# Sample Cooler Option

# Installation and Maintenance Guide

**For Use With the Model 4551/4551A Vial Autosampler**

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Revision 2.0 — June 2000

OI Analytical Part #263350

Printed in the U.S.A.
Publication 05230600

# Introduction

The Sample Cooler Option for the Model 4551/4551A Vial Autosampler lowers the sample temperature inside the autosampler down to approximately 3°C. The main components are a Model 4551/4551A with insulation and cutouts for airflow, a heat exchanger, and a refrigerated recirculating bath (chiller). (The standard chiller with the Sample Cooler Option is the Caron Model 2050; however, others with similar capacity may be used.)

# Installation

To install the heat exchanger on a Model 4551/4551A built for the Sample Cooler Option:

1. Remove the Model 4551/4551A carousel cover and sample carousel.

2. Mount the heat exchanger to the left side of the Model 4551/4551A with the three 11/32" flanged hex nuts (Part #257295) on the outside and the three #8-32 x ½" socket-head cap screws (Part #112391) on the inside. (The ball-end wrench in the start-up kit is recommended for turning the cap screws.) Hold the heat exchanger in place until all screws are attached. Do not leave it unsupported on the studs protruding from the Model 4551/4551A chassis.

3. Attach the coolant lines from the heat exchanger to the chiller. With a Caron chiller, push the fitting on the end of the heat exchanger coolant lines into the quick-connect latches on the chiller. (Other brands of chillers may require different fittings, not included. )

**Note:** For optimum circulation, attach the coolant line from the lower part of the heat exchanger to the chiller outlet. Attach the coolant line from the upper part of the heat exchanger to the chiller inlet.

The heat exchanger coolant lines are 9/16" O.D. x 3/8" I.D. x 6 ft. (Coolant lines may be extended; however, this may result in additional heat gain.) The chiller can be placed next to the Model 4551/4551A or underneath a standard laboratory bench to save benchspace.

4. Remove the white thermometer (Part #261701) from the box. Keeping the temperature probe straight, insert the temperature probe into the hole in the back of the sample cooler box. When the probe is in the proper position, a seal should be created between the probe and rubber grommet.

**Note:** The hole in the heat exchanger is aligned with the hole in the back of the sample cooler box. If the probe is not inserted straight, it will not measure the temperature inside the heat exchanger. Verify that the temperature probe is in straight and inserted into the heat exchanger within the sample cooler box.

This will monitor the temperature of airflow from the heat exchanger into the Model 4551/4551A chassis. Set the thermometer display/readout in a convenient location, such as on top of the heat exchanger. (If the thermometer is not installed or is later removed, plug and seal the hole in the heat exchanger to prevent air exchange through the hole.)

5. Route the latex tubing from the bottom of the heat exchanger to a collection vessel (not included). The tubing should be at a continual downslope for adequate drainage from the heat exchanger. Check the water level in the collection vessel regularly as drainage amounts can vary.

6. Connect the power cord (Part # 116038 for North America 110 VAC (±10%)) to the back of the heat exchanger and to an appropriate power supply. Connect the chiller power cord to an appropriate power supply.

7. Replace the sample carousel and the insulated carousel cover included with the Sampler Cooler Option.

# Operation

The Sample Cooler Option is designed for an environment with a dew point of 10°C (50°F) or less (see Figure 1). Operation in a dew point higher than 10°C may result in condensation on the instrument. Condensation will not affect temperature differentials, explained below, or instrument performance.

Moisture should not gather inside the vial chamber if the carousel cover is replaced within a few minutes of removal. Moisture inside the heat exchanger collects at the bottom of the box and drains to a collection vessel (not included) via the latex tubing attached to the hose barb at the bottom of the heat exchanger. The tubing should be at a continual downslope for adequate drainage.

Because of heat gain between the chiller and the vials (see Figure 2), set the chiller to 0°C to obtain a 4°C sample temperature. From room temperature, it will take the chiller approximately three hours to reach steady state; if the chiller is already cold, it will take approximately one hour. With a chiller temperature of 0°C, the thermometer (from the temperature probe) should read 3°C to achieve a sample temperature of 4°C. Ambient temperature changes can cause up to 0.2°C change on the thermometer. (The Caron 2050 will not be able to achieve a bath temperature much lower than -1.5°C, regardless of the temperature it is set for, if it is connected to the heat exchanger and the fans are on.)

Always operate the instrument with the carousel cover in place.

Given the temperature and humidity, this graph determines the temperature at which dew will form.

1. Locate the correct RELATIVE HUMIDITY line.

2. Find the point where the RELATIVE HUMIDITY and the horizontal AIR TEMPERATURE lines intersect.

3. Draw a vertical line from the intersection, down to the axis marked DEW POINT TEMPERATURE and read the temperature at which dew will appear.

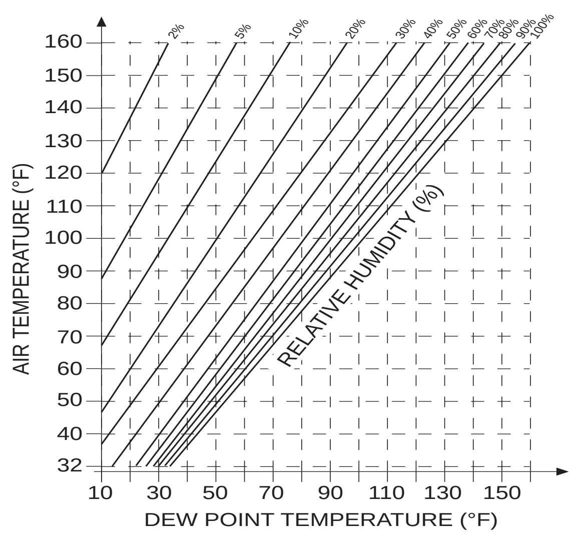


Figure 1. Dew Point Graph in °F

1. Turn on the chiller and the heat exchanger.

2. Set the chiller temperature (see above and Figure 2 for heat gain information).

The chiller and heat exchanger can operate continuously and do not need to be turned off for short periods.

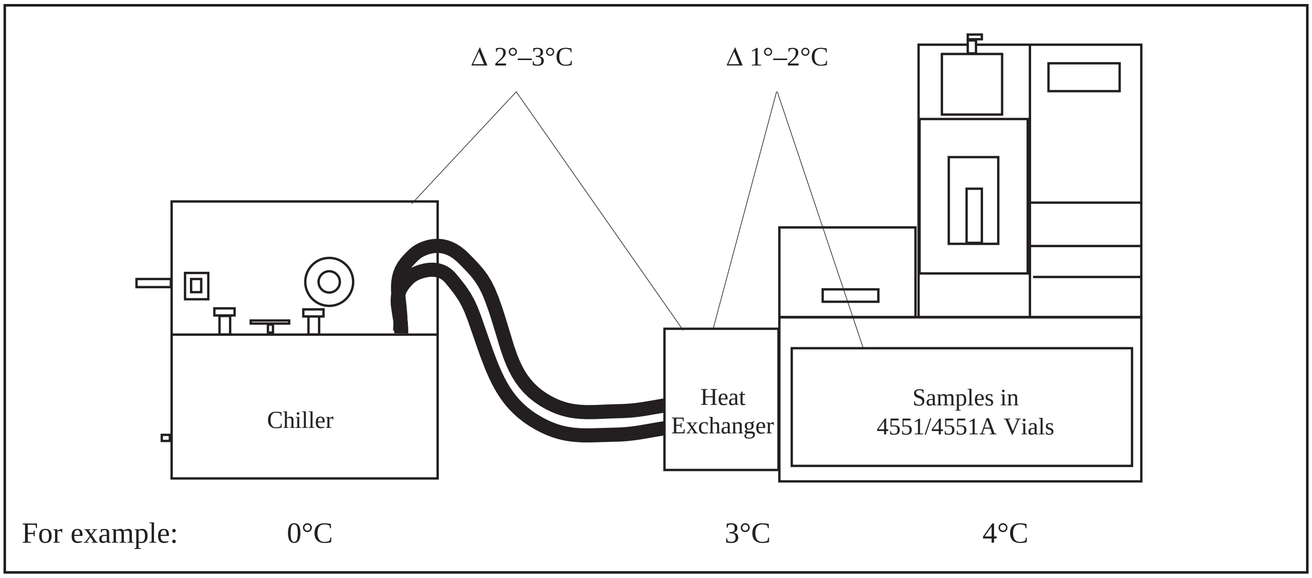


Figure 2.  Diagram of Heat Gain Between the Chiller, Heat Exchanger, and Samples

# Maintenance

## Heat Exchanger Fan Maintenance

Temperature changes shown on the thermometer from the temperature probe, without changes in ambient temperature, may indicate that a fan has stopped running. A drop of about 0.2°C after steady state has been achieved may indicate that the back fan has failed. A rise of about 1.1°C after steady state has been achieved may indicate that the front fan has failed.

***CAUTION:*** Use care to avoid the fans when they are running; the fan blades are metal.

Remove the carousel cover and sample carousel, and look through the vent to verify that the fans are running.

## Chiller Bath Maintenance

Follow the maintenance procedures in the chiller manual. The Caron Model 2050 Instruction Manual, included with the chiller, lists instructions for cleaning the bath and the refrigeration unit.

***CAUTION:*** Any maintenance not included in this document should be performed only by an authorized OI Analytical service representative.

The coolant level inside the chiller bath reservoir will rise as ambient moisture enters the reservoir. Periodically check the coolant level to avoid coolant overflow.

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