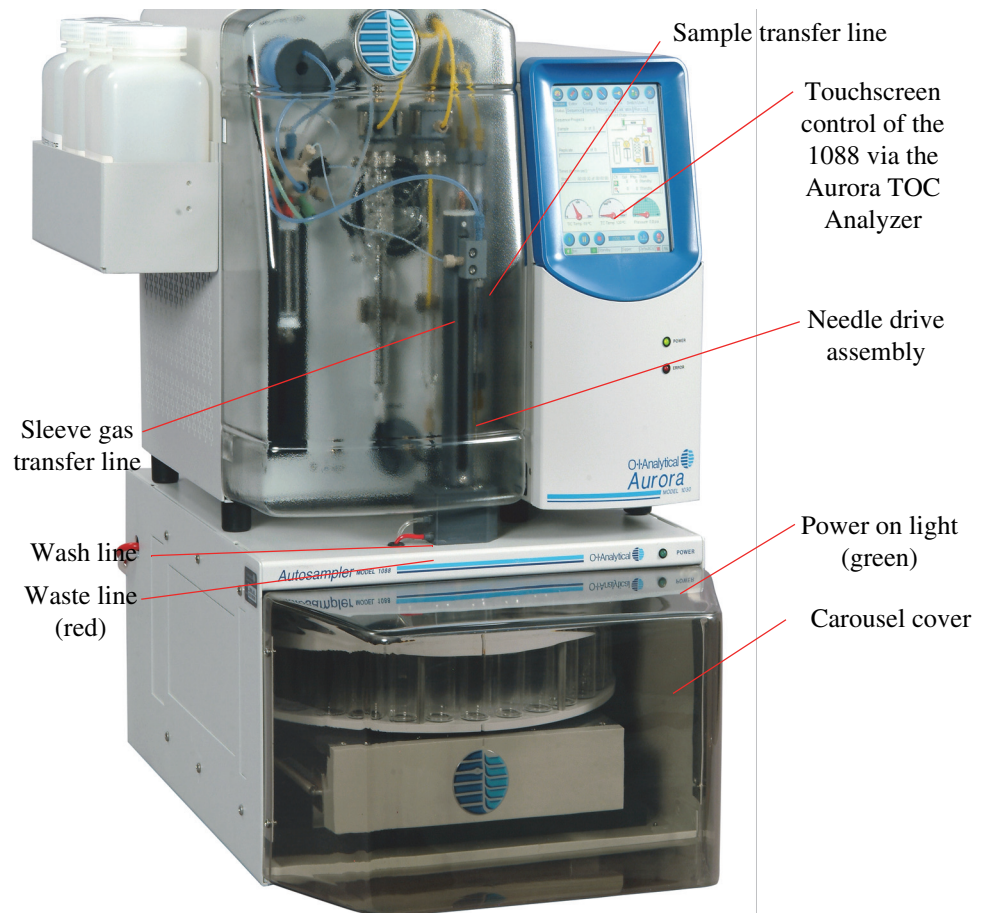


Figure 2.1. 1088 Rotary Autosampler docked with Aurora 1030 TOC Analyzer

**Carousel cover** is an operator safety device that must be kept in place during operation. It also protects samples from outside contamination. Removing the carousel cover while the 1088 is operating stops the autosampler.

**Needle drive assembly** holds, and raises and lowers the needle assembly.

**Needle assembly** contains a stainless steel coaxial needle assembly with sleeve, including a side-hole septum piercing needle and vial pressurizing needle sleeve to pierces the sample vial to extract the liquid sample.

**Sample transfer line** provides the transfer pathway for liquid sample and rinse water from the needle drive assembly to the Aurora.

**Sleeve gas transfer line** provides the transfer pathway for gas supplied to the sample vial during sampling, preventing a vacuum from forming in the vial. This line may not be necessary when sampling from open vials. It also delivers acid from the analyzer to the sample vials when required for external TIC removal.

**Wash bottle** (not shown) holds reagent water used for wash sequences.

**Wash line** connects to the reagent water bottle and provides the transfer pathway for reagent water used for wash sequences.

**Waste line** connects to the waste bottle and provides the transfer pathway for drained wash water, blank water, and sample waste,

**Waste bottle** (not shown or supplied) receives drained wash water, blank water, and sample waste.

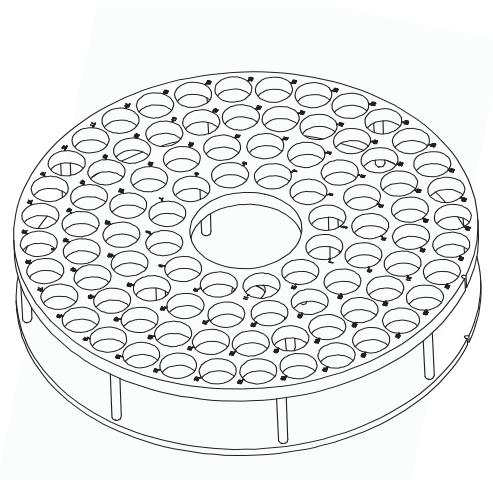


Figure 2.2. 88-place sample carousel

**Sample carousel** holds 88 samples and a wash container.

## Needle Drive Assembly

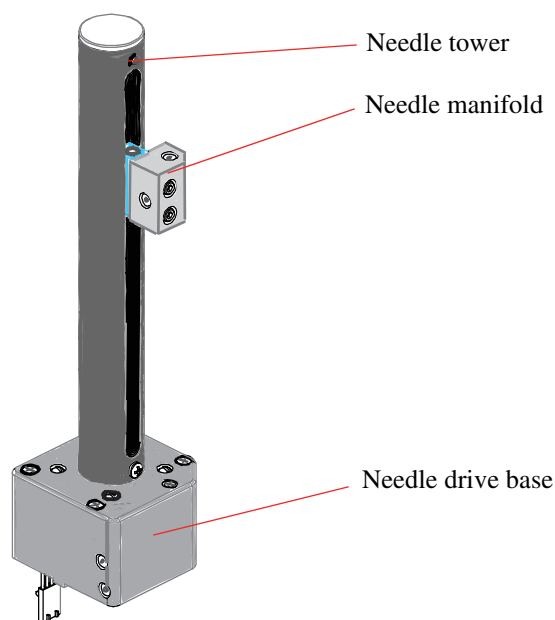


Figure 2.3. Needle drive assembly

**Needle drive motor** (not shown) is enclosed in the needle drive base and provides power to the needle drive assembly.

**Needle manifold** facilitates connecting the sample transfer and sleeve gas transfer lines to the needle drive assembly.

**Needle** (not shown) automatically lowers to draw sample out of the sample vials. The 1088 is equipped with a septum piercing needle and two needle sleeves.

**Needle drive base** is the base on which the needle drive assembly mounts.

## 1088 Autosampler Back Panel

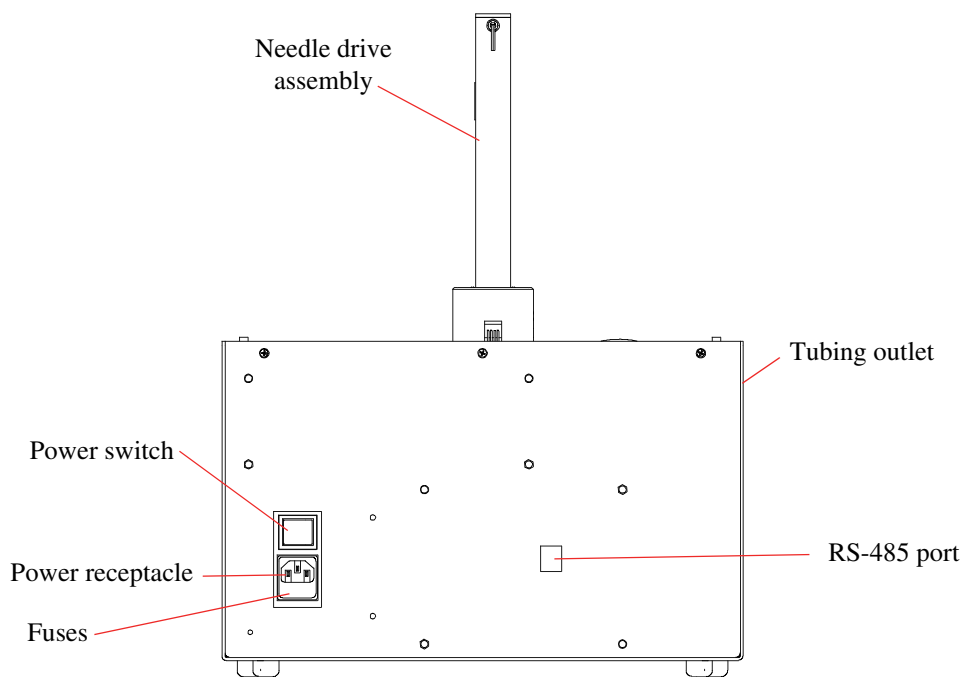


Figure 2.4. 1088 Rotary Autosampler back panel

**RS-485 port** connects the 1088 to the Aurora.

**Fuses** protect the 1088 from electrical damage. If replacing the fuses, use only 4 amp Slo-Blo<sup>®</sup> fuses.

**Needle drive assembly** holds, and raises and lowers the needle assembly.

**Power receptacle** receives the appropriate power cable provided in the startup kit, 115–230 VAC.

**Tubing outlet** provides an opening to route the wash and waste lines.



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## Chapter 3 Installation

This chapter describes basic installation procedures for connecting the 1088 Rotary Autosampler to the Aurora 1030 TOC Analyzer.

### Required Materials

The 1088 startup kit **does not** contain the waste bottle (>4 L capacity) required for installation.

### Unpacking and Positioning the 1088

Unpack the instrument(s) and check the items against the component list. If any damage appears, notify the carrier immediately. Save all packing materials until verifying proper component operation.

#### **WARNING:**

*Lifting Hazard: Single person lift could cause injury. Use assistance whenever moving or lifting. NEVER ATTEMPT TO LIFT OR MOVE A 1088 WHILE A 1030 IS DOCKED ON TOP; ALWAYS SEPARATE THEM BEFORE MOVING OR LIFTING!*

**NOTE:** Ship all instruments returning to OI Analytical for service or warranty repair in the instrument's original OI Analytical box with its packing materials. ***If instruments are damaged due to improper shipping, OI Analytical is not responsible for the cost of repairs.*** If no access exists to proper shipping materials, contact the OI Analytical Order Entry Department at (800) 336-1911 or (979) 690-1711.

Prepare the 1088 for installation using the following steps:

1. Remove any additional packing materials, as necessary, from the autosampler. Save all packing materials until verifying proper autosampler operation.
2. Turn off the TOC analyzer power, if applicable.
3. Align the Aurora's rubber feet with the white nylon screws on the autosampler platform to mount the Aurora on the 1088.
4. Position the wash and waste bottles behind and to the left of the autosampler to allow routing the wash and waste lines from the autosampler.

**NOTE:** Position the waste bottle so it is level with or lower than the 1088 to allow proper drainage.

## Electrical Connections

1. Connect the communications cable (PN 322310) to the COM port on the autosampler back panel. Connect the other end of the cable to one of the Aurora RS-485 ports on the back of the analyzer (Figure 3.1).
2. Plug the appropriate end of the autosampler power cord into the power receptacle on the autosampler back panel. Plug the other end into an appropriate 115–230 VAC grounded outlet.
3. Position the 1088/1030 so that the chassis air vents are not blocked and the power switch is easily accessible.

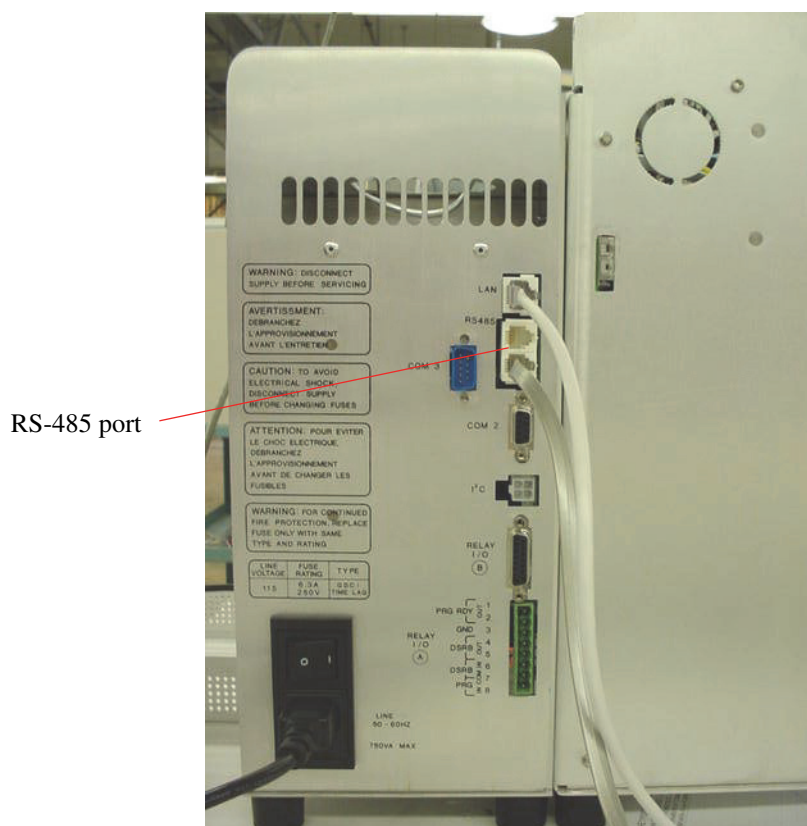


Figure 3.1. Aurora back panel electrical and communication connection ports

## Plumbing Connections

1. Verify the 1088 power is off.
2. Rinse the wash bottle with carbon-free reagent water to ensure cleanliness. Fill the wash bottle with carbon-free reagent water.
3. Route the clear silicone water line from the tubing outlet on the 1088 to the bottom of the wash bottle.
4. Route the red waste line from the tubing outlet on the 1088 to the waste bottle or appropriate drain.



5. Verify the needle is installed in the 1088. The 1088 ships with the septum piercing needle in place. If not installed, install the needle and appropriate sleeve (Chapter 5, “Replacing the Needle” on page 21 and “Replacing the Needle Sleeve” on page 21).
6. Connect the end of the sample transfer line (PN 321320) to the top port of the needle manifold.
7. Place the waste cup (PN 321290), found in the 1088 startup kit, in the center of the carousel.

### Septum Piercing or Pre-Acidification

Connect the Q/qy" tubing sleeve gas transfer line from the front panel of the Aurora to the side port of the needle manifold (see Figure 2.1, “1088 Rotary Autosampler docked with Aurora 1030 TOC Analyzer,” on page 5).

### Loading and Unloading the Carousel

Load or unload sample vials from the carousel using the following steps:

1. If running a sequence on the Aurora TOC Analyzer, press **Pause** before removing the carousel cover.
2. Remove the carousel cover and the carousel.
3. Remove the sample vials or insert new sample vials into the carousel.
4. Replace the carousel.

#### **WARNING:**

*As a safety feature, the 1088 does not function if the carousel cover is not in place. Do not attempt to perform any analyses without the carousel cover installed.*

#### **CAUTION:**

*Do not expose the carousel to ketones (acetone) or concentrated aromatics.*

5. Replace the carousel cover.

### Carousel Home Position

The 1088 Autosampler home position is vial holder 57. When the autosampler power is turned on, the autosampler automatically moves to the home position. A notch in the upper vial holder on the carousel is next to vial position 57. For operator safety, the autosampler shuts down and the sample needle raises when the carousel cover is removed. The carousel moves to the home position when the carousel cover is replaced.

If the autosampler does not move to the home position when the power is turned on, contact the OI Analytical Customer Support Center for help at (800) 336-1911 or (979) 690-1711.

### Starting the 1088

1. Install the carousel cover.
2. Turn on power to the Aurora and 1088.

**NOTE:** If installed on the Aurora, verify the Aurora passes the automatic selftest.





## Chapter 4 Operation

Configuration, operation, and maintenance of the 1088 occurs using the Aurora touchscreen. The Config button and Maint button access the pathways to configuring the 1088 to operate with the Aurora. See the *Model 1030C Operator's Manual* or the *Model 1030W Operator's Manual* for complete information.

### Operating with the Aurora

#### Configuration Parameters

1. Press **Config**. Press the **General** tab to display all configurations installed on the Aurora. A check mark inside a circle displayed on the icon designates the active configuration (Figure 4.1).

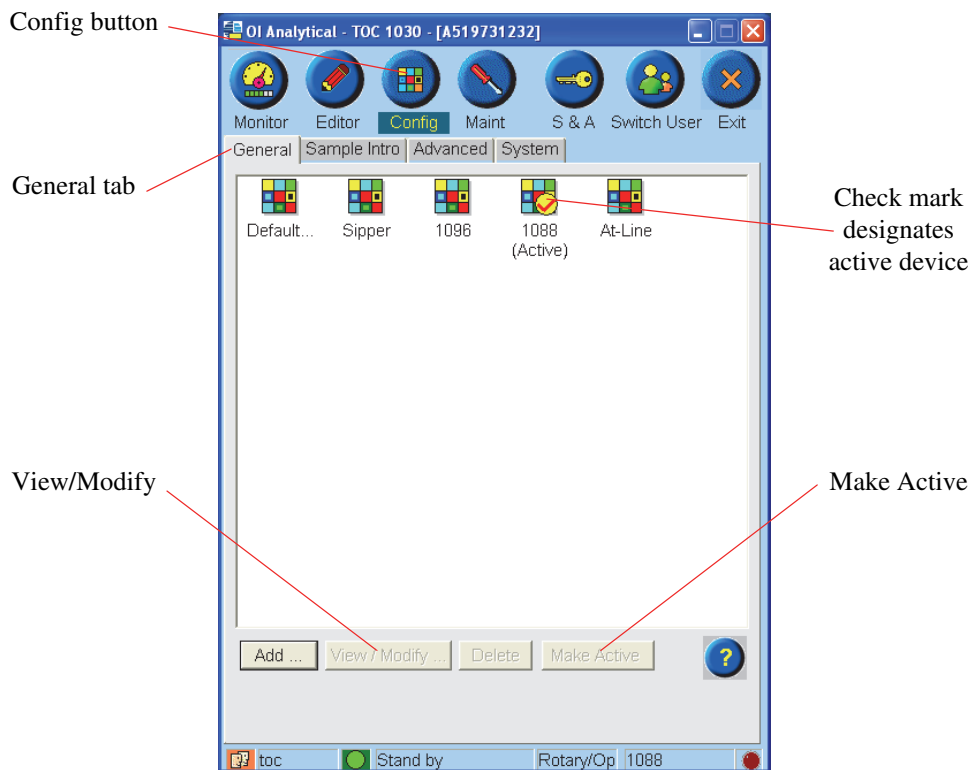


Figure 4.1. General configuration screen rotary autosampler active

2. Press **View/Modify...** at the bottom of the screen to view the current configuration of the device. The **Basic** tab appears.

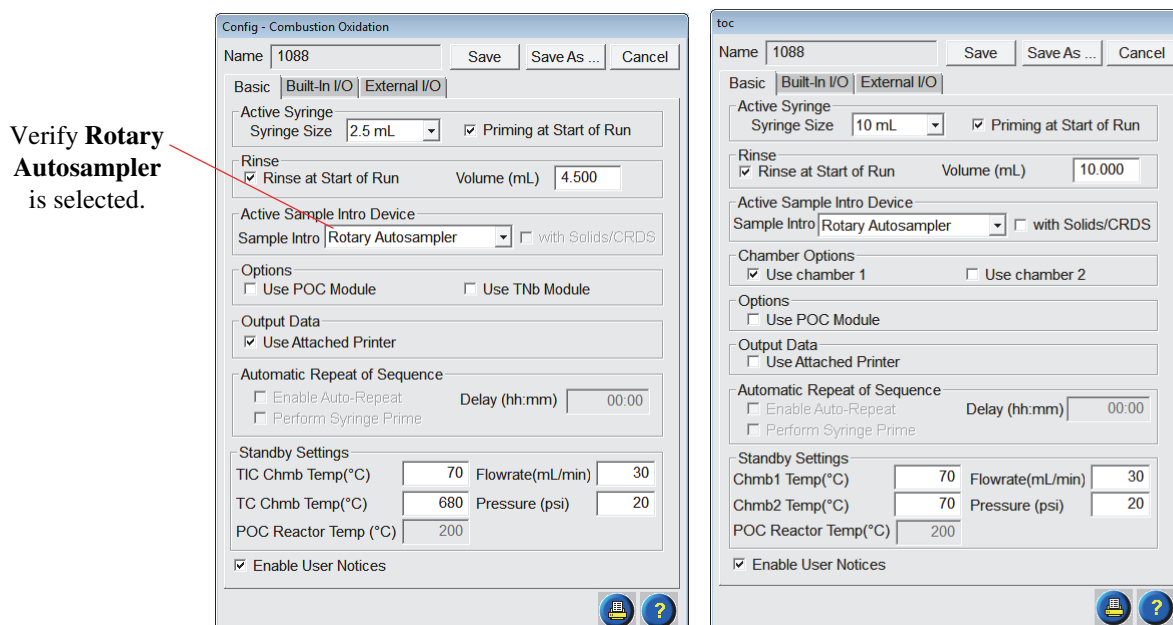


Figure 4.2. Basic tab Aurora 1030C, (left), and Aurora 1030W, (right), rotary autosampler configuration screens

**NOTE:** Verify the Active Sample Intro Device is set to **Rotary Autosampler** (Figure 4.2).

3. If a rotary autosampler configuration does not exist, add a new configuration using the following steps:
  - Open the Default configuration.
  - Select **Rotary Autosampler** for the Active Sample Intro Device.
  - Press **Save As...** and enter a new configuration name (i.e., Rotary sampler).
4. Select the rotary autosampler configuration by pressing its icon. Press **Make Active** at the bottom of the screen (Figure 4.1).
5. Press **View/Modify...** in the General tab to select or enter parameters for specific instrument configuration. See Chapter 4 of the *Aurora 1030C TOC Operator's Manual* or *Aurora 1030W TOC Operator's Manual* for complete information. Press **Save** to save the changes or **Cancel** to exit the screen without saving the changes and accept the default parameters.

## Programming Sampling Parameters

Press **Config**. Press the **Sample Intro** tab (Figure 4.3). Press the **Rotary Autosampler** icon to access more configuration parameters (Figure 4.4).

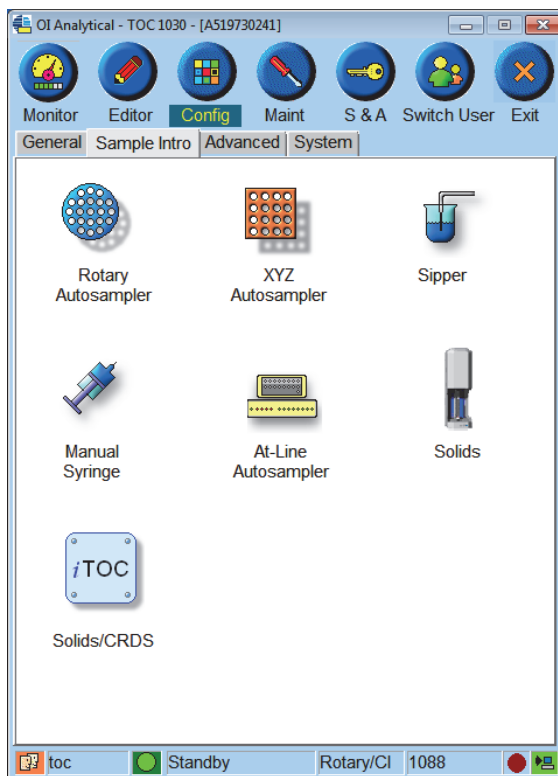


Figure 4.3. Sample Intro screen

The Config-Sample Intro-Rotary Autosampler dialog box appears (Figure 4.4).

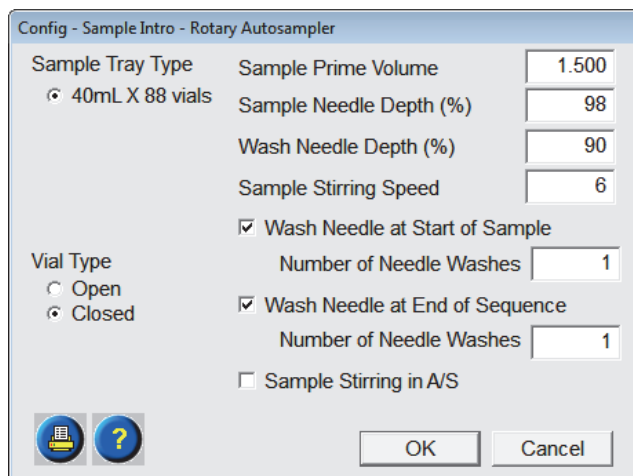


Figure 4.4. Config-Sample Intro-Rotary Autosampler dialog box

### Sample Tray Type

The default sample tray is 40 mL x 88.

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<b>Vial Type</b>	Select <b>Open</b> or <b>Closed</b> .
<b>Sample Inlet Volume</b>	Enter a volume from 0 to 10 mL. This value represents the volume of the needle and sample transfer line.
<b>Sample Needle Depth (%)</b>	<p>Enter a value from 0 to 100. A typical setting is 98. For example, if the depth is set to 98%, the needle lowers 98% into the vial.</p> <p>The user can optimize this value for the application. For example, if the sample is particulated and the user chooses to sample above the sediment, reduce the Sample Needle Depth. A depth of 70% is recommended for particulated samples to prevent large settled particles from clogging the needle.</p> <p>To maximize sample use, the Sample Needle Depth can be increased. However, the user must ensure the needle does not hit the bottom of the vial.</p>
<b>NOTE:</b>	Decreasing the needle depth decreases the number of replicates available from a vial.
<b>Wash Needle Depth (%)</b>	Enter a value from 0 to 100.
<b>Sample Stirring Speed</b>	Enter a value from 0 (off) to 6. Select a setting appropriate for the sample. Generally, higher viscosity samples or samples with particulates require slower stirring speeds.
<b>Wash Needle at Start of Sample</b>	Selecting this option washes the needle before each sample. Set the number of washes from 1 to 10.
<b>Wash Needle at End of Sequence</b>	Selecting this option washes the needle after the sample sequences completes. Set the number of washes from 1 to 10.
<b>Sample Stirring in A/S</b>	Selecting this option turns the stirring motor on for the sequence.

## Preparing the Carousel

### **WARNING:**

*As a safety feature, the needle does not lower without the carousel cover in place. Do not attempt to perform any analyses without the carousel cover installed.*

## Unloading and Reloading the Sample Tray

1. Place the Aurora in standby. See the *Model 1030W Operator's Manual* or *Model 1030C Operator's Manual* for more information.
2. Remove the carousel cover. The sample needle automatically raises.
3. Lift and remove the sample carousel.
4. Remove the sample vials or insert new sample vials into position.
5. Remove the wash/waste container from the 1088 startup kit and rinse with reagent water. Place the container in the wash station position.
6. Replace the sample carousel by rotating it until it drops on the locating pin.
7. Replace the carousel cover.

## Using Sequences

The Aurora uses sequences to automate sample runs when working with the 1088. Create, view, and edit sequences from the Sequence Editor screen. Make a sequence active from the Active Sequence screen. See the *Model 1030W Operator's Manual* or *Model 1030C Operator's Manual* for more information.







## Chapter 5 Maintenance

The 1088 Rotary Autosampler requires very little maintenance other than cleaning and routine part replacements. This chapter describes cleaning, replacing, and other general maintenance procedures for the needle drive assembly and sample line.

### Maintenance Dialog Box

The Maintenance dialog box directly controls 1088 key functions for testing and diagnostic purposes. Press **Maint** to access the Maintenance screen. Press the **Rotary Autosampler** icon to access the Rotary Autosampler maintenance functions and view status indicators (Figure 5.1).

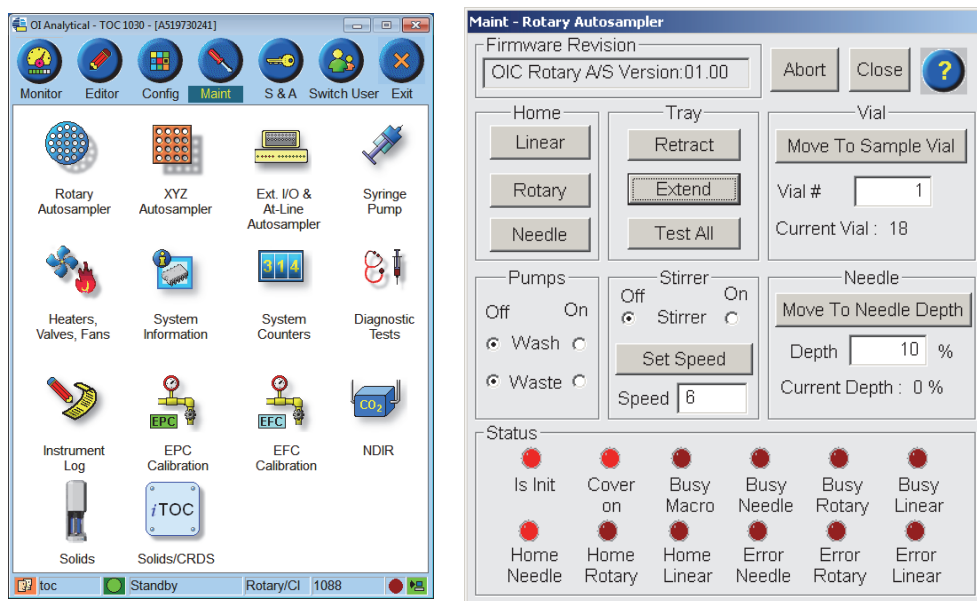


Figure 5.1. Aurora Maintenance screen (left), Maint-Rotary Autosampler screen (right)

<b>Home</b>	Allows the operator to home the Linear, Rotary, or Needle movements.
<b>Tray</b>	Allows the operator to Retract, Extend, and Test All.
<b>Vial</b>	Displays the Current Vial position and allows the operator to change the Vial number (#).
<b>Pumps</b>	Allows the operator to turn the Wash and Waste pumps Off or On.
<b>Stirrer</b>	Allows the operator to turn sample stirring Off or On and Set Speed.
<b>Needle</b>	Allows the operator to test the needle depth.
<b>Status</b>	Displays with red indicator lights on or off.

Press **Abort** or **Close** to exit the screen.

## Replacement Procedures

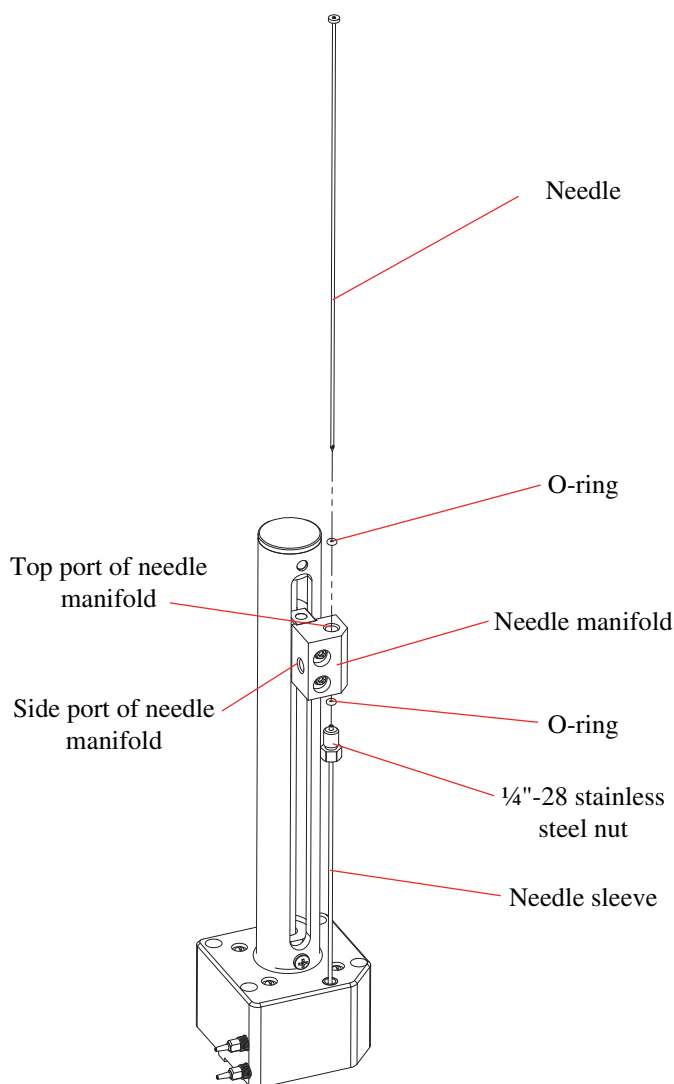


Figure 5.2. Needle drive assembly

### Replacing the Sample Transfer Line

Replace the sample transfer line (PN 321320) only if it becomes damaged or contaminated.

1. Loosen and remove the Q/i" fitting nut from the top port of the needle manifold.
2. Loosen and remove the Q/i" fitting nut on the other end of the sample transfer line, which connects to the Aurora front panel.
3. Install the new sample line by performing the above steps in reverse order.
4. Fingertighten the fitting.

---

## Replacing the Needle

Replace the needle (PN 321323) if it becomes clogged, damaged, or too dull (septum piercing) to perform analysis.

1. Remove the sample transfer line (PN 321320). See “Replacing the Sample Transfer Line” on page 18.
2. Remove the needle out through the top port of the needle manifold. Ensure the needle’s O-ring is also removed.
3. Slide the replacement needle with O-ring through the top port of the needle manifold.
4. Reattach the sample transfer line (PN 321320).

## Replacing the Needle Sleeve

Convert from closed vial (septum piercing) to open vial sampling or vice versa by changing the needle sleeve. For closed vial, septum piercing applications, use the short needle sleeve (PN 321322). For open vial applications, use the long needle sleeve (PN 321321). Also, replace the needle sleeve if it becomes clogged or damaged.

1. Remove the sample transfer line (PN 321320). See “Replacing the Sample Transfer Line” on page 18.
2. Slide the needle out through the top port of the needle manifold.
3. Loosen the needle sleeve’s ¼-28" stainless steel nut attached to the bottom port of the needle manifold.
4. Remove the needle sleeve and O-ring from the manifold.
5. Attach the new needle sleeve and O-ring by screwing in the ¼-28" stainless steel nut onto the bottom port of the needle manifold. Fingertighten the fitting. Use a wrench to tighten ¼-turn beyond fingertight.

**NOTE:** Do not overtighten the tube nut, or the needle sleeve may collapse around the needle.

6. Replace the needle through the top port of the needle manifold. Ensure the needle’s O-ring is in place.
7. Reattach the sample transfer line.

## Cleaning the Wash Bottle

Clean the wash bottle by rinsing thoroughly with reagent water.





## Chapter 6 Troubleshooting

This chapter lists problems that might occur during normal operation of the 1088 Autosampler, along with possible solutions. Any maintenance that involves the interior components of the 1088 Autosampler should be performed by OI Analytical trained technical support personnel only. If a problem still exists after reviewing the following chart, or if it is not addressed, contact the OI Analytical Customer Support Center for assistance at (800) 336-1911 or (979) 690-1711.

**WARNING:**

*To reduce the risk of electrical shock, do not remove the 1088 Autosampler back cover. No user-serviceable parts are located inside. Refer servicing to qualified OI Analytical Customer Support personnel.*

Table 6.1. 1088 Rotary Autosampler troubleshooting chart

Symptom	Probable Cause	Corrective Action
Unit does not respond	Unit not connected to an electrical outlet	Connect the power cord.
	Blown fuse	Replace the fuse.
	Interface cable not connected	Connect the interface cable.
	Faulty power supply	Call the OI Analytical Customer Support Center.
Communications lost between the 1088 and Aurora	Interface cable not connected	Connect the interface cable.
Samples not extracted from vials or the wash station	Leak	Perform the Aurora leak test.
	Clogged needle	Clean or replace the needle.
	Sample transfer and sleeve gas transfer lines reversed	Switch the lines.
Sample leaks from the needle to the top of the sample vial	Leak	Check for loose connections between the interface tube and the Aurora.
Slow sample transfer to the Aurora	Leak	Perform the Aurora leak test.
Rinses not performed	Rinses turned off	Check configuration settings.

Table 6.1. 1088 Rotary Autosampler troubleshooting chart

Symptom	Probable Cause	Corrective Action
Needle assembly not lowering to pierce the vial	Carousel cover off or interlock switch interrupted	Replace the carousel cover.
Carousel advances to unwanted positions	Wrong “start” sample position configured	Check configuration settings.
Needle not piercing the septum center	Bent needle	Replace the needle.
	Carousel needs calibration	Call the OI Analytical Customer Support Center.
One of the following warning screens appears: “Tray changed. . . Recalibrate” or “Autosampler is not calibrated.”	Carousel needs calibration	Call the OI Analytical Customer Support Center.
Needle remains in wash or waste station without raising	Carousel cover off	Replace the carousel cover.
Carousel wobbles	Carousel not seated properly	Manually rotate the carousel until it drops into position with the carousel alignment notch.



## Chapter 7 Replacement Parts

Product	Unit	PN
Cable, RS-485, 6 conductor, 61 cm (2 feet)	each	322310
Cap assembly for wash bottle	each	323585
Caps, open hole, for 40-mL VOA vials	72/pk	296079
Chassis cover, clear	each	321374
Connector, gray, nipple w/ ¼	each	A001264
Ferrule, Tefzel®, Q/i" flangeless	each	317545
Fitting nut, PEEK®, Q/r-28, Q/i" blue flangeless	each	319345
Fuse, 4 A, 5 x 20 mm, 250 V, Slo-Blo	each	291211
Manifold, needle, tower assembly	each	321319
Needle drive assembly	each	321238
Needle sleeve, short	each	321322
Needle sleeve, long	each	321321
Needle wash dual pump assembly	each	321375
Needle	each	321323
O-ring, 0.0705 I.D. x 0.070 thick x 0.2 O.D., Viton	each	A001266
O-ring, for needle assembly and sleeve	5/pk	323416
PCF, 1088 Autosampler control	each	323176
Power cord, 125 V, 10 A, North America	each	116038
Power supply, 12 VDC	each	320593
Rotary stage assembly	each	321347
Septa, Teflon faced, for 40-mL VOA vials	50/pk	173211
Septa, Teflon faced, for 40-mL VOA vials	100/pk	258566
Startup kit	each	321263
Stir bar, Teflon	5/pk	314013
Tray assembly	each	321260
Tube assembly, sample transfer	each	321320
Tube assembly, sleeve gas	each	323599
Tubing, silicone, ¼" x Q/i" I.D., clear	foot	179085
Tubing, TFE, Q/i", 0.062 I.D., blue	foot	319607

Product	Unit	PN
Tubing, urethane, Q/i" x Q/qy" I.D., clear	foot	166224
Vial, 40 mL, Low TOC w/ caps and septa	80/case	325272
Vial, 40 mL, VOA, with caps and septa	72/case	296053
Wash bottle, 1 L	each	322444
Waste cup	each	321290



P.O. Box 9010  
College Station, TX 77842-9010  
Tel: (979) 690-1711 • FAX: (979) 690-0440 • [www.oico.com](http://www.oico.com)